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ABBREVIATIONS AND SYMBOLS

A\$	Australian dollar
B-billion	thousand million
CIF	cost, insurance, freight
e	estimate
FOB	free on board
FOR	free on rail
g/t	gram per ton
kg	kilogram
kt	thousand tons
lb	pounds avoirdupois
LME	London Metal Exchange
m	metre
Mt	million tons
Mt/a	million tons per annum
na	not available
ozt	troy ounce
t	metric ton
t/a	tons per annum
t/m	tons per month
μ	micro-
\$	US dollar, unless stated otherwise
¥	yen
€	Euro
PGM	Platinum Group Metals
SARB	South African Reserve Bank
ETL	Exchange Traded Fund
SACCI	South African Chamber of Commerce and Industry
PICC	Presidential Infrastructure Co-ordination Committee
KPCS	Kimberley Process Certification Scheme

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1. THE PERFORMANCE OF SOUTH AFRICA'S PRECIOUS METALS AND MINERALS SECTOR DURING THE SECOND QUARTER OF 2016.

South Africa's (SA) precious metals production rose by 33.0 percent in the second quarter of 2016 (Q2 2016) when compared with Q1 2016 (Table 1). This was largely attributed to improved gold grades, as well as normal production after stock-taking and safety stoppages at Amplats' Precious Metal Refinery (PMR) during Q1 2016. Production improved by 4.7 percent year-on-year (y-o-y) after a nearly flat gold production was offset by just over 7 percent increase in PGMs production. Total sales mass and revenue increased quarter on quarter (q-o-q) by 24.2 percent and 30.9 percent, respectively, due to higher production and demand for the metals, with the latter also boosted by higher prices, despite a stronger R/\$ exchange rate in Q2 2016 compared with Q1 2016. The same effect can be observed y-o-y, where a marginal decrease in sales mass still yielded a 14.5 percent increase in revenue. The effects of price increases are also apparent in both local and export sales. Diamond production decreased by 3.2 percent q-o-q and by 15.5 percent y-o-y (Table 2) as producers continued to reduce output in a bid to support prices during period of stagnant demand. Total diamond sales mass fell by 20.9 percent q-o-q, with the corresponding revenue declining by 7.9 percent. This was consistent with a decrease in both local and export sales masses, while an improvement in export revenue may indicate that relatively better quality stones were available for exports.

TABLE 1: SOUTH AFRICA'S QUARTERLY PRODUCTION AND SALES OF PRECIOUS METALS.

	Production (t)	Local sales		Export sales		Total sales	
		Mass (t)	value (R' mil)	Mass (t)	value (R' mil)	Mass (t)	value (R' mil)
Q2 2016	111.4	13.4	6 436.6	98.2	42 053.4	111.6	48 490.0
Q1 2016	83.7	13.4	5 898.1	76.5	31 145.5	89.9	37 043.6
Q2 2015	106.4	13.0	4 954.9	99.6	37 396.1	112.6	42 350.9
% Change(QQ)	33.0	-0.1	9.1	28.4	35.0	24.2	30.9
% Change(YY)	4.7	3.0	29.9	-1.4	12.5	-0.9	14.5

TABLE 2: SOUTH AFRICA'S QUARTERLY PRODUCTION AND SALES OF DIAMONDS.

	Production (ct)	Local sales		Export sales		Total sales	
		Mass (ct)	value (R' mil)	Mass (ct)	value (R' mil)	Mass (ct)	value (R' mil)
Q2 2016	1 715 119.0	358 413.0	1 904.6	2 178 002.0	3 611.4	2 536 415.0	5 516.0
Q1 2016	1 771 351.0	490 687.0	2 581.4	2 716 444.0	3 404.5	3 207 131.0	5 985.9
Q2 2015	2 028 882.0	968 977.0	2 402.9	1 362 409.0	1 669.0	2 331 386.0	4 071.9
% Change(QQ)	-3.2	-27.0	-26.2	-19.8	6.1	-20.9	-7.9
% Change(YY)	-15.5	-63.0	-20.7	59.9	116.4	8.8	35.5

Average prices of all precious metals improved during Q2 2016. The gold price increased by 6.7 percent q-o-q and 5.5 percent y-o-y, largely spurred on by investor demand in response to low interest rates in Europe and the USA (Table 3). The platinum price increased by 10.9 percent q-o-q due to improved automotive demand, but fell by 10.4 percent y-o-y as a result of oversupply perceptions. The same was true for palladium and rhodium prices, both of which improved q-o-q but were down y-o-y. Polished diamond prices increased marginally q-o-q as demand remained relatively stagnant, but decreased by 3.9 percent y-o-y.

TABLE 3: AVERAGE PRICES (\$/oz).

Period	Gold	Platinum	Palladium	Rhodium	PPI*	R/\$
Q2 2016	1 258.81	1 016.71	584.93	694.08	124.9	14.9228
Q1 2016	1 180.08	916.97	526.13	670.00	123.8	15.8634
Q2 2015	1 192.78	1 135.32	765.97	1 046.82	130.0	12.0952
%change (q/q)	6.7	10.9	11.2	3.6	0.9	-5.9
% change (y/y)	5.5	-10.4	-23.6	-33.7	-3.9	23.4

*PPI: Polished Diamond Price Index. This is a percentage number that shows the extent to which a price has changed over a period as compared with the price in a certain year, in this case April 2004-March 2005, taken as a standard year.

Over the quarter, the rand (R) lowered by 5.9 percent to the dollar (\$). The decline was substantially lower than expected. However, the Rand increased by 23.4 percent, y-o-y. This was directly due to an influx of investments in SA following the Brexit phenomenon.

Production of precious metals is expected to increase marginally during Q3 2016, assisted by an expectation of higher yields of recently acquired operations as well as an increase in production on the back of new bore technology. Sales mass, and therefore prices, are also expected to increase on the back continued increasing demand. Similarly, rough diamond production is expected to increase in Q3 2016 due to increased and sustained output from the combination of Kimberly and Ekapa Mining Consortium, while a slightly stronger rough diamond demand in is expected to put an upward pressure on prices. Local diamond sales mass is also expected to increase significantly after the launch of the beneficiation project by the private sector and the SA government.

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DO Moumakwa and P Perold

2. SOUTH AFRICA'S DIAMOND BENEFICIATION BOOST

Developments underway to re-capture the country's legacy.

South Africa's (SA) disproportionately small and underdeveloped diamond beneficiation industry has been well documented. The industry has, for a number of years now, been battered by challenges to new entrants, resulting in a significant portion of locally produced rough diamonds being reserved for international markets and, consequently, the local downstream industry remaining significantly small. The industry currently employs approximately 200 workers, from a peak of 4 500 workers about 20 years ago, losing ground in Africa to Botswana in the process. In order to re-capture the country's legacy as one of the global diamond destinations, several developments and programs have been devised. These include the SA Diamond Indaba and the launch of the SA Young Diamond Beneficiators' Guild, as well as the launch of the Enterprise Development Project for Diamond Beneficiators.

Having been conceptualized during the State Diamond Trade's national pavilion at the Hong Kong Gem and Jewellery Fair in March 2015, The SA Young Diamond Beneficiators' Guild was launched at the inaugural SA Diamond Indaba in Johannesburg in 2015, with the aim of helping start-ups led by mainly black entrepreneurs to cut and polish rough diamonds. Traditionally, manufacturers and middlemen who buy rough stones for beneficiation and re-selling purposes, have struggled with stronger dollar and liquidity problems, having to rely on bank loans to cover costs until they can sell their finished products. To bridge the gap between SA diamond resources and the beneficiation of such resources, the Guild is expected to get more SA youth into the diamond beneficiation industry, thereby strengthening the sector with new cutting and polishing skills.

The enterprise development project for Diamond Beneficiators was launched in Johannesburg on the 13th July 2016 as a partnership between the private sector, SA government and members of the country's diamond manufacturing industry. The project aims to facilitate the transformation and growth of the diamond cutting and polishing sector in SA and, is specifically targeted at black-owned businesses, in the hope of developing increasingly more efficient businesses to better compete on the global diamond stage. The development program includes interventions to improve industry and business knowledge, and aims to foster opportunities to gain experience in rough diamond purchasing and manufacturing, as well as marketing and distribution. Government partners in the project include the Department of Mineral Resources (DMR) and the Department of Trade and Industry (DTI), with the latter having committed support as funders for capital and operational requirements.

