



# Lithium Report 2016



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Security transactions – what to watch out for as an investor:

[https://www.bafin.de/SharedDocs/Downloads/DE/Broschuere/dl\\_b\\_wertpapiergeschaefft.pdf?\\_\\_blob=publicationFile](https://www.bafin.de/SharedDocs/Downloads/DE/Broschuere/dl_b_wertpapiergeschaefft.pdf?__blob=publicationFile)

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# Tables of Contents

# Imprint

Disclaimer	02
Table of Contents   Imprint	07
Preface	09
Lithium – the substance of the 21 <sup>st</sup> century is just gaining momentum!	10
Interview with Tobias Tretter – Manager of Structured Solutions Lithium Index Strategic Fund	20
<b>Company profiles</b>	
Advantage Lithium	22
Avalon Advanced Materials	26
Birimian Limited	30
Fairmont Resources	34
Jourdan Resources	39
Lithium X	42
MacArthur Minerals	46
Millennial Lithium	50
Nemaska Lithium	54
Pure Energy	58
Zadar Ventures	62

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# Preface

Dear Readers,

In the following pages we present to you with pleasure our first special report on the topic "Lithium". This report is the start of a series of such informative reports. Swiss Resource Capital AG has made it its business to topically and comprehensively inform precious metals and commodity investors, interested parties and the individual wants to become an investor in various commodities and mining companies. On our website [www.resource-capital.ch](http://www.resource-capital.ch) you will find 17 companies and information and articles about the topic commodities.

Our series of special reports begins with lithium because we consider this metal to be one of the great future metals in the energy sector and in spite the already happened boom, see big chances and potentials in the long term. The battery development is only at the beginning of a long road and the electric automobile has to capture its place among consumers and in the automobile history. Lithium is the main component of all available large-scale production batteries and accumulators and therefore the crucial link in the electro mobility dream. The necessary charging infrastructure is pushed along and expanded in Germany which might accelerate the future trend.

The Paris car show in the fall of 2016 will be dedicated to the electro mobility and the 2017 shows in Geneva as well as Tokyo should not be different. The issue of the short range should resolve itself with new accumulator technologies within the coming three to five years. This will drastically increase the demand for electric cars. According to experts the demand increase will be based on the formula "500+200" meaning 500 km range plus 200 km reserve. Then, it is believed, the die-hard driver of combustion engines will switch to electric cars. Mercedes is already working on a bus for clean local public transport with a range of over 300 km. Volkswagen wants to invest around € 10 billion in the electro mobility during the next five years and starting 2025

to sell more than one million electric cars per year.

All this will be enormous drivers for the lithium demand and in the interview with the expert and fund manager Tobias Tretter (interview also available on Rohstoff-TV) you will read how and in which directions the developments advance. Commodities are the base of our whole life. Without commodities there are no products and no technical innovations. New technologies need a variety of special metals which are mostly rare and difficult to extract.

With our special reports we would like to give you the necessary insights and inform you comprehensively. In addition, our two Commodity IPTV channels [www.Commodity-TV.net](http://www.Commodity-TV.net) & [www.Rohstoff-TV.net](http://www.Rohstoff-TV.net) are available to you free of charge. On the go we recommend our new Commodity-TV App for iPhone and Android which also provides real-time charts, share prices and the latest videos.

My team and I hope you will enjoy reading this edition of the special reports and hope that we can provide you with much new information, impressions and ideas. Only the one who gets broadly informed and takes matters relating to investments in his own hand will be in the winners and preserve his wealth during these difficult times.

Jochen Staiger



Jochen Staiger is founder and CEO of Swiss Resource Capital AG, located in Herisau, Switzerland. As chief-editor and founder of the first two resource IPTV-channels Commodity-TV and its German counterpart Rohstoff-TV, he reports about companies, experts, fund managers and various themes around the international mining business and the correspondent metals.



Tim Roedel is chief-editorial- and -communications-manager at SRC AG. He has been active in the commodity sector since 2007 and held several editor- and chief-editor-positions, e.g. at the publications Rohstoff-Spiegel, Rohstoff-Woche, Rohstoffraketen, Wahrer Wohlstand and First Mover. He owns an enormous commodity expertise and a wide-spread network within the whole resource sector.

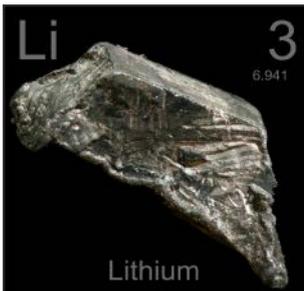
# Lithium – the substance of the 21<sup>st</sup> century is just gaining momentum!

## Carbon was the past – Lithium is the future

Rarely was a chemical element of similar great importance be as lithium will be in the coming decades. Since the announcement of Tesla Motors' plans to build up to 500,000 electric vehicles per year in its mega-factory starting 2017, lithium, in connection with lithium-ion batteries, is on everyone's lips. The metal in its future significance is comparable only with carbon that is not only important in daily life in the form of plastics but also as energy source in form of coal and crude oil. Whereas carbon above all is an energy supplier and energy source, lithium will become more and more the energy storage medium of the future.

## What is lithium?

Lithium is a light metal belonging to the alkali metal group. It is the least dense of all known solid elements. It has half the weight of water, is silver-gray and relatively soft. Lithium is highly reactive and therefore found in nature only as a lithium compound. Contact with air tarnishes the surface due to the formation of lithium oxide and lithium nitride. In pure oxygen lithium combusts at 1800C with a bright red flame forming lithium oxide. Lithium reacts with water violently forming lithium hydroxide.



Source: [www.periodictable.com](http://www.periodictable.com)

The global lithium extraction is divided in several branches producing the following types of lithium compounds:

1. Lithium carbonate
2. Lithium hydroxide
3. Lithium chloride
4. Butyl lithium and
5. Lithium metal

Usually metallic lithium is produced in a multi-stage process starting from lithium

carbonate, and is traded mostly with a purity of 99.5 %. The metallic lithium is used as a catalyst in the chemical and pharmaceutical industry as well as in the production of aluminum lithium alloys.

The industry distinguishes three basic types or qualities of lithium compounds:

1. "Industrial grade", with a purity of over 96 % for glass, fluxing agent and lubricant;
2. "Technical grade", with a purity around 99.5 % for ceramics, lubricants and batteries; and
3. "Battery grade", with a purity of over 99.5 % especially for high end battery cathode materials.

## Main application area: batteries and accumulators

The above mentioned specific and versatile properties make lithium a sought-after material used in many application areas. It is not a surprise that the main application area of lithium was constantly changing in the past. Initially it was used primarily in medicine and in the 1950's the element became commercially successful as an alloy component. Due to its low weight and the positive properties regarding to tensile strength, hardness and elasticity lithium became an inherent part of the aerospace technique. During the past 20 years the situation changed. In the course of the beginning of the electro revolution it was recognized that due to the low standard electrode potential of lithium the metal is almost perfectly suited as the anode in batteries. Lithium batteries are characterized by a very high energy density and can generate a very high voltage but they are not rechargeable. This property is found in lithium-ion accumulators where lithium metal oxides, like lithium cobalt oxide, are used as cathode material. For the production of accumula-

tors and batteries purity grades above 99.5 % are needed. Industrial grade lithium hydroxide is used, among other things, as raw material for lubricants as well as coolants and technical grade lithium hydroxide is used in the production of accumulators and batteries. Lithium carbonate – crystalline, granulated or as powder – for example is used for the electrolytic production of aluminum, in the ceramic and pharmaceutical industry as well as in the alloy technique. For the production of lithium-ion accumulators lithium carbonate with a specific purity is used in the form of a very fine powder (battery grade powder). The extraction and processing of (especially high grade) lithium is considered to be very expensive.

### Lithium-ion accumulators are considered the non-plus-ultra

Currently research is conducted and works done globally on increasing the power of accumulators for electric cars. In the meantime it has become evident that the lithium-ion accumulator is a clear favorite. One reason among others is that inside a lithium-ion accumulator the voltage is generated through the exchange of lithium ions. Due to the high energy density lithium-ion accumulators deliver – in contrast to conventional mercury or nickel based batteries – a constant performance throughout the discharge peri-

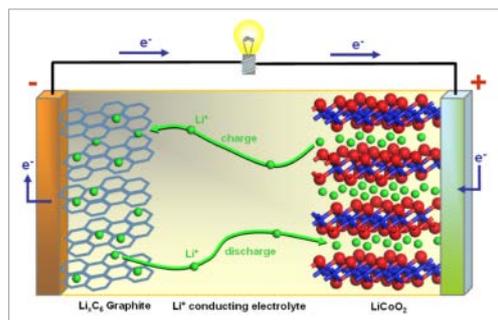
od and not subjected to any memory effect - that is, the gradual capacity loss throughout their service life due to many partial discharges. Therefore lithium-ion accumulators have a clear advantage over conventional nickel-cadmium accumulators.

### The production requires large quantities of lithium

The “disadvantage”: the production of lithium-ion accumulators requires large quantities of lithium. According to a recent BMW study depending on the model around 80 to 130 grams of metallic lithium per kilowatt hour storage capacity is needed. Initially, that doesn’t sound like much but it adds up to a significant amount. For example, the Mini E, a BMW built electric car within a prototype study, has a lithium-ion accumulator with a total capacity of 35 kilowatt hours. The range with one charge is 200 to 250 km. It is clear that such a range does not meet the desired expectations of the producers as well as all of the (future) customers. They would like to have a range of at least 500 km, but best would be 1,000 km.

### Application in the area of regenerative energies

The application of lithium in lithium-ion batteries or accumulators in car manufacturing is only one of many possible uses. Corresponding energy storage systems will be increasingly used for the storage of electricity derived from alternative energy sources. The phenomenal expansion of the power generation in wind farms or solar cells is a giant advantage for the environment but an enormous challenge for the power grids. The reason for this is the extreme fluctuations during power generation by regenerative energy sources. When the wind blows or the sun



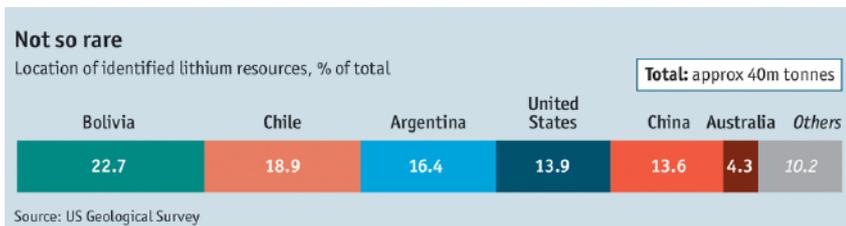
Source: [www.intechopen.com](http://www.intechopen.com)

shines large quantities of electric energy are “pumped” into the grid in a very short time creating enormous short lived over-capacities that are not used. According to calculations of the Bundesverband Windenergie (Federal Association of Wind Energy) 20 percent of the annual return of a wind farm is lost due to turbine shut-down during power grid overload.

### The biggest future field of application for lithium-ion accumulators: Decentralized Energy Storage

Smart-Grid-Systems should prevent a power grid overload but need a large number of short and middle term energy storage systems to store the surplus energy and feed it into the grid when there is a lack of wind and solar power. Lithium-ion accumulators could be the solution to this problem by buffering the surplus energy and feeding it into the grid on demand. Many producers already build efficient lithium-ion accumulators that will be used decentralized in a family home with a photovoltaic system on the roof. An example is the Tesla Powerwall, a solar battery for private homes which is produced in the Tesla mega-factory in Nevada, USA, since October 2015. The electric energy storage system consists of accumulators, charge control and a liquid cooling system. It is possible for private customers to connect up to 9 batteries to reach a total capacity of 57.6 kWh. With this, Tesla got the ball rolling and by doing so is making the decentralized energy storage cheaper as well as efficient and this area to be the most important driver for the lithium market.

(Source: Economist.com)



## Supply Situation

### Two types of lithium deposits

In general lithium is derived from two different sources.

1. Brine deposits: Lithium carbonate is primarily derived by evaporating the lithium bearing brines with addition of sodium carbonate in salt lakes. For the production of metallic lithium the lithium carbonate is dissolved in hydrochloric acid which produces carbon dioxide that escapes as gas and lithium chloride in solution. This solution is reduced in the vacuum evaporator until crystallisation of the lithium chloride.
2. “Hard rock spodumene” deposits: in this case the lithium compounds are not derived from the salt of salt lakes but from spodumene, a lithium bearing aluminum silicate mineral. The spodumene is mined using conventional techniques and processed to a concentrate that is often transformed to lithium carbonate with a purity of more than 99.5 %. The necessary intensive thermal and hydrometallurgical processes are considered as very expensive. This type of deposit is almost exclusively mined in Australia and the processing takes place primarily in Chinese facilities.

### Lithium is abundant

In the past it was wrongly assumed that a global switch from conventional combustion engines to electric motors is impossible due to lack of lithium. That is not quite right. Lithium is not that rare in the earth, accounting for approximately 0.006 % of the earth’s crust, therefore rarer than zinc, copper and tungsten but a bit more common than cobalt, tin and lead. According to estimates of the US Geological

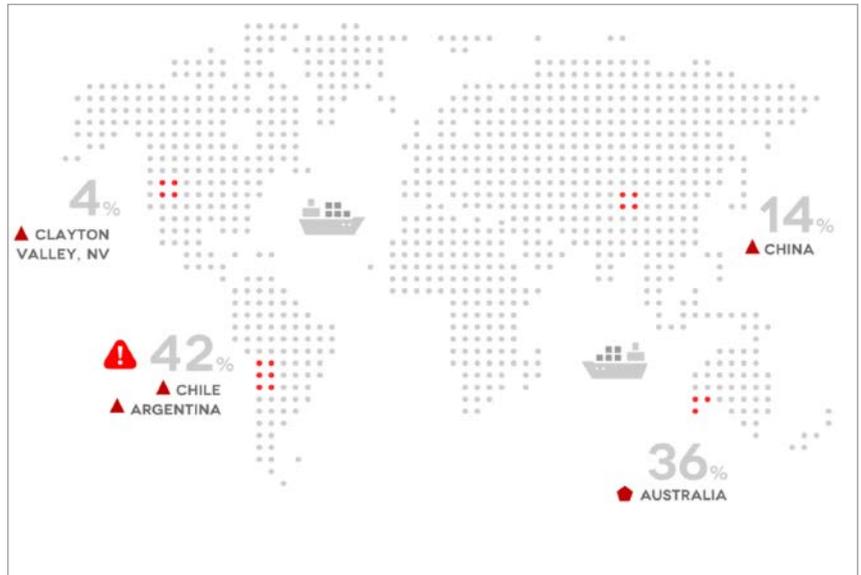
Survey, there are 40 million tonnes of lithium mineable globally, 65 % of that alone in the South American countries of Bolivia, Chile and Argentina. Currently the biggest lithium carbonate production takes place in the Salar de Atacama, a salt lake in the northern Chilean province of Antofagasta. Approximately 40 % of the global lithium production originates in this region.

### Currently Lithium production is focused primarily in four countries and by four companies

Currently, around 80 % of the total lithium production worldwide originates in these three South American countries plus Australia and production is split between four companies. As a result, the whole lithium market is lacking transparency. This is the reason the big battery and accumulator producers like Panasonic and the leading electric car manufacturers, above all Tesla Motors, are looking for long-term supply contracts with relatively small development companies that in part are not producing before 2020. As a result of this supply oligopoly, lithium is currently not traded in the market and the actual trading prices are strictly confidential. One reason often mentioned by the supplier is that the available and produced lithium qualities are too different for a standardized market place.

### Lithium production will increase sharply

In 2015 the global lithium production (for standardization reasons LCE = "lithium carbonate equivalent" a universal conversion factor for all above mentioned lithium compounds) was approximately 175,000 tonnes LCE. According to projections, this number will increase to 360,000 tonnes LCE by 2020 and over 650,000 tonnes LCE by 2025. The latter is not based on concrete mine expansions or new mi-



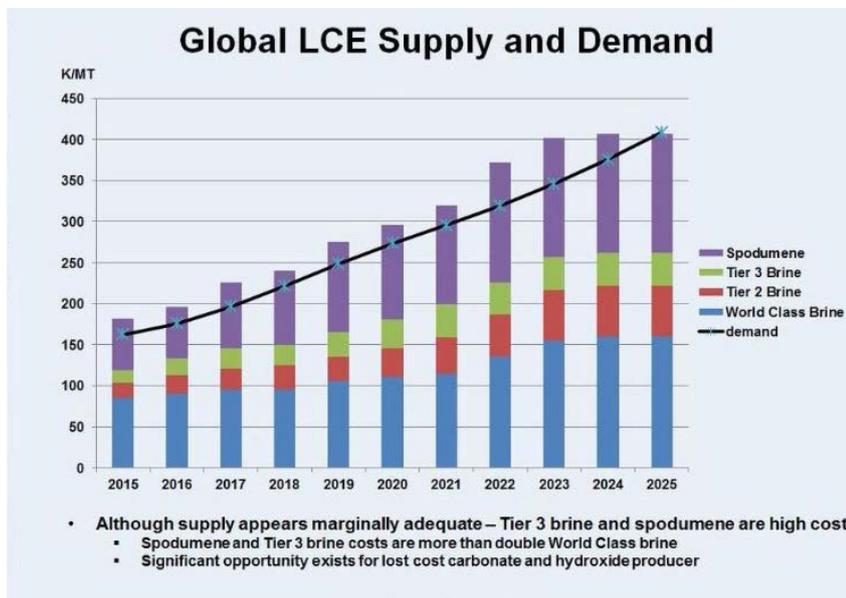
nes and we can assume that the production in 2025 will be between 360,000 and 650,000 tonnes.

Currently, around 80 % of the total lithium production worldwide originates in four countries. (Source: USGS Mineral Commodity Summaries / Lithium X)

### The price is always crucial but relatively negligible for the accumulator production!

In the end the price is only important for the economic extraction of the existing lithium deposits. In the past months the price has risen sharply. In mid 2015 the price for a tonne lithium carbonate was around US\$ 6,000 and has climbed to the presently over US\$ 20,000 and surely just a snap shot. We can assume that the price will settle, in the middle to long term, between US\$ 10,000 and 12,000 per tonne lithium carbonate. Either way, this is a lucrative business for the producer because the mining costs at current projects are US\$ 3,000 to 6,500 per tonne.

**From a quantitative point lithium accounts for a significant part of a battery, but accounts for only roughly 4-5 % of the costs of a battery. Hence the lithium price is insignificant for the production of lithium ion batteries and could be kept at an economic level for the lithium producer.**



(Source: [www.kirillklip.blogspot.com](http://www.kirillklip.blogspot.com))

## Development companies work under high pressure at new projects, ...

As the big companies **Albemarle**, **SQM**, **FMC** and **Tianqi** have plans to increase their production and at the same have no interest in falling lithium prices, many development companies work on the advancement of new lithium projects and the delineation of concrete deposits and resources.

## ... in part at new lithium hot spots

Therefore, besides the typical lithium regions South America and Australia, new regions in North America and especially Canada, Mexico and (due to the proximity to the future top consumer Tesla Motors) the US state Nevada emerge as lithium hot spots. In the past years the **Clayton Valley** in Nevada has become the Lithium-Eldorado because it hosts Albemarle's Silver Peak Mine, the only operating brine lithium mine in North America. The Clayton Valley is one of the few areas worldwide where commercially mineable

lithium brines are found. Recently, **Pure Energy Minerals** closed an offtake agreement with Tesla Motors. Besides **Albemarle** and **Pure Energy Minerals**, more than a dozen development companies are now active in the Clayton Valley including **Advantage Lithium**, **Lithium X Energy**, **Nevada Sunrise** and **Zadar Ventures**. Some promising companies like **MacArthur Minerals** and **Zadar Ventures** are also active in Australia. The (main) Australian hot spot is in Western Australia in the Pilbara Region. As well as **MacArthur Minerals**, **Altura Mining** and **Pilbara Minerals** are active in this region and each of these two companies already have a large resource. A second smaller lithium hot spot is in Australia's southwest. There, in the so called Ravensthorpe District, **Galaxy Resources** is operating the Mt Cattlin lithium mine. **Zadar Ventures** has an option to acquire two lithium claims in the Ravensthorpe District. The third hot spot is in **Argentina's northwest** where **Orocobre** operates the Olaroz lithium mine. In this region, some development companies like **Millennial Lithium** and **Lithium X** are active. An additional lithium hot spot seems to be emerging in **Canada**. Active at the moment are, among others, **Avalon Advanced Materials**, **Nemaska Lithium**, **Fairmont Resources** and **Jordan Resources**.

