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Issue: May 7, 2018

CEOCFO Magazine

International Battery Metals, Inc. is developing a Revolutionary Mobile Lithium Extraction and Production System that allows for Rapid Exploitation of New Untapped Oilfield Brine Resources

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CEOCFO: ***Dr. Burba, International Battery Metals, Inc. acquired Selective Absorption Lithium (SAL) on April 13th. Would you tell us about the origins of the relationship, your role with SAL and your role now with International Battery Metals?***

Dr. Burba: I have been in and out of the lithium industry since 1979. My first exposure was with Dow Chemical Co. at that time and later with FMC Corporation and then a couple other ins and outs as I have gone through different phases of my career.

In the early 1990's Dr. Bill Bauman and I invented a material, CLA, that will selectively remove lithium from brine. It is very specific, absorbing only lithium chloride. It does not take any other metal ions out of the brine. This material demonstrates surprisingly high specificity for lithium over all other metal ions that are found in brines.

Lithium baring brine resources are highly complex systems. It is not just like a simple sodium chloride solution. They have very high concentrations of many different salts. Because of its unique crystal structure, CLA literally picks up only lithium chloride. Several years after we filed patents on the CLA material, I went to work for FMC. At the time, they were in great need of a new technology to extract lithium from a salar that they had acquired, Salar del Hombre Muerto in Argentina. FMC had intended to use solar evaporation for that process. On the surface, this appeared to be a good technology choice. Foote Mineral Company had pioneered lithium recovery by solar evaporation at Silver Peak, NV and they were extracting lithium via solar evaporation in the Atacama Desert in Chile. Unfortunately, the process did not work well at Salar Hombre Muerto. This was due to brine composition issues.

Solar Evaporation is what the name implies. Basically, you bring the brine out of the ground and then you have a series of evaporation ponds that are sized to match flow of the brine and evaporation rates. As brine flows through the ponds, water is evaporated. Because the brine is saturated, relatively pure salt fields are laid down. Flow rates and pond sizes are controlled such that a given salt field is deposited in a given pond. The first pond collects sodium chloride. Other salts such as potassium magnesium chloride and potash, are removed in subsequent ponds. Ultimately, lithium chloride solution is left in the last pond. This is a pretty impure solution. The brine is then processed through a chemical purification process and a lithium carbonate process.

FMC wanted to use solar evaporation, but it did not work because of brine chemistry. The result of this problem was a development program to test our invention and develop a process. Ultimately, the technology worked and my partner and I sold our technology to FMC. The plant started up in 1998.

CEOCFO: ***That was quite an accomplishment at the time for you and Dr. Bill Bauman.***
Dr. Burba: Yes, it was. Unfortunately, Bill is no longer with us or I would still be partnering with him on everything. He was one of the most brilliant men and a terrific guy.

CEOCFO: ***Is FMC still using the plant and technology you and Dr. Bauman developed?***
Dr. Burba: It has been FMC's source of lithium since 1998. There are a couple of features in that process that make it really interesting. It is actually a low cost process because you do not have to spend a lot of money in removing high concentrations of impurities. It produces a feed stock to the lithium carbonate that is extremely pure. This allows FMC to produce very pure lithium carbonate.

Ever since the plant started up it has produced the highest purity primary lithium carbonate in the world. The new battery grade specs for lithium carbonate are the FMC product quality specs. I was just reading recently on the FMC website that they receive significant premium for their lithium carbonate because of its purity.

However, there are also some disadvantages to the process. Specifically, you have to build a huge plant and it needs to sit on top of a big resource because of the engineering realities. Lithium extraction plants are typically large stationary facilities that cannot be moved. In order to economically employ FMC's technology you need to have a really big resource with brine that has very good flow. Basically, you want to sit on top of a brine lake, which is in essence what these salars are. They are salt structures with very high porosity and saturated brine is in these pores, so it is very easy to pump out.

"Our goal is to develop a low cost, an environmentally responsible, elegant lithium extraction and production system that can be rapidly deployed in target resources. Once proven, we believe that this technology will allow us to significantly reduce resource development time, allowing rapid exploitation of new untapped resources."- Dr. John Burba, Ph.D

CEOCFO: ***That is the technology that you sold to FMC.***
Dr. Burba: That is the technology that we sold to FMC. Yes it is.