In addition to a forecasted recovery in diamond markets after a slump in demand and subsequently prices, both the Young Diamond Beneficiators' Guild and the Enterprise Development Project could be viewed as a silver lining in an otherwise dark cloud. This is because they are expected to revitalize

industrial capacity by encouraging value-addition to rough diamonds prior to export, which would further help create jobs in a country already battling high levels of unemployment.

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2. www.debeersgroup.com, 14 Jul 2016.
3. www.idexonline.com, 11 Dec 2016.
4. www.miningweekly.com, 11 Dec 2015.
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Donald O Moumakwa

3. SOUTH AFRICA'S FERROUS SECTOR PERFORMANCE DURING THE SECOND QUARTER OF 2016

Performance of South Africa's ferrous minerals sector improved slightly during the second quarter of 2016 (Q2 2016), with aggregated production increasing by 8.5 percent from 20 479kt in the first quarter of 2016 (Q1 2016), Table 1. Chrome and iron ore sectors were responsible for the increase in production both increasing by 9 and 11 percent, respectively in Q2 2016, while manganese production declined slightly by 2.3 percent. Improvement in the chrome and iron ore sector's production was in part effected by the upward movement in prices, which acted as a market signal for a production ramp-up. The South Africa's 44 percent chrome concentrate and the UG2 chrome prices reached the \$147.8/t and \$128.6/t mark respectively in Q2 2016 (Table 2), a 32 percent and 49 percent change quarter on quarter (q-o-q). The iron ore spot price, on the other hand, recorded a 14.7 percent improvement in Q2 2016 from an average of \$47.7/t in Q1 2016.

Ferrous minerals total sales mass increased by 3 percent in Q2 2016, with the corresponding revenue increasing by 32.4 percent, due to increased ferrous commodity prices. Total local sales mass increased by 5.5 percent in Q2 2016, despite a 2.6 percent contraction in ferroalloys production during the same period, with total exports also increasing by 4.6 percent in the same period.

TABLE 4: SOUTH AFRICA'S AGGREGATED QUATERLY PRODUCTION AND SALES OF FERROUS MINERALS

	Production (Kt)	Local Sales		Export Sales		Total Sales	
		Mass (Kt)	Revenue (R'mil)	Mass (Kt)	Revenue (R'mil)	Mass (Kt)	Revenue (R'mil)
Q2 2016	22 228	4 113	3 386	18 592	16 779	22 150	19 298
Q1 2016	20 479	3 899	2 784	17 777	11 949	21 495	14 574
Q2 2015	24 252	4 713	3 625	18 912	12 554	23 625	16 179
% QQ Change	8.5	5.5	21.6	4.6	40.4	3.0	32.4
%YY Change	-8.3	-12.7	-6.6	-1.7	33.7	-6.2	19.3

Source: DMR, Mineral Economics Directorate

Year-on-year, however, the picture looked rather gloomy, with the total ferrous production falling by 8.3 percent due to lack of stimulus from the market. Chrome and Iron ore production fell by 10.3 and

6.6 percent, respectively, while manganese ore production also declined by 14.5 percent to 2 987kt during the same period. Total sales mass declined by 6.2 percent with the corresponding revenues increasing by 19.3 percent due to an increase in the ferrous minerals prices.

TABLE 5 AVERAGE FERROUS COMMODITY PRICES

Period	Iron ore (\$/t)	Chrome ore (\$/dm ³)			Manganese ore (\$/dm ³)			R/\$
		SA Concs.44%	Turkish Lump 42%	UG2	36-39%	44%	46%	
Q2 2016	54.6	147.7	190.2	128.6	3.48	3.73	3.79	14.9228
Q1 2016	47.6	112.2	160.2	86.0	2.28	2.24	2.19	15.8634
Q2 2015	58.5	179.9	220.7	160.7	2.73	3.03	3.39	12.0952
%change (q/q)	14.7	31.7	18.7	49.4	52.4	65.8	73.5	-5.9
% change (y/y)	-6.5	-17.9	-13.8	-19.2	27.4	23.1	12.1	23.4

Source: CRU

According to CRU, the spike in iron ore price is unlikely to be sustained as production costs continue to increase. It predicts that the price of iron ore will drop by 27 percent to \$40/t halfway through the year, and will see some producers exiting the market. As the demand for steel continues to dwindle, Chinese steel production is expected to decline by a marginal 1.5 percent during the remainder of 2016, and show a 3.1 percent improvement in 2017. Therefore, for the second half of 2016, the demand for South African iron ore and manganese is expected to decrease accordingly. Global stainless steel demand is forecast to decline by 1 percent in Q3 2016, driven mainly by dwindling demand in Europe, according to Metal Bulletin. As such, demand for South African chrome ore and its associated alloy is likely to fall during that period.

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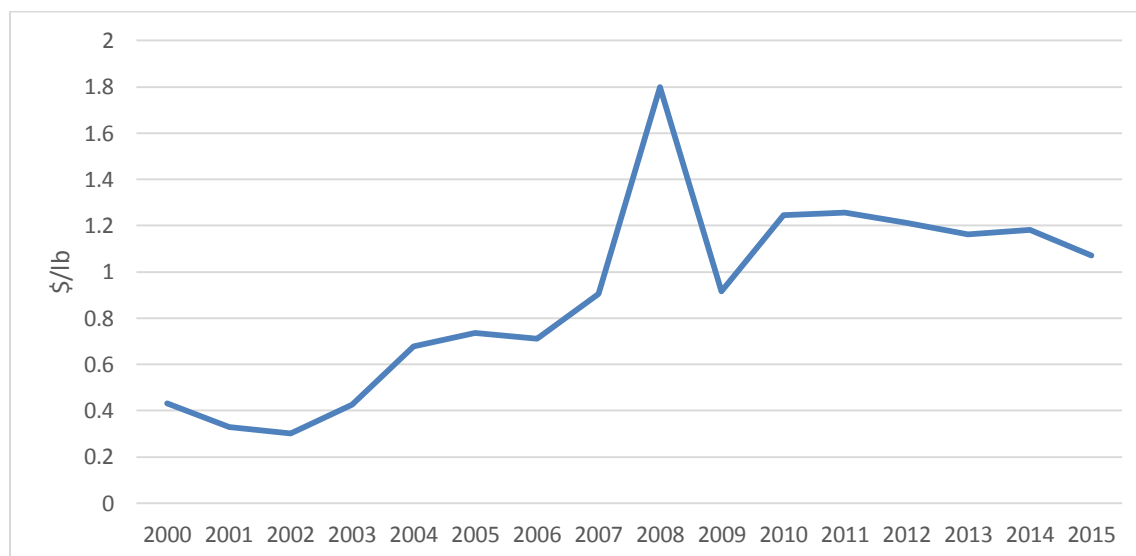
M Khaile

4. ANALYSIS OF FERROCHROME PRICE TRENDS, 2010 – 2016

Ferrochrome prices increased at a Compound Average Growth Rate (CAGR) of 15.5 percent over a 5 year period (2003 to 2008), driven mainly by China's demand and stainless steel growth, increasing by 3.6 percent in the same period (Figure 1). Ferrochrome prices increased significantly in 2008 by 80 percent to \$1.8/lb from \$1/lb in 2007 mainly due to the commodity boom effect. However in 2009, prices dropped by 49.1 percent due the effect of the global economic crisis which impacted negatively on demand. In 2010 prices started to improve in line with the global economic recovery, however

dropped on average by 3.4 percent from 2011 to 2015 due to the slow economic growth in China as well as an oversupplied market.

FIGURE 1: AVERAGE FERROCHROME PRICE, 2010 – 2016



Source: CRU

Despite China's slow economic growth and reduced demand, South Africa's ferromanganese production and exports increased by 2.9 percent and 1.5 percent respectively, between 2011 and 2015. South Africa was ranked as the world's largest ferromanganese producer, until it was overtaken by China in 2012, dropping to a market share of 33 percent in 2015, as compared with 36 percent in 2011. The drop in South Africa's market share is partly attributed to shortage of electricity and availability of the low grade UG2 chrome ore to the Chinese market at low prices, giving China ample opportunity to increase ferromanganese production capacity.

