

Exciting Economic News For Low Grade U.S. Manganese Deposits

Ken Reser; 07/10.

*Note: The following process outlined may not be applicable to all types of Low Grade Manganese Ore deposits due to the Manganese ore mineral composition and other extenuating factors.

A new report submitted by Kemetco Research Inc. on behalf of American Manganese Inc. <http://www.americanmanganeseinc.com/> and partially funded by the National Research Council of Canada, should at some point have major reverberations thru-out the Manganese Mining sector, especially in the USA. Most notably for those mining companies with lower grade Mn deposits once deemed marginally economic. For the sake of including the specific details of the process as they are somewhat technical, I have used some of the information directly contained in the news article.

*Below Quoted from July 13/10 News:

"The Recovery of Manganese From Low Grade Resources: Bench Scale Test Program Completed," prepared by **Kemetco Research Inc.** of Richmond, B.C. The report describes and summarizes the extensive bench-scale metallurgical tests of the unit operations - operations which when linked together form the basis of a complete innovative conceptual flow sheet complete with heat, mass and energy balances - designed to process lower-grade manganese ("Mn") mineralization into high purity manganese metal.

In May 2009, the Company commissioned Kemetco to develop a robust energy efficient hydrometallurgical process which would yield high purity manganese metal and/or manganese dioxide while minimizing potential environmental impacts. The work integrates and builds upon the extensive research carried out most notably by the United States Bureau of Mines intermittently from the 1940's through the 1980's and proprietary third party research conducted by other mining companies.

The report confirms that American Manganese's proprietary process can extract manganese at greater than 90% efficiency while minimizing water use and potential environmental impacts. The conceptual process flow sheet developed during this test program is based on a unique application of commercially available process equipment so that the process is deemed to be robust and energy efficient. In addition to the production of electrolytic manganese metal, a saleable anhydrous sulphate by-product will also be produced.

Treatment of typical manganese samples containing between 4% and 7% Mn by weight (primarily in the form of pyrolusite, psilomelane and wad), is carried out in a hydrometallurgical process whereby four-valent Mn is reduced and leached by sulphur dioxide (SO₂) dissolved in water. The hydrometallurgical processing of friable lower-grade material avoids intensive crushing and grinding, as well as the

undesirable high temperature reduction roasting that is conventionally used in processing hard high-grade material. Roasting at temperatures typically between 800 degrees C and 1000 degrees C is energy intensive and would not be economical for lower-grade material.

Leaching studies performed on typical manganese samples of large particle size (greater than 9.5 mm) with dilute SO₂ in stirred tanks indicates that the material is readily leachable. The material is friable and large particles break down easily during stirred tank leaching. SO₂ leachant is produced on-site by burning elemental sulphur with 20% excess air. At a feed processing rate of 3500 tonnes/day, heat exchanging the exhaust gases from the sulphur burner will produce an estimated 20 tonnes per hour of steam at 400 degrees C and 45 bar pressure. In a condensing turbine, this steam can produce 5 MW of continuous electrical power.

The pregnant leach solution (PLS) is purified in 2 stages prior to separating the manganese by precipitation. Dissolving the precipitate with recycled electrolyte produces a Mn-containing solution that is conducive to producing high-grade Mn metal by electro-winning.

Solid tailings with minimum water content are produced by filtration of the final counter current decantation underflow material, minimizing water requirements for the overall process. The solid tailings produced from test work were shown to be benign by the Toxicity Characteristic Leaching Procedure, and can be returned to mined-out areas of an open pit facilitating immediate progressive reclamation of disturbed areas.

Based on the successful test work, conceptual flow sheets have been developed which include applications of novel, proprietary, innovative technology to minimize process operating costs through low water use, low overall energy use and economic destruction of unwanted by-products. Accordingly, American Manganese Inc. has requested Kemetco to file an application for patent protection. (end)

Now the reason I mentioned earlier that this news was of great importance for Manganese Mining in the US is the fact that the USA has several rather large scale (long) known deposits of lower grade Manganese in various parts of the country but NO domestic Manganese mines whatsoever today.

