



# **Technical Report**

## **Resource Estimate for Lithium & Potassium**

### **Sal de los Angeles Project**

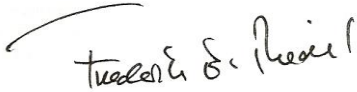
Prepared by: Frits Reidel, CPG

Effective Date: August 29, 2016



## DATE AND SIGNATURE PAGE

This report titled "Technical Report: Resource Estimate for Lithium and Potassium; Sal de los Angeles Project, Salta, Argentina, dated August 29, 2016 was prepared and signed by the following author:



**(Signed & Sealed) "Frederik Reidel"**

Dated at Santiago, Chile  
August 29, 2016

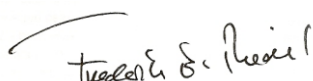
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## Qualified person Frederik Reidel

I, Frederik Reidel, CPG, as author of this report entitled "NI 43-101 Technical Report: Resource Estimate for Lithium and Potassium, Sal de los Angeles Project, Salta Argentina, prepared for Lithium X Energy Corporation, dated August 29, 2016 do hereby certify that:

1. I am employed as Principal Hydrogeologist and General Manager by FloSolutions-Chile, residing at: Los Refugios 19000, P32 Santiago, Chile.
2. I am a graduate of New Mexico Institute of Mining and Technology with a Bachelors of Science Degree in Geophysics, 1986
3. I am registered a Certified Professional Geologist (#11454) with the American Institute of Professional Geologists
4. I have worked as hydrogeologist for a total of 29 years since my graduation. My relevant experience for the purpose of the Technical Report is:
  - Qualified Person and Member of the technical committees of Li3 Energy Ltd and Minera Salar Blanco for the development of the Maricunga Lithium Project in Chile (2011 – to date).
  - Co-author of the NI 43-101 Technical Report on the lithium and potash resources in Salar de Maricunga for Li3 Energy Ltd (2012).
  - Evaluation of lithium and potash resources in Salar de Olaroz for Orocobre Ltd. in support of the project's DFS and NI 43-101 Technical Report (2010-2011).
  - Evaluation of lithium and potash resources in Salar de Cauchari for Lithium Americas Corporation; NI 43-101 Technical Report preparation; member of the company's Technical Advisory Panel (2009-2010).
  - Evaluation of brine resources in Salar de Hombre Muerto for FMC (1992-1993)
  - Consulting hydrogeologist in the evaluation and development of groundwater resources for international mining companies in North- and South America.(1989-2012).
5. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
6. I have visited the Sal de los Angeles Project and had meetings with management of Lithium X Energy Corporation in Salta between August 15 and 19, 2016.
7. I have had no prior involvement with the property and LiX Energy Corporation.
8. I am responsible for the overall preparation of this report.
9. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
10. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.
11. To the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Dated this 29<sup>th</sup> day of August, 2016



Frederik Reidel, CPG

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# 1 SUMMARY

The Sal de los Angeles Project, that covers the vast majority of Salar de Diablillos, is an advanced exploration stage brine project that is characterized by elevated lithium, potassium, and boron hosted in a high altitude salar, or evaporitic basin. On March 3, 2016 Lithium X Energy Corporation (TSX.V: LIX) (LiX) entered into an agreement with Aberdeen International Inc (TSX: AAB) to acquire up to 80% of Potasio y Litio de Argentina (PLASA), which owns 100% of the Sal de los Angeles Project. The company intends to develop the project from resource through to feasibility using a combination of extraction wells and surface ponds to produce concentrated brine. The first step, which is the subject of this technical report, is to integrate historical brine geochemical analyses with historical and more recent hydrogeologic data in order to provide an updated mineral resource estimate. Recommendations for advancing the project are also included as part of this technical report.

## 1.1 Property Description and Ownership

The Sal de los Angeles property is located in the Puna region of northwest Argentina, approximately 145 km southwest of the city of Salta, a few kilometers north of the border between the Provinces of Salta and Catamarca, Argentina. The property area lies entirely within the Province of Salta. Centroid coordinates for the Project are approximately 726,800 E and 7,206,050 N (Universal Transverse Mercator (UTM) system, WGS84 Zone 19 South).

Verification of the land titles and mining rights purchased by Rodinia through its wholly owned subsidiary Potasio y Litio Argentina S.A.(PLASA), and previously owned by Borax Argentina and private land owners, was conducted by Mr. Ignacio Frezze Durand of Perez Alsina Frezze Durand, an independent Argentine legal counsel firm. Mr. Frezze documented his legal opinion in the March 15, 2016 letter and concluded the following:

- Mining rights and assets transferred to Rodinia and/or PLASA with respect to the Salar de Diablillos, properties by Héctor Vittone, Mario Moncholi and Colorado S.A., and Borax Argentina S.A. are valid, and confirm the assigners' property on the mines and mining rights as assigned.
- The certificates also confirm that the mining canon has been duly paid (through the first semester of 2016)

On December 29, 2015, Rodinia sold 100% of PLASA and the rights to the Salar de Diablillos to Aberdeen International, Inc. (Aberdeen). On March 3, 2016, Aberdeen sold the rights to earn an 80% interest in the project to LiX who renamed the project Sal de los Angeles.

The Sal de los Angeles property consists of 32 mining concessions covering 8,186.5 hectares of Salar de Diablillos evaporitic basin. PLASA maintains active mining and exploration permits for Salar de Diablillos. There is no other owner or operator with mining or exploitation rights within the brine resource area. PLASA intends to conduct brine extraction and concentration activities at the salar.

## 1.2 Physiography, Climate, and Access

The Salar de Diablillos is characterized by broad valleys separating mountain ranges that extend south from Peru and Bolivia and into northern Chile and northwestern Argentina. The region exhibits large plateaus averaging 3,500 masl surrounded by mountain ranges with heights exceeding 6,000 masl. The

average elevation in the project area is approximately 4,000 masl, with the nearby volcanic mountains exceeding that elevation by several hundred meters. The Salar is located east of Ratones Hill, at an altitude of 4,000 masl.

Within the Argentine Puna region the climate is extremely dry and arid, with little or no annual rainfall. During the winter season (July and August), temperatures average between 8°C to 10°C during the daytime and -5°C to -8°C during the night, but exhibit large daily variations commonly reaching -25°C and 15°C within 24 hours. During the summer months (December to February) temperatures average between 25°C to 30°C during the daytime and around freezing during the night. Strong northwest and west winds in excess of 45 km/h are common in the area, particularly during the winter and spring seasons. At nearby Salar de Hombre Muerto, rainfall is reported to average 60 to 80 mm/year. The majority of the precipitation occurs during the months of January through March. The Freshwater Pan and Brine Pan annual evaporation rates have been estimated to equal approximately 2,005 and 1,305 mm/yr, respectively with a Net Brine Pond Evaporation rate around 860 mm/yr.

The Project property is accessible from the city of Salta through the town of San Antonio de Los Cobres via National Highway 51, and then through a secondary gravel road (all-weather provincial Route 129) via the town of Santa Rosa de Los Pastos Grandes. By road the distance from Salta to the property is approximately 320 km, which is a driving time of six to seven hours. Exploration activities have been conducted throughout the year, and it is expected that future exploitation operations can be conducted year-round. Exceptions may occur in the latter half of January and early February, when summer rains may complicate access to certain portions of the salar.

### 1.3 History

The bulk of the exploration work was completed by Rodinia Lithium between 2009 and 2015, and included:

- Surface sampling: brine samples were collected from 140 shallow auger wells regularly distributed on the surface of the Salar at approximately 300 m by 300 m spacing;
- Geophysical surveys: gravity survey consisting of ten lines and seismic survey consisting of 52 km of seismic tomography profiles to model basement depth covering most of the Project;
- Reverse circulation (RC) drilling program: 21 RC drill holes were completed to develop vertical profiles of brine chemistry and to provide geological and hydrogeological data at depth in the salar;
- Down-hole geophysical surveys and brine flow monitoring during drilling and during the flow of the artesian well;
- Diamond drilling (DD) program: 7 diamond drill holes were drilled to help evaluate aquifer geology and matrix material, obtain limited brine chemistry data, and samples for relative brine release capacity (RBRC) analyses;
- Short term pumping tests to characterize subsurface hydraulic properties; and
- Pilot Pools: on-site pilot pools were constructed and operated for metallurgical processing investigations

- In 2010 Rodinia retained AMEC International Ingeniería y Construcción Limitada of Chile to prepare a NI 43-101 Technical Report for a brine resource estimate using data gathered from the first 16 reverse circulation drill holes, downhole geophysical surveys and the gravity survey. This resource assessment was published January 21, 2011.
- A follow-up NI 43-101 Preliminary Economic Assessment was completed by SRK Consulting (U.S.), Inc. on December 22, 2011.

## 1.4 Geology and Mineralization

The basement of the salar consists of rocks of the Rio Blanco Precambrian metamorphic complex. Extensive alluvial plains ascend to the north and south. The endorheic basin covers an area of 416 km<sup>2</sup>, from which 33 km<sup>2</sup> corresponds to the evaporitic salar environment. The salar has a thin salt efflorescence crust covering a layer of borate ulexite on some salar surfaces. Towards the edges, this crust graduates to a more clastic facies.

The stratigraphy of the Salar consists of an upper unit (Unit 1) to a depth of 4 m with a silt and clay dominant lithology and some minor sands. Underlying Unit 2 consists primarily of stratified fine to medium sands with occasional coarser sands and gravels; clay and silts occur as secondary lithologies. The lithology of Unit 3, which generally underlies Unit 2 and continues to basement, is similar to Unit 2; but with an increase in fine to coarse grained gravels; clays and silts again occur as secondary lithologies.

The analysis of pumping test and RBRC information provided by LiX suggest that the specific yield (or drainable porosity) for Unit 1 ranges between 2% and 4%. The specific yield for Unit 2 and 3 range from 9% to 29% and average at 15%.

The hydrothermal fluids that are inferred to be the source of boron to the basins have been associated with correlative levels of lithium and potassium. Examples of this are Cauchari, Ratones and Diablillos salars which exhibit high concentrations and distribution of borate minerals as well as high concentrations of lithium in sub-surface brines.

The Salar de Diablillos contains near surface borate mineralization, predominantly in the form of ulexite. The areal distribution of borates within the salar is irregular and is thought to be related to the location of the hot springs from which they are derived. In Diablillos remains of ancient hot spring deposits have been identified so that the predominant hypothesis is that their genesis is directly related to the supply of hot boron-bearing water from vents at the margins and/or interior of the depressions. These hydrothermal fluids rose through fracture planes that structurally control the depressions during periods of relaxation, or within extensional periods in the predominantly compressive regional tectonics. The range and average concentrations of analytes used to characterize the brine resource are summarized in **Table 1.1**. The data was compiled from 296 primary samples that were submitted for chemical analysis.

**Table 1.1** show the range and average concentrations of elements in Salar de Diablillos based on the analyses carried out on the brine samples collected during the DD and RC drilling program.

**Table 1.1 Summary of Sal de los Angeles Project brine composition**

Analyte	HCO <sub>3</sub>	B	Ca	Cl	Li	Mg	K	Si	Na	Sr	SO <sub>4</sub>	Density
Units	mg/L as CaCO <sub>3</sub>	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	g/cm <sup>3</sup>
Maximum	2,800	980	2,500	150,000	810	3,400	9,300	35	78,000	30	14,000	1.18
Average	1,580	580	770	79,100	490	1,850	5,400	9	44,600	15	7,150	1.10
Minimum	150	2	40	50	0.3	10	20	2	100	0.2	48	1.00

## 1.5 Status of Exploration, Development and Operations

The Project is currently in development with further definition of the mineral resource and assessment of the metallurgical test work to define the process flow sheet and project economics.

## 1.6 Sample Preparation, Analyses and Security

The authors were not present during the sample preparation, analysis, and security described as part of this section, and no additional sampling has been completed by the authors. Therefore, confirmation and verification cannot be completed, and the authors are taking the provided information as fact and are reliant on past reporting. Information has been provided to the authors from Lithium X or reproduced from published technical reports and memoranda.

## 1.7 Data Verification

The preponderance of the data has been verified as part of the original resource assessment that was completed by AMEC during 2011. However, additional samples of brine and core materials for RBRC testing were collected and analyzed after publication of the original resource assessment. To account for additional brine geochemistry data that has been collected an updated data verification has been completed by the authors to support this resource assessment; no deviations were identified that would affect the resource estimation and the data was observed to be sound to the best of our abilities. Specifics related to the RBRC testing could not be verified as the authors of this report were not involved with this aspect of the program. The authors recommend that slight operational adjustments and additional steps should be taken in the future to improve upon the QAQC procedures that were employed for both the brine geochemical and RBRC analyses.

## 1.8 Mineral Resource Estimate

The mineral resource estimate was determined by defining the aquifer geometry, the specific yield (Sy) of the hydrogeological units in the salar, and the concentration of the elements of economic interest, mainly Li, K, and B. Resources were defined as the product of the first three parameters.

The model resource estimate is limited to the LiX mining concessions in Salar de Diablillos that cover an area of 8.186.5 ha. Additionally, the resource model domain is constrained by the following factors:

- The top of the model coincides with brine level in the Salar that was measured in a number of boreholes and monitoring wells historically and during the authors' site visit.
- The boundaries of the model domain in the north and south were limited by data availability and cutoff approximately 2 km away from the northern and southern most data points. The western and eastern boundaries of the model domain either coincide with claim boundaries or with the physical Salar boundary in areas where the claim boundaries fall outside of the nucleus of the Salar.
- The bottom of the model domain coincides with the bedrock contact. The bedrock surface was defined by RC and DD drilling intercepts and further refined by the seismic tomography data.

The specific yield values used to develop the indicated resource are based on results of the logging and hydrogeological interpretation of chip samples and recovered core of 11 RC boreholes and 7 DD boreholes, results of 7 RBRC tests on undisturbed core samples, and two pumping tests. The boreholes are appropriately spaced at a borehole density of one bore per 1.3 km<sup>2</sup>

The specific yield values used to develop the inferred resource are based on results of the logging and hydrogeological interpretation of chip samples and recovered core of 10 RC boreholes and their correlation with the results of the 7 RBRC tests, and the two pumping tests. The boreholes within the inferred resource are appropriately spaced at a borehole density of one bore per 2.9 km<sup>2</sup>.

The distributions of lithium, potassium and boron concentrations in the model domain are based on a total of 353 brine analyses (including QA/QC analyses).

The resource estimate was developed using SgeMS software. Dr. Gregoire Mariethoz, Professor at the University of Lausanne, Switzerland led the numerical model effort to develop the resource estimate. The author was in close communication with Dr. Mariethoz throughout the model development process; all results have been reviewed and checked at various stages and are believed to valid and appropriate for these resource estimates.

**Table 1.2 Indicated and inferred resources for the Sal de los Angeles project, August 29, 2016 (lithium cut-off concentration of 100 mg/L applied)**

	Indicated			Inferred		
	Li	K	B	Li	K	B
Aquifer area (km <sup>2</sup> )	22.2			32.4		
Aquifer volume (km <sup>3</sup> )	3.195			3.807		
Mean specific yield	0.122			0.120		
Brine volume (km <sup>3</sup> )	0.390			0.457		
Mean grade (g/m <sup>3</sup> )	60.8	668.5	67.6	49.3	539.0	60.7
Concentration (mg/L)	501	5,512	556	410	4,489	505
<b>Resource (tonnes)</b>	<b>194,860</b>	<b>2,143,491</b>	<b>216,807</b>	<b>189,130</b>	<b>2,068,161</b>	<b>232,601</b>

Notes:

1. CIM definitions were followed for Mineral Resources.
2. The Qualified Person for this Mineral Resource estimate is Frits Reidel, CPG
3. The Qualified Person relied entirely on data provided by Lithium X Energy Corporation for the preparation of the resource estimate and no independent data collection was carried out to verify the accuracy of the data provided.
4. A lithium cut-off concentration of 100 mg/L has been applied to the resource estimate
5. Numbers may not add due to rounding
6. The effective date is August 29, 2016.

## 1.9 Conclusions and Recommendations

Based on the review and analyses of the results of the exploration work carried out on the Sal de los Angeles Project the following concluding statements are prepared:

- The entire Salar and a portion of the northern slope has been covered by exploratory drilling on an approximate 1.5 km by 1.5 km grid;
- The results of the drilling of 21 reverse circulation drill holes and seven diamond drillholes identify distinct brine composition and grade at specific depth intervals, showing a relatively uniform distribution of lithium bearing brines throughout the basin;
- The lithium bearing brine appear to contain sufficient levels of lithium, potassium and boron to be potentially economic for development;
- The geometry of the Salar has been defined by the combination of drilling and geophysical surveys. The bedrock contact below the salar deposits has been defined by drilling intercepts and the seismic survey. Total thickness of the salar deposits reaches a maximum of 189 m in the northeast corner of the project area.

- The basin appears to deepen in the northern half of the Project area and appears to contain higher grade lithium intervals.
- It is the opinion of the author that the Salar geometry, brine chemistry composition and the specific yield of the Salar sediments have been adequately defined to support the resource estimate described in Section 14.7 and summarized in Table 1.2.
- Based on the results of the resource evaluation herein, the authors recommend that the Project is taken forward into the (pre)feasibility stage including the elaboration of all documentation required to obtain environmental and operating approvals.
- A work program should be executed to continue upgrading the Project resource estimates and develop a reserve estimate in support of the (pre)feasibility study. It is recommended that the proposed work program includes the following components:
  - Diamond core drilling (3-4 holes to bedrock) in the northern portion of the property to obtain additional information on geology, basin geometry, brine chemistry and drainable porosity.
  - Drill and complete two test production wells to carry out long-term (30 day) pumping tests to determine hydraulic parameters of the Salar and monitor brine chemistry evolution, also in the northern section of the Salar.
  - Implement a monitoring network of observation wells around the DPT-4 area.
  - Implement a baseline surface and groundwater monitoring network in the Diablillos basin to support the development of a water balance and a hydrogeological conceptual model.
  - Shallow drilling / geophysics around the perimeter of the Salar to define the fresh water / brine interface and improve the understanding of the continuity of the salar hydrogeological units along the margins.
  - Complete a hydrogeological conceptual model for the Diablillos Basin in support of numerical reserve modelling.
  - Develop a three-dimensional groundwater flow model for the basin to facilitate reserve estimates and the layout of a brine production wellfield in support of the PFS.

The estimated cost for the above program is approximately USD\$4 million.

## 2 INTRODUCTION

### 2.1 Terms of Reference

Lithium X Energy Corporation (TSX.V: LIX) (LiX) retained FloSolutions (Chile) to prepare this Technical Report for the Sal de los Angeles Project, previously known as the Salar de Diablillos Project (herein the Project) in the Salta Province of Argentina. The objective of this report is to prepare an updated estimate of brine resources based on exploration work carried out between 2011 and 2016 on the mineral claims held by LiX in Salar de Diablillos. Resource estimates are for lithium, potassium and boron contained in brine.

This report has been prepared in conformance with the requirements of National Instrument 43-101 – *Standards of Disclosure for Mineral Projects* and the associated Companion Policy 43-101CP and Form 43-101F1 of the Canadian Securities Administrators and the associated Best Practice Guidelines for Industrial Minerals and Mineral Processing as issued by the Canadian Institute of Mining and Metallurgy. The Report also includes technical judgment of appropriate additional technical parameters to accommodate certain specific characteristics of minerals hosted in liquid brine as outlined in CIM Best Practice Guidelines for Resource and Reserve Estimation for Lithium Brines and as discussed by Houston (Houston et al, 2011).

### 2.2 Sources of Information

Previous technical reports prepared for the Project include:

- Technical Report on the Diablillos Property Salta Province, Argentina: technical report prepared by independent consultant Todd Keast dated March 22, 2010.
- NI 43-101 Technical Report on Brine Resource Estimate, Salar de Diablillos Project, Salta Province, Argentina, prepared for Rodinia Lithium, Inc. by AMEC dated January 21, 2011.
- NI 43-101 Technical Report, Preliminary Economic Assessment Salar de Diablillos Project Salta, Argentina, prepared for Rodinia Lithium Inc. by SRK Consulting (USA) dated December 2011.
- NI 43-101 Technical Report Salar de los Angeles Project, Salar de Diablillos, Salta Province, Argentina, prepared for Aberdeen International Inc. by Raymond Spanjers dated May 2, 2016.

A site visit was carried out to the Project area in Salar de Diablillos by Frits Reidel and Ryan Jakubowski during August 2016. Full access was provided to the Project's exploration / hydrogeological database. The documentation reviewed, and other sources of information, are listed at the end of this report in Section 27 References

Meetings were held at the Project Site as well as in the offices in Salta with:

- Mr. William Randall, Vice President of Project Development, LiX and
- Mr. Jesse Randall, Argentina Country Manager, LiX and
- Mr. Eduardo Morales, Chief Operating Officer, LiX and
- Mr. Juan Deus, Project geologist, LiX

- Pablo Gomez, Hydrogeologist, Grupo AGV

The report was prepared by Frits Reidel, CPG, “qualified person” (QP) and who is independent of LiX as such terms are defined by NI 43-101. The author has relevant experience in the evaluation of brine deposits in South America.

## 2.3 Units

The metric (si system) units of measure is used in this report unless otherwise noted.

### List of abbreviations

All currency in this report is US dollars (US\$) unless otherwise noted.

μ	micron	km <sup>2</sup>	square kilometer
°C	degree Celsius	kPa	kilopascal
°F	degree Fahrenheit	kVA	kilovolt-amperes
μg	microgram	kW	kilowatt
A	ampere	kWh	kilowatt-hour
a	annum	L	litre
bbbl	barrels	L/s	litres per second
Btu	British thermal units	M	metre
C\$	Canadian dollars	M	mega (million)
cal	calorie	m <sup>2</sup>	square metre
cfm	cubic feet per minute	m <sup>3</sup>	cubic metre
cm	centimetre	Min	minute
cm <sup>2</sup>	square centimetre	MASL	metres above sea level
d	day	Mm	millimetre
dia.	diameter	Mph	miles per hour
dmt	dry metric tonne	MVA	megavolt-amperes
dwt	dead-weight ton	MW	megawatt
ft	foot	MWh	megawatt-hour
ft/s	foot per second	m <sup>3</sup> /h	cubic metres per hour
ft <sup>2</sup>	square foot	opt, oz/st	ounce per short ton
ft <sup>3</sup>	cubic foot	Oz	Troy ounce (31.1035g)
g	gram	Ppm	part per million
G	giga (billion)	Psia	pound per square inch absolute
Gal	Imperial gallon	Psig	pound per square inch gauge
g/L	gram per litre	RL	relative elevation
g/t	gram per tonne	S	second
gpm	Imperial gallons per minute	St	short ton
gr/ft <sup>3</sup>	grain per cubic foot	Stpa	short ton per year
gr/m <sup>3</sup>	grain per cubic metre	Stpd	short ton per day
hr	hour	T	metric tonne
ha	hectare	Tpa	metric tonne per year
hp	horsepower	Tpd	metric tonne per day
in	inch	US\$	United States dollar
in <sup>2</sup>	square inch	USg	United States gallon
J	joule	USgpm	US gallon per minute
k	kilo (thousand)	V	volt
kcal	kilocalorie	W	watt
kg	kilogram	Wmt	wet metric tonne
km	kilometre	yd <sup>3</sup>	cubic yard

km/h

kilometre per hour

| Yr

year

### 3 RELIANCE ON OTHER EXPERTS

The author has relied on the following experts:

- Mr. Gregoire Mariethoz, PhD, associate of FloSolutions and the DHI Group, regarding matters relating to the resource modeling. Gregoire Mariethoz is independent of LiX as such terms are defined by NI 43-101. Gregoire Mariethoz obtained a PhD in hydrogeology at the University of Neuchâtel. After that, he worked as a researcher at Stanford University (USA) where he focused on developing methods for reservoir characterization, and for the resolution of hydrogeological inverse problems. He then moved to the University of New South Wales, Australia, where he was for four years Senior Lecturer in hydrogeology and Chief Investigator in the National Center for Groundwater Research and Training, one of the world leading research endeavors in the field of subsurface hydrology. Since 2014 Gregoire Mariethoz is Assistant Professor at the University of Lausanne. He has extensive experience in stochastic modeling, geostatistics and its applications. His works include the development of the Direct Sampling multiple-point simulation method, the most cited application of the pluriGaussian method, and the first reference textbook on the topic of multiple-point geostatistics. He is the author of over 40 peer-reviewed publications, and received in 2013 the Vistelius Award by the International Association of Mathematical Geosciences. Mr. Mariethoz was responsible for preparing the resource estimates in this Report in close coordination with the author.
- Mr. Ryan Jakubowski, Principal Hydrogeologist, FloSolutions (Peru), regarding matters relating to brine chemistry, analysis and interpretation. Ryan graduated with a Bachelor of Science in Geology and Geophysics from the University of Wisconsin at Madison in May 2000, and he obtained a Master of Science in Hydrology from the New Mexico Institute of Mining and Technology in December 2006. Ryan is a licensed Professional Geologist from the State of Wyoming, and he has worked as a hydrogeologist for a total of 13 years. Mr Jakubowski is independent of LiX as such terms are defined by NI 43-101.
- Mr. William Randall, QP, Vice President of Project Development, LiX regarding matters related to the Project's history and the details of the exploration programs carried out since 2011. Mr. Randall is not independent of LiX as such terms are defined by NI 43-101.
- Mr. Ignacio Frezze Durand, Partner, Estudio Perez, Alsina, Frezze Durand in Buenos Aires, Argentina for the legal opinion on property tenure status. For the purpose of this report, the author has relied on ownership information provided by LiX. LiX has relied on a legal opinion by Estudio Perez, Alsina, Frezze Durand dated March 15, 2016 respecting legal title to the property. The author has not researched property titles or mineral rights for the Sal de los Angeles Project and expresses no opinion as to the ownership status of the property.

The information, conclusions, opinions, and estimates contained in this Report are based on:

- Information available to the author at the time of preparation of this report,
- Assumptions, conditions, and qualifications as set forth in this report, and
- Data, reports, and other information supplied by LiX and other third party sources.

Except for the purposes legislated under provincial securities laws, any use of this Report by any third party is at that party's sole risk.

## 4 PROPERTY DESCRIPTION AND LOCATION

### 4.1 Property Description and Location

The Sal de los Angeles Project consists of 8,186.5 hectares and is located in the Puna region of northwest Argentina (**Figure 4.1**), approximately 145 km southwest of the city of Salta, a few kilometres north of the border between the Provinces of Salta and Catamarca, Argentina. The property area lies entirely within the Province of Salta. Centroid co-ordinates for the Project are approximately 726,800 E and 7,206,050 N (Universal Transverse Mercator (UTM) system, WGS 84 Zone 19 South).

### 4.2 Mineral Titles

According to Argentine Law, mineral resources belong to the provinces where the resource is located. Such province has the authority to grant exploration permits and exploitation concession rights to private applicant entities. However, the Federal Congress is entitled to enact the National Mining Code and any substantive mining legislation which is similarly applicable in all of the country. Provinces have the authority to regulate the procedural aspects of the National Mining Code and to organize each enforcement authority within its territory.

In general, there are two types of mining rights that can be granted under Argentinean mining law:

- Exploration Permits (usually refer to as “Cateos”) that are limited in time and have limited obligations.
- Exploitation Concessions (usually refer to as “Minas” or “Claims”) that are unlimited in time as long as obligations set out in the National Mining Code are met by the title holders.

All concessions are granted by the regulating province either by a judicial (Salta) or administrative decision, depending on the province. An Exploration Permit can be transformed into a Mining Permit any time before the expiry date of the Exploration Permit by presenting a report and paying canon fee. Tenure for exploitation concessions is indefinite providing that annual payments are made in February and July each year.

In the Salta province, all concessions are granted by a judge in the Mining Court. Each property is recorded by number in the Mining Court registry, and each property has its own judicial file. In addition, the Mining Secretariat records the property in the Registro Gráfico (“Land Register Office”) and adds the property to a digital map of the area.

In January of 2010, Rodinia acquired the rights to explore and exploit the lithium-rich brines properties on the Salar de Diablillos held by Borax Argentina S.A, a subsidiary of Rio Tinto Minerals (“Borax Argentina”). Following this transaction, Rodinia purchased the rights to an additional three mining leases and two exploration licences (cateos) corresponding to an additional 2,987 ha; these claims collectively form the Project.

Verification of the land titles and mining rights purchased by Rodinia through its wholly owned subsidiary Potasio y Litio Argentina S.A.(PLASA), and previously owned by Borax Argentina and private land owners, was conducted by Mr. Ignacio Frezze Durand of Perez Alsina Frezze Durand, an independent Argentine legal counsel firm. Mr. Frezze documented his legal opinion in the March 15, 2016 letter and concluded the following:

- Mining rights and assets transferred to Rodinia and/or PLASA with respect to the Salar de Diablillos, properties by Héctor Vittone, Mario Moncholi and Colorado S.A., and Borax Argentina S.A. are valid, and confirm the assigners' property on the mines and mining rights as assigned.
- The certificates also confirm that the mining canon has been duly paid (through the first semester of 2016).

