

ASX ANNOUNCEMENT
18 April 2018

# NUSANTARA DELIVERS MAIDEN 1.0 MOZ GOLD ORE RESERVE Confirming Potential for Long-life Open Pit Mine

Asia-Pacific gold development company Nusantara Resources Limited ('Nusantara', ASX: NUS), is pleased to announce a maiden Ore Reserve of 1.0 million ounces contained gold for its 100%-owned Awak Mas Gold Project located in South Sulawesi, Indonesia.

- Ore Reserve supports a long-life, low cost gold operation at a 2.5 Mtpa processing rate, with a low strip ratio of 3.5 and good access to established power and transport infrastructure
- Nusantara continues to deliver on project milestones following the successful August 2017 IPO
- Nusantara expects to continue to grow the Awak Mas Gold Project reserves and resources to a
  globally significant quality and scale, with significant exploration potential still to be tested

The Awak Mas Gold Project Probable Reserve at 0.5 g/t Au cut-off using a US\$1250/oz gold price is 23.7 Mt at 1.35 g/t Au for 1,030,000 contained ounces. The Ore Reserve estimate (Table 1) is based on the Mineral Resource estimate reported for the Awak Mas and Salu Bulo deposits in January 2018<sup>1</sup> and February 2018<sup>2</sup> respectively (Figure 1), and work completed in the first stage of the Definitive Feasibility Study (DFS)<sup>3</sup>.

The DFS remains on track for delivery in July 2018:

- A further material upgrade in the Ore Reserve which will be used to finalise the DFS is anticipated in June, following incorporation of the 16 remaining drill holes not included in the current Mineral Resource estimate
- The focus of the DFS is now on value enhancement with attention to waste dump design, pit optimisation, materials handling efficiency, and mine scheduling

"Our maiden Ore Reserve represents a significant milestone for the Company and now places Nusantara among an elite group of ASX-listed gold development companies", commented Nusantara's Managing Director and CEO, Mike Spreadborough. "This Ore Reserve combined with the exploration potential of the project demonstrates the value of a proposed long-life, low cost, stand-alone gold project at Awak Mas."

<sup>&</sup>lt;sup>1</sup> ASX Announcement released 31 January 2018

<sup>&</sup>lt;sup>2</sup> ASX Announcement released 27 February 2018

<sup>&</sup>lt;sup>3</sup> ASX Announcement released 1 September 2017



Table 1: Awak Mas Ore Reserve estimates (April 2018) by deposit.

	Classification	Tonnes (Mt)	Au Grade (g/t)	Contained Gold (Moz)
Awak Mas	Proved	-	-	-
	Probable	21.0	1.32	0.89
	Sub-total	21.0	1.32	0.89
Salu Bulo	Proved	-	-	-
	Probable	2.7	1.60	0.14
	Sub-total	2.7	1.60	0.14
Total	Proved	-	-	-
	Probable	23.7	1.35	1.03
	Total	23.7	1.35	1.03

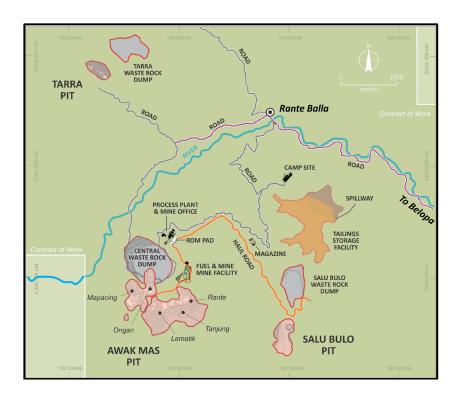


Figure 1: Awak Mas Site Layout showing the location of the three deposits: Awak Mas, Salu Bulo and Tarra



# APPENDIX: AWAK MAS GOLD PROJECT DEFINITIVE FEASIBILITY STUDY (OPTIMISATION STUDY PHASE)

# **Background**

The Awak Mas gold deposit, located in Sulawesi was discovered in 1988. Since that time a number of owners have undertaken drilling and technical studies within the 14,390 ha Contact of Work (CoW). This work has led to the definition of Mineral Resources at the Awak Mas, Salu Bulo and Tarra deposits, collectively, the Awak Mas Gold Project ("Project"), and completion of Pre-feasibility Studies (PFS). The project has been granted all environmental and construction approvals for continued development<sup>1</sup>.

In 2017, Nusantara Resources Limited (Nusantara, ASX: NUS) became owners of the Project from One Asia Resources through an ASX IPO<sup>1</sup>. Nusantara has undertaken further resource definition drilling, metallurgical evaluation, and mining studies targeted for the completion of a Definitive Feasibility Study (DFS) by July 2018.

The Project is 100%-owned through a 7th Generation CoW with the Government of Indonesia (GoI). The CoW was secured prior to the current Mining Law and has recently been amended by mutual agreement to align with the current law.<sup>2</sup> PT Masmindo Dwi Area (Masmindo), a wholly owned subsidiary of Nusantara, has sole rights to explore and exploit any mineral deposits within the project area until 2050. After this period, the operations under the CoW may be extended in the form of a special mining business license (IUPK) in accordance with prevailing laws and regulations, which currently allows for an extension of 10 years and a further extension of 10 years.

In the 10th year after commercial production, Masmindo is required to offer at least 51% of its share capital to willing Indonesian participants at fair market value according to international practice.

The release of the maiden Ore Reserve represents the first stage of work completed for the DFS. The DFS Optimisation Study targeted resolution of uncertainties, which Nusantara identified from the PFS completed by previous owners.<sup>3</sup>

The DFS work program includes completion of:

- Metallurgical and physical properties test work to support plant design and performance, and definition of tailings properties;
- Tailing Storage Facility (TSF) design;
- Process Plant and Infrastructure design to support the DFS;
- Materials handling optimisation studies;
- An Ore Reserves update, based on the Mineral Resource Estimate (MRE) update in early May 2018;
- Mining operations optimisation including final open pit design, materials handling strategy, and truck fleet;
- Definition of the early works program for the Project;
- Preliminary Project Execution plan;
- Preliminary Operations Implementation Plan; and
- Finalisation of capital and operating cost estimates and financial analysis.

These activities are targeting optimisation of the project financial outcomes.

<sup>&</sup>lt;sup>1</sup> Nusantara's IPO Prospectus dated 15 June 2017 as lodged with the ASX on 1 August 2017

<sup>&</sup>lt;sup>2</sup> ASX Announcement released 15 March 2018

ASX Announcement released 1 September 2017



# **Basis of Definitive Feasibility Study**

In August 2017, Nusantara commenced a diamond drilling program to grow and increase the confidence in its May 2017 Awak Mas Gold Project Mineral Resource Estimate (MRE) of 38.4 Mt at 1.41 g/t Au for 1.74 Moz at 0.5 g/t Au cut-off, for a resultant 73% Indicated and 27% Inferred classification. This MRE was the result of a new geological model following re-logging, re-assaying and interpretation work completed by Nusantara's geologists and consultants on a selection of the extensive core library of over 1,000 diamond drill holes stored at site.

Drilling by Nusantara completed in 2017 and early 2018 has resulted in subsequent updates of the MRE:

- 31 January 2018 Awak Mas deposit Indicated and Inferred Resource update with a 12% increase to 39.0
   Mt at 1.37 g/t Au for 1.72 million contained ounces; and
- 27 February 2018 Salu Bulo deposit Indicated and Inferred Resource update with a 65% increase to 3.7 Mt at 1.53 g/t Au for 180,000 contained ounces

These combined, provide a Project MRE of 1.9 Moz Au with 85% reporting to the Indicated Resource category. This MRE is used as the basis for the preparation of this maiden Ore Reserve for the Project as part of the work completed in the first stage of the DFS. The Tarra deposit requires further resource drilling before it can be included in future studies.

Nusantara has led the preparation of the DFS Optimisation Study, and is working towards a DFS, with work undertaken by the following independent consultants:

- Mineral Resources Estimates Cube Consulting;
- Ore Reserves, pit optimisation & mine planning, mining geotechnical AMC Consultants;
- Metallurgical and Mineral Processing Minnovo;
- Tailing Storage and hydrology Golder Associates (PT Geotechnical & Environmental Services Indonesia);
- Engineering and lead consultant PT Resindo;
- Environmental and social components PT Lorax Indonesia; and
- Capital and operating costs AMC Consultants, Minnovo, Resindo with mining costs verified by specialist mining contractors.

