

# Australian & New Zealand Gold Operations March Quarter 2024

## Overview

The average All-in Sustaining Cost (AISC) for Australia and New Zealand was A\$2,054/oz, which is up 9.5% (A\$177/oz) on the previous quarter average AISC of A\$1,877/oz. Evolution Mining's North Parkes and Ernest Henry operations were the lowest cost producers reporting an AISC of **-A\$4,334/oz**, **-A1,842/oz** respectively followed by Ramelius Resources' Mt Magnet operations with an AISC of A\$1,030/oz. The average gold spot price for the quarter was A\$3,148/oz (US\$2,072/oz). It should be noted that North Parkes and Ernest Henry benefit from significant base metal by-products. Aurum Analytics' estimate of these operations AISC on a co-product basis (Co-AISC) is as follows; North Parkes Co-AISC of A\$1,590/oz and Ernest Henry Co-AISC of A\$1,837/oz. The lowest cost "gold only" operations were Ramelius Resource's Mt Magnet operations with an AISC of A\$1,030, Northern Star's KCGM operations (A\$1,407/oz), followed by Capricorn Metals' Karlawinda mine (A\$1,515/oz).

Newmont's Boddington operation took out top spot as Australia's largest gold producer with 142,000 oz for the quarter, followed by their Cadia Valley operations (122,000 oz) and Northern Star's KCGM operations (129,313 oz). Of the mines where gold is a by-product, BHP's Olympic Dam produced the most gold 49,128 oz followed by their Carrapateena mine with 22,190 oz, then their Prominent Hill mine with 21,019 oz.

Grade wise for the companies that report AISC, the average reported mill head/feed grade was 2.41 g/t (Open Pit (OP) - 0.89 g/t, Underground (UG) – 3.35 g/t, Open Pit & Underground (OP/UG) - 2.08 g/t) which was down on the previous quarter, 2.55 g/t (-5.6%). Mandalay Resources' Costerfield mine took out the honour as the operation with the highest average feed grade with 12.41 g/t, followed by Silver Lake's Deflector mine 6.50 g/t. The lowest grade mine was Evolution's North Parkes mine processing an average head grade of 0.28 g/t. The high-grade operations that do not report an AISC were Agnico Eagle's Fosterville mine with 10. g/t and Kaiser Reef's A1 mine with 7.40 g/t.

