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Bacanora Minerals



Bacanora intends to bring its Magdalena borate project in Sonora, Mexico, to production within three years. Concurrently, Bacanora will continue exploration of its Sonora lithium project, also in Sonora, Mexico.

Initiation Report

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Key Points

Bacanora Minerals offers investors one of the few junior company exposures to a borate project. The company intends to bring its Magdalena borate project in Sonora, Mexico, to production within three years. Concurrently, Bacanora will continue exploration of its lithium project, also in Sonora, Mexico.

- The Magdalena project has potential to deliver quick and robust cash flow The Magdalena borate deposit is an advanced project that has the potential to be fast-tracked to production. Projected capital costs are modest, with current estimates of less than US\$7.5m. This, combined with a reasonable expectation of US\$6m in annual cash flow will result in quick payback, followed by significant profit over a potential 30-year mine life. Bacanora plans an aggressive programme to continue development at Magdalena this year.
- Magdalena hosts a significant resource of colemanite

The Magdalena borate project currently hosts an established NI 43-101-compliant mineral resource at Cajon, one of three known targets on the property. Bacanora estimates Cajon contains an indicated resource of 11.1 million tonnes, averaging 9.9 percent borate (B_2O_3), based on a cut-off of 8 percent. Further, the target hosts an inferred resource of 7.3 million tonnes, grading 9.3 percent B_2O_3 . This resource is substantially larger at a cut-off of 5 percent.

Magdalena offers considerable blue-sky potential

Cajon is the most advanced of several mineral targets at Magdalena. The Bellota and Pozo Nuevo targets are at an earlier stage but offer significant potential for future development. Further, the property hosts two other occurrences, including the recently discovered Represo occurrence, where two drill holes encountered substantial intersections of colemanite.

• The greenfield Sonora lithium project is an interesting new development Bacanora recently wrapped up its first drilling programme on the La Ventana concession of its Sonora lithium project with promising results. Assays returned lithium in all four holes, with estimated grades of up to 2.71 percent lithium carbonate (Li₂CO₃) over 19.2 metres. Although at an early stage, the assays compare favourably with other lithium deposits, notably the Kings Valley deposit in Nevada, being developed by Western Lithium USA Corp., which hosts Stage 1 indicated resources of 10Mt grading 0.43% lithium and inferred resources of 10Mt grading 0.42% lithium.

• **Bacanora's Sonora lithium has the potential to be a low cost operation** Cost of lithium from brine production is highly dependent on the brine magnesium content. Hard rock spodumene has higher mining costs and total costs of lithium carbonate derived from spodumene can be between two and three times higher than carbonate from brines. Bacanora's hectorite target, potentially offers a low cost production opportunity.

8 March 2011 Price: C\$0.60



Current fair value of equity				
Expected value	US\$27.5m			
Value per share	US\$0.80			
Value per share	C\$0.81			
Derisked upside potential*				
Our core scenario	C\$1.18			
Our optimistic scenario	C\$1.50			
Our pessimistic scenario	C\$0.60			
Maximum potential	C\$1.70			
*potential assuming projects reach permitting				

Company details

Quote		
Shares		
- TSX-V		BCN.V
Hi-Lo last 12-mo	os. (C\$)	0.70 - 0.11
Shares issued (I	n)	37.3
Fully diluted (m	ı)	38.7
Market Cap'n (C\$m)	22.4
Website: w	ww.bacano	raminerals.com

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Overview

Bacanora Minerals is a Canadian-based junior resource company listed on the TSX Venture Exchange in Canada offering exposure to a borate project in northwestern Mexico that has potential for quick, profitable development.

Bacanora was incorporated in 2008 and obtained its listing as a capital pool company in May 2009. Shortly after listing, Bacanora arranged for and announced the completion of its required material transaction, the acquisition of Mineramex Ltd., a private company owning rights to the Magdalena project, for C\$5.25m. Since the company's inception, it has been focused on development of Magdalena, with a secondary focus on the Sonora lithium prospect.

Generating cash flow from Magdalena is Bacanora's immediate focus

Bacanora's priority is to develop a profitable borate mine at its 15,508-hectare Magdalena property, north of Hermosillo in Sonora, northwestern Mexico. Bacanora holds a 100-percent interest in the property, which is subject to a 3-percent GOR royalty to each of MSM and Colin Orr-Ewing, a Bacanora director.

Bacanora Minerals intends to fast-track Magdalena into production, although we have adopted a conservative start-up date of 2014. The company has not yet completed a feasibility study, but initial modelling suggests Magdalena could be placed into production through a modest capital expenditure, perhaps US\$7.5m or less, for an open-pit operation with a mining rate of up to 325,000 tonnes per annum, processing 250,000 tonnes of ore. This would be sufficient to generate enough cash flow to achieve payback in considerably less than two years, with a potential mine life in excess of 30 years. Accordingly, there would be ample opportunities for expansion during this period.

There are several mineral deposits or occurrences present on the property: Cajon, Bellota, Pozo Nuevo, Represo and Escuadra. Cajon, the most developed of these, currently has an NI 43-101-compliant mineral resource defined. Current estimates include an indicated resource of 11.1 million tonnes averaging 9.9 percent borate (B_2O_3) and an inferred resource of 7.3 million tonnes averaging 9.3 percent B_2O_3 , all at a minimum cut-off of 8 percent. (Based on a 5-percent cut-off, the indicated resource grows to 43.6 million tonnes, albeit at a lower grade of 6.5 percent.) This resource is spread over three separate zones at Cajon.

Bacanora plans an aggressive development programme at Magdalena

Bacanora wrapped up a drill programme at Magdalena late last year and is currently conducting preliminary metallurgical work on the obtained core samples, with results expected by April. The company intends to continue advanced exploration and development work this year, including the collection of a bulk sample, infill drilling to upgrade the mineral resource estimate, and advanced metallurgical testing. Contingent upon successful results, Bacanora envisages proceeding to full feasibility at Magdalena before the end of 2011. The greenfield Represo project displays considerable potential based on the initial four-hole drill programme last year. Two holes, drilled approximately one kilometre apart, yielded substantial intersections of calcium borate colemanite. Further drilling and exploration is contemplated at the other deposits and occurrences on the property.

The Sonora lithium project is also a priority

Bacanora completed a four-hole drill programme on the La Ventana concession, one of the Sonora lithium properties last autumn. Assays from all four holes, received in late January, yielded promising values of lithium carbonate. Among the best results, were a 30.5-metre interval in Hole No. 1 that averaged 1.11 percent Li₂CO₃, including a 9.8-metre interval averaging 1.97% Li₂CO₃. Hole No. 4 produced a 54.3-metre intercept that averaged 1.45% Li₂CO₃. That hole included a 19.2-metre zone averaging 2.71% Li₂CO₃, as well as a 10.9 metre interval averaging 1.89% Li₂CO₃.¹

Although the project is at an early stage, these results are encouraging as they compare well with other lithium projects. The Kings Valley lithium deposit in Nevada currently hosts a NI 43-101-compliant indicated resource of 10 million tonnes averaging 0.43% lithium (2.29% Li_2CO_3) and an inferred resource of 0.42% lithium (2.24% Li_2CO_3). Kings Valley is being developed as a sole project by Western Lithium, which currently has a market capitalisation of C\$125m.

There is of course no guarantee that continued exploration will successfully delineate a resource comparable with Kings Valley, but based on the early potential, Bacanora intends an aggressive exploration programme concurrent with its development of Magdalena. The company is currently conducting metallurgical testing on core samples with the intent of planning a follow-up drill programme. Exploration on other lithium concessions within the Sonora lithium project is continuing.

¹ Li₂CO₃ equivalency with respect to Li is determined using a factor of 0.0005329 times Li ppm. Additional processing is required to convert the lithium minerals on Bacanora's project to lithium carbonate and there is no guarantee that such a process will be able to convert 100% of the Li to Li2CO3. The economics of that process have not been established.

Valuation

Our valuation approach

We have valued Bacanora Minerals based on assessing the economic potential of the company's key property, the Magdalena borate project in Sonora, Mexico. In so doing we have accounted for: the likelihood that an economic resource will ultimately be proven; the likelihood that feasibility will be established, after considering metallurgical, social and permit issues etc; and the likely economics if actual mining were to occur, considering parameters such as tax, operating costs, revenues etc.

One of the key issues that any mining analysis must consider is the problem posed by the dependence of our assessment on commodity prices. This issue takes two forms – what will be the price environment when mining eventually occurs; and the operating dynamics in response to changing mining prices.

From a valuation perspective, the aspect of operational dynamics that is of interest is the ability to "mothball" operations during periods when the commodity price is below the marginal cost of extraction. This creates what is frequently referred to as "optionality" – something that traditional NPV fails to capture. Intuitively this can most easily be understood by thinking of NPV as assuming that positive and negative deviations from our mid-case have a similar likelihood of occurring and hence balance each other – however, in mining, the downside is capped at the cost of "mothballing" the site.

We capture these aspects by valuing each year's production as an option assuming that prices revert to mean over the long run - that is, the mine will only operate if the commodity price is above the extraction cost. In essence, rather than valuing that year's production as we would in an NPV model as the discounted value of the cash-flow estimated using the mid-case for the commodity price we value the probability that the price is above the extraction cost.

In valuing the economic potential of resource projects, we assume that while commodity prices are volatile they return to an inflation-adjusted, long-run mean. For example, borate, B_2O_3 , has historically traded at approximately US\$300 per tonne in current dollars since the early 1950s, with deviations from mean normally correcting over 12.2 years with a volatility of 6.5 percent.