The aim of the DFS is to ensure the technical, engineering, risk, operational readiness and financial aspects of the project are sufficiently advanced to allow for making an investment decision regarding the Awak Mas Project's future. Nusantara is targeting DFS completion in July 2018.

#### Location

The Project is located 45 km by road from Belopa on the east coast of the South Sulawesi Province, Indonesia. Belopa is the capital of the Province's Luwu Regency. The nearest major centre is the coastal port city of Palopo, 60 km north along the coast from Belopa.

Access to the Site from Makassar (Figure 1), capital of South Sulawesi and Indonesia's fifth largest city, is via a 370 km paved road to Belopa, or a regional airport at Bua. There are three daily flights between Makassar and Bua.





Figure 1: Awak Mas Gold Project Location

## **Tenure**

The Project tenure is held under a 7th Generation CoW that is wholly-owned by Masmindo, a wholly-owned subsidiary of Nusantara. A CoW is a legally binding agreement between the GoI and a company, as contractor, to carry out all mining activity periods, which include general survey, exploration, feasibility study, construction, exploitation and the marketing and sale of the relevant minerals in the area covered by the agreement.

The CoW covers an area of 14,390 hectares (Figure 2) and allows for a construction period of three years and an operating period of 30 years.

No forestry permit is required for the Project. The key areas of the Project including Mineral Resources, identified Exploration Targets, and anticipated processing areas are on Area Penggunaan Lain (APL), or land for other uses.

# **Geology and Mineral Resources**

The Awak Mas, Salu Bulo and Tarra mineralised systems comprise a complex sequence of intercalated metasediments and intrusive rocks. A high level, low sulphidation hydrothermal system has developed which is overprinted by a strong sub-vertical fracture control which has channelled mineralising fluids.

The Project is an active growth project where recently completed diamond drilling by Nusantara has defined a 2.0 Moz Mineral Resource. The Awak Mas deposit currently contains an Indicated and Inferred Mineral Resource of 39 Mt at 1.37 g/t Au for 1.72 Moz utilising a lower cut-off grade of 0.5 g/t Au (Table 1). The smaller satellite deposits of Salu Bulo (3.7 Mt at 1.53 g/t Au) and Tarra (2.3 Mt at 1.34 g/t Au) together contain additional Mineral Resources of 0.28 Moz of gold and are located 2.5 km east and 4.5 km to the north of the Awak Mas deposit respectively (Figure 2).



The Mineral Resources for Awak Mas and Salu Bulo are the basis for the preparation of a maiden Ore Reserve for the Project as part of the DFS Optimisation Study.

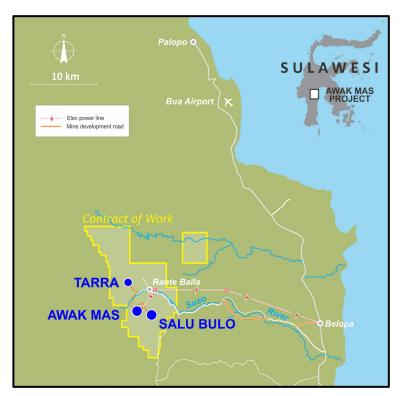


Figure 2: Picture showing the three deposits

#### **Awak Mas**

The Awak Mas deposit is defined by a total of 757 diamond drill holes and 158 RC holes, of which Nusantara has completed 25 DDH holes.

This Phase 1 infill resource drill program by Nusantara has focussed on the Rante, Lematik and Tanjung domains. The 25 diamond core holes (PQ3/HQ3/NQ3) drilled for 4,263m were completed in the period from November 2017 to January 2018.

Host lithologies for mineralisation are the cover sequence of meta-sedimentary rocks and to a lesser degree the underlying basement sequence of diorites and biotite dominant schists. The Cover and Basement sequences are separated by an unconformable and sheared thrust contact.

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 mineralising fluids have exploited these pathways and migrated laterally along foliation parallel shallowly dipping favourable strata. In addition to the conformable style of mineralisation there is a late stage hydrothermal overprint that has also deposited gold in some of the major sub vertical structures. The multi-phase gold mineralisation is characterised by milled and crackle breccia, vuggy quartz infill, and stockwork quartz veining with distinct sub-vertical feeder structures.

The Awak Mas deposit consists of five broad geologically based 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.



The complex interaction of multi-phased stockwork and breccia mineralisation associated with at least two dominant structural orientations (shallow thrusts and sub-vertical feeders) results in rapid local changes in the grade tenor and orientation at a scale of less than the current average drill hole spacing (25 m to 50 m).

The Awak Mas MRE has been reported within a US\$1,400 gold price optimisation shell ("Mineral Resource Shell") as detailed below in Table 1. Approximately 85% of the MRE is classified as Indicated.

#### Salu Bulo

The satellite Salu Bulo gold deposit is located 2.5 km to the southeast of the main Awak Mas deposit and hosts a number of mineralised quartz vein breccia structures referred to as the Biwa, Bandoli and Lelating trends.

Drilling has been conducted in a number of campaigns by several companies since 1991 to the present date, where a total of 144 diamond core holes for 14,248 m have now been completed.

The Nusantara Phase 1 drill program has focused on the Lelating and Biwa domains with 12 diamond core holes (PQ3/HQ3) for 1,337.5 m completed in the period from November 2017 to January 2018.

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. Primary bedding dips between 25° to 85° towards the east and northeast, with the foliation developed parallel to bedding except near faults.

The mineralisation is hosted within a sequence of chloritic and intercalating hematitic meta-sedimentary rocks, with the two primary structural orientations being dominant sub-vertical north-south anastomosing structures, and foliation parallel low angle thrusts.

The ladder stockwork vein system developed at Salu Bulo is analogous to that at Awak Mas where there is inherent complexity of two mineralisation orientations, and short scale grade continuity at generally less than the drill hole spacing. (25 m to 50 m drill collar centres).

The multi-phase gold mineralisation is characterised by milled and crackle breccias, vuggy quartz infill, and stockwork quartz veining with distinct sub-vertical feeder structures. Gold mineralization typically occurs with minor disseminated pyrite (< 3%) within sub-vertical quartz veins, breccias, and stockwork zones.

The mineralised domains at Salu Bulo are orientated north-south, and have an overall combined strike length of approximately 800 m.

The Salu Bulo MRE has been reported at a 0.5 g/t Au cut-off grade within a US\$1,400 gold price optimisation shell as detailed below in Table 1. Approximately 86% of the MRE is classified as Indicated.

#### Tarra

The Tarra deposit lies approximately 4.5km north of the main Awak Mas deposit. The mineralisation style at Tarra is considered to be analogous to that at the Awak Mas deposit, but with a more dominant sub-vertical structural control.

The Tarra deposit 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. The mineralised zone is tabular and has an overall strike length of approximately 480m, dips 70° to the northeast and extends to 300m below the surface with the top of the mineralisation capped by a cover of colluvium.

Gold mineralisation occurs in a 30m silicified zone at the footwall of the fault and along quartz-pyrite filled fractures in the sandstone. Silica-albite-calcite-pyrite alteration is associated with veins, stockworks and zones of the silicified breccias.

The Tarra deposits represents a relatively untested opportunity for Mineral Resource growth for the Project.

The current MRE is considered to be a low risk robust model which reflects the likely outcome from open pit selective mining.



Table 1: Awak Mas Mineral Resource estimates (February 2018) by deposit at 0.5 g/t Au cut-off and constrained within a US\$1400/oz optimisation shell.

