

**AUSTPAC  
RESOURCES NL**

**ANNUAL GENERAL  
MEETING**

**23 November 2006**

# Austpac's Business - 2006

## Mineral processing

- **Titanium minerals:**
  - Synthetic rutile for  $\text{TiO}_2$  pigment & Ti metal
  - Fine mineral agglomeration
- **Iron and Steel Industries:**
  - Recycling waste iron oxides and chlorides
  - Direct reduction of iron ores

## Gold exploration - China

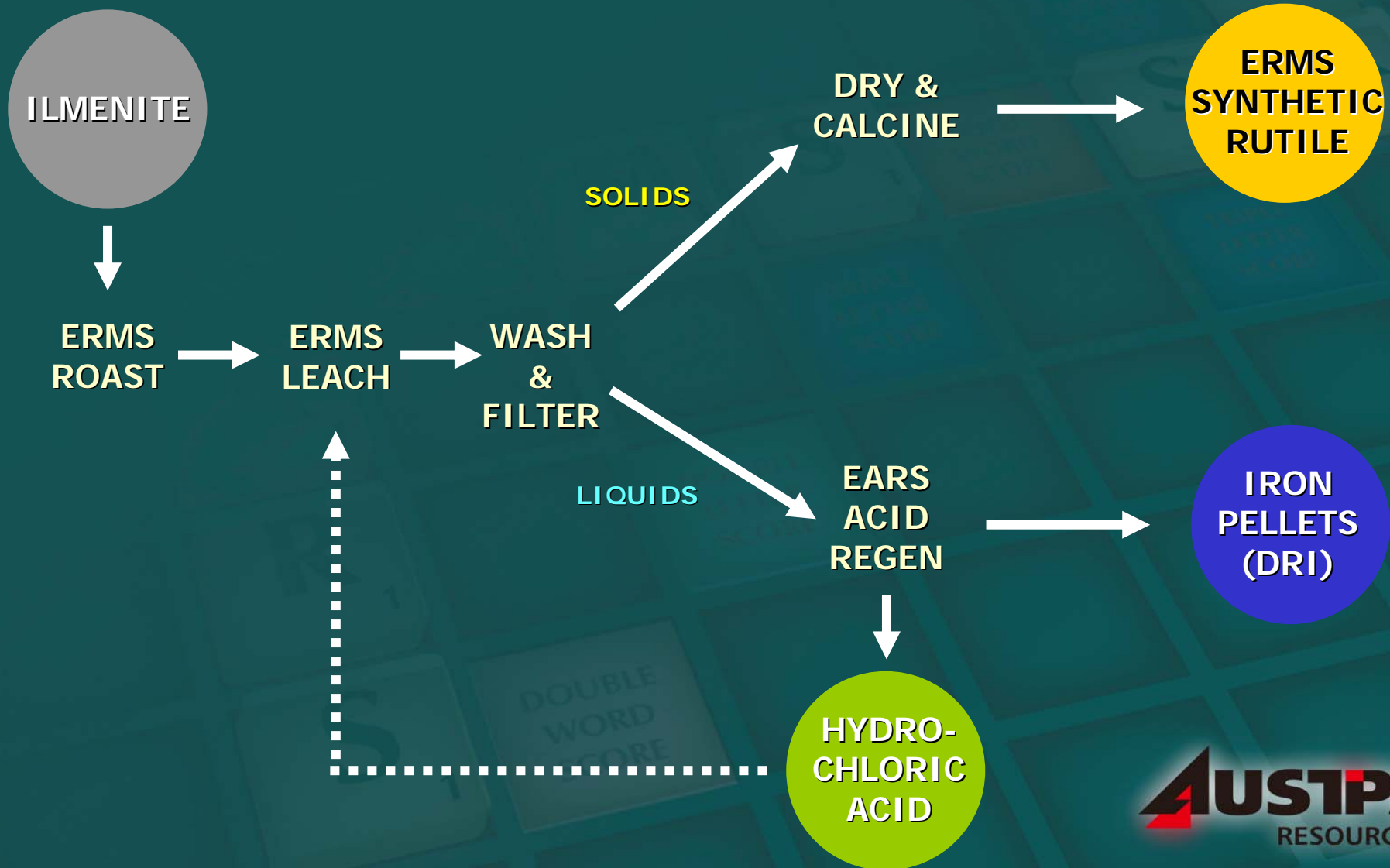
# Minerals Processing Technologies:

Our processes were developed to treat mineral sands

Key proprietary technologies include:

- ERMS SR Roasts and leaches ilmenite to produce high grade synthetic rutile (“SR”)
- EARS Converts iron chlorides in spent leach liquors into hydrochloric acid and iron pellets
- Direct Reduced Iron Simple fluid bed process to reduce iron oxide to iron metal
- Mineral Agglomeration Fluid bed process to agglomerate fine minerals

# ERMS SR Process



# ERMS SR Process

## Unique Features:

Produces two valuable products:

- Ultra-high grade synthetic rutile (for pigment & metal)
- Iron pellets for steel (not fine oxide waste)

Continuous - therefore lower capital & operating costs

Versatile - can treat any ilmenite and use any fuel  
(solid, liquid or gas)

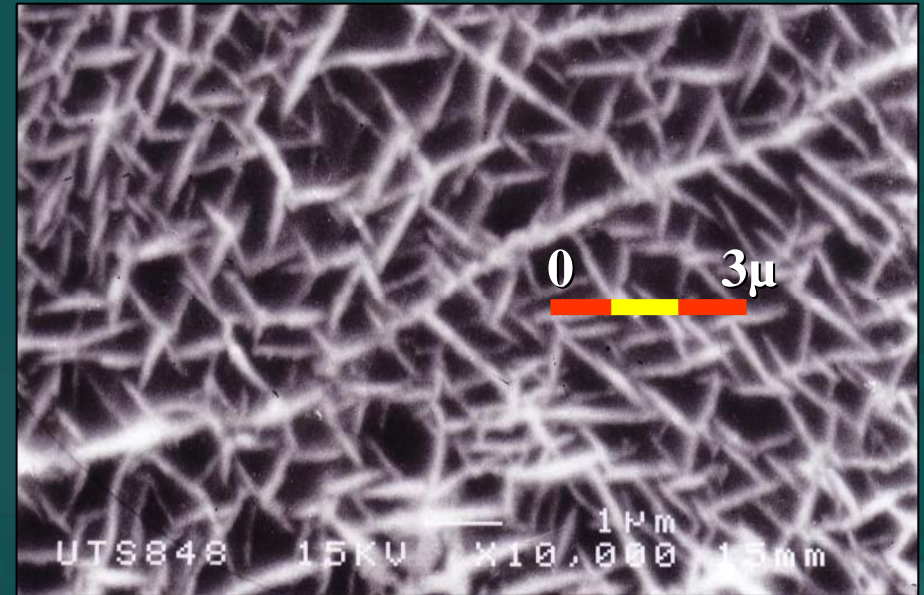
Environmentally friendly - no solid or liquid  
effluents



# ERMS SR

## Chemical Analysis

- $\text{TiO}_2$  97.0%
- $\text{Fe}_2\text{O}_3$  0.55%
- $\text{SiO}_2$  0.57%
- $\text{Al}_2\text{O}_3$  0.17%
- $\text{Cr}_2\text{O}_3$  0.01%
- $\text{CaO}$  <0.01%
- $\text{MgO}$  0.02%
- $\text{MnO}$  0.01%
- $\text{U+Th}$  <10ppm



# EARS Iron Pellets (DRI)

## Chemical Analysis

■ Fe	89.7%
■ FeO	6.00%
■ TiO <sub>2</sub>	0.16%
■ SiO <sub>2</sub>	0.18%
■ Cr <sub>2</sub> O <sub>3</sub>	0.08%
■ CaO	0.03%
■ MgO	1.18%
■ MnO	2.29%
■ V <sub>2</sub> O <sub>5</sub>	0.84%
■ P <sub>2</sub> O <sub>5</sub>	0.007%





# Steel from EARS Pellets

## Chemical Analysis

■ C	0.002%
■ P	0.005%
■ Mn	0.01%
■ Si	0.003%
■ S	0.015%
■ Ni	0.05%
■ Cr	0.01%
■ Cu	0.01%
■ V	0.001%
■ Ti	0.003%
■ Pb	0.01%
■ Sn	0.001%





# BHP Billiton & ERMS SR

- Research Agreement – September 2006
  - Metallising EARS oxide pellets
  - Continuous leach reactor
  - Re-estimation of Demonstration Plant costs
  - Capital and operating costs for large commercial plant
- Three month program is well advanced
  - Positive results to date
  - Completion before end 2006
- “Right to negotiate exclusive licence for ERMS SR for Africa”

# ERMS SR Demonstration Plant

Raw  
Materials  
Feed Bins  
and  
Enclosure

Plant  
Control  
Room

Motor  
Control  
Centre

Roaster  
Train

Raw Materials  
Hoist Shaft

Magnetic  
Separation  
Building



# ERMS SR – Commercialisation

Austpac's current plan:

- Scale-up from Demonstration Plant – ideally 20:1
- 60,000 tpa ERMS SR plant
- 30,000 tpa EARS iron pellets (DRI)
- Economically attractive
  - Capital cost: A\$ 80M
  - EBITDA: > A\$ 30M
  - IRR: > 30%, Payback: < 3 years
- South eastern Australia is attractive

# Other Technology Applications

- EARS – Recycling in the Steel Industry
- DRI – Iron oxides / iron ores
- Agglomeration of fine minerals



# EARS Recycling in the Steel Industry

- Regenerates low cost HCl from waste chloride solutions from steel pickling / galvanising operations
- Transforms iron units now lost as mill scales and dusts into high value electric arc furnace feed
- One tonne pickle liquor + two tonnes waste iron oxide = one tonne of fresh acid + 1.6 tonnes iron metal

# EARS Recycling in the Steel Industry

“BOO” EARS Plant example:

- Cost \$130, Value >\$750; Profit = \$620 per tonne
- 50 tonnes/day plant – Capital cost ~ \$6 million
- Generates \$11million profit p.a.
- Discussions commenced with steel companies regarding testwork
- Demonstration Plant essential for commercialisation

# Iron Ore to DRI

- Value addition in the iron ore industry:
  - Reduction of magnetite sands to direct reduced iron (DRI)
  - Reduction of low value iron ore fines to high value DRI
- The continuous metallisation unit now testing EARS iron oxide will demonstrate process using iron ores (Pilbara sample)
- ERMS SR Demonstration Plant will also be used to process bulk iron ore samples
- Iron ore producers interested in process





# Fine Mineral Agglomeration

- New fluid bed process; no binders
- Demonstrated on “Hi-Ti” minerals



- WIM 150 could supply a south eastern Australia ERMS SR plant



# Technology Opportunities are:

## ERMS SR

- Demonstration Plant (3,000 tpa) - Newcastle
- First commercial plant (60,000 tpa) - south eastern Australia
- Large commercial plant(s) / technology licence

## EARS Acid Regeneration

- Recycling in steel industry
- Nickel applications

## DRI

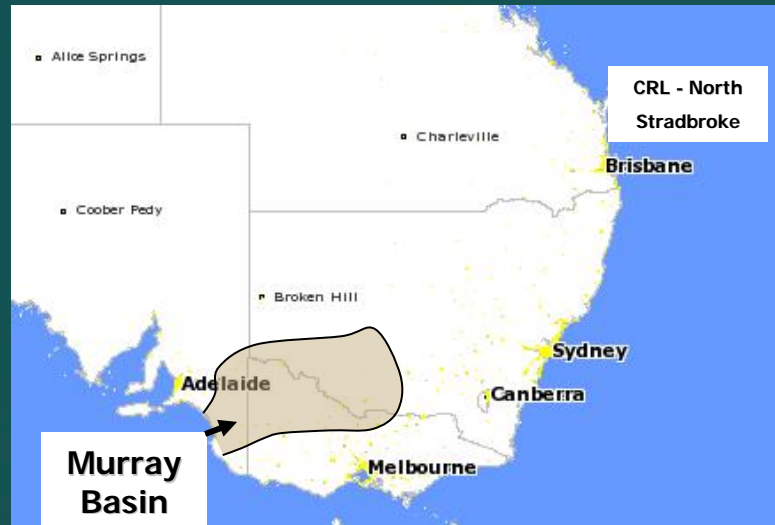
- Magnetite sands
- Iron ore fines

## Agglomeration






- Fine titanium minerals
- ERMS SR from WIM 150 deposit

# Mineral Sand Developments

## Eastern Australia



- 2006 – two new mineral sand mines commenced production in the Murray Basin
- Unsaleable ilmenite (high chrome)
- ERMS SR is the only suitable process for upgrading

-  River
-  Railway
-  Major Town
-  Mineral Sands Prospects
-  Murray Basin Outline

