

# **Nusantara Resources**



Transitioning to a low-cost 100koz gold producer



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# **Nusantara Resources Limited**

# October 2018

### **Stock Data**

Share price (A\$):	0.18
Shares in issue (m):	123.2
Market cap (A\$m):	\$ <b>22.1</b> m
Ticker:	NUS
Exchange:	ASX

#### **Company Profile**

Mining
Gold
DFS
Awak Mas
Indonesia
2 Moz
1.1 Moz
Exp 100 koz pa
US\$758/oz
US\$146m

#### **Directors and Management**

Grag Foulis	Chairman
dieg Foulis	Chairman
Mike Spreadborough	MD
Boyke Abidin	Executive Director
Derek Humphry	CFO
Rob Hogarth	NED
Robin Widdup	NED
Colin McMillan	GM Geology
Adrian Pratt	<b>GM Technical Services</b>
Adrian Rollke	Country Manager

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# **Nusantara Resources Limited** 100koz p.a low-cost, long-life project, construction ready

Nusantara has just completed a DFS at its 100%-owned Awak Mas Gold Project in South Sulawesi, Indonesia. The DFS confirms Awak Mas Gold Project as a long-life operation with sector-leading cash costs. The project is fully permitted and construction ready. Subject to funding, a short construction period should target first gold production in 2021, producing around 100koz pa over an 11-year mine life.

Robust DFS. The October 2018 DFS is a critical milestone in the development of the project. The DFS demonstrated competitive capital and operating cost estimates. Upfront capex \$146m, 11-year LOM, c.100koz pa gold production, C1 \$643/oz and AISC \$758/oz. The financial outcome of the DFS was a posttax NPV<sup>5%</sup> of US\$152m and IRR of 20.3% at \$1,250/oz gold, indicating post-tax cash flow of US\$39m p.a. The DFS is a major de-risking event and demonstrates that NUS has one of the most robust new gold development projects on the block, in our view.

...with further upside. Planned close spaced drilling in early mining areas to upgrade the resource to measured is expected to produce an uplift in grade (+7%), boosting NPV<sup>5%</sup> by \$44m according to the DFS. Potential extensions to the Awak Mas and Salu Bulo deposits have the potential to increase LOM - the DFS indicates a \$51m increase in NPV<sup>5%</sup> for a 3-year extension to LOM. Taken together, this equates to a potential 63% value improvement of \$95m to \$247m over the DFS NPV<sup>5%</sup> of \$152m before factoring in other project optimisation opportunities that NUS plans to explore.

Resources and Reserves. Awak Mas has a 2Moz (45.3Mt at 1.4g/t Au) JORC resource (May 2018) of which 89% sits within the higher confidence Indicated Category. NUS has grown the resource from 1.74Moz since ASX IPO with a high-impact drill programme. An updated ore reserve of 1.14Moz (26.9Mt at 1.32g/t Au) was reported in September 2018.

A simple, low-cost operation. Awak Mas is a straightforward, relatively low-risk project. Simple open pit mining is to be employed and with a 3.5 strip ratio, the project has one of the lowest strip ratios compared to other gold development projects. The metallurgy is favourable, with low grinding requirements and high recoveries (91%). Conventional CIL (whole ore leaching) will be employed using proven technology.

Infrastructure in place. The low costs also stem from the established infrastructure with the project only 45km from the coast, with good roads and access to two ports. The project will be powered by low-cost grid power and NUS has recently signed an MOU with an Indonesian national power utility.

Fully permitted/construction ready. All permits are in place for construction. As the project is situated on non-forestry land, a forestry permit is not required. The EIS/AMDAL has been approved.

10-years divestment free. The 7th generation CoW has been successfully renegotiated. This defers the standard practice of divesting a 51% share in the CoW to Indonesian participants until the 10<sup>th</sup> year of production. Based on the current timeline, NUS is likely to retain 100% until at least 2030. The importance of this cannot be understated as it will give NUS considerably more flexibility with regards to financing.

Resource growth and exploration upside. The Awak Mas CoW is highly prospective, and NUS has identified several high priority targets in under-explored areas. The current focus is on the "Mine Corridor", effectively the ground between the Awak Mas and Salu Bulo deposits. Large areas of mineralisation have been identified in the near-mine area, where surface gold grades have a higher tenor than the Awak Mas surface expression. Exploration is also focused around the Tarra deposit. Recent interpretation of geophysical data has produced numerous new greenfield targets. The potential for the discovery of satellite deposits and low-cost additional feed for the proposed Awak Mas processing plant is compelling.

Discounted entry-point. Our analysis suggests that NUS is severely undervalued compared to peers. On an EV/oz basis, our data suggests that NUS is trading 7.2x below the peer developer average for resources and 18x below the average for reserves. The disconnect is stark, and we argue that the Indonesian risk discount is no longer justified given that NUS is on the cusp of construction with a low-cost, technically straightforward project and development plan.

Valuation. We model a conservative base-case NPV<sup>10%</sup> of US\$74m (A\$100m) for Awak Mas which feeds a risked sum-of-the-parts valuation of A\$0.36/sh. Our preferred upside-case NPV10% is US\$135m (A\$182m) feeding a risked sum-of-the-parts valuation of A\$0.50/sh on a post-funding, fully diluted basis. This implies that NUS is currently trading at an unchallenging valuation of between 0.36 and 0.50x to NAV.

Securing a strategic partner and funding are the last remaining hurdles for the development of Awak Mas. Given the current disconnect between market capitalisation and our NAV, we see this as a good entry point into a simple new gold development project with attractive economics and upside potential.

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# Nusantara Resources Limited (ticker: NUS)

### Summary of NUS and Awak Mas

- **Company:** Nusantara is an ASX-listed exploration and development company.
- Asset: The company's flagship asset is the 100% owned Awak Mas Gold Project in South Sulawesi Indonesia. Awak Mas is comprised of three separate but proximal deposits; Awak Mas, Salu Bulo and Tarra.
- Key Catalysts: Securing strategic partner, funding, further exploration discoveries.
- **Resources & reserves:** Awak Mas Gold Project has a current Mineral Resource of 2Moz and an Ore Reserve of 1.1Moz gold.
- Timing: Nusantara expects first gold production in 2021.
- **Production:** NUS anticipates a 2.5Mtpa, 100kozpa operation over a 11-year mine life, with significant scope to increase the LOM through resource expansion and further discoveries.
- **Costs.** The DFS indicated industry competitive capex of US\$146m and AISC of US\$758/oz. This makes Awak Mas one of the lowest cost new gold development projects globally. The project benefits from existing infrastructure, access to grid power, simple open pit mining and favourable metallurgy.
- **Fully-permitted.** All approvals are in place to commence production, and the project is located on non-forestry land.
- **Exploration upside.** Compelling exploration upside exists within the company's two high-priority focus areas; the Mine Corridor connecting Awak Mas and Salu Bulo, and the Eastern Corridor connecting Salu Bulo and Tarra. This is in addition to numerous greenfield exploration targets within the wider CoW.





Source: NUS

### Capital and corporate structure

Nusantara Resources Limited is listed on the ASX under the ticker "NUS". Nusantara owns a 100% interest in the Awak Mas Gold Project through its wholly-owned subsidiary, PT Masmindo Dwi Area. NUS completed an IPO on the ASX in August 2017, raising A\$16.2m.

**Capital structure.** Nusantara has 123.2m shares in issue, 18.0m new listed options, 32.5m listed loyalty options which expire imminently (exercise price \$0.42 and expiry date 14<sup>th</sup> November 2018), and 6.3m unlisted options on issue.

**Entitlement Issue.** In July, NUS completed a fully underwritten Rights Entitlement Issue for A\$5.1m at A\$0.20/sh. In a sign of strong support, major shareholders, Lion Selection Group and AustralianSuper had pre-committed A\$2m of entitlement broadly in line with their existing shareholdings.

**Strategic partner process:** NUS is currently in discussions with Indonesian, Chinese and other International parties to potentially share the funding risk with the planned development of the project. NUS report that interest in the project has been high.

**New Exploration push.** Following on from the completion of the DFS, work is underway to define additional low-cost feed for the proposed Awak Mas processing plant, along with a renewed focus on greenfield opportunities in the CoW.

