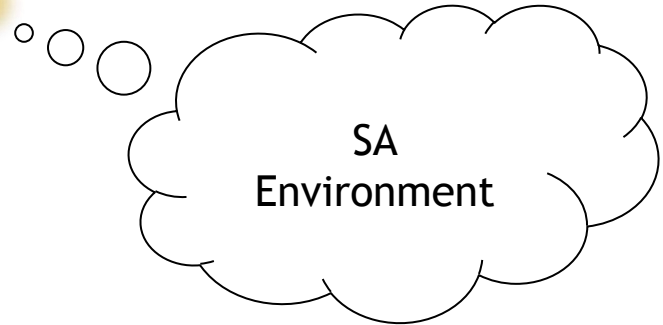
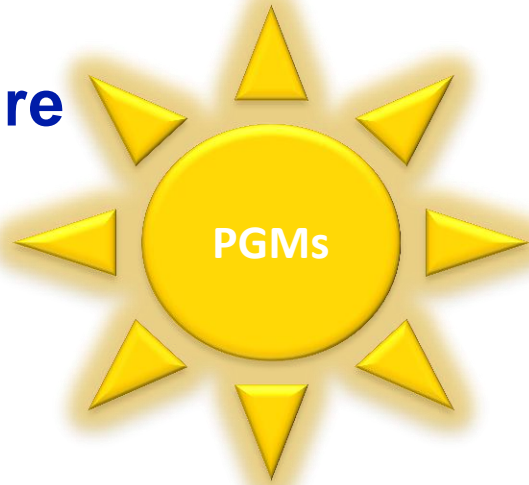
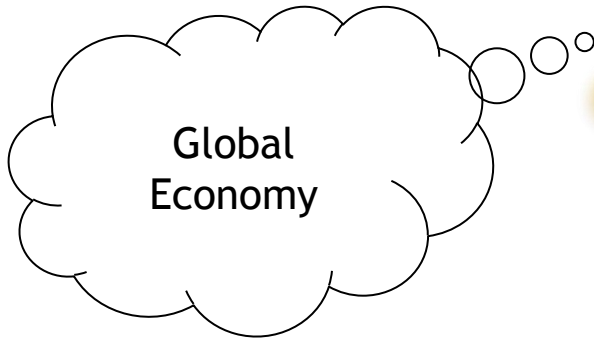


# Process Division – Analyst Presentation



28<sup>th</sup> June 2011

# Lonmin of the Future



**Macro**

- Markets & China
- Global Risks
- Communications
- Energy & Water

**Social**

- Sustainability
- Safety
- SLP / Transformation
- Culture / Values
- Employee Relations

**Growth**

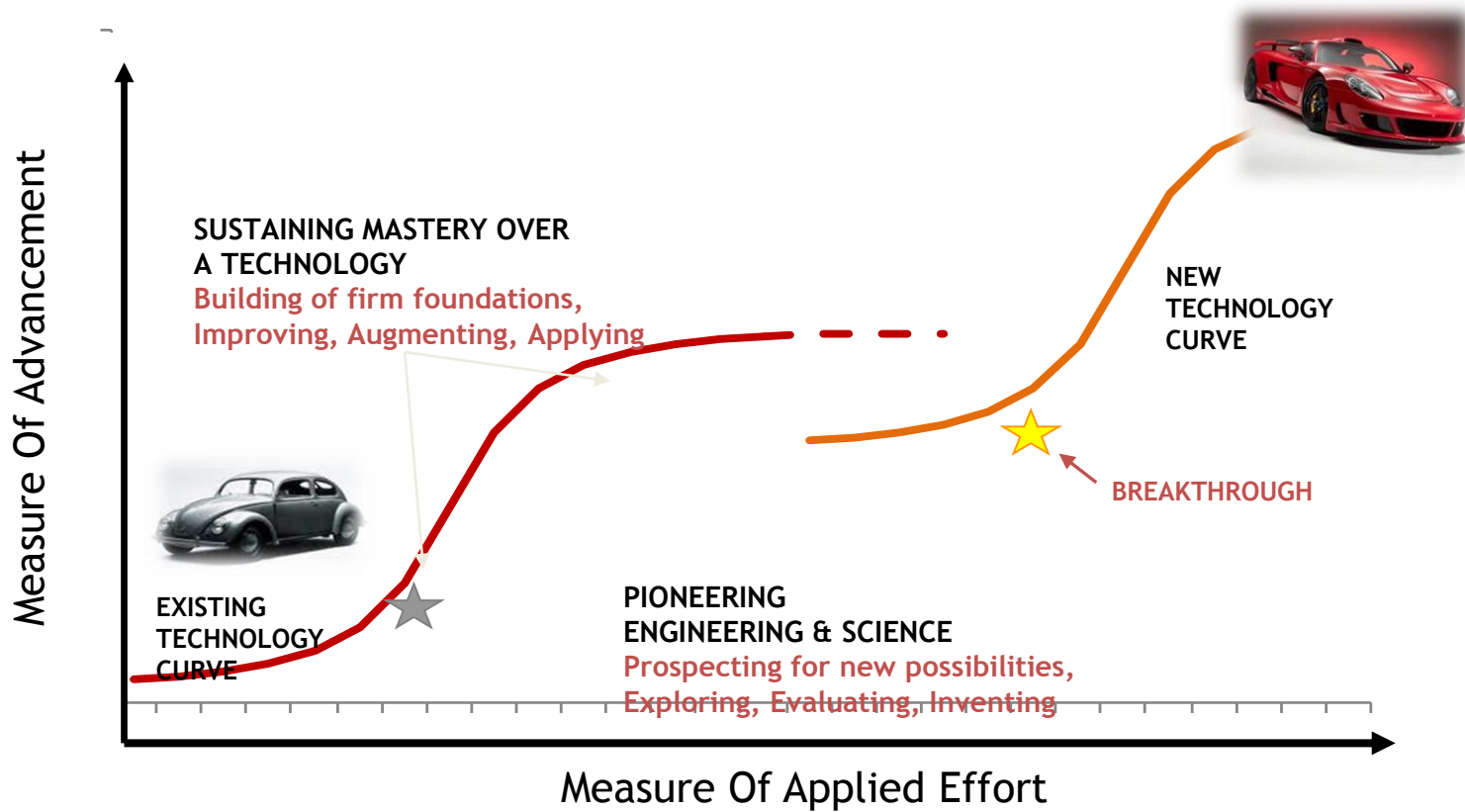
- LTP
- Leverage Marikana
- Productivity
- HR Development
- Other assets
- B/Sheet Capacity

**Costs**

- Productivity
- Growth
- Systems

**Focused on successful integration of initiatives**

# Process Division: ...of the future



SHE Ownership by everyone in Process Division

Stable, predictable and efficient operation. *Intelligent Predictable Plants*

Unit cost on the lowest cost measured in Rand per PGM ounce

A passionate and competent workforce reflecting the South African demographic

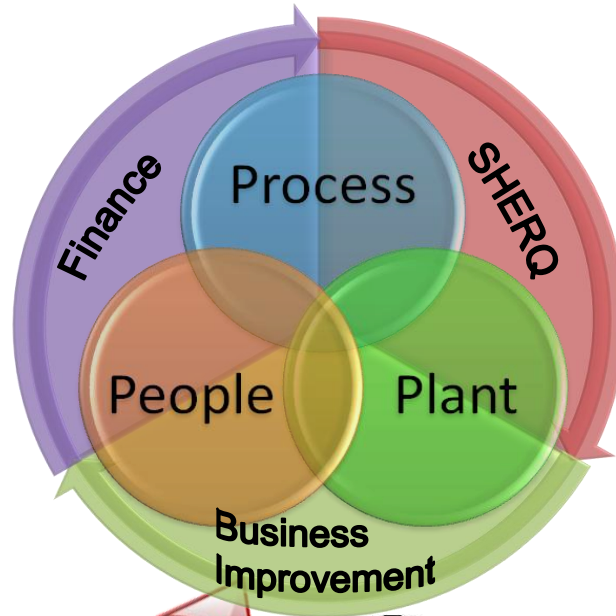
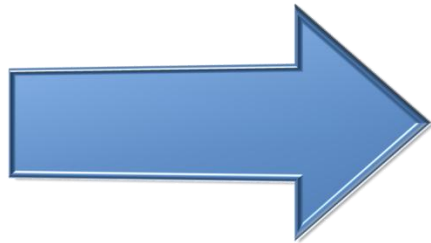
Grow down the cost curve through asset optimisation and growth