Source: Objective Capital

Fair value summary (US\$m)

Scenario	Base	Pessimistic	Optimistic
Property portfolio			
- Magdalena	31.8	18.7	41.7
- La Ventana	1.9	1.9	1.9
Total	33.7	20.6	43.6
Less: overhead	7.8	7.8	7.8
Expected value of portfolio	26.0	12.8	35.8
Add: other investments	0.0	0.0	0.0
Add: starting cash + new funds	1.9	1.9	1.9
Total current value for firm	27.9	14.7	37.7
Less: bank & other debt	0.0	0.0	0.0
Total value to equity claims	27.9	14.7	37.7
Less: warrants and options	0.4	0.4	0.6
Ordinary equity holders	27.5	14.4	37.2
Value per share (US\$)	0.80	0.42	1.08
Value per share (C\$)	0.81	0.43	1.09

Expected fair value of Bacanora Minerals

Scenario	Risked mineable resources (m tonnes)	Magdalena value (US\$m)	Bacanora Valuation (US\$m)	Value per share (US\$)	Value per share (C\$)
Base case outlook	8.4	31.8	27.5	0.80	0.81
Value for scenarios	of further e	exploration	success		
Full proved up	11.6	44.7	40.2	1.16	1.18
Optimistic outlook	10.8	41.7	37.2	1.08	1.09
Pessimistic outlook	5.2	18.7	14.6	0.42	0.43
Value with no furth	er explorati	on success			

15.7

11.6

0.34

Current resource

estimate

Notes:

- 'fully proven up' scenario assumes that current mineable resource estimates are upgraded to 'Proven' status

- for further details see Bacanora projects section

4.4

Sensitivities to market assumptions on ...

Long run real borate price (US\$/t)	299.80	299.90	300.00	300.10	300.20
Value (C\$/share)	0.80	0.80	0.81	0.81	0.81
Change in value (%)	-0%	-0%		+0%	+0%
Time for borate price to revert to					
mean (years)	10	11	12	13	14
Value (C\$/share)	0.81	0.81	0.81	0.80	0.80
Change in value (%)	+1%	+0%		-0%	-1%
Volatility of borate price (%)	2%	7%	12%	17%	22%
Value (C\$/share)	0.78	0.81	0.86	0.94	1.05
Change in value (%)	-3%		+6%	+16%	+30%
Interest rate (%)	3.4%	3.5%	3.6%	3.7%	3.8%
Value (C\$/share)	0.83	0.82	0.81	0.79	0.78
Change in value (%)	+3%	+2%		-2%	-3%

Sensitivities to assumptions on ...

Change in borate recovery rate (%)	80%	85%	+90%	+95%	+100%
Value (C\$/share)	0.52	0.66	0.81	0.95	1.09
Change in value (%)	-36%	-18%		+18%	+36%
Operating Costs (C\$ per milled tonne)	11.88	12.50	13.13	13.75	14.38
Value (C\$/share)	0.88	0.81	0.73	0.65	0.57
Change in value (%)	+10%		-10%	-19%	-29%
Increase in Capital Cost (%)	+0%	+10%	+20%	+30%	+40%
Value (C\$/share)	0.81	0.80	0.79	0.78	0.77
Change in value (%)		-1%	-2%	-4%	-5%

Components of Bacanora Minerals' entity value



Magdalena valuation (US\$m)

Scenarios for exploration success	Base	Optimistic	Pessimistic
Net value of production	73.7	73.7	73.7
Expected mining success*	65%	84%	40%
Expected net value of production	48.2	62.1	29.8
Add: tax shield on depreciation charge	3.6	3.6	3.6
Less: development & operational capex	6.4	6.4	6.4
Value of mining operations	45.4	59.3	27.0
Probability of reaching mine development	71%	71%	71%
Expected value of deposit	32.4	42.3	19.3
Less:			
 expect pre-development costs** 	0.5	0.5	0.5
- further exploration costs ***	_	—	_
Expected value of project	31.8	41.7	18.7
effective risk haircut	54%	40%	73%
Ownership	100%	100%	100%
Bacanora Minerals's share	31.8	41.7	18.7

* portion of reserve/resource expected to be converted to a mineable resource, probability-weighted for our confidence they will be proven-up

- ** shown as expected value of being incurred after allowing for likelihood of reaching each development stage
- *** present value

0.34

Commodity market assumptions

•	-
Borate prices are mean rev	rerting
Long run level	300.00 US\$/t
Avg time to revert	12.2 years
Volatility	6.5%
Inflationary price growth	ר <i>2.0%</i>

Expected borate price (US\$/t)



Our key assumptions

We have modelled Bacanora's Magdalena project based on the following key assumptions:

- the property contains a theoretical mineable total of 18.4 million tonnes of borate mineralisation, averaging 10 percent borate. Our analysis assumes that further exploration will convert this combined amount to a mineable resource of some 12.9 million tonnes - or, after allowing for the confidence level of each resource category, 8.4 million tonnes on a risk adjusted basis.
- assuming exploration success we have modelled that mining will commence in the third quarter of calendar 2014 with a milling capacity of 900 tonnes per day. We assume capital expenditures will begin by mid-2013, with a total capital cost of approximately US\$7.0m over the following 12 months.
- we assume initial mining costs of US\$2.75 per tonne of ore and waste and processing and labour costs of US\$12.50 per tonne of ore, escalating at a nominal rate of inflation thereafter. We assume a tax rate of 30 percent.

Bacanora's Magdalena project has reached the mid-stages of development, with a full feasibility study expected to commence later this year. We have assumed success probabilities of 75 percent and 95 percent at the feasibility and permitting stages respectively.

Our results

After allowing for likely economics, exploration potential and development risk our analysis suggests an expected value of C\$32.7m for the Magdalena borate project. We ascribe a nominal value of US\$1.9m to the Sonora lithium project. This is set an order of magnitude larger than book carrying cost to reflect the initial exploration success.

After allowing for corporate overhead and outstanding warrants, our assessment of Bacanora Minerals' ordinary equity results in a base case current valuation of US\$27.5m, or C\$0.81 per share, with an optimistic current valuation of C\$1.09 per share, assuming higher probabilities of exploration success.

Our analysis suggests that Bacanora's current value is based largely on the potential for development at Magdalena and for future exploration success at Sonora. Should there be no further, or limited success, then the current level of risked resources may not be sufficient to justify extraction. Alternately, if all available potential resources in the company's Magdalena project were ultimately proven, they could yield up to C\$1.70 per share.

Our base-case and optimistic outlooks, assuming success at all stages through permitting, result in valuations of C\$1.18 and C\$1.50 per share respectively. Delineation of additional resources beyond our hypothesised estimates could add significantly to these estimates. Bacanora Minerals' borate and lithium projects in Sonora, Mexico offer good potential for exploration and development success, but only the Magdalena borate project has reached the mid-stages of exploration and development. The Magdalena borate project is not yet at feasibility and the Sonora lithium project does not yet have a formal resource calculation. As a result, much of the company's value will depend on the ability of Bacanora to delineate sufficiently large quantities of mineralisation with sufficient grade to support the calculation of a mineral resource to NI 43-101 standards at Sonora, and to successfully complete a full feasibility study at Magdalena. Consequently, its projects carry significant risk.

Bacanora's success depends onmanaging country risk issues

Although Mexico appears stable politically and the country has a market-based economy, there are factors that contribute to sovereign risk. There is significant concern about corruption in business, a rigid, burdensome and non-transparent bureaucracy, and the escalation of violence between drug traffickers, particularly in the northern regions of the country. Foreign investment in Mexico still faces some restrictions and controls, and the enforcement of property and business rights are occasionally problematic. Further, privatisation and liberalisation of the economy has not yet reached the energy and electricity sectors. There are social issues at Mexican mines, with labour agitating for increased wages and improved conditions.

...the company successfully completing a full feasibility study at Magdalena

Bacanora has successfully delineated a NI 43-101-compliant mineral resource for the Cajon deposit at Magdalena, with sufficient grade to support a hypothetical mine plan. Nevertheless, there remains the inherent risk that the results of detailed engineering, metallurgical work, infill drilling and bulk sampling will have an adverse impact on projected revenues and operating costs, which could render the deposit uneconomic. Further, external influences such as rising energy costs could adversely impact the project.

... the company having continued exploration success at Sonora

Bacanora recently obtained promising results from its first drill programme at La Ventana, on its Sonora lithium project. Nevertheless, as with all early-stage exploration projects, there is considerable risk that future drilling and testing will fail to deliver satisfactory results, rendering the project uneconomic.

... the company's ability to raise further funds for exploration and development Bacanora is a junior exploration company with limited access to capital and will need increasing and significant amounts of cash to fund its exploration and development programmes. Although the capital costs associated with development of Magdalena are modest, shareholders could nevertheless experience significant dilution if the company is forced to raise capital at low share prices particularly as the company plans to finance project development entirely through equity. Additional capital will be required to advance the Sonora lithium project.

... the company's ability to retain key personnel

Bacanora requires stable and experienced leadership to advance its key projects. The credentials and experience of Ing. Martin Vidal Torres are clear but the company will need to support him with experienced technical teams to assist with the feasibility studies and mine development at each site.

Key Risks

Bacanora Minerals Ltd

Bacanora Minerals Ltd was incorporated under the Business Corporations Act of Alberta, Canada, on September 29, 2008. It obtained a public listing in May 2009 as a capital pool company as defined by the TSX Venture Exchange. At the time, Bacanora's strategy was to identify and acquire businesses in the minerals exploration sector.

Rio Tinto had been involved previously with drilling of the Magdalena calcium borates. However, as its subsidiary, US Borax, was already selling sodium borates produced in California to the major Mexican glass manufacturer, Vitro, there was little incentive for Rio to develop the calcium borates in Sonora. Bacanora recognised the potential this represented as a greenfield opportunity.

