

## **5 AUGUST 2018**

**Analyst & Investor Visit** 

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- There are a number of risks specific to IGO and of a general nature which may affect the future operating and financial performance of IGO and the value of an investment in IGO including and not limited to economic conditions, stock market fluctuations, commodity demand and price movements, access to infrastructure, timing of environmental approvals, regulatory risks, operational risks, reliance on key personnel, reserve and resource estimations, native title and title risks, foreign currency fluctuations and mining development, construction and commissioning risk. The production guidance in this presentation is subject to risks specific to IGO and of a general nature which may affect the future operating and financial performance of IGO.
- Any references to IGO Mineral Resource and Ore Reserve estimates should be read in conjunction with IGO's 2018 Mineral Resource and Ore Reserve announcement dated 26 July 2018 and lodged with the ASX, which is available on the IGO website.
- All currency amounts in Australian Dollars unless otherwise noted.
- Net Debt is outstanding debt less cash balances.
- Cash Costs are reported inclusive of Royalties and after by-product credits on per unit of payable metal basis, unless otherwise stated.
- IGO reports All-in Sustaining Costs (AISC) per ounce of gold for its 30% interest in the Tropicana Gold Mine using the World Gold Council guidelines for AISC. The World Gold Council guidelines publication was released via press release on 27 June 2013 and is available from the World Gold Council's website.
- Underlying EBITDA is a non-IFRS measure and comprises net profit or loss after tax, adjusted to exclude tax expense, finance costs, interest income, asset impairments, redundancy and restructuring costs, depreciation and amortisation, and once-off transaction costs.
- Underlying NPAT comprises net profit (loss) after tax adjusted for; post tax effect of acquisition and integration costs, and impairments.
- Free Cash Flow comprises Net Cash Flow from Operating Activities and Net Cash Flow from Investing Activities. Underlying adjustments exclude acquisition costs, proceeds from investment sales and payments for investments.





#### **OVERVIEW**

#### Location:

330 km ENE of Kalgoorlie in WA

#### **Ownership:**

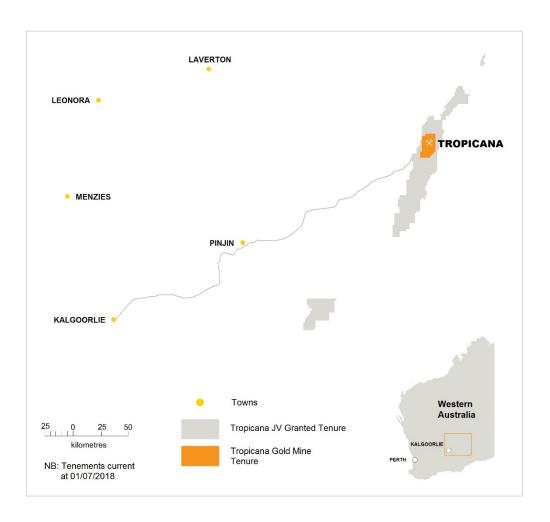
AngloGold Ashanti Australia Ltd (70% and manager), Independence Group NL (30%)

Mining: Conventional open cut

**Processing:** Crushing, High Pressure Grinding, Ball Mill, CIL

Ore Reserve (100%)\*: 64.9Mt grading 1.89 g/t for 3.95 Moz of gold

Mineral Resource (100%)\*: 139.7Mt grading 1.62 g/t for 7.29 Moz of gold



<sup>\*</sup> Mineral Resource estimates are inclusive of Ore Reserve estimates. For full details, see Independence Group NL's Annual Update of Exploration Results, Mineral Resources and Ore Reserves as at **30 June 2018** on www.igo.com.au





# Current Performance Mining & Processing Optimisation Boston Shaker Underground

Exploration





#### **DELIVERING TO PROMISE**



- Exceeded Feasibility Study parameters
- Consistently achieved or exceeded production and cost guidance
- 2017/18 production of 467,000oz better than mid point of guidance
- June 18 quarter production of 114,300oz
- On track to deliver 478,000oz 492,000oz in CY 2018



#### MINING OPERATIONAL EXCELLENCE

Embedding a cost-focused culture...



Backfilling

- Backfill remains a key strategy
- Rehabilitation integration
- 600t shovel implemented November 2017
- Lightweight tray trials
- Mobile crib huts
- Focus towards a sustained lower unit cost

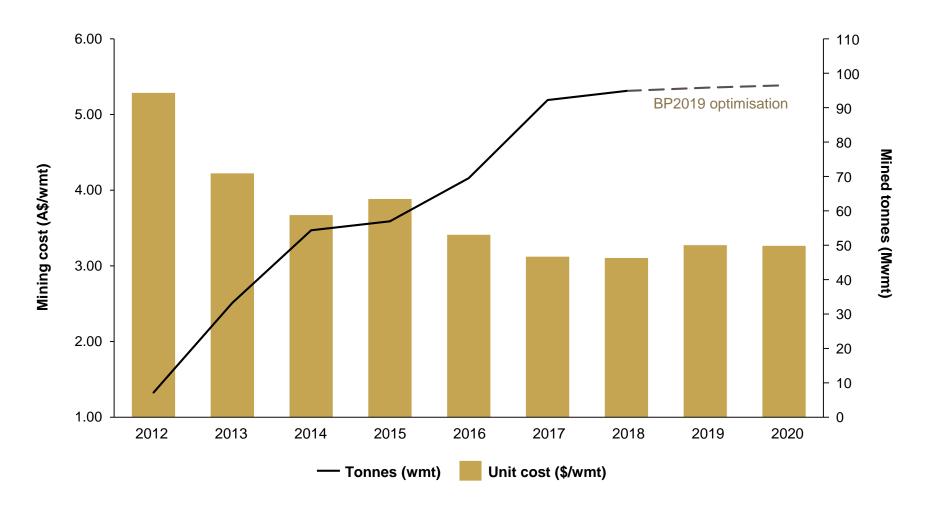






#### MINING OPTIMISATION

Material movement has remained consistent utilising the same fleet...



...and a key focus is continuing to identify initiatives to reduce unit cost

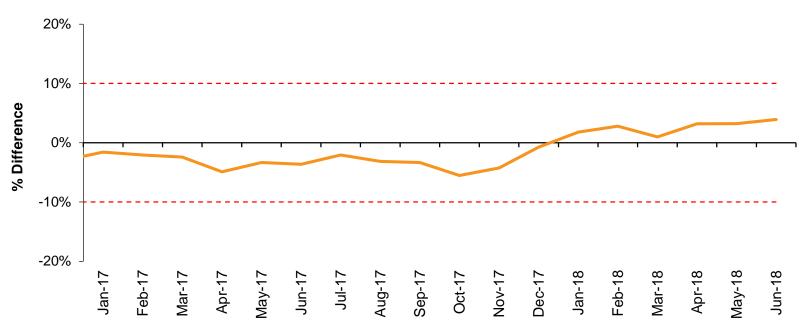




## **MINE-TO-MILL RECONCILIATION**

Mine-to-mill reconciliation confirms...