**Balance sheet.** NUS had A\$1.9m in cash on the balance sheet at the end of June 2018, not including the A\$5.1m proceeds (before costs) from the Entitlement issue. The company is debt-free.

Figure 2 - NUS's Major shareholders	
Name	%
Lion Selection Group	32%
AustralianSuper	10%
Macquarie	4%
Zhaojin Mining	3%
Gravitas	2%
Top 5 Shareholders	51%
Total shares in issue (m)	123.20
Options (m)	56.9

Source: NUS

### Share price performance and recent key events



Source: ASX, NUS, Optiva

# **Board & Management**

### Greg Foulis (Chairman & Non-Executive Director) M.Comm, B.AppSc. (Hons)

Greg has over 30 years' experience in the international resource sector across a variety of roles ranging from senior executive and business development, to investment advisory. Greg's most recent position was CEO of Kingsgate Consolidated Limited, an ASX-listed gold mining and development company. Greg led the restructuring, divestment and re-focus of the business, including the elimination of a debt burden of over US\$100 million. Greg received an M.Comm (Finance) from the University of NSW in 1992 and a B.AppSc. (Hons) in Geology from the NSW Institute of Technology in 1984. He is a Graduate Member of the Australian Institute of Company Directors and a Fellow of the Australian Institute of Mining and Metallurgy.

#### Mike Spreadborough (Managing Director) B.Eng, MBA

Mike is a mining engineer with extensive experience in the development and operation of resource projects spanning a range of commodities including copper, gold, uranium, lead, zinc and iron ore. Over the past 20 years, Mike has held senior executive roles with several mining companies including COO of Sandfire Resources and Inova Resources Ltd (formerly Ivanhoe Australia), General Manager - Coastal Operations for Rio Tinto and General Manager – Mining for WMC and later Vice President – Mining for BHP Billiton at the world-class Olympic Dam mine in South Australia. Mike holds a Bachelor of Mining Engineering from the University of Queensland and an MBA from Deakin University, as well as a WA First Class Mine Manager's Certificate of Competency. He is also a Non-Executive Director of Clean TeQ Holdings Limited.

#### Rob Hogarth (Non-Executive Director) **B.Ec, Fellow ICAA**

Rob built his mining industry expertise during a 37-year career with KPMG, where he was leader of KPMG's Energy and Natural Resources & Major Project Advisory Practices, and lead partner for many of the firm's listed mining clients in the Asia Pacific region. He has been involved with Indonesia since 1983. Since retiring from KPMG in 2009, he has become a director of a range of companies, including AMC Consultants, and sits on several audit committees. Rob is a Non-Executive Director of the Environment Protection Authority of Victoria.

### Robin Widdup (Non-Executive Director)

Robin is the founder and a director of Nusantara's largest shareholder, Lion Selection Group Limited. Robin has 40 years' mining industry and equity market experience. After working in a range of operations in the United Kingdom, Zambia and Australia, Robin joined the J B Were & Sons Resource Research team, prior to founding Lion Selection Group and Lion Manager in 1997. He is currently Managing Director of Lion Manager, director of Lion Selection Group Limited, and a non-executive director of Lion investees One Asia Resources Limited and Asian Mineral Resources Ltd.

### Boyke Abidin (Executive Director)

Boyke holds a Bachelor of Science in Business Administration from International University Europe – London. He has more than 25 years' experience in Indonesian management. Previously a Government Liaison Officer for the Rawas Gold Mine in South Sumatra, Boyke has extensive in-country expertise. He is President Director of Indonesian Operations for One Asia Resources and has been a Director of PT Masmindo Dwi Area since 2000. He is also a director of PT Resources Indonesia, PT Dwinad Nusa Sejahtera and PT Sorikmas Mining.

#### Derek Humphry (CFO and Company Secretary) B.Comm.Ec

Derek has a strong background in both finance and mining, graduating from Murdoch University with a Bachelor of Commerce and Economics. Derek's extensive experience spans from feasibility and financing to mine development. Derek has previously held senior management roles at Brockman Mining Australia, Energy and Minerals Australia, Intrepid Mines and LionOre Mining.

### **B.Sc Bus. Admin**

### BSc (Hons), MAusIMM

### Colin McMillan (General Manager of Geology)

Colin is a geologist having worked at Newcrest for almost 30 years, including six years as Mineral Resource Manager at Gosowong in Indonesia. Colin led the team responsible for the discovery of the world class Telfer Deeps and Ridgeway deposits and has extensive experience with both epithermal and porphyry gold/copper deposits in Australia and Indonesia. Colin has been involved with several mine start-ups including the initial Cadia Hill open pit operation and the underground mines at Ridgeway and Cadia East at the Cadia Valley Operations in NSW, Australia and the Toguraci underground mine at Gosowong in Indonesia. Colin is a Member of the AusIMM.

# **Development plan and timeline**

Based on the current development timeline as per the company's October 2018 corporate presentation, first production is anticipated in H1 2021:

- Permits. All major permits and approvals for the project are in place for construction. A forestry permit is not required and the ESIA / AMDAL has been approved. Several minor permits are required for the operation phase of the project. Examples include TSF dam safety permit, tailings permit, explosive permit, water use permit, hazardous waste storage permit, etc. These permits will need to be secured during construction and operations
- **Timeline.** The remaining focus during 2018 and early 2019 will be on securing a strategic partner and arranging financing for the development of the project including advancing debt funding discussions. If this is concluded as per the company's schedule, NUS has a target of making a final investment decision by mid-2019. Construction will commence after this during the balance of 2019 and throughout 2020 equating to commissioning and first gold production in early 2021.



# **October Definitive Feasibility Study (DFS)**

NUS released the DFS for Awak Mas on 4<sup>th</sup> October. The main assumptions are as follows.

# **Operating Costs**

Operating costs	Unit	Assumption
Operating costs per tonned milled, LOM		
Mining Cost	\$/t milled	11.97
Processing Cost	\$/t milled	9.00
General & Administration	\$/t milled	3.33
Total Cash Cost at Mine Site	\$/t milled	24.30
C1 Cash Costs per ounce, LOM		
Mining Cost	US\$/oz	315
Processing Cost	US\$/oz	237
General & Administration	US\$/oz	87
Total Cash Cost at Mine Site	US\$/oz	639
Refining and Transport	US\$/oz	4
C1 Cost	US\$/oz	643
AISC per ounce, LOM		
C1 Cash Cost	US\$/oz	643
Royalties	US\$/oz	72
Sustaining Capex	US\$/oz	27
Jakarta Corporate, Community Social responsibility, and Land Tax (gross profit	US\$/oz	16
Total All in Sustaining Cash Cost (AISC)	US\$/oz	758
		Source: N

# **Capital Costs**

Figure 6 - October 2018 DFS – capital cost assumptions\*

Upfront Capital Cost Estimate	Unit	Assumption
Mining Facilities and Contractor Mobilisation	\$m	16.8
Processing Plant and Earthworks	\$m	49.6
Tailing Storage Facilities	\$m	13
Infrastructure and Services	\$m	13.9
Establishment of Site Support Functions	\$m	10.7
Project Execution	\$ <i>m</i>	17.2
Owner's Cost	\$m	11.7
Subtotal Project Capital (excluding contingency)	\$m	132.9
Contingency	\$m	12.6
Upfront Capital Cost Estimate	\$m	145.5
Sustaining capital (LOM)	\$m	28.9
Mine closure	\$m	7.4
fexcluding pre-production, value added tax (VAT) and environmental and clo	sure bonds	
		Source: NUS

Note that the capital cost estimate of \$145.5m excludes pre-production mining costs of \$15.8m which are included as a cash outflow for the purpose of the project evaluation and financial analysis in the DFS.

# **DFS Physicals and Financial Outcomes**

The DFS financial analysis is based on a 100% equity basis, excluding the benefits debt leverage can provide.