	Classification	Tonnes (Mt)	Au Grade (g/t)	Contained Gold (Moz)
Awak Mas	Measured	-	-	-
	Indicated	31.6	1.43	1.45
	Inferred	7.4	1.11	0.26
	Sub-total	39.0	1.37	1.72
Salu Bulo	Measured	-	-	-
	Indicated	3.0	1.60	0.16
	Inferred	0.7	1.24	0.03
	Sub-total	3.7	1.53	0.18
Tarra	Measured	-	-	-
	Indicated	-	-	-
	Inferred	2.3	1.34	0.10
	Sub-total	2.3	1.34	0.10
Total	Measured	-	-	-
	Indicated	34.6	1.45	1.61
	Inferred	10.3	1.17	0.39
	Total	45.0	1.38	2.00

# **Near Mine Exploration Potential**

An exploration model for drill targeting of the priority exploration area between Awak Mas and Salu Bulo, known as the Mine Corridor, has been developed based on the potential for further fault repetitions of Rante style mineralisation to the east of Awak Mas towards the Salu Bulo deposit. Figure 3 is a schematic east-west section across the Awak Mas to Salu Bulo corridor and shows the exploration model which will become the focus for future exploration.

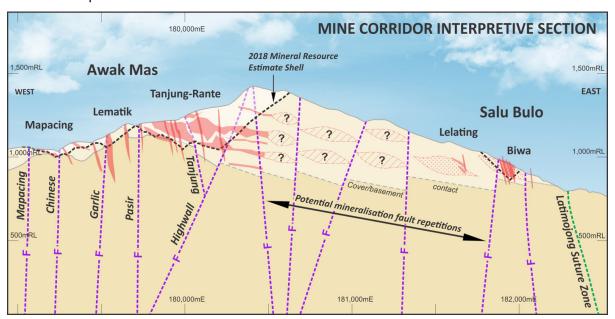


Figure 3 Awak Mas to Salu Bulo – Exploration model for future drill targeting



Planned Phase 2 exploration drilling at Salu Bulo will focus on extending the near surface strike length at Lelating and also on resource extensions to the north and south at Biwa. The main objective is growth of the Mineral Resource outside of the currently delineated mineralised domains.

Future exploration work programs for Nusantara will be directed to prospect exploration in order to define any nearby shallow mineralisation that is amenable to open pit mining. In particular, two corridors have been identified – the 'Mine Corridor' as described above and the 'East Corridor' which covers the numerous prospects between the Salu Bulo and Tarra deposits.

Promising early exploration results within the East Corridor require follow-up exploration, especially at the northern end around the Tarra Main deposit. To date focus has been on the Mine Corridor, however, it is proposed to resume exploration activities in this highly prospective area within the 2018-19 work program.

# **CoW Exploration Potential**

Nusantara's focus is to continue exploration within the immediate near mine area as well as at a CoW scale. Encouraged by exploration success to date, target generation will concentrate on further developing the 'known' prospects (Figure 4) with real potential to expand into the largely untested areas outside of the two recognised corridors.

The historic exploration can be enhanced by application of the new geological model and use of the recently completed Lidar topographic survey, both of which have opened up significant opportunity for further discovery within the highly prospective ground covered by the CoW.

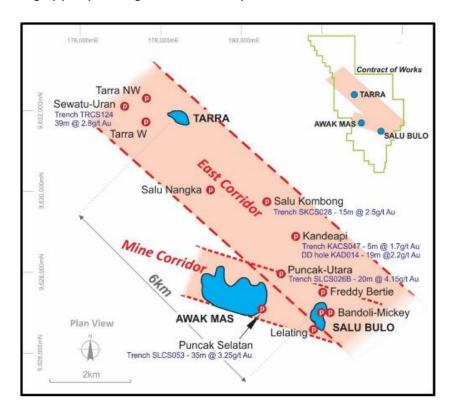


Figure 4: Over 16 high grade exploration targets recognised previously.

## Mining and Ore Reserves

AMC has completed pit optimisation, mine design and scheduling for the two deposits, Awak Mas (Figure 5) and Salu Bulo (Figure 6), with Indicated Resources.



AMC initially developed a diluted mining model based on the latest Mineral Resource update<sup>4</sup>. The diluted mining model was used in Whittle pit optimization software to develop optimum mining shells. Detailed practical pit designs were developed based on the shells.

A life of mine schedule was developed based on practical mining rates assuming conventional open pit mining methods. The approach assumes a mining contractor operation using 90 tonne excavators and 40 tonne articulated dump trucks. The mine plan and schedule allow for the projects steep terrain and tropical setting.

A detailed first principles cost model was developed to estimate contractor and owners operating and capital costs. The operating costs were benchmarked against local mining contractor provided budget quotes.

The Ore Reserve is an estimate of that part of the Measured and Indicated Mineral Resource model located within the detailed pit designs.

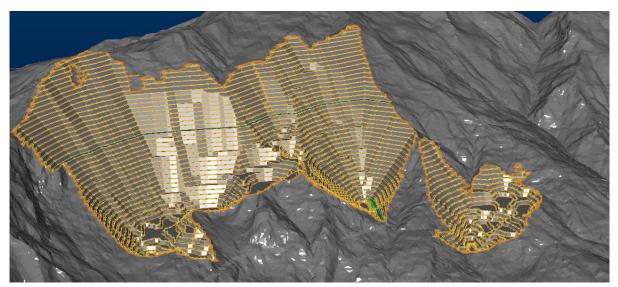


Figure 5: Awak Mas pit

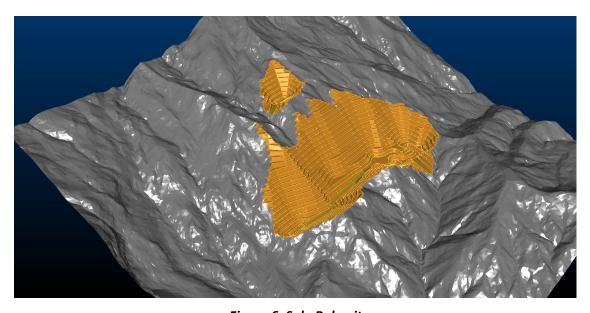


Figure 6: Salu Bulo pit

ASX Announcement released 31 January 2018 and ASX Announcement released 27 February 2018.



A site layout was developed including waste dumps, haul and access roads, mine workshops and ore pads (Figure 7).

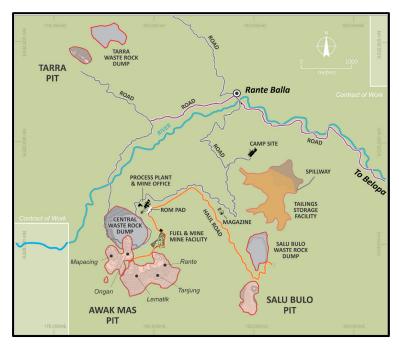


Figure 7: Awak Mas Site Layout

# Pit Design

Table 2 outlines the mine design for the Awak Mas and Salu Bulo pits.

The Awak Mas open pit will be expanded in future studies as the resource classification confidence increases for the Ongan and Mapacing deposits (these areas are predominantly Inferred<sup>1</sup>) and consideration of the recently completed Highwall Eastern area drilling.

Probable Ore Reserves for the Awak Mas Gold Project are 23.7 Mt at 1.35 g/t Au for 1,030,000 contained ounces. These Ore Reserves calculated at 0.5 g/t Au cut-off using a US\$1250/oz gold price are for Awak Mas and Salu Bulo deposits:

- Awak Mas 21.0 Mt at 1.32 g/t Au for 0.89 Moz, Strip Ratio of 3.3
- Salu Bulo 2.7 Mt at 1.60 g/t Au for 0.14 Moz, Strip Ratio of 5.1

The Ore Reserve (Table 3) estimate demonstrates that the open pits (Figures 5 and 6) will support an ore processing rate of 2.5 Mtpa with a strip ratio of 3.5 over a ten-year period. The mining operation will be by conventional means with all waste stored adjacent to the open pit.



**Table 2: Mine Design Criteria** 

Units	Base Case	Source
Mtpa	2.5	Client
	Conventional truck and excavator	Assumed/typical
	5.0m benches with 102mm holes.	Assumed/typical
	2 excavators	Site specific estimate
	3 front end loaders	
	5 dozers	
Mt	83.7	Estimated
Mt	107.0	Estimated
t:t	3.5	Estimated
Mtpa	14.0	Estimated
years	10 including ramp up	Estimated
Operating costs		
\$/t	3.35	Estimated
	Mtpa  Mt  Mt  t:t  Mtpa  years	Mtpa 2.5  Conventional truck and excavator 5.0m benches with 102mm holes. 2 excavators 3 front end loaders 5 dozers  Mt 83.7  Mt 107.0  t:t 3.5  Mtpa 14.0  years 10 including ramp up

The 0.5 g/t Au cut-off grade reflects the low operating cost environment (low strip ratio, access to grid power, moderate bond index and good access to established infrastructure).