#### Mine call factor – mine delivered vs plant accounted head grade



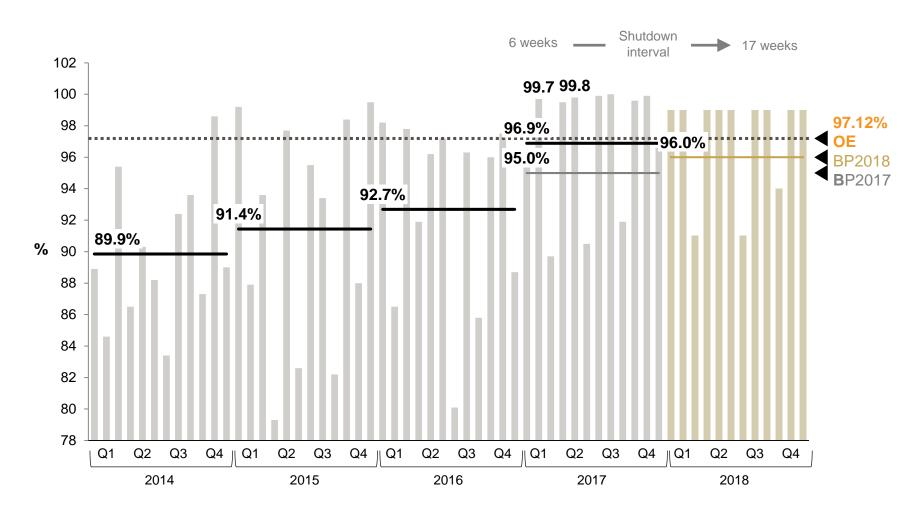
...the orebody is performing





# **RELIABILITY IMPROVEMENT – MILL RUNTIME (%)**

Continuous reliability improvements...



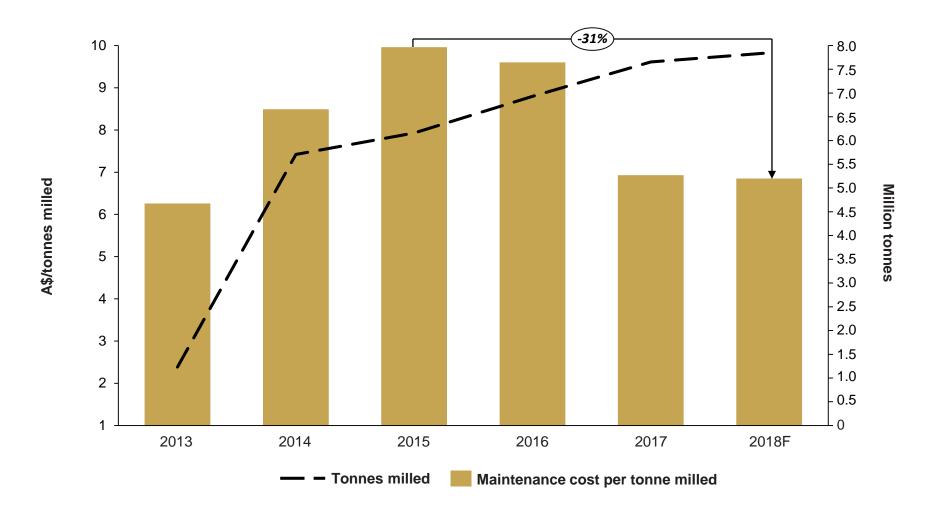
...have delivered world class run time





# MAINTENANCE (\$A/T MILLED)

Maintenance and wear life improvements...



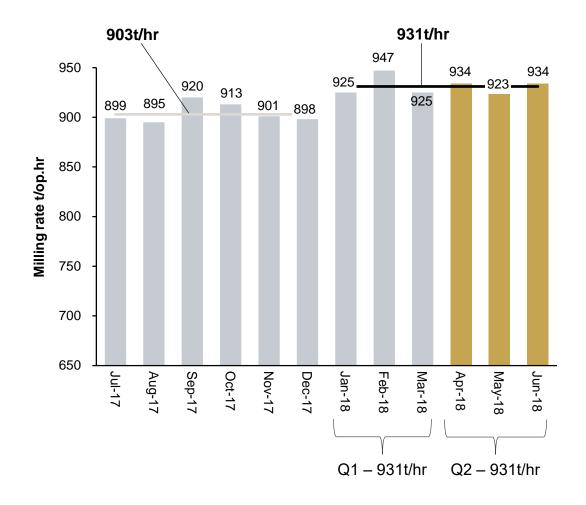
...leading to sustainable cost reduction





#### MILL THROUGHPUT RATE

Sustainable increases in mill throughput rate...



#### **Highlights**

- Higher rates Q1 and Q2
- Mill throughput year to date:
  - 931t/op.h (actual)
  - 890t/op.h (budget)
  - 940t/op.h (OE target)
- HPGR performance
  - centralised feed auto gates
  - wear liners keep profile longer
- Mill control
  - · auto grind control
  - reliable online P80 analysis

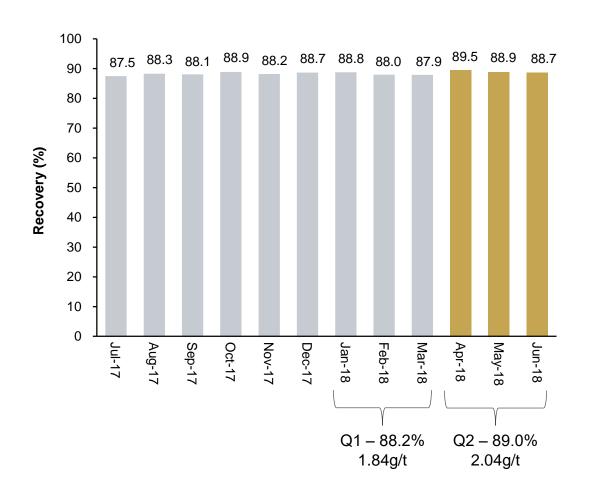
...leading to increased cash flow





#### **RECOVERY**

Projects deliver improved recovery at increased throughput rates...



#### **Highlights**

- Recovery levels are stable with upside opportunity
- Orebody and recovery models have behaved as expected

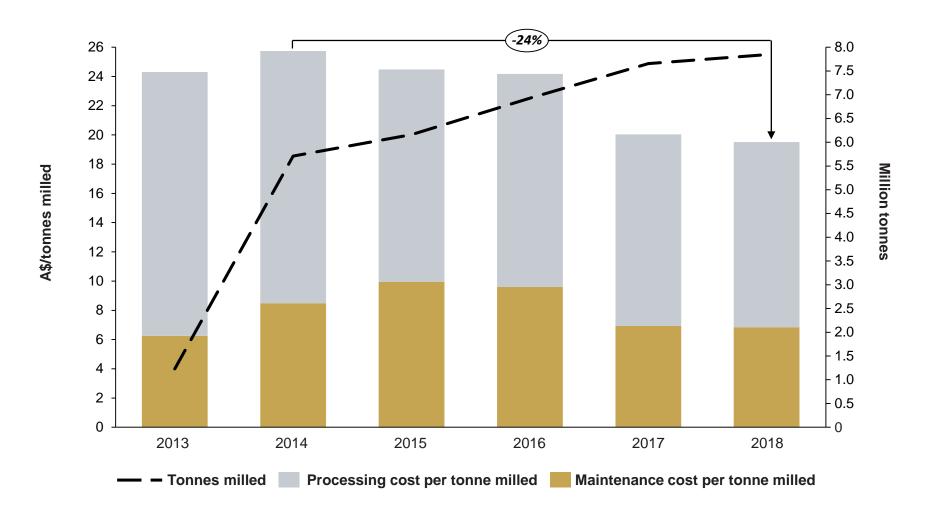
...leading to increased cash flow





#### PROCESSING/MAINTENANCE COSTS

Productivity and reliability improvements...