**Figure 4.1 Location of the Sal de los Angeles property**

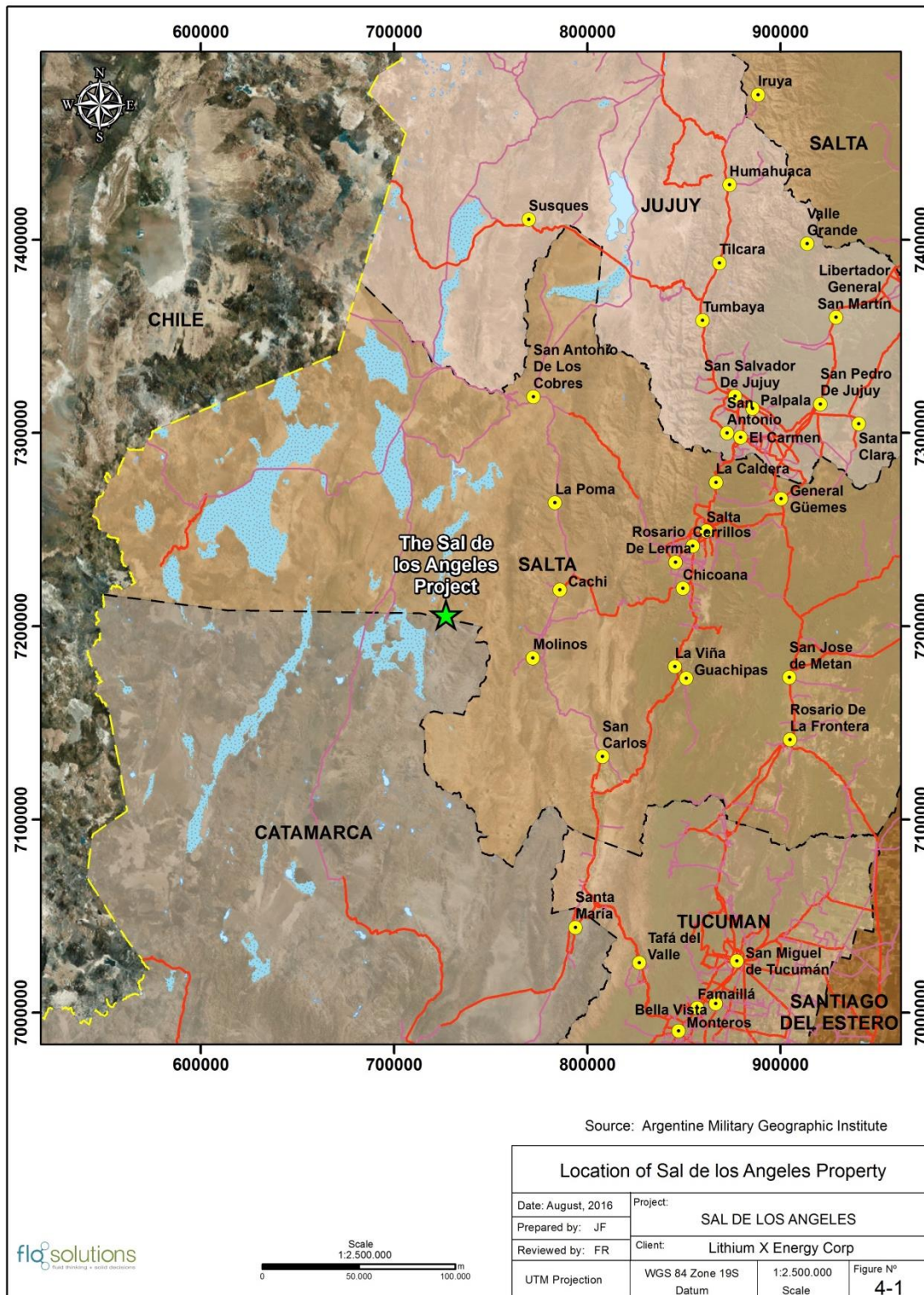


Figure 4.2 presents the property boundaries and land tenure for the Project.

Table 4.1 presents a summary of lease agreements and legal status related to the Project. The Project includes 16 mining concessions (minas). In summary, there is no other owner/operator with mining or exploration rights for lithium or potash within the brine resource area.

**Table 4.1 Description of land titles**

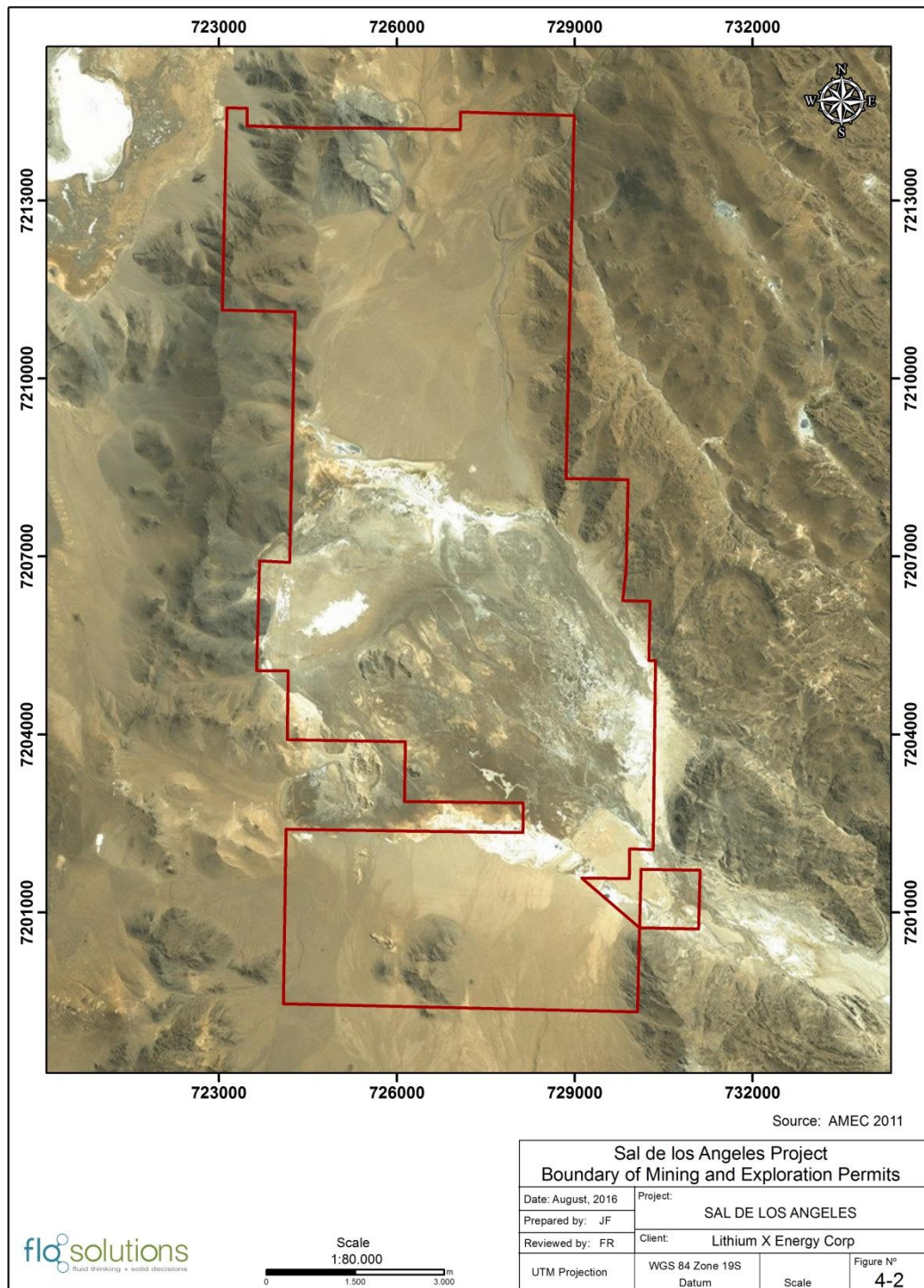
Order	File	Name	Type	Area (has)	Owner	Rights	NSR
1	11.691	Grupo Minero	Mining Group		Borax Argentina	PLASA Usufruct	1.5
		Sol Argentino		100			
		Santa Rosa		100			
		Santiago		100			
		San Miguel		100			
		San Marcelo		100			
		San Jose		100			
		San Felipe		100			
		La Entrerriana		200			
		La Pichunga		100			
		La Tosca 1 y 2		100			
		Odin y Thor		100			
		Esperanza		100			
		Consuelo		100			
		Aegyr		100			
		San Pablo		100			
San Pedro	100						
San Juan	100						
Santo Tomás	100						
2	12.652	Chinchillas	Mine	200	Borax	PLASA Usufruct	1.5
3	7.021	Coral	Mine	100	Borax	PLASA Usufruct	1.5
4	12.653	La	Mine	200	Borax	PLASA Usufruct	1.5
5	1.178	San Andres	Mine	100	Borax	PLASA Usufruct	1.5
6	1.169	San Jorge	Mine	100	Borax	PLASA Usufruct	1.5
7	1.173	San Martin	Mine	100	Borax	PLASA Usufruct	1.5
8	1.181	Santo	Mine	100	Borax	PLASA Usufruct	1.5
9	17.920	Angélica	Mine	100	PLASA		
10	1.188	San Atilio	Mine	100	PLASA		
11	1.183	Nuestra	Mine	100	PLASA		
12	17.778	La Petisa	Mine	246.5	PLASA		
13	19.656	Zorro I	Mine	165	PLASA		
14	20.671	Zorro II	Mine	975	PLASA		
15	21.025	Santa Maflo	Mine	1,500	PLASA		
16	19486	Ratonex 2	Mine	2,200	PLASA		
Total Area (has)				8,186.50			

**Source:** March 15, 2016 letter titled "Potasio y Lito de Argentina S.A., Diablillos Mining Project" prepared by Ignacio Frezze Durand, Partner

## Legal Status:

- **Diablillos Mining Group** file N° 11.691 (that comprehend the following mines: “Odin y Thor”, “Aegy”, “Consuelo”, “La Pichunga”, “San Felipe”, “San Marcelo”, “La Tosca”, “San José”, “Santa Rosa”, “San Miguel”, “Santiago”, “Esperanza”, “Sol Argentino”, “San Pedro”, “San Pablo”, “San Juan”, “Santo Tomas”); **Coral** file N° 7021; **Santo Domingo** file N° 1181; **La Entrerriana** file N° 12653; **San Martín** file N° 1173; **San Jorge Mine** file N° 1169; **San Andrés** file N° 1178 and **Chinchillas** file N° 12652”, are mines granted to Borax Argentina S.A.. The Company has an usufruct right on all brines on those properties, incorporated by Public Deed Nr. 9 (of “Usufruct Incorporation on Mining Properties”), registered by the Mining Court of Salta under file Nr. 07 of the Book of Registry of Leases Nr. 4 on February 29th, 2012. For the brines usufruct right that the Company has on these mining properties, there is also registered a 1.5% Net Smelter Return in favor of Borax Argentina S.A., with a purchase option to the Company of U\$ 1.500.000.
- **“La Petisa”** file N° 19.656, **“Zorro I”** file N° 17.778, **“Zorro II”**, file N° 20.671 and **“Santa Maflo”** N° 21025 are owned by The Company. On February 8th 2.012, The Company purchased the mine from Mr. Hector Vittone, executing public deed Nr. 12.-
- **“Angelica”** file N° 17920 is owned by the Company. The company purchased the mine from Mr. Mario Moncholi, executing public deed Nr. 275.-
- **“San Atilio”** file N° 1188 and **“Nuestra Señora de Luján”** file N° 1183, are owned by the company. These properties were purchased by the Company to Colorado S.A., executing public deed Nr. 276. Colorado S.A. and Santiago Sáenz S.A. reserved the usufruct right to exploit the solid borates deposits on those mines.
- **“Ratonex 2”** file N° 19.486 is owned by the Company. It was requested as a vacant mine on September 2.013, and granted to the Company on April 24th 2014 by Mining Court Resolution.

Figure 4.2 Boundaries of the Sal de los Angeles mining and exploration permits



Source: Boundaries provided by LiX 2016

### 4.3 Royalties, Agreements and Encumbrances

The federal government of Argentina regulates different systems of ownership of mineral resources. In 1993, the federal government established a limit on mining royalties to be paid to the provinces, set at a 3% maximum of the 'pithead value' of the extracted mineral.

Individual Argentinian provinces have promulgated rules that govern the exercise of mineral rights. The province of Salta adopted the 3% maximum of the “pithead value” of the extracted mineral established by the federal government. As of the date of this report, there is no specific royalty agreement between Salta and Lithium X, i.e., there is no special contract on royalties at the present time.

The province defines the “pithead value” of minerals as the value obtained in the first stage of the commercialization process, less the direct and operative costs necessary for getting the pithead mineral to that stage (Ley 24.196 of Argentine Mining Code).

As per the usufruct agreement between PLASA and Borax Argentina SA incorporated by Public Deed Nr. 9 (of “Usufruct Incorporation on Mining Properties”) and registered by the Mining Court of Salta under file Nr. 07 of the Book of Registry of Leases Nr. 4 on February 29th, 2012 there is a registered 1.5% Net Smelter Return in favor of Borax Argentina S.A., with a purchase option to PLASA of US\$ 1,500,000. This Net Smelter Royalty only applies to the claims upon which the usufruct right is registered, as detailed in **Table 4.1**.

On December 29, 2015, Rodinia sold PLASA and the rights to the Salar de Diablillos to Aberdeen International, Inc. (Aberdeen). As part of that transaction, a 2% Net Smelter Royalty was applied in favour of Rodinia on the entire Sal de los Angeles Project. Half of the 2% Net Smelter Royalty can be purchased by the PLASA shareholders for US\$2,000,000.

Servidumbres (easements) are requested when it is not possible to install service facilities that are needed to exploit the natural resource within the concession boundary (e.g. water, camp, roads, etc.). If work or service is performed within the concession boundary, it is not required to obtain an easement. Only when the surrounding lands are affected is an easement needed. Whenever the ground belongs to an individual, the price of such ground and the damages shall be paid previously. However, if the miner has occupied the ground or is willing to occupy the ground, the miner shall provide adequate security while payment arrangements are being made. In case the ground of a mine license belongs to the local government, such ground shall be freely assigned.

## 4.4 Environmental Liabilities

Information regarding environmental liabilities discussed below is taken directly from NI 43-101 Technical Report Salar de los Angeles Project, Salar de Diablillos, Salta Province, Argentina, prepared for Aberdeen International Inc. by Raymond Spanjers dated May 2, 2016.

The Salar de Diablillos is not subject to any material environmental liabilities. There has been some ulexite mining in the Project area in the past, but at shallow depth (less than 1 m). Although records for these activities are not available, it is unlikely that lithium-bearing brines would have been exposed during these past activities. Now that the majority of these small-scale operations have ceased, natural reclamation is expected.

Drilling and earthworks completed by previous operators during 2011 and 2012 did incur a fine of AR\$43,200 (approximately USD\$3,000) for certain failures to comply with environmental standards and reporting. The Mining Secretary for Salta province has since resolved, after a series of administrative appeals, that there has not been any environmental damage as a result of these drilling activities, including a resultant and actively flowing artesian well, and any orders which could hinder the further advancement of the property have been removed. The fine has been maintained, as it relates to administrative charges.

## 4.5 Other Significant Factors and Risks

There are no other significant factors and risks that may affect access, title or the ability to perform work on the Salar de Diablillos.

## 5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

The following information was originally described in the NI 43-101 “Technical Report on Brine Resource Estimate, Salar de Diablillos Project, Salta Province, Argentina” (AMEC 2011) and subsequently in “NI 43-101 Technical Report, Preliminary Economic Assessment, Salar de Diablillos Project” (SRK 2011). The effective date of the SRK Technical Report is 8 November 2011 and there has been no material change in the descriptions provided below.

### 5.1 Topography, Elevation and Vegetation

The Salar de Diablillos is located in the Puna region of the Andes, characterized by broad valleys separating mountain ranges that extend south from Peru and Bolivia and into northern Chile and northwestern Argentina. The region exhibits large plateaus averaging 3,500 masl surrounded by mountain ranges with heights exceeding 6,000 masl. The average elevation in the project area is approximately 4,000 masl, with the nearby volcanic mountains exceeding that elevation by several hundred meters.

### 5.2 Climate and Length of Operating Season

The Salar de Diablillos is located in the Argentine Puna region with an extremely dry and arid climate, with little or no annual rainfall. **Table 5.1** provides a summary of climate data for the Salar de Diablillos including temperature, precipitation, pan evaporation, and the expected brine evaporation rate calculated from the pan evaporation rate. At nearby Salar de Hombre Muerto, rainfall is reported to average 60 to 80 mm/year (Garrett 2004, in Keast, 2010), which is consistent with the value presented by LithiumOne for the same salar (77.4 mm/year, presented in **Table 5.1**) (2011). The majority of the precipitation occurs during the months of January through March.

The Pan Evaporation Rate shown in **Table 5.1** was calculated using the empirical relationship derived from several salars in the Atacama Desert presented in Houston (2006). Using this equation, (Freshwater Pan Evaporation =  $4,364 - (0.59 \cdot A)$  where A is Altitude and equal to 4,000 m), a Pan Evaporation Rate of 2,004 mm/year is calculated. Monthly values were calculated using monthly fractional values of annual Pan Evaporation for sites in the Atacama Desert presented by Houston (2006). Brine Pan Evaporation was calculated using the relationship between fluid density and Pan Evaporation, where it is shown that for every 0.1 kg/m<sup>3</sup> increase in fluid density, evaporation decreases by 700 mm/year. Finally, a Net Evaporation rate for ponds was calculated by multiplying the Brine Pan Evaporation Rate by 0.7, which is a factor commonly used to convert between Pan Evaporation and Pond Evaporation Rates.

**Table 5.1 Climate data for Salar de Diablillos**

Month	Precipitation (mm)	Temperature (°C)	Freshwater Pan Evaporation (mm)	Brine Pan Evaporation (mm)	Net Brine Pond Evaporation (mm)
January	35.6	11.6	230.16	149.77	79.92
February	20	10.9	214.29	139.44	83.61
March	7.8	9.0	204.37	132.98	87.63
April	1.1	5.5	158.73	103.29	71.53
May	0.7	1.6	123.02	80.05	55.54
June	1	-0.8	107.14	69.72	48.10
July	1.2	-1.6	105.16	68.43	47.06
August	0.8	0.3	125.00	81.34	56.38
September	1.6	2.7	144.84	94.25	64.85
October	0	5.4	186.51	121.36	84.95
November	0.4	7.4	192.46	125.24	87.38
December	7.1	9.6	212.30	138.15	91.73
<b>Annual Total:</b>	<b>77.4</b>	<b>5.2</b>	<b>2004.00</b>	<b>1,304.00</b>	<b>858.62</b>

During the winter season (July and August), temperatures average between 8°C to 10°C during the daytime and -5°C to -8°C during the night, but exhibit large daily variations commonly reaching -25°C and 15°C within 24 hours. During the summer months (December to February) temperatures average between 25°C to 30°C during the daytime and around freezing during the night. Strong northwest and west winds in excess of 45 km/h are common in the area, particularly during the winter and spring seasons.

Exploration activities are conducted throughout the year, and it is expected that future exploitation operations can be conducted year-round. Exceptions may occur in the latter half of January and early February, when summer rains may complicate access to certain portions of the salar.

### 5.3 Sufficiency of Surface Rights

As described in Section 4.2, LiX holds over 8,186.5 ha of mineral tenure. In the immediate vicinity of the historical exploitation area, and within the LiX ground holdings, there is sufficient area to support construction of a lithium operation. Planned infrastructure, in the event of mine construction, could include evaporation ponds, wells, permanent housing, and a carbonation plant. The size and extent of these facilities are not known with sufficient accuracy at this time and are anticipated to be addressed further in future studies.

### 5.4 Accessibility and Transportation to the Property

The Project property is accessible from the city of Salta through the town of San Antonio de Los Cobres via National Highway 51, and then through a secondary gravel road (all-weather provincial Route 129) via the town of Santa Rosa de Los Pastos Grandes (**Figure 4.1**). By road the distance from Salta to the property is approximately 320 km, which is a driving time of six to seven hours.

An alternate road route exists via the town of Pocitos on Provincial Route 17, which is the main road to Antofagasta, Chile and the primary road access to the Borax Argentina Minas Tincalayu borax mine, located a few kilometres southwest of the Diablillos property on the north-eastern shore of the Salar Hombre Muerto. These secondary roads are regularly maintained, as they are used daily for transportation purposes during mining and processing of borates in the region.

The Salar de Diablillos may be accessed from the north and the south by two local roads veering off the secondary trucking road. The local roads are relatively narrow gravel roads that can be driven with regular two-wheel drive vehicles with high clearance; however, during the rainy periods between January and March, sections of the road are susceptible to flooding or small landslides, and in those months four-wheel drive vehicles are required for access within the property.

The nearest commercial airport to the Salar de Diablillos is located in Salta and is serviced by regular commercial flights from major cities in South America.

Local borate producers have established and regularly make use of trucking routes between Diablillos, Pocitos and San Antonio de los Cobres. Salta is connected to the Chilean seaport of Antofagasta by the narrow-gauge General Belgrano Railway.

## 5.5 Infrastructure

Salta, the largest urban center in the proximity of El Salar de Diablillos, has a population of around 500,000. It is located 145 km northeast in a straight line from the Project area and 320 km by road. Salta is the primary commercial center for the region and most supplies, fuel and equipment may be purchased here and trucked to the project site year-round.

### 5.5.1 Power

The town of Estacion Salar de Pocitos (Pocitos), approximately 100 km north of the Project area, is the closest access point to the nearest high-tension power line. A natural gas pipeline can also be accessed at Pocitos.

### 5.5.2 Water

Rodinia installed a water supply well for the provision of potable water for exploration operations. Projected water demand for production activities will be defined as the conceptual process design is refined. Freshwater enters the salar from the Diablillos River. LiX will evaluate the feasibility of securing this freshwater supply.

Potable and non-potable water is available at Pocitos; however, LiX has not confirmed water demand requirements for the off-site production facility.

### 5.5.3 Mining Personnel

Santa Rosa de los Pastos Grandes and San Antonio de los Cobres, with populations of 100 and 1,500, respectively are the nearest permanent communities to Salar de Diablillos. Unskilled labor, lodging, fuel and basic supplies may be obtained in San Antonio de los Cobres.

Existing infrastructure at Salar de Diablillos includes a semi-permanent camp with a maximum capacity of 40 people, a work shop, offices and fuel dispensers. LiX is currently permitting an 80 person permanent camp and constructing storage for machinery and equipment.

Argentina has sufficient experienced and skilled professionals to operate lithium, potash and boron recovery circuits. LiX will rely on a combination of regional personnel (e.g., Salta-based) and local resources.

## 6 HISTORY

Information regarding Project history is taken directly from NI 43-101 Technical Report Salar de los Angeles Project, Salar de Diablillos, Salta Province, Argentina, prepared for Aberdeen International Inc. by Raymond Spanjers dated May 2, 2016

### 6.1 Pre-Rodinia (prior to 2009)

The early exploration and production history on the Salar de Diablillos, prior to 2009, has been restricted to minor ulexite ( $\text{NaCaB}_5(\text{OH})_6 - 5\text{H}_2\text{O}$ ) exploitation by local miners and exploration work by Borax Argentina during the last decade. Records of this work are not available to the author

Early historical information on drilling in the Salar reported by the Servicio Geológico Minero Argentino indicates that a drill hole was completed in the south-eastern margin of the Salar, reaching the metamorphic basement at a depth of 75 vertical metres. The reported stratigraphy consisted of a one metre layer of ulexite followed by 10 cm of caliche and more extensive, but unspecified, clays. Below the clays a sand aquifer was logged to a depth of 30 m giving way to a basal conglomerate towards the bottom of the hole (AMEC, 2011).

### 6.2 Prior Ownership and Ownership Changes

In January 2010, Rodinia Lithium Inc (“Rodinia”), a company listed on the TSX Venture Exchange with its corporate head office and exploration office located in Toronto, Ontario, acquired the rights to explore and exploit the lithium-rich brines of Borax Argentina S.A., a subsidiary of Rio Tinto Minerals (“Borax Argentina”), properties on the Salar de Diablillos. Following this transaction, Rodinia purchased 100% ownership of an additional 2,987 ha of the surrounding salar. Rodinia maintained this holding through Potasio y Litio de Argentina S.A. (PLASA), a wholly-owned subsidiary based in Argentina.

On December 29, 2015, Rodinia sold PLASA and the rights to the Salar de Diablillos to Aberdeen International, Inc. (Aberdeen). On March 3, 2016, Aberdeen sold the right to earn an 80% interest in the project to Lithium X Energy Corporation, who subsequently renamed the project Sal de los Angeles.

As described in a March 3, 2016 press release, Lithium X issued 8,000,000 common shares to Aberdeen International for a 50% interest in the Project on closing. Lithium X has the option for a 26 month period (the “Option”) to acquire an additional 30% interest by issuing common shares worth \$5,000,000 to Aberdeen and fulfilling several terms, including incurring \$3,000,000 in exploration and development expenditures over a two-year period and completing a feasibility study on the Project. As of the date of this Technical Report, Lithium X has not exercised this option. As part of the agreement, Lithium X will be considered the initial operator of the project for as long as the Company maintains interest greater than or equal to 50% in the Joint Venture.

### 6.3 Exploration and Development Results of Previous Owners

Historic exploration at the Salar de Diablillos has been limited to informal small-scale ulexite mining by local miners, and the exploration of the top 3–5 m of the salar that was conducted by Borax Argentina S.A. Rodinia commenced exploration in 2009 during a due diligence evaluation prior to purchase of the Project. Since then, Rodinia conducted the following exploration programs:

- Surface sampling: Brine samples were collected from 140 shallow auger wells regularly distributed on the surface of the salar at approximately 300 m by 300 m spacing;
- Gravity survey: Ten lines were surveyed to model basement depth;
- Reverse circulation (RC) drilling program: RC drilling was conducted to develop vertical profiles of brine chemistry and to provide geological and hydrogeological data at depth in the salar;
- Down-hole geophysical surveys;
- Flow monitoring program: Brine flow was monitored during drilling and continues being monitored up to date; and
- Pumping test programs.

### 6.3.1 Grids and Surveys

Rodolfo Moreno, an accredited surveyor from Salta, was contracted in 2010 by Rodinia to survey RC collars and to provide topographic contours for the property. The survey points were established by differential GPS. Location coordinates are provided using the Universal Transverse Mercator (UTM) system, WGS84 Zone 19 South.

Topographic contours have 1m accuracy and cover the full extent of the salar surface and the majority of the Project mineral tenure.

### 6.3.2 Geological Logging

Geological logging consistent with the industry standard is only available only for eight of the auger drill holes. Where auger drill hole collars were altered, or drill holes were terminated early due to the presence of a caliche layer, this information is also available. RC holes have a complete logging procedure that involves different aspects such as, primary and secondary lithology and granulometric facies, and other observations related to brine flow.

