
The University Of Queensland
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SMI ICEChile
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Centro de Investigación en
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Facultad de Ingeniería
ENCUENTRO NACIONAL
LITIO 360
DECIDE
DESARROLLA
IMPACTA
LiNERGIA
SORCIA
MINERALS
THE FUTURE OF ENERGY
RJR SALAR
SQM
Solutions
for human
progress
6 AÑOS
Universidad del Desarrollo
ACREDITADA EN TODAS LAS ÁREAS
NIVEL DE EXCELENCIA
Diciembre 2021 - Diciembre 2027
Gestión Institucional · Docencia de Pregrado
Vinculación con el Medio · Investigación · Docencia de Postgrado

Developing lithium projectsin scarcity

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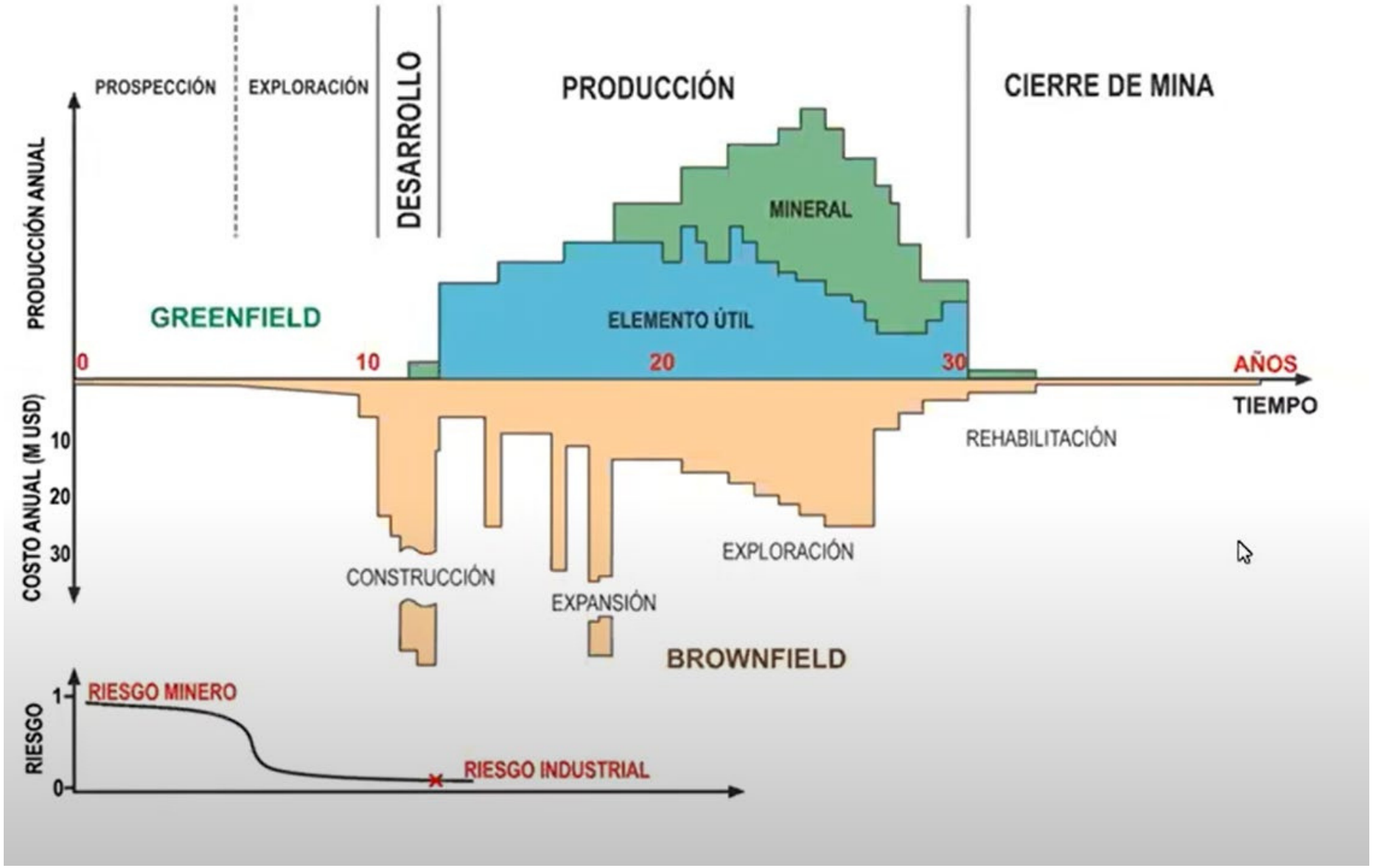
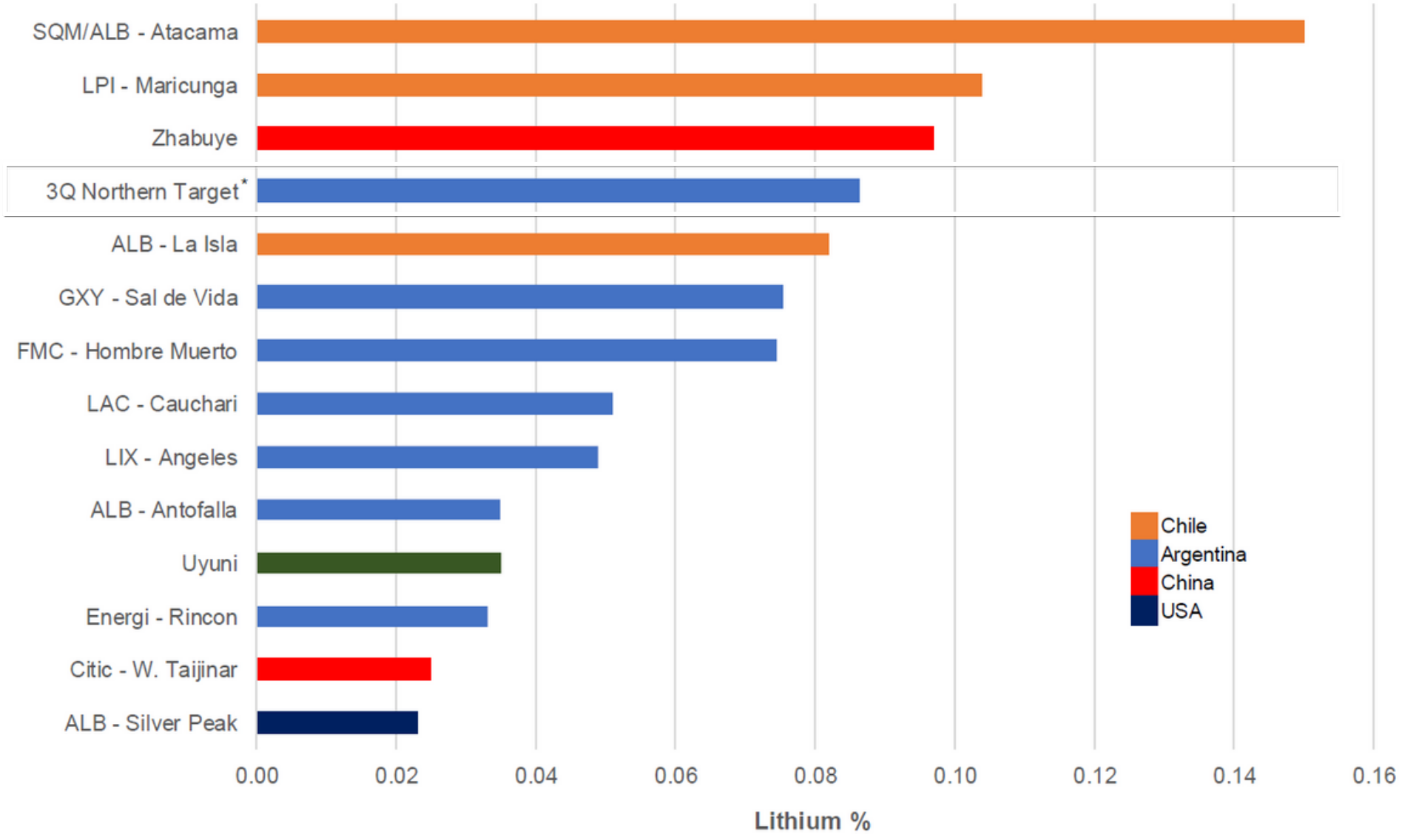
Exploration Manager **Litica Resources**
a PluspetrolMining Company

