



## **Facility visit**

**September 2007**

# Agenda



**Safety**



**Ore body**



**Mining methods**



**Production**



**Operating costs**



**Capital expenditure**

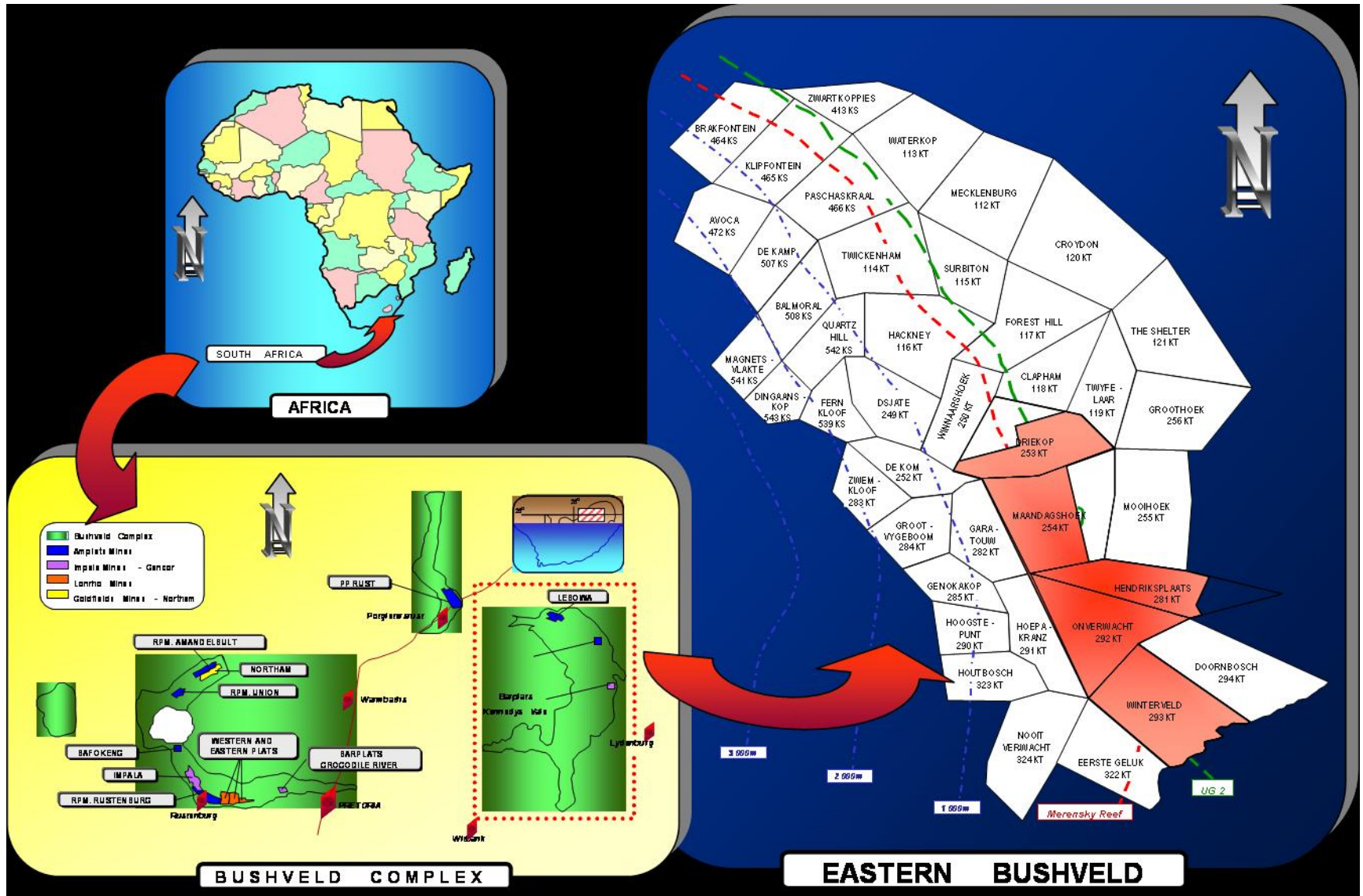


**Human resources**

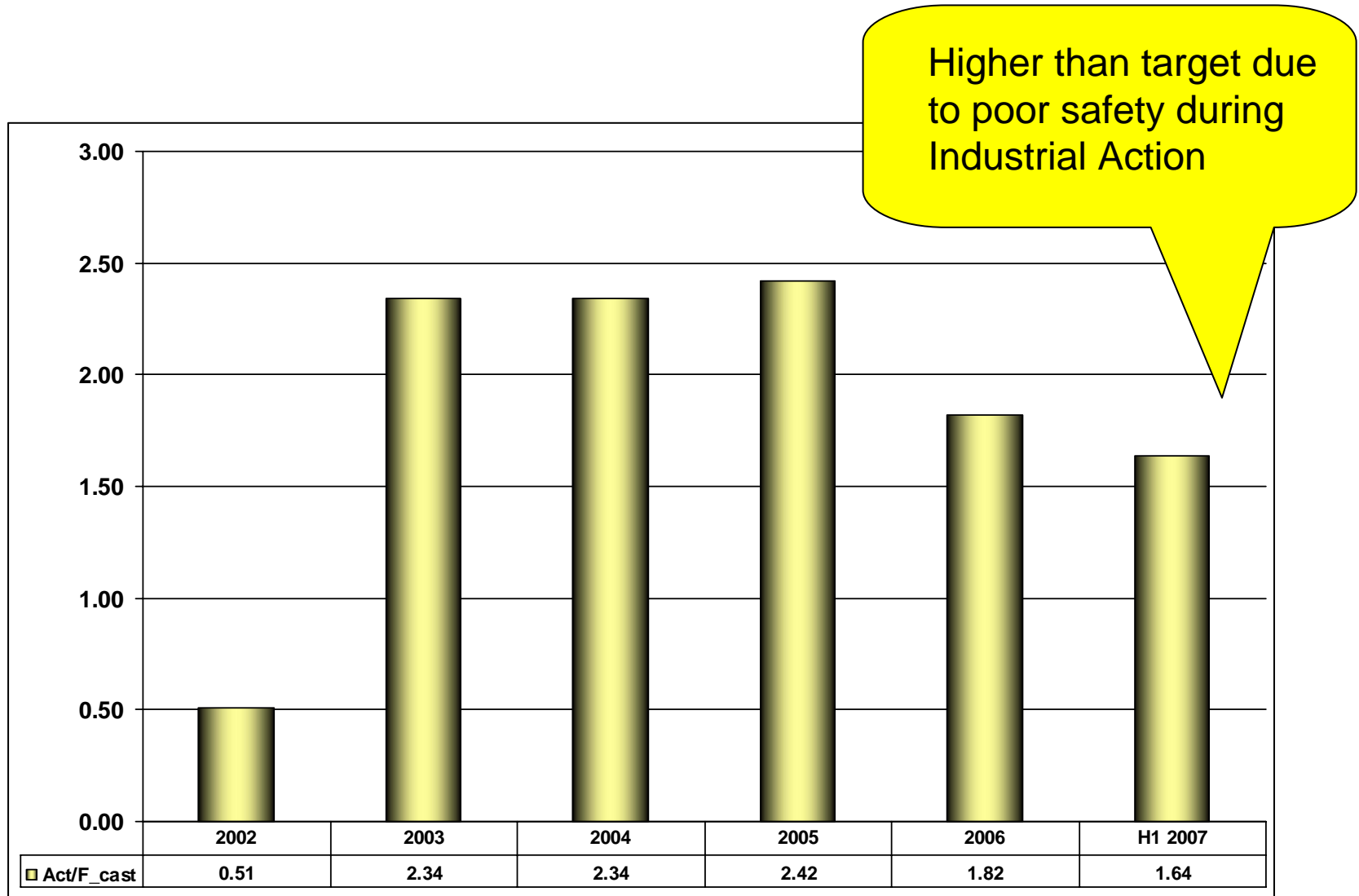


**Key business issues**

# Locality – Modikwa Platinum Mine



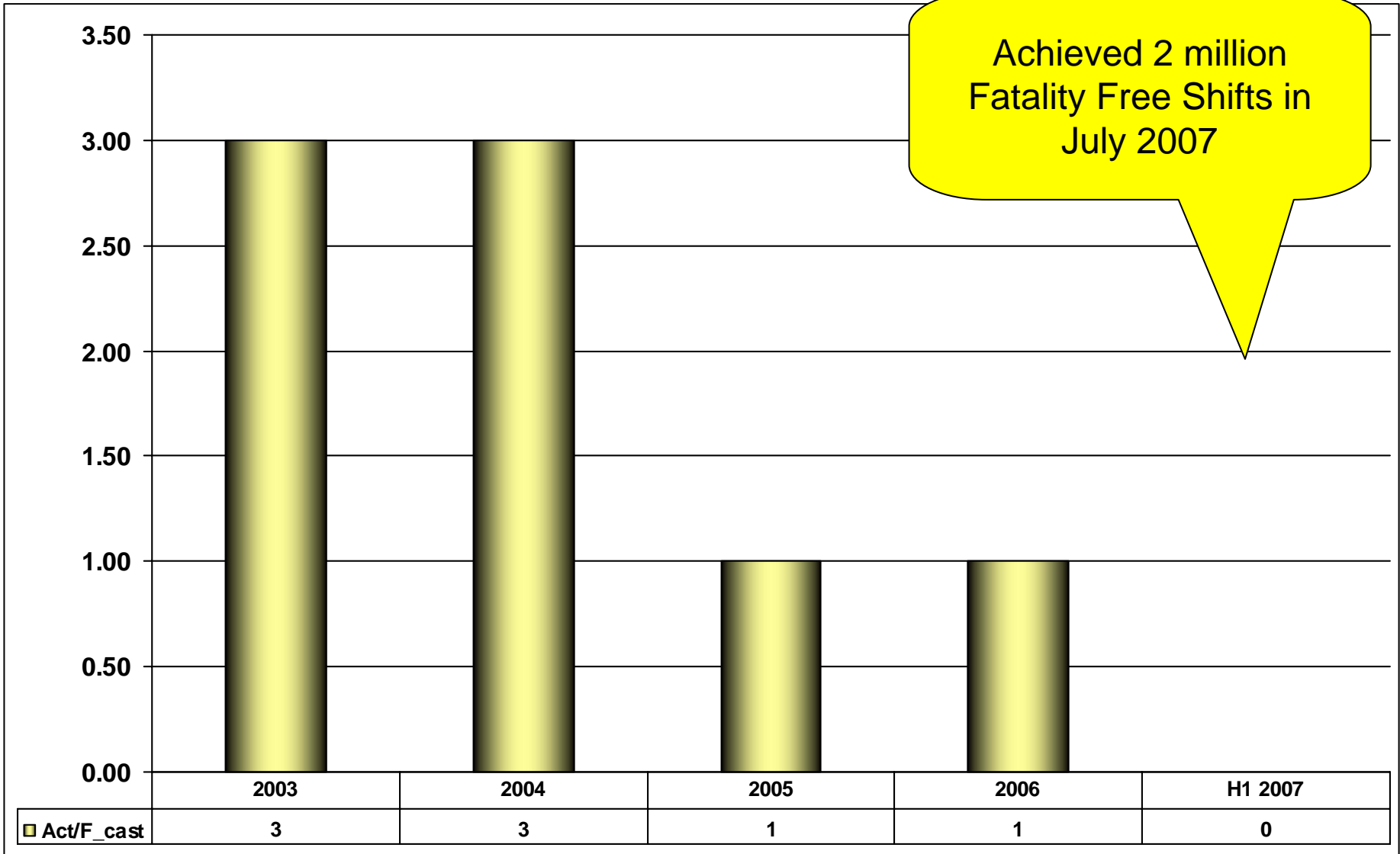
# Lost time injury frequency rate



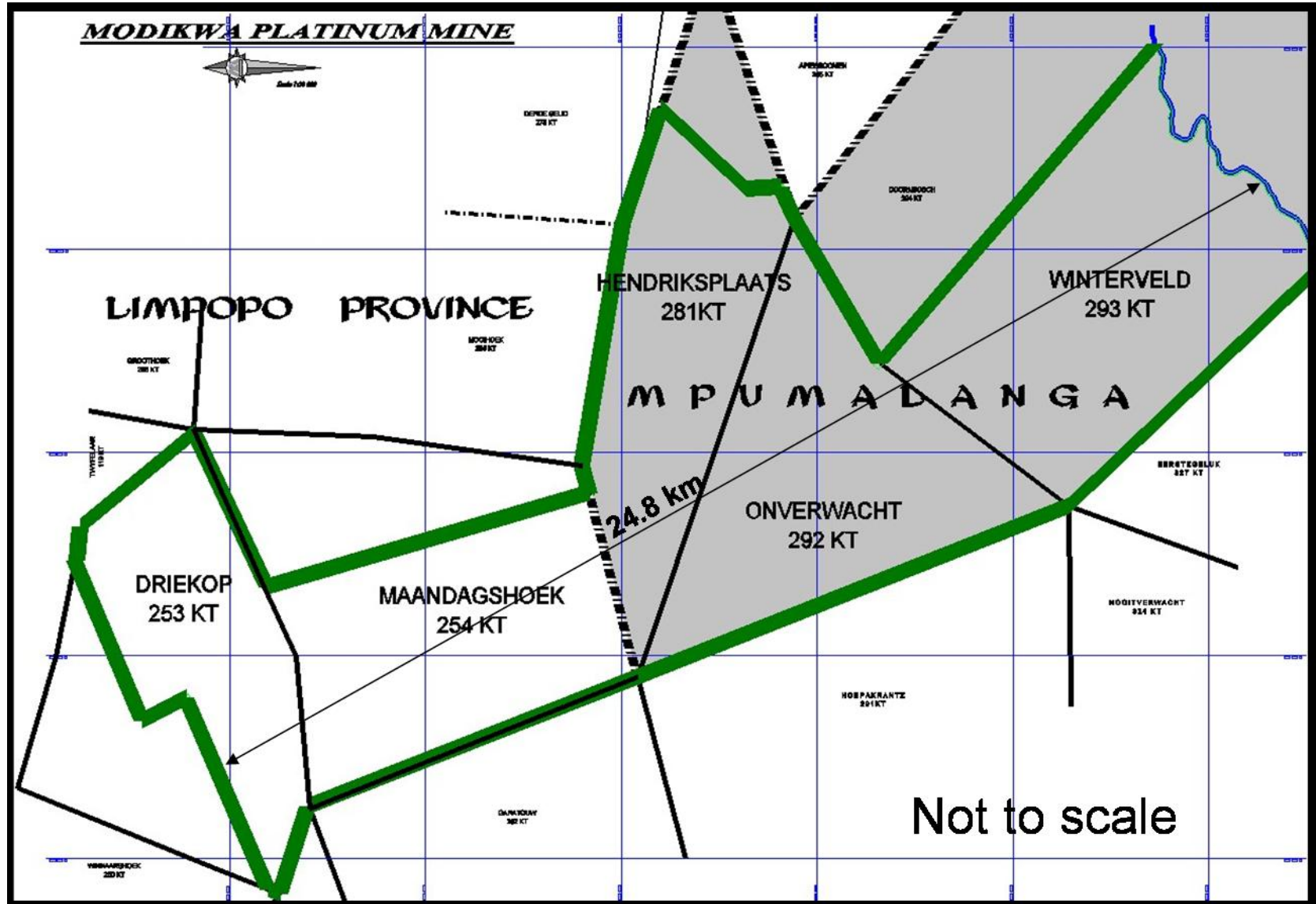
- Safety programs are aimed at continuous improvement to achieve zero accidents