## Summary supply side

The lithium production is (still) in the hands of a few producers. The worldwide biggest lithium producer Albemarle acquired Rockwood Holdings, the owner of the two largest lithium deposits in Chile at the beginning of 2015. Albemarle and three other companies, SQM, FMC and Tianqi (i.a. Albemarle's joint venture partner in Australia) share the lithium market mostly between each other. Although there is seemingly enough lithium on the planet, the extraction can be costly and time consuming so that higher prices are not an automatically leading to a supply

increase. The supply should increase in the coming years but forecasting is difficult for the period after 2020 due to current lack of data for potential mine extensions or construction of new mines. Increased exploration activities by (smaller) development companies are indications of the potential establishment of new mines. As of the middle of June 2016, besides the established majors, in total around a dozen companies already have a lithium resource.

## Demand situation

### The demand is rising rapidly!

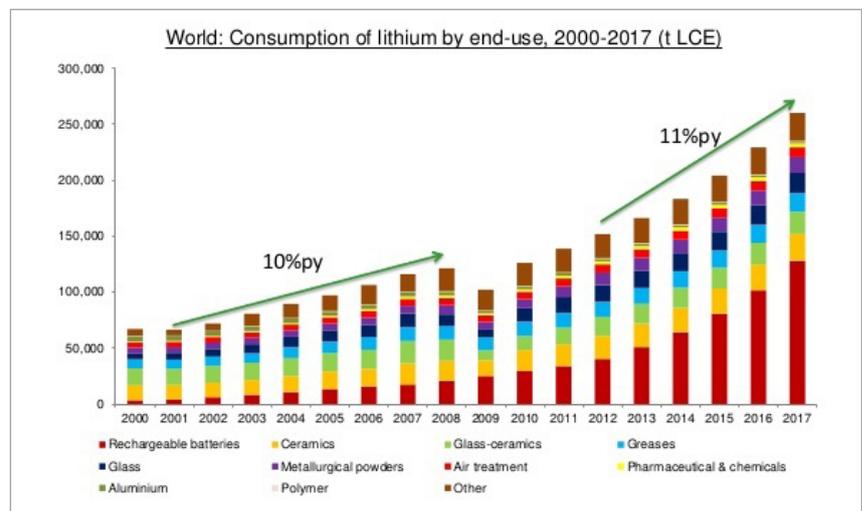
One reason for the current rapid price development is a constantly rising demand. In 2000 the demand was at approximately 65,000 tonnes LCE and reached 175,000 tonnes LCE by 2015.

Leading analyst firms like Canaccord that have been dealing with the lithium market for many years anticipate an increase in lithium demand to 350,000 tonnes by 2020 and to up to 700,000 tonnes by 2025. The driving factor will primarily be the demand from the battery and accumulator sector in association with the automotive industry. Today, one third of the lithium demand comes from this sector; by 2025 it will probably reach 75 %.

### China the biggest consumer

At the moment China is the biggest lithium consumer. The country accounts for one third of the total demand. Experts estimate this will not change soon because China produces the most accumulators, batteries, glass, lubricants, air conditioning units and synthetic rubber by far. This stimulates the immense lithium consumption of the country. According to expectations China will have the strongest yearly increase in lithium demand of

all important market participants during the coming 5 to 10 years due to an expected tripling of the quantity of rechargeable batteries. In this context, it is interesting that in China from 2014 to 2015 the number of electric and hybrid vehicles sold tripled to 171,000 (this is only one percent of all sold vehicles). Additional important suppliers of lithium-ion batteries including South Korea and Japan will also guarantee a robust increase of the lithium demand. The highlights are by far the electronic giants Sony, Panasonic, Samsung, LG and ATL in Hong Kong. India should not be underestimated. The country will advance strongly its ceramics, glass, engineering and founding industry.



(Source: Roskill Information Services Ltd.)

### North America is Tesla Country

Outside Asia, North America in particular will dominate the lithium demand. Tesla Motors will above all play an important part. The company is constructing a so called "mega-factory" in Nevada.

Starting in 2017 lithium-ion cells and battery packs for up to 500,000 electric vehicles per year will be built there. Tesla Motors alone would consume just over 13 % of the annual lithium production. However, Tesla doesn't currently buy lithium

directly but lithium accumulators. In the future it could be possible that Tesla will purchase the necessary lithium from its previous cathode partner Panasonic. On the other hand, there is the possibility to buy the needed lithium hydroxide and lithium carbonate directly from the relevant producer. The company has closed relevant offtake agreements with only two lithium developers in Nevada and Mexico. These two companies (**Pure Energy Minerals** and Bacanora Minerals plus their joint venture partner Rare Earth Minerals) will most likely not start with production before 2019 and satisfy only part of Tesla's demand. This indicates that Tesla has no reliable lithium supplier between 2017 and 2019 and they still have to secure additional offtake agreements for the time afterwards to guarantee acceptable prices and to become independent from middlemen like Panasonic.

### **Additional mega-factories in the planning stage**

Tesla is not the only lithium consumer who plans a bigger production of lithium-ion accumulators. LG Chem has already begun production for Chevy in Michigan in October 2015. Also Foxconn,

BYD (largest producer of rechargeable accumulators especially for cell phones) and Boston Power are building their own mega-factories for, among other things, so called power banks, i.e. decentralized energy storage units. Therefore the produced capacity of lithium-ion accumulators could more than triple by 2020.

### **Summary demand side**

The demand for lithium will be defined primarily by three different parties:

1. The Asian electronic groups, which aim primarily for the mass production of powerful lithium-ion batteries and accumulators for the daily use in multimedia devices etc.
2. The car manufacturer and (initially) above all Tesla Motors which is preparing itself to become THE absolute dominant producer of electric vehicles.
3. The producer of power banks i.e. decentralized energy storage units which are used in the private and industrial sector where electricity is produced by photovoltaic cells as well as wind power stations and used for their own needs.

*That's how it will look like when it will be completed: Tesla's Gigafactory will produce up to 500,000 rechargeable batteries per annum.*



This constellation will increase the lithium demand by 100 % and beyond during the coming 5 years whereby the power banks will generate the biggest demand increase and could eclipse the other sectors.

## Conclusion

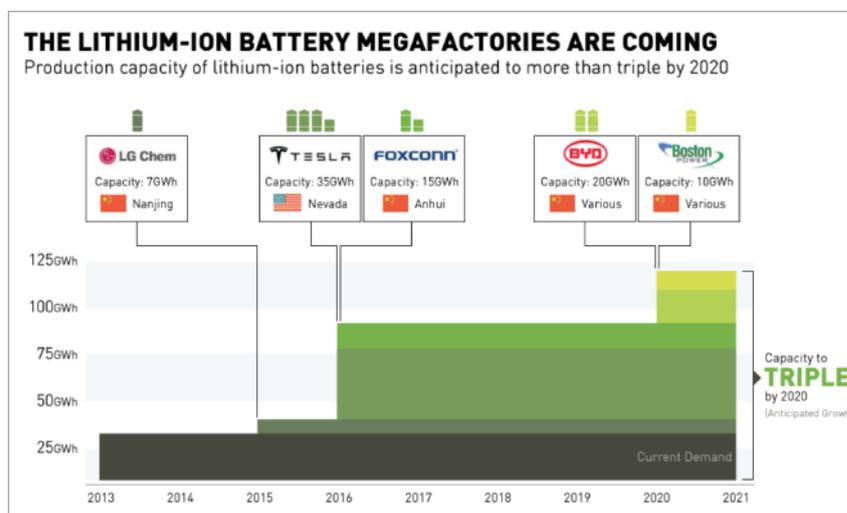
Currently, the lithium market is clearly a supply oligopoly-market. This means few suppliers face many customers. Unlike rare earth element the market power is not with one country (China) but with four suppliers who have significant projects in four countries: Australia, Argentina, Bolivia and Chile. Currently, several (smaller) development companies advance and try to bring to production good projects not only in the previous production countries but also in Canada, USA (above all in Clayton Valley a downright playground for lithium developers), Australia, Zimbabwe, Mexico, Serbia and some other countries. One reason is the rapidly growing demand which, in the course of the electro revolution, is exploding.

The low price for crude oil is playing, if at all, a minor part because lithium is used above all as a medium for energy storage and not for energy generation. A great unknown is still Tesla Motors the leading producer of electric vehicles. Their mega-factory will need large quantities of lithium carbonate and lithium hydroxide but the company actually has no reliable lithium source for the period from 2017 to 2019. During this period Tesla has to rely on the partner and cathode supplier Panasonic. Starting in 2020 Tesla's hunger for lithium could lead to additional demand and higher prices.

On an overall basis a supply deficit is emerging on the market because the demand increase will exceed the supply expansion in the future. Because there is no end of the demand increase in sight past 2025 and there are no big noteworthy lithium production projects in the pipeline,

that condition could last for a foreseeable time.

In addition, the few suppliers have a significant market power but are possibly not interested in a lower market price. This is the reason why smaller lithium companies will have very good development and production opportunities. Besides, from a quantitative point lithium ac-



counts for a significant part of a battery, but it accounts for only roughly 4-5 % of the costs of a battery. Hence the lithium price is insignificant for the production of lithium ion batteries and could be kept at an economic level for the lithium producer. The lithium companies whose projects are at a very advanced stage should see the biggest upward price potential in the coming months and possibly consolidation that is via takeover scenarios.

(Source: Benchmark Mineral Intelligence / [www.visualcapitalist.com](http://www.visualcapitalist.com))

# Interview with Tobias Tretter – Manager of Structured Solutions Lithium Index Strategic Fund



Tobias Tretter has been active in the mining sector since 2000. During his activity at Dr. Jens Ehrhard Wealth Management he supported the management of the DJE Gold & Resources Fund, which was awarded as the best performing commodity fund of 2003. From 2005 to 2008 he co-managed the Stabilitas Funds, which have been awarded as the "best performing Gold Fund" in 2006. Since 2009, Mr. Tretter acts as CEO and responsible person for the Index- and Portfolio-Managements of Commodity Capital AG. He is managing the Commodity Capital Global Mining Fund, the Structured Solutions Lithium Index Strategie Fund and the Managed Accounts of Commodity Capital. Tobias Tretter holds a business diploma degree from the University of Bayreuth.

**Mr. Tretter you are manager of Structured Solutions Lithium Index Strategic Fund. Which strategies do you follow and what does the fund represent?**

The fund was established in 2010 because we were aware of the potential for the resource Lithium at that time. We couldn't realize our original idea of a physical backed ETF of the metal Lithium because of its specific properties; it is indelible and cannot be stored in a safe: The only interesting possibility for our clients was a public fund which invests directly into the 25 biggest producers and developers of lithium deposits. We don't want to invest directly into the battery producers, because in contrast to the lithium producers they will not profit from the higher lithium prices in the long term, but rather have to pay these. Our investors should have the possibility to benefit directly from the coming boom for lithium batteries brought on by the demand for lithium, based on electric cars or powerwalls, without the risk of single investments. With the fund, we have created for investors a possibility for diversified investments in the lithium sector.

**Is such a fund which is focussed at a niche resource not too specialized and thereby too risky?**

Yes and no. The fund is very specialized and the success of the lithium sector put us right. The risk as well potential opportunities in other sectors are the reason we are restructuring and diversifying the fund. In the future, the fund will not only invest in lithium but also in companies from other sectors which profit from the lithium battery boom. Particularly the resources graphite, cobalt or magnesium are very interesting. For example, cobalt used as cathode has some superior properties like a faster recharging of batteries. But cobalt is not fully used by the

battery producers because the biggest part of the global production comes from the Congo and is thereby not a reliable source of this metal. Also the mining conditions in the Congo are very questionable and not only investors but buyers as well avoid this production. The demand for reliable sources and ethically and environmentally clean mined cobalt is enormous and will be another trend in the years to come. We are diversifying the fund a bit more and will diversify even more in the future. Regarding the risks we think that it is not too risky. The fund is a niche product and thought as an addition in a broad diversified portfolio. If an investor believes in the success of electric cars and powerwalls he has the choice to buy shares of one or two companies in the sector or a specialized fund. Due to the specifications of the sector the investors should prefer funds or certificates to direct investments in order to minimize the risk of a single stock.

***In the past 10 years we have observed once in a while the formation of bubbles in "trend resources". The uranium bubble and the hype around the rare earth elements, graphite etc. comes to mind. Why should it be different for lithium?***

With all the three mentioned "hypes", each one was a hype among the investors which was not based on the rising demand from the industry. Yes, there was a rising demand for uranium until the terrible events in Fukushima. Since then the operators of nuclear power plants in Japan are more the sellers than the buyers and are the main reason for the falling uranium prices. There was never a bottleneck in the production of rare earth elements but instead it was during processing in the Chinese refineries. And with graphite the problem is that the demand rises parallel to the demand for lithium but it is possible to produce synthetic

graphite but with lower quality. It is also difficult for experts to estimate which resource project has the right quality for the end consumer that is the battery producer.

With lithium the fundamental situation is totally different. I believe that Goldman Sachs gave the best answer in their study at the beginning of the year with the headline "is lithium the new gasoline". I would not go that far and compare lithium with the situation of the oil in the 1970s, but one thing is for sure; the switch to electric cars and regenerative energy sources and a decentralized storage of energy is with the currently available technology not possible without lithium ion batteries. This is very well recognized by the huge investments from the industry in new battery factories which will all need lithium. From a quantitative point lithium accounts for a significant part of a battery, but accounts for only roughly 4-5 % of the costs of a battery. Hence the lithium price is insignificant for the production of lithium ion batteries. The only important point is the sufficient supply of lithium. In view of the massive expansion of the battery production there are reasons for questioning if it will be possible to satisfy enough of the demand with new production in the coming years.

***What do you look for specifically in your evaluation of a lithium company or a lithium resource?***

In a lithium company like any other company the investor should look at management first. What is their track record, how much has management personally invested and which investors are supporting the company. Many of the "new" lithium exploration companies that in the past years were active during each of the above-mentioned "hypes" try their luck with a new project now in the lithium sector. These will continue to be unsuccessful

and disappear as they have done before. It is important to look carefully at the relevant quality of the management.

Regarding the projects, you have to distinguish primarily between brine projects - the extraction from dried-out salt lakes - and hard rock projects - the conventional processing of hard rock. Besides the grades, profitability etc. it is of vital importance for the investor to look particularly at the ratio of magnesium to lithium. A too high amount of magnesium renders it unprofitable or impossible to leach out the lithium carbonate from the salt. A good example is one of the biggest lithium resources: the Salar de Uyuni which contains approximately 50 to 70 % (!) of the global lithium resources, but due to the ratio of above 20:1 of magnesium to lithium and the lower evaporation rate a production is not profitable with the recent extraction methods. Furthermore, environmental aspects have to be respected. Especially for the extraction from salt lakes some conditions have to be considered. For the conventional production by evaporation in big ponds a lot of land is necessary and the operator has to ensure that there is not too much damage to the natural environment.

Most of these projects often fail because Mother Nature did not close off completely the basin that the lithium is extracted from and the water that is pumped into the ground follows the easiest way out of the basin and does not stay there to absorb the lithium and to be pumped back up to the surface as brine. Just look on Google Maps at the geography of the project and decide for yourself if the basin seems closed or not for you.

Besides the grades, profitability etc. it is of vital importance for the investor to look particularly at the ratio of magnesium to lithium.

The higher grade a project, not only is the return increasing there is also more scope for solving potential problems or cost increases.

***Previous main mining regions are South America and Australia with smaller operations in China and the USA. Where do you think the future main mining regions for lithium will be?***

Currently the biggest part of the lithium production comes from the tri-border region Chile, Argentina and Bolivia. Because of the low lithium price the production from the salt lakes is cheaper and thereby profitable. There are lithium occurrences around the world and we will see a variety of new lithium production sites in the future. Currently the focus of the industry is on the Clayton Valley near Las Vegas in the USA. There we have similar conditions like in South America and the new mega-factory of Tesla is not far in Reno. Besides the USA we also observe projects and companies in Canada as well as Europe, for example in Portugal or Rio Tinto's project in Serbia. In general I believe that the number of hard rock projects will increase due to the higher lithium prices and worldwide production will further diversify, but the main mining regions will still be South America and Australia.

***How important are the planned mega-factories for the production of lithium ion batteries for the lithium market in the future?***

The mega-factories are the key or the engine of the lithium demand and play an essential part for the demand of lithium. Tesla's mega-factory alone will double the global production of lithium batteries. Not only Tesla but BYD, Foxconn, LG or Daimler are also building new mega-factories and investing several billion US\$ in the upgrading/installation of new battery productions, so that by 2020 the production will triple to 87 GWh. But this is not only for the production of batteries for future electric cars but also for the decent-

ralized storage of regenerative energies using batteries as well.

As mentioned before the lithium price plays a minor role in the costs of the battery production so that primarily the availability of lithium is the important factor and to a lesser extent its price. For sure the mega-factories don't want to stop their production because of the temporary lack of lithium. Currently the lithium market is a bit of a race against time. Certainly there are enough lithium resources worldwide. The massive increase of the production of lithium batteries and with it the demand for lithium in the coming years could cause problems for the mining companies which didn't invest in the past years due to the general crisis in the mining sector. In the coming years the question for the lithium sector will not be: "How high is the lithium price" but "where do I source my lithium and how is the availability".

***Mr. Tretter let us get back to your fund. Which are the biggest single positions in your fund and why?***

Generally we closely follow – also with our global mining fund – the life cycle of the resource companies and see by far the best chance/risk ratio for junior companies which just have started production or will start the production in the near future. These are the companies which have already successfully overcome the biggest risks and are potential takeover targets for major mining companies. Therefore, besides the established big producers, particularly Orocobre and Nemaska Lithium as coming producers are represented. While Orocobre is close to the start of production at the Olaroz brine project in Argentina, Nemaska owns one of the highest grade and biggest hard rock projects worldwide in the politically stable province of Quebec. Besides these

two future producers, lithium companies from the Clayton Valley in Nevada in particular drew attention in the past months. As already mentioned the doubling of the battery production due to Tesla's mega-factory plays a significant part. And what could be more obvious that Tesla gets the necessary lithium from the immediate neighbourhood in the Clayton Valley. Currently there is Albemarle, the only lithium producer in North America and the supply and legal security will play an important part at Tesla where they will source the necessary lithium. Pure Energy is for sure in the pole position. They are the most advanced and have already a purchase agreement with Tesla. Also promising is the lithium explorer Lithium X. Besides projects in the Clayton Valley they are also active in Argentina and have with Paul Matysek and Frank Giustra an exceptional management team with an outstanding track record.

***Which companies with an actual low weighting in your fund or that are not represented in your fund do you currently have on your radar screen and why?***

Every single day there are new companies which want to benefit from the outstanding perspectives in the lithium sector. However, I expect a stronger consolidation of the lithium exploration companies in the next 24 months. This will ensure that the "promotion" companies disappear and the investors will focus once again on the companies with the best management teams and the best projects. One of the "new" companies where we see a significant potential is Millennial Lithium. The company has quietly acquired a very prospective lithium brine project in the Puna Region where the projects of Orocobre, Galaxy and Lithium X are located. Furthermore, the company could hire Ian Scarr an absolute expert who was responsible for multiple

discoveries for Rio Tinto worldwide including the Jadar lithium project in Serbia, one of the most prospective lithium occurrences in the world.

***Mr. Tretter a last question and I would ask you for a brief answer: You have mentioned your selection of criteria is among other things management and the magnesium/lithium ratio. Which three purely economic or project specific criteria should interested lithium investors keep in mind?***

As the saying goes among geologists: "grade is king"! The higher grade a project, not only is the return increasing there is also more scope for solving potential problems or cost increases. But you have to bear in mind that in general brines have definite lower grades than hard rock projects and they are easier and cheaper to mine.

Also pay attention to the infrastructure. Water and electricity are key factors which can lead to success or ruin of a project. Pay attention to the availability and the respective costs.

I should mention as last point that political framework like the support of the local residents is an important investment criterion and is frequently responsible for the failure of a project. In fact most of the investors can not visit the projects themselves but in most cases it is already very helpful to read the local newspapers online.



Interview with Tobias Tretter on  
Commodity-TV:  
<http://bit.ly/2cmzn5D>

# Advantage Lithium: immediate neighbour to the only North American lithium mine and the only development Company with water rights in Clayton Valley!



Dev Randhawa, CEO

Advantage Lithium is a Canadian mining company specializing in the development of lithium projects in North America. The company is an immediate neighbour to Albemarle's Silver Peak Mine the only lithium brine mine in North America, and has its own water rights in Clayton Valley. Advantage Lithium is managed by the successful management team of Fission Uranium.