### 6.3.3 Geophysical Surveys

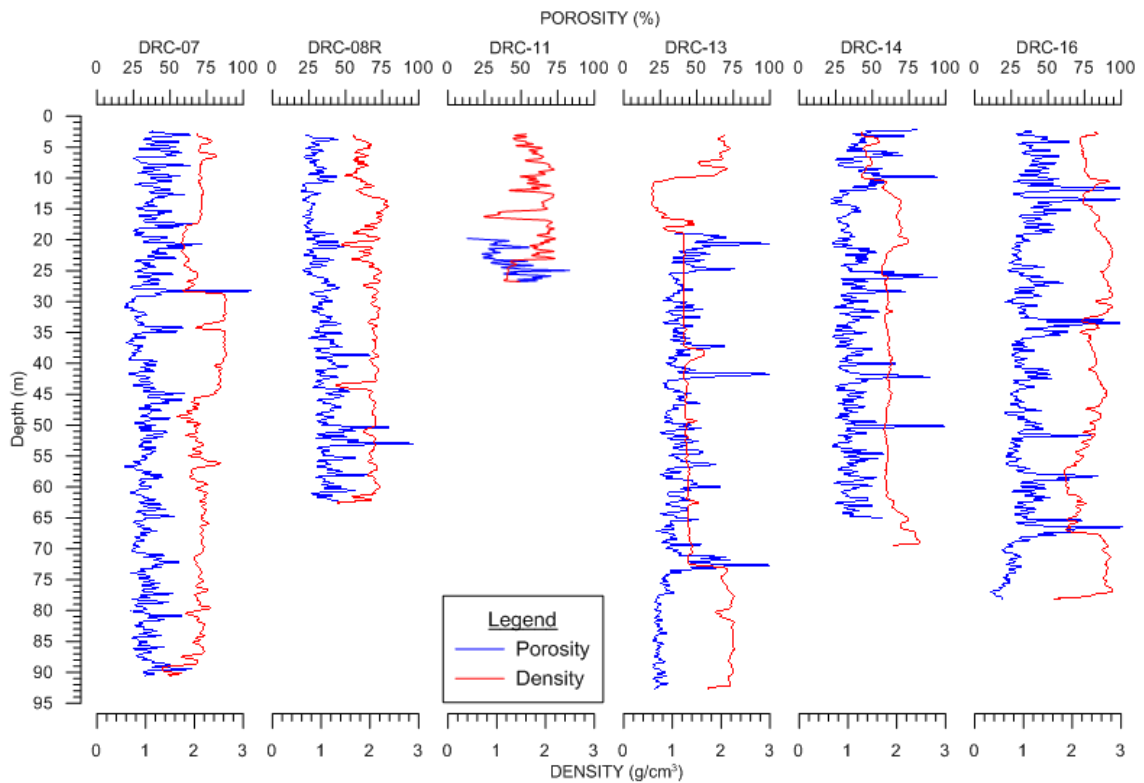
#### **Borehole Geophysical Logging**

Wellfield Services Ltda. (Wellfield) conducted the borehole geophysical characterization for six RC drill holes for Rodinia. Down-the-hole geophysical logging is available for drill holes DRC-07, DRC-08R, DRC-11, DRC-13, DRC-14 and DRC-16 (**Figure 6.1**). The figure is included because it gives an indication of the relative porosity and density changes that may be expected with drill hole depth.

Average total resistivity from the neutron–neutron logs indicates minimum and maximum values of 29% and 47% for total porosity. Density values ranged between 1.9 grams per cubic centimeter ( $\text{g/cm}^3$ ) and  $2.7 \text{ g/cm}^3$  for the brine.

The neutron logging tool records neutron absorption, which can be correlated to the hydrogen content in soil. Factors which can affect the log, and which require the instrument to be appropriately calibrated, include hole diameter, fluid characteristics, presence of chlorides or salt water, presence of hydrogen atoms in the lithologies downhole (for example in clays, gypsum).

**Figure 6.1 Porosity and density logs (AMEC, 2011)**



### **Gravity Survey (2010)**

Rodinia contracted Quantec Geoscience Argentina S.A. (Quantec Geoscience) to conduct a gravity survey at Salar de Diablillos with the objective of determining the relative depth-distribution of the salar and providing data for 3D model depth estimates of the salar.

The gravity survey was carried out through nine east-west gravity profiles and one north-south tie-line. The nominal line separation was 1,000 m or 1,500 m. Down-line survey stations were located at 250 m intervals.

For the modeling process, data were interpreted using the free air gravity reduction method. Since density measurements from the survey site were unavailable at the time of the surveying and modelling, a value of 1.7g/cm<sup>3</sup> was assumed for the sandy overburden, whereas 2.6 g/cm<sup>3</sup> was found to produce the best data fit over the hills around the salar.

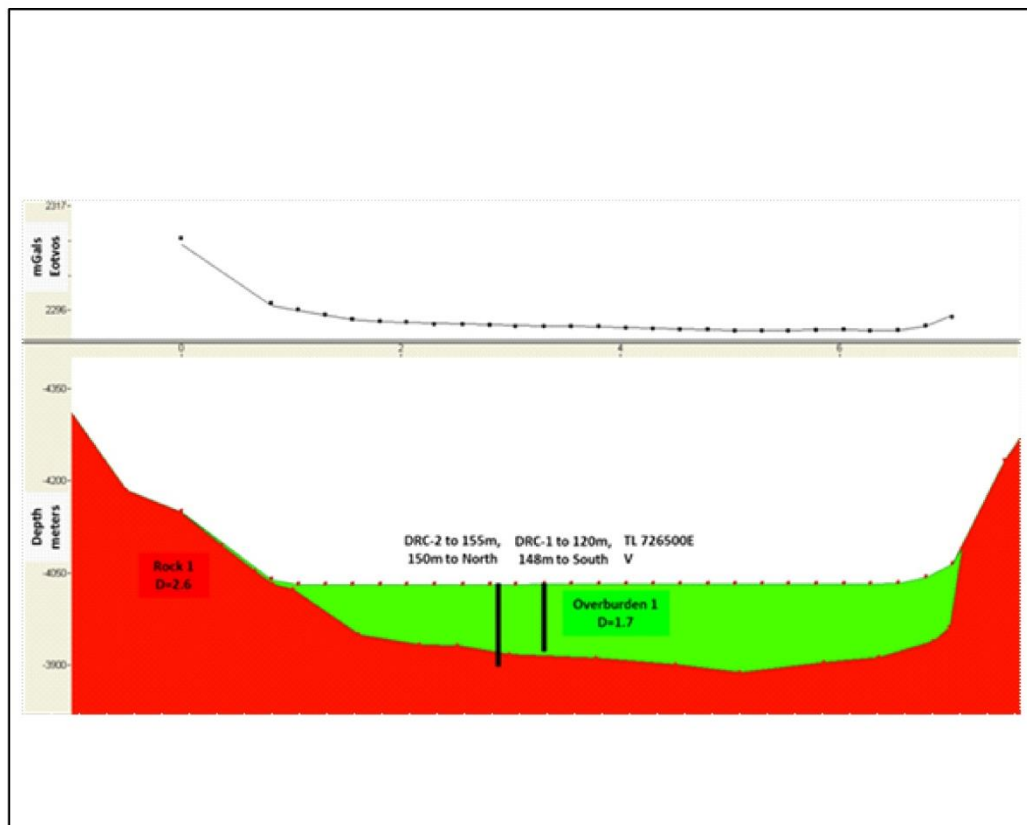
In order to achieve a better global fit, a first-order trend correction of the northern tie-lines was introduced through the addition of an underlying wedge of 2.9 g/cm<sup>3</sup>.

These different gravimetrical compensations could represent a more complex lithological sequence, like for example, the presence of alluvial fans with possible different densities that cover the aquifers at the northern and southern of the salar limits.

The gravity model shows a larger “gravity low” or depression elongated in the north-south direction in the northwest portion of the salar basin; another “gravity low” can be found towards the southeast. These gravity lows are consistent with depths in which brine flow was recorded at RC holes and support the continuity of the aquifers across the salar.

Figure 6.2 shows an example of a cross section of the gravimetric model provided by Quantec Geoscience (2010).

**Figure 6.2 Gravimetric survey cross section (7,206,500N) (AMEC, 2011)**



### Seismic Survey (2011)

In June 2011 Rodinia contracted Geophysical & Exploration Consulting S.A. (GEC) to conduct a seismic tomography survey over the Salar de Diablillos claims. A total of 52 km of lines were surveyed between June 2011 and December 2011. The field survey was operated and supervised by D. Aguado (Geophysical Operator/Party Chief)/GEC and data processing and the final interpretation were carried out by S. Bölling (Senior Geophysicist)/GEC. Final reports were produced by March 2012.

The main survey objective is the identification and detailed definition of the bedrock basement boundary. Further purposes of the survey are to map geologic stratigraphy and structure relative to the occurrence of lithium brine, identify layers that are thought to be representative of lithium-bearing brine and to provide any additional information or interpretations regarding subsurface geology conditions or characteristics of surficial material (lithology, faults, weak or weathering zones, depression zones, etc.).

Figure 6.3 shows the locations of the 12 seismic refraction tomography lines (light green lines) superimposed upon a Google Professional Earth satellite map. The map also shows the gravity survey grid (light blue lines) as well as the positions of the reverse circulation holes (DRC-01 to DRC-21) and the diamond drill holes (DDD-01 – DDD-07) in the Salar de Diablillos investigation area.

Geophysical Exploration & Consulting S.A. (GEC) used the 24-bit GEODE3 Acquisition System to carry out refraction tomography surveys. The Geode seismic recorder is a seismic recording system that

combines the Geometrics' traditional seismic recorders with the flexibility and convenience of a distributed system. It's ideal for refraction or reflection tomography surveys.

The Geode seismic modules house from 3 to 24 channels each, weigh only 3.6 kg and interconnect using inexpensive digital network cable. The Geode will run all day on a small 12 Volt battery and sleeps when not in use. For light-duty applications, Geode can be run from a laptop to view, record, and process acquired data. The software interfaces to the Geode as a simple high-speed network device, eliminating the need for special drivers and cards.

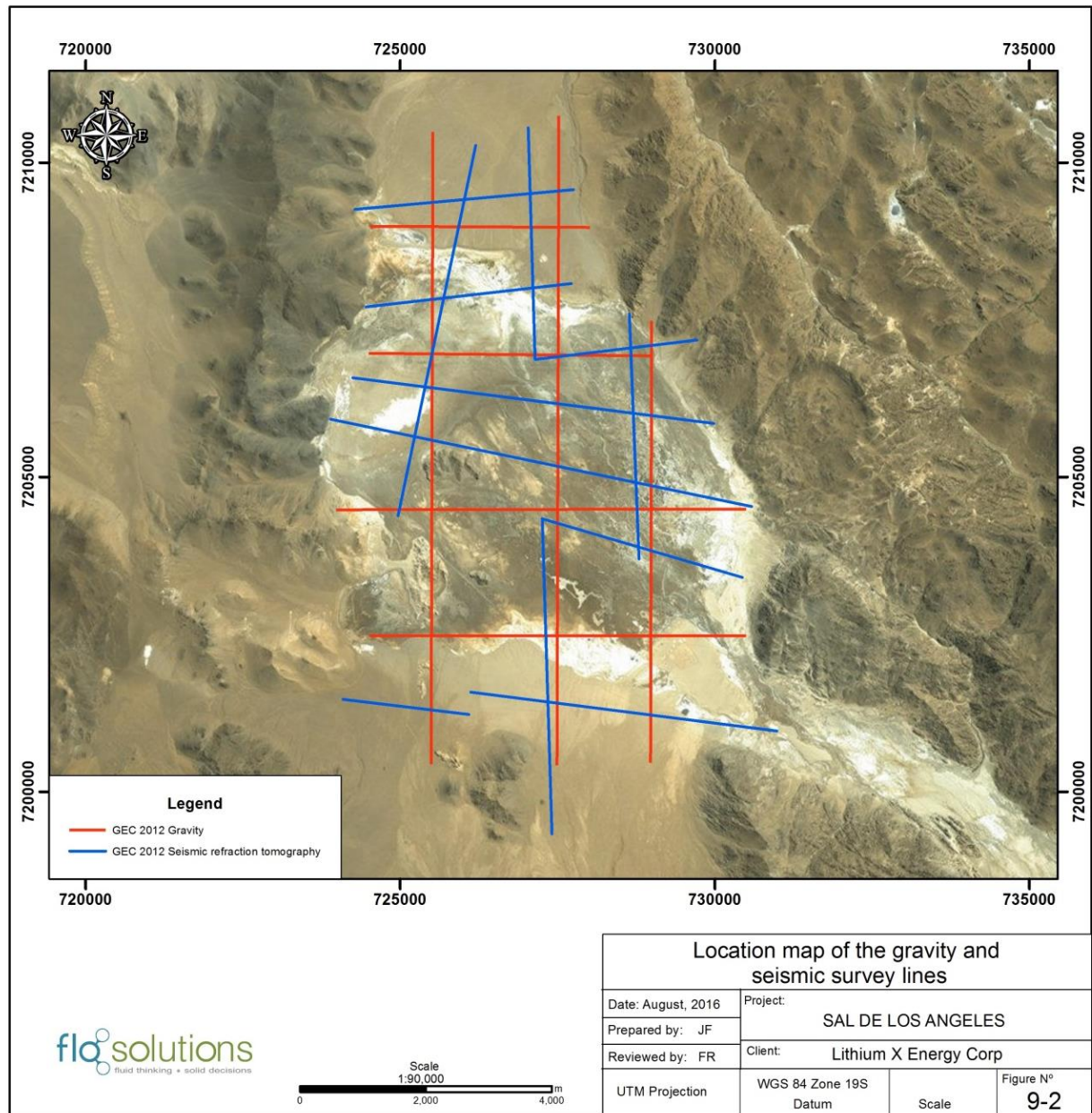
The final seismic data processing sequences were carried out in the GEC office in Mendoza, Argentina. The processing sequences included the following main steps:

- Geometry editing,
- Shot and trace edit,
- Picking of travel times FIRST BREAKS (including trigger delay corrections),
- Calculation and fixing of refracted waves,
- Calculation of initial Velocity model,
- Correction of FIRST BREAKS,
- Delta-TV Inversion (initial model for WET Inversion)
- WET Inversion (final model),
- Depth value correction relative to the sea level of the earth's surface,
- Plotting of results (depth-velocity sections),

### **Interpretation**

The refraction tomography data processing was carried out with the Intelligent Resources Inc. Program package RAYFRACT 32. The final interpretation of the seismic sections was based on the WET Inversion results, the regional geology information, the available drillhole information and the technical reports (PEA Technical report on the Diablillos Property/NI 43-101 on the Diablillos Property) compiled by SRK (2011) and AMEC (2011).

**Figure 6.3** Location map of gravity and seismic refraction tomography lines (modified after Spanjers, 2016)



Considering the seismic velocity distributions (velocity range 600 m/s to 5.600 m/s) GEC defined the following layers for the interpretation:

**Surficial Layers:**

- Dry Alluvial Sediment Layer (600 – 1.600 m/s in some parts up to 2.000 m/s) principally detected over the extensive alluvial plains ascending to the north and south.
- Partially saturated Salar Crust Layer (600 m/s – 1.300 m/s) covering almost the entire Salar surface.

### **Intermediate sediment Layers:**

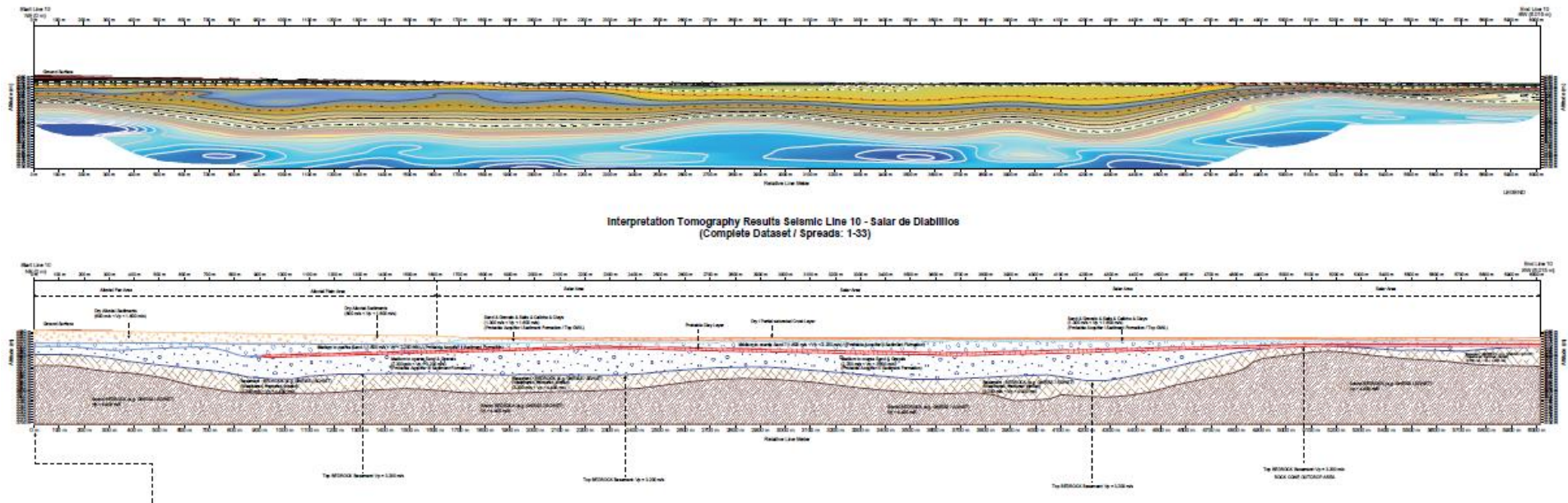
- Sediment Layer I (below Salar Crust Layer): Sand & Gravels & Caliche & Clays (1.300 m/s – 1.600 m/s). This layer seems to disappear below the alluvial plain areas.
- Sediment Layer II (below the Sediment Layer I): Fine to medium Sand (1.600 m/s – 2.200 m/s in some parts up to 2.400 m/s).
- Sediment Layer III (overlying the Basement): Medium to coarse Sand & Gravels (2.200 m/s – 3.200 m/s).
- Finer grain size fractions such as Clay & Silt (1.800 m/s – 2.200 m/s) in between the intermediate sediment sequences were also marked in parts of the sections although the confidence in this interpretation has to be improved due to the still existing ambiguities.

### **Rock Basement Layers:**

- Top Basement Layer: Bedrock (e.g. Gneiss / Schist) highly weathered, fractured jointed, etc. (3.200 m/s – 4.400 m/s). The top of the rock basement is characterized by a seismic velocity of 3.200 m/s (depth of bedrock boundary).
- Sound Bedrock Layer: Seismic velocities higher than 4.400 m/s were interpreted as sound Bedrock (e.g. Gneiss / Schist).
- Probable basement structures as well as probable fault structures were also interpreted and depicted in the sections.

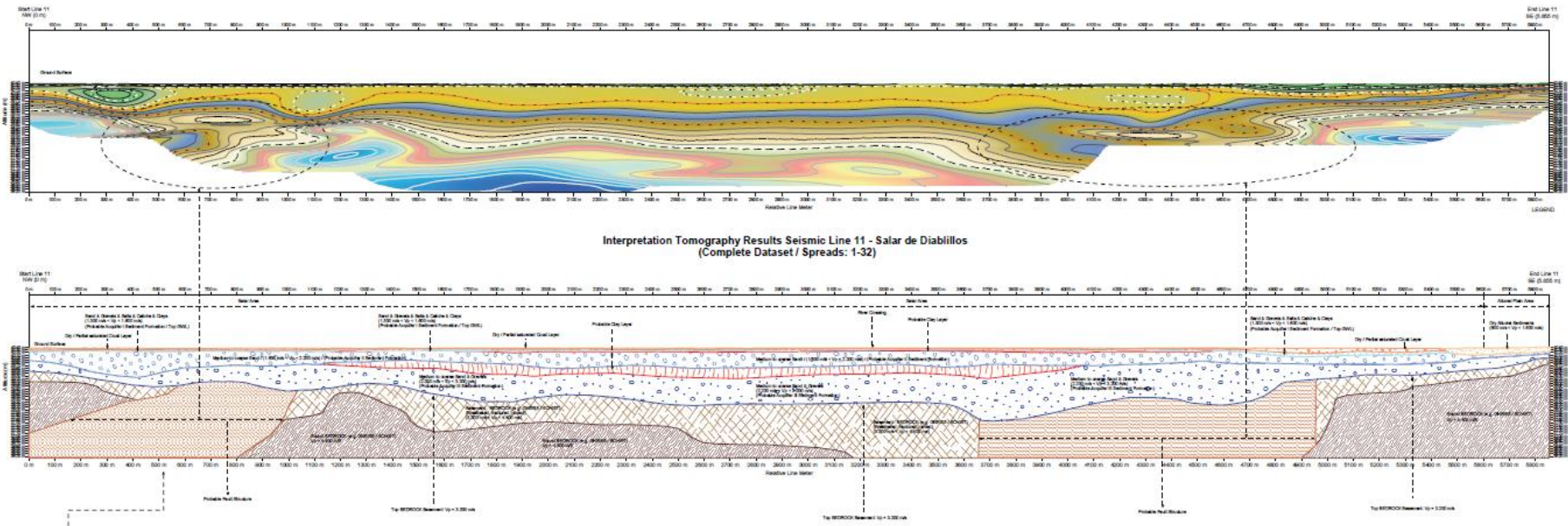
**Figure 6.4** and **6.5** show, respectively, examples of a north south and east west cross section of the seismic line interpretation provided by GEC (2012), and are considered representative of the overall basin stratigraphy.

Figure 6.4 Final WET tomography results seismic Line 10 and interpretation – Salar de Diablillos (GEC, 2012)



Source: Spanjers (2016)

Figure 6.5 Final WET tomography results seismic Line 11 and interpretation – Salar de Diabrillos (GEC, 2012)



Source: Spanjers (2016)

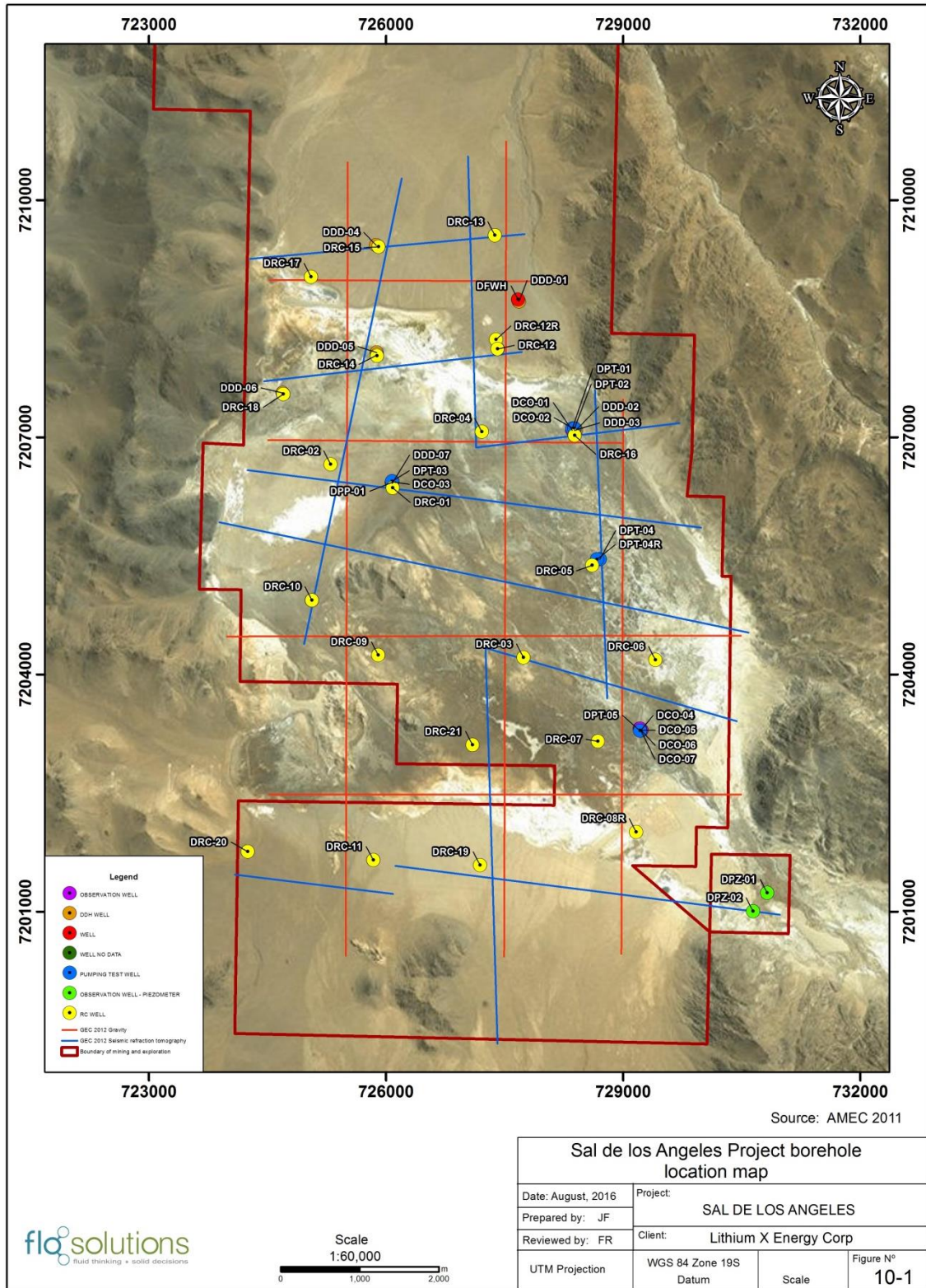
### 6.3.4 Hydrogeology

Rodinia initiated a surface water monitoring program in late 2010 to record the flow and chemistry of surface water in the Salar de Diablillos. Measurements were taken for each 6 m interval in the RC drilling and auger holes for pH, conductivity and temperature. Flow rates in RC drilling at a 6 m support were quantified by Rodinia's geologists through the record of the time of filling of 18 litre-buckets with brine from the cyclone; these measurements were taken in seconds and, then recalculated to obtain the final litres per minute flow rate.

### 6.3.5 Drilling Campaigns

As reported by Spanjers (2016), Rodinia completed several drilling campaigns on the Project between 2009 and 2012 comprising 140 auger holes, 21 reverse circulation (DRC) holes, 7 diamond drill (DDD) holes, 7 observation wells (DCO), 5 pump test wells (DPT), 1 production sized well (DPP), 2 piezometer wells (DPZ) and 1 fresh water well. A total of 6,298.45 m were drilled on the Project during the period (**Table 6.1**). **Figure 6.6** shows the drill hole locations, with the exception of the auger drill hole locations.

Figure 6.6 Drill hole locations and GEC 2012 gravity and seismic lines



**Table 6.1 Drilling summary (Rodinia 2009 to 2012)**

Year	Drill Hole	Easting <sup>1</sup>	Northing <sup>1</sup>	Elevation (m)	End of Hole (m)	Drill Type
2009 – 2010	D-A-02 to 145	140	492.45	3.8		Auger
2010	DRC-1	726,084	7,206,359	4,037	120	RC
2010	DRC-2	725,298	7,206,655	4,037	155	RC
2010	DRC-3	727,738	7,204,214	4,039	113	RC
2010	DRC-4	727,211	7,207,068	4,038	114	RC
2010	DRC-5	728,606	7,205,378	4,039	48	RC
2010	DRC-6	729,408	7,204,183	4,039	81	RC
2010	DRC-7	728,680	7,203,155	4,039	101	RC
2010	DRC-8	729,066	7,202,098	4,042	N/A	RC
2010	DRC-8R	729,165	7,202,008	4,043	71	RC
2010	DRC-9	725,902	7,204,243	4,039	71	RC
2010	DRC-10	725,062	7,204,939	4,038	60	RC
2010	DRC-11	725,838	7,201,651	4,060	264	RC
2010	DRC-12	727,412	7,208,115	4,042	71	RC
2010	DRC-13	727,377	7,209,553	4,058	164	RC
2010	DRC-14	725,885	7,208,039	4,027	125	RC
2010	DRC-15	725,903	7,209,408	4,053	122	RC
2010	DRC-16	728,387	7,207,023	4,038	106	RC
2011	DRC-12R	727,391	7,208,235	4,033	126	RC
2011	DRC-17	725,052	7,209,029	4,034	156	RC
2011	DRC-18	724,702	7,207,545	4,029	108	RC
2011	DRC-19	727,188	7,201,587	4,049	119	RC
2011	DRC-20	724,250	7,201,758	4,057	78	RC
2011	DRC-21	727,093	7,203,108	4,030	66	RC
2011	DDD- 01	727,682	7,208,715	4,050	206	DD
2011	DDD- 02	728,406	7,207,089	4,039	156	DD
2011	DDD- 03	728,382	7,207,087	4,039	102	DD
2011	DDD- 04	725,871	7,209,428	4,052	216	DD
2011	DDD- 05	725,880	7,208,068	4,038	162	DD
2011	DDD- 06	724,691	7,207,558	4,038	18	DD
2011	DDD- 07	726,078	7,206,417	4,038	252	DD
2011	DCO-01	728,355	7,207,086	4,039	96	RT
2011	DCO-02	728,382	7,207,103	4,039	89	RT
2011	DCO-03	726,079	7,206,434	4,038	252	RT
2011	DPT-01	728,357	7,207,110	4,039	54	RT
2011	DPT-02	728,382	7,207,112	4,039	96	RT
2011	DPT-03	726,077	7,206,443	4,037	252	RT
2012	DPT-04	728,707	7,205,455	4,038	297	RT

Year	Drill Hole	Easting1	Northing1	Elevation (m)	EOH (m)	Drill Type
2012	DPT-04R	728,673	7,205,458	4,038	102	RT
2012	DPT-05	729,218	7,203,288	4,039	162	RT
2012	DCO-04	729,226	7,203,289	4,038	228	RT
2012	DCO-05	729,243	7,203,294	4,037	234	RT
2012	DCO-06	729,216	7,203,312	4,038	120	RT
2012	DCO-07	729,221	7,203,313	4,039	30	RT
2012	DPP-1	726,075	7,206,428	4,038	240	RT
2012	DPZ-1	730,830	7,201,239	4,041	102	RT
2012	DPZ-2	730,654	7,201,008	4,040	102	RT
<b>Totals:</b>					<b>6,298.45 m</b>	

Source: Spanjers (2016)

Note: 1. Coordinates (UTM WGS84)

### **Auger Sampling (2010)**

Rodinia performed the auger hole sampling program. The field team used a gas-powered auger to drill the 2–3 m deep auger holes. A six-inch diameter auger blade was used for the first two metres of drilling and then downsized to a four-inch diameter auger blade for the final metre of drilling. A four-inch diameter plastic casing (Figure 6.9), perforated at the lower end was inserted into the hole to minimize caving of the hole prior to the water sampling.