# Process Division: Operating Model

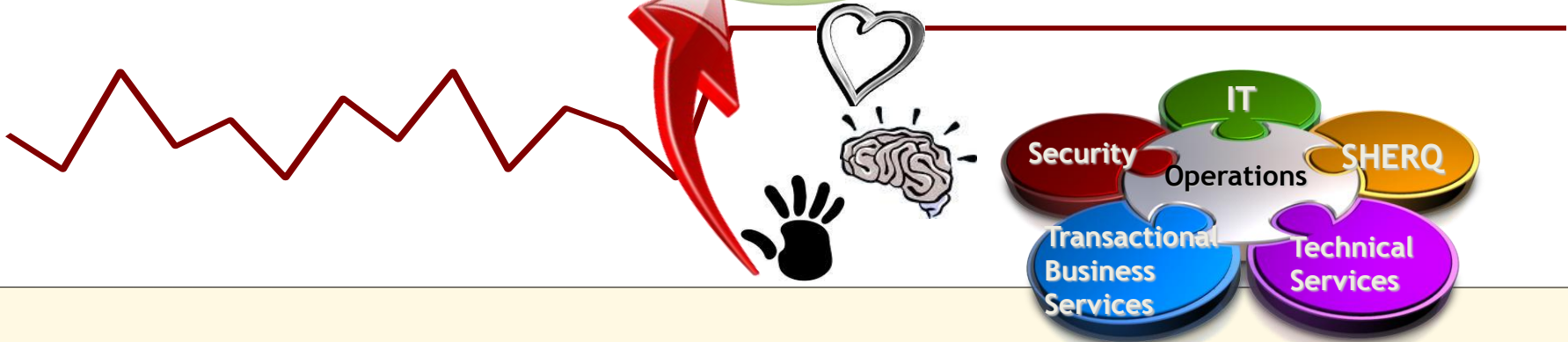
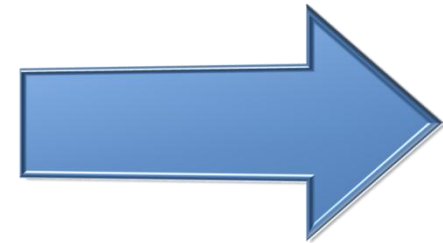
“Unlocking the Value”