15thMay 2023


PROSPECCIÓN
EXPLORACIÓN
DESARROLLO
PRODUCCIÓN
CIERRE DE MINA
PRODUCCIÓN ANUAL
MINERAL
ELEMENTO ÚTIL
GREENFIELD
0
10
20
30
AÑOS
TIEMPO
COSTO ANUAL (M USD)
10
20
30
REHABILITACIÓN
EXPLORACIÓN
CONSTRUCCIÓN
EXPANSIÓN
BROWNFIELD
RIESGO
1
0
RIESGO MINERO
RIESGO INDUSTRIAL

DEVELOPING LITHIUM PROJECTS IN SCARCITY

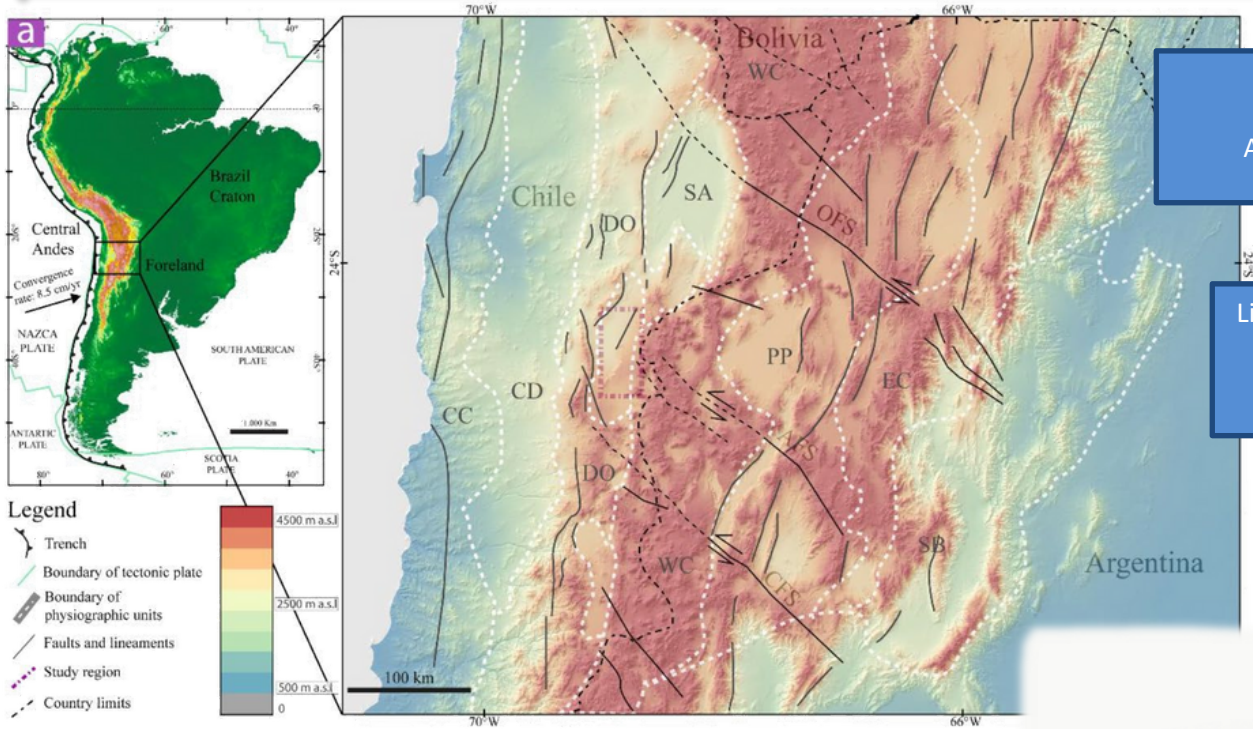
ARGENTINA LITHIUM PROJECTS



* Based on average composition of the Northern Target samples, see 43-101 report for full disclosure on estimation methods and historical information

DEVELOPING LITHIUM PROJECTS IN SCARCITY

MORPHOTECTONIC UNITS PRESENT ON THE CENTRAL ANDES OF NORTHERN CHILE AND NEIGHBORING REGIONS IN ARGENTINA.



CC: Coastal Cordillera; CD: Central depression; DO: Domeyko Cordillera (or Chilean Precordillera); SA: Pre-andean depression, WC: Western Cordillera, PP: Puna Plateau,EC: EasternCordillera,SB: SantaBarbaraRange.
Principal fault systems; OFS: Calama-Olacapato-El Toro lineament, AFS: Archibarca
lineament, CFS:Culampajalineament (modifiedfromSalfity1985)

McDermitVolcanic Field
Composition: riolitic
Age: Middle Miocene (16.6 Ma)

Source

Li metheoric leaching
Water transport

Process

Large caldera lake with lacustrine deposits (100000 years ago)