CEOCFO: ***You have since developed a new technology to accomplish the same objectives. Why was that necessary?***
Dr. Burba: Our technology is focused on being able to extract lithium from oilfield brine resources. Oilfield conditions favor small, portable extraction units that can produce intermediate products that can be economically shipped to a central chemical plant where the final product is produced. When I started evaluating the idea of economically extracting lithium from oilfield brines, I had my doubts that it would be feasible because these resources are just too defused. The resource does not fit an FMC style extraction facility.

Finally, I asked "What needs to be different?" It struck me that smaller high efficiency mobile units would be a better approach for this problem. However, this concept would require a complete reengineering of the entire extraction process and engineering. Therefore, I sat down and started doing some work and came up with the concept of our mobile extraction units. We also have some improvements on the absorbent as well. I then got with a couple of engineers that I worked with who are absolutely outstanding and we formed a company called NA Lithium. We started talking to people about contracting with us to build lithium plants and oil field applications. We started working on that and through a roundabout process we got connected with the International Battery Metals guys. At the time the company was called Rheingold Exploration Corp. We started talking about what we could do and ultimately we decided that a merger made the most sense. We closed our deal a couple of weeks ago.

CEOCFO: ***Will you be selling and licensing to the companies you work with?***
Dr. Burba: Great question. We do not intend to license our technology. However, we are happy to partner with other companies. These partnerships will probably be similar to what oilfield Exploration and Production companies do. For instance, several oil companies may decide to co develop a resource. One of those companies will function as the operator.

In a similar manner, we would function as the operating partner. We like this concept because there are a lot of resources out there. The attractive thing about the oil industry and the oil fields is that through drilling all these wells, the operators have found vast amounts of brine that contain impressive amounts of lithium just in Canada and the United States.

Developing the ability to economically extract lithium from oilfield brines is very important to our industry. The supply/demand picture for the lithium industry is pretty dire. To keep up, we need new, untapped resources to come on line. The current lithium producers have some bright business people great engineers that certainly know how to do what they are doing and they have done it a long time. However, rapid expansion is a real problem. I question whether the industry will be able to keep up with long term lithium demand unless we bring new resources online in a timely manner. Recent solar evaporation projects have required over a decade to come on line.

This is the problem that Ibat is trying to solve. We believe that efficient lithium extraction for oilfield brine will go a long way toward solving this issue.

CEOCFO: ***What are the drives for lithium?***
Dr. Burba: This is not dissimilar to what the oil and gas industry underwent in the early 20th century. The drivers are similar. The lithium industry today is driven by three big needs. The first is transportation. China is leading the way. They have such a huge pollution problem in the big cities that is a health menace, so the Chinese government is trying to clean up the air. Therefore, going to electric vehicles is an obvious way to minimize pollution sources. The EU is really pushing this hard because of the CO2 issues. A lot of people in the United States want the same thing.

The second driver is grid stabilization and security. In a lot of places we have essentially the same electric grid that was built one hundred years. These grids are old and overburdened and it does not take much to create a brownout. The idea now is to utilize battery systems that can respond to issues and prevent supply disruptions. The industry is also are looking for battery backup for solar and wind in conjunction with natural gas.

The third driver is the datacenters. Our society is producing unbelievable amounts of data every day. Most of this data is stored in large data farms. One of the fastest growing construction activities in North America is building datacenters to handle all the cloud information. These data farms must have reliable electricity back up to avoid data loss in the event of a power disruption. Lithium ion batteries are rapidly moving into this space.

Demand for these three battery applications are growing at about the same rate so fundamentally we have reached a tipping point in global society. Today lithium is the chemistry of choice for high power, light weight batteries. I am often asked if other battery chemistries will replace lithium. I always go back to the chemistry. In my opinion, lithium has the best set of fundamental chemistry characteristics for rechargeable batteries. We all know that you never say never. However, I think that lithium based rechargeable batteries will be with us for a long time.