## Top 10 Gold Producing Operations

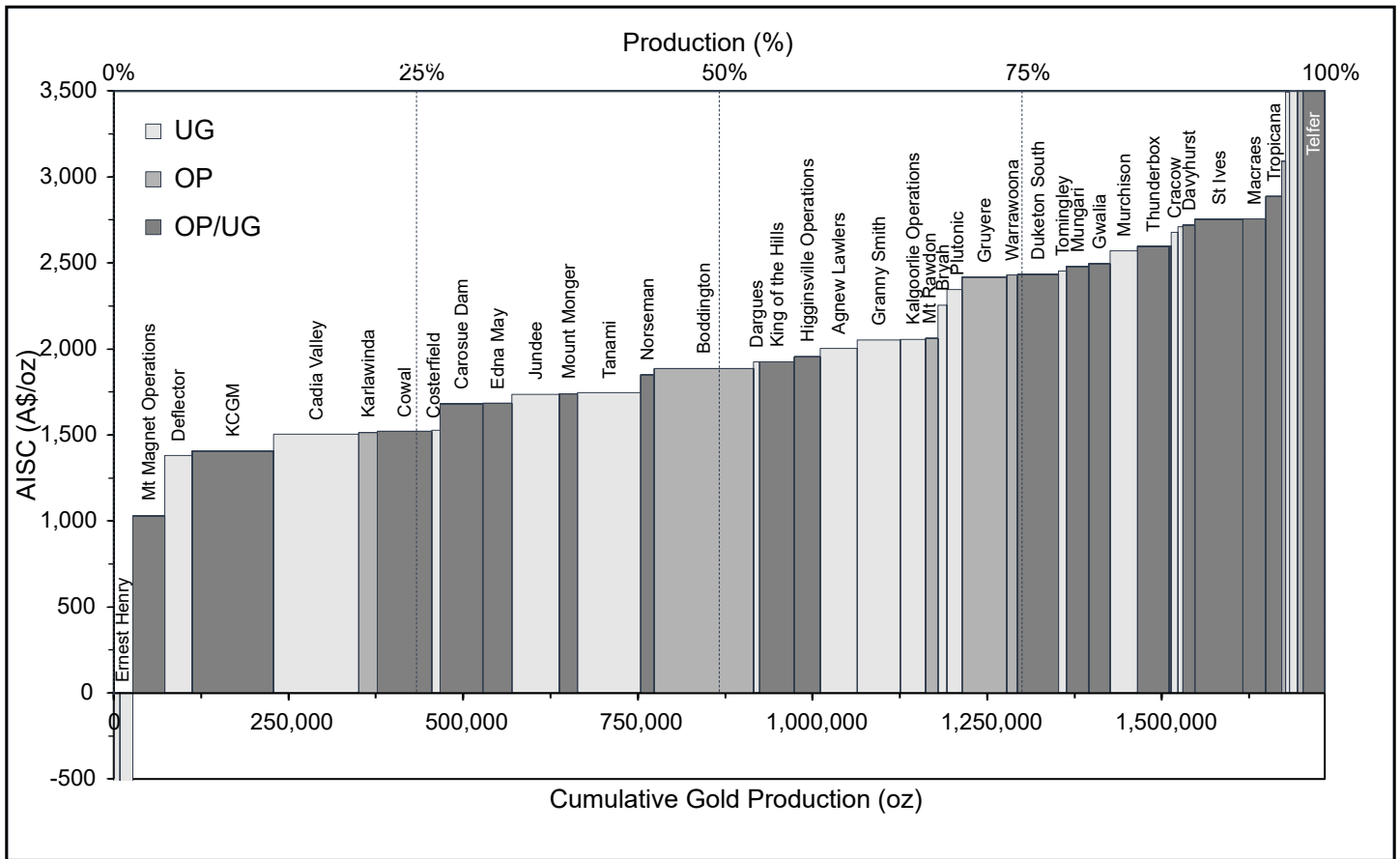
Rank	Operation	Company	Mine Type	Au Produced (oz)
1	Boddington	Newmont Corporation	OP	142,000
2	Cadia Valley	Newmont Corporation	UG	122,000
3	KCGM	Northern Star Resources Limited	OP/UG	116,714
4	Tanami	Newmont Corporation	UG	90,000
5	Cowal	Evolution Mining Limited	OP/UG	78,109
6	Tropicana	JV AngloGold Ashanti Limited/Regis Resources Limited	OP/UG	77,223
7	St Ives	Gold Fields Limited	OP/UG	68,900
8	Jundee	Northern Star Resources Limited	UG	68,651
9	Gruyere	JV Gold Fields Limited/Gold Road Resources Limited	OP	64,323
10	Granny Smith	Gold Fields Limited	UG	61,700