Studies show this maiden Ore Reserve will support an ore mining and processing production rate of 2.5 Mtpa with a strip ratio of 3.5 for more than ten years.

Mine development allows for a 6-month pre-production period where access is developed to the Awak Mas pit via pioneered haul roads over the vertical extent of the project. Mining costs are estimated inclusive of ongoing access development and access road maintenance and assumes contract mining.

Table 3: Awak Mas Ore Reserves estimates (April 2018) by deposit.

	Classification	Tonnes (Mt)	Au Grade (g/t)	Contained Gold (Moz)
Awak Mas	Proved	-	-	-
	Probable	21.0	1.32	0.89
	Sub-total	21.0	1.32	0.89
Salu Bulo	Proved	-	-	-
	Probable	2.7	1.60	0.14
	Sub-total	2.7	1.60	0.14
Total	Proved	-	-	-
	Probable	23.7	1.35	1.03
	Total	23.7	1.35	1.03

Reported at a 0.5 g/t cut-off grade



# **Metallurgy and Mineral Processing**

The Project's process flowsheet proposed in previously studies was a gold flotation process with carbon in leach ('CIL') treatment of reground sulphide concentrate. This testwork provided recoveries in the range of 85% to 91%.

Following a review of extensive historical comminution testwork, historical gravity and leach testwork and the recent DFS Phase 1 testwork program<sup>5</sup>, a flowsheet comprising gravity and leach ("Whole of Ore Leach") was selected as the subject of any further Nusantara study work (Figure 8). The Whole of Ore Leach flowsheet offers a simplified process route and is a proven flowsheet in the gold industry. The key process plant design criteria derived from available and reviewed testwork is summarised in Table 4.

**Table 4: Process Plant Design Criteria Summary** 

Criteria	Units	Base Case	Source
Ore Throughput	Mt/y	2.5	Client
<b>Crushing Plant Utilisation</b>	%	75.0	Assumed/Typical
Wet Plant Utilisation	%	91.3	Assumed/Typical
Head Grade	Au g/t	1.40	Feb 2018 US\$1,200/oz pit shell Mineral
			Resource Estimate
	%S	0.84	Testwork
Physical Characteristics		•	
BWi	kWh/t	12.8	Testwork
RWi	kWh/t	17.9	Testwork
Ai	g	0.35	Testwork
JK Axb	-	60.8	Testwork
Gold Recovery		•	
Gravity	%	40.0	Testwork
CIL	%	85.2	Testwork
Overall Gold Recovery	%	91.1	Testwork
Primary Grind Size P80	μm	75	Testwork
Leach and Adsorption			
CIL Feed Rate	t/h	313	Calculated
Residence Time	h	24	Testwork/Engineer
Cyanide Consumption	kg/t CIL Feed	0.40	Calculated/Testwork

The Whole of Ore Leach process plant would have a capacity of 2.5 Mtpa, an average head grade of 1.40 g/t Au and a gold recovery of 91.1%. The process plant comprises 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. CIL tailings would be thickened and cyanide detoxified prior to disposal in the Tailings Storage Facility. The process plant would produce a gold doré product.

ASX Announcement released 10 October 2017



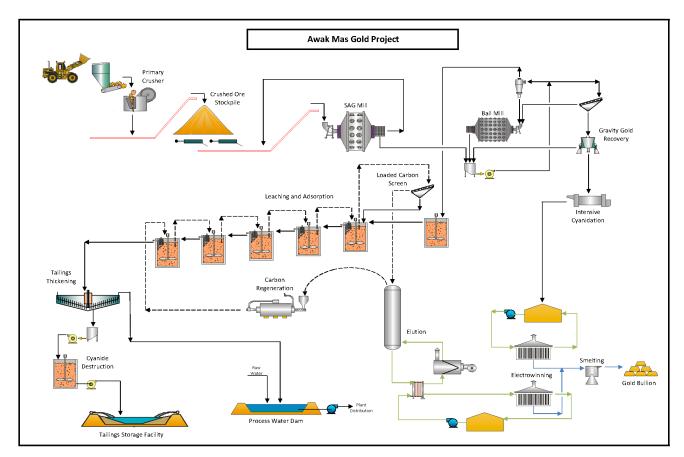


Figure 8: Process Flowsheet

# **Tailings Storage Facility**

Golder Associates completed a preliminary geotechnical investigation, tailings characterisation and TSF design for the PFS for the Project in 2013 and is currently conducting a geotechnical investigation and seismic study to progress the design of the TSF for the DFS.

The hazard category for the TSF has been classified as Major, based on ANCOLD Guidelines, considering the Severity Level of Impacts and the failure Consequence Category. Accordingly, the containment embankment of the TSF must be designed and constructed as a fully engineered structure, taking into consideration the foundation conditions, site seismicity, available construction materials, tailings characteristics and the range of potential rainfall events.

The Kandeapi Valley, approximately 3 km east of the proposed process plant site, is considered to be most suitable location for the TSF (Figure 7). The proposed TSF embankment is aligned east-west across the Kandeapi Valley, with a saddle dam extension to the south-east.

A conventional downstream embankment configuration has been selected as most appropriate for this highly seismic environment. For the pre-feasibility study the design slopes adopted are 1:2.5 (V:H) downstream and 1:3 (V:H) upstream.

The required capacity of the TSF for the 10-year planned life of mine (LOM) is as follows:

Tailings tonnage 25 Mt
 Tailings volume 18 Mm³.



# Infrastructure

The Project's location (Figure 2) near the east coast of South Sulawesi provides very good access to the established infrastructure networks, offering greater support and fewer constraints than many comparative projects in the Asia-Pacific region.

The access point from the east coast of South Sulawesi to the Project is Belopa, the capital of the Luwu Regency (the Regency's population is  $\sim$  300,000), located only 45 km by road from Site. The company is working with the Regency on proposals to upgrade sections of the road as part of the early works for the Project.

Belopa has access to the other provincial centres including Makassar and Palopo City, via highway, coastal shipping and scheduled air services. Belopa is connected to Sulawesi's power supply grid and is the proposed connection point for the Project's power supply, via a 150kW transmission line, and communication facilities. A MOU has been signed with the Indonesian power provided (PLN) for the construction of the power line from Belopa to site.

Makassar is the provincial capital for South Sulawesi with a population of more than 1.5 million people and is a regional hub for Indonesia. It has domestic and international airports with connections to Australian and major South East Asian centres. Makassar has significant port infrastructure and work by the Indonesian Government has ensured it is the regional hub for eastern Indonesia. The City is also a centre for education with universities able to produce a supply of graduates relevant to the operation of a mining business.

Palopo City is the largest city in the immediate region, with a population of 150,000. It is 60 km north along the coast from Belopa by road. Palopo has port facilities for coastal shipping and is serviced by a regional airport at Bua, which is between Belopa and Palopo. There are three daily flights between Bua and Makassar and expansion of these services is likely with completion of the new terminal building, which is under construction.

The Belopa to Palopo infrastructure corridor includes a regional fuel distribution depot for Pertamina, Indonesia's state-owned oil and natural gas corporation. This depot would serve as the supply base for diesel fuel required by the Project.

# **Environmental and Community**

The environmental and social components of the DFS targets Good International Industry Practice (GIIP), compliance with all applicable Indonesian laws and regulations, as well referencing the requirements of the World Bank Group's (WBG) Equator Principles (EP) and the International Finance Corporation's (IFC) Environmental and Social Sustainability Performance Standards (PS).

Extensive environmental and social baseline studies have been conducted at the Project site from 2013 to 2017. The studies have established a seasonal database for key environmental components, which include meteorology, hydrology, terrestrial ecology; aquatic ecology; hydrogeology; surface water quality; stream/river sediment quality; soils, air quality and noise. Geochemical characterization test work on ore/tailings and waste rock have been completed to assess the potential for acid rock drainage/metal leaching (ARD/ML) for mine wastes. In additional, the social setting for the project has been established through socioeconomic, cultural heritage and public health baseline studies.

