Initiation | Mining Companies

3 March 2016

Wolf Minerals Ltd

New strategic metal producer

Wolf Minerals' (Wolf's) new tungsten mine commenced production in September 2015. By the end of 2016 the mine should be one of the world's most significant non-Chinese producers of this strategic metal.

The Drakelands open pit mine, in Devon, is the first new metal mine in the UK for 45 years. Wolf has built the mine at a cost of £123 million, to produce 345,000 metric ton units (mtu) of WO_3 per year for 12 years, based on current reserves and working five and a half days per week.

Wolfram is the raw material for tungsten production, which is mainly used in cemented carbides, for cutting tools used in the mining, oil and gas and manufacturing industries. Drakelands has brought new wolfram supply into the market at a time when Western processors are increasingly concerned about security of supply, given China's dominance of the market. There are few other options outside China and doubt as to whether or not projects will come to fruition, as financing is scarce.

Fin. year (end June)	WO_3 prod (kmtu)	Cash costs (US$/ mtu)	Rev (A$M)	EBITDA (A$M)	EBITDA margin (%)	EPS (A$)
2016f	269.0	123	61.5	(2.8)	n/a	(4.57)
2017f	392.3	97	134.7	57.1	42	2.43
2018f	386.6	106	154.8	73.4	47	4.32

Source: Marten & Co

Valuation summary

The sum-of-the-parts net asset value (NAV) valuation of Wolf is 16.8 pence per share, implying that the company is currently trading at 51% of NAV. If the company is successful in obtaining approval to operate seven days a week, annual production could increase by over 25% and the NAV would increase to 21.3 pence per share.

Listed	AIM, ASX
Ticker	WLFE, WLF
Base currency	GBP
Price (pence)	8.50
Trading Volume (daily average)	411,765
1 year high	21.50
1 year low	6.75
1 month performance (%)	3.0
3 month performance (%)	-20.0
1 year performance (%)	-54.4
Calendar YTD perf. (%)	-5.6
Yield (%)	Nil

Perf vs Aim Basic Res. rebased

Jan 2014 to Feb 2016

Source: Bloomberg.

Net cash (A$M) (30/9/15)	52.0
NAV[5%] per share	16.8p
P/NAV	51%
Market cap (£M)	68.8
Shares outstanding (M)	809.7

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Investment highlights

Production

Wolf has brought into production a new tungsten mine, at a time when rival companies are struggling to secure financing for their projects, because of the current weak market.

Its Drakelands open-pit mine is one of the largest and lowest-cost mines, outside China, which accounts for more than 80% of world production.

The mine's tungsten output (equivalent to approximately 15% of non-Chinese production) is of strategic importance to North American and European users concerned about security of supply for this critical metal.

The mine has good potential to expand production, at minimal cost, and to extend its life from existing resources and exploration within and near the property.

Market situation

Sixty per cent of tungsten production worldwide goes into the manufacture of cemented carbides for use in wear-resistant parts and cutting tools in the mining, oil and gas and manufacturing industries. Another important use is in steel alloys and superalloys (24% of demand) for the automotive industry.

The market is currently in oversupply because of the recession in the mining and oil and gas industries and excessive production in China. However, the Chinese government is working to restrict output and exports from its mines.

Product prices plunged in 2015 and remain weak but a modest recovery is expected by industry analysts over the next two years. Prices are then expected to return to levels last seen in 2011, before the downcycle in commodities.

New mine supply outside China is limited, with only a few projects at the feasibility-study stage and the majority of those yet to secure financing.

Secondary supply from recycling is believed by market analysts to have reached a ceiling in Europe of about 50%, although within China, they believe the figure to be a lot lower.

Wolf has secured long-term purchase agreements with users in North America and Austria.

Company

The company is valued, on a NAV basis, at 16.8 pence per share against the market price on London's AIM of 8.5 pence per share.

The company's major shareholder is an Australian private equity firm Resource Capital Fund (RCF). It has shown its support for the company by agreeing to invest up to £25 million in new equity, as it ramps the mine up to full production, against a backdrop of low product prices.

Wolf has high awareness among domestic retail-investors due to Drakelands' status as the first new metal mine in the UK for 45 years (resulting in substantial media coverage of its opening in September 2015).

Introduction

More information can be found at the company's website: www.wolfminerals.com.au

Wolf is a publicly traded company listed on London's AIM and on the Australian Stock Exchange (ASX).

Wolf's sole mineral asset is the Drakelands tungsten and tin mine, in Devon, UK, which the company commissioned in September 2015. When fully operational, the mine will produce around 3% of global demand for tungsten (or 15% of non-Chinese demand), with the potential to expand production by over 25%.

The company's registered office is in Perth, Australia, and operational offices are at the mine site, outside Plymouth, in the UK.

The company's financial year runs from 1 July to 30 June and accounts are denominated in Australian dollars.

Investment case

Wolf transitions from developer to producer

Wolf has financed and brought a mine into production when other projects are struggling to obtain finance.

The fact that Drakelands is now in production is positive news for shareholders. By reaching this stage, the company has not only successfully negotiated the formidable barrier of raising the necessary capital, which other developers still face, but has also managed the complex process of taking a feasibility plan on a greenfield site through the construction phase and has delivered an operating mine.

With tungsten prices currently historically low and investors shy of the commodity markets, it is believed that many of the other tungsten projects around the world will struggle to be financed and built in the short to medium term.

The company has experienced "teething problems", not uncommon for any operation of this scale, as it commissions the plant in the initial stages of commercial ramp-up to full capacity. Once the mine reaches steady state in Q2 16, Wolf could benefit by being rerated in the market as a producer rather than a developer, provided the tungsten price recovers (see pages 26, 27 and 28 for further discussion on the tungsten price).

Figure 1: Overview of the Drakelands mine, with the plant in the left foreground and the open pit in the top right

Source: Wolf Minerals

Potential production increase

A34% increase in reserves offers the potential to increase annual production and 24/7 working is now being trialled.

In March 2015, the company was able to increase reserves by 34% from the 2011 feasibility study estimate, by steepening the pit slope and deepening the pit depth. Rather than extend the life of the mine, the company plans to generate profits earlier, by accelerating the rate of production through an extension of working hours.

The mine currently has a permit for a five and a half day operating week but is currently trialling 24/7 operations. If it receives approval for the longer working week, then management believes that the mine could increase ore production by over 25% to 4.0 million tonnes per year (Mt/y) at minimal cost. This would result in annual average WO_3 production rising from 345,000 mtu to 417,000 mtu.

The reason for limiting the operations to five and a half days is to restrict the effect on the local community of the noise from the primary crusher. Wolf changed the original plant design to replace the jaw crusher with a rolling tooth crusher, which is quieter. Devon County Council, which granted the original planning permission in 1986, has indicated its willingness for the extended working hours and is working with the local parish council to progress this.

In addition to increasing throughput, the programme of grade control drilling that the company has undertaken (some 20,000 m) suggests a positive reconciliation to ore reserve grades of approximately 10%. It would be premature at this stage to assume that such improved grades could result in a 10% increase in head grades (the mill needs to be working at steady state for a few months) but, if it proves to be the case, then it will have a material impact on production and the bottom line.

Large reserve with resource upside

The Drakelands mine has a reserve base that should support a mining operation for approximately 12 years (or 10 years if the company increases the ore production rate by 25% by increasing throughput as discussed above).

In addition, it is estimated that there is good potential to extend the life or increase production by expanding the resource base.

There are a number of identified opportunities to increase pit resources.

Drilled-off resources extend to the south of the permitted pit shell and Wolf is in discussions with the regulatory authorities and landowners seeking approval for a 150 m extension to the open pit to exploit the approximately 10 Mt of resources contained.

Figure 2 shows the permitted area in plan view with the proposed extension to the pit outline indicated.

Figure 2: Plan of Drakelands mining permit area

Source: Wolf Minerals

In addition, by deepening the pit, the company could bring existing inferred resources into the mine plan towards the end of the projected life. That then opens up the possibility of underground mining once reserves in the open pit are exhausted, as

drilling has intersected mineralisation at a depth of around 140 m below the final pit bottom.

Finally, there is potential to bring back into resources mineralisation in the country rock, or killas, around the perimeter of the pit that was excluded in the more stringent Joint Ore Reserves Committee (JORC) code used for the 2015 resource estimate. In this estimate, measured and indicated resources fell by 64% as mineralisation in the killas was excluded, as there was not enough evidence of metallurgical recoveries to justify the economic potential required under this most recent JORC code. Wolf has started a work programme to assess recoveries in the killas.

Strategic importance

The EU and the US class tungsten as a strategic metal or "critical raw material" based on concerns about the dominance of China as a supplier to Western processors. Consumers are thus looking to reduce their reliance on Chinese material and, in this regard, the introduction into the marketplace of an alternative production source at Drakelands is timely.

Drakelands is one of the few non-Chinese mines in production.

In addition, exports of concentrate from China are expected to decrease in the short to medium term, as the Chinese authorities limit production through a system of licences and many mines are becoming uneconomic, constraining supply of feedstock.

There are other potential sources of supply, notably in Australia, Canada, Spain and Korea, but most of these projects still need to secure financing and are therefore, in many cases, several years away from production.

High profile

Drakelands is the first new metal mine in the UK for 45 years. The mine, and its official opening in September last year, have received extensive media coverage, creating high levels of awareness and interest within the UK retail investment sector. This is expected to continue.

