

# **Robust Woodlark Gold Project PFS Supports Development**

Geopacific Resources Limited (Geopacific **ASX:GPR**) is pleased to report the Pre-Feasibility Study (PFS) results which demonstrate that the Woodlark Gold Project (Woodlark) is a robust, low-cost, low-stripping ratio, open pit operation that can deliver an average of 100Koz Au per annum over 10 years. Under the terms of the joint venture agreement with Kula Gold Limited (Kula **ASX:KGD**), the completion of this work allows Geopacific to increase its overall economic interest to 93%<sup>1</sup>.

## **Highlights**

- Annual production of 100Koz over 10-year mine life for 1.01Moz Au (incl. 51Koz Au Inferred)
- Free milling ore, with recovery of 92% for first five years and 90% over mine life
- Up to 60% of gold recoverable by gravity
- Conventional 2.4Mt.pa CIL circuit optimised with upgraded ore from year three
- Head grade up to 1.63g/t Au in first years
- Low stripping ratio of 2.5:1 for first five years, 3.1:1 over mine life
- All in sustaining cost A\$990/oz for first five years, A\$1,110/oz over mine life
- Capital cost A\$180m
- 2.2-year, post-tax project payback
- Free cashflow over life of mine A\$388m (pre-tax) and A\$314m (post-tax) at A\$1,650 gold price
- Post-tax IRR 33%
- Recent discovery shows significant, regional exploration potential across Woodlark goldfield

#### Reserve

- 34.7 million tonnes at 0.99g/t Au for 1,101,600 ounces of gold<sup>2</sup>
- High conversion of Resources to Reserves

#### Resource

- 47.04 million tonnes at 1.04g/t Au for 1,573,000 ounces of gold<sup>3</sup>
- 86% of Resource in Measured and Indicated JORC categories

### Corporate

- Mining and Environmental permits granted
- Board approval for Lycopodium to finalise a Definitive Feasibility Study, expected Q3 2018
- Joint venture incentive milestone achieved, overall economic interest increases to 93%<sup>1</sup>
- Woodlark is located on Woodlark Island, with favourable logistics and flat topography
- Geopacific's team has a strong track record of bringing gold mining projects into production

## Managing director, Ron Heeks said

"We are extremely pleased at how the project has evolved over the past year. Our PFS indicates a robust, open-pit mine plan with strong, steady-state production over a long mine life.

"Woodlark benefits from flat topography, wide zones of ore from surface, a substantial proportion of freedig material, as well as the close proximity of the plant to the pits and waste dumps. These factors result in an impressive strip ratio and higher operating margins. Our PFS presents a low-cost solution for treating low-grade ore, to improve returns and deliver a project payback estimated at 2 years.

"We expect the Project to grow further from the substantial, demonstrated exploration upside. We are rapidly progressing the DFS, moving towards a development decision."

<sup>1</sup> See page 15 for further information

<sup>2</sup> See Table 13 for a breakdown of the Mineral Ore Reserve

<sup>3</sup> See Table 15 for a breakdown of the Mineral Resource Estimate





The pre-tax project payback is achieved in two years and the post-tax payback in 2.2 years.

Figure 1: Cumulative pre-tax cashflow over mine life showing project payback in year 2

# **Project background**

Geopacific has focussed on delivering the Woodlark gold project (Woodlark or the Project) as a strong, economic project. The PFS results presented in this announcement support the development of a profitable, long-life mining operation. The Project benefits from favourable logistics and topography, being located on the coast and well-supported by regional shipping and airlines. The flat topography (see figure 2) and supportive social environment present strong positives to operating Woodlark.



Figure 2: Woodlark's flat topography and the close proximity of the proposed plant site to the deposits<sup>4</sup>

The Island, pictured in figure 3 is approximately 70 kilometres long and up to 30 kilometres wide. Average annual rainfall on the island is around 4,000 millimetres, with little seasonal variation. The project areas lie within the upper parts of relatively small catchments that drain rapidly along well-defined creek lines. The Island experiences low to moderate winds and low seismic activity.

<sup>&</sup>lt;sup>4</sup> Photo credited to Paydirt Media



The Pre-Feasibility Study (PFS) focussed on the Kulumadau, Busai and Woodlark King deposits and all are located on the existing mining lease, which covers 60 square kilometres and includes environmental permitting (yellow outline). The proposed plant site is situated between the Kulumadau and Busai deposits on flat terrain, and less than 3 kilometres from each. The mining lease and environmental permit to mine are standout features of this Project, providing significant levels of comfort in relation to timing and jurisdictional risk.

Exploration leases covering 580 square kilometres are marked with a red outline (figure 3). Numerous defined exploration targets are currently being assessed ahead of planned drill testing, with the aim of making new discoveries.

Bathometry surveys of the protected port show water depths of up to 15 metres, which will facilitate deliveries by large shipping vessels.

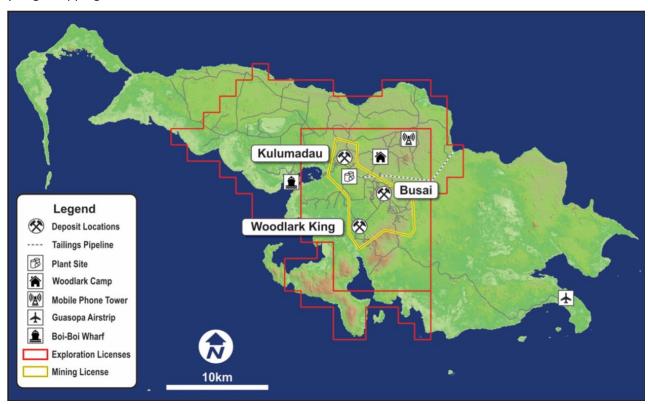


Figure 3: Showing the location of the deposits and infrastructure within the mining lease.

# **PFS** summary

Geopacific, in conjunction with independent consultants, has undertaken studies into the development of Woodlark to a PFS level. Some elements, including mining costs and metallurgical testwork, have been completed to a Definitive Feasibility Study (DFS) level. The PFS assesses the technical and financial viability of the Project, supporting the estimation of JORC 2012 compliant Mineral Resource Estimates (by MPR Geological Consultants) and Mineral Ore Reserve (by Mining Plus). The high proportion of Measured and Indicated Resources demonstrates confidence in the geological model and enables a high rate of conversion to Reserves. This benefit is carried through to the mining inventory, which contains less than 5% (50,600oz Au) of Inferred material which is situated within the pits. There is a low level of geological confidence associated with Inferred mineral resources and there is no certainty that further exploration work will result in the determination of Indicated mineral resources or that the production target itself will be realised. Additional financial modelling confirmed the robust nature of the operation when Inferred material is excluded.

Metallurgical testwork by Ammtec identified that the Woodlark orebody is amenable to being upgraded using simple gravity techniques. Geopacific engaged Independent Metallurgical Operations (IMO), Lycopodium and ALS Metallurgy to review and verify the testwork. The reviews confirmed that 85% of the gold is contained in 20% of the mass of the ore and can easily be separated using gravity techniques. In other words, the nature of Woodlark mineralisation allows for simple, cost effective upgrading of ore to produce a higher-margin product for a low capital cost. Geopacific has elected to utilise the opportunity to upgrade low-grade ore in



the grade range between 0.3g/t Au and 0.6g/t Au in order to maximise plant efficiency, reduce capital costs and increase margins by delivering a higher overall CIL plant feed grade.

Flat topography, wide zones of ore from surface, a substantial proportion of free-dig material, as well as the close proximity of the plant to the pits and waste dumps, together result in a low strip ratio and low forecast operating costs. The low operating costs have enabled optimisation of the pit designs at a 0.47g/t Au cut-off grade with an in-pit cut-off grade of 0.3g/t Au.

Mine scheduling and processing has been optimised, with ore classified according to grade then processed:

Run of mine ore (>0.6q/t)	21.5Mt at 1.37g/t Au Processed through standard 2.4Mt.pa CIL plant	943Koz Au
Upgraded ore (0.3 to 0.6g/t)	3Mt at 1.84g/t Au 15Mt at 0.43g/t for 209Koz gold is stockpiled and from the middle of the third year is upgraded through a simple, 2.4Mt.pa gravity upgrade plant to produce an upgraded product of 3Mt at 1.84g/t for 177Koz gold which supplements feed to the CIL circuit.	177Koz Au
Processing	24.5Mt at 1.42g/t Au	1,120Koz Au
Gold recovered		1,011Koz Au

The process flow of the operation is shown in the figure below.

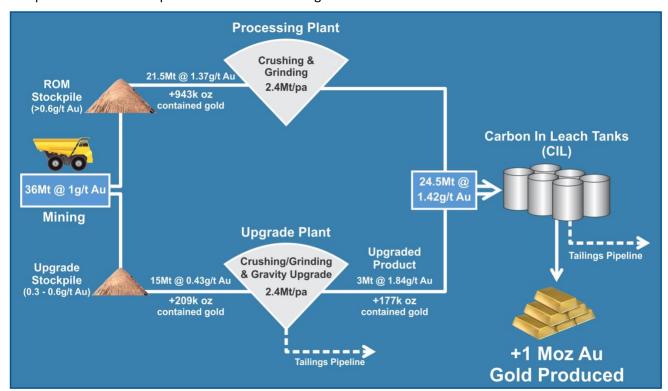


Figure 4: Process flow

Detailed mine scheduling will deliver ROM ore grading of up to 1.63g/t Au, to the processing plant over the first three years of operations. When combined with the low stripping ratio, the resulting strong cashflow in the first years of operation enables a project payback in two years.