## **Clayton Valley Lithium Projects – Letter of Intent with Nevada Sunrise**

On June 20th, 2016 Advantage Lithium (under the former name North South Petroleum Corp.) signed a letter of intent (LOI) with Nevada Sunrise for an option to acquire State of Nevada water right Permit 44411 and five projects in the Clayton Valley and Lida Valley Region. According to the LOI, Advantage Lithium has the option to acquire in two stages an interest in the projects of up to 50 % and 70 % respectively.

All project areas have road and power connection to Las Vegas and Reno. See a summary of the projects below.

## **Clayton Northeast Lithium Brine Project – directly adjacent to Albemarle's Silver Peak Project**

The Clayton Northeast Property is comprised of 50 claims covering in total 405 hectare and borders the eastern part of the Silver Peak Mine. Albemarle had bought the mine for US\$ 6 billion which is in operation in Clayton Valley since the 1960's. One of Albemarle's pumping stations is only a few meters from Advantage Lithium's project border and several lithium brine production wells are situated within 110 m to the Clayton Northeast Project. Albemarle's processing plant is

at a distance of two kilometers. In 1977 the United States Geological Survey completed several drill holes in this area. One of the drill holes encountered lithium grades of up to 110 ppm Li<sub>2</sub>O in a shallow depth of less than 146 m. Advantage Lithium plans an extensive drill program to quickly outline an initial NI 43-101 resource. The start of the drill program is expected in September 2016. The first six holes will be collared directly at the property border to Albemarle. The company assumes potential brines in depths below 150 m with higher grades than the brines from the historic drill hole.

## **Jackson Wash Lithium Brine Project – independent brine basin similar to Clayton Valley Basin**

The Jackson Wash Project is comprised of 166 claims covering in total 1,335 hectare and is situated 30 km southeast of Clayton Valley. Jackson Wash is an independent brine basin and analogous in sedimentary formations and underlying structures to Clayton Valley basin. To date these formations were not drill tested but in 2011 several soil samples were taken containing up to 117 ppm lithium. Advantage Lithium plans three to four drill holes to test the area down to a depth of 400 m.

## **Neptune Lithium Brine Project – Lithium already proven!**

The Neptune Project is comprised of 316 claims covering in total 2,557 hectare and is situated southwest of Lithium X's properties. Lithium was already proven at Neptune. One of the two holes drilled by Nevada Sunrise encountered grades averaging 156 ppm Li<sub>2</sub>O over 65.5 m. Advantage Lithium already has the permit for eight additional drill holes and will start the drill related activities in 2016. An up to

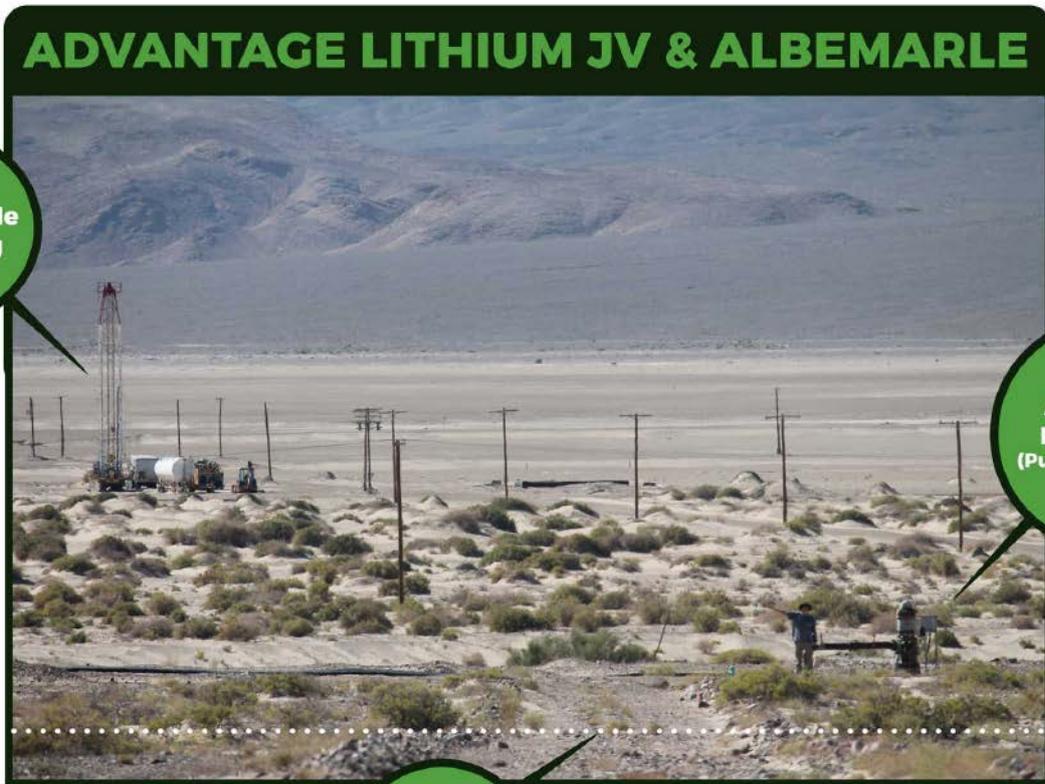
2,000 m deep drill hole is planned in an area interpreted in a recently completed geophysical study as the potential source of several brine bearing strata.

**Aquarius/Gemini – future top chances in the project pipeline**

The two other projects, Aquarius and Gemini are not drill ready yet and should be considered as future top chances in the project pipeline. A drill permit was applied for Gemini. For Aquarius, that like Neptune adjoins Lithium X’s properties in the west, an application is planned.

**Water Rights Permit 44411 – only water right besides Albemarle!**

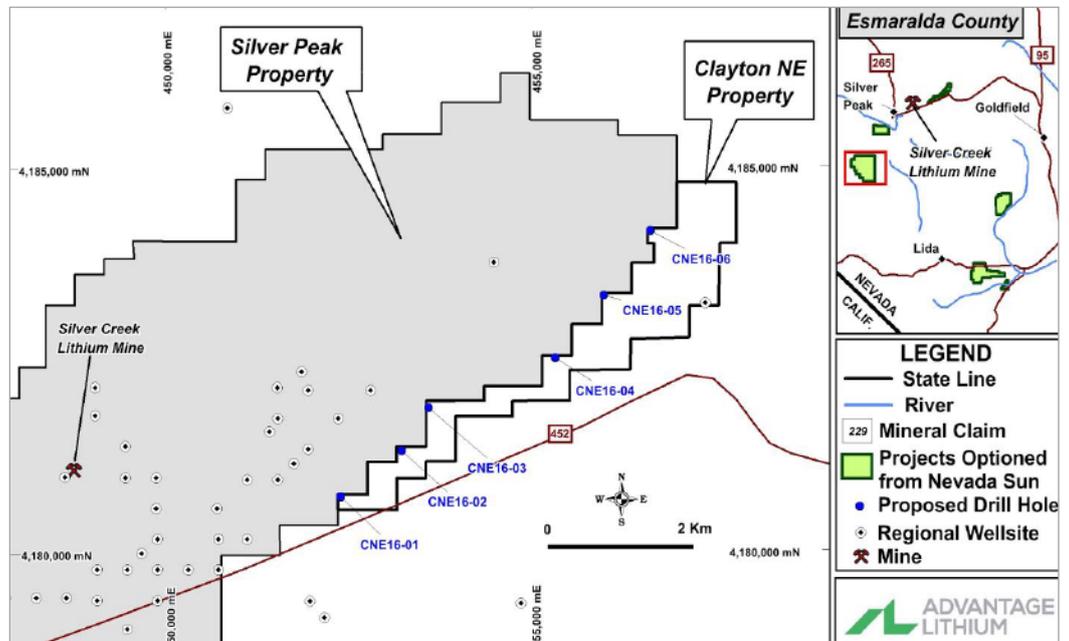
Lithium brine mines need water for the lithium extraction. But Nevada is the highest regulated US-State with respect to the water usage. Albemarle needs large quantities of water which is scarce in Nevada. The competent regulatory authorities in Nevada made it clear that in Clayton Valley hardly any water rights can be issued. A big advantage over all other competitors is Advantage Lithium’s Water Rights Permit 44411. This is the only right, besides Albemarle’s right, allowing the extraction of groundwater in Clayton Valley. Which means, to date no other (de-



**Albemarle  
Drill Rig**

**Albemarle  
Production  
(Pumping Station)**

**Advantage  
Lithium JV  
Property**



velopment) company has any type of rights to direct groundwater extraction in Clayton Valley. In December 2015 an independent certified appraiser valued the Water Rights Permit 44411 with US\$ 1.42 million but it is basically worth a mint for Advantage Lithium! It will allow Advantage Lithium the potential development of any lithium brine in Clayton Valley, a giant advantage no other exploration company has in Clayton Valley!

### Top Management team wants to score again

Advantage Lithium’s management team is comprised primarily of board members of Fission Uranium. Recently Fission Uranium made the biggest uranium discovery of the last 40 years on Patterson Lake South in Canada’s Athabasca Basin. Dev Randhawa is an experienced CEO with a great wealth of experience in resource expansion, mine exploration and energy companies. Northern Miner Magazine named him “Mining Person of the Year 2013” and Finance Monthly awarded

him the “Deal Maker of the Year 2013” Award. He is the current CEO of Fission Uranium and Fission 3.0 Corp. Currently, Fission Uranium is the most award-winning uranium developer in the world.

President David Sidoo manages a successful private investment banking and finance management company. He worked as broker at Yorkton Securities and rose quickly to one be of the best paid driving force in the company with commissions continuously ranking nationwide under the top five.

He was a founding shareholder of American Oil & Gas Inc. which was sold to Hess Corporation in an all stock transition valued at US\$ 630 million. Currently he is in the Board of Governors for the University of British Columbia. On June 14th, 2016 Sidoo was awarded the Order of British Columbia, the highest civilian honor of the province of British Columbia. Ross McElroy is a professional geologist with nearly 30 years of experience in the mining industry. He is the winner of the PDAC Bill Dennis award for exploration

# Factsheet

success and the Northern Miner's "Mining Person of the Year 2013". McElroy has held positions with both major and junior mining companies, which include BHP Billiton, Cogema Canada (now AREVA), and Cameco. He was a member of the early stage discovery team of the MacArthur River uranium deposit. Mr. McElroy was part of the hugely successful Fission Energy Corp. team as President, COO and Chief Geologist. He headed up the technical team that made Fission Uranium Corp.'s PLS discovery.

## Summary: multiple top potential meets top management

Advantage Lithium has several potential high grade lithium projects in THE North American lithium hot spot Clayton Valley and neighbouring valleys. Before the deal with Nevada Sunrise, the company wanted to acquire claims from Lithium X. But the management team under Dev Randhawa liked the current projects better and the deal with Lithium X was canceled and the Nevada Sunrise Claims were acquired. Starting September the drill results from several projects will reveal why. The management had already had several direct hits with Fission Uranium and previously with Strathmore and wants to repeat this with Advantage Lithium. So, at Advantage Lithium a top management team meets a multiple exploration potential. The final touch is the only right to the water extraction besides Albemarle in Clayton valley. These are prime conditions for a successful development in the coming months which will be characterized above all by the announcement of corresponding drill results.

**ISIN:** CA00782P1080  
**WKN:** A2AQ6C  
**FRA:** 14D  
**TSXV:** AAL

Shares outstanding: 40.2 million  
Options: 2.3 million  
Warrants: 1.1 million  
Fully diluted: 43.6 million

### Contact:

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www.advantagelithium.com

### CEO:

Dev Randhawa



(reference: BigCharts)

# Avalon Advanced Materials Inc.

## High grade open pit lithium project with additional cash generator



Donald S. Bubar, CEO

Avalon Advanced Materials is a development company that received the “Corporate Knights” Future 40 Responsible Corporate Leaders in Canada award twice and has been working since 20 years in the lithium sector. It has secured a high grade project in Ontario, Canada. The Separation Rapids Lithium Project is well connected to the Canadian infrastructure and promises initial open pit mining operation for a period of over 20 years! The company plans to publish a feasibility study for the project by the middle of 2017.

Water for the production can be taken from the English River which passes the project at a distance of a few hundred meters. The Separation Rapids Lithium Deposit was discovered in 1996 and explored by local mining experts. Avalon Advanced Materials secured the right to a 100 % acquisition of Separation Rapids one year later. In 2012 the, at that time, negotiated 2% net smelter royalty was bought back for \$220,000. Between 2008 and 2011 the land position was consolidated and a mining lease signed. Separation Rapids belongs 100 % to Avalon Advanced Materials now for mining activities and is free of royalty obligations.

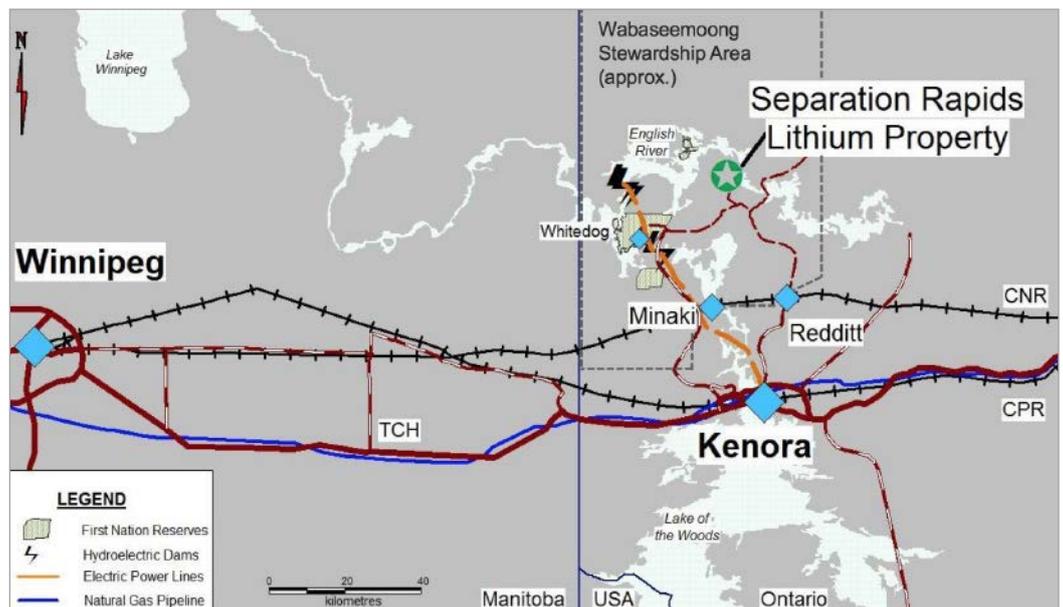
### Separation Rapids Lithium Project – location and actual ownership

The Separation Rapids Lithium Project is located in the west of the Canadian province of Ontario approximately 70 km north of Kenora, a town with a population of 15,000. Separation Rapids is accessible by well maintained roads. Three hydroelectric power plants are within a distance of 25 km to the project and are connected to the Canadian power grid.

### Separation Rapids Lithium Project – Exploration activities and First Nations

Before the turn of the millennium Avalon Advanced Materials (former Avalon Ventures Ltd.) conducted an initial resource estimate which resulted in over 10 million tonnes of mineable ore material. In addition, a prefeasibility study was prepared

Separation Rapids is accessible by well maintained roads.



and a memorandum of understanding signed with the local First Nations, an important early step Avalon is credited for. From 2000 to 2001, Avalon and Placer Dome had a joint venture agreement for the exploration of the tantalum potential. Following, a lithium feldspar model and a scoping study were completed which resulted in a bulk sampling program including processing and the sale to a customer in 2006. However, this customer could not be convinced for further programs so that test runs were resumed only in 2013 with the beginning of the recent lithium boom. At the same time the memorandum of understanding with the First Nations was renewed.

### Separation Rapids Lithium Project – Deposit

Separation Rapids is a very rare petalite deposit which formed in lithium bearing granite pegmatite. This was already recognized by the Ontario Geological Survey Group which discovered the project. To date there is only one significant petalite producer in the world, which is located in Zimbabwe. Separation Rapids hosts a petalite deposit that is extraordinary enriched with lithium. In addition the deposit contains as by-products tantalum, feldspar, silica (silicon dioxide) and rubidium oxide in the form of K-feldspar. The special nature of the deposit is the high purity and the relative high lithium grade averaging 1.4 % Li<sub>2</sub>O. The in February 2002 published historic (meaning not according to Canadian standard NI 43-101) resource estimate indicates a probable reserve of 3.2 million tonnes ore grading on average 1.41 % Li<sub>2</sub>O (down to 60 m) and 5.6 million tonnes ore grading on average 1.41 % Li<sub>2</sub>O (down to 110 m) in total a resource of 11.6 million tonnes ore grading on average 1.34 % Li<sub>2</sub>O plus traces of feldspar, silica and tantalum. In this context it is important that the indicated



*Separation Rapids is a very rare petalite deposit which formed in lithium bearing granite pegmatite.*

reserves can possibly be mined in an open pit operation.

### Separation Rapids Lithium Project – Feasibility Studies, Resource updates, Test mining, Infrastructure

The 2016 expected Preliminary Economic Assessment (PEA) and for 2017 planned Feasibility Study will present more detailed information about possible mining scenarios. As well, the company is working to upgrade the existing reserves and resources to a NI 43-101 estimate, the prerequisite for a PEA. In addition, this year Avalon produced one tonne of ultra pure lithium concentrate from a bulk sampling program. Meanwhile the metallurgic work continues. To date the most important objectives have always been reached. A demonstration plant will provide additional results regarding the metallurgy and the use of the by-products. In terms of quality the company has reached a level which is sufficient for the glass and ceramics industry. In a further step the company is working to produce battery grade lithium hydroxide concentrate. Furthermore the company currently plans an additional drill program to identify additional resources. The start is expected at the end of 2016/beginning of 2017. As well, different studies are planned about a

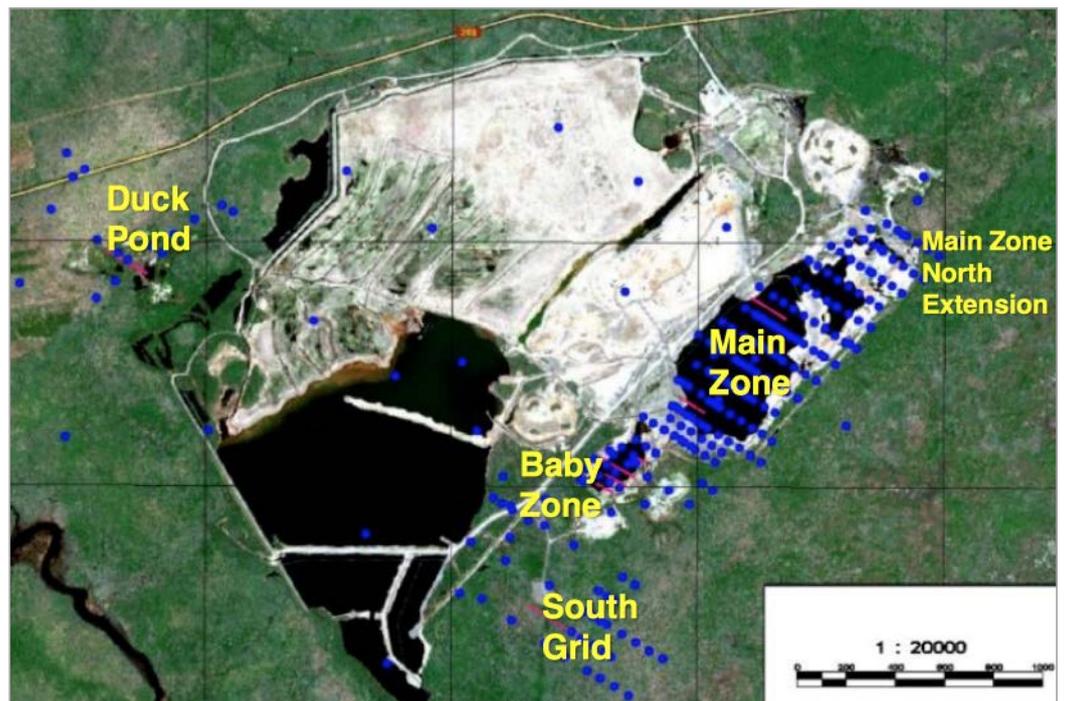
possible entirely self-sufficient energy supply. Avalon considers and examines the possibility of its own hydroelectric plant in the area of the nearby English River and the use of wood waste in a biomass power plant. The company will expand the existing road connection. Environmental studies completed in preparation of the targeted feasibility study complement the many current work programs.