The auger hole locations were selected on an approximately regular 300 m x 300 m grid spacing in the nucleus of the salar. Minor displacements from the theoretical grid location result from drilling difficulties caused by the presence of caliche layers. The objective of the auger campaign was to map lithium concentrations and brine chemistry near the surface, as well as subsurface water levels and surface geology.

### **Reverse Circulation (2010 and 2011)**

Rodinia retained Compañía Argentina de Perforaciones S.A. (CAPSA), an independent drill contractor, to drill the RC holes. CAPSA used a T4W Ingersoll Rand rig with 8", 6", and 4½" drill pipe and tri-cone bits.

RC holes were drilled on an irregular and wider grid of up to 1.5 x 1.5 km, with the objective of defining the margins of the salar and the depth extent of the brines. RC locations were selected to target the deeper portions of the salar based on the gravity survey results when made available.

The holes were located using a non-differential GPS unit, while RC holes were surveyed by Rodolfo Moreno, an accredited surveyor from Salta. All drill holes are vertical; no down-the-hole deviations from the -90° dip were measured. No down-hole surveys were performed. Due to the shallow length of the drill holes and the fact that all drill holes are vertical, no significant deviations are expected.

**Table 6.2** presents a summary of brine assays from the RC program.

**Table 6.2 Drillhole brine assay results for RC program (2011 to 2012)**

Drill Hole	From (m)	To (m)	Interval (m)	Li (mg/L)	K (mg/L)	B (mg/L)
DRC-01	6	120	114	713	9000	543
DRC-02	12	150	138	607	6877	794
DRC-03	18	108	90	510	5700	649
DRC-04	6	108	102	458	5406	567
DRC-05	Excess CO2 in brine @ 48m			530	5700	690
DRC-06	18	84	66	471	5054	732
DRC-07	42	100.5	58.5	515	5340	619
DRC-08	Excess CO2 in brine @ 70.5m			260	2200	550
DRC-09	24	60	36	521	6063	556
DRC-10	brine @ 36m			560	7100	480
DRC-11	60	264	204	536	5638	741
DRC-12	42	60	18	527	5867	603
DRC-12R	60	126	66	563	5810	694
DRC-13	108	163.5	55.5	649	7011	677
DRC-14	54	120	66	629	7600	491
DRC-15	60	114	54	612	6082	582
DRC-16	Excess CO2 in brine @ 76m			600	6700	710
and	Excess CO2 in brine @ 106.5m			600	6700	700
DRC-17	48	156	108	640	6631	688
DRC-18	54	108	54	647	7056	739
DRC-19	48	54	6	350	1900	510
DRC-20	72	78	6	140	1300	410
DRC-21	No significant values					

Source: Spanjers (2016)

### **Diamond Drilling (2011)**

As reported by Spanjers (2016), a total of 7 diamond drill holes were drilled by Rodinia between June 2011 and September 2011. Major Drilling S.A. was contracted to perform the diamond drilling. All seven of the diamond drill holes were collared at sites used previously for reverse circulation drill holes. The purpose of this was to confirm the stratigraphy of these locations to match the indicative flow rates achieved by airlifting the brine at defined intervals, as well as the brine grade and chemical composition.

Diamond drill results were also used to aid in seismic tomography interpretation, in particular the basement contact, as two of these diamond drill holes intersected the basement lithology. In some cases, diamond drill holes also serve as observation or monitoring wells for pump tests, as is the case

with DDD-02 and DDD-03, which were both drilled on the DRC-16 sites where pump tests were performed by SRK in 2011.

Diamond drilling generally shows (Table 6.3) a consistent basin fill grading from upper sandy layers, with some interbedded clays, to coarser grained gravels towards the basement contact. In some instances the basal stratigraphy is composed of abundant angular rock fragments most probably derived directly from the underlying basement rocks. Basement rocks appear to be either metamorphic schists or phyllites.

**Table 6.3 Drillhole lithology for diamond drilling program (2011)**

Drill Hole	From (m)	To (m)	Interval (m)	Dominant Lithology	Secondary Lithology	DRC Location	
DDD-01	0	84	84	Sand	Gravel	DFWH	
DDD-01	84	157.5	73.5	Gravel	Sand	DFWH	
DDD-01	157.5	187.5	30	Rock Fragments	Gravel	DFWH	
DDD-01	187.5	205.5	18	Basement Schist		DFWH	
DDD-02	0	36	36	Sand	Clay	DRC-16	
DDD-02	36	51	15	Sand	Gravel	DRC-16	
DDD-02	51	100.5	49.5	Gravel	Sand	DRC-16	
DDD-02	100.5	156	55.5	Basement Schist		DRC-16	
DDD-03	No recovery – drilled in same drill location as DDD-03						DRC-16
DDD-04	0	136.5	136.5	Sand	Gravel	DRC-15	
DDD-04	136.5	168	31.5	Gravel	Sand	DRC-15	
DDD-04	168	216	48	Basement Phyllite (fractured)		DRC-15	
DDD-05	0	27	27	Sand	Clay	DRC-14	
DDD-05	27	162	135	Sand	Gravel	DRC-14	
DDD-06	0	18	18	Clay	Sand	DRC-18	
DDD-07	0	99	99	Clay	Sand	DRC-01	
DDD-07	99	115.5	16.5	Sand	Clay	DRC-01	
DDD-07	115.5	177	61.5	Sand	Gravel	DRC-01	
DDD-07	177	204	27	Gravel	Sand	DRC-01	
DDD-07	204	237	33	Rock Fragments	Gravel	DRC-01	
DDD-07	237	249	12	Basement Schist (fractured)		DRC-01	
DDD-07	249	252	3	Basement Schist (fresh)		DRC-01	

Source: Spanjers (2016)

### 6.3.6 Hydrogeologic Testing (2011 and 2012)

SRK assisted Rodinia with drilling and construction of a set of wells near the site of DRC-16 in June and July of 2011, and with testing of the wells in August and September. The goals of the drilling and the pumping test program were to:

- More precisely characterize the sedimentology and stratigraphy of the basin-fill deposits;
- Quantify hydraulic conductivity and storativity (K and S) of the basin sediments;
- Estimate K and S of the fractured upper part of bedrock;
- Estimate specific yield ( $S_y$ ) of the shallow sediments (if possible with the given pumping conditions); and
- Estimate in-situ effective porosity ( $n_e$ ) of the aquifer sediments.

#### **Drilling and Well Construction**

Drilling by Rodinia through mid-2011 was mostly by RC-air (AMEC, 2011) and RC-mud drilling, and some core drilling with poor recovery. As a consequence, detailed stratigraphy has yet to be described with confidence in any hole, and very little clay, as distinct beds, has been described. Cuttings and recovered core are dominated by sand and gravel at all locations. The deepest extents of the basin have not yet been drilled, although there is some indication that in general, finer sandy fill overlies coarser gravel-dominated sediments at depth. The sediments are unconsolidated and all holes tend to collapse without heavy mud to keep them open. The presence of some laterally-extensive clay beds beneath the salar surface is expected, based on the broad surficial muds occupying the current center of the salar. AMEC (2011) reported that the basin-fill sediments beneath Salar de Diablillos constitute three separate aquifers. However, their drilling results included evidence of a discontinuous aquitard only between their uppermost and middle aquifers, and no significant breaks in the sandy, gravelly stratigraphy of the middle and deep aquifers.

In June 2011 rotary drilling switched from reverse-circulation air-rotary to conventional mud rotary drilling, and this change apparently resolved many of the problems related to gas exsolution (Section 8.2.8) encountered in the previous campaign. The mud also helped to keep the boreholes open during drilling and well construction.

Standard wireline core drilling has not met with similar success. The diamond drillholes (through September) were PQ in size (a hole diameter of 123 mm), and a triple-tube recovery system was used in an effort to enhance core recoveries, which were nevertheless relatively low, especially in sandy and gravelly intervals. Low core recovery might be due in part to the restricted aperture of the bits used to accommodate the triple-tube coring. The gravelly portions of the sediments also impede the effective use of sand baskets to aid in recovery of loose materials.

Groundwater samples were collected during core drilling after first purging drilling fluids from the sampling interval. Groundwater sampling employed a heavy, 6m steel bailer on the wireline to purge the corehole at the various sample depths, a process observed to be slow and tedious, especially at greater depths. The bailing process also removed drilling mud from the coreholes, which, in some cases was helping to keep gas in solution. As a result, in some instances, the suction induced by pulling up the

bailer caused de-gassing and consequent violent expulsion of gas, water, mud, wireline, and bailer. Recommendations were made to use a 1in PVC pipe and small air compressor to airlift-purge the coreholes.

Drilling and well construction at test site DRC-16 was based on the assumption of three semi-distinct aquifers, as described in AMEC (2011). The sedimentary sequence at DRC-16 was believed, based on interpretations of geophysical data, to be approximately 150 m deep. In fact, the basement contact was encountered at this location at a depth of 102 meters below grade (mbg – here and below, “grade” refers to the surface of a drilling pad constructed of imported fill, to a level of about 1 m above the dry lake bed); core and cuttings showed clayey sediments and caliche to a depth of 12 mbg, sand-dominated sediments to about 50 m, and sandy gravels below that depth. Based on that very general stratigraphy, SRK proceeded with tests based on an upper, or shallow, sand aquifer from surface to about 12 m; a middle sand aquifer from about 12 mbg to about 50 mbg; and a lower, or deep, sand aquifer from about 50 mbg to about 102 mbg.

Drilling for monitoring wells was done both by diamond-core and conventional mud-rotary drilling techniques. Conventional mud-rotary drilling was proceeded by pumping heavy drilling mud down the rods and up the borehole annulus. The available drillrig was not able to drive deep casing, however, this proved to be unnecessary. A blowout system was used at the wellhead to control discharges from de-gassing of the sediments; in most instances though, the heavy mud kept the gas under control.

Well construction in all drillholes was done in open holes, after the rods had been removed, relying on the mud to keep the holes open. Well screens were placed in open holes, without a filter sand, relying on the formation sands to collapse around and stabilize the well. Cement baskets were used above the screen intervals to support a solid seal of bentonite pellets. The borehole annuli were then grouted above the bentonite seal with a cement/bentonite slurry. The grout mixture contained a ratio of approximately 10 bags of clean Portland cement to 3 bags of bentonite powder and 1,800 liters of water.

SRK noted that a tremie pipe was not used for emplacement of either the bentonite chips or the cement grout; all materials were introduced into the borehole annuli from the surface, allowing gravity to work the materials into place. Although the drilling mud was more or less replaced with water before introduction of the annular materials, SRK is concerned that in some instances the seals between the screen and the ground surface may have been imperfect, especially in the deeper well completions.

### **Monitoring Wells**

Middle-sand monitoring well DC-01 was constructed in a nominal 6-inch rotary borehole drilled to a depth of 54 m. The well was completed with nominal 2-in, schedule-80 PVC screen from 42 mbg to 12 mbg. The actual length of the screen was not recorded, however, a tagline down the center of the casing encountered a solid floor at 42 m. Solid 2-in, schedule-80 PVC casing extends from 12 m depth to surface.

Deep-sand monitoring well DDD-03, was also constructed in a 6-in rotary borehole, and completed with 2-in schedule-80 box thread PVC screen from 96 to 54mbg, and solid casing from 54m to surface. Well construction, including use of a cement basket and emplacement of annular materials, as described above.

DDD-02 (deep-level, basement piezometer) was constructed in a PQ corehole. The basement piezometer was completed with 2-in schedule 80 PVC screen and casing inserted down the inside of the PQ core rods and shoe bit. A cement basket was included on the PVC sequence just above the

screen interval. The screen was set from 154 to 102 mbg; solid PVC extended to the surface. With the PVC string resting on the bottom of the corehole, the rods were retracted to a level above the screen interval, so that the cement basket opened into the open corehole. Bentonite pellets were gravity-fed down the PQ rods to form a seal above the cement basket. Cement grout was then pumped down the rods to fill the annular space above the seal.

A fourth monitoring well, DC-02, was drilled at site DR-16 to be used as an injection well for a tracer test in the sediments. DC-02 was drilled on a line between PT-02 and DDD-03, at a distance of 8m from PT-02. The screen interval of DC-02 was the same as that for DDD-03. The well was constructed by methods similar as those used for other monitoring wells, and airlift developed for two hours after the annular cement had set up.

### **Pumping Wells**

The middle-sand pumping test well PT-01 was completed with 140 mm (4.5-inch) schedule 80 PVC screen from 52 m to 12 mbg. No 140 mm solid PVC casing was available at site, so additional PVC screen was run to surface, and wrapped with plastic. A cement basket was placed at 12 m, between the open screen and the sealed screen, and packed with granular bentonite upon installation. Approximately 5 more bags of granular bentonite were then poured into the annular space to fill to surface. The remaining hole around the lower, open screen was allowed to collapse around the well.

PT-02, the deep-sand pumping test well, was constructed with 162 mm (6.375-in) PVC screen and casing. Screen was emplaced from 89 to 47mbg (mechanical and hole conditions precluded a deeper screen placement). A nominal 6-in cement basket was fastened to the casing string at 47 m, and bentonite was placed around the cement basket upon installation. Thirty additional bags of bentonite chips were poured from surface around the annular space of the well, followed by the addition of cement bentonite grout to the surface.

### **Well Development**

All pumping and monitoring wells were airlift developed to remove drilling mud and to help the formation materials to collapse around the well screens. Pressure transducers were used in each development to capture hydraulic data for preliminary analysis of hydraulic properties. Water samples were collected by Rodinia from the deep-sand monitoring well only. Static water levels were measured in each monitoring well one day after well development.

During development of the middle-sand monitoring well DC-01, grout was seen to be seeping out around the annular seal at the surface. Airlifting rates were high, approximately 70 liters per minute (L/min), including discharge from both the well casing and from around the well annulus. The resultant airlift recovery data were used to estimate a preliminary hydraulic conductivity value of about 1.8 m/day. A static groundwater level was measured in DC-01 at 1.2 m below top of casing (TOC). The casing is 0.65 m above the top of grade, which in turn is about 1.0 m above the lake surface. The static water level, therefore, is just slightly above the surface of the lake bed (**Table 6.4**).

**Table 6.4 Static water levels in wells at the DR-16 test site**

Well	Screen Interval	Aquifer	Grade above Lake Bed	TOC Height above Grade	Water Depth below TOC	Static Water above Lake Bed	Date
	m (below grade)		(m)	(m)	(m)	(m)	
DDD-3	54-96	Deep sand	1	1.1	2.62	-0.52	22-Aug-11
DCO-1	12-42	Middle sand	1	0.65	1.02	0.63	
DDD-2	102-154	Basement rock	1	0.97	-0.1	2.07	
DCO-02	54-96	Deep sand	1	--	--	--	
PT-1	12-52	Middle sand	1	0.49	0.97	0.52	
PT-2	47-89	Deep sand	1	0.6	0.4	1.2	

Basement piezometer DDD-02 was airlift developed at a rate of 5 L/min; recovery was slow. Both drawdown and recovery data collected during the airlift development were analyzed. Graphical, Theis analyses yielded a K value in the fractured bedrock of about 0.01 m/day. The static water level in DD-02 is slightly higher than the top of casing; consequently there is artesian flow from the well, at a very low rate.

The deep-sand monitoring well DDD-03 was airlift developed at a sustained flow rate of about 90 L/min, for 30 mins. After air was shut off, discharge of gas and water continued at about 40 L/min for 45 minutes. During this process, a transducer recorded pressure changes deep in the well casing. An examination of the recovery data that were recorded after the transition from 70 L/min to 40 L/min indicated a possible K value in the range of about 4 m/day, however, subsequent numerical model results (next section) are considered much more reliable. The static water level is 2.6 m below TOC, and slightly below the lake-bed surface (Table 6.4).

**Middle-Sand Pumping Test: PT-01**

Two long-term pumping tests were conducted at the DRC-16 test wellfield, in the middle-sand and deep-sand pumping wells. The middle and deep tests included approximate 36- and 72-hour periods of pumping, respectively, followed by equivalent periods of recovery.

Pumping of PT-01 was done by airlifting, using compressed air from the rotary drill rig, injected through an ad-hoc wellhead using 1-in high-pressure air hose. Air-water discharge was directed through a cyclone and then to a measuring tank via a lined ditch. The tank included a 90-degree, sharp-crested V-notch weir cut into the end, which was used to measure water discharge rates. The flow rate was also measured by stage-volume at the cyclone discharge, and averaged 8.0 L/s (127 USgpm) through the 36 hour test. De-gassing of the groundwater induced by the pumping is thought to have contributed somewhat to the airlift rate.

The middle-sand pumping test was monitored in DDD-03, DDD-02, and DC-01, using data-recording transducers suspended on cables beneath the wellheads. The monitoring wells were initially sealed at the wellheads during the testing periods, in order to minimize de-gassing of groundwater in the monitoring well casings as pressures declined, which could obscure pressure changes during the tests. Midway through the pumping, the transducers were unsealed, with no unfavorable effects.

The discharge water was not channeled away from the test site, but allowed to pond on the lake bed around the well platform. It was thought that clay and caliche (logged at 12 mbg) would prevent recirculation of the discharged water back into the formation. Unfortunately, drawdown in monitoring wells ceased at about 10 to 18 hours into the test, indicating that recharge was occurring at a rate equivalent to the pumping rate. It is most likely that the discharge water re-circulated to the formation, probably through unsealed boreholes and other construction-related irregularities in the hydrostratigraphy. The curve at DDD-02 “flat-lined” about 8 hours before the curve at DC-01, indicating that the pathway of recirculation was from the south, in the direction of DRC-16 (which did not fill with water) or at DDD-02 itself.

Drawdown curves for DC-01 and DDD-02 from the first 10 hours of the shallow pumping test were analyzed graphically, and provided preliminary K values of 3 to 12 m/day in the sediments. These values proved useful in preparing for the second pumping test and accompanying dye-tracer test.

### **Deep-Sand Pumping Test: PT-02**

Pumping in PT-02 was initiated by airlifting, using compressed air from a portable air compressor, injected through a site-constructed wellhead using 1-in high-pressure air hose. The compressed air was turned off for a short time to see if the airlift pumping could continue entirely by way of degassing of the groundwater, but was re-initiated after a few hours when the discharge rate was seen to decline. Air-water discharge was directed again through a cyclone and then to a series of tanks, ending with a tank cut with a 90-degree, sharp-crested, V-notch weir. The flow rate was measured at the weir and at the cyclone discharge, and again averaged 8.0 L/s (127 USgpm) through the 76 hour pumping period.

Discharge water from the deep-sand pumping test was conveyed away from the test site using two sump pumps and a 6-in layflat hose. The water was discharged to the lake bed at a distance of 500 m from the test site, and did not drain, on surface, back toward the test. Drawdown in monitoring wells showed no sign of recharge during the 76-hour pumping period.

The deep-sand pumping test was also monitored in DDD-03, DDD-02, and DC-01; and in DC-02, after injection of dye (see below). The monitoring wells were not sealed at the wellheads, except for DC-02, after dye injection. Drawdown and recovery curves for DC-01, DDD-02, and DDD-03 were analyzed numerically, as described in sections below.

### **6.3.7 Tracer Test**

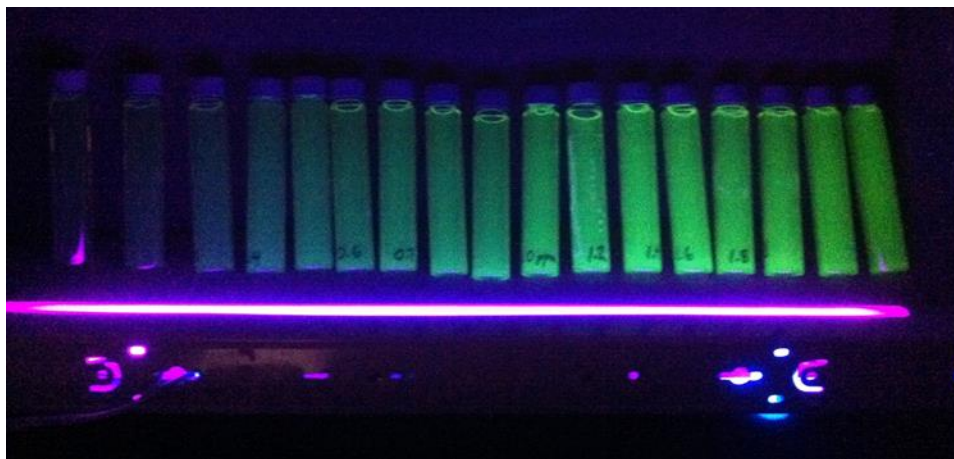
A dye-tracer test was conducted in the deep sediments during the 72-hour pumping test. The tracer test consisted of injection of a dye into a monitoring well close to the pumping well, and periodic sampling of the pumping discharge water to define the arrival time and dispersion of the dye. For the PT-02 test, a monitoring well (DC-02) was drilled specifically to inject the dye, because the existing monitoring well in the deep sediments (DDD-03), 25m away from PT-02, was too distant to ensure arrival of the dye in detectable quantities within a reasonable period of time.

The dye mixture consisted of 4.5 Kg (10 lbs) of fluoresceine powder mixed into 350 L of formation water (from DDD-03) for an initial concentration of 13,000 mg/L. From the 350 L batch of dye, standard solutions were prepared by diluting with formation water. Dye standards at concentrations of from 0.01 mg/L to 4.0 mg/L were prepared in glass vials (**Figure 6.7**) to be used in visual (black-light) comparison to discharge-water samples. Unfortunately, the extreme salinity of the brine caused

chemical and/or surface reactions between the fluoresceine and the dissolved and suspended constituents of the brine. As a result, part of the dye apparently flocculated by the second day.

A small centrifugal pump was used to inject the dye into DC-02, starting 8 hours after initiation of the pumping test. Injection took 14 minutes, after which the injection well was sealed. Samples of the discharge water were subsequently collected in glass sample bottles at regular intervals until the dye concentration obtained a steady, maximum level. The samples were evaluated visually under black light for relative concentrations of the dye; however, the actual concentrations observed were at the very low end of the range of dye-standard concentrations. Consequently, times could be estimated for initial arrival ( $t_0$ ), arrival of the maximum concentration ( $t_{max}$ ), and arrival of the midpoint concentration ( $t_{50}$ ), however, the absolute concentrations could not be quantified. The arrival times for  $t_0$ ,  $t_{max}$ , and  $t_{50}$  were compared to type curves generated by a MODFLOW simulation of the test (see below) to estimate effective porosity and dispersivity values.

**Figure 6.7 Fluoresceine dye standards under black (UV) light (SRK, 2011)**



## 6.4 Interpretation

SRK used quasi 3-D numerical models (Visual MODFLOW 2010.1) to estimate the hydraulic conductivities ( $K_h$  and  $K_v$ ) from test site PT-01 and PT-02. Two numerical models were constructed (one for each pumping test) using the geological information from the site, the distance between piezometers and pumping well, screen intervals of piezometers, and time and pumping rates. The numerical approach was found to be superior to analytical methods because traditional pumping test analyses are not designed to evaluate tests with multi-level monitoring wells screened in different levels and units.

The numerical groundwater models used for evaluation of the pumping and tracer test results included the following attributes:

- A 3-D quadrant model of 5,000m by 5,000m by 200m;
- Fine grid sizes of 0.2m by 0.2m in the pumping well area, which coarsened to approximately 600m by 600m further away from the piezometer area;
- The ground surface and all layers simulated as horizontal beds throughout the model extent;

- Pumping wells simulated by Pumping Well cells, using four to six hydraulically connected layers for screen intervals;
- Monitoring wells simulated using the Head Observation Well option with observation points in the same layer as the screen interval;
- No recharge applied to the model due to the short time of the pumping test;
- Initial water levels assumed to be 2 m below the ground surface elevation; and
- All simulations made in the transient state.

Each simulation correlated the simulated drawdown to the measured drawdown, using different values of horizontal and vertical hydraulic conductivities ( $K_h$  and  $K_v$ ), with the goal of obtaining a single hydraulic conductivity value for each unit in each site tested. In PT-01, pumping induced a stress within the host shallow and middle sand units (combined) and the underlying deep sand unit. In PT-02 the pumping induced a stress within the deep sand unit, between the shallow/middle sands and the Bedrock.

### **Model Results**

Optimal calibration of the two models yielded a horizontal hydraulic conductivity ( $K_h$ ) value of 4 m/day, and a vertical hydraulic conductivity ( $K_v$ ) value of 0.02 m/day for the combined shallow/ middle sand. The low  $K_v$  in the shallow/ middle sand in part reflects the presence of the clay/caliche aquitard at 12 mbg, which was not modeled discretely.

Deep sand values of  $K_h$  and  $K_v$  best calibrate at 4 m/day and 1 m/day, respectively. The numerical analysis of the pumping test results show the basement rocks to be of relatively low hydraulic conductivity, with calibrated  $K_h$  equal to  $K_v = 0.01$  m/day.

Additionally, specific storage values of  $1.0 \times 10^{-5}/m$ ,  $1.0 \times 10^{-6}/m$ , and  $5.0 \times 10^{-7}/m$  were found, respectively, in the shallow/middle sand, deep sand, and basement rock units. **Table 6.5** summarizes the results of the numerical analysis of the test data.

The calibrated deep-sand was used as a basis for tracer test analysis, which was carried out during the PT-02 pumping test. Because the samples collected at the recovery well contained dye in concentrations at the very low end of the range of visible dye concentrations, the goal of the analysis was to obtain dispersivity and effective porosity values using the initial arrival ( $t_0$ ) and arrival of the maximum concentration ( $t_{max}$ ).

The tracer-test model simulation used the hydraulic conductivity ( $K_h$ ,  $K_v$ ) and specific storage ( $S_s$ ) values obtained from numerical analysis of the pumping tests. Additionally, estimated specific yield ( $S_y$ ) of 10% and 1% were assumed for sand units and bedrock, respectively. Results of the analysis include reasonable values of 15% for effective porosity and 15 m for dispersivity in the deep sand Unit (**Table 6.5**).

**Table 6.5 Summary of test results (SRK, 2012)**

	Hydraulic Conductivity		Specific Storage (1/m)	Specific Yield (assumed) (%)	Dispersivity (m)	Effective Porosity (%)
	Horizontal	Vertical				
	(m/day)	(m/day)				
Shallow Sand	4	0.02	1.00E-05	10	--	--
Middle Sand						
Deep Sand	4	1	1.00E-06		15	15
Basement	0.01	0.01	5.00E-07	-	--	--

### **DCO-3 Pumping Test**

In late 2012, a 36 hour pumping test was conducted in the vicinity of DRC-01, Pumping was done in well DPT-03 while monitoring wells DCO-3 and DDD-07 (see **Tables 6.1** and **6.3**). The test was conducted while the surrounding area was flooded, and late-time data in the test hydrographs in both monitoring wells suggested a possible recharge from surface water either leaking through an unsealed well casing or entering the test horizon from other unsealed drillholes in the vicinity. However, the hydrograph from the pumping well showed no recharge effects, and the recovery data were used to calculate transmissivity. Results showed a K value 0.7 m/day. The K value is lower than obtained in the tests from the DRC-16 tests, and is consistent with the finer-grained sediments logged in this area.

## **6.5 Gas Exsolution**

A peculiar characteristic of the Salar de Diablillos aquifer is that the groundwater locally contains a high concentration of dissolved gas. The composition of the odorless gas has not yet been analyzed; however, it is believed to be dominated by CO<sub>2</sub>. RC drilling at DRC-16 (**Figure 6.8**) and at several other locations encountered small amounts of exsolving gas at shallow depths, around 40 mbg. Gas exsolution increased to a violent, voluminous, and sustained outflow of gas at depths of about 100 mbg. Early drilling, without mud, could not penetrate below that depth in some holes, due to the degassing.

It is important to note that the initial reports of very high artesian heads and strongly-flowing artesian wells were in fact describing wells and boreholes where water was being lifted out by rising gasses. Upward groundwater gradients and flowing-artesian conditions do exist at Diablillos, but much more subtly.