Baseline studies and stakeholder inputs have been considered in the environmental and social impact assessment (ESIA) for the Project. The approved-ESIA (AMDAL in Indonesian) determined the significant impacts of the projects and environmental and social management plans have been developed to eliminate, and where not possible, mitigate negative impacts and enhance positive impacts associated with the proposed mining and processing operations. Monitoring of key environmental components will be continued during the construction, operations and closure phases of the project as stipulated in the approved AMDAL/Environmental Permit for the project. In addition to extensive consultation with local communities as



a part of the AMDAL process, on-going consultation and reporting back to local communities is being conducted every 6 months by the company in order to continue to solicit inputs as well as inform local communities regarding project development status. The monitoring data and stakeholder inputs will form the basis for assessment of the efficacy of environmental and social management plans and continual improvement in environmental and social management practices for the Awak Mas project.

All major approvals/permits for the Project are in place. The Awak Mas project location is classified as "land for other uses" and does not have a forestry use designation. Therefore, a Forestry (borrow-to-use) Permit is not required for the Project.

# **Project Capital and Development Strategy**

It is expected that the DFS will report capital costs for the project within the range of US\$150 – US\$170 million inclusive of owner's costs and contingency. This estimate will include, project establishment activities on Site and in Belopa, upgrades to Site access roads, mine establishment, process plant and Site infrastructure, including power and water supplies.

The Project development strategy is based on a staged approach:

- Early works road access upgrade to Site, establishment of the Belopa logistics hub for the Project
- Construction establishment on Site work to make ready for construction, and water and sediment management
- Construction processing plant and Site infrastructure
- Commission and project ramp up processing plant and mining operation

Project commissioning is expected 27 months after a Final Investment Decision including establishment, site permits and early works.

# **Project Operations**

The operating activities for the Project will include:

- Mining Pioneering through to the crusher tip
- Processing Crusher through to tailings disposal and doré production
- General and Administration site support functions, include all FIFO and related accommodation costs

The low strip ratio is supporting low mining costs, and together with grid power, moderate bond index, and low infrastructure costs, will see operating costs of between US\$24 and US\$26/tonne.



# **JORC Code, 2012 Edition - Table 1**

# Section 4 Estimation and Reporting of Ore Reserves

(Criteria in this section 1, and where relevant in sections 2 and 3, also apply to this section.)

Criteria	JORC Code (2012) Explanation	Commentary
Mineral Resource estimate for conversion to Ore Reserves	Description of the Mineral Resource estimate used as a basis for the conversion to an Ore Reserve.	The Mineral Resource estimate used as the basis of this Ore Reserve for the Awak Mas Gold Project ("Project"), is comprised of the Awak Mas and Salu Bulo deposits. This Mineral Resource estimate was compiled by Adrian Shepherd of Cube Consulting, who is the Competent Person for these resources. The estimate is based on assay data from 159 historic Reverse Circulation (RC) holes, 864 historic diamond holes and 37 recently drilled Nusantara diamond holes. The data set, geological interpretation and model was validated using Nusantara's internal Quality Assurance and Quality Control (QAQC) processes and reviewed by an independent external consultant. The grade estimation approach used a combined Localised Uniform Conditioning ("LUC") and Ordinary Kriging ("OK") technique to estimate the Indicated and Inferred components of the resource. Ordinary Kriging was only applied to the narrow, steep dipping sub-vertical domains. LUC is a recoverable estimation technique typically used for estimation into small blocks using wider spaced resource definition drilling. The technique was considered appropriate given high short-scale grade variability and the uncertainty associated with the estimation of the local grade tonnage distribution.  The LUC panel was set at 20m x 20m x 5m (XYZ) with a block size for local estimation to a SMU size of 5m x 5m x 2.5m (XYZ).
	Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.	The Mineral Resources are reported inclusive of the Ore Reserve (refer ASX announcements for: Awak Mas, 31 January 2018 and Salu Bulo, 27 February 2018).
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	The Competent Person conducted a Site visit in October 2017. The following activities were completed:
	If no site visits have been undertaken indicate why this is the case.	<ul> <li>Gained general familiarization with the site including likely mining conditions, proposed pit location, waste dump location, site drainage and site access</li> </ul>
		<ul> <li>Assessed proposed locations of mining related infrastructure relative to the designed open pit</li> </ul>
		Observed resource drilling activities



Criteria	JORC Code (2012) Explanation	Commentary
		<ul> <li>Inspected core drill hole sites to get an understanding of the variations in weathering profiles across the deposit</li> </ul>
		Viewed diamond drill core from selected holes.
Study status	The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves.  The Code requires that a study to at least Pre-Feasibility Study level has been undertaken to convert Mineral Resources to Ore Reserves. Such studies will have been carried out and will have determined a mine plan that is technically achievable and economically viable, and that material Modifying Factors have been considered.	The Ore Reserve estimate is the result of a preparation of an Optimisation Study, which is part of an overall work program for a Definitive Feasibility Study (DSF) in progress by a team consisting of Nusantara personnel and independent external consultants. The Optimisation study is being prepared at feasibility level, it draws on work completed for a pre-feasibility study on the two deposits, Awak Mas and Salu Bulo. The current work includes consultants from AMC Consultants, Cube, Golder Associates, Minnovo, Lorax, and Resindo.  The proposed mine plan is technically achievable. All technical proposals made for the operational phase involve the application of conventional technology which is widely utilised in gold mining operations in Indonesia. Financial modelling completed as part of the Optimisation Study shows that the project is economically viable under current assumptions.  Material Modifying Factors (mining, processing, infrastructure, environmental, legal, social and commercial) have been considered during the Ore Reserve estimation process.
Cut-off parameters	The basis of the cut-off grade(s) or quality parameters applied.	Variable economic cut-off grades have been applied in estimating the Ore Reserve and were rounded up to 0.5 g/t Au for reporting. Cut-off grade is calculated in consideration of the following parameters:  • Gold price  • Operating costs  • Process recovery  • Transport and refining costs  • General and administrative cost  • Royalty costs.
Mining factors or assumptions	The method and assumptions used as reported in the Pre-Feasibility or Feasibility Study to convert the Mineral Resource to an Ore Reserve (i.e. either by application of appropriate factors by optimisation or by preliminary or detailed design).	The current deposits associated with the Awak Mas Gold Project will be mined by open pit mining methods utilising conventional mining equipment. Pit designs and waste dump designs were completed as part of the Optimisation Study. The pit designs are the basis of the Ore Reserve estimates.  The selected mining method, design and extraction sequence are tailored to suit orebody characteristics, minimise dilution and ore loss, defer waste



Criteria	JORC Code (2012) Explanation	Commentary
	The choice, nature and appropriateness of the selected mining method(s) and other mining parameters including associated design issues such as pre-strip, access, etc.	movement and capital expenditure, utilise proposed process plant capacity and expedite free cash generation in a safe and environmentally sustainable manner.  Mining operating and capital costs were estimated from first principals as part
	The assumptions made regarding geotechnical parameters (e.g. pit slopes, stope sizes, etc), grade control and pre-production drilling.	of the Optimisation Study and referenced against contractor budget quotes.  Geotechnical modelling has been commenced by AMC Consultants and is based on a review of the geotechnical work completed as part of previous studies, supported by a Site visit and inspection of diamond drill core samples. The recommended geotechnical design parameters are drawn from the PFS and assume dry slopes on the basis of adequate dewatering ahead of mining.
	The major assumptions made and Mineral Resource model used for pit and stope optimisation (if appropriate). The mining dilution factors used. The mining recovery factors used. Any minimum mining widths used.	<ul> <li>Mining dilution and recovery modifying factors were simulated by modelling to a Selective Mining Unit (SMU) of 5x5x5m and regularizing the Mineral Resource block model to that SMU. The selected SMU is matched to the proposed mining equipment and methodology.</li> <li>The modelling yielded the following results: <ul> <li>Mining tonnage dilution factor of 14% for Awak Mas and 6% for Salu Bulo</li> <li>A net mining recovery factor of 104% of tonnes and 98% contained gold for Awak Mas and net mining recovery factor of 96% of tonnes and 96% contained gold for Salu Bulo.</li> </ul> </li> </ul>
	The manner in which Inferred Mineral Resources are utilized in mining studies and the sensitivity of the outcome to their inclusion.	The mining schedule is based on supplying variable throughput rates to a processing plant with a name plate capacity of 2.5 Mtpa. The plant feed included a mix of oxide and fresh material from Awak Mas and Salu Bulo.  The mining schedule is based on realistic mining productivity and equipment utilisation estimates, and considered the vertical rate of mining development. Inferred Mineral Resources were considered as waste during the pit optimisation and production scheduling process.  Waste material from mining activities will be disposed of as follows:  Topsoil will be disposed of at designated stockpiles for application in on-going rehabilitation activities;  Some waste rock may be utilised to construct the Run Of Mine (ROM) pad;  Some waste rock may be utilised to construct on-going TSF lifts;