# Fatalities

Achieved 2 million  
Fatality Free Shifts in  
July 2007



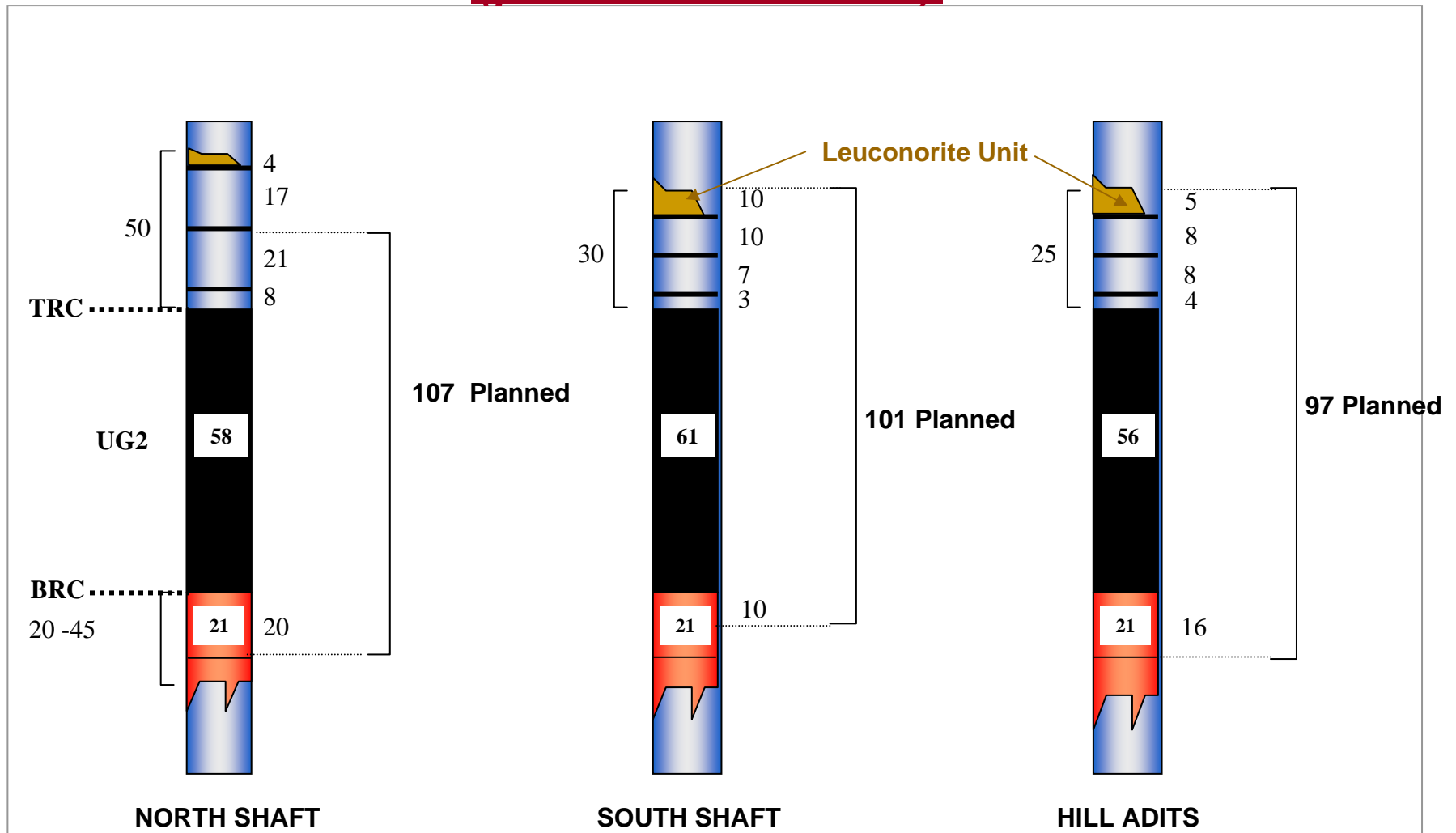
# Modikwa Platinum Mine – lease area



■ Mpumalanga Province

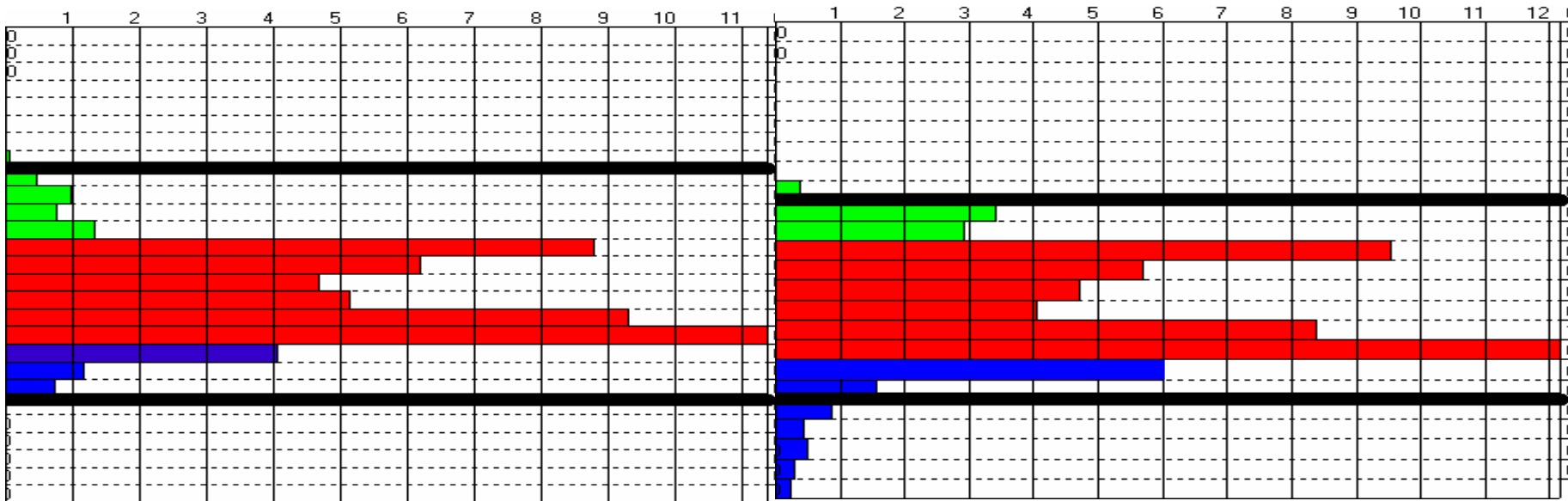
Total lease area 14 278 ha

# Optimal Stopping Cut (per shaft area)



❖ Mine average planned at 102 cm – Currently 103cm

# Vertical grade distribution in UG2



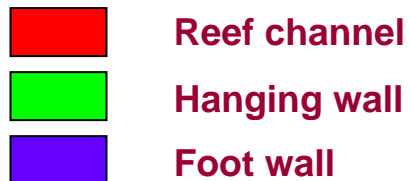
North Shaft

South Shaft

Average g/t 4E: North 5.91

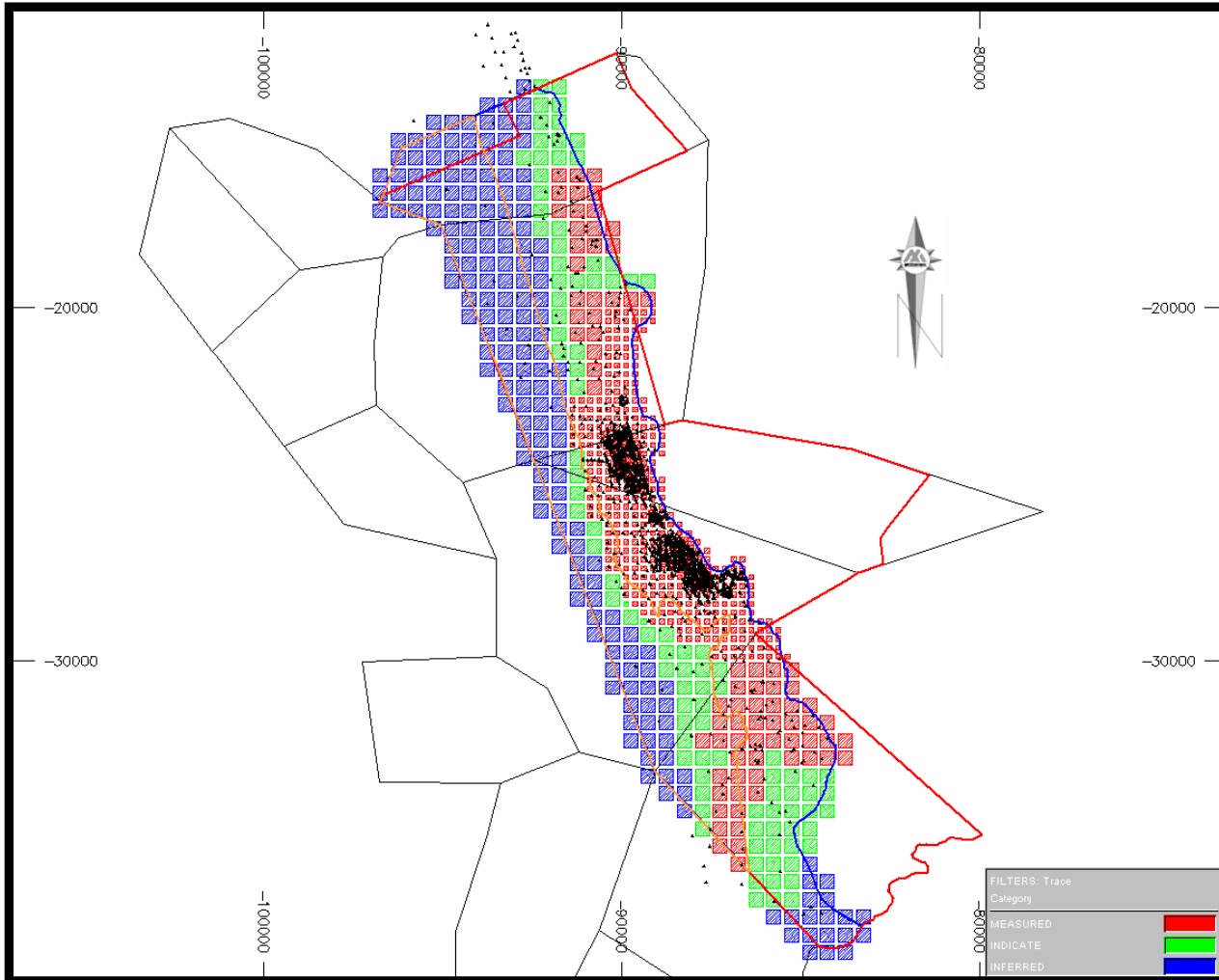
South 5.86




Total 5.89





# 2006 UG2 resource categories (Data Mine model)



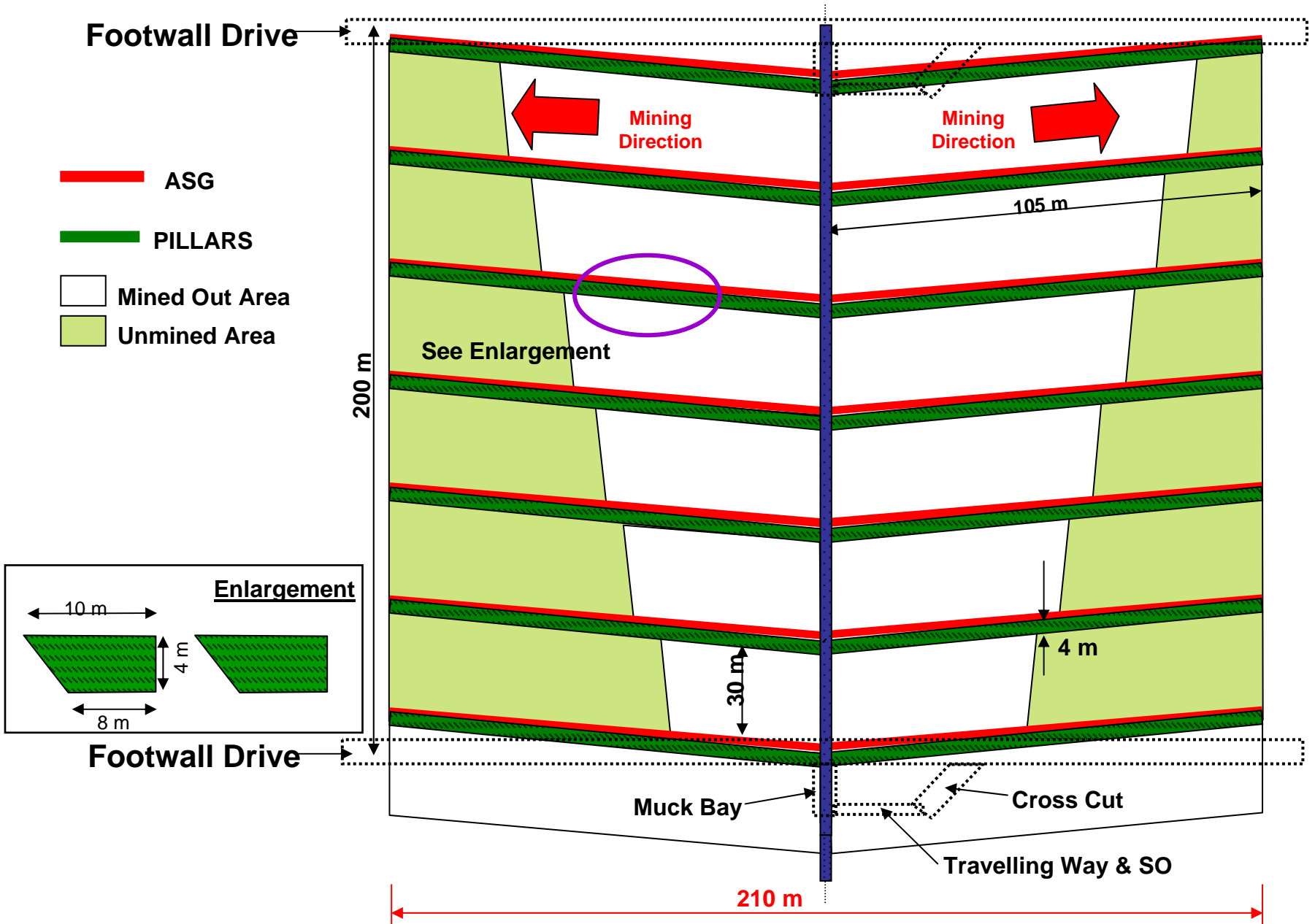
-  **Measured Resource**
-  **Indicated Resource**
-  **Inferred Resource**

## Resource Classification – Tonnage 100 % JV (Millions)

	Merensky	UG2	Total
Measured	18.7 (8.6%)	68.5 (30.1%)	87.2 (19.6%)
Indicated	46.8 (21.5%)	62.8 (27.6%)	109.6 (24.6%)
Inferred	152.0 (69.9%)	96.1 (42.3%)	248.1 (55.8%)
Total	217.5	227.4	444.9

- Excluding proved and probable ore reserves
- Resource discounted for Geological losses