The company quickly completed its required material transaction – the acquisition of Mineramex Ltd. In summer, 2009, Bacanora agreed to acquire Mineramex, which owned 99.9 percent of the Magdalena borate project and a 60-percent interest in the Tubutama borate project. The agreed price, C\$5.25m, was satisfied by payment of \$250,000 in cash and the issuance of 21.74 million shares at a deemed price of 23 cents. The transaction closed in April 2010. As a result of the transaction, Bacanora acquired the Carlos project, which has six mining concessions; the San Francisco project, which has six mining concessions; and the El Represo project, which has one concession.

In August 2010, Bacanora acquired four lithium claims in Sonora, which comprise the company's Sonora lithium project, for US\$40,000 and 600,000 shares at a deemed price of 25 cents.

As of September 30, 2010, Bacanora had 35.2 million shares issued and outstanding. The total included 4.78 million issued prior to the reverse takeover of Mineramex, the 21.74 million shares issued to Mineramex shareholders, the 0.6 million shares issued to the vendors of the Sonora lithium properties, as well as 8.05 million shares issued at 25 cents through a private placement in April 2010. There are no share purchase warrants outstanding and as of Sept. 30, 2010, Bacanora had 545,915 stock purchase options issued and outstanding, exercisable at C\$0.20.

As of 30 September 2010, Bacanora had spent an aggregate of C\$1.95m on exploration at its Mexican properties. The company had C\$0.6m in cash on hand, C\$0.29m in accounts receivable and C\$0.16m in accounts payable.

As a junior resource company with limited financial resources, Bacanora Minerals does not have a large number of employees. Paul Conroy, who has over 30 years of experience directing and managing public resource companies, serves as President and Chief Executive Officer. He is assisted by Derek Batorowski, who serves as Chief Financial Officer and Secretary. Both sit on the company's five-man board of directors, with Colin Orr-Ewing, George Jones and Raymond Hodgkinson; all of whom have significant experience with public resource companies. Additionally, Bacanora employs Ing. Martin Fernando Vidal Torres as vice-president of exploration. Ing. Vidal Torres is intimately familiar with mineral exploration and development in Northern Mexico.

The Borate Market

Production

Elemental boron is marketed in grades from 90% to 99% purity. Borax, one of the most important boron minerals for industrial use, is a white crystalline substance chemically known as sodium tetraborate decahydrate and found in nature as the mineral tincal. Boric acid, also known as orthoboric acid or boracic acid, is a white, colourless crystalline solid containing 56% boron oxide (B_2O_3) and sold as granules or powder. Boron oxide is a colourless, hard, brittle, glassy solid that is ground and marketed most often under the name anhydrous boric acid. Four minerals account for 90% of world production and these are colemanite (hydrated calcium borate), kernite (hydrated sodium borate), tincal (borax), and ulexite (hydrated sodium calcium borate).

Boron combines easily with other elements and there are more than 200 minerals that contain boron but only a few are of commercial importance. Boron compounds and minerals are produced by surface and underground mining and from brine. The four minerals commonly mined are extracted primarily in California and Turkey and to a lesser extent in Argentina, Bolivia, Chile, China, and Peru.

Turkey hosts the world's largest colemanite and ulexite deposits. World production of boron minerals increased slightly in 2008 to an estimated 4.35 million metric tons (Mt) compared with 4.22 Mt in 2007 (not including the US). Boron products are priced and sold based on their boric oxide content, which varies by ore and compound, and on the absence or presence of sodium and calcium.

In 2011, world production of natural and refined borates still remains highly concentrated in the USA and Turkey, with Rio Tinto Minerals' Boron Mine in California and the Eti Mine accounting for around 75% of world supply. The high B_2O_3 content (>26%) of the colemanite, tincal and kernite mined in Turkey and California is the main factor contributing to the leading position of these two companies.

China's domestic production does not meet local demand and this is exacerbated by the low-grade and processed quality of locally mined borate ores. In 2009 China produced about 350,000t of borates but to meet its estimated consumption of 700,000t it imported at least 300,000t. China's difficulty (and demand) is the main driver of worldwide production capacity expansions. Since 2003, capacity expansions by Rio Tinto Minerals in the USA, Quiborax in Chile, Eti Mine, a state owned company, in Turkey and Manufacturas Los Andes in Argentina, have raised boric acid capacity by over 200,000tpy, largely to supply increasing Chinese demand.

Turkey has a total boron reserve of 851 million tons on the basis of B_2O_3 content and has about 72% of the world boron reserves. Its borate mineral deposits are found mainly in the Eskisehir, Kütahya and Balikesir provinces. The important

Operating Environment

boron minerals in Turkey are tincal, colemanite and ulexite. Approximately 40% of Turkish boron production is exported as lumpy ore or concentrate. The remaining production is refined to produce borax decahydrate, borax pentahydrate, boric acid, ground colemanite and sodium perborate.

Eti Mine plans to expand capacity for refined borates, boron oxide and calcined tincal. Other projects being considered are to increase boric acid production in Argentina and Bolivia and to exploit brine deposits in Tibet and Qinghai.

Of the future projects, Rio Tinto's Jadarite ($LiNaB_3SiO_7(OH)$) project in Serbia is likely to be the largest if it is completed. This unique mineral occurs in 3 stacked beds. The deepest of these, the 'Lower Jadarite Zone' was subject to an Order of Magnitude Study by Rio which has identified an Inferred Resource of 114.6million tonnes grading 1.8% Li_2O and 13.1% B_2O_3 . The project is at feasibility stage and if mined over 25 years it would produce 60,000 t/y lithium carbonate and 300,000 t/y boric acid. This inferred resource may double after further exploration work. There are however possible complications related to the ownership of this project by Rio and a third party, Victoria Canada based Erin Ventures.

Rio Tinto's Borax property in Boron is the world's leading producer of refined borate products, processing the borate ore into sodium borate or boric acid products in the refinery complex adjacent to the mine. An onsite plant also produces anhydrous sodium borate and boric oxide. Refinery products are shipped by rail or truck to North American customers or to Rio Tinto's facility at the Port of Los Angeles for international distribution.

Borate applications

Boron compounds play specialised roles as high-strength lightweight structural and refractory materials. In glasses and ceramics they provide resistance to thermal shock. Boron-containing reagents are used for the synthesis of organic compounds, and as intermediates in the synthesis of pharmaceuticals that do not contain boron. In biology, borates have low toxicity in mammals (similar to table salt), but much more so to many arthropods. Small amounts of boron compounds play a strengthening role in the cell walls of all plants, making boron a necessary element in soils.

Borates are mined and processed to produce boric acid [H₃BO₃], and other compounds which are used to manufacture a broad range of products. The distribution by industry type is approximately: glass and fibreglass manufacturing (43%); ceramics (12%); soaps, detergents, sodium perborate bleaches and personal care products (17%); fire retardants (4%); and agricultural micronutrients (5%); many other applications are found in metallurgical, nuclear, pharmaceutical and the chemical industries which account for most of remaining production (19%).

Percentage of global borate reserves held by producing countries



Borate markets

Global demand for borates grew strongly at up to 8% per annum, in the three years to 2008. This growth in demand is partially because glass manufacturing processes use less energy to melt and mix glass containing borates. The Chinese market, has seen consumption rise by 15% per annum from 2000 to 2008, and was largely responsible for the increased consumer demand. In other Asian markets growth in market share has partly been driven by the shift in production of textile-grade fibreglass, borosilicate glass and ceramics away from North America and Europe to countries with lower production costs for manufactured goods.

Following nearly a decade of strong growth, 2009 saw a sharp drop in borates demand but this recovered in the second half of the year. The markets for both textile-grade fibreglass and borosilicate glass strengthened and demand for borosilicate glass for LCD screens grew by about 15% in 2010. The main factors affecting future demand for textile-grade fibreglass are continued growth in markets for electronic products, increased penetration of fibreglass in markets traditionally held by steel and concrete and the emergence of new markets such as turbine blades for wind power generation. An up-turn in construction activity and the increase in government-led initiatives to reduce energy consumption will provide a recovering market for insulation-grade fibreglass over the medium term. The construction industry also uses borates to treat lumber used in building homes. The treatment prevents the infestation of the wood by termites and also acts as a fire retardant.

Bacanora's Sonora borate deposits are located close to rail infrastructure giving the company access to the port of Guyamas. With the local market for glass manufacturing in Mexico and access to the Chinese market via Guyamas, Bacanora's project is well situated.

The lithium industry

Lithium is the lightest metal of the periodic table and is widely distributed in trace amounts in most rocks, soils and natural waters. It is electrochemically reactive, has a low thermal expansion coefficient and has the highest specific heat of the solid elements. Some lithium compounds also possess flat viscosity/temperature ratios.

Because lithium and its compounds have these attributes, the metal is now used in many commercial applications. By 2010, world consumption of lithium had increased to more than 70,000 t/y.

Lithium is relatively abundant within the earth's crust ranking 33rd amongst all elements. It is the 16th most common element in the oceans. Its occurrence, at 17-20 parts per million, is greater than gold, platinum, tantalum, iodine, silver, boron, uranium, tin, cadmium and lead. Lithium occurs as a minor component of igneous rocks, with the largest concentrations in granites. Granitic pegmatites also provide the greatest abundance of lithium-containing minerals, with spodumene and petalite being the most commercially viable sources. A more recently recognised source for lithium is hectorite clay, the only active development of which is through the Western Lithium Corporation in the United States.

In 2009 it was estimated that worldwide lithium reserves total 28.4 Mt of lithium or 150 Mt of lithium carbonate equivalents. Reserves in active or proposed operations are estimated to be 14Mt or 74Mt of lithium carbonate.

