South Australia Groundwater Forum - 2015

Water management at Jacinth-Ambrosia

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Outline

- Company overview
- Jacinth-Ambrosia overview
- Water supply and requirements
- Infrastructure upgrades and water use efficiency
- Improvement to groundwater levels
- Summary and potential investigations

Mineral sands – part of everyday life

Roof/building/construction

Home/office

Bathroom/lifestyle

Kitchen/utilities

Automotive

Sporting goods/recreation

Healthcare/medicine

Aircraft/industry

Operations and assets

- Mining and processing operations in Australia and USA
- Distribution warehouses located within major markets
- Zircon and titanium dioxide products supplied to more than 40 countries
- Major supplier in emerging and developing markets (China, India, Middle East, South America)

Operational overview

- Operations in Australia and United States, sales offices globally distributed
- Approximately 620 direct employees (excluding contractors)
- At end-2014 approximately 8 years reserve cover; resources ~7 times Ore Reserves
- Flexible operational mindset developed
- Close collaboration with market developments through mine to market

JORC Status (31 December 2014)	Ore (Mt)	HM In-Situ (Mt)	Rutile (%)	Zircon (%)	Ilmenite (%)
Ore Reserves	460	24.9	6	18	52
Mineral Resources	2,569.2	176.4	6	10	59

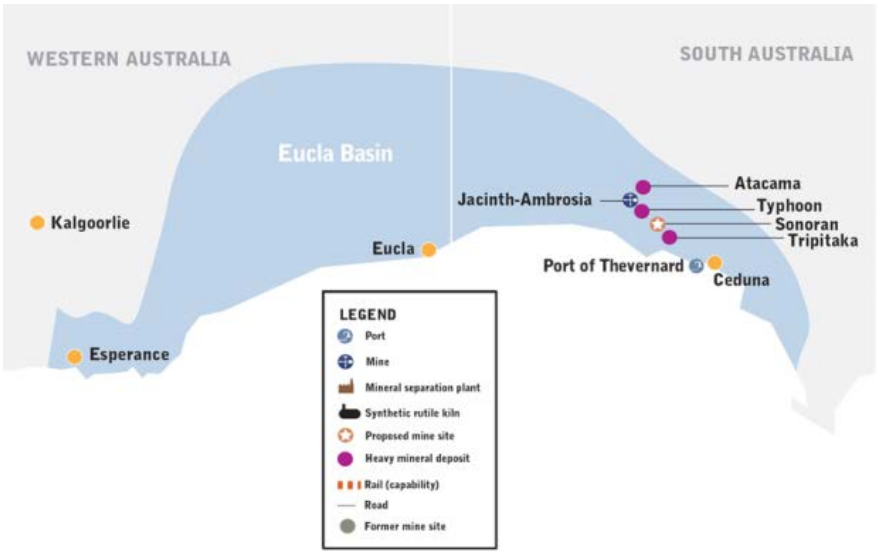
Refer Iluka's Annual Report 2014 Ore Reserves and Mineral Sources Statement