Upgrade ore is stockpiled for the first three and a half years, after which it is fed into a simple gravity upgrade plant to produce mill feed product grading 1.84g/t Au. The simple, 2.4Mt.pa upgrade plant generates free cash of A\$89 million after paying back the estimated A\$17 million capital cost of upgrade plant. The construction of the upgrade plant is envisaged to commence post payback of the initial development.



The PFS was led by Geopacific with work undertaken and verified by the following independent consultants:

**Table 1: Independent consultants** 

Area of focus	Compiled by					
Metallurgy	Independent Metallurgical Operations, ALS Metallurgy and Lycopodium					
Mineral Resource Estimate	MPR Geological Consultants					
Reserves, pit optimisations & pit designs	Mining Plus					
Geotechnical	Peter O'Bryan and Assoc					
Capital costs	Mincore updated figures from Arccon					
Operating costs	Mining Plus, Independent Metallurgical Operations, Lycopodium, with mining costs verified by specialist mining contractors					

### **Decision to finalise DFS**

Geopacific's board has approved the completion of the final elements of the DFS. These will centre around Front End Engineering Design (FEED). The aim of the DFS is to finalise and optimise the plant design and infrastructure to deliver capital cost estimates to within a 15% level of accuracy and further optimise operating costs.

Aspects of the PFS have already been completed to a DFS-level, these include mining costs and metallurgical testwork.

The work conducted during the DFS will target further optimisation of the Project with a view to increasing efficiency and profitability.

The DFS program will include the following aspects and related opportunities for optimisation:

- Finalise plant design and costs
- Marine tailings pipeline design and costs
- Infrastructure design and costs
- Mining fleet and fleet management
- Power generation and consumption
- Operational costs

DFS preparation commenced at the beginning of 2017 and completion is targeted for Q3 2018.



# **Key information summary**

Key metrics and financial information in the tables below highlight the strength of the Project.

Table 2: Key mining metrics

Mining		
Waste mined	Mt	112.9
Ore mined	Mt	36.5
Total mined	Mt	149.4
Waste:Ore stripping ratio – LOM	t:t	3.1:1
Waste:Ore stripping ratio – Years 1 to 5	t:t	2.5:1
Pit design cut-off	g/t Au	0.47
In-pit cut-off	g/t Au	0.30

Table 3: Mine life annual mining schedule

Metric	Unit	Summary	Pre	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Yr 11*
Waste mined	kt	112,957	5,538	5,924	5,641	7,693	10,276	13,796	16,119	16,480	14,506	10,238	6,737	8
Ore mined	kt	36,481	563	2,860	3,493	4,090	3,489	3,303	4,084	3,537	3,881	3,652	3,459	71
Grade mined	g/t	0.98	1.07	1.43	1.02	1.06	1.04	0.95	0.87	0.91	0.90	0.88	0.84	1.12
Contained gold	OZ	1.152.100	19.407	131.125	114.957	139.413	116.131	100.627	113.998	103.989	112.591	103.359	93.958	2.545

<sup>\*</sup> Year 11 includes one month of operation.

The pie charts below show the amount of gold contained in each classification of ore, clearly showing that the majority of the gold is contained in the ROM ore which includes all material grading over 0.6g/t Au, with the remainder included in upgrade ore between grades of 0.3g/t Au to 0.6g/t Au.

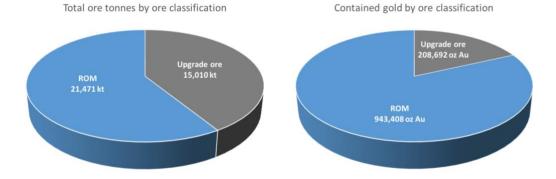


Figure 5: Ore tonnage and contained gold by feed type

Tables 4 & 5: Processing metrics

Processing	Tonnes	Grade
ROM ore processed	21.5Mt	1.37g/t Au
Upgrade ore processed through upgrade plant	15.0Mt	0.43g/t Au
Upgrade product processed through CIL	3.0Mt	1.84g/t Au
Total ROM ore and upgrade product processed through CIL	24.5Mt	1.42g/t Au
		Oi

Processing		
Processing recovery – LOM	%	90%
Processing recovery – years 1 to 5	%	92%
Ounces recovered – average per year in years 1 to 10	Koz Au	100
Ounces recovered – LOM	Moz Au	1.01



Table 6: Mine life annual processing schedule

Metric	Unit	Total	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Yr 11
Ore processed *	Kt	24,473	2,107	2,400	2,400	2,444	2,494	2,487	2,487	2,487	2,472	2,365	331
Grade	g/t	1.42	1.63	1.54	1.43	1.41	1.45	1.38	1.40	1.44	1.40	1.27	0.86
Recovery	%	90%	92%	92%	92%	92%	92%	92%	92%	92%	86%	79%	81%
Gold produced	0z	1,010,985	101,717	109,575	101,166	101,767	106,990	101,245	103,195	105,666	95,888	76,393	7,382

<sup>\*</sup>To be conservative, a lower through-put of 85% has been assumed over the commissioning period.

Steady-state production is achieved across the life of the mine with a head grade of 1.42g/t into the leaching circuit, as demonstrated in the graph below. Mining inventory contains less than 5% (50,600oz/Au) of Inferred material.

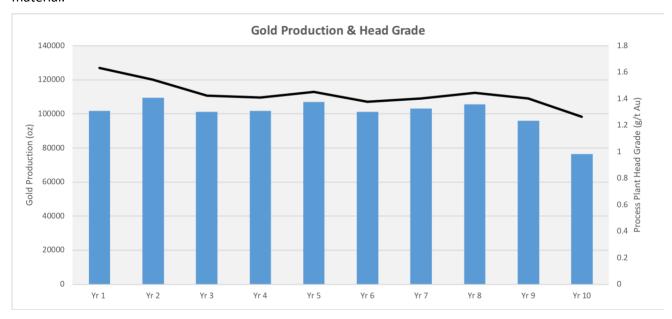


Figure 6: Gold production and head grade into CIL circuit

The steady-state production supports strong cashflow over the life of the mine, particularly in the first years of operation, enabling the capital payback of two years as demonstrated in the graph below. The pre-tax capital payback is two years and the post-tax payback at 2.2 years.

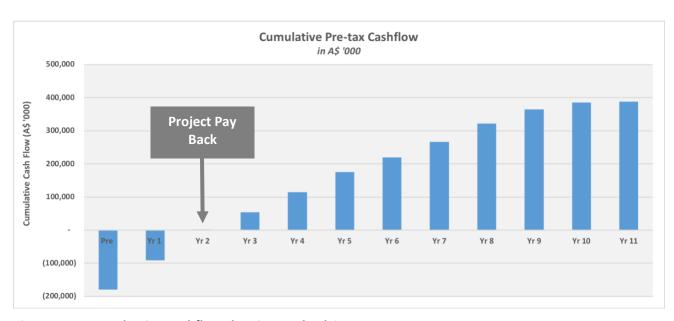


Figure 7: Pre-production cashflow showing payback in year 2



Table 7: Key results from financial analysis

Summary of key results from financial analysis	US\$m	A\$m
Revenue – LOM	1,251	1,668
Gross Operating Costs (including PNG Government Royalty)		
ROM ore (includes pre-strip of A\$18m)	698	930
Upgrade ore	116	154
Operating Margin	438	584
Capital		
Pre-production capital	122	162
Upgrade plant capital cost (in year 3.5)	13	17
Sustaining capital	12	16
Free cashflow – pre-tax	291	388
Income tax	55	74
Free cashflow – post tax	236	314
Production Costs		
All-in sustaining costs (years 1 – 5)	742	990
All-in sustaining costs (years 1 – 10)	832	1,110
NPV <sub>8%</sub>		
Pre-tax	170	226
Post-tax Post-tax	134	178
IRR (effective discount rate that delivers an NPV of zero)		
Pre-tax		38%
Post-tax Post-tax		33%
Project payback (years)		
Pre-tax		2.0
Post-tax Post-tax		2.2

Geopacific elected to use a gold price of A\$1,650/oz in the financial analysis, based on gold price averages<sup>5</sup>. Geopacific also conducted sensitivity analysis to understand the impact of changes in the gold price using gold prices of A\$50 intervals between A\$1,600/oz and A\$1,750/oz. The results are represented in the graph below.