# Breast stoping layout with footwall development

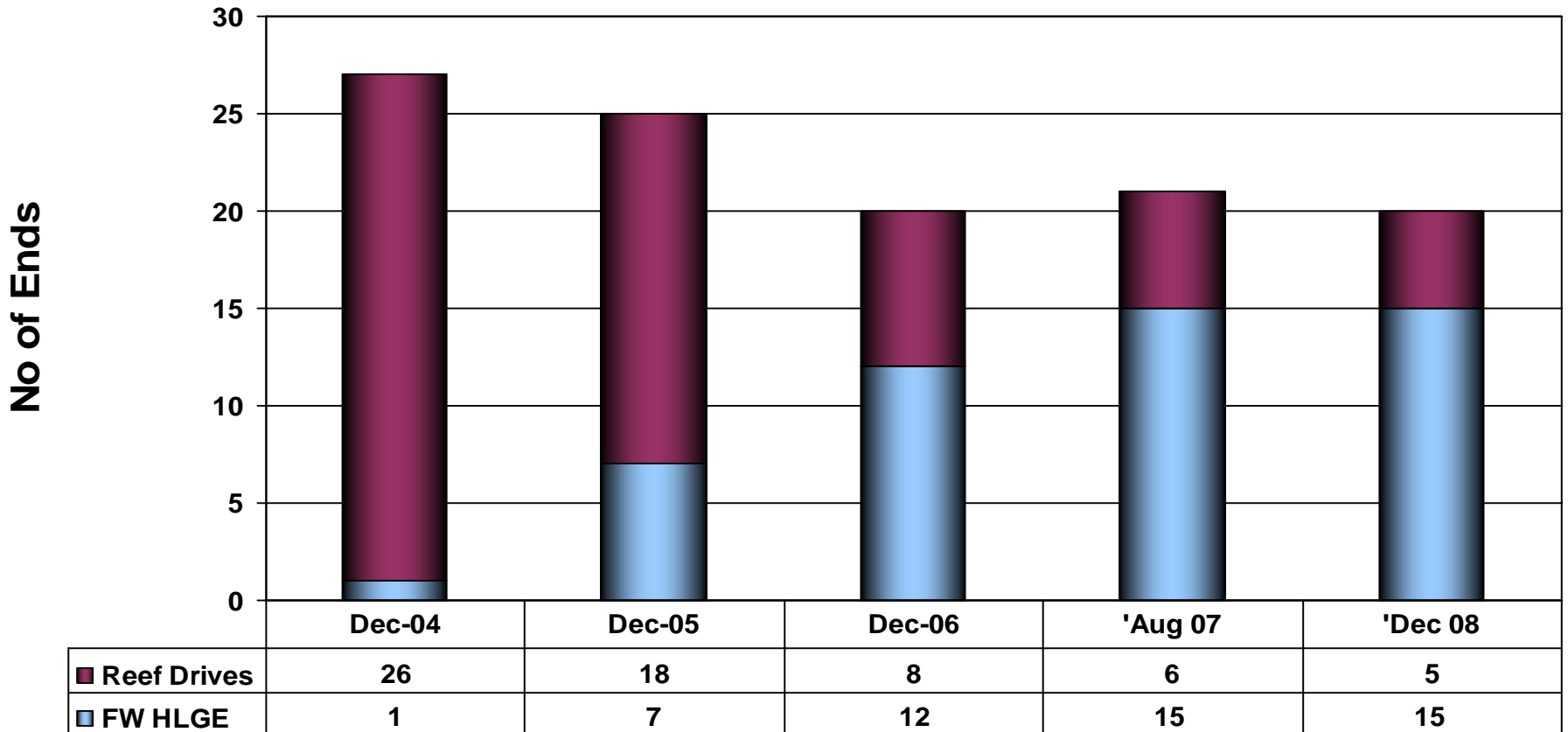


**Final Layout**

# Modikwa Development Ends

## Large Ends – Reef Drives vs Footwall Drives

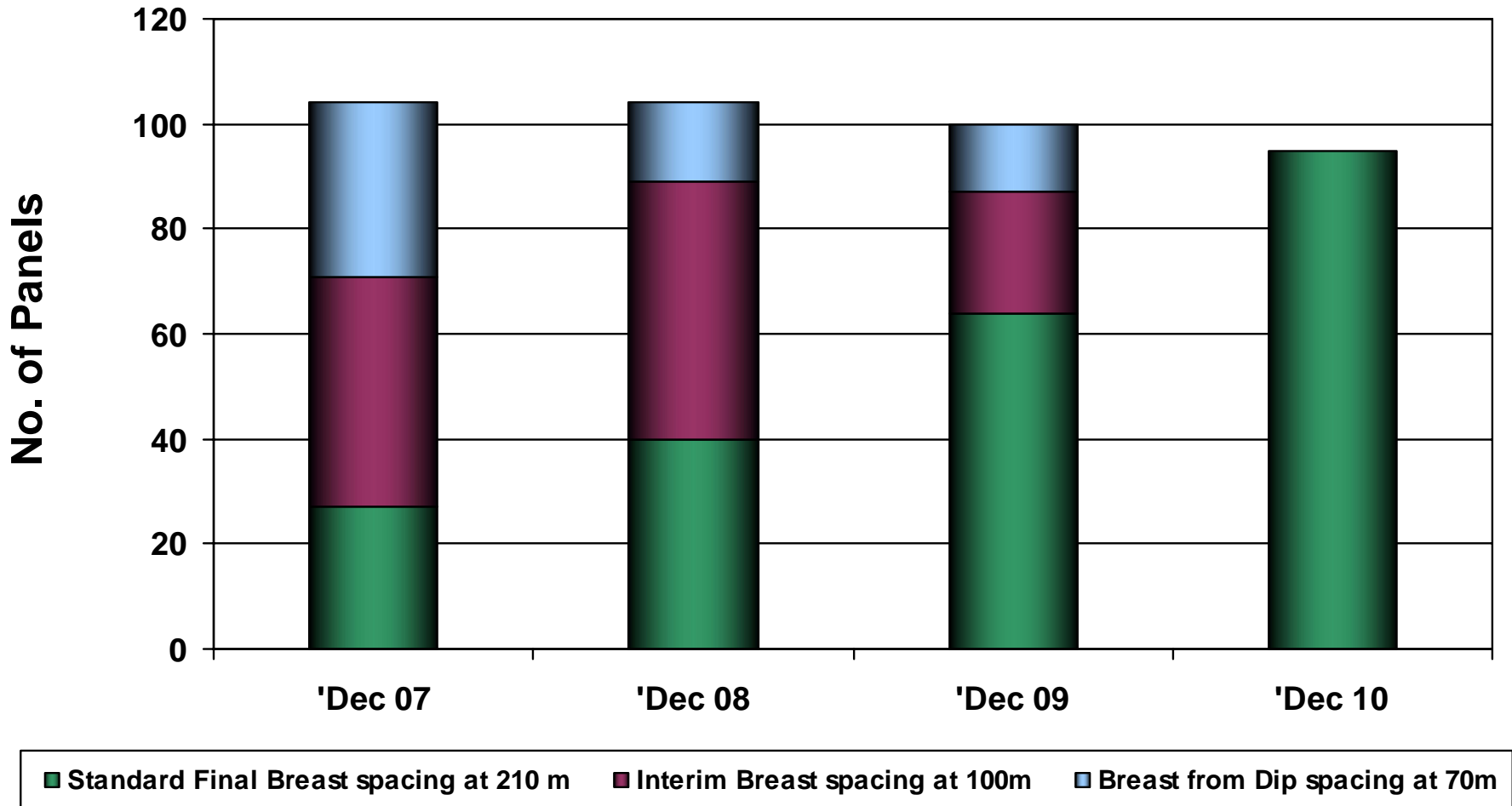
Move from Reef Drives to Footwall



- All large ends will be in footwall by 2010

# Modikwa

## Conversion from Dip to Breast Mining



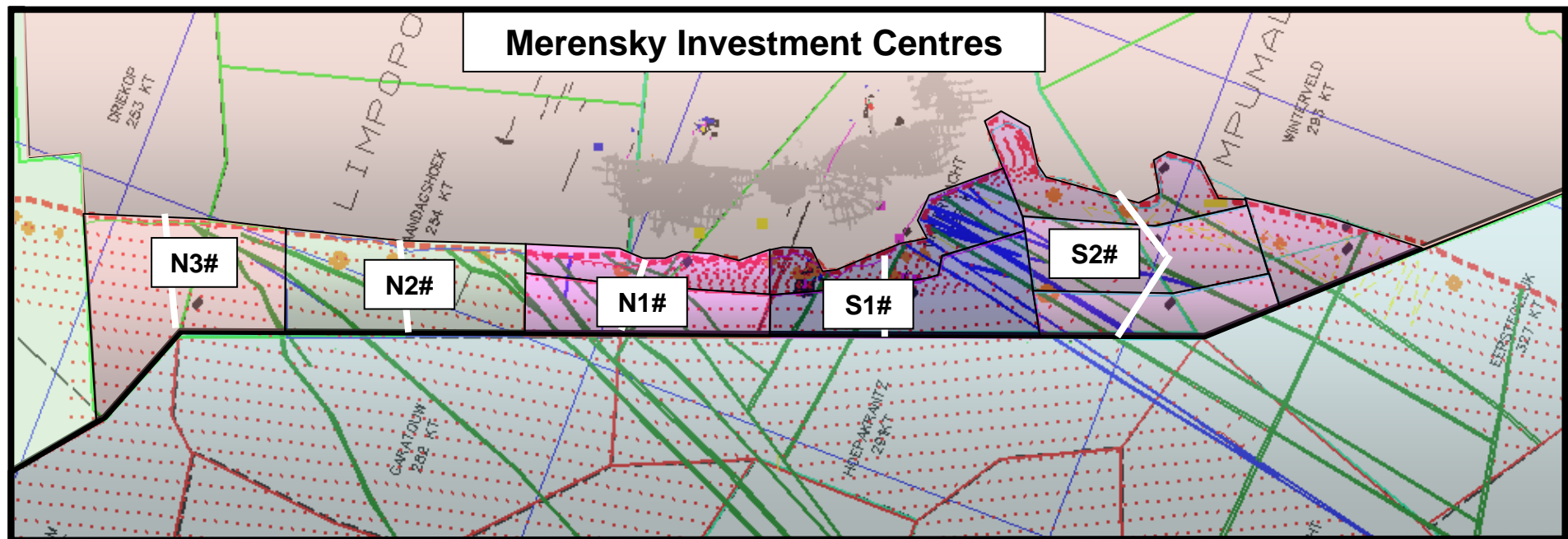
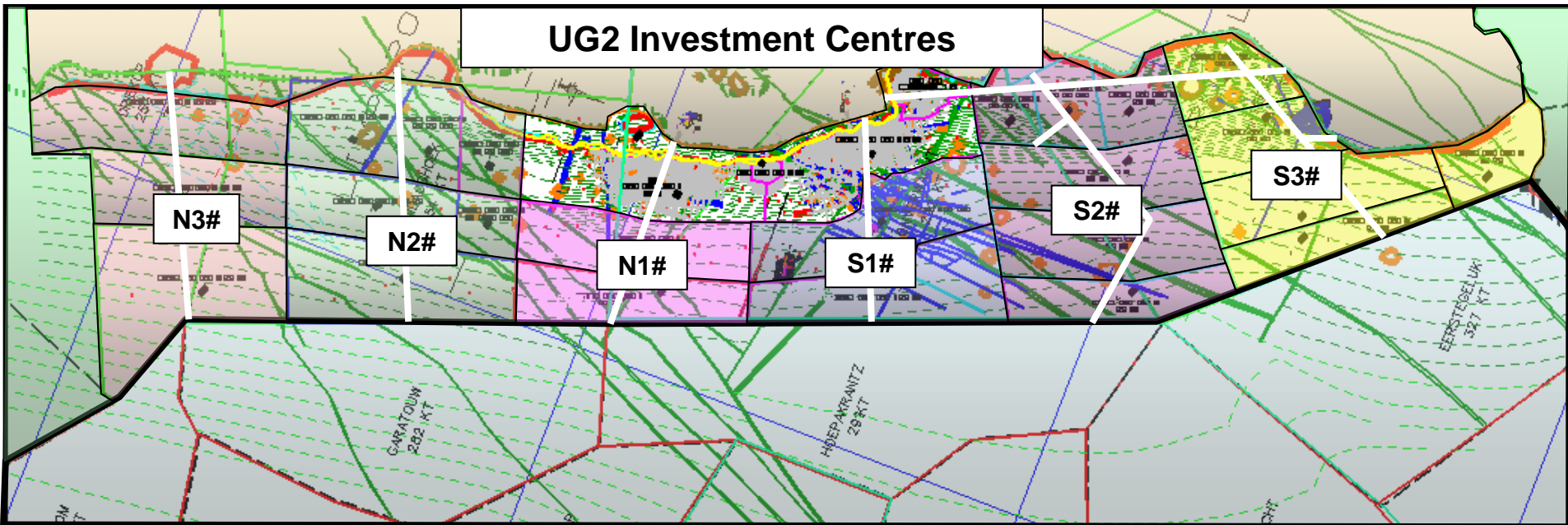
- Only breast mining is taking place (dip mining completely phased out)
- All panels are expected to be on the standard 210m breast spacing by 2010

# Conversion to footwall strike development & breast stoping

Lower development profile required to generate ore reserves for breast mining

	Breast mining Footwall drives		Dip mining Twin raise & reef drives	
	m <sup>2</sup> /metre	Required to replace 50 000 m <sup>2</sup>	m <sup>2</sup> /metre	Required to replace 50 000 m <sup>2</sup>
<b>Total Dev</b>	<b>53</b>	<b>943</b>	<b>17</b>	<b>2 941</b>
<b>Prim.- R/W, TW, BH &amp; Diag</b>	<b>107</b>	<b>467</b>	<b>22</b>	<b>2 272</b>
<b>Prim.- Large Ends</b>	<b>106</b>	<b>472</b>	<b>83</b>	<b>602</b>