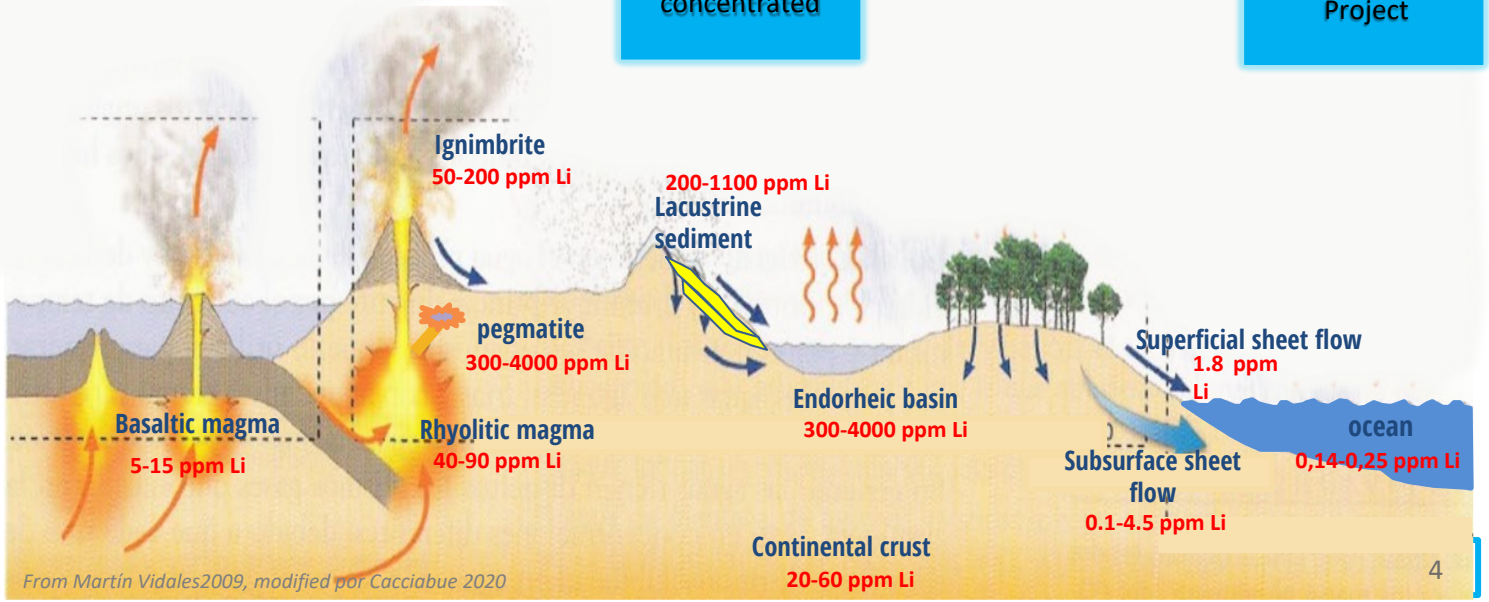
Uplifting
New volcanic episode

Process

Montana Mountains

1stResult : Li pre-concentrated

Final Result: Thacker Pass Project



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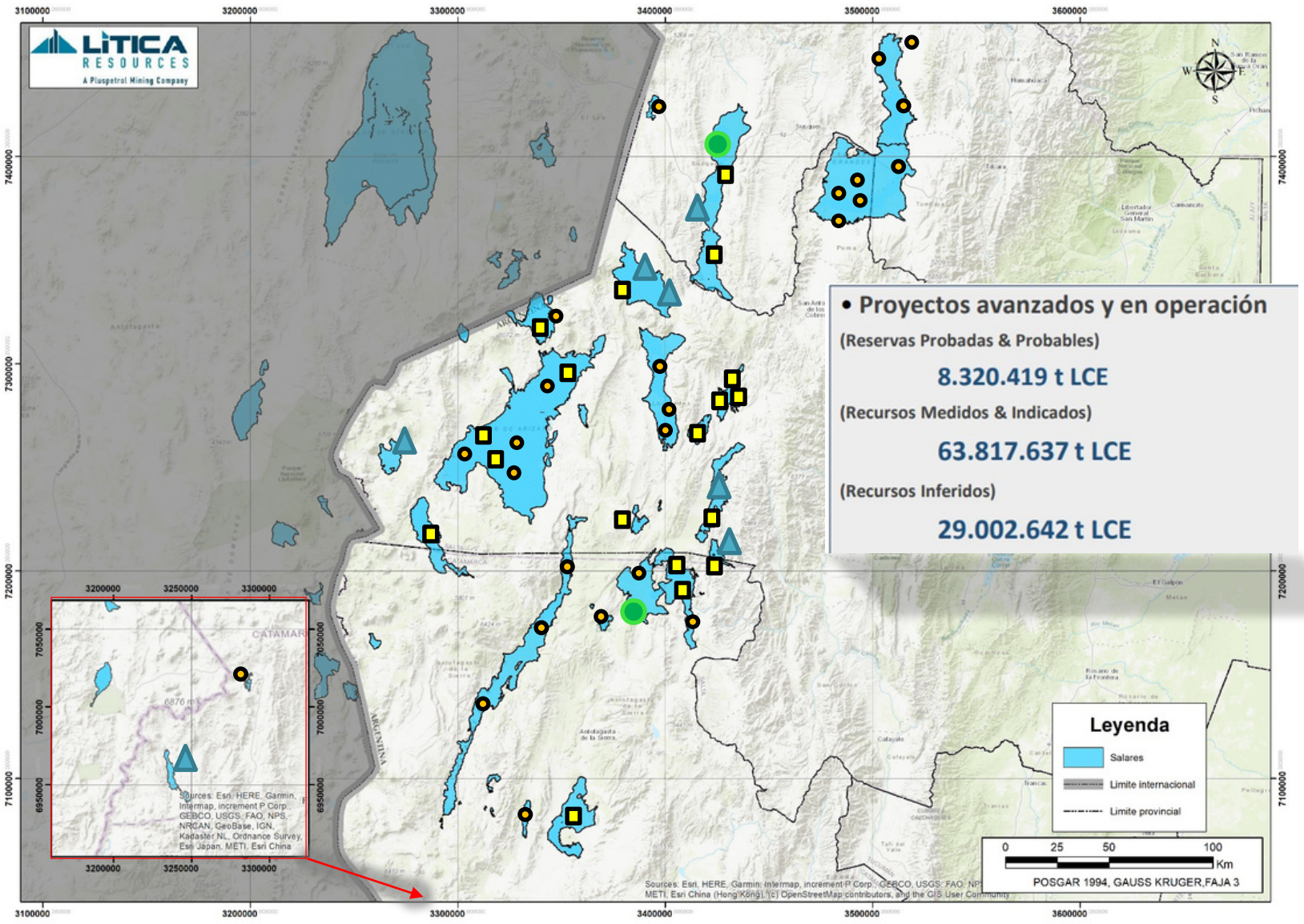
ARGENTINA LITHIUM PROJECTS