### **East Kemptville Tin-Indium Project as short term cash generator!?**

Besides Separation Rapids, Avalon Advanced Materials is focused on an additional project called East Kemptville. It is located in the Canadian province of Nova Scotia and hosts a tin-indium mine which was in operation between 1985 and 1992. The area includes untouched sections in the mine and a large ore stockpile as well

as some bigger tailings ponds. The ore stockpile alone contains an inferred Resource of 5.87 million tonnes ore averaging 0.112 % tin. The mine contains indicated and inferred resources of 35.5 million tonnes in total averaging 0.148 to 0.176 % tin plus zinc and copper. The element indium became the focus only recently. Drilling in the so called Baby Zone returned among other results 0,46 % tin, 25.2 ppm indium and 0.63 % zinc over 82.3 m which are much higher grades than in the last resource estimate. Due to these very good drill results Avalon Advanced Materials is working on a PEA. The completion is expected in the summer of 2016. First estimates indicate initial capital costs of C\$ 15 to 20 million, primarily for a new processing plant. If the PEA returns positive numbers the company could start processing the stockpiled ore in 2017. This would provide the company with a cash generator in the short term and that will help Separation Rapids be developed faster and easier.

*East Kemptville, Mineralized Zones and Drilling Areas*



# Factsheet

## Solid Finances – disciplined use of shareholder capital

To date the company has invested approximately C\$ 7.6 million in the project, C\$ 1.4 million in the nine months before May 31st 2016 alone. At that time Avalon had cash on hand of C\$ 2.0 million. In the past Avalon Advanced Materials did not stand out due to its excessive financings. The company raised only enough fresh cash necessary to reach selected targets. In the current year 2016 a total of C\$ 2.145 million was raised.

## Summary: well advanced, high grade open pit project and additional revenues

Avalon Advanced Materials demonstrated foresight almost 20 years ago by securing one of the best lithium projects in North America. This project hosts not only a relatively high grade lithium resource with optional by-products but can also be mined with cost saving open pit methods. A soon to be published Economic Assessment will present more detailed information. For all the above mentioned reasons we can expect very economic key figures which could rapidly lead to a production decision upon completion of a feasibility study in the coming year. In addition the company has with East Kemptville the opportunity to generate the needed cash flow in the short term to advance Separate Rapids faster and easier. The most important catalysts in the coming months: PEA Separation Rapids, PEA East Kemptville, resource estimate Separation Rapids, Drill results, production decision East Kemptville, feasibility study Separation Rapids. A full program that could give the Avalon shares a strong boost

**ISIN:** CA05337L1067  
**WKN:** A2AFJK  
**FRA:** OU5  
**OTCQX:** AVLNF  
**TSX:** AVL

Shares outstanding: 179.5 million  
Options: 11.0 million  
Warrants: 24.4 million  
Fully diluted: 214.9 million

### Contact

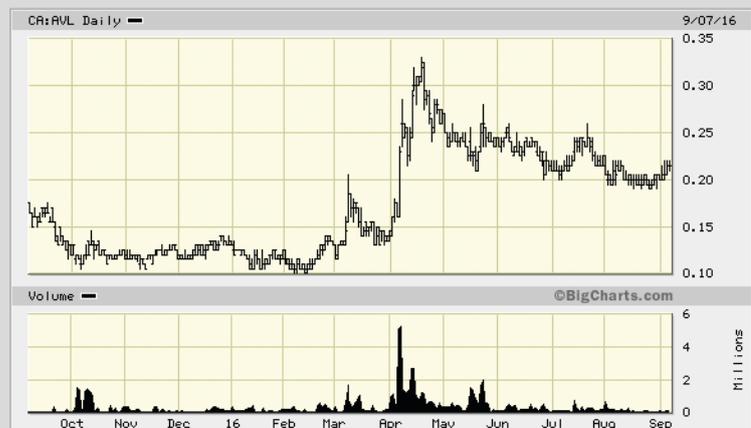
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www.avalonadvancedmaterials.com

### CEO:

Donald S. Bubar



(reference: BigCharts)

# Birimian Limited

## Very high lithium grades and open-pit mining potential

Birimian Limited is one of the most active lithium exploration companies in western Africa. The Australian company has lithium and gold licences primarily in Mali, covering approximately 2,000 km<sup>2</sup>. The development areas are characterized by a well developed infrastructure and increased exploration and mining activity.

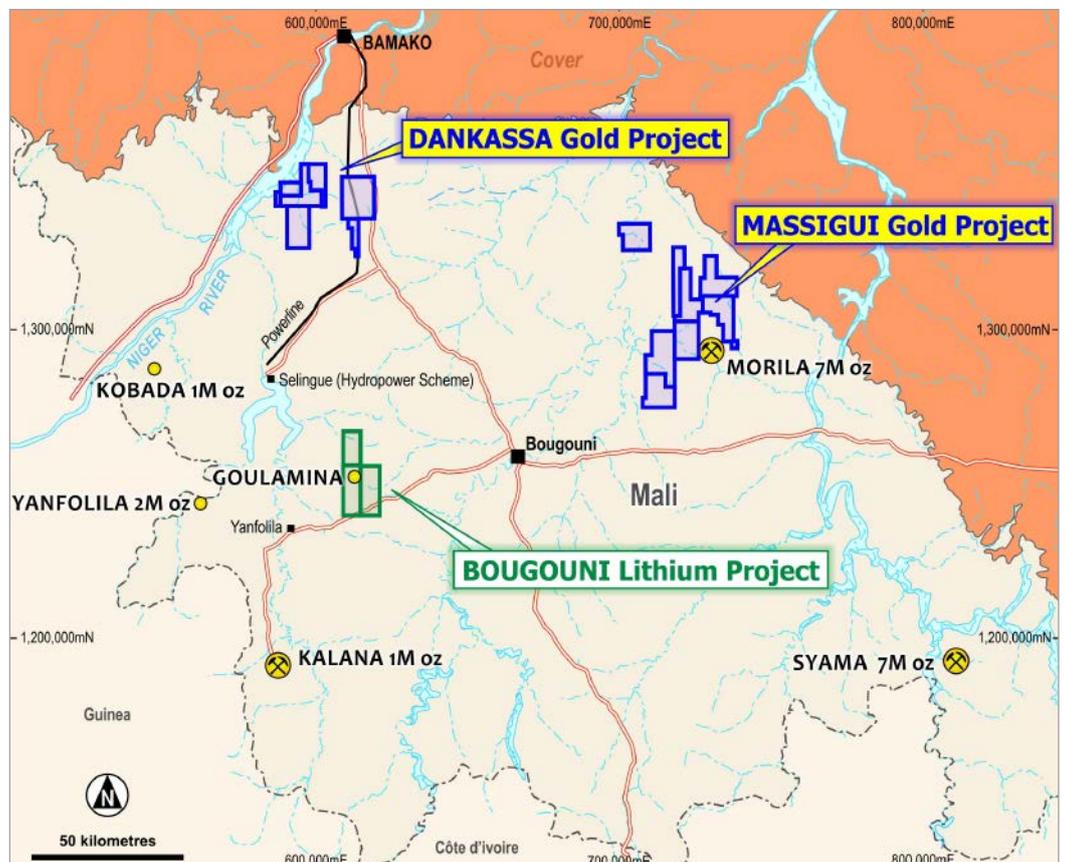
### Bougouni Lithium Project: Location

The main focus is on the development of the Bougouni Lithium Project. In March 2016 Birimian Limited acquired 100 % of the project located in southwestern Mali about 50 km from the border to Guinea. Mali's southwest features several large new discoveries. Several million ounce gold projects are located within a radius

of 50 km of Bougouni. The project area which was comprised of three licences which was consolidated into one covering 257 km<sup>2</sup>. Bougouni is located approximately 150 km south of Mali's capital Bamako. The project site is crossed by a main road. Sufficient quantities of power and water are also available in the immediate surroundings. The town Yanfolila with a population of 12,000 is at a distance of 20 km.

### Bougouni Lithium Project: Resource

The Bougouni licence hosts the known lithium deposit Goulamina. From the beginning Birimian's main focus was that deposit. Two months after the acquisition announcement, the company began the



Location of the Bougouni-lithium project and the two gold projects Dankassa and Massigui.

first drilling activities returning high grade results including 52 m @ 1.70 % Li<sub>2</sub>O, 40 m @ 1.84 % Li<sub>2</sub>O and 23 m @ 1.96 % Li<sub>2</sub>O. All the results were encountered in depths of less than 120 m and in part in a depth of only 10 m. Overall, Birimian obtained grades up to 2.20 % Li<sub>2</sub>O with the first 14 drill holes including 18 m @ 2.10 % Li<sub>2</sub>O!

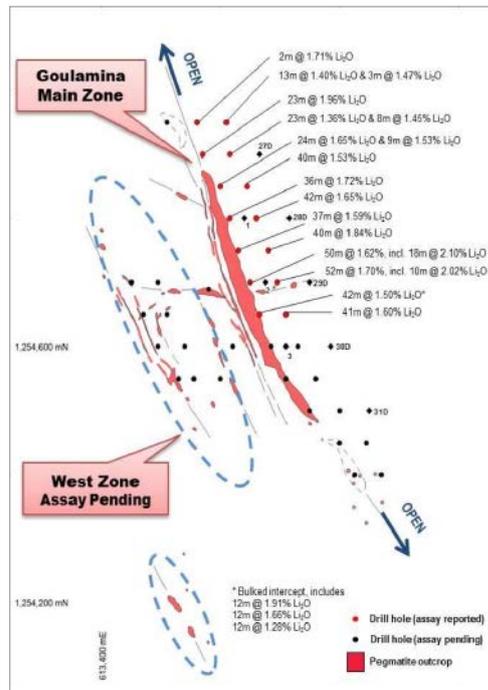
### Bougouni Lithium Project: Potential

The announcement of the results of additional 27 RC drill holes is expected by the middle of September 2016. These drill holes also tested the West Zone that like Goulamina shows lithium outcrops at the surface. The first two drill holes in this area returned astonishing results, for example 46 m @ 1.79 % Li<sub>2</sub>O starting in a depth of 6 m including 11 m @ 2.19 % Li<sub>2</sub>O.

Goulamina extends for over 700 m and the resource remains open along strike and to depth. Due to the previous results Birimian's management assumes an initial exploration target of 15 to 18 million tonnes of ore averaging 1.8 to 2.2 % Li<sub>2</sub>O. By now it is clear that Goulamina can be mined in an open pit scenario. The previous results which were derived from shallow depth allow this conclusion. Nevertheless, Birimian is drilling diamond core drill holes down to depths below 150 m to test for further potential and to obtain information about potential high grade lithium resources in deeper layers. First visual inspections seem to confirm this assumption but assay results are still pending.

### Bougouni Lithium Project: Metallurgy

Besides its own drill results, Birimian Limited can also use the data from metal-



Goulamina extends for over 700 m.

urgical tests. These tests were carried out by the renowned company CSA Global with the aid of a World Bank program before the acquisition. In a bulk sample comprising three tonnes of material an average grade of 2.2 % Li<sub>2</sub>O was identified plus 0.5 to 0.8 % iron oxides. Test runs demonstrated the possibility to produce a high grade lithium concentrate. With screening and dense media separation a 6.7 % chemical grade lithium concentrate was produced. The recovery rate, the percentage of the total lithium in the rock that can be recovered from it, was a very high 84.7 %. Due to the high grade nature a high mass yield of 31.5 % was achieved.

### Bougouni Lithium Project: JORC Resource and Scoping Study

The previous and current drilling should be soon included in an initial JORC resource (comparable with the Canadian

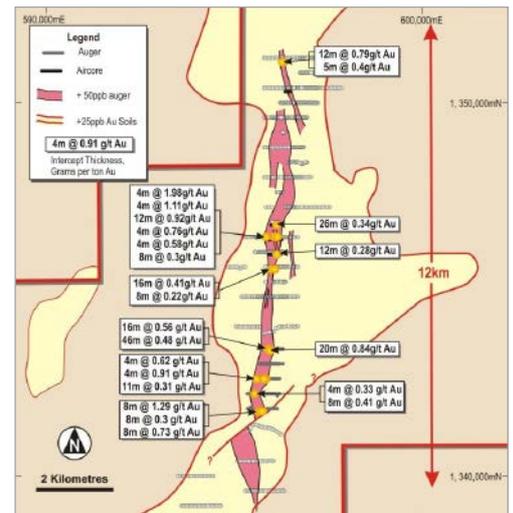
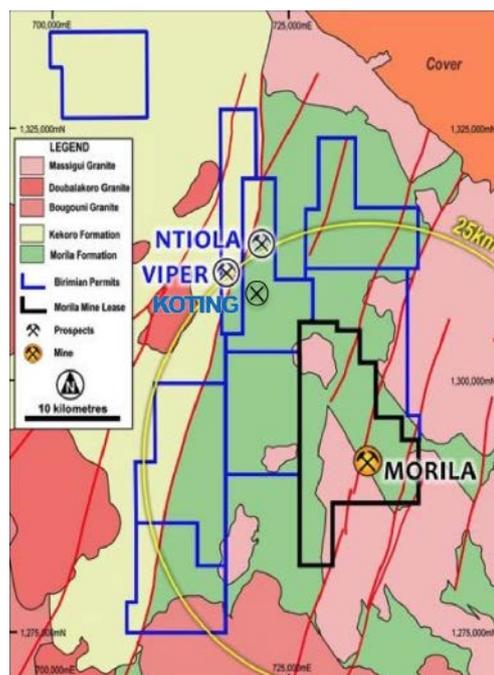
resource standard NI 43-101) by October 2016. With this first resource Birimian will complete a scoping study by the end of the year.

### Massigui Gold Project

Besides the high grade Bougouni Lithium Project, Birimian Limited has three promising gold projects. The main focus is above all on the Massigui Gold Project that is also situated in southwestern Mali. The licence area covers 754 km<sup>2</sup>. The single licences border in the north the Morila Gold Mine operated by Randgold and AngloGold Ashanti that has produced in excess of six million ounces of gold since 2000. So far Birimian Limited's drilling activities at Massigui comprised of more than 35.000 m and identified three gold deposits which are located within a radius of maximal 25 km of Morila. Birimian's management believes that at least 8 million tonnes of ore averaging 1.5 g/t gold for 400,000 ounces can be mined by open-pit techniques in these three depo-

sits. In addition, the licence area shows a far greater potential for additional resources. The Morila Mine has reserves of only 300,000 ounces and resources of 400,000 ounces left and will survive only a few years with its own deposits. Birimian has the opportunity either to process its own gold ore in the gigantic processing plant or form a joint venture with Randgold/AngloGold or to sell Massigui to these major companies. Considerations and discussions are ongoing.

The main focus is above all on the Massigui Gold Project that is also situated in southwestern Mali. The licence area covers 754 km<sup>2</sup>



Dankassa Project Drill Hole Results, June 2014

### Dankassa Gold Project / Basawa Gold Project

With Dankassa only 50 km south of Bamako and Basawa in Liberia, Birimian Limited has two additional promising gold projects even if they are not the main focus of the company at the moment. Birimian Limited has identified a 12 km long gold mineralization at Dankassa. On the huge Basawa Gold Project covering 1,000 km<sup>2</sup>, the company discovered several gold areas that require further testing.

# Factsheet

## Summary: at full throttle to one of the highest grade and possibly most economic lithium resources worldwide

Birimian Limited has seized the chance as one of a few development companies to secure a lithium deposit on the African continent. If the high grade nature of Bougouni is confirmed than the African continent might not be spared from copycats. Until then, Birimian Limited is in pole position.

The company benefits from previous tests that clearly demonstrate that Bougouni hosts a high grade and high quality lithium resource confirmed by the company's own drilling within a very short time. It is not surprising that Birimian Limited will be able to present an initial resource estimate within a year followed by a first economic assessment. A closer look at the known facts and parameters leads to the conclusion that Bougouni could be one of a few absolute jackpots in the lithium sector. Good infrastructure, high grades and the possibility of low cost open-pit mining as well as high cash reserves of AU\$ 8.5 million (June 30, 2016) is exactly what investors look for in projects in the lithium sector! In addition, it is possible to generate a relative short term positive cash flow with the Massigui Gold Project.

**ISIN:** AU000000BGS0  
**WKN:** A1JQXE  
**FRA:** N9F  
**ASX:** BGS

Shares outstanding: 178.1 million  
Options: 28.9 million  
Warrants: -  
Fully diluted: 207.0 million

### Contact:

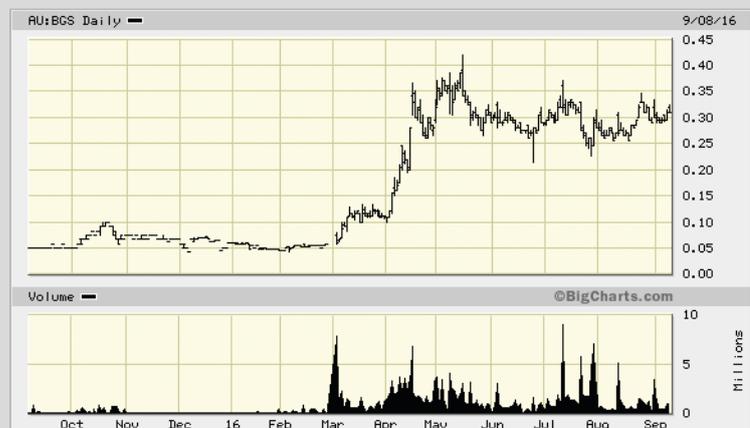
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fax: +61 8-9226-2027

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### Managing Director:

Kevin Joyce



(reference: BigCharts)

# Fairmont Resources

## With lithium and industrial minerals a two-pronged approach for success



Michael Dehn, CEO

Fairmont Resources is a Canadian resource company specializing in the development of lithium and industrial minerals projects. The company has, among others, a promising lithium project in Québec and will acquire a granite quarry in Spain. In addition Fairmont Resources owns several conveniently located quartz and quartzite projects which could be brought to production relatively quickly with low costs.

### Rome Lithium Project

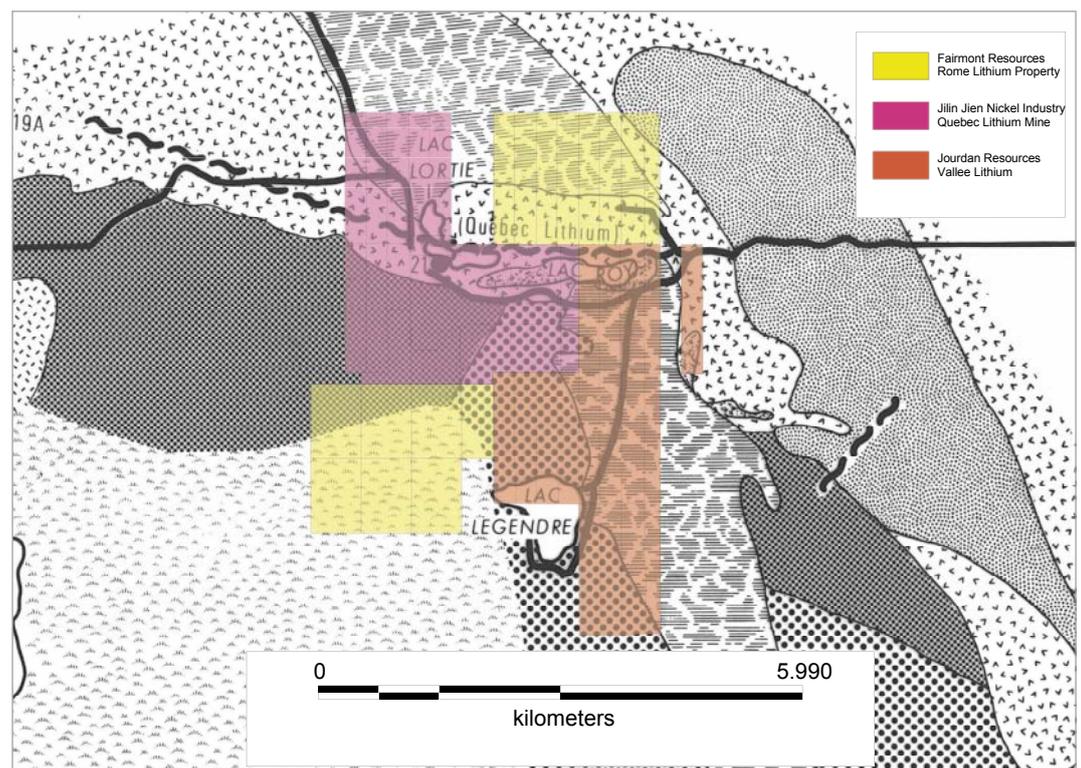
Fairmont Resources has a 100 % interest in the Rome Lithium Project in Québec. This comprises of two separate licence areas which border in the north and south Jilin Jien's Québec lithium mine. The mine hosts a measured and indicated resource of 41.5 million tonnes averaging 1.09 Li<sub>2</sub>O as well as a inferred resource of 17.7 million tonnes averaging 1.10 % Li<sub>2</sub>O.

