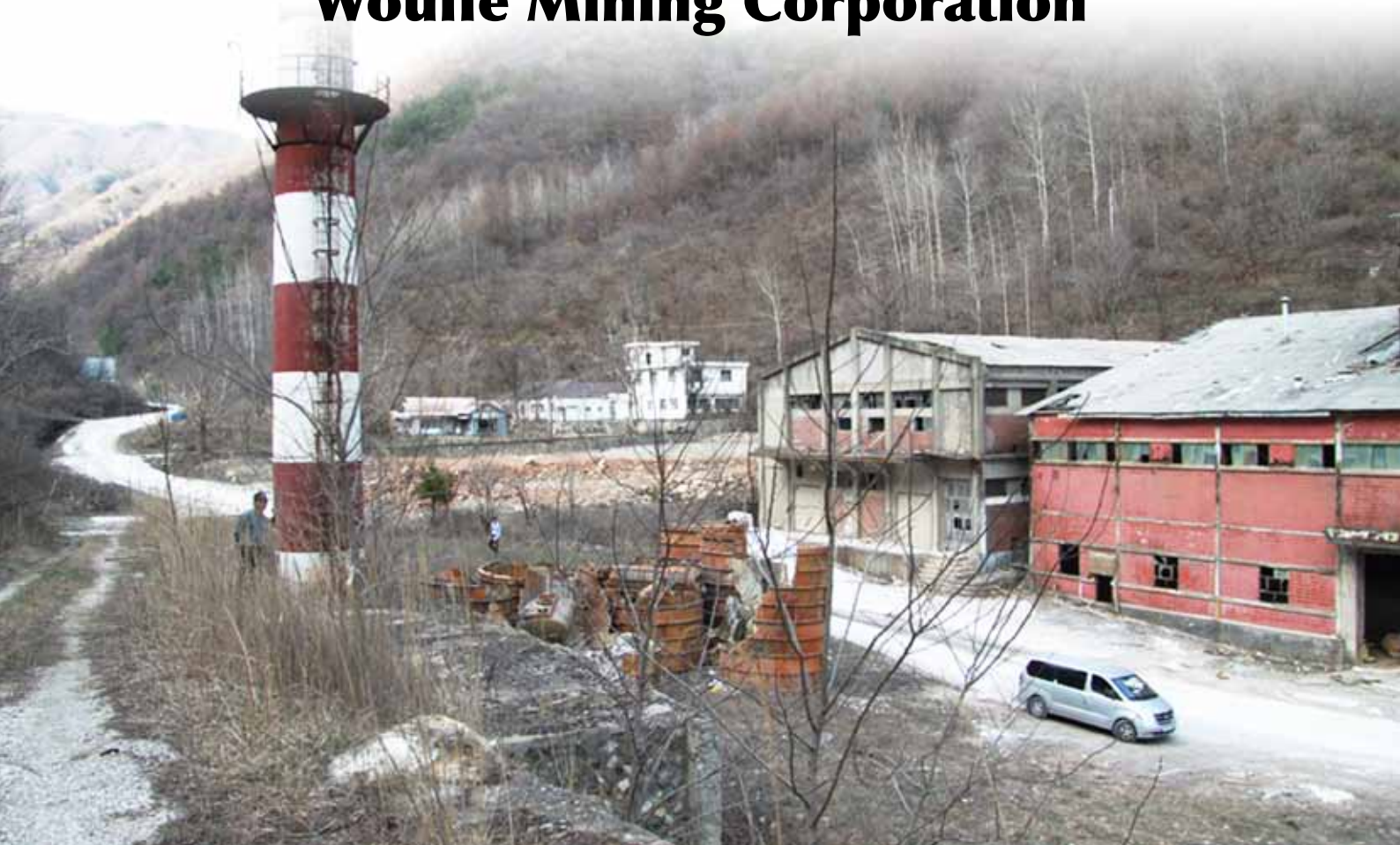


## **Woulfe Mining Corporation**



*Woulfe expects to clear feasibility late this year and make a production decision in 2012 on reopening the former producing Sangdong tungsten mine in South Korea.*

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## Contents

### Executive Summary

Key Points	3
Overview	4
Valuation	6
Key Risks	9
Corporate Overview	10
The tungsten industry	11
Sangdong Property	15
Muguk Gold	30
Other properties	34
Financials	36
Appendix: Management	37

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I certify that this report represents my own opinions.

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## Key Points

15 Apr 2011  
Price: C\$0.24

*Wolfe Mining offers excellent exposure to tungsten, molybdenum and gold through two advanced projects in South Korea. The Sangdong tungsten-molybdenum project, a former producer that retains a substantial resource, is most advanced. Woulfe expects to clear feasibility late this year and make a production decision in 2012. In keeping with its strategy to acquire and develop advanced projects, the company is concurrently exploring the Muguk gold property, another former producer.*

- **Woulfe is reopening the Sangdong tungsten mine**

Woulfe Mining took control of Korea's Sangdong tungsten and Muguk gold-silver properties in December 2009 and released a scoping study in March 2010 that envisaged reopening the Sangdong tungsten mine. Prior to closure in 1992, Sangdong was one of the world's largest tungsten producers, with a reported historical "remnant reserve" of 17 Mt averaging 0.5 % tungsten oxide (WO<sub>3</sub>).

- **Sangdong hosts a considerable resource**

The scoping study delineates an inferred resource of 103.2 Mt of ore, averaging 0.35% WO<sub>3</sub> and 0.04% molybdenum sulphate (MoS<sub>2</sub>). The study envisaged a full mine recovery programme, including total dewatering of the historic underground workings. Woulfe is presently working on a revised mining plan and is evaluating the previously unmined Sangdong Hangingwall zone which it now plans to mine first.

- **Woulfe has lined up a key strategic partner to advance Sangdong**

Pursuant to a heads of agreement, Korea Zinc invested C\$10m into Woulfe at C\$0.30. Korea Zinc has also tentatively agreed to inject C\$38m into a Woulfe subsidiary, in exchange for a 51% interest in the subsidiary, which holds title to the Sangdong project. This injection of capital will likely now depend on the outcome of a 5,000m drilling programme currently near completion at Sangdong. Concurrently, Korea Zinc has tentatively agreed to invest C\$1.8m into a second Woulfe subsidiary in exchange for a 51% interest in the Muguk gold project. In both cases, subsequent to feasibility, Korea Zinc has tentatively agreed to arrange debt financing sufficient to achieve production.

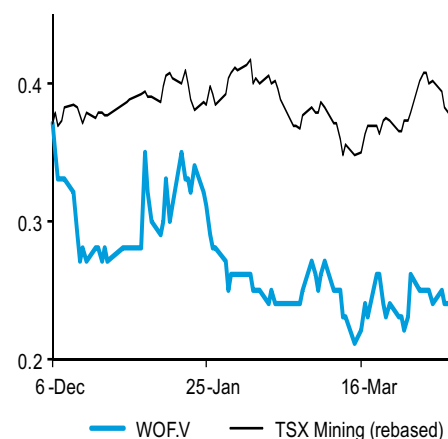
- **Woulfe is fast-tracking Sangdong toward early production**

A full feasibility study is in progress, targeted for completion in late 2011. The current plan is based on the potential contained within the hangingwall infrastructure pillar which traverses the upper portion of the mine. A 5,000-metre drill programme is currently under way in this region, designed to delineate the mineable reserve within this pillar. Mining is formally expected to commence in March 2013, based on the expectation of a satisfactory feasibility study.

- **The Muguk gold project is also being advanced**

Woulfe intends to complete further work on the Muguk gold property this year, including further drilling to upgrade the historic resource. The company has already drilled deep into the old mine to reconfirm historical gold grades. Woulfe also has other properties and projects with a lower priority that remain active.

### Price chart (C\$)



### Value of equity\*

Expected Value	C\$123.4m
<b>Value per share</b>	<b>C\$0.46</b>
Optimistic Scenario	C\$309.6m
<b>Value per share</b>	<b>C\$1.20</b>

\* shown before closing of Korea Zinc deal

### Company details

#### Quote

Shares	
- TSX Venture	WO.FV
- Frankfurt	OZ4.F
- Pinksheets	WFEMF.PK
Hi-Lo last 12-mos. (C\$)	0.07 - 0.55
Shares issued (m)	265.1
Fully diluted (m)	336.9
Market Cap'n (C\$m)	63.6
Website:	<a href="http://www.woulfemining.com">www.woulfemining.com</a>

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## Overview

Woulfe Mining is a Canadian-based junior resource company listed on the TSX Venture Exchange in Canada. Until early 2010, the company was known as Oriental Minerals Ltd prior to a management change and reorganisation. Under current management, the company's focus is on the development of resource projects with existing identified mineralisation that can be fast-tracked to production.

Currently, Woulfe is putting most of its resources into advancing the Sangdong tungsten project in Korea to production. The company is concurrently exploring the Muguk gold deposit, also in Korea, with a longer-term goal of achieving production. Woulfe also has several other projects on its books, including uranium, lead-zinc and tungsten projects in Korea.

### **Achieving production at Sangdong is Woulfe's immediate focus**

Woulfe is focused on reopening the Sangdong mine, once one of the world's larger sources of tungsten products until it closed in the early 1990s. The company commenced its acquisition of Sangdong in 2006 and now holds a 100% interest in the project. If the deal with Korea Zinc completes, Woulfe will remain with 49% of the Sangdong project. Woulfe formally took control of Sangdong 15 months ago and within months had completed a scoping study investigating the reopening of the mine.

### **Sangdong scoping study reveals robust economic potential**

Woulfe's Sangdong scoping study, completed in March 2010 by Wardrop, was based on the NI 43-101-compliant inferred resource contained within the footwall at Sangdong. This resource, 57.4 Mt averaging 0.37%  $WO_3$  and 0.04%  $MoS_2$ , represents just 55% of the available inferred resource. The scoping study did not consider the 45.8Mt of inferred resource contained within the hangingwall, which averages 0.32%  $WO_3$  and 0.05%  $MoS_2$ , because of issues regarding the existing mine infrastructure.

The scoping study, based on mining 36 Mt of the footwall ore, achieved an internal rate of return of 26.4% and a capital cost payback of 3.4 years. Wardrop envisaged a 2.5Mt per year processing plant at Sangdong and a mine life of 15 years. Based on an assumed price of US\$250 per tonne per metric tonne unit (MTU) of ammonium paratungstate (APT), the financial analysis indicated a net present value of C\$367m, based on a 10% discount.

### **A full bankable feasibility study is now under way**

Based on the scoping study outcome, Woulfe has elected to skip the pre-feasibility stage and is proceeding to full feasibility. The bankable feasibility study will be based on an underground mining rate of 1.2 Mt per year, which will be increased in stages to 2.4 Mt per year. The lower mining rate will allow Woulfe to fast-track development, achieving production as early in March 2013.

### **Woulfe has agreed to take on Korea Zinc as a strategic partner**

In November, Woulfe Mining signed a heads of agreement with Korea Zinc that would have the two companies jointly develop Sangdong. In January, pursuant to the agreement, Korea Zinc purchased 30 million Woulfe shares at C\$0.30, then a premium to market, giving Korea Zinc one seat on Woulfe's board of directors. Also pursuant to the agreement, Korea Zinc agreed to inject C\$38m directly into a 100%-owned Woulfe subsidiary, Sangdong Mining Corp, in exchange for a 51% interest in the subsidiary, which holds title to the Sangdong project. This part of the agreement has not closed yet and it now appears to us that Korea Zinc are awaiting the results of the 5,000m drilling programme at Sangdong before it proceeds with this funding. Further, upon successful conclusion of feasibility, Korea Zinc had tentatively agreed to arrange debt financing, an estimated C\$75m, to achieve production at Sangdong. Under the terms of the heads of agreement, which remains subject to due diligence and formal completion, Woulfe would remain manager of the project through to mine commissioning.

### **Meanwhile, Woulfe is concurrently advancing the Muguk gold project**

Woulfe is evaluating the Muguk gold deposit, which was once Korea's largest gold mine until the operation closed in the 1990s. Also pursuant to the heads of agreement with Korea Zinc, Korea Zinc will contribute C\$1.8m to Muguk Gold, Woulfe's 100-percent-owned subsidiary, in exchange for a 51% interest in the subsidiary. Woulfe drilled at Muguk during autumn 2010 to define a mineral resource to NI 43-101 standards. Initial assays have been promising from the No. 7 vein, including a 0.37-metre interval that averaged 16.7 grams of gold and 16 grams of silver per tonne.