# Both Reefs under continuous evaluation



# *Production sources*

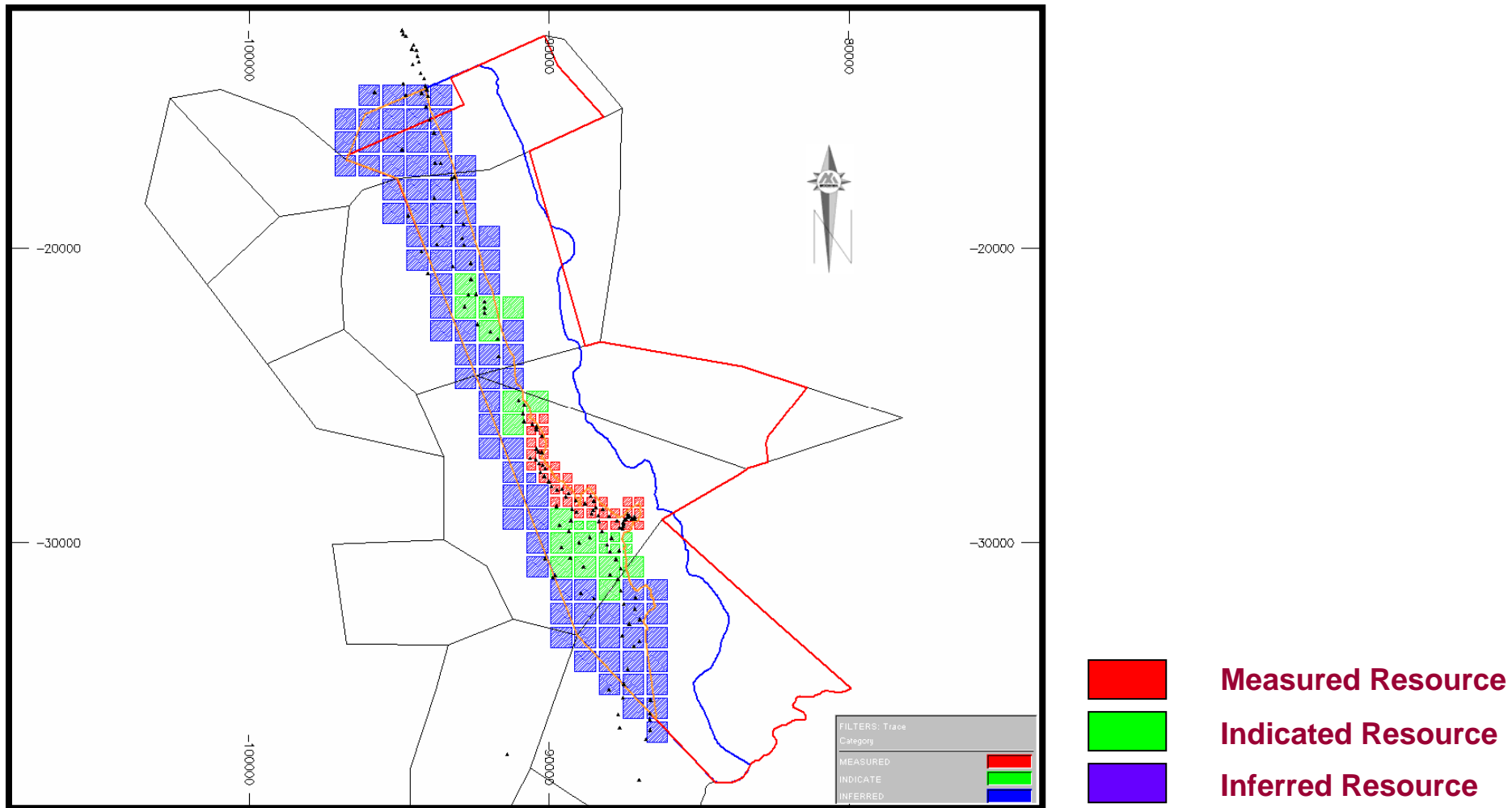
*(000's tons per month)*

<b>Production area</b>	<b>2005</b>	<b>2006</b>	<b>Steady state</b>
<b>North 1 Shaft</b>	<b>86</b>	<b>96</b>	<b>120</b>
<b>South 1 Shaft</b>	<b>63</b>	<b>75</b>	<b>120</b>
<b>Hill</b>	<b>32</b>	<b>27</b>	<b>-</b>
<b>Mid Shaft</b>	<b>9</b>	<b>10</b>	<b>-</b>
<b>South 2 &amp; 3 Shaft</b>			
<b>North 2 &amp; 3 Shaft</b>			
<b>TOTAL</b>	<b>190</b>	<b>207</b>	<b>240</b>
<b>Life in Years</b>			<b>90</b>

- Evaluation of possible expansion underway
- Possible inclusion of Merensky



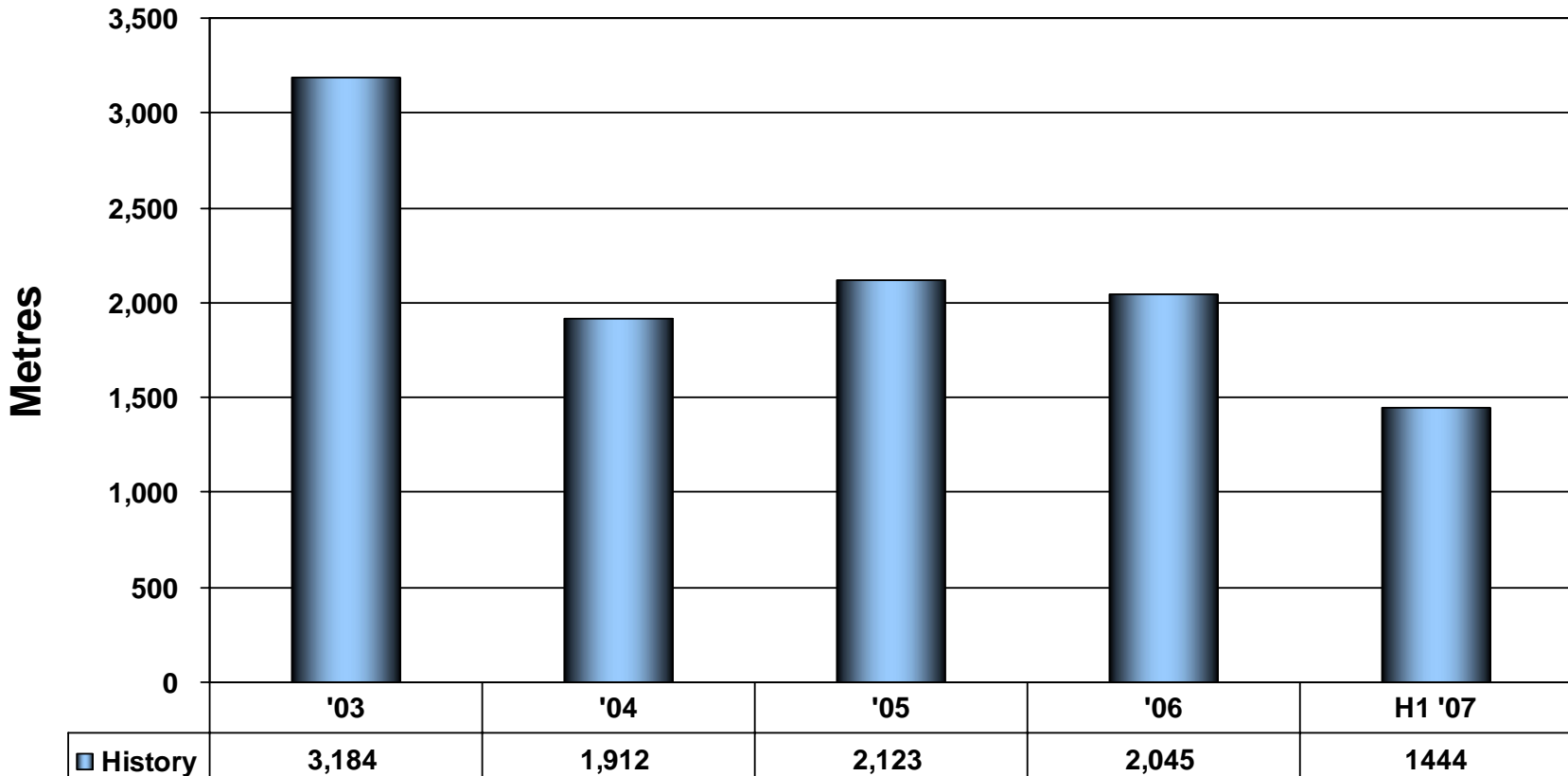
# 2006 Merensky resource categories (Data Mine model)