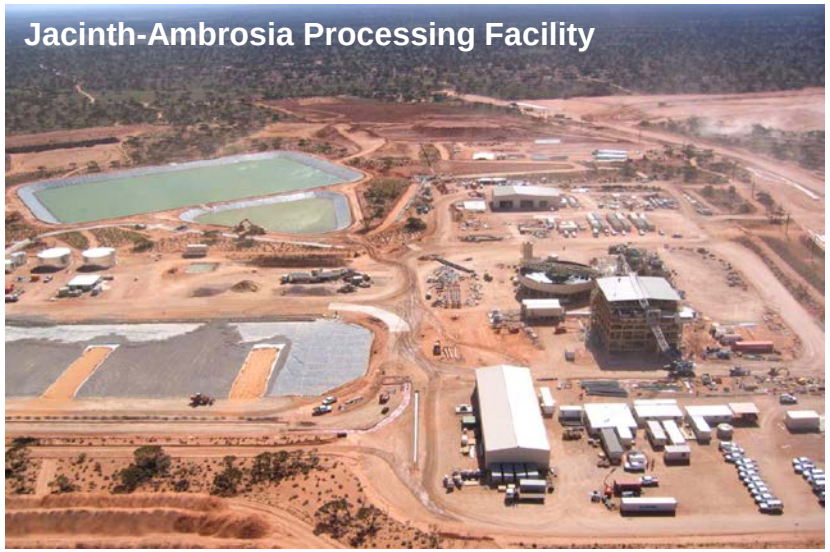
Jacinth-Ambrosia overview

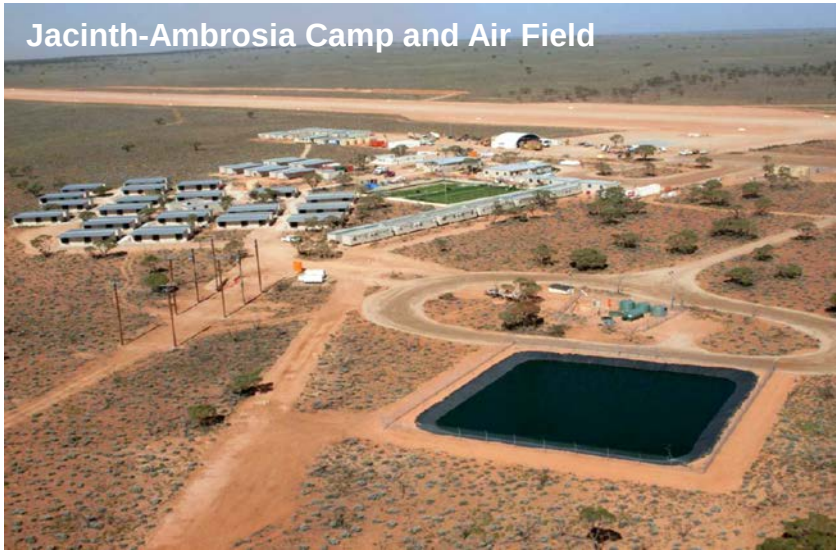
- The largest and highest zircon assemblage development globally
- Located within Yellabinna and Nullarbor regional reserves
- Development capital expenditure: $390 million
- Commissioned 2009, full production mid 2010
- At current mining rate, reserves extend through to ~2026
- Options for expansion and concurrent mining

Scope of operation

- Jacinth ore body 900 m wide by 5 km long
- ~50% Zircon
- low in moisture
- ore above groundwater table
- strip ratio small 0.5:1
- ore thickness of ~20 metres
- mining unit plant in-pit ~1,300tph
- wet Concentrator ~1,000tph