# Valuation

## Our valuation approach

We have valued Woulfe Mining based on assessing the economic potential of the company's primary focus, the Sangdong tungsten project in Korea. In so doing we have accounted for: the likelihood that a sufficiently large economic reserve will ultimately be proven; the likelihood that feasibility will be established after considering metallurgical, social and permit issues etc; and the likely economics if actual mining were to occur, considering parameters such as tax, operating costs, revenues etc.

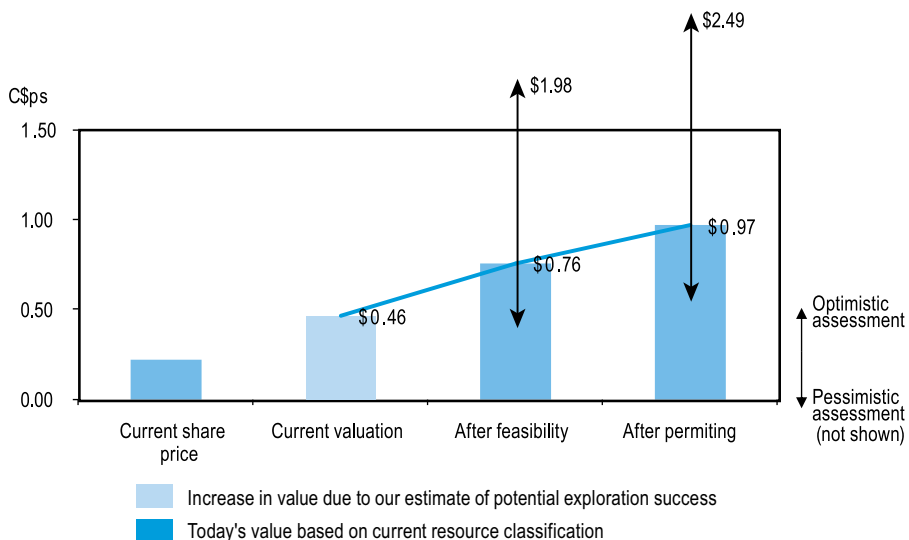
One of the key issues that any mining analysis must consider is the problem posed by the dependence of our assessment on commodity prices. This issue takes two forms – what will be the price environment when mining eventually occurs; and the operating dynamics in response to changing mining prices.

From a valuation perspective, the aspect of operational dynamics that is of interest is the ability to “mothball” operations during periods when the commodity price is below the marginal cost of extraction. This creates what is frequently referred to as “optionality” – something that traditional net present value (NPV) fails to capture. Intuitively this can most easily be understood by thinking of NPV as assuming that positive and negative deviations from our base-case have a similar likelihood of occurring and hence balance each other – however, in mining, the downside is capped at the cost of “mothballing” the site.

We capture these aspects by valuing each year's production as an option assuming that prices revert to mean over the long run – that is, the mine will only operate if the commodity price is above the extraction cost. In essence, rather than valuing that year's production as we would in an NPV model as the discounted value of the cash flow estimated using the base case for the commodity price we value the probability that the price is above the extraction cost.

In valuing the economic potential of resource projects, we assume that while commodity prices are volatile they return to an inflation-adjusted, long-run mean. For example, ammonium paratungstate has historically traded at approximately US\$210 per metric tonne unit (MTU) in current dollars since the 1950s, with deviations from mean normally correcting over 12.0 years with a volatility of 35 percent.

## What Woulfe Mining could be worth - now and in the future



Source: Objective Capital

## Fair value summary\* (C\$m)

Scenario	Base	Pessimistic	Optimistic
Property portfolio			
- Sangdong	146.6	90.2	372.0
- Muguk & others	5.0	5.0	5.0
Total	151.6	95.2	377.0
Less: overhead	22.6	22.6	22.6
Expected value of portfolio	129.0	72.6	354.4
Add: other investments	0.0	0.0	0.0
Add: starting cash + new funds	13.0	13.0	13.0
Total current value for firm	141.9	85.6	367.3
Less: bank & other debt	0.0	0.0	0.0
Total value to equity claims	141.9	85.6	367.3
Less: warrants and options	18.5	9.7	57.7
Ordinary equity holders	123.4	75.9	309.6
Value per share (C\$)	<b>0.46</b>	<b>0.29</b>	<b>1.20</b>

\*Valuation is shown prior to closing of remaining parts of the Korea Zinc deal.

## Expected fair value of Woulfe Mining

Scenario	Risked mineable resources (m tonnes)	Sangdong property value (US\$m)	WOF Valuation (C\$m)	Value per share (C\$)
<b>Base case outlook</b>	<b>20.6</b>	<b>150.2</b>	<b>123.4</b>	<b>0.46</b>
<b>Value for scenarios of further exploration success</b>				
Full proved up	46.4	428.3	367.0	1.38
Optimistic outlook	41.3	372.0	319.0	1.20
Pessimistic outlook	15.5	90.2	78.1	0.29
<b>Value with no further exploration success</b>				
Current resource estimate	18.1	118.4	102.3	0.38

### Notes:

- 'fully proven up' scenario assumes that current mineable resource estimates are upgraded to 'Proven' status
- for detailed assumptions see details on property

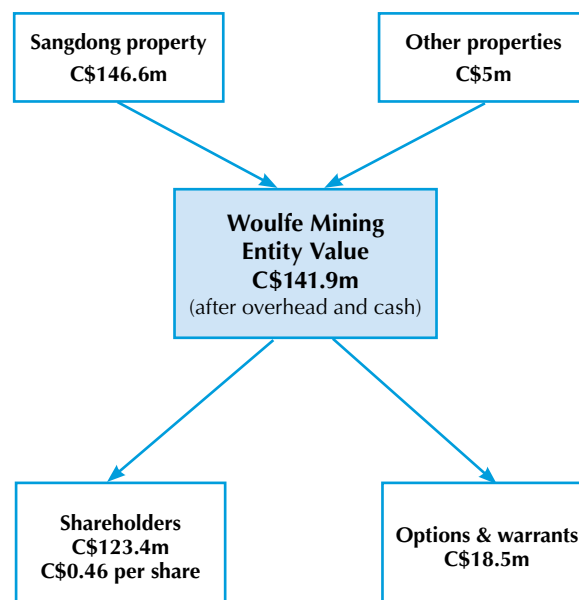
## Sensitivity to market assumption on...

Long run real tungsten price (US\$/MTU)	-50	-25	<b>0</b>	+25	+50
Value (C\$/share)	0.11	0.30	<b>0.46</b>	0.58	0.66
Change in value (%)	-76%	-34%		+24%	+42%
Time for tungsten price to revert to mean (years)	10	11	<b>12</b>	13	14
Value (C\$/share)	0.39	0.43	<b>0.46</b>	0.50	0.54
Change in value (%)	-17%	-8%		+8%	+16%
Volatility of tungsten price (%)	30%	<b>35%</b>	40%	45%	50%
Value (C\$/share)	0.40	<b>0.46</b>	0.55	0.64	0.77
Change in value (%)	-14%		+17%	+39%	+65%
Interest rate (%)	3.6%	3.7%	<b>3.8%</b>	3.9%	4.0%
Value (C\$/share)	0.48	0.47	<b>0.46</b>	0.45	0.45
Change in value (%)	+4%	+2%		-2%	-4%

## Sensitivity to operating assumption on ...

Recovery rate (%)	66%	68%	<b>+70%</b>	+72%	+74%
Value (C\$/share)	0.37	0.42	<b>0.46</b>	0.51	0.54
Change in value (%)	-20%	-10%		+9%	+17%
Operating Costs (US\$ per tonne)	0.86	<b>0.91</b>	0.95	1.00	1.04
Value (C\$/share)	0.50	<b>0.46</b>	0.42	0.37	0.31
Change in value (%)	+7%		-10%	-21%	-34%
Increase in Capital Cost (%)	<b>+0%</b>	+10%	+20%	+30%	+40%
Value (C\$/share)	<b>0.46</b>	0.44	0.42	0.40	0.38
Change in value (%)		-4%	-9%	-13%	-18%

## Components of Woulfe Mining's entity value



## Sangdong valuation (US\$m)

Scenarios for exploration success	Base	Optimistic	Pessimistic
<b>Net value of production</b>	<b>1,031.5</b>	1,031.5	1,031.5
Expected mining success*	<b>40%</b>	80%	30%
<b>Expected net value of production</b>	<b>412.6</b>	825.2	309.4
Add: tax shield on depreciation charge	<b>47.2</b>	47.2	47.2
Less: development & operational capex	<b>179.3</b>	179.3	179.3
<b>Value of mining operations</b>	<b>280.5</b>	693.1	177.4
Probability of putting into production**	<b>56%</b>	56%	56%
<b>Expected value of deposit</b>	<b>157.1</b>	388.2	99.3
Less:			
- expect pre-development costs***	<b>6.9</b>	6.9	6.9
- further exploration costs****	-	-	-
Expected value of project	<b>150.2</b>	381.3	92.5
effective risk haircut	<b>83%</b>	57%	89%
Ownership*****	<b>100%</b>	100%	100%
Woulfe Mining's share	<b>150.2</b>	381.3	92.5

\* mining success incorporates our assumptions on ultimate exploration success and the portion of resource expected to be mined

\*\* probability of successfully completing pre-feasibility, full feasibility and required permitting and actual construction in realistic timeframe

\*\*\* shown as expected value of being incurred after allowing for likelihood of reaching each development stage

\*\*\*\* present value

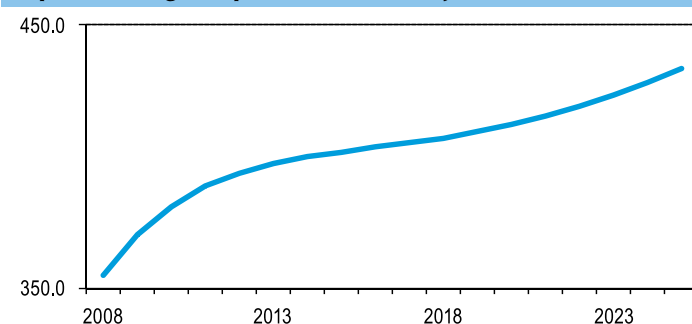
\*\*\*\*\* shown prior to closing of remaining parts of the Korea Zinc deal

## Commodity assumptions

Tungsten prices are assumed to be mean reverting based on

Historic average real level at current prices	210.0 US\$/MTU
Avg time to revert to mean	12.0 years
Volatility	35%
Inflationary price growth	2.5%

## Expected tungsten price (inflation-adjusted) (US\$/MTU)



## Our key assumptions

We have modelled Woulfe's Sangdong project based on the following key assumptions:

- The property contains a currently delineated inferred resource totalling 103.2Mt, averaging 0.34% WO<sub>3</sub> and 0.04% MoS<sub>2</sub>. Our analysis assumes that further exploration will convert this combined amount to a mineable resource of some 41.3 Mt or, after allowing for the confidence level of each resource category, 20.6 Mt on a risk adjusted basis.
- Assuming continued project development, we have modelled that mining will commence in March 2013 with a milling capacity of 3,500t per day. We assume this rate will increase in stages over the following 10 years to 7,000t per day. We further assume capital expenditures will begin in late 2011, with an initial capital cost of approximately US\$150m over the following 15 months.
- We assume initial operating costs of US\$50 per tonne, escalating at a nominal rate of inflation thereafter, but with scale reductions as production rates increase. The company estimates it will face a tax rate of 20%.
- Woulfe's Sangdong project is advanced but appropriate feasibility studies have not yet been undertaken. We have assumed typical success probabilities of 70% and 80% at the feasibility and permitting stages respectively.

## Our results

After allowing for likely economics, exploration potential and development risk our analysis suggests an expected value of C\$146.5m for the Sangdong tungsten project. We ascribe current nominal book values of C\$4m for the Muguk gold project and C\$1m for the company's less advanced projects.

After allowing for corporate overhead and outstanding warrants, our assessment of Woulfe's ordinary equity results in a base case current valuation of C\$123.4m, or C\$0.46 per share, with an optimistic current valuation of C\$1.20 per share, assuming higher probabilities of development success. Our analysis suggests that Woulfe's current value is based largely on the potential for further resource delineation and mine development at Sangdong. Should there be no further, or limited success, then the current level of risked resources may not be sufficient to justify extraction. Alternately, if all available potential resources in the company's Sangdong project were ultimately proven, they could yield up to C\$2.86 per share.