Towards the end of 2014, China's ferromanganese production became sluggish due to stainless steel producers bargaining for a lower tender price and environmental concerns. However, due to continued slow growth from China and an oversupplied market caused by China's newly found overcapacity, China's sluggish production offered no reprieve to the price of the stainless steel input, as it continued on a downward trajectory well into 2015 to reach the \$1.07/lb mark, a year-on-year change of 9 percent.

The effect of the ferromanganese prices saw some of the ferromanganese producers such as International Ferrometals South Africa (IFM-SA), Tata Steel KZN and ASA Metals going into business rescue, with Tata Steel announcing liquidation in early 2016. Amid all of this, the 2016 quarterly price trend of ferromanganese paints a rather optimistic picture, averaging at \$0.83/lb in the second quarter of 2016, a 3.9 percent recovery from the first quarter of 2016. This was partly due to the market's adjustment to the deprivation of supply during the previous year, owing to the non-operational smelters. With this price upswing, South Africa's ferromanganese export earnings spiked to R8.4 billion in Q2 2016, a quarter-on-quarter increase of 35.8 percent.

Sources:

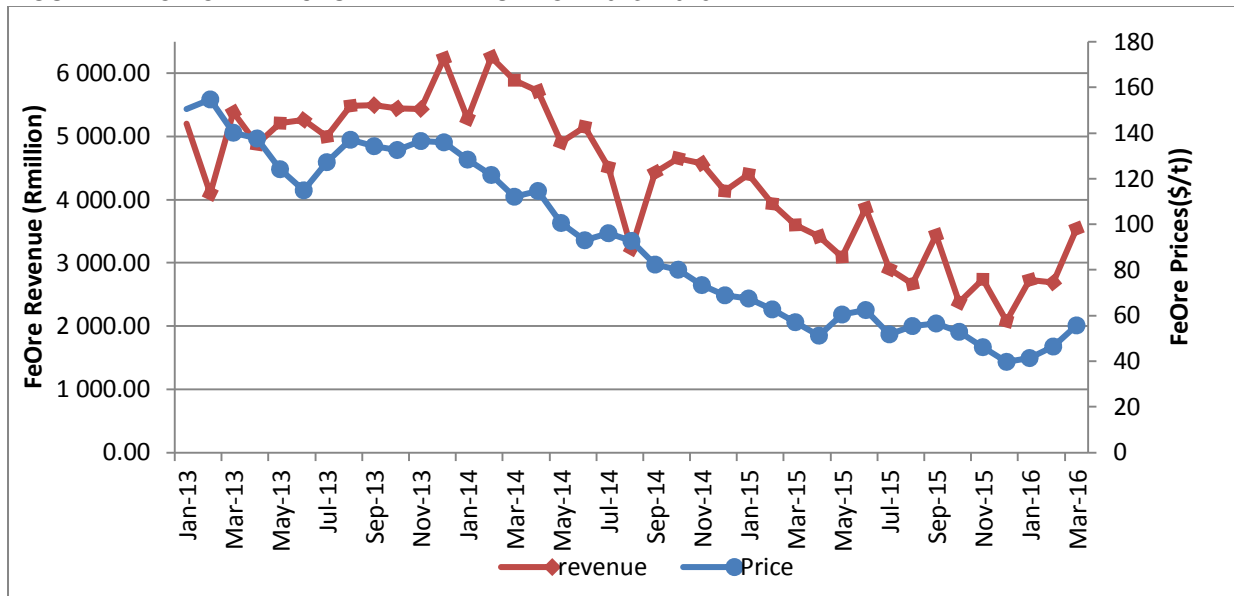
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4. International Chromium Development Association, Ferrochrome – A focus on China. 2nd edition. 2015

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5. THE IMPACT OF LOW IRON ORE PRICES ON THE IRON SECTOR

The global economic downturn has affected steel output and consumption in many regions. A slackened iron ore demand from the second largest economy, China has negatively impacted iron ore prices which dropped by 12 percent in 2014 compared with 2013, falling further by 3 percent in 2015 to a record low of below \$40/dmtu (Figure 1). The drop in iron ore price impacted negatively on revenue generated by most iron ore producers in South Africa. Despite an increase in South Africa's total iron ore export mass by 3.02 percent over a 3 year period, total revenue decreased by 23.2 percent from R63 billion in 2013, to R58 billion in 2014, and dropping further to R39 billion in 2015.

FIGURE 2: IRON ORE PRICES AND REVENUE FOR 2013- 2015



Source: www.indexmundi.com and DMR: Mineral Economics

According to World Steel Association, a slow growth in steel demand from China is likely to remain unchanged in the short term and steel use will continue to record negative growth of 0.5 percent, while demand in the developed economies, is expected to grow by only 1.8 percent in 2016. South Africa exports approximately 75 percent of its iron ore production, and as such a slowdown in China which is the country's major export market, is expected to impact negatively on the country's iron ore, production and thus exports. South Africa's iron ore production dropped by 12 percent in 2015 compared with 2014 possibly due to some iron ore producers reducing production in response to low prices, particularly the high cost producers. Iron ore prices are expected to remain low for the

remainder of 2016, due to lower demand from China and anticipated oversupply due to increased iron ore output from major global iron ore producers.

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7. www.mining.com
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R Ravhugoni

6. SOUTH AFRICA'S PRODUCTION AND SALES OF NONFERROUS METALS AND MINERALS DURING THE SECOND QUARTER OF 2016

Preliminary data released by Mineral Economics Directorate indicate that South Africa's production of nonferrous metals and minerals, excluding aluminium and mineral sands, increased by 3.5 percent to 44.5kt from 43.0 kt in the second quarter of 2016 (Table 1). This is a result of increased lead production, which offset declines in cobalt, nickel, copper and zinc production. On a year on year (y-o-y) basis, production declined by 4.5 percent, owing to the lack of demand from major consuming markets.

TABLE 6: SOUTH AFRICA'S PRODUCTION AND SALES OF NONFERROUS METALS AND MINERALS IN THE FIRST QUARTER OF 2016

PERIOD	PRODUCTION	LOCAL SALES			EXPORT SALES			TOTAL SALES	
		MASS (t)	VALUE (R'mil)	UNIT VALUE	MASS (t)	VALUE (R'mil)	UNIT VALUE	MASS(t)	VALUE (R'mil)
Q1:2016	43 040	7 931	924	529 204	37 095	3 707	564 332	45 026	4 631
Q2:2016	44 520	8 105	1 004	523 775	26 772	3 381	585 006	34 877	4 385
Q2:2015	46 617	14 687	2 142	562 226	32 730	4 175	586 442	47 417	6 317
CHANGE % (Q/Q)	3.4%	2.2%	8.6%	-1.0%	-27.8%	-8.8%	3.7%	-22.5%	-5.3%
CHANGE % (Y/Y)	-4.5%	-44.8%	-53.1%	-6.8%	-18.2%	-19.0%	-0.2%	-26.4%	-30.6%

Source: Mineral Economics

Local sales volume and revenue rose by 2.2 and 8.6 percent to 8.1 kt and R1.004 billion, respectively on quarter on quarter (q-o-q) basis, as result of improving local demand from major consumers. However, export sales volume and revenue both fell by 27.8 and 8.8 percent to 26.8 kt and R3.381 billion, respectively in the same period, due to China's weak demand for base metals. On a y-o-y basis, both local and export sales revenues fell by 53.1 percent and 19.0 percent correspondingly as a result of a 44.8 percent and 6.8 percent decline in local sales volume and local sales unit value

respectively, while export sales volume and unit value fell by 18.2 percent and 0.2 percent in that order.