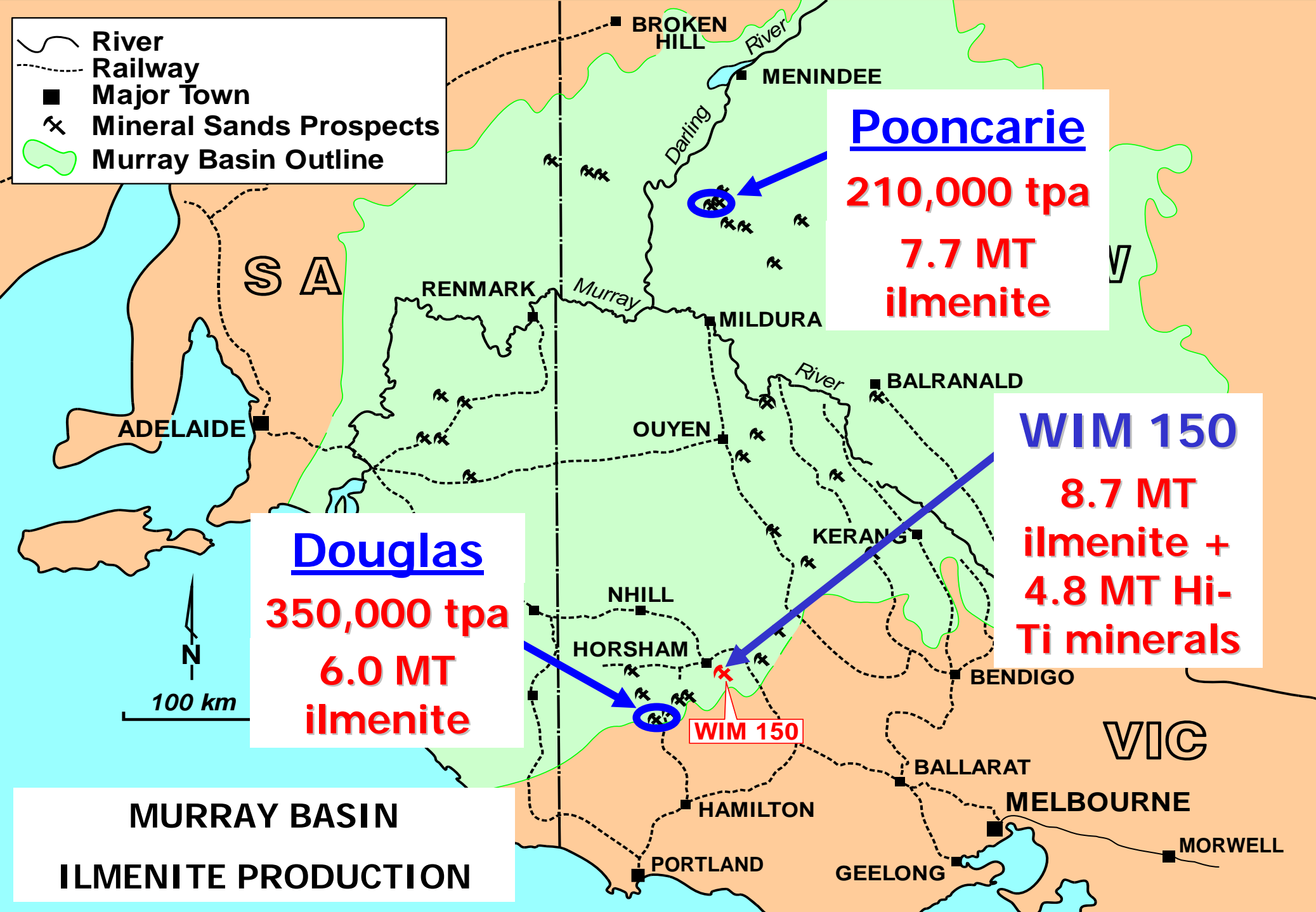
**Pooncarie**  
**210,000 tpa**  
**7.7 MT**  
**ilmenite**

**WIM 150**  
**8.7 MT**  
**ilmenite +**  
**4.8 MT Hi-**  
**Ti minerals**

**Douglas**  
**350,000 tpa**  
**6.0 MT**  
**ilmenite**

**WIM 150**

**MURRAY BASIN**  
**ILMENITE PRODUCTION**



# Austpac's WIM 150 Deposit

- Very large, fine grained HM deposit - zircon and high chrome ilmenite
- ERMS SR process - ~96% TiO<sub>2</sub> fine grained SR
- Austpac's new agglomeration process solves fine grained problem
- Proven reserves adequate for major ERMS SR plant for over 100 years
- Australian Zircon N.L. drilling in Dec. 2006



# South East China Gold

- State-owned Gold Bureau offered opportunity to explore below operating oxide gold mines
- Exclusive LOI for four mines plus exploration areas
- Carlin (Nevada) geologic setting
- Sino Gold's Jinfeng deposit – 4 million ounces
- Third party to fund initial exploration
- Negotiations for formal agreement well advanced

# Austpac in 2007:

- ERMS SR - Commercialisation
- EARS - Recycling in the Steel Industry
- DRI - Iron oxides / iron ores
- Agglomeration of fine minerals
- WIM 150
- China Gold