Our base-case and optimistic outlooks, assuming success at all stages through permitting, result in valuations of C\$0.97 and C\$2.49 per share respectively. Delineation of additional resources beyond our hypothesised estimates could add significantly to these estimates.

Should the tentative agreement with Korea Zinc close, Woulfe's interest in Sandong would drop to 49%, but our confidences in the project progressing on schedule and obtaining sufficient financing increase significantly. Under these assumptions, our base-case valuation of Woulfe increases to C\$0.51 per share, with an optimistic assessment of C\$0.92 per share. Assuming success at all stages through permitting and financing, our base-case and optimistic valuations increase to C\$1.55 and C\$2.88 respectively.

Woulfe's Sangdong tungsten project in Korea offers good potential for development success as the project advances. The preliminary formal resource calculation is very promising and the company anticipates a favourable feasibility study later this year based on a further round of drilling, currently under way. As a result, much of the company's value will depend on the ability of Woulfe to delineate large quantities of ore with sufficient grade and economic potential to support a favourable production decision based on an NI 43-101 compliant bankable feasibility study.

### **Woulfe's success depends on ...**

#### ***... the company delineating a sufficient mining reserve to support mining at Sangdong***

Woulfe has a considerable inferred resource in both the hangingwall and footwall at Sangdong, but further drilling is needed to upgrade this resource to measured or indicated, and to define a formal mining reserve. We base our valuation of Woulfe on the reasonable assumption that the company will successfully delineate a significant reserve at Sangdong. Failure to achieve minimum tonnage, grade targets and an economic processing method could render the deposit uneconomic.

#### ***... the tungsten and steel markets recovering from the global recession***

The price of ammonium paratungstate experienced a number of sharp increases over the past 50 years, followed by equally sudden corrections. The price is currently recovering from the latest of these cycles. Although the potential exponential increase in demand from China offers significant upside price potential, the price of tungsten remains strongly correlated with demand for steel. As a result, the future price of ammonium paratungstate will depend heavily upon recovery from the global recession and the resumption of significant rates of growth in Asia, notably China and India.

#### ***... the company's ability to work effectively in a politically challenging area***

The Sangdong deposit benefits from its location in mining and foreign investment friendly South Korea. Nevertheless, there is some risk imposed by the proximity of politically unstable North Korea.

#### ***... the company's ability to demonstrate economic potential***

Woulfe has yet to complete a formal feasibility study at Sangdong. As a result, there remains the risk that the company will be unable to demonstrate the deposit can be mined economically, given capital and operating costs, and projected future revenues.

#### ***... the company's ability to raise further funds for exploration and development***

Woulfe is a junior exploration company with limited access to capital and will need increasing and significant amounts of cash to fund its exploration programmes. The tentative agreement with Korea Zinc and that company's recent investment in Woulfe may mitigate much of the financing risk when completed. Nevertheless, shareholders could face significant dilution if Woulfe is forced to fund its share of construction costs by selling new equity at low share prices.

## Corporate Overview

Woulfe Mining Corp is a developing mineral resource company with corporate headquarters in Vancouver, Canada. It is listed on the TSX Venture Exchange in Canada. The company completed its initial public offering in 1999 as CanAustra Resources Inc, changed its name to Oriental Minerals Inc in 2005, concurrent with a 1-for-2 consolidation of its shares. The company adopted its current name, Woulfe Mining, in early 2010, concurrent with a change of management.

Woulfe is focussed on acquiring advanced projects that can be brought into production rapidly, and at low cost. The company's current list of projects is led by the Sangdong tungsten-molybdenum project in South Korea, historically one of the largest tungsten mines in the world, and its associated Sangdong Molybdenum stockwork project. Woulfe has a second priority project, the Muguk gold-silver mine, formerly the largest gold mine in South Korea. The company has several other prospects with known uranium, base metals and tungsten mineralisation, and excellent potential for exploration and development.

Unlike most exploration juniors, Woulfe has put together a skilled technical team residing in or intimately familiar with conditions in South Korea. The company's management team is strong, led by Australia-based mining engineer Brian Wesson who has a reputation as a mine developer,.

Also unlike most junior resource companies, Woulfe Mining has a tentative agreement with a major resource company for joint development of its flagship Sangdong project, Korea Zinc Corp. Korea Zinc, which has a market capitalisation of US\$5bn, invested C\$10m into Woulfe at C\$0.30 for a 13.5% interest in the company. In January 2011, Korea Zinc tentatively agreed to invest C\$38m into a Woulfe subsidiary holding title to Sangdong, in exchange for a 51% interest in the subsidiary, and a further C\$1.8m into a Woulfe subsidiary holding title to the Muguk gold project, in exchange for a 51% interest in that subsidiary. Korea Zinc has also tentatively agreed to provide C\$75m in debt financing to complete development at Sangdong, assuming completion of the agreement and successful feasibility at Sangdong. It appears that Korea Zinc is now waiting to see the outcome of a 5,000m drilling programme at Sangdong before it invests the C\$38m.

Woulfe Mining had 214.3 million shares outstanding as of September 30 2010 and at last report a total of 265.1 million shares, which includes the recent purchase of 30 million shares by Korea Zinc. The company had 7.63 million stock purchase options outstanding as of September 30 2010, with a weighted exercise price of C\$0.30. The company subsequently granted 1.35 million options, exercisable at C\$0.11 and 3.5 million options exercisable at C\$0.32. Further, Woulfe had 60.64 million share purchase warrants outstanding as of September 30 2010, with a weighted exercise price of C\$0.12. Subsequently, 10.54 million warrants were exercised, as of 29 November 2010.

Tungsten is an extremely hard and heavy metal with robust properties that support a wide variety of uses, many of which have no available substitutes. Coloured steel-grey to tin-white, tungsten is a series-three transitional metal that appears in the periodic table directly below molybdenum. Tungsten occurs in a variety of ores, but wolframite ((Fe,Mn)WO<sub>4</sub>) and scheelite (CaWO<sub>4</sub>) are the most common varieties.

Tungsten has the highest melting point of all pure metals, at 3,422 degrees Celsius, some 600 degrees above the melting point of molybdenum. The metal has the highest tensile strength of any metal and the lowest coefficient of thermal expansion. Tungsten stands up well to mineral acids and is highly resistant to corrosion. The metal alloys well with steel and greatly increases its toughness.

### **Demand**

As a result, tungsten has a wide variety of uses, many of them critical. Tungsten's high melting point makes the metal essential to the aerospace industry, where superalloy uses include rotor fans in jet engines and certain electrical components. Other high-temperature uses of the metal include the armaments and electronics sectors. As a result, tungsten is frequently classed as a strategic metal.

Tungsten's thermal expansion qualities are comparable with those of borosilicate glass, making the metal an excellent choice for metal-to-glass seals. Its heavy weight and hardness characteristics make tungsten useful for keels in boats and as counterweights. Tungsten powder is a viable non-toxic substitute for lead in bullets and radiation shields, through its use as filler material in plastic composites.

Over one-half of the annual supply of tungsten goes to the manufacture of cemented carbides, typically called hardmetals. Tungsten carbide is a metal heavily resistant to wear that has a wide variety of uses in the metalworking, mining, petroleum and jewellery sectors.

Tungsten in steels or other alloys accounts for another one-fifth of the annual demand, much of which goes to the manufacture of tools, hardened stainless steels and superalloys. Products milled from tungsten go mainly to the electric sector, primarily for use as lamp filaments and electronic contacts. These uses account for just over one-tenth of the annual demand. Notably, lamp filaments account for less than 3% of demand. The remaining supply of tungsten goes to the manufacture of catalysts and pigments, and other chemical uses, such as high-temperature lubricants.

Substitutes are available for many of tungsten's applications, but most carry increased costs and a significant loss of product performance. Of these potential substitutes, molybdenum is the most common one. The metal is a workable substitute for tungsten in many of its carbide applications and for some milled

tungsten applications, and in steel alloys. Wholesale substitution does not appear likely however, as the price of molybdenum is higher than that of tungsten, and although its physical properties track those of tungsten, they are generally inferior. Tungsten should therefore remain the top choice for most applications, despite significant expected price appreciation.

The world economy drives demand for tungsten and consumption figures show considerable variation over the past two decades. Consumption reached 51,000t in 1989, but the severe recession and the end of the cold war at the end of the 1980s cut demand nearly in half, with consumption dropping to 27,000t in 1992. Demand for the metal increased through the 1990s and 2000s, and recent, prerecession estimates place consumption at 76,500t per year. Demand is likely to mirror growth in global economies, notably China and India.

### **Supply**

Primary production of tungsten reached 55,000t in 1990, but dropped to 30,000t by 1997. Over the last decade, production increased to 50,800t by 2001 and to 73,300t in 2006, with supply increasing by 6.7% annually over the past five years. A significant amount of supply since the end of the cold war has come from strategic stockpiles, which are now nearly depleted. A decision by countries such as the United States to rebuild strategic stockpiles of tungsten would exacerbate the supply crunch.

China has long dominated the production of tungsten and the nation accounted for nearly 85% of global production over the past five years. Russia ranks second, with a 7.2% share of the tungsten produced since 2002. Canada is a distant third, producing 2.6% of the tungsten supply over the past five years. Other producing nations of note are Austria, which accounted for just under 2.0% of the tungsten supply, and Portugal, which mined just over 1.1% of the tungsten supply.

At the end of 2006, global reserves of tungsten amounted to about 6.2 Mt approximately two-thirds of the amount residing in Chinese deposits. Canada ranks a distant second, with a reserve base of about 490,000t, or nearly 8.0% of the world total. Russia's reserve base of 420,000t of tungsten puts it third, with 6.7% of the global total. Other nations with noteworthy reserves are Bolivia, Kazakhstan and the United States.

### **Tungsten pricing**

Unlike gold, lead or copper, tungsten is not a commodity traded on a metals exchange and its pricing is more complex than most metals. Tungsten prices receive limited coverage, with the London Metal Bulletin acquiring transaction data from producers and consumers.

Quoted tungsten prices are expressed as a cost per metric tonne unit (MTU), which is the amount of tungsten oxide ( $WO_3$ ) contained in one tonne of material grading one percent  $WO_3$ . Therefore, one MTU is equal to 10 kilograms of  $WO_3$ , which in turn contains 7.93 kilograms of pure tungsten metal. The tungsten price most generally quoted is for ammonium paratungstate, (APT) but the MTU price still refers to a cost per 10 kilograms of tungsten oxide.

### **The China syndrome**

China's control over most of the world's supply has allowed it to control the price over the past 50 years. In 1963, China suddenly decreased its exports, along with North Korea and Russia, prompting a tripling of the price during the mid-1960s. Prices hit an inflation-adjusted maximum in the late 1970s of nearly US\$540 per MTU.

China then began making massive sales and a series of recessions subsequently pushed the real price steadily lower over the next 15 years. The inflation-adjusted price dipped below US\$100 per MTU of  $WO_3$  in the late 1990s and bottomed at an average of US\$76 during 2003.

The price of a metric tonne unit of ammonium paratungstate took a dramatic jump early in 2005 and has averaged nearly US\$260 per MTU since then. This value equates to US\$11.80 per pound of tungsten oxide, or US\$14.90 per pound of pure tungsten metal.

The 2005 price surge was again the result of China restricting its exports, but this time the driving force behind the move was the country's own booming economy, not purely a political decision to exercise control over a strategic metal. China had long been the largest exporter of tungsten concentrate but its own growth recently turned it into the leading consumer of the metal. This, combined with the continued demand across the rest of the world precipitated the sudden surge in the price of tungsten.

Demand for tungsten is expected to remain strong, buoyed by the developing Asian economies, notably that of China. This will put added pressure on the supply of the metal, as China directs most of its production to meet its internal demand. This makes a return to the low prices that prevailed from 1997 through 2004 unlikely, without a major economic slowdown.

Although we view tungsten prices as unlikely to drop to the US\$70 per MTU level, we do model the price of tungsten under the assumption that ammonium paratungstate will revert to its long-term, inflation-adjusted average price of US\$210 per MTU since 1970. Our model assumes a mean time to revert of 12.0 years and a volatility of 35 percent. Based on this model, APT would increase in value to above US\$300 per MTU by 2013, with inflationary increases thereafter.

This model represents a base-case scenario that assumes China will continue to restrict exports to meet its internal requirements, but will make available a portion of its excess. A more optimistic scenario results from an assumption the Chinese economy will continue to grow at recent rates, producing commensurate growth in demand for tungsten within China. This would result in a higher long-term, inflation-adjusted average price of US\$280 per MTU, based on the assumption that recent highs now represent the norm. This model carries the price above US\$300 per MTU early in 2011 and above US\$400 per MTU by late 2015.