Lithium production

Lithium is mined from two distinct sources: continental brines and hard rock ore. Since 1997, Chile has been the world's leading producer of lithium carbonate, the raw material from which lithium metal and other lithium compounds are made. Chilean production is from two lithium brine operations located on the Salar de Atacama in the Andes Mountains. Brines are concentrated by natural evaporation in large lagoons for up to two years before being transported for processing at two lithium carbonate plants in Antofagasta.

In the United States, which was until recently the world's leading producer, lithium carbonate is produced from a lithium brine operation with an associated lithium carbonate plant in Nevada. Lithium carbonate and lithium chloride are also produced from brines from the Salar del Hombre Muerto in the Andes Mountains in Argentina. In China, lithium carbonate is produced from brines pumped from the Zabayu Salt Lake in western Tibet, and the Dongtai and Xitai Salt Lakes in Qinghai Province.

Australia is the leading producer of lithium concentrates mined from spodumene deposits with Brazil, Canada, China, Portugal, and Zimbabwe also producing significant quantities of spodumene and petalite from hard rock mines. China is the only country producing large quantities of lithium carbonate from spodumene concentrates imported from Australia.

Much of the lithium carbonate produced in South America is exported to the United States for consumption in industrial applications and as feed material for the production of downstream lithium compounds, such as lithium hydroxide monohydrate, lithium metal and organic lithium compounds.

Worldwide, most lithium minerals mined are used directly as ore concentrates in ceramics and glass applications rather than as feedstock for lithium carbonate and other lithium compounds. To improve the quality of lithium suitable for high capacity batteries used in vehicles, the sole active lithium production company in United States began the expansion of its lithium operation in North Carolina to include production of battery-grade lithium hydroxide. Funding for this project was provided partially by the U.S. Department of Energy.

An emerging lithium ore producer has started lithium concentrate production in Western Australia. The lithium concentrate is to be converted to battery-grade lithium carbonate in China, to supply the Asian market. Further, Australia's leading lithium ore miner recently merged with an emerging lithium brine mining company to develop a lithium brine mining operation in Chile.

Applications

Lithium is sold as brines, compounds, metal, or mineral concentrates depending on the end use. Its electrochemical reactivity and other unique properties have resulted in many commercial lithium products. For many years, most lithium compounds and minerals were used in the production of ceramics, glass, and primary aluminium. It was also used as a pharmaceutical treatment for Bi-Polar disorder. Recently, growth in lithium battery use and decreased use of lithium in aluminum production has resulted in lithium's use in batteries becoming predominant.

Rechargeable lithium batteries continue to gain market share over rechargeable non-lithium batteries used in cordless tools, portable computers and cellular telephones, and video cameras. The major automobile companies are developing the use of lithium batteries for hybrid electric vehicles—vehicles with an internal combustion engine and a battery-powered electric motor. Now, in 2011, electric vehicles powered solely by batteries containing lithium are being produced. Non-rechargeable lithium batteries are used in calculators, cameras, computers, electronic games, watches, and other devices.

In 2008, a major Chilean lithium producer, Sociedad Química y Minera de Chile S.A. (SQM), listed the main global markets for lithium as follows—ceramics and glass, 31%; batteries, 23%; lubricating greases, 10%; air treatment, 5%; continuous casting, 4%; primary aluminum production, 3%; and other uses, 24%. The other uses refer to several lesser applications including production of alloys, the construction industry and the manufacture of dyestuffs, industrial bleaches, sanitation products, swimming pool chemicals, and specialty inorganic chemicals.



Source: Resources Policy, Sept. 2005

Asian technology companies continue to invest in the development of lithium extraction operations in other countries to ensure a stable supply of lithium for their battery industries. With lithium carbonate being one of the lowest cost components of a lithium-ion battery, the key issue for many manufacturers is not price or production efficiency but supply security. They are achieving this by sourcing lithium internationally from different suppliers.

Market

Market conditions improved for lithium-based products in 2010. Sales volumes for the major lithium producers were reported to be up more than 30% by mid-2010. Consumption by lithium end-use markets for batteries, ceramics and glass, grease, and other industrial applications all increased. The leading lithium producer in Chile, SQM, (60% of world production) lowered its lithium prices by 20% in 2010. Many new companies (including Bacanora) continued exploring for lithium on claims worldwide. Numerous claims in Nevada, as well as Argentina, Australia, Bolivia, and Canada, have been leased or staked.

In the United States the only active lithium carbonate plant is the brine operation in Nevada. Subsurface brines have become the dominant raw material for lithium carbonate production worldwide because of lower production costs compared with the mining and processing costs for hard-rock ores. The two brine operations in Chile dominate the world market.

Market changing? - Electric vehicle batteries

Increasing demand and high expectations for the use of lithium batteries in electric vehicles, is driving the mining sector's rush to explore for and to produce lithium ores. This has caused great interest in projections of future demand for lithium carbonate. Forecasts vary greatly because of large variations in assumptions regarding total vehicle sales numbers, the penetration rate of electric vehicles; and the percentage of those that will be lithium-ion powered.

The three main producers, SQM, Chemetall and FMC use the same figure of 0.6 kg lithium carbonate per 1kWh of battery capacity with the type, battery capacity and carbonate required shown here to forecast future demand.

However, there remain large differences in projections made for electric car demand. An SQM forecast until 2020 considers two scenarios assuming 9% and 20% electric vehicles in the fleet with 60% and 80% being powered with Li-ion. The annual lithium carbonate demand ranged from 20,000 to 30,000 tonnes in the conservative case and 55,000 to 65,000 tonnes in the optimistic case. SQM made a forecast to 2030 with 15% and 25% electric vehicles in the fleet and 75% and 90% being Li-ion powered resulting in a demand of 65,000 to 75,000 in the conservative case and 135,000 to 145,000 in the optimistic case.

Chemetall also estimates a range of scenarios with 2020 demand for vehicles from a low 5,000 to 60,500 tonnes of carbonate demand.

FMC estimated the penetration into the car market of HEV's at 20-30%, PHEV's at 2-5% and EV's at 1-3% in 2020 resulting in a carbonate demand of 70,000 tpa.

TRU Group, a lithium consultant recently published a study made on behalf of Mitsubishi Corporation. It estimated the production of battery equipped cars at approximately 5 million/year by 2020. It also predicted that technical issues such as vehicle range, will be resolved for HEV's by 2011, for PHEV's by 2014 and for EV's by 2016. This may be optimistic.

TRU Group also claims that the 'outlook (for lithium) is shocking'. It claims that the apparent supply growth will cause such huge overcapacity that the stability of the industry will be threatened. Projects being planned and expansions at existing operations could increase capacity by about 40,000t/y Li-contained over the next decade, which is twice many of the forecast increases in market demand over the same period.

TRU considers that existing lithium chemical producers have the in-ground resources and ability to meet nearly all market requirements by expanding capacity. In early 2010 demand and prices for lithium carbonate remained weak with prices dropping to about \$4,500 per ton. (battery grade lithium carbonate in January 2011 is now priced at circa \$5,750/t.) Over the longer term no market-driven upward-price pressure is predicted and so prices are predicted to remain stable.

Vehicle Type	Battery capacity kWh	Lithium carbonate Kg
Mild HEV	2	1.2
PHEV	12	7.2
EV	25	15.0

The TRU report claims that lower prices and fierce competition over the forecast period will hurt new project promoters who will find it impossible to compete against the distinctive natural cost advantage of the three main brine-based producers Chemetall-SCL, FMC and SQM. These dominant, existing suppliers have deposits with three times the lithium concentration of most others and also hold reserves well in excess of those held by any newcomers to the market.

Future production

Current capacity for chemical production approximates to 115,000 tpa lithium carbonate equivalents. Chemetall, a German company, is planning expansions in response to market demand which could more than double its capacity to 50,000 t/y lithium carbonate and 15,000 t/y lithium hydroxide by 2020 and FMC, and American Corporation have reserves to last for 70 years at present production rates.

Chile's SQM pumps sufficient brine to recover approximately 800,000 t/y of potash - potassium chloride and potassium sulphate - together some boric acid. From this feedstock SQM produces 40,000 t/y lithium carbonate. As the lithium in the brine greatly exceeds this tonnage the excess is pumped back into the salar. SQM's expansion potential is significant and it claims that the returned brine contains more than 200,000 t/y lithium carbonate.

China is known to have increased capacity to 85,000 tonnes in 2010 but two of their brine sources have high magnesium/lithium ratios which cause processing problems.

Apart from Bacanora's Mexican hectorite venture, there are several other active projects planned. Three pegmatite based operations are being evaluated, one each in Australia (Galaxy Resources), Canada (Canadian Lithium) and one in Finland (Keliber Resources) with combined in situ reserves of 124,000 tonnes Li. Also, in Argentina the Salar de Rincon project is targeted to produce 17,000 tpa carbonate and the Salar de Olaroz, further north, is being evaluated by Orocobre.

In Bolivia, the Salar de Uyuni, has attracted much attention since 2008. It is reported to contain nearly 50% of the world's reserves, estimated at 5.5 million tonnes Li, but this only represents one sixth of the world's resources. The brines are problematic with low lithium concentration and a high Mg/Li ratio which increases processing costs. Also, the whole salar floods seasonally which dilutes the grade and requires the construction and management of a very large area of solar evaporation ponds to concentrate the brine.

In the western United States, Western Lithium has identified hectorite deposits which contain a resource in excess of 2.0 million tonnes Li. Simbol Mining is also planning to recover lithium from the rich geothermal brines in the Salton Sea area of Southern California. In both cases production costs are not yet known.