Fairmont Resources' licence areas also border Jourdan Resources' Vallee Lithium Project. Drill holes totaling over 4.000 m resulted in the discovery of over 100 pegmatite and aplite dykes. Jourdan Resources identified up to 1.19 % Li<sub>2</sub>O over 5.50 m in these dykes. The Rome Lithium Project is surrounded by projects with high grade lithium resources.

### Acquisition of Granitos de Badajoz S.A.

Fairmont Resources is currently in the acquisition phase of Granitos de Badajoz S.A. (Grabasa) a Spanish granite company operating from 1975 until 2011. The company still has an operational processing and finishing facility and almost all the necessary quarrying equipment. The ISO 9001:2008 certified company situated just outside of Burguillos del Cerro, is state of the art. The purchase price inclu-

*This comprises of two separate licence areas which border in the north and south Jilin Jien's Québec lithium mine.*



des new cutting and polishing equipment valued € 2.2 million purchased by Grabasa as part of a production expansion between 2008 and 2010. In addition, a large number finished or half finished granite slabs are stored at the production site which can be sold quickly. Grabasa has an annual production capacity in excess of 250,000 square metres and is comprised of 23 granite quarry licences. 18 of the 23 licences are located within a radius of 8 km to the processing plant and the remaining 5 within a radius of 20 km. The granite of the Spanish province of Estremadura, where Grabasa is located, has a very high quality. The acquisition costs are in total € 4.275 million whereof the company has paid € 1.725 million already.

In contrast, Grabasa averaged over €6 million in annual sales in the last 5 years of its operation. The operative margin was approximately 30 %. Fairmont Resources' management team under CEO Michael Dehn believes that this margin can be increased by optimizing the workforce and equipment. As well by opening up new markets in North America and Asia higher sales prices could be achieved.

### Buttercup / Hearth Claims

Another promising project is Buttercup. It is located northwest of Saguenay, Québec, and has access to a deep water port in the Saint Lawrence River and thus to the Atlantic Ocean. Buttercup is an iron-titanium-vanadium project with a historical resource on 3.5 million tonnes @ 48 % iron, 19 % TiO<sub>2</sub> and 0,66 % V<sub>2</sub>O<sub>5</sub>. This estimate only includes the Lenses A and B tested down to a depth of only 30 m. In addition a Lense C was outlined. Sampling of Lense A and C returned in part over 73 % iron and over 20 % TiO<sub>2</sub>. Buttercup is comprised of 31 claims and permitted for potential production.

The Hearth Project comprising 96 claims lies in the immediate neighbourhood.

### Quartz and Quartzite Projects

Fairmont Resources has controlling interests in three quartz and quartzite projects in Québec. The Lac Bouchette Project is conveniently located 60 km west of Saguenay. It surrounds the past producing Lac Bouchette Mine that produced 62,000 Tonnes silicon dioxide and still contains a historic reserve of 312,000 tonnes @ 99.8 % SiO<sub>2</sub>, 0.06 % Al<sub>2</sub>O<sub>3</sub>, and 0.03 % Fe<sub>2</sub>O<sub>3</sub>. Currently, a plan for the pit expansion is prepared.



The Forestville Quartzite Project is located 20 km northwest of Forestville in Québec. The Québec government through Sigeom (Système d'information géominère du Québec) provided 162 surface samples. These samples, with up to 99.91 % SiO<sub>2</sub> were collected along a traverse in the western portion of the licence area. Fairmont Resources plans a drill program and to apply for a mining licence upon completion of the metallurgical tests in 2017.

The Baie-Comeau Quartzite property is 8 kilometres northwest of the town with the same name Baie-Comeau, Québec. The project hosts a historic reserve of 11.2 million tonnes @ 99.20 % SiO<sub>2</sub>, 0.41 %



# Factsheet

can almost be used as raw material. Only the purchase of mining equipment and transport trucks will be reflected in the budget being a single-digit million US-dollar amount. Buttercup is a fully permitted project that can be brought to production immediately. The permitting processes are simpler with these projects compared with precious or base metal projects.

The not yet closed acquisition of Granitos de Badajoz S.A. will provide Fairmont Resources a regional diversification. The operation seems to be solidly positioned and can be brought back to production in the short term. In a few years the management team under the experienced CEO Michael Dehn could create a project portfolio containing important industrial minerals projects which have the potential for a long term raw material production and at the same time a short term realizable raw material production.

In addition Fairmont Resources has only 31.5 million shares outstanding which can lead to a significant share price increase when the company hits the target on the potential high grade Rome Lithium Project that seems to be surrounded by resources.

**ISIN:** CA3055542060  
**WKN:** A1T9SG  
**FRA:** F001  
**OTCQX:** FRSSF  
**TSX:** FMR

Shares outstanding: 31.5 million  
Options: 3.1 million  
Warrants: 4.3 million  
Fully diluted: 38.9 million

## Contact:

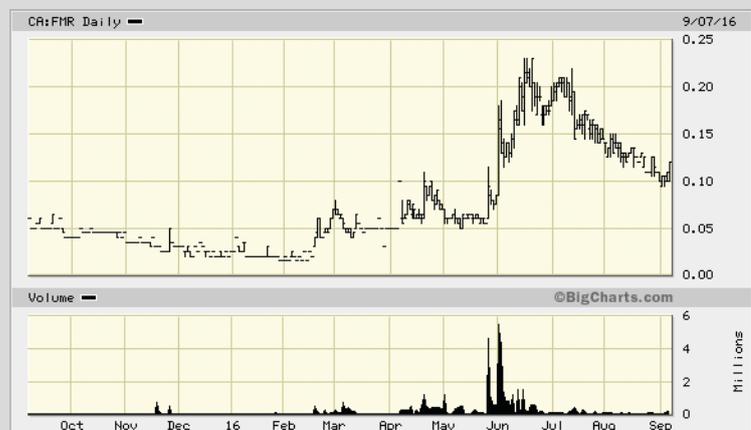
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michael@fairmontresources.ca  
www.fairmontresources.ca

## CEO:

Michael Dehn



(reference: BigCharts)

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# Jourdan Resources Inc.

## Two promising early stage lithium projects in top locations



Michael Dehn, CEO

Jourdan Resources is a Canadian junior mining company focused on the development of lithium projects. The intention of the company is to maximize shareholder value by establishing high grade lithium projects with a professional and highly experienced management.

### Vallee Lithium Project

Jourdan Resources has a 100 % interest in the Vallee Lithium Project in Québec. It borders in the west and northwest Jilin Jien's Québec Lithium Mine, which is in the pre-production phase and will later produce 20,000 tonnes annually of battery grade lithium carbonate. This mine hosts a measured and indicated resource of 41.5 million tonnes averaging 1.09 % Li<sub>2</sub>O as well as an inferred resource of 17.7 million tonnes averaging 1.10 % Li<sub>2</sub>O.

The spodumene pegmatite dykes that will be mined by Jilin Jien continue on to Jourdan Resources' licence area. Jourdan Resources drilled several drill holes on its licence area in the past. 21 drill holes totaling more than 4.250 m on the Vallee Lithium Project resulted in the disco-

very of over 100 pegmatite and aplite dykes in 2011. Jourdan Resources identified up to 1.19 % Li<sub>2</sub>O over 5.50 m in these dykes. In addition, the following results were received:

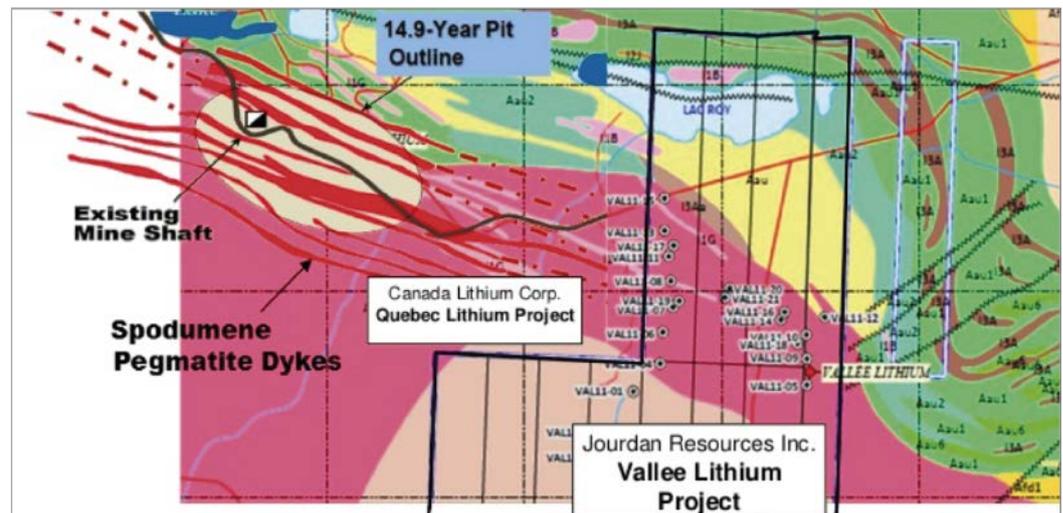
- ▶ 1.19 % Li<sub>2</sub>O over 5.50 m
- ▶ 1.05 % Li<sub>2</sub>O over 4.31 m
- ▶ 1.03 % Li<sub>2</sub>O over 4.63 m
- ▶ 2.68 % Li<sub>2</sub>O over 0.85 m

All drill locations are about 2 km from the planned 14.9 year pit and approximately 1 km from the planned 30 year pit of Jilin Jien's Québec Lithium Mine.

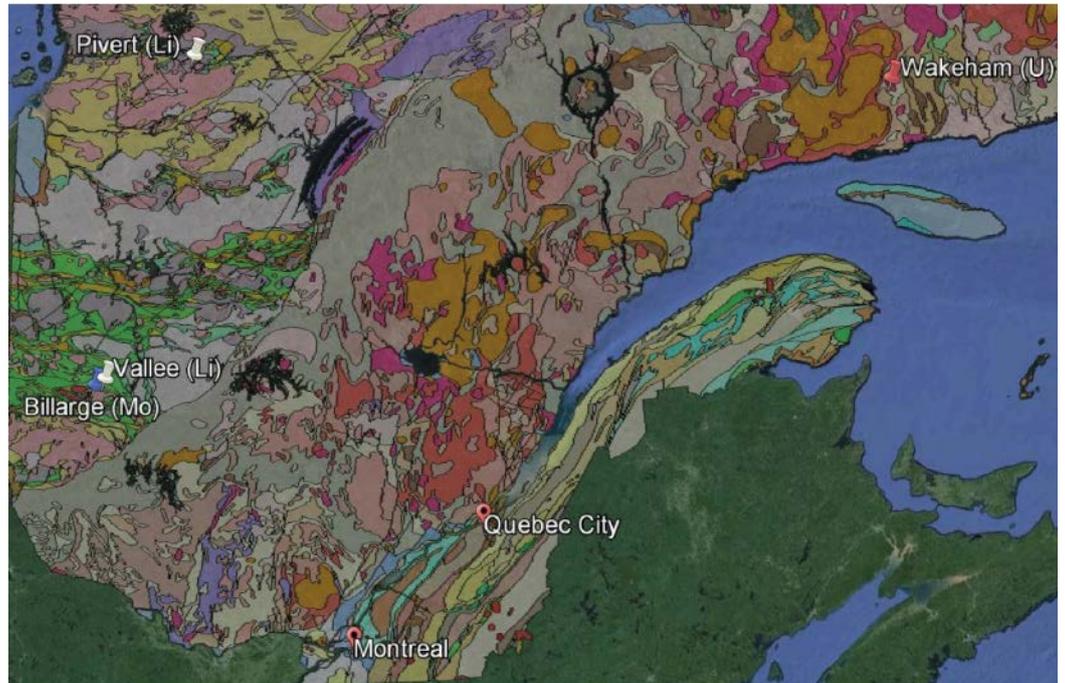
Historic results are in the range of up to 2.97 % Li<sub>2</sub>O but have to be confirmed.

### Baillarge Lithium-Molybdenum Project

Jourdan Resources' second lithium project is located only a few kilometers southwest of Vallee. The Baillarge Project is situated next to the former La Corne Mine, which was operated as an underground mine by Molybdia Corporation Limited (now Romios Gold) between 1951 and 1972. During this period the La Corne



*The two lithium projects  
 Vallee and Baillarge are only a few  
 kilometers apart .*



Mine produced in total 3.8 million tonnes ore averaging 0.33 % MoS<sub>2</sub> (equal 6.6 pound per tonne) and 0.04 % bismuth (0.8 pound per tonne). Jourdan Resources collected several surface soil sample returning up to 5.47 % Mo. The Québec Government, through Sigeom (Système d'information géomineière du Québec) conducted a drill program in the 1950's that confirmed a significant lithium mineralisation on the eastern extension of the La Corne Mine which is Jourdan Resources'

Baillarge licence area. Drilling on Baillarge returned, among others, 2.48 % Li<sub>2</sub>O over 2.30 m.

### **Planned exploration activities and additional project**

Jourdan Resources' management team under the experienced CEO Michael Dehn is working on several permit applications for drilling activities on both projects. As well the company is carrying out preliminary works like stripping of out-crops and channel sampling.

In addition, Jourdan Resources is in the due diligence phase of an additional lithium project situated in the same region as the other two.



### **Experienced and innovative CEO**

Jourdan Resources is managed by CEO Michael Dehn. Mr. Dehn has over 20 ye-

# Factsheet

ars experience in the mining industry. He has held the position of Senior Geologist, VP Corporate Development, President, CEO, and/or Director of several public and private companies. He has worked in diamond, base metals, precious metals, oil and natural gas, as well as sand, gravel and peat deposits, primarily in the Americas for public and private companies and on government projects. Michael Dehn's combination of technical and business skills have led to the development of new economical hydrometallurgical processes on historical geological deposits.

## Summary: early stage projects with top potential

Jourdan resources should be considered as an early stage chance nevertheless the company has been working on the Vallee Lithium Project for several years. Both projects are situated in the immediate neighbourhood of former mines with branches of their mineralization zones extending on to Jourdan Resources' licence areas. Furthermore, the company is working on the acquisition of an additional project with similar potential. Jourdan Resources now has a multiple chance for a hit which could catapult the share price of the company sky high. The company only has 13.6 million shares outstanding from which 28 % are in the possession of the management and the board members! This is a stock with a narrow market promising a high volatility but also excellent price chances. Jourdan will be relisted in the middle of September 2016 and, besides a listing on the TSX Venture Exchange, be tradable in Germany.

**ISIN:** CA4809014042  
**WKN:** A12DWV  
**TSXV:** JOR

Shares outstanding: 13.6 million  
Options: 0.3 million  
Warrants: -  
Fully diluted: 13.9 million

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### CEO:

Michael Dehn

# Lithium X

## Cost saving expansion strategy in two lithium hot spots



Brian Paes-Braga, CEO

Lithium X Energy is a Canadian lithium development company with promising projects at two absolute lithium hot spots. In Clayton Valley the company has the largest land position of all lithium development companies and borders Albemarle's Silver Peak Mine Project. The second high grade lithium project is located in the lithium triangle between Chile, Bolivia, and Argentina.

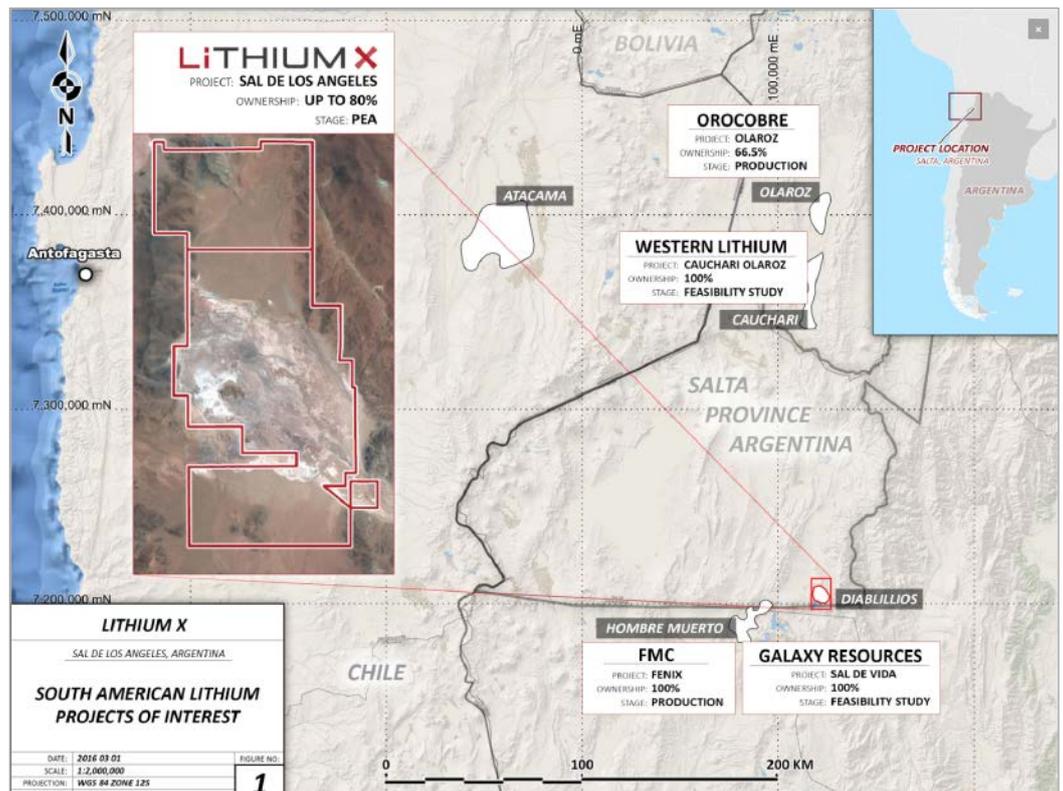
ration and development on the project site, C\$ 17.2 million in the years 2010 to 2015 alone. The Sal de Los Angeles Lithium Project has a historic inferred resource of 2.8 million tonnes LCE (Lithium Carbonate Equivalent) with extremely high average grades of 556 mg/l Li and 6,206 mg/l K respectively.

### Sal de Los Angeles: Location and Resource

Lithium X owns 50% of the Sal de Los Angeles Project in Argentina. The Sal de Los Angeles Project covers more than 95% of the Salar de Diablillos located in the very mining friendly province of Salta. The Project includes 32 claims covering 8,156 hectare. Previous owner and leaseholder invested C\$ 19 million in the explo-

### Sal de Los Angeles: Exploration activities

The previous owners and leaseholders drilled around 170 drill holes as well as 16 pumping and monitoring wells in the licence area. Several pumping tests were carried out with positive results. In addition, gravity and seismic surveys were carried out as well as transport and production models created. These activities resulted in having all the necessary data for a resource upgrade. Lithium X wants





*Sal de Los Angeles*

to publish an upgraded resource and install a ponding facility first. Sal de Los Angeles could host a much larger resource because to date the outlined resource is open to the north and also contains a high grade core section with lithium grades of up to 640 mg/l.

### **Sal de Los Angeles: positive historic Economic Assessment**

Rodinia Lithium Inc., one of the previous leaseholders, published a Preliminary Economic Assessment (PEA) prepared by the renowned SRK Consulting on Dec. 22, 2011. The PEA was based on an operation producing 15,000 tonnes of lithium carbonate and approximately 51,000 tonnes of potash per year. The PEA projected a 34% internal rate of return (“IRR”) pre-tax and a US\$561-million pre-tax net present value (“NPV”) at an 8% discount rate. The PEA also outlined an increased annual production of 25,000 tonnes lithium carbonate and 85,000 tonnes potash and estimated a pre-tax IRR of 36% and a NPV of US\$964 million. Although the PEA is based on inferred resources which doesn’t comply with guidelines of the Toronto Stock Exchange (TSX) the study contained very positive economic numbers. The PEA was based on a lithium carbonate price of US\$ 5,000 per tonne.

Currently, Chinese traders pay four times more per tonne!

### **Sal de Los Angeles: Acquisition**

In May 2016 Lithium X announced the closing of a joint venture agreement with Salta Exploraciones SA for the construction and operation of a pilot lithium production facility on the Sal de Los Angeles Lithium Project. According to the agreement, a pilot production facility will be installed and operated for the production and commercial sale of up to 5,000 tonnes LCE per year (tpa). Salta Exploraciones SA is a consortium of Argentinian Engineering and construction companies already having a great wealth of experience with the establishment of lithium brine projects in Argentina. The company can earn up to 50 % in Lithium X’s interest in the Sal de Los Angeles Project by contributing the required amount for the construction and operation (estimated US\$ 6 million) of an initial 2,500 tpa facility. This includes financing one full year of post-construction operation. Later there will be an option for expanding the facility to 5,000 tpa. Lithium X estimates that the operation of a ponding facility at Sal des Los Angeles will provide enough data for a larger operation during the next three years.

