Canadian Metals – Passing the Tests with Flying Colours..

This company, with its Langis project in Quebec, is on the road towards becoming a new Western source of Ferrosilicon, a mineral mainly produced by China until now. As the mining (quarrying really) of the silicon is rather a no-brainer the key to success is going to be in the processing. Several months back the company announced an agreement with the South African company, MINTEK, for performing the prototype testing of the production of ferrosilicon from Langis silica sand. This test work will be conducted in two phases, the first of which has just been completed.

The aim of the **first phase** was to demonstrate the proof-of-concept and the technical feasibility of producing ferrosilicon from the quartzite, to evaluate the quality of ferrosilicon which can be produced and to provide indicative operational and metallurgical data which can be used for scale-up to a semi-commercial scale. During the **second phase**, the previous results and performances will be used, in part, to conduct a PEA study on a commercial facility. The study will include a generalized flow sheet of the commercial plant, overall mass and energy balances, and capital and operating costs estimates of within 25-30% accuracy.

Previous Work

GENIVAR supervised a nine-hole, 456m drilling program at Langis in September 2013. Of these, three representative drill holes were sampled and analyzed at CTMP laboratory in order to characterize the silica sand for potential economic end usages.

Based on the preliminary test work by CTMP laboratory, the basic properties of the Langis sandstone indicated that it had

potential to be a usable source of silica. The impurities contained in the core samples are about 1% with a silica grade in the order of 98.55% SiO_2.

First Phase Results

To confirm these initial results, material from Langis was sent to South Africa and the company this week announced that the first lumps of ferrosilicon (prototype testing) were successfully produced at the MINTEK state-of-the art facilities in Randburg, South Africa (pictured below). The series of prototype tests was conducted between end of May 2015 and early June 2015.

This Phase One was intended to give a very rough indication of the technical feasibility of producing ferrosilicon from the Langis quartzite. It involved smelting four batches of quartzite, low ash coal, wood chips, and iron ore (Hematite) in a 40kW DC electric arc furnace. The feed was pre-mixed and charged into the furnace intermittently over a 6-8 hour period. The furnace was then switched off and allowed to cool down before collecting (digging out), weighing, sampling, and analyzing the products. Four tests (8-hours per test) were attempted where the major variables were the feed recipe and target temperature.

During the tests the thermal shock resistance of the Langis quartzite was confirmed considering the low carry-over of fines that was observed. All the samples were independently analyzed by MINTEK confirming that ferrosilicon can be produced from the Langis quartzite.

In the coming weeks, a detailed report will be issued by MINTEK.

Ferrosilicon

This alloy of iron and silicon has an average silicon content ranging between 15% and 90% (by weight). It is produced by reduction of silica or sand with coke in the presence of iron. Ferrosilicons with silicon content up to about 15% are made in blast furnaces lined with acid fire bricks. Ferrosilicons with higher silicon content are made in electric arc furnaces. The melting point and density of ferrosilicon depends on its silicon content. The usual formulations on the market are ferrosilicons with 15%, 45%, 75%, and 90% silicon. The remainder is iron, with about 2% consisting of other elements like aluminium and calcium. Microsilica is a useful byproduct of this process which is used in pozzolanic cement.

In contact with water, ferrosilicon may slowly produce hydrogen. The reaction, which is accelerated in the presence of base, is used for hydrogen production.

The Langis Project

The main project of Canadian Metals is its 100%-owned Langis Silica deposit located in the eastern Matapedia Region of Quebec, in Appalachian terrain. The concession covers a geologically-mapped area of highly siliceous sandstone of economic interest as a potential source of silica sand. It is the site of a small non-operating sandstone quarry that was explored and operated briefly during the 1980’s.

Langis is being actively being explored by CME with the company having announced a start of a drilling campaign in mid-May. The results of this drilling campaign will be used in the future PEA that will be conducted in the coming months.

Drilling will focus on a broad area of highly siliceous sandstone has been outlined by government mapping and by the existing quarry and the aforementioned drilling completed by CME in September, 2013.

Geological mapping and historic exploration drilling have outlined a large lobe of highly siliceous Lower White

Sandstone of the Val Brillant Formation at Langis. Historical exploration drilling and attendant historical geochemical and physical analyses indicate the potential for an economic silica sand deposit of more than 25 mn tonnes contained within this lobe.

Conclusion

Proving that the material from Langis is suitable for ferrosilicon production is a key step on the way to production. In comparison the mining is the relatively easy part.

With a track record of moving projects to production the prospects of Canadian Metals becoming a real producer are enhanced. That it should already have a rather stellar team of engineers, with heavy iron ore experience on board, means that we are looking at real business builders.

In ferrosilicon, Canadian Metals has found itself a somewhat unique niche in the listed markets with no other competitors we know of. With a tailwind from strengthening prices the sooner this project steps up to production mode the better.