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# HALLGARTEN & COMPANY

Thinkpiece

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**Happy Campers**

With mainstream mining in the doldrums still, enterprising boards have thought laterally about what they should be doing to survive the long drought of financing. Some have looked at their deposits and asked themselves the question “what else have we got here that we can sell?” and the answer has come back, for a lucky few, as products to feed the still healthy oil & gas E&P sector, which has been on a roll for a fistful of years now on the back of the fracking phenomenon. Before recently if we had been asked what mineral product could exploit the oil and gas trend we would have been hard pressed to think of anything more than Cesium, which is used as a drilling and completion fluid, or Barite that is used in drilling mud. We would have been equally pressed to name a player in the Cesium space besides Cabot Corp (NYSE:CBT) which makes Cesium formate brines.

However there are some names to conjure with in the fracking minerals space and all of them are new to the activity. What they are doing is largely under the radar in a “couldn’t care less” mining market but they manage to straddle the gap between a fully-valued hydrocarbons sector and down-in-the-dumps mining sector. If some of the higher value that propels the valuations on oil services players (think Schlumberger) might be afforded to these bottom-feeders in the provision of fracking minerals then managements (and shareholders) should be happy campers indeed.

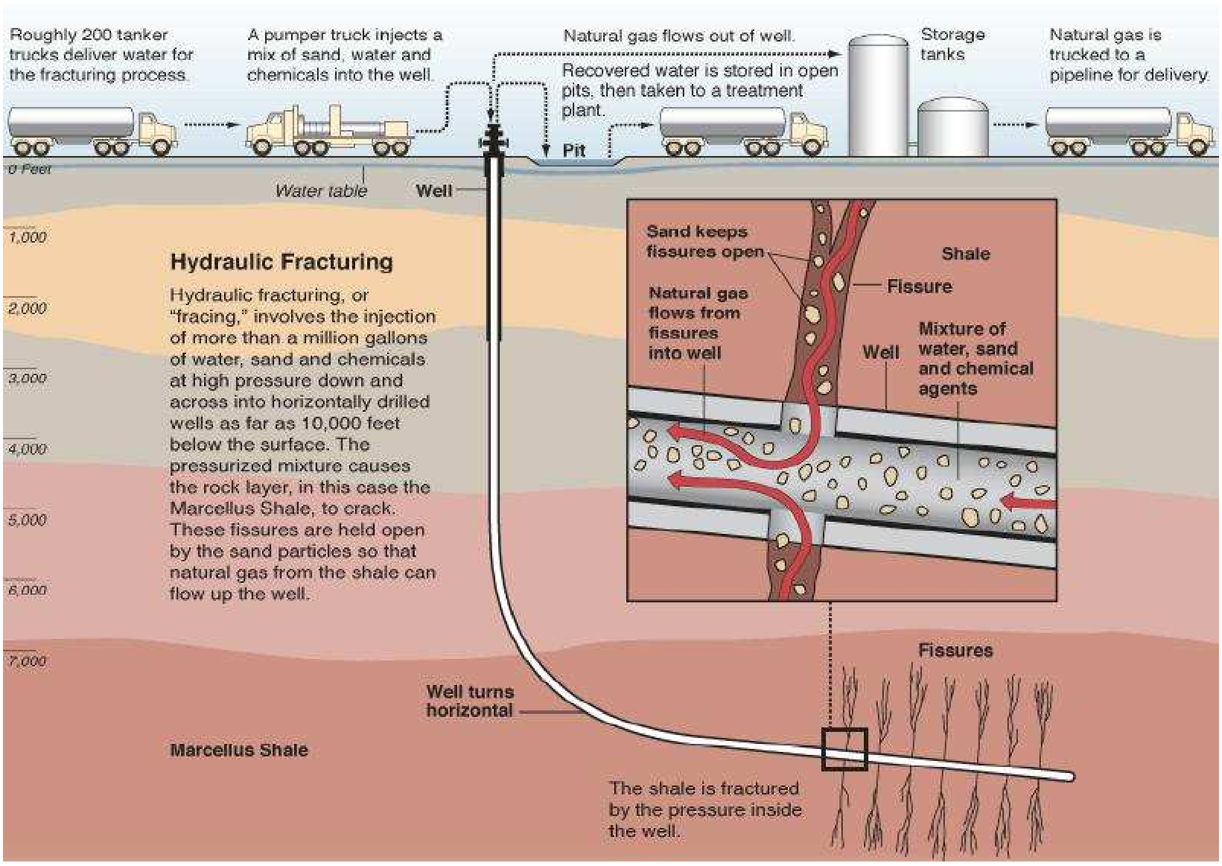
**The Big Dynamic**

The main driver for the very rapid, steadily increasing demand of fracking minerals is the United States focus on becoming self-sufficient in energy by the year 2020 or if not sooner. The demand has been generated by the technology breakthrough of horizontal drilling combined with multiple fracking.

Key to the fracking process is the use of proppants, of which fracking sand is one of the most important. A proppant is a solid material, typically treated sand or man-made ceramic materials, designed to keep an induced hydraulic fracture open, during or following a fracturing treatment. It is added to a fracking fluid which may vary in composition depending on the type of fracturing used, and can be gel, foam or slickwater-based.


*Source: Minnesota Dept of Environmental Quality*

Natural sand is the least expensive proppant used in fracking thus the demand for frac sand continues to grow and is now 90% of the market; expensive ceramic proppants are now less than 10%.