Limited



Criteria	JORC Code (2012) Explanation	Commentary
		waste rock dumps.
	The infrastructure requirements of the selected mining methods.	The proposed mine plan includes waste rock dumps, a ROM pad, a quarry, a surface water diversion channel, sediment control structures, surface dewatering bores, light and heavy vehicle workshop facilities, explosives storage and supply facilities and technical services and administration facilities.
Metallurgical factors or assumptions	The metallurgical process proposed and the appropriateness of that process to the style of mineralisation.	A processing flowsheet, mass balance, water balance, equipment identification, mechanical and electrical design were all developed to Australian standards.
	Whether the metallurgical process is well-tested technology or novel in nature.  The nature, amount and representativeness of metallurgical test work undertaken, the nature of the	A single stage primary crushing, Semi Autogenous Grinding and Ball Milling comminution circuit followed by a conventional gravity and carbon in leach (CIL) process is proposed. This process is considered appropriate for the Awak Mas and Salu Bulo ore.
		The proposed metallurgical process is commonly used in the Indonesian and international gold mining industry and is considered to be well-tested and proven technology.  Significant comminution testing has been carried out on diamond drill core samples. These tests have been carried out on oxide, transitional, and fresh ore types which were obtained across the deposits. These comminution parameters have been applied to process design and equipment selection.  An average gravity and whole ore leach gold recovery value of 91.1% has been estimated based on historical gravity and whole ore leach test data (completed between 1994 to 2014) and the recent Phase 1 gravity and leach testwork managed by Minnovo in 2017. Gold recovery was estimated for each ore type based on the average testwork conducted to date for each ore type, weighted by the individual ore domain tonnage proportions from the February 2018 Mineral Resource Estimate.  The majority of historical whole ore leach test data (completed between 1994 to 2014) was completed on the Rante, Tanjung and Lematik ore domains. Only a single whole ore leach test was completed for Mapacing, Ongan and Salu Bulo and no historical whole ore leach testwork was completed on Tarra. Much
		of the historical whole ore leach testwork was conducted with a different flowsheet to the current design (no gravity concentration and/or a different grind size) and these historical results have been adjusted to reflect the current plant design and grind size.



Criteria	JORC Code (2012) Explanation	Commentary
		The recent Phase 1 testwork program replicated the proposed process flowsheet on a single composite of each of the seven ore domains (Rante, Tanjung, Lematik, Ongan, Mapacing, Salu Bulo and Tarra). Excellent results were produced from the recent Phase 1 gravity and leach testwork, with gold recoveries ranging from 92 – 98% after 24 hours of leach.
		The average gold recovery of 91.1% that was used for the Optimisation Study is generally lower than achieved in the recent Phase 1 testwork but higher than achieved in the historical testwork. It is thought some of the historical tests were affected by preg robbing and/or lack of cyanide addition, which are thought to have been addressed by the addition of carbon and extra cyanide to the recent Phase 1 testwork.
		Gold recovery will be evaluated in more detail as a part of the DFS Phase 2 metallurgical testwork program, where more extensive variability testwork will be conducted across the various ore types.  No deleterious elements of significance have been determined from metallurgical testwork and mineralogy investigations.
Environmental	The status of studies of potential environmental impacts of the mining and processing operation. Details of waste rock characterisation and the consideration of potential sites, status of design options considered and, where applicable, the status of approvals for process residue storage and waste dumps should be reported.	Extensive environmental baseline studies have been conducted at the Awak Mas Gold Project site from 2013 to 2017. The studies have established a seasonal database for key environmental components, which include: meteorology, hydrology, terrestrial ecology (flora and fauna); aquatic ecology (algae, plankton, benthic invertebrates, nekton and biota tissue metal contents); hydrogeology; surface water quality; stream/river sediment quality; soils, air quality and noise.
		Baseline studies have been considered in the environmental and social impact assessment (ESIA) for the Awak Mas project. The ESIA (AMDAL in Indonesian) determined the significant impacts of the projects and environmental management plans have been developed to eliminate, and where not possible, mitigate negative environmental impacts associated with mining and processing operations. Monitoring of key environmental components will be continued during the construction, operations and closure phases of the project as stipulated in the approved AMDAL/Environmental Permit, April 2017, for the project. The monitoring data will form the basis for assessment of the efficacy of environmental management plans and continual improvement in environmental management practices for the Project.
		Geochemical characterization test work on ore/tailings and waste rock have been completed to assess the potential for acid rock drainage/metal leaching



Criteria	JORC Code (2012) Explanation	Commentary
		(ARD/ML) from mine wastes. The test work has involved static tests to assess potential for ARD and kinetic tests to provide an assessment of the long-term drainage chemistry from waste rock and tailings. Majority of the waste rock samples analysed were non-acid forming (NAF) with only 15% to 20% of the waste rock samples being categorized as potentially acid forming (PAF). Given the relatively small proportion of PAF materials, standard ARD/ML management strategies such as segregation and encapsulation of PAF in NAF in waste dumps or blending would be employed to reduce the risk of ARD/ML from waste rock storage facilities. Tailings samples were classified as PAF or UAF. Storage of tailings under saturated conditions in the tailings storage facility (TSF) will eliminate the risk of acid generation from the tailings. The kinetic geochemical test work demonstrated that both the waste rock and tailings have a low risk of metal leaching.  Locations for engineered waste rock and tailings storage facilities have been selected based on geographical, geotechnical, hydrological, economic and environmental considerations.
Infrastructure	The existence of appropriate infrastructure: availability of land for plant development, power, water, transportation (particularly for bulk commodities), labour, accommodation; or the ease with which the infrastructure can be provided, or accessed.	The project site is within economic distances of existing infrastructure of the South Sulawesi province. Existing roads into and from Belopa, the capital of the Luwu Regency, to Site provide for delivery services and consumable supplies. Belopa is some 45km to the east, on the coast, with access to coastal shipping facilities. Nusantara would work with the Regency Government on proposals to upgrade sections of the road that provide access to Site as part of the early works for the Project.  An electricity supply lateral from Sulawesi's power supply grid would be built from Belopa to Site to supply electric power on Site.  The mine workforce will be a mix of personnel from within the Luwu Regency and Fly In-Fly Out (FIFO) based at a camp on Site during rostered days on. There is a regional airport at Bua, north of Belopa, which has daily scheduled flights to Makassar, the provincial capital for South Sulawesi. Makassar is a regional hub for the area and has a large port and international airport, which provides connection to south east Asia and Australia.  Hydrological studies, completed as part of previous PFS work indicates that there is sufficient water available in the river systems adjacent to the Project to service the needs of the Project for the life of mine. The water from the Songan River would be pumped to a raw water pond at the process plant. The AMDAL allows for the extraction of water for these purposes.