131 boreholes have been drilled with 242 reef intersections

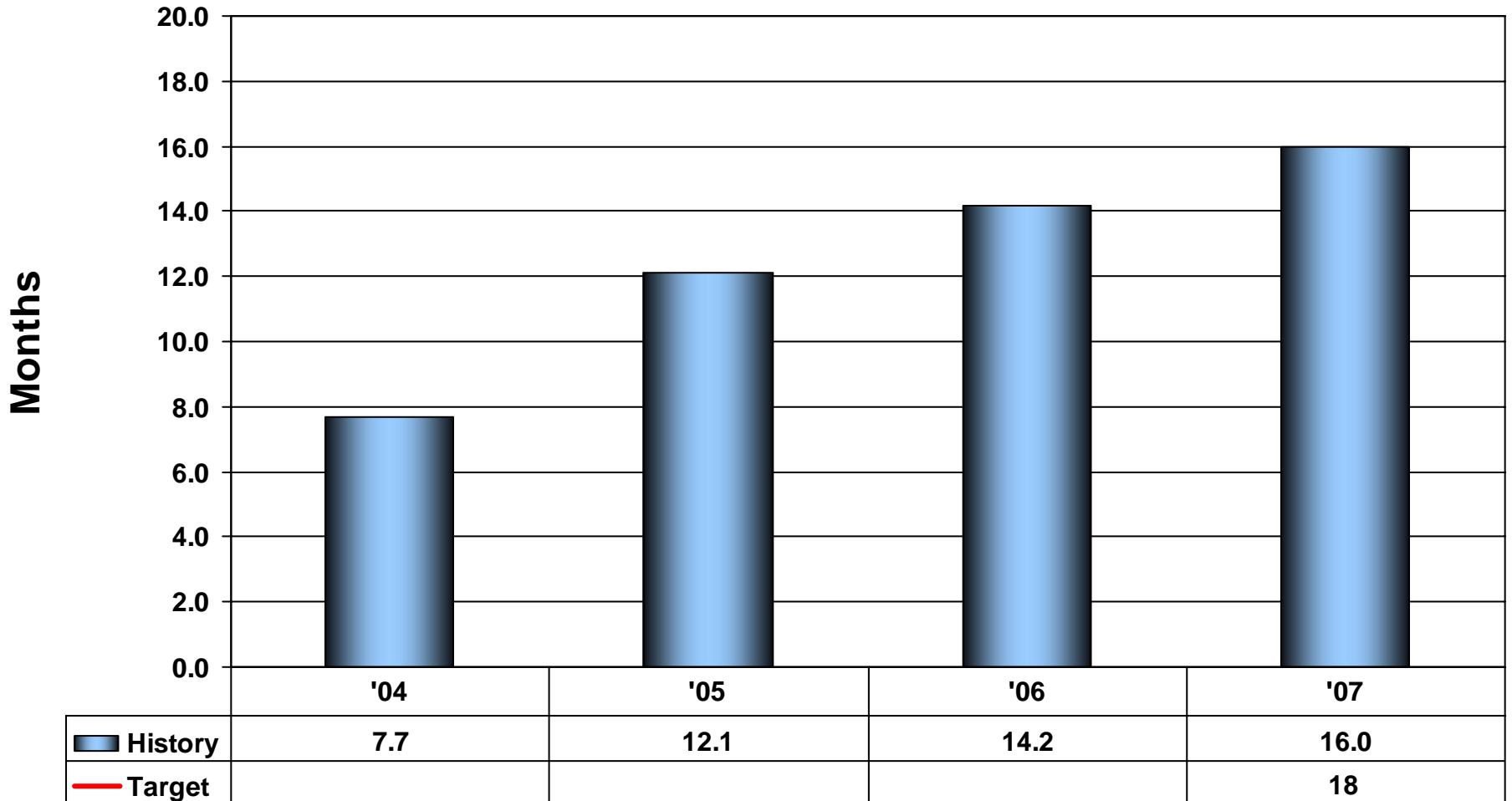
*Production*

# Total primary development metres / month (Excludes # Sinking)



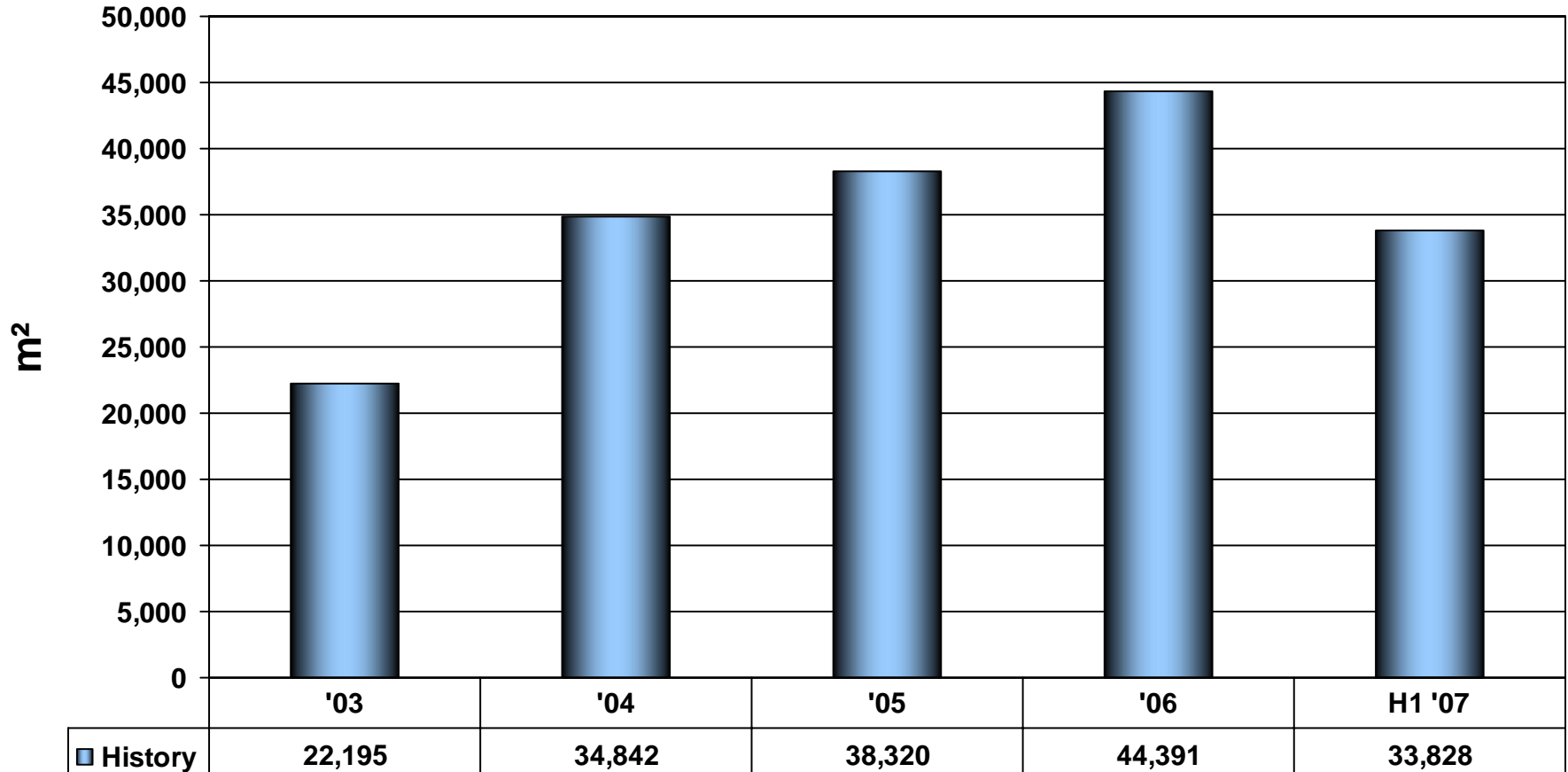
- ❖ At steady state breast requires less development than dip to generate the same ore reserves
- ❖ H1 2007 affected negatively due to strike
- ❖ Planned between 1 900 to 2 000 m per month into the future

# Immediately Available Reserves



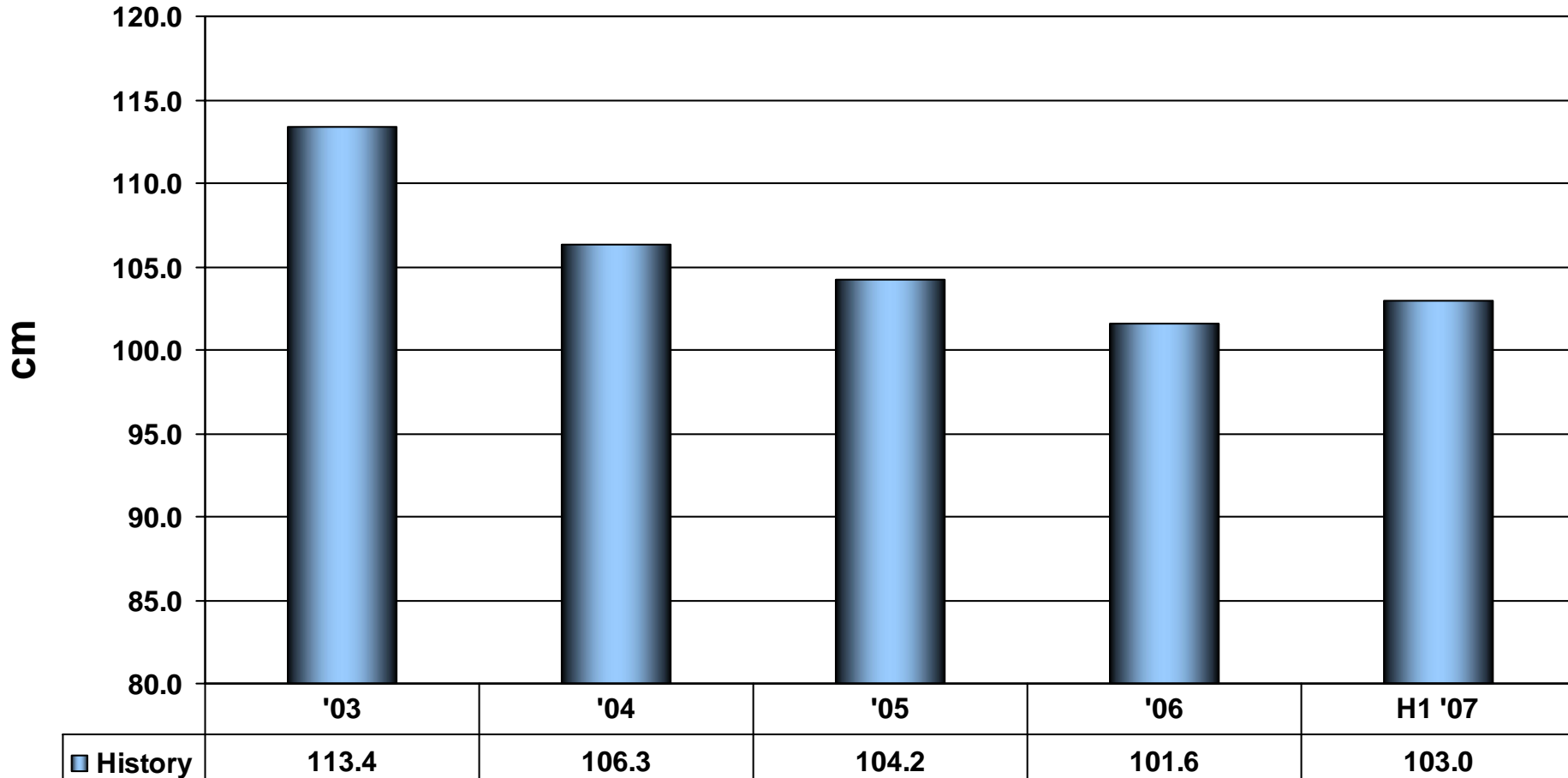
- ❖ 18 month reserve expected to be achieved in 2008
- ❖ Transition to 100% underground production
- ❖ Excludes Temporary Non Available Reserves

## Monthly area mined (m<sup>2</sup>)



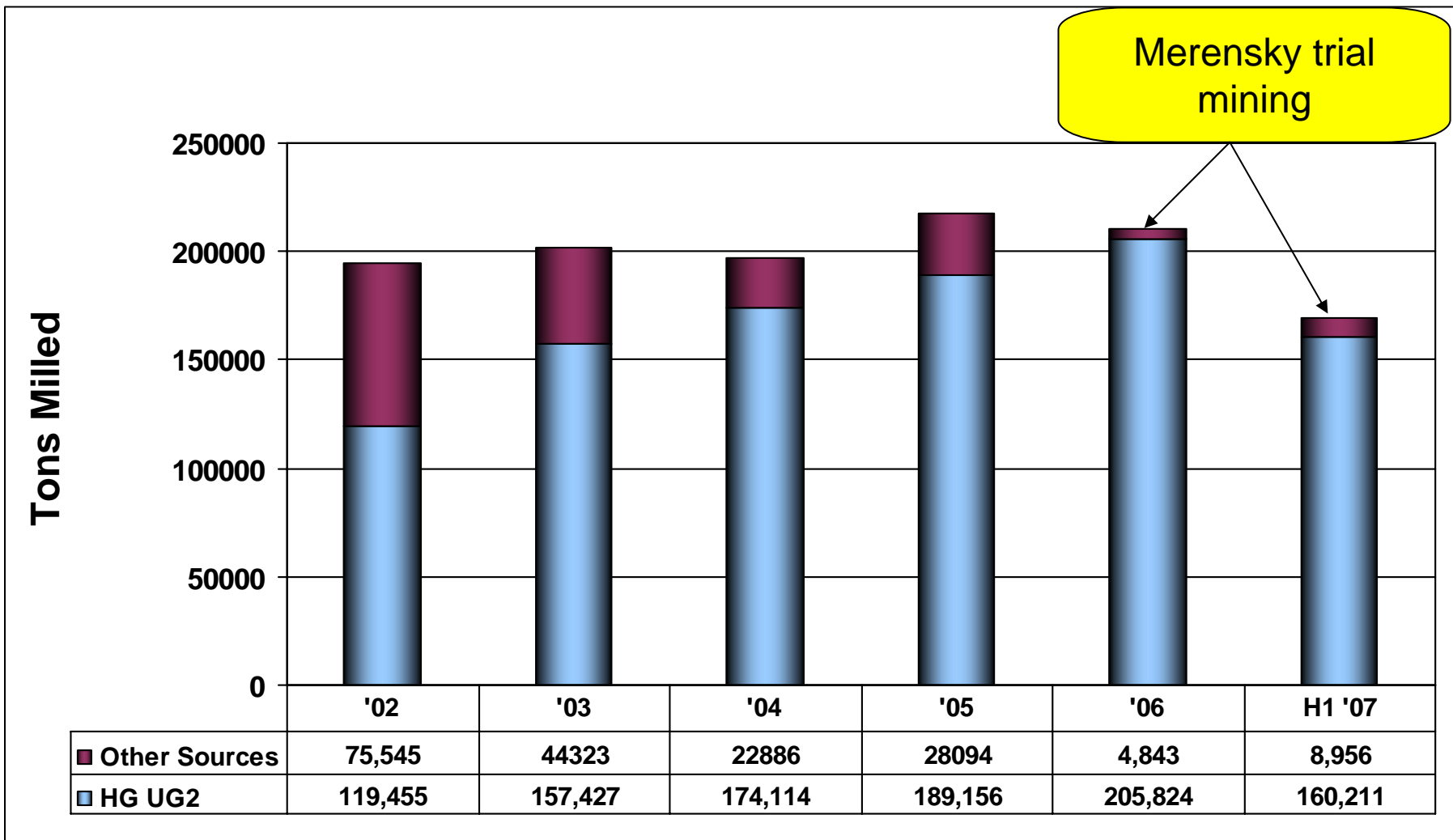
- ❖ H1 2007 affected negatively due to strike
- ❖ In steady state the production is planned at 50 000m<sup>2</sup> / month to be achieved in 2008