...lead to sustainable cost reduction





#### **GAS PIPELINE UPDATE**

- 293km of pipeline constructed to Tropicana via Sunrise Dam – commissioned end 2015 and now in third year of operation
- Based on current diesel price, savings on power costs are ~A\$1 – \$2 million pa
- The incremental cost of additional power is relatively cheap – benefits projects such as new ball mill and Boston Shaker underground
- Further reductions in gas price locked in for 2020 and 2021
- 6% reduction in greenhouse gas emissions in 2017
- 1,400 fewer road train trips per year







## Current Performance

# **Mining & Processing Optimisation**

Boston Shaker Underground

Exploration

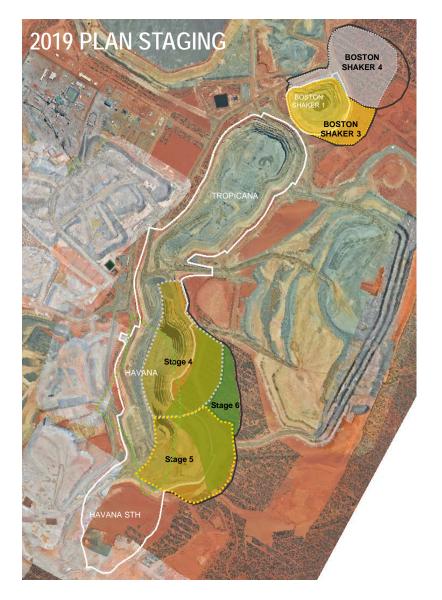




## **OPEN PIT OPTIONALITY**

- Backfill remains a key strategy
- Sequencing further optimised
- Mine life 2026 and stockpile exhaustion 2029









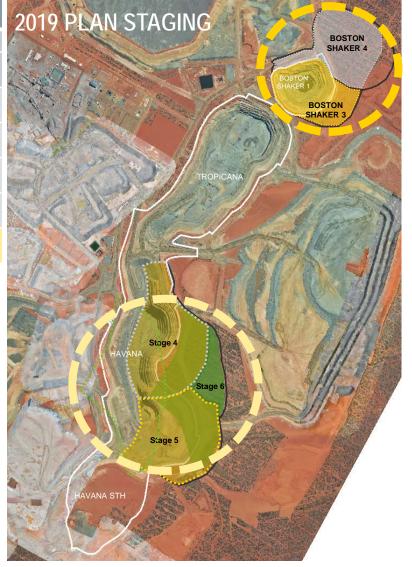
## **OPEN PIT OPTIONALITY**

Mining stage	2018	2019	2020	2021	2022	2023	2024	2025	2026
Current mining activity									
Tropicana/Havana 3 and Havana South									
Boston Shaker 3									
Boston Shaker 4									
Havana Stage 4									
Havana Stage 5									
Havana Stage 6									

# Two locations and five stages



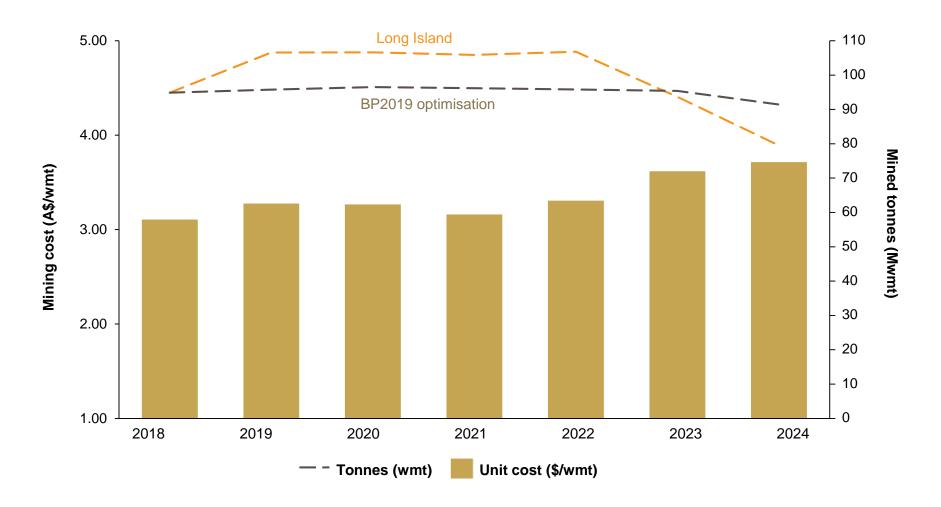
Four decision points





#### **FUTURE OF THE MINE – MINING OPTIMISATION**

Material movement has remained consistent utilising same fleet...

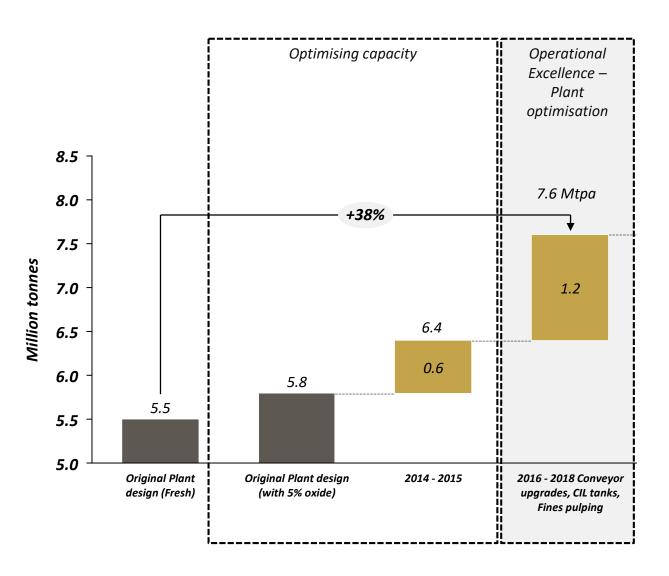


...and a key focus is continuing to identify initiatives to reduce unit cost





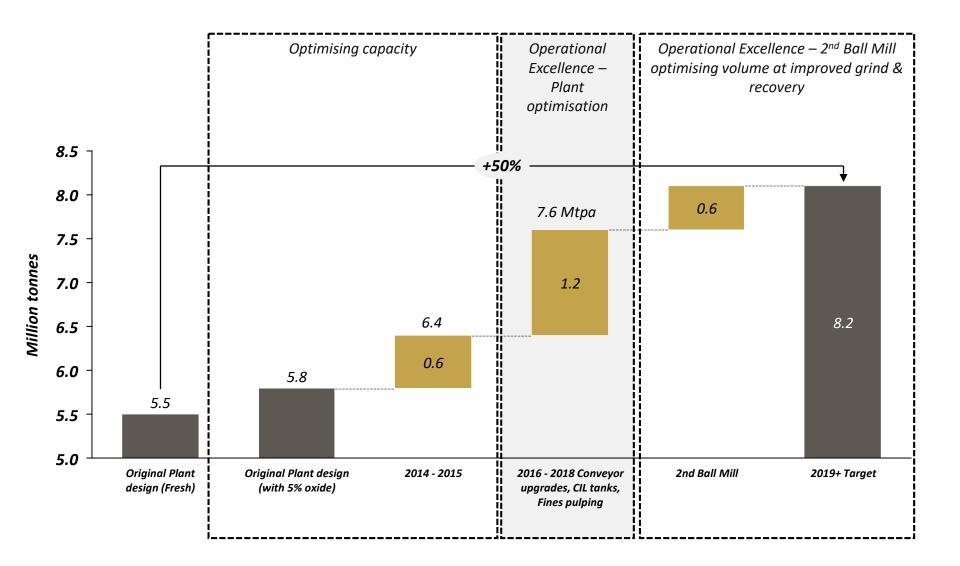
## MILL THROUGHPUT IMPROVEMENT JOURNEY TO DATE