Figure 7 - October 2018 DFS – physicals and financial outcomes

Mine Design and physicals		
Ore Throughput	Mtpa	2.5
Mining method	Conve	ntional truck and excavator
Ore Mined	Mt	28
Waste mined	Mt	97.6
Total material mined	Mt	125.6
LOM Strip ratio	t:t	3.5
Maximum mining rate	Mt	16
Mine life	years	11.5 including ramp up
DES Financial Analysis		
Physcials		
, Initial Life of Mine (LOM)	vears	11.25
Mine grade	, q/t Au	1.34
LOM Strip ratio excluding pre-strip	Waste : Ore	3.4
Gold produced (LOM)	OZ	1,066,335
Gold produced (Annual average per year)	OZ	94,785
Gold Recovery (LOM average)	%	90.9
Annual throughput	Mtpa	2.5
DFS Financial Outcomes		
Upfront Capital	Şm	146
Mining cost per tonne moved	\$/t	2.75
Processing cost per tonne processed	\$/t	9
Administration cost per tonne processed	\$/t	3.33
C1 Cash Cost	US\$/oz	643
AISC	US\$/oz	758
Revenue LOM	\$m	1,333
NPV (before tax; 5% discount rate)	\$m	210
NPV (after tax; 5% discount rate)	\$m	152
IRR (before tax)	%	24.4
IRR (after tax)	%	20.3
Payback (after tax)	years	4
NPV (after tax) / Capex		1



### Sensitivity analysis

		NPV <sup>5%</sup> pos	t tax (\$m)	NPV change for % sensitivity	% NPV change for %	
		+%	-%	change (\$m)	sensitivity change	
Base		152	152	-	-	
Recovery	+/- 1%	159	144	7	5%	
Capex	+/- 10%	140	163	11	7%	
Mining Opex	+/- 15%	121	182	30	20%	
Opex	+/- 10%	94	209	57	38%	
Grade	+/- 10%	217	85	65	43%	
Gold Price	+/- 10%	217	85	65	43%	

### **DFS value improvement scenarios**

NUS has identified additional opportunities in the DFS that may increase the NPV of Awak Mas:

### Grade uplift + \$44m

- NUS believes that higher grades can be expected from better definition of the observed and statistically demonstrated effect realised by the prevalence of higher grade sub-vertical veins/structures within the Awak Mas deposit.
- NUS plans to undertake closer spaced drilling within selected sections of the early mining areas of the deposit where it expects that mining will encounter a substantially greater percentage of higher grade vertical controlling veins/structures than could be modelled by the Resource spaced drilling program.



Source: NUS

This is expected to result in a higher-grade LOM ore feed around 7% based on detailed analysis of the • mineral resource model using conditional simulation. The DFS indicates that the potential upside scenario financial modelling of a 7% uplift in ore feed grade results in a 29% improvement in post-tax NPV to \$196m and an improvement of 19% in post-tax IRR to 24%.

### Mine-life extension +\$51m

- Exploration in both Near Mine and Brownfield areas to date has confirmed the potential for extensions • to both Awak Mas and Salu Bulo deposits Along with the inclusion of the Tarra deposit following more drilling, NUS believes this has the potential to provide additional three years LOM.
- The DFS indicates potential upside from a 3-year LOM extension (+300koz) of \$51m, increasing posttax NPV<sup>5%</sup> to \$203m and an improvement of 6% in post-tax IRR to 22%.

### Other optimisation opportunities

A number of other opportunities for value optimisation have been identified and will be evaluated as development progresses. This optimisation of the mining pre-production schedule and mining operation may include reagent and water recycling opportunities, further metallurgical test-work (including ore sorting) in addition to ongoing design and engineering work with a focus on reducing opex and capex. e.g. the TSF comprises a large component of capital cost and further work on engineering and procurement will be undertaken.

# **Optiva's base-case valuation**

We initiate with a A\$0.36/sh target price based on a 0.8x NAV multiple of our base-case Awak Mas DCF valuation in combination with a sum-of-the parts valuation. This represents an **uplift of 2.0x** the current share price. We see significant scope for further value accretion as Nusantara transitions from a development company into a producer, and from optimisation to head-grade, production scale or mine life.

We also present an upside case valuation in which we assume a higher rate of resource to reserve conversion giving a longer mine life in addition to a slightly higher head-grade assumption. **Our upside case valuation**, also based on a 0.8x NAV multiple is **A\$0.51/sh**, an **uplift of 2.8x** the current share price.

Base case Valuation				
NPV	Disc Rate	US\$m	A\$m	A\$/sh
Awak Mas	10%	74	100	0.21
Subtotal		74	100	0.21
Risked NPV	NAV multiple			
Awak Mas	0.80x	59	80	0.17
Exploration	-	5	7	0.01
Sub-total		64	87	0.19
Cash from B/S		5.0	6.7	0.01
Cash from option exercise		4.0	5.3	0.01
Equity funding		60.2	81.3	0.17
Forward Corporate G&A / Oth	ner	(11)	(15)	(0.02)
Base-case NAV VALUATION		122	165	A\$0.36
Current NAV Multiple (Implie	d)			0.50
Shares on issue (basic)		123.2m		
Shares on issue (diluted)		466.0m		
			Source	: Optiva estima

Figure 9 - Indicative Base-case valuation (Optiva estimates)

### Sum-of-the-parts assumptions

### **Operating NAV**

Our sum of the parts valuation starts with our US\$74m (A\$100m) NPV<sup>10%</sup> for Awak Mas. See the next page for the major assumptions used in our base-case DCF valuation. Note we use a punitive 10% discount rate in contrast to 5% used in the DFS. Despite the clear prospectivity of the company's exploration ground within the wider CoW, we conservatively ascribe only US\$5m at this stage as we see the current value of the company predicated on the development of Awak Mas. We view the exploration potential of the CoW as excellent, which provides compelling blue-sky for not only near-mine potential, but also new discoveries.

We adjust our Awak Mas NPV using a 0.8x P/NAV multiple to reflect development and funding risk. For our riskweighted NPV approach, we typically value development companies in the range of 0.2x-1.0x NAV, in line with industry averages. We believe that Nusantara deserves to trade in the upper-middle of this range with a robust, high-quality, low-cost, near-term production asset with attractive economics and significant growth potential. We also deem that the potential for resource expansion and further discoveries as excellent. This is partially off-set by risks around financing, timelines and Indonesian mining legislation.

Nusantara's timeline anticipates a rapid development curve after the final investment decision (target mid-2019), with a short construction period which should see the company transition into gold producer in 2021.

### Funding and other adjustments

Corporately, we adjust for current cash and cash from option exercise and adjust for forward corporate G&A (DCF basis) and related costs. We present our valuation on a fully-funded basis and adjust for equity dilution and funds coming in from equity.

We assume a total funding requirement of US\$160m which is comprised of \$145m in capex and an additional \$15m for pre-production activities. We conservatively assume a 60:40 debt/equity split. Prior the completion of the strategic partner process we have limited visibility on funding mechanisms and the magnitude of debt that can be secured on the project. Nevertheless, our assumption provides a base-case view of a fully-funded valuation, with a fairly punitive view on equity dilution. We model equity being raised at A\$0.25/sh, which we also view as conservative versus the current share price. We assume fully-diluted share capital of 466m shares in our valuation including the mine-build equity raise and outstanding options<sup>1</sup>

### **Base-case Assumptions**

Our base-case unrisked **NPV<sup>10%</sup> of the Awak Mas project (100% interest) is US\$74m** (A\$100m) or A\$0.22/sh fully-diluted, with a 20% IRR. Our valuation is driven by a DCF model of Awak Mas with parameters based on the October 2018 Awak Mas DFS.

The main assumptions included in our modelling are:

- **Timing.** We assume the Final Investment Decision is made in mid-2019. We assume first production in late 2021. This is more cautious then Nusantara's schedule which anticipates first production in H1 2021.
- **Mining.** We model open-pit based on the DFS physicals, giving a mine life of 11.5 years assuming 2.5Mtpa mining rate (250ktpa in year 1). We incorporate LOM strip ratio of 3.5 and flat head-grade of 1.4g/t Au which assumes no upside from planned in-fill drilling.
- **Processing.** We assume 2.5Mtpa ore throughput to the mill and conventional CIL whole-ore leaching as per company guidance. We assume life of mine metallurgical recovery of 91%.
- Production. 11.5-year LOM, average 94koz per annum, peak 103koz. 10koz in year 1 (2021).
- **Operating costs** LOM average C1 cash costs \$650/oz. LOM AISC \$760/oz.
- **Capex** We assume total capex of US\$145m and an additional \$15m in pre-production expenditure, and we assume sustaining capex at 4% of opex or \$2.6m annually.
- **Tax and royalties** We assume corporate tax of 25% tax, 2% NSR royalty to Vista Gold, and a 3.75% Indonesian government royalty.
- **Prices and FX.** Our base-case uses a flat LT gold price of \$1,250/oz, and USD:AUD FX rate of 1.35. We discount our NPV<sup>10%</sup> calculation from 2019.