Supplier:  
Mining Operations

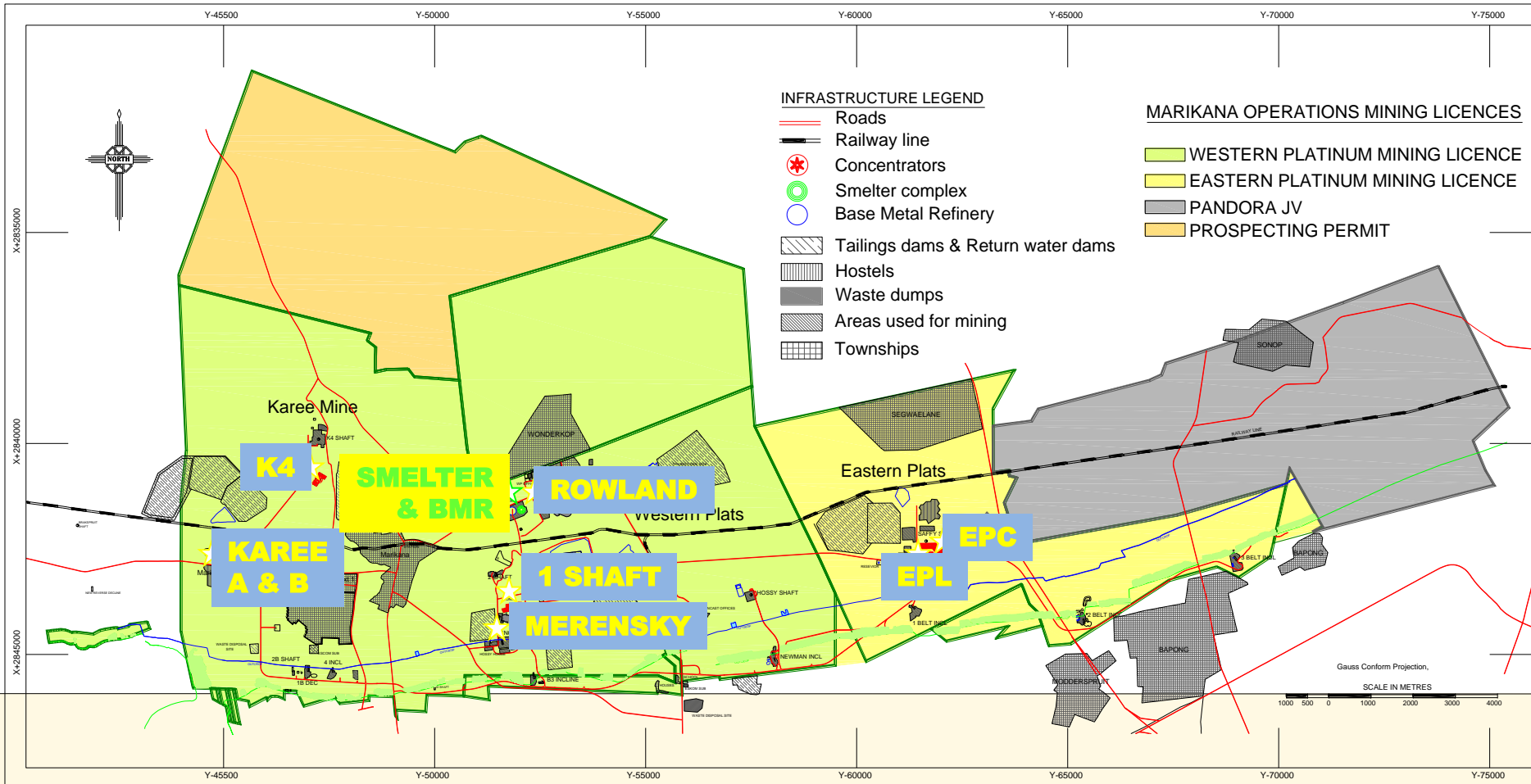


Customers:  
Pt, Pd, Au, Rh, Ru, Ir



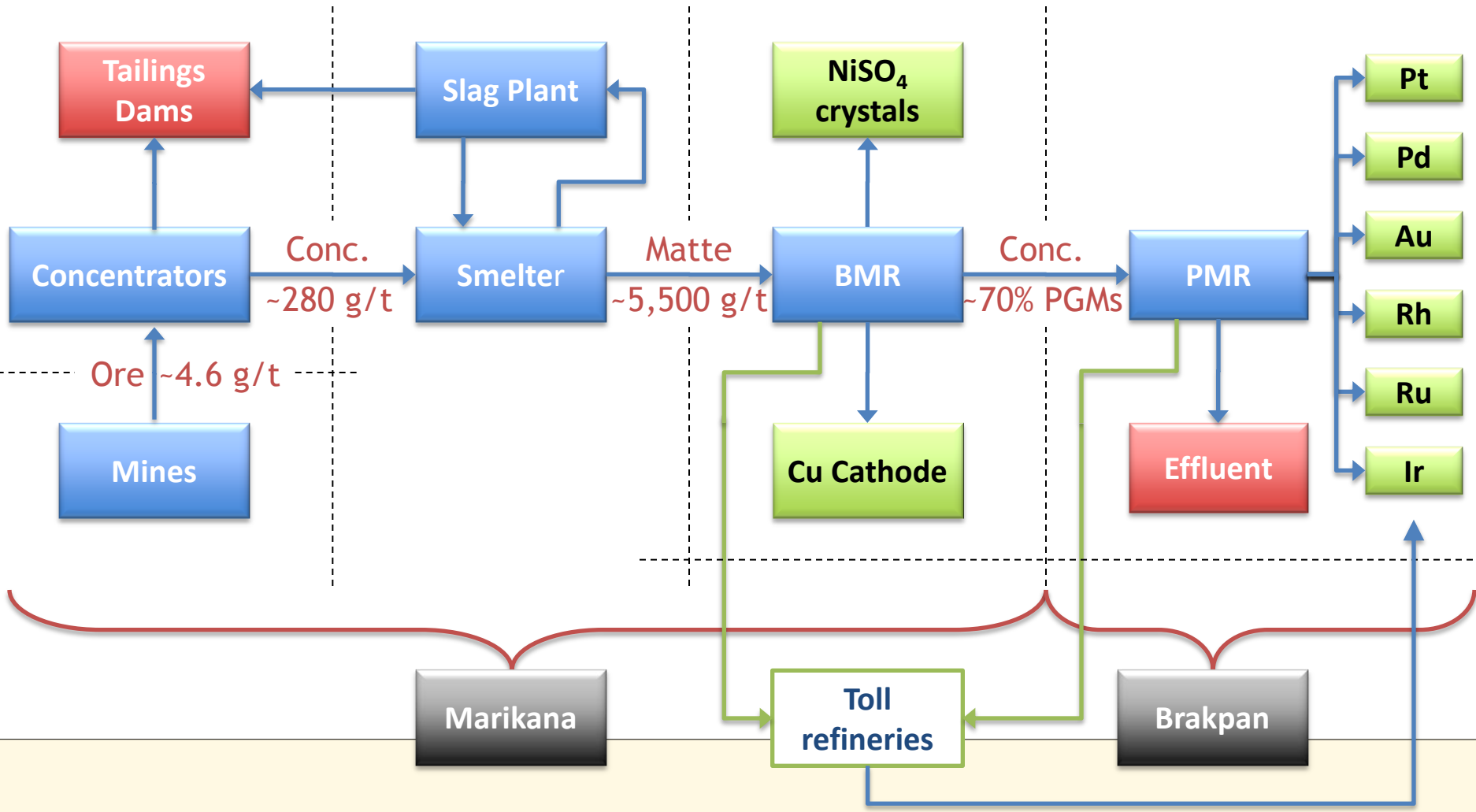
# Process Division

## Map



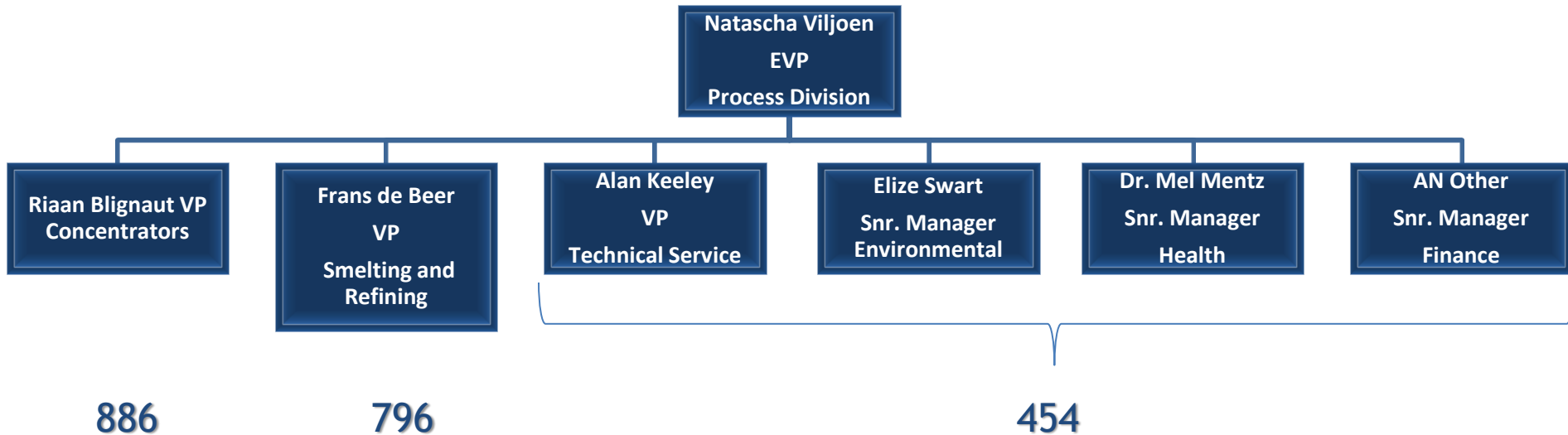
# Process Division: Overview

## Flow Chart



# Process Division: Overview

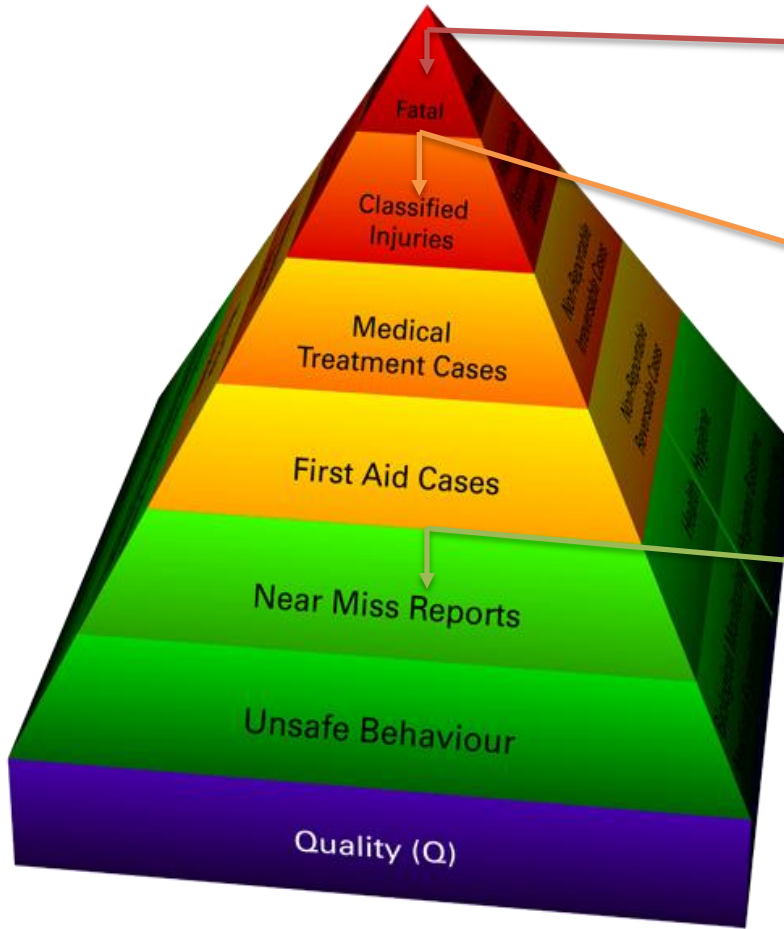
## Structure



### Experience Base of the Team

- Consistent +3 years
- Combined experience in the mining industry (96 Years, Management team only)
- Unique experience in unlocking value from UG2 ores

# Process Division: Safety Strategy



**Fatality Prevention**

- FRCP
- MOC
- Cross site audits
- Critical procedures
- Forward energy module
- Safety Toolbox