The company's free float is relatively small, which might deter institutional investors. The company could address this by seeking to become a "favourite" of the retail sector, as part of its investor relations strategy.

Supportive major shareholder

The Drakelands mine has experienced some commissioning issues in the plant ramp-up (equipment failures, which are the responsibility of various manufacturers), which have hampered production to date. In addition, the base ammonium paratungstate (APT) price (see next section for definition) has virtually halved over the past year (to levels below the breakeven price for the project). Taken together, the impact of these factors is that revenue and cash flow for FY2016 are likely to be below budget.

The major shareholder is very supportive but there is some dilution for others.

Major shareholder, RCF, which held almost 42% of the company at the beginning of the year (see Capital Structure, page 21), has agreed to invest up to £25 million in return for new equity. It is thought that RCF will phase its investment and an initial tranche of £12 million is assumed, for which Wolf would issue 128.2 million new shares at a price of A$0.19 per share (9.2 pence per share), representing a premium of 13% over market price immediately prior to the announcement.

The issue of new equity requires approval at a shareholders' meeting in April 2016.

This will result in some dilution for the other shareholders and there is the risk of further dilution should the full facility be drawn down, although this should only happen if APT prices fail to recover at the rate expected.

Valuation

Wolf is valued on a sum-of-the-parts basis taking into account the after-tax net present value (NPV) at a discount rate of 5% for the Drakelands mine.

Figure 3: Base case valuation model for Wolf

	US$M	£M	Pence per share
Drakelands NPV$^{5\%}$	272	178	21.9
Net debt	(63)	(41)	(5.1)
NAV	209	136	16.8

Source: Marten & Co £/US$ exchange rate = 1.53

Drakelands' NPV is 21.9 pence per share. Wolf NAV 16.8 pence per share.

The base case analysis leads to an NPV$^{5\%}$ for the project of 21.9 pence per share and an NAV for Wolf of 16.8 pence per share, meaning that Wolf is currently trading in London at about 48% of NAV. The project after tax internal rate of return (IRR) is 29%, based on these numbers.

Wolf produces a WO_3 concentrate, the price of which is based on the price of the most commonly traded tungsten raw material, APT. APT is priced in terms of US dollars per mtu. (1 mtu = 10 kg).

The APT price has firmed slightly so far in 2016 and is currently around US$175/mtu, having halved over the past year. APT prices of US$200/mtu in FY2016 and US$300/mtu in FY2017 are used in the base case analysis. It is assumed that the current oversupply situation in the market will tighten. This reflects the further assumptions that there will be less material exported from China, little in the way of significant new supply from projects and that, on forecast GDP growth, demand also picks up. Longer term, APT prices of US$400-450/mtu are used. Note that a 20% discount to the ruling APT price is assumed as the price Wolf will receive for its concentrate product.

As far as production is concerned, it is assumed that the operation ramps up to permitted production of 3 Mt/y by May 2016 and it is expected that recoveries will be lower than the long-term average in the first year of operation.

In addition to the base case, a higher production case has been modelled. This is based on the assumption that Wolf is able to obtain permission to work a seven-day week (the mine's initial permit is for five and a half day working) following on from the end of its trial period in H1 2016.

Figure 4: 4 Mt/y production case valuation model for Wolf

	US$M	£M	Pence per share
Drakelands NPV$^{5\%}$	327	214	26.4
Net debt	(63)	(41)	(5.1)
NAV	**264**	**172**	**21.3**

Source: Marten & Co £/US$ exchange rate = 1.53

A higher annual production case increases NAV.

Using the higher production rate, the NPV for the project increases to 26.4 pence per share and the NAV of the company to 21.3 pence per share, implying the potential for a 210% increase from the current share price.

Comparative valuation

In this analysis, Wolf and its mine have been compared with other non-Chinese tungsten project developers and producers in terms of value in the ground, size and grade of resources and production and unit costs.

On an analysis based on the company's enterprise value (EV) and the size of its resources (in terms of tonnes of WO_3 in the ground), Wolf is the third most highly valued of all the producers and developers, behind Vietnam's Masan Resources (which is in operation feeding a captive APT plant) and the much smaller W Resources. This high value arguably reflects the fact that the company has funded and constructed the Drakelands mine, whereas the others are some way short of achieving this stage (see Figure 27 for more detail on these projects' status).

High EV per resource tonne reflects the fact that Wolf is producing.

Figure 5: EV/t WO_3 for major global tungsten developing companies

Company	EV (US$M)	Measured and indicated (M&I) resource (contained WO3 t)	EV/t WO_3 (US$)
Wolf Minerals	**287**	**99,620**	**2,877**
Almonty Industries	69	54,858	799
Carbine Tungsten	9	33,110	187
King Island Scheelite	13	80,316	113
Masan Resources	705	130,000	5,426
Northcliff Resources	11	220,397	38
Ormonde Mining	7	51,620	218
Tungsten Mining	10	3,900	1,779
Vital Metals	6	37,044	107
W Resources	18	7,854	3,416

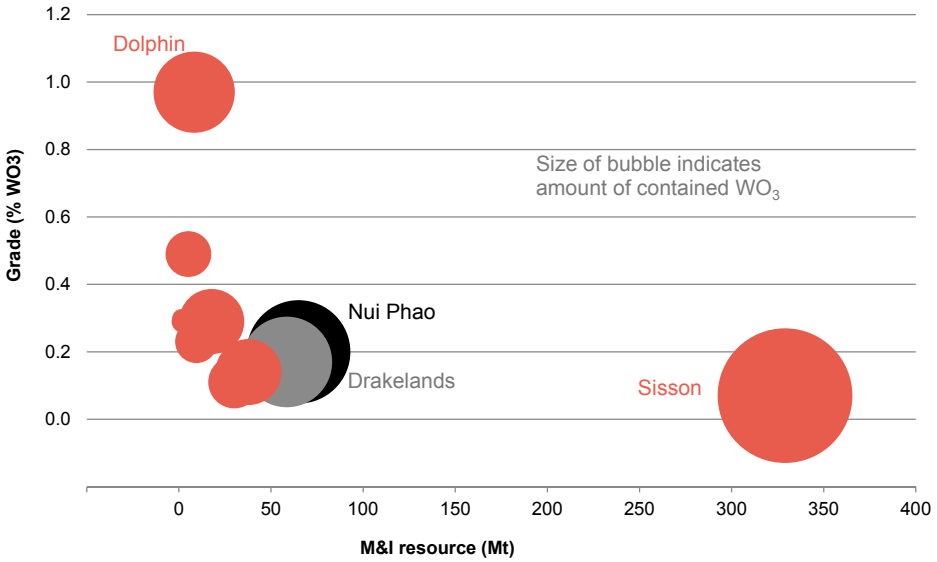
Source: Bloomberg, company reports

Drakelands is a large resource; the second largest in production, behind Masan Resources' Nui Phao mine, in Vietnam as shown in Figure 6.

Large resource can be mined at low cost.

Other large projects in the project pipeline, outside China, are Northcliff Resources' Sisson project and King Island Scheelite's Dolphin project, which has the highest grade resource.

Figure 6: M&I resource tonnes and WO_3 grade of major world projects

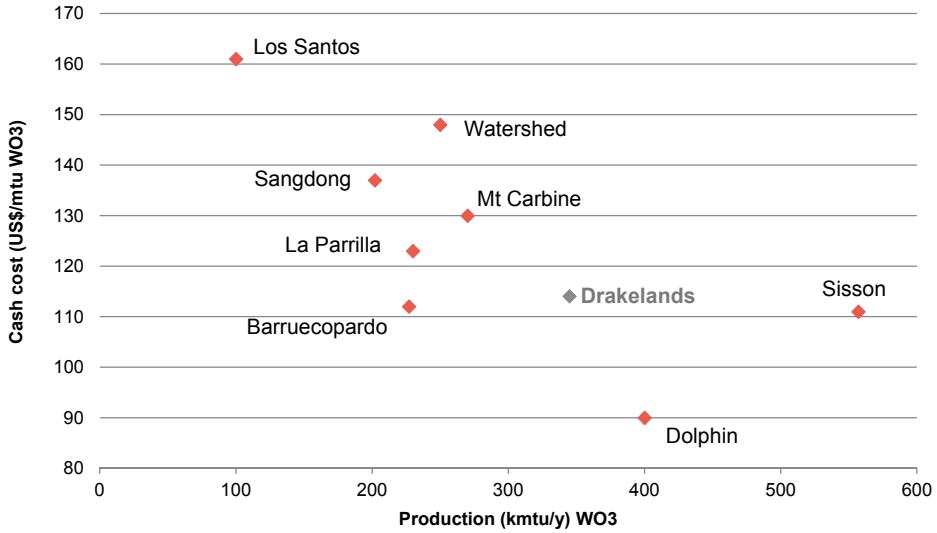


Source: Company reports, Marten & Co

At full production, Drakelands will be one of the largest and lowest-cost producers of tungsten in the world.

Drakelands' resource size means that it contains one of the largest inventories of WO_3 in the industry and its geometry means that it can be extracted relatively inexpensively through open pit, bulk mining (see Figure 7). This means that, all things being equal, it will be both one of the largest non-Chinese producers and lowest-cost producers of tungsten in the world, once it reaches full production.