Criteria	JORC Code (2012) Explanation	Commentary
		Construction of a quarry within the Contract of Work (CoW) is proposed to provide rock, which is of sufficient quality for construction of TFS embankment, sediment catchment embankments, haul roads, other infrastructure and to provide feed for the production of aggregates for construction and operation of the mine.
Costs	The derivation of, or assumptions made, regarding projected capital costs in the study	All capital estimates are based on a mix of market rates as at the first quarter of 2018; key equipment priced by Indonesian vendors and factored PFS information.
		It is assumed that all mobile mining equipment required for the project will be supplied by a mining contractor.
		It is assumed that power infrastructure to Site will be supplied by Perusahaan Listrik Negara (PLN), which is an Indonesian government-owned corporation which generates and manages electricity distribution in Indonesia.
		The capital cost estimate accuracy is +/-20%.
		Mine development costs were developed from a combination of inputs from Nusantara, AMC Consultants, PT Resindo Resources & Energy (Resindo) and Minnovo. The basis of the estimate is:
		<ul> <li>Contract mining assuming drill and blast with conventional excavator and truck mining. Support mining equipment is allowed for site pioneering and ongoing mining.</li> </ul>
		<ul> <li>Mobilisation of mining equipment and personnel from within Indonesia</li> </ul>
		<ul> <li>Earthworks quantities determined from detailed site inspections by a competent civil engineer and geological modelling</li> </ul>
		<ul> <li>Mine dewatering requirements developed from PFS level hydrogeological modelling</li> </ul>
		<ul> <li>A mining schedule developed on a monthly basis for the first 2 years and then annually</li> </ul>
		<ul> <li>A contingency allowance on capital cost items calculated to reflect the relevant level of confidence in the estimate</li> </ul>
		Processing and infrastructure development capital costs have been estimated by Minnovo and PT Resindo Resources & Energy (Resindo) on the basis of:
		Earthworks quantities determined from detailed site inspections by a



Criteria	JORC Code (2012) Explanation	Commentary
		<ul> <li>competent civil engineer</li> <li>Concrete and structural quantities developed from site layouts and similar designs from other projects</li> <li>A mechanical equipment list developed from the recommended process design criteria</li> <li>Budget pricing from local and international suppliers</li> <li>Contingency allowances calculated on a line by line basis relevant to the source and confidence in market rates</li> </ul>
	The methodology used to estimate operating costs.	The operating cost estimate accuracy is +/-20%.  Operating costs assume a mix of people from the within the Luwu Regency and a FIFO scenario with various rosters on Site.  Mining operating costs have been estimated by AMC on the basis of scheduled material movement and mining rates for a contractor mining scenario with technical services supplied by Nusantara employees. Mine design and schedules were prepared by competent mining engineers. Process and process plant infrastructure operating costs have been estimated by Minnovo using:  Reagent and grinding media consumption rates derived from testwork and budget quotations A load list for power consumption Industry standards  The Minnovo operating costs are based on the assumption that: A primary crush, conventional SAB circuit, gravity and leach process plant will be utilised to treat ore at a rate of 2.5 Mtpa Primary crusher utilisation of 75% and wet plant utilisation of 91.3% Grid power is available through PLN Reagent delivery will be to the Belopa warehouse for storage, prior to consolidation for delivery to Site The process plant will be operated by Nusantara employees  The operating cost estimate is considered to be appropriate for the current market in Indonesia.

Limited



Criteria	JORC Code (2012) Explanation	Commentary			
	Allowances made for the content of deleterious elements.	No allowance is made for deleterious elements since testwork to date on ore from Awak Mas and Salu Bulo has not shown the presence of deleterious elements.			
	The source of exchange rates used in the study.	Capital Costs for process plant and infrastructure are estimated in 2018 United States dollars.  Foreign currency exchange rates were derived as tabled below, for a base date of 2 January 2018.			
		Currencies	Code	1 Native = USD	1 USD = Native
		US Dollar	USD	1.0000	1.0000
		Indonesian Rupiah	IDR	0.0001	13,537
		Australian Dollar	AUD	0.7825	1.2780
	The derivation of, or assumptions made, regarding projected capital costs in the study. Derivation of transportation charges.	Euro	EUR	1.2020	0.8319
		Japanese Yen	JPY	0.0089	112.7
		Singapore Dollar	SGD	0.7495	1.3342
		Korean Won	KRW	0.0009	1,066
		Chinese Yuan Renminbi	CNY	0.1538	6.5025
The basis for forecasting or source of refining charges, penalties for failu specification, etc.	refining charges, penalties for failure to meet	Treatment and refining charges are estimated on the basis of rates f leading Indonesian Gold Refinery.  An allowance has been made for all royalties, including an allowance of 3			
	The allowances made for royalties payable, both		s payable to tl	he Government of	
Revenue factors	The derivation of, or assumptions made regarding revenue factors including head grade, metal or commodity price(s) exchange rates, transportation and treatment charges, penalties, net smelter returns, etc.	The mined ore head geostatistical technique factors.			

Limited



Criteria	JORC Code (2012) Explanation	Commentary
	The derivation of assumptions made of metal or commodity price(s), for the principal metals, minerals and co-products.	Gold price and exchange rates have been determined by an external financial expert group on the basis of current market trends.  A Life-of-mine (LOM) gold price forecast of US\$1,250/oz (Real 2018) is applied in the financial modelling for the Ore Reserve calculation process. This price forecast was established by Nusantara on the basis of review of US\$ gold price forecasts and gold price inputs for ore reserves by peer projects. The information reviewed had a range between US\$1,200/oz and US\$1,300/oz and a long term forecast from a leading investment bank of US\$1,250/oz.
Market assessment	The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future.  A customer and competitor analysis along with the identification of likely market windows for the product.  Price and volume forecasts and the basis for these forecasts.  For industrial minerals the customer specification, testing and acceptance requirements prior to a supply contract.	There is a transparent market for the sale of gold.
Economic	The inputs to the economic analysis to produce the net present value (NPV) in the study, the source and confidence of these economic inputs including estimated inflation, discount rate, etc.  NPV ranges and sensitivity to variations in the significant assumptions and inputs.	Discounted cash flow modelling and sensitivity analysis has been completed to evaluate the economic performance of the Ore Reserve. Key value driver inputs into the financial model included:  • Gold price at US\$1,250/oz based on forecast long term pricings • Discount rate of 10% as determined by the Board of Directors of Nusantara
		The Ore Reserve estimate is based on work completed to at least a PFS level of accuracy with inputs for mining, processing, general and administration, sustaining capital and contingencies scheduled and costed to generate the initial Ore Reserve cost model.  The Ore Reserve cost model returns a positive NPV based on assumed commodity prices and the Competent Person is satisfied that the project economics that support the statement of the Ore Reserves retains a profit margin against reasonable future commodity price movements.
Social	The status of agreements with key stakeholders and matters leading to social licence to operate.	Nusantara and previous owners through a wholly owned subsidiary, PT Masmindo Dwi Area (Masmindo), have occupied the site for over a decade and has worked harmoniously with the local community over that period. There has



Criteria	JORC Code (2012) Explanation	Commentary
		been extensive and ongoing community engagement over a number of years, including specialist studies as part of an Environmental and Social Impact Assessment. Masmindo enjoys a strong relationship with the communities around Awak Mas and are committed to working with these communities to ensure the project benefits extend beyond direct employment.
Other	To the extent relevant, the impact of the following on the project and/or on the estimation and classification of the Ore Reserves:  Any identified material naturally occurring risks.  The status of material legal agreements and marketing arrangements.  The status of governmental agreements and approvals critical to the viability of the project, such as mineral tenement status, and government and statutory approvals. There must be reasonable grounds to expect that all necessary Government approvals will be received within the timeframes anticipated in the Pre-Feasibility or Feasibility study. Highlight and discuss the materiality of any unresolved matter that is dependent on a third party on which extraction of the reserve is contingent.	The Project is held under a 7th Generation Contract of Work (CoW) signed with the Indonesian Government (GOI) in 1998 and is owned 100% by PT Masmindo Dwi Area (Masmindo), a wholly owned subsidiary of Nusantara. The CoW grants Masmindo the sole right to explore and develop the Awak Mas Gold Project.  In March 2018 Masmindo signed an amendment with the GOI which reaffirms Masmindo as the legal holder of the CoW with the sole rights to explore and exploit minerals within the CoW area until 2050 with the option of two ten year extensions under the IUPK mining licence regime  All major environmentally-related approvals/permits for the Awak Mas project are in place, specifically these are:  • Government of Indonesia Feasibility Study (GOI FS) – Approval of the technical and economic components was granted by Ministry of Energy and Mineral Resources (MEMR) on June 17, 2015 and approval of the complete GOI FS (including environmental components) was granted on May 17, 2017 (subsequent to the approval of the AMDAL in mid-2017)  • AMDAL/Environmental Permit – Approval of the AMDAL and issuance of the Environmental Permit was granted by the Government of South Sulawesi on April 12, 2017  • Construction Permit – MEMR issued the Construction Permit for the Awak Mas project on June 20, 2017 followed by a Minister's Decree on January 16, 2018 regarding change from Exploration to Production/Operations Phase (which includes construction) for the Awak Mas Project, which is valid until June 19, 2050  The Project location is classified as "land for other uses" and does not have a forestry designation. Therefore, a Forestry 'borrow and use' (Pinjam Pakai) Permit is not required for the Awak Mas project.  In addition to the major permits listed above, several minor permits are required for the operation phase of the project. Examples include TSF dam safety permit, tailings permit, water use permit, hazardous waste storage permit, etc.