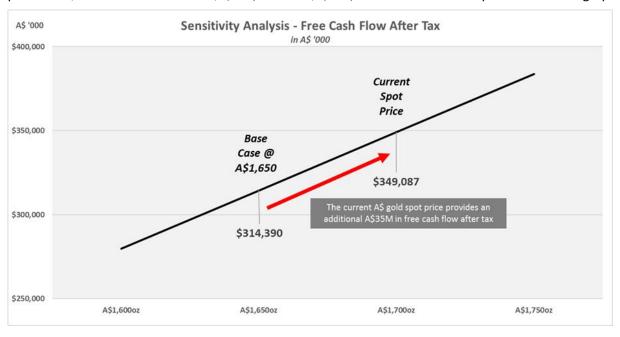


Figure 8: Impact of gold price on after tax free cashflow

 $<sup>^{\</sup>rm 5}$  See table 9 for information on financial inputs



## **Mining**

Open-cut mining using conventional excavator and truck fleets was selected to mine the shallow pits, which will be developed using multiple, staged pit designs. Staging pits allows flexibility, the targeting of high-grade ore, facilitates steady state ore movements and reduces risk by removing reliance on a single pit. Ramps are designed at 1 in 9 gradient and are 20 metres wide, except for lower pit levels and small sub-pits where the ramps are designed at 11 metres wide.

Ore will be hauled directly to a Run of Mine (ROM) pad adjacent to the processing plant. A conservative approach was adopted in selecting mining fleet, with the use of articulated dump trucks to ensure equipment efficiency in the high-rainfall operating environment. This may be optimised in future with the potential to use larger, conventional trucks being evaluated as mining progresses. Due to the limited options of contract mining available in PNG, owner-operated mining has been assumed for financial analysis. Opportunities to optimise fleet management will be assessed under the DFS.

Geotechnical studies were completed by Peter O'Bryan and Associates and are used in the pit designs to estimate the Ore Reserves.

A highlight of the PFS is the low waste-to-ore stripping ratios that significantly improve project economics. Stripping ratios over the mine life are 3.1:1 and are particularly low for the first five years at 2.5:1. This generates higher upfront operating margins, a lower All-in Sustaining Cost (AISC) and a short project payback period.

The annual material movements and strip ratio are shown in the graph below. Low material movements are clearly visible in the first years of operations, while ore movements remain consistent over the mine life. The staged pits allow for targeting of high grade material in the first two years of operation where grade is 1.63g/t Au and 1.54g/t Au respectively. The schedule is flexible, with no significant cut-backs planned in the first years of operation, reducing operational costs and reducing risk in the initial years.

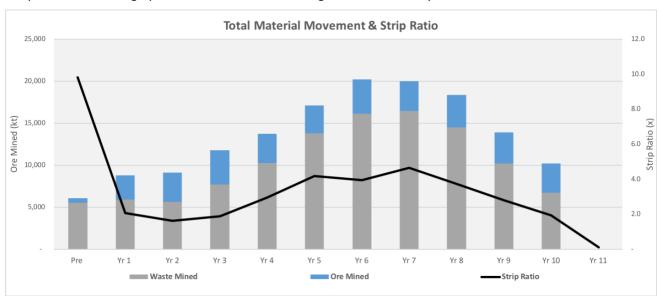


Figure 9: Ore and waste mined in relation to stripping ratio

Information on key mine life physicals is included in the section above, titled 'Key information summary'.

## Metallurgy

Multiple, progressive stages of metallurgical testwork were completed for all of the deposits included in the Ore Reserve Estimate. This includes testwork undertaken in 1992/1993, 1996, 2010 to 2012 and 2017. The 2010 to 2012 testwork programs were undertaken by Ammtec and managed by RW Nice and Associates. Geopacific engaged Independent Metallurgical Operations and Lycopodium to review all previous testwork. Based on their review, Independent Metallurgical Operations used core generated by Geopacific to conduct further testwork to verify the ability to upgrade ore as well as further comminution and recovery testwork. In



addition, further variability testwork was independently designed and managed by Lycopodium and carried out by ALS Metallurgy to validate ore upgrade potential and variability studies.

Metallurgical testwork programs have included comminution, gravity gold and intensive leach extraction, gravity upgrading, cyanidation leach and thickening and rheology. The recent variability testwork by Lycopodium was designed to provide comfort to engineering companies for the provision of process guarantees on the processing plant in an Engineer Procure Construct (EPC), fixed-price contract.

The majority of the mineralisation at Woodlark is free milling with free or gravity gold recoveries of up to 60%, followed by leaching in a conventional CIL circuit. Metallurgical recoveries of 92% were applied to ROM ore from Kulumadau, Woodlark King and most upper areas of Busai. Discrete areas of Busai have a decreased recovery due to increasing levels of arsenic in the ore. A recovery of 77% was used for ore from these discrete zones. It is noted that this ore forms a small portion of the ore and is scheduled towards the end of the mine life, presenting to the processing plant in years nine and ten.

### **Processing plant**

The processing plant will use conventional processing methods, incorporating equipment that ensures effective capital expenditure while optimising operating costs.

The process facility modelled includes a 2.4Mt.pa milling capacity for an operating life in excess of ten years. Up to 60% of the gold will be recovered by a gravity concentrator, significantly decreasing the use of consumables in the CIL circuit.

The process flow was developed by Independent Metallurgical Operations, Lycopodium with Geopacific and will be subject to further design and optimisation in the DFS. The proposed processing plant design is simple and comprises the following elements:

- Jaw crushing
- Semi Autogenous Milling (SAG)
- Ball milling
- Gravity separation
- Conventional CIL leaching
- Marine tailings discharge

The configuration of the processing circuit is typical of gold plants. Ore is loaded from the ROM pad into a jaw crusher, then initially ground using a Semi Autogenous Grinding (SAG) mill. The ore is then fed into a ball mill which grinds the material to P80 of  $106\mu m$  (microns). The ore is then passed through a gravity concentrator to remove up to 60% of free gold and sent to a 24-hour Carbon-In-Leach (CIL) leaching circuit.

From the middle of the third year, a simple upgrade plant will provide an upgraded product with contained gold of approximately 25,000 ounces per annum to the CIL circuit. The feed to the upgrade plant will comprise 2.4 million tonnes of 0.3g/t Au to 0.6g/t Au ore per annum. It is expected to produce three million tonnes of upgraded feed grading 1.84g/t Au over the mine life. This feed will be suitable for leaching in the CIL circuit of the processing plant,.

Testwork has shown that Woodlark mineralisation is amenable to this simple, cost-effective upgrading of ore to produce a higher-margin product for a low capital cost. Geopacific has elected to utilise the opportunity to upgrade low-grade ore in the grade range between 0.3g/t Au and 0.6g/t Au. The upgrade circuit commences production mid-way through the third year of operation, post project payback, with the estimated capital cost of the upgrade plant being A\$17 million. The economics of the upgrade plant allows for a lower in-pit cut-off grade of 0.30g/t Au to be used in the Mineral Reserve Estimate, maximising the potential of the orebody and cashflow.

Over 10 tonnes of metallurgical sample were evaluated in the most recent testwork, focussing on variability studies to allow engineering construction contractors to offer an EPC on a guaranteed, fixed price basis (where the processing capability is guaranteed by the engineering construction contractor). Lycopodium has indicated that further metallurgical testwork will not be required for the DFS.



Tailings are planned for disposal by way of a marine tailings pipeline. Marine tailings offer a cost-effective and minimal impact solution, which addresses the challenges faced in high-rainfall regions that experience a degree of seismic activity. A permitted, marine tailings disposal site is located on the eastern side of the Island. It saves the requirement for construction, management and rehabilitation of onshore tailings facilities. This tailings management solution is used widely across PNG by respected ASX listed companies. Prior to permitting in 2012, studies comparing on-land and marine tailings were undertaken and clearly demonstrated the benefits of marine tailings over land-based solutions in a high rainfall region which experiences low seismic activity.

### **Upgrade plant**

From the middle of the third year, ore from the upgrade stockpile will be processed through the upgrade plant. Ore will be loaded into a jaw crusher and ground to P80 of  $125\mu m$  by a SAG mill. It is expected that the ore will then passed through a Knelson concentrator to remove up to 60% of the free gold, with the remainder then passed through spirals. This separates the heavy fraction containing iron oxides and free-milling sulphides to produce an upgraded ore product that holds 85% of the gold within 20% of the original mass. The upgraded, free milling 1.84g/t Au product is then ground in a small ball mill to a grind size of P80 of  $106\mu m$  and fed into the CIL circuit of the processing plant.

The construction of the upgrade plant is envisaged to commence post payback of the initial development.

## **Capital cost estimate**

The capital cost estimate has been developed through the collation of first-principle estimates based on information derived from independent consultants, Geopacific staff and work taken from the previous Definitive Feasibility Study undertaken in 2012. Mincore Engineers rebased capital costs derived from a DFS study in 2012. Detailed capital costs will be further refined during the DFS.

Capital cost estimates have been refined to within a 25% level of accuracy, as required for a PFS. Optimisation of plant, infrastructure and related operational costs will be the focus of the DFS, in order to deliver costs to within a 15% level of accuracy.

The capital cost estimate has been developed by Mincore Engineers and Geopacific from first-principle estimates and rebasing capital costs derived from the DFS study completed in 2012.

Capital costs will be further refined during to the DFS through the optimisation of plant and infrastructure layout, to deliver the life-of-mine plan.

Table 8: Capital cost estimates

Captital cost estimates	US\$m	A\$m
Establishment costs		
Process Plant (including marine tailings)	64	85
Infrastructure	23	30
Other	12	16
Contingency	7	9
Total establishment costs	106	140
Mining capital	17	22
Pre-strip costs	14	18
Total capital costs	137	180
Sustaining capital	12	16
Upgrade plant capital (year 3)	13	17

Geopacific plans to evaluate equipment financing options to reduce the upfront mining capital.