#### MILL THROUGHPUT IMPROVEMENT JOURNEY NEXT PHASE







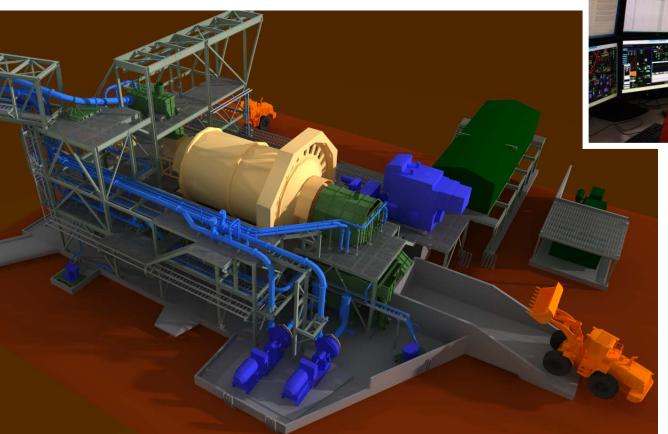
#### **NEW 6MW MILL TO UNLOCK POTENTIAL**

#### Additional 6MW ball mill to unlock potential

Good fit with Long Island mining plan

Will increase throughput to 8.2Mtpa

• Will increase recovery by up to 3% to 92% by reducing grind size



- Construction 35% complete
- New mill to be operational by January 2019
- In budget for 2019



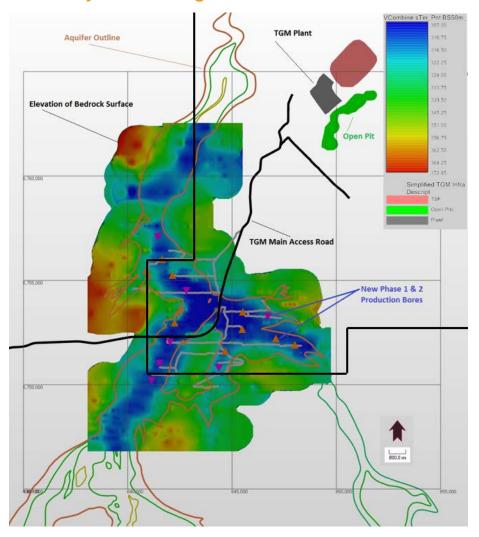


#### KAMIKAZE BOREFIELDS

## Exploration at Kamikaze Borefield has successfully defined significant water resources...

- Located 13km SW of Tropicana
- Shallow, paleochannel aquifer
- Low saline water: <5,000 TDS compared to PWSB ~50,000 TDS
- High water yields from production bores
  - @ 150 m3 per hour ~ 20-year life
  - @ 400 m3 per hour ~ 8-year life
- Further expansion to north and south
- Water blending provides potential for processing benefits and reduced reagent consumption
- Lower cost borefield to run than PWSB

(Triangles - Phase 1 & 2 water bore drilling. Elevation of bedrock surface – blue 300mRL & red 370mRL – topo from 365mRL to 385mRL)



...required for additional processing throughput in second ball mill





Current Performance

Mining & Processing Optimisation

# **Boston Shaker Underground**

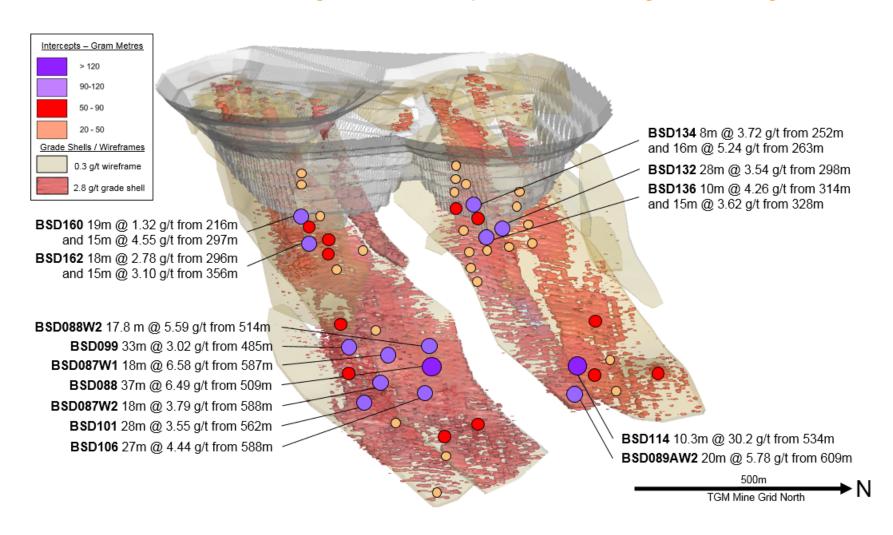
Exploration





#### **BOSTON SHAKER**

## Boston Shaker extension drilling has confirmed potential for underground mining...



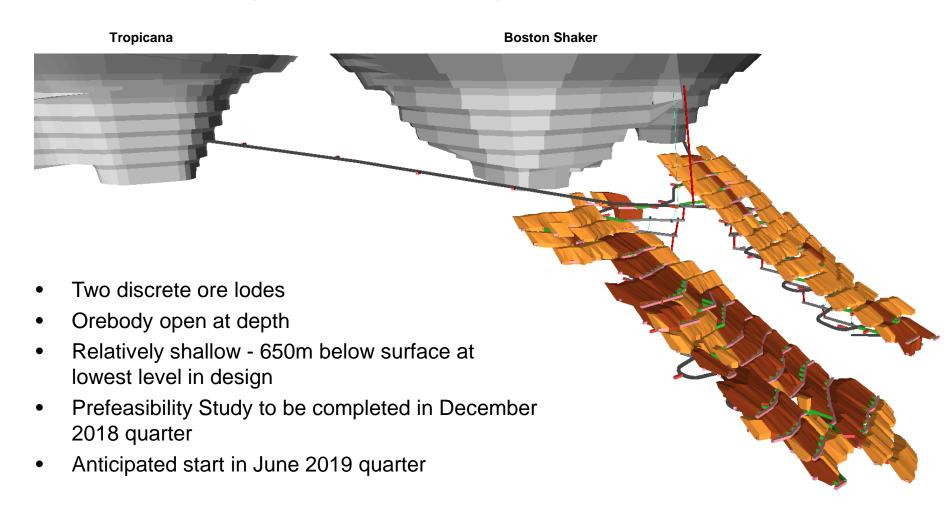
...and could contribute supplementary high-grade ore to production from 2020





#### **UNDERGROUND OPTIONALITY**

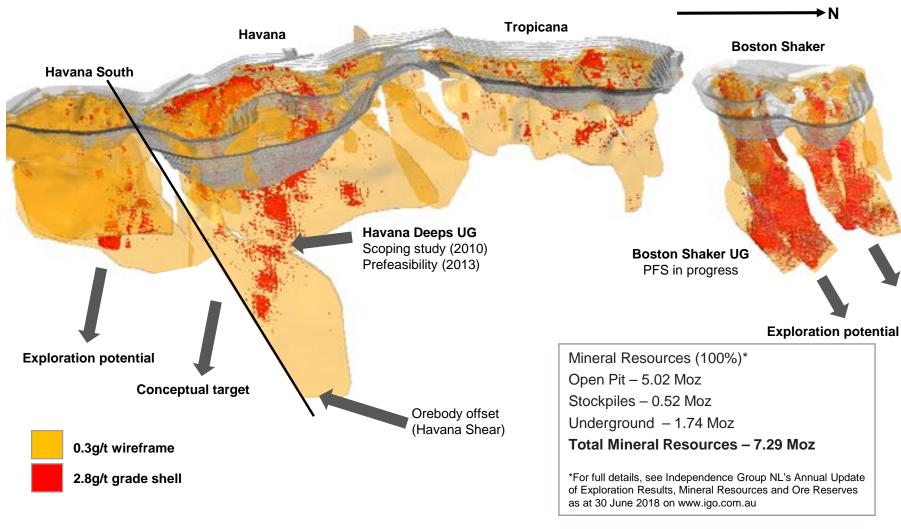
Boston Shaker Underground PFS study showing...