<sup>&</sup>lt;sup>1</sup> We do not include the 42c and 61c options which we deem out of the money

### **Optiva valuation and modelling outputs**

We model production commencing in 2021, ramping up to steady-state nameplate capacity of 2.5Mtpa in 2022, with steady-state gold production of 102koz per annum. We incorporate a timeline delay and conservatively assume only 10koz of production in year 1. We keep the grade constant at 1.4g/t Au in line with the reserve.

Our base-case DCF at flat US\$1,250/oz gold price indicates annual revenue of US\$133m, annual average EBITDA of US\$59m, and annual steady-state net free cash flow of US\$45m. Our US\$648/t C1 cash cost estimate and US\$758/oz AISC estimate illustrate the potential for robust cash margins even under a relatively benign gold price environment.

		2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Dre Mined	kt	0	0	0	250	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Gold head grade	g/t Au	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
Total ore processed	kt	0	0	0	250	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,50
Metallurgical recovery	%	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%	91%
Gold produced	koz	0	0	0	10	102	102	102	102	102	102	102	102	102	102
C1 cash cost	US\$/oz	0	0	0	639	639	639	639	639	639	639	639	639	639	639
AISC	US\$/oz	0	0	0	817	757	757	757	757	757	757	757	757	757	757
Expansion Capital	\$'000	0	-36	-109	0	0	0	0	0	0	0	0	0	0	0
Sustaining Capital	\$'000	0	0	0	262	2,617	2,617	2,617	2,617	2,617	2,617	2,617	2,617	2,617	2,617
Realised gold price	US\$/oz	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250
Gross Revenue	\$'m	0	0	0	13	128	128	128	128	128	128	128	128	128	128
Direct Operating cost	\$'m	0	0	0	-7	-65	-65	-65	-65	-65	-65	-65	-65	-65	-65
Total opex	\$'m	0	0	0	7	73	73	73	73	73	73	73	73	73	73
EBITDA	\$'m	0	0	0	6	55	55	55	55	55	55	55	55	55	55
EBIT	\$'m	0	0	0	4	44	44	43	43	43	43	42	42	41	41
Net Profit (Loss)	\$'m	0	0	0	5	35	34	34	33	33	32	32	31	31	31
Free Cashflow	\$'000	0	-44	-117	6	43	43	43	43	43	42	42	42	42	42













# **Upside-case Valuation**

Whilst the 1.1Moz ore reserve robustly underpins the 11-year life of mine (at 2.5Mtpa ROM), we acknowledge that the 2Moz (43Mt at 1.4g/t Au) resource provides considerable near-mine potential for further resource to reserve conversion along with the potential for further discoveries. Our base-case does not attribute any value to mine life extensions, and we present an upside-case valuation below.

Our upside case is based on an additional 3 years of mine life similar to the DFS upside case, equating to total LOM production of 1.5Moz (versus 1.1Moz in the base-case). We also tweak the head-grade assumption from 1.4g/t to 1.5g/t Au. We keep all other metrics constant as per the base-case.

Our upside-case NPV<sup>10%</sup> for Awak Mas is US\$135m (A\$182m). As with our base-case we risk this at 0.8x NAV to feed our sum of the parts valuation. Our total post-funding, fully diluted upside-case valuation is thus A\$0.50/sh, an **uplift of 2.8x** the current share price.

Note that we still view this as conservative, given our punitive application of a flat gold price, timeline delay and still only using a global 75% resource to reserve conversion excluding further resource upside. The A\$0.50/sh upside-case is thus our preferred valuation yardstick for Nusantara on a longer-term basis.

NPV	Disc Rate	US\$m	A\$m	A\$/sl
Awak Mas	10%	135	182	0.39
Subtotal		135	182	0.39
Risked NPV	NAV multiple			
Awak Mas	0.80x	108	146	0.31
Exploration	-	5	7	0.01
Sub-total		113	153	0.33
Cash from B/S		5.0	5.4	0.01
Cash from option exercise		4.0	5.3	0.01
Equity funding		60.2	81.3	0.17
Forward Corporate G&A / Other		(11)	(15)	(0.02
Base-case NAV VALUATION		171	229	A\$0.50
Current NAV Multiple (Implied)				0.36

Figure 13 - Indicative Upside-case valuation (Optiva estimates)

# Sensitivity Analysis – project NPV

Base-case & upside-case

Sensitivity analysis on our base-case and expansion-case DCF modelling indicates that Awak Mas is highly leveraged to the prevailing gold price, as would be expected. Our base-case NPV<sup>10%</sup> increases by 127%, or \$126m for a 10% (to \$1,375/oz) uplift in our LT gold price assumption.





Base case NPV Sensitivity (USD \$m)

	Discount rate (%)								
		5%	8%	10%	12%				
(Z	1,150	107	61	38	19				
\$	1,200	133	82	56	35				
S	1,250	159	103	74	50				
8	1,300	185	124	92	66				
Pri	1,350	212	144	110	82				
핃	1,400	238	165	128	97				
Ğ	1,450	264	186	146	113				
	1.500	291	207	164	128				

#### Base case NPV Sensitivity (AUD \$m)

	Discount rate (%)					
		5%	8%	10%	12%	
(z	1,150	144	83	51	26	
\$/o	1,200	179	111	76	47	
(US	1,250	215	139	100	68	
8	1,300	250	167	124	89	
Pri	1,350	286	195	148	110	
Pe	1,400	321	223	172	131	
Ğ	1,450	357	251	197	152	
	1,500	392	279	221	173	

Upside case Sensitivity (USD \$m)

		Disc	ount rate	e (%)	
		5%	8%	10%	12%
R	1,150	201	128	92	63
š	1,200	234	153	113	81
Ins.	1,250	268	179	135	100
8	1,300	301	205	157	119
Pri	1,350	335	230	179	137
P	1,400	368	256	200	156
ĕ	1,450	402	282	222	174
	1.500	435	308	244	193

#### Upside case NPV Sensitivity (AUD \$m)

	Discount rate (%)						
		5%	8%	10%	12%		
(z	1,150	271	172	124	85		
\$/0	1,200	316	207	153	110		
(IN	1,250	362	242	182	135		
9	1,300	407	276	212	160		
Pri	1,350	452	311	241	185		
la	1,400	497	346	271	210		
Ğ	1,450	542	380	300	235		
	1,500	588	415	329	260		

### **Gold Leverage**

• As expected, both our base-case and expansion case valuations show very high leverage to an increase in our LT gold price assumption. Our base-case project NPV10% for Awak Mas increases from US\$74m to US\$110m if we increase our LT gold price assumption by US\$100/oz to \$1,350/oz.



Figure 15 - Project NPV<sup>10%</sup> - Leverage to higher gold prices – **base-case** (US \$m)

Figure 16 - Project NPV<sup>10%</sup> - Leverage to higher gold prices – upside-case (US \$m)



Source: Optiva estimates



### Sensitivity Analysis - valuation

Figure 17 - Valuation sensitivity (10% discount rate) at various gold price assumptions (A\$/sh)

0.50 0.40 0.40 0.40 0.30 0.20 0.10 0.10 1,150 1,200 1,250 1,300 1,350 1,400 1,450 1,500 LT Gold Price assumption (US\$/oz)

# **Charts: Putting Awak Mas into context**

# **Corporate-level comps**

# **EV/ Resources**

On an enterprise value per resource or reserve ounce, our data suggests that NUS appears to be trading at a considerable discount to most other ASX-listed companies in the gold space. NUS is currently trading at an EV of a mere \$10/oz resources, compared to the average we calculate for developers of A\$72/oz and for producers of A\$129/oz. Whilst we are not the biggest proponent of EV/oz methodology (we view it as a slightly blunt instrument), it is still useful as a broad-brush indicator of value, and the value disconnect for NUS shares is distinct.