Figure 7: Production and cash costs for tungsten mines and development projects



Source: Company reports

A detailed discussion of current and possible new supply to the market is presented on pages 24 and 25.

Sensitivity analysis

A 5% discount rate has been used in the base case calculations, but for comparison NPV and NAV values at other discount rates are shown below.

Figure 8: NPV and NAV at various discount rates

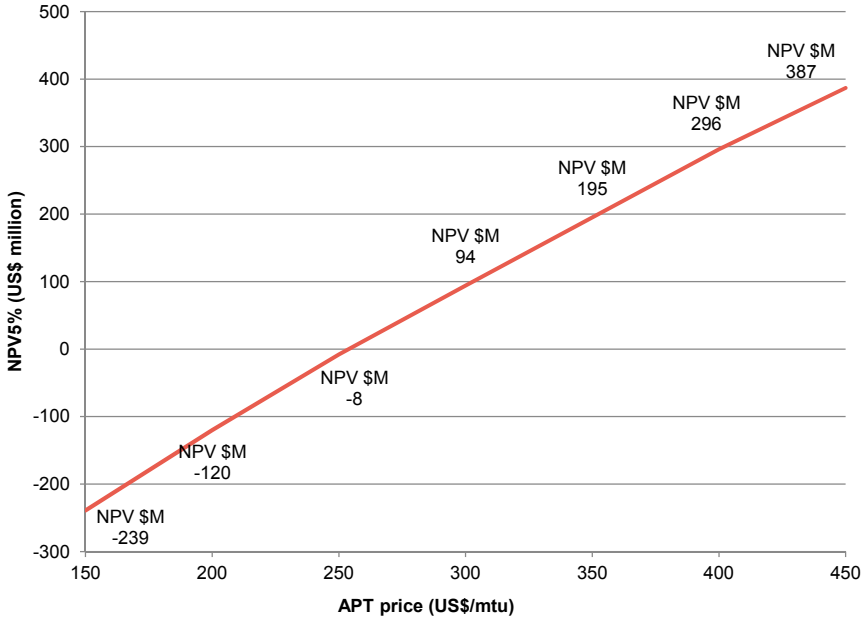
Discount rate	NPV (US$ million)	NAV (pence per share)
5%	272	16.8
8%	210	11.9
10%	176	9.1

Source: Marten & Co

In addition to considering a 4 Mt/y production scenario (Figure 4), the project has been stress-tested against volatility in the APT price, which is the most critical variable as far as project profitability is concerned and is also extremely pertinent given the current low market prices.

Figure 9 shows the company's NPV at various APT prices.

Figure 9: Project NPV at various APT prices



Source: Marten & Co

The project is very sensitive to product price.

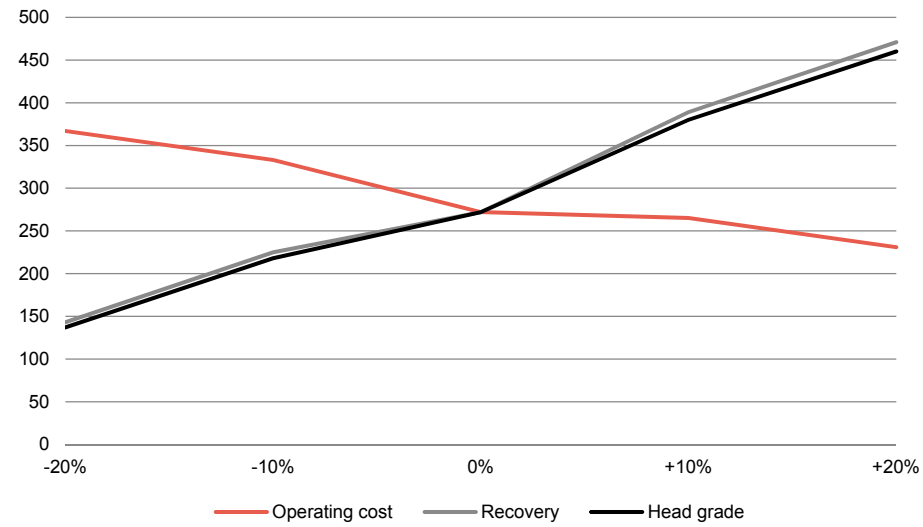
The project breakeven (including debt financing) APT price is US$250/mtu (which equates to a received price of US$200/mtu) according to the model. Currently the price is trading at less than US$200/mtu but it is assumed that recovers over the longer term (see pages 29 and 30 for further discussion).

The Drakelands mine model's sensitivity to other key metrics such as operating costs, plant recoveries and head grade has also been tested.

The project is also sensitive to changes in grade and recovery.

Out of these metrics, the project is most sensitive to variations in recovery and head grade.

Figure 10: Sensitivity of Drakelands NPV to changes in key metrics



Source: Marten & Co

Drakelands mine

Location

Drakelands mine, part of the Hemerdon project, sits within granite moorlands by the rural village of Hemerdon, in Devon, south-west England. The port town of Plymouth (population: 250,000) is 10 km to the south-west.

The infrastructure is highly developed, with sealed roads and electrical power from the national grid. Ample water is available.

There is a working china clay (kaolin) quarry, which is operated by international company Imerys Minerals (Imerys), to the immediate north of the licence area.

Ownership

Wolf acquired a 40-year lease in December 2007 from the Hemerdon Mineral Trust for A$1 million (approximately £450,000) plus an annual rental of A$160,000 (approximately £80,000). Wolf simultaneously agreed to purchase remaining mineral rights and freehold land from Imerys.

The mine permit, issued by the UK government in January 2011, expires in 2021. Application to extend this to 2036 is being processed by Devon County Council.

A 2% net smelter royalty (NSR) is payable to local landowners and another 2% NSR is payable to RCF, after RCF acquired the royalty for A$7 million (approximately £4.4 million at the time) in 2012 (see discussion of mine financing on page 16).

Brief history

Archaeological evidence around Hemerdon and Drakelands indicates mining as early as 1,300 BC. The Drakelands tungsten-tin deposit was most recently discovered in 1867.

Mining started in 1917 when World War One increased demand for tungsten for use in armaments. Commercial production was sporadic until the end of World War Two when it stopped altogether. Exploration restarted in the 1960s and British Tungsten reported a resource of 5.6 Mt of ore in the early 1970s. The lease was transferred to Hemerdon Mining and Smelting (HMS) in 1976.

American molybdenum mining company, AMAX, completed a feasibility study in 1981 with work that included a 260 m decline through the orebody to determine metallurgical recoveries and deposit continuity, and a pilot plant for large scale testwork. Recoveries and a preferred process route were established after processing 6,670 tonnes of mineralised granite.

A mine permit application in 1981 was refused in 1984, prompting HMS to sell out of the joint venture. A 35-year permit was granted in 1986, but tungsten prices had by then fallen and the project was deemed uneconomic.

When Wolf acquired the project in 2007, it aimed to validate and update the feasibility study, then upgrade permits to build a large-scale, open-pit tungsten and tin mine.

Geology and mineralisation

The Drakelands tungsten-tin deposit is a stockwork and sheeted greisen vein system hosted almost exclusively within the Hemerdon Ball granite, which is a satellite cupola of the Dartmoor granite and forms a steeply dipping (eastwards) dyke-like porphyritic intrusion some 1,200 m long within Devonian slates.

The Dartmoor granite is the result of the Variscan orogeny that formed the supercontinent, Pangaea, in the late Palaeozoic. In the Carboniferous period, around 300 million years ago, granite intruded into older (Devonian) sediments and low-grade metamorphic sequences.

The southern and western areas of the granite show mild alteration, while the north-north-east area is highly kaolinised and greisenised. The extent of the mineralised area is 600 m x 400 m within the granite, though greisenisation and limited tungsten-tin veining continue into the country slate, known locally as killas. The deposit outcrops on surface over its entire strike length.

Veining is either quartz and/or feldspar veins with greisen borders forming a stockwork with minor mineralisation; or tungsten-tin-arsenic mineralised, greisen-bordered, sheeted veins in subparallel sets. These vein systems occur in at least three orientations.

Dominant mineralisation comprises wolframite with arsenopyrite and minor cassiterite. Gangue minerals are predominantly quartz and tourmaline.

Supergene weathering by meteoric waters has oxidised the arsenopyrite, remobilising the iron and arsenic, forming secondary arsenate minerals in the upper part of the resource.

Kaolinisation, forming 'soft granite' or clay, extends to a depth of some 50 m, below which is the 'hard' or 'fresh granite', which is referred to in this report as simply 'granite'.

Reserves and resources

In March 2008, SRK Consulting (SRK) re-logged and re-assayed core from the AMAX drilling to confirm an inferred JORC resource. Later that year, Wolf completed a diamond drill programme, which upgraded the resource to the indicated and measured categories and subsequently declared a reserve estimate based on its economic mine plan.

In 2011, SRK compiled the following JORC-compliant resource estimate based on 309 historic AMAX holes and six confirmatory holes that Wolf drilled.

Figure 11: Resources used in 2011 feasibility study

Classification	Tonnage (Mt)	WO_3 grade (%)	Sn grade (%)
Measured	76.8	0.15	0.02
Indicated	40.3	0.13	0.02
Measured and indicated	117.1	0.14	0.02
Inferred	284.2	0.13	0.02

Source: SRK Cut-off grade of 0.063% WO_3 Resources include reserves

From the above resources SRK derived the following ore reserves based on an optimised two-stage open-pit development using a 1.5:1 life of mine (LOM) strip ratio.