We must also consider the more pessimistic situation whereby China again becomes a major exporter of tungsten. A significant decline in China's growth rate could be a driving force behind this scenario, with a desire to liquidate a large tungsten stockpile at a high price providing added enticement. We would then adopt a lower long-term, inflation-adjusted mean price of US\$190 per MTU, with a mean time to revert of 10.4 years and a volatility of 26 percent, based on the actual performance over the past 50 years. This would result in lower prices than we currently model going forward.

### **The mining environment in Korea**

With the surge in demand for mineral resources spurred by the quickening development of the BRIC economies and especially China since 2004, there is presently renewed interest in Korea's mining potential. Woulfe is one of the few foreign companies investing in the opportunity to rebuild the Korean metals mining industry. In addition to its acquisition of Sangdong and Muguk, Woulfe also has interests in other properties in the country including further tungsten, lead-zinc and uranium prospects.

In 2008, the mining and quarrying sector of Korea's industrial economy amounted to only 0.22% of real GDP. This compares with a time nearly 60 years ago when Korea's exports of tungsten were worth US\$16.5m, or 56% of all Korea's exports. Today, Korean miners produce small quantities of anthracite coal, concentrates of ferrous metals, mineral ores, and nonferrous metals. The value of mine and quarry production decreased by 7.0% during 2008 whilst the country's economy grew by 2.5 percent. The output of the non-metallic industrial minerals sector, strongly supported by a significant construction industry, accounted for about 70% of the real value of the country's total mineral production.

With limited domestic mineral resources, the Republic of Korea has depended on imports of raw materials to meet manufacturing and fuel demands. Korea imports all its bituminous coal, ores and concentrates of copper, and fluorite and phosphate rock and most of its need for iron ore and nonferrous metallic minerals, including lead and zinc. Korea has relatively large reserves of the industrial minerals kaolin, limestone, pyrophyllite, silica stone (quartzite), and talc and small reserves of antimony, copper, gold, iron ore, lead, molybdenum, silver, tin, tungsten, and zinc.

## Regional Geology

The Korean Peninsula is situated on the eastern margin of the North China – Korea Platform, a craton comprised of three blocks of Archean age: the Nangrim-Pyeongnam Block, and the Gyeonggi and Yeongnam Massifs that are separated by the northeast trending Imjingang and Okcheon mobile belts of Phanerozoic age. The Sangdong Property is located within the Okcheon Belt.

The Okcheon Belt is a fold-and-thrust belt sandwiched between the Gyeonggi massif to the northwest and the Yeongnam massif to the southeast. The Belt has been divided into the southern Okcheon, and northern Taebaeksan basin or zone.

The Okcheon zone, in which the Sangdong Property is located, is comprised of low to medium-grade metasedimentary and metavolcanic rocks of Cambrian to Ordovician age. The Taebaeksan zone contains weakly-metamorphosed shallow-marine Paleozoic sedimentary rocks and marginal-marine to non-marine Early Mesozoic sedimentary rocks that contain economically important coal measures. These rocks rest unconformably upon Precambrian gneiss and metasedimentary rocks of the Yulli Group of the Yeongnam massif.

In the Sangdong area, the Cambro-Ordovician strata belong to the Joseon System that is divided into the lower Yangdeok and overlying Great Limestone Series. The Yangdeok Series is comprised of two formations, the basal Jangsan and overlying Myobong. The Great Limestone Series is subdivided into seven formations, from oldest to youngest, the Pungcheon and Hwajeol Formations, Dongjeom Quartzite, Dumugol, Makgol and Duwibong Formations.

Plutonism occurred primarily during the Jurassic and Cretaceous Periods and most intrusions are of biotite granite composition.

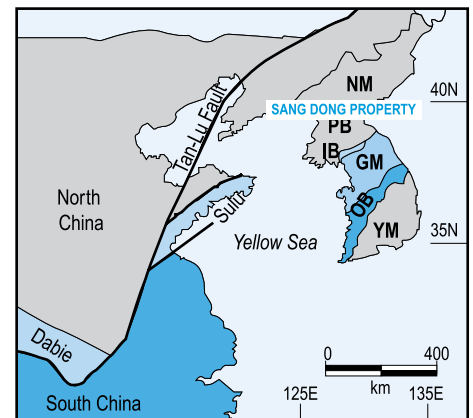
## Political

South Korea today is a fully functioning modern democracy. In June 2000, an historic first North-South summit took place between the South's President Kim Dae-jung and the North's leader Kim Jong Il. In October 2007, a second North-South summit took place between the South's President Roh Moo-hyun and the North Korean leader. Recently, harsh rhetoric and unwillingness by North Korea to engage with President Lee Myung-bak following his February 2008 inauguration has strained inter-Korean relations. In 2010 these have further deteriorated after North Korea sank a South Korean naval vessel and more recently, shelled a South Korean island.

## Climate

The climate of the Korean Peninsula differs significantly from north to south. The southern regions experience a relatively warm and wet climate similar to that of Japan, affected by warm ocean waters and the East Korea Warm Current. The

## Regional geology of Korea



Crustal Block and massifs of the Korean Peninsula and adjacent north-east Asia: Nangrim Massif (NM); Pyeongnam basin (PB); Imjingang belt (IB); Gyeonggi massif (GM); Okcheon belt (OB); Yeongnam massif (YM)

Source: Woulfe Mining Corp

northern regions experience a colder and to some extent more continental climate in common with Manchuria. For example, the annual precipitation of the Yalu River valley (600 mm) is less than half of that on the south coast (1500 mm). Likewise, during January, there is a 20°C difference in temperature between the peninsula's southern and northern points.

The whole peninsula is affected by similar general patterns, including the East Asian monsoon in midsummer and the frequent incidence of typhoons during autumn. The majority of rainfall occurs during the summer with nearly half of this due to the monsoon alone. Winters are cold, with January temperatures below freezing apart from Jeju Island. Winter precipitation is minimal, with little snow accumulation away from the mountainous areas.

### **Discovery and mining history**

Tungsten mineralisation in the form of scheelite (CaWO<sub>4</sub>) was discovered in the area in 1916 and two small deposits were worked there intermittently until the present tungsten deposit was identified at the present Sangdong site in the period 1939 – 1940. This deposit was then mined continuously from 1940 until 1992. The first operator was Sorim Resources Co. and then, between 1946 and 1949, the mine functioned under the jurisdiction of the United States military government office.

The Korean Tungsten Mining Company, a government agency, took over the mine from late 1949 until 1951. In 1952, this company changed its name to Korea Tungsten Mining Co. Ltd., and resumed mining, producing tungsten, scheelite, bismuth and molybdenum concentrates. Over forty years until 1992, when the mine closed, annual rates of production reached up to 600,000t of ore. At closure, 20 levels of workings with a cumulative length of 20 km had been developed between 242 and 755m. above sea level.

As the mine was operating until 1992, some infrastructure remains. This includes a mining town with 600 people (at its peak, the population of Sangdong was near 20,000), roads, power, water, tailings dams and an area that was the location of the process plant. Some of the mine and process buildings remain and have potential for refurbishment and re-use to house mine workshops, offices and a new process plant.

### **Location**

Woulfe's Sangdong property is located in the south eastern part of the Korean Peninsula, 170 km to the southeast of the capital, Seoul. The property comprises an aggregation of 23 Mining Rights having a total area of 5,924 ha. Woulfe has 12 blocks with an area of 3,173 ha. The property title is held in the name of Se Woo Mining Co. Ltd. (Se Woo), a private Korean company. On 19th October

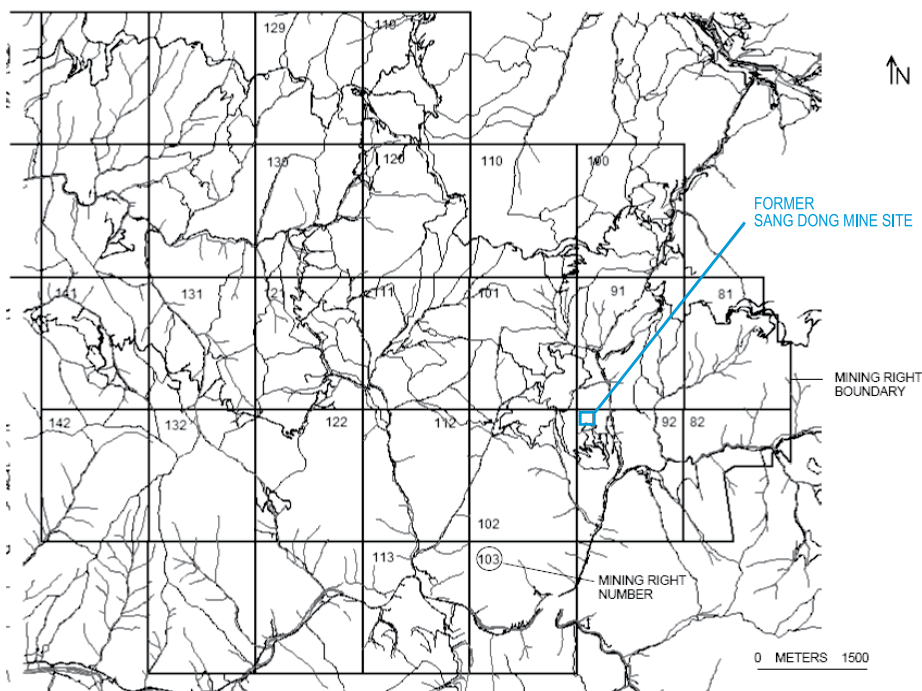
2006, Oriental Minerals Inc. entered into an agreement (now held by Woulfe) with Se Woo whereby Oriental would earn up to 100% interest in the property through a series of payments and investment in exploration.

### Sangdong location



Source: Woulfe Mining Corp

### Woulfe's Sangdong permits



Source: Woulfe Mining Corp

## Geology of the property

The Sangdong Property area is underlain by metasedimentary rocks belonging to the Yangdok and Great Limestone Series that are situated on the south limb of a syncline that plunges gently to the south-east; strata strike at approximately 110° and dip to the north-northeast at 20° to 30°.

The lowermost formation is the Changsan (Jangsan) Formation that is comprised of milky-grey, milky-white and light-yellow quartzite and is about 250m thick. This formation contains the molybdenum mineralisation that underlies the main Sangdong deposit.

The Myobong Formation conformably overlies the Changsan Formation and is comprised of black, dark greenish-grey and brownish-grey shale and phyllite with seven or eight interbedded horizons of calcareous shale that, within the deposit area, have been altered to skarn. This formation is about 150 to 200 m thick in the property area and is the host of all significant tungsten mineralisation there.

The Great Limestone Series, of Cambrian to Ordovician age, is comprised of six formations that have a cumulative thickness in excess of 1,000 m. These formations are largely limestone and dolomite with interbedded shales, quartzite, calcareous shale and sandstone. From base to uppermost they are:

- The Pungchon Limestone; a white and grey limestone and dolomite overlying the Myobong Formation.
- The Sesong Shale; a thinly-interbedded grey to dark grey shale, arenaceous shale, and white to pink limestone.
- The Hwajeol Limestone; a limestone and basal, interbedded grey to dark-grey shale.
- The Tongjeom Quartzite; a varicoloured quartzite and basal, interbedded black shale.
- The Dumudong Limestone: an interbedded light-brown calcareous shale, dark-grey shale, and light-grey limestone.
- The Makdong Limestone: an interbedded grey limestone, light-brown calcareous shale and black shale.

In the immediate area of the deposit, the Changsan, Myobong, Pungchon and other overlying formations have been affected by thermal metamorphism. Several Cretaceous-age granitic intrusive bodies outcrop within a few kilometres of the Sangdong deposit and a granitic intrusive of Cretaceous age (85 million years [Ma], Le, 2001) was intersected some 700 m below the tungsten mineralisation in at least three holes drilled to sample the quartzite-hosted molybdenum mineralisation.

The tungsten mineralisation of the Sangdong deposit is held within a series of three tabular, bedding-conformable skarn horizons within the Myobong Shale

that have been interpreted to have been carbonate-bearing horizons that were altered and mineralised by fluids ascending from the underlying Sangdong Granite. From uppermost to lowermost, these horizons are designated the Hangingwall, Main, and Footwall horizons. Calc-silicate layers from 50 centimetres to 1m in thickness have developed on the upper and lower contacts of the Main and Footwall Horizons.