CEOCFO: ***How much lithium comes from oil fields today?***
Dr. Burba: Today there is no commercial oil field production.

CEOCFO: ***Sounds like you are going to revolutionize the lithium industry!***
Dr. Burba: Yes. The challenge that I am putting to our group is we will be the first commercial oil field lithium exploration production company. We are patterning this company after oil and gas companies. We expect that our technology will allow us to do that.

CEOCFO: ***Where are you in the process? Have you already started to apply your new technology?***
Mr. Burba: No. We filed a number of key patent applications and we have a number more that will be coming out. We are now take some engineering steps and build our first extraction unit. We have already begun the design work on that so we are far along. We need to test out some models in a laboratory. Then we will build our first big unit and put it at a site in the field and start our operation. We are engineering these devices to be mass produced. If we are successful this will be a significant feature. We will not have to go out and build in the field and build foundations and haul in giant equipment. We can have these things built in fab shops.

CEOCFO: ***Lithium is very important to the green industry. What are the environmental concerns in mining and processing lithium?***
Mr. Burba: Several years ago there were several articles that it pointed out that lithium production was a dirty process and although it has been tied to green electric vehicles. This is a fair criticism of some current lithium production plants.

Currently lithium comes from two sources. It comes as a pegmatite rock through hard rock mining. Typically, this is open-pit mining with the consummate rock piles and tailings ponds. This process consumes a lot of chemicals and produces correspondingly large amounts of chemical waste. This is also the most expensive route to get to get the lithium carbonate. Today that accounts for 45% to 49% of global lithium production. The rest of the lithium produced comes from brine resources in the Atacama in Chile and Salar del Hombre Muerto in Argentina.

There are two processes for lithium brine production, the FMC Selective Absorption process and solar evaporation. Solar evaporation generates huge amounts of waste salt that is stacked on the salar. It also covers thousands of acres of land with evaporation ponds.

Our process will be different. We will pump brine from the ground, recover the lithium and pump the brine back down an injection well. So, our process will have a much smaller environmental footprint.

CEOCFO: ***What is involved in the traditional processing of lithium?***
Mr. Burba: If you want to go out and build a lithium plant, you first have to find a salar, and now you have to drill that thing to determine if there is enough lithium to justify the cost. That is about a two-year process if everything goes well. Typically engineers will construct a pilot scale plant to test critical steps in the process. Then a full plant is designed based on the pilot data. After that the full plant is constructed, taking another 2 to 4 years. Based on recent industry costs, you are going to spend on average between $300 million to $600 million by the time you are all done. This does not include start-up costs. Additionally, lithium carbonate will begin eighteen to twenty four months after the plant is started up. Recent history indicates that from start to end the process will require from about 8 to 12 years to reach production.

CEOCFO: ***How will your technology change that?***
Dr. Burba: Our vision is to produce high tech mobile extraction units that can be placed in locations where we have access to appropriate lithium containing brine, and utilities. Once we have built and demonstrated our prototype, we will be able to mass produce these units. Because the units are mobile, we can place them in a field. If lithium concentrations drop off, we can move them to a different location and start again. Furthermore, the characteristics of the selective absorption technology allows us to effectively operate in a wide range of brine compositions.

The result of these characteristics is that our goal is to dramatically reduce the time that is necessary to build and startup a new resource.

CEOCFO: ***What are you doing to get the word out about your efforts? Are you attending conferences? Do you have a web page where you list your releases? Are you keeping up with social media and blogs to enable people to follow you and your efforts?***
Dr. Burba: The merged company has been together now for six days. We are rapidly putting things in place. We are working on our corporate presentation. I have given a number of talks at various conference and we will be going to more conferences. I am happy to talk with anybody at any time. I think that the technology is exciting for us and the company is exciting but I think this is the kind of thing that needs to happen in order for the industry to be able to respond to the stunning demand, because otherwise the industry is going to get throttled just from lack of lithium. Our goal is to develop a low cost, an environmentally responsible, elegant lithium extraction and production system that can be rapidly deployed in target resources. Once proven, we believe that this technology will allow us to significantly reduce resource development time, allowing rapid exploitation of new untapped resources.