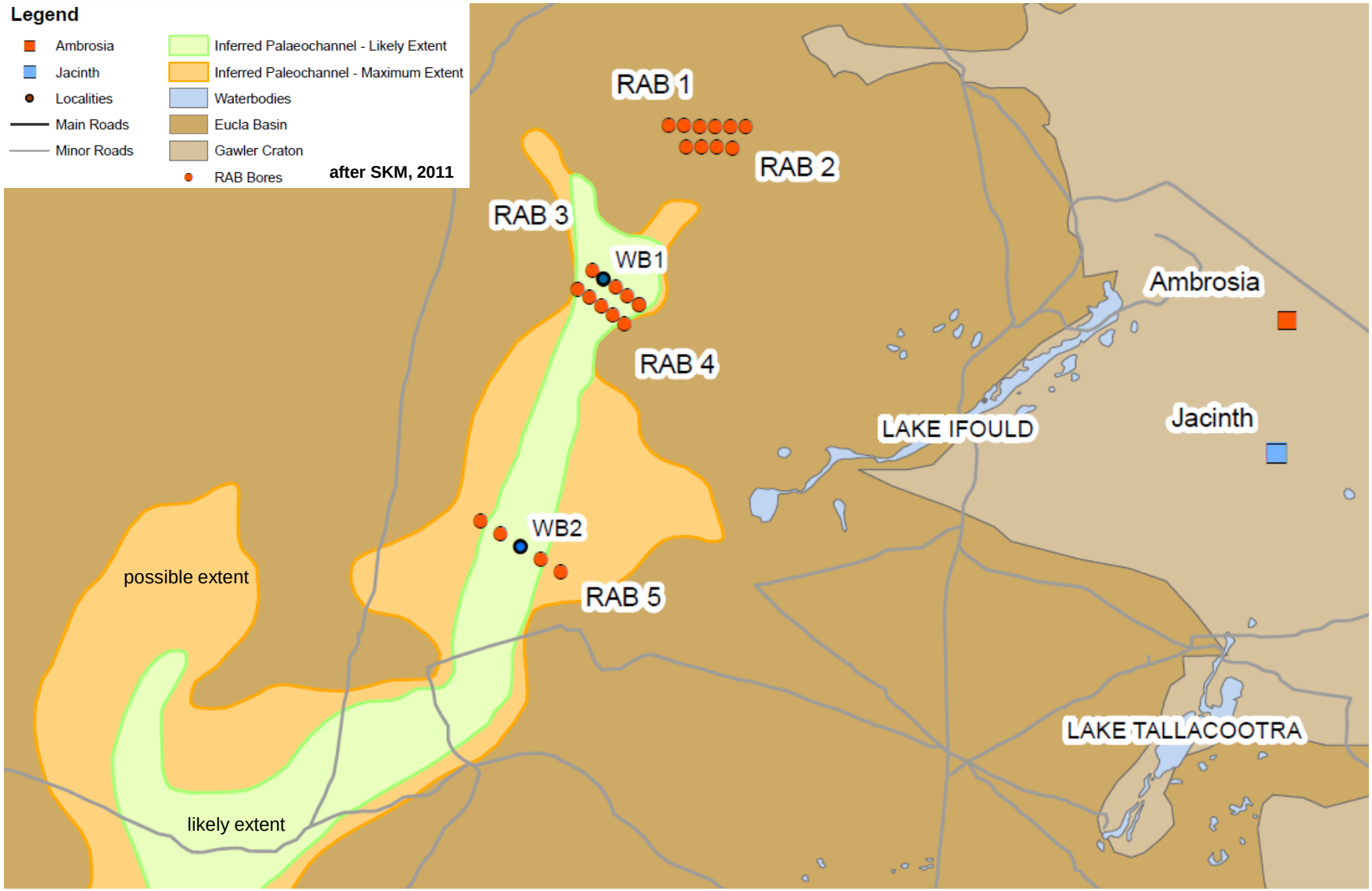




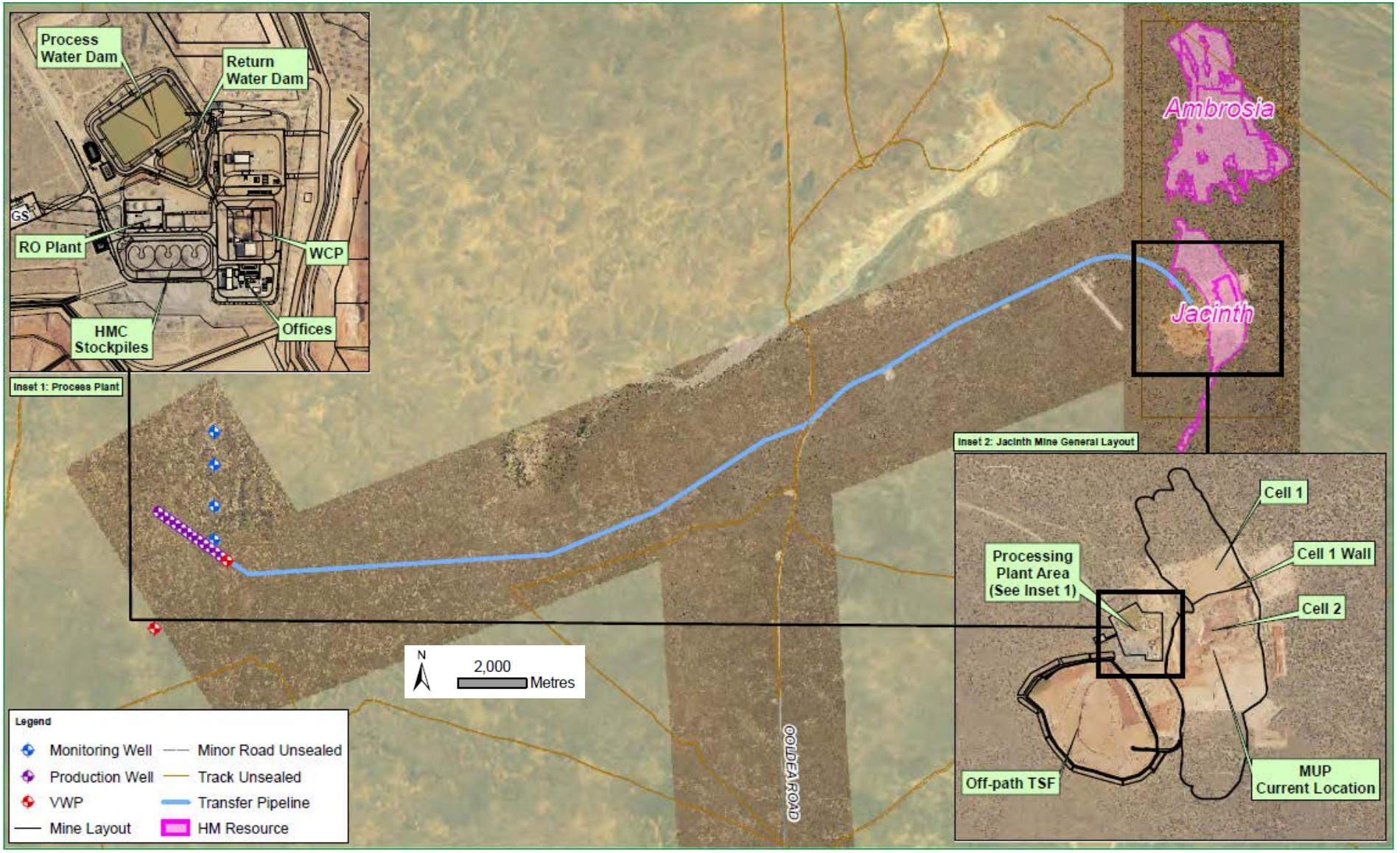
Water supply

- Palaeochannel located 32 km west of J-A, on the eastern fringe of the Eucla Basin
- Resource drilling first identified source in 2006 (1.5 to 2.5 km wide, 15 km in length)
- AEM survey confirmed the source (up to 10 km wide and 40 km in length)