-Manganese is, or used to be, the USA's Strategic Metal # 1, and is still near the top of the Gov't list of Strategic Metals today, especially in the Munitions and Defense Industry.

-Manganese is the world's 4th largest traded metal commodity

-World Manganese Consumption stands @ 30 Billion Pounds p/yr

-Manganese demand is currently growing at 8% p/yr (1.5 B lbs)

-EMM- Electrolytic Manganese Metal demand has been growing at 26% p/yr for the last 5 years

-US Gov't has essentially sold off all of their Strategic Stockpiles of Manganese over the last few years

-Manganese is a key alloy in not only crude Steel but also in Stainless Steel, Aluminum, Chemicals and a VERY key component in various types of existing Battery technologies as well as Hybrid Batteries now being developed

-Many Stainless Steel applications use 6% Manganese and series 200 Stainless Steel requires 12% Manganese, thereby replacing Nickel

As I have outlined in previous commentaries regarding Manganese (Symbol "Mn"), China controls 97% of the World's supply of Electrolytic Manganese and you cannot make Steel without Mn being added as an alloying agent to prevent brittleness of the Steel. ie: 10 to 20 pounds of Mn per T of Steel and no substitutions are possible.

When one considers the sad state of the US Steel industry today and the industrial competitiveness of other Nations involved in Steel production that are not exactly 3rd world status anymore, but yet still have a much cheaper labour force, I have to ask what exactly can be done to help level the playing field?

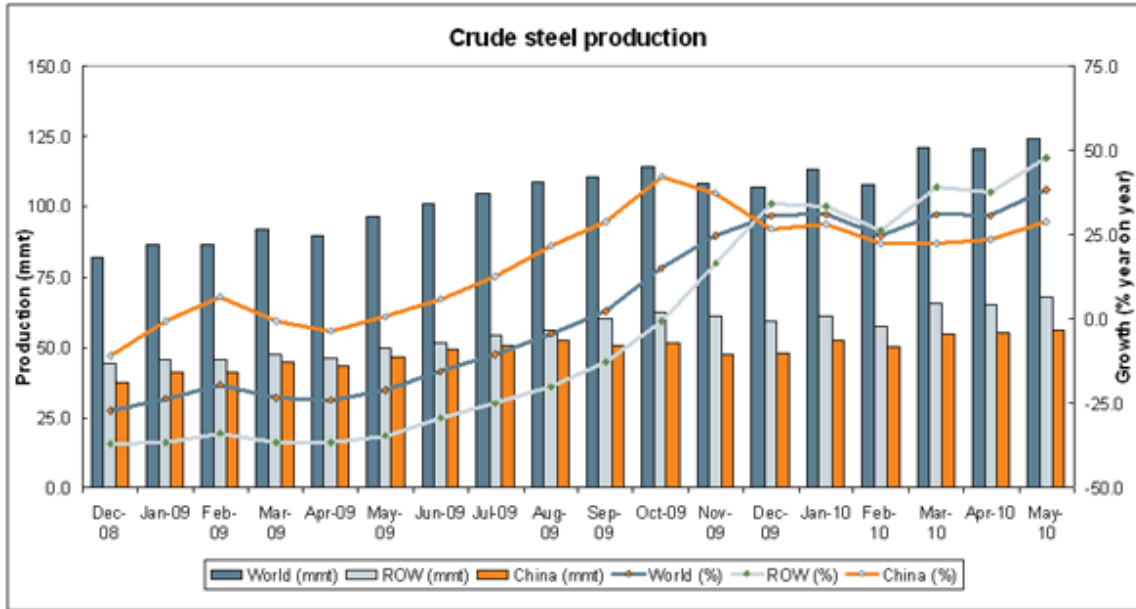
-Looking Back on US Steel Production in 1950's-
(Quote from Ben Fairless, Chairman of US Steel; January 1951)

"What most Americans do not know is that their own steel industry is bigger than those of all the other Nations on earth put together. No other Nation could have matched that record. It is a record that stands as a glorious tribute to the men who make steel and the men who built steel in America" (end quote).