RC drilling (any airlift pumping) injects air at depth in the borehole; and that air rises and expands, entraining and lifting the water in the casing. As the air and water rise, it further lowers the pressure in the water column below, causing more groundwater, under hydrostatic pressure in the formation, to enter the casing and in turn to be “lifted” out of the well. In the case of the gaseous wells at Diablillos, the formation water that is drawn into the low-pressure borehole carries with it a high concentration of dissolved CO<sub>2</sub>. Upon encountering the low pressure of the borehole, the CO<sub>2</sub> comes out of solution, forming bubbles. Just as with an engineered airlift, those bubbles rise and lift the water, causing more water to flow into the well. As long as CO<sub>2</sub>-rich groundwater is able to flow in at a rate that can keep pace with the water/gas mixture rising out of the well, the process will continue.

**Figure 6.8 Airlift Effect at DRC-16**



**Source:** Photo by SRK

The “gaseous zones” in DRC-16 and other wells most likely represent zones of higher hydraulic conductivity, from where groundwater can flow into the well at a high rate. In those zones, water lifted out of the well by the expanding and rising CO<sub>2</sub> bubbles is quickly replaced by more CO<sub>2</sub>-saturated groundwater, so that a chain reaction of inflow, de-gassing, and “airlifting” becomes self-sustaining (e.g., a rapidly un-corked bottle of soda).

Lower-permeability strata above (and possibly below) may contain similar concentrations of CO<sub>2</sub> under similar pressures, however, lower inflow rates result in less de-gassing, less airlifting, smaller decreases in water column pressure, and thus un-sustainable airlifts (comparable to a slowly un-corked bottle of soda).

Once the well is re-capped, the chain reaction described above is broken: de-gassing is suppressed under more or less hydrostatic confinement, inflow of water stops, and the well stabilizes. The reaction can also be stopped if the borehole collapses, as at DRC-8. In this case, the conduit for escaping groundwater is greatly restricted so that the de-gassing rate must also decrease.

The origin of the dissolved gas is not known, however, it does not appear to be evenly distributed beneath the Salar. Drilling in some locations has not encountered gas at concentrations high enough to be problematic. SRK currently assumes that the gas is of igneous origin, and enters the sediments through deep-seated structures cutting the floor of the basin. Consequently, greater concentrations (apparently) occur near the bedrock contact, and concentrations decrease upward as hydrostatic confining pressures decrease.

## 6.6 Historical Mineral Resource Estimates

In situ brine resources were initially reported in a press release entitled “Rodinia Lithium Inc. Defines 4,959,000 Tonne Lithium Carbonate Equivalent Resource at Salar de Diablillos” dated March 2, 2011.

AMEC prepared the 2011 mineral resource statement for the brine resource. The effective date for this historical estimate is January 21, 2011.

Lithium X and SRK considers the previous mineral resource estimate as historical. This historical estimate includes descriptions such as “in-situ inferred resource” and “recoverable inferred resource” that are not recognized terms under the 2014 CIM Definition Standards on Mineral Resources and Mineral Reserves. A qualified person has not done sufficient work to classify this historical estimate as current mineral resources and the Company is not treating the historical estimate as a current mineral resource for the Sal de los Angeles Project.

## 6.7 Historical Production

To date, there is no recorded historical production of lithium or potassium from Sal de Los Angeles. Previous production has been limited to borates (ulexite and borax).

## 7 GEOLOGICAL SETTING AND MINERALIZATION

### 7.1 Regional Geology

According to Turner (1972) and Isacks (1988), the main lithium-bearing region of South America is located in the Altiplano Puna plateau, which is approximately 2,000 km long by 300 km wide with an average elevation of 3,700 m, controlling the geomorphology of the central Andes. A volcanic arc forms the western margin of the Puna/Altiplano. East of the volcanic arc, local volcanic edifices are present within the plateau. The volcanic arc and eastern volcanic centres have been active from Miocene times to the present day (Jordan and Gardeweg, 1989) and they are the origin of mineralized fluids. Uplift of the plateau is the combined result of late Tertiary crustal shortening and magmatic addition (Isacks, 1988).

The climate of the Puna varies from semiarid on the eastern border to arid along the western volcanic arc. The volcanic arc marks the limits of the Puna hydrologic basin to the west and a tectonic highland area to the east (Eastern Cordillera). In the southern Puna, combinations of east-trending volcanic chains and north-trending, reverse fault-bounded structural blocks bound several hydrologic sub-basins (Alonso, 1986; 1991; Vandervoort, 1995). Extensive salars cover the basin floors, which are typically surrounded by expansive alluvial systems. Thick (up to 5 km) sections of Neogene strata are present within the modern depositional basins (Jordan and Alonso, 1987; Alonso et al., 1991) containing evaporites (mainly halite, gypsum and borates) and alluvial clastic material with minor tuffaceous horizons (Alonso, 1986). Exposed Neogene strata are present in reverse fault-bounded slices along salar margins or as intrabasin uplifts within salars (Vandervoort, 1995). Waters drain towards these closed basins so that the only way of returning to the hydrological cycle is by means of evaporation, leaving behind brines enriched in various metals and salts, sometimes including anomalous levels of lithium, boron, and/or potassium. **Figure 7.1** shows the simplified regional geology of the Puna Plateau. **Figure 7.2** shows a stratigraphic column of the Puna Plateau.

The Salar de Diablillos is located on the western margin of the central portion of the Puna geological province (Turner, 1972) and within the Puna Austral geological sub-province defined by Alonso et al., (1984). The altitude of the saline salt flat or playa is approximately 4,000 masl. The Salar constitutes a typical evaporite depositional environment emplaced within an isolated depression bound by Pre-Palaeozoic, Palaeozoic and Cainozoic crystalline metamorphic basement rocks (Vinante & Alonso, 2006).

Brine deposits form in evaporite-terrigenous depositional environments where brines have generally obtained lithium from geothermal waters. Most active and/or recent terrigenous-evaporite-depositional environment brines contain lithium in small concentrations, of which, three brine deposits were commercially exploited as of 2011: Salar de Atacama, Chile; Salar de Hombre Muerto, Argentina; and Clayton Valley, USA. These deposits have the following features in common:

- Brines are obtained from the porous strata under the surface of the playas
- Sedimentation and evaporation occurred within enclosed basins that generally form a regional topographic low with restricted outflow
- Proximity to lithium-containing hot springs (some extinct)

- Proximity to past volcanic activity
- Comparatively high levels of lithium in brine, all above 160 ppm Li
- High-altitude areas (>1,200 masl)
- Salt flats greater than 40 km<sup>2</sup>
- Low precipitation rates and arid climates
- Extreme weather conditions, including high wind conditions and daily/seasonal temperature variation.

**Figure 7.1 Simplified Geological Map of the Puna Plateau (Gomez, 2008)**

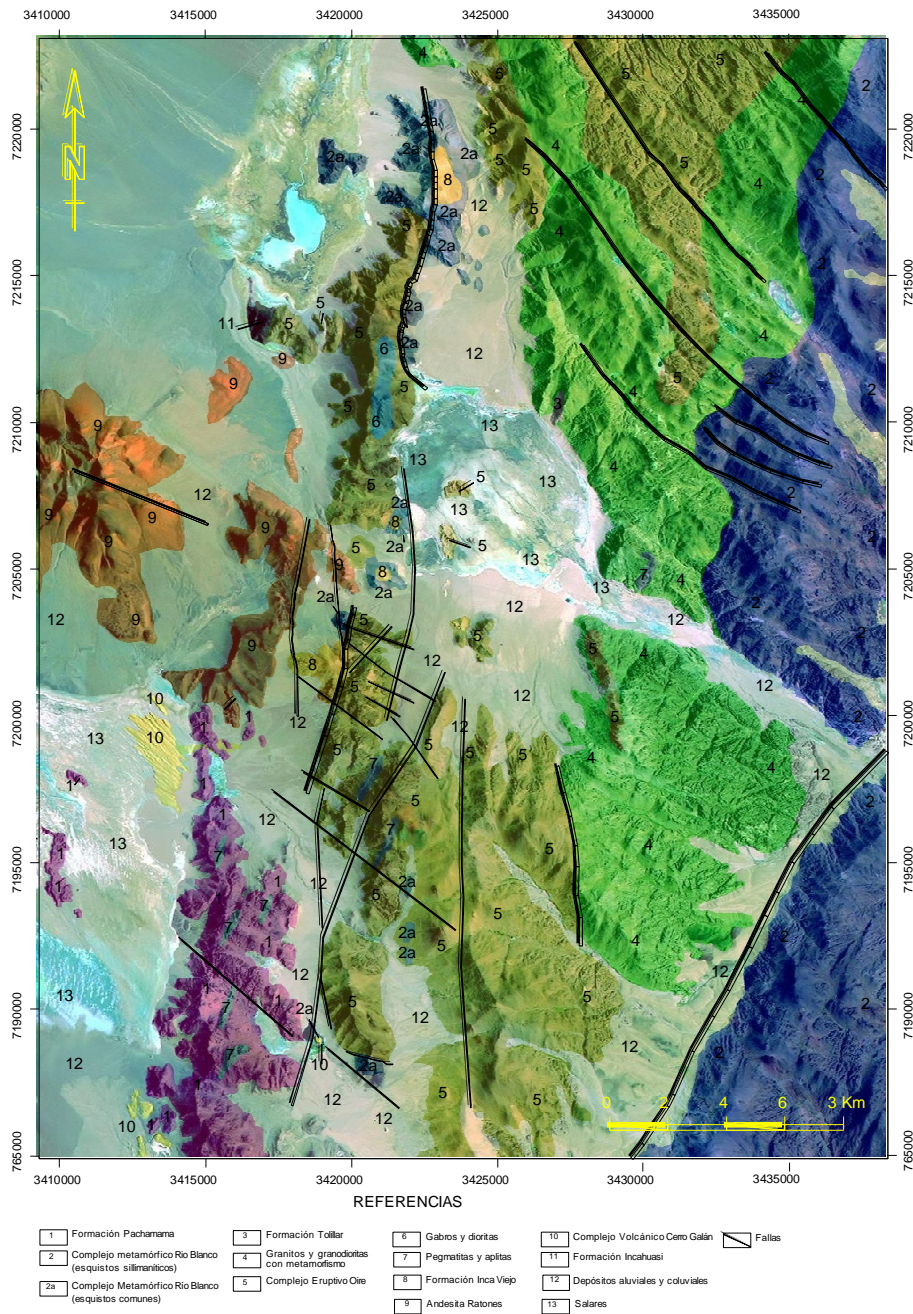
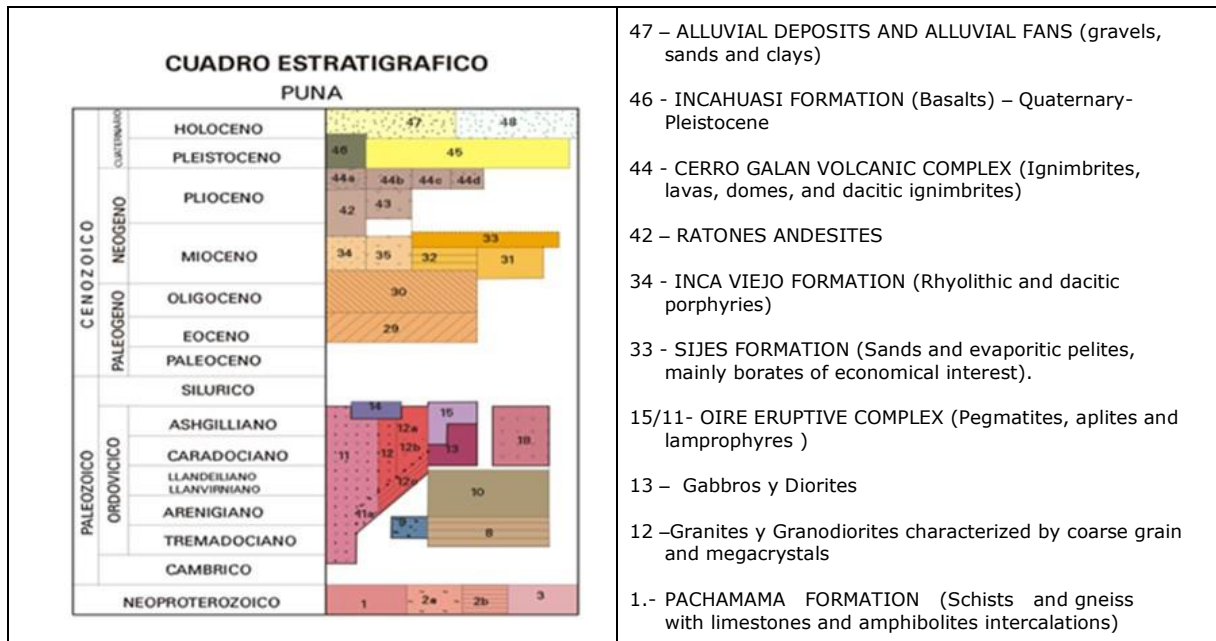


Figure 7.2 Stratigraphic column of the Puna Plateau (AMEC, 2011)



## 7.2 Mineralization

The hydrothermal fluids that are inferred to be the source of boron to the basins have been associated with correlative levels of lithium and potassium (Viramonte, Alonso, Gutierrez & Argañaz, 1984). Examples of this are the Cauchari, Ratones and Diablillos salars which exhibit high concentrations and distribution of borate minerals as well as high concentrations of lithium in sub- surface brines. The Salar de Diablillos hosts near surface borate mineralization, primarily in the form of ulexite (Alonso, 1984). According to Viramonte et al (1984) it is possible to classify the salars of the region based on this association between lithium and borates in two groups: lithium-borate rich and lithium- borate deficient.

Although limited published literature is available describing the stratigraphy of the basin, there are various references to the large extent and grade of the ulexite mineralization within the surficial sandstone strata. The Salar is generally described as a “boratera” referring to the ulexite mineralization that covers parts of the Salar, varying from 20 cm to several metres in thickness (Alonso 1984, Alonso 1999, Alonso 2006, among others). The borate minerals are an example of chemical-evaporitic sedimentation in arid continental environments with periods of active volcanism.

The areal distribution of borates within the Salar is irregular and is thought to be related to the location of the hot springs from which they are derived (Alonso 1999). In Diablillos remains of ancient hot spring deposits have been identified so that the predominant hypothesis is that their genesis is directly related to the supply of hot boron-bearing water from vents at the margins and/or interior of the depressions (Alonso & Gutierrez, 1984; Alonso 1988). These hydrothermal fluids rose through fracture planes that structurally control the depressions during periods of relaxation, or within extensional periods in the predominantly compressive regional tectonics. As shown in **Figure 7.1**, the Salar de Diablillos is bound to the south by the roughly east–west-trending Ratones fault(s), to the east by a perpendicular north–south unnamed fault, and to the west by a chain of granitic-composition hills that are elongated north–south and are probably structurally controlled.

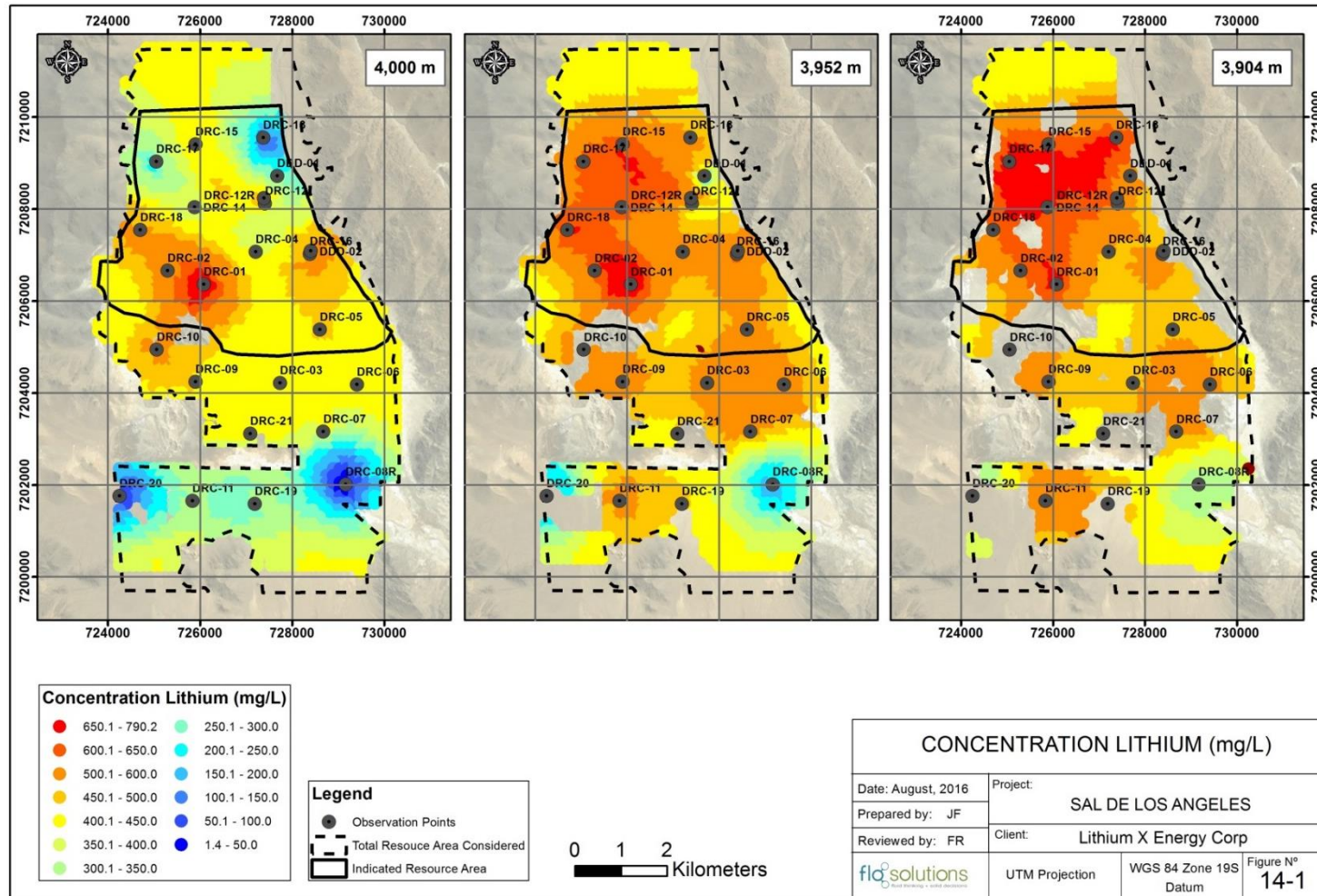
**Table 7.1** show the average concentrations of elements in Salar de Diablillos based on the analyses carried out on the brine samples collected during the DD and RC drilling program.

**Table 7.1 Average elemental concentration of the brine in Sal de los Angeles Project**

Analyte	HCO <sub>3</sub>	B	Ca	Cl	Li	Mg	K	Si	Na	Sr	SO <sub>4</sub>	Density
Units	mg/L as CaCO <sub>3</sub>	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	g/cm <sup>3</sup>
Maximum	2,800	980	2,500	150,000	810	3,400	9,300	35	78,000	30	14,000	1.18
Average	1,580	580	770	79,100	490	1,850	5,400	9	44,600	15	7,150	1.10
Minimum	150	2	40	50	0.3	10	20	2	100	0.2	48	1.00

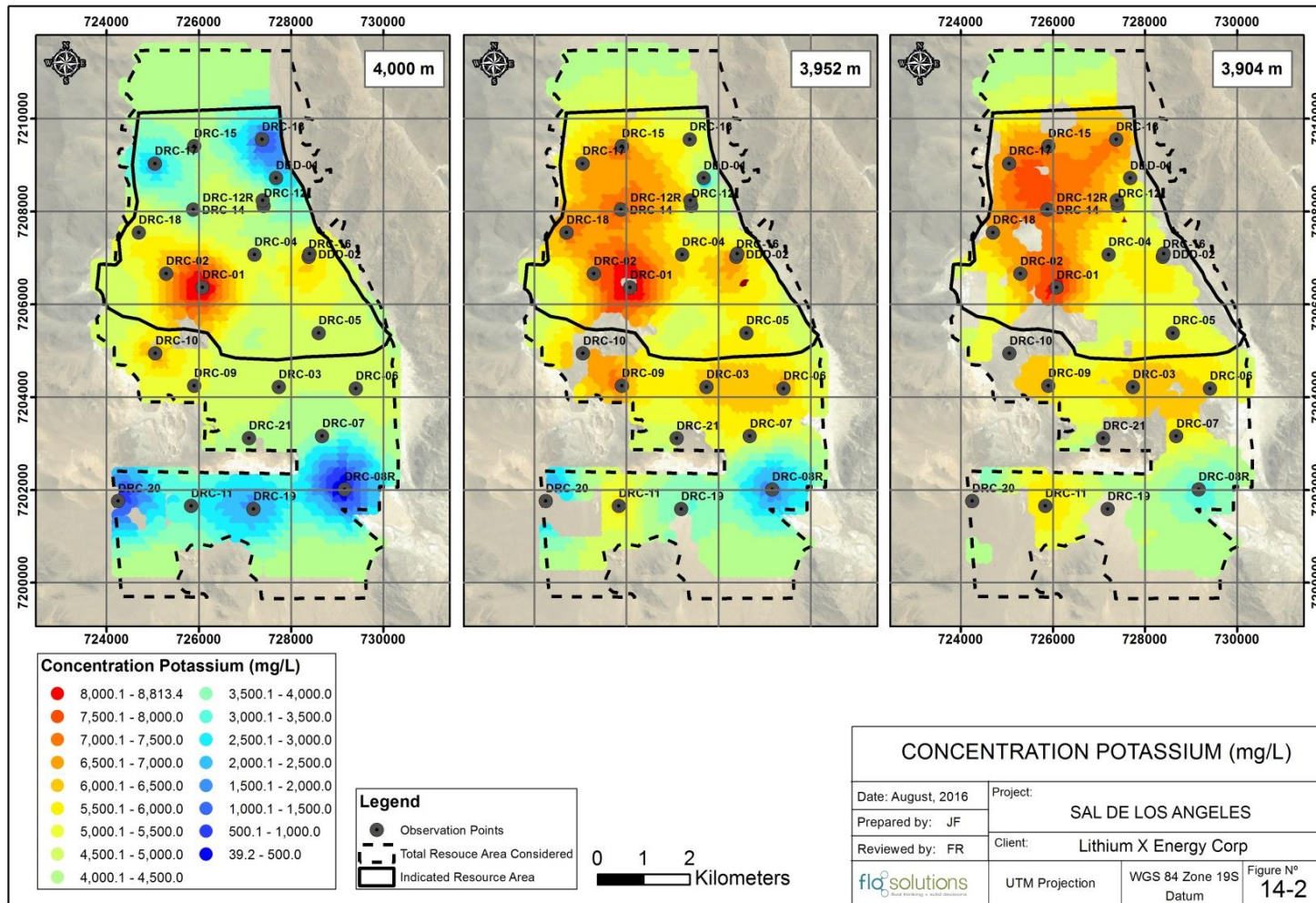
**Figures 7.3 to 7.5** shows the lithium, potassium, and boron concentration distribution in the Salar at the approximate 30 m, 50 m and 100 m depth intervals. Typically, high and low concentrations are correlated.

Figure 7.3 Lithium concentration distribution at 4,000 m, 3,950 m, and 3,904 m elevation



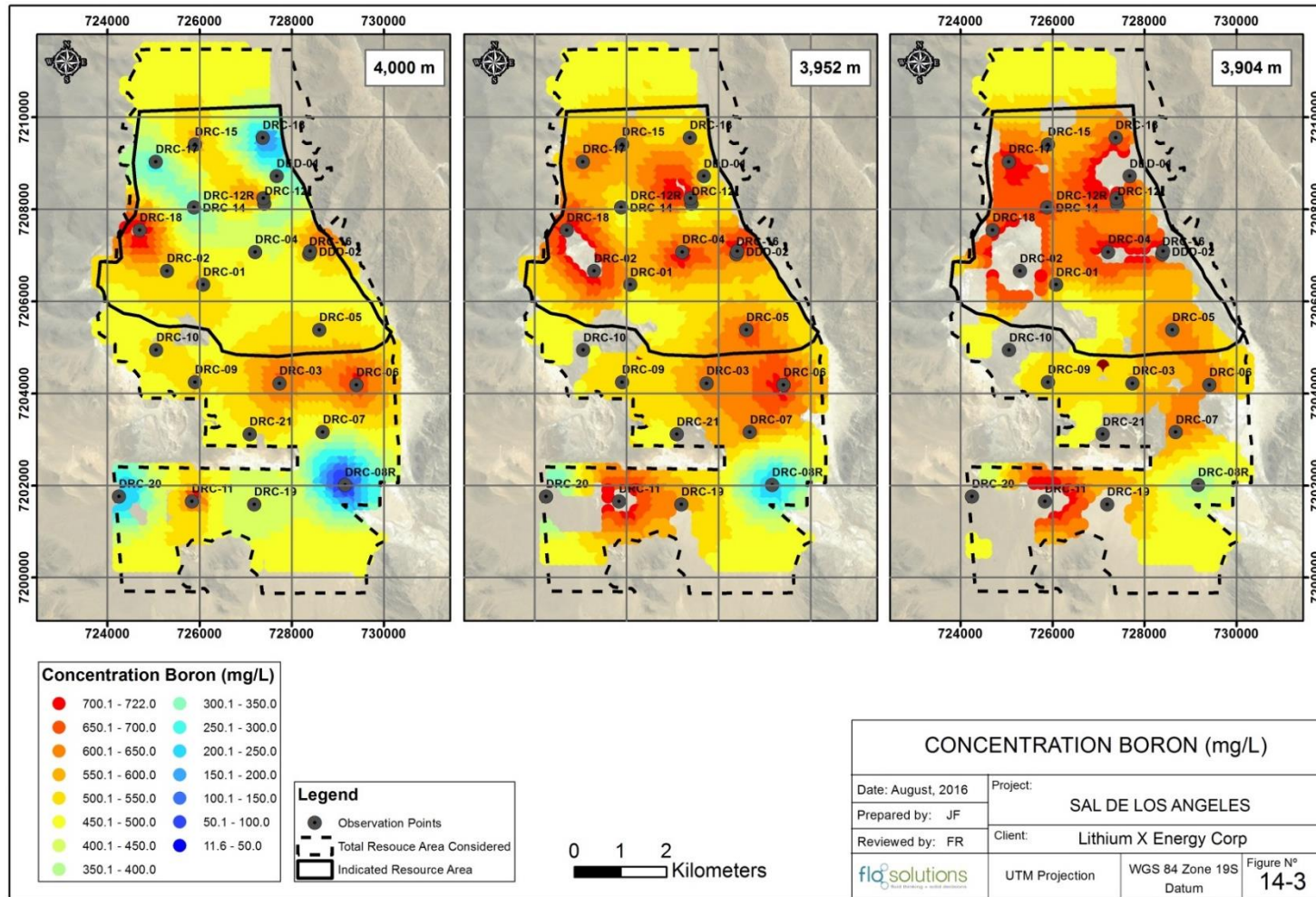
Scale

Figure 7.4 Potassium concentration distribution at 4,000 m, 3,950 m, and 3,904 m elevation



Scale

Figure 7.5 Boron concentration distribution at 4,000 m, 3,950 m, and 3,904 m elevation



Scale

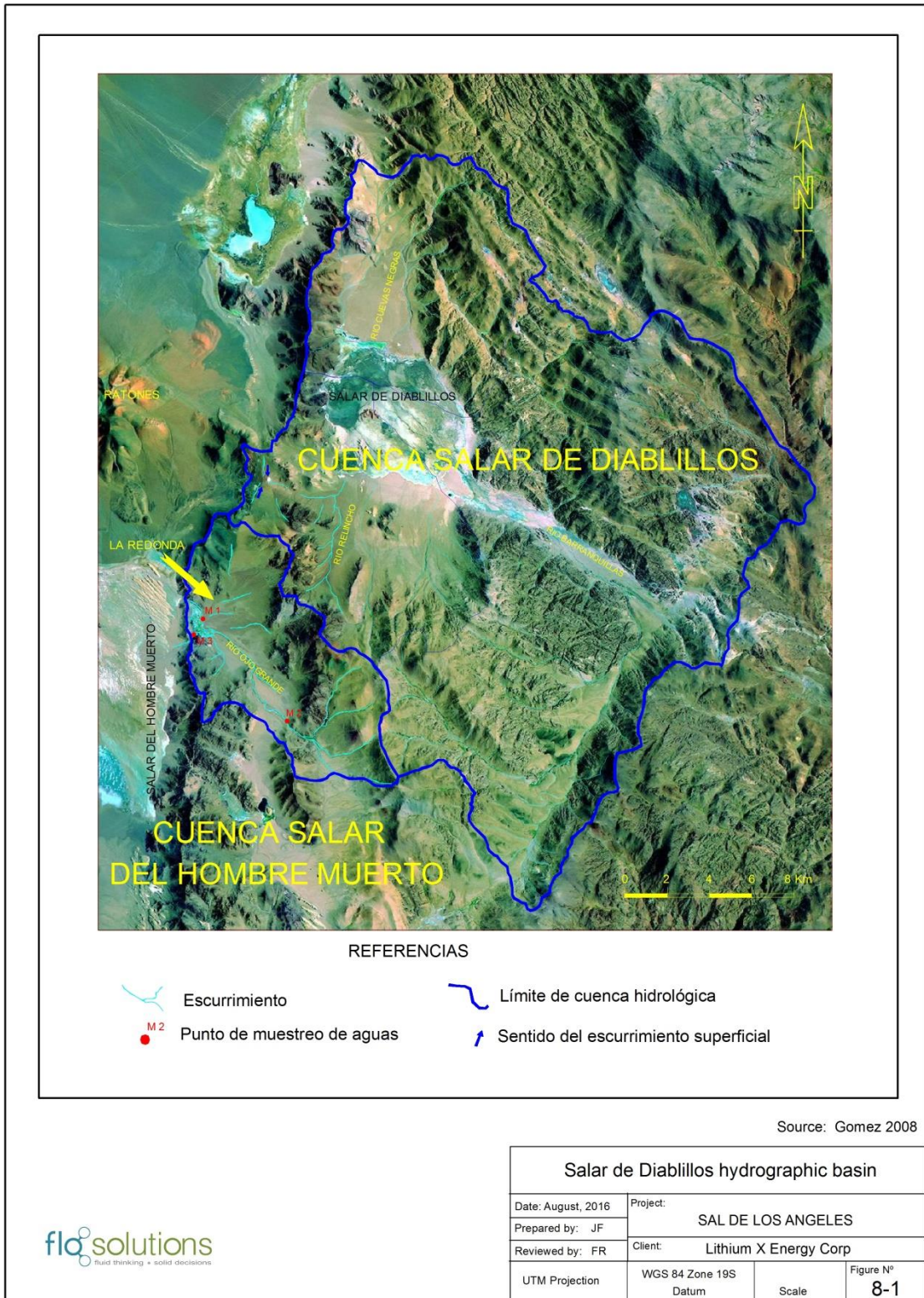
## 8 DEPOSIT TYPE

### 8.1 Local Setting

Salar de Diablillos is located in the northwest portion of the of Diablillos hydrographic basin as shown in **Figure 8.1**. The hydrographical basin is an enclosed intermountain plane a with length of approximately 40 km in the north–south direction and a width of approximately 15 km in the east–west. The Salar surface covers approximately 33 km<sup>2</sup>.

