

# Mungari operation

Ten year mine life and reliable low cost mill



**A\$1,181/oz**



**118,498oz**

[www.evolutionmining.com.au](http://www.evolutionmining.com.au)

Evolution Mining is a leading, growth focussed Australian gold company. In FY18 Evolution produced 801,187 ounces of gold at an AISC of A\$797 per ounce to reach seven consecutive years of achieving production and cost guidance. Evolution has guided FY19 Group gold production of 720,000 – 770,000 ounces at an All-in sustaining cost of A\$850 – A\$900 per ounce of gold.

The Mungari operation has opportunity for high-grade discoveries to increase production, lower costs and extend mine life. The operation is forecast to produce between 125,000oz and 135,000oz in FY19. In FY19, our challenge is to increase our production, a reduction in capital expenditure and investment in discovery.

**Location:** 600km east of Perth, 20km west of Kalgoorlie, Western Australia

**Producing:** Gold

**Management:** Owner operator

**Site management:** Andrew Millar - General Manager

**Mine Site contact number:** +61 8 9268 4000

The operation is a key asset in Evolution's portfolio and consists of underground mining at Frog's Leg, open pit mining at White Foil and a strategically located 1.6Mtpa process plant.

Safety improved at Mungari with a significant reduction in Significant Safety Occurrence Frequency (SSOF) over the year from 6.0 to 2.4 and TRIF from 13.3 to 9.7.

The operational performance also improved, highlighted by milling costs reducing by A\$2/t processed against budget. Total gold production for FY18 of 118,498oz was slightly below guidance of 120,000 – 130,000oz which resulted in FY18 AISC of A\$1,181/oz being above the guidance range of A\$990 – A\$1,050/oz. Full year net mine cash flow was A\$23.7 million.

Mungari's performance is expected to improve in FY19, built on the completion of the White Foil Stage 3 cutback and increased availability of high-grade ore feed from Frog's Leg underground.

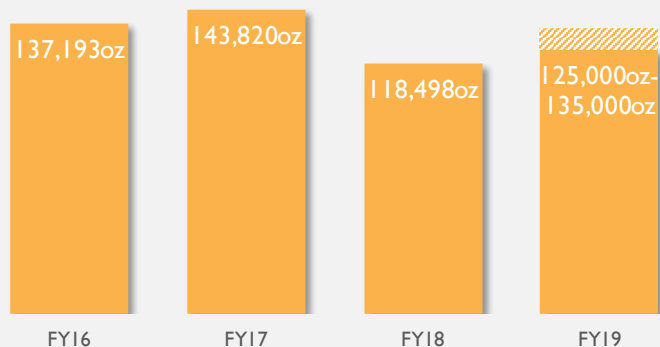
## ➔ FY18 performance

- Mine life extension - 10 year base load
- Reserves increased by 38% year-on-year to 828koz - addition of Castle Hill
- Investment in White Foil cutback
- Return on invested capital - 14%