With the majority of peer projects located in Western Australian, we believe that NUS has largely been overlooked by the market at present, which reflects the location in combination with an Indonesian risk discount being applied by the market. In our view, the current market valuation does not reflect a robust project with 2Moz resource, 1.1Moz reserve and post DFS.

• If we apply the average A\$72/oz EV/oz resource metric for developers to NUS, it implies a value NUS's EV at A\$144m. Applying the producer average of A\$129/oz would value NUS's EV at A\$258m, indicating the potential opportunities for value appreciation if NUS transitions into a producer.



Figure 18 - EV per total JORC resource (A\$/oz) – Australian peer equities

Source: Optiva estimates \*Green = producers, Grey = Developers

Figure 19 - Key to ASX peers

Ticker	Company	Ticker	Company	Ticker	Company	Ticker	Company
BDR	Beadell Resources	EAR	Echo Resources	GOR	Gold Road Resources	RRL	Regis Resources
BLK	Blackham Resources	EGS	Eastern Goldfields	MOY	Millenium Minerals	RSG	Resolute
СММ	Capricorn	EVN	Evolution Mining	NST	Northern Star	SAR	Saracen Mineral Holdings
DCN	Dacian Gold	EXG	Excelsior Gold	NUS	Nusantara	SBM	St Barbara
DEG	De Grey Mining	GCY	Gascoyne Resources	PGO	Primary Gold	SLR	Silverlake Resources
DRM	Doray Minerals	GMD	Genesis Minerals	RMS	Ramelius Resources	TRY	Troy Resoruces
						WGX	Westgold

Nusantara sits at the bottom of the pack of developers in terms of EV/oz resources. We believe that
the current market value of the stock does not reflect the true potential of this near-term production
gold play. We believe that the Indonesian risk discount has been overdone, and we expect a re-rating
if NUS is successful in securing funding on the back of a positive Final Investment Decision.



Figure 20 - EV per total JORC resource (A\$/oz) – Australian peer equities – developers only

### **EV/ Reserves**

- NUS's discount to peers is also evident on the EV / reserve ounce metric. NUS is currently trading at an EV of A\$17/oz reserves, compared to the average we calculate for developers of A\$308/oz and for producers of A\$422/oz. This is a function of both NUS's currently low market cap and relatively large reserve base compared to peers. Put another way, the average ASX gold peer trades at 18x the current value of Nusantara.
- If we apply the average A\$308/oz EV/oz reserve metric for developers to NUS, it implies a value NUS's EV at A\$351m. Applying the producer average of A\$422/oz would value NUS's EV at A\$481m. This excludes any upside from increased resource to reserve conversion.



Figure 21 - EV per total JORC reserves (A\$/oz) – Australian peer equities

# **Reserves (corporate level)**

• NUS's 1.14Moz reserve stacks up well against peers, with one of the largest endowments in the junior sector. Note that the majority of peers with a larger reserve base have multiple projects or mines.



2.5 2.0 JORC Reserve (Moz) NUS 1.14 Moz 1.5 1.0 0.5 0.0 PGO MOY TRY RMS DRM SIH GCY SLR CMM EMR BDR GPR NUS DCN BLK SIH GOR SAR EXG EAR Source: Optiva estimates

Figure 23 - JORC reserve (Moz) – Australian peer equities – sub-3Moz peer group - total corporate attributable

# **Resources (corporate level)**

- NUS's resource base, contained within a single project, puts the company on par with some of the larger ASX gold plays.
- NUS's total resource grade of 1.4g/t Au is about average compared to peer companies.



MOY DEG DRM PGO CMM EAR EGS NUS GCY RMS GOR DCN BDR SLR BLK RRL SAR SBM NST RSG EVN

Figure 24 - JORC resource (Moz) – Australian peer equities – total corporate attributable



Figure 25 - JORC resource grade (g/t Au) – Australian peer equities

2.0

1.0

0.0

GMD EXG

TRY



# **Project-level comps**

### **Capital intensity**

- Based on modelled LOM production of 1.06Moz and NUS's capex of US\$145m (A\$195m), we calculate a capital intensity of A\$182/oz, which puts Awak Mas close to the A\$166/oz average for other peer projects.
- This benchmarks Awak Mas' capital intensity very closely to Okvau and Woodlark which being Asia-Pac gold development projects are very close comparators to Awak Mas.



Figure 26 - Capital intensity – A\$/oz – per LOM production

• Set against our entire database of global open-pit gold projects, Awak Mas sits just below the industry average indicating that the project is potentially competitive on a global basis.

Figure 27 - Capital intensity – US\$/oz – per LOM production – open pit gold global database



### **Operating costs**

- LOM All-in-sustaining cost (AISC) in the DFS is US\$758/oz (A\$1,023/oz) over LOM.
- NUS has several competitive advantages at Awak Mas that feed through to low operating costs. These
  include relatively low site infrastructure costs and access to cost effective grid power. The project has
  a low strip ratio in conjunction with simple open pit mining and projected high recoveries from industry
  standard CIL processing. The ore has a relatively low bond work index which reduces grinding (i.e.
  power) costs.



Figure 28 - All-in-sustaining costs (AISC) – A\$/oz – per LOM average

Fiaure 29	- Close com	parator develo	proiects
	0.000 00		

	Company	Country	Project	Resources Moz	Reserves	Prod Koz p a	KozLOM	LOM	Capex	Opex	Stage	Plant Size	Strip
Ticker				10102	10102	NOL p.u.	KOZ LOIM	rears	Ayın	ABC A9702		mepu	LOW
NUS	Nusantara Resources	Indonesia	Awak Mas	2.0	1.1	95	1,066	11.5	195	1023	Funding	2.5	3.5
GCY	Gascoyne Resources	Aus (WA)	Glenburgh	1.0	-	73	316	4	70.4	991	PFS	1.2	8.1
GPR	Geopacific Resources	PNG	Woodlark	1.6	1.1	100	1,000	10	180	1110	PFS	2.4	3.1
KIN	Kin Mining	Aus (WA)	Leonora LGP	0.7	-	48	309	6.5	57	1185	DFS	1.2	5.1
SIH	Sihayo	Indonesia	Sihayo Pungkut	1.4	0.6	90	553	6.1	-	-	DFS	-	-
СММ	Capricorn	Aus (WA)	Bibra	1.5	0.9	100	800	6.5	132	1038	DFS	3.0	4.81
EMR	Emerald Resources	Cambodia	Okvau	1.1	0.9	106	742	7	127	950.3	DFS	2.0	5.8
DCN	Dacian Gold	Aus (WA)	Mount Morgans	3.3	1.2	150	1,201	8	220	1039	Construction	2.5	7.5
GOR	Gold Road Resources	Aus (WA)	Gruyere	6.6	3.5	270	3,210	13	514	945	Construction	7.5	2.8
GCY	Gascoyne Resources	Aus (WA)	Dalgaranga	1.3	0.6	100	592	6	86.2	931	Construction	2.5	7.1
WGX	Westgold	Aus (WA)	Fortnum	1.8	0.3	70	350	5	15	1250	Commissioning	1.0	-
									Sourc	e: Compa	any reports, C	ptiva est	imates

### **Production scale**

• Awak Mas is one of the largest gold development projects in the pipeline amongst ASX-peers, excluding very large new projects such as Gruyere (Gold Road Resources ASX: GOR).



Figure 30 - LOM average annual production – peer projects

### **Project resources**

• Awak Mas already has one of the largest resource bases within the peer group.

Figure 31 - Total resource – ASX peer gold projects – sub 3Moz



Figure 32 - ASX Peer projects – grade-tonnage plot



• Our data indicates that Awak Mas has one of the more robust resources versus peer projects with 89% of the total contained ounces sitting within the Indicated category.



Figure 33 - ASX Peer projects - resource confidence - % of resource classified as Measured & Indicated

### **Project Reserves**

• We expect Awak Mas' ore reserve to increase on the back of the recent update to the MRE and with further optimisation work.



Figure 34 - Proven & Probable reserves – ASX peer gold projects

### **Strip ratios**

• Awak Mas' LOM strip ratio is projected to be 3.5, which is low compared to most other peer projects.