The southern portion of the Salar receives fresh water inflow from the Rio Diablillos and some minor intermittent inflow from Rio Relincho. The northern portions of the Salar may receiver intermittent inflow from Rio Cuevas Negras. No surface water flow records are available for these tributaries.

Figure 8.1 Salar de Diablillos hydrographic basin (Gomez, 2008)



## 8.2 Local Geology

The basement of the Salar corresponds to the Rio Blanco Precambrian metamorphic complex. Extensive alluvial plains ascend to the north and south. The Salar has a thin salt efflorescence crust covering a layer of borate ulexite on almost all salar surfaces (Alonso, 1986). Towards the edges, this crust graduates to a more clastic facies. Travertine deposits from former springs are irregularly distributed across the Salar. Substantial sediments were deposited from the southeast and north and cover most of the Salar.

Based on the auger, RC and core drilling carried out to date three general units within the Salar can be identified as follows:

### Unit 1

Unit 1 includes an upper layer of 3-4 m thick that consists of calcareous sediments caliche and clays. Below the borate layer, generally between 1 m and 5 m below surface occurs mix of clays, thin evaporite facies (sodium chloride, mirabilite ( $\text{Na}_2\text{SO}_4 - 10\text{H}_2\text{O}$ )) carbonate facies, ulexite facies and coarse grained clastic sediments from alluvial fans encroaching on the salars. Thinly-bedded clay, silt, sand and evaporite facies (mostly halite and scarce gypsum) continue below.

### Unit 2

Unit 2 consists primarily of stratified fine to medium sands with occasional coarser sands and gravels in a proportion from 55% to 90%. Clay and silts occur as secondary lithologies in a 10% to 45% proportion.

### Unit 3

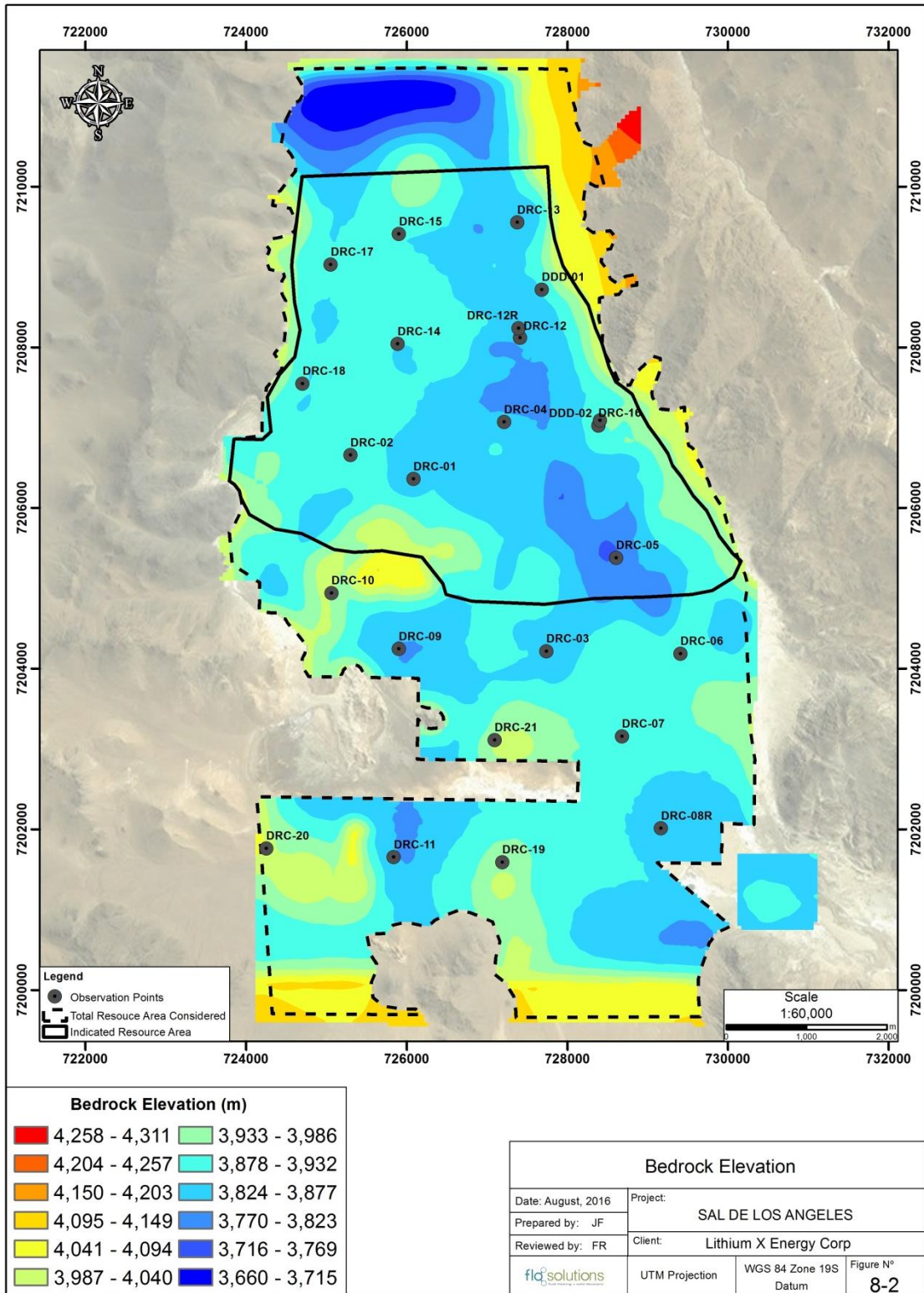
The lithology of Unit 3 is similar to Unit 2; but with an increase in fine to coarse grained gravels. Clays and silts again occur as secondary lithologies.

The bedrock underlying the above three units was intercepted by 10 boreholes as shown in **Table 8.1**. A seismic refraction survey carried out across the Salar further refined the understanding of the bedrock topography which is shown in **Figure 8.2**. Depth to bedrock varies from approximately 23 to 186 m.

**Table 8.1 Summary of drill hole data**

ID	Easting	Northing	Elevation	Depth	Sum Recovery	% Recovery	Bedrock Intercept	Area
DDD-01	727682	7208715	4050	205.5	118.83	57.8	186	Indicated
DDD-02	728406	7207089	4039	156	89.59	57.4	102	Indicated
DDD-03	728382	7207087	4039	102	6.2	6.1	99	Indicated
DDD-04	725875	7209426	4038	216	112.57	52.1	169.5	Indicated
DDD-05	725880	7208068	4038	162	61.89	38.2		Indicated
DDD-06	724691	7207558	4038	18	5.99	33.3		Indicated
DDD-07	726078	7206417	4038	252	87.03	34.5	154	Indicated
DRC-01	726084	7206359	4037	126				Indicated
DRC-02	725298	7206655	4037	154.5				Indicated
DRC-03	727738	7204214	4039	113				Inferred
DRC-04	727211	7207068	4038	114				Indicated
DRC-05	728606	7205378	4039	48				Indicated
DRC-06	729408	7204183	4039	81				Inferred
DRC-07	728680	7203155	4040	100.5				Inferred
DRC-08R	729165	7202008	4043	70.5				Inferred
DRC-09	725902	7204243	4039	70.5				Inferred
DRC-10	725062	7204939	4038	60			49.5	Inferred
DRC-11	725838	7201651	4060	264				Inferred
DRC-12	727412	7208115	4042	70.5				Indicated
DRC-12R	727391	7208235	4044	126				Indicated
DRC-13	727377	7209553	4053	163.5				Indicated
DRC-14	725885	7208039	4038	124.5				Indicated
DRC-15	725903	7209408	4059	121.5				Indicated
DRC-16	728387	7207023	4038	106.5				Indicated
DRC-17	725053	7209029	4045	156			144	Indicated
DRC-18	724702	7207545	4039	108			85	Indicated
DRC-19	727189	7201587	4060	118.5			102	Inferred
DRC-20	724250	7201758	4067	88.5				Inferred
DRC-21	727093	7203108	4040	66			23	Inferred

Figure 8.2 Bedrock surface topography



### 8.3 Groundwater Levels

During RC drilling, Rodinia’s geologists registered the depth of ground water level and the depths where artesian conditions were encountered. **Table 8.2** summarizes this information. The reasons for these artesian conditions are not well understood at this stage but are likely related to some confining (low permeability) layers in the Salar. The occurrence, depth and thickness of this confining layer do not appear continuous between boreholes.

**Table 8.2 Groundwater levels (AMEC, 2011)**

Hole ID	Water Level (m)	Artesian Conditions (m)
DRC-01	5	100
DRC-02	1.5	104
DRC-03	4	52
DRC-04	1.5	96
DRC-05	4	48
DRC-06	-	81
DRC-07	15	93
DRC-08R	12	66
DRC-09	1.5	-
DRC-10	1.5	-
DRC-11	35	130
DRC-12	42	-
DRC-13	42	-
DRC-14	16	105
DRC-15	46	80
DRC-16	3	54

### 8.4 Drainable Porosity

Porosity is highly dependent on lithology. Total porosity is generally higher in finer grained sediments, whereas the reverse is true for drainable porosity or specific yield since finer grained sediments have a high specific retention. The lithology within the Salar is highly variable with gravel-sand-silt-clay mixes spanning the full range of possibilities. Thus, it is only possible to discriminate the dominant lithology, for example, sand dominant or clay dominant. With this in mind, it is not surprising that the porosity of sand dominant, or clay dominant (for example) lithologies have a wide range with considerable overlap. Values for specific yield were determined from Relative Brine Release Tests and pumping tests. **Table 8.3** presents the range of drainable porosities observed in the Salar.

**Table 8.3 Drainable porosity (specific yield)**

Lithology	Drainable Porosity (%)	
	From	To
Clay dominant	0.1	4
Unit 2: Sand dominant	9	15
Unit 3: Sand dominant	10	29
Unit 3: Gravel dominant	9	29

## 8.5 Permeability

Permeability has been determined from pumping tests carried out on two production wells. The analysis of the pumping tests is further discussed in Section 12 below. The results of the permeability calculations from the pumping tests are summarized in **Table 8.4**.

**Table 8.4 Permeability**

Test	Permeability (m/d)	
	From	To
DPT 1 (2016)	1	1.28
DPP 2 (2011)	1.9	14

## 9 EXPLORATION

The authors of this report were not responsible for the design and execution of all historical pumping tests completed at the Project.

Lithium X conducted a field program in July 2016. This program consisted of sampling existing, cased boreholes and a 3-day aquifer test program at DPP-01.

### 9.1 Aquifer Test at DPP-01 (2016)

During July 2016, a 3-day pumping test was conducted at DPP-01, on the same drillpad as DPT-03, which was airlift tested in 2012. Results from the 2016 test show a permeability (K) value of 1.3 m/day, somewhat higher than the 0.7 m/day found in 2012. No boundaries were encountered during the 3-day test. The analyses from the 2016 test of DPP-01 are further discussed in **Section 12**.

### 9.2 Additional Hydraulic Testing (2016)

Additional testing in the northern-most portions of the Diablillos basin in 2016 met with limited success. Boreholes DRC-17 and DRC-18 were not open when visited. Tests were attempted in diamond coreholes DDD-04 and DDD-05, and in DRC-13, where PVC casings were found to be accessible. However, recovery hydrographs from the three airlift tests showed either the casings to be unsealed, so that surface water flowed into the wells during testing, or insufficient stress of the aquifer to overcome wellbore-storage effects in recovery. As a consequence, the results of the three completed airlift tests cannot be reliably analyzed for hydraulic properties.

Two pumping tests were conducted at the DRC-16 site, consisting of approximate 36- and 72-hour periods of pumping, respectively, followed by equivalent periods of recovery.

## 10 DRILLING

### 10.1 Overview

LiX has not conducted any drilling at Salar de Diablillos since it closed its acquisition of PLASA which owns the Sal de los Angeles Property. All drilling activities were carried out by Rodinia Lithium Inc. and are described previously in **Section 6**.

# 11 SAMPLE PREPARATION, ANALYSIS, AND SECURITY

The authors were not present during the sample preparation, analysis, and security described as part of this section, and no additional sampling has been completed by the authors. Therefore, confirmation and verification cannot be completed, and the authors are taking the provided information as fact and are reliant on past reporting. Information has been provided to the authors from Lithium X or reproduced from published technical reports and memoranda as documented below.

Information regarding reverse circulation (RC) drilling and sampling performed by Rodinia between 2010 and 2011 that is described below was taken from NI 43-101 “Technical Report on Brine Resource Estimate, Salar de Diablillos Project, Salta Province, Argentina” (AMEC, 2011) and “NI 43-101 Technical Report, Preliminary Economic Assessment, Salar de Diablillos Project” (SRK, 2011). Minor modifications without material changes to the original text have been completed in some instances to suite the format of this report.

Additional samples of brine were collected and analyzed after publication of the original resource assessment completed by AMEC (2011). The sampling method and approach for these additional samples is as follows. Reverse circulation drilling and sampling performed by Rodinia during 2010 and 2011 is assumed by the authors to be have been completed using methods described in the aforementioned NI 43-101 technical reports. Diamond drilling and sampling completed by Rodinia during 2011 are assumed by the authors to have been completed using methods described by SRK (2011).

## 11.1 Reverse Circulation Drilling Brine Sampling

A procedure established by Rodinia and TRU Group at Clayton Valley was implemented at Diablillos. The procedure establishes that brine and sediments samples are airlifted when possible. Injection of drilling fluids (water) is allowed only in the upper part of the hole until before the water table is intercepted; after that, only air was used so as to avoid dilution or contamination of the brines. AMEC reviewed the written procedures and sample handling and drilling procedures of two holes (RC-15 and RC-16) that were being completed at the time of their site visit during December 2010.

Logs for each RC drill hole were completed which consisted of the following: lithology (primary and secondary), flow (measured as seconds per 18 liters), temperature, pH, specific gravity, electrical conductivity, decantation time, total dissolved solids (TDS) and operational conditions, among other observations such as brine coloration and absence of flow. Brine and solids recovery were recorded.

Rock chips/sediments and brine were collected every 6 m, or less when a noticeable change in the grainsize from visual inspection or consolidation occurred. However, if collected more frequently, the samples were combined into a 6 m representative sample after geological logging. Solid samples were stored in plastic trays as shown in **Figure 11.1**.

**Figure 11.1 Rock chip/sediment sample storage in the warehouse in Salta, Argentina (SRK, 2011)**



The chip samples recovered during the RC drilling were logged and photographed. Solids and liquid fractions were separated at the cyclone; no sieving was involved (Figure 11.2). The liquid from the cyclone was allowed to stand for several minutes to let the small amount of sediments to settle out.

The brine samples were taken after the drilling was stopped and the equipment lifted, allowing for the total flushing of the internal pipe until the brine appeared reasonably clean of sediment. Drill holes were allowed to fill with water, and in cases where there was sufficient inflow, pumped out in order to rinse the hole and minimize the effect of material that may have fallen into the hole. The drill holes were then allowed to fill again for two hours from the aquifer below, and then a sampling device was lowered into the hole to collect the brine samples.

**Figure 11.2 Cyclones at RC drilling platform (SRK, 2011)**



### 11.1.1 Comments

In the original resource assessment, AMEC (2011) stated that they were of the opinion that the sampling procedure, samples collected, and methods employed and approach were thorough, and provide sufficient information to support brine resource estimation:

- All collection and bagging of solid and brine samples were carried out by Rodinia personnel.
- Sample collection and handling of cuttings was undertaken in accordance with industry standard practices, with procedures to limit potential sample losses and sampling biases.
- No factors were identified within the drilling programs that could affect the reliability of the sample data used for brine resource estimation.
- Data are collected following industry-standard sampling protocols for brine deposits.
- There are no drilling or recovery factors identified that would materially impact the accuracy and reliability of the drilling results.
- The samples collected are considered of sufficiently high quality to provide unbiased results of the gross brine geochemistry.
- The size of the sampled areas is representative of the distribution and orientation of the brines.

The authors of this report are in agreement.

## 11.2 Diamond Drilling Brine Sampling

Diamond drilling was completed using a triple tube recovery system in an effort to enhance core recoveries, which were nevertheless relatively low, especially in sandy and gravelly intervals. Low core recovery might be due in part to the restricted aperture of the bits used to accommodate the triple-tube coring. The gravelly portions of the sediments also impede the effective use of sand baskets to aid in the recovery of loose materials.

Brine was collected during core drilling after first purging the sample interval. Sampling employed a heavy, 6-m steel bailer on the wireline to purge the borehole at the various sample depths, a process observed to be slow and tedious, especially at greater depths. The bailing process also removed drilling mud from the boreholes, which in some cases was helping to keep gas in solution. As a result, in some instances, the suction induced by pulling up the bailer caused de-gassing and consequent violent expulsion of gas, water, mud, wireline, and bailer. SRK recommended using a 1-inch PVC pipe and small air compressor to airlift-purge the boreholes.

### 11.2.1 Comments

The authors of this report are of the opinion that sampling during diamond core drilling is generally reasonable to provide sufficient information to support the brine resource assessment. Future diamond drilling should more accurately record the type and volumes of fluids used during drilling, sampling purging and collection methods, include the use of a conservative tracer, and other QA/QC procedures.

## 11.3 Brine Sample Preparation and Analysis

One set of 500 mL brine samples, corresponding to 6 m drill hole intervals, was packaged and sent to ALS, in Fort Collins, Colorado, USA. ALS is an ISO 9001:2000 certified laboratory.

Samples were submitted to the laboratory with their drill hole identification depth. At ALS, a correlative number was provided. Because of this, control samples inserted by Rodinia as part of their QA/QC program were not blind to the analytical laboratory. ALS sample receipt records indicate the samples arrived in good condition with no apparent damage, except for some occasional leaks.

Based on the reports provided by ALS, samples were received at ambient temperature and were unpreserved. Prior to analysis, samples were filtered, but not digested.

Samples were assayed for barium, boron, calcium, iron, lithium, magnesium, potassium, silicon, silicon as SiO<sub>2</sub>, sodium, and strontium using trace inductively-coupled plasma (ICP) method 6010B and to SOP 834, Rev. 7 and Rev. 8. Details of the elements and detection limits are summarized in **Figure 11.3**.

**Figure 11.3 Details of Assay Methods used by ALS (SRK, 2011)**

Sample Matrix: WATER	Prep Batch: IP100726-10	Sample Aliquot: 5 ml
% Moisture: N/A	QCBatchID: IP100726-10-1	Final Volume: 5 ml
Date Collected: 20-Jul-10	Run ID: IT100726-1A6	Result Units: MG/L
Date Extracted: 26-Jul-10	Cleanup: NONE	Clean DF: 1
Date Analyzed: 26-Jul-10	Basis: As Received	
Prep Method: SW3005 Rev A	File Name: T100726A	

Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
BARIUM	100	10	10	U	
BORON	100	570	10		
CALCIUM	100	1100	100		
IRON	100	10	10	U	
LITHIUM	1000	810	10		
MAGNESIUM	100	2800	100		
POTASSIUM	1000	8800	1000		
SILICON	100	13	4.6		
SILICON AS SiO <sub>2</sub>	100	28	9.8		
SODIUM	1000	78000	1000		
STRONTIUM	100	21	1		

### 11.3.1 Comments

In the original resource assessment, AMEC (2011) stated that they were of the opinion that the sample preparation and analytical methods used by ALS were appropriate for the project and that sample containers and sampling equipment were rinsed prior to collecting the samples; bottles were rinsed at least three times with brine, then filled, labelled, and sealed for transportation to the laboratories. The rinsing of sample bottles was never verified for samples collected during diamond drilling. Primary (A series) samples were collected and shipped to the laboratory. Secondary (B series) samples were collected and stored for future analysis as a backup.

The laboratory typically reported that all analyses were analyzed at dilutions in order to bring target analytes into the calibration range and protect the Trace ICP instrument from the high TDS content of the samples. In-house quality control procedures were followed such that initial and continuing calibration blanks were below the practical quantitation limits for the requested analytes and initial and continuing calibration verifications were within the acceptance criteria for the requested analytes.

## 11.4 Brine Sample Security

Sample security during the drilling program relied upon the remote nature of the site and the fact that samples were locked at the warehouse at the camp and Salta. Brine samples were stored in tamper-proof containers which could not be opened without destroying the containers.

The B series samples were collected for future analysis and as a backup samples in case A series samples became damaged during transport. The B series of samples were stored at Rodinia storage facilities in Salta (**Figure 11.4**).

**Figure 11.4** Brine Sample Containers Stored at Rodinia's Warehouse (SRK, 2011)



### 11.4.1 Comments

In the original resource assessment, AMEC (2011) stated that they were of the opinion that no sample-security factors were identified during the sampling process that would materially impact the accuracy and reliability of the results.

Solid rejects of RC cuttings were bagged and labelled. Retrieved core was packaged and kept in the original sleeves. The authors cannot comment on security procedures regarding the core.

## 11.5 RBRC Preparation and Analysis

Seven undisturbed samples were shipped to Daniel B. Stevens & Associates Inc. (DBSA) in Albuquerque, New Mexico, USA, for determination of porosity and Relative Brine Release Capacity (RBRC) (equivalent to specific yield ( $S_y$ )). The undisturbed samples were selected from DD drilling intervals with high core recovery rates (near 100%). The authors were not involved with the selection, preparation and shipping of these undisturbed core samples.

## 12 DATA VERIFICATION

### 12.1 Brine chemistry analysis

The preponderance of the data has been verified as part of the original resource assessment that was completed by AMEC (2011). This information was originally described in the NI 43-101 “Technical Report on Brine Resource Estimate, Salar de Diablillos Project, Salta Province, Argentina” (AMEC 2011) and “NI 43-101 Technical Report, Preliminary Economic Assessment, Salar de Diablillos Project” (SRK 2011b). However, as explained in Section 11, additional samples of brine were collected and analyzed after publication of the original resource assessment completed by AMEC (2011). To account for additional data that has been collected an updated data verification has been completed by the authors to support this resource assessment. In support of the data verification, the authors have randomly compared the assay certificates (original laboratory data reports) to the compiled database for approximately 50% of the samples; no deviations were identified that would affect the resource estimation. A similar finding was also noted by AMEC (2011). In regard to drill collar locations, AMEC (2011) verified the location of the drill collars of 30% of the holes using a hand-held GPS unit, and did not observe significant differences compared to the location recorded in the database.

#### 12.1.1 Analytical QAQC

Analytical quality assurance and quality control was monitored through the use and insertion of blanks and standards throughout the sampling program. The geochemistry database compiled for this assessment consisted of 353 samples of which 28 blanks, 29 standards, and 296 primary samples were submitted for chemical analysis. Approximately 16% of the samples were submitted for QAQC with blank or standard samples being submitted on average approximately every 14 m. During drilling, primary samples were composited along approximately 6 m intervals for a total composited length approximately equal to 1,735 m. Samples were collected during 2010 and 2011.

The majority of the primary (254) and QAQC (48) samples were collected from RC holes and sampled over approximately 1,487 m. The following RC holes were sampled as part of this resource assessment: DRC-1, DRC-2, DRC-3, DRC-4, DRC-5, DRC-6, DRC-7, DRC-8R, DRC-9, DRC-10, DRC-11, DRC-12, DRC-13, DRC-14, DRC-15, DRC16, DRC-17, DRC-18, DRC-19, DRC-20, and DRC-21. The remaining dataset consisted of primary (42) and QAQC (9) samples collected from diamond holes and sampled over approximately 248 m. The following diamond holes were sampled as part of this resource assessment: DDD-1 and DDD-2.

As stated by AMEC (2011), QAQC samples are typically blind-inserted into the sample stream and submitted to the analytical laboratories. However, assay certificates from ALS show that this was not the case, as samples were submitted to the laboratory with the drill interval marked for drill samples, and no interval if the samples were QAQC samples. Typically, QAQC samples should be labeled with no reference information. The authors do not believe the procedure employed by Rodinia historically has effected data quality but emphasize that this should be avoided for all QAQC and primary samples in the future.

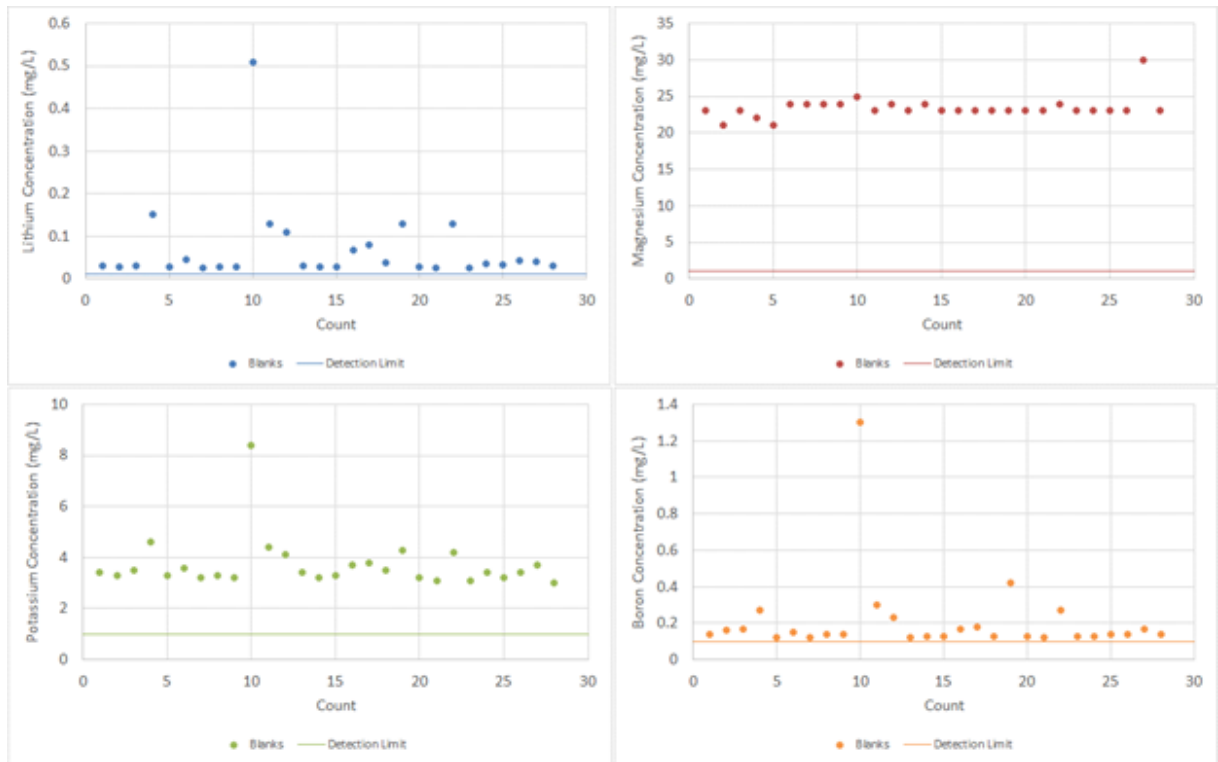
## 12.1.2 Blanks

Blanks are used to measure contamination that may have been introduced into the sample as a result of sampling and/or laboratory related activities. Typically, sources of contamination may occur as a result of field activities, insufficient equipment decontamination, laboratory analysis or reporting errors, or contamination at the laboratory. The exact nature of how the blanks were collected for the project (e.g., equipment blank, field blank, etc.) has not been documented to date. So the targeted source of bias and potential contamination can only be generally assessed; this is further compounded by the chemical nature of the water that was used as a blank (i.e., commercial mineral water as opposed to distilled water).