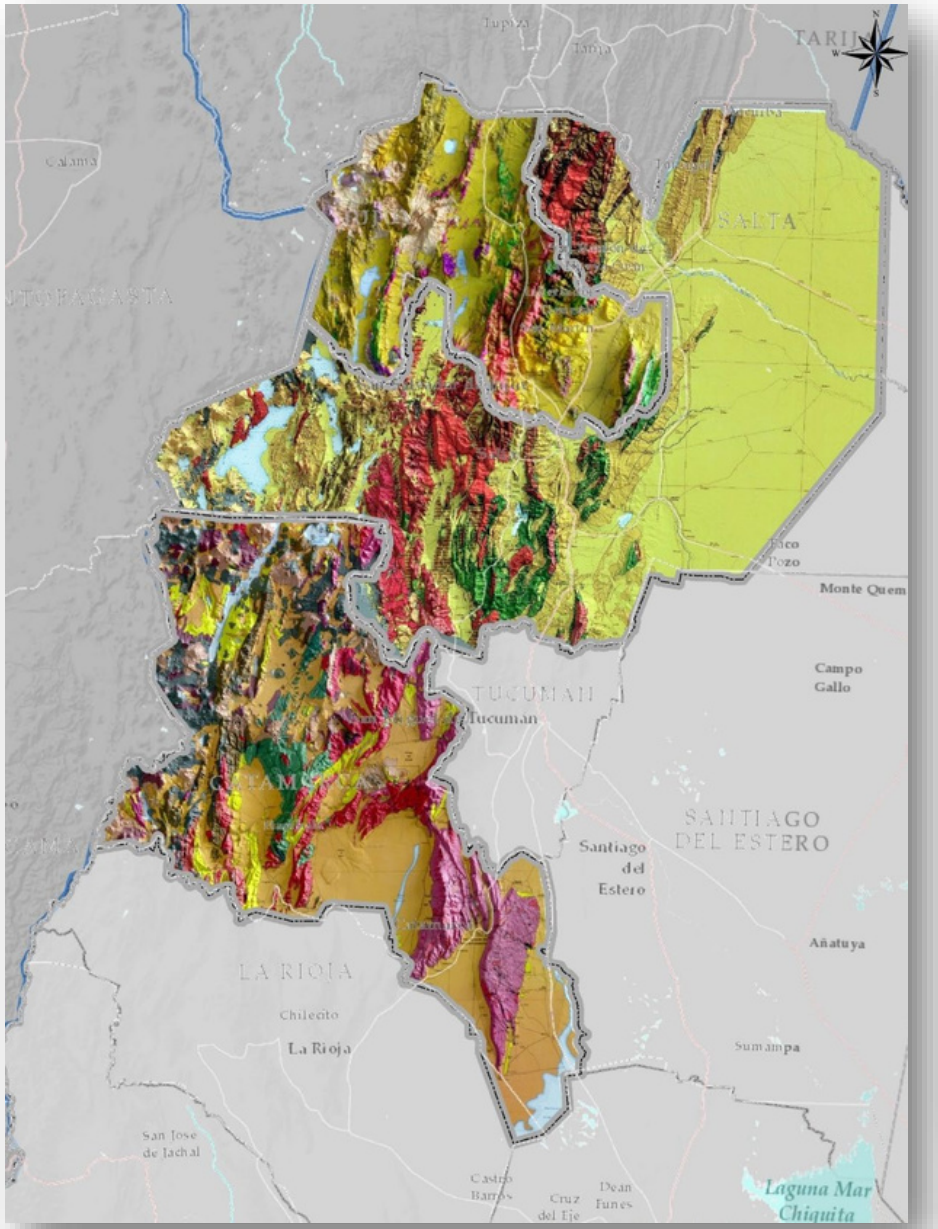


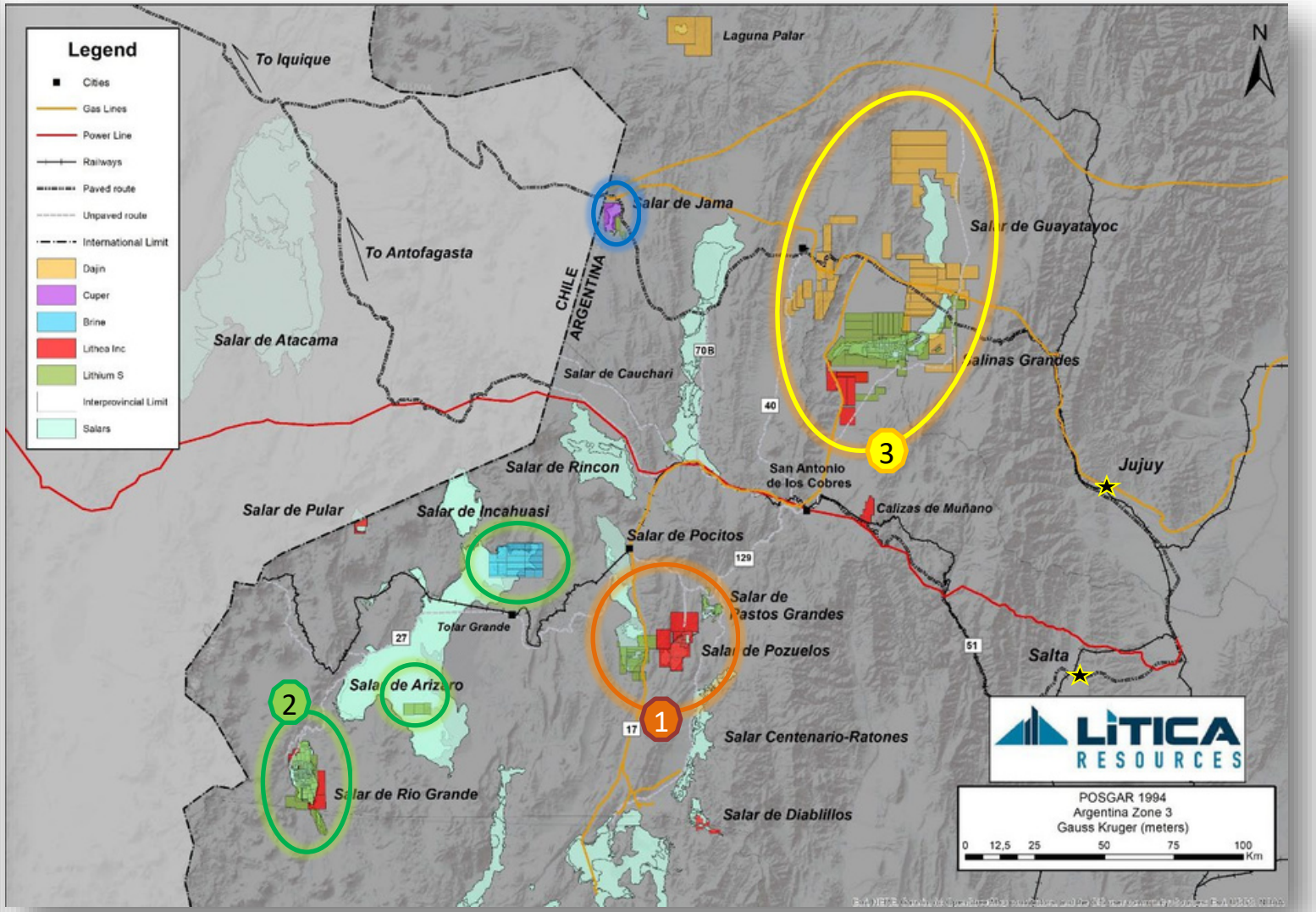
Salar	Status de Proyectos			
1 Laguna Guayatayoc				4
2 Salinas Grandes				4
3 Salar de Jama				1
4 Salar de Olaroz	1			
5 Salar de Cauchari		1	2	
6 Salar del Rincon		2	1	
7 Salar de Pocitos				4
8 Salar de Incahuasi				2
9 Salar de Pular				2
10 Salar de Arizaro			3	4
11 Salar de Tolillar			1	
12 Salar de Pozuelos			1	
13 Salar de Pastos Grandes			3	
14 Salar Centenario		1		1
15 Salar de Ratones			1	
16 Salar de Diablillos		1	1	
17 Salar del Hombre Muerto	1		3	3
18 Salar de Antofalla			1	3
19 Salar Carachi-Pampa				2
20 Laguna Tres Quebradas		1		
21 Salar de Llullaillaco		1		
22 Salar de Rio Grande				1
	2	7	17	3
				1

Status de Proyectos	
Operación	
Construccion	
Factibilidad/Exploración avanzada	
Exploración Inicial/ Prospección	
Empresas Operadoras	1

DEVELOPING LITHIUM PROJECTS IN SCARCITY

LITICA LITHIUM PROJECTS





DEVELOPING LITHIUM PROJECTS IN SCARCITY

LITHIUM PROJECT ROADMAP

Prospection

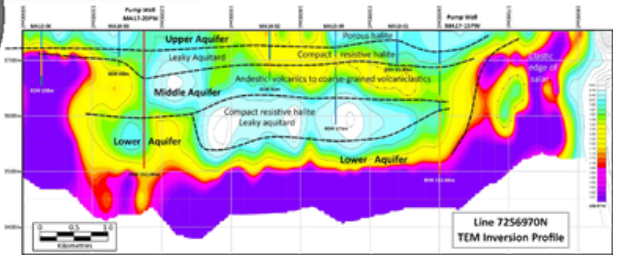
EIA

*

Hydrostatic Model

Geochemistry Values
Cut off 300-500 mg/L Li
Mg/Li < 10

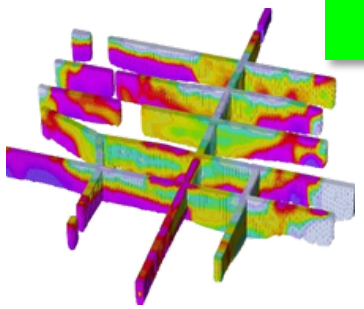
Exploration



1

2

Resources Estimation
1-5 year; 6-20 year; 21-40 year



Recovery factor (Tons per year)
Evaporation studies

3

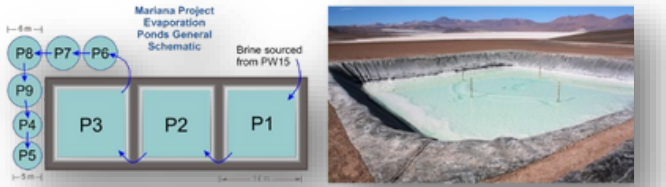
Pond & Facilities Construction

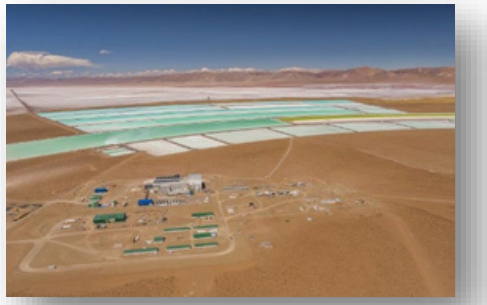
Full Development

Pilot Test

Feasibility

Preliminary Economic Assessment





DEVELOPING LITHIUM PROJECTS IN SCARCITY

EXPLORATION WORK PROGRAM

LITICA RESOURCES
A Pluspetrol Mining Company

- **Geophysics**
- **Drilling Stratigraphic + Pumping Test Wells**
- **Geochemistry: Understand lithium source and migration process to the endorreic basins (salt flat) + REE exploration**
- **Hydrogeological Studies. Water availability.**
  Climate modeling. Hydric balance (influx & outflux)
- **Hydro Geo Chemistry Models (Static & Dynamic)**
- **Resources Optimization -Subsurface Production Strategy.**