Figure 35 - Strip ratio (LOM average)

# Awak Mas asset review & DFS outcomes

# Location

Awak Mas is located in the Indonesian Province of South Sulawesi, which is situated in the southwestern part of the island of Sulawesi, on the western side of the Gulf of Bone. The closest centre of population is the town of Palopo. Awak Mas is situated 200km south of the equator in an area of high topographic relief, with steep slopes ranging in elevation from near sea level to as high as 3,400 m. The Awak Mas deposit itself ranges in elevation from about 800–1450m.

The project area is covered by a combination of primary rainforest in rugged areas, and areas that have been subject to logging and partial land clearance. Current activity on the CoW is limited to extensive subsistence farming, primarily for coffee and cloves.



Figure 36 - Awak Mas - location in Sulawesi, Indonesia

Source: NUS

### Infrastructure and Access

Ostensibly, whilst appearing to be in a relatively remote area, Awak Mas does in fact have well-established infrastructure at site and regional logistics links. Firstly, the location, only 45km from the coast provides a key advantage, with a good network of road, port and airport infrastructure.

- **Roads.** Access is via public concrete/asphalt roads from the provincial capital of Ujung Pandang (Makassar) for approximately 370km to Belopa. From Belopa, final access is via 45km of secondary asphalt and gravel roads of variable quality to site. The road between Ranteballa and Belopa is mostly sealed and is the subject of ongoing upgrades work by local governments.
- **Power.** The exploration camp is connected to the Sulawesi power grid by PLN using a 20kV distribution line. The previously-used gensets have been retained for back-up. This line can provide construction power up to a maximum of 8MVA (likely use 2MVA). For mining operations, power demand is estimated at 15MVA. NUS has signed an MOU with PT PLN, an Indonesian national power utility, to complete the construction of a 150kV line from their grid backbone substation in Belopa to the site.

• **Port and airport access.** Road access to two ports for importing construction materials and consumables is possible, near to Belopa to the east, and Palopo to the north. Bua airport provides 45 minute light access to Makassar, a city of 2m people.



#### Source: NUS

### Mineral Tenure – no mandatory divestment until 10<sup>th</sup> year of production

NUS has secured mineral tenure and holds a 100% interest in Awak Mas through its wholly-owned subsidiary PT Masmindo Dwi Area. Key points regarding the tenure of the project are:

- A 7<sup>th</sup> generation Contract of Work (CoW) with the Indonesian Government covering 14,340 ha of nonforestry land. Amendment signed in March 2018.
- NUS has secured CoW tenure until 2050, with extensions possible via the IUPK system until 2070.
- Significantly, NUS has negotiated the terms of the CoW and no divestment is required until after the 10<sup>th</sup> year of commercial production. After this time, which NUS expects not to be before 2030, the company is required to offer at least 51% of its share capital to Indonesian participants at fair market value using International valuation practices. This in contrast to the requirements for holders of an IUP/IUPK where staged divestment begins after the 5<sup>th</sup> year of production. This provides more funding flexibility as divestment should not impinge until very late in the mine life.
- The AMDAL, comprised of an Environment Impact Statement and associated plans, was approved in April 2017 by the Governor of Sulawesi. Forestry law permits are not required as the CoW land is designated as "land for other use".

# **Brief exploration history**

Awak Mas has a relatively long exploration history with various owners undertaking exploration on the property since 1986. The bulk of the work was undertaken in the mid-1990s by Masmindo Mining Corporation Limited (MMC) which drilled over 83,000m.

- Battle Mountain. The original partners in the Awak Mas JV were New Hope Consolidated Industries Pty Ltd (New Hope) and PT Asminco Bara Utama (Asminco). In 1991, Battle Mountain Gold Company (BMGC) concluded a farm-in agreement with New Hope and subsequently earned 60% equity in the project.
- LSE. In 1994, Lone Star Exploration NL (LSE) negotiated the right to acquire the equity of both BMGC and New Hope. A single corporate entity of Masmindo Mining Corporation Limited (MMC) was formed by combining the interests of LSE, along with Gasgoyne Gold Mines (GGM) and JCI Limited. LSE subsequently acquired GGM's interest in the project.
- **MMC.** In 1999, MMC purchased JCI's interest in the project, prior to an option purchase agreement was executed with Vista Gold Corp in 2004.
- Vista Gold completed additional exploration and delineation work between 2004 and 2008, including 13 drill holes to update the resource to NI 43-101 compliance in 2008.
- **One Asia** drilled a further 87 holes (6,000m) at Awak Mas in addition to a new thrust of exploration and drilling the Salu Bulo and Tarra deposits.

Date	Operator	Hole type	# holes	Metres drilled	Average depth
Dec 1991 - Feb 1993	BMGC (Battle Mountain)	Core	77	8,288 m	108 m
Jun 1994 - Aug 1995	Lone Star Exploration (LSE)	Core	31	2,749 m	89 m
Mar 1995 - Apr 1996	Masmindo Mining Corp (MMC)	Percussion	101	10,317 m	102 m
Jun 1995 - Mar 1997	ММС	Core	451	57,860 m	128 m
Apr 1996	ммс	Core	59	7,503 m	127 m
Apr 1997 - Jul 1997	ммс	Percussion	57	6,062 m	115 m
Apr 1997 - Jun 1997	ммс	Core	14	2,070 m	150 m
Oct 2006 - Feb 2007	Vista Gold	Core	13	2,576 m	184 m
Mar 2011 - Sep 2012	One Asia Resources	Core	87	5,956 m	68 m
		Core	904	106,168 m	121 m
	Historic Totals:	Percussion	187	18,701 m	109 m
		All	1,091	124,869 m	119 m
2017 - 2018	Nusantara	Core	73	11,861 m	-
	Grand total:	All	1,164	136,685 m	109 m

### Figure 38 - Summary of historical exploration drilling at Awak Mas (excludes Salu Bulo & Tarra)

- Nusantara Resources. NUS's Phase 1 drilling programme in 2017-2018 at Awak Mas, but also extending to the Salu Bulo satellite, amounted to 73 diamond drill holes for 11,816m. The drilling was a combination of in-fill drilling and extensional drilling, along with exploration and metallurgical holes. The drilling was designed to target areas of unclassified mineralisation and to upgrade the Inferred Resource at Awak Mas, Salu Bulo and Tarra.
- The Phase 1 drilling culminated in the updated Mineral resource estimate (May 2018), maiden Ore Reserve (April 2018) and Ore Reserve update (September 2018).
- In December 2017, NUS commenced a high-impact drill programme focusing on the Mine Corridor of the Awak Mas project, testing for extensions to mineralisation and structural repetitions along the corridor.
- In March, a six-hole (2,726m) programme focused on the Awak Mas highwall extension to test for extensions to mineralisation to the east across the recognised Awak Mas Highwall fault.

# Brief history of development/economic studies

Awak Mas has undergone several development studies since 1997. One Asia released a PFS in 2012 which went through several iterations. One major revision in 2015 where the ROM throughput was decreased to 2.5Mtpa from 3.5Mpta, and a minor update in 2016 to reflect updated costs and inputs. The DFS was released in October 2018.



### Geological and mineralisation overview

Awak Mas is located in Sulawesi, at the approximate junction of the Eurasian, Pacific, and Australian Plates in a geologically complex but highly prolific gold and copper belt. The project is located in the West Sulawesi Arc, in rocks of the Central Sulawesi Metamorphic Belt – a 50km long NNE-trending fault block, bounded to the east by a shallowly east-dipping thrust and on the west by a major basement structure, which reflects the dominant regional structure of a NNW–SSE low-angle thrust along the suture zone between two tectonic plates.

Gold mineralisation at Awak Mas is dominantly hosted within the cover sequence (mainly of meta-sedimentary rocks including sandstones, siltstones, mudstones, and rare grits and conglomerates). NUS believes that these rocks originate from deep marine fore-arc basin flysch sediments that have undergone low-grade metamorphism to greenschist facies.

Gold occurs with pyrite associated with late stage stockwork (quartz-albite-ankerite) veinlets, with stockworks occurring within and adjacent to, multi-phase epithermal breccias representing a series of steeply dipping sheeted 'feeder' bodies. Petrology has highlighted that the majority of the gold has been remobilised and recrystallised indicative of a late stage hydrothermal overprint or possible supergene processes.