**Injury Prevention**

- SIR's and ICAM's
- SOP
- PTO
- Risk assessment and PTW
- Contractor management

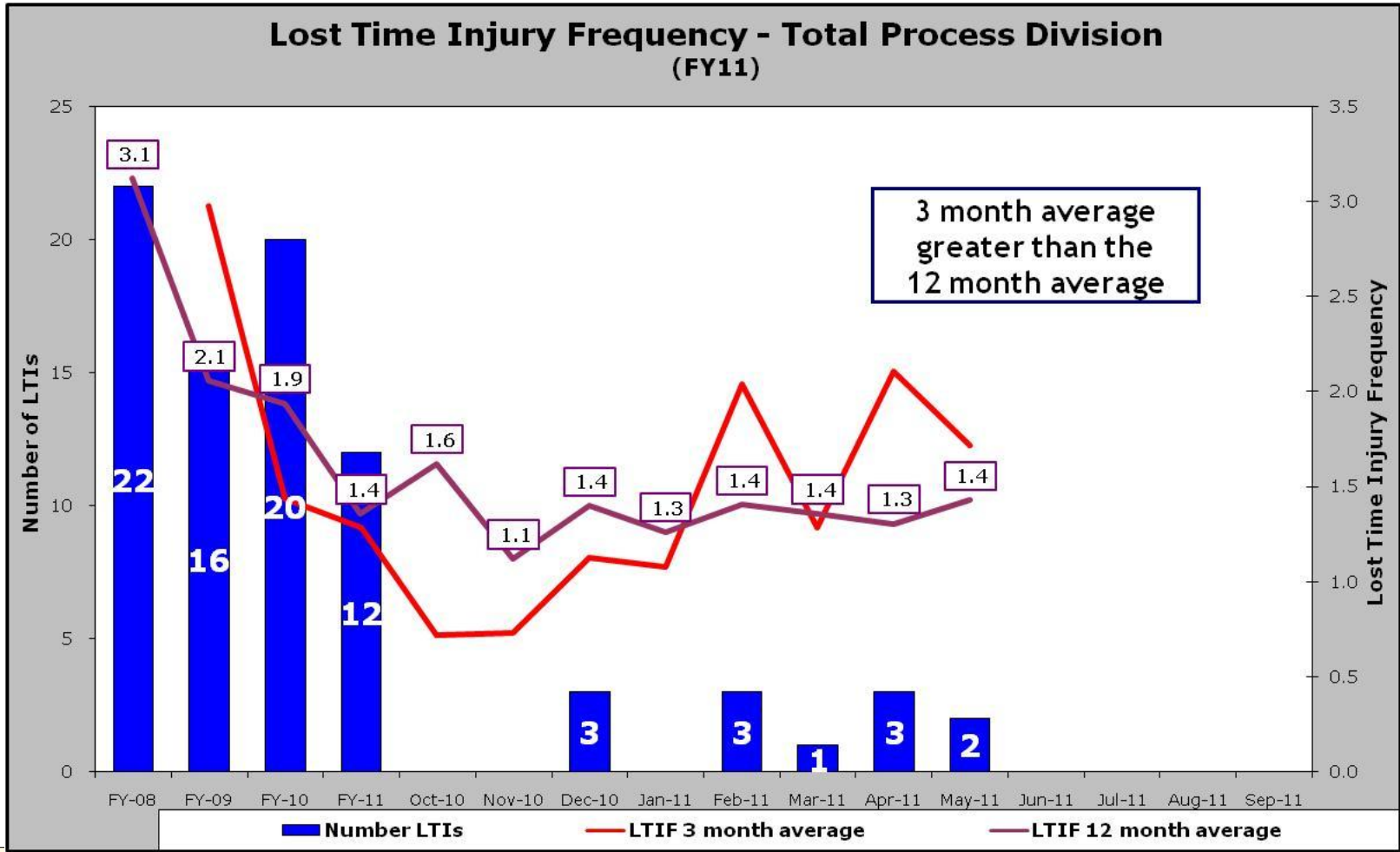
**Safety Culture change**

- Near miss reporting
- SBO
- LSBO
- Safety pauses
- Incident reporting and investigation
- Red stop cards and life rules
- Training



# Process Division: Safety

## Lost Time Injury Frequency



### Highlights

Between 34 days and 1 894days LTI free

ISO 14001(All), ISO 18001 (Smelter, Refineries and laboratory) and ISO 9000 (PMR)



# Process Division: LOBP

# Process Division: LOBP

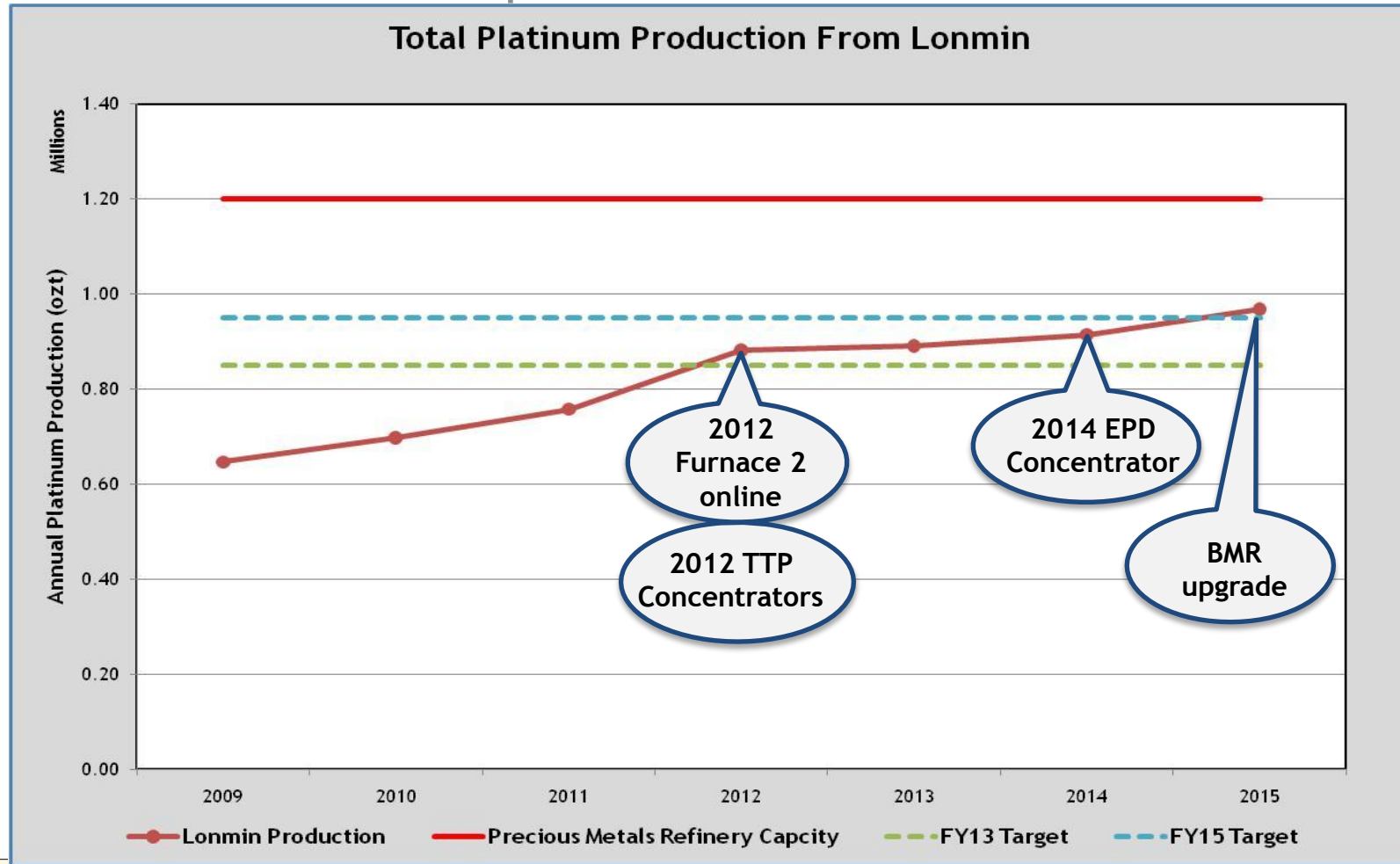
## Process Division Expansion



- **Additional Concentrator capacity by 2014**
- **Concentrator asset optimisation**
- **Invest in additional capacity at the Smelter including:**
  - Furnace capacity upgrade
  - SO2 plant optimisation
- **Upgrade the BMR for additional capacity**
- **Modifications to the PMR for extra throughput**