Figure 12: Reserve estimate for 2011 feasibility study

Ore type	Tonnage (Mt)	WO_3 grade (%)	Sn grade (%)
Granite	21.3	0.18	0.03
Soft granite	5.5	0.21	0.03
Total	26.7	0.19	0.03

Source: SRK Cut-off grade of 0.063% WO_3

In 2014, Wolf examined the potential to increase reserves within the permitted boundary by deepening the pit design through steepening the final pit slope. Geotechnical investigation experts, SLR Consultants, completed a six-hole drilling programme to test the pit perimeter and determined that the wall rock could support an increase in pit slope, allowing the company to take the final pit floor 65 m deeper, increasing reserves by 34%.

The pit was optimised in 2015 with a 34% increase in reserves.

The revised JORC reserves (March 2015), containing 6.43 million mtu WO3 in the optimised pit, are shown in Figure 13 below.

Figure 13: Updated reserves March 2015

Classification	Tonnage (Mt)	WO_3 grade (%)	Sn grade (%)	WO_3 contained (million mtu)
Reserves	35.7	0.18	0.03	6.43

Source: SRK, Marten and Co Cut-off grade of 0.063% WO_3

Under the more stringent JORC code used for the 2015 pit optimisation resources have decreased by 64%. This is due to excluding mineralisation in the killas, as there is not enough evidence of metallurgical recoveries to justify any economic potential.

Figure 14: Updated resources March 2015

Classification	Tonnage (Mt)	WO_3 grade (%)	Sn grade (%)	WO_3 contained (million mtu)
Measured	39.9	0.18	0.02	7.18
Indicated	18.7	0.16	0.02	2.99
Measured and indicated	58.6	0.17	0.02	10.17
Inferred	86.6	0.14	0.02	12.12

Source: SRK, Marten and Co Cut-off grade of 0.063% WO_3 Resources include reserves

Feasibility study

In 2011, the company completed an internal feasibility study, which outlined the economics of an open pit delivering ore to a 3 Mt/y concentrator, producing 345,000 mtu/y of tungsten in concentrate and 462 t/y of tin contained in a separate concentrate for over nine years.

The capital cost of the mine, based on the use of contract mining, was estimated at £104 million and LOM cash costs, net of tin credits, were estimated at US$105/mtu.

Using a long-term APT price of US$360/mtu and a tin price of US$30,000/t, the study produced an after-tax IRR of 21% and indicated payback within four years.

Mine financing and development

With a positive feasibility study, in May 2011 the Wolf board decided to proceed with building a mine.

Wolf financed the mine through a combination of debt and equity. It first secured a £75 million project finance facility (£70 million, 7.5-year term loan and a £5 million bond) with UniCredit Bank, ING Bank and Caterpillar Finance in May 2013. About half of the debt was guaranteed by the German government and offtake partners.

The German government views tungsten as a strategic metal (it is used in the country's automobile industry) and the guarantee from the German government was in terms of the German Untied Loan Guarantee Scheme (UFK), which is designed to enhance the national supply of commodities, by providing financial guarantees to national and international financial institutions lending to commercial projects in the mining sector.

The loan term was set based on the expiry of the current mine planning permission, which is 2021. If the company extends the permit, and it has stated its intention to do so, it may be able to reschedule the debt.

In December 2012, the company arranged a US$75 million bridging loan from RCF, to allow it to start development of the mine, as part of a funding package that included US$7 million in consideration of a 2% NSR.

In May 2014, it raised gross proceeds of A$182.7 million (£99.2 million) through a placement of 609 million shares at A$0.30 each, US$75 million of which was used to repay the balance on the bridging facility.

The engineering, procurement and construction (ECP) contractor began construction in Q3 14. Dry commissioning was completed in Q2 15 and wet commissioning in September 2015, when the first concentrate was dispatched.

In January 2016, the company signed a binding term sheet with RCF for an equity facility of up to £25 million.

Mining and processing

An open pit using mining contractors.

Drakelands is an open pit operation, with a mining contractor using conventional hydraulic excavators and truck haulage.

No pre-strip or waste mining was necessary other than for material to construct the tailings management facility embankment.

Initially, in the soft granite, the ore is free digging, which obviates the need for drilling and blasting.

Figure 15: Shovel and ore loading operations in the Drakelands pit

Source: Marten & Co

The optimised pit dimensions are 800 m by 400 m by 260 m deep. The predominant bench height below 40 m depth is 15 m, although it will be less at shallower depths.

Operations are permitted on a 24-hour basis for five and a half days a week, although the company currently has a dispensation to trial 24/7 workings, which it hopes to extend after completion of the trial. At the lower, permitted, rate the nominal ore feed to the plant is 3 Mt/y.

Tungsten and tin minerals are both very dense and lend themselves to gravity separation after initial crushing and grinding to separate them from the gangue (the commercially worthless material that surrounds, or is closely mixed with, a wanted mineral in an ore deposit.) Moreover, and importantly for a low-grade feed, the gravity separation removes much of the mass in the early stages, significantly reducing the material being treated in the latter end, which reduces both capital and operating costs.

After crushing, grinding and the gravity circuit, the ore is roasted to produce a concentrate containing tungsten/tin, which is then separated by high-intensity

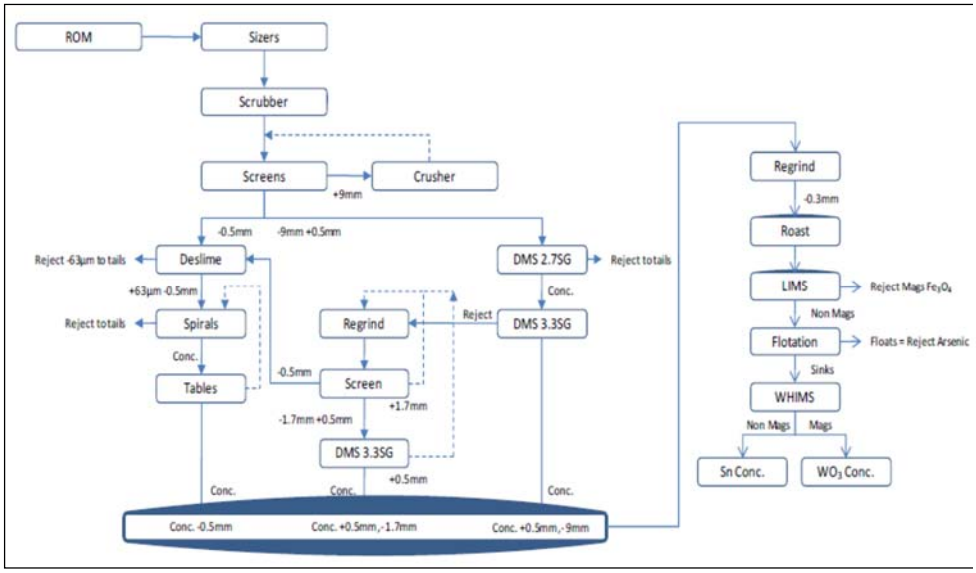
magnetics. The products are a 62% wolframite concentrate and a 40% cassiterite concentrate.

Tails and waste are trucked and pumped to a mining waste facility located to the north of the pit.

Water management is a key element of the site plan and the company undertook numerous studies to ensure adequate water for the plant, while taking care to protect the water resources that supply the local community. Water for the plant will be recovered from various sources - the tailings facility, pit, local sumps, a local brook and run-off from the site.

The plant flowsheet is shown in Figure 16.

Figure 16: Drakelands plant flowchart



Source: Wolf Minerals

Mine modelling and production forecasts

A 12-year mine life to produce 4.20 million mtu WO_3.

The following parameters and assumptions have been used to calculate the NPV for the Drakelands mine.

Figure 17: Model assumptions and parameters

Parameter	Value	Source
Initial capital	£123.1 million	Wolf guidance March 2014
In-pit reserves	35.7 Mt @ a grade of 0.18% WO3	March 2015 updated estimate
LOM production rate	3.0 Mt/y	Feasibility study
LOM	12 years	Marten & Co
LOM hard granite milled	30,184 kt	Marten & Co
LOM hard granite grade	0.14% WO_3	FS
LOM hard granite recovery	65.7%	FS
LOM soft granite milled	5,479 kt	Marten & Co
LOM soft granite grade	0.16 %WO_3	FS
LOM soft granite recovery	57.6%	FS
Concentrate grade	62% WO_3	FS
LOM concentrate production	67,790 t	Marten & Co
LOM WO_3 production	4.20 Mmtu	Marten & Co
LOM tin production	5,255 t	Marten & Co
Average C1 cash cost*	US$114/mtu	Marten & Co
Long-term APT price	US$450/mtu	Marten & Co
Long-term tin price	US$15,000/t	Marten & Co
Corporate taxation rate	20%	

Source: Marten & Co * cash cost after by-product tin credits (see Figure 19)

In March 2014, the company updated the estimated capital investment required to build the mine. The table below shows the breakdown of the updated capital cost estimate.

Figure 18: Capital cost breakdown

Item	£ million
Process plant	73.4
Infrastructure	13.4
Land purchases	13.7
Owners' costs	15.7
Contingency (9%)	6.9
Total	123.1

Source: Wolf Minerals

LOM cash cost of US$114 per mtu WO_3.