NUS recognises two broad structural styles of mineralisation:

- Gently to moderately-dipping (20-40°) broadly tabular zones of cm thick veinlets and altered rock whose overall orientation is similar to that of the foliation in the host rocks
- More steeply dipping (30-70°) zones of quartz veinlets, local brecciation, and altered rock, which commonly coincide with faults that cut across foliation in both the cover and basement sequences

### Awak Mas Resource - three separate deposits

- The total Awak Mas Mineral resource is comprised of three separate deposits; **the main Awak Mas deposit, and two smaller satellite deposits; Salu Bulo and Tarra.** All three deposits are contained within the same CoW.
- Awak Mas is the main deposit, consisting of five broad mineralised areas, which from west to east are Mapacing, Ongan, Lematik, Tanjung and Rante. These predominantly north-south to north-east striking zones lie adjacent to each other, cover an extent of 1,450 m east-west by 1,050m north-south and extend to a maximum tested vertical depth of 400m. A high level, low sulphidation hydrothermal system has developed at Awak Mas which is overprinted by a strong sub-vertical fracture control which has channelled the mineralising fluids. The Awak Mas MRE is 39.5Mt at 1.4g/t Au for 1.72Moz.
- Salu Bulo lies 2.5km to the southeast of the main Awak Mas deposit. The Salu Bulo deposit consists of three main north-south trending mineralised corridors, which from west to east are Lelating, Biwa North and Biwa South. The mineralised domains at Salu Bulo are orientated north-south, and have an overall combined strike length of approximately 800 m. The current MRE is 3.6Mt at 1.6g/t Au for 0.18Moz Au.
- **Tarra** lies 4.5km north of the main Awak Mas deposit, and NUS considers the mineralisation style to be analogous to Awak Mas. Tarra consists of a single 10m to 50m wide, northwest-trending, sub-vertical structurally controlled mineralized zone in the hanging wall of the Tarra Basal Fault, with gold mineralisation occurring in a 30m silicified zone at the footwall of the fault. The current MRE is 2.3Mt at 1.4g/t Au for 100koz.



Figure 40 - Awak Mas Site Layout showing the location of the three deposits: Awak Mas, Salu Bulo and Tarra

Source: NUS

### Mineral Resource Estimate – May 2018 – 2Moz

In May 2018, NUS updated the Awak Mas Mineral Resource estimate. The total mineral resource for Awak Mas, Salu Bulo and Tarra amounts to 2Moz (45.3Mt at 1.4g/t Au at a 0.5g/t Au cut-off grade). The latest iteration of the resource incorporates the final 31 holes from the resource definition and metallurgical drilling from NUS's Phase 1 drill programme. The resource represents a 15% increase over the May 2017 MRE of 1.74Moz.

- The resource is calculated using a 0.5g/t Au cut-off and constrained by a US\$1,400/oz gold optimisation shell.
- Note that 89% of the total resource sits within the Indicated category. At the Awak Mas deposit alone, 94% of the resource sits within the Indicated category, and 90% at Salu Bulo.
- We view the resource as robust, given the extensive drill hole database (over 1,000 holes) and additional 59 holes at Awak Mas, and 14 holes at Salu Bulo, drilled by Nusantara. The resource also reflects strong confidence in the geological model which has been refined by Nusantara.
- Further upgrades in confidence and grade possible. NUS is planning further drilling to increase the resource category to the Measured status in the initial mining areas and also believes that this closer spaced drilling has the potential for an uplift in grade through the intersection of additional higher-grade vertical zones that are pervasive through the Awak Mas and Salu Bulo deposits.

Deposit	Category	Tonnes (Mt)	Grade (g/t Au)	Contained Au (Moz)
Awak Mas	Measured	-	-	-
	Indicated	36.4	1.4	1.62
	Inferred	3.1	1.0	0.10
	Sub-total	39.5	1.4	1.72
Salu Bulo	Measured	-	-	-
	Indicated	2.9	1.7	0.16
	Inferred	0.6	1.1	0.02
	Sub-total	3.6	1.6	0.18
Tarra	Measured	-	-	-
	Indicated	-	-	-
	Inferred	2.3	1.3	0.10
	Sub-total			0.10
Total	Measured	-	-	-
	Indicated	39.3	1.4	1.78
	Inferred	6	1.1	0.22
	TOTAL	45.3	1.4	2.00

### Figure 41 - JORC Resource – May 2018, 0.5g/t Au cut-off

Source: Optiva, company reports





Source: Optiva, company reports

*Figure 43 - Awak Mas Deposit showing Mineral Resource using May 2018 Mineral Resource shell* 



Awak Mas Deposit showing Mineral **Resource grades > 0.5 g/t Au** using May 2018 Mineral Resource shell



Awak Mas and Salu Bulo cross-section



### Ore Reserves upgraded – 1.14 Moz

In April 2018, NUS released the maiden Ore Reserve estimate for Awak Mas amounting to 23.7Mt at 1.35g/t Au for 1.03Moz contained. The Ore Reserve was updated in September 2018 to incorporate data from the May 2018 Mineral Resource estimate for Awak Mas and Salu Bulo, resulting in an upgrade to 26.9Mt at 1.32g/t Au for 1.14Moz contained:

- The total Ore Reserve is all contained with the Probable category and calculated using a 0.5g/t cut-off grade and US\$1,250/oz gold price (no change from the April 2018 reserve). The updated reserve represents an 11% increase in contained gold and a 14% increase in tonnes, with only a 2% reduction in grade over the previous reserve.
- The Ore Reserve estimate is based on the May MRE for Awak Mas and Salu Bulo and included the latest holes from the company's phase 1 drilling and mine planning completed as part of the DFS.
- Studies indicate that the maiden Ore Reserve will support of a mine life of more than 11 years at a processing production rate of 2.5Mtpa and strip ratio of 3.5.

Deposit	Category	Tonnes (Mt)	Grade (g/t Au)	Contained Au (Moz)
Awak Mas	Proved	-	-	-
	Probable	24.1	1.28	0.99
	Sub-total	24.1	1.28	0.99
Salu Bulo	Proved	-	-	-
	Probable	2.8	1.67	0.15
	Sub-total	2.8	1.67	0.15
Total	Proved	-	-	-
	Probable	26.9	1.32	1.14
	TOTAL	26.9	1.32	1.14

### Figure 44 - JORC Ore Reserve estimate – April 2018, 0.5g/t cut-off

Source: Optiva, company reports

### Mining and pit design

The Ore Reserve is based on mine design and costs consistent with the October DFS. The main mining assumptions as part of the Ore Reserve estimate are as follows:

- Awak Mas will be a conventional excavator and articulated truck open pit mine, drilled on 5m benches.
- The Awak Mas deposit open pit will be developed in stages to provide early access to ore supply and to manage waste and total material movements Contractor mining, using 90t excavators and 60t articulated dump trucks.
- Annual ore throughput of 2.5Mtpa, total ore mined 28Mt, total material mined over LOM 125.6Mt, total waste mined 97.6Mt. Waste will be stored next to the open pit. LOM strip ratio of 3.5 and total LOM of 11.5 years.
- 10-month pre-production period comprising 4 months of access development and 6 months of combined development and pre-strip mining where access is developed to the Awak Mas pit via pioneered haul roads over the vertical extent of the project.

# Metallurgy and processing

Awak Mas has very simple metallurgy and consequently, low-cost, low-risk conventional processing techniques can be used. The key points in terms of metallurgy and processing are:

- The gold mineralisation is **not refractory** and a variant of standard CIL processing (Whole Ore Leaching) will be employed following extensive historical test-work.
- Previous studies proposed flotation with CIL treatment of reground sulphide concentrate with indicative recoveries of between 85% and 91%. Following a review of historical work and extensive testwork by Nusantara, latterly as part of the DFS, a new flowsheet comprising gravity and leach (whole ore leach) was selected. This produces a more streamlined flowsheet whilst still utilising proven industry techniques. **Overall recovery in the DFS is estimated at 91%**.
- The ore has moderate competency, with a bond work index of 12.8 kWh/t and a primary grind of only P80 passing 75µm required. 40% of gold is expected to be recovered by the gravity circuit. Reagent consumption is expected to be moderately low, further reducing operating costs.
- The process is straightforward comprising of primary crushing, wet grinding in a SAG and ball milling circuit (SAB circuit), gravity gold recovery, cyanide carbon in leach gold recovery and elution, reagents, air and water services.
- The process plant would produce a gold doré product, the quality of which is improved by the inclusion of a mercury retort to remove mercury from gold sludge prior to smelting.
- NUS plans to complete further metallurgical and physical properties testwork aimed at exploring opportunities to increase recoveries through flowsheet or operating strategy changes such as grind size, residence time or reagent addition. The scope of this testwork is focused on the first 3 years of the Mining Schedule.



