A Novel Form of "Mine Water": A Lithium Brine Deposit Under Dry Salt Lakes (Salaris) in the Puna Region of Argentina

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Outline

➢ World Lithium Demand
➢ Lithium Sources
➢ Salar Geology
➢ Lithium Americas Program
➢ Conceptual / Numerical Salar Brine Model
➢ Ongoing Work

Uses and Demand for Lithium

As of 2009:

➢ Lithium consumption has increased at a rate of 6% between 2000 and 2008; projected rate of 11% per year
➢ Primary future growth area is batteries, mainly for electric and hybrid cars; will quickly become the largest component of lithium demand

Electric Vehicles

Three Electric Drive Technologies:

Hybrid Electric Vehicle (HEV)

Toyota Prius
sold since 1997 and available in ~ 60 countries
1.5 kWh battery

Plug-in Hybrid Electric Vehicle (PHEV)

Chevy Volt – on sale Q4/10
16 kWh battery

Electric Vehicle (EV)

Mitsubishi i-MiEV – already for sale in Japan
16 kWh battery

Nissan Leaf – on sale Q4/10
24 kWh battery

Additional transportation applications for lithium ion batteries already in use and expected to grow significantly: Electric bicycles and scooters (especially in Asia), buses, garbage trucks, trains, and heavy equipment (for forklifts, excavators, etc…)

Primary Sources of Lithium

<table>
<thead>
<tr>
<th>Source</th>
<th>Hard Rock Mining</th>
<th>Lithium Brines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mining Method</td>
<td>Hard rock conventional open pit mining</td>
<td>Pumping and evaporation</td>
</tr>
<tr>
<td>Minerals</td>
<td>Spodumene, petalite, lepidolite, amblygonite</td>
<td>In solution in hypersaline brines</td>
</tr>
<tr>
<td>Main Producers</td>
<td>Australia, Canada, India, China, Zimbabwe</td>
<td>Chile, Argentina, China, US</td>
</tr>
<tr>
<td>World Resources</td>
<td>0.9 million t (26% of world resource)</td>
<td>2.5 million t (74% of world resource)</td>
</tr>
<tr>
<td>World Production</td>
<td>7.756 T (33% of world production)</td>
<td>15.377 T (67% of world production)</td>
</tr>
<tr>
<td>Production Costs</td>
<td>$4.250 - $4.850 per tonne</td>
<td>$2.700 - $2.850 per tonne</td>
</tr>
</tbody>
</table>

Brine sources are attractive due to the simple processing method (evaporation ponds)
Lithium Americas has the 6th largest known lithium brine resource, with all drill holes open at depth and exploration potential still to the north and the south.

Comparison of Known Li Brine Deposits

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Company</th>
<th>Country</th>
<th>Lithium Carbonate Resource (in Tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salar de Uyuni 1</td>
<td>Comibol</td>
<td>Bolivia</td>
<td>29,150,000*</td>
</tr>
<tr>
<td>Salar de Atacama 1</td>
<td>SQM</td>
<td>Chile</td>
<td>26,500,000*</td>
</tr>
<tr>
<td>Zabuye 1</td>
<td>Zabuye</td>
<td>China</td>
<td>8,109,000*</td>
</tr>
<tr>
<td>Salar de Rincon 1</td>
<td>Sentient Group</td>
<td>Argentina</td>
<td>7,435,000*</td>
</tr>
<tr>
<td>Donghai 1</td>
<td>Qinghai</td>
<td>China</td>
<td>6,990,000*</td>
</tr>
<tr>
<td>Salar de Cauchari</td>
<td>Lithium Americas</td>
<td>Argentina</td>
<td>4,900,000</td>
</tr>
<tr>
<td>Salar de Hombre Muerto</td>
<td>Orocobre</td>
<td>Argentina</td>
<td>4,505,000*</td>
</tr>
<tr>
<td>Salar de Atacama 2</td>
<td>Rockwood</td>
<td>Chile</td>
<td>2,650,000*</td>
</tr>
<tr>
<td>Xitai 1</td>
<td>Tianhao</td>
<td>China</td>
<td>2,650,000*</td>
</tr>
<tr>
<td>Salar de Olaroz 2</td>
<td>Orocobre</td>
<td>Argentina</td>
<td>1,500,000*</td>
</tr>
<tr>
<td>Silver Peak 1</td>
<td>Rockwood</td>
<td>USA</td>
<td>530,000*</td>
</tr>
</tbody>
</table>