## Gold Operations That Report AISC

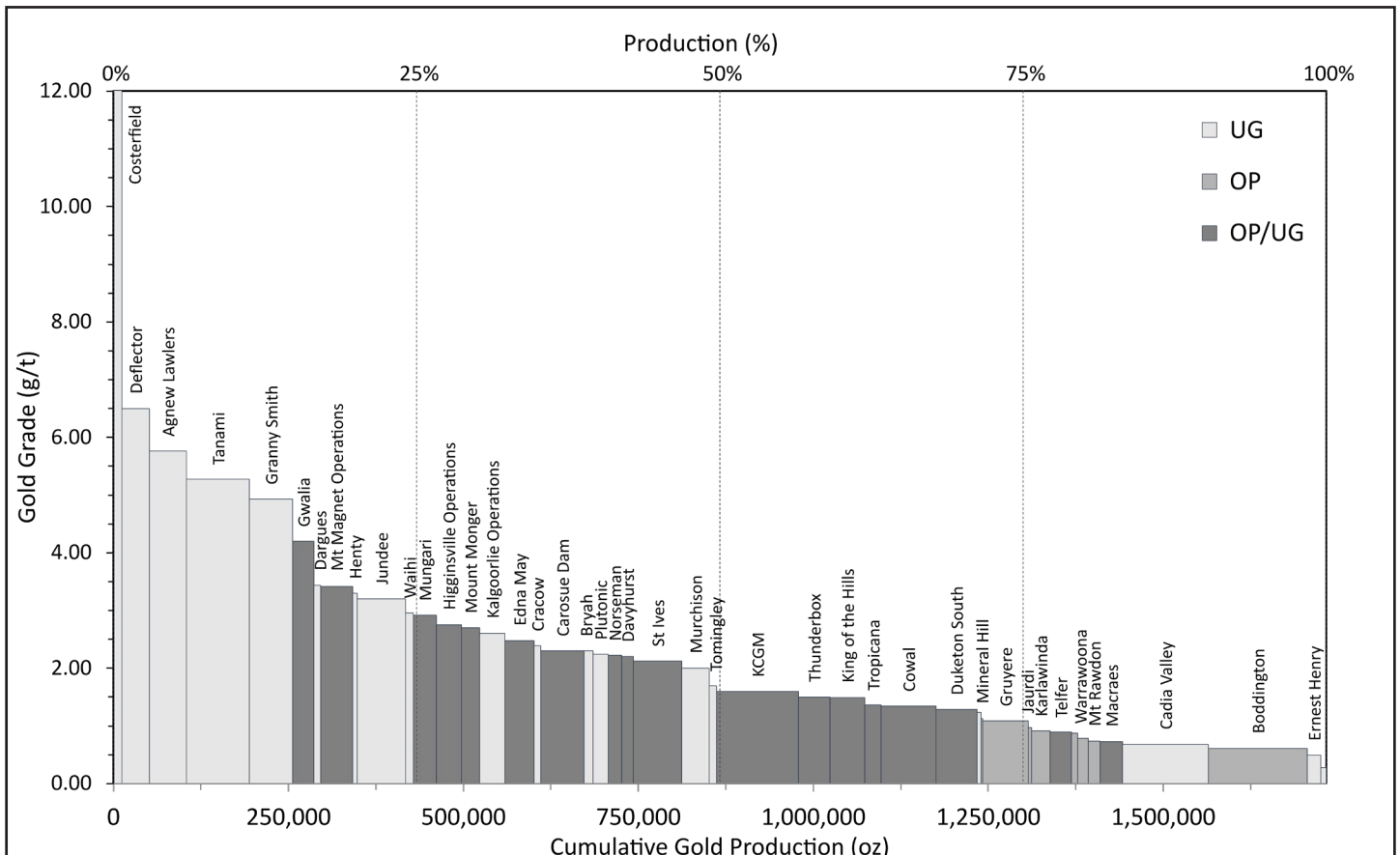
AISC Rank	Operation	Company	Mine Type	AISC (A\$/oz)	Grade (g/t)	Grade Rank	Au Produced (oz)
1	North Parkes	Evolution Mining Limited	UG	-4,334	0.28	45	8,402
2	Ernest Henry	Evolution Mining Limited	UG	-1,842	0.49	44	18,534
3	Mt Magnet Operations	Ramelius Resources Limited	OP/UG	1,030	3.42	8	45,927
4	Deflector	Silver Lake Resources Limited	UG	1,381	6.50	2	39,051
5	KCGM	Northern Star Resources Limited	OP/UG	1,407	1.60	26	116,714
6	Cadia Valley	Newmont Corporation	UG	1,503	0.68	42	122,000
7	Karlawinda	Capricorn Metals Limited	OP	1,515	0.91	36	26,017
8	Cowal	Evolution Mining Limited	OP/UG	1,522	1.34	30	78,109
9	Costerfield	Mandalay Resources Limited	UG	1,527	12.41	1	11,976
10	Carosue Dam	Northern Star Resources Limited	OP/UG	1,681	2.30	18=	61,567
11	Edna May	Ramelius Resources Limited	OP/UG	1,684	2.48	16	41,001
12	Jundee	Northern Star Resources Limited	UG	1,737	3.20	10	68,651
13	Mount Monger	Silver Lake Resources Limited	OP/UG	1,740	2.70	14	25,916
14	Tanami	Newmont Corporation	UG	1,746	5.27	4	90,000
15	Norseman	Pantoro Limited	OP/UG	1,850	2.22	21	19,235
16	Boddington	Newmont Corporation	OP	1,887	0.61	43	142,000
17	Dargues	Aurelia Metals Limited	UG	1,925	3.44	7	9,205
18	King of the Hills	Red 5 Limited	OP/UG	1,926	1.49	28	50,132
19	Higginsville Operations	Karora Resources Inc	OP/UG	1,953	2.75	13	36,147
20	Agnew Lawlers	Gold Fields Limited	UG	2,002	5.76	3	53,300
21	Granny Smith	Gold Fields Limited	UG	2,051	4.93	5	61,700