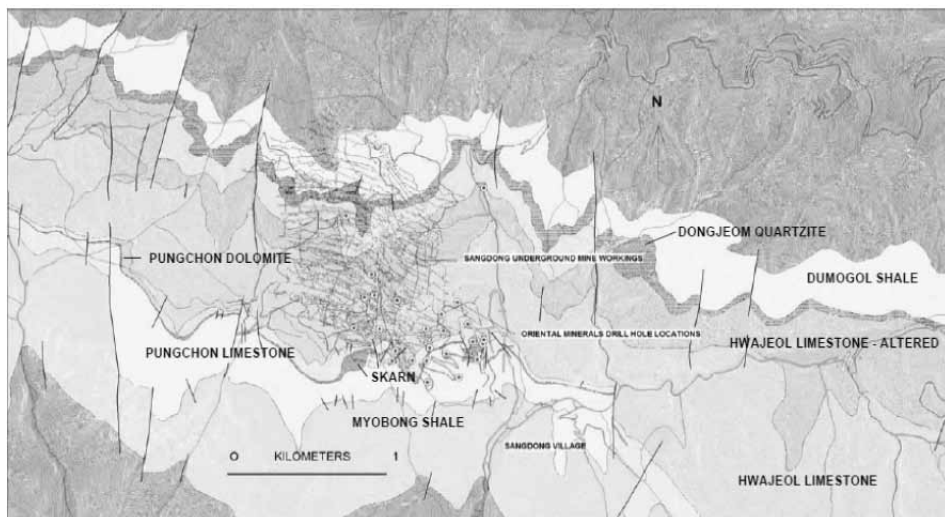
The Hangingwall Horizon is found near the upper contact of the Myobong shale and varies in thickness from about 5 to 30m because of the irregular boundary of the shale with the overlying Pungchon Limestone. This zone has a strike length of about 600m and a down-dip extent of about 800m. Above the most altered section of the Main Horizon, the Hangingwall Horizon is not tabular, but extends steeply into the overlying limestone. The base of the Hangingwall Horizon is about 14m above the upper contact of the Main Horizon.

The Main Horizon strikes about 100° and dips northerly between 15° and 30°. The known strike length of the deposit is in excess of 1,300 m and thickness varies between 5m and 6m. Alteration (skarnification) within the Main Horizon forms three concentric, roughly circular zones. There are also indications that the prospective strike length of the deposit may be at least 10,000m.

The Footwall Horizons comprise three layers: Footwall I occurs 1 m below the Main Horizon and is about 2m thick; Footwall II and III are situated 35 m to 40 m below the Main Horizon and are less than 1m in thickness. The area of these horizons and zonal distribution of calc-silicate minerals in them are similar to that of the Main Horizon.

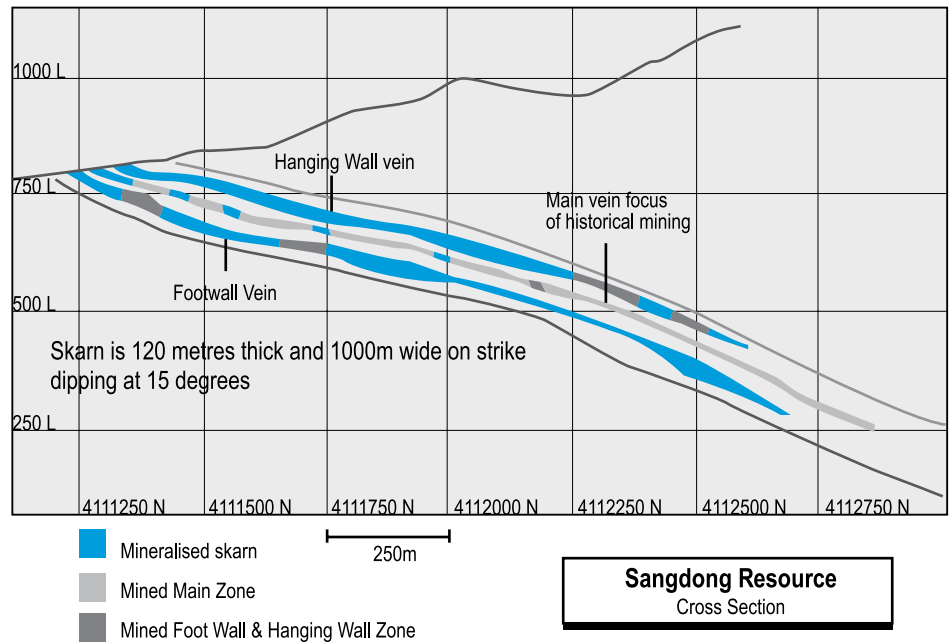
Age determinations of metapelites beneath the footwall of the Main Horizon gave Potassium-Argon ages of 81.2 Ma and 84.0 Ma consistent with the age of the underlying Sangdong Granite, implying that this intrusive was responsible for the alteration and mineralisation.

## Geology of Sangdong property



Source: Woulfe Mining Corp

## Cross-section of Sangdong deposit and mine



Source: Wardrop

### Mineralisation

The mineralisation presents as a gently inclined skarn-type tungsten-molybdenum-bismuth deposit within altered horizons in the Cambrian-age Myobong Shale Formation and to a minor extent, within the overlying and parallel Pungchon Limestone and underlying Jangsan Quartzite. It is primarily associated with concordant and cross-cutting quartz veins. Alteration is concentrically zoned with respect to the axis of an underlying Cretaceous-age granitic intrusive that was the source of the hydrothermal fluids that caused alteration and introduced the mineralisation. Mineralisation is also concentrically zoned with respect to the underlying intrusive, particularly in the Myobong Shale. Here, the highest grades of tungsten, molybdenum and bismuth occur in the central, most intensely altered zone and diminish radially.

The tungsten and associated molybdenum mineralisation within the skarn horizon is divided into three zones: Main, Hangingwall and Footwall. Workings of the former underground Sangdong mine largely mined out the Main zone, with minor working of the Hangingwall Zone.

### Drilling

Between 1980 and 1985, 15 drill holes with a total length of 8,940 m and a 1km long drift were used to investigate the East Tungsten Orebody referred to as Sangdong East, located about 1 km east of the main orebody. In 1990, some 100,000 t were mined here. Between 1979 and 1989, 18 holes totalling 16,502m were drilled in the West Tungsten Orebody referred to as Sangdong West, about 2 km north-west of the Sangdong Mine area. This was not further explored.

Between 1980 and 1987, 22 vertical holes totalling 12,390m were drilled underground from the Sangdong workings to investigate the extent of molybdenum mineralisation in the quartzite unit that underlies the main skarn zone. At an unspecified time some 780 holes with an aggregate length of 30,000 m were drilled underground within the Main Horizon.

After 1992, no surface drilling was undertaken until a programme was completed by Oriental between 2006 and 2008 prior to its new ownership in late 2009. Exploration and subsequent modelling focused on assessment of the skarn mineralisation in an extended zone around the area mined out during the historic mining operations.

Since April 2010 Woulfe has embarked on verification drilling programmes at both its Sangdong and Muguk properties. At Sangdong, following a decision to fast-track the mining programme in early June and examination of the underground access conditions in historical workings, Woulfe management elected to initiate a drilling programme of the upper hangingwall portion of the mine from drill stations positioned underground and on the surface. The first phase of this planned for 3,600m of drilling and this has been increased in November to a total of 5,037m.

## Resources

Since Woulfe took over this project from Oriental Minerals, it has access to a body of historical information which includes some production data, drill hole records and a core library.

Detailed mine production records from 1952 to 1987 were lost but annual production of tungsten concentrate varied between 994t and 3,268t, and total production over the period was 74,911t. Various quantities of ammonium paratungstate, tungsten metal and tungsten steel were also produced. Between 1961 and 1987, 2,930t of bismuth were extracted and 2,725t of paramolybdate or molybdenum oxide were produced during the period 1967 to 1987. Gold and silver were also recovered, with maximum annual production rates of 37 kilograms of gold (1987) and 531 kilograms of silver (1974), apparently from the bismuth concentrate.

Two historic tungsten resource estimates were prepared for the Sangdong mine, in 1985 and 1988. The 1985 estimate was prepared by the mine staff and the 1988 estimate was prepared by Korea Resources Corp. (KRC). The results were as follows:

Year	Total WO <sub>3</sub> ore MT	Grade
1985	20.0	0.5%
1988	18.8	0.5%

The 1988 estimate confirms a reported tungsten historical “remnant reserve” of 189 million lbs of tungsten oxide (WO<sub>3</sub>) from 17 million tonnes grading 0.5% WO<sub>3</sub> per tonne.

The KRC estimate includes about 1.4 Mt attributed to the Sangdong East deposit and thus the difference between the two estimates does not represent the tonnage mined in the period 1985-1988. These were polygonal estimates and used a standard density of 2.9 relative density (RD). An estimate also reported that Sangdong West contains 2.3 Mt WO<sub>3</sub> ore at an average grade of 0.5% WO<sub>3</sub> but no details of the calculation nor the number of holes drilled to obtain this information is known.

Wardrop, in the April 2010 Scoping Study modelled the remaining Hangingwall zone and the Footwall zone using the following data: 91 NQ surface core holes (aggregate length 22,800m) within and up dip of the area of the former underground Sangdong tungsten deposit, following drilling by Oriental between 2007 and 2009; 788 underground holes (aggregate length 30,000 m) drilled by the Korean Tungsten Mining Co., Ltd (KTMC) during its operations. Grade estimation was completed using ordinary kriging<sup>1</sup>.

The results from the current drilling to verify the data from the infrastructure pillar, which Woulfe now plans to fast-track into production, will be published in a 43-101 compliant statement before end 2011.

All current resources at Sangdong are reported within the inferred category within the scope of Canada’s 43-101 reporting requirement. They will remain so until the current drilling programme is completed and resource quantities, quality and categories are reviewed.

### ***Jangsan Molybdenum Stockwork***

Immediately underlying the skarn footwall mineralised zone, within the quartzite, lies the Jangsan Stockwork, a zone of quartz veins hosting predominantly molybdenum mineralisation. Wardrop modelled this zone from historical data taken from 32 holes drilled from the underground workings by KTMC (aggregate length approximately 9,000m) and the grade estimation was completed using ordinary kriging. The resource estimated for the Jangsan Stockwork is reported at a cut-off of 0.16% Molybdenum Disulphide (MoS<sub>2</sub>):

(Mt)	MoS <sub>2</sub> (%)
7.1	0.18

<sup>1</sup> Kriging is the term for a group of geostatistical techniques used to interpolate the value of a random field (e.g., the elevation, z, of the landscape as a function of the geographic location) at an unobserved location from observations of its value at nearby locations.

With uncertainty of location and sampling of the KTMC underground drilling, all the resources reported are classified in the Inferred category.

The surface ore stockpiles together with the Jangsan molybdenum stockwork beneath the original tungsten mine workings provide an historical resource of 140million lbs of MoS<sub>2</sub> from 16 Mt grading 0.40% MoS<sub>2</sub> per tonne (or 8.8 lbs MoS<sub>2</sub>) and an additional 199 million lbs of MoS<sub>2</sub> from 104 Mt grading 0.087% MoS<sub>2</sub> per tonne (or 1.9 lbs MoS<sub>2</sub>).

These estimates predate the institution of National Instrument 43-101 and do not necessarily conform to the reporting requirements of that instrument. Although of unknown reliability they are relevant as an indicator of the order of magnitude of t and grades of mineralisation present.

### **Planning**

Wardrop Engineering completed a positive Preliminary Economic Assessment (a 'Scoping Study') in mid-March 2010. This showed an Inferred footwall resource ( $\pm 30\%$  in scoping study) of 57.4Mt at 0.35% WO<sub>3</sub> and 0.04% MoS<sub>2</sub> reducing at zero grade, 15% by dilution and a 95% extraction factor.

In the scoping study the underground mining economics were based on a cut-off grade of 0.1% WO<sub>3</sub>, long term price forecasts of US\$250/mtu for APT and US\$15/lb Mo, with production of APT at 815,357 mtu or 8,154t APT per annum.

The original key project financing parameters showed a requirement for US\$289 million of capital including 15% contingency of Direct Mining Cost and 10% of Other Direct Costs. The internal rate of return will be 26.5% with a 3.4 years payback on capital. Direct cash operating costs of US\$32.60/t processed will provide a cash margin of \$22.64 per tonne of ore milled. Project NPV is US\$463M pre-tax @ 8% real discount rate and break even NPV at 8%. The current estimate of the resources base is 103.2 million tonnes at 0.35 WO<sub>3</sub>. Predicted overall recovery is tungsten 69% and molybdenum 70%. Processing will require crushing, grinding, gravity separation, regrind and flotation followed by concentrate feed to an APT plant.