The following table shows unit costs in terms of tonnes of ore milled and mtu of WO_3 produced.

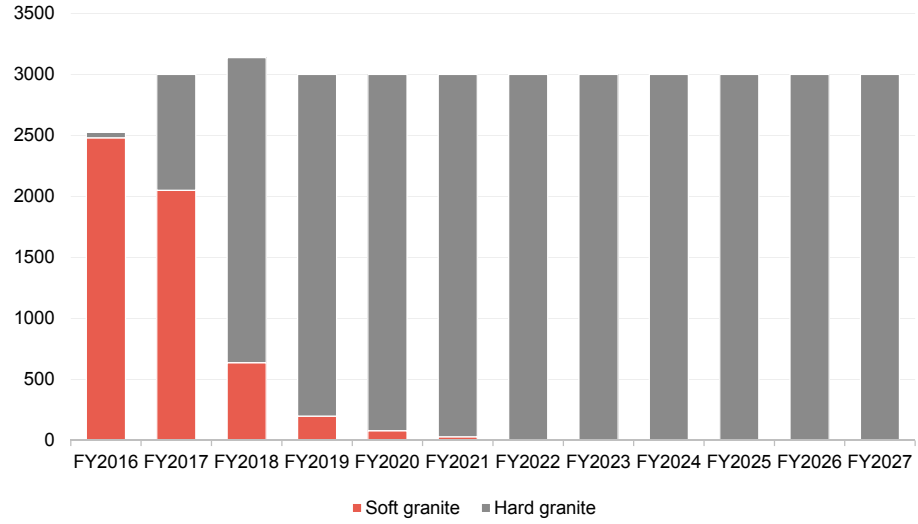
Figure 19: Base Case LOM C1 cost breakdown

Category	£/t ore	US$/mtu WO_3
Mining	4.90	64
Processing	3.88	50
General and administrative (G&A)*	1.13	15
Total cost	9.91	129
Less: by-product tin credits	(1.91)	(15)
Net cost	8.00	114

Source: Wolf Minerals, Marten & Co * minesite plus marketing expenses

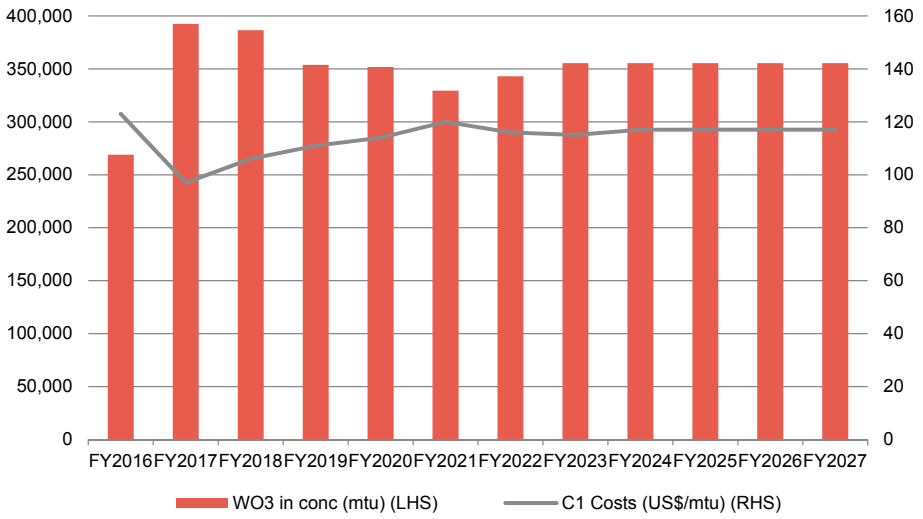
Figure 20 shows the processing schedule as modelled.

Figure 20: Base case ore processing schedule (kt/y)



Source: Wolf Minerals, Marten & Co

Figure 21: Base case tungsten production and costs



Source: Wolf Minerals, Marten & Co

The base case treats 3 Mt/y of ore to produce approximately 350,000 mtu per year.

Commercial arrangements

Five-year offtake agreements are in place.

Wolf has offtake agreements with two refiners/finished product manufacturers - Wolfram Bergbau und Hütten (WBH), in Austria, and Global Tungsten & Powders Corporation (GTP), in the USA. WBH and GTP will take 80% of base case production for a minimum of five years.

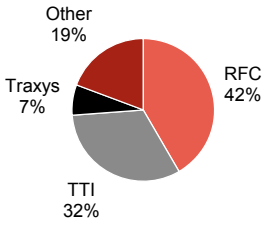
Prices are based on the European APT price less treatment charges.

Wolf is selling 100% of the tin concentrates to international trading firm, Traxys Corporation (Traxys), at spot prices based upon the London Metal Exchange (LME) cash price in terms of a five-year agreement.

Capital structure

Wolf has 809.7 million shares outstanding (818.5 million fully diluted). Shares have traded between 6.75 pence and 21.50 pence over the past year and closed on 1 March 2016 at 8.50 pence per share giving the company a market capitalisation of £68.8 million.

Figure 22: Major shareholders



Source: Wolf Minerals

The company has two major shareholders – RCF and TTI (NZ) Ltd (TTI).

RCF is an Australian mining-focused private equity firm, which, since inception in 1998, has invested in 143 mining companies and now has US$2.4 billion in assets under management.

TTI is a wholly-owned subsidiary of Todd Corporation Ltd (Todd), a major private NZ-based company with interests in oil and gas, minerals, energy and property.

Todd has an 11.5% direct interest and a 17.6% indirect interest in a joint venture evaluating the Sisson tungsten and molybdenum project, in Canada.

Traxys, which is the offtake partner for the Drakelands tin production, holds 6.9% of Wolf.

Directors and management of Wolf own 0.15% collectively.

Directors and management

The Wolf executive and management team has considerable financial, mining and engineering experience and has generally used consultants to carry out limited geological requirements. The team is split between the UK and Australia.

The board

Russell Clark is managing director, a position he has held since his appointment in October 2013. He is the only executive on the board.

Mr Clark has more than 36 years' experience in senior corporate, operational and project management positions across a wide range of commodities and several continents.

Previously he was Azimuth Resources' chief executive (January 2013 – September 2013), where he negotiated a takeover by Troy Resources. Prior to that, Mr Clark produced the feasibility study for the A$3 billion Southdown magnetite project, in Western Australia, for Grange Resources and oversaw the company's merger with Australian Bulk Minerals, which operates the large Savage River iron ore mine, in Tasmania.

He holds a mining degree from the Royal School of Mines in London and a post-graduate Diploma in Finance and Investment Analysis. Mr Clark is a Chartered

Engineer and a member of both the Australasian Institute of Mining and Metallurgy (AusIMM) and the Institute of Metals, Materials and Mining.

John Hopkins OAM is non-executive chairman and joined the board in 2010. Mr Hopkins has been a board member of more than 20 listed companies across Australia and Canada, which has given him some 30 years' experience of financing a range of resource projects, mainly in Australia. Mr Hopkins has a law degree from the University of Western Australia and was awarded the Medal of the Order of Australia (OAM) in 2015 for his services to the minerals and resources sector.

Further finance experience is added by non-executive directors **Ronnie Beevor, Chris Corbett** and **Don Newport**. Mr Beevor is an investment banker of 30 years, Mr Corbett is a principal at RCF and Mr Newport has led Standard Bank's and Barclays' mining investment teams.

Fellow non-executive directors **Nick Clarke** and **Michael Wolley** provide engineering expertise. Mr Clarke has 40 years' experience as a mining engineer and is currently Central Asia Metals' chief executive, while Mr Wolley is a chemical engineer and vice president (minerals and coal) for Todd Corporation.

Executive team

Richard Lucas is chief financial officer (since April 2011) and shares the company secretary role with **Pauline Carr**. Mr Lucas is a Chartered Accountant with 18 years' experience across various sectors including mining. Ms Carr holds an MBA, is a Chartered Secretary and has 29 years' resources industry management and commercial experience.

Jeff Harrison is operations manager for Drakelands. He is a mining engineer and was responsible for on-site management through the project's permitting and development phases. Mr Harrison was formerly a senior manager for Imerys. He has more than 35 years' global mining and mineral processing experience.

Mechanical engineer and Drakelands project manager, **Rupert McCracken**, has more than 35 years' experience in development, construction and commissioning mineral processing projects. He has managed projects for Minproc Engineers, Comet Resources, Ticor South Africa, BHP Billiton and Resolute Mining.

Emma Hall, general manager, business development, has legal and finance qualifications and a background in investment banking, corporate strategy, marketing and sales.

Tungsten market

Uses

Tungsten is most often used in chemical combination with carbon and in a matrix with other metals (commonly cobalt) as a cemented carbide. Its extreme hardness and high abrasion resistance make it an excellent material for use in cutting tools. Sixty per cent of tungsten production goes into the manufacture of cemented carbides for use in wear-resistant parts and cutting tools in the mining, oil and gas and manufacturing industries.

Sixty per cent of tungsten production goes into the manufacture of cemented carbides for cutting tools.

Other important uses are in steel alloys and superalloys (24% of demand, used in the automotive industry) and in tungsten electrical products (14%).

The main intermediate product between wolframite and cemented carbides is APT, which is the most commonly traded tungsten raw material.