22	Kalgoorlie Operations	Northern Star Resources Limited	UG	2,054	2.60	15	36,487
23	Mt Rawdon	Evolution Mining Limited	OP	2,063	0.74	40	17,319
24	Bryah	Westgold Resources Limited	UG	2,254	2.30	18=	12,960
25	Plutonic	Catalyst Metals Limited	UG	2,346	2.24	20	21,252
26	Gruyere	JV Gold Fields/Gold Road	OP	2,417	1.09	34	64,323
27	Warrawoona	Calidus Resources Limited	OP	2,429	0.78	39	15,118
28	Duketon South	Regis Resources Limited	OP/UG	2,435	1.28	31	59,017
29	Tomingley	Alkane Resources Limited	UG	2,454	1.69	25	10,861
30	Mungari	Evolution Mining Limited	OP/UG	2,479	2.92	12	32,473
31	Gwalia	Genesis Minerals Limited	OP/UG	2,497	4.20	6	30,473
32	Murchison	Westgold Resources Limited	UG	2,569	2.00	24	39,140
33=	Thunderbox	Northern Star Resources Limited	OP/UG	2,597	1.50	27	44,992
33=	Mineral Hill	Kingston Resources Limited	OP	2,597	1.13	33	2,984
35	Cracow	Aeris Resources Limited	UG	2,679	2.39	17	10,200
36	Henty	Catalyst Metals Limited	UG	2,712	3.30	9	6,832
37	Davyhurst	Ora Banda Mining Limited	OP/UG	2,721	2.20	22	17,368
38	St Ives	Gold Fields Limited	OP/UG	2,753	2.12	23	68,900
39	Macraes	OceanaGold Corporation	OP/UG	2,756	0.73	41	32,300
40	Tropicana	Regis Resources Limited	OP/UG	2,887	1.36	29	23,167
41	Jaurdi	Beacon Minerals Limited	OP	3,092	0.97	35	5,273
42	Peak	Aurelia Metals Limited	UG	3,492	1.23	32	5,343
43	Waihi	OceanaGold Corporation	UG	3,636	2.96	11	11,400
44	Duketon North	Regis Resources Limited	OP	4,054	0.87	38	8,466
45	Telfer	Newmont Corporation	OP/UG	4,584	0.89	37	31,000