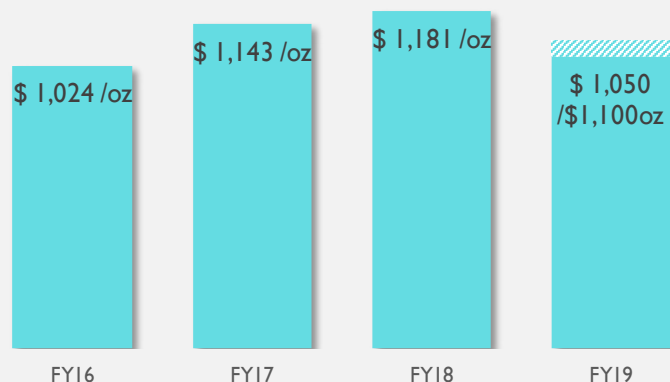
# STRATEGIC FOOTPRINT IN WO

## Snapshot

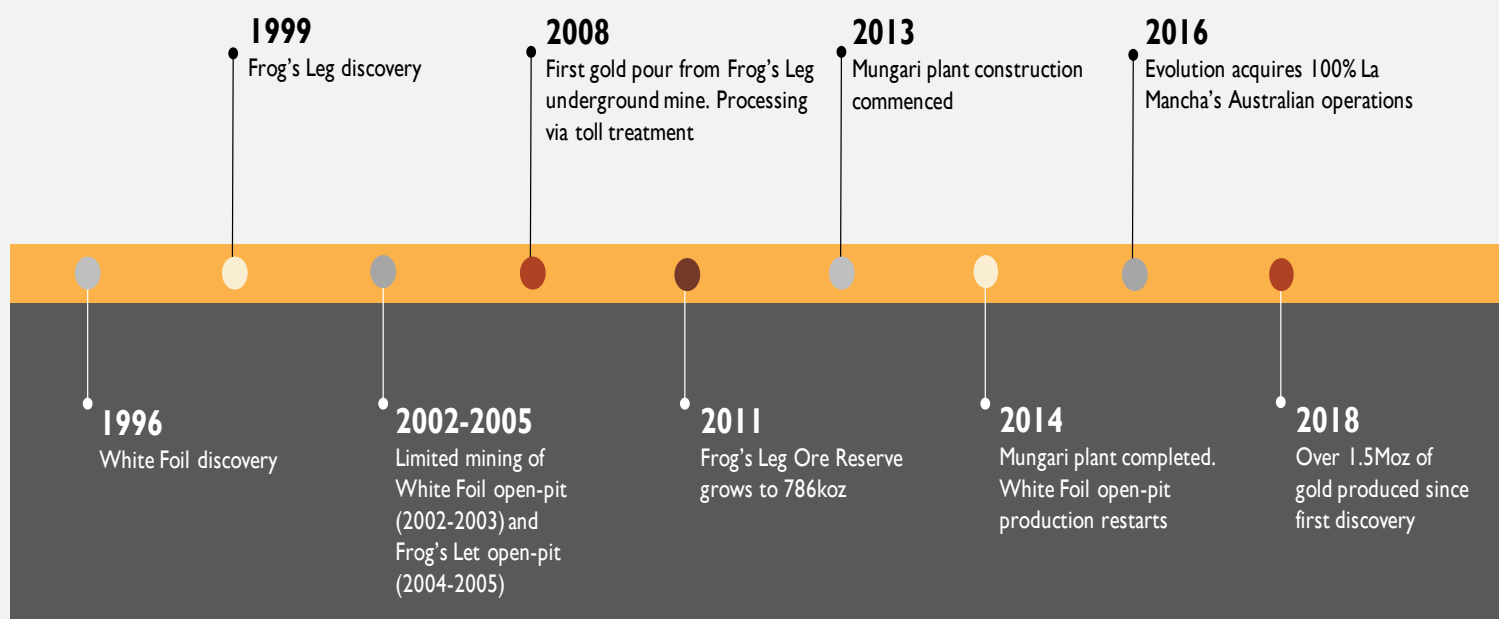
### Gold production (oz)



### AISC (A\$/oz)



## History - Mungari Evolution



## Safety, health and wellness culture

### Safety

- Significant reduction in TRIF under Evolution ownership from 35 to 8.5
- Operational personnel seconded to safety; ownership of safety; focus on small things; training commitments

### Community

- Strong local community support: e.g. Hannans Primary School adventure playground completed, Coolgardie Skate Park
- Native Title and Cultural Heritage agreements signed with Maduwongga

### Environment

- Kalgoorlie Boulder Urban Land Care

### Diversity

- Lead partner in the 2018 Women in Leadership Forum Kalgoorlie
- Back to work program

TRIF: Total recordable injury frequency. The frequency of total recordable injuries per million hours worked. Results above are based on a 12 month moving average

# WORLD CLASS GOLD DISTRICT

## Mineral Resources (Dec 17)



## Ore Reserves (Dec 17)



(1) See our website for further details of Mungari's Mineral Resources and Ore Reserves

## Geology

The White Foil and Frog's Leg deposits are situated within the Norseman-Wiluna Greenstone Belt of the Yilgarn Craton, Western Australia. White Foil lies three kilometres to the west of the Mungari Shear, a regional scale shear zone, and is hosted within a quartz rich gabbro unit which is part of the Powder Sill intrusive complex. The mineralised zone is 70m wide, 400m long and dips to the WSW and WNS at between 50° to 60° and is open at depth.

The Frog's Leg deposit is located on the sheared contact between the porphyritic "cat rock" (regionally known as the Victorious Basalt) and volcanoclastic rocks of Black Flag Beds. The ore lodes are between 2m and 20m thick and occur as sub-parallel lodes.

The regional tenement package has positions on two main prospective structures:

- Zuleika Shear - Notable deposits include Frogs Leg and Bullant, as well as the Kundana group of Centenary, Strezlecki, Raleigh, Barkers, Hornet and Millenium
- Kunanalling Shear - Notable deposits include Castle Hill, Catherwood and Carbine

## Mining

White Foil is the open pit mine at the Mungari operations and utilises conventional drill and blast, load and haul methods. At our underground mine, Frog's Leg mining methodology is top-down bench stoping with paste fill. White Foil open-pit mine recommenced mid-2014 and in FY18 produced approximately 501kt @ 1.61g/t gold. Frog's Leg underground mine produced 462kt @ 5.32g/t gold in FY18.