#### UNDERGROUND RESOURCE DEVELOPMENT

Boston Shaker is still open at depth and further underground potential exists along strike...



...which could contribute further supplementary high-grade ore to production





Current Performance

Mining & Processing Optimisation

Boston Shaker Underground

**Exploration** 



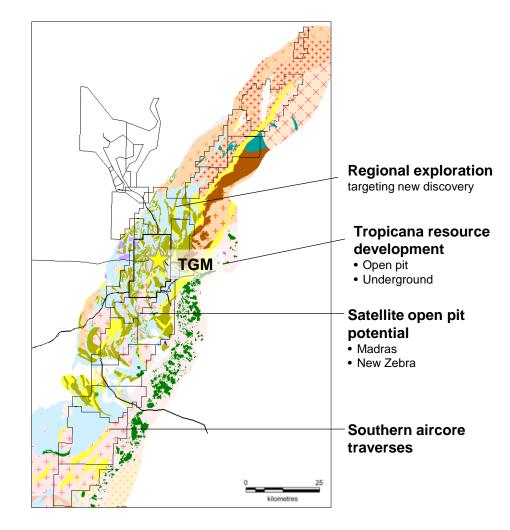


#### **EXPLORATION**

## Exploration strategy continues to focus on...

#### **Exploration strategy is focused on:**

- Tropicana resource development
  - open pit
  - underground
- Satellite open pit potential
  - Madras
  - New Zebra
- Regional exploration
  - targeting new discovery
- Large tenement package
  - 180km strike length
  - 2,800 square kilometres of tenure



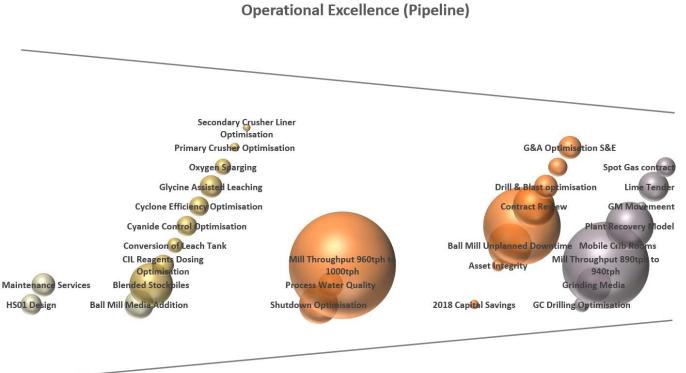
...Tropicana resource development, satellite open pit potential and new discovery





#### **OPERATIONAL EXCELLENCE INITIATIVES**

Transitioning the site from a cost-aware to a cost-focused culture...





...leading to sustainable cost reductions





#### **COMPETENT PERSONS STATEMENTS**

The information in this report that relates to Exploration Results is based on information compiled by Mr Damon Elder who is a full-time employee of AngloGold Ashanti Australia Ltd and is a member of The Australasian Institute of Mining and Metallurgy. Mr Elder has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Elder consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

The information in this report that relates to Mineral Resources or Ore Reserves is a compilation of previously published data for which Competent Persons consents were obtained. Their consents remain in place for subsequent releases by the Company of the same information in the same form and context, until the consent is withdrawn or replaced by a subsequent report and accompanying consent. The information in this report has been extracted from the AngloGold Ashanti Ltd Mineral Resource and Ore Reserve Report 2017 and is available on the AngloGold Ashanti website at <a href="www.anglogoldashanti.com">www.anglogoldashanti.com</a> and from the Independence Group NL Annual Update of Exploration Results, Mineral Resources and Ore Reserves 30 June 2018 which is available on The Independence Group website at <a href="www.igo.com.au">www.igo.com.au</a>

The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcements and that all material assumptions and technical parameters underpinning the estimates in the market announcements continue to apply and have not materially changed and confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcements.



## **APPENDIX 1 TABLE OF INTERCEPTS**

Hole ID	Hole Type	East (MGA94_51)	North (MGA94_51)	RL	Dip	Azimuth	Drill Date	Total Depth	Depth From	Depth To	Intercept Width	Grade	Gram Metres
BSD087W1*	DDH	652394.798	6763263.75	345.89	-63.29	319.39	6/08/2017	669.4	587	605	18	6.58	118.4
BSD087W2*	DDH	652394.798	6763263.75	345.89	-63.29	319.39	6/08/2017	648.4	588	606	18	3.79	68.3
BSD088*	DDH	652320.151	6763540.469	356.04	-83.21	319.14	16/08/2017	599.8	509	546	37	6.49	240
BSD088W2*	DDH	652320.151	6763540.469	356.04	-83.21	319.14	18/08/2017	579.6	514	531.85	17.8	5.59	99.8
BSD089AW1*	DDH	652804.438	6763482.622	350.17	-63.44	317.29	5/09/2017	716.5	661	674	13	3.95	51.3
BSD089AW2*	DDH	652804.438	6763482.622	350.17	-63.44	317.29	5/09/2017	701.95	609	629	20	5.78	115.5
BSD090	DDH	652760.223	6762961.93	348.08	-63.86	317.99	29/08/2017	993.2	787	798	11	2.23	24.6
BSD091A	DDH	653108.937	6763041.244	349.44	-63.58	318.56	30/08/2017	1002.2	952	954.31	2.3	2.7	6.2
BSD093	DDH	652145.5	6763302	363.7	-69.97	314.73	17/10/2017	534.3	449	451	2	3.29	6.6
BSD094	DDH	652321.365	6763142.642	363.64	-58.15	317.19	5/11/2017	774.5	552	557	5	1.13	5.6
									400	404	4	2.38	9.5
									442	444	2	1.98	4
BSD098*	DDH	652213.342	6763391.355	344.55	-63.88	317.73	16/10/2017	507.74	458	484	26	3.33	86.5
								549.2	441	443	2	1.05	2.1
BSD099	DDH	652287.541	6763325.062	344.98	-64.52	316.24	15/10/2017	549.2	485	518	33	3.02	99.8
BSD100	DDH	652352.776	6763248.727	345.73	-65.76	317.93	14/10/2017	606.6	542	568	26	2.42	62.9
BSD101*	DDH	652423.651	6763177.986	346.26	-67.31	318.5	14/10/2017	636.3	562	590	28	3.55	99.5
BSD103	DDH	652265.47	6763463.141	345.76	-65.15	319.12	16/10/2017	500.2	462	469	7	4.92	34.4
BSD104	DDH	652416.158	6763314.084	352.51	-74.81	318.87	3/11/2017	636	598	611	13	3.2	41.6
BSD105A	DDH	652560.89	6763169.659	347.38	-65.42	319.27	17/10/2017	723.8	692	698	6	1.85	11.1
									588	615	27	4.44	119.8
BSD106	DDH	652478.623	6763393.354	353.54	-67.9	316.79	17/11/2017	645.7	623	625	2	3.12	6.2
									666	668	2	4.47	8.9
BSD107	DDH	652605.792	6763265.664	348.46	-62.74	316.2	20/11/2017	735	671	693	22	2.7	59.5
BSD108A	DDH	652603.738	6763266.963	348.45	-73.38	316.44	27/11/2017	707.54	665	674	9	5.34	48.1
BSD110	DDH	652495.556	6763517.16	363.15	-81.23	321.95	19/11/2017	687.1	624	639	15	3.75	56.3
BSD114	DDH	652657.379	6763644.046	347.96	-65.88	313.94	3/12/2017	573.3	533.7	544	10.3	30.22	311.3
BSD117A	DDH	652668.945	6763767.251	347.74	-69.42	316.75	16/12/2017	630.7	522	529	7	3.02	21.2
BSD119	DDH	652808.643	6763628.868	348.81	-65.2	316.59	16/12/2017	630.58	598	609	11	3.35	36.8
BSD120	DDH	652673.368	6763905.783	346.91	-67.06	313.98	17/12/2017	588.19	488	493	5	1.68	8.4