# **Financial analysis**

A summary of the key inputs and outputs from the financial analysis conducted by Geopacific are included in the table below. Financial modelling is based on an A\$1,650/oz long term gold price.

Table 9: Key inputs for mining costs

Key inputs for financial analysis		
Foreign exchange	US\$:A\$	0.75
Gold price	A\$/oz	1,650
Mining cost *	A\$/t mined	2.75
Government royalty, net of refining costs	% revenue	2.25%

<sup>\*</sup> Mining costs have been estimated to a DFS level, based on a 'first principles' and verified by specialist mining contractors with a working knowledge of environments similar to those experienced at Woodlark.

Geopacific has validated the existing, project-level tax losses of A\$139,000. This number is expected to increase with capital expenditure on the Project.

Table 10: Key results from financial analysis

Summary of key results from financial analysis	US\$m	A\$m
Revenue – LOM	1,251	1,668
Gross Operating Costs (including PNG Government Royalty)		
ROM ore (includes pre-strip of A\$18m)	698	930
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Operating Margin	438	584
Capital		
Pre-production capital	122	162
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Post-tax		33%
Project payback (years)		
Pre-tax		2.0
Post-tax		2.2

#### **Financing**

Geopacific's board believes that there are reasonable grounds to assume that future funding will be available for the ongoing development of Woodlark, as envisaged in this announcement, on the following basis:

- Geopacific's board has relevant experience in financing projects of similar scope in similar jurisdictions.
- The production and economics outcomes delivered in the PFS are sufficiently robust to provide confidence in the Company's ability to fund development of the project through conventional debt and equity finance.



- The management of the Company has a successful track record of raising funds for the ongoing development of the Company's assets.
- The Company enjoys the benefit of a strong, institutional shareholder base including a significant proportion of resource-focussed, international investment funds which focus on providing project development finance.

# Mining lease granted

Mining lease ML508 was granted in 2014 by the Minister of Mines with a validity of 20 years (expires in 2034). All Resources and Reserves are located on the mining lease, which covers 60 square kilometres.

A comprehensive environmental impact study was completed as part of the mining lease application and included permitting of the marine tailings disposal.

In 2016, Geopacific successfully applied to maintain the currency of the mining lease by gaining approval for the extension of the condition to complete of construction and commissioning by 30 December 2019.

Geopacific has developed strong working relationships with PNG Authorities, who continue to express their support for the development of the Project. Any changes to the approved development plan may require amendments; these would be considered revisions and be handled in the normal course of business.

# **Environmental approval granted**

Environmental approvals required to build and operate the Project are granted, setting Woodlark apart from its peers.

Environmental approval for the project was granted in 2014 by the PNG Department of Environment and Conservation (now the Conservation and Environment Protection Authority Department), with a validity of 20 years (expires 2034).

This followed completion of an Environmental and Social Impact Assessment prepared by Coffey Environments Pty Ltd, underpinned by a range of studies completed by various experts addressing all the environmental and social aspects of the project.

Studies included but were not limited to surface water and groundwater, terrestrial, aquatic and marine ecology, geochemistry and acid mine drainage, meteorology, cultural heritage and archaeology, health, and social characterisation.

## Social licence to operate

There was extensive and ongoing community engagement over a number of years at Woodlark, including specialist studies completed as part of the Environmental and Social Impact Assessment process. Several agreements were finalised and signed by all affected stakeholders, including a Relocation Agreement for those people whose land will be impacted during Project development.

Geopacific enjoys an active and strong relationship with the communities living on Woodlark Island and is committed to a local training and employment strategy, local business development strategy and continuing to work with communities to ensure that Project benefits extend beyond direct employment. Woodlark will be the largest employer on the Island and will be in a unique position to positively benefit the welfare of the local and wider community.



## **Initial JORC 2012 compliant Mineral Ore Reserve**

Independent consultants, Mining Plus have completed the initial Mineral Ore Reserve with results reflected in the table below.

Table 11: Woodlark Ore Reserves

Total by deposit	Category (>0.3g/t lower cut)	Tonnes (Mt)	Grade (g/t)	Ounces (oz)
Busai	Proven	11.0	0.92	326,100
	Probable	5.2	0.78	131,200
Kulumadau	Proven	8.6	1.23	338,500
	Probable	6.4	1.02	209,500
Woodlark King	Proven	2.4	0.92	70,400
	Probable	1.1	0.71	25,900
	Proven	22.0	1.04	735,000
<b>Total Ore Reserve</b>	Probable	12.7	0.90	366,600
	Total	34.7	0.99	1,101,600

Mining Plus utilised the mining costs derived from their own first-principles work-ups, and processing cost and other information derived from the consultants listed below. Whittle software was used to derive a number of economic pit shells for each deposit. The shell that produces the maximum undiscounted cashflow was selected to be used as the basis for pit design work. The economics dictated that a lower cutoff of 0.47g/t was appropriate for creating the optimal pit shell.

Pit designs were undertaken using Surpac software and made allowance for the pit wall angles recommended and incorporated pit ramps suitable for the mining equipment selected. As the final pit designs were derived, a small amount of Inferred mineralisation was included within the pit mining inventory. Although this material is excluded from the Ore Reserves, it is included in the mining schedule as mill feed. The proportion of this Inferred material included in the mining inventory is less than 5% of the total pit mill feed inventory, and the project does not rely on inclusion of this Inferred material as mill feed in order to be feasible. This explains why the mining inventory is larger than the mining reserve which cannot include inferred resources.

Within the final pit designs, all material above 0.3g/t was included in the reserve estimate, as the material between 0.3g/t and 0.6g/t can be treated via the Upgrade circuit to produce a higher-grade feed for the CIL circuit, whilst all material greater than 0.6g/t can be fed directly into the CIL circuit. Not using the 0.3g/t to 0.6g/t material to design the pits is taking a conservative approach to the designs.

The Ore Reserve is based on the following information presented in the table below:

Table 12: Ore Reserve inputs

Parameters	Compiled by		
Gold price	Geopacific based on historic average gold price		
Gold recovery	Independent Metallurgical Operations, ALS Metallurgy and Lycopodium		
Mineral Resource Estimate	MPR Resource Consultants		
Pit optimisations & pit designs	Mining Plus		
Geotechnical	Peter O'Bryan and Associates		
Capital costs	Mincore updating Arccon, Lycopodium & Geopacific		
Operating costs	Mining Plus, specialist contractor quotes, Lycopodium & Geopacific		
Government royalty	PNG legislation		



#### Joint Venture incentive milestone calculation

Under the terms of the Joint Venture Agreement (JV Agreement) with Kula, Geopacific holds the right to increase its direct interest in Woodlark by way of standard and incentive options<sup>6</sup>.

Achieving the next incentive milestone required estimating a reserve of at least 1,200,000 ounces of gold, using gold price methodology set out in the JV Agreement (JV Reserve Estimate). The calculated gold price under the JV Agreement is \$A1,694/oz, derived from the average forward gold price estimate of the next 8 quarters, as compiled by Consensus Economics Ltd. This gold price, for the purpose of the JV incentive milestone calculation, was agreed between Geopacific and Kula and announced by Kula on 23 February 2018.

The JV Reserve Estimate is strictly for the purposes of the JV Agreement, using the agreed parameters, and has not been used by Geopacific in any published financial calculations.

Both Reserve Estimates were calculated by Mining Plus using identical modelling parameters.

Table 13: JV Agreement Reserve Estimate

Deposit	Category (>0.3g/t lower cut)	Tonnes (Mt)	Grade (g/t)	Ounces (oz)
Busai	Proven	12.7	0.87	355,000
	Probable	6.3	0.73	149,300
Kulumadau	Proven	9.2	1.18	351,100
	Probable	7.5	0.96	234,100
Woodlark King	Proven	3.0	0.84	81,200
	Probable	1.4	0.68	31,400
JV Agreement Reserve Estimate*		40.2	0.93	1,202,100

<sup>\*</sup> This JV Reserve Estimate is expressly for the purposes of the JV Agreement and has not been used in any of Geopacific's published financial calculations.

Geopacific is of the view that the next incentive milestone has now been satisfied such that its overall economic interest in Woodlark will increase to 93% comprising a direct interest of 51% and a further interest of 42% by virtue of its 85% holding of Kula shares.

Geopacific will provide Kula notice pursuant to the JV Agreement regarding the satisfaction of the incentive milestone and the consequential increase in its direct interest in Woodlark to 51%.

<sup>&</sup>lt;sup>6</sup> For further information on the standard and incentive options please see the ASX announcement, Gold Project Acquisition, dated 11 July 2016 by Geopacific Resources Limited.



### **Mineral Resource Estimate**

Exploration and mining on Woodlark Island dates back to the 1890s. Modern exploration (post 1962) includes a total of 2,262 drill holes over 288,454 metres of drilling. This drilling comprises 396 diamond drill holes for 56,064 metres, 22 RAB holes for 1,729 metres and 1,844 RC drill holes for 230,670 metres.

Of this total, Geopacific completed 90 diamond drill holes for 14,240.2 metres plus 109 RC drill holes for 11,373 metres used in resource estimations. Additional Geopacific drilling included metallurgical and geotechnical diamond drill holes.