# Process Division: LOBP

## Process Division Expansion: Pt Profile

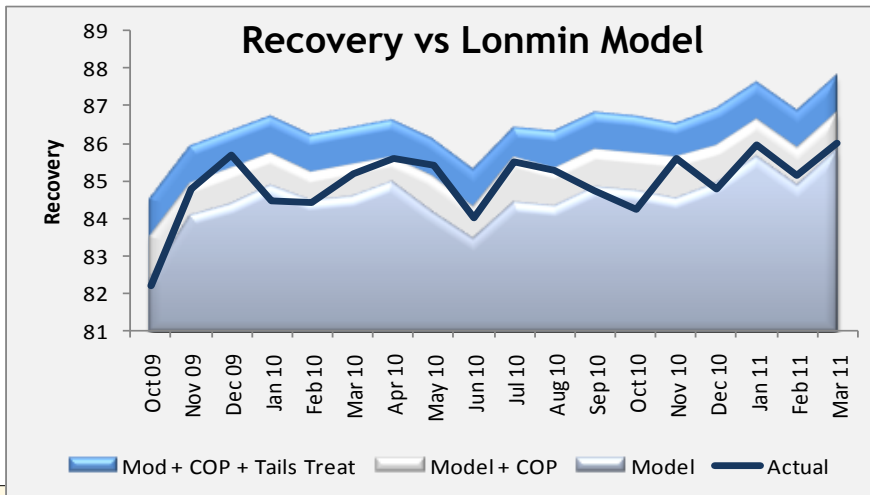
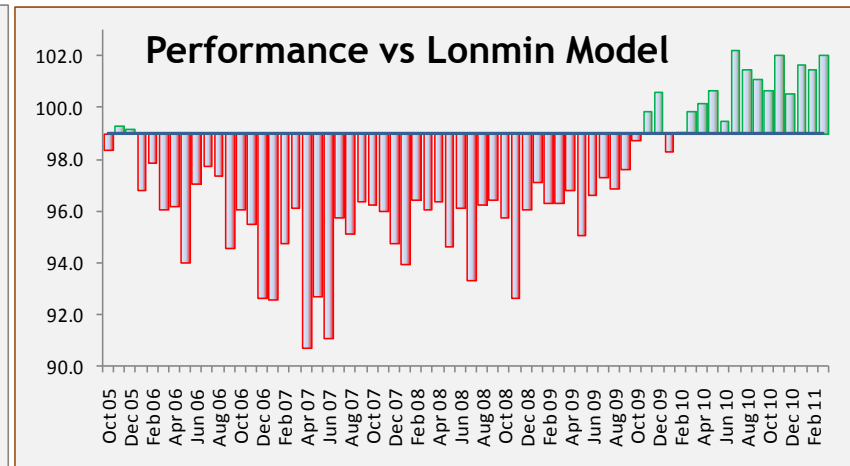
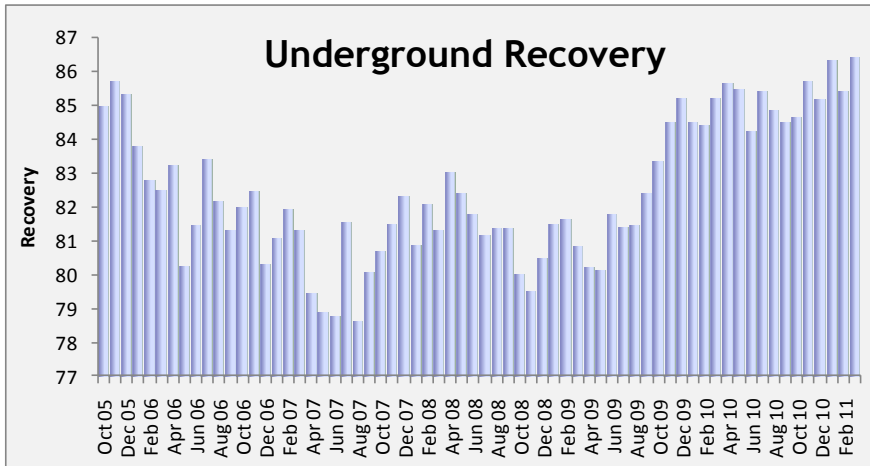


# Concentrators



# Process Division: Concentrators

## Performance against Lonmin Model



	Overall Recovery	Pt Oz Sold from Additional Recovery
FY 08	79.02	
FY 09	79.79	6,632
FY 10	84.68	46,412
FY 11 YTD Mar	85.40	26,511

# Process Division: Concentrators

## Chrome Plants



	Commissioned	Chrome Production FY11 (Kt)	Chrome Production FY12 (Kt)
Xatrata (Rowland)	April 2011	172	445
Xatrata (K4)	June 2011	85	265
ChromTech (K3)	June 2011	50	215

**Commissioning of Xstrata Chrome Plant at Rowland**

# Process Division: Concentrators

## Achieving LOBP

LONMIN

- **TTP (Tailings Treatment Plant) EPC**
  - **Objective** – ETTP to retreat tailings arising from current operations on the eastern concentrators post chrome removal
  - **Benefits** include a 2% recovery increase resulting in 10 kozt additional PGMs
  - **Full production in H2 FY12**





# Smelting & Refining



# Process Division: Smelter

## No. 1 Furnace Design Achievements (2008 – 2010)



- **Copper cooler corrosion reduced**

Installation of graphite in high corrosion area performed well

- **Matte tap block movement controlled**

Movement during last two ramp-up as per design

- **Tap block life increased**

Additional taphole assisted in spreading the load increasing the time between deep repairs

Area above tap hole more maintenance friendly

- **Online pressure test system performing well**

Detection of small water leaks leads to safer furnace operation



## **Process Division: Smelter**

### No. 1 Furnace Remaining Challenges before Nov 2010

- **High operating temperatures**
- **Furnace movement**
- **Low matte buffer zone**
- **Mushy layer formation and Chrome build-up**

## **Process Division: Smelter**

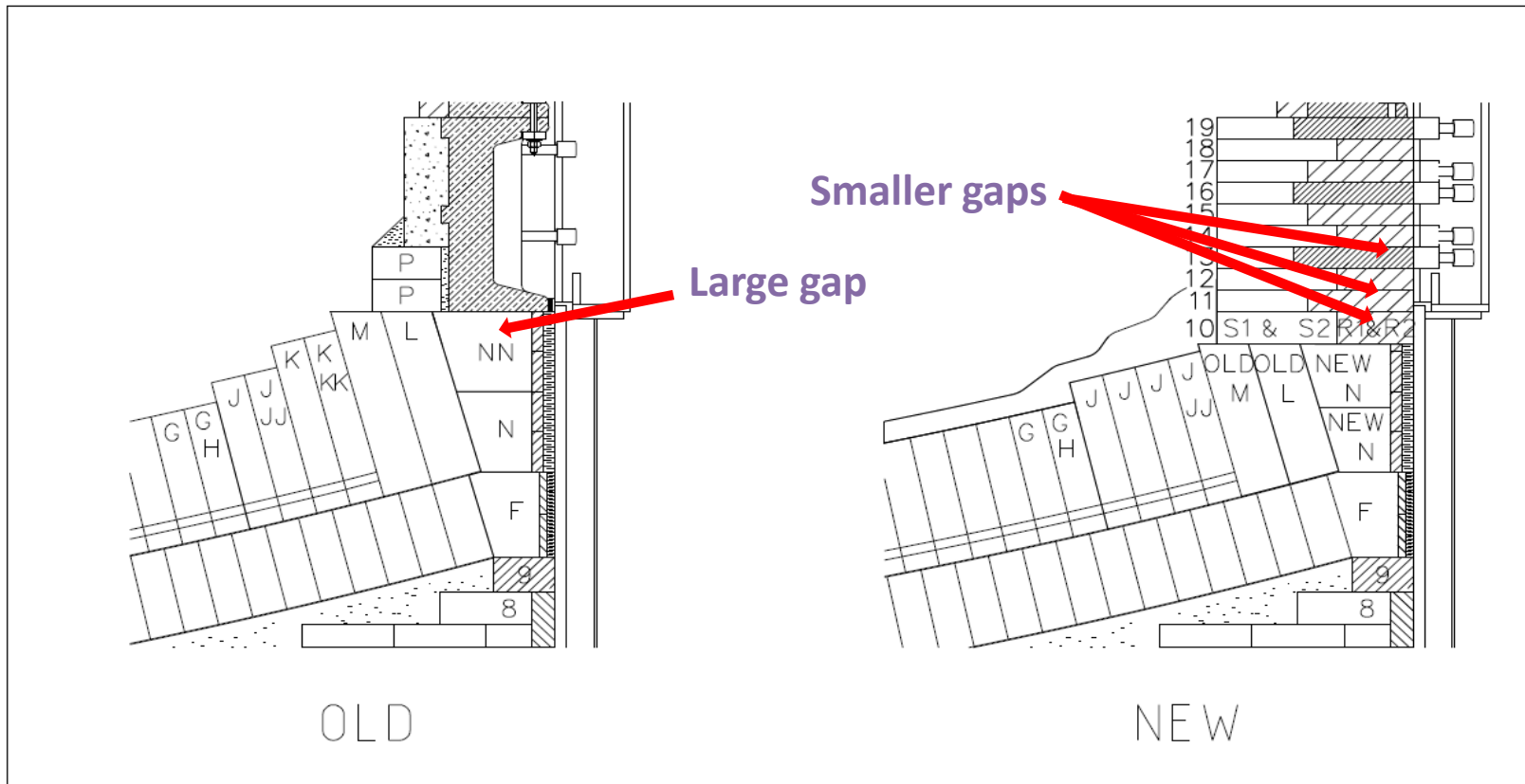
### No. 1 Furnace Design Intent (Nov 2010)