Commodity prices for most nonferrous mineral showed slight improvement in the 2nd quarter of 2016, compared to the previous quarter. However, zinc prices recorded the highest increase q-o-q, rising by 14.2 percent to \$1 913.53/t compared with \$1 675.88/t in the previous quarter. The growing supply deficit in the zinc market is putting an upward pressure on prices. Aluminium and nickel also rose by 3.76 and 3.77 percent to \$1 570.94/t and \$8 819.11/t, respectively. Price driven nickel production cuts globally, declines in Chinese production and environmental compliance clamp down of nickel producers in the Philippines pushed the market into a deficit in Q2 of 2016, however the struggling stainless steel market did not promote large nickel price movements. Lead price decreased by 1.3 percent to an average of \$1 719. /t in Q2 (Table 2), primarily due to lower demand from China, following the reduction in e-bikes production. On a y-o-y basis, all nonferrous minerals and metal prices declined in line with other commodity prices as markets remain oversupplied and weak demand from major consumers.

TABLE 7: AVERAGE PRICES OF NONFERROUS METALS AND MINERALS, 2015-2016

Commodity	Q2:2015	Q1:2016	Q2:2016	Change%(Q/Q)	Change%(Y/Y)
Aluminium (\$/t)	1 797.45	1 514.06	1 570.94	3.76%	-12.60%
Cobalt (\$/lb)	13.97	10.88	10.97	0.85%	-21.43%
Copper (\$/t)	5 814.58	4 668.57	4730.03	1.32%	-18.65%
Lead (\$/t)	1 806.27	1 742.18	1719.00	-1.33%	-4.83%
Nickel (\$/t)	14 346.73	8 498.86	8 819.11	3.77%	-38.53%
Zinc (\$/t)	2 080.94	1 675.88	1 913.53	14.18%	-8.04%

Source: various sources

The economic outlook has generally been bearish during the first quarter of the year, the market has been fearful that China's economy was slowing more than previously expected. However, given the significant production adjustments and strategic buying in recent quarters, there are a handful of encouraging signs and reports from Asia that demand is improving; there seems a good chance that fundamentals will improve. In sectors where the supply glut is starting to end (like the zinc sector) and production cuts are in place (like nickel and aluminium), prices have shown signs of improvements. The current status of the zinc market is likely to trigger investment in new and long dormant projects including the Gamsberg in South Africa. Demand is anticipated to improve as some economies begin to show signs of growth, complemented by supply restraints, could lead to an upside pressure on prices. Copper seems to be the worst performing metal amongst the nonferrous group with markets oversupplied and inventory levels at the highest since the beginning of the year. Supply is also anticipated to outpace demand and this is likely to suppress price growth. The nickel market is expected to remain undersupplied in the medium term and prices to improve from current levels.

In South Africa, production for nonferrous metals is expected to recover as demand from emerging economies improves. Lead and zinc production will continue to boost overall nonferrous metals production, due to current high grade ore mining at Black Mountain Mine. Production of cobalt and nickel is expected to increase in line with increases in the Platinum Group Metals (PGM) sector. The ban on Indonesian nickel ore exports is likely to stimulate production growth at Nkomati Nickel mine as Chinese market struggle to secure nickel supply for their stainless steel mills.

Sources

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L Ramane and S Mnyameni

7. SOUTH AFRICA'S QUARTELY TITANIUM PRODUCTION AND SALES

New mine expected to boost supply

The titanium market has been experiencing a period of declining demand due to slow economic growth in a number of global regions, particularly Asia. As such, many producing countries have curbed supply as they try to match production with market demand as well as reduce high inventory levels. South Africa's production of titanium minerals (mostly mined as ilmenite, rutile and tiokwa) declined by 3.9 percent q-o-q in the second quarter of 2016 and 21.5 percent y-o-y to 463.7 kt (Table 1). This was due to the temporary closure of Richards Bay Mine due to disruptions and reduced production from Tronox.

TABLE 8: SOUTH AFRICA'S PRODUCTION AND SALES OF TITANIUM IN THE SECOND QUARTER OF 2016

PERIOD	PRODUCTION (kt)	LOCAL SALES			EXPORT SALES			TOTAL SALES	
		MASS (kt)	VALUE (R'mil)	R/t	MASS(kt)	VALUE(R'mil)	R/t	MASS(kt)	VALUE(R'mil)
Q1:2016	482.3	314.1	185.9	590	22.8	230.1	9,621	336.9	416.0
Q2:2016	463.7	306.3	247.9	819	21.1	186.9	8,497	327.4	434.8
Q2:2015	590.5	580.1	700.2	1,206	26.2	225.9	8,481	606.2	926.2
Q/Q	-3.9%	-2.5%	33.4%	38.7%	-7.5%	-18.8%	-11.7%	-2.8%	4.5%
Y/Y	-21.5%	-47.2%	-64.6%	-32.1%	-19.5%	-17.3%	0.2%	-46.0%	-53.1%

Source: Directorate Mineral Economics, DMR

Local sales volume shrunk by 2.5 percent to 306.3 kt in Q2 of 2016, however its revenue rose by 33.4 percent to R247.9 million owing to recovering prices. Y-o-y, both local sales volume and revenue

diminished by 47.2 and 64.6 percent, respectively mainly due to reduced production as a result of weak demand and low prices. An increase of 38.7 percent q-o-q in local unit sales value improved revenues generated by 33.4 percent as prices began to recover from the Q1 slump. However, y-o-y unit sales value plummeted by 32.1 percent from R1 206 to R819 in the Q2 2016, due to reduced demand for titanium minerals. The announced closure of Huntsman Corp's 25 000t TiO₂ manufacturing facility in Umbogintwini in the fourth quarter of 2016 will impact on the country's future local sales volume and employment in this sector.

Weak global demand especially in emerging economies and an oversupplied market had an impact on South Africa's export market. Export sales volume and revenue fell by 7.5 percent and 18.8 percent q-o-q to 21.1 kt and R186.9 million, respectively. Similarly, y-o-y exports sales volume and revenue dropped by 19.5 percent and 17.3 percent from 26.2 kt and R225.9 million, correspondingly. The export unit sale value declined by 11.7 percent q-o-q and slight increased by 0.2 percent y-o-y.

According to TZMI, sentiments in the titanium minerals sector are improving due to improvements in some economies, including North America, most of Western Europe and to a lesser extent China and India as well as destocking, which will draw down on inventory levels. Also, the closure of major plants in the USA and China is expected to contribute to reduced stock levels. As a result, feedstock producers are expecting prices to increase and encourage increases in output. In April 2016, Tronox's Fairbreeze mine in Kwa-Zulu Natal was opened and is expected to increase titanium production in South Africa at a time when an upswing in market prices is expected to kick in. The mine will create 250 permanent jobs and a R3.3 billion investment by the end of the project will have been made.

Sources

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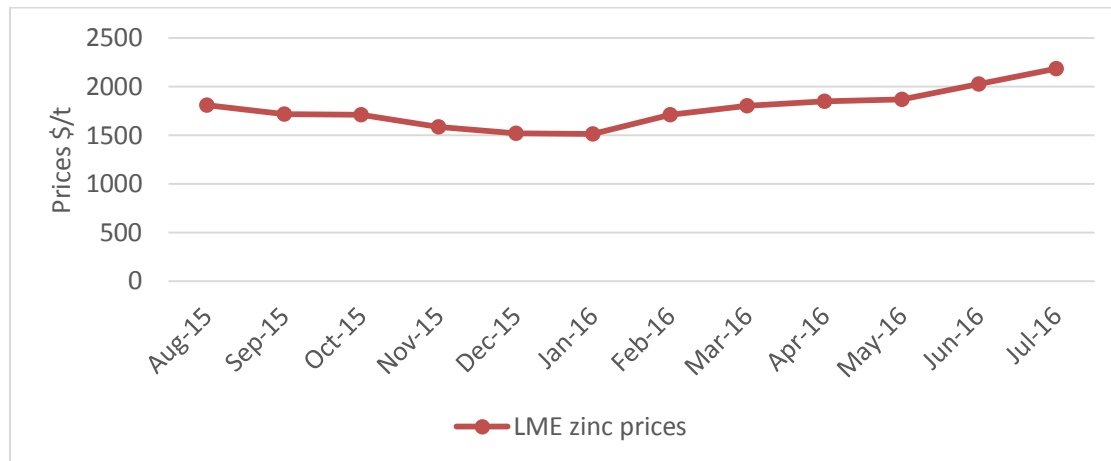
8. THE DEVELOPMENT OF THE GAMSBERG PROJECT COULD BOOST SOUTH AFRICA'S ZINC OUTPUT

The world's biggest undeveloped zinc deposit

South Africa's zinc sector is a small player in the global zinc market, contributing 0.2 percent to the global output and was ranked 27 in 2015. Over the past decade, the country's zinc production has averaged 32 kt per annum and was 14.7 percent lower in 2015 than in 2006. Subdued zinc prices did not support investment in expansion and a new development, as such, Vedanta's Gamsberg project

which was discovered a decade ago, was put on hold. Zinc prices fell by 41 percent from an average of \$3 276 /t in 2006 to \$1 931 /t in 2015. However, the tide seems to be turning with expected zinc prices upswing amid the looming supply deficit and likely to benefit the local zinc industry. This follows the closure of various zinc mines, such as MMG’s Century mine in Australia and Vedanta’s Lisheen mine in Ireland which ceased production in August and November 2015, respectively.

