

Commentary and Analysis

Contributed Commentary and Analysis on the Mining and Exploration Sector

CRU's Helen O'Malley Speaks Manganese

Source: Brian Sylvester and Karen Roche of [The Gold Report](#) 5/10/10

<http://www.theaureport.com/pub/na/6252>



"The price for manganese ore has recovered a lot more swiftly and strongly than we anticipated," explains Helen O'Malley, a bulk manganese specialist with London-based CRU, adding: "The price bottomed out last year to about \$3.50 per dry metric ton unit (DMTU) and now it's up to about \$8.00." In this exclusive interview with The Gold Report, O'Malley sheds some light on the seldom-discussed metal and its supply and demand fundamentals. She also explains how the market is really being driven by China and even lists several junior mining companies who are actively exploring manganese properties.

The Gold Report: Helen, our readers may be unfamiliar with manganese and its applications. Could you please provide us with an overview of the metal and its main uses?

Helen O'Malley: We estimate about 98% of manganese is consumed in carbon steel or stainless steel. So that accounts for the bulk of consumption. The other 2% is chemical applications, mainly for making batteries, so it's really a small segment. CRU is focused on the steel side of demand.

The annual production or demand of the manganese ferroalloys would be around 14 million tons per year and of that manganese metal would be just over 1 million tons a year.

What is a manganese ferroalloy? Well it's essentially an alloy of iron, hence the "ferro" in the name. They contain a high proportion of manganese, anything between 65% and 78%, perhaps even higher.

The ferroalloys fall into three main categories. We have silico-manganese, high-carbon ferromanganese and refined ferromanganese. These grades differ in chemical composition, with varying levels of carbon, manganese, silicon and impurities.

These alloys are used in the production of carbon steel. There are two main uses of manganese alloys in the steel-making process. Firstly as a deoxidizer and desulphurizer in the steel-making process and also they're added to steel in varying quantities to give it certain properties like hardness and strength. You can't make steel without manganese.

Manganese metal, on the other hand, is mainly used to make stainless steel, as well as other specialty types of steel.

TGR: What are some of the specialty steels?

O'MALLEY: Stainless steel would be classified as a specialty steel. Manganese is used in relatively high proportions to make 200 series stainless steel. This grade of stainless steel has emerged in the last few years, particularly in China, in response to high nickel prices and it has gradually grown as a proportion for the stainless steel market. Other steels containing a high manganese content might be line pipe, tool steels and high-strength low-alloy (HSLA) steel, which is a class of alloy steel that has good mechanical properties and is lighter than carbon steels.

TGR: How much manganese is used to make a ton of steel?

O'MALLEY: We estimate you need about 10 kilograms of manganese alloy to make 1 ton of steel (carbon steel). This consumption rate is actually gradually rising over time, very slowly; but we think this is due to increasing demand and, therefore, production of these high-strength steel grades.

The consumption of manganese is highly dependent on the type of steel you're producing, whereas the relative consumption of each grade of alloy depends more on the steel-making process route (electric arc furnace [EAF] versus basic oxygen furnace [BOF]) and availability of alloy to the steelmaker.

TGR: You're a bulk manganese specialist. Where does bulk manganese fit into the sector?

O'MALLEY: It's called bulk because there's actually a large family of metals under the umbrella "ferroalloys." So you might have things like ferrovandium, ferrotitanium and lots of other alloys; but we put a fence around three main groups of alloys, which are relatively large in volume. These are manganese, silicon and ferrosilicon.

On the other hand, if you compare these to markets like coal (around 800 million tons per year) or iron ore (around 2 billion tons per year), then the scales are actually very small.

TGR: You follow manganese prices as well. Judging by my research, manganese prices are up year-over-year by about 20% and about 7% since the end of 2009. What's causing the demand side pressure on the price?