A critical review of the historical drill hole data resulted in the removal of all RC drilling completed prior to 1996 due to concerns of downhole contamination caused by outdated drilling methods.

Drilling undertaken by Geopacific focused on:

- converting Inferred category resources to Measured and Indicated categories;
- replacing historical drill holes that were removed from the database;
- twin diamond and RC drill holes for quality control and assurance purposes;
- extensional drilling beneath the Kulumadau West and Busai deposits;
- the discovery and drill out of the Boscalo deposit;
- sterilisation drilling
- geotechnical drilling; and
- metallurgical testwork drilling.

Resource Estimations were undertaken for the Kulumadau, Busai, Woodlark King and Munasi deposits by Independent consultants, MPR Geological Consultants of Perth, using drilling information from several generations of exploration. The drilling database has been rigorously interrogated by Geopacific and MPR and any deficiencies identified have been removed, replaced or infilled with new drilling which meets JORC 2012 QA/QC standards.

This work resulted in the majority of the Resource inventory for Busai and Kulumadau reporting to Measured and Indicated, giving greater confidence in deposit modelling and orebody continuity.

Independent consultants MPR used the method of Multiple Indicator Kriging (MIK) with block support adjustment to estimate gold resources into blocks with dimensions of 20 metres (east) by 25 metres (north) by 5 metres (elevation). MIK of gold grades used indicator variography based on the two-metre resource composite sample grades. MIK was used as the preferred method for estimation of gold Resources at Woodlark as the approach has been demonstrated to work well in a large number of deposits of diverse geological styles. The gold mineralisation seen at Woodlark is typical of that seen in most structurally controlled epithermal gold deposits where the MIK method has been found to be of most benefit.

MIK resources are considered fully diluted and do not need the further step of applying ore loss and dilution factors in the reserve calculation phase. MIK resources are therefore inherently lower grade than other resource estimation techniques that do not have an inbuilt allowance for dilution or ore loss. The Mineral Resource estimates can be reasonably expected to provide appropriately reliable estimates of potential mining outcomes at the assumed selectivity without application of additional mining dilution or mining recovery factors.

The estimate of Mineral Resources is constrained to an optimal pit shell generated using cost and revenue parameters derived from the current PFS and a gold price of A\$2,400/oz. The cut-off of 0.4g/t Au for reporting Mineral Resource estimates reflects the approximate average break-even cut-off that derives from the same economic parameters and gold price. The price of A\$2,400/oz reflects the company's view of potential upside long-term gold price.



The initial Geopacific Woodlark Mineral Resource Estimate is JORC 2012 compliant. Global Resource Estimates and individual deposit Resource Estimates are presented below the tables below.

Table 14: Woodlark Global Resources

Category (>0.4g/t lower cut)	Tonnes (Million)	Grade g/t Au	Ounces (Thousand)
Measured	21.24	1.10	754
Indicated	18.94	0.98	597
Inferred	6.80	1.00	222
Total	47.00	1.04	1,573

Resource Estimations were undertaken for the Kulumadau, Busai, Woodlark King and Munasi deposits by Independent consultants, MPR Geological Consultants of Perth, using drilling information from several generations of exploration. The drilling database has been rigorously interrogated by Geopacific and MPR and any deficiencies identified have been removed, replaced or infilled with new drilling which meets JORC 2012 QA/QC standards.

Table 15: Kulumadau Resource Estimation

Category (>0.4g/t lower cut)	Tonnes (Million)	Grade (g/t Au)	Ounces (Thousand)
Measured	8.88	1.30	372
Indicated	8.54	1.10	303
Inferred	2.90	1.20	108
Total	20.32	1.20	784

Table 16: Busai Resource Estimation

Category (>0.4g/t lower cut)	Tonnes (Million)	Grade (g/t Au)	Ounces (Thousand)
Measured	12.36	0.96	382
Indicated	7.16	0.84	193
Inferred	1.40	1.10	48
Total	20.93	0.93	623

Table 17: Woodlark King Resource Estimation

Category (>0.4g/t lower cut)	Tonnes (Million)	Grade (g/t Au)	Ounces (Thousand)
Indicated	3.24	0.96	100
Inferred	0.20	1.10	9
Total	3.49	0.97	109

Table 18: Munasi Resource Estimate

Category (>0.4g/t lower cut)	Tonnes (Million)	Grade (g/t Au)	Ounces (Thousand)
Inferred	2.30	0.80	58
Total	2.30	0.80	58

<sup>\*</sup> rounding may result in minor discrepancies



### **Contact**

For further information on this update or the Company generally, please visit our website at <a href="https://www.geopacific.com.au">www.geopacific.com.au</a> or contact:

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### **Competent Person's Statement**

The information in this announcement that relates to exploration results is based on information compiled by or under the supervision of James Kerr, a Competent Person who is a Member of The Australasian Institute of Mining and Metallurgy and General Manager, Geology for Geopacific. Mr Kerr has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and the activity he is undertaking 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 Kerr consents to the inclusion in the announcement of the matters based on his information in the form and context in which it appears.

The information in this report that relates to Woodlark Mineral Resources is based on information compiled and reviewed by Mr Nicholas Johnson, a Competent Person who is a Member of the Australian Institute of Geoscientists and a full-time employee of MPR Geological Consultants Pty Ltd. Mr Johnson has sufficient experience which is relevant to the style of mineralization and type of deposits under consideration and to the activity which he has undertaken to qualify as a Competent Person as defined in the JORC Code 2012 and is a qualified person for the purposes of NI43-101. Mr Johnson has no economic, financial or pecuniary interest in the company and consents to the inclusion in this report of the matters based on his information in the form and context in which it appears.

The information in this report that relates to Woodlark Mineral Reserves is based on information compiled and reviewed by Mr John Battista, a Competent Person who is a Member and Chartered Professional of the Australian Institute of Mining and Metallurgy (AusIMM) and a full-time employee of Mining Plus Pty Ltd. Mr Battista has sufficient experience which is relevant to the style of mineralisation and type of deposits under consideration and to the activity which he has undertaken to qualify as a Competent Person as defined in the JORC Code 2012 and is a qualified person for the purposes of NI43-101. Mr Battista has no economic, financial or pecuniary interest in the company and consents to the inclusion in this report of the matters based on his information in the form and context in which it appears.

### **Forward Looking Statements**

All statements other than statements of historical fact included in this announcement including, without limitation, statements regarding future plans and objectives of Geopacific Resources Limited are forward-looking statements. When used in this announcement, forward-looking statements can be identified by words such as 'may', 'could', 'believes', 'estimates', 'targets', 'expects' or 'intends' and other similar words that involve risks and uncertainties.

These statements are based on an assessment of present economic and operating conditions, and on a number of assumptions regarding future events and actions that, as at the date of this announcement, are expected to take place. Such forward-looking statements are not guarantees of future performance and involve known and unknown risks, uncertainties, assumptions and other important factors, many of which are beyond the control of the company, its directors and management of Geopacific Resources Ltd that could cause Geopacific Resources Limited's actual results to differ materially from the results expressed or anticipated in these statements.

Geopacific Resources Ltd cannot and does not give any assurance that the results, performance or achievements expressed or implied by the forward-looking statements contained in this announcement will actually occur and investors are cautioned not to place undue reliance on these forward-looking statements. Geopacific Resources Ltd does not undertake to update or revise forward-looking statements, or to publish prospective financial information in the future, regardless of whether new information, future events or any other factors affect the information contained in this announcement, except where required by applicable law and stock exchange listing requirements. Woodlark is permitted by the PNG Government, subject to meeting the conditions of the licence.



# Appendix A: JORC Code, 2012 Edition – Table 1

# **Section 1: Sampling Techniques and Data**

(Criteria in this section apply to all succeeding sections.)

CRITERIA	JORC CODE EXPLANATION	COMMENTARY
Sampling techniques	Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry	Sampling was conducted using diamond drilling (DD) and Reverse Circulation Drilling (RC).
	standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.	Sampling of the diamond drilling comprised half core samples taken based on lithological, alteration, and mineralisation breaks observed in geological logging. Generally, sampling is at 1m intervals.
	Include reference to measures taken to ensure sample representivity and the appropriate	1 in 50 samples is a duplicate sample, taken from quarter core.
	calibration of any measurement tools or systems	Core recovery is routinely recorded for each drill run
	used.	RC drilling samples were collected in 1m intervals from a cyclone and weighed. The entire sample is riffle split using a 75% / 25% splitter, yielding approximately 3kg sub split for assaying. The 75% split is stored in plastic sample bags and removed from site on the completion of the hole to a bag farm for future reference if required.
		The sample splitter is cleaned with compressed air and water if necessary to ensure no contamination between samples.
		1 in 50 samples is a duplicate sample, collected as a re-split of the residual sample material.
		All samples were submitted to ITS Pty Ltd PNG (Intertek Services Ltd) - operated sample preparation laboratory on site.
		Sample pulps were sent for fire assay gold and four- acid multi-element analysis by ICPMS method at Intertek Genalysis Townsville analytical laboratory. Blank, duplicate, and standard samples were inserted at various intervals based on Geopacific's QAQC procedure to ensure sample representivity and repeatability of the sampling results.



