Sierra Rutile
Company update & Market Overview

Industrial Minerals Congress
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Disclaimer

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Overview

Exceptional Mine:
- The largest primary rutile deposit in the world.
- Operational since 1969, the mine historically produced over 30% of the world's rutile.

Exceptional Market:
- Rutile prices quadrupled from 2011.
- The market is being driven by:
  - Increasing demand,
  - Limited supply response,
  - Price elasticity,
  - Limited substitution risk,

Exceptional Growth:
- Three projects
- Three times the production
- Three years
An Exceptional Mine
With solid foundations, Sierra Rutile is moving quickly to re-establish itself as a world leader in high-quality, natural rutile production.
A World-Class Deposit

The largest primary rutile mine in the world
• JORC Mineral Resource\(^1\) in excess of 600 million tonnes

Exceptional, high-value assemblage
• 72% of payable heavy mineral\(^2\) is rutile
• 22% of payable heavy mineral\(^2\) is zircon

Significant opportunity to expand resource
• 559 sq. km of land licensed for mining
• 318 sq. km of reconnaissance permits
  – Less than 20% of the mining leases have been drilled
  – New exploration campaign commenced in 2012, $3 million to be invested in exploration

<table>
<thead>
<tr>
<th>Classification</th>
<th>Tonnes</th>
<th>Grade (%)</th>
<th>Contained Tonnes (kt)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Millions</td>
<td>HM</td>
<td>Rutile</td>
</tr>
<tr>
<td>Measured</td>
<td>4.4</td>
<td>2.30</td>
<td>1.13</td>
</tr>
<tr>
<td>Indicated</td>
<td>436.6</td>
<td>6.18</td>
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<tr>
<td>Measured &amp; Indicated</td>
<td>441.0</td>
<td>6.14</td>
<td>1.42</td>
</tr>
<tr>
<td>Inferred(^3)</td>
<td>163.9</td>
<td>-</td>
<td>0.96</td>
</tr>
<tr>
<td>Total Measured, Inferred</td>
<td>604.9</td>
<td>-</td>
<td>0.96</td>
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Sierra Rutile’s deposit is large, long-life, and its assemblage dominated by high-value, high-grade rutile with significant opportunity for expansion

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\(^1\)Mineral Resources include those resources which have been modified to produce the Ore Reserves. The figures reported represent 100% of the Mineral Resources and Ore Reserves attributable to Sierra Rutile Limited.

\(^2\)By value assuming a rutile price of $1000/t; zircon of $1715/t and ilmenite of $190/t.

\(^3\)Insufficient historical data was available to provide a JORC-compliant inferred heavy mineral, ilmenite and zircon grade estimate.
An Operating Mine

Port - Niti

Shipping fleet

D1 - 1,000tph dredge

23MW power station

Mineral separation plant

Floating concentrator

SIERRA RUTILE LIMITED

Working for a better Sierra Leone

Mine Area (see above)
Continuing Investment in Existing Operations

**Increase continues in 2012 with further upgrades**

400% increase in capital spend in 2011

**A business starved of sustaining capital**

![Bar chart showing capital expenditure and depreciation from 2008 to 2012.]

### 2011 Investment

<table>
<thead>
<tr>
<th>Improvement</th>
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<tbody>
<tr>
<td>New rougher spirals</td>
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<tr>
<td>Critical spares</td>
</tr>
<tr>
<td>Bucket ladder upgrades</td>
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<tr>
<td>Auto samplers</td>
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<td>Fire suppression system</td>
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</table>

### 2012 Investment

<table>
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<th>Improvement</th>
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<tr>
<td>New mid &amp; scavenger Spirals</td>
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<tr>
<td>Rotary dryer to fluid bed dryer</td>
</tr>
<tr>
<td>New cyclones</td>
</tr>
<tr>
<td>New product barges</td>
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</tbody>
</table>

### Improvements in operational performance are already being realised

**Asset Optimisation**

- New mid & scavenger Spirals: Increased recovery – up to 2%
- Rotary dryer to fluid bed dryer: Reduce fuel consumption, reduce downtime
- New cyclones: Increase recovery, reduce maintenance, reduce power consumption
- New product barges: Improve final product logistics

**Depreciation**

- 2008: $0, 2009: $2,000, 2010: $4,000, 2011: $6,000, 2012: $12,000

**Capital Expenditure**

- 2008: $2,000, 2009: $4,000, 2010: $6,000, 2011: $10,000, 2012: $14,000
**Yielding Improved Operating Results**

**2011 Actuals**

- 2011 production guidance was met with the Company producing 67,961 tonnes of rutile;
- Rutile production increased 50% (2H11 vs. 1H11) following operational improvements made throughout the first half of the year;
- 2H11 production of 40,767 tonnes was 28% above the average rutile production for the last three years.