### Frog's Leg (underground mining)

<b>Mining method/s:</b>	Top-down long hole stoping, with paste fill
<b>Access:</b>	5m x 5.5m decline from portal in pit, then twin declines from 125 metres below surface (mbs) to access north (Mist) and south (Rocket) sections Deepest current level is 700mbs
<b>Ore mined:</b>	FY18: 962kt for 105koz contained gold
<b>Workforce:</b>	Owner operation and maintenance
<b>Work roster:</b>	7 on / 7 off and 5/2/4/3
<b>Loading:</b>	2 x Caterpillar R2900G, 1 x Caterpillar R1700G
<b>Trucking:</b>	3 x Caterpillar AD55B
<b>Drilling - development:</b>	1 x Sandvik DD421 twin boom jumbo
<b>Drilling - production:</b>	2 x Sandvik DL421 production drill
<b>Ground support:</b>	Standard: friction bolts and mesh. Additional (as required): cable bolts, dynamic bolts, fibrecrete
<b>Ancillary equipment:</b>	2 x Rocmec charge-up, 3 x integrated tollcarrier
<b>Explosives:</b>	Stoping: emulsion, electronic initiation. Development: ANFO, non-electric initiation
<b>Underground communications:</b>	VHF leaky feeder network (radio and data). Optic fibre to copper LAN (microseismic system, video, data)



## White Foil (open pit mining)

<b>Mining method/s:</b>	Conventional open pit (drill, blast, load and haul)
<b>Final design:</b>	525m EW, 1,120m NS, 240m deep
<b>Ore mined:</b>	FY18: 497kt for 26koz contained gold
<b>Workforce:</b>	Load and haul: owner operator; drill & blast: Ausdrill contractors; maintenance; Emeco contractors
<b>Work roster:</b>	7/3/5/6
<b>Loading:</b>	1 x Hitachi EX2600, 1 x Komatsu PC1250, 1 x Komatsu PC2000
<b>Hauling:</b>	7 x Caterpillar 785C
<b>Dozers:</b>	2 x Caterpillar D10T
<b>Road maintenance:</b>	1 x Caterpillar 16M, 1 x Caterpillar 773D water cart
<b>Drilling equipment:</b>	5 x Sandvik DP1500i
<b>Explosives:</b>	Bulk Watergel

## Processing

The onsite 1.7Mtpa Mungari processing plant was completed on-time and on-budget (A\$110 million) in June 2014. The processing plant consists of three stage crushing and ball milling, followed by conventional leaching.

White Foil now benefits from lower processing and haulage costs, making a larger portion of the resource economic.