CRITERIA	JORC CODE EXPLANATION	COMMENTARY
	Aspects of the determination of mineralisation that are Material to the Public Report.  In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases, more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.	Core was cut in half using a core saw. Where core competency was low, whole core was wrapped in plastic clingfilm to help maintain integrity of the sampled interval while being cut. Samples were prepared on the on-site sample prep laboratory operated by ITS Pty Ltd PNG (Intertek Services Ltd). Standard preparation of samples is to kiln dry samples, crush ~2kg through a jaw crusher, with a blank bottle wash between each sample. Crushed sample is then transferred to a LM-2 pulveriser for reduction to pulp. A 150gm pulp sample is split from the master sample and submitted for analysis. Coarse reject material and pulps are bagged and stored on site for future reference.  Samples were sent for fire assay gold analysis using a 50g charge, as well as multi-element analysis using multi-acid digest with ICP finish at Intertek's Townsville laboratory.
Drilling Techniques	Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).	Geopacific Resources diamond drilling was undertaken using triple tube methodology in PQ or HQ core diameter depending on the ground conditions and depth of investigation.  Casing of DD holes was to variable depths depending on ground conditions.  All core was oriented using Reflex ACT III digital orientation equipment.  Geopacific Resources RC drilling utilised a dual-purpose Sandvik D880 rig, capable of drilling RC and diamond. RC drilling used a 139mm face sampling hammer and cyclone return. All RC holes were pvc collared to 12m minimum. A 350psi / 850cfm compressor plus booster compressor were utilised for RC drilling.  Some holes completed by Geopacific used RC drilling for a pre-collar and diamond drilling for the lower part of the hole. These holes are prefixed RD, e.g. KU17RD011 is an RC pre-collar hole with a diamond tail.  All holes were downhole surveyed using a Reflex EZ Gyroscope.
Drill Sample Recovery	Method of recording and assessing core and chip sample recoveries and results assessed.	Core recovery is recorded by measuring the core recovered from the drill hole against the actual drilled metres.  RC drilling samples were all weighed on collection from the cyclone, with relative moisture content noted. A back-calculation of sample weight relative to estimated specific gravity is made to assess for potential downhole blowouts (where the hole diameter gets enlarged by the action of the compressed air against the wall rock at certain intervals, potentially causing downhole contamination).



CRITERIA	JORC CODE EXPLANATION	COMMENTARY
	Measures taken to maximise sample recovery and ensure representative nature of the samples.	Triple tube drilling as well as shorter runs in zones of broken ground were used to maximise the sample recovery. A rigorous programme of experimentation and refinement of drilling mud regimes was conducted, resulted in significant improvements to recoveries in poor ground conditions when compared to historical drilling in similar zones.
	Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.	Historically, some core loss was recorded in particularly poor ground, especially at Kulumadau West diamond drilling. Gold mineralisation in the cataclasite zones is typically preferentially within the fine, muddy breccia matrix as opposed to the harder, resistant breccia clasts. Unless great care is taken through these zones, DD drilling may inadvertently wash away the mineralised clays, resulting in overall core loss and significantly reduced gold grades in the sampled interval.
		Geopacific has gone to great lengths to improve drilling methodology and practice and as a result, has consistently achieved good core recoveries. Overall, there is no discernible bias recorded against gold values and sample recoveries in Geopacific DD and RC holes.
		Some concerns over potential smearing of gold grades in RC drilling pre 1996 were identified. These holes were removed from the database for resource calculation purposes and replaced by new RC holes.
Logging	Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource	All drill samples were geologically logged by Geopacific geologists using Geopacific's logging procedure.
	estimation, mining studies and metallurgical studies.	Geotechnical logging of Rock Quality Designation (RQD), hardness, degree of fracturing and weathering is undertaken by Geopacific staff using Geopacific's logging procedure.
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.	Drill core and RC chips were logged both qualitatively (e.g. lithology, alteration, structure, etc.) and quantitatively (e.g. veining and mineralisation percentage, structural orientation angles, etc.). Drill core is photographed both dry and wet and is stored in plastic core trays in our exploration core yard.
	The total length and percentage of the relevant intersections logged.	All holes are logged their entire length.
Sub-sampling techniques	If core, whether cut or sawn and whether quarter, half or all core taken.	Core is halved, with one half sent for sample preparation and analysis. The remaining core is stored in the core trays on site.



CRITERIA	JORC CODE EXPLANATION	COMMENTARY
and sample preparation	If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.	RC drilling used a cyclone and riffle splitter for dry samples. If samples were damp, cuttings were heaped, quartered, spear sampled, with the process repeated 8 times per sample to generate a representative sample. Unless drilling a pre-collar, RC drilling is terminated if the sample cannot be delivered dry. For pre-collar RC drilling, RC drilling is outside the target ore zone and as there is no expectation of encountering mineralisation, there is minimal concern over potential sample contamination for this section of the drill hole if the sample is delivered wet. 4 metre composite samples are collected for this style of drilling to ensure analytical coverage of the entire hole.
	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	Samples are kiln dried, crushed to a nominal 2mm by a jaw crusher, with the whole sample pulverised to 85% passing 75µm and then split; one 150gm sample for submission with residue stored on site.
	Quality control procedures adopted for all sub- sampling stages to maximise representivity of samples.	Field blank, duplicate, and standard samples are introduced to maximise the representivity of the samples. Two blank samples, two reference standard samples and two duplicate samples are included per 100 samples.
	Measures taken to ensure that the sampling is representative of the in-situ material collected, including for instance results for field duplicate/second-half sampling.	Field duplicates are inserted in accordance with Geopacific's QAQC procedure. This includes two blank samples and two field duplicate samples. Field duplicated for RC drilling are created by splitting a 1m sample twice into two separate samples. For DD core, core is quartered, with quarter core per sample interval used.
	Whether sample sizes are appropriate to the grain size of the material being sampled.	Sample sizes are appropriate to the grain size of the material being sampled.
Quality of assay data and laboratory tests	The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.	50gm fire assay Au and four-acid digest ICP analysis are thought to be appropriate for determination of gold and base metals in fresh rock and are considered to represent a total analysis. Representative check samples were submitted to ALS laboratories to assess the effectiveness of 50gm Fire Assay method by repeating both Fire Assay and Aqua Regia gold analyses, with acceptable results.
	For geophysical tools, spectrometers, handheld XRF instruments, etc., the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.	No results from geophysical tools, spectrometers, or handheld XRF instruments are included in this report. Some modelling of As values of historical drill sample pulps using a hand held XRF instrument was undertaken.



CRITERIA	JORC CODE EXPLANATION	COMMENTARY
	Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.	Field and lab blank, duplicate, and independent certified standard samples were used in drilling. Laboratory blanks, duplicates and reference standards are routinely used. Results from these QAQC samples were within the acceptable ranges, with the only exception being the detection of very low values of gold in a blank sample. The weak gold value in a blank sample was attributed to a preceding sample containing significant amounts of free gold, which appeared to have contaminated the jaw crusher in the sample prep laboratory. A full review of equipment cleaning and increased attention to the bottle wash process has eliminated any repeat of this occurrence.
Verification of sampling and	The verification of significant intersections by either independent or alternative company personnel.	Significant intersections were inspected by senior geological staff.
assaying	The use of twinned holes.	Twin holes were drilled as part of the evaluation and QAQC process for Kulumadau, Busai and Woodlark King deposits. Twin holes were utilised in the resource calculations for each respective deposits.
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	Data entry, data validation and database protocols are an integral part of the capture and use of geological information. A rigorous industry-standard system is utilised, which is administered by an Independent third party to ensure data integrity and off-site data backup.
	Discuss any adjustment to assay data.	No adjustments were made or required to be made to the assay data. Some historical RC drill holes were removed from the database due to sample contamination concerns. These holes were re drilled.
Location of data points	Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.	Drill hole collars were located using a total station surveying instrument. Survey control points were established in 2007 across the project and provide excellent ground control for total station surveying.
		Downhole surveys using a Reflex EZ Gyro were conducted on all drillholes with readings recorded every 5 metres downhole.
		Historical drilling utilised both a single shot down hole camera and a multi shot downhole camera to determine downhole dip and azimuth readings.
	Specification of the grid system used.	Coordinates are recorded in PNG94 geodetic system
	Quality and adequacy of topographic control.	LiDAR survey data obtained over the licence area, tied in to total station collar readings provide submetre accuracy.



CRITERIA	JORC CODE EXPLANATION	COMMENTARY
Data spacing and distribution	Data spacing for reporting of resource calculation results.	Drilling used to inform the resource estimates is variably spaced from as close as 5m x 5m basis in some areas to a more nominal 25m x 40m spacing. Generally speaking, the high grade sections of both Busai and Kulumadau are very tightly drilled.
	Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.	Drilling results referred to in this report confirm mineralisation delineated in previous drilling and confirm both grade and geological continuity. Drill spacing is deemed to be appropriate for this style of mineralisation.
	Whether sample compositing has been applied.	Some RC drilling utilised 4m composites for initial sampling of zones considered unlikely to host mineralisation. All samples were split at 1m intervals and where deemed appropriate, composited using a 75/25 riffle splitter. Where composite samples returned a gold value greater than 0.25g/t Au, the zone was re sampled using original 1 metre sample splits collected when the hole was drilled.
Orientation of data in relation to geological	Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.	Current interpretations of the mineralised zones in all areas indicate that the orientation of the drillholes has achieved unbiased sampling of the structures.
structure	If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.	An interpretation of the mineralisation has indicated that no sampling bias has been introduced to the drillholes reported herein.
Sample security	The measures taken to ensure sample security.	All samples are collected by GPR staff and put into numbered plastic bags, along with a corresponding sample ticket, which are immediately sealed and placed in order on a pallet with other samples in an area directly adjacent to the onsite sample preparation laboratory. The pallet containing the sealed samples is then delivered directly into the onsite sample prep lab, where chain of custody hands over to ITS Ltd.
Audits or reviews	The results of any audits or reviews of sampling techniques and data.	QAQC sample data is constantly collected and reviewed for each sample submission.