1 The Economics of Lithium, Eleventh Edition, 2009, Roskill Inf, 2
2 Orocobre Limited website, www.orocobre.com.au
* NON 43-101 Compliant

In Production
Under Development

The 2009 exploration program included 9 holes that defined a NI 43-101 compliant Inferred Resource of:

- 4.9 million tonnes of lithium carbonate with average concentration of 580 mg/L lithium and a magnesium to lithium ratio of 2.84
- 14.7 million tonnes of potash with average concentration of 0.48% K.

The 2010 exploration program included 40 holes and the update will be released at the end of Q3.

PUNA PLATEAU
- Argentina, Bolivia, Chile
- High desert environment between two ridge lines of the Andes
- Inward drainage + evaporation leads to concentration of salts

PUNA SALARS
- Formed in dropped horst and graben basins in the Puna Plateau
- Compression and expansion faulting due Andes mountain building
- Concentration of salts from salar watersheds
- Hydrothermal fluid inputs to salars through the basin faults

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Cauchari Salar Geology
- Sediments in the Cauchari basin are Pleistocene or younger
- Can be simplified into three main hydrogeological units
  - Upper Mixed Sequence from 0 m to 40 m in thickness – low permeability
  - Thin Bedded Sequence 0 m to 175 m in thickness – moderate permeability
  - Coarse Bedded Sequence up to at least 310 m in thickness – main aquifer
- Low permeability alluvial fans on the salar boundary
- Hydrothermal springs in watershed

© by Authors and IMWA
Lithium-bearing hydrothermal springs in the headwaters of the Cauchari Salar

>1500 brine samples collected from discrete borehole sampling depths throughout the salar
40 reverse circulation and diamond drill boreholes to depths of as much as 300 metres

Groundwater / Brine Modelling
- Preliminary 2D flow, density and transport model through Cauchari salar along SW-NE section
- MODFLOW / SEAWAT Software
- Model geology based is simplified
- Short Term Goal – support Recoverable Reserve estimate
- Longer Term Goal – support design of optimal brine production strategy
- Examine hydro-dynamics of ‘Sweet-water’ input on basin boundary
Groundwater movement beneath Cauchari is controlled by:
- Groundwater and surface water inputs at the salar boundary
- Flow resistance of the geology (porosity, hydraulic conductivity)
- Evapotranspiration (ET), as a function of depth to water table
- Differences in groundwater density

Evapotranspiration (decreasing towards the centre of the salar)

"SWEET WATER" ENTERS THE EDGE OF THE SALAR AND FLOWS TOWARDS THE CENTRE, ON TOP OF THE HEAVIER BRINE

Simultaneous brine distribution beneath the salar with density contrast

Next Numerical Modelling Steps
- More detailed representation of geologic layers
- Implement full 3D flow, density and transport
- Calibrate to Pumping Tests
- Use calibrated Model to support Recoverable Reserve Estimates and design of Production Well Field

Schedule to Production
FAST MOVING PROJECT:

<table>
<thead>
<tr>
<th>Task Description</th>
<th>Start</th>
<th>End</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pumping well installation / Pump tests</td>
<td></td>
<td></td>
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<tr>
<td>3D Brine Model</td>
<td></td>
<td></td>
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<tr>
<td>Pilot process plant, engineering</td>
<td></td>
<td></td>
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<tr>
<td>Measured Resource Report: Q4 2010</td>
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<tr>
<td>Recoverable Reserves Report: mid-2011</td>
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