O'MALLEY: If you look at the difference between the trough in prices last year and where we are now, prices are actually up about 80%. So prices have come up quite a bit from the middle of 2009. However, they are still about 40%-50% below the peak levels of 2008; while there has been some recovery, they're still long way off pre-crisis levels.

TGR: What's been causing this rise?

O'MALLEY: There are two factors. First, the tightening in supply/demand fundamentals. This is directly in line with recovery in global steel production, so that's your demand pull. On the supply side, last year the major producers around the world slashed production quite aggressively. That's been putting pressure on supply side fundamentals.

Another factor is that production costs have been rising, so this has been raising the floor price for manganese. This is coming from rising manganese ore costs. In fact, manganese ore is a very important component of production costs and it can account for as much as 60% of the manganese alloy production costs. So it's a very important driver of alloy prices. The price for manganese ore, for example, has recovered a lot more swiftly and strongly than we anticipated. The price bottomed out last year to about \$3.50 per DMTU (dry metric ton unit) and now it's up to about \$8.00. This market is really being driven by China; but, because it feeds into production costs around the world, it's affecting global alloy prices.

TGR: Please explain the unit price.

O'MALLEY: The price unit that most people refer to is dollars per DMTU because it's a way of normalizing ore to manganese content. It means that the price per unit (based on 100 units per metric ton) of pure manganese would be \$8.00, at today's prices. If you want to convert that to a price in dollars per ton of actual ore, you would have to multiply it by the contained manganese of your product and multiply again by 100 (to bring it from a unit to a metric ton).

TGR: How do you determine the grade of manganese in products in order to set the price?

O'MALLEY: We choose a benchmark grade, which is a medium grade ore. That would be around 43%-44% manganese. It's important to understand the distinction between the ore market, which is obviously a mined material, and the alloy market, which is a processed metal.

TGR: What price do you expect both manganese alloy and ore to fetch in 2011 and 2012 and even beyond that?

O'Malley: Looking at the alloy side first, the price is rising at the moment and that's because supply and demand fundamentals are tight and also because ore prices are rising. We think that this tightness in the alloy market will persist for another couple of years. This is because global demand from the steel sector continues to recover. You've got recovery in Europe and North America, as well as continued very strong growth in the developing countries-especially China.

There are really only a few producers that account for the bulk of production. We think that they will be maintaining supply discipline for the next couple of years. That will help to keep fundamentals tight enough for prices to rise. We expect prices to continue firming through 2011. On an annual basis we would expect prices to rise between 20% and 30% this year over the 2009 average; next year another 10%-15% on that.

This is referenced to 2009 where prices got quite low. After 2012, we sort of see some downward pressure emerging as more supply comes into the market and demand growth starts to moderate.

That said, we don't think that either manganese ore or manganese alloy price will return to historical trends. This is because we think the manganese ore market is going to remain structurally tight. This is going to add or provide support to alloy prices.

TGR: Helen, let's say you were talking with an investor who wanted to play the manganese market. What should that investor know and should she or he be excited?

O'MALLEY: I'm biased. I think the manganese market is exciting anyway! In previous years, the manganese market was kind of hidden. No one really talked about it; no one really knew what it was. We saw prices increase very sharply in 2008, then collapse and now they've come back strongly. I think this is exciting for investors and maybe junior mining companies.

The manganese market is mostly either privately held or represents one of a number of commodities for someone like [BHB Billiton Ltd. \(NYSE/ASX:BHP,PKSHEETS:BHPLF\)](#). It's pretty difficult to get a pure play exposure to manganese at this point in time.

There are a few hot spots that you should keep an eye on in terms of developments in the market. The first one is the ore market. Prices have come back a lot more quickly and strongly than we were anticipating. This is a market that's really driven by China, which is "hoovering" up any manganese ore it can get its hands on because of the strength in steel production and the constraints in China's domestic ore production. The supply chain cannot really keep up.