Blank samples were inserted into the program by Rodinia personnel at a rate of approximately 1 per 62 m on average. All of the blanks were submitted to ALS labs. Commercial mineral (bottled) water was used which is contrary to convention which recommends the use of distilled water. Blanks should have little to no chemical signature so that most analyte concentrations cannot be detected, thereby reporting analytical detection limits. As expected, based on the use of commercial mineral water as a blank, the presence of low-level contamination is evident by the high number of blanks that reported detectable concentrations of Li, Mg, K, and B as shown in **Figure 12-1**. Cross contamination between sampling cannot be ruled out but is considered to have a low-probability of effecting the results because of the elevated concentrations of the brine resource. The average concentrations measured in the primary samples for the analytes of interest (Li, Mg, K, and B), and most major ions, are a few orders of magnitude above concentrations measured in the blanks as shown in **Table 12-1**.

The results of one blank sample suggest a very limited contamination issue. For the one sample the metals concentrations were comparable to the other blank samples while concentrations of chloride and sulfate (but not bicarbonate, the other major anion) report concentrations more typical of a brine; the source of this error is likely a result of incorrect labeling in the lab or a reporting error by the lab. This error has not been identified elsewhere within the dataset and is considered to be a random error that should not affect the resource estimate.

**Figure 12.1 Concentrations of Li, Mg, K, and B in blanks compared to analytical detection limits**



**Table 12.1 Comparison of concentrations measured in primary samples and blanks**

Symbol	HCO <sub>3</sub>	B	Ca	Cl	Li	Mg	K	Si	Na	Sr	SO <sub>4</sub>
Units	mg/L as CaCO <sub>3</sub>	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Average of Blanks	205	0.2	50	2,830	0.07	23	4	16	40	0.4	2,030
Maximum of Primary Samples	2,800	980	2,500	150,000	810	3,400	9,300	35	78,000	30	14,000
Average of Primary Samples	1,580	580	770	79,100	490	1,850	5,400	9	44,600	15	7,150
Minimum of Primary Samples	150	2	40	50	0.3	10	20	2	100	0.2	48

### 12.1.3 Standards

Standards are used to measure the accuracy of the laboratory analyses. For brine resource assessments, standards of known concentration are submitted to the laboratory throughout the sampling program. Rodinia prepared a standard from brine collected from DRC-8R. No additional details are known about how this standard was prepared. The standard, named “New Standard”, was subject to a round robin using three certified laboratories: ALS, SGS in Lakefield, Canada, and Alex Stewart in Mendoza, Argentina. SGS Laboratory in Lakefield is an ISO 9001:2000-certified laboratory (AMEC 2011). Alex Stewart branch in Mendoza is an ISO 9001:2000-certified laboratory (AMEC 2011). Three samples were submitted to each lab for a total of 6 samples. These standard samples are not considered part of the geochemical database but are used to determine the chemistry of the standard. There were 18 samples of the New Standard that were inserted into the sampling program in 2010 and 2011 to evaluate potential bias in the analytical measurements.

The standards submitted as samples are compared to the average chemistry determined from the round robin. Standards submitted are considered excessive if two or more standards in a row have more than two standards deviations from the mean, on the same side of the mean. The data are plotted in **Figure 12.2** for the principal analytes of interest (Li, Mg, K, and B). Only two standards failed the statistical check for potassium and boron showing a lower concentration. This occurred at the end of the sampling program. Lithium and magnesium analyses are accurate.

Rodinia also used a certified standard that was diluted using mineral water. The certified standard was provided by INORGANIC VENTURES of Christiansburg, Virginia, USA. There were 11 samples of the New Standard that were inserted into the sampling program 2010 to evaluate potential bias in the analytical measurements. Unfortunately, no analyses of the diluted standard were completed for QAQC and potential bias can only be assessed qualitatively only for lithium. The data are in general agreement.

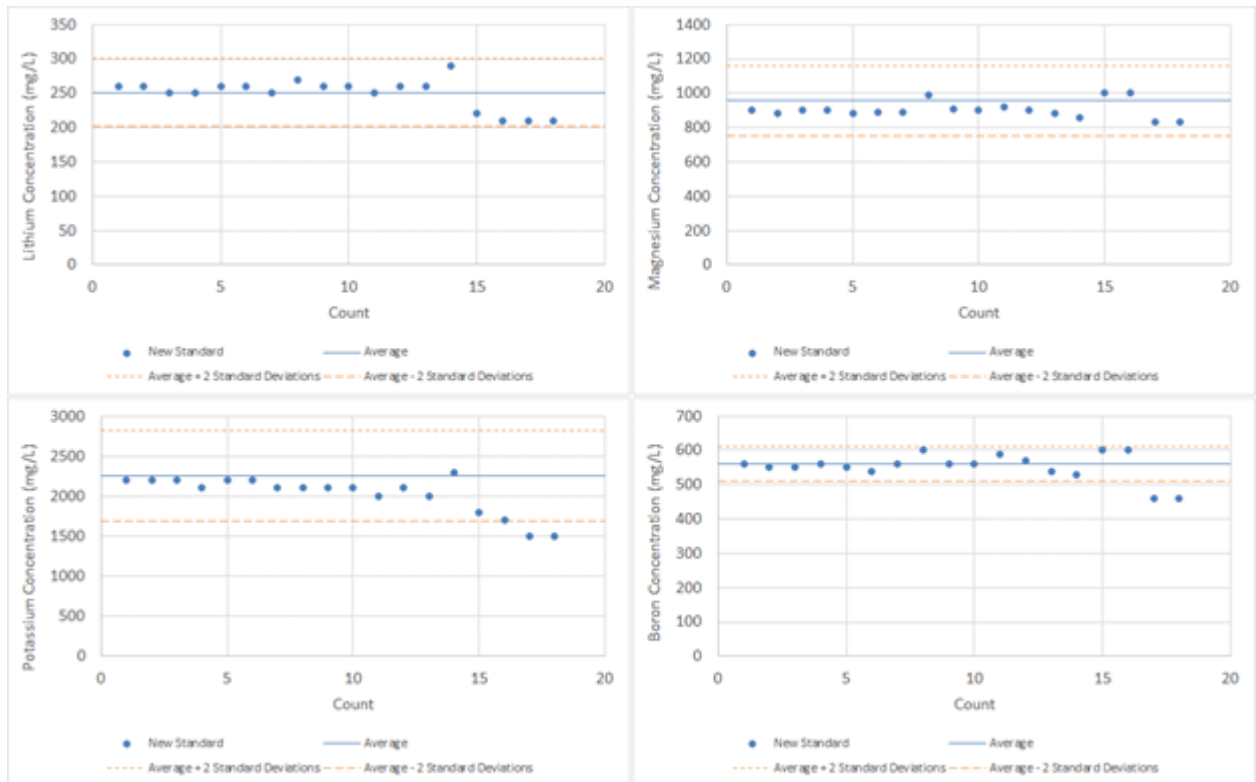
### 12.1.4 Ion Balance

Ion balance was used as a measure of analytical accuracy. Theoretically water samples should be electrically neutral. However, slight positive or negative charge imbalance is typically observed. The majority of the samples yielded reasonable charge imbalance. Approximately 4% of the dataset was higher than  $\pm 10\%$  and approximately 30% of the dataset was higher than  $\pm 5\%$ . Typical acceptance criterion is a maximum difference of  $\pm 5\%$ . Despite the large number of analyses with high charge imbalance the authors feel that the data are acceptable for the resource estimate since the principal analyte of economic interest, most notably lithium, are present at equivalent concentrations much less than other cations that are controlling the ion balance such as sodium. For example, equivalent concentrations of lithium are approximately 3% of the cations while sodium represented approximately 83%.

### 12.1.5 Follow-up Duplicates

To supplement time-of-sampling QAQC procedures, follow-up analyses of the B-series samples, between one and two years after the samples were collected, was completed by SRK after the original resource assessment was completed by AMEC (2011). The methodology for the assessment and results were not documented by SRK and therefore any conclusions regarding their interpretation should be regarded as speculative. In this context, the results of B-series follow-up analyses are used as a soft, qualitative check on the original analytical results. The analyses are not referred to as duplicates to avoid categorization errors with standard nomenclature. It is also imperative to point out that the authors cannot verify the actual sample submission process as they were not involved with the project at the time. SRK submitted 15 samples from 12 RC holes for follow-up analyses. The manner in which these samples were selected was not disclosed by SRK. Despite all of these limitations, the analyses are in good agreement for the principal analyte of economic interest, most notably lithium. For example, the average concentration between the two datasets only varied by approximately 20 mg/L.

**Figure 12.2 Results of the New Standard for concentrations of Li, Mg, K, and B inserted into the sampling program**



## 12.2 Relative Brine Release Capacity

### 12.2.1 Specific yield and porosity testing

Seven undisturbed samples were shipped to Daniel B. Stevens & Associates Inc. in Albuquerque, New Mexico (DBSA) for determination of porosity and Relative Brine Release Capacity (RBRC) (equivalent to specific yield ( $S_y$ )). The undisturbed samples were selected from DD drilling intervals with high core recovery rates (near 100%). The authors were not involved with the selection, preparation and shipping of these undisturbed core samples.

### 12.2.2 Relative brine release capacity test

The Relative Brine Release Capacity test predicts the volume of solution that can be extracted from an unstressed geologic sample. The test method is briefly described below:

- Undisturbed samples from the site were saturated in the laboratory using site specific brine solution. The bottom of the samples are then attached to a vacuum pump using tubing and permeable end caps, and are subjected to a suction of 0.2 to 0.3 bars for 18 to 24 hours. The top end cap is fitted with a one-gallon air bladder which allows sufficient drainage while inhibiting continuous atmospheric air flow. The vacuum system permits testing multiple samples simultaneously in parallel. The samples are then oven dried at 60°C.

- Based on the density of the brine, the sample mass at saturation, and the sample mass at 'vacuum dry', the volumetric moisture (brine) contents of the samples are calculated. The difference between the volumetric moisture (brine) content of the saturated sample and the volumetric moisture (brine) content of the 'vacuum dry' sample is the "relative brine release capacity".

This methodology has been widely accepted by companies involved in the lithium brine exploration activities and is regarded as being a suitable method for determination of Specific Yield (Houston, 2011).

DBSA employed the following standard test methods for determination of some of the physical properties of the samples:

- Dry Bulk Density: ASTM D7263
- Moisture Content: ASTM D7263
- Calculated Porosity: ASTM D7263
- Particle Size Analysis: ASTM D422
- USDA Classification: ASTM D422, USDA Soil Textural Triangle

DBSA relied upon the brine solution density provided by Rodinia in calculating the volumetric moisture (brine) content. Particle densities of the samples were calculated based on the assumption that the samples were 100% saturated after the saturation stage of the test procedure. The calculated particle density was then used to calculate the total porosity of each of the samples. Volume measurements for each sample were obtained at the "as received", "saturated", and "vacuum dry" conditions. It is noted that due to irregularities on the sample surfaces, volume measurements should be considered as estimates.

### 12.2.3 RBRC test results

FloSolutions carried out an independent review of the results of the RBRC test as described below. Drainable porosity is largely dependent on lithology which is highly variable in the Diablillos brine aquifer as observed from the drilling results. Therefore, based on the particle size analyses carried out by DBSA on each sample the samples were grouped in two types as follows: 1) sand dominant mix, 2) silt-clay dominant mix. **Table 12.2** shows the results of the laboratory drainable porosity analyses.

**Table 12.2 Results of RBRC specific yield ( $S_y$ ) analyses**

	$S_y$ - Silt-clay mix	$S_y$ - Sand mix
<b>Number of samples</b>	4	3
<b>Max</b>	0.032	0.168
<b>Min</b>	0.001	0.99
<b>Mean</b>	0.016	0.132

## 12.3 Pumping Tests

### 12.3.1 (Re)-interpretation of pumping test (FloSolutions 2016)

This section summarizes work carried out on pumping test re-interpretation. The authors of this report were not responsible for the design and execution of all historical pumping tests completed at the Project. **Table 12.3** shows a summary of pumping tests carried out for the Sal de los Angeles Project between 2011 and 2016. The results of the pumping test re-interpretation of the 2011 DPT-2 and 2016 DDP-1 are shown in **Figure 12.3** and **12.4**. The DDP-1 and DPT-3 tests (2016) were discarded due to large variation on pumping rates, and uncertainty in pre-test static water levels. Table 12.4 summarizes the results of this work,

**Table 12.3 Pumping test history**

Test	Year	Method	Pumping well	Obs. wells	Q (L/s)	Observations
DPP-1	2011	Airlift	DDP-01	DDD-07	4.4	Replaced by 2016 test
DPP-1	2011	Airlift	DDP-01	DDD-07	22	Replaced by 2016 test
DPT-2	2011	Airlift	DPT-02	DDD-02/3, DCO-1	8	OK, included in analysis
DPT-2	2011	Tracer	DPT-02	-	8	Inconclusive results
DPT-3	2011	Airlift	DPT-3	DCO-03, DDD-07	6	No static water levels prior to test
DPT-4	2016	Pumping	DDP-01	DDD-07	4-22	OK, included in analysis

Figure 12.3 DPT-2 pumping test 2011

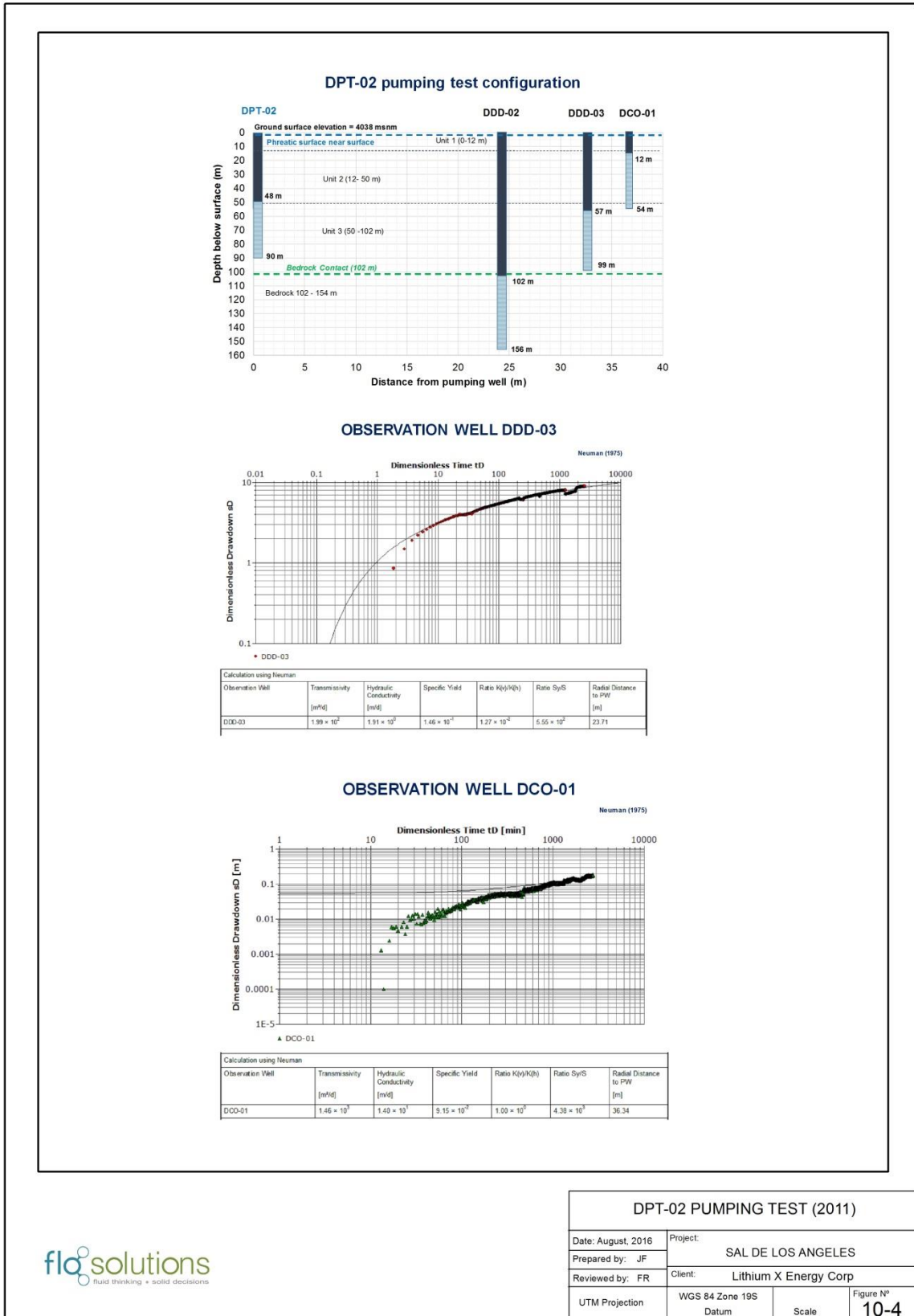
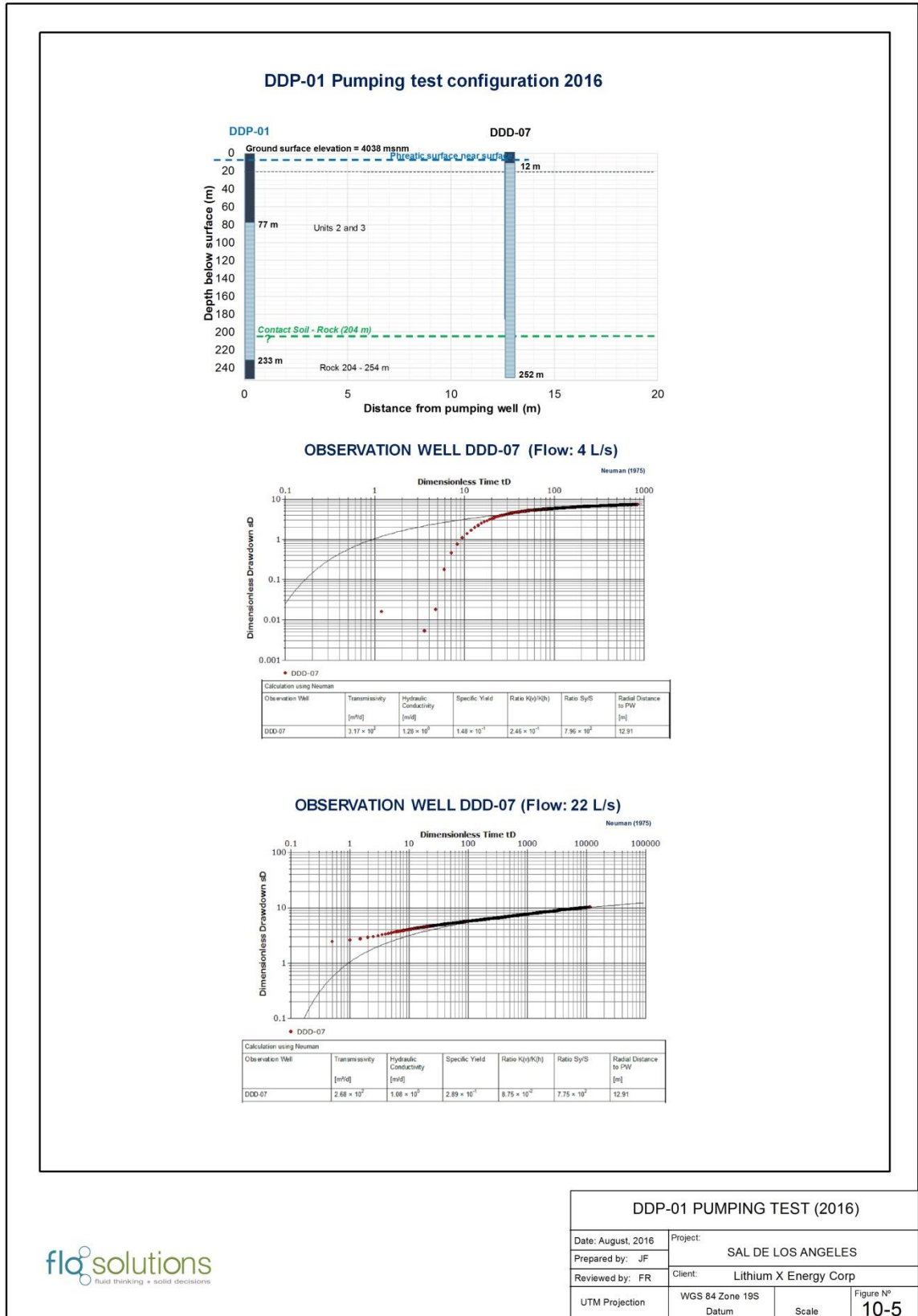


Figure 12.4 DDP-1 pumping test 2016



**Table 12.4 Results of DPP-2 and DPT-1 pumping test interpretation (FloSolutions 2016)**

Summary of pumping test interpretation (Flosolutions 2016)													
Pumping well	Test	Date	Q (L/s)	Observation well	Geology	Duration(Hours)	Analysis	Transmissivity (m <sup>2</sup> /d)	Permeability (m/d)	Specific Yield (Sy)	K(V)/K(h)	Vertical permeability(m/d)	Storage coefficient (S)
DPT-02	Constant rate	september, 2011	8.00	DDD-03	Unit 2	46.18	Neuman(1975)	199	1.91	15%	0.01	0.02	2.63E-04
							Theis (1935)	199	1.91	-	-	-	2.64E-04
				DCO-01	Unit 1	46.18	Neuman(1975)	1460	14	9%	1.00	14.00	2.09E-05
							Theis (1935)	814	7.83	-	-	-	2.29E-01
DDP-01	Constant rate	july, 2016	4.39	DDD-07	Unit 2/3	2.00	Neuman(1975)	317	1.28	15%	0.25	0.31	1.86E-04
							Theis (1935)	317	1.28	-	-	-	1.86E-04
DDP-01	Constant rate	july, 2016	22.06	DDD-07	Unit 2/3	64.62	Neuman(1975)	268	1.08	29%	0.09	0.09	3.73E-04
							Theis (1935)	268	1.08	-	-	-	4.12E-04
DDP-01	Recovery	july, 2016		DDP-01	Unit 1	23.90	Theis (1935)	250	1.00	-	-	-	-

Average transmissivity: 454.67 m/d  
Storage (mean) : 4.53E-04  
Specific Yield: 9% to 29% (average: 17%)

DPP-2 and DPT-1 pumping test results (Flosolutions 2016)			
Date: August, 2016	Project: SAL DE LOS ANGELES		
Prepared by: JF	Client: Lithium X Energy Corp		
Reviewed by: FR	UTM Projection	WGS 84 Zone 19S Datum	Figure N° 10-6
		Scale	

## 13 MINERAL PROCESSING AND METALLURGICAL TESTING

The information contained in Section 13 was provided by the LiX management team and has not been verified by the author.

Initial processing and metallurgical testing of the Sal de los Angeles brine for lithium recovery was performed by Rodinia between 2010 and 2015. Testing focused on conventional processes whereby impurities are removed from the brine by the addition of certain reagents and the resultant brine left to evaporate in solar evaporation ponds until a desirable concentration of lithium in brine solution is reached. Tests were performed both in laboratories and on site, including running a pilot pool facility, constructed using eight lined pools of approximately three metres in diameter each.

Testing performed by Rodinia concentrated on removing magnesium impurities from the brine early in the ponding cycle by adding various qualities and forms of lime. These tests were successful in removing magnesium so that it would drop below 100 ppm Mg in solution.

An important step forward for the project was the incorporation of Eduardo Morales (Chief Operating Officer of LiX) and Andrés Barrientos (Project Manager of LiX) on June 29, 2016 who, along with Bob Cinq-Mars, constitute a very strong group with knowledge and experience in developing brine resources for the production of lithium, potassium, boron and other salts. As a result, the pilot pool testing activities at Diablillos were expanded to continue the process optimization at the existing conditions of wind, rain, solar radiation and temperatures found at the site.

The brine will continue to concentrate via solar driven evaporation in conventional lined ponds until the desired level of lithium concentration is reached, expected to be above 5% lithium by weight, or approximately 30% lithium chloride by weight. The concentrated brine, or bittern, at levels above 5% lithium by weight, contains residual magnesium and boron.

Boron is completely removed in a liquid-liquid extraction process. The boron free brine feeds the lithium carbonate plant to eliminate the residual magnesium and other ions prior to lithium carbonate precipitation.

In parallel to the on-site pilot testing work, additional testing at a laboratory scale was initiated to evaluate a new technology to extract lithium directly from brines. The advantage of this technology, if it proves to be applicable to Sal de los Angeles brine, is that it makes the process independent of the seasonal effects on temperature and evaporation levels. In addition, it provides a significant reduction in the solar ponding area and reduces the lithium losses due to entrainment in the salts.

### 13.1 Raw Brine Chemistry

The chemistry of the brine has been monitored over time and space by means of results from exploration work conducted by Rodinia and Lithium X and the systematic measurements of brine from a flowing artesian well between 2012 and present. The average inflow brine chemistry to the pilot facility is shown in **Table 13.1**.

**Table 13.1 Inflow brine chemistry**

Element	Parts per million (ppm)
Li	580
Na	51,000
K	7,200
Mg	2,000
Ca	880
Cl	93,000
SO <sub>4</sub>	8,600
B	520
CO <sub>3</sub>	100
HCO <sub>3</sub>	880

Source: Rodinia, 2011

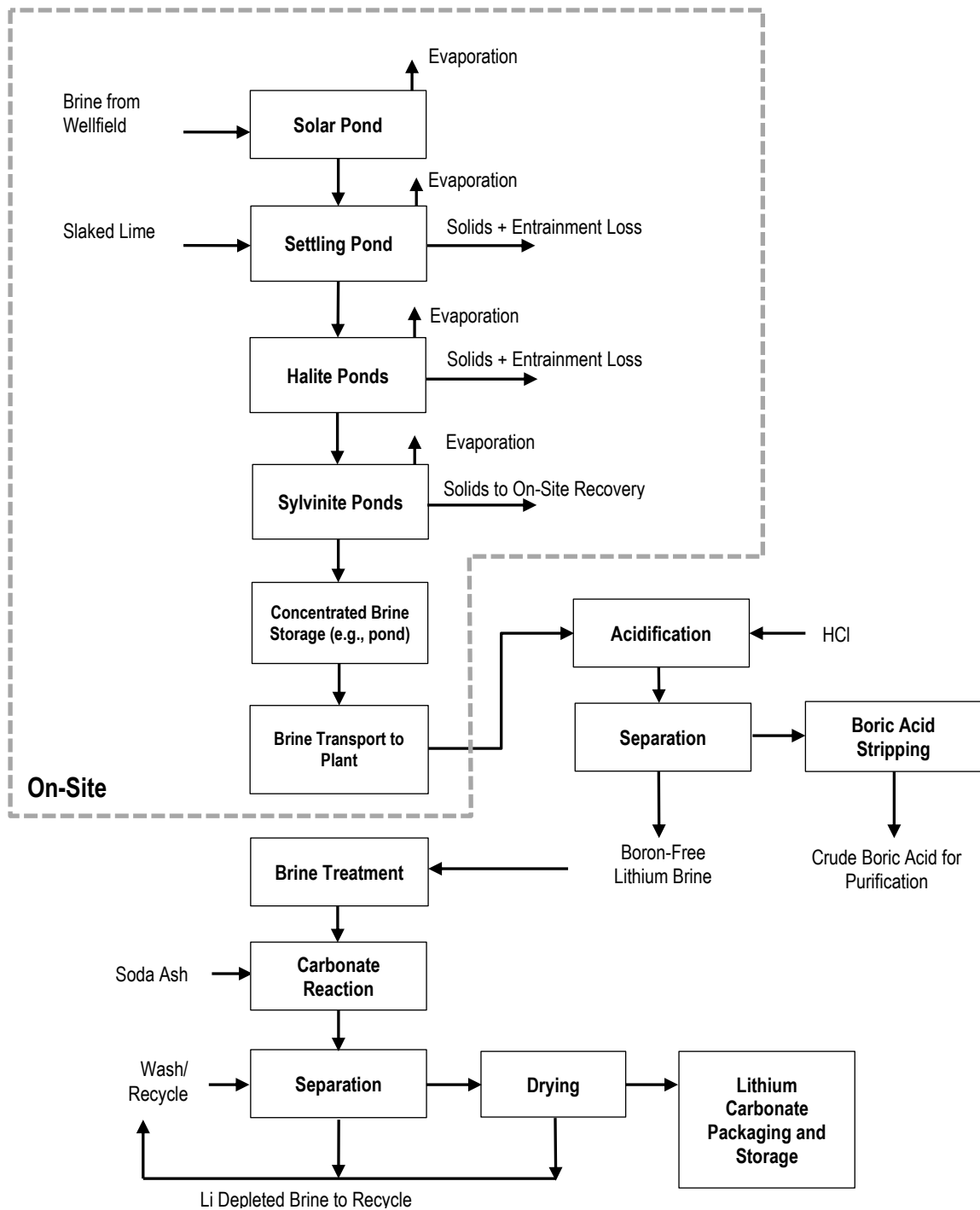
Subsequent tests have shown 10 to 20 ppm nitrogen, analyzed as nitrates and nitrites, to be present in the brine. This likely originates in nearby caliche deposits. Nitrates, for the purpose of this evaluation will be ignored because lithium nitrate is equally or more soluble than any other component in the chemistry. Nitrates do not present a problem in the production of carbonate.