# Stoping width



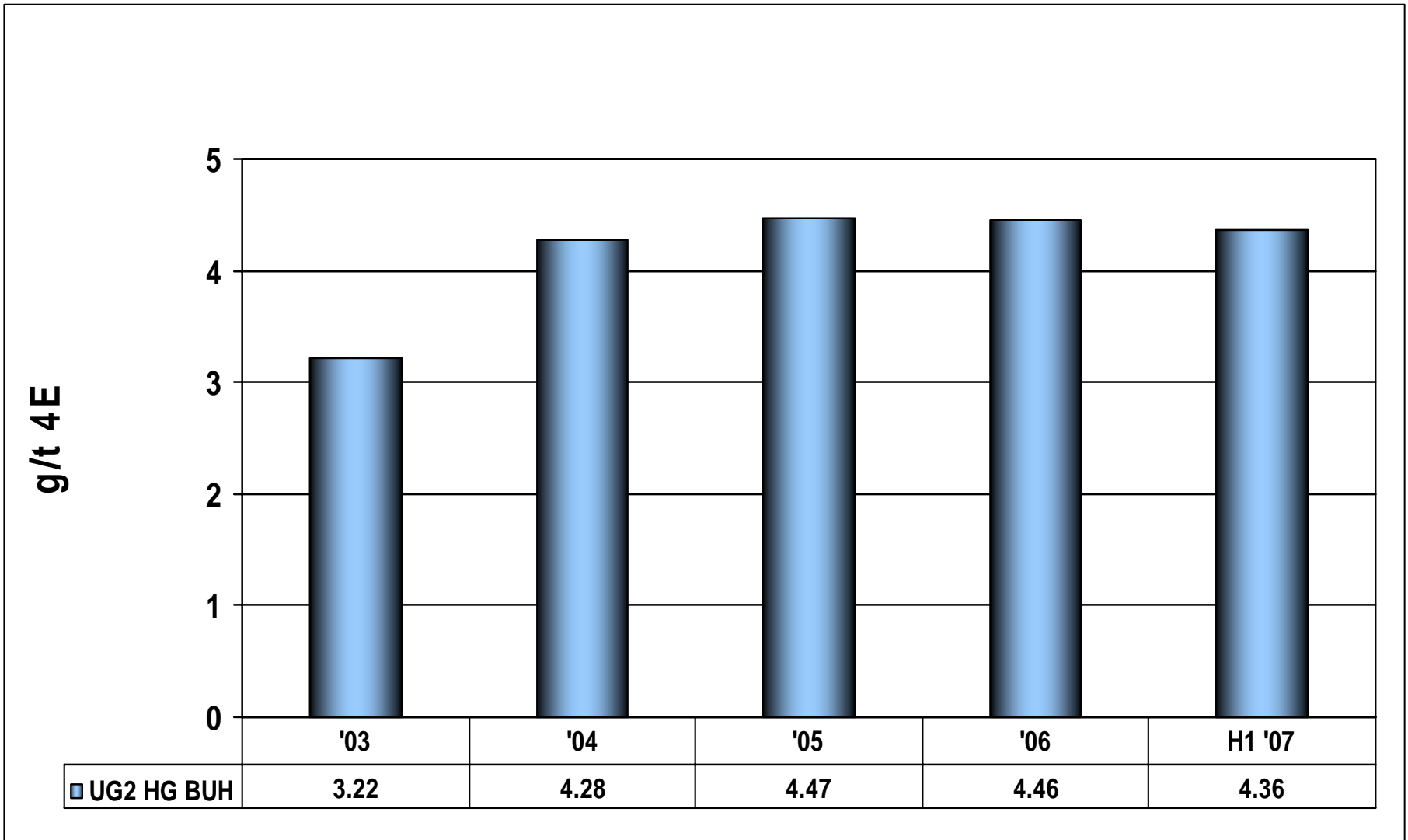
❖ **Steady state mine average planned at 103cm for 2008 and 2009**

# Average Tons Milled per Month



- ❖ H1 2007 affected negatively due to strike
- ❖ In steady state the production is planned at 240 kt/ month to be achieved in 2008