FIGURE 3: AVERAGE ZINC LME CASH SETTLEMENT PRICES, AUGUST 2015 – JULY 2016



Resources: London Metal Exchange (LME)
www.westmetall.com

The positive outlook on zinc prices has prompted Vedanta to expedite the development of the Gamsberg project, the world’s biggest known undeveloped zinc deposit, which is expected to come on stream early in 2018. The feasibility of the project was based on the positive outlook on zinc prices. Zinc prices have surged 44.5 percent to \$2 184.83 /t in July 2016 from \$1 512.2 /t recorded in January of the same year (Fig: 1), as a result of low zinc inventories levels at LME zinc warehouse

There is a considerable short to medium term supply challenge facing the zinc market as there are no new large or advanced-stage development projects to fill the void left by the permanent closures of above mentioned mines. Global demand for zinc metal is expected to exceed supply by 350 kt in 2016 and by further 400 kt in 2017, according to International Lead and Zinc Study Group (ILZSG). The likelihood of the closure of the supply demand gap in the near future is slim, giving South Africa’s Gamsberg project a good chance to take advantage of a looming zinc supply deficit which is likely to put an upward pressure on prices. The 50 Mt first phase of the project is expected to produce 250 kt of zinc concentrate per annum over a 13 year period. The project is expected to come on stream when the market deficit is forecast to be at its highest and likely take South Africa up in the zinc producing countries rankings.

Sources:

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S Mnyameni

9. SOUTH AFRICA'S PRODUCTION AND SALES OF ENERGY COMMODITIES DURING THE SECOND QUARTER OF 2016

In the second quarter of 2016 South Africa's coal production increased by 5.94 percent and 1.74 percent, quarter-on-quarter (q-o-q) and year-on-year (y-o-y) both to 64.28 Million tons (Mt). This increase can be attributed to higher output recorded by a majority of coal mines and the end the devastating labour unrest at some coal mines.

TABLE 9: SOUTH AFRICA'S PRODUCTION AND SALES OF ENERGY COMMODITIES IN THE SECOND QUARTER OF 2016.

Commodity	Period	Production	Local Sales			Export Sales			Total Sales	
		Quantity (Mt)	Quantity (Mt)	Value Billion (R)	Unit Value (R/t)	Quantity (Mt)	Value Billion (R)	Unit Value (R/t)	Quantity (Mt)	Value Billion (R)
Coal	Q2 2016	64.28	45.84	15.08	329	18.71	11.55	617	64.55	26.63
	Q1 2016	60.67	42.50	13.92	327	17.43	11.21	643	59.93	25.13
	Q2 2015	63.18	44.74	13.80	293	17.36	10.88	721	62.11	24.68
	Q2 2016 vs Q1 2016 (%)	5.94	7.85	8.35	0.51	7.33	3.03	-4.04	7.70	5.98
	Q2 2016 vs Q2 2015 (%)	1.74	2.45	9.27	12.29	7.75	6.14	-14.38	3.93	7.89
Natural Gas	Q2 2016	0.15	0.15	0.30	1980	-	-	-	0.15	0.30
	Q1 2016	0.20	0.20	0.32	1568	-	-	-	0.20	0.32
	Q2 2015	0.26	0.26	0.54	2051	-	-	-	0.26	0.54
	Q2 2016 vs Q1 2016 (%)	-26.47	-26.47	-6.07	26.32	-	-	-	-26.47	-6.07
	Q2 2016 vs Q2 2015 (%)	-42.90	-42.90	-44.94	-3.45	-	-	-	-42.90	-44.94
Natural Gas Condensate	Q2 2016	0.011	0.011	0.082	7813	-	-	-	0.011	0.082
	Q1 2016	0.014	0.014	0.085	6220	-	-	-	0.014	0.085
	Q2 2015	0.018	0.018	0.157	8515	-	-	-	0.018	0.157
	Q2 2016 vs Q1 2016 (%)	-21.68	-21.68	-3.12	25.61	-	-	-	-21.68	-3.12
	Q2 2016 vs Q2 2015 (%)	-41.76	-41.76	-47.60	-8.24	-	-	-	-41.76	-47.60
*Uranium (kt)	Q2 2016	0.11	-	-	-	0.08	0.07	875.00	0.08	0.07
	Q1 2016	0.11	-	-	-	0.10	0.10	973.00	0.10	0.10
	Q2 2015	0.15	-	-	-	0.18	0.18	1978.00	0.18	0.18
	Q2 2016 vs Q1 2016 (%)	5.16	-	-	-	-19.57	-27.63	-10.07	-19.57	-27.63
	Q2 2016 vs Q2 2015 (%)	-23.04	-	-	-	-52.93	-58.31	-55.76	-52.93	-58.31

Source: Directorate Mineral Economics

Uranium production increased by 5.16 percent q-o-q and fell by 23.04 percent y-o-y to 0.11 kt. Natural gas production dropped by 26.47 percent and 42.90 percent to 0.15 Mt, q-o-q and y-o-y. Similarly, natural gas condensate production also depreciated by 21.68 percent and 41.76 percent q-o-q and y-o-y to 0.011 Mt.

Both q-o-q and y-o-y coal local sales volumes increased by 7.85 percent and 2.45 percent to 45.84 Mt. The revenue generated from local coal sales surged 8.35 percent q-o-q and 9.27 percent y-o-y to

R15.08 billion, boosted by the unit price that appreciated by 0.51 q-o-q and 12.29 y-o-y to R329 /t (Table 2). Higher local sales volumes also contributed in lifting the revenue collected from local sales.

TABLE 10: PRICES OF ENERGY COMMODITIES IN THE SECOND QUARTER OF 2016.

Commodity	Period	Local Sales	Export Sales
		Unit Value (R/t)	Unit Value (R/t)
Coal	Q2 2016	329	617
	Q1 2016	327	643
	Q2 2015	293	721
	Q2 2016 vs Q1 2016 (%)	0.51	-4.04
	Q2 2016 vs Q2 2015 (%)	12.29	-14.38
Natural Gas	Q2 2016	1980	-
	Q1 2016	1568	-
	Q2 2015	2051	-
	Q2 2016 vs Q1 2016 (%)	26.32	-
	Q2 2016 vs Q2 2015 (%)	-3.45	-
Natural Gas Condensate	Q2 2016	7813	-
	Q1 2016	6220	-
	Q2 2015	8515	-
	Q2 2016 vs Q1 2016 (%)	25.61	-
	Q2 2016 vs Q2 2015 (%)	-8.24	-
*Uranium (kt)	Q2 2016	-	875.00
	Q1 2016	-	973.00
	Q2 2015	-	1978.00
	Q2 2016 vs Q1 2016 (%)	-	-10.07
	Q2 2016 vs Q2 2015 (%)	-	-55.76

Source: Directorate Mineral Economics

Natural gas local sales volumes plunged by 26.47 percent q-o-q and 42.90 percent y-o-y to 0.15 Mt (Table 1). Revenues generated also tumbled by 6.07 percent q-o-q and 44.94 percent y-o-y to R300 million. The unit value that appreciated by 26.32 percent q-o-q to R1 980 /t was not sufficient to support revenue growth. Similarly, y-o-y, both the sales volumes and the unit value led to the huge drop in natural gas local sales revenues (Table 2).