## Clayton Valley Project / Nevada

Lithium X has licences in Clayton Valley covering 6.075 hectare owning the biggest land position of all development companies. Currently there are more than a dozen development companies active in Clayton Valley. The Clayton Valley Project is divided into two different subprojects. The northern part borders in the north and the southern part in the southwest Albemarle's area and in the west Pure Energy's licences. In March 2016 Lithium X received the permit for an initial four drill holes down to a depth of 350 m. There the company assumes a basal gravel aquifer. In total the basin hosts at least five known lithium bearing strata and this gravel aquifer with some expected potential. The drilling began at the end of July 2016. Positive results from these drill holes could lead to a first resource estimate.



## An incredible successful management

Lithium X's biggest asset is its extremely successful management team. It was involved in mining transactions valued US\$ 14 billion during the 12 years.

As former chief of the Latin America division of Rockwood Lithium, Lithium X's COO Eduardo Morales led this company to the US\$6.2 million takeover by Albemarle. Part of the deal was the Silver Peak Mine in Clayton Valley.

Executive Chairman Paul Matysek is said to be the ultimate uranium and lithium expert and has founded three mining companies in the last decade. The companies ended in takeover deals totaling US\$ 2.3 billion. Among them was Lithium One, which merged with Galaxy Resources.

Further transactions with involvement of Lithium X's management were among others the US\$ 2.4 billion merger of Goldcorp with Wheaton River in 2004, the US\$ 1.8 billion merger of Uranium One with Energy Metals as well as with UrAsia Energy (US\$ 3.1 billion) both in 2007 and the takeover of Potash One by K+S (US\$ 434 million) in 2011.

With the new VP Project Development Will Randall, Lithium X has gained not

# Factsheet

only a team member with great experience in the lithium sector but also someone who was involved in drill programs in Clayton Valley and the Argentinian Salars.

## Summary: little own expenditure, lots of competency, high potential

Lithium X is quite clever: the company secures a (majority) interest in a very promising lithium brine project in Argentina, where it has to invest only a manageable amount and then transfers the initial (pilot) production to a local consortium consisting of experienced engineering and construction companies that will incur all necessary costs for the construction and the initial operation of the pilot facility. In return, Lithium X has to yield a part of the project but has only small expenses and can focus on additional projects. Although the Sal de Los Angeles currently has the highest priority the company has an equally high potential for a future lithium production in Clayton Valley. After all the large licence area borders immediately the only producing lithium brine project in North America. Investors with an investment in Lithium X have a multiple chance for positive news and for a positive share price development.

**ISIN:** CA5368161017  
**WKN:** A2ABEY  
**FRA:** RUT  
**OTCQX:** LIXXF  
**TSXV:** LIX

Shares outstanding: 66.6 million  
Options: 6.4 million  
Warrants: -  
Fully diluted: 73.0 million

### Contact:

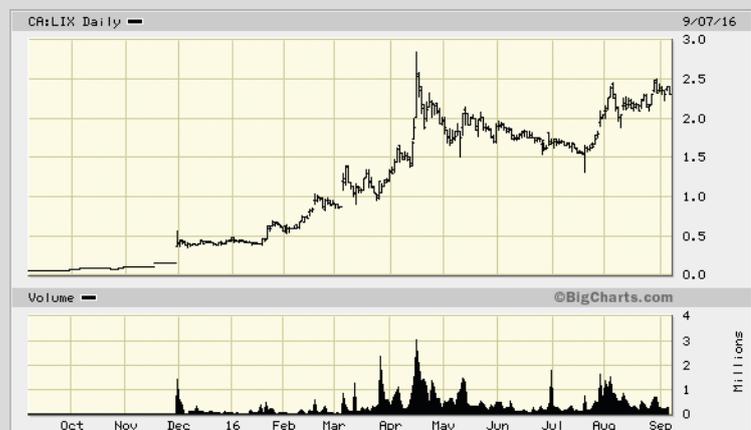
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www.lithium-x.com

### CEO:

Brian Paes-Braga



(reference: BigCharts)

# MacArthur Minerals

## High exploration potential at Australia's lithium hot spot!

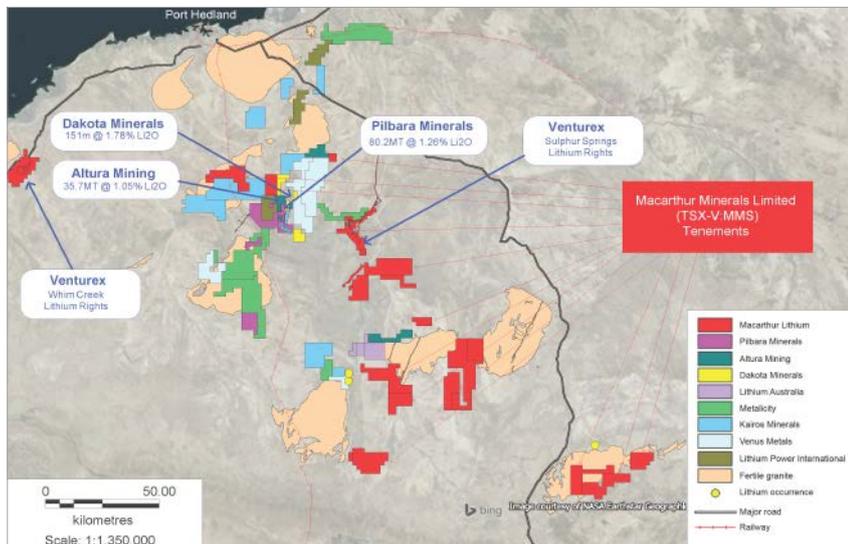


David Taplin, CEO

MacArthur Minerals is one of the few Australian companies which is listed at the TSX Venture Exchange that has significant lithium exploration interest in Australia. MacArthur Minerals has applied for a total of 21 exploration licences and prospective interest in rights to lithium covering a total area of 2,029 km<sup>2</sup> in the Pilbara, Ravensthorpe and the Yalgoo/Edah regions of Western Australia. In addition, the Company has also entered into an agreement to acquire the Stonewall Project in Nevada, which covers an area of approximately 23 km<sup>2</sup>.

With this the company has one of the biggest land positions in the much frequented lithium region. The company has already identified pegmatitic rocks at several locations which is indicative of the occurrence of elements like lithium, tantalum, beryllium and tin.

which are an important source of lithium rich spodumene which in turn is the source for the commercial production of lithium. Some of the most significant lithium discoveries were made in this district. Above all Pilbara Minerals could already present a JORC reserve of 29.5 million tonnes @ 1.31 Li<sub>2</sub>O as well as a prefeasibility study with an IRR of solid 44 %. Recently Pilbara closed a financing of AU\$ 100 million to advance its lithium project. Altura Mining has a resource of 35.7 million tonnes @ 1.05 % Li<sub>2</sub>O and an IRR of 42.5 %. Only recently AU\$ 20 million were financed for the Pilgangoora Lithium Project. Dakota Minerals' Phase 1 drill program on the Lynas Find Lithium Project encountered among other 20 m @ 2.61 % Li<sub>2</sub>O. AU\$ 12.3 million of fresh funds were recently raised for additional exploration programs.



### MacArthur Minerals' licences in the Pilbara District

All the above mentioned projects are only a short distance from MacArthur Minerals' 18 exploration licence applications located in the Pilbara Lithium District covering in total 1,449km<sup>2</sup>. More important: MacArthur Minerals' licence areas have a similar geology to the above mentioned projects of the leading Australian lithium projects.

In May 2016, the Company completed its initial heliborne reconnaissance across a portion of its acreage in the Pilbara. Assay results from the initial heliborne reconnaissance sampling of pegmatites located within three of the Company's Exploration Licence Applications are encouraging, given the short nature (few days) of the initial reconnaissance program and the fact that reconnaissance work was only done on 7 of applied for licences. The company is planning additional reconnaissance activities on its ex-

### In good company in the Pilbara Lithium District

The most promising and important licences are located in Western Australia's Pilbara District. It is known above all for its rich iron ore deposits and hosts many lithium-caesium-tantalum pegmatites

ploration license applications. The majority of the Company's total lithium acreage is expected to grant by November/December 2016.

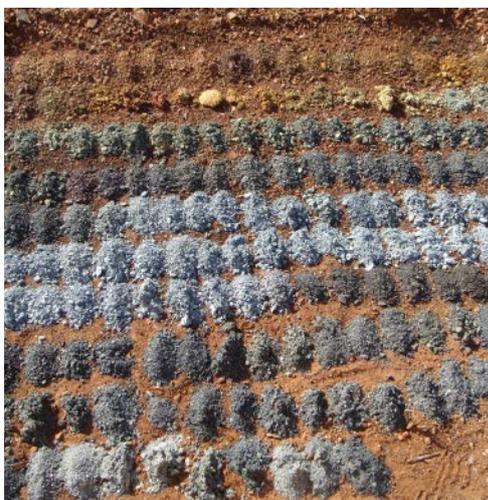
### **Memorandum of Understanding for Farm-in Agreement with Venturex Resources**

In May 2016 Macarthur Minerals and Venturex Resources Limited signed a memorandum of understanding for a farm-in agreement and a joint venture for the lithium rights on Venturex's Sulphur Springs Project. In July 2016 Venturex's Whim Creek Project was included in the agreement. Accordingly, Macarthur Minerals can earn a 51 % interest in the lithium rights through their own exploration activities.

Sulphur Springs covers about 118 km<sup>2</sup> and is adjacent to three of Macarthur Minerals' exploration licence applications. In addition, several of Venturex's and Macarthur Minerals' licences border the mining area of the Australian iron ore producer Atlas Iron Ore. Its managing director David Flanagan announced in May 2016 that his company held prospective tenure in zones of known world class-lithium.

Whim Creek covers 124 km<sup>2</sup> of the Archaean Whim Creek Greenstone Belt within the North Pilbara region.

Most of the Sulphur Springs and Whim Creek licences come with a granted mining lease and/or exploration permit which will allow for exploration and drilling activities. Venturex has already completed some Reverse Circulation Drilling on Sulphur Springs but to date only tested for the occurrence of zinc and copper. Nevertheless, a geochemical databank was set up and the drilled rock chips can be analyzed for lithium and the corresponding indicator minerals.



*A geochemical databank was set up and the drilled rock chips can be analyzed for lithium and the corresponding indicator minerals.*

### **Memorandum of Understanding for Farm-in Agreement with Zadar Ventures**

In July 2016 Macarthur Minerals entered into a memorandum of understanding for a Farm-in agreement with the Canadian lithium company Zadar Ventures Ltd. This is an agreement whereupon Zadar Ventures can acquire a 51 % interest in two of the Company's exploration licences applications (a total of 91 km<sup>2</sup>) from Macarthur in the Ravensthorpe region of Western Australia, by expending AU\$ 2 million for exploration within two years. Upon completing a NI 43-101 Preliminary Economic Assessment within three years, Zadar Ventures can increase its interest on the project to 75 %. The two licence applications, E74/587 and E74/588, which most likely will be granted in November/December 2016, are at a distance of approximately 7 km to Galaxy Resources and General Mining Corporation's Mount Cattlin lithium mine where lithium and tantalum concentrate is produced.

Zadar plans to commence initial field reconnaissance on Macarthur Minerals' lithium acreage at Ravensthorpe in the near future.

### **Edah Hill Acreage Package**

Besides the above mentioned licences Macarthur Minerals has applied for an additional licence in the Mt. Edah District, Western Australia. This licence covers 121 km<sup>2</sup> and is located in the Murchison Province.



### **Yalgoo Lithium Project**

On August, 2016, MLI entered into an agreement to acquire exclusive rights for lithium and other rare earth minerals on two granted exploration licenses covering an area of 191 km<sup>2</sup> in the Yalgoo region of Western Australia. The Yalgoo Acreage on which rights to lithium are acquired is in proximity to the Company's existing Edah Hill lithium acreage and consists of granted exploration licenses allowing immediate exploration for lithium. The underlying licences on which the rights of lithium are acquired consists of granted exploration licences, allowing for immediate exploration for lithium. Due diligence will focus on a reconnaissance trip to sample pegmatites revealed by historical records and sampling of core stored in Geological Survey of Western Australia facility.

### **Stonewall Nevada Lithium Project**

Macarthur Minerals has entered the United States lithium supply sector through an agreement to acquire the Stonewall Project in Nevada, which is prospective for lithium. The Stonewall Project covers an area of approximately 23 km<sup>2</sup> and the majority of a Salt Lake Playa in Nevada's Lida Valley Basin, the adjacent basin to the Clayton Valley Basin, which hosts the United States' only producing lithium mine. The Stonewall Project is considered essentially "drill ready" and a United States mineral exploration company is being engaged to undertake a shallow drilling program for due diligence purposes.

### **Iron Ore**

Before entering the lithium sector, the company developed several iron ore projects.

There is real potential for the iron ore assets to again add considerable market value in the future, with the company having previously spent over \$60 million to develop them to a "shovel ready" stage. The advanced iron ore projects for hematite and magnetite remain very valuable assets. There are good indications that the price of iron ore has recovered from its 2015 low of US\$38.30 per tonne to a spot price today of around \$US 60 per tonne. The Company will identify opportunities to maximise the value of the two iron ore projects as the global iron ore market continues to recover. This could be via joint venture, farm-in or sale or other options.

### **Strategic Investment by Rare Earth Minerals**

Since March 2016 Macarthur Minerals has an anchor investor in form of Rare Earth Minerals PLC who is a specialist In-

# Factsheet

vestment Company with significant interests in the Sonora Lithium Project in Mexico and the Cinovec Lithium Project in the Czech Republic and currently holds 12.29% of Macarthur Minerals.

## Financing

The Company has received this year, a total of \$1.3m from the pay up of warrants. It is also expected that the Company will receive by May 2017 a further C\$750,000 from the exercise of warrants by its major shareholder, Rare Earth Minerals Plc.

## Summary: low market cap, high exploration potential, more exposure than the Australian competitors

The strategy of Macarthur Minerals management is clear: to identify and develop high quality lithium projects. Macarthur is currently evaluating its acreage and commencing discussions with various third parties concerning potential joint ventures to maximise the exploration effort throughout 2016. Macarthur Minerals has made significant steps forward to become a significant new player in the evolving global lithium supply market. The Company has acquired one of the largest "hard rock" lithium acreage packages for any junior company in the Pilbara, Ravensthorpe and Edah regions of Western Australia. Macarthur's lithium acreage is in the heart of the Australian lithium boom province (the Pilbara). Macarthur will rapidly move forward to explore its lithium acreage and continue to identify and acquire high quality lithium assets.

**ISIN:** AU000000MFE9  
**WKN:** A2AD6M  
**FRA:** MMLA  
**TSXV:** MMS

Shares issued: 122 million  
Options: 10.4 million  
Warrants: 15 million  
Fully diluted: 147.4 million

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www.macarthurminerals.com

### CEO:

David Taplin



(reference: BigCharts)

# Millennial Lithium

## With infrastructural advantages on the fast lane to become a lithium producer



Graham Harris, Chairman

Millennial Lithium is a Canadian development company focused on lithium projects in Argentina. The company has a better connection to the existing infrastructure than most competitors and aims to start production within three years.

### **Pastos Grandes Lithium Project – location and acquisition**

The company's flagship project is Pastos Grandes a lithium project in Argentina's northwestern province of Salta. Pastos Grandes is a salt lake which is part of a row of similar lakes which stretch like a string of pearls across the provinces Salta and Catamarca. The project is located at a distance of approximately 50 – 60 km from the lithium projects of Lithium X, Lithium Americas, Galaxy Resources and Orocobre.

### **Overall the Pastos Grandes project consists of three different parts:**

- ▶ Millennial Lithium owns the option to acquire a 100 % interest in an exploration licence (1,221 hectare) from the actual private lessor Jorge Moreno. Millennial Lithium can acquire the 1,221-hectare project area for a total of US\$ 2.2 million plus one million shares of Millennial Lithium. Payment and share issue will be gradual. In addition there is a 1.5 % net smelter royalty which Millennial Lithium can buy back for US\$ 3 million.
- ▶ Meanwhile an application to the Provincial mining authority of Salta, REMSA, for additional 2.233 hectare land was granted. These are former claims that were given back to REMSA.
- ▶ Applications for the use of additional 4,236 hectares were filed with the pro-

vincial government in Salta. This area has not seen any exploration activities to this date.

### **Pastos Grandes Lithium Project – well connected to the existing infrastructure**

The biggest advantage is the relative proximity to the province capital of Salta. While the projects of most competitors are located in the middle of nowhere, Millennial Lithium has with its project a direct connection to the City of Salta with its 350,000 inhabitants located some 235 km away. Salta is the capital of the province of the same name in Argentina's northwest. There is also a 490 km road connection to the Chilean port city of Antofagasta, which not only has a deep water harbour but is also one of the leading mining cities in South America. Situated some 12 km north of the project area the small town of Los Pastos Grandes provides freshwater supply as well as a diesel generated 220 volt power supply. A 600 megawatt, 375 kV power line connecting Salta with Mejillones in Chile runs 53 km north of the project area. Some 26 km northwest of the project runs a natural gas pipeline.

### **Pastos Grandes Lithium Project – previous exploration activities**

In the years 2011 and 2012, the previous leaseholder Eramine Sudamerica SA invested over US\$ 4 million in the exploration on the 1,221 hectare part of the overall project. Historic sampling showed primarily very high grade lithium of 400 to 600 milligram per litre (mg/l) with some samples containing up to 3,000 mg/l. Consequently, Eramine Sudamerica SA drilled six exploration holes in total to determine the extension of the brine as well as the aquiferous layer. In this context pumping tests were performed. In additi-

on geophysical studies and acoustic tests were developed. Also evaporation tests in a pilot plant were carried out on site. Eramine Sudamerica SA analyzed in three of its own brine samples lithium grades of 602.2 – 665.9 mg/l and 6,342 – 7,146 mg/l potash.

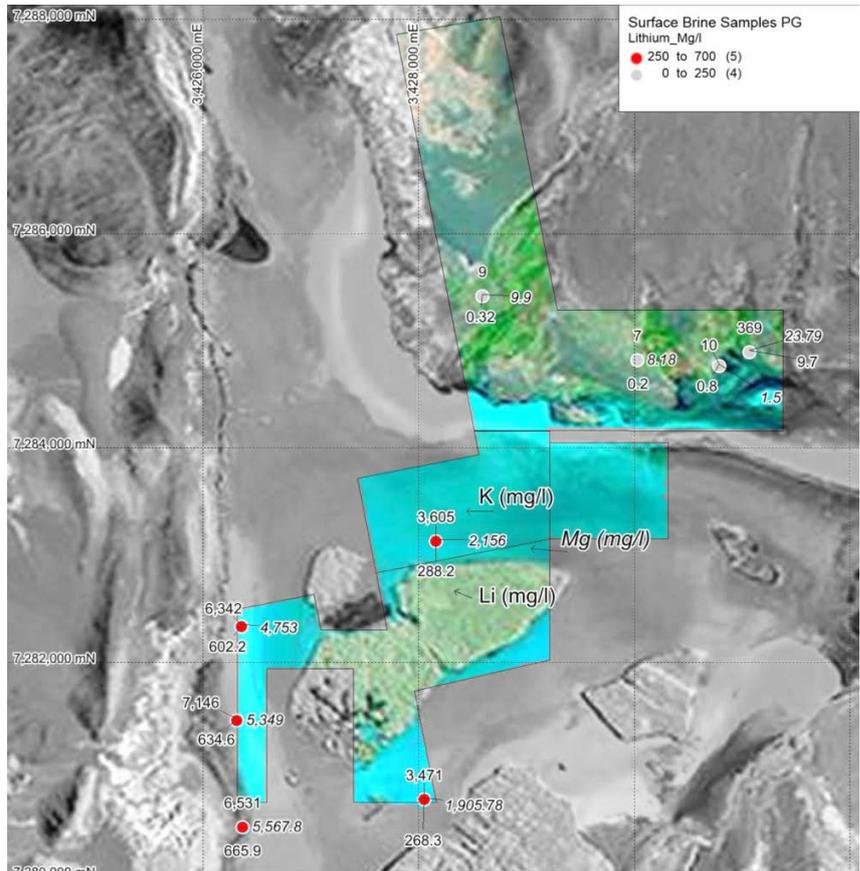
### Pastos Grandes Lithium Project – further exploration activities, production planning

Millennial Lithium is currently working on its own NI 43-101 resource estimate. The completion is expected by the end of September 2016. The company has budgeted US\$ 3 million for its initial exploration program. The start of the program will be in fall 2016.