HIGH RISK — ASSET VALUE — LOW RISK

Salt Lake Geology
- Surface maps
  - Isoconcentrations, hydrology, base maps, etc.

Aquifer-Brine
- Geometry
  - Basin configuration
  - Structural timing
  - Brine/fresh water interface
  - Stratigraphic correlation
  - Facies modeling
- Geochemistry
  - Geophysical data
  - Petrophysical
  - Wells
  - modeling of aquifers
  - Geochemical modeling
  - Hydraulic behavior of reservoir

2D interpolation

2D Model

3D interpolation

Well correlation, facies modeling Structural/ stratigraphic sections Isoconcentration sections

3D Model "static model"

Volumetric maps Structural/ stratigraphic sections Well prognosis

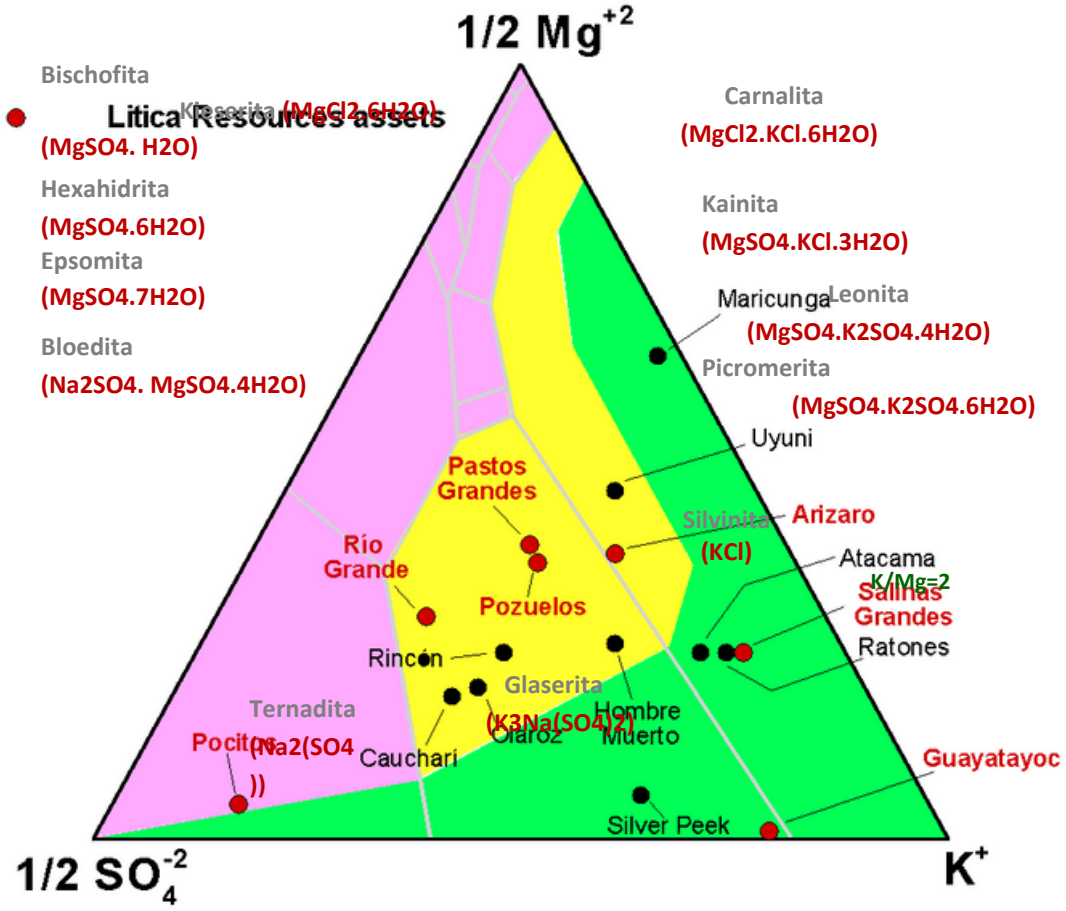
Flow simulation

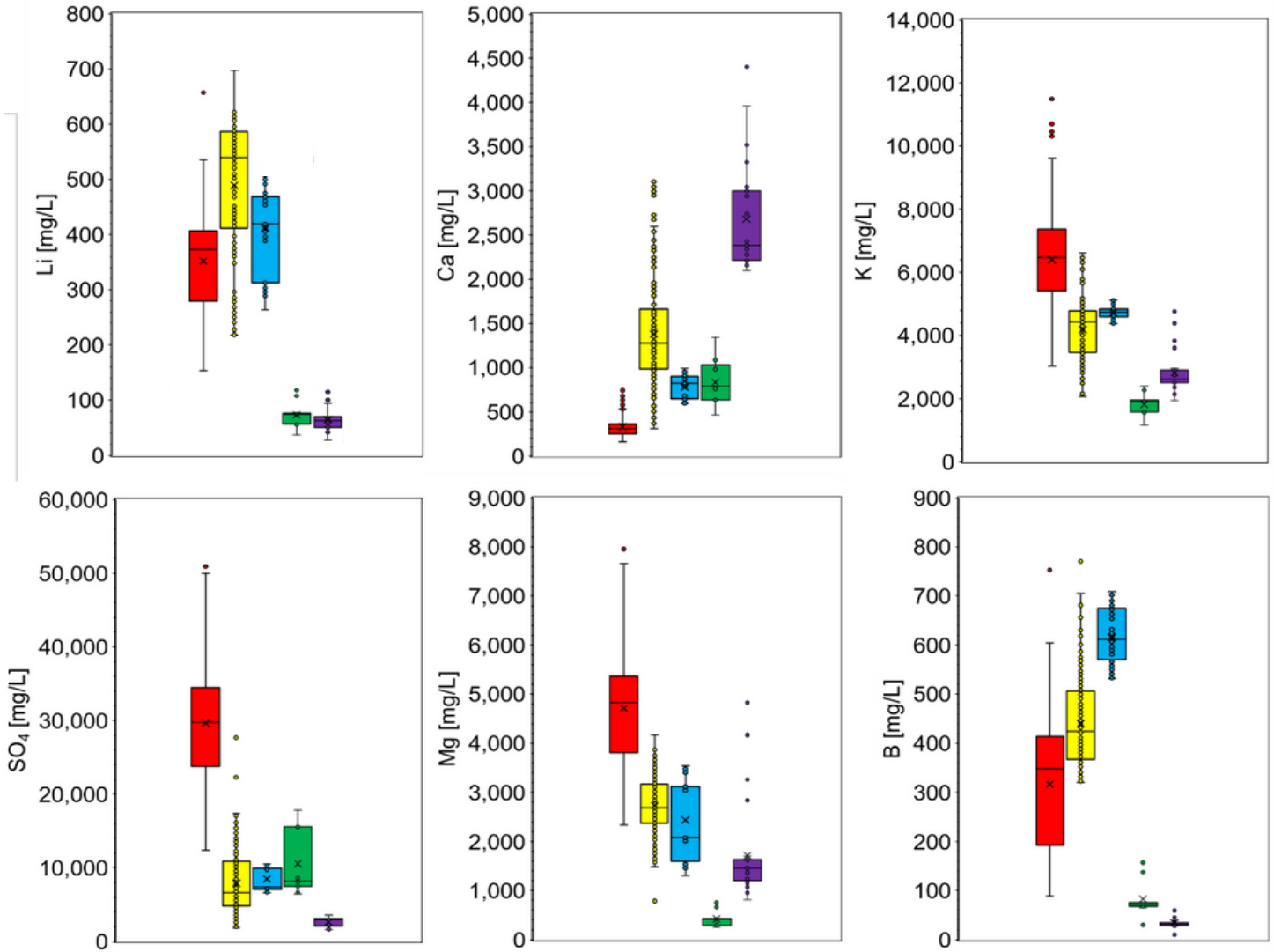
Dynamic model

Hydrological balance Variation in brine composition vs. time

PEA

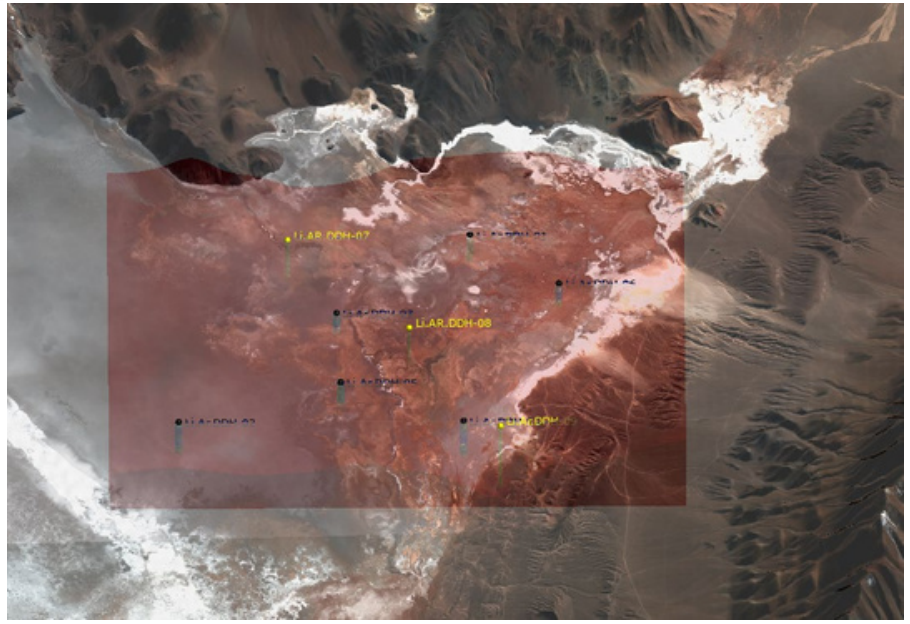
HYDROCHEMISTRY STUDIES