Demand

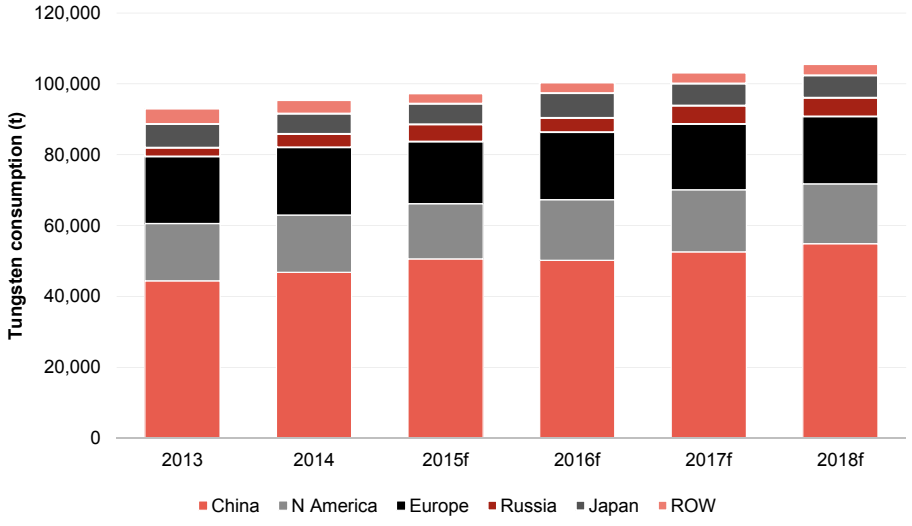
Because of its main uses in industrial applications (mining, automotive, aerospace, engineering and construction), tungsten demand has historically been closely linked to GDP. Demand for the metal has increased by an annual average of 5.8% since 2003, driven by high economic growth in Asia, the Commonwealth of Independent States (CIS) and other emerging markets.

Demand is correlated with GDP and set to grow at 4% compound annual growth rate (CAGR).

According to a 2014 market report by Roskill Information Services, in 2013, world demand for tungsten was 93 kt (equivalent to approximately 11.7 million mtu WO_3). Roskill forecasts consumption rising to over 105 kt (equivalent to 13.2 million mtu WO_3) by 2018 (see Figure 23).

In a 2015 report, Argus Media forecasts global demand for tungsten growing to approximately 99 kt (equivalent to 12.5 million mtu WO_3) by 2020. Although a little more conservative than Roskill's forecast, this still represents a CAGR of just over 4%.

Figure 23: Actual and forecast tungsten consumption (t)

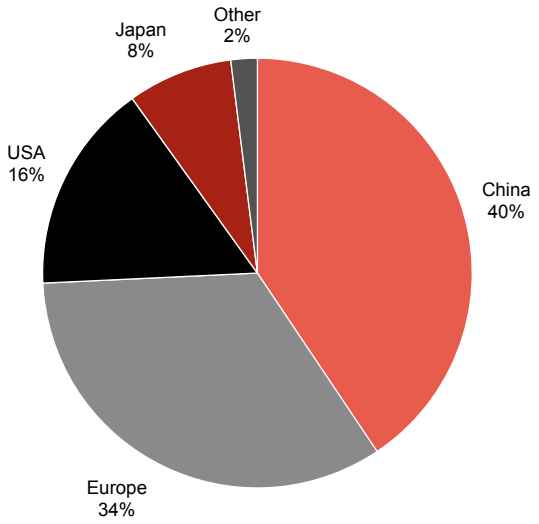


Source: Roskill Information Services

China is the largest consumer, but North America and Europe are also important.

As Figure 24 shows, global demand for tungsten raw materials is dominated by China, as the world's largest producer of cemented carbides.

Figure 24: Distribution of world cemented carbide production, 2013



Source: Roskill Information Services

Supply

Tungsten mine production increased by an average of 2.7% annually from 2003 and reached approximately 76 kt (equivalent to approximately 9.6 million mtu WO_3) in 2013.

Secondary supply of tungsten through recycling and stockpiles has become increasingly important in recent years and reached over 21 kt in 2013, or around 23% of demand.

China accounts for over 80% of world production.

As illustrated in Figure 25 overleaf, China is the dominant player on the production side, accounting for over 80% of world production in 2013.

Other significant producers include Russia, Austria, Bolivia, Portugal and Vietnam.

Outside China, a number of tungsten mines are owned by the processors and users of the metal, who have integrated vertically downwards to ensure security of supply. For example, the Mittersill mine, in Austria, is owned by mining equipment manufacturer, Sandvik.

The Nui Phao tungsten-bismuth-fluorspar mine, in Vietnam, reportedly reached commercial production in 2013 at a rate of 520,000 mtu/y WO_3. Vietnamese business group, Masan Resources, owns and operates the mine, which feeds a captive APT plant at the minesite, operated by HC Stark (49% interest).

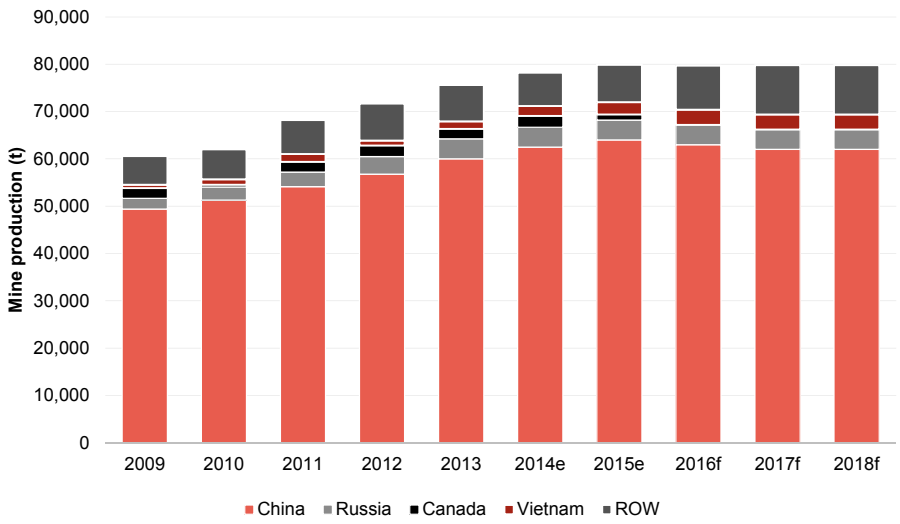
Canadian company, Almonty Industries, has producing mines at Los Santos, in Spain; Wolfram Camp, in Queensland; and Panasqueira, in Portugal, which it acquired in January 2016. In addition, Almonty has projects at Sangdong, in Korea, and Valtreixal, in Spain.

According to the latest figures released by the company, in the nine months to the end of June 2015, Los Santos produced 73,654 mtu WO_3 at all-in costs of US$161/mtu. Wolfram Camp, meanwhile, produced 29,750 mtu WO_3 at all-in costs of US$329/mtu.

Another Canadian tungsten producer, North American Tungsten, has put its Cantung mine on care-and-maintenance (production has been stopped, but the mine is being maintained with a view to potentially being re-opened) after seeking court protection from creditors in June last year. For the nine months to the end of June 2015, the mine produced 206,352 mtu WO_3 in concentrate at an average cash cost of US$237/mtu, while receiving a price of US$236/mtu.

Figure 25 shows estimated tungsten production from 2009 and forecast to 2018.

Figure 25: Tungsten mine production – actual and forecast (t)



Source: Roskill Information Services

Note that the production forecast on Figure 25 includes projects that have yet to obtain financing, so there is some doubt that such levels will be achieved.

China – seeking to lift tungsten price

China is both the world's largest tungsten producer (more than 80%) and consumer (60%).

China is the major player in the tungsten industry. It produces more than 80% of world tungsten and consumes roughly 60%, exporting the surplus to the rest of the world.

Chinese production is characterised by a number of large producers - state-owned China Minmetals Corporation is the biggest, accounting for roughly 40% of global production in 2013 – and a substantial number of small, generally informal operations, which are getting deeper and consequently more expensive to run.

Chinese tungsten exports are restricted by the World Trade Organisation and the Chinese authorities have historically tried to police this through a system of export quotas. However, more recently the authorities have moved to a regime that attempts to control exports through a system of licences to pre-approved producers. Given the number of small, informal (illegal) mining operations in China, the task of enforcing the regime will not be easy. Their task may be helped by the fact that many Chinese mines are old, are often having to work lower grades and are thus becoming uneconomic.

In a recent development, China's state reserve bureau has announced that it will buy up to 10 kt of tungsten concentrate while eight large Chinese tungsten producers announced plans to reduce their tungsten concentrate output by 20% and halted supplies until the end of January 2016 in an effort that appears to be aimed at boosting tungsten prices.

In a parallel move, the Chinese authorities are trying to encourage producers to supply the domestic market and to add value to their tungsten raw materials by beneficiating (any process which removes the gangue minerals from ore to produce a higher grade product, the concentrate, and a waste stream, the tailings) more.

Future primary supply

Chinese production is likely to fall but there is a lack of funded projects globally to replace this.

Given the expected constraints on available material from China, analysts are predicting that opportunities will open up for Western producers to fill the gap, especially as recycling levels may have reached the maximum feasible (up to 50% in Europe and 35% globally).