The management under President & CEO Kyle Stevenson anticipates the production to begin in approximately three years and an extraction of 10,000 to 15,000 tons of lithium per year due to the good infrastructural location and the simplicity of the potential mining operation.

### Lincoln Lithium Project in Nevada

In addition to Pastos Grandes, Millennial Lithium owns a second lithium project called Lincoln in Big Smoky Valley, Nevada. The licences are in immediate vicinity to claims of Ultra Lithium Inc. and Avarone Metals Inc. In June 2016 on Avarone Metals Inc.'s Moab lithium project located west and adjacent to Lincoln Avarone could not only confirm the presence of lithium close to the surface but also boron and potash. Also, in June 2016 Ultra Lithium could prove the presence of two potential lithium bearing brine targets at their South Big Smoky Valley brine lithium project south of Millennials licences. There Millennial plans an initial surface sampling program and first drillings with



Properties optioned by Millennia at Salar de Pastos Grandes. Also showing surface brine sample distribution, showing Li, K, & Mg% assays in mg/l.

hand held drills to test the upper layers for lithium and other elements.

### Other lithium projects – focus on Argentina

Although the company has the potential high grade Lincoln lithium project in Nevada, Millennial wants to focus on the development of lithium projects in Argentina. In addition to Pastos Grandes the company completed a detailed Due Diligence on several potential brine projects and negotiations with the owners were initiated. Further acquisitions can be expected shortly.



### Top management for a rapid project development

A top management team was formed for the rapid advancement of some projects. Chairman Graham Harris was over five years the Senior Vice President and Director of the Canadian investment house Canaccord. He raised over 250 million dollars for public and private companies. Harris is also the owner of Sunrise Drilling which is a key advantage for the exploration.

President & Director Kyle Stevenson is, among other things, founder of High North Resources Ltd. an oil and gas producer in Alberta, Canada. In addition, he founded Waterproof Studios, an animation and visual effects studio that cooperates with leading movie companies. He is also the founder of RuralCom Networks, a leading Canadian telecom service provider.

Director Brent Butler was, among other things, Managing Director at Kinross Gold Australia Pty Ltd.

Director Andrew Bowering is co-founder of Sunrise Drilling and generated over 100 million dollars for several exploration and development companies. He also supervised several big acquisition programs.

At the end of July 2016 Millennial Lithium was able to hire Iain Scarr as VP of Exploration & Development. Among other things, Scarr worked at Rio Tinto for 29 years where he played an important role in many discoveries in North and South America as well in Africa. He was also re-



# Factsheet

sponsible for the commercial justification of the Jadar lithium-boron project in Serbia. At Lithium One he was responsible to guide the Sal de Vida lithium brine project in Argentina through the feasibility phase with Galaxy Resources. At Galaxy he advanced the Rincon project to the definitive feasibility study. Scarr is a real asset for Millennial. He has an immense wealth of experience and an extensive network in the lithium sector.

## Summary: at full throttle towards production

Even though there is a long way to the anticipated production start it can be seen that the management under President & CEO Kyle Stevenson and Chairman Graham Harris has kicked into high gear. Only two to three months maximum after the new start (since renaming from Redhill Resources to Millennial Lithium) the first significant resource estimate will be available. For the first exploration campaign at Pastos Grandes US\$ 3 million are budgeted! There is certainly the potential for a high grade lithium resource in Argentina. The good infrastructure in the area (in contrast to the many competitors) could accelerate a potential production. For investors the low market cap is interesting which could rise quickly with the help of their first own exploration results and a resource estimate.

**ISIN:** CA60040W1059  
**WKN:** A2AMUE  
**FRA:** A3N1  
**OTCQX:** ATWGF  
**TSXV:** ML

Shares issued: 19.8 million  
Options: 1.3 million  
Warrants: 8.0 million  
Fully diluted: 29.1 million

### Contact:

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www.millenniallithium.com

### Chairman:

Graham Harris



(reference: BigCharts)

# Nemaska Lithium

## Second largest low cost hard rock lithium deposit worldwide ready for take off!



Guy Bourassa, CEO

Nemaska Lithium is a Canadian development company specializing in the lithium sector. Their flagship project Whabouchi is deemed to be the second largest hard rock lithium deposit on the planet. As a result of the granting of most of the permits (to date only three lithium development projects have achieved that) Whabouchi is ready for mine construction as well as of the corresponding processing plants.

The project site is directly situated by the Route du Nord, a road maintained year-round in Central Québec connecting Chibougamau with the James Bay Road. The Nemiscau road-house/camp is located 15 km and the Nemiscau airport 18 km to the west of the project. In addition, two Hydro-Québec electricity transformation substations are within 20 km of the project. The project site therefore has direct access to power supply and road connections.

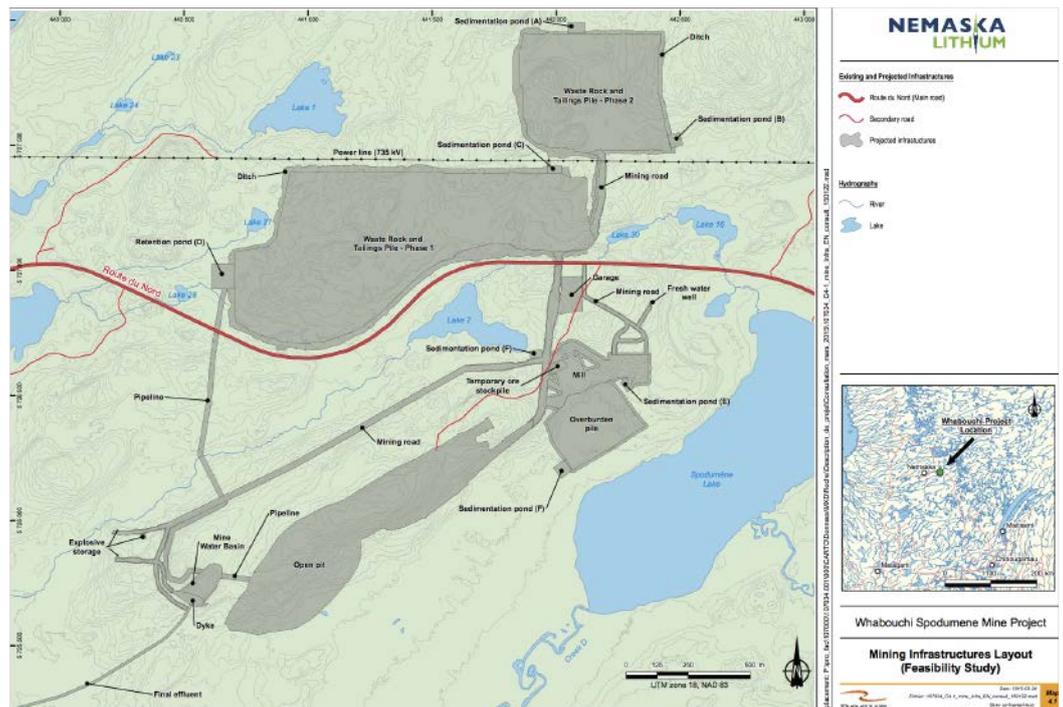
### Whabouchi Spodumene Lithium Project: location and infrastructure

The Whabouchi Spodumene Lithium Project is composed of 33 claims in total, covering an area of 1,761.9 hectare. The Project is located in the Eeyou Istchee James Bay Region, about 300 km north of Chibougamau in the northwestern part of the Canadian province of Québec. The infrastructure is better than it looks at first

### Whabouchi Spodumene Lithium Project: deposit, reserves and resources

The Whabouchi deposit is characterized by its location near the surface allowing initial open pit mining. The existing reserves and resources can be mined over 20 years down to a depth of 190 m. The strip ratio, the ratio of waste rock/ore containing rock, is 2.2:1. During the first phase

*The project site is directly situated by the Route du Nord, a road maintained year-round in Central Québec connecting Chibougamau with the James Bay Road.*



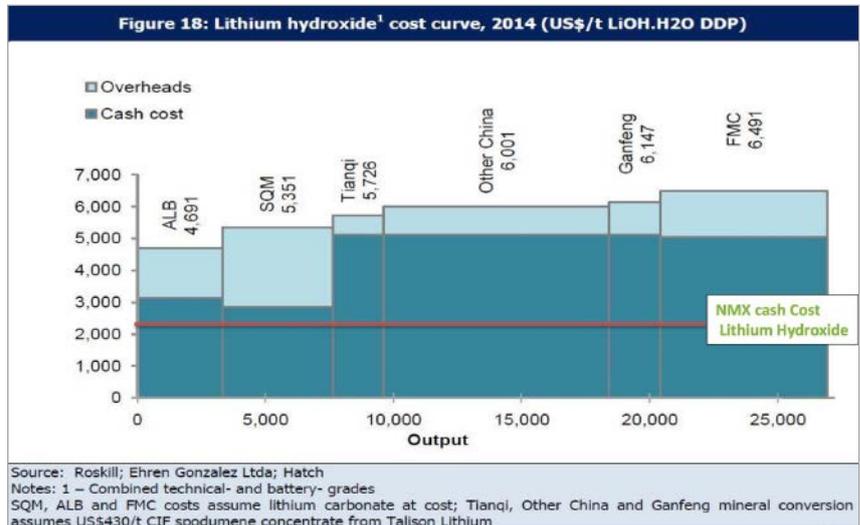
2,470 tonnes of ore material per day will be mined and processed. During the second phase, the last 6 years, the deeper resources will be mined by underground methods at 3,342 tonnes per day.

The last resource estimate in 2014 indicates open pit reserves of 20 million tonnes @ 1.53 % Li<sub>2</sub>O and underground reserves of 7.3 million tonnes @ 1.28 % Li<sub>2</sub>O. The resources of the deposit amount to 32.6 million tonnes @ 1.56 % Li<sub>2</sub>O. Whabouchi therefore hosts the second largest hard rock lithium deposit known worldwide and has the potential for additional resources.

## Whabouchi Spodumene Lithium Project: Feasibility Study

In April 2014 Nemaska announced a very positive feasibility study. In addition to the already mentioned expected mine life of 26 years an independent party estimated a pay back time of capital costs of 2.4 years. The initial capital costs are approximately US\$ 439 million. Based on average proceeds of US\$ 9,500 per tonne lithium hydroxide and US\$ 7,000 per tonne lithium carbonate the company could generate an after tax undiscounted cash flow of US\$ 3.1 billion. Accordingly the After-Tax NPV 8% Discount will amount to US\$ 1.2 billion and the After-Tax Internal Rate of Return (IRR) 30.3 %. Nemaska based the calculations on production of 213,000 tonnes 6% Li<sub>2</sub>O concentrate per year at the mining site and processing to 25,000 tonnes lithium hydroxide and 3,245 tonnes lithium carbonate per year in its processing plant in Shawinigan.

Nemaska's numbers are by all means conservative. Recently Chinese traders paid US\$ 20,000 per tonne and more for ultra pure 99.99 % lithium carbonate. Similar prices are paid for lithium hydroxide. The calculated production costs are even



more interesting. They are far below the costs of previous producers and even below the costs that the previous low cost leader Albemarle achieved in its Silver Peak mine. Nemaska anticipates mining and production costs in total of US\$ 2,154 per tonne lithium hydroxide as well as US\$ 2,753 per tonne lithium carbonate with 99.99 % purity. Albemarle has costs of roughly US\$ 2,900 per tonne lithium carbonate and just under US\$ 4,700 per tonne lithium hydroxide, which is more than double as Nemaska's calculation for their own production.

*The calculated production costs are far below the costs of previous producers.*

## Modular processing mill at Whabouchi

Nemaska Lithium plans the construction of a dense media separation (DMS) modular mill at Whabouchi. The necessary applications were filed and a construction contract was signed with the renowned company Met-Chem Canada. The company expects the commissioning of the plant by the end of October 2016 which will produce the targeted 6% Li<sub>2</sub>O concentrate. The commissioning phase is followed by a test phase of 12-18 months. For this purpose, the mine representative bulk sample was increased from 29,000 tonnes to 60,000 tonnes.

## Hydromet plant in Shawinigan

Nemaska already owns in Shawinigan, Québec, the buildings to process the on the mine site produced 6% Li<sub>2</sub>O concentrate. Shawinigan is located some 855 km south of the future mine. According to the previous plans the concentrate will be transported by trucks to the rail loading station in Chibougamau and from there by train to Shawinigan. At first glance it might look like a disadvantage, but it turns out to be a big advantage for the company. Nemaska saves not only C\$ 20 million capital cost but also has its own loading siding in Shawinigan as well as direct access to the Saint Lawrence River and thus to the Atlantic Ocean. This renders the transport of chemicals to Whabouchi that would have been needed for the production process unnecessary, avoiding the need for approval as well as having environmental advantages.

Currently, in the building that is owned 100 % by Nemaska the work on phase 1 of the future processing plant is being



*Currently, in the building that is owned 100 % by Nemaska the work on phase 1 of the future processing plant is being carried out.*

carried out. The concentrate will be processed over several processing steps in the facility. First a lithium sulfate solution is produced, followed by the separation of all the unwanted elements like copper, iron, aluminum, magnesium and calcium. Subsequently further impurities are remo-

ved via ion exchange so that the impurities are in the ppb range. After the membrane electrolysis, the produced lithium hydroxide solution will be processed to lithium hydroxide and lithium carbonate. In addition to the phase 1 facility, Nemaska has enough space in the same building for the future commercial processing plant. Phase 1 will be completed by the end of 2016 and the first lithium hydroxide from the bulk sampling program can be delivered to several customers in the first quarter of 2017.

## Offtake agreement with speciality chemicals and sustainable technology company

In May 2016 Nemaska closed an offtake agreement with Johnson Matthey Battery Materials Ltd, a subsidiary of Johnson Matthey Plc a leading company of speciality chemicals and sustainable technology. According to the agreement Johnson Matthey Battery Materials Ltd is paying C\$ 12 million in advance being used for the construction of phase 1 facility in Shawinigan.

## Financing of phase 1 facility secured

Financing of phase 1 facility is already secured. Of the total amount of C\$ 38 million Johnson Matthey Battery Materials Ltd, Sustainable Development Technologies Canada is contributing C\$ 13 million, Technoclimat Program of the Bureaus de l'efficacité et de l'innovation énergétiques of the Ministère de l'Énergie et des Ressources naturelles C\$ 3 million and C\$ 10 million from an equity financing of Ressources Québec Inc.. This demonstrates the big support Nemaska receives from different parties in Québec.

# Factsheet

## Analysts surpassing each other with share price forecasts

The Nemaska's tremendous advance during the past months didn't stay unnoticed by the leading analyst firms. They surpassed each other with price forecasts ranging from C\$ 1.55 to 2.30. This is a real luxury problem for Nemaska because the company is only one of a handful of lithium developers which is covered by the relevant research firms.

## Summary: perfect timing to benefit in the greatest possible way from the imminent lithium supply deficit

Regarding the imminent lithium supply deficit in the coming years Nemaska has picked the perfect timing for its production project. The construction of phase 1 processing facility seems to be a solid decision of the management which saves a lot of capital and lowers the start-up risk of the commercial production. Fact is that Nemaska wants to bring Whabouchi, the second largest hard rock lithium deposit in the world, to production. The expected life of the mine will be 25 years in a time the lithium boom is just beginning and prices are quite high. The company has not only a head start but also a technological advantage. No other company in the peer group is that advanced technologically like Nemaska. This together with the secure offtake agreement with Johnson Matthey Battery Materials should not present too many problems for Nemaska at the coming financing and mine construction. Nemaska could already secure the first C\$ 69 million in July 2016.

**ISIN:** CA64045C1068  
**WKN:** A1JQUB  
**FRA:** NOT  
**OTCQX:** NMKEF  
**TSXV:** NMX

Shares issued: 312.4 million  
Options: 14.5 million  
Warrants: 70.0 million  
Fully diluted: 396.9 million

### Contact:

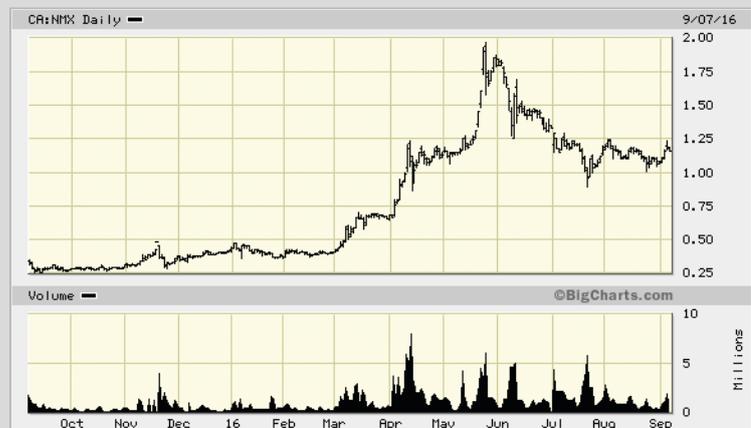
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### CEO:

Guy Bourassa



(reference: BigCharts)

# Pure Energy Minerals

## With an offtake agreement in the pocket on the fast lane to production



Patrick Highsmith, CEO

Pure Energy Minerals has achieved what many lithium developers, even the big producers, are keen to get but only a few will ever accomplish: an offtake agreement for their own lithium with one of the biggest future producers of lithium ion batteries. Backed by such a partner it should be a bit easier for the Canadian company to get the necessary funds to build a mine.

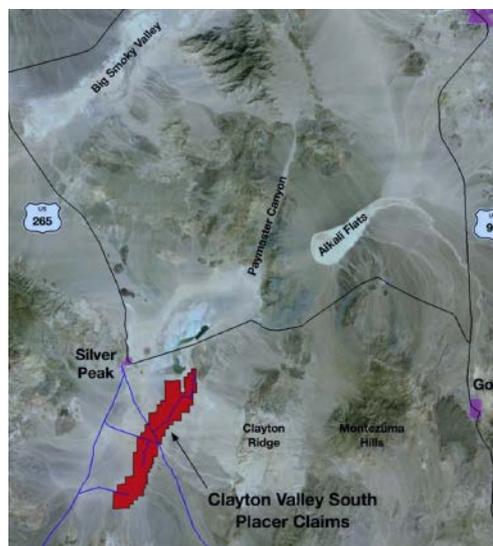
### The Tesla Deal

On September 16th 2015 Pure Energy Minerals announced that the company had entered into a conditional agreement with Tesla Motors for the supply of lithium hydroxide over a period of five years. In doing so a fixed purchase price was negotiated. This will enable Pure Energy to include that price for at least a portion of its production in upcoming economic studies. Even though not much is known about the deal, Pure Energy's focus on an environmentally friendly disruptive new processing technology and the short driving time of only 3.5 hours between the Clayton Valley South Project and Tesla's giga-factory could have been decisive factors. The short distance would likely

assure a just-in-time delivery. The giga-factory is currently under construction, but there was a grand opening ceremony for a portion of the giant facility in July. In addition, Tesla secured a right to a 20 % share of project financing to build the future mine. This is a customary component of such supply agreements, but it doesn't give the EV company any control or role in the management of Pure Energy's Clayton Valley South Project. Nevertheless, this could be seen as anchor for future project financings.

### Clayton Valley South (CVS) Project – location and size

The Clayton Valley Project is located directly south of the evaporation ponds of Albemarle's Silver Peak Mine and covers 3,865 hectares. Geophysical and geological studies suggest that the brine hosting basin exploited by Albemarle extends for about 10 km onto Pure Energy's land package. The deepest point in the basin is estimated at 1,500 metres and it occurs on Pure Energy's claims. This is definitively a closed independent basin, a prerequisite for accumulation of these lithium brines and successful lithium mining.

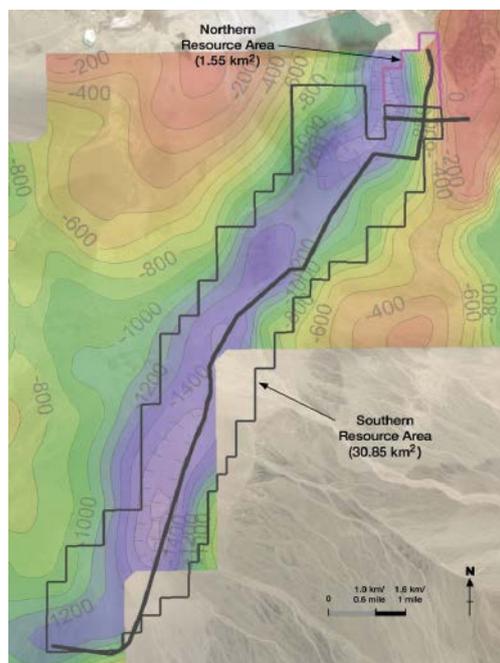


The Clayton Valley Project is located directly south of the evaporation ponds of Albemarle's Silver Peak Mine and covers 3,865 hectares.