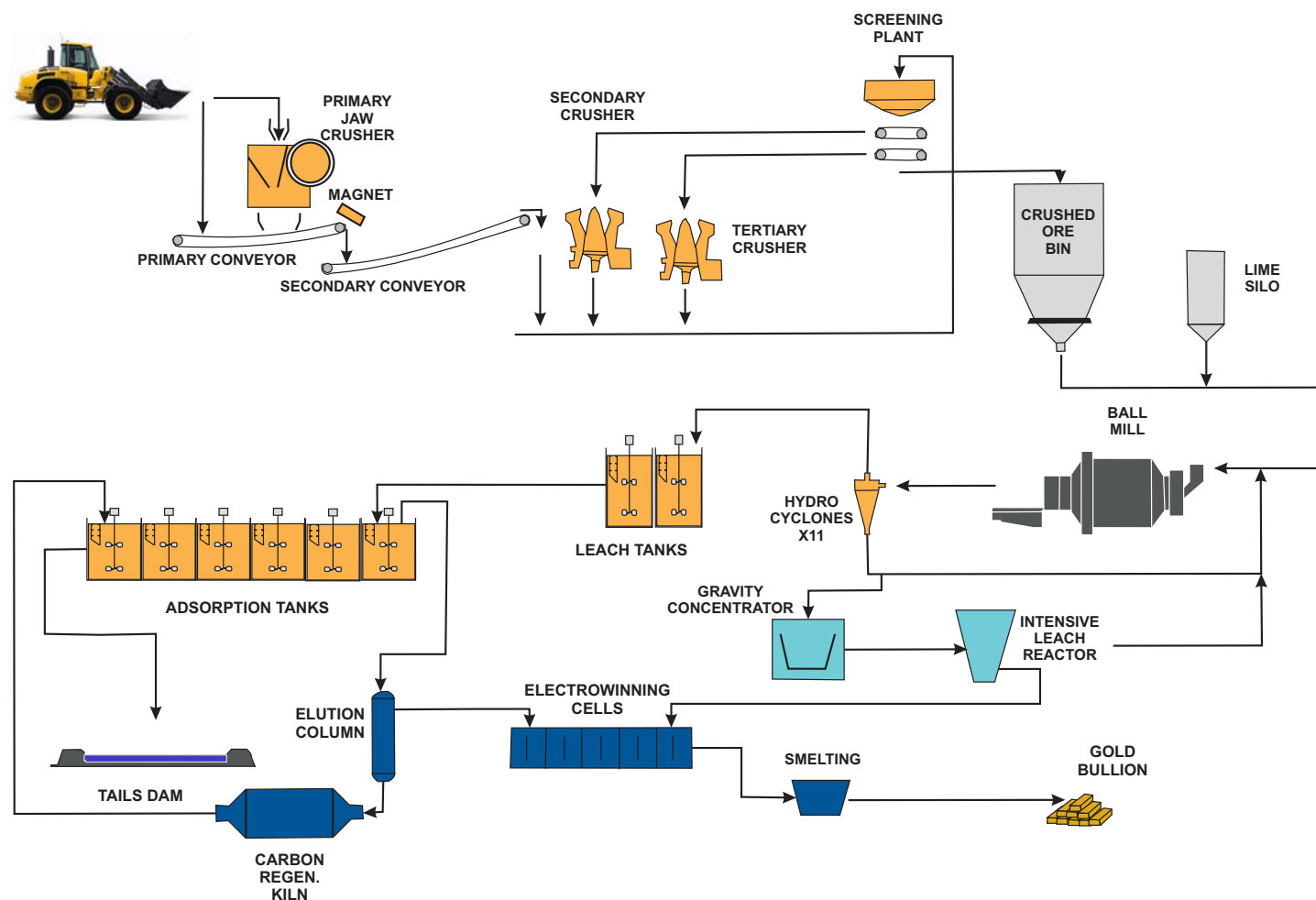
Driven by this ability to process the White Foil ore, exploration resumed in late 2012 and resulted in a 4-fold increase to reach an endowment of nearly 2 Moz.

- **Three stage crushing, ball mill, gravity and carbon-in-pulp (CIP)**
- **Annual average throughput rate**  
1.7Mtpa (nameplate = 1.5Mtpa)
- **Recovery**  
92 - 95%
- **Power**  
Western Power - grid supply
- **Crushing**  
Primary: 220kW Jaw  
Secondary: 315kW Cone  
Tertiary: 315kW Cone
- **Grinding**  
Ball Mill: 4.5MW, 8.7mL x 5.5m. diameter  
Grind Size p80: 106 um
- **Media:** 94mm and 78mm hi-chrome balls
- **Recovery method**  
Gravity and CIP
- **Leaching**  
Leaching: 2 x 1,140 m<sup>3</sup> tanks  
Adsorption: 6 x 750 m<sup>3</sup> tanks  
Elution: split AARL  
Electrowinning: 3 x Consep tanks [2 x carbon-in-leach (CIL), 2 x gravity]
- **Gravity circuit**  
Concentrator: 2 x Knelson  
Intensive Leach: Consep Acacia
- **Work roster**  
7/7 and 8/6



Mungari processing plant

# Process flowsheet



## General

- **Accommodation**  
Residential accommodation in Kalgoorlie
- **Mine workforce**  
342 employees & contractors
- **Safety / Environment / Community**

Evolution strives to enable all work activities related to its operations to be carried out safely and with all reasonable measures taken to remove or reduce risks to the health, safety and welfare of personnel, plant and equipment.

Evolution is committed to attaining an outstanding level of environmental performance in all of its workplaces and has a strong corporate culture and a commitment to proactively and positively engage with the communities in which we operate. At Mungari we are on the traditional land of the Maduwongga people. Our local communities are Kalgoorlie and Coogardie. Evolution is committed to building relationships with our community stakeholders based on trust, mutual respect and genuine partnership. We want the communities in which we operate to be better off overall for us having been there. Underpinning this is our desire to always leave a positive legacy.

We are committed to attaining an outstanding level of environmental performance in all our workplaces. Evolution incorporates environmental considerations into all areas of our business to effectively manage environmental impacts and risks. We have developed an Environment and Sustainability Policy that we expect our people and contractors to adhere to. We believe we have an obligation to not only achieve legislative compliance but to strive for best practice and to meet the expectations of the communities we operate within and are part of. We are focussed on enhancing environmental stewardship through the implementation of our Environmental Protocols and Life of Mine Environmental Management Plans across all project sites. For further information please go to our website.