Subject to drilling findings, Woulfe plans to prepare a full feasibility plan in early 2011. In parallel with this Woulfe will progress its Phase 1 fast-track mining development in the hangingwall zone. The mining rate in the hangingwall zone will be 1.2 million tonnes per annum in ore grading 0.5% WO<sub>3</sub>.

After completion of the full feasibility study, Woulfe will apply for a Phase 2 licence for development approval and reopening of the remainder of Sangdong mine and dewatering of the flooded underground benched room and pillar workings. The Phase 2 planning is now focused on the molybdenum below the footwall zone and will depend on the molybdenum price.

### Scoping study

The Wardrop scoping study released at the end of March 2010 delineated an inferred 103.2Mt of ore at an average grade of 0.35%  $WO_3$  and 0.04%  $MoS_2$ . The planned feasibility study required the drilling of the three lodes, the Hangingwall, Main and Footwall zones of mineralisation, to verify historical work, increase the level of confidence and move the resources to a higher category. The adjusted plan will leave work on the Main and Footwall zones until later.

The application for the mine development licence was submitted to the provincial authorities in April 2010 and was approved in June giving Woulfe clearance to access the old mine for underground exploration drilling purposes. A drilling programme of 5,037m in the Hangingwall zone is expected to complete early in the 2nd quarter of 2011. The drill samples will also be tested to determine whether there is any mineralisation in the limestone overburden.

The company has purchased its own drilling machines, loaders and associated support equipment to gain access to the underground workings and with these it has prepared the drill locations used to test the targets in the Hangingwall zone. Underground services such as power, ventilation and safety equipment are being installed and site staff are being trained.

Now that underground access is established and Phase 1 drilling is nearly completed, a block model of the upper zones will be prepared. This will determine and verify the intended mining schedule. The ore was treated for 40 years at an average recovery of 70% and this legacy gives Woulfe some confidence concerning future operational risks when comparing this venture with a greenfield operation.

The initial capital estimates considered 100% new mine development, giving no value to the existing vertical shafts, ventilation shafts or the 25km of underground development pending scrutiny and evaluation of the access conditions. At the present time, the capital costs have been based on prices in Canada and Australia. As the project is in Asia there may be scope to revisit and improve on capital costs when the feasibility study is prepared in 2011.

Due to the presence of old workings and related uncertainties the following resources were excluded from the original study:

- The Hangingwall Zone in the skarn where drilling is now focused.
- Jangsan Molybdenum Stockwork
- Pillars in the Main Zone.

The Jangsan Molybdenum Stockwork of 7.1M, at 0.18% for  $MoS_2$ , will be evaluated in future studies.

## Envisaged mining method

Last year, Woulfe had planned to use a benched room-and-pillar mining method for ore extraction. This mining method, which creates high yielding working places, was expected to achieve a target production of approximately 3,500t per day.

Room-and-Pillar mining typically recovers up to 70% of the available resource.

Due to the lack of data for the old workings and the geometry of the orebody, a 65% extraction factor has been assumed. A mining dilution factor of 15% has been applied to this and is appropriate at this level of study. The dilution carries no grade and accounts for mining overbreak in the development of the deposit. Dilution has been identified as a risk for the project and will be more accurately assessed in future studies of the underground conditions. A mining recovery of 95% has been applied to the diluted resource for:

- losses for material re-handle during loading and hauling;
- unplanned events during mine production that will affect the ore recovery on the bench.

A fully mechanised operation is proposed to achieve the target production rate.

Underground mine electro-hydraulic jumbos will develop 15% decline ramps of 5m x 5m section to access the orebody and be used for mine production. A fleet of 14t capacity underground Load-Haul-Dump (LHD) units will load 40t articulated trucks which will haul broken material from the underground working areas to the surface Run-of-Mine (ROM) bins or surface waste dumps.

During the autumn of 2010, Woulfe has reviewed its mining plan and is now focusing on a new drilling plan to evaluate the Hangingwall zone in which a continuous block of ore was left in place by the former mine operators. The block is 60m to 200m wide and extends 1.2 km across the entire ore body and down the eastern and western sides of the deposit for its entire length. Last year Woulfe had not considered this as a potential source of ore as it protected the original, critical mine infrastructure including the hoist chambers, incline shafts and main haulage, all essential for mining the Main Ore Zone in the lower parts of the mine.

There were few drill holes in this portion of the Main Ore Zone compared with the lower levels which had been intersected with over seven hundred holes. Now, a 3D block model of the upper ore zones and previous mining areas has been prepared to use in making a first pass conceptual mining plan. The new drilling programme is aimed at validating this model and Woulfe expects to formulate a firm mining plan for the first 5 years of operation once the drilling is completed in 2nd quarter of 2011. The drilling will consist of 38 holes totalling approximately 5,000m to complement the 91 holes previously drilled on the Sangdong property by Woulfe.

## Processing

Mineralogical studies and preliminary metallurgical test work have been conducted on four composite core samples taken from the Sangdong deposit by SGS Mineral Services Europe (SGS). The samples represented the four historical mineralised horizons, namely A,B,C and D+E combined. The key findings of the SGS test work were:

- the primary economic minerals in the Sangdong ore are scheelite and molybdenite;
- the sample average head grades are 0.22%  $WO_3$  and 0.03%  $MoS_2$ ;
- fluorite, rhenium (Re), gold, silver, copper and bismuth are present but at sub-economic levels<sup>2</sup>;
- the bond work index was determined as 18.7 kilowatt hour per tonne and the ore is classified as medium hard;
- scheelite becomes increasingly liberated below 500 $\mu$ m (microns) with ultimate liberation at approximately 50 $\mu$ m;
- scheelite is not associated with molybdenite or bismuthinite. Provided the ore minerals are sufficiently liberated from the host rock silicates then separation should be relatively straightforward;
- the relative density of the ore falls between 2.87 and 3.03 and averages 2.90;
- preconcentration by gravity may give recoveries of 63% for tungsten and 55% for molybdenum.

Although the theoretical grade and recovery curves were established as part of the quantitative mineralogical programme, the process grade and recovery data is yet to be established. The Sangdong plant estimates have been based on the following design parameters:

- plant capacity 2,500,000t per year or 7,150t/d;
- milled head grades of 0.33%  $WO_3$  and 0.04%  $MoS_2$ ;
- a plant overall availability of 94% based on 365 days per year. The plant will be stopped for up to 10 hours per week for planned maintenance, shared between all sections;
- crushing section will operate for 80% of available time, i.e. a run time of 18h/d (hours per day);
- milling and downstream sections will operate for 91.66% of available time, i.e. a run time of 22 h/d;

The plant operations are envisaged to comprise a mill and concentrator and ammonium paratungstate refinery. The proposed conceptual process is summarised here and comprises the following main process steps:

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<sup>2</sup> historically small quantities of gold have been recovered

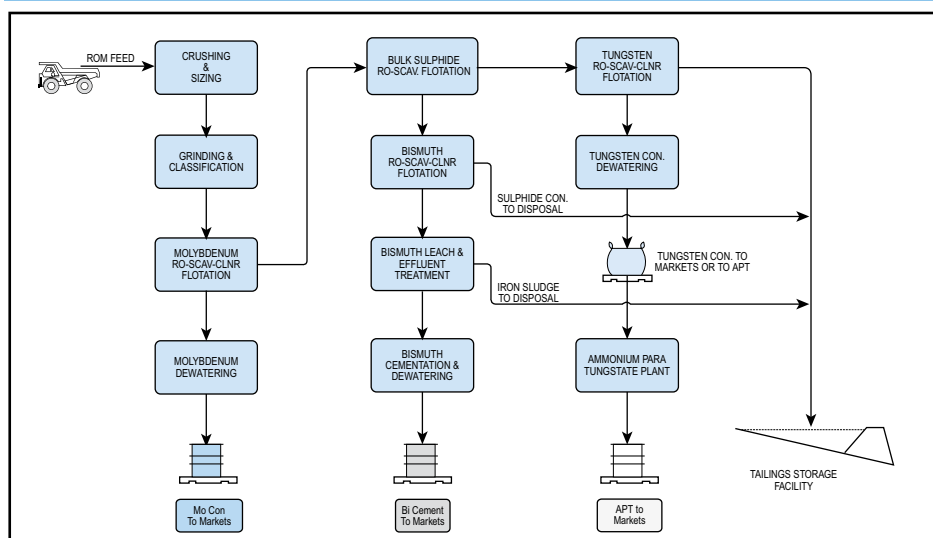
- a three-stage crushing plant to reduce ROM material from 900 mm to -15mm, nominally;
- a two-stage grinding circuit to reduce the -15mm crushed material to the required mesh of grind, likely to be around an 80% passing size of 150µm;
- moly rougher and regrind/cleaner circuits to produce a +50% Mo concentrate followed by dewatering of the concentrate to <0.5% moisture. Overall moly concentrate recovery is predicted at 75%;
- bulk sulphide flotation on moly rougher tailings to concentrate bismuth into a separate sulphide concentrate for further processing, and to remove the sulphides from the subsequent tungsten circuit feed. Bulk sulphide tailings will proceed to the tungsten flotation circuit;
- bismuth rougher and regrind/cleaner circuits to produce a +15% Bi concentrate followed by leaching and cementation of the concentrate for the production of a Bi cement containing +90% Bi. Overall bismuth recovery is predicted at 54% into the marketable cement. Instead of bismuth cement, the production of bismuth oxy-chloride BiOCl may be considered for economic viability in future studies;
- tungsten rougher/scavenger/cleaner flotation circuit to produce a medium grade concentrate at +40% WO<sub>3</sub>. Higher grades may be possible but an optimum grade, in an integrated plant including APT, is predicted to be at around this level;
- following dewatering, the tungsten flotation concentrate would be sent to an APT plant for conversion of WO<sub>3</sub> into APT;
- final tailings from both the sulphides and tungsten processing will be combined and prepared into paste tailings for backfill underground using cement as required.

The final product will be APT. The plant is expected to produce APT at a grade of 79% WO<sub>3</sub> at 95% recovery. The APT plant will be fed by two streams from the mill and concentrator:

- a high grade gravity concentrate grading 65% WO<sub>3</sub> at 33% WO<sub>3</sub> recovery;
- a low grade flotation concentrate grading 25% WO<sub>3</sub> at 40% WO<sub>3</sub> recovery.

This will yield an overall WO<sub>3</sub> recovery of 69%. In addition a separate molybdenum concentrate, grading 70% MoS<sub>2</sub> recovery will be produced. The process will also produce a by-product low grade sulphide concentrate containing small quantities of base metals, gold, and bismuth. For the purpose of and no value has been ascribed to it. This concentrate has the potential to add value in future studies.

## Sangdong process plant – conceptual diagram



Source: Woulfe Mining Corp

## Risked mineable resource assumptions

Reserves	Probability	Tonnes (m)
Proven	90%	0.0
Probable	50%	0.0
<b>Total</b>	<b>0%</b>	<b>0.0</b>

Resources	Conversion	Probability	Tonnes (m)
Measured	80%	90%	0.0
Indicated	80%	50%	0.0
Inferred	50%	35%	103.2
Hypothesised	80%	15%	0.0
<b>Total</b>	<b>50%</b>	<b>35%</b>	<b>103.2</b>

Mineable resource	Tonnes (m)
<b>Mineable resource</b>	<b>51.6</b>
<b>Risked mineable resource</b>	<b>Tonnes (m)</b>
Current classification	18.1
<i>Scenarios for exploration success</i>	
- base case	20.6
- optimistic case	41.3
- pessimistic case	15.5

### Notes:

- mineable resource have been estimated as reserves plus the portion of resources that would be expected to convert to reserves considering deposit type and likely grade variability
- risked mineable resource refers to the various classes of resource/reserve weighted by their assumed confidence level

## Proforma Sangdong operation profit and loss

Proforma P&L (US\$m)	Year ending June									
	'11	'12	'13	'14	'15	'16	'17	'18	'19	'20
<b>Gross revenues</b>	<b>0.0</b>	<b>0.0</b>	<b>20.1</b>	<b>101.0</b>	<b>121.6</b>	<b>122.0</b>	<b>122.4</b>	<b>122.9</b>	<b>154.5</b>	<b>155.4</b>
Operating costs	0.0	0.0	10.2	52.4	64.3	65.9	67.5	69.1	88.5	90.7
<b>Operating profit</b>	<b>0.0</b>	<b>0.0</b>	<b>9.9</b>	<b>48.7</b>	<b>57.3</b>	<b>56.1</b>	<b>54.9</b>	<b>53.8</b>	<b>66.0</b>	<b>64.8</b>
Depreciation	0.0	0.0	17.0	19.9	20.9	21.1	21.4	24.2	25.8	28.7
Administrative costs	0.0	0.0	5.4	5.5	5.7	5.8	5.9	6.1	6.2	6.4
<b>EBIT</b>	<b>0.0</b>	<b>0.0</b>	<b>-12.4</b>	<b>23.3</b>	<b>30.8</b>	<b>29.2</b>	<b>27.6</b>	<b>23.6</b>	<b>33.9</b>	<b>29.7</b>
<i>Assumptions</i>										
Capital costs (US\$m)	0.0	105.1	54.9	4.0	5.0	5.2	5.5	30.8	7.4	32.8
Tonnes ore processed (millions)				1.0	1.2	1.2	1.2	1.2	1.5	1.5
Variable operating Costs (US\$/t)				50.3	51.6	52.9	54.2	55.6	56.9	58.4

### Other assumptions

- average recovery rate: tungsten 70%

Source: Objective Capital

## Environmental and social

The Sangdong Project is located at the site of an earlier underground tungsten mine and synthetic scheelite plant, which ceased production and closed in 1992. Some infrastructure, mainly buildings and roads, remains at the site. The Project involves the further development of a partially flooded underground mine.