### Figure 45 - Awak Mas process flow sheet

Figure 46 - Schematic of planned Awak Mas processing and related site infrastructure



Source: NUS

### **Tailings Storage**

CIL tailings will be thickened and cyanide detoxified prior to disposal a Tailings Storage Facility (TSF) which has been designed as a fully engineered structure taking into consideration the foundation conditions, site seismicity, available construction materials, tailings characteristics and potential design rainfall events.

A site at Kandeapi Valley, approximately 3km east of the proposed process plant site, is considered to be the most suitable location for the TSF. The tailings will be pumped from the process plant via a slurry delivery pipeline for deposition into the TSF. The required storage capacity of the tailings is 28Mt for the 11-year LOM.

# **Exploration potential**

Nusantara has identified numerous high-grade exploration targets on the Awak Mas CoW. NUS has previously defined an Exploration Target of 300-500koz gold (7-10Mt at 1.3-1.5g/t Au) that was associated with the infill and extensional drilling program that has been completed and incorporated into the current Mineral Resource. The company has an "aspirational target" to define a 5Moz goldfield in the surrounding district. The completion of the DFS allows a shift in focus to exploration in the broader CoW area.

The compelling aspect is that the identified exploration targets are all very close to the planned location of the Awak mas processing plant and could be potential satellite pits to provide feed to a central processing operation. Once processing and site infrastructure is established, this could provide important cost-saving synergies and further discoveries are likely to be value accretive from an early stage.

The exploration focus is split into three areas; near-mine, brownfields and greenfields. The near mine area includes the "The Mine Corridor" – the trend between Awak Mas and Salu Bulo, a high priority area. The brownfields area includes the ground around the Tarra resource.





Source: NUS

# Near-Mine Exploration Potential and "Mine Corridor"

Nusantara's highest priority exploration area is the "Mine Corridor" area which covers the ground between the defined resource at Awak Mas and Salu Bulo.

- Exploration work is focused on the potential for further fault repetitions of Rante style mineralisation to the east of Awak Mas towards the Salu Bulo deposit.
- The mine corridor covers the area closest to the planned Awak Mas processing plant providing the potential for low-cost satellite mines, low infrastructure costs and operational synergies.
- The focus is on extending the existing mineral resource outside the currently defined mineralised envelope at both Awak Mas and Salu Bulo, whilst testing the continuity of mineralisation between both deposits and potential for structural repetitions.



Figure 48 - Near Mine prospects showing selected historic and recent results

- Near-Mine prospects. In October 2018, NUS reported that ongoing surface exploration at the near mine prospect locations of Salu Kombong, Puncak Utara and Puncak Selatan continues to support the potential for additional satellite deposits within close proximity to the Awak Mas and Salu Bulo deposits. Figure 48 above. These have the potential to supplement feed to the proposed processing plant, or to substitute lower grade ore with potentially higher-grade feed from satellite deposits.
- Salu Kombong. Newly recognised gold and copper mineralisation has been identified in an area 1.5km away from the proposed process plant location. Historic sampling returned more than 350 samples ≥0.5 g/t Au with individual assays up to 32.7 g/t Au and averaging 2.6 g/t Au. Recent work by NUS (reported Oct 2018) has identified three significant new gold and copper outcrops identified on intrusive related quartz veining covering an area of approximately 250m x 100m. Recent results from trenching in the area include 3m at 2.8g/t Au and 1.2% Cu.

- **Puncak Utara**. Trenching and sampling in September 2018 returned individual assay results up to 11 g/t Au and an average grade of 3.6 g/t Au. A broad footprint of mineralisation approaching 750m x 1500m in extent has now been defined with good continuity returned from costeans, e.g. 12m at 2.39g/t Au.
- Puncak Selatan. An area located immediately adjacent to the south eastern rim of the planned Awak Mas pit and therefore presents a significant opportunity for early access to supplementary mill feed. Historic sampling in this area had highlighted significant grade at surface, some of which has now been resampled by Nusantara. This sampling has returned 37 samples with an average grade of 1.6g/t Au and a high of 5.3g/t Au. Recent manually excavated trenching returned promising intervals including 5m at 2.8g/t Au.

### Awak Mas High-wall extension – structural repetition connecting Awak Mas and Salu Bulo

- The area within the east of the Awak Mas mineral resource has previously had very limited drilling, with the "Rante Domain" mineralisation remaining open in an easterly direction. The theory is that the interpreted Awak Mas highwall fault has resulted in offsets of the Rante domain to the immediate east of the highwall – previous drilling had intersected 13m at 1.7g/t Au and 13m at 2g/t Au.
- Significant mineralisation confirmed in previously untested fault-block. Recent results from three holes (HWD001, HWD002 and RTD023) successfully demonstrated the continuity of high-grade mineralisation beyond the highwall confirming the presence of quartz-veining and sub-vertical breccia structures as per the company's modelling.





- Grades in excess of current resource grade. Further drilling returned several intersections where significantly, the tenor of mineralisation was well above the average 1.4g/t Au grade of the current Awak Mas mineral resource. Key intercepts include:
  - o **HWD003** 6.6m at 1.9g/t Au from 291m, inc. 1.5m at 4.6g/t Au from 293m
  - HWD004 41.7m at 2g/t Au from 299m, inc. 6.9m at 3.5g/t Au from 291m and 3.8m at 4.8g/t Au from 309m
  - HWD005 42.4m at 1.6g/t Au from 276m, inc. 6m at 4.6g/t Au from 284m and 5.4m at 3.5g/t Au from 299m

# **CoW Exploration Potential**

The northern and southern portions of the CoW have not been extensively explored. NUS believes that there is considerable potential for further discoveries using up-to-date geophysical methods and modern exploration techniques. The company's aspirational target is to define a 5Moz gold field. The broader CoW area includes the greenfield prospect areas but also the "Eastern Corridor" which comprises of some of the near-mine and brownfields areas between Salu Bulo and Tarra. Exploration will now be stepped up as the DFS has been completed.

### New geophysics interpretation.

NUS recently engaged Global Ore Discovery consultants to reprocess a significant amount of historic geophysics (airborne magnetic and radiometric) data that was flown in 1996 by World Geoscience Corporation. NUS reported in October 2018 that the reprocessing of the magnetics and radiometrics data has produced enhanced imagery on which to base interpretation and identify exploration targets.

- The new geophysics interpretation has defined a regional scale structural and intrusive architecture of major west-northwest structural corridors (the Awak Mas Salu Bulo trend), intersecting with established north trending zones (parallel to the Kandeapi Fault Zone), which appears to present opportunity for the occurrence of the current deposits.
- Global Ore Discovery reports "The recognition of geophysical signatures and characteristics of the known mineralisation have led to recognition of several near mine targets and significant prospectivity in the CoW for new intrusive-related systems". Targets for ground-truthing have been generated west and east of the Kandeapi Fault Zone.
- NUS is in the process of reviewing and generating targets from the large amount of new data. Further prospect scale analysis is required to complete the interpretation in more detail; particularly in the near mine area and to integrate geological and geochemical data with field evaluation.



*Figure 50 - Geological model showing modelled potential for continuity of mineralisation to the east* 

Source: NUS

• Waihi analogy. Global Ore Discovery has noticed a strong analogy between the hydrothermal alteration and Analytical Signal of the world class Waihi low-sulphidation epithermal Au - Ag system in New Zealand. NUS believes this is important as similar processing of other epithermal deposits show the significance of these zones associated with hydrothermal alteration & mineralisation.



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Figure 51 - Comparison showing significance of hydrothermal alteration & mineralisation zones at Waihi and similarity at Awak Mas

Source: NUS

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