Notes: Operations shown on a 100% basis, except North Parkes only Evolution's 80% interest is shown and Tropicana only Regis Resources' 30% interest shown, Anglo-Gold has ceased reporting quarterly AISC values..

## Gold Production Cost Curve Ranked By Reported AISC



## Gold Production Grade Curve Ranked By Average Mill Feed/Head Grade



## Gold Mines That Did Not Report All-in Sustaining Costs

Rank	Operation	Company	Mine Type	Grade (g/t)	Au Produced (oz)
1	Fosterville	Agnico Eagle Mines Limited <sup>1</sup>	UG	10.51	56,569
2	Sunrise Dam	AngloGold Ashanti Limited <sup>2</sup>	OP/UG	1.79	56,000
3	Tropicana	AngloGold Ashanti Limited <sup>2</sup> (70%)	OP/UG	1.36	53,000
4	Bellevue	Bellevue Gold Limited	UG	5.00	37,338
5	Matilda-Wiluna	Wiluna Mining Corporation Limited <sup>3</sup>	NM	0.75	7,088
6	Kundana EKJV	JV Tribune Resources Limited/Rand Mining Limited	UG	4.03	6,553
7	Coolgardie	Focus Minerals Limited	OP	0.79	5,938
8	A1	Kaiser Reef Limited	UG	7.40	1,597
NR	Marvel Loch	Minjar Gold Pty Ltd <sup>4</sup>	OP/UG	NA	NA
NR	Paddington	Zijin Mining Group Company Limited <sup>4</sup>	OP/UG	NA	NA
NR	Pajingo	Minjar Gold Pty Ltd <sup>4</sup>	UG	NA	NA
NR	Ravenswood	EMR Capital <sup>4</sup>	OP/UG	NA	NA

1. Agnico Eagle Mines Limited does not report quarterly AISC values for individual mines.

2. Anglo Gold Ashanti Limited no longer reports quarterly AISC values. Tropicana's production is based on their 70% share.

3. Wiluna Mining Corporation Limited is in administration.

4. These companies do not provide detailed quarterly production statistics.

## Mines Where Gold Is A By-Product

Rank	Operation	Company	Mine Type	Au Produced (oz)
1	Olympic Dam	BHP Group Limited	UG	49,128
2	Carrapateena	BHP Group Limited	UG	22,190
3	Prominent Hill	BHP Group Limited	UG	21,019
4	Ernest Henry	Evolution Mining Limited	UG	18,534
5	North Parkes <sup>1</sup>	Evolution Mining Limited	UG	8,402
6	Rosebery	MMG Limited	UG	8,372
7	Golden Grove	29Metals Limited	UG	2,787
8	Eloise	AIC Mines Limited	UG	1,532
9	Mt Colin	Aeris Resources Limited	UG	1,300
10	Tritton	Aeris Resources Limited	UG	1,200

1. North Parkes is a joint venture between Evolution Mining Limited (80%) and Sumitomo Australia Pty Ltd (20%). Gold produced represents Evolutions 80% interest for part ownership of the quarter only.

## Quarter on Quarter Change in AISC and Grade

Statistic	AISC (A\$/oz)	Change (%)	Grade (g/t)	Change (%)
Average (Simple) <sup>1</sup>	2,054	9.5%	2.41	-5.6%
Average (Weighted) <sup>2</sup>	1,959	3.0%	1.33	-9.4%
Minimum	-4,334	23.7%	0.28	33.3%
First Quartile <sup>3</sup>	1,522	-5.4%	1.09	-10.7%
Median <sup>3</sup>	1,887	3.9%	1.60	-18.4%
Third Quartile <sup>3</sup>	2,435	-0.2%	2.92	-9.6%
Maximum	4,584	15.5%	12.41	-5.6%

Notes: This table of statistics is only based on mines that report an AISC.

1. Simple averages done by number of mining operations.

2. AISC weighted by gold ounces produced, Au grade weighted by ore tonnes milled.

3. First Quartile, Median and Third Quartile values are based on production in the AISC Cost Curve and Grade Curve.

## Top 5 Gold Operations - Major Gold Miners

Gold Production (Attributable)			All-in Sustaining Costs		
Rank	Operation	oz	Rank	Operation	A\$/oz
1	Boddington	142,000	1	KCGM	1,407
2	Cadia Valley	122,000	2	Cadia Valley	1,503
3	KCGM	116,714	3	Carosue Dam	1,681
4	Tanami	90,000	4	Jundee	1,737
5	St Ives	68,900	5	Tanami	1,746

## Top 5 Gold Operations - Mid-Tier Gold Miners

Gold Production (Attributable)			All-in Sustaining Costs		
Rank	Operation	oz	Rank	Operation	A\$/oz
1	Cowal	78,109	1	North Parkes	-4,334
2	Duketon South	59,017	2	Ernest Henry	-1,842
3	King of the Hills	50,132	3	Mt Magnet Operations	1,030
4	Mt Magnet Operations	45,927	4	Deflector	1,381
5	Edna May	41,001	5	Cowal	1,522