Similar to the natural gas, natural gas condensate local sales volumes dipped 21.68 percent q-o-q and 41.76 y-o-y to 0.011 Mt. The unit value that surged higher by 25.61 percent q-o-q to R7 813 /t was not enough to offset the effect of lower sales volumes which caused the revenue collected from local sales to decrease to R82 million. Y-o-y, the fall in revenues was exacerbated by the 8.24 percent drop in unit value to R7 813/t.

Uranium export volumes plunged 19.57 percent q-o-q and 52.93 percent y-o-y to 0.08 kt. Uranium export revenue, dropped accordingly by 27.63 percent q-o-q and 58.31 percent y-o-y to R70 million. In tandem with export volumes, the unit value plunged by 10.07 percent q-o-q and 55.76 percent y-o-y to R875 /t.

During the second quarter of 2016, coal exports increased by 7.33 percent q-o-q and 7.75 percent y-o-y to 18.71 Mt. The price of export coal dipped by 4.04 percent q-o-q and 14.38 percent y-o-y to average R617/t in the second quarter of 2016 (Table 2). Revenues generated from coal export sales increased by 3.03 percent q-o-q and 6.14 percent y-o-y to R11.55 billion.

Coal export prices are expected to remain flat in the third quarter of 2016 as prices are determined by demand for low grade coal from the Indian market which tends to be price sensitive. According to an Exxaro executive, further growth in coal exports is expected from Africa, Pakistan and South-east Asia markets. Coal production is expected to remain stable at current levels or decrease slightly in the third quarter of 2016 as local winter demand dwindles. Local sales are also forecast to remain at current levels until Eskom commissions the next unit at the new Medupi power station. Domestic coal price is expected to edge up slightly, reaching R333 /t during the third quarter of 2016. Coal export volumes might be affected by the planned 14 day maintenance shutdown at the Richards Bay Coal Terminal and the subdued demand in the export market.

The South African hydrocarbon market (gas and oil) is very depressed currently, with oil production having stopped for more than 12 months to date; and gas reserves also dwindling. Natural gas and natural gas condensate production is forecast to fall further due to the depleting resources at PetroSA's gas fields. However, the country is currently rolling out gas infrastructure, with Coega recently completing the preliminary work for combined-cycle gas turbine power project in the Coega Industrial Development Zone (IDZ) as well as, integrating the Liquid Natural Gas receiving infrastructure within the deep water Nqura port. All this work will lay a foundation for shale gas extraction if the country does consider following that route, the infrastructure will be ready. Uranium production is expected to remain at current levels.

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KL Revombo

10. INDUSTRIAL MINERALS SECTOR PERFORMANCE – QUARTER 2, 2016

The slowdown in China's economy coupled with high degrees of volatility surrounding emerging market currencies and capital flows contributed to a lacklustre performance of the South African economy from a global perspective. Total volume of sales of industrial minerals was down by 14.5 percent (q-o-q) to 25.1 Mt in the second quarter of 2016 compared with 21.9 Mt in the first quarter of 2016 (Table 1). The value of total sales increased by 8.2 percent recording R4.4 billion in the same period, owing to improved demand for most of industrial minerals. Local sales volumes increased by 14.2 percent to 24.7 Mt resulting in a 4.1 percent increase in revenue to R3.6 billion because of gains in volume from the aggregate and sands sub-sector. Volume of aggregate and sands increased by 15.8 percent to 15.9 Mt raising the level of revenue to R1.7 billion, an 18 percent increase compared with the previous quarter. Export sales volume increased by 37.1 percent to 362 kt owing to improved exports of vermiculite. Export sales value also increased by 29.3 percent to R846 million, revenue could have made more gains, but was offset by weak commodity prices.

TABLE 11: SOUTH AFRICA'S SALES OF INDUSTRIAL MINERALS QUARTER 2, 2016 COMPARED WITH QUARTER 1, 2016

QUARTERS	LOCAL SALES (FOR)		EXPORT SALES (FOB)		TOTAL SALES	
	Mass (kt)	R'000	Mass (kt)	R'000	Mass (kt)	R'000
Q1 (2016)	21 627	3 403 615	264	654 769	21 891	4 058 384
Q2 (2016)	24 700	3 544 567	362	846 296	25 062	4 390 863
Q2 (2015)	24 610	3 243 368	356	737 867	24 967	3 981 235
Change Q2/Q1 (q-o-q)	14.2%	4.1%	37.1%	29.3%	14.5%	8.2%
Change Q2/Q2 (y-o-y)	0.4%	9.3%	1.6%	14.7%	0.4%	10.3%

Source: DMR, Directorate Mineral Economics

Local sulphur prices decreased by 6.1 percent to R1 113/t (q-o-q) on the back of changing market dynamics from oil refineries/synthetic fuels markets. Vermiculite prices decreased by 5.5 percent (q-o-q) to R2 318/t owing to effects of lower commodity prices. Phosphate rock prices decreased by 10.6 percent (q-o-q) to R1 901/t as demand from fertiliser applications decreased, exacerbated by prevailing drought conditions. Prices for aggregate and sand increased by 2.5 percent (q-o-q) to R110/t, while prices for limestone went down by 12.5 percent (q-o-q) to R142/t as a result of influx of cheap imports from other countries. Dimension stone prices increased by 5.7 percent to R2 543/t.

TABLE 12: AVERAGE UNIT VALUE OF SELECTED COMMODITIES

Commodity	Q1 2016 (R/t)	Q2 2016 (R/t)	% change
Andalusite	1 482	1 531	3.3%
Fluorspar	2 870	2 878	0.3%
Sulphur	1 185	1 113	-6.0%
Vermiculite	2 453	2 318	-5.5%
Phosphate Rock	2 127	1 901	-10.6%
Limestone and dolomite	162	142	-12.5%
Dimension stone	2 406	2 543	5.7%
Aggregate and sand	107	110	2.5%

Source: DMR, Directorate Mineral Economics

Weakened economic fundamentals, characterised by low investor confidence and higher lending rates has resulted into general weak demand for commodities. According to Industry Insight, the overall growth outlook for private sector residential construction has deteriorated over the last 12 months, with the trend now officially sitting at -1.7 percent growth over the last 12 months. The growth rate has declined month after month in the last year, indicating a clear downturn in the demand for residential building on a national scale.

Growth in industrial minerals is expected to remain muted in the medium term on the back of the current drought conditions, which have had severe effects on agricultural output, affecting demand for input minerals such as phosphate rock and vermiculite into fertilisers. The low growth environment in the construction sector will also push down consumption of minerals like limestone in the manufacturing of cement and aggregates and sands in spite of R865 billion infrastructure expenditure, announced in the 2016/17 Budget Vote, to be spent over the next three years.

Sources:

1. DMR, Directorate Mineral Economics
2. Industry Insight, Construction Monitor, July 2016.

R Motsie

11. SOUTH AFRICA'S VERMICULITE PRODUCTION AND SALES DURING THE FIRST HALF OF 2016

Vermiculite is currently produced in one mine in South Africa and its application is diverse in markets such as agriculture, horticulture ceramics and construction. In agriculture and horticulture, vermiculite has a lot of uses ranging from improving aeration to water retention among many other uses, resulting in healthier and more robust plants. Horticulture accounts for about 50 percent of vermiculite consumption followed by light weight concrete at 10 percent and insulation applications at 5 percent. South Africa's production of vermiculite in the first half of 2016 increased by 11.8 percent to 83.7 kt compared with 74.7 kt during the same period in 2015. Demand for coarse grained vermiculite

increased from agriculture and horticulture during this period (Table 1). The volumes sold locally, increased by 30.4 percent to 6 kt while local sales values increased by 31.4 percent to R6.5 million under the review period. Export sales volumes decreases by 51.5 percent from 71.4 to 34.3 kt. During 2015 the Phalabora Mining Company increased production targets in order to meet demand from its consumers. Unlike most of industrial minerals, about 90 percent of vermiculite produced in South Africa is exported, with about less than 10 percent sold locally.