Rio Tinto's jadarite deposit in Serbia appears to be extremely attractive. This unique mineral occurs in 3 stacked layers, one of these has reserves of 0.95 million tonnes Li. Mining this during a 20 year period would produce 60,000 t/y lithium carbonate with co-production of 300,000 t/a boric acid. Geological evidence indicates that this deposit may contain twice the currently announced reserves.

Lithium price considerations

Given the current global lithium resources, it is unlikely that prices will increase significantly in the near future. A high percentage of current Chinese lithium production is from spodumene and three years ago SQM estimated production costs at between \$1.80 to \$2.20/lb. A former North Carolina producer recently estimated a cost of \$2.50-\$3.00/lb for production at operations there.

In Santiago, Chemetall estimated prices related to battery costs. Assuming a battery cost of 500 Euros per kW/h and a carbonate cost of 6 Euro/kilo the carbonate cost is less than 1% of the total.

Prices of lithium carbonate rose steadily from 2000 until 2010 when there was a downturn from about US\$6,300 per t to US\$5,000 per t. As demand from the battery industry increases the price trend in 2011 will depend on the availability of carbonate material.

Global resources total approximately 30.0 million tonnes and recovery of 50% is possible. With an increase in exploration activity more resources will be discovered and partly explored pegmatites will be drilled at depth and along unexplored strike lengths. An example of this is the Tallison pegmatite in Western Australia where an increase in reserves from 223,000 tonnes Li to 1.5 million tonnes were announced following more exploration drilling.

Another forecast shows that each million tonnes of recovered elemental lithium (5.32 billion kilos of carbonate) will be sufficient for 532 million vehicles requiring a 10 kW/h battery. The inference here is that if half of global resources are recovered there is sufficient lithium to power 7.98 billion vehicles. This is not taking into consideration lithium that would be recovered by recycling batteries.

There are also a large number of additional Salares in the Andean altiplano and if recovery from hectorites becomes economically viable there are numerous other occurrences of this mineral which have not been drilled. It is noted that there is a cost to Andean production which requires large quantities of magnesium chemicals to be transported to the production sites.



Source: International Lithium Alliance

Lithium market risk

The two main threats to the future price of lithium are the short term (5 year) risk of overproduction and the longer term risk (10 year) of price erosion as producers try to retain their market share. Furthermore, brine producers are most likely to inhibit the success of miners, particularly of underground miners where costs are high.

Mining in Mexico

Mexico's mining sector contracted in 2009 due to declining commodity demand caused by the recession at home and abroad. Now, with easing of the global economic crisis, the Mexican mining sector is expected to grow steadily for the period to 2014. Mexico is recognised as a major mining economy, with abundant resources of coal, copper, gold, iron ore, lead, silver and zinc, and industrial minerals. The country also has a world-class steel industry. The Mexican mining sector is perceived as attractive for foreign investment, notably from Canada and the US and the sector benefits from political and financial stability, coupled with a sound regulatory framework. The country's Chamber of Mines, Camimex, is forecasting that mining investment in Mexico over the 2010-2012 period will total US\$13.1bn.

Mexico has a total territorial area of approximately 1,964,375 square kilometres. Between 15% and 20% of this area has been explored whilst about 60% of Mexico's has geological conditions which exhibit potential for ore deposits. Furthermore, only 4% of Mexico's surface has been fully explored for ore deposits. Recent amendments to the mining law and the North American Free Trade Agreement, which allows foreign investors to fully participate in the stock of Mexican companies, has boosted mining exploration opportunities for foreign investors.

Bacanora's borate projects

The Magdalena and Tubutama Basins in which Bacanora holds concessions have been subject to mineral exploration for over 100 years. Prior to Bacanora acquiring the rights to concessions in these basins the most recent drilling campaigns had been carried out by Minera Sonora Borax S.A. de C.V. (MSM) and Minerales Industriales Tubutama S.A. de C.V. (MIT), both companies registered and operating under the laws of Mexico.

Historical exploration work			
Year	Event		
1969	First notices about borates in Mexico by US Borax.		
1972	Howlite found in Magdalena.		
1976	Establishment of Materias Primas Magdalena (MPM) as JV between US Borax and Vitro		
1977	MPM started drilling in the Magdalena Basin and discovery of the Tinaja Del Oso (TDO) colemanite deposit		
1978	The Mexican government (CMR) declared the western portion of the Tubutama Basin a National Reserve in order evaluate its borate potential		
1979-1985	Drilling continued at different portions of the Magdalena Basin		
1980	Construction of the Magdalena Shaft at TDO for metallurgical samples		
1980	Installation of a pilot plant in Hermosillo by Vitro		
1980	CMR drilled more than 12,000m in 64 holes and obtained an estimated of 16MT of ore with 8% B ₂ O ₃ at Tubutama		
1982-1986	Evaluation of processes for the beneficiation of colemanite from TDO		
1987-1990	Intense drilling, reserve calculation studies, construction of a second shaft (Kino Shaft) in the TDO area		
1990	Completion of geologic, geotechnical studies in the TDO area		
1991	Creation of Minera Santa Margarita by Rio Tinto in order to explore for industrial minerals in Mexico		
1992	Dissolution of the US Borax-Vitro JV. Vitro paid US\$6M back to US Borax to maintain the TDO deposit		
1996-2006	Rio Tinto (MSM) drilled 28 holes in different targets of the Magdalena Basin for borates. Rio also drilled 51 holes in other basins of Sonora, all for borates		
2002	Rio Tinto staked the San Francisco claims in the Magdalena Basin in order to evaluate the remaining borate potential		
2003	First drilling campaign in Magdalena by MSM at Cajon and Bellota targets. Mapping and sampling		
2004	More drilling at Pozo Nuevo and Tigre targets. First gravity survey. Ground magnetic survey in the central portion of the basin		
2005	MIT incorporated in Mexico in June, 2005 and the Carlos claims (Tubutama) were acquired		
2005	Drilling at Pozo Nuevo and Escuadra targets in Magdalena. Complete gravity survey (610 stations)		
2006	Reduction of MSM land from 23k Ha to 12.6 Ha at Magdalena. Acquisition of El Represso concession		
2007	Drilling of 8 core holes in the Carlos claims complemented with mapping and trenching at Tubutama		
2008	Contract between MSM and MSB		
Source: Bacanora M	inerals		

Bacanora's Projects

In 1977, MSM carried out core drilling in the Magdalena Basin which resulted in the identification of four target areas. Work at Bellota, Cajon, Pozo Nuevo and Escuadra identified borate mineralisation intersections grading up to 15.3% B_2O_3 over 5.5m thickness at a depth of 115m.

Similarly, MIT prospected with trenching and drilling in the Tubutama Basin and identified wide zones over 14 metres thick with lower grade mineralisation, averaging 7% B_2O_3 . The mineralised zones were also examined by taking samples of surface rain water for analysis. Bacanora does not plan any work on its Tubutuma property for the time being.

In September 2010 Bacanora geologists discovered a new borate occurrence in the Represo basin which is distinct and separate from the Magdalena and Tubutuma Basins. It is located close to the company's Magdalena concessions.

Regional geology

The Magdalena and Tubutama Basins are identified as part of the upper plates of metamorphic core complexes and contain synkinematically deposited terrigenous sediments, volcanic rocks, lacustrine sediments and evaporates. Borate deposits in North America, such as those in Death Valley, occur in conditions similar to these Tertiary Lacustrine basins of the Basin and Range Province. One deposit of colemanite, known as the Tinaja Del Oso (TDO) is located adjacent to the Magdalena concessions.

The tectonic history of northwestern Mexico also played an important part in the formation of the Magdalena and Tubutama Basins. The late Cretaceous – early Tertiary Laramide Orogeny developed a shallow subduction zone under the continental North American plate. The steepening of the slab changed the tectonic regime from compressional to extensional. Two different structural events have been identified as associated with the extensional event: 1) dynamic, horizontal displacement in the Eocene-Oligocene; and 2) high-angle normal faulting known as Basin and Range (Vidal, 2007).

Geology - Magdalena - Tubutuma

The Magdalena Basin has evolved as a Tertiary, Metamorphic Core Complexrelated basin that lies in northern Sonora, in the southern extent of the Basin and Range Province corresponding to the southernmost portion of the Great Basin. The Great Basin is the host to all known bedded rock-hosted borate occurrences and deposits in North America (Vidal, 2007).

The basin is a topographic depression floored and surrounded by metamorphic and volcanic rocks. Two types of basement rocks have been observed: 1) metamorphic, composed of mylonites, gneisses and leucogranites from La Madera and Magdalena ranges; and 2) volcanic, composed of latite flow from La Ventana

Range (Vidal, 1990 & 2003 & 2007). The metamorphic rocks associated with the Magdalena Basin have been identified as the lower plate of the Magdalena-Madera Metamorphic Core complex (Vidal, 1990 & 2003 & 2007). The lower and upper plates are separated by the low-angle Magdalena detachment fault (Miranda-Gasca et al., 1998). The lower plate also consists of tertiary granites.

The upper plate rocks consist of fossiliferous Cretaceous rocks of the Bisbee Group. These are overlain by the La Ventana Volcanic rocks. La Ventana is overlain by the Magdalena Formation. The lower portion is several hundred metres thick and consists of sedimentary breccias and conglomerates. Its middle portion consists of lacustrine sediments including: conglomerates, sandstones, green and black shales, and lacustrine limestones. The sediments are interbedded with basaltic flows deposited underwater. The Magdalena Formation is unconformably overlain by the 300m thick Torreon volcanic unit, a sequence of rhyolites interbedded with alkaline basalts. A swarm of rhyolitic dykes is associated with this unit, intruding parts of the Sierra La Madera.

It is the Magdalena Formation that hosts the borate deposits.