Recently it has been indicated that there are no environmental liabilities associated with the former mine and associated infrastructure. Potential liabilities included acid discharge from rock piles and discharge of water from the former underground workings and contaminants to soil and groundwater from the original processing plant. The initial baseline assessment has confirmed that there are no such liabilities.

Baseline environmental studies are necessary to provide site characterisation parameters, to predict potential environmental impacts and to provide a baseline for monitoring during the operational phase. The data generated by the baseline studies will be presented in an Environmental and Social Impact Assessment (ESIA) report. Since Sangdong closed in 1992, global environmental legislation and regulation has considerably improved and Woulfe will work using today's best practice.

The environmental management issues associated with the Sangdong Project are primarily associated with the location and structure of historical and planned tailings storage facilities (TSF), waste rock dumps and water resources.

Two designs for new tailings storage facilities are being considered following a report by AMEC. The report "Preliminary Alternatives and Siting Evaluation Mine Waste Management, Sangdong Project, Kangwon Province, South Korea" offers two designs:

- **Dry Stack Tailings.** This method applied with waste rock disposal for buttressing, under-drain collection and erosion control is the preferred option given the site conditions.
- **Thickened Tailings and Co-Disposal.** Both Woulfe and AMEC believe that partial dewatering by thickening rather than filtering will still permit the dry stack method.

Woulfe has committed to developing a mine that meets Korean requirements and standards and also meets the social and environmental standards that apply in various international conventions, acts and principles. An environmental bond will be required as part of the mining permitting process.

# Muguk Gold

## History

The Muguk Mine was historically South Korea's largest gold producer and was intermittently mined from 1913 to 1990's with recorded production of 8.15t of gold mined between 1934 and 1972. The mine was developed down to a total depth of 600m with lateral drives driven within the ore for sampling and exploration.

Muguk, an epithermal gold-silver style deposit hosted in Cretaceous granite, was worked between 1987 and 1997 and mined at a rate of 200t per day, all from the No. 2 vein. Previous exploration identified more than 20 separate sub-parallel vein systems, with at least 6 individual vein systems traceable over 1.3 – 2.2km strike lengths. Individual veins are 0.1 to 3.0m wide. The most significant veins within Woulfe's tenements are referred to as Baksan, Samhyeongje (or Three Brothers), No.'s 1 and 2 and No.'s 7 to 11 Veins. The mineralised veins extend discontinuously on surface from 400m to 2,000m and to known depths of up to 800m. The veins typically dip to the ENE at 75° to 85° degrees. The Three Brothers and No. 2 Veins were extensively mined prior to mine closure in 1997. Individual ore shoots within the No. 2 vein have been exploited down to 750m depth, with mill recoveries historically averaging 95.7%.

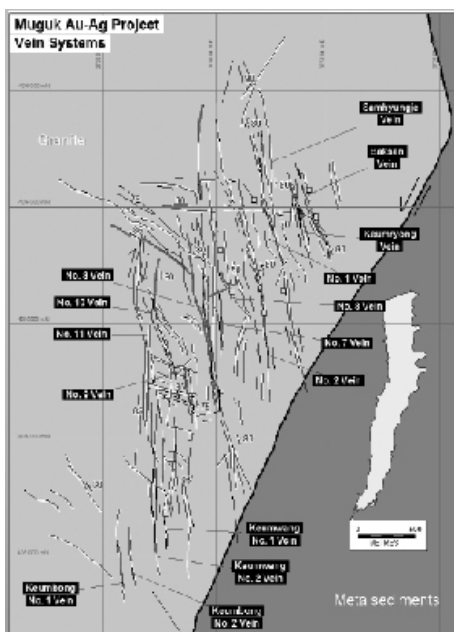
The mine is adjacent to the operating Yuil Gold Mine property in the south and adjoins the Summit Gold Mine, currently on care-and-maintenance, to the south east. Muguk comprises 5 mining rights covering a total of 573ha.

## Resources

Mineralisation at Muguk is considered to be a deep level, multi-phase low sulphidation epithermal system, comprising grey chalcedonic banded veins and stockworks. Higher gold grades are associated with electrum-bearing sulphide bands on the margins of these veins. Two reports of reserves and resources were provided of Muguk in the mid-1990s:

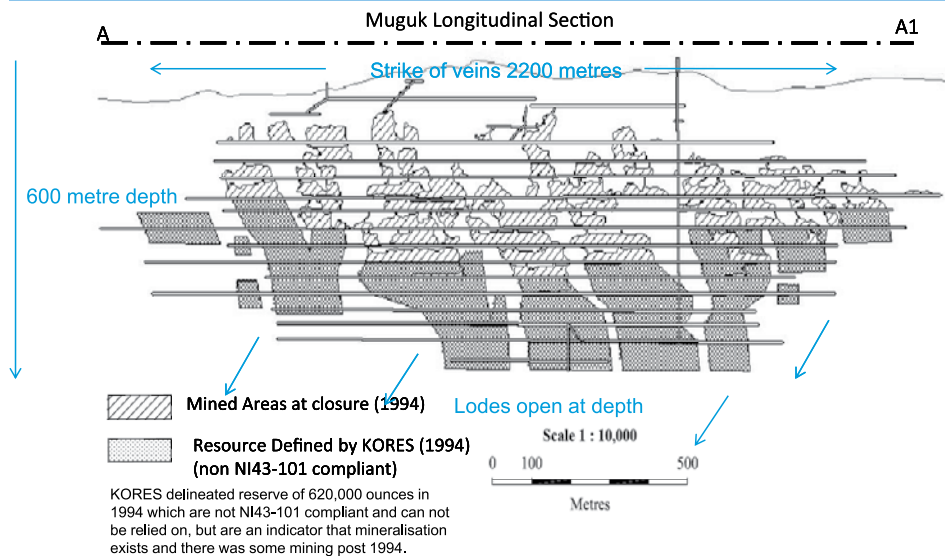
- In 1994 KORES, prior to cessation of mining, reported "reserves" of 714,000t grading 14.5g/t gold and 83g/t silver (non NI 43-101 compliant), and "inferred resources" of 705,000t grading 12.5g/t gold and 62g/t silver (non NI 43-101 compliant). The review of over 1000 face samples taken by KORES at the time has a mean grade of 30 g/t over an average width of 1.15m which is a significant target.
- In 1998, Muguk was reported by KORES to contain a combined resource of 1,418,980t @ 13.5g/t Au, 72.8g/t Ag (615,956oz Au & 3,321,599oz Ag). A qualified person has not done sufficient work to classify either of these historical resources as current mineral resources.

## Vein systems at the Muguk project



Source: Woulfe Mining Corp

## Muguk longitudinal cross section showing previously exploited areas



Source: Woulfe Mining Corp

Mining over the long term produced an average head grade of 8g/t until the mine was closed in 1997 when the gold price fell. Independent assessment of historical channel sampling data from 1353 assays taken from underground mine workings from the Samhyungje vein suggest that the vein was between 0.3m and 2.7m in width with an average width of 1.15m and an average sampled gold grade of around 30g/t. The median gold grade of these samples is 13.9g/t with a value for the highest assay at the 95th percentile of 104 g/t. If the data is regularised to metre x grams the average is around 30m.g with a median value of 16.2 and a value at the 95th percentile of 102g/t. The sampling methods and quality control procedures are undocumented for this data so it must be treated as purely an historical guide to mineralisation as it does not comply with NI 43-101 standards.

As well as the channel sampling data, samples from 99 NQ size diamond drill holes from the surface will be analysed. When analysis of all this available data is complete drilling will be carried out by 'twinning' holes with some of the previous KORES bores to verify the drill hole data. It is also likely that some new exploratory holes will be drilled to assess the extent and quality of the mineralisation in extensions of the vein system which are known to extend along a strike of 2.5km.

## **Planning**

Woulfe will evaluate the potential at Muguk to establish a high grade gold-silver mine or a bulk tonnage low grade gold-silver mine exploitable by open pit. If established, a central milling complex at Muguk could potentially exploit additional high grade gold-silver resources from satellite deposits identified in the surrounding region.

Woulfe is undertaking modelling of the mineralisation and in 2010 two diamond holes of 700m each were drilled from surface to targets underground with the purpose of verifying the historical KORES sampling data. Woulfe had planned to use the data from these holes to make a decision on whether to access the mine via an existing decline to dewater.

Now, in early 2011, the company plans to drill one more 520m exploration hole to investigate the possible extension of the No. 2 vein lode at Muguk. Historically No. 2 vein generated about 75% of gold production. Analysis of the geology suggests that No. 2 vein may extend to the north of the known defined resource.

The hole is targeted to intersect the ore position at around 165m to the North of the last mine working on level 8 (285m from surface). On level 8 immediately above the target area, historical sampling showed the vein to be 1.6m true thickness with grades varying from 5.8g/t to 14.7g/t.

## **Geology and mineralogy**

The Muguk mine was the largest gold-silver producer in South Korea yielding more than ten metric tons of gold from ores with an average grade of about 8 g/ton. Au and Au/Ag ratios near 1:5. The Au-Ag deposits at Muguk, in particular their mineralogy, Au/Ag ratios and fluid geochemistry, are the result of episodic meteoric water events within the granite-hosted hydrothermal system. Early stages of the hydrothermal history involved successive introduction of new pulses of meteoric ore fluids, each of which equilibrated with the host granitic rocks at successively higher water-to-rock ratios and lower temperatures during deposition of gold-silver mineralisation. Later stages were the result of inundation of the hydrothermal system by isotopically unevolved meteoric waters, resulting in a silver-rich overprint on the earlier gold-silver system.

The ore deposits consist of >10 subparallel quartz-calcite veins (typically 0.6 to 1.0m wide) that fill faults and fractures in Jurassic granodiorite and a Cretaceous quartz porphyry. The veins were formed during six successive hydrothermal events of Late Cretaceous age. The ore mineralogy of the veins is complex, consisting mainly of pyrite and base-metal sulphides including electrum (23-51 atom. % Au), native silver, argentite and the silver sulphosalts polybasite and pyrargyrite.

There are believed to have been five stages of mineralization. Stage I veins are barren and contain no gold or silver. During stages II to V, economic quantities of gold and silver were precipitated. Stages III and IV represent the culmination of gold precipitation in distinct sulphide bands, whereas stage V represents a change to dominantly silver deposition. Stage VI veins are barren with post-ore quartz-calcite-fluorite deposition.

A variety of types of geochemical data indicate that deposition of gold and silver resulted mainly from cooling of ore fluids, accompanying successive incursions of meteoric water into the hydrothermal system. Fluid inclusion data show general decreases of temperature and salinity within each stage. Ore mineral assemblages indicate decreases in the evanescence of sulphur with decreasing temperatures during the deposition of gold and silver. Measured and calculated  $\delta^{18}\text{O}$  values of hydrothermal fluids decrease from +3.0 to -7.4‰ from stages II through VI, and  $\delta\text{D}$  values range from -66 to -84‰.