TABLE 13: SOUTH AFRICA'S PRODUCTION AND SALES OF VERMICULITE COMPARISON OF HALF 1 2016 AND HALF 2 2015

Period	Production (kt)	Local sales		Export sales		Total sales	
		Mass (kt)	value (R' 000)	Mass (kt)	value (R'000)	Mass (kt)	value (R' 000)
H1 2015	74.7	4.6	4 994	71.4	233 127	75.9	243 115
H1 2016	83.5	6.0	6 563	34.3	166 883	40.6	180 011
% change (Q-o-Q)	11.8	30.4	31.4	-51.5	-28.4	-46.5	-26.0

Source: DMR, Mineral Economics

Consumers of vermiculite have always preferred coarser grades over finer grades due to effectiveness of these coarser grades. Globally and locally supplies of finer vermiculite grades far exceeds those of coarse grades, which has resulted in consumers exploring more ways of using finer grades. South Africa is the largest producer of vermiculite globally, the country through its sole producer, Phalabora Mining Company, had challenges meeting demand for coarse grades due to lower recovery rates from the vermiculite ore body. Zimbabwe seems to be the only country that can consistently provide enough coarser grades to the market at the moment. Global supplies of fine, superfine, and micron vermiculite are expected to be maintained by the operations in Brazil and the United States.

PMC's production is expected to increase in 2016 on the back of anticipated demand from the horticulture/agriculture markets. End markets that have showed potential for growth include animal feeding and fire proofing. Climate change and future availability of water are likely to drive vermiculite consumption, owing to its water retention characteristics. South Africa's construction industry is expected to continue expanding until 2020 driven by investment in infrastructure, residential and energy project. As construction activities grow, demand for vermiculite is expected to grow, subsequently.

Sources:

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4. USGS commodity summaries, 2016

M Muravha

12. THE FLUORSPAR MARKET UNCERTAINTY CONTINUES

Downward pressure on prices emanating from weak demand

Fluorspar is an essential raw material in the chemical, steel and aluminium industries, as well as in a growing number of high-tech green technologies. However, like many other mineral and metal commodities, fluorspar is experiencing a slump, owing to a weak market and falling prices. Most fluorspar consumption and trade involve either acid grade fluorspar (acidspars), which is greater than 97 percent calcium fluoride CaF_2 , or sub acid grade, which is 97 percent or less CaF_2 . The latter includes metallurgical and ceramic grades and is commonly called metallurgical grade. Acid grade is considered most desirable and its greater demand is driven by the global market for hydrofluoric acid (HF), the primary use of the mineral. As much as 45 percent to 60 percent of HF consumption is used to make hydrofluorocarbons (or HFCs) to be used in coolants.

The global fluorspar industry has been in the doldrums for around three years, as declining prices and falling demand for fluorochemicals used in refrigerants and steel manufacturing has led to significant price erosion. The continuing downturn in demand for fluorochemicals, owing to change in legislations of many countries towards pro-environmentally friendly prescripts, and overcapacity in China, has had a considerable impact on acidspars. Chinese and European acidspars prices fell by as much as 46 percent since 2012. Regional deterioration in demand has forced the closure of some projects, notably in Africa, while some fluorspar exploration companies have moved away from the sector. The tough market has to date forced the closure of a number of fluorspar mines, including the Witkop and Buffalo projects in South Africa and Okurusu in Namibia. The market has since been further stifled by increasing competition from new low-cost supplies with structural adjustments in the downstream market, restricting any upward trend, pushing prices for some acidspars grades far below the levels seen during the 2008-2009 financial crises.

While a recovery in the fluorochemicals sector remains challenging in light of the escalating environmental concerns, oversupply of acidspars is also adding to the woes of the industry not rebounding any time soon. The market is unable to absorb growing inventories; existing producers across the world are reducing output in an attempt to ease the growing supply chain backlog. Nevertheless, these efforts have been scuppered by new low-cost suppliers with structural adjustments in the downstream market, restricting any upward trend, pushing prices for some acidspars grades far below the levels seen during the 2008-2009 financial crises. While fluorspar prices continue to remain under pressure owing to limited downstream demand, aggressive price undercutting by new capacities raises further concerns. Very few suppliers have been able to secure contracts at the higher ends of published price ranges, while most have been forced to lower offers by around 10 percent. These discounts are likely to weigh heavily on the margins of suppliers elsewhere, particularly in Africa and Mexico, where some producers are seeking to compete with China's low-cost material. Downward pressure on prices is likely to continue into next year, as demand remains static in an oversupplied market.

Despite having the world's largest fluorspar reserves, South Africa's fluorspar industry has been underperforming amid sluggish industrial demand and a lack of financing. South Africa is a significant contributor to the African fluorspar portfolio, with a production capacity of 200 kt per annum, alongside Morocco (75 kt per annum) and Kenya (65 kt per annum). However, out of the country's three fluorspar mines – Vergenoeg, Buffalo and Witkop – Vergenoeg is the only active producer of fluorspar, while operations at the other two mines were shuttered when the market started to stumble in 2012. The country has been the focus of increased fluorspar exploration in recent years. However, weakening prices for fluorspar and fluorochemicals since 2012 have undermined financial backing for projects. South Africa's fluorspar-to-fluorochemical initiatives are in a strong position to bear fruit, as pressure mounts from downstream consumers to establish non-Chinese sources of fluorspar products. But investor confidence in the sector remains a barrier to the realisation.

Market uncertainty continues to weigh on both acidspar and metspar prices. Little change in consumption levels has been reported. Despite the closure of some of the significant producing plants, fluorspar prices have shown limited signs of resurgence as a new generation of low-cost suppliers took the market by storm, making up for the lost capacities. While this demand-side pressure has suppressed prices, producers seeking to supply higher-quality material are trying to insulate themselves from further decreases. Although the industry remains pessimistic over the demand outlook for fluorspar, it is agreed that the key to sustainability is lowering costs, in order to cope with reduced margins in the current buyer-driven market.

Sources:

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13. THE ROLE OF SMALL SCALE MINING IN THE SOUTH AFRICAN ECONOMY

Community upliftment, job creation and poverty alleviation

Mining is an important part of South African economy and has been the driver of much of its economic development. Small scale mining refers to an alternative to the conventional large-scale mining and is characterized by low value technology and low capital-intensive infrastructure. It has also been defined as a mining activity that employs less than 50 people, with an annual turnover of less than R7.5 million. Approximately 100 million people rely on this sector for income, particularly in South Africa and other developing countries. However, lack of safety measures, health care and environmental protection remain challenges associated with small scale mining.

Small scale mining focuses mainly on some of industrial minerals such as sand, clay, dolerite, sandstone, slate and granite used for infrastructural development in building of roads and home dwellings. In addition, extensive small scale mining operations also include alluvial diamond and salt mining. There is a distinction between small scale mining and illegal mining, the latter is predominantly unauthorized mining activities at abandoned sites and is characterized by limited production. Small scale mining has a huge potential to address issues of unemployment and poverty alleviation in local communities if activities are conducted within the ambit of the law and are well-regulated.

Challenges in small scale mining sector, include but not limited to lack of access to finance and markets, shortage of skills and non-compliance with regulatory requirements. However, the government fully encourages the sustainable development of small scale mining in the Minerals and Petroleum Resources Development Act, in order to ensure the maximum exploitation of small mineral deposits and, to enable the small scale mining sector to make a positive contribution to the national, provincial and local economies.

Government through the Department of Mineral Resources in collaboration with the Department of Small Business Development and Small Scale Mining and Beneficiation Division has initiated information dissemination workshops with small scale miners across the country. These government interventions are aligned with the miner's needs, in order to maximize the impact of small-scale mining intended to contribute meaningfully towards the livelihood of the communities.

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14. HOW THE RECENT OUTSOURCING OF A BROAD BASED BLACK ECONOMIC RECOVERY OPERATION FACILITATES JOB CREATION AND ERRADICATES ILLEGAL MINING

Rehabilitation of the Randfontein Cluster is a great success

Gold dumps in Mogale City's Randfontein Cluster (RC) contain vast quantities of untapped gold resources that have been identified for tailings retreatment. The RC lies at and around the Wonderfontein spruit and contains gold resources of approximately 126 Million tons (Mt). At the current recovery rate of 500 000 tons per month, the open cast mine is expected to last in excess of 20 years. However, these types of tailings could potentially have a detrimental environmental impact,

contaminating ground water as a result of spillages around the dams. In addition, many illegal mining operations are also centred in close proximity to these dumps and are a great cause for concern.