- **Reduce the risk of gap formation**
- **Increase buffer zone for matte level control**
- **Limit skew disturbance during refractory repairs**
- **Ease of Lintel cooler change during deep tap hole repair**
- **Ability to with stand mushy layer effect**

# Process Division: Smelter

## No. 1 Furnace Design Intent

- Decrease the risk of gap formation



**Replace lower waffle cooler ring with refractory and plate coolers**

Allow side wall to move more freely as skew rotation and movement occurs

Gap formation is distributed over a larger area

# Process Division: Smelter

## No. 1 Furnace Design Intent

- Decrease the risk of gap formation



**Replace lower waffle cooler ring with refractory and plate coolers**

Allow side wall to move more freely as skew rotation and movement occurs

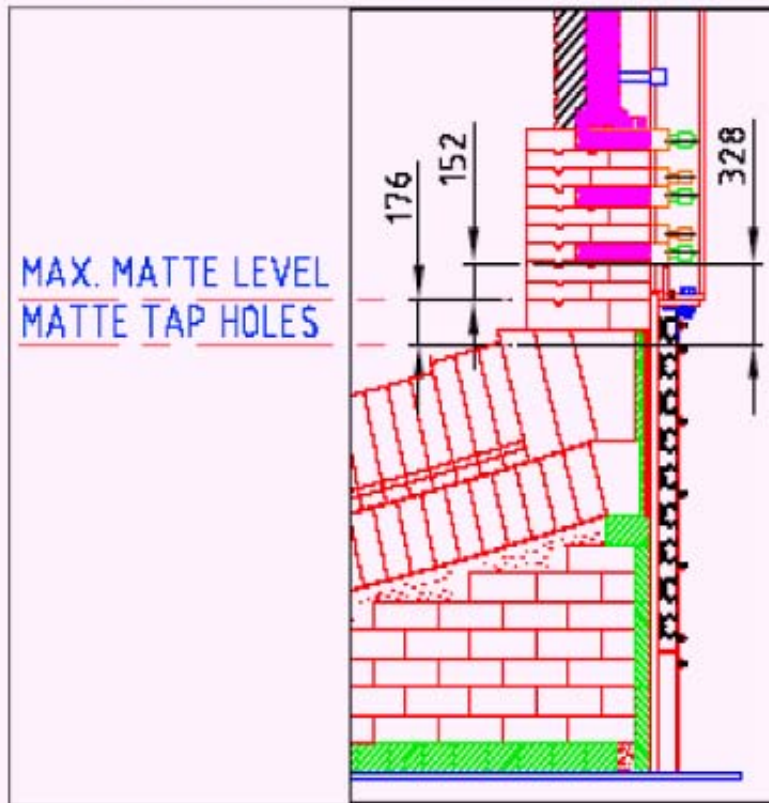
Gap formation is distributed over a larger area

# Process Division: Smelter

## No. 1 Furnace Design Intent



- Increase buffer zone for matte level control



**Copper cooling is moved up by 152mm**

Allowance for safety buffer during process upset conditions

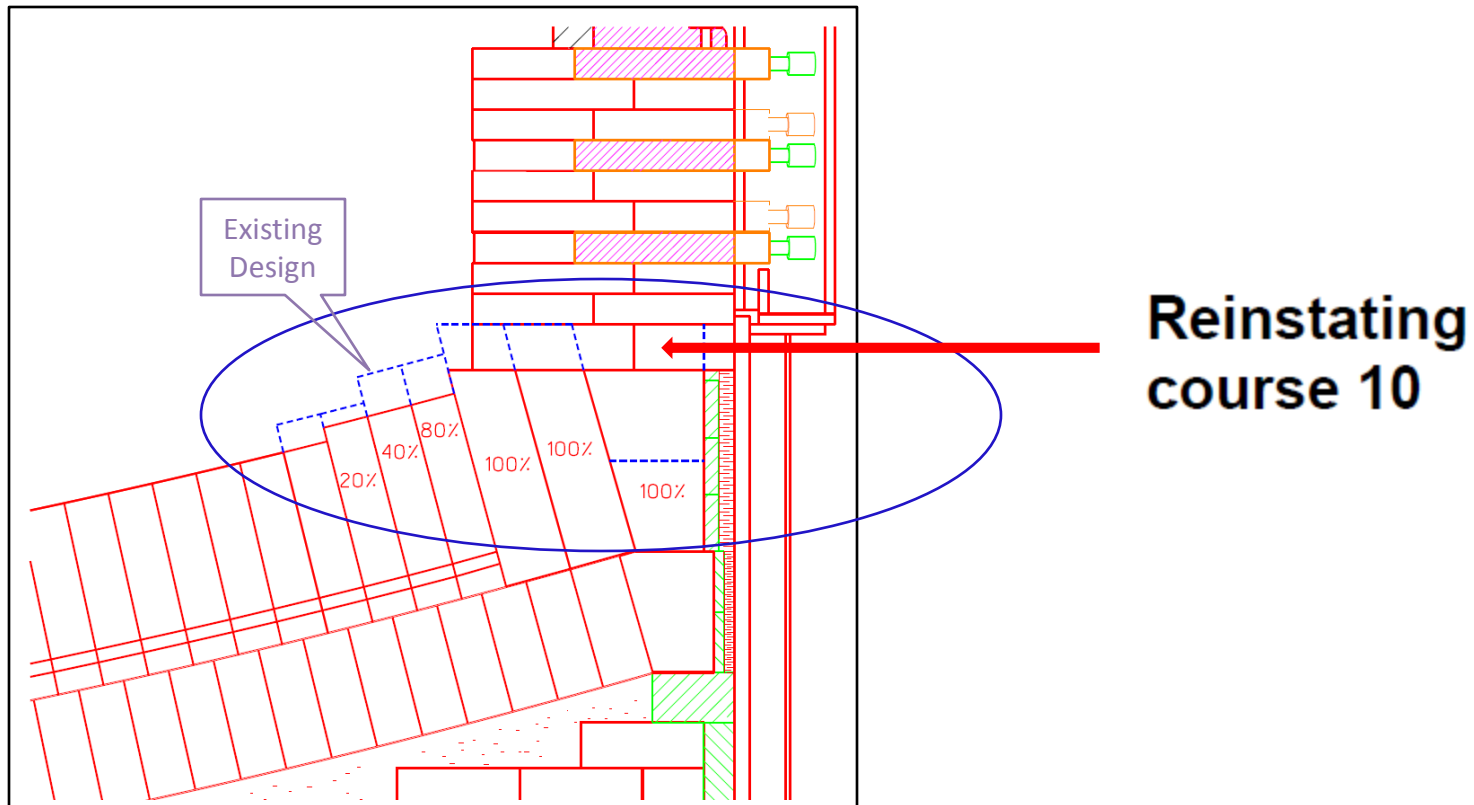
Copper cooling is now higher than previously

