Salar del Rincon lithium

Geological setting
The promise of the Rincon salar as a reserve base lends itself to its geological setting within the Antofalla-Pocitos volcanic rift valley. Admiralty’s research has led to the conclusion that the brine reserve is being replenished with lithium by underground river systems that pass through two volcanoes and other intrusive systems that surround the salar.

The brine halite body averages 40 metres depth with a porosity of ~23% (may be revised after completion of all hydrological tests). It is bounded at depth by a layer of unconsolidated pyroclastic sands, although full geological history is unknown, pending test completion.

The in-situ concentration of the salar ranges from 200-2,400ppm, however this is negligible as Phillip Thomas, managing director at Admiralty, explained to IM: “The concentration of lithium is not relevant due to the immense reserve we have. The in-situ concentration is more than satisfactory where we have located our seven production pumps.”

Development
The development of the salar is making good progress and is on course for production start up in the third quarter of 2007. The development before production involves a number of stages, including: design and construction of evaporation ponds; construction and mining camp; and construction of a meteorological station.

Admiralty has already completed all the exploration work in the field and is just awaiting the laboratory results to finalise the report.

Final environmental approval from the provincial government has been granted for all of the 500 evaporation ponds. The detailed engineering and specifications for the ponds and pre-treatment plant has been finalised with a total cost, once pipes are connected and operational, of between $24-27m.

The number of ponds was increased after a preliminary risk analysis indicated that the major risk was climatic, the evaporation rates over long periods is less than the required minimum (4.5 kg H2O/day/m²). The additional ponds negated the risk with a surface area increase from 4.7 km² to 7 km².

The optimum location for the ponds was found after establishing a meteorological station on site.

Admiralty has acquired property rights over the land north of the salar to secure access to the site which can also be used should double production be needed in the future. Currently, 14.6 km of mining roads have been established in the salar, with another 14.2 km to be built to service the pipeline.

Thomas spoke of the main challenges at Rincon, he told IM: “Our main challenges have been coming up with a more efficient method to produce lithium carbonate than the traditional fractional crystallisation method. We also had to overcome the high cost of acquiring sodium carbonate as the major ingredient, which we have done by producing our own.” Admiralty is currently at the 1:100 pilot plant stage.

The lithium era?
Admiralty took a long term view of the need for lithium in 2003. Thomas said Admiralty knew alkali was the metal of choice for energy storage and building applications (where intense heat is involved). He said “The current demand for lithium is what we anticipated, although lithium use in metals, ceramics, grease, and organo-compounds is also on the increase, most of which are major global markets.”

Thomas told IM: “The target date is September 2008 for 50% capacity production and March 2009 for full production. Full production targets are: 10,000 tonnes of lithium carbonate; 4,000 tonnes of lithium hydroxide; 3,000 tonnes of lithium chloride; 80,000 tonne of potash.”

The quality of the final product has been estimated by Admiralty at “upwards of 99.0%” with probable limited production of 99.999%.

Admiralty has predicted that the market will be short 10-15,000 tonnes of lithium carbonate, which is exactly what is intended to be produced at Salar del Rincon.

For a review of the lithium market see Head to head, p.58