South Africa (SA) has many similar type dumps that are located in and around Gauteng. However, many of these dumps are not rehabilitated and the majority of them are simply too costly to rehabilitate. According to a recent study, insitu rehabilitation (rehabilitation excluding mining) is not economically feasible; it is costly and would not be covered by existing available environmental funds. In addition, insitu mine rehabilitation could potentially sterilise locked-in gold resources, ultimately denying SA the opportunity to create value and additional jobs as most similar operations simply crush all the excess material which have potential gold bearing ore as well.

A Broad Based Black Economic Empowerment (B-BBEE) recovery operation is successfully recovering gold from these types of dumps while avoiding costly insitu rehabilitation. This small scale mining company delivers in excess of 10 000 cubic metres (m³) of tailings per week for reprocessing to a surrounding open cast mine in the RC. In addition, the innovative B-BBEE uses state of the art screening technology such as X-ray fluorescent machines to avoid crushing possible gold bearing material. After reprocessing, recovered rough gold content is between 0.6 to 0.8 grams per ton (g/t).

Despite the relatively marginal content of contained gold in these dumps, the additional recovered gold creates value to the host company which offsets the high costs of gold extraction and enables more funds for job creation and environmental rehabilitation. The B-BBEE operation employs more than 200 reef-pickers in the area, in addition to truck drivers. Thus, value derived from recovered gold in the area has been assisting job creation, improving socio-economic requirements while at the same time benefitting the environment and promoting rehabilitation.

South Africa has many old existing gold dumps that pose a number of risks to SA. In contrast to the negative effect on the environment, these dumps could potentially be a hot spot for illegal mining that have already established operations in and around the areas. The majority of these dumps contain gold bearing resources that can be extracted, albeit at a marginal rate. Apart from the intrinsic value addition, these operations could create additional employment opportunities for previously disadvantaged economic market participants, while at the same time eradicating illegal mining to a large extent. As a result, these projects could positively contribute to the social and environmental climate as well as increase job creation.

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15. POTENTIAL IMPLICATIONS OF BREXIT ON SOUTH AFRICA AND OTHER AFRICAN STATES

Introduction

Brexit is an abbreviation for "British exit," which refers to the June the 23rd 2016 referendum, whereby British citizens voted to exit the European Union. The European Union (EU) - is an economic and political partnership involving 28 European countries. It was established after World War Two to foster economic co-operation, with the idea that countries which trade together are more likely to avoid going to war with each other. It has since grown to become a "single market" allowing goods and people to move around, basically as if the member states were one country.

Impacts of BREXIT

Brexit will have an impact on the global economy; trade and investment are likely to bear the brunt of this. African countries expected to be the worst affected by Britain's exit from the EU include South Africa, Nigeria; Kenya and Egypt. The only trade arrangements the UK has with African countries are negotiated through the EU, which in effect means that when the UK leaves the EU the trade relationships and agreements will be null and void. It will have serious consequences for Africa as the UK will no longer shape and lead some of the most important initiatives on the African continent that form the basis of co-operation between Europe and the continent. Brexit will also negatively affect the key regional blocks in Africa, as it has served as one of the strongest supports for the development of economic growth and democracy.

South Africa's already bad economy may be the worst affected by Brexit. It is the UK's largest African trading partner, and the UK is SA's eighth largest import and export market in global terms, according to 2015 data. Trade, investment and indirectly development aid could also be badly affected if Brexit voids all trade agreements deals including the EU-SADC Economic Partnership Agreement.

South Africa's trade relations with the EU are governed by the Trade, Development and Co-operation Agreement concluded with the EU in 1999. South Africa, while part of the African Caribbean Pacific group of countries, is not party to the same preferential trade arrangements granted to the African Caribbean Pacific countries under the Cotonou Agreement. South Africa joined the Economic Partnership Agreement (EPA) negotiations as part of the Southern African Development Community Group in February 2007. South Africa is an emerging economy and the EU is by far South Africa's most important development partner, providing for 70% of all external assistance funds.

However, between the periods 2000-2014, significant changes were seen in the destination and source countries of trade flows between South Africa and the rest of the world. In 2000, more than half (approximately 53 per cent) of South Africa's exports were destined for Europe, the US and

Japan, however, by 2014 this had contracted to 37 per cent. There has been a very significant expansion into SADC over the same period, and a more than tenfold increase in trade with China. The EU, US and Japan also provided a smaller overall share of imports than they did in 2000, with more goods imported from China and the rest of Africa. The regions with which South Africa trades the most are SADC and the European Union. Together, they currently absorb just less than half of South Africa's exports. This shift focusing more on other African countries could mitigate the potential impact of South Africa's trade due to Brexit.

Potential benefits of BREXIT to South Africa and other African States

Taking a long-term perspective, there may be some advantages for South Africa in respect of trade relations. Crucially now that the UK has voted to leave the EU, all of the country's trade deals – brokered through the EU – will need to be renegotiated. Whilst, this may cause lull in trade between the UK, EU, and South Africa as well as other African states – and put further pressure on economies already dealing with a drop in commodity prices, economic slowdown in China and currency volatility, it could paradoxically put South Africa and other African states in a stronger position in the long-term as the UK and EU will be in a weaker positions.

In a globalized economy, Britain has no option but to as-quickly-as-possible forge new trade agreements and ties with its traditional Commonwealth partners (many of which are African), if it is to mitigate the damning economic predictions of multilateral and financial institutions. As a result, Britain, once a global power, is now on the back foot and at the whim of African countries which have increasingly diverse economic ties with the Middle East, Asia, and the US through the African Growth and Opportunity Act (AGOA). Most African states are not or do not need to be dependent on the UK and the EU as export markets.

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16. TECHNOLOGIES FOR THE ERADICATION OF ACID MINE DRAINAGE

Technological breakthrough for AMD and fertiliser industry

South Africa's mining industry has been battling with acid mine drainage (AMD) due to years of extensive mining activities. Most of South Africa's AMD challenges are in the Witwatersrand Basin where gold mining has been taking place since the 1880's. However, coal mining basins are also affected by AMD because of the sulphur bearing coal seams. AMD develops when sulphide bearing minerals, often in the form of pyrite, are exposed to oxygen and water, resulting in the generation of sulphuric acid and dissolved iron. AMD has started flowing into wetlands, streams and rivers,

negatively affecting all aquatic life. Furthermore, it can contaminate shallow aquifers, and if the underground mine water reaches the near surface environment, geotechnical impacts (e.g. sinkhole formation) may occur. South Africa's rivers are used as the source of water supply for agriculture, recreation and drinking purposes, and therefore, AMD potentially affects the fitness for use of such water.

A company called Finnish technology innovator has made a breakthrough in developing a possible solution for AMD through a technology provided by Global EcoProcess Services Oy (EPSE) that extracts saleable metals from AMD while producing purified clean water as a by-product. This technology is not only limited to treating AMD but can also be applied to hazardous industrial waste as a whole. This technology was successfully piloted and implemented at Finland's Talvivaara nickel mine and was rolled out at pilot projects in South Africa, with all the test results showing its readiness to enter full scale commercial production. Another technology, locally developed by Trailblazer Technologies (TT), can convert AMD into valuable fertilizer materials. This technology is being piloted in Krugersdorp, where about 15 Mega litres (ML) a day of AMD yields 49 000 t per year of potassium nitrate as well as 24 000 t per year of ammonium sulphate. It is envisaged that when commercially operating, about 5 475 ML per year of water will be processed.

These technologies can provide a crucial solution for South Africa's environmental issues of water pollution and agricultural land degradation. The technologies can address the challenges created by AMD while benefitting the agricultural sector. The implementation of these AMD treatment technologies could assist government address the challenge of AMD in ownerless and derelict mines while generating significant foreign exchange as well as create jobs in previously abandoned mining areas. According to TT director, by pumping up to 30 ML a day of AMD, South Africa could irrigate 2 200 hectares of ground and create 15 000 jobs and; importantly the government could save R12 billion that is about to spend on its long term AMD solution.

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