A further high grade occurrence lies within the Unimin claims in the Magdalena concessions where lacustrine sediments host precipitation from brines forming the borate deposits. (The Unimin claims are close to urban areas which could become an issue when mining). The primary mineralisation consists of the calcium borate minerals of colemanite and howlite. The model for the Magdalena-Tubutama borates is the lacustrine Bigadic deposit, in Turkey. Bigadic is the world's largest known borate deposit with mainly colemanite mineralisation.

The Magdalena and Tubutama concessions are also seen as viable exploration targets for gold, silver and gypsum. The Yeso gypsum mine is adjacent to the Magdalena Concession and is currently producing. Close to the Tubutama Basin the El Chanate gold deposit and Penasco Quemado silver deposit are currently being developed as mines.

Geology - Represo

The Represo Basin is a northwest trending, eastward dipping, half graben that is delimited by a main high angle normal fault. The basin rock units dip to the east but were dragged along the downthrown block to create a syncline and suggest a syn-extensional origin of the sediments with respect to the basin development.

The basin contains a fluvial-lacustrine sequence composed of siltstone and fine grained sandstone interbedded with light green calcareous mudstone.

The outcropping sequence contains hot spring type limestone, gypsum and interbedded volcanic rocks. At least two tuff layers are interbedded within the sequence and a dark grey, vesicular basalt is interbedded high in the sequence in the east-central portion of the basin. The pre-basin rocks are composed of an andesitic flow (27 ma) and Cretaceous sedimentary rocks. The mineralisation is deep because it is located in the central portion of a syncline structure.

Further drilling will be needed to delineate the Represo Basin. It is planned to target the mineralised sequence at shallower depths found in western areas of the basin.

Location and description of the properties

Magdalena and Tubutama

The Magdalena and Tubutama properties consist of thirteen individual concessions, totalling 16,503 and 1,661 hectares respectively. The properties are approximately 60 km apart as the two basins are separated by a narrow, low range of mountains. The Magdalena Basin is situated in the Sonoran desert between the Sierra La Ventana to the west and southwest and the Sierrra La Madera to the south and east. Both mountain ranges vary in elevation from 1,360m to 2,045m. The elevation of the Basins varies between 730m and 1,000m above mean sea level.

Represo

In late 2010 Bacanora discovered a new borate occurrence in the Represo Basin located between Santa Ana and Magdalena de Kino in Sonora State. This is located about 15km from the Magdalena property. This Represo Basin is located in an area in which there was no previous exploration or drilling activity.



Source: Bacanora Minerals

The Represo property is also located in the Sonoran Desert (also known as the Gila Desert after a local river) approximately 180 km north of the city of Hermosillo and some 80km south of Mexico's border with Arizona, USA. The concession area is characterised by an arid to semi-arid climate and gentle hills of up to 100m elevation. It is possible to conduct exploration work throughout the year. The average ambient temperature is 21° C, with minimum and maximum temperatures of -5° C in winter and +50° C in summer.

Average annual rainfall for the area is 330 millimetres with a maximum of 880 mm. A desert "monsoon" season occurs between the months of July and September and on rare occasions heavy rainfall can disrupt exploration. The desert hosts plants from the agave, palm, cactus, legume, and many other families. The Saguaro Cactus, a protected species, is present in the concession area.

Regional infrastructure – Sonora State

Sonora State has well developed infrastructure despite being a sparsely populated desert region. An extensive network of roads, including the four-lane Highway 15, crosses the state from south to north, joining Sonora with the rest of Mexico and with the United States. The region is well known for cattle ranches and fenced zones are located throughout the area. There is a network of secondary dirt roads built by ranchers to access remote areas and with permission these roads may be used to access the properties.

Other major infrastructure in the region is also available close to the projects. The main Pacifico Ferro Carril (Railway) serves the town of Magdalena de Kino and connects the main Port of Guaymas on the east coast of the Gulf of California to the State capital city of Hermosillo. Two high voltage power lines traverse the northern part of the Basin and a natural gas pipeline, constructed in 1986, runs parallel to these. Water is supplied to ranchers for farm irrigation from the Sasabe and Magdalena Rivers which cross the region. There is a small dam which impounds water in the Magdalena Basin creating a small lake. No other source of surface water is available.

For exploration and mining all water must be sourced from wells bored into underground aquifers beneath the water table. The sufficiency of water for advanced exploration or mining and mineral processing has not yet been assessed. Other mining activity in the area for silver and gypsum has resulted in an influx of workers to the region, leading to the development of a skilled labour pool. At Magdalena, to support the activity at El Cajon, a warehouse and office have been built to facilitate management of the work.

Historical exploration

Until 2007, 311 NQ drill holes totalling 54,550m in length had been drilled in the Magdalena Basin by various operators.

The first drilling was contracted by Materias Primas Magdalena (MPM), a joint venture company between US Borax and Vitro. MPM drilled between 1972 and 1992 to test for mineral potential in a number of areas and in 1977 identified the Tinaja del Oso deposit now referred to as TDO or Unimin. MPM drilled 280 NQ holes totalling 44,538m of which 175 holes were on the TDO.

MSM followed-up the interpretations of MPM and began an intensive basin-wide exploration programme consisting of 28 holes over five drill campaigns. The MSM drill programmes identified six priority follow-up targets: the Bellota Yeso; Cajon; El Tigre; Pozo Nuevo; Escuadra; and Syncline. By 2007, mapping, surface sampling and first pass drilling had been conducted on 5 of the targets but the Syncline Target remained untested.

Recent exploration

Based on positive results from borate exploration programmes carried out by MIT and MSM, Bacanora initiated more detailed studies in Tubutuma and Magdalena. The recent 2009-2010 exploration activities on the Magdalena concessions had two objectives:

- to re-interpret the basin geology to clarify and define the basin stratigraphy;
- to diamond drill the high priority targets to check previous data and confirm future priorities.

Following the acquisitions grab samples were also collected to confirm borate outcrops at surface and diamond drill core was re-sampled and re-assayed to verify the reported grades.

At the time it was recommended that to delineate an economic borate deposit, additional work would be needed on the concessions. This work was carried out during 2010 and from this and the earlier exploration it became evident that the Magdalena concessions should be considered as high priority targets with the Tubutama Concessions treated as a secondary interest for the time being.

At the recently discovered Represo basin, four holes were drilled and two of them (ER-2 and ER-3) intersected colemanite. The drilling indicated that total thickness of the Represo Basin is greater than 300 metres. The most significant interval discovered was in drillhole ER-3, which had a total thickness of 133 metres, with three main mineralised zones as follows:

- 20.1 metres (from 143.2 to 163.3 metres) with re-crystallised and disseminated colemanite, minor howlite, moderate gypsum and calcite in gray-green mudstone;
- 28.5 metres (from 199.8 to 228.3 metres) with disseminated colemanite in masses and blebs, disseminated colemanite and anhydrite "cementing" the core, minor gypsum and calcite in gray mudstone;

 10 metres (from 251.9 to 261.9 metres) with abundant re-crystallised colemanite partly altered to calcite, colemanite rosettes partly replaced by calcite and minor howlite, moderate gypsum in a gray mudstone with minor siltstone and sandstone.

Further intersections of borate were made in drillhole ER-2 at a depth of 65.8 metres with a thickness of 86.3 metres and two main mineralised zones:

- 4.27 metres (from 76.8 to 81.07 metres) with disseminated colemanite in layers along bedding containing small howlite nodules and moderate gypsum in a gray mudstone/siltstone with minor sandstone;
- 3.5 metres (112.5 to 116 metres) with disseminated colemanite in masses and blebs and "rosettes", partly replaced with calcite/mudstone and gypsum in a gray-brown intercalation of mudstone, siltstone and sandstone. At a depth of 152.1 metres, drilling difficulties were encountered and further drilling on this hole was abandoned.

Drillhole ER-1, which is considered to be on the edge of the Basin, did not discover significant borate mineralisation, although 27 samples from ER-1 were sent to the SGS lab in Lakefield for analysis. Also, 60 samples from ER-2 and 174 samples from ER-3 were forwarded to SGS Lakefield (a total of 316 samples).

In addition to the foregoing, ER-4 was also drilled to a depth of 154.2 m at the southernmost portion of the area in order to track the borate section in that direction. No borate mineralisation was found in hole ER-4.

Risked mineable resource assumptions based on El Cajon drilling results					
Reserves		Probability	Tonnes (m)		
Proven		90%	0.0		
Probable		50%	0.0		
Total		0%	0.0		
Resources	Conversion	Probability	Tonnes (m)		
Measured	90%	90%	0.0		
Indicated	70%	50%	11.1		
Inferred	70%	10%	7.3		
Hypothesised	70%	0%	0.0		
Total	70%	34%	18.4		
Mineable resource			Tonnes (m)		
Mineable resource			12.9		
Risked mineable resource			Tonnes (m)		
Current classification			4.4		
Scenarios for exploration success					
- base case			8.4		
- optimistic case			10.8		
- pessimistic case			5.2		

Notes:

- mineable resource have been estimated as reserves plus the portion of resources that would be expected to convert to reserves considering deposit type and likely grade variability

- risked mineable resource refers to the various classes of resource/reserve weighted by their assumed confidence level

Source: Objective Capital

Proforma Bacanora operation profit and loss

	Year ending June											
Proforma P&L (US\$m)	'11	'12	'13	'14	'15	'16	'17	'18	'19	'20	'21	'22
Gross revenues	0.0	0.0	0.0	0.0	10.2	16.9	17.4	17.8	18.2	18.7	19.1	39.1
Operating costs	0.0	0.0	0.0	0.0	4.9	8.5	8.9	9.4	9.9	10.4	10.8	22.7
Operating profit	0.0	0.0	0.0	0.0	5.2	8.5	8.4	8.4	8.3	8.3	8.2	16.4
Depreciation	0.0	0.0	0.0	0.0	0.6	1.0	1.0	1.0	1.0	1.0	1.0	2.1
Administrative costs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EBIT	0.0	0.0	0.0	0.0	4.6	7.4	7.4	7.3	7.3	7.3	7.2	14.3
Assumptions												
Capital costs (US\$m)	0.0	0.0	0.0	7.0	0.3	0.4	0.5	0.5	0.5	0.6	3.6	1.2
Tonnes ore processed (millions)					0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.7
Cash Operating Cost (US\$/t)					19.8	21.1	22.4	23.8	25.1	26.4	27.8	29.2

Other assumptions

Source: Objective Capital

Future exploration

Following the work in 2010 to determine priorities Bacanora is now planning further phases of exploration work targeted at Magdalena – Cajon during 2011. The phased work includes:

Phase 1

- a programme of drilling, to better define known mineralised lenses;
- 3-D modelling to support interpretation of the drilling programme and also to facilitate conceptualisation of the borate lenses for anticipated infill definition drilling.