## 13.2 Current On-Site Process

This section was adapted from SRK (2011). While current on-site testing in the pilot pool facility is evaluating changes to the process results have not yet been received and evaluated so as to incorporate any possible changes to the flow sheet described in Rodinia's 2011 Preliminary Economic Assessment (SRK, 2011).

The current proposed lithium recovery process is a combination of solar evaporation steps, in-field brine treatment, by-product boric acid and sylvinitic recovery and chemical processing to produce lithium carbonate. Rodinia anticipates construction of various solar and process ponds at the salar with production of sylvinitic as a saleable product. **Figure 13.1** presents the conceptual process flow diagram for the on-site processes..

Figure 13.1 Process Flow Diagram for On-Site Brine and Sylvinite Production



### 13.3 Significant Factors

The salar is at an elevation of approximately 4,000m with daily temperatures at night to be at or below freezing. Daytime temperatures vary in the single digits in the winter to 25 to 30 degrees Celsius in the summer. The variation of temperatures will have a serious effect on the crystallization of compounds as well as changing the dynamics of the phase diagram. Piloting on site over several full seasons has allowed for additional understanding of the effects of wide temperature variations at Sal de los Angeles. Testing will continue to test the effects on crystallization of compounds for different process routes.

Evaporation at the altitude of the salar is an advantage over evaporation at sea level due to the low atmospheric pressure. This will enhance evaporation at the lower diurnal temperatures at the salar. Another important factor for enhanced evaporation rates is the low level of magnesium in the brine in relation to other producing deposits, including the Salar de Atacama.

Variation of the brine chemistry from the well field should have minimal instantaneous effect on the process and there will be significant averaging brine composition in the salt fields due to the volumes handled. Any major shift in brine chemistry will be identified by the sampling of the ponds during production and allow the operation to shift or divert flow to maximize recoveries of products as well as increase or decrease treatment flow.

## 14 BRINE RESOURCE ESTIMATES

### 14.1 Overview

The essential elements of brine resource determination for a salar are:

- Definition of the aquifer geometry,
- Determination of the Specific Yield (Sy) of the hydrogeological units in the salar, and
- Determination of the concentration of the elements of interest.

Resources may be defined as the product of the first three parameters. The use of specific yield allows the direct comparison of brine resources from the widest range of environments. Specific yield is to be estimated for separate layers in the salar if these are separated by impermeable layers.

Aquifer geometry is a function of both the shape of the aquifer, the internal structure and the boundary conditions (brine / fresh water interface). Aquifer geometry and boundary conditions can be established by drilling and geophysical methods. Hydrogeological analyses are required to establish catchment characteristics such as ground and surface water inflows, evaporation rates, water chemistry and other factors potentially affecting the brine reservoir volume and composition in-situ. Drilling is required to obtain samples to estimate the salar lithology, specific yield and grade variations both laterally and vertically.

### 14.2 Resource Model Domain and Aquifer Geometry

The model resource estimate is limited to the LiX mining concessions in Salar de Diablillos that cover an area of 8.186.5 ha.

The resource model domain is constrained by the following factors:

- The top of the model coincides with brine level in the Salar that was measured in a number of boreholes and monitoring wells historically and during the authors' site visit.
- The boundaries of the model domain in the north and south defined by a 2 km cutoff radius from the nearest borehole.
- The western and eastern boundaries of the model domain either coincide with claim boundaries or with the physical Salar boundary in areas where the claim boundaries fall outside of the nucleus of the Salar.
- The bottom of the model domain coincides with the bedrock contact. The bedrock surface was defined by RC and DD drilling intercepts and further refined by the seismic refraction data.

### 14.3 Specific Yield

Specific yield is defined as the volume of water released from storage by an unconfined aquifer per unit surface area of aquifer per unit decline of the water table.

The specific yield values used to develop the indicated resource are based on results of the logging and hydrogeological interpretation of chip samples and recovered core of 11 RC boreholes and 7 DD boreholes, results of 7 Relative Brine Release Capacity tests on undisturbed core samples, and two pumping tests. The boreholes are appropriately spaced at a borehole density of one bore per 1.3 km<sup>2</sup>

The specific yield values used to develop the inferred resource are based on results of the logging and hydrogeological interpretation of chip samples and recovered core of 10 RC boreholes and their correlation with the results of the 7 RBRC tests and the two pumping tests. The boreholes within the inferred resource are appropriately spaced at a borehole density of one bore per 2.9 km<sup>2</sup>.

## 14.4 Brine Concentrations

The distributions of lithium, potassium and boron concentrations in the model domain are based on a total of 353 brine analyses (including QA/QC analyses) as discussed in **Section 7** of this technical report.

## 14.5 Resource Category

An Inferred Mineral Resource is that part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity. An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource.

An Indicated Mineral Resource is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of Modifying Factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit. Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing and is sufficient to assume geological and grade or quality continuity between points of observation.

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

Consequently, in the opinion of the Qualified Person the inferred and indicated resource areas as shown on **Figure 14.1** and **Figure 14.2** are adequate and appropriate.

## 14.6 Resource Model Methodology and Construction

The resource estimate was developed for the LiX Sal de los Angeles Project using SgeMS software. Dr. Gregoire Mariethoz, Professor at the University of Lausanne, Switzerland led the numerical model effort to develop the resource estimate. The author was in close communication with Dr. Mariethoz throughout the model development process; all results have been reviewed and checked at various stages and are believed to valid and appropriate for these resource estimates.

The total resource is calculated by multiplying, on the entire grid, the lithium concentration by the porosity. The overall resource is estimated by taking the average of this weighted concentration on the entire grid.

The following steps were carried out to calculate the Li, K and B resources.

1. Adjust a variogram on the data in x, y and z directions.
2. Definition of model grid (52,154 nodes) and node size (x =150 m, y=150, z=6 m).
3. Interpolation of Li, K B and Sy in each node in g/m<sup>3</sup> using kriging with the variogram models of step 1.
4. Calculation of total resource.
5. Preparation of grade-tonnage curve for Li.

Figure 14.1 N-S section through the resource model showing the lithium grade distribution (g/m<sup>3</sup>)

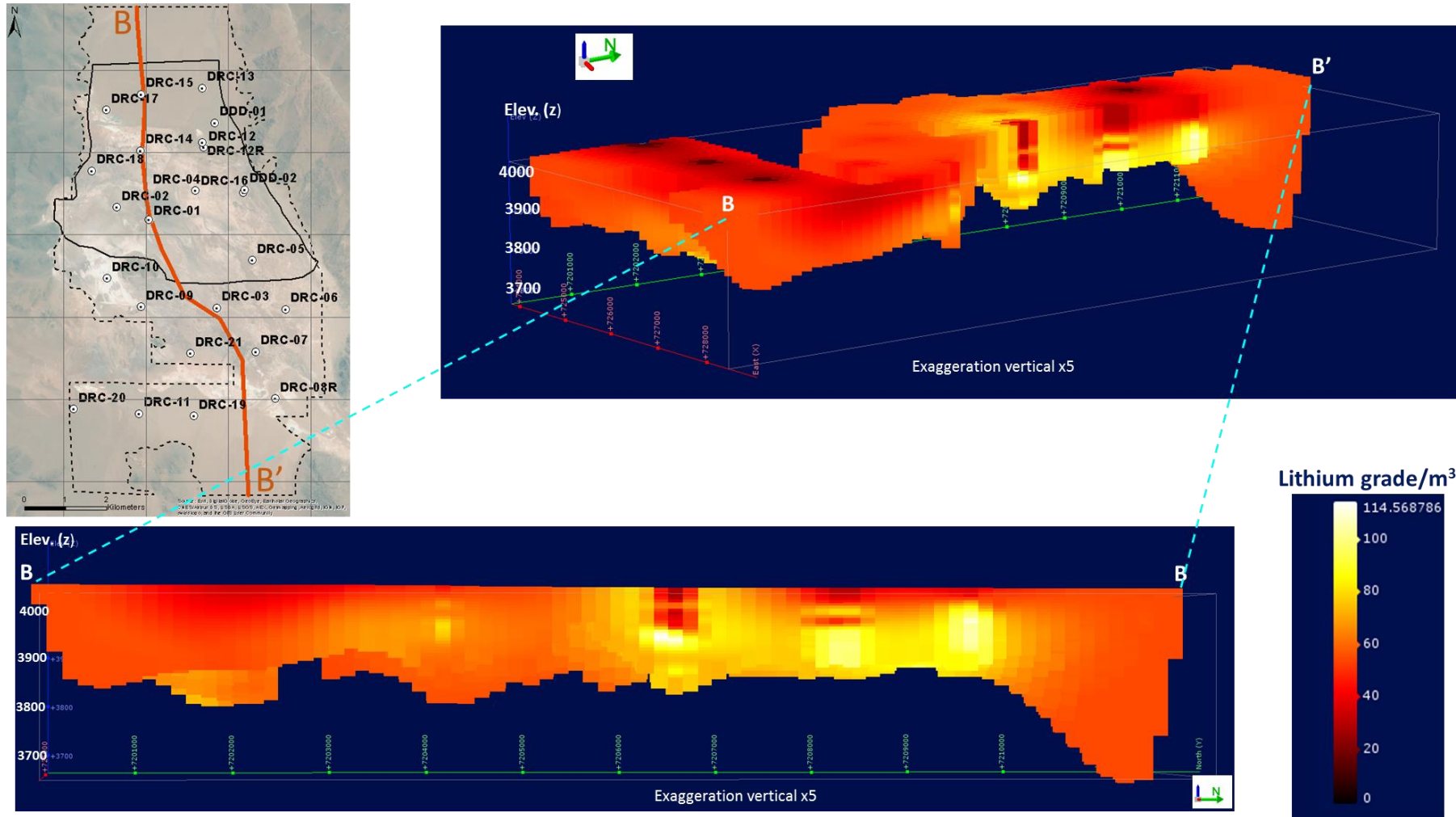
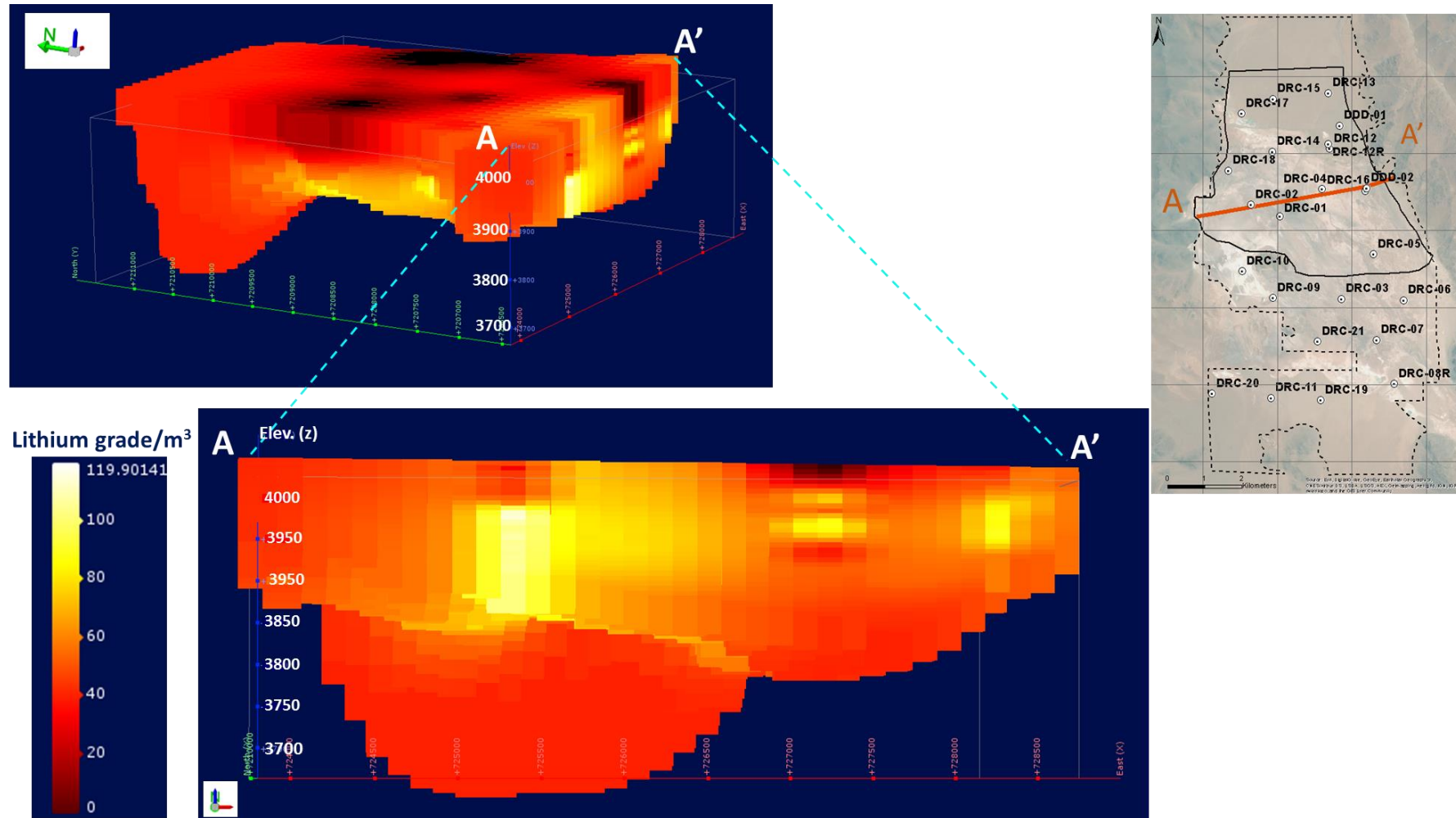


Figure 14.2 E-W section through the resource model showing the lithium grade distribution (g/m<sup>3</sup>)



## 14.7 Resource Estimate

The lithium, potassium and boron resource estimate were calculated as the volume under the grade contours and are summarized in **Table 14.1**. A lithium cut-off grade of 100 mg/L was applied to the resource estimate.

**Table 14.1 Indicated and inferred resources for the Sal de los Angeles Project, August 29, 2016 (Lithium cut-off concentration of 100 mg/L applied)**

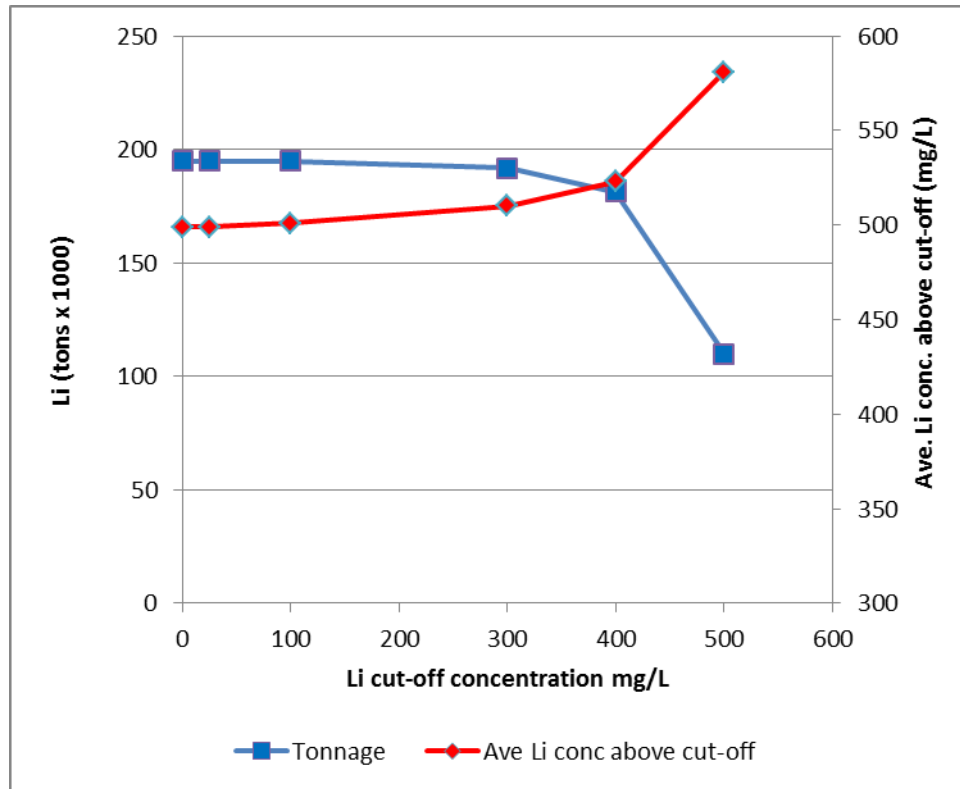
	Indicated			Inferred		
	Li	K	B	Li	K	B
Aquifer area (km <sup>2</sup> )	22.2			32.4		
Aquifer volume (km <sup>3</sup> )	3.195			3.807		
Mean specific yield	0.122			0,120		
Brine volume (km <sup>3</sup> )	0,390			0,457		
Mean grade (g/m <sup>3</sup> )	60.8	668.7	67.6	49.3	539.0	60.7
Concentration (mg/L)	501	5,512	556	410	4,489	505
Resource (tonnes)	194,860	2,143,491	216,807	189,130	2,068,161	232,601

Notes to the resource estimate:

1. CIM definitions were followed for Mineral Resources.
2. The Qualified Person for this Mineral Resource estimate is Frits Reidel, CPG
3. The Qualified Person relied entirely on data provided by Lithium X Energy Corporation for the preparation of the resource estimate and no independent data collection was carried out to verify the accuracy of the data provided.
4. A lithium cut-off concentration of 100 mg/L has been applied to the resource estimate
5. Numbers may not add due to rounding
6. The effective date is August 29, 2016.

The lithium grade-tonnage curve for the indicated resource (**Figure 14.3**) shows the tonnage is not very sensitive to lithium concentration cut-off below 300 mg/L.

Figure 14.3 Grade – tonnage curve for lithium indicated resource



## 15 MINERAL RESERVE ESTIMATES

No reserve estimates have been prepared for the Sal de los Angeles Project.

## 16 MINING METHODS

This Technical Report addresses mineral resources and does not include the mine plan for the Project.

## 17 RECOVERY METHODS

This Technical Report addresses mineral resources and does not include the mineral recovery method for the Project.

## 18 PROJECT INFRASTRUCTURE

This report addresses mineral resource estimate and does not include project infrastructure

## 19 MARKET STUDIES AND CONTRACTS

This Technical Report addresses mineral resources and does not include reference to independent market studies or contracts.

## 20 ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT

This Technical Report addresses mineral resources and does not include a complete assessment of the environmental, social and permitting status of the project. The following discussion provides an overview of the regulatory context for mining operations in Argentina and a summary of the current Environmental Impact Assessment for the Project.

### 20.1 Regulatory Context

Argentine mineral law requires national, provincial and municipal permits for resource exploitation. Lithium X maintains the necessary environmental permits and mineral rights for current site operations. Rodinia filed and received approval for an Environmental Impact Study (EIS) for Advanced Exploration activities. This EIS, titled “Informe de Impacto Ambiental Etapa II- Exploracion Avanzada con Perforaciones”. The EIS process is the primary environmental permitting document to conduct mining activity.

A prospecting or exploration EIS describes where the mining property sits in relationship to its environmental status and declares the kind of search/exploration activities to be performed on site. The prospecting or exploration EIS is presented to the Court of Mines, along with the request for the mining property. This filing is then sent to the Ministry of Mines of the Province of Salta. At this stage the mining property is mapped out and any conflict with neighboring properties is checked. Once the folder with the request of the mining property is filed with the secretary of the Ministry of Mines, the EIS will be reviewed within approximately two weeks. After that period, it will be approved or the Ministry will provide comments.

The prospecting or exploration EIS must be renewed after 24 months. If there are large activities in progress, an Advanced Exploration EIS may need to be issued. The Advanced Exploration EIS describes the environmental impacts associated with use of drilling with machine excavators, bulldozers, and deep drilling with either tri-cone, adamantine or reverse air. This also involves the construction of drilling rigs, roads, earthworks and camps. The environmental impact report will be reviewed and approved or returned by the Ministry of Mines (Province of Salta) within 20 days. All deep wells performed must be reported to the Hydraulics Secretary from the province of Salta. Lithium X currently operates under an approved Advanced Exploration EIS.

To advance a project from the exploration phase, each EIS requires completion of Environmental Baseline Studies. Typically, a contractor (consultant or group of consultants) will perform a detailed report that includes hydrogeology, geology, flora, fauna, air, archaeology and community relationship. This report is a detailed study showing the status of the project from the environmental point of view, the land involved just before the start of larger activities. This study will serve as the basis for the Production level EIS.

When a project will advance into the production state, the operator will file a Production level EIS. This report typically has a high level of detail. Every environmental impact that was caused in the exploration stage is declared. The production process is detailed and the location of the plant, camp, open pit, tailings dams, transportation, etc. is defined. This report is typically issued by a third party unrelated to the mine owners (e.g., a consulting company).

Regulatory authorities require up to 7 months to review a Production Level EIS. The Ministry of Mines will communicate with the project owner to define the necessary modifications, corrections or additions. At this

stage it is important for the project owner to engage the local communities in anticipation of a “social permit” process prior to production. In general, this process entails:

- Direct contact with the involved communities; and
- Organize a town meeting with the community where the mining company, the provincial authority and the community are invited to attend.
- The Production Level EIS and social license activities would start after Lithium X confirms the detailed project development plan.

## 20.2 Environmental Issues

The Advanced Exploration EIS provides a basis for describing exploration-related environmental issues. Lithium X's approved EIS defines potential impacts associated with exploration and appropriate mitigation methods. There are no known environmental issues that could materially impact Lithium X's ability to extract mineable resources from the Salar de Diablillos.

## 21 CAPITAL AND OPERATING COSTS

No capital and operating costs have been prepared as part of this mineral resource estimate.

## 22 ECONOMIC ANALYSIS

No economic analysis has been carried out as part of this mineral resource estimate.

## 23 ADJACENT PROPERTIES

There are other brine-type deposits proposed for development or in production in the southern region of the Salta Province and northern region of the Catamarca Province. These brine deposits are in separate basins and not hydraulically connected to the Salar de Diablillos. There are no adjacent properties.

The Salar de Hombre Muerto is located approximately 40km west-southwest of the Salar de Diablillos. Hombre Muerto hosts the El Fenix Mine (a lithium carbonate production facility owned and operated by FMC) and the Tincalayu Mine (a sodium borate mineral mine operated by Rio Tinto Minerals). Galaxy Lithium plans development of the Sal de Vida Project, a lithium and potash extraction and recovery operation proposed in the central Salar de Hombre Muerto.

## **24 OTHER RELEVANT DATA AND INFORMATION**

No other data and information is relevant for this mineral resource estimate.

## 25 INTERPRETATION AND CONCLUSIONS

Based on the review and analyses of the results of the exploration work carried out on the Sal de los Angeles Project the following concluding statements are prepared:

- The entire Salar and a portion of the northern slope has been covered by exploratory drilling on an approximate 1.5 km by 1.5 km grid;
- The results of the drilling of 21 reverse circulation drill holes and seven diamond core holes identify distinct brine composition and grade at specific depth intervals, showing a relatively uniform distribution of lithium bearing brines throughout the basin (**Table 25.1**);

**Table 25.1 Summary of the Sal de los Angeles Project brine composition**

K (mg/L)	Li (mg/L)	Mg (mg/L)	Ca (mg/L)	SO <sub>4</sub> (mg/L)	B (mg/L)	Mg/Li (-)	K/Li (-)	(SO <sub>4</sub> +2B)/(Ca+Mg) (-)
5,400	490	1,850	770	7,150	580	3.8	11	3.2

- The lithium bearing brine appear to contain sufficient levels of lithium, potassium and boron to be potentially economic for development;
- The stratigraphy of the Salar consists of an upper unit (Unit 1) to a depth of 4 m with a silt and clay dominant lithology and some minor sands. Underlying Unit 2 consists primarily of stratified fine to medium sands with occasional coarser sands and gravels; clay and silts occur as secondary lithologies. The lithology of Unit 3, which generally underlies Unit 2 and continues to basement, is similar to Unit 2; but with an increase in fine to coarse grained gravels; clays and silts again occur as secondary lithologies.
- The analysis of pumping test and RBRC information provided by LiX suggest that the specific yield (or drainable porosity) for Unit 1 ranges between 2% and 4%. The specific yield for Unit 2 and 3 range from 9% to 29% and average at 15%.
- The geometry of the Salar has been defined by the combination of drilling and geophysical surveys. The bedrock contact below the salar deposits has been defined by drilling intercepts and the seismic survey. Total thickness of salar deposits reaches a maximum of 189 m in the northeast corner of the project area.
- The basin appears to deepen in the northern half of the Project area and appears to contain higher grade lithium intervals.
- It is the opinion of the author that the Salar geometry, brine chemistry composition and the specific yield of the Salar sediments have been adequately defined to support the following Indicated and Inferred Resource estimate:

**Table 25.2 Indicated and Inferred Resources for the Sal de los Angeles Project, August 29, 2016 (Lithium cut-off concentration of 100 mg/L applied)**

	Indicated			Inferred		
	Li	K	B	Li	K	B
Aquifer area (km <sup>2</sup> )	22.2			32.4		
Aquifer volume (km <sup>3</sup> )	3.195			3.807		
Mean specific yield (-)	0.122			0.120		
Brine volume (km <sup>3</sup> )	0,390			0,457		
Mean grade (g/m <sup>3</sup> )	60.8	668.5	67.6	49.3	539.0	60.7
Concentration (mg/L)	501	5,512	556	410	4,489	505
Resource (tonnes)	194,860	2,143,491	216,807	189,130	2,068,161	232,601

**Notes to the resource estimate:**

1. CIM definitions were followed for Mineral Resources.
2. The Qualified Person for this Mineral Resource estimate is Frits Reidel, CPG
3. The Qualified Person relied entirely on data provided by Lithium X Energy Corporation for the preparation of the resource estimate and no independent data collection was carried out to verify the accuracy of the data provided.
4. A lithium cut-off concentration of 100 mg/L has been applied to the resource estimate.
5. Numbers may not add due to rounding
6. The effective date is August 29, 2016.

- Based on the results of the resource evaluation herein, the authors recommend that the Project is taken forward into the (pre)feasibility stage including the elaboration of all documentation required to obtain environmental and operating approvals.

## 26 RECOMMENDATIONS

It is recommended by the authors that the Sal de los Angeles Project is moved forward to (pre)feasibility. A work program should be executed to continue upgrading the Project resource estimate and develop reserve estimate in support of the (pre)feasibility study. It is recommended that the proposed work program includes the following components:

- Diamond core drilling (3-4 holes to bedrock) in the northern portion of the property to obtain additional information on geology, basin geometry, brine chemistry and drainable porosity.
- Drill and complete two test production wells to carry out long-term (30 day) pumping tests to determine hydraulic parameters of the Salar and monitor brine chemistry evolution, also in the northern section of the salar.
- Implement a monitoring network of observation wells around the DPT-4 area.
- Implement a baseline surface and groundwater monitoring network in the Diablillos basin to support the development of a water balance and hydrogeological conceptual model.
- Shallow drilling / geophysics around the perimeter of the Salar to define the fresh water / brine interface and improve the understanding of the continuity of the salar hydrogeological units along the margins.
- Complete a hydrogeological conceptual model for the Diablillos Basin in support of numerical reserve modelling.
- Develop a three dimensional groundwater flow model for the basin to facilitate reserve estimates and the layout of a brine production wellfield in support of the PFS.

The estimated cost for the above program is approximately USD\$4 million.

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