Intercepts calculated based on minimum intercept 2m @ 0.5 g/t, lower cut-off grade 0.5 g/t, maximum consecutive waste 2m, minimum intercept grade 1 g/t.

Calculation based on downhole length which approximates true width, noting true thickness/width not calculated. Coordinates and azimuths reported in MGA94 Zone 51.

Note \* Intercept previously reported - refer to ASX release - Announcement: Tropicana partners AngloGold Ashanti and Independence Group commit to Long Island dated 07 December, 2017.





## **APPENDIX 1 TABLE OF INTERCEPTS**

Hole ID	Hole Type	East (MGA94_51)	North (MGA94_51)	RL	Dip	Azimuth	Drill Date	Total Depth	Depth From	Depth To	Intercept Width	Grade	Gram Metres
BSD121	DDH	652743.006	6763835.814	347.55	-69.43	317.98	17/12/2017	603.7	574	581	7	1.26	8.8
BSD122	DDH	652814.481	6763765.292	348.35	-68.7	317.24	18/12/2017	678.7	546	561	15	3.76	56.4
BSD123	DDH	652886.88	6763693.726	349.13	-70.11	316.86	27/01/2018	732.35	600	612	12	1.37	16.5
BSD124	DDH	652375.957	6764026.28	345.12	-68.91	265.61	8/03/2018	333.65	270	280	10	4.64	46.4
BSD125	DDH	652393.348	6763867.007	345.73	-62.28	316.02	26/02/2018	357.5	331	338	7	4.35	30.5
BSD126	DDH	652429.799	6763830.406	346	-62	318.62	26/02/2018	390.4	356	360	4	1.78	7.1
BSD127	DDH	652287.901	6764079.469	344.05	-68.4	265.78	8/03/2018	245.3	213	220	7	3.2	22.4
BSD128	DDH	652322.751	6764043.484	344.61	-67.73	266.01	8/03/2018	282.7	243	250	7	3.8	26.6
									303	307	4	1.22	4.9
BSD129	DDH	652346.421	6763854.223	349.84	-59.92	310.65	27/02/2018	346.8	316	322	6	3.6	21.6
									332	339	7	3.29	23
BSD130	DDH	652382.028	6763819.824	350.27	-60.36	313.03	28/02/2018	384.7	345	351	6	3.45	20.7
BSD131	DDH	652249.143	6764043.923	344.19	-63.04	266.21	7/03/2018	249.2	207.4	212	4.6	2.11	9.7
BSD132	DDH	652321.046	6763833.868	354	-61.01	316.66	16/02/2018	342.1	298	326	28	3.54	99.2
									213	220	7	1.95	13.6
BSD133	DDH	652214.717	6763904.904	345.55	-59.86	318.11	7/03/2018	249.2	227	236	9	4.6	41.4
									252	260	8	3.72	29.8
BSD134	DDH	652256.407	6763862.832	345.7	-59.76	321.18	7/03/2018	285.3	263	279	16	5.24	83.9
									289	298	9	2.25	20.2
BSD135	DDH	652295.054	6763823.065	354.25	-58.68	316.28	11/02/2018	333.84	306	317	11	4.68	51.5
									314	324	10	4.26	42.6
BSD136	DDH	652323.638	6763795.682	354.65	-60.61	321.92	13/02/2018	358.83	328	343	15	3.62	54.3
									334	344	10	5.66	56.6
BSD137	DDH	652358.498	6763760.581	355.36	-60.91	316.51	13/02/2018	381.37	356	362	6	1.53	9.2
									150	154	4	1.9	7.6
BSD138	DDH	652125.402	6763959.058	344.73	-62.22	321.51	6/03/2018	188.4	159	170	11	3.49	38.3
									178	183	5	1.66	8.3
BSD139	DDH	652157.253	6763926.504	345.1	-62.7	320.46	6/03/2018	222.1	191	196	5	4.31	21.5
BSD141	DDH	652177.914	6763871.147	345.56	-60.12	319.16	6/03/2018	296.4	209	215	6	5.27	31.6
BSD142	DDH	652220.218	6763828.516	345.45	-60.15	316.77	28/02/2018	319.2	244	251	7	7.7	53.9

Intercepts calculated based on minimum intercept 2m @ 0.5 g/t, lower cut-off grade 0.5 g/t, maximum consecutive waste 2m, minimum intercept grade 1 g/t. Calculation based on downhole length which approximates true width, noting true thickness/width not calculated. Coordinates and azimuths reported in MGA94 Zone 51.

Note \* Intercept previously reported - refer to ASX release - Announcement: Tropicana partners AngloGold Ashanti and Independence Group commit to Long Island dated 07 December, 2017.