# Process Division: Smelter

## No. 1 Furnace Design Intent



- Limit skew disturbance during refractory repairs



### Change skew design to accommodate a replaceable section

The matte/slag tidal zone will fall in the area of the first row of barrel refractory  
Will be able to replace first row without disturbing the skew refractory



# Process Division: Smelter

## No. 1 Furnace Design Intent



- Limit skew disturbance during refractory repairs



Nov 2008-Oct 2010 skew design

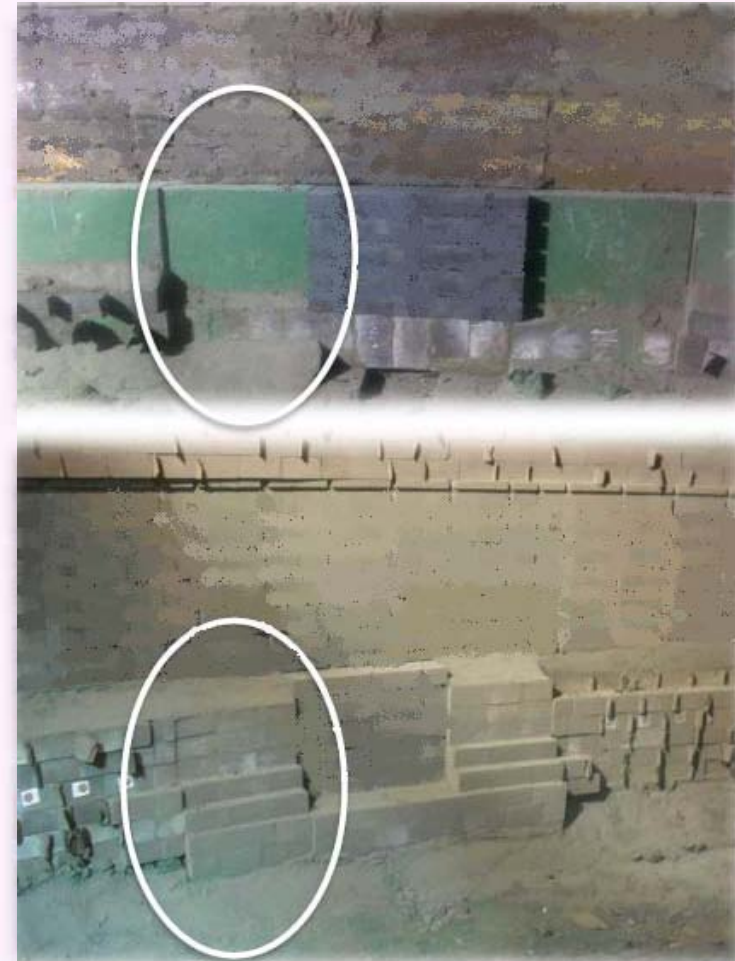
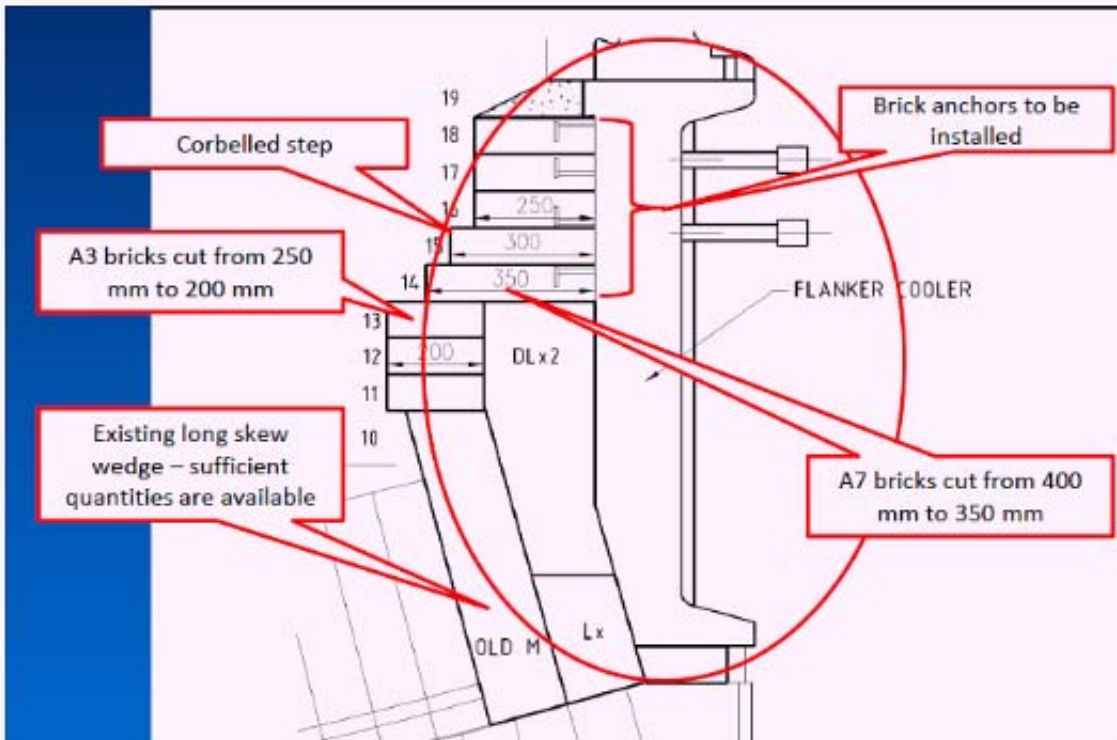


Space for course 10

# Process Division: Smelter

## No. 1 Furnace Design Intent

- Ability to with stand mushy layer effect



**Replace castable with refractory bricks in tap hole areas**

Remaining lower waffle cooler elements will be protected by refractory and replaced

# Process Division: Smelter

## No. 1 Furnace Shutdown Overview

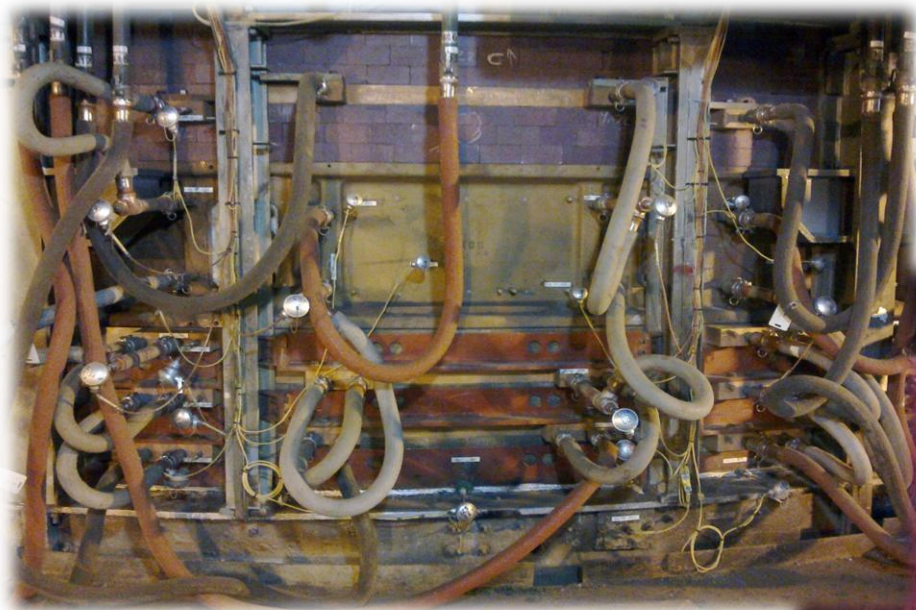
LONMIN

- Sidewall and furnace preparation



# Process Division: Smelter

## No. 1 Furnace Start-up



# Process Division: Smelter

## No. 1 Furnace Performance



- **Matte temperatures under control**
- **Furnace movement as per design intent**
- **Lintel cooler area behaving (only one spike so far)**
- **Gap formation noticed at higher elevations**
- **Tidal zone temperatures still stable**
- **Increase matte buffer zone helped with high % matte fall**