Criteria	JORC Code (2012) Explanation	Commentary	
		Applications for these permits are scheduled in early 2018 as application for these operational permits can only be lodged subsequent to the approval of the GOI Feasibility Study and AMDAL/Environmental Permit.	
Classification	The basis for the classification of the Ore Reserves into varying confidence categories.  Whether the result appropriately reflects the Competent Person's view of the deposit.  The proportion of Probable Ore Reserves that have been derived from Measured Mineral Resources (if any).	The main basis of classification of Ore Reserves is the underlying Mineral Resource classification. All Probable Ore Reserves derive from Indicated Mineral Resources in accordance with JORC Code (2012) guidelines. The results of the Ore Reserve estimate reflect the Competent Person's view of the deposit.  No Probable Ore Reserves are derived from Measured Mineral Resources.  No Inferred Mineral Resource is included in the Ore Reserves.	
Audits or reviews	The results of any audits or reviews of Ore Reserve estimates.	<ul> <li>The testwork and models, which form the basis of the Ore Reserve estimate was subjected to various reviews and audits:</li> <li>Metallurgical testwork was reviewed by Nusantara metallurgists and process engineers and confirmed to be adequate for a PFS level study</li> <li>Geotechnical inputs drawn from the PFS were reviewed by AMC.</li> <li>Open pit designs, production schedules and mining cost models were reviewed through AMC's internal peer review system</li> <li>The basis of design for the process plant and infrastructure was reviewed by Nusantara metallurgists and process engineers and was deemed appropriate for an optimisation Study</li> <li>The financial model applied for project valuation was reviewed by Nusantara financial accountants and was considered to be appropriate for an Optimisation Study</li> </ul>	
Discussion of relative accuracy/ confidence	Where appropriate a statement of the relative accuracy and confidence level in the Ore Reserve estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the reserve within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors which could affect the relative accuracy and confidence of the estimate.	The Awak Mas DFS Optimisation Study resulted in a technically robust and economically viable business case. This is deemed to be an appropriate basis for the Ore Reserves estimate.  In the opinion of the Competent Person, cost assumptions and modifying factors applied in the process of estimating are reasonable and to a level of accuracy supporting the statement of Probable Ore Reserves.  Gold price and exchange rate assumptions were set out by Nusantara and are subject to market forces and present an area of uncertainty.	



Criteria	JORC Code (2012) Explanation	Commentary
	The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.  Accuracy and confidence discussions should extend to specific discussions of any applied Modifying Factors that may have a material impact on Ore Reserve viability, or for which there are remaining areas of uncertainty at the current study stage.	In the opinion of the Competent Person, there are reasonable prospects to anticipate that all relevant legal, environmental and social approvals to operate will be granted within the project timeframe.
	It is recognised that this may not be possible or appropriate in all circumstances. These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	



#### **About Nusantara Resources**

Nusantara is an ASX-listed gold development company with its flagship project comprising the 1.0 million-ounce Ore Reserve and 2.0 million-ounce Mineral Resource Awak Mas Gold Project located in Sulawesi, Indonesia. Discovered in 1988, the Project has over 135 km of drilling completed in over 1,100 holes.

The Project is 100%-owned through a 7th Generation Contract of Work (CoW) with the Government of Indonesia (GoI). The CoW was secured prior to the current Mining Law and has recently been amended by mutual agreement to align with the current law. PT Masmindo Dwi Area (Masmindo), a wholly owned subsidiary of Nusantara, has sole rights to explore and exploit any mineral deposits within the project area until 2050. After this period, the operations under the CoW may be extended in the form of a special mining business license (IUPK) in accordance with prevailing laws and regulations, which currently allows for an extension of 10 years and a further extension of 10 years.

In the 10th year after commercial production, Masmindo is required to offer at least 51% of its share capital to willing Indonesian participants at fair market value according to international practice.

Nusantara's development strategy is for construction of a modern, low strip ratio open pit operation with ore processed by standard carbon-in-leach (CIL) processing delivering high gold recoveries. Environmental approval has already been received for the Project, which is favourably located in non-forestry land close to established roads, ports and grid power, enabling the Project to quickly advance towards development upon completion of the DFS by mid-2018.

Nusantara's second strategy is to grow the resource base and support a mining operation beyond the initial targeted life of 10 years. Multiple drill-ready targets have already been outlined extending from the three main deposits and in other areas of the 140km<sup>2</sup> CoW.

Website: www.nusantararesources.com

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# **Competent Persons Statements**

The information in this announcement that relates to the Ore Reserves of Nusantara Resources is summarised from publicly available reports as released to the ASX of the respective companies. The results are duly referenced in the text of this report and the source documents noted above.

#### **Exploration and Resource Targets**

Any discussion in relation to the potential quantity and grade of Exploration Targets is only conceptual in nature. While Nusantara Resources may report additional JORC compliant resources for the Awak Mas Gold Project, there has been insufficient exploration to define mineral resources in addition to the current JORC compliant Mineral Resource inventory and it is uncertain if further exploration will result in the determination of additional JORC compliant Mineral Resources.

#### **Exploration Results**

The information in this report which relates to Exploration Results is based on, and fairly represents, information compiled by Mr Colin McMillan, (BSc) for Nusantara Resources. Mr McMillan is an employee of Nusantara Resources and is a Member of the Australian Institute of Mining and Metallurgy (AusIMM No: 109791).

Mr McMillan has sufficient experience that 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 McMillan consents to the inclusion in the report of the matters based on this information in the form and context in which it appears.

#### Mineral Resources

The information in this report that relates to the Mineral Resource Estimation for the Awak Mas Gold Project is based on and fairly represents information compiled by Mr Adrian Shepherd, Senior Geologist, (BSc), MAusIMM CP, for Cube Consulting Pty Ltd. Mr Shepherd is an employee of Cube Consulting Pty Ltd and is a Chartered Professional geologist and a current Member of the Australian Institute of Mining and Metallurgy (AusIMM No: 211818).

Mr Shepherd has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as Competent Person as defined in the 2012 Edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves". Mr Shepherd consents to the inclusion in the report of the matters based on this information in the form and context in which it appears.

#### **Ore Reserves**

The information in this report that relates to the Ore Reserves Estimation for the Awak Mas Gold Project is based on and fairly represents information compiled by Mr David Varcoe, Principal Mining Engineer, for AMC Consulting Pty Ltd. Mr Varcoe is an employee of AMC Consulting Pty Ltd and is a current Fellow of the Australian Institute of Mining and Metallurgy (AusIMM No: 105971).

Mr Varcoe has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as Competent Person as defined in the 2012 Edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves". Mr Varcoe consents to the inclusion in the report of the matters based on this information in the form and context in which it appears.

#### Metallurgy

The information in this report that relates to metallurgy and metallurgical test work and findings for Awak Mas Gold Project is based, and fairly represents information compiled by Mr John Fleay, Manager Metallurgy, FAusIMM, for Minnovo Pty Ltd. Mr Fleay is an employee of Minnovo Pty Ltd and is a current Member of the Australian Institute of Mining and Metallurgy (AusIMM No: 320872).Mr Fleay has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as Competent Persons as defined in the 2012 Edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves". Mr Fleay consents to the inclusion in the report of the matters based on this information in the form and context in which it appears.

# **New Information or Data**

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

# For more information regarding this release, please contact:

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