## Other properties

Woulfe's other properties in South Korea include Yeonwha 1, Taebaek base metals property, Chongyang tungsten property and seven uranium mining licences in the Geumsan area.

### Yeonwha 1 and Taebaek

In an option agreement dated October 9, 2006 (the "Jangseong Option Agreement"), Woulfe was granted the option to acquire various mineral projects in South Korea held by Se Woo Mining Co. Ltd., a company owned and controlled by Jae Youl Sim, and certain private individuals, including Jae Youl Sim and members of his family (the "Vendors") for a three year period. Immediately before the expiry of this Option Agreement, on October 9, 2009, the Company issued the required notice to the Vendors to exercise its option on the properties.

To acquire a 100% interest in each property, the Company has paid US\$50,000 in cash and US\$50,000 in common shares of the Company at the average closing price of the common shares for the 10 day trading average price prior to the payment date. On development of the project Woulfe must pay a further US\$1m in cash and US\$1m in cash or common shares of the Company, at the discretion of the Company, at the average closing price of the common shares for the 10 day trading average price upon commencement of commercial production and on production an output grant at 2% of net smelter return royalty to the Vendors. To keep the option in good standing, the Company must complete a pre-feasibility study on the property within five years of the transfer of the properties to the Company.

Mr. Jae Youl Sim currently owns directly and indirectly, through Se Woo Mining Co. Ltd., 20,799,493 common shares, representing 11.34% of the issued and outstanding shares of the Company. Following completion of the initial option exercise payments, Mr. Sim will hold 21,049,403 common shares of the Company representing 11.47% of the then issued and outstanding shares.

The Jangseong Option comprises two contiguous blocks, referred to as Yeonwha which comprises five mining titles (Registration #s 76094, 76361, 76499, 76500, 76501), and Taebaek which comprises three mining titles (Registration #s 76359, 76360, 76505).

The Yeonwha and Taebaek blocks comprising the Jangseong Option are referred to as the Yeonwha I property which lies within the historic Taebaek silver-lead-zinc mining district of South Korea. This district hosts numerous known deposits of 2 to 12 million tonnes in size with combined lead-zinc grades of approximately 10%. All mining in the district had ceased by the 1990s due to depressed metal prices. Yeonwha I lies approximately 4km to the south west of the Yeonwha II property which is currently being evaluated by a Korean joint venture group including Korea Resources Corporation.

### ***Geology and mineralisation***

Three past-producing lead-zinc-silver mines lie within the Yeonwha I property: Taebaek, Bonsan and Dongjeom. These deposits were mined from the early 1960s to the early 1990s. The mineralisation occurs in skarns within Cambrian to Ordovician limestone and shale and is hosted within tabular veins and breccia pipes that form discrete ore bodies within each deposit. One of the largest of the ore bodies, Taebaek 1 within the Taebaek deposit, occurs within a sub-vertical tabular vein that attains a maximum thickness of around 9m. It has been mined over a strike length of some 400 to 500m and a vertical extent of approximately 400m. The vein crest is reached at about 400 m from surface.

Detailed 'ore reserves and resources' were documented in a 1991 report by KORES prior to mine closure. The report quotes 'reserves' and 'resources' as categories that can be translated from Korean as 'proved' and 'inferred', however these are not equivalent to similar terms used under the JORC and NI 43-101 requirements, and therefore the KORES estimates are not compliant and cannot be relied on and are only indicative of the target to be explored.

The historical non-compliant resources include total "proved reserves" for the three deposits of 3.6 million tonnes grading 3.5% lead and 4.8% zinc, of which 96% was contained in the Taebaek deposit, and total "inferred resources" of 3.6 million tonnes grading 3.4% lead and 4.8% zinc, of which 73% was contained in the Taebaek deposit.

Woulfe will be considering these properties in the longer term.

### **Chongyang**

This former molybdenum-tungsten mine, closed in 1977 and may have bulk open-pit potential. It lies on the same formation as Sangdong but is not anticipated to be a producer with the same capacity as Sangdong. Woulfe will consider whether to develop this opportunity alongside others after the Sangdong project is underway.

### **Uranium & Vanadium**

Other projects include seven uranium/vanadium leases and four under application.

# Financials

Profit and Loss							
Year ending June (C\$m)	2009A	2010E	2011E	2012E	2013E	2014E	2015E
<b>Revenues</b>	—	—	—	—	<b>20.1</b>	<b>101.0</b>	<b>121.6</b>
COGS	—	—	—	—	(15.2)	(55.9)	(67.6)
Gross profits	—	—	—	—	4.9	45.2	54.1
Administrative Costs	(2.1)	(3.0)	(2.5)	(2.5)	(2.5)	(2.5)	(2.5)
<b>EBITDTA</b>	<b>(2.1)</b>	<b>(3.0)</b>	<b>(2.5)</b>	<b>(2.5)</b>	<b>2.4</b>	<b>42.7</b>	<b>51.6</b>
Depreciation & amortisation	(0.0)	1.9	—	—	(17.0)	(19.9)	(20.9)
EBIT	(2.4)	(1.1)	(3.9)	(2.5)	(14.5)	22.8	30.7
Interest	(0.1)	—	0.3	(1.0)	(2.9)	(2.4)	(0.1)
EBT	(2.5)	(1.1)	(3.6)	(3.5)	(17.4)	20.4	30.7
Tax paid	0.7	0.2	0.6	0.7	—	—	—
<b>Earnings</b>	<b>(1.8)</b>	<b>(0.9)</b>	<b>(3.0)</b>	<b>(2.8)</b>	<b>(17.4)</b>	<b>20.4</b>	<b>30.7</b>
Dividends	—	—	—	—	—	—	—
<b>Retained earnings</b>	<b>(1.8)</b>	<b>(0.9)</b>	<b>(3.0)</b>	<b>(2.8)</b>	<b>(17.4)</b>	<b>20.4</b>	<b>30.7</b>

Cashflow							
Year ending June (C\$m)	2009A	2010E	2011E	2012E	2013E	2014E	2015E
EBIT	(2.4)	(1.1)	(3.9)	(2.5)	(14.5)	22.8	30.7
Depreciation	—	—	—	—	17.0	19.9	20.9
Stock-based Comp, Writedowns, Tax Recovery	0.8	(0.8)	—	—	—	—	—
(Increase) decrease in receivables	0.3	(0.1)	0.2	—	(3.0)	(12.1)	(3.1)
(Increase) decrease in inventory	0.4	(0.1)	(0.0)	—	(2.3)	(6.1)	(1.8)
Increase (decrease) in payables	1.1	(1.2)	(0.3)	—	1.2	3.3	0.9
<b>Net cash from Ops</b>	<b>0.2</b>	<b>(3.3)</b>	<b>(4.0)</b>	<b>(2.5)</b>	<b>(1.7)</b>	<b>27.7</b>	<b>47.7</b>
Tax paid	—	—	0.6	0.7	—	—	—
Dividends	—	—	—	—	—	—	—
Net interest recieved (paid)	(0.1)	—	0.3	(1.0)	(2.9)	(2.4)	(0.1)
New equity	0.1	10.2	10.0	30.0	—	—	—
New (deposits) borrowings	1.5	—	—	50.0	—	(20.0)	(30.0)
Capital expenditure	(2.3)	(2.3)	—	(52.5)	(27.5)	(2.0)	(2.5)
<b>Net cash from financing</b>	<b>(0.7)</b>	<b>7.9</b>	<b>10.9</b>	<b>27.1</b>	<b>(30.4)</b>	<b>(24.4)</b>	<b>(32.5)</b>
<b>Net increase (decrease) in cash</b>	<b>(0.6)</b>	<b>4.6</b>	<b>6.9</b>	<b>24.6</b>	<b>(32.0)</b>	<b>3.3</b>	<b>15.1</b>

Balance sheet							
Year ending June (C\$m)	2009A	2010E	2011E	2012E	2013E	2014E	2015E
Fixed assets at NAV	22.9	27.5	27.5	80.0	90.5	72.6	54.2
Cash	0.0	4.7	11.6	36.3	4.2	7.5	22.7
Receivables	0.0	0.1	(0.1)	(0.1)	2.9	15.0	18.1
Inventory	0.0	0.2	0.2	0.2	2.5	8.6	10.3
Less Payables	(3.3)	(2.3)	(2.1)	(2.1)	(3.3)	(6.5)	(7.5)
<b>Net current assets</b>	<b>(3.3)</b>	<b>2.6</b>	<b>9.7</b>	<b>34.3</b>	<b>6.3</b>	<b>24.6</b>	<b>43.7</b>
Less loans	(2.1)	—	—	(50.0)	(50.0)	(30.0)	—
<b>Capital employed</b>	<b>17.6</b>	<b>30.1</b>	<b>37.1</b>	<b>64.3</b>	<b>46.9</b>	<b>67.2</b>	<b>97.9</b>
<i>Represented by</i>							
Shares in issue	29.1	39.3	49.3	79.3	79.3	79.3	79.3
Add retained profit							
Prior periods	(9.8)	(8.3)	(9.2)	(12.1)	(15.0)	(32.4)	(12.0)
This period	(1.8)	(0.9)	(3.0)	(2.8)	(17.4)	20.4	30.7
<b>Shareholders' funds</b>	<b>17.5</b>	<b>30.1</b>	<b>37.2</b>	<b>64.3</b>	<b>46.9</b>	<b>67.3</b>	<b>97.9</b>

Source: Objective Capital

The management team of Woulfe consists of internationally experienced senior geological, mining and administrative professionals and Korean professionals with long management experience in the two companies which operated the Sangdong and Muguk mines. This is an ideal management mix for Woulfe, bringing together new technology and modern best practice whilst at the same time drawing on the experience and knowledge of the past senior management drawn from the two target mines.

### **Brian Wesson**

#### ***CEO/ President***

An engineer with 30 years' experience, he has an MBA and is a Fellow of the Australian Institute of Mining and Metallurgy and a Fellow of the Australian Institute of Company Directors. He has extensive experience in the operation, design and construction of mines and process plants. His company, Westech bought the Vatukoula Mine in Fiji after mine closure and Westech refinanced and refurbished the operation, putting it back into production. On listing, Vatukoula Gold took over.

### **Amelia Wesson**

#### ***Director/ VP Admin and Corporate***

A principal of Westech, a consulting company which was instrumental in working with government and staff to restructure the Vatukoula Mine from 2,200 staff to 700 and inducting and retraining the staff. Amelia previously worked in companies servicing the large mines in South Africa giving her an excellent understanding of personnel and administration.

### **Bill Kable**

#### ***VP Technical***

An economic geologist with over 30 years' experience in the minerals, oil and gas and broking industries. His specialisation is valuation and due diligence studies for public reports, corporate mergers, acquisitions and company floats. He has wide experience of projects throughout Australasia, Africa and South America

### **Dr Kun Joo Moon**

#### ***Senior Adviser***

Dr Moon holds a Ph.D in Geology from the University of Tasmania on the Sangdong Tungsten Project and had an extensive career history with Korean Tungsten.

**Mr Kwan Yi Jeong**

***Technical Adviser***

Mr Jung was General Manager of Muguk Gold and Yeonwha Base Metals when it closed. He is a highly respected mining engineer in Korea and adviser to large companies.

**Mark Gelmon**

***CFO***

A Chartered Accountant and a member of the Institute of Chartered Accountants of British Columbia. He has served as an auditor, Director, Chief Financial Officer, corporate controller and accountant for several public and private companies.

**Ms Marion McGrath**

***Corporate Secretary***

Ms McGrath has been actively engaged in the securities industry for over 25 years. She has served as a director and officer of numerous public companies in a corporate administrative capacity and is the owner of iO Corporate Services Limited, a company which provides corporate and accounting services to various publicly-traded Canadian companies. Prior to organizing iO Corporate, Ms McGrath was a senior paralegal with a Vancouver-based securities law firm.

We are pleased to bring you this report on **Woulfe Mining Corporation**.



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As always, I welcome your comments and feedback on our research!

Gabriel Didham, CFA  
Objective Capital

#### **Will Purcell**

Will has been involved in the resource sector for 30 years in a variety of roles. Since the late 1990s, he has been active in assessed mineral resource investment projects. Will has a B. Math degree from the University of Waterloo in Ontario.

#### **Richard Thompson**

Richard Thompson is a graduate mining engineer (Camborne) and has worked for over 40 years in the mining industry. His expertise covers mining techniques, the application of mining equipment, mine project evaluation, mining investment promotion and project management.

#### **About our relationship with Woulfe Mining**

Objective Capital has been sponsored by the company to provide research coverage of Woulfe Mining.

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