### Clayton Valley South Project – Resource

Pure Energy reported its maiden inferred resource in July 2015 containing approximately 816,000 tonnes of LCE (lithium carbonate equivalent) at an average grade of 102 mg/L lithium. In spite of basin depths of 1,500 metres, the first phases of drilling only included samples down to approximately 500 metres depth, so there is likely to be exploration potential beneath that depth.

Of great advantage is the magnesium/lithium (Mg:Li) ratio, which must be relative



vely low, otherwise mining of the lithium resources is not economical. In Pure Energy’s CVS Project the ratio is 2:1, among the lowest of all the known lithium brine projects worldwide! In addition, the potash/lithium ratio is around 18:1. This is not a problem, rather there is a possibility for future by-product potash, which could improve project economics.

Pure Energy continues to report progress from the field and good results in its technical test work. They recently announced that drill hole CV-3 achieved a much greater depth than targeted, 610m versus a target of around 500m. Additional deep drilling will follow in the fall of 2016.

### Clayton Valley South Project – New Technology

While many development companies are still searching for lithium, Pure Energy has already outlined a large resource. And that’s not all, by now the company has

started the pre-production phase. The Israeli firm Tenova Bateman Technologies is running numerous tests for Pure Energy in the mini pilot plant that was constructed for this purpose. Among other things, they are testing the separation of the alkaline earth elements (magnesium and calcium) using membranes. In a second step, lithium is recovered into an ultra pure lithium sulphate solution through solvent extraction. In a third and last step, the lithium sulphate solution is converted into a concentrated ultra pure lithium hydroxide solution via electrolysis. From here, the ultra pure lithium hydroxide is crystalized.

The new technology that Pure Energy is testing has the potential to produce lithium with a much lower impact on the environment and with greater efficiency than the conventional technology. The large evaporation ponds that are the signature of the current brine producers consume massive amounts of water, as none of the groundwater is conserved or re-injected back into the ground after lithium recovery. In addition to the visible scars on the landscape, these ponds can impact wildlife and air quality. The process of lithium recovery by evaporation ponds can be quite slow, sometimes requiring up to two years to recover the lithium. The ultimate recovery of lithium from this older technology is also relatively low, in the neighbourhood of 50%. Given the projections of future shortages in supply, slow and inefficient lithium processing may put more pressure on the supply chain.

The Tenova Bateman – Pure Energy approach could achieve much higher lithium recoveries, and the footprint of the anticipated industrial plant is much smaller than that of evaporation ponds. Typical of any real-time industrial process, lithium recovery by solvent extraction should be much faster than evaporation technology – hours vs months. Perhaps

best of all, Pure Energy plans to re-inject brine back into the ground after lithium recovery. In a high tech industry like lithium batteries, we expect innovation from the battery makers and end users of lithium, why shouldn't we expect the same from lithium producers?



In the middle of August 2016 Pure Energy announced significant progress with their pilot test program. According to the company the halfway point has been surpassed towards the desired result.

### **Short and middle term milestones and catalysts**

The early test phase which is very important for the brine extraction and the corresponding processing to high grade and expensive battery grade lithium hydroxide is only one of several milestones Pure Energy will reach in the coming weeks and months.

An updated resource estimate is targeted for September/October 2016. Management's focus is primarily on the resource quality and upgrading its technical understanding in order to demonstrate its potential economics. The company is working frenetically on the test procedures as well as internal engineering studies to de-

termine as quickly and efficiently as possible when and if mining can go forward.

As early as October 2016, Pure Energy intends to publish a Preliminary Economic Assessment. This will lower the project risk on one side and in addition give direction to all following steps. The main factor is a good profitability and with that, the necessary funds could be raised for a production permit and ultimately a mining operation including processing.

The permitting process is ongoing and shouldn't be a big problem due to the proximity to Albemarle's producing operation and the favourable rules for mining in Nevada. After all Pure Energy and Albemarle share a top-class brine basin. To be on the safe side a leading firm, SRK Consulting, has been retained to assist with permitting and environmental impact studies.

### **CEO Highsmith as lithium mastermind**

At the centre of the whole success story is Pure Energy's CEO, Patrick Highsmith. He is said to be the mastermind of the company because he has worked for several big mining companies like Rio Tinto, BHP Billiton, and Newmont, but he also has experience in the lithium industry as a co-founder and CEO of Lithium One. During his career of over 25 years, Mr. Highsmith has evaluated and worked on more than 250 projects and helped acquire and develop the best of these. His strength is primarily the successful guidance of company teams to major engineering and development milestones. He advanced Galaxy Resources' Sal de Vida Lithium Brine Project from discovery to a successful pre-feasibility study and company sale. Investors hope he can have similar success with Pure Energy during the coming months.

# Factsheet

## Summary: there are two possibilities – a mining operation of their own or a takeover!

Pure Energy's offtake agreement with Tesla was a highlight setting the anticipated lithium boom rolling. Backed by a partner like Tesla who seeks to buy lithium and potentially help finance the mine development, Pure Energy can not only work well but also generate further interest in its project as well as in the company's shares. In July, Pure Energy conducted a private placement which was oversubscribed with final proceeds of C\$ 6.16 million. Nevertheless, management has a track record of not diluting shareholders unnecessarily and staying focused on the next important steps. Given continued success, higher amounts can be raised at even higher share prices. Of all the lithium development companies active in the Clayton Valley Pure Energy is the most advanced and should have the best chances for its own production. But there is always the possibility of a takeover by a major lithium company. Above all Alcoa could have an increased interest in a combination of its deposit with Pure Energy's Clayton Valley Project.

**ISIN:** CA74624B2057  
**WKN:** A111EG  
**FRA:** AHG1  
**OTC:** PEMIF  
**TSXV:** PE

Shares issued: 90.2 million  
Options: 7.0 million  
Warrants: 13.8 million  
Fully diluted: 111.0 million

### Contact:

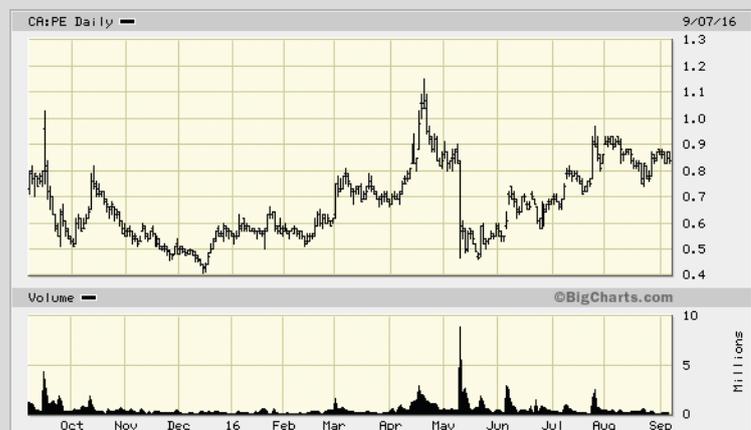
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### CEO:

Patrick Highsmith



(reference: BigCharts)

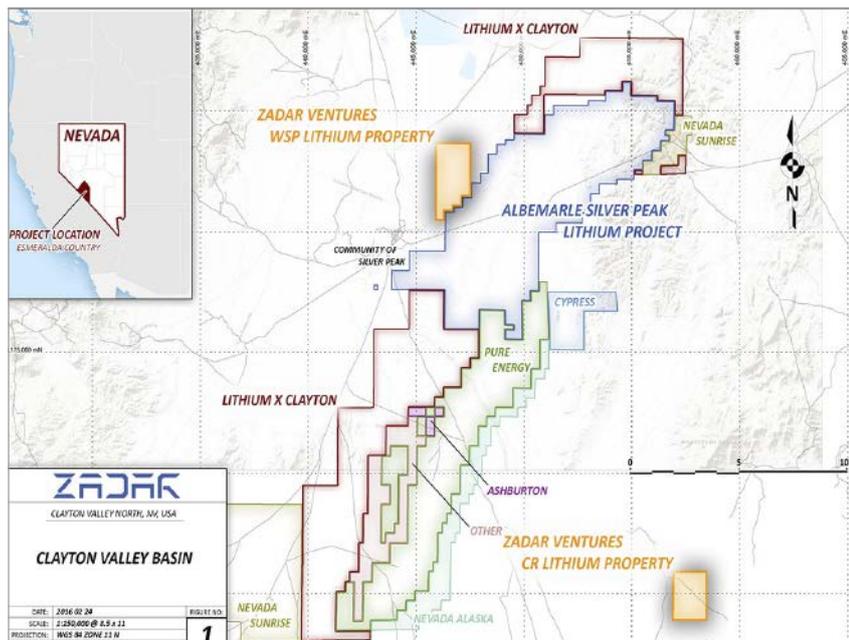
# Zadar Ventures

## Lithium projects in two rock types at two hot spots on two continents

Zadar Ventures is a Canadian resource development company focused on lithium and uranium deposits. Zadar Ventures is one of a few companies that do not concentrate its efforts on a single lithium hot spot but rather on multiple. The company has several exploration licences in Clayton Valley, Nevada, where since the 1960's lithium brine deposits were exploited, as well as in the Ravensthorpe region in Western Australia.

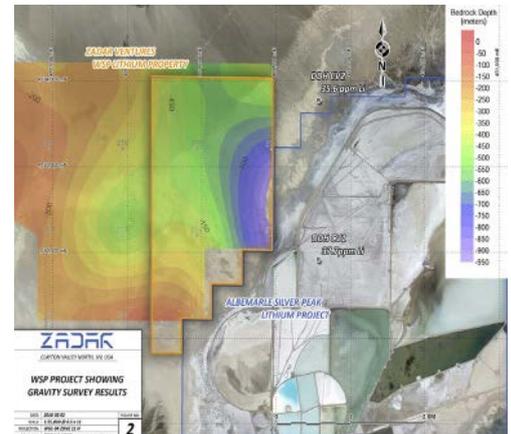
### Zadar Ventures' lithium assets in Clayton Valley, Nevada

Zadar Ventures' main assets are located in Clayton Valley in the state of Nevada, USA. These are two independent sub-projects.

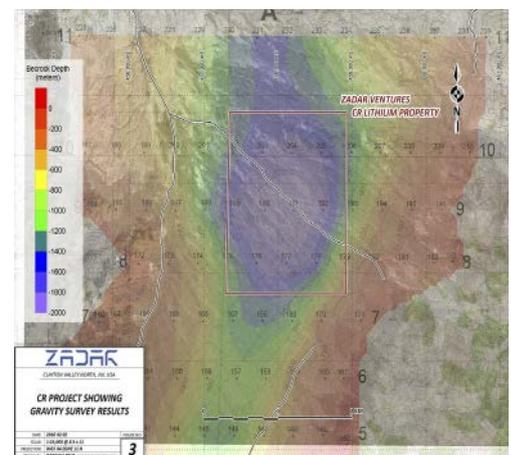


### WSP Lithium Claims

The WSP lithium claims are located immediately west of Albemarle's lithium project and border on the area where Albemarle's lithium mine is situated, the only



The WSP lithium claims are located immediately west of Albemarle's lithium project



A second project area, the CR Lithium Claims, is located approximately 18 km southeast of Albemarle's lithium project.

producing lithium mine in North America. The WSP Claims cover 425 hectare and host brines with elevated concentrations of lithium. Zadar Ventures has an option to acquire a 100 % interest in the project. The United States Geological Survey detected in drill holes just east of the project area lithium in solution. One of those drill holes 600 m east of the project area reported 55 ppm lithium content from analyzed fluid samples indicating a potential lithium occurrence in deeper layers or in layers the analyzed water flowed through.

Initial gravity tests and electromagnetic surveys revealed a significant anomaly. The local basin hosts demonstrably lithium bearing brines and the project area is easily accessible.

Currently Zadar Ventures is completing additional gravity tests in this area, including never before tested locations. In addition, the company has filed an application for a permit to drill three test holes in the third quarter of 2016. Also in the third quarter of 2016 the Company wants to acquire additional gravity results for interpretation. Additional test holes to define the existing brine reservoirs are planned in 2017.

### **CR Lithium Claims**

A second project area, the CR Lithium Claims, is located approximately 18 km southeast of Albemarle's lithium project. The claims cover 330 hectare of an isolated un-drilled basin within the Clayton Valley watershed, which has the potential to host a similar brine environment by virtue of its proximity to the possible source of the lithium within the Clayton Valley system. Zadar Ventures has also an option to acquire a 100 % interest in the project. The company completed initial gravity tests which showed a basin like structure with a nearby lithium source. The project area is easily accessible and permit application procedures are relatively easy.

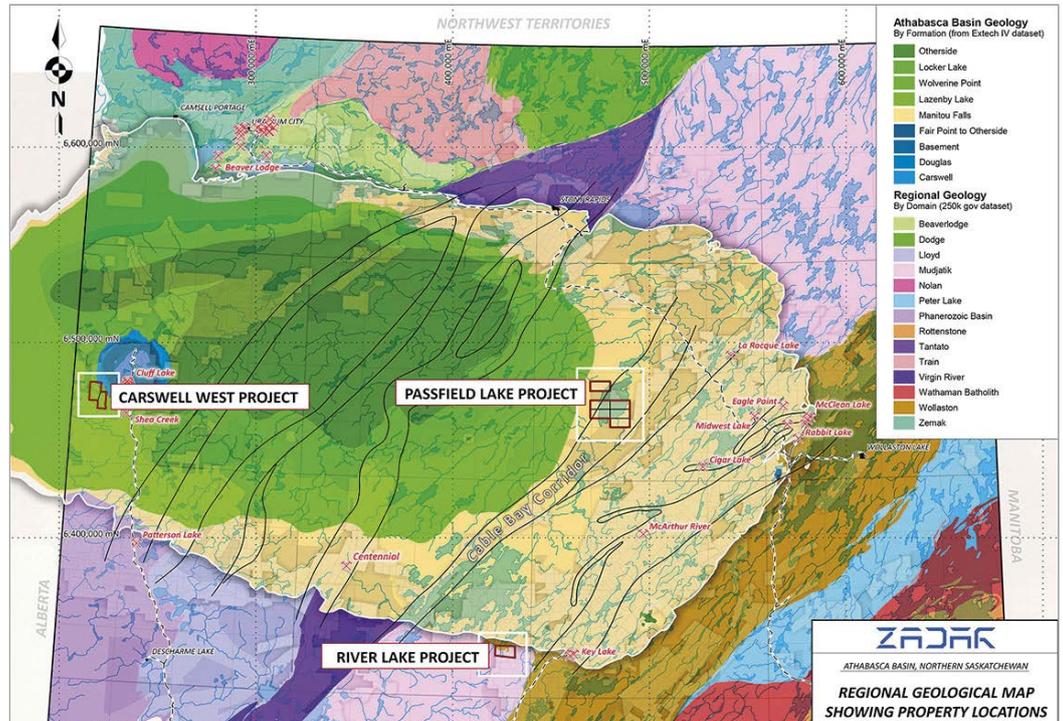
There Zadar Ventures will carry out additional gravity tests in the fourth quarter of 2016. In addition the company has filed an application for a permit to drill three test holes in the first quarter of 2017. In the fourth quarter of 2016 the Company wants to acquire additional gravity results for interpretation. Additional test holes to define the existing brine reservoirs are planned in 2017.

### **Memorandum of Understanding for Farm-in Agreement with MacArthur Minerals**

In July 2016 Zadar Ventures entered into a memorandum of understanding for a Farm-in agreement with the Australian lithium company MacArthur Minerals. This is an agreement whereupon Zadar Ventures can acquire a 51 % interest in two applied for licences (a total of 91 square kilometer) from MacArthur in the Ravensthorpe region by expending AU\$ 2 million for exploration within two years. Upon completing a NI 43-101 Preliminary Economic Assessment within three years, Zadar Ventures can increase its interest on the project to 75 %. The two licence applications, E74/587 and E74/588, which most likely will be granted in November 2016, are at a distance of approximately 7 km to Galaxy Resources and General Mining Corporation's Mount Cattlin lithium mine where lithium and tantalum concentrate is produced. Between the two licences lie Lithium Australia's Horseshoe, Phillips South and Deep Purple prospects. Initial assay results from these prospects range between 2.4 % Li<sub>2</sub>O and 4.1 % Li<sub>2</sub>O. On both licences in the Ravensthorpe region a potential high grade pegmatite was discovered which needs further exploration.

### **Uranium projects in the Athabasca Basin**

In addition to their lithium projects, Zadar Ventures has some options on uranium projects in the Athabasca Basin. Zadar has in total options on five different uranium projects of which two will be briefly outlined.



*In addition to their lithium projects, Zadar Ventures has some options on uranium projects in the Athabasca Basin.*

## Carswell West Project

One of the most prospective projects is the Carswell West Project situated 15 km from Areva’s Cluff Lake uranium deposits and Areva’s Shea Creek uranium deposit. Carswell West covers 8,257 hectare and is surrounded by projects of the major uranium producer Areva and of the well advanced development companies Denison Mines, NexGen and Unity Energy. The Carswell structure, a remnant of a meteorite impact hosts the Harrison Shear Zone which traverses the southwest margin of the Carswell structure. This is where Zadar’s Carswell West Project is located. To date only airborne electromagnetic surveys were completed on the project.

## Upper Poulton Lake Project

The upper Poulton Lake Project is located in the southeast of the Athabasca Basin

approximately 21 km southeast of the Cigar Mine. The project is almost completely surrounded by development projects from Cameco, Areva and Denison Mines. The claims (2,730 hectare) are located on the Bird Lake Reverse Fault which is intensively drilled by Cameco approximately 5 km northeast of the project boundary. If the mineralized zone continues on to Upper Poulton Lake, Zadar would be in position for a potential discovery.

## Experienced and successful CEO

The most prominent member in Zadar Ventures’ management team is President & CEO Paul D. Gray. He has a great wealth of experience as an exploration geologist. Mr. Gray has worked the past 20 years as a geologist in Canada, the USA, Asia and Central and South America and the last 10 years of which in the uranium sector. There he focused on the Colorado

# Factsheet

Plateau in the USA, the Athabasca Basin in Canada and on projects in South America. Mr. Gray served as President and COO of Doublestar Resources Ltd. until it was acquired by Selkirk Metals Corp. in July of 2007.

## Summary: smart regional and rock based diversification could make Zadar Ventures a match winner

Zadar Ventures is one of the few lithium developers who doesn't only have one project within a lithium hot spot but is also exploring for deposits in several lithium rich regions (Clayton Valley in Nevada and Ravensthorpe region in southwest Australia). The company deliberately selected claims which are located in the immediate vicinity to already known deposits. This increases the probability to host a lithium deposit on their project site. This regional diversification makes Zadar Ventures unique and doubles the chance for a significant discovery. Both projects appear to have a strong potential for lithium deposits and have to be tested further during the coming months. In addition to the regional diversification there is the rock based diversification. This means the company has not only a brine project but also a hard rock project. Furthermore, Zadar Ventures has a few potential high quality uranium assets in its portfolio which could be developed parallel in the case of a uranium turnaround. In addition, Zadar has a low market cap which should shoot up in the case of a discovery.

**ISIN:** CA98884X1024  
**WKN:** A1KC2D  
**FRA:** ZAV  
**OTCQX:** ZADDF  
**TSX:** ZAD

Shares issued: 65.9 million  
Options: -  
Warrants: 18.4 million  
Fully diluted: 84.3 million

### Contact:

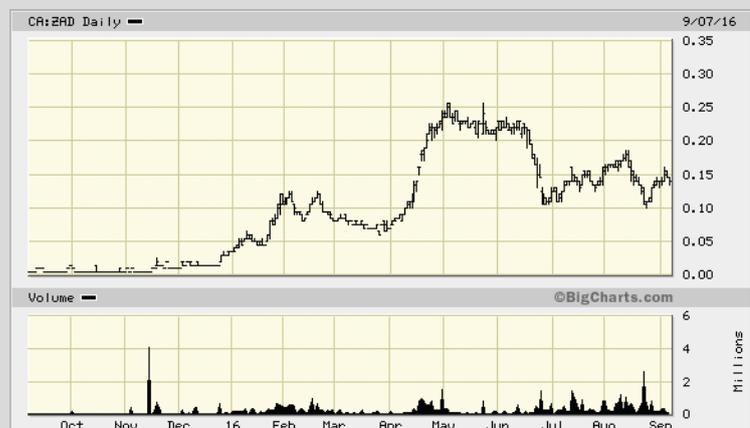
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### CEO:

Paul D. Gray



(reference: BigCharts)