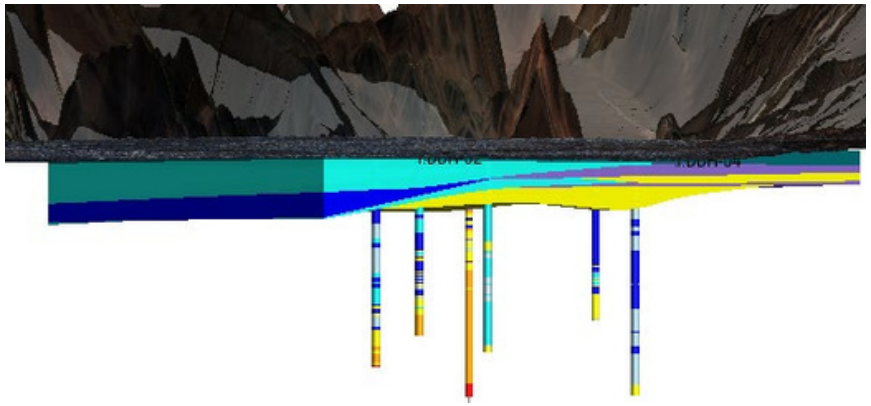


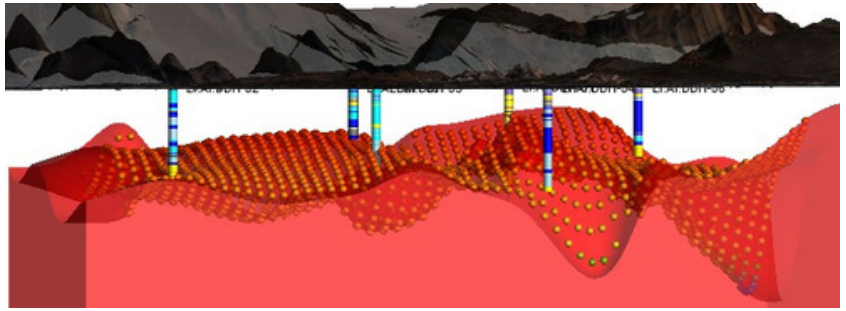


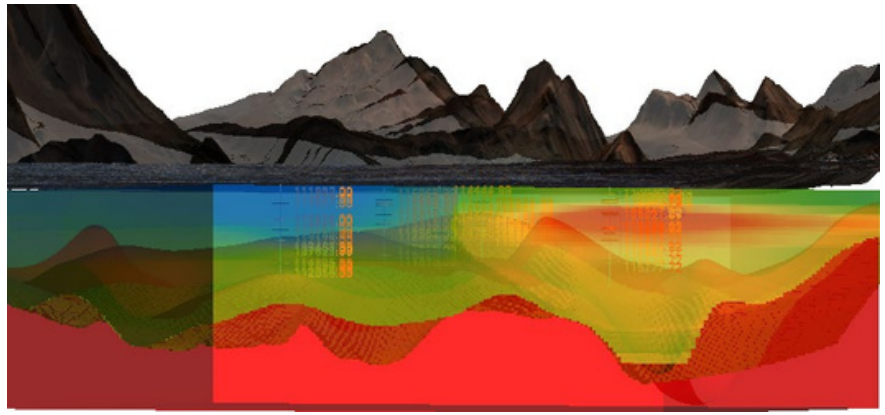
DEVELOPING LITHIUM PROJECTS IN SCARCITY

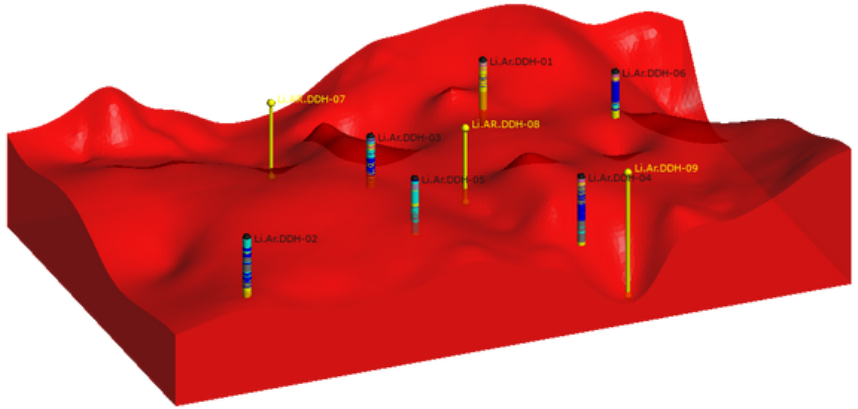
INTEGRATION BETWEENWELLS AND GEOPHISYCS

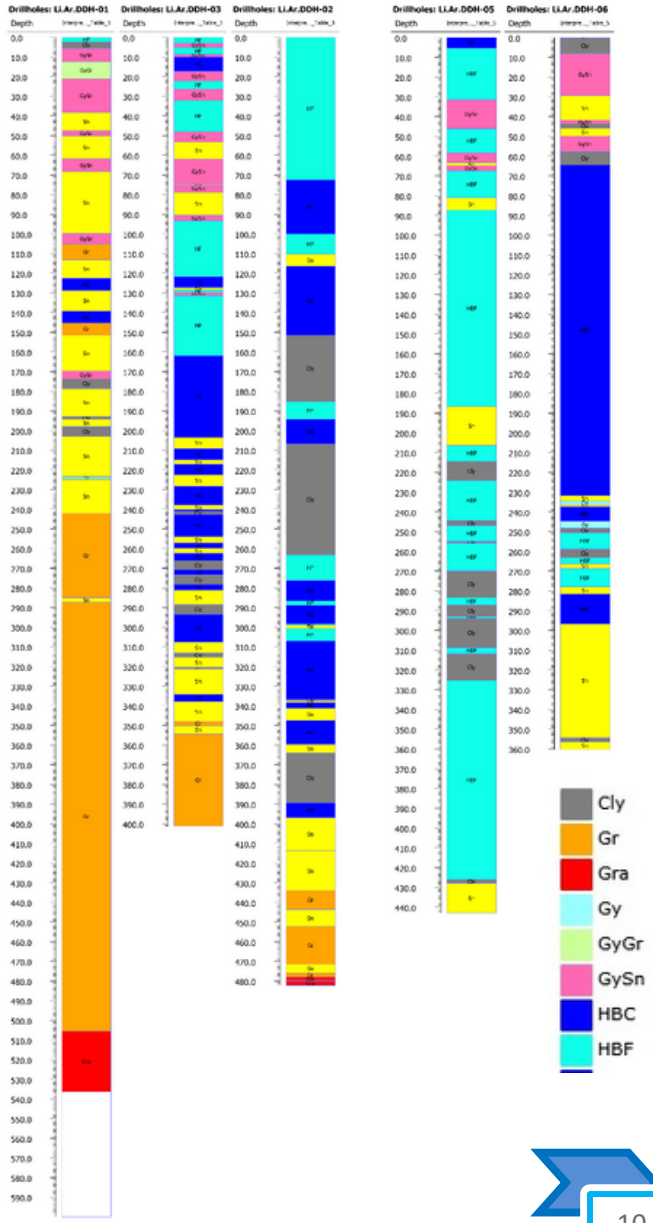




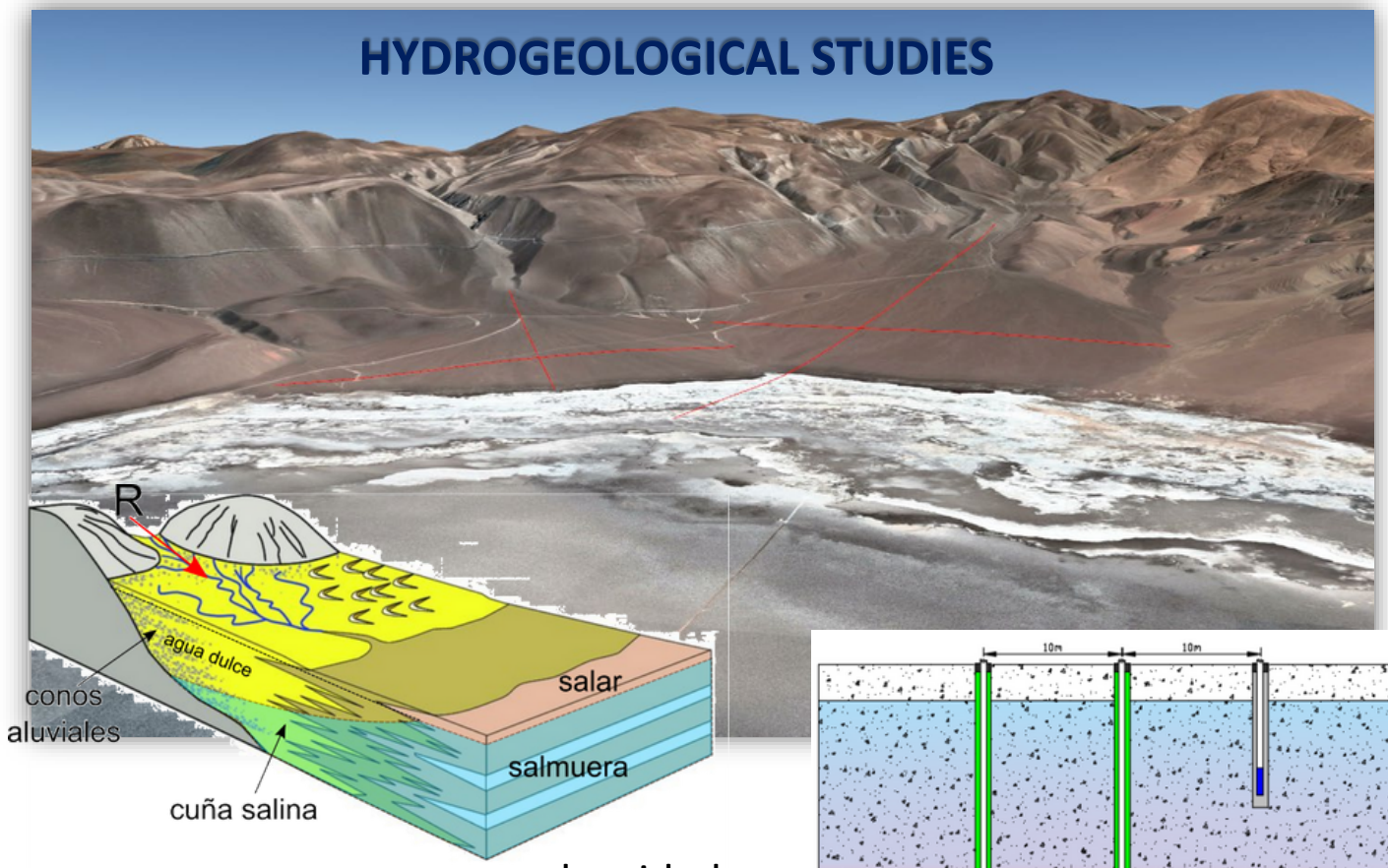




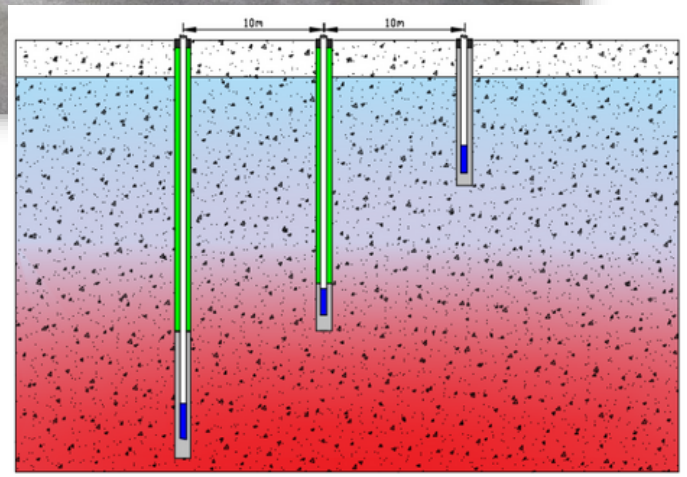




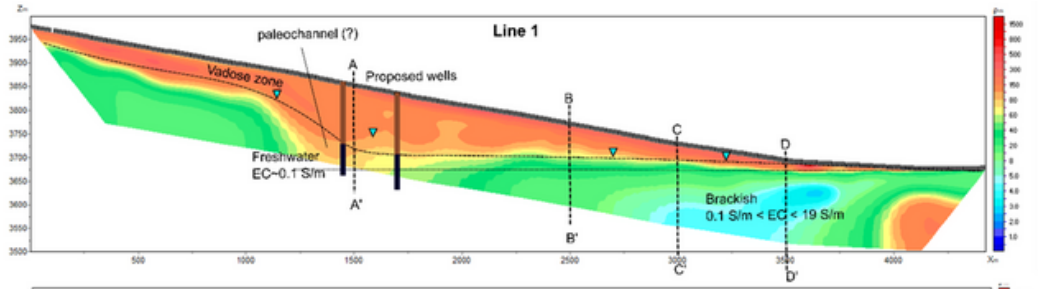
HYDROGEOLOGICAL STUDIES

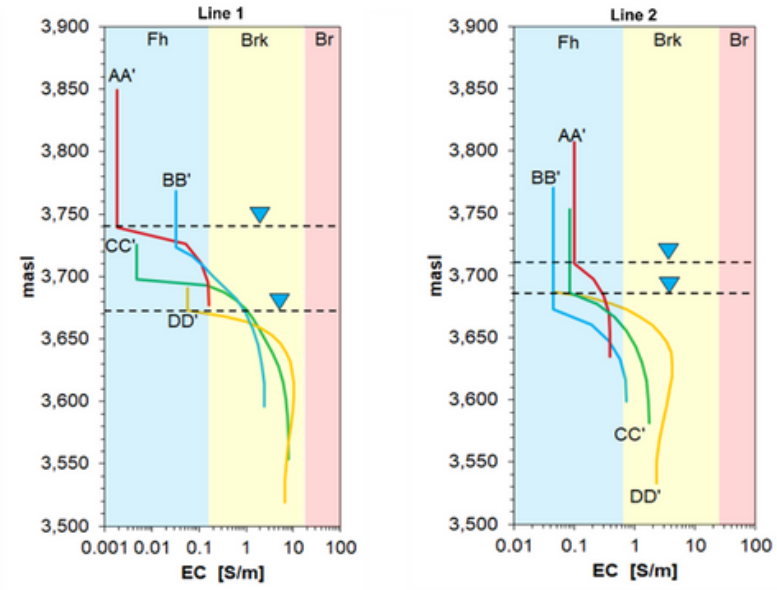


densidad agua dulce

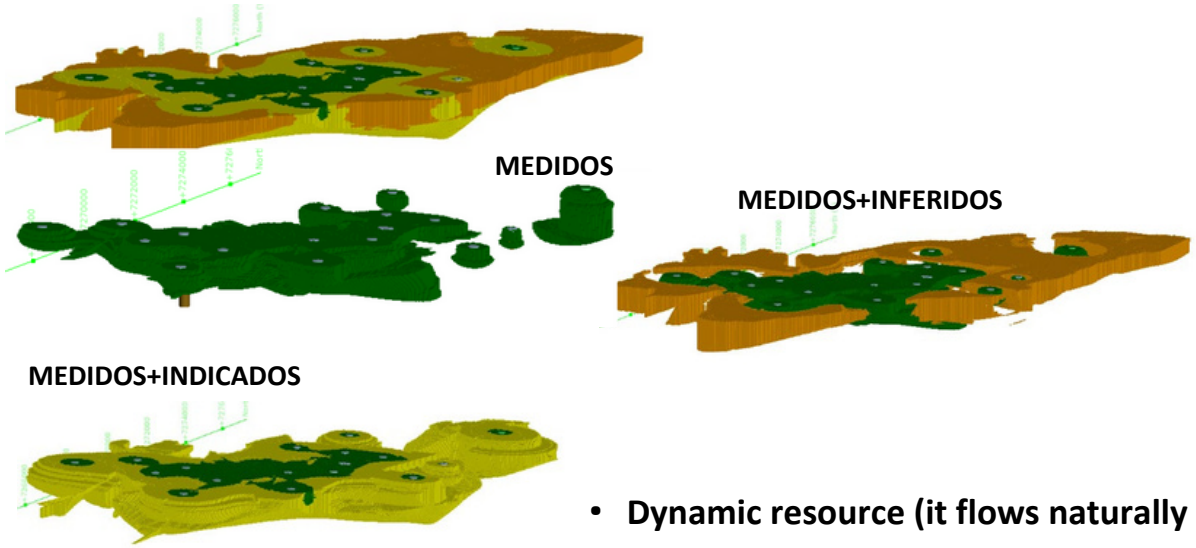


densidad salmuera





- **To reduce uncertainty Litica carried out a hydrochemical model to know the spatial distribution of lithium and different brine types and use it to classify three classes:**



- **Dynamic resource (it flows naturally or pumping)**
- **Weather: precipitation can affect grade distribution**
- **Dilution: fresh water lateral inflow (recharge)**