- Water level at ~ 23 mAHD (48 mBGL)
- Hosted within poorly sorted, fluvial sands and gravels of the Lower Pidinga Formation
- Saturated thickness ~ 40 to 50 m
- Hydraulic conductivity of 50 m/d
- Na-Cl type
- Highly saline with typical EC of 40,000 to 70,000 µS/cm
- Near-neutral to mildly acidic pH
- Transfer via glass reinforced pipeline, with a design delivery rate of 360 L/s @ 2100 kPa.

Water supply



Water supply and site layout

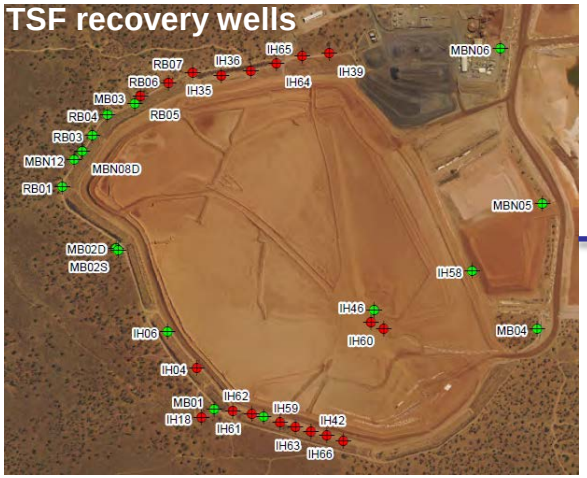


Operational infrastructure and improvements

- Improvement to tailings management = better water management

Sand stream

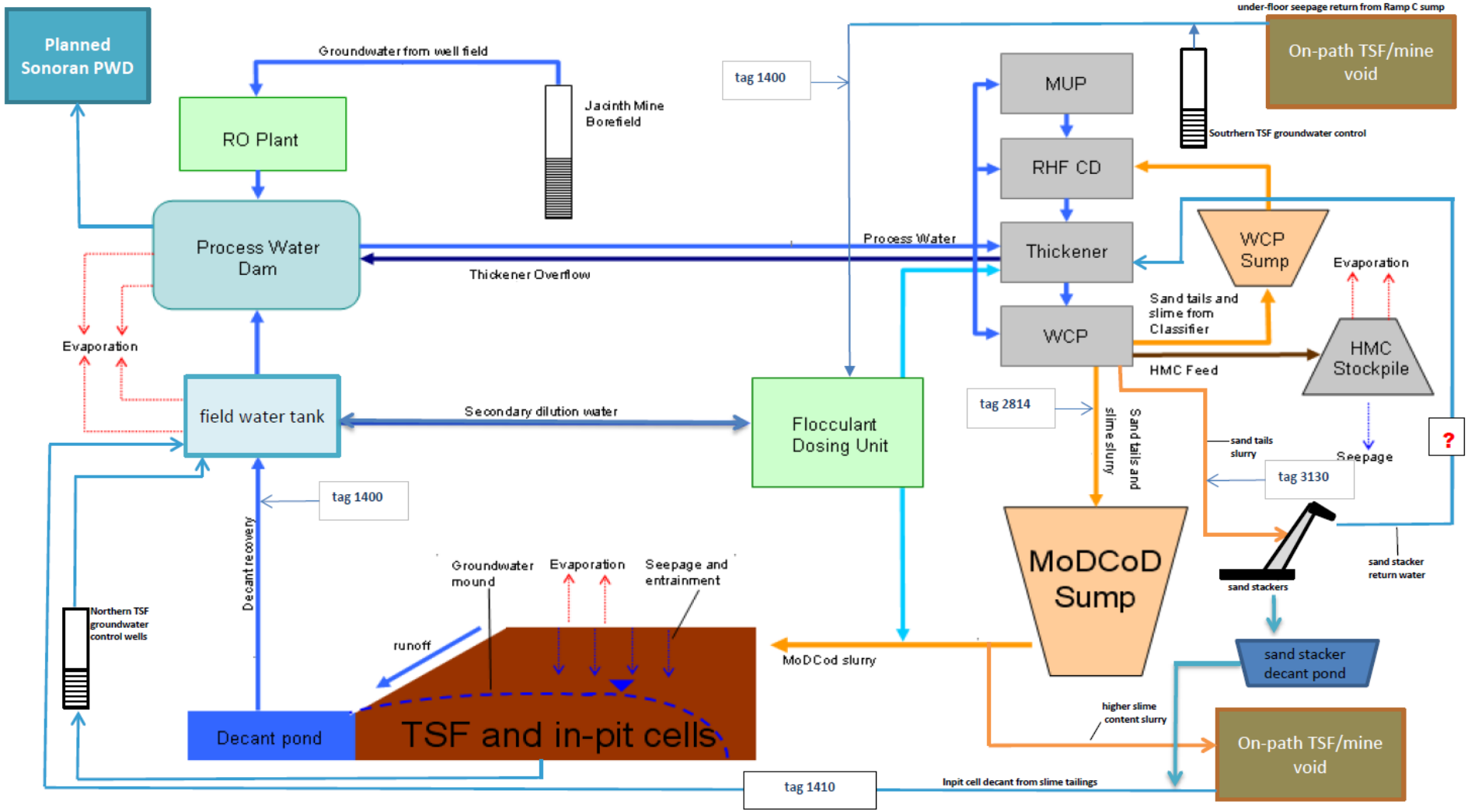
Sep-11 Feb-12 Jul-12 Dec-12 May-13 Oct-13 Mar-14 Aug-14 Jan-15 Jun-15