The budget for this phase is set at US\$ 750,000.

Phase 2

- a programme of follow up infill definition drilling;
- preparation of metallurgical and feasibility studies at bench and pilot scale;
- geological assessment of the potential for gold, silver and gypsum on the concessions.

The budget for this phase is set at US\$ 1m.

Resource estimation – El Cajon

In November 2010, Bacanora commissioned Servicios Geologicos IMEX SC (IMEx) to prepare an independent resource estimation for the El Cajon target located to the South East of the company's Magdalena concession. The results of this study based on data received from Bacanora were as follows:

The minerals of interest were calcium borates such as colemanite and howlite. IMEx was asked to calculate its preliminary estimate of the tonnage, thickness and grade of borate mineralisation within the target, using the method of geometric polygons and the extension of the mineralisation was delimited with grids generated from geological information provided by Bacanora.



The Cajon target consists of three mineralised beds, hosted in mid-Tertiary clastic sediments. Of these three units, the lower unit, termed Unit 'C', is overlain by a basalt flow named El Cajon Basalt which was adopted as a marker bed. Where Unit 'C' outcrops it has been replaced by amorphous carbonate.

The other two zones, locally termed Units 'A' (top) and 'B' (middle) overlie the Cajon basalt. In November, Bacanora's field geological team defined and described the Units 'B' and 'C' by surface mapping and core logging. Historical drilling data was used to describe Unit 'A' and the interpretation and continuity was based on generalised lithological descriptions and pre-dated assay results held by Bacanora.

Two resource estimations were performed using 5% and 8% B_2O_3 cut-offs (the latest has a minimum thickness of 3 metres).



Source: Bacanora Minerals

El Cajon resource estimation							
	Resource Classification	Cut off 5	$5\% B_2O_3$	Cut off 8% B_2O_3 (>3 m)			
Unit	(CRIRSCO)	Tonnage	Grade	Tonnage	Grade		
		Mt	$\% B_2O_3$	Mt	$\mathbf{B}_{2}\mathbf{O}_{3}$		
А	Inferred	21.8	5.88	7.3	9.3		
В	Indicated	16.5	6.4	5.3	9.3		
С	Indicated	27.1	6.5	5.8	10.4		

Source: Bacanora Minerals

According to the Committee for Mineral Reserves International Reporting Standards (CRIRSCO) the estimated resources for Unit 'A', may be classified as Inferred Resources. This classification is based on the concept that the available lithological and assay results data were taken from historical information which cannot be currently replicated or properly validated. Therefore there is not enough confidence for the standards. The estimated resources for Units 'B' and 'C' can be classified as Indicated, based on the spacing of the available data and the level of confidence on the geological continuity of the mineralisation, the confidence on the sampling techniques and assaying procedures. Bacanora is conducting further QA/QC analysis of the assays results and mineral density estimations to increase the confidence and to support the categorisation above.

The resource at El Cajon is now reported at 10mt grading at 10.1% B₂O₃.

Mining and processing

Bacanora has not yet completed a feasibility study for mining its deposit at El Cajon. However, it is likely to use a conventional mining extraction system. Initially this may require mining from an open pit but later, as the deposit continues at depth, underground mining may be required.

After access to the deposit is developed drill, blast, load and haul methods will be used to extract the waste rock and borate minerals. After mining the minerals will be transported to a process plant (mill) and first crushed to -25mm mesh sized pieces before extraction of the borates may start. The raw ore is then treated to produce the refined products by desliming, flotation, drying and decrepitation to produce a high grade product.

La Ventana lithium project

Previously known as the Sonora Occidental (SMO) lithium project it comprises four granted exploration licenses covering approximately 4,050 ha. The project area is situated 120 km northeast of Hermosillo in Sonora State, Mexico.

The original target area at La Ventana is composed of a (3,000m x 100m) northwesterly trending outcrop of volcaniclastic sedimentary rocks hosting hectorite and other clays. A rhyolitic tuff floors the sequence and a capping basaltic flow overlies the outcrop. Surface sampling and mapping has been conducted in this claim obtaining values ranging between 0.17 to 0.55% Li with an average of 0.264% Li. Boron (>200 and up to 559 ppm) and cesium (>500 ppm) among other elements are also highly anomalous.



Source: Bacanora Minerals

A second claim, the Buenavista, is located close to Huasabas town about 15 km north from the La Ventana claim. In here, a fine-grained fluvial-lacustrine sequence is exposed in the central and southeastern portions of the Huasabas basin. The sequence is composed of tan, fine-grained sandstone-siltstone-mudstone intercalated in thin to medium beds. The top contains abundant light green, tuffaceous mudstone beds. The surface sampling provided some low Li anomalies ranging between 203-611 ppm Li in the northern part of the area. Medium anomalies with values ranging between 612-1019 ppm Li were obtained from the north and central portions and high anomalies with values over 1019 ppm of Li were obtained at the southernmost portion.

Two other areas (San Gabriel and El Sauz) were added to this project due to the similarities in the geology and stratigraphy. Areas adjacent to these properties may have exploration potential and will be seriously considered in order to increase the resource.

La Ventana claim areas									
				Claim					
Project	Claim	Title No.	Valid from-to	Size (ha)	Location				
SMO Lithium	Ventana	235611	01/22/10 - 01/21/60	875	Bacadehuachi				
	Buenavista	235613	01/22/10 - 01/21/60	650	Huasabas				
	San Gabriel	235816	03/12/10 - 03/11/60	1500	Divisaderos				
	El Sauz	235614	01/22/10 - 01/21/60	1025	Bacadehuachi				
Source: Bacanora Minerals									

La Ventana lithium targets – key issues

- access to the project areas is easy but the local access roads need improvement;
- negotiation with land holders is ongoing and permits to access the project areas have been granted;
- infrastructure around Huasabas and Bacadehuachi is moderate; abundant water and paved roads from Hermosillo and Telecommunications are accessible;
- the electricity and gas supply will need to be connected to the site if
 a lithium processing facility is to be built adjacent to the mine;
- a field office with warehouse and a secure, dry core store needs to be set up.

Geology

The region is characterised by thick piles of volcanic rocks with interbedded volcano-sedimentary sequences associated with the early calc-alkaline, andesitic and later rhyolitic volcanism from the Sonora Occidental (SMO). These volcaniclastic sequences were deposited as volcanic ashes and pyroclastic flows and weathered (or hydrothermally altered) within the containing basin to produce the lithium-bearing clays that are now present in the form of hectorite and other clays.

In the Buenavista area, these volcano-sedimentary sequences were eroded and re-deposited in the Huasabas basin, as the fluvial-lacustrine sequence appears to be younger.

XRD analyses

Two samples from the La Ventana target were submitted to the University of Sonora's laboratory for XRD analyses to check for the presence of hectorite. It is estimated that the samples contain 17% of hectorite by weight with big peaks of quartz and carbonate.

Exploration – La Ventana

Bacanora has set aside a budget of US\$340,000 for exploration at La Ventana in 2011. Eventually the mapping of the other targets and other areas with similar geology in the region will be needed.





BASEMENT:

Thin bedded marine seds

Source: Bacanora Minerals



Source: Bacanora Minerals



Resource calculations

The estimate per block of 1000m x 300m x 20m (thickness) and a density of 1.8, is equivalent to 10.8Mt @ 1.5% of Li_2CO_3 (average from sampling), yielding a total of 162,000t of Li_2CO_3 . The current market price of a pound of lithium carbonate is between US\$4,500 and US\$5,000 per ton. Using these numbers, 162,000 tons of Li_2CO_3 represent a gross income of between US\$729M and US\$ 810M per block.