# **Section 2 Reporting of Exploration Results**

(Criteria listed in the preceding section also apply to this section.)

CRITERIA	JORC CODE EXPLANATION	COMMENTARY
Mineral tenement and land tenure status	Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.  The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.	Woodlark Mining Limited (WML) holds a 100% interest in Mining Lease 508, within which all reported resources in this report are located. WML is owned 95% by Kula Gold Limited (Kula), a Public Company incorporated in New South Wales, Australia, and 5% by Geopacific Resources Limited (Geopacific), a Public Company incorporated in Western Australia, Australia. Geopacific is the largest shareholder of Kula with an 85% holding. Geopacific's total interest in WML is 86%, which includes both the direct interest and the indirect interest through Kula.  Geopacific became the Project Manager in October 2016 and has been responsible for all activities on the Project since that time.  Mining Lease 508 was granted to Woodlark Mining Limited on the 4th of July 2014 and is valid for 21 years, renewable.
Exploration done by other parties	Acknowledgment and appraisal of exploration by other parties.	This report is primarily based on work done by Geopacific Resources Limited.
Geology	Deposit type, geological setting and style of mineralisation.	Most of Woodlark Island is covered by a veneer of Plio-Pleistocene limestones (coronus) of variable thickness with associated marine clays and basal conglomerates. A central elevated portion of the island (horst structure) contains Miocene volcanic rocks.  Gold mineralisation within the Woodlark Island Gold Project is principally hosted by andesites and their sub-volcanic equivalents within the Miocene age stratigraphic unit known as the Okiduse Volcanics. The mineralisation is variously associated with lodes, quartz veins, stockwork zones and breccias developed within proximal phyllic and marginal propylitic alteration envelopes regionally associated with intrusive breccia complexes. Gold mineralisation is consistent with low sulphidation, base metal carbonate, epithermal systems typical of the south-west Pacific.



CRITERIA	JORC CODE EXPLANATION	COMMENTARY
Drill hole Information	A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:  o easting and northing of the drill hole collar elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar dip and azimuth of the hole down hole length and interception depth hole length  If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.	This report does not refer to exploration results specifically.
Data aggregation methods	In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.	This report does not refer to exploration results specifically.
	Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.	Aggregated intercepts are not reported.
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	No metal equivalent values are reported.
Relationship between mineralisation widths and intercept lengths	These relationships are particularly important in the reporting of Exploration Results.  If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.  If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').	The orientation of drilling relative to strike and dip of mineralisation encountered suggests there is some variability to how perpendicular drillholes have intersected mineralised zones. All drilling attempts to intersect mineralised as close to perpendicular as is possible. All intercepts are downhole and not true width calculations.
Diagrams	Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.	Diagrams relevant to the report content are included in the body of the report.
Balanced reporting	Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.	This report does not refer to exploration results specifically.



CRITERIA	JORC CODE EXPLANATION	COMMENTARY
Other substantive exploration data	Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.	Additional information generated through the exploration process and through specific, targeted work programmes is utilised in the calculation of Resources and Reserves as set out in Sections 3 and 4 of Table 1.
Further work	The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).  Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	Exploration activities undertaken by Geopacific to date have identified numerous exploration targets that are actively being assessed. Geopacific intends to maintain an active exploration presence on Woodlark Island.



# **Section 3: Estimation and Reporting of Mineral Resources**

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

CRITERIA	JORC CODE EXPLANATION	COMMENTARY
Database integrity	Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.	Geopacific utilise a digital logging process for data collection that interfaces with a rigorous software auditing and tracking system that validates data entry prior to uploading to the database.  Pre-determined logging codes, internal meterage calculation and cross references plus unique sample number identifiers are all utilised to ensure the quality of input data.  Any modification of data once entered into the database is key stroke recorded by user name to ensure both accountability and ability to reverse changes if required.
		All data is re-validated by site geologists post merge with assay data against physical core and drill cuttings.
	Data validation procedures used.	Following importation, the data goes through a series of digital checks for duplication and non-conformity, followed by manual validation by the relevant project geologist who checks the collar, survey, assay and geology for errors against the original field data and final paper copies of the assays. The process is documented, including the recording of holes checked, errors found, corrections made and the date of database update.
		Basic validation checks are carried out to confirm the data is valid and acceptable to support resource estimation work. MPR Geological Consultants Pty Ltd ("MPR") reviewed the QA/QC results and Geopacific drilled twin holes to assess the veracity of the sampling and assaying of historical drilling.
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.  If no site visits have been undertaken indicate why this is the case.	Nicolas Johnson of MPR visited the Woodlark Gold Project in January 2018 to review the project geology and exploration field practices as part of the 2018 Mineral Resource update.
Geological interpretation	Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.	The confidence in the geological interpretation is considered to be good and is based on drilling and ongoing logging.
	Nature of the data used and of any assumptions made.	The drill hole database used for resource estimation consists of DD core and RC samples. Numerous validation steps have been taken by MPR and Geopacific Competent persons. MPR is of the opinion that the accepted drill hole database is of sufficient quality to support the estimation of Mineral Resources.
	The effect, if any, of alternative interpretations on Mineral Resource estimation.	The geology and interpretation of the deposits is considered robust. There is no apparent alternative to the interpretation in the competent person's opinion.



CRITERIA	JORC CODE EXPLANATION	COMMENTARY
	The use of geology in guiding and controlling Mineral Resource estimation.	The logging in the geological data base of lithology and weathering were considered during the mineralisation domain interpretations
	The factors affecting continuity both of grade and geology.	The infill drilling performed by Geopacific during the 2016 and 2017 drilling campaigns have increased confidence in grade and geology interpretations which are the basis for the Mineral resource estimation.
Dimensions	The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the	The Kulumadau Mineral Resources area extends over strike length of 650m and a plan width of 850m. Typical width of the gold mineralisation zones are up to 60 to 90m. Vertically, the Mineral Resource extends 280m from surface.
	Mineral Resource.	The Busai Mineral Resources area extends over strike length of 1,150m and a plan width of 660m. Typical width of the gold mineralisation zones are up to 40 to 60m. Vertically, the Mineral Resource extends 180m from surface.
		The Woodlark King Mineral Resources area extends over a strike length of 1,500m and a plan width of 300m. Typical width of the main zone of gold mineralisation is 40 to 60m. Vertically, the Mineral Resource extends 120m from surface.
		Munasi Mineral Resource area extends over a strike length of 650m and a plan width of 260m. Width of the main zone of gold mineralisation is 100m. Vertically, the Mineral Resource extends 130m from surface.
Estimation and modelling techniques	The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used.	MPR used the method of Multiple Indicator Kriging (MIK) with block support adjustment to estimate gold resources into blocks with dimensions of 20 m (east) by 25 m (north) by 5m (elevation). MIK of gold grades used indicator variography based on the two-metre resource composite sample grades. Gold grade continuity was characterised by indicator variograms at 14 indicator thresholds spanning the global range of grades. A block support adjustment was used to estimate the gold resources at Woodlark. The shape of the local block gold grade distribution has been assumed lognormal and an additional adjustment for the "Information Effect" has been applied to arrive at the final Mineral Resource estimates.
		MIK was used as the preferred method for estimation of gold resources at Woodlark as the approach has been demonstrated to work well in a large number of deposits of diverse geological styles. The gold mineralisation seen at Woodlark is typical of that seen in most structurally controlled epithermal gold deposits where the MIK method has been found to be of most benefit.
		In the MPR study data viewing, compositing and wire- framing have been performed using Micromine software. Exploratory data analysis, variogram calculation and modelling, and resource estimation have been performed using FSSI Consultants (Australia) Pty Ltd



CRITERIA	JORC CODE EXPLANATION	COMMENTARY
		(FSSI) GS3M software. GS3M is designed specifically for estimation of recoverable resources using MIK.
		The sample data set containing all available assaying were composited to two metre intervals each located by their mid-point co-ordinates and assigned a length weighted average gold grade. The composite length of two metres was chosen because it is a multiple of the most common sampling interval (1.0 metre) and is also an appropriate choice for the kriging of gold into the model blocks where open pit mining is expected to be undertaken on 2.5 metre benches.
	The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.	No modern mining data available.
	The assumptions made regarding recovery of by-products.	No by-products are present or modelled.
	Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).	No deleterious elements were estimated or assumed.
	In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.	Block dimensions of 20m (across strike) by 25m (along strike) by 5m (elevation) was chosen as it approximates the average drill hole spacing in the horizontal direction, with the 5m elevation being a multiple of the mining bench height of 2.5m. The interpolation utilised a 3-pass octant search strategy with search radii generally in the order of category 1 searching 20m and 25m in the x and y direction and 15m in the z direction, 16 minimum composites used, a maximum of 4 composites per octant and a minimum of 4 octants with data. Category 2 uses a 50% search distance increase but otherwise the same parameters and category 3 uses the same search distance as category 2 but only requires 8 minimum composites and only 2 octants require data. The search ellipse on each category is consistently orientated and orthogonal to drilling grid.
	Any assumptions behind modelling of selective mining units.	A block support adjustment was used to estimate the recoverable gold resources at each deposit. The shape of the local block gold grade distribution has been assumed lognormal and an additional adjustment for the "Information Effect" has been applied to arrive at the final Resource estimates. Selective mining unit assumed to be in the general range 4mE by 8mN by 2.5mRL.
	Any assumptions about correlation between variables.	No correlated variables have been investigated or estimated.