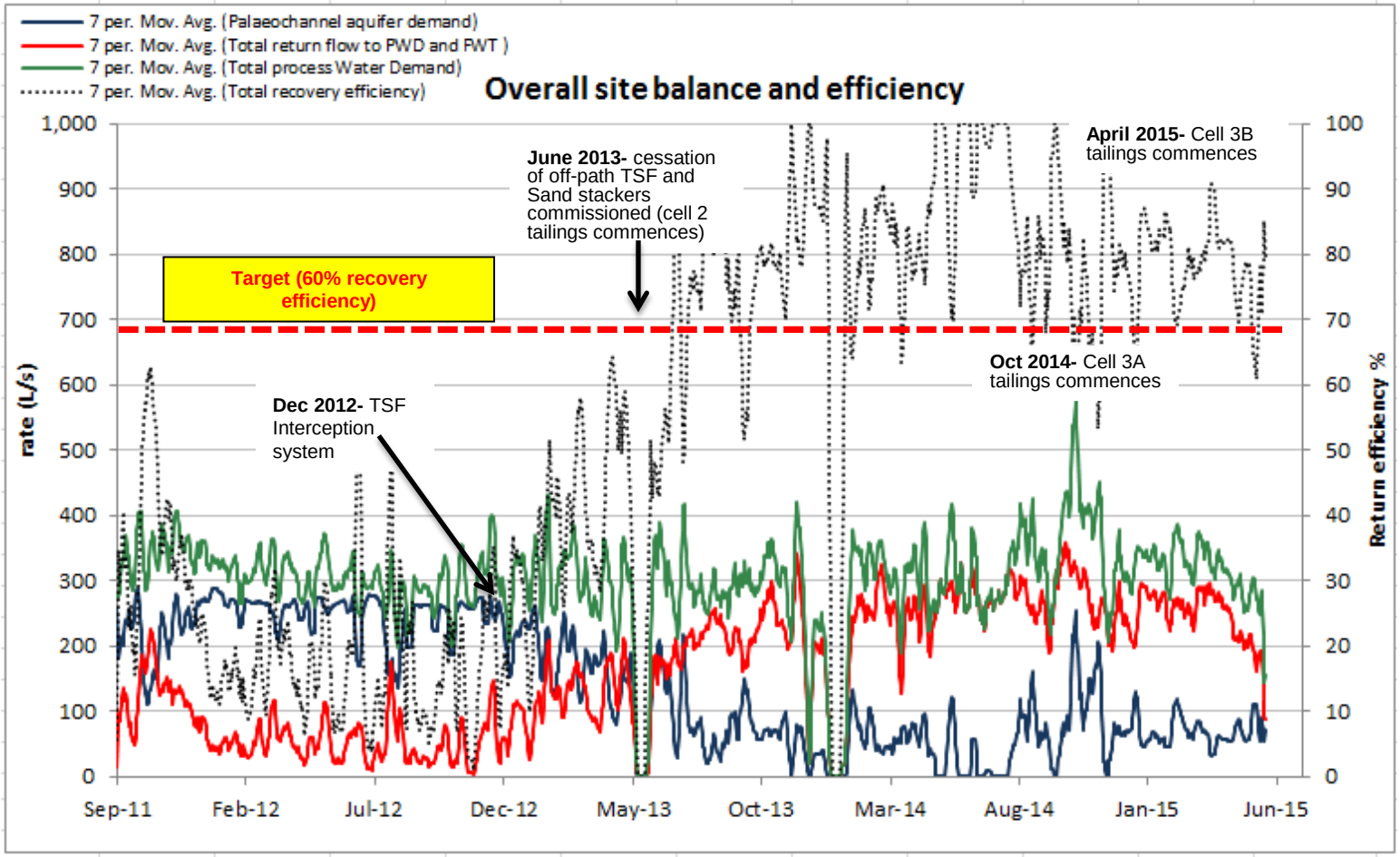
Slime stream

Water balance development

Site water balance circuit



Site water balance over time



Trends – Average Site Recovery Efficiency:

Pre- Dec 2012
21 %

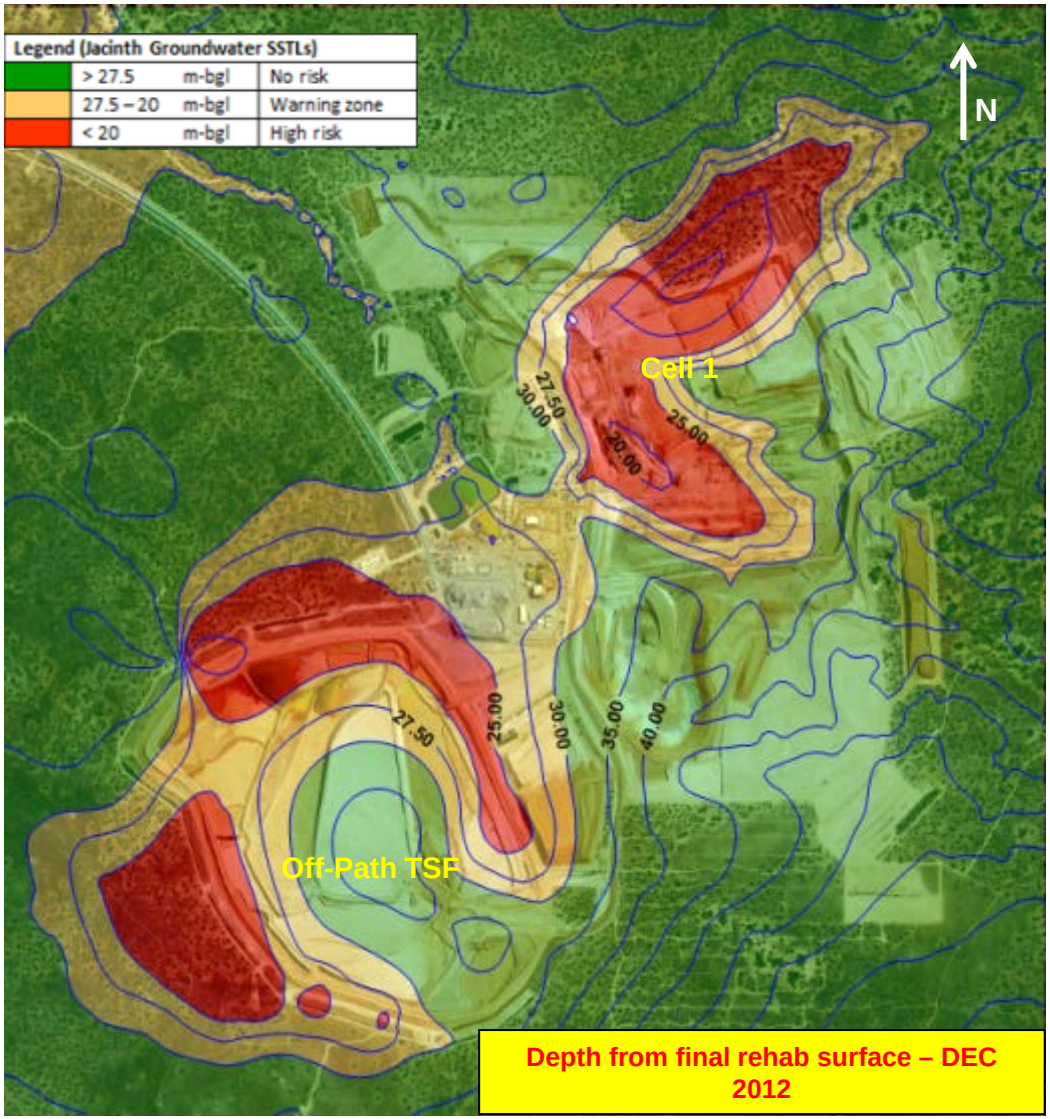
Dec 2012 – Jun 2013:
40.7 %
Borefield demand ↓ 23% (avg)

