ASSMANG LIMITED

FUTURE EXPANSION
AT KHUMANI IRON ORE MINE
SOUTH AFRICA Locality Map

Saldanha 861 km

PE 1104 km

Dwarsrivier Machadadorp

Cato Ridge
IRON ORE Locality Map
Distribution of Ore deposits Northern Area
- Mine is physically divided into Bruce and King mining areas by rail lines and roads
- Mining areas connected with road
- Conveyor from crushers to plant stockpiles
MANDATE

- KHUMANI IRON ORE MINE must replace part/all of Beeshoek’s tonnage
- Design & engineer a mine in two phases:
  - Phase 1 = 8.4 Mt pa export (BASE CASE)
  - Phase 2 = 16.8 Mt pa export (Anticipated)
- Product grades:
  - Lumpy @ 66.0% Fe
  - Fines @ 65.0% Fe
  - MSIO @ 65.5% Fe
MANDATE CONTINUE

Production rate:

- **Phase One**
  - Jan. 2008 to June 2008: 1.2 Mt pa
  - July 2008 to June 2009: 7.4 Mt pa
  - July 2009 to June 2010: 9.5 Mt pa

- **Phase Two**
  - July 2010 to June 2015: Ramp-up to 16Mt
  - July 2015 to June 2016: 16.8 Mt pa
  - Local sales @ 800Kt pa when Beeshoek closes (± 2019)
CASE STUDY

2. Larger & less individual units through redesign
3. More compact plant
4. “Drop-in” equipment when needed
DESIGN OBJECTIVES

1. Optimize exploitation of available resources
2. Maximize water recirculation/conservation
3. State of art technology (Fit-for-purpose)
4. Maximize productivity
5. Social and Environmental responsible mining activities - Responsible corporate citizenship
METALLURGY

1. Ore mined as “on-grade” or “off-grade” dependent on Fe grades and impurities
2. On/off-grade ROM stockpiled and blended separately
3. On/off-grades processed separately
4. On-grade is only washed and screened
5. Off-grade is washed, screened and beneficiated by jigging
Mine design
- Require selective mining to minimise dilution and ore loss
- Blending to optimally exploit resources @ required rate
- Plan bench height = 10m
- Overall Pit Slopes = 45°
- Safety berms = 15m

Dump design
- 10m lifts & 1 in 3 overall slope
- Backfill of mined out pits 172 Mt
- Stockpiles - In pit/multiple face/pits blending + Pre crusher 90 000 ton muckpiles
Other

- 24 hour 7 day Operation - 4 shifts
- Global Positioning System (GPS) / Dispatch system
- Blasthole sampling – GPS Positioning
- Major equipment
  - CAT 994 F Front End Loaders
  - CAT 789 C Dump trucks
  - Atlas Copco Pit Viper 271 Drills
  - Cat D10T Track Dozers
  - Cat 834 Wheel Dozers
  - Cat 16H Graders
PROCESS DESIGN

- Primary, Scalping & secondary crushing (Bruce/King)
- Convey to plant on Parsons
- Run Of Mine blending stockpiles
- Tertiary crushing
- Washing & screening
- Beneficiation
  - Jigging
PROCESS DESIGN CONTINUE

- Three products stockpiled separately
  - Lumpy
  - Fines
  - Medium Size Iron Ore
- Dual rapid loadout @ 5400 tph into 342 x 100-ton wagons within 5.0 hour turn-around
- Private siding connected directly to Sishen Saldanha line
PROCESS DESIGN
POTENTIAL UPSIDE

- Secondary Fines
  - Super Fines produced from the jig middlings by re-crushing and jigging
  - ±3% additional yield
- Super Fines
  - Produced from the main circuit by treating slimes discard tons through a magnetic separation plant
  - ±5% additional yield
PASTE DEPOSITION

1. More efficient volumetric storage and higher in-situ dry densities
2. Improved water management
3. Improved stability and reduced safety risk
4. Lower operational cost and risk
5. Accelerated rehabilitation
PASTE DEPOSITION
OUTPUTS KHUMANI
TOTAL FINAL PRODUCTS

YEAR

TONS

Millions

2007/2008
2008/2009
2009/2010
2010/2011
2011/2012
2012/2013
2013/2014
2014/2015
2015/2016
2016/2017
2017/2018
2018/2019
2019/2020

LUMPY
FINES
MSIO

0
2
4
6
8
10
12
14
16
18
ANTICIPATED SALES VOLUME SCHEDULE

<table>
<thead>
<tr>
<th>YEAR</th>
<th>Total</th>
<th>Beeshoek</th>
<th>Khumani</th>
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<tbody>
<tr>
<td>2006/2007</td>
<td>6.21</td>
<td>6.21</td>
<td>6.21</td>
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<td>2007/2008</td>
<td>6.71</td>
<td>6.71</td>
<td>6.71</td>
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<tr>
<td>2008/2009</td>
<td>8.70</td>
<td>8.70</td>
<td>8.70</td>
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<tr>
<td>2009/2010</td>
<td>10.30</td>
<td>10.30</td>
<td>10.30</td>
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<td>2010/2011</td>
<td>11.10</td>
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<tr>
<td>2011/2012</td>
<td>11.43</td>
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<tr>
<td>2012/2013</td>
<td>11.90</td>
<td>11.90</td>
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<tr>
<td>2013/2014</td>
<td>12.50</td>
<td>12.50</td>
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<tr>
<td>2015/2016</td>
<td>16.80</td>
<td>16.80</td>
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<tr>
<td>2016/2017</td>
<td>16.80</td>
<td>16.80</td>
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<tr>
<td>2017/2018</td>
<td>16.80</td>
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<tr>
<td>2019/2020</td>
<td>16.80</td>
<td>16.80</td>
<td>16.80</td>
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## KHUMANI OUTPUTS