Profit and Loss							
Year ending June (C\$m)	2010A	2011E	2012E	2103E	2014E	2015E	2016E
Revenues	0.0	_	_	_	_	10.0	16.7
COGS	_	_	_	_	_	(4.9)	(8.4)
Gross profits	0.0	_	_	_	_	5.2	8.4
Administrative Costs	(0.1)	1.0	1.0	1.1	1.1	1.1	1.1
EBITDTA	(0.1)	1.0	1.0	1.1	1.1	6.3	9.5
Depreciation & amortisation	(0.1)	_	_	_	_	(0.6)	(1.0)
EBIT	(0.1)	1.0	1.0	1.1	1.1	5.6	8.5
Interest	0.1	0.2	0.4	0.2	1.1	3.6	2.4
EBT	(0.0)	1.2	1.4	1.2	2.2	9.2	10.8
Tax paid	_	(0.4)	(0.5)	(0.4)	(0.8)	(3.1)	(3.7)
Earnings	(0.0)	0.8	0.9	0.8	1.5	6.1	7.1
Dividends	_	_	_	_	_	_	_
Retained earnings	(0.0)	0.8	0.9	0.8	1.5	6.1	7.1
Cashflow							
Casnilow	00101	00445	0.040 F	0400 F	00445	004 - 5	00465
Year ending June (C\$m)	2010A	2011E	2012E	2103E	2014E	2015E	2016E
EBII	(0.1)	1.0	1.0	1.1	1.1	5.6	8.5
	0.0	_	_	_	_	0.6	1.0
Stock-based Compensation	0.0	_	_	_	_		_
Gains, Writedowns, Recoverables	0.0	_	_	_	_	(1 -	(1.0)
(Increase) decrease in receivables	0.1	0.0	_	_	_	(1.5)	(1.0)
(Increase) decrease in inventory	(0.1)	-	-	-	-	(0.6)	(0.4)
Increase (decrease) in payables	(0.0)	-	-	—	—	0.7	0.5
Net cash from Ops	(0.1)	1.0	1.0	1.1	1.1	(2.1)	(2, 7)
lax paid	—	(0.4)	(0.5)	(0.4)	(0.8)	(3.1)	(3.7)
Dividends		_	_			-	_
Net interest recieved (paid)	0.1	0.2	0.4	0.2	1.1	3.6	2.4
New equity	2.0	1.5	3.0	2.0	2.0	2.0	
New (deposits) borrowings	(0.5)	_	_	3.0	(2.5)	(0.1)	(0, 2)
Capital expenditure	(0.5)	—	_	-	(3.5)	(0.1)	(0.2)
Net cash from financing	1.6	1.3	2.9	4.8	(1.1)	2.3	(1.5)
Net increase (decrease) in cash	1.5	2.3	3.9	5.8	0.0	7.2	7.1
Balance sheet							
Year ending June (C\$m)	2010A	2011E	2012E	2103E	2014E	2015E	2016E
Fixed assets at NAV	1.4	1.4	1.4	1.4	4.9	4.4	3.6
Cash	1.5	3.8	7.7	13.5	13.5	20.8	27.8
Receivables, Recoverables	0.1	0.1	0.1	0.1	0.1	1.6	2.6
Inventory	0.0	0.0	0.0	0.0	0.0	0.6	1.0
Less Payables	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(1.0)	(1.5)
Net current assets	1.4	3.7	7.6	13.4	13.4	22.0	30.0
Less loans	_	_	_	(3.0)	(3.0)	(3.0)	(3.0)
Less Future Tax Liability	—	_	_	_	_	_	_
Capital employed	2.8	5.1	9.0	11.8	15.3	23.4	30.5
Represented by							
Shares in issue	3.2	4.7	7.7	9.7	11.7	13.7	13.7
Add retained profit							
Prior periods	(0.3)	(0.3)	0.5	1.4	2.2	3.7	9.7
This period	(0.0)	0.8	0.9	0.8	1.5	6.1	7.1
Shareholders' funds	2.8	5.1	9.1	11.9	15.3	23.4	30.6
Source: Objective Capital							

Financials

Appendix: Management

Paul Conroy

President and Chief Executive Officer

Mr Conroy is the founder of Bacanora Minerals. He also serves as President, Chief Financial Officer, Corporate Secretary and a Director of Westcore Energy Ltd, a TSX capital pool company. He was the founder and CEO of an oil and gas exploration company, Nemco Exploration Ltd (listed on the Toronto Stock Exchange in March 1977, now defunct). Over the past 30 years he has been involved in numerous resource companies holding the positions of principal, officer and director. Mr Conroy matriculated from Presentation College in Dublin, Ireland in 1959.

Colin Orr-Ewing

Director

Mr Orr-Ewing began his career as an investment manager for the Shell Pension Fund in London after qualifying as a Certified Accountant. He has over 35 years experience spanning both the oil and mining industries and has been a director of UK and Canadian oil companies and Irish and Canadian mining companies. Mr Orr-Ewing also currently acts as an adviser to a fund management company on its natural resources portfolios. He was actively involved in the oil industry from 1971 through to 1987 working with numerous companies in the North Sea, Libya, Nigeria and Algeria.

Derek Batorowski

Chief Financial Officer, Corporate Secretary, Director

Mr Batorowski is currently employed as the Chief Financial Officer of Regal Energy Ltd (TSXV). He is also presently serving on the board of directors of Westcore Energy Ltd (TSXV), a capital pool company. Since 1993, he has been an independent consultant to the oil and gas industry, having held various financial positions with junior private and public companies. Mr Batorowski received his Business Administration Diploma from Mount Royal College in Calgary, Alberta in 1989. He has been a member of the Certified General Accountants Association of Alberta since 21 June 2000.

Raymond Hodgkinson

Director

Mr Hodgkinson currently acts as an engineering consultant to Ripper Oil & Gas Inc and Canrock Energy Ltd and serves on the board of directors of Westcore Energy Ltd and Troy Energy Corp. (TSXV). He has also served as the Chief Operating Officer and Vice-President, Engineering of Aztek Energy Ltd (TSXV) prior to its sale to Spartan Exploration Ltd. Mr Hodgkinson received his Bachelor of Science in Engineering from the University of Calgary in June 1977. He has been a member of the Alberta Association of Professional Engineers, Geologists and Geophysicists of Alberta.

George Jones

Director

Mr Jones has practiced law since 1959, formerly as a prosecutor for what was then Revenue Canada, and since 1964 in private practice. His preferred area of practice is taxation litigation. He is the senior partner of the law firm, Jones Emery Hargreaves Swan, Barristers & Solicitors, operating out of Victoria, British Columbia. Mr Jones has been extensively involved in community sports and charitable institutions and has served as a director of several public companies and registered societies, both charitable and not-for-profit. He recently served as a director of Paramax Resources Corp. (TSXV).

Martin Vidal Torres

Vice-President Exploration, Mexico

Mr Vidal started his career as geologist with the US Borax exploration team and has years of experience working in Northern Mexico particularly in the borate basins that Bacanora are now developing. His experience includes almost 20 years of working with Rio Tinto in the exploration of industrial minerals in several countries in the Americas, occupying different technical and managerial positions. He has a BSc in Geology from the University of Sonora (1987) and studies in Non-Ferrous extractive Metallurgy. He is a licensed geologist in Mexico.



Appendix: Boron and its compounds

Boron is a Group 13 element and a metalloid; it is most closely related to aluminium but as a pure metal it has few commercial applications. It is not a common element and does not occur naturally in its elemental state but in concentrations derived from the water solubility of its more common natural compounds, the borate minerals. These evaporite minerals include borax, colemanite, kernite, and ulexite. Pure boron has few specialist commercial applications but its compounds, especially the borates are important. Generally the deposits of boron are measured in terms of contained borate (B_2O_3), which contains 31% elemental boron.

Properties of Boron	
Name, symbol, number	boron, B, 5
Element category	metalloid
Group, period, block	13, 2, p
Standard atomic weight	10.811g∙mol−1
Phase	solid
Liquid density at melt point	2.08 g•cm−3
Melting point	2349 K, 2076 °C, 3769 °F
Boiling point	4200 K, 3927 °C, 7101 °F

Commercially important Borate minerals

Mineral	Chemical Composition	B ₂ O ₃ , Weight Percentage
Boracite (Strassfurite)	Mg ₃ B ₇ O ₁₃ Cl	62.2
Colemanite	$Ca_{2}B_{6}O_{11}\bullet 5H_{2}O$	50.8
Datolite	CaBSiO ₄ OH	24.9
Hydroboracite	$CaMgB_6O_{11}\bullet 6H_2O$	50.5
Kernite (rasortie)	$Na_2B_4O_7 \bullet 4H_2O$	51.0
Priceite (pandermite)	$CaB_{10}O_{19}\bullet7H_{2}O$	49.8
Probertite (kramerite)	NaCaB ₃ O ₉ •5H ₂ O	49.6
Sassolite (natural boric acid)	H ₃ BO ₃	56.3
Szaibelyite (ascharite)	MgBO ₂ OH	41.4
Tincal (natural borax)	$Na_2B_4O7 \bullet 10H_2O$	36.5
Tincalconite (mohavite)	$Na_2B_4O7 \bullet 5H_2O$	47.8
Ulexite (bonatrocalcite)	NaCaB5O9•8H ₂ O	43.0

The name 'borax' is often given to a number of closely related minerals or chemical compounds that differ in their crystal water content, These are:

- Anhydrous borax (Na₂B₄O₇)
- Borax pentahydrate $(Na_2B_4O_7 \bullet 5H_2O)$
- Borax decahydrate ($Na_2B_4O_7 \bullet 10H_2O$)

Borax is generally described as $Na_2B_4O_7 \bullet 10H_2O$. However, it is more accurately expressed as $Na_2[B_4O_5(OH)_4] \bullet 8H_2O$, as borax contains the $[B_4O_5(OH)_4]^{2-}$ ion. In this structure, there are two four-coordinate boron atoms (two BO_4 tetrahedra) and two three-coordinate boron atoms (two BO_3 triangles). Borax is easily converted to boric acid and other borate compounds for use in many applications. Its reaction with hydrochloric acid to form boric acid is:

Na2B4O7•10H2O + 2HCl \rightarrow 4B(OH)3 [or H3BO3] + 2NaCl + 5H₂O

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Gabriel Didham, CFA Objective Capital

Will Purcell

Will has been involved in the resource sector for 30 years in a variety of roles. Since the late 1990s, he has been active in assessed mineral resource investment projects. Will has a B. Math degree from the University of Waterloo in Ontario.

Richard Thompson

Richard Thompson is a graduate mining engineer (Camborne) and has worked for over 40 years in the mining industry. His expertise covers mining techniques, the application of mining equipment, mine project evaluation, mining investment promotion and project management.

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