## Top 5 Gold Operations - Junior Gold Miners

Gold Production (Attributable)			All-in Sustaining Costs		
Rank	Operation	oz	Rank	Operation	A\$/oz
1	Bellevue	37,338	1	Karlawinda	1,515
2	Higginsville Operations	36,147	2	Costerfield	1,527
3	Gruyere (50% Gold Road Resources Limited) <sup>1</sup>	32,162	3	Norseman	1,850
4	Gwalia	30,473	4	Dargues	1,925
5	Karlawinda	26,017	5	Cowal	1,953

1. Gruyere's gold produced represents Gold Road Resources Limited's 50% attributable interest.

## Top 5 Pure Gold Operations (No Base Metal By or Co-Products)

Gold Production (Total)			All-in Sustaining Costs		
Rank	Operation	oz	Rank	Operation	A\$/oz
1	KCGM	116,714	1	Mt Magnet Operations	1,030
2	Tanami	90,000	2	KCGM	1,407
3	Cowal	78,109	3	Karlawinda	1,515
4	Tropicana <sup>1</sup>	77,223	4	Cowal	1,522
5	St Ives	68,900	5	Carosue Dam	1,681

1. Tropicana is a joint venture between AngloGold Ashanti Limited (70%) and Regis Resources Limited (30%).

## General Notes

Data was sourced from company quarterly reports. Aurum Analytics created the cost and grade curves. Mine Type reflects the source of the ore mined for the quarter, OP - Open Pit, UG - Underground, OP/UG - Open Pit and Underground and NM - No Mining.

For operations in joint venture such as Gruyere and Tropicana AISC values were apportioned by equity ownership percentages.

Where AISC values were reported in US\$ and no A\$ equivalent provided, the quarterly average US\$/A\$ exchange rate (0.6581) from the Reserve Bank of Australia was used.

## Disclaimer

The information contained in this report is provided for information purposes only. Accordingly, it is provided on the basis of no liability whatsoever to Aurum Analytics, or the directors, officers and employees of Aurum Analytics who will not be responsible for any damages arising from any use made of the information herein. While all care has been taken in its preparation, this information has not been independently audited and Aurum Analytics, or the directors, officers and employees of Aurum Analytics make no representation and give no warranty or undertaking, express or implied, nor assume any responsibility for the authenticity, origin, validity, accuracy or completeness, or for any errors or omissions contained in the information. The assumptions that were made in its preparation were based on publicly available information which has not been verified by Aurum Analytics, or formally audited.



**ARGONAUT**  
*The Natural Choice in Resources*

## About Argonaut

Argonaut is a full-service corporate finance, stockbroking and investment house based in Perth with a Foreign Broker-Dealer Agreement for the USA and an International Dealer Exemption for Canada. Argonaut is technically driven & focused on natural resource companies & businesses that service the metals, mining, energy, industrial and agri-business sectors. Argonaut is led by an experienced executive team with deep industry knowledge, who have previously held senior executive roles at leading international investment and securities houses. In our target markets, Argonaut is recognised as a trusted, independent corporate advisor with a strong track record of success. Argonaut has proven expertise across the full capital spectrum, being able to deliver optimal financing solutions during a company's entire life cycle.



## About Aurum Analytics

Aurum Analytics is an independent business providing information and analysis on the Australian and New Zealand gold industry. The information and analysis given is a by-product of Sam Ulrich's PhD research at The University of Western Australia's Centre for Exploration Targeting titled "Insights into the Economic Cost Structure of Gold Mining: From All-in Sustaining Costs to Quantifying Externalities."

## Contact

### Sam Ulrich

#### Aurum Analytics

**E** sam@aurumanalytics.com.au  
**W** www.aurumanalytics.com.au  
**T** +61 439 997 814

### Liam Twigger

#### Argonaut Group

**E** ltwigger@argonaut.com  
**W** www.argonaut.com  
**T** +61 8 9224 6888