## **APPENDIX 1 TABLE OF INTERCEPTS**

Hole ID	Hole Type	East (MGA94_51)	North (MGA94_51)	RL	Dip	Azimuth	Drill Date	Total Depth	Depth From	Depth To	Intercept Width	Grade	Gram Metres
BSD143	DDH	652258.412	6763789.685	354.23	-57.76	317.03	12/02/2018	384.35	283	290	7	4.81	33.7
BSD145	DDH	652323.116	6763724.989	355.6	-60.63	316.36	9/02/2018	375.19	331	340	9	4.39	39.5
BSD146	DDH	652356.258	6763692.365	356.03	-61.05	317.8	10/02/2018	426.1	358	367	9	4.57	41.1
BSD147	DDH	652393.12	6763655.321	356.49	-59.88	318.71	10/02/2018	450.6	391	398	7	3.8	26.6
BSD148	DDH	652144.256	6763833.444	345.2	-58.04	317.9	1/03/2018	337.7	206	209	3	2.98	8.9
BSD149	DDH	652175.214	6763797.848	345.36	-57.92	320.1	1/03/2018	351.4	236	241	5	3.39	17
BSD151	DDH	652021.827	6763709.138	344.5	-63.24	319.29	2/02/2018	357.7	297.5	302	4.5	2.12	9.5
BSD152	DDH	652054.189	6763676.736	345.24	-64.04	319.51	2/02/2018	369.45	339	349	10	3.81	38.1
									256	265	9	2.24	20.2
BSD153	DDH	651975.081	6763648.462	347	-62.44	320.93	2/03/2018	363	307	316	9	2.16	19.4
									273	280	7	1.81	12.6
BSD154	DDH	652004.584	6763618.98	347.78	-60.34	323.53	3/03/2018	390.4	329	337	8	7.86	62.8
									286	290	4	1.57	6.3
BSD155	DDH	652034.407	6763590.138	347.61	-59.76	324.03	4/03/2018	426	347	361	14	3.76	52.6
BSD156	DDH	652075.601	6763548.691	346.22	-59.94	323.09	4/03/2018	444.48	309	317	8	1.04	8.3
BSD156	DDH	652075.601	6763548.691	346.22	-59.94	323.09	4/03/2018	444.48	379	389	10	3.69	36.9
BSD156	DDH	652075.601	6763548.691	346.22	-59.94	323.09	4/03/2018	444.48	392	395	3	1.33	4
									185.2	197	11.8	1.71	20.1
BSD157	DDH	651875.144	6763714.743	342.07	-55.09	319.29	5/03/2018	309.05	237	245	8	3.61	28.8
									190	201	11	4.47	49.1
BSD158	DDH	651875.424	6763714.356	342.09	-61.13	321.26	4/03/2018	300.3	245	253	8	2.12	17
									216	233	17	1.07	18.2
BSD159	DDH	651912.774	6763677.161	342.68	-63.65	316.27	2/02/2018	347.43	277	279	2	5.02	10
									258	277	19	1.32	25.1
BSD160	DDH	651948.091	6763634.469	343.59	-62.87	318.31	2/02/2018	372.61	297	312	15	4.55	68.3
									277	294	17	1.78	30.2
BSD161	DDH	651980.223	6763602.093	343.41	-63.55	318.64	6/02/2018	393.51	321	335	14	3.09	43.2
									296	314	18	2.78	50
BSD162	DDH	652016.3	6763565.93	343.95	-62.38	318.97	9/02/2018	438.4	356	371	15	3.1	46.4

Intercepts calculated based on minimum intercept 2m @ 0.5 g/t, lower cut-off grade 0.5 g/t, maximum consecutive waste 2m, minimum intercept grade 1 g/t.

Calculation based on downhole length which approximates true width, noting true thickness/width not calculated. Coordinates and azimuths reported in MGA94 Zone 51.

Note \* Intercept previously reported - refer to ASX release - Announcement: Tropicana partners AngloGold Ashanti and Independence Group commit to Long Island dated 07 December, 2017.





# APPENDIX 2: TABLE 1 SECTION 1: SAMPLING TECHNIQUES AND DATA

Criteria	Commentary
Drilling techniques	AngloGold Ashanti Australia (AngloGold) has used drilling and sub-sampling of the cuttings or cores as the data basis for the Mineral Resource estimates of the Tropicana deposit. Details are given in the following subsection.  Drill hole spacing ranges from 25m×25m grids to 100m×100m grids, with most of the drilling of the Open Pit Mineral Resources on a 50m×50m spacing with 25m×25m testing the starter pits of the Tropicana and Havana initial pits, and the southern end of the Boston Shaker deposit.  A 100m×100m area of Havana was drilled out on a 10m×10m grid to validate the resource model and optimise the grade control sample spacing.  The Underground Mineral Resource down-plunge extensions of Havana Deeps is tested using a 100m×100m grid. Deep +800m deep step-out holes have been drilled on nominal *200m×100m to test the high-grade mineralisation of Havana Deeps.  All holes are drilled plunging towards the west to intersect the east dipping mineralised zones
Drilling techniques	Reverse circulation (RC) percussion drilling using face-sampling bits (5 ½ inch or 133 mm diameter) has been used to collect samples from the shallower (up-dip) part of the deposits with a nominal maximum RC depth of 150m.  Diamond core drilling has been used for deeper holes, with diamond tails drilled from RC pre-collars. To control the deviation of deep DD holes drilled since 2011, many of these holes were drilled from short » 60m RC pre-collars or using 63.5mm (HQ) diameter core from surface.  Diamond core drilling for Mineral Resource definition is predominantly 47.6mm (NQ) diameter core, with a lesser number of holes drilled for collection of metallurgical and/or geotechnical data using 63.5mm (HQ2, HQ3) or 85mm (PQ) core diameters.  In fresh rock, cores are oriented wherever possible for collection of structural data. Prior to 2009, core orientations are made using the EzyMark tool with the Reflex Ace Tool replacing the system in later drilling programmes.
Drill Sample Recovery	<ul> <li>RC recovery</li> <li>Prior to 2008 semi-quantitative assessment was made regarding RC sample recovery with recovery visually estimated as 25%, 50%, 75% of 100% of the expected mass volume of a 1m drilling interval.</li> <li>Since 2008, AngloGold has implemented quantitative measure on every 25<sup>th</sup> interval where the masses of the sample splits are recorded and compared to the theoretical mass of the sampling interval for the rock type being drilled.</li> <li>AngloGold found that overall recovery in the regolith was &gt;80% and total recovery in fresh rock.</li> <li>DD Recovery</li> <li>DD recovery has been measured as percentage of the total length of core recovered compared to the drill interval.</li> <li>Core recovery is consistently high in fresh rock with minor losses occurring in heavily fractured ground or for DD drilling in the regolith.</li> <li>The main methods to maximise recovery have been recovery monitoring as described above and diamond core drilling below &gt; 150m depth.</li> <li>No relationships have been noted between sample recovery and grade and sample biases that may have occurred due to the preferential loss or gain of fine or course material are considered unlikely.</li> </ul>
Logging	RC cuttings and DD cores have been logged recording geological and geotechnical characteristics with reference to AngloGold's logging standard library, to levels of detail that support Mineral Resource estimation, Ore Reserve estimation and metallurgical studies.  Qualitative logging includes codes for lithology, regolith, and mineralisation for both RC and DD, with sample quality data recorded for RC such as moisture, recovery, and sub-sampling methods.  DD cores are photographed, qualitatively structurally logged with reference to orientation measurements where available.  Geotechnical quantitative logging includes QSI, RQD, and matrix and fracture characterisation.  The total lengths of all drill holes have been logged.