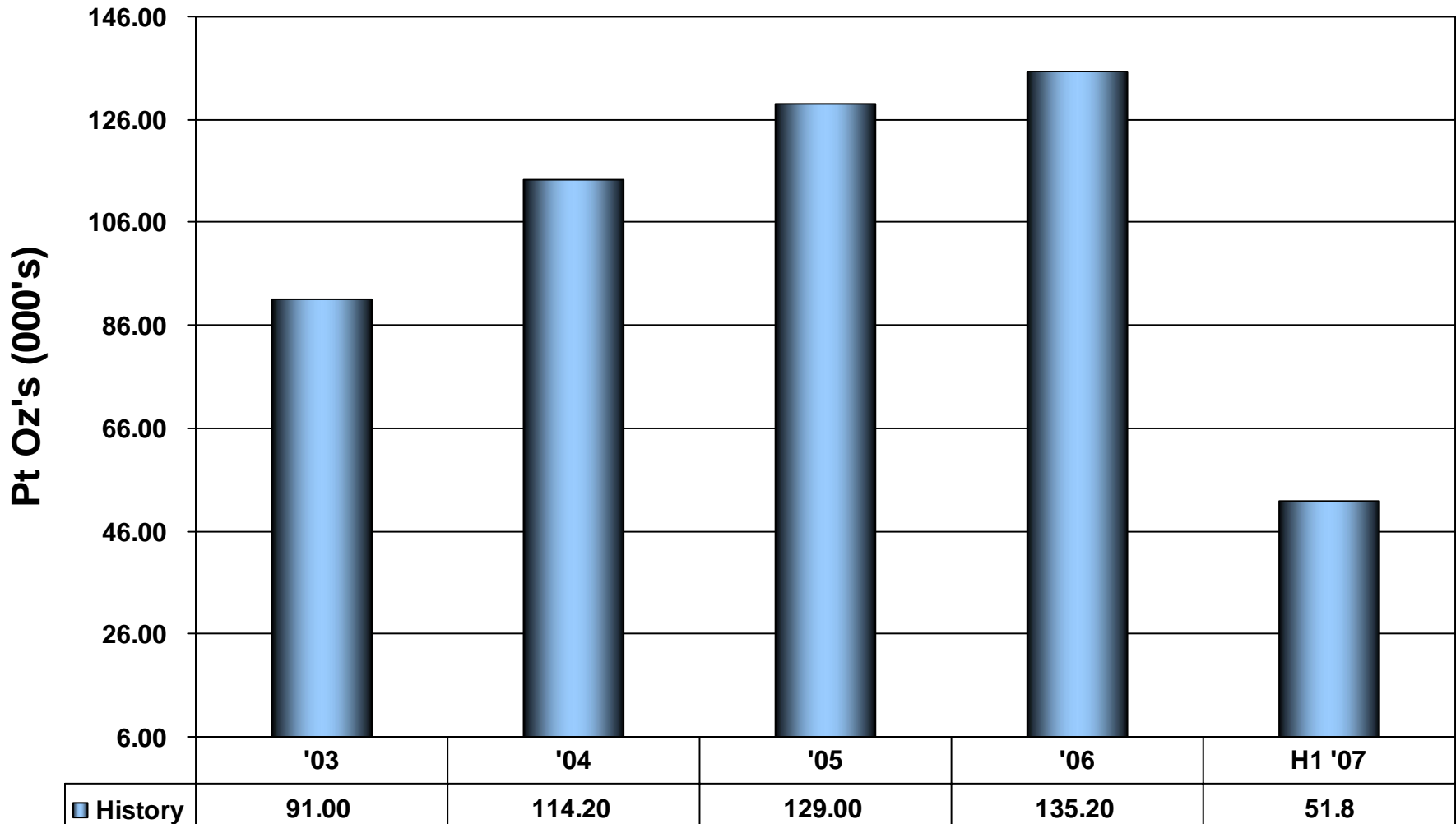
# Built-up Headgrade



❖ Head grade at 4.5 g/t will be achieved when stoping reaches full production

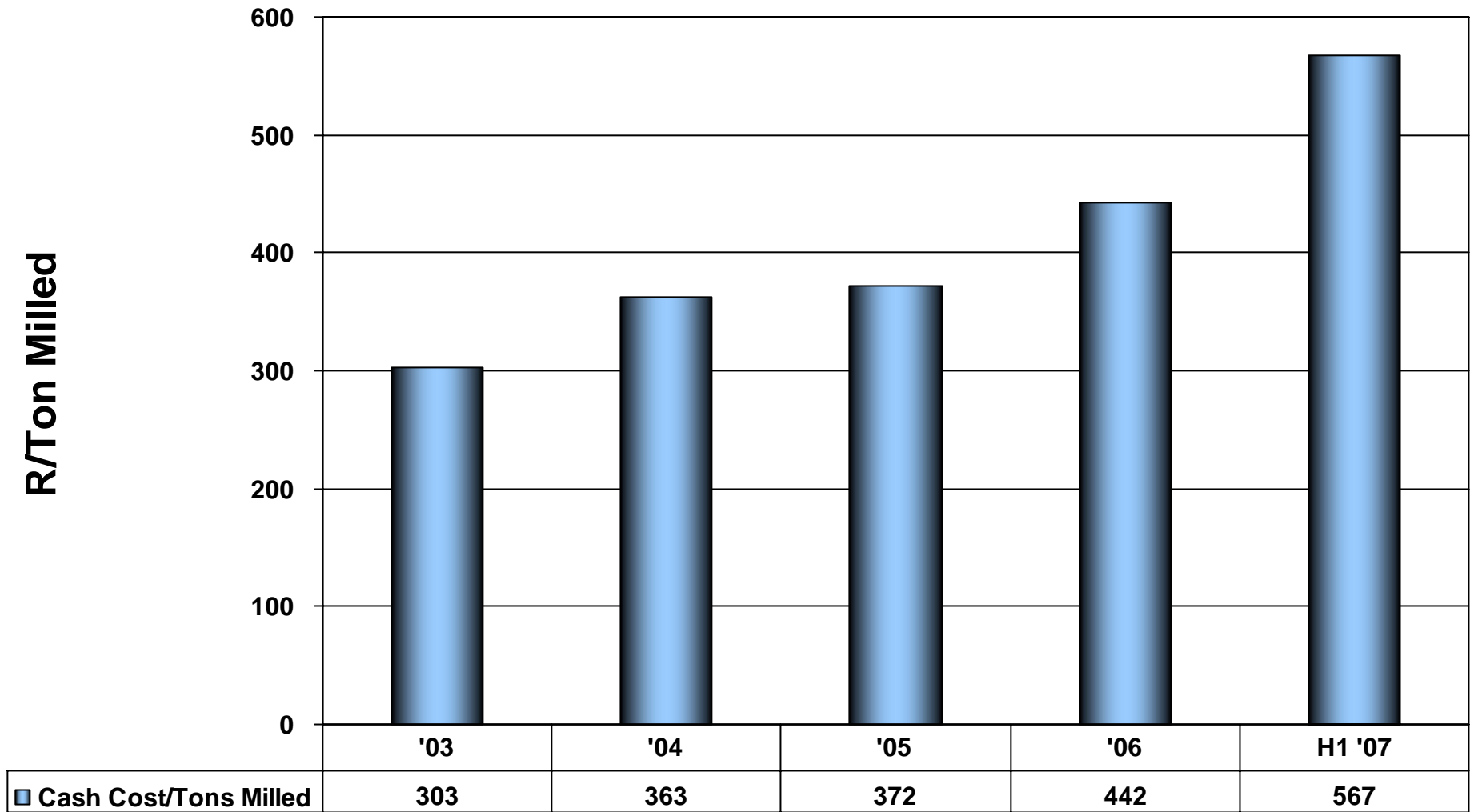


# Equivalent refined Pt oz / annum



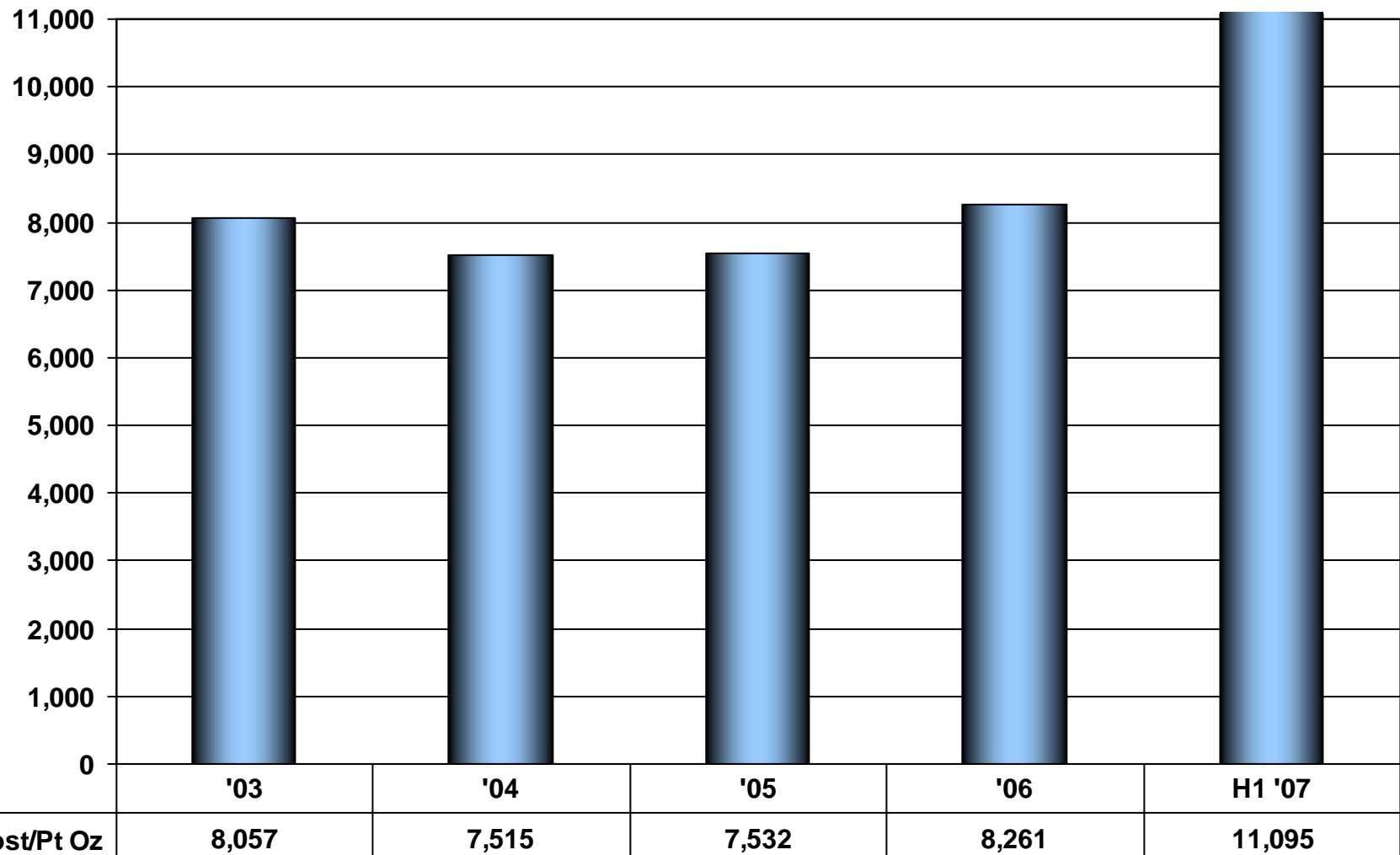
- ❖ H1 2007 affected negatively due to strike
- ❖ In steady state the Platinum profile is planned between 150 and 155 koz/annum

# Cash cost / ton milled



❖ H1 2007 affected negatively due to strike

# Cash cost / equivalent refined Pt oz

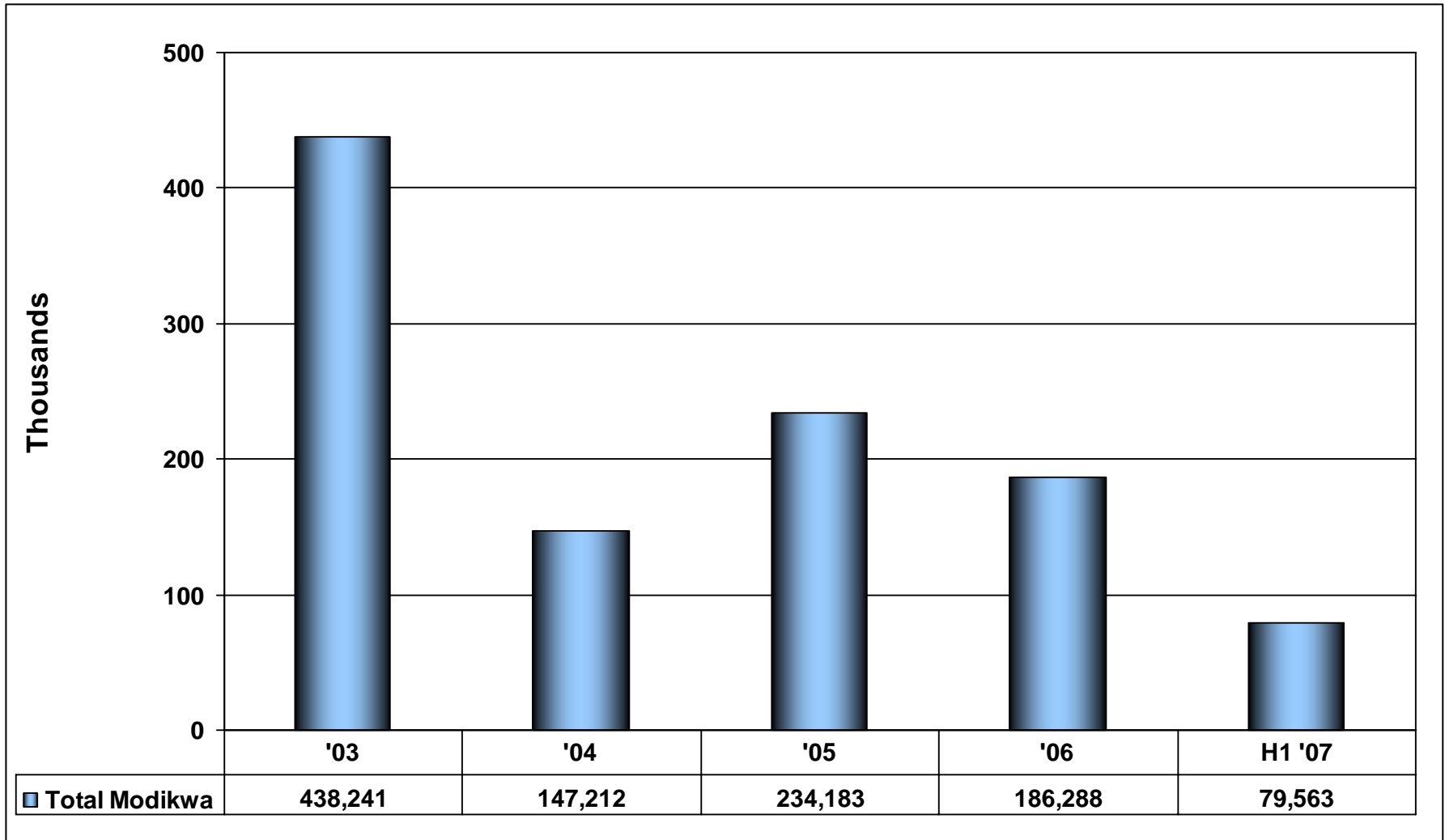


- ❖ Lower platinum content of Modikwa ore results in higher unit cost per Pt oz, comparable cost per PGM oz (44.46% Platinum)
- ❖ H1 2007 affected negatively due to strike

## Operating costs

- ❖ Current cash costs per ton milled and Pt oz high as build up continues.
- ❖ Drivers of cost reduction
  - ❖ Volume increase
  - ❖ 4 mining areas to 2
  - ❖ 1,5m of equipped face per m face blasted
  - ❖ Novice workforce moving up learning curve
  - ❖ Less development required
  - ❖ Cost reduction initiatives

# Capital expenditure (R000's)



- ❖ R100m/100koz of platinum production life of mine average.
- ❖ Approximately R200m/100koz per annum for the next 4 years as capex profile is 'lumpy' when deepening

## *Capital expenditure*

- ❖ Main Items for 2007
  - ❖ Replacement or refurbishment of mechanised fleet – R89 million
  - ❖ Merensky Trial Mining – R31 million
  - ❖ North Shaft Deepening – R51 million
  - ❖ Ore Reserves – R27 million

# *Employee and Community Relations*

- ❖ Community relations improving with more challenges in some community groupings than others
- ❖ The 25 day strike and delayed return to Sunday work around February 2007 heightened tensions but situation is back to normal
- ❖ Training programmes for learner miners and supervisors resulting in improved supervision
- ❖ Implemented and achieved 38% of the HDSA in management positions
- ❖ SED expenditure of approximately R 8m in 2007

## *Key business issues*

- ❖ Improved safety performance
- ❖ Achieve planned volume increase
- ❖ Smooth transition from down dip to breast stoping and moving drives into footwall
- ❖ Further improve efficiency of the mechanised development and tramming
- ❖ Improve efficiencies of stoping teams
- ❖ Steady state production will be achieved in 2008



***END***