**2012 Forecast**

- 2012 rutile production is forecast to be at 80,000 tonnes, 22% above 2011 production.

*The actions taken in 2011 are delivering results, 2H11 production was the best half production in three years*
A Responsible Steward

Strong relations with local stakeholders

• Contributions to the local community
  – Over $1m invested annually in the local community
  – The Company’s medical facility treats over 24,000 people a year with free HIV testing, education, and mosquito nets for Malaria prevention
  – Agricultural project initiated in 2010, aims to provide significant sustainable employment for the local people
  – Local technical college, sponsored by Sierra Rutile, provides education to over 300 students
  – Through the Sierra Rutile Foundation the company funds local projects such as: schools, wells, grain stores, latrines, courts, bridges, clinics a local radio station and more
  – Fish farms located in old mining ponds provide local villagers with work and a reliable source of food

• Environmental management
  – The Company is committed to the continual rehabilitation of mined-out areas
  – The Company has full environmental permits and licenses for all current deposits
  – In 2011, a full survey of disturbed land was conducted and a plan has been developed and is being implemented to rehabilitate all legacy disturbed areas over the next 6 years

Sierra Rutile is a force for good in the local community

* Forecast
Exceptional Growth
**Overview of Expansion**

*Significant number of brown field expansion opportunities allow for a near-term step-change in Sierra Rutile’s production profile*
Dry Mining

Potential for near-term, high-grade dry mining

- Targeting high-grade pockets of resource, inaccessible to dredge mining
  - 28.1 million tonnes at 1.5% recoverable rutile
- Production of 30,000 to 35,000 tonnes per annum of rutile
- Mining operation due to commence in late 2012 at a total project cost of $20 million¹
- Competitive operating costs of $680 per tonne²

Update on Project

- Site preparation work is underway
- Concentrator plant construction contract signed
- Concentrator plant fabrication has commenced, first components already on the water heading to Sierra Leone

Dry mining provides access to localised high-grade areas with short lead times and low capital cost, enhancing Sierra Rutile’s leverage to rising prices

¹ Includes 20% contingency.
² Operating costs vary with grade in the particular year of operation and include by-product credits from ilmenite only
Mogbwemo Tailings (D2)

Mogbwemo Tailings (D2)

- 22.0mt @ 1.13% rutile, made up of unconsolidated sand tailings, located adjacent to the existing land plants and nearby dry mining deposits
- Potential for 20,000 to 25,000 tonnes per annum of rutile finished product at an operating costs of approximately $580 per tonne\(^1\)
- Capital cost of $25 million\(^2\)
- Implemented in 2013 and ramping up to full production in 2014
- Production will be via a small scale (ca.500tph) dredge and land-based concentrator plant

Update on Project

- Final detailed study being conducted
- Lump Sum Turn Key concentrator plant construction on tender
- Project management in place on site

**Significant historic tailings in close proximity to the land plant provide for low risk, near-term, production expansion**

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\(^1\) Operating costs vary with grade in the particular year of operation and include by-product credits from ilmenite only
\(^2\) Includes 20% contingency
New Large Dredge (D3)

Construction of a new large dredge

- A feasibility study has been commissioned into the construction of a second large dredge (D3) and wet plant concentrator unit to be completed in July 2012, (the project is being managed by third party contractor PPM)
- The dredge will have a design capacity of >1,000tph and will produce 60,000 to 90,000 tonnes per annum of natural rutile
- Construction is estimated to take 18 months and have a total project development cost of $125 million

Update on Project

- Floating treatment plant feasibility study has been awarded
- Trade off studies complete – dredge to take form of separate digging unit and wet plant (as per existing dredge) due to:
  - Lowest risk
  - Lowest long term operating cost

*The construction of a large dredge will provide a significant step change in natural rutile production profile*

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1 Includes dredge and wet plant construction; upgrade of the process and power plants; pre-mining development costs; and working capital
Exceptional Market
Increasing Demand for TiO₂ Feedstocks

- Demand for all TiO₂ feedstocks is outstripping supply. Overall demand is being driven by general global economic growth and by “quality of life” growth in developing economies.
- Sierra Rutile’s core product is natural rutile (a high-grade TiO₂ feedstock used in the pigment and the titanium metal industries), with ilmenite and zircon by-products.
- 90% of TiO₂ feedstocks are used in the production of pigment for the paint, plastics and paper industries. High grade feedstocks are required to produce pigment via the chloride process.