# Process Division: Smelter

## Furnace Operating Strategy



- **High operating temperatures**
  - Matte temperatures to be controlled by immersion and blend control
- **High matte level risk**
  - Matte tap holes are slaged once a week and matte level predictor zeroed
  - Power down if in doubt of high matte level
- **Power set point**
  - Furnace to be operated at 15MW max after rebuild
  - Furnace power would be dictated by fines in feed or operating temperatures
  - Excess concentrate to be smelted with Pyromet furnaces

## **Smelting and Refining: Furnace 2**

# Process Division: Smelter

## Furnace 2 Introduction



- **Project Feasibility study completed in Sep 2010**
- **Furnace supplier selected is Tenova Pyromet**
- **Project Execution started Oct 2010**
- **Also a round furnace incorporating lessons learnt on Furnace 1**
- **Old Merensky furnace was demolished and area used**



# Process Division: Smelter

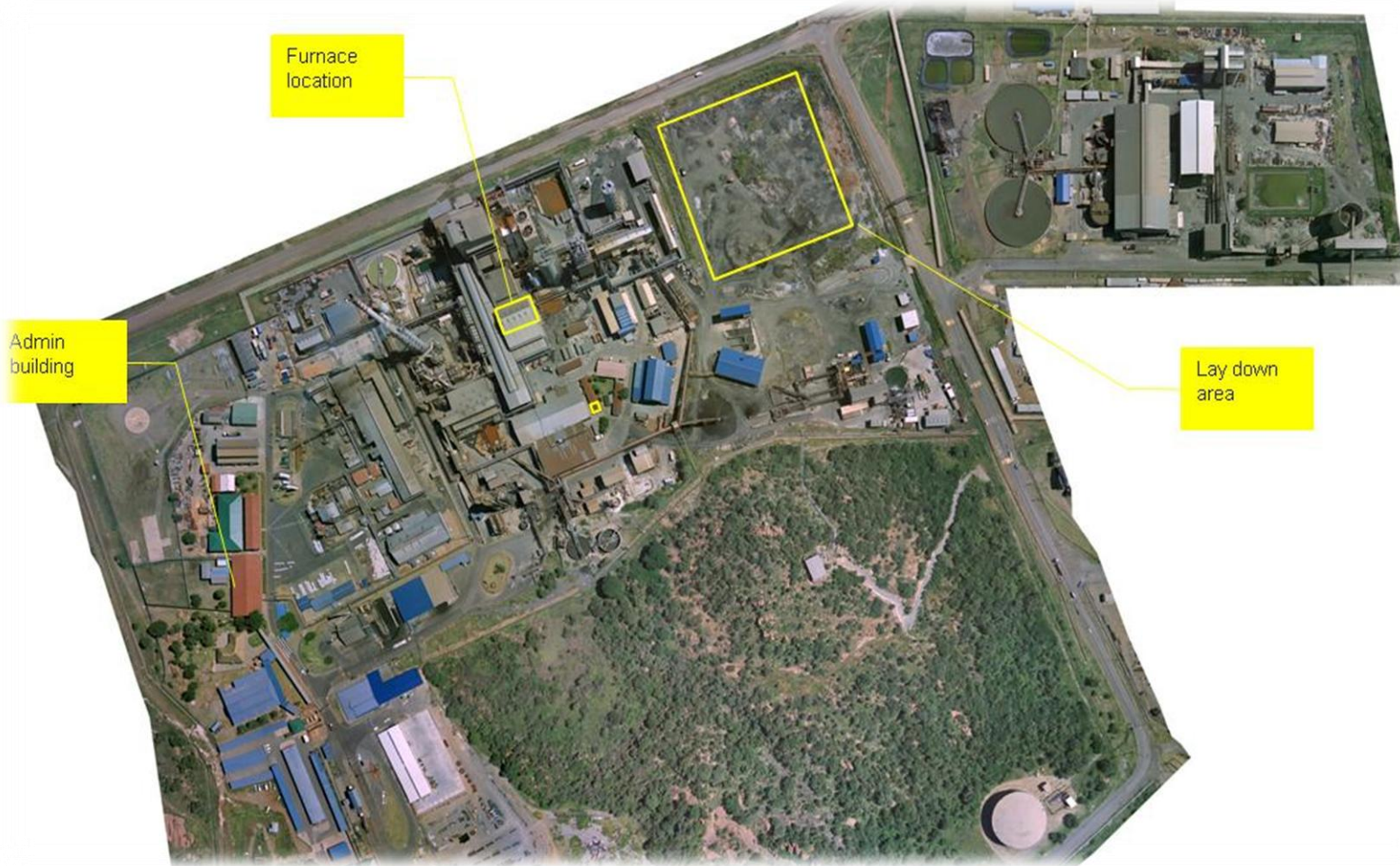
## Furnace 2 Project Schedule



- **Schedule**
  - Current project forecast is on schedule and will finish in May 2012
  - Major demolition is complete
  - Civil and structural work has commenced.
  - All major components have been ordered
- **Budget**
  - Overall budget still on target for approved value of R354 m

# Process Division: Smelter

## Furnace 2 Location

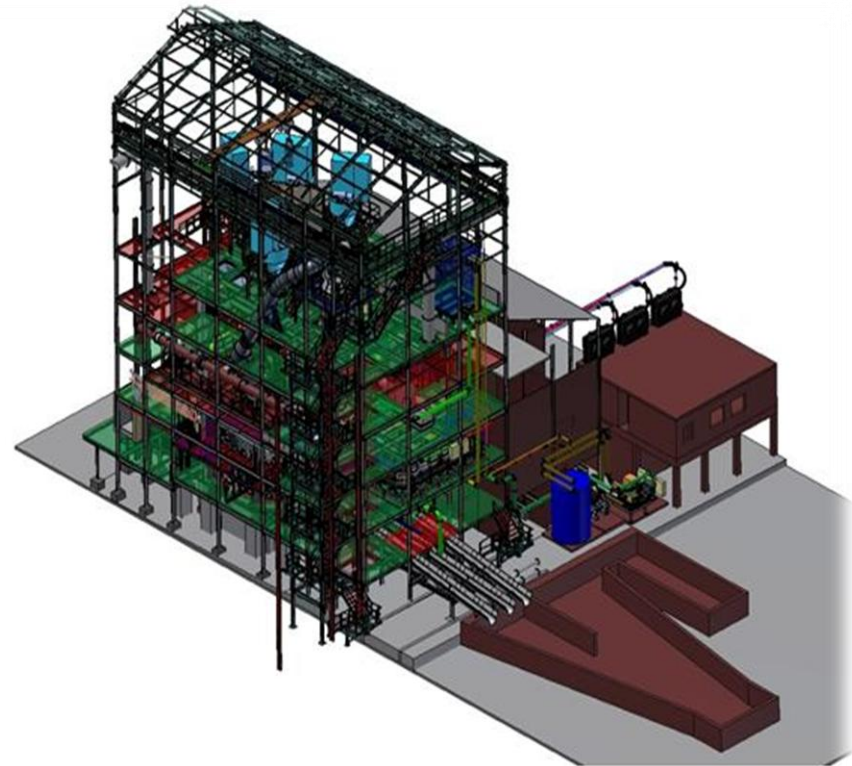


# Process Division: Smelter

## Furnace 2 Location



Shell



Overall layout

# In Closing



- **Safety remains a priority**
- **On track to achieve growth**
- **A robust company with growth, scale and a strong balance sheet**
- **Integrated strategy to develop attributes required for success**
- **Further opportunities beyond Marikana**