# **SECTION 1: SAMPLING TECHNIQUES AND DATA**

Criteria	Commentary
Sub-sampling techniques and sample preparation	RC – Primary splitting Prior to 2007 RC samples were collected from the cyclone stream using a tiered riffle splitter. From 2007 a static cone splitter was introduced and replaced riffle splitters on all rigs. The splitters collected a ** 12% split from the primary lot with two 12% splits collected — the first for laboratory submission and second as a reference or replicate. Most samples were collected dry with





# **SECTION 1: SAMPLING TECHNIQUES AND DATA**

Criteria	Commentary
Quality of assay data and laboratory tests	No geophysical tools were used to determine any element concentrations material to the Mineral Resource estimate.  All Mineral Resource prepared pulps have undergone 50g fire assay which is considered a total assay for gold As discussed above all laboratories have used industry standard quality control procedures with standards used to monitor accuracy, replicate assay to monitor precision, blanks to monitor potential cross contamination and sieve tests to monitor PSD compliance.  AngloGold has also used other 'umpire' laboratories to monitor accuracy including Genalysis Perth (prior to November 2006), SGS (from November 2006 to August 2007) and ALS Perth (since August 2007), with these check assaying campaigns coinciding with each Mineral Resource update.  AngloGold has reviewed the quality sample results on a batch by batch and monthly basis and has found that the overall performance of the laboratories used for Mineral Resource estimation samples is satisfactory.
Verification of sampling and assaying	Significant intersections of mineralisation are routinely verified by AngloGold senior geological staff and have also been inspected by several independent auditors as describe further below.  Twin holes have been drilled to compare results from RC and DD drilling with the DD results confirming that there is no material down-hole smearing of grades in the nearby RC drilling and sampling.  All logging and sample number data is captured digitally in the field using Field Marshall Software (upgrade to Micromine Geobank in 2016). Data is downloaded daily to the Tropicana exploration server and checked for accuracy, completeness and structure by the field personnel.  Assay data is merged electronically from the laboratories into a central Datashed database, with information verified spatially in Vulcan software.  AngloGold maintains standard work procedures for all data management steps.  An assay importing protocol has been set up to ensure quality samples are checked and accepted before data can be loaded into the assay database All electronic data is routine backed up to AngloGold's server in Perth and provided to IGO via FTP transfer.  There have been no adjustments or scaling of assay data other than setting below detection limit values to half detection for Mineral Resource estimation work.
Location of data points	All early drill hole collar locations of surface holes have been surveyed using RTK GPS equipment, which was connected to the state survey mark (SSM) network.  The grid system is GDA94 Zone 51 using AHD elevation datum.  Prior to 2007, drill hole path surveys have been completed on all holes using Eastman single shot camera tools, with down-hole gyro tools used for all drilling post 2007  A digital terrain model was prepared Whelan's Surveyors from aerial photography flown in 2007, which has been supplemented with collar data surveyed using RTK GPS. This model is considered to have centimetre-scale accuracy.
Data spacing and distribution	The drill hole spacing nominally ranges from 25mNx25mE to 100mNx10mE (local grid) over most of the Mineral Resource area with a small area of 10mNx10mE used for grade control calibration work.  Most of the Open Pit Mineral Resources has been tested on a 50mNx50mE grid with closer spaced 25mNx25mE patterns in the upper parts of the deposit within initial open pit designs.  The Havana Deeps area has been drilled on a 100mNx100mE pattern.  Down-hole sample intervals are typically 1m with 2m compositing applied for Mineral Resource estimation work.  The Competent Person considers that data spacing is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedures applied, and the JORC Code classification applied.
Orientation of data in relation to geological structure	Most drill hole are oriented to intersect the shallowly east dipping mineralisation at a high angle and as such, a grade bias introduced by the orientation of data in relation to geological structure is highly unlikely.





# **SECTION 1: SAMPLING TECHNIQUES AND DATA**

Criteria	Commentary
Orientation of data in relation to geological structure	Most drill hole are oriented to intersect the shallowly east dipping mineralisation at a high angle and as such, a grade bias introduced by the orientation of data in relation to geological structure is highly unlikely.
Sample security	The chain-of-sample custody is managed by AngloGold.  Samples were collected in pre-numbered calico bags, which are then accumulated into calico bags for transport from the collection site. The accumulated samples are then loaded into wooden crates and road hauled to the respective laboratories (Perth or Tropicana).  Sample dispatches are prepared by the field personnel using a database system linked to the drillhole data.  Sample dispatch sheet are verified against samples received at the laboratory and any missing issued such as missing samples and so on are resolved before sample preparation commences.  The Competent Person considers that the likelihood of deliberate or accidental loss, mix-up or contamination of samples is considered very low.
Audits or reviews	Field quality control data and assurance procedures are review on a daily, monthly and quarterly basis by AngloGold field personnel and senior Ogeological staff.  The field quality control and assurance of the sampling was audited by consultant QG in 2007 and 2009. The conclusion of the audit was that the data was suitable for Mineral Resource estimation work.  In 2017, consultants Optiro reviewed data collections and assay quality as part of an MRE review and found no issues





## **SECTION 2: REPORTING OF EXPLORATION RESULTS**

Criteria	Commentary
Mineral tenement and land tenure status	The Tropical Gold Mine Mineral Resources are located wholly within WA mining lease M39/1096, which commenced on 11 Mar 2015 and has a term of 21 years (expiry 10 Mar 2036).  Tropicana Gold Mine in a joint venture between AngloGold (70%) and IGO (30%) with AngloGold as manager.  Gold production is subject to WA State royalties of 2.5% of the value of gold value.  There are no material issues relating to native title or heritage, historical sites, wilderness or national parks, or environmental settings  The tenure is secure at the time of reporting and there are no known impediments to exploitation of the Mineral Resource and Ore Reserve and on-going exploration of the mining lease.
Exploration done by other parties	AngloGold entered in to a JV with IGO in early 2002 with the main target of interest being a WMC gold soil anomaly of 31ppb, which was reporting in a WA government open file report. Prior to the JV, the WMC soil sampling program was the only known exploration activity and the only dataset available were WA government regional magnetic and gravity data.
Geology	The Tropicana Gold Mine is on the western margin of a 700km long magnetic feature that is interpreted to the collision suture zone between the Archean age Yilgarn Craton to the west and the Proterozoic age Albany-Fraser Origan to the east of this feature. The gold deposits are hosted by a package of Archean age high metamorphic grade gneissic rocks.  Four distinct structural domains have been identified – Boston Shaker, Tropicana, Havana and Havana South, which represent the same mineral deposit offset by NE striking faults that post-date the mineralisation.  The gold mineralisation is hosted by a shallowly SW dipping sequence of quartz-feldspar gneiss, amphibolite, granulite and meta-sedimentary chert.  The gold mineralisation is concentrated in a 'favourable horizon' of quartz-feldspar gneisses, with a footwall of garnet gneiss, amphibolite or granulite.  Mineralisation is characterised by pyrite disseminations, bands and crackle veins within altered quartz-feldspar gneiss. Higher grades are associated with close-spaced veins and sericite alteration  Mineralisation presents as stacked higher grade lenses within a low-grade alteration envelope. Geological studies suggest the mineralisation is related to shear planes that post-date the development of the main gneissic fabric and metamorphic thermal maximum.
Drill hole Information	A summary of the all drillholes used to prepare the Mineral Resource estimate is not practical for this public report. The Mineral Resource estimate gives the best-balanced view of all the drillhole information available as at June, 2017.
Data aggregation methods	No metal equivalent values are considered in the Mineral Resource estimate.
Relationship between mineralisation widths and intercept lengths	Exploration results included in this report are for extensional drilling at Boston Shaker (underground resource extension).  All Mineral Resource drilling interests the mineralisation at a high angle and as such approximate true thicknesses in most cases.
Diagrams	A representative 3d oblique view for Boston Shaker results is included in the body of this report.
Balanced reporting	The current Mineral Resource is based on all available data and as such provides the best-balanced view of the Tropicana gold deposits as at Dec, 2017. The Exploration results reported are not included in the current Mineral Resource Estimate reported.
Other substantive exploration data	Information relating to other exploration data, such as density, metallurgical assumptions are detailed in Section 3 further below
Further work	Exploration drilling for 2018 is complete at Boston Shaker (Underground resource extension drilling) and will be included in the next Mineral Resource update, planned for Q3, 2018. The Boston Shaker extensional drilling is currently being evaluated in Boston Shaker Underground PFS study, due for completion Q4, 2018.