Although there are a number of known tungsten deposits around the world, many of which have been evaluated up to feasibility level, there is considerable doubt about their ability to obtain the necessary financing given the steep decline in prices, the low market capitalisation of many of the junior mining company owners and the lack of investor interest in the mining sector.

With the low-price environment ruling for the past 18 months, even those that have managed to complete a feasibility study are looking at ways to optimise projects to be less capital intensive.

Almonty Industries, which already has three mines in production, has two projects at feasibility stage – Almonty Korea (Sangdong), in Korea, and the Valtreixal project (25%-owned), in Spain.

In September 2015, Almonty completed an all-share business combination with tungsten developer, Woulfe Mining, which gave it a 100% interest in the Sangdong tungsten/molybdenum project, which the former owner completed a positive feasibility study on in 2015.

The study indicated a capital investment of US$64 million required to build an underground mine producing 640,000 t/y of ore to produce an average of 202,000 mtu/y WO_3 in concentrate over a LOM of eight years. With a high head grade averaging 0.42% WO_3 and a high expected recovery of 81%, the project has projected operating costs of US$137/mtu.

In January 2016, Almonty updated the 2015 feasibility study and commissioned detailed engineering and design work for a mine and processing plant with the aim of starting construction by mid-2016 and going into production in 2017.

In 2015, Almonty failed in its attempt to acquire Ormonde Mining, which owns the Barruecopardo project, in Spain. Based on a 2012 feasibility study, the Barruecopardo open pit will produce 227,000 mtu/y WO3 from the treatment of 1.1 Mt/y of ore over a life of nine years. Cash costs are estimated at €104/mtu and capital costs at €53.5 million.

In April 2015, the company secured financing for the project through an investment by Oaktree Capital Management of US$99.7 million, comprising project debt of US$55.5 million (€50.3 million) and the injection of US$44.2 million (€40.1 million) into the project giving it 70% of the joint venture.

With funding secured, development of the mine was expected to commence in late 2015, with initial production scheduled for late 2016, but the company has not given any updates since October 2015 and Wolf management believes that there is doubt as to whether or not it will proceed.

Meanwhile, a number of other projects are in the pipeline awaiting financing.

AIM-listed W Resources has intermittently produced tungsten from a small-scale tailings operation since 2014 at the old La Parrilla mine, in Spain. The company is looking to raise US$42 million to construct an open pit mine at La Parilla in two stages to eventually produce 230,000 mtu/y WO_3 at a cash cost of US$123/mtu by 2017.

The company is also evaluating the potential to develop a tungsten resource at Régua, in Portugal, and in October 2015 expanded indicated resources by 76%.

Northcliff Resources is looking to finance a large project at Sisson, in Canada. Wolf part-owner, Todd Corporation, has an 11.5% direct interest and a 17.6% indirect interest (through its interest in Northcliff) in the Sisson joint venture.

According to a 2013 feasibility study, the mine will cost US$579 million to build and is projected to produce 557,000 mtu/y WO_3 (for an onsite APT plant) at a cash cost of US$123/mtu (after credits from by-product molybdenum production amounting to US$108/mtu).

King Island Scheelite is finalising a feasibility study at its high-grade Dolphin project, in Australia, based on an open pit producing some 400,000 mtu/y WO_3 at a cash cost of A$155/mtu (A$129/mtu, excluding royalties) at a capital cost of A$78.5 million.

Vital Metals' 100%-owned Watershed project, in Australia, is said to require US$109 million in capital to produce an average of 250,000 mtu/y WO_3 at a cash cost of US$148/mtu over a 10-year life. Former partner Japan Oil, Gas Metals, National Corporation (JOGMEC) was unable to secure a buyer for its 30% interest before the end of 2015, so it forfeited its interest in Watershed to Vital Metals.

Funded projects could add 429,000 mtu/y WO_3 over next two years.

In the supply pipeline, therefore, in the short term Almonty's Sangdong and Ormonde's Barruecopardo projects could add 429,000 mtu/y of WO3 to the market, although there are question marks over progress at the latter.

Most other projects have yet to secure financing so will not have an impact on the market in the short term. It is estimated that 1,437,000 mtu/y of capacity is waiting to secure financing, as illustrated in Figure 26.

Figure 26: Potential supply from projects yet to secure financing

Project	Capital estimate (US$M)	WO_3 capacity (mtu/y)
Sisson	579	557,000
Dolphin	55	400,000
Watershed	109	250,000
La Parrilla	42	230,000
TOTAL		1,437,000

Source: Marten & Co

Figure 27 summarises the status of major world tungsten mines and projects (outside China).

Figure 27: Major world (outside China) tungsten mines and projects

Company	Project	Capital (US$M)	Annual output (kmtu WO_3)	Cash cost (US$/mtu)	Status
Wolf Minerals	**Drakelands**	**188**	**345**	**114**	**Producing**
Almonty Industries	Los Santos	n/a	110	161	Producing
	Wolfram Camp	n/a	40	329	Producing
	Sangdong	64	202	137	Detailed design and engineering work underway. Production anticipated to start in 2017
Masan/HC Starck	Nui Phao	n/a	650	n/a	Producing (for captive APT plant co-owned with HC Starck)
North American Tungsten	Cantung	n/a	n/a	n/a	Closed
Ormonde Mining (30%)	Barruecopardo	58	227	112	Funded. Production anticipated to start in 2017
Northcliff Resources	Sisson	579	557	111	Feasibility study completed. Environmental impact statement approved.
W Resources	La Parrilla	42	230	123	Small production from tailings. Expansion anticipated to take place by 2018
Vital Metals	Watershed	103	250	148	Looking for partner
King Island Scheelite	Dolphin	55	400	90	Resource update provided December 2015. Finalising feasibility study
Carbine Tungsten	Mt Carbine	38	270	130	Offtake memorandum of understanding (MoU) with Mitsubishi. On hold.
Tungsten Mining	Kilba	56	154	212	Feasibility study underway. Company has acquired Mt Mulgine and Big Hill from Hazelwood
Hazelwood Resources	Cookes Creek	n/a	n/a	n/a	Trading in shares suspended. Company recapitalising
Largo Resources	Northern Dancer	645	n/a	116	Preliminary Eeconomic Assessment (PEA) completed (2011) with APT plant on site. Offtake joint venture discussions but focus switched to vanadium
	Currais Novos	n/a	n/a	n/a	Operation suspended 2012
Venture Minerals	Mt Lindsay	138	190	n/a	Feasibility study completed 2012. Tin and magnetite.

Source: Company reports, Argus Tungsten Monthly Outlook

Prices

Tungsten is most commonly traded as APT.

Tungsten is most regularly traded as APT, but as there is no terminal market for tungsten compounds or metal, the price discovery mechanism is opaque. Industry publications *Metal Pages* and *Metal Bulletin* track and publish reported spot prices, although with much product tied up in long-term offtake agreements, the spot market is relatively small.

Tungsten concentrates, such as those produced by Drakelands, are invariably sold at prices based on the APT price, discounted for processing costs, usually by about 20%. Prices are expressed in US$/mtu.

APT prices have slumped dramatically since their highs close to US$500/mtu in 2011.

An April 2015 market report prepared for Wolf by Argus Media, noted that tungsten prices experienced two major upward corrections in 2005/06 and in 2010/11, with APT prices peaking at almost US$480/mtu in June 2011: “Since 2011 tungsten prices have drifted lower as stocks have been rebuilt with two years of production exceeding demand...” the report states.

Another reason given for the low prices is the role of recycling, which has been a big factor in recent years but has probably reached close to practical limits in Europe and the USA, according to Argus Media.

APT prices have tumbled from almost US$500/mtu in 2011 to approximately US$175/mtu currently.

Tungsten prices tumbled almost 40% between May and November 2015 and fell as low as US$160-170/mtu in December 2015.

However, there are signs that the market is improving as prices in January 2016 recovered by 3%. Argus Media notes in its January 2016 monthly report that the price gain was probably as a result of production cutbacks. Demand appears to have remained muted, with concerns over the slowdown in the Chinese economic growth and the low oil price, affecting USA demand for tungsten carbide in oil and gas drilling. The number of active drilling rigs in the industry has fallen significantly with the lower oil prices.

Despite the dramatically poor performance of the tungsten price over the past year, which surprised industry analysts, the slight upturn early in 2016 may herald a modest recovery in prices over the course of the year. Although recent events in world stock markets have sparked fears of a 2008-like recession, the IMF is expecting modest economic growth over the next few years, which is good for tungsten as its fortunes have been closely linked historically to GDP growth.

Some unexpected good news comes from the mining sector, another significant consumer of tungsten carbide, as a recent report by the Freedonia Group predicts global demand for mining machinery increasing by 8.6% in value terms through to 2017. This is likely to be stimulated by growing demand for aluminium and steel making minerals out of China and India.

Finally, on the demand side, the automobile industry continues to be strong.

Putting all this together, global GDP growth is expected to average 4% per annum through to at least 2019, with Chinese GDP growth forecast to average 6.5% per annum, according to Argus Media.