How things have changed since those glory days!

Steel is one of the basic building blocks of the modern world and in the words of Brian Gilbertson, former CEO of BHP Billiton and currently CEO of Pallinghurst Resources: **"You cannot make steel without Manganese and if you can't make steel the world stops."**

World Steel Production Today:



(Chart: Courtesy of www.steel-grips.com)

In 2009 The Five Major Steel Producing Countries Were:

- *China- 567.8 mmt**
- *Japan- 087.5 mmt**
- *India- 062.8 mmt**
- *Russia- 060.0 mmt**
- *USA- 058.2 mmt**

When you consider that China just keeps tightening the economic noose on natural resources worldwide, then you factor in the 20% export tax they have on Electrolytic Manganese exported to World Steel producers and a multitude of other end users, plus a 14% import tax the US Gov't adds in the mix one can see part of the uneven playing field US Steel producers have to work with. Also noteworthy is the fact that much of the Chinese Manganese is of poor quality to begin with.

The western world, primarily the USA needs to wake up and act in order to keep their technology, industry and military on an even playing field with China. Research shows that the USA is 100% dependent on imports of 18 different key metals and 90% import dependent on 4 others as well.

With all the fanfare now being dedicated to Rare Earth's and calls for Government grants and loan guarantees to create Rare Earth mines in the US, I can only wonder why nothing is said about domestic Manganese Mines and the state of the US Steel industry.

“Senator Lisa Murkowski” are you listening? “President Obama” you need a lot more than just Rare Earth’s for your Electric Cars and Wind-farms! As the legendary billionaire T Boone Pickens constantly & publicly states, “We need to take control of our own Natural resources”, and I take that to mean not just oil, but all natural resources. Senator Bayh of Indiana recently stated (quote) “Without a secure, domestic supply of Rare Earth metals, our country is forced to rely on China for these materials, an unacceptable situation that jeopardizes our economy, our energy supply and our National Security interests. (end) That statement by Senator Bayh would and should also apply to Manganese and not just Rare Earths.

Here you have right here in the continental USA more than enough good quality, albeit lower grade Manganese deposits to supply the domestic needs as well as exports for the world and they sit idle in the ground. Jobs needed in the sickly US economy, but none being created by mining it seems.

It appears, that here and now, there is at long last, an efficient and low cost Manganese recovery process pioneered by the US Bureau of Mines back in the 1940’s, used for production @ the Three Kids Mine, Henderson Nevada in late 1940 and 50’s for US Steel companies that has been refined, modernized thru new equipment and technology and tested extensively over the last year by Kemetco Research on behalf of a lone Jr Mining Company with a clear vision coupled with a large low grade Manganese deposit in mine friendly Arizona that may just prove to be the defining factor in the US becoming independent of one very important strategic metal that China has a world stranglehold on at present.

When I recently contacted the COO of American Manganese Inc. I asked if this process could be termed as a somewhat “Green” or Environmentally friendly mine operation as it appeared to be at first glance, the response was a firm “yes”. He stated that with the ore mineralogy and this Kemetco process they had no grinding costs as the ore was “Friable” and they used very little water, used no toxic chemicals in the leach process, cogeneration of electrical power from steam generated in the process would off-set electrical use and costs, they required no roasting of ore and the toxically benign solid waste tailings were able to be replaced back into mined out areas with no effect on the environment. Not often you hear the words environmentally friendly in mining discussions.

Well there you have it in a nutshell...One more small potential step for American independence from Chinese Imports of Strategic Metals, but a step as yet untaken by the US Government and mining media who profess to keep us informed. Lets hope when all are worn out from the Rare Earth chatter and fanfare they may just take a reality check on the vast importance of Manganese to the US economy, national security and the fact that you can’t mine everything in somebody else’s backyard and be competitive or

secure, much less create new job's. N America has some of the best mining people and technology in the world and it's time to get back to utilizing them.

As Always: Thanks for reading:

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