Overall TiO₂ market
6.8 million tonnes

Source: company estimates
Demand Stronger for High-Grade Feedstocks

- High-grade feedstocks are more in demand than lower-grade feedstocks due to:
  - General move to the chloride process for pigment production and the use of higher TiO₂ blends, driven by waste and energy reduction requirements.
  - Growth of the titanium sponge market, driven by increasing use of titanium metal in aerospace and other applications. The 2010 global production of titanium sponge was around 145,000mt, this is expected to double before 2020.
  - Switch to high quality welding materials and a move towards flux-cored wire technology, driven by the shipbuilding and construction industries.

Move to Chloride Process

![Graph showing the transition to chloride process for TiO₂ pigment production](chart1.png)

Titanium metal usage by commercial aircraft type

![Bar chart showing titanium metal usage by Boeing and Airbus aircraft types](chart2.png)

TiO₂ feedstock consumption in the welding markets

![Line chart showing TiO₂ consumption in the welding markets](chart3.png)
Limited Supply Response

• **Historic underinvestment:** The long-term semi-fixed price contracts combined with high capital requirements for new developments has led to a historic underinvestment in titanium feedstock mining capacity.

• **Long project lead times:** The long project lead times required to commission new capacity will ensure a significant deficit in the feedstock market going forward.

• **Aging deposits:** much of the worlds high-grade, low-cost ore has been mined. Mines now operate at lower grades, with some mines coming offline altogether.

• **No new deposits:** there have not been any significant new resources discovered in the past 10 years, those that are being brought online now were historically unfeasible.

• **Increased investment will take time:** higher prices will encourage increased investment in new projects but these will likely have higher operating costs and will take time to bring to market.
Price Elasticity

- **High price elasticity:** There is only a minor (2.3% increase) flow-through impact on the final end-use customers (paint consumers) from a doubling in feedstock prices.

- **High price tolerance of paint consumers:** The high numbers of paint consumers and the low frequency of purchase mean that the end-consumers are less sensitive to price increases.

- ** Increasing pigment producer margins:** Pigment producers have anticipated feedstock price increases and have been raising pigment prices well ahead and in excess of feedstock prices, resulting in substantially increased margins.

- **Flexible supply chain pricing:** Supply chain (feedstocks, TiO₂, pigment and paint) is all priced on a short-term basis allowing for an efficient pass through of costs.

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**Pigment producers margins**

![Graph showing pigment producers margins]

**Feedstock price effect on pigment price**

- Doubling of ore price increase equates to an 18% increase in pigment price

**Pigment price effect on paint price**

- 18% pigment price increase equates to a 2.34% increase in paint price

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Source: Companies; Sierra Rutile

Huntsman: EBITDA margin; DuPont: Pre-tax op. income margin; Kronos: Gross margin; Rockwood: EBITDA margin

Source: GS&PA Research estimates
TiO₂ Pricing - Just Catching Up

The current price increase can be seen as correction for the decades of deflation in real terms. Relative to other constituents in paint, TiO₂ is only now reaching long-term pricing parity.
Limited Substitution Risk

There is limited substitution risk for TiO₂ in the manufacture of paints and plastics.

**Technical characteristics:** The brightness and opacity of TiO₂ is significantly higher and more effective than any known substitutes.

**Reduction in intensity of use:** Research by paint producers has been ongoing for over 60 years to find substitutes and additives that will reduce the intensity of use on TiO₂. To-date, the technological benefits of using TiO₂ has outweighed any cost savings from the use of other potential materials.

**No ability to recycle material:** The end-use nature of TiO₂ into paints, plastics and paper make recycling inefficient and cost prohibitive.

The technological benefits of using TiO₂ in the manufacture of paint and plastics ensures that there are limited effective known substitutes to TiO₂.
China not in the High Grade Market... Yet

- **Significant demand growth in China for TiO2 pigments:** Chinese consumption of per capita TiO2 is only 33% that of Europe and 17% of the United States. Chinese demand for pigments is expected to increase 10% per annum between 2010 and 2015.

- **Chinese desire to develop chloride technology:** There is an increasing desire in the Chinese pigment industry to move away from the sulphate pigment process to the chloride process as a result of its reduced environmental impact and their growing need to produce higher quality grades of TiO2 pigment.

- **Chinese requirements will increase demand for high-grade feedstocks:** The 12th Chinese Five-Year plan encourages:
  - Adopting the chloride TiO2 process;
  - Using titanium-rich feedstocks with a TiO2 content of >90%; and
  - Decommissioning or upgrading plants with a single train capacity of less than 30,000tpa.

These requirements will result in further competition for high-grade feedstocks.
Conclusions

**Mine**

- Unique resource
- Operating asset
- Significant infrastructure & human resources
- Excellent stakeholder relations

**Growth**

- Three projects
- Tripling of production
- Three years

**Market**

- Increased demand for high quality titanium feedstock
- Limited supply response
- Continued deficit
- Further price increases
Thank you!