*Source: Indmin*

**Production – Hitherto Highly Geographically Concentrated**

Total US frac sand production in 2012 was 31 million tons, of which about three million tons were exported mainly to Canada. Around 75% of the US supply of frac sand is currently produced in Wisconsin and neighbouring states. In the state of Wisconsin alone; in the past five years, a total of 105 frac sand mines feeding 65 processing plants have been put into production. In comparison Canada only has four frac sand mines in production producing about two million tons of sand per day.

**Demand - On a Tear**

According to Hart Energy, a major US consulting firm which focuses on the shale oil and gas industry, in 2012, the US produced around two million barrels of shale oil per day, mainly from the Bakken and Eagle Ford basins in Texas. In 2012, the US added one million barrels of new shale oil per day, while Canada added 200,000 barrels of new oil per day (mainly in Saskatchewan and Alberta).

The USGS statistics show that 28 million tons of frac sand was used in 2012, thus on average a million barrels of new oil requires about 14 million tons of frac sand. It is estimated that to increase the US oil production to six million barrels of shale oil per day would require a massive 80 to 100 million tons of frac sand by 2020. As all the Western Canadian oil fields get redrilled and fracked, the Canadian demand will increase exponentially as well. For example the 200,000 b/d increase in 2012 would have required an additional 2.8 million tonnes of frac sand, nearly equivalent to the total amount imported from the US.

Another important driver of future growth of the Canadian frac sand market is for drilling natural gas to feed the large LNG plants planned in British Columbia.

This trend sparked a land rush best exemplified by a transaction in 2011 when Natural Resource Partners purchased 2.8 square kilometers of frac sand reserves in east Texas for $16.5 million.

**Dynamics**

All sand may seem the same when one is sprawled on the beach. But there is a myriad of difference in the quality and usefulness of sand for the fracking process. Increased strength often comes at a cost of increased density, which in turn demands higher flow rates, viscosities or pressures during fracturing, which translates to increased fracturing costs, both environmentally and economically. Lightweight proppants conversely are designed to be lighter than sand (~2.5 g/cm3) and thus allow pumping at lower pressures or fluid velocities. Light proppants are less likely to settle. Proppant geometry (i.e. shape) is also important; certain shapes or forms amplify stress on proppant particles making them especially vulnerable to crushing.

Because the sand is used in large quantities, as production and processing are relatively low-cost, transport to the fracking location is a key component of the pricing. The largest US and Canadian locations where fracking is undertaken are distant from the sea and largely inaccessible to river transport, so the product needs to be moved by truck (mainly) or rail. Proximity to the end-user is thus an important factor.

**Western Lithium (WLC.to) – Branding Products**

If we recall rightly this was the first Lithium company we ever met, right at the start of the Lithium boom and it seems like an eternity ago. The company project then and now is the Kings Valley Lithium Project is located in Humboldt County in northern Nevada. The area is sparsely populated ranching land and covers approximately 40,000 acres. Humboldt County though is famous for its various mines both past and present.

The deposit has a resource of 11 million tonnes of lithium carbonate equivalent (historical estimate based on exploration work by Chevron Resources during the 1970s and 1980s) in a near surface deposit. The Pre-Feasibility Study dating from December 2011 is based upon for nominal production of 26,000 tonnes per year lithium carbonate, with nominal production of by-product potassium sulfate and sodium sulfate of 90,000 and 100,000 tonnes per year, respectively over a 20 year mine life.

However like so many in the lithium space it had to contend with the “hunger phase” of the last two years. In response to this the company thought laterally and decided that its properties resource of hectorite clay could be a short term solution to its production hiatus on lithium. Therefore it invented itself a brand name, Hectatone (not quite De Beers, but it works). It then set about exploiting the simplified refining processing requirements and properties of the WLC hectorite clay for the development of additives to drilling fluids. This organoclay is an essential drilling fluid additive for new directional drilling completion techniques that target previously inaccessible reserves of natural gas and oil.

With high active clay content, the hectorite clay-based organoclay is dry processed, and the company expects to have a cost advantage over wet processed products. It’s positioning itself as a cost competitive new entrant to the drilling industry targeting the growing high pressure high temperature market.

**U3O8 - Stirrings in Patagonia**

Argentina has come from nowhere in fracking a year or two back to being predicted to have one of the largest potential resources in this space. It was a particularly timely discovery as the previous ten years had been full of predictions of Argentina falling into a severe hydrocarbon deficit. U3O8, which has been in Argentina for a long while now searching for Uranium was suffering the travails of the price in that mineral and much to the surprise of many suddenly announced it had a fracking sand asset within its territory and thus decided to up the profile of that asset, spun it out into a new vehicle and hopes to ride the fracking boom in Patagonia.

**Others…**

Other names to conjure with are Victory Mountain Ventures (VMV.v) and Claim Post Resources (CPS.v) which are both pursuing fracking sands, both in Alberta.

**Conclusion**

Minerals for the fracking industry may not be a widely known subject but in these current tough times, they are nothing to be sneezed at if they bring in money. Those companies that find themselves with a resource that can be turned to this purpose, in total or in part, would be foolish not to exploit the moment. We should recall that it is often said of the California Gold Rush of the 1850s that those who made the most money were not those doing the mining but rather those selling them the shovels. The new push for energy independence in the US and the aggressive hunt elsewhere for frackable resources means that there are good prospects for those “selling shovels” to that industry for the foreseeable future.

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