The international manganese ore market is really in the hands of only a few producers in three or four countries. Manganese is a bulk commodity, so it's going to be subject to constraints from infrastructure. Mines are ramping up as quickly as they can in an attempt to bring on new capacity. But at the moment it's lagging the rate of growth in demand.

In 2008, you saw prices spike up to \$18. I don't think we can rule out another spike in prices.

TGR: Is that what's causing Australian-based companies [OM Holdings Ltd. \(ASX:OMH\)](#) and the private firm Consolidated Minerals to merge?

O'MALLEY: As I said, it's Chinese demand for manganese ore that's really driving prices higher. If you have a view that this pattern is going to continue, then you'd certainly be interested in expanding your exposure to the metal. In terms of what this could do to the market, it's hard to say, but, as I've said, the ore market is already very consolidated.

The size of the market, excluding India and China, in terms of supplies is around 25 million tons a year. Only about five or six producers account for that production.

TGR: Are there some junior companies out there that have manganese properties that perhaps investors should be looking at?

O'MALLEY: We try to keep a database of all known manganese mining projects. I can tell you that the list of projects in Australia has gone from a handful to several handfuls just in the space of about six months. There has been a lot of activity in Australia among the junior mining companies, although almost all of them are pre-exploration phase. They're trying to raise money to start exploration programs. Just to name a couple, [Aurora Minerals Ltd. \(ASX:ARM\)](#) and another called [Encounter Resources Ltd. \(ASX:ENR\)](#), are both set to start drilling this year.

There's another one called [Spitfire Resources Ltd. \(ASX:SPI\)](#), also in exploration stage. Spitfire completed an initial Joint Ore Reserves Committee (JORC) compliant resource estimate on part of its deposit last year, but continues to raise finance to fund further exploration.

There's one company that's actually started trial mining already. They're called Auvex Resources Ltd. (privately held). They started trucking ore from their mine at Ant Hill to Port Hedland late last year and plan to start full production this year. Auvex is in a joint venture with a company called [Mesa Minerals Ltd. \(ASX:MAS\)](#) (formerly HiTec Energy Ltd.).

TGR: Are there any explorers in the U.S. with significant manganese assets?

O'MALLEY: There's [Wildcat Silver Corp. \(TSX.V:WS\)](#) and its Hardshell silver-manganese-lead-zinc property in Arizona. As we understand it, silver is the main product. I think Wildcat's deposit and the manganese stream is from a pretty low-grade deposit relative to the standard manganese mines owned by primary producers. I think that's one difference; and, if silver is the main product, that probably will be more key in determining the actual viability of the mine as opposed to necessarily manganese.

However, given the relatively large size and breadth of the manganese market, there is a place for Wildcat Silver to participate as long as the project is competitive and that they produce a product this market can use.

TGR: I don't know how many manganese players there are in the U.S., but there can't be many. What would it mean to have a company producing manganese in the U.S.?

O'MALLEY: You're right. As far as I know, there aren't any active primary manganese mines in the U.S. There are only two main manganese smelters in the U.S., and each is owned by major international producers who source manganese ore from their captive mines overseas. The U.S. is also dependent on imports of manganese alloys for its steel sector.

TGR: Helen, thank you for your time. We've learned a lot.

Helen O'Malley joined London-based think tank [CRU Group](#) CRU's Steel Raw Materials Team in 2005, and has since developed considerable knowledge of and expertise in the analysis of metallics, iron ore, crude steel, and ferroalloys markets. Up until early 2009, she managed CRU's Iron Ore Cost Model and was a key contributor to research in the iron ore market, with her expertise focused on iron ore supply and production costs. Her current responsibilities centre on the production of CRU's manganese ferroalloys market analysis and forecasting products: Helen is editor of the Bulk Ferroalloys Monitor and the Manganese Ferroalloys Market Service. In addition, she supports research activities in manganese production costs. Prior to her career at CRU, Helen completed a Masters in Engineering from Cambridge University, this incorporating a year of study at Massachusetts Institute of Technology (MIT), Boston, Mass.

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