Post- Jun 2013:
80.6 %
Borefield demand ↓ 54% (avg)

Groundwater surface improvements

DECEMBER 2012 (mbgl)

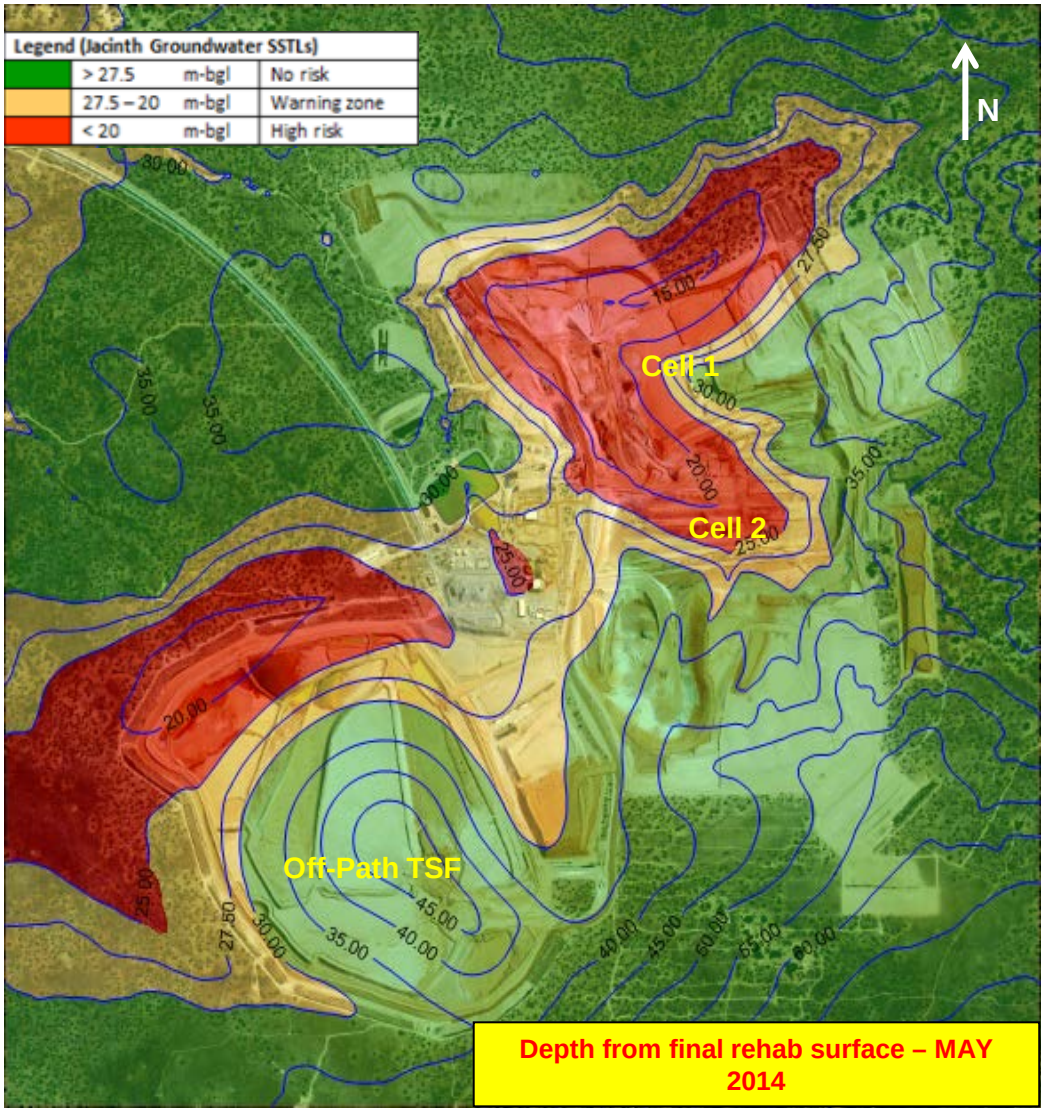
- Extensive groundwater mounding at off-path TSF and Cell 1.
- Emerging connection between mounds.
- TSF interception scheme commissioned.