Argus Media’s base case scenario in its report predicts a small but growing deficit for tungsten in 2016; a market in rough balance in 2017 and a further growing deficit to 2019. This results in an increase in the APT price to a US$380/mtu average in 2016

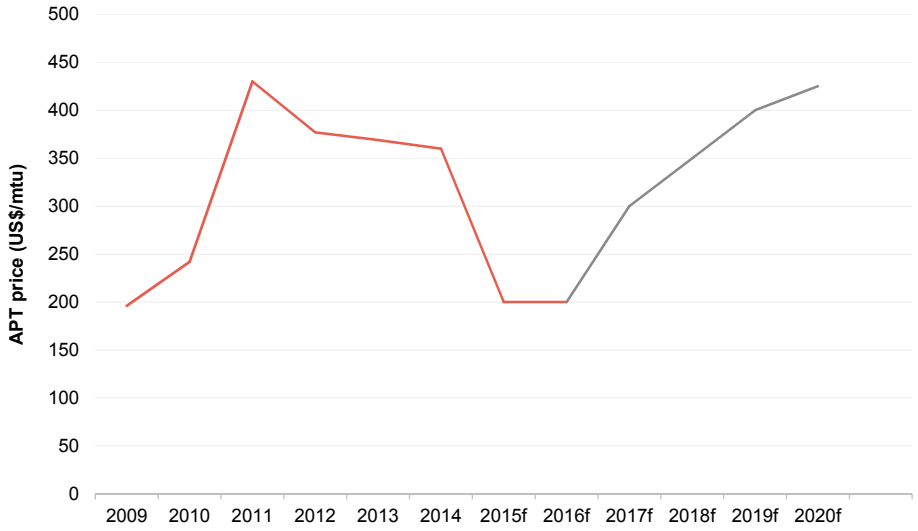
It is thought that prices will firm slightly before climbing by 2020 to a long-term average price of US$450/mtu.

and then US$400/mtu in 2017, before consolidation at around that level in 2018. The report forecasts a further increase to US$425/mtu in 2019 and US$450/mtu in 2020.

The evaluation of Wolf has been based on much more conservative prices until 2020, when they match those of Argus Media. After 2020, a long-term APT price of US$450/mtu is used.

Figure 28 shows historic APT prices and forecasts to 2020.

Figure 28: Historic and forecast APT prices (US$/mtu)



Source: Argus Media, Marten & Co

Risks

Prices

The Drakelands mine came on stream at a time of historically low APT prices. According to the modelling, the project breakeven APT price is US$250/mtu (which equates to a received price of US$200/mtu). The current APT price is approximately US$170/mtu.

As discussed in the preceding section, it is assumed that prices will recover from their current lows to reach a long- term price of US$450/mtu by 2020.

As far as sales are concerned, Wolf has medium-term offtake agreements in place, effectively eliminating any commercial risk. Any production within that period over the base case output can be sold in the spot market.

Grade and recovery

As shown in the sensitivity charts, the project is most sensitive to changes in head grade and recovery. Indications from grade control drilling are that the head grade of ore may be higher than reserve estimates.

Single asset

Investors should be aware of the fact that Wolf is a single-asset company. All the value of the company derives from the Drakelands mine. Long-term growth, therefore, will be dependent on how successful the company is in developing and exploiting existing reserves and additional resources on the property.

Exchange rates

The bulk of the company's input costs are in sterling, whereas the sales price of its products is denominated in US dollars. In addition, the company reports in Australian dollars. Any strength in the US dollar will increase the reported price and revenue.

The company has arranged currency hedges between sterling and the US dollar to cover US$33.0 million of revenue.

Water management

Water management is a key element of the site plan and the company must continue to ensure adequate water for the plant, while taking care to protect the water resources that supply the local community.

Permitting

The current mine planning permission expires in 2021. Key to optimal exploitation of the Drakelands orebody will be an extension of the permit to match the economic life of the mine. This will also mean that the company will be able to reschedule its debt.

The company is currently trialling an extension of permitted operating times to see if there are any noise concerns from local residents. Devon County Council has indicated its willingness for the extended working hours and is working with the local parish council to progress this.

Relations with the local community and the village of Hemerdon are good and a number of local people are part of the mine's workforce.

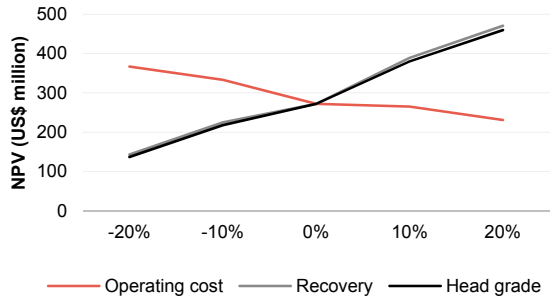
Figure 29: Wolf Minerals summary

Asset valuation summary

Base case: sum-of-the-parts valuation – February 2016	US$M	Pence per share
Drakelands NPV5%	272	**21.9**
Cash	34.	
Debt	(97)	
Net debt	(63)	**(5.1)**
NAV	**209**	**16.8**

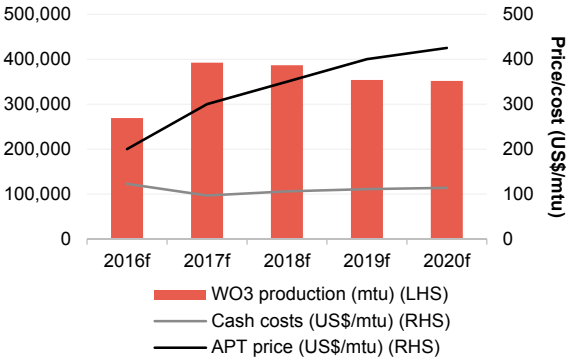
4 Mt/y Case: sum-of-the-parts valuation – February 2016	US$M	Pence per share
Drakelands NPV5%	327	**26.4**
Cash	**34**	
Debt	**(97)**	
Net debt	(63)	**(5.1)**
NAV	**264**	**21.3**

Sensitivity of Drakelands NPV to changes in key metrics



WLFE share price (pence per share)

Production summary



Tungsten reserves and resources (2015)	Mt	WO_3 (%)	WO_3 (Mmtu)
Reserves	**35.7**	**0.18**	**6.43**
Measured	39.9	0.18	7.18
Indicated	18.7	0.16	2.99
M&I	**58.6**	**0.17**	**10.17**
Inferred	86.6	0.14	12.12

Y/E 30 June, all figures in A$M unless otherwise stated

Forecast assumptions	2016f	2017f	2018f	2019f	2020f
Tungsten (APT) price (US$/mtu)	200	300	350	400	425
Price received (US$/mtu)	160	240	280	320	340

Production summary	2016f	2017f	2018f	2019f	2020f
Hard granite					
Tonnes milled (kt)	45	950	2500	2800	2920
Head grade (% WO_3)	0.169	0.175	0.154	0.146	0.143
Recovery (%)	65.7	65.7	65.7	65.7	65.7
Soft granite					
Tonnes milled (kt)	2480	2050	638	200	80
Head grade (% WO_3)	0.168	0.171	0.146	0.104	0.101
Recovery (%)	50.0	57.6	57.6	57.6	57.6
Total milled (kt)	**2,525**	**3,000**	**3,138**	**3,000**	**3,000**
Tungsten production (kmtu)	269.0	392.3	386.6	353.8	351.8
Tin production (t)	440.4	612.9	561.1	523.8	441.2
C1 cash costs (US$/mtu)	123	97	106	111	114
AISC (US$/mtu)	219	168	179	192	197

Y/E 30 June, all figures in A$M unless otherwise stated

Profit & loss	2016f	2017f	2018f	2019f	2020f
Revenues	61.5	134.7	154.8	161.9	171.0
Cost of production	54.7	65.0	68.0	65.0	65.0
G&A	5.0	5.0	5.0	5.0	5.0
Royalty	2.5	5.4	6.2	6.5	6.8
Other	2.1	2.1	2.1	2.1	2.1
EBITDA	(2.8)	57.1	73.4	83.2	92.0
Depreciation and amortisation (D&A)	27.5	27.5	27.5	27.5	27.5
Interest	8.2	6.8	5.5	4.1	2.7
Taxation	-	-	-	13.0	14.4
Net income	**(38.5)**	**22.8**	**40.5**	**38.7**	**47.4**
Ave shares outstanding (million)	841	937	937	937	937
EPS (cents)	(4.57)	2.43	4.32	4.13	5.06

Abridged balance sheet	2016f	2017f	2018f	2019f	2020f
Cash and equivalents	14.5	36.0	75.2	112.5	158.6
Fixed assets	325.2	326.6	328.0	329.4	330.9
Total assets	345.7	368.6	409.2	448.0	495.5
Current liabilities	22.0	22.0	22.0	22.0	22.0
Long term liabilities	164.1	115.4	88.0	60.7	33.3
Total liabilities	186.1	137.4	110.0	82.7	55.3
Total liabilities and shareholders' equity	345.7	368.6	409.2	448.0	495.5

Cash flow	2016f	2017f	2018f	2019f	2020f
Cash from operations	(11.0)	50.2	67.9	66.2	74.9
Cash from investing activities	(27.2)	(1.4)	(1.4)	(1.4)	(1.4)
Cash from financing activities	18.3	(27.3)	(27.3)	(27.3)	(27.3)
Net cash at end	14.5	36.0	75.2	112.5	158.6

Profitability and valuation	2016f	2017f	2018f	2019f	2020f
EBITDA margin (%)	-5%	42%	47%	51%	54%

Note that financial tables above are summaries and totals may not always agree

QuotedData

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