- **Volumetric estimation;**

  (a) How to define lateral limits?

  (b) How tolink aquiferlithology withbrine chemestry?(Lithology ≡% Li)

  (c) Efective porosity (Φ ef) Sy or Sr

Resource Classification

Increase Geological knowledge and confidence grade

Inferred
Surface geochemistry (trenches)
Permeability & hydraulic connectivity
low confidence grade

Indicated
Sub Surface geochemistry (DDH wells)
Permeability & hydraulic connectivity.
2D hydrostatic model. Geophysics
statistic confidence grade

Measured
RW wells and **aquifer stimulation**
Hydrodynamic conceptual model
Technical and consistent support
3D-high confidence grade

1. Mineral resources are notmineral reserves anddonot havedemonstrated economic viability.There isno certaintythat allofanypartofthemineral resource willbeconverted tomineral reserves. 2. The valuesin thetablesaboveareexpressed astotalcontainedmetals. Mineralreserve estimates arebased onnumerical model predictionsofpumped brine(pre-processing).

DEVELOPING LITHIUM PROJECTS IN SCARCITY

CHALLENGES

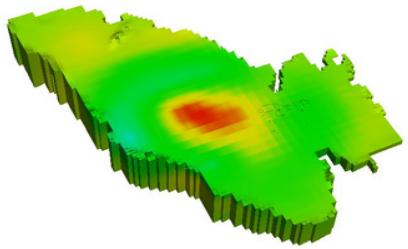
Understand lithium source and migration process to the endorreic basins (salt flat).

Water availability (extremely arid environment). Hydric balance (influx & outflux)

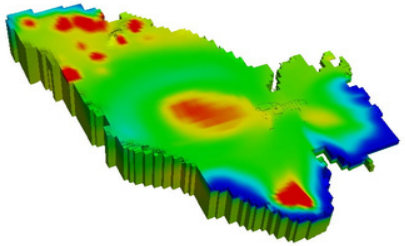
Exploration and Definition. Spatial and temporal variability of concentrations during production. Dilution for long pumping and lateral reentry of fresh water

Brine recovery factor: How much resource will be produced economically?. Reservoir understanding

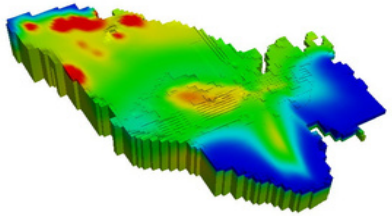
Many “landholders“ over the same resource. Managing of processed and sterile brine. Reinjection of brine to maintain piezometric levels and pressure.



Time = 0 years(Now)



Time = 10 years



Time = 20 years

GRACIAS