Groundwater surface improvements

MAY 2014 (mbgl)

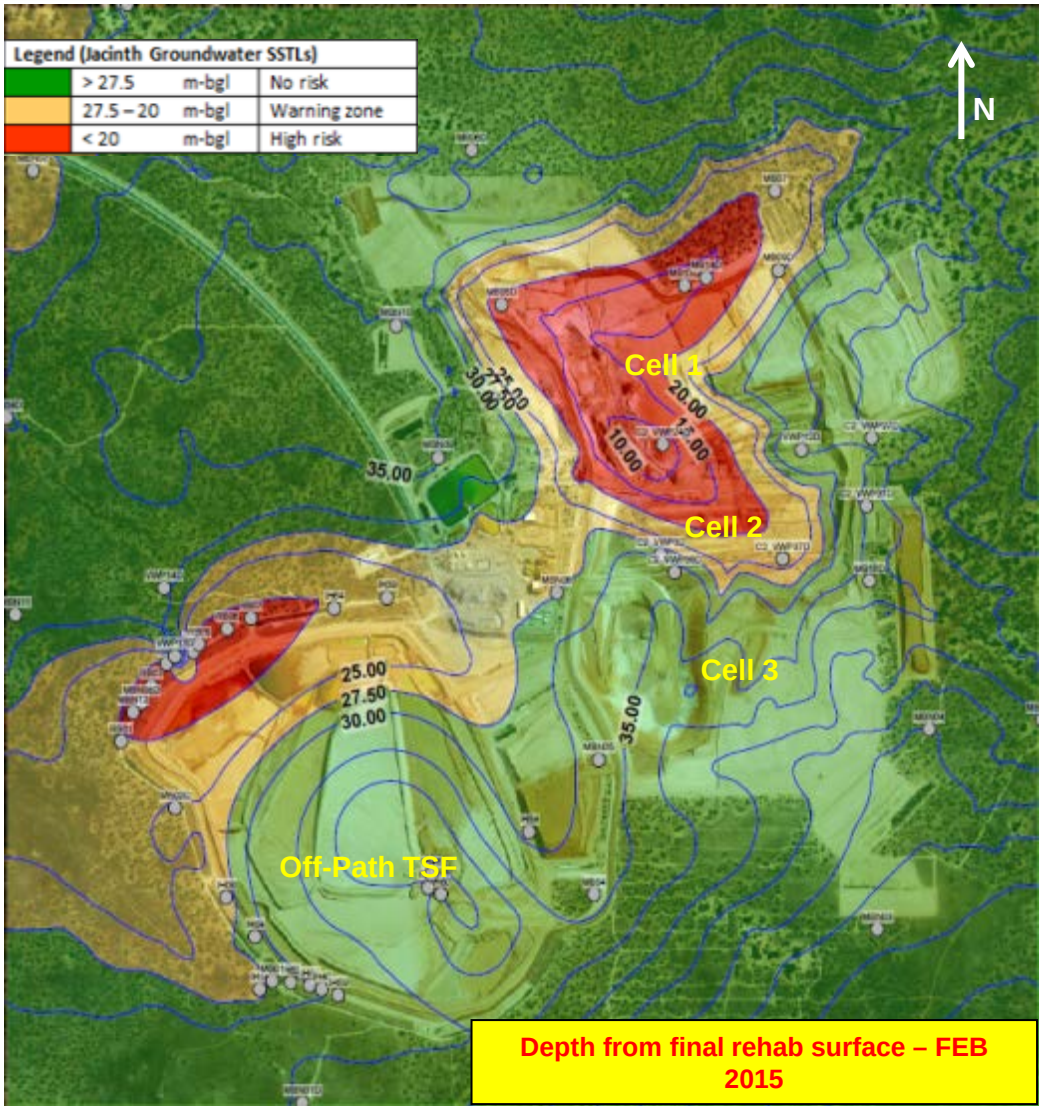
- TSF groundwater mound migrating north-west away from TSF.
- Groundwater levels across southern TSF in decline.
- Active tailings into Cell 2 increasing interconnection of mound systems.



Groundwater surface improvements

FEBRUARY 2015 (mbgl)

- Significant reduction in off-path TSF groundwater mound**.**
- Several bores on southern side of off-path TSF decommissioned.
- Active tailings into Cell 2 and Cell 3.
- Reduction in mounding at Cell 1 and 2 as mine progresses to the south
- Mound levels beneath on-paths cells controlled by sub-surface drain RLs and active decant pumping



Groundwater management – current & beyond

Current Strategies

- Off-Path TSF
  - Continued operation of TSF interception system
- In-pit tailings cells
  - Sub-floor drainage systems (in place for Cell 2 and Cell 3)
  - Sand stacking formalised as tailings method
- Continued vegetation stress monitoring

Potential Investigations

- Geophysical surveys
  - identify presence of basement rock fractures zones (potential high-yield interception sites)
- Hydrogeological assessment of TSF groundwater mound attenuation (level and rate)

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