### EXPORT Production/Sales

<table>
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<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Lumpy %</td>
<td>44</td>
<td>44</td>
<td>44</td>
<td>44</td>
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<tr>
<td>Fines %</td>
<td>37</td>
<td>46</td>
<td>44</td>
<td>46</td>
</tr>
<tr>
<td>MSIO %</td>
<td>19</td>
<td>10</td>
<td>13</td>
<td>10</td>
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<tr>
<td>Lump Production Ktpa</td>
<td>0.439</td>
<td>3.171</td>
<td>3.860</td>
<td>4.380</td>
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<tr>
<td>Fines Production Ktpa</td>
<td>0.370</td>
<td>3.279</td>
<td>3.840</td>
<td>4.640</td>
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<tr>
<td>MSIO Production Ktpa</td>
<td>0.191</td>
<td>0.750</td>
<td>1.100</td>
<td>1.000</td>
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<tr>
<td>Lump Sales (local + export) Ktpa</td>
<td>0.533</td>
<td>3.241</td>
<td>4.149</td>
<td>4.079</td>
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<tr>
<td>Fines Sales (local + export) Ktpa</td>
<td>0.494</td>
<td>3.345</td>
<td>4.186</td>
<td>4.196</td>
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<tr>
<td>MSIO Sales (local + export) Ktpa</td>
<td>0.191</td>
<td>0.813</td>
<td>1.172</td>
<td>1.125</td>
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</table>
ORE TYPES (In Situ)

Laminated Ore

Conglomeratic Ore

Detrital Ore
BRUCE PITS

Ore Distribution
80% laminated ore
20% conglomerate ore
KING PITS

Ore Distribution
80% conglomerate ore
20% laminated ore
KHUMANI MINE RESOURCES

- + One Billion Tons of High Grade Iron Ore Resources
- + 300 Million tons Saleable reserves
- Ongoing Exploration on Mokaning
## Anticipated Typical Quality at Port of Delivery

<table>
<thead>
<tr>
<th>EXPORT</th>
<th>% Fe Min</th>
<th>%SiO2 Max</th>
<th>Al2O3 Max</th>
<th>% P Max</th>
<th>% S Max</th>
<th>% K2O Na2O3 Max</th>
<th>H2O Max</th>
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</thead>
<tbody>
<tr>
<td>LUMPY</td>
<td>66.0</td>
<td>3.7</td>
<td>1.5</td>
<td>0.048</td>
<td>0.025</td>
<td>0.25</td>
<td>2</td>
</tr>
<tr>
<td>FINES</td>
<td>65.0</td>
<td>4.8</td>
<td>1.8</td>
<td>0.068</td>
<td>0.055</td>
<td>0.25</td>
<td>3.5</td>
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<tr>
<td>Medium Size</td>
<td>65.5</td>
<td>4.5</td>
<td>1.7</td>
<td>0.05</td>
<td>0.025</td>
<td>0.25</td>
<td>2</td>
</tr>
</tbody>
</table>
**CAPITAL EXPENDITURE FOR PHASE ONE - R000’s**

Excluding capitalization of interest and fees

<table>
<thead>
<tr>
<th>Description</th>
<th>Budget Rand - US Dollar (R6.05 = $1.00)</th>
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</thead>
<tbody>
<tr>
<td>Mining</td>
<td>R 208 939 000 – US$ 34 535 370</td>
</tr>
<tr>
<td>Bruce Crusher</td>
<td>R 194 810 079 – US$ 32 200 013</td>
</tr>
<tr>
<td>Materials Handling</td>
<td>R 560 993 719 – US$ 92 726 234</td>
</tr>
<tr>
<td>Process Plant</td>
<td>R 446 957 207 – US$ 73 877 224</td>
</tr>
<tr>
<td>Infrastructure and Services</td>
<td>R 305 962 439 – US$ 50 572 304</td>
</tr>
<tr>
<td>Electrical and Instrumentation</td>
<td>R 145 391 952 – US$ 24 031 728</td>
</tr>
<tr>
<td>Paste / Waste Disposal</td>
<td>R 77 217 578 – US$ 12 763 235</td>
</tr>
<tr>
<td>Rail and Roads</td>
<td>R 179 261 122 – US$ 29 629 938</td>
</tr>
<tr>
<td>Indirects</td>
<td>R 497 522 904 – US$ 82 235 190</td>
</tr>
<tr>
<td></td>
<td><strong>Sub Total</strong> R2 617 056 000 – US$ 432 571 240</td>
</tr>
<tr>
<td>ROE variation/Escalation/Contingencies</td>
<td>R 559 341 000 – US$ 92 453 058</td>
</tr>
<tr>
<td></td>
<td><strong>Total Budget</strong> R3 176 397 000 – US$ 525 024 298</td>
</tr>
</tbody>
</table>
PROJECTS TIMING

- Earthworks:
  - Detail design  
  - Tender, adjudication & appoint  
  - Site Establishment  
  - Start earthworks  
  - Completed

- Start civil construction
- Start steel/plate fabrication
- Start mech. erection
- Start pipe fabrication
- Start pipe erection
- Start Electrical & Instrumentation installation  
- Start cold commissioning
- Start hot commissioning
- Hot commissioning complete
- Wash/screen plant
- Jig plant
- May 06
- Sept. 06
- Jan. 07
- Feb. 07
- May 07
- June 07
- Sept. 07
- Nov. 07
- Feb.08
- Mar.08
- Apr.08