CRITERIA	JORC CODE EXPLANATION	COMMENTARY
	Description of how the geological interpretation was used to control the resource estimates.	The 2m resource composites were initially coded by the mineralisation domain interpretations and the resultant primary domain coding further subdivided using the weathering surfaces to form sub-domains. Sample composites in each primary and sub-domain combination were reviewed for their univariate and indicator statistics and spatial continuity and were the basis of grade modelling.
	Discussion of basis for using or not using grade cutting or capping.	The selection of the medians instead of means for the average grade of the highest indicator thresholds in each resource model were used to guard against a few higher grades within the population from having a disproportional influence on the gold estimation.
	The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.	The grade estimate was checked against the input exploration drilling/composite data both visually on section (cross and long section) and in plan at the time of creation.
Moisture	Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.	The resource tonnage is reported using a dry bulk density and therefore represents dry tonnage excluding moisture content.
Cut-off parameters	The basis of the adopted cut-off grade(s) or quality parameters applied.	The cut-off grade of 0.4g/t for the stated Mineral Resource estimate is determined from economic parameters that reflect the anticipated open pit mining and milling operation.
Mining factors or assumptions	Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.	The Resource model assumes open cut mining is completed and a moderate level of mining selectivity is achieved in mining. It has been assumed that high quality grade control will be applied to ore/waste delineation processes using RC drilling, or similar, at a nominal (and no greater) spacing of 5 metres by 8 metres and applying a pattern sufficient to ensure adequate coverage of the mineralisation zones.  This is consistent with MPR's experience at comparable gold mines.
Metallurgical factors or assumptions	The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding	Woodlark Mining undertook 16 separate metallurgical test programmes as part of the completion of the initial Woodlark Feasibility Study before GPR's involvement.  A full review of all metallurgical test work was undertaken by IMO Metallurgists on behalf of Geopacific, including some leach and floatation confirmatory tests.



CRITERIA	JORC CODE EXPLANATION	COMMENTARY
	metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical assumptions made.	Over 6 tonnes of new metallurgical drill sample material were submitted by Geopacific to ALS Metallurgical Laboratories, Perth for test work, which included leach variability profiling, gravity concentration / upgrading, comminution test work and floatation analysis.  Test work confirms that Woodlark ore is highly amenable to gold extraction by conventional CIP method and to being upgraded by gravity separation.
Environmental factors or assumptions	Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.	All resources are located on granted mining lease ML508.  A comprehensive environmental impact study was completed as part of the mining lease application and includes a proposed Deep-Sea Tailings Disposal option (DSTP).  The DSTP option was subject to a rigorous study and was approved and permitted by the government of PNG in 2014.
Bulk density	Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.	A substantial number of bulk density measurements for the Woodlark deposits have been collected as part of Geopacific's phases of exploration. Bulk density is determined using Archimedes principal on DD core samples.
Classification	The basis for the classification of the Mineral Resources into varying confidence categories.	Mineral resources were classified on the basis of estimation search passes. A progressively less stringent three pass search strategy produces the three categories of confidence. The highest confident estimate uses a search ellipse of approximately the same dimension of the dominant drill spacing and a significant number of resource composites selected from within an octant constraint. The search radii are expanded, and sample criteria relaxed for the second and third categories  At Kulumadau and Busai the current drill hole spacing, and historical data validation results supports Measured (search pass 1), Indicated (search pass 2) and Inferred (search pass 3) Mineral Resources to be reported.  At Woodlark King the estimation model relies on mostly historical RC drilling data which has yet to be fully validated by Geopacific and therefore only Indicated (search pass 1 and 2) and Inferred (search pass 3) Mineral Resources are reported.



CRITERIA	JORC CODE EXPLANATION	COMMENTARY
		Munasi estimation model is wholly reliant on relatively broad spaced historical data which has yet to be fully validated by Geopacific and no deposit specific density data available (Busai density data used), therefore, only Inferred (search pass 1, 2 and 3, combined) Mineral Resources reported.
	Whether appropriate account has been taken of all relevant factors (ie relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).	The Mineral Resource classification method which is described above has also been based on the quality of the data collected (geology, survey and assaying data), the density of data, the confidence in the geological models and mineralisation model, and the grade estimation quality.
	Whether the result appropriately reflects the Competent Person's view of the deposit.	The resource classification accounts for all relevant factors and reflect the competent person's views of the deposits.
Audits or reviews	The results of any audits or reviews of Mineral Resource estimates.	The Mineral Resource reported here was reviewed by Geopacific personnel, who have sufficient experience to be regarded Competent Persons for the purposes of reviewing Mineral Resources. An audit of the Mineral Resource is yet to be completed.
Discussion of relative accuracy / confidence	Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource 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 resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.	There is a moderate risk for tonnes above the cut-off grade due to the variable nature of gold mineralization, typical of epithermal gold deposits, exceeding the cut-off grade. The average grade of the deposit above the cut-off grade is sensitive to the treatment and volumes applied to high grades.  The resulting classification reflects the Competent Person's view of the deposit.
	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.	The precision of the estimation is globally acceptable with the assumption that at a mining level more detailed grade control drilling will be undertaken.
	These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	The geostatistical technique applied to estimate the Woodlark deposits is deemed appropriate for the anticipated mining method proposed.



# **Section 4 Estimation and Reporting of Ore Reserves**

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

CRITERIA	JORC CODE 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.  Clear statements as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.	The Measured and Indicated Resources from Section 3 for the Busai, Kulumadau and Woodlark King deposits, have been used as the basis for Ore Reserves.  The Mineral Resources are reported inclusive of the Ore Reserves.
	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	A site visit to Woodlark Island was undertaken during the period 21-25 January 2018 by John Battista (Principal Mining Consultant with Mining Plus and CP for Mining and Ore Reserves). All relevant areas of the Project were visited.  Site visits by representatives from Peter O'Bryan and Associates and Mincore Pty Ltd who were contributors to the studies have also been undertaken at various times.
	If no site visits have been undertaken indicate why this is the case.	See above.
Study Status	The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves.	The ore reserve is a result of a Feasibility Study completed for Kula Gold in October 2012 by Arccon Mining Services and further optimisation studies completed by a team consisting of Geopacific personnel and independent external consultants including Mincore Pty Ltd, Independent Metallurgical Operations Pty Ltd, Mining Plus, Peter O'Bryan and Associates and Lycopodium Minerals Pty Ltd. All work is completed to at least Pre-feasibility study level, with some components considered to be at Feasibility Study level.
	The code requires that a study to at least Pre-Feasibility Study level has been undertaken to convert Mineral Resource 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.	Work is ongoing to fully update studies to Feasibility Study level; this work will involve completion of detailed metallurgical test work and detailed processing plant and site infrastructure design. The studies to date have considered material Modifying factors and have determined the mine plan to be technically achievable and economically viable at the time of reporting. The mine plan involves the application of conventional open pit gold mining methods and mineral processing technologies that are widely utilised in Australia and PNG.
Cut-off parameters	The basis of the cut-off grade(s) or quality parameters applied.	Cut-off grade is calculated in consideration of the following parameters:  - Gold price  - Process recovery  - Operating Costs  - G&A costs



CRITERIA	JORC CODE EXPLANATION	COMMENTARY
		- Royalty costs
		An economic cut-off grade of 0.47 g/t Au was used for the purposes of pit optimisation to produce optimal shells that were the basis of the pit designs. Within these pit designs a cut-off grade of 0.3 g/t Au was used for ore reserve estimation purposes to allow for the inclusion of material between 0.3 g/t Au and 0.6 g/t Au used in the density beneficiation circuit.
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 Resource model which formed the basis for estimation of the Ore Reserve was used in a open pit optimisation process using Whittle software to produce a range of pit shells using operating costs and other inputs derived from all the mentioned studies. Mining costs were built up from a first principles cost model derived by Mining Plus, using inputs from both Geopacific and Mining Plus's internal databases.  The resultant optimal pit shells were then used as a basis for detailed pit and stage designs for each deposit. The
		Ore Reserves are the Measured and Indicated resources within the final pit designs for each deposit.
	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.	The mining method selected is open cut with conventional excavator and truck fleets. The open pits will be developed using multiple stage pit designs, all of which have been completed to a Pre-Feasibility study standard. Ramps are designed at 1 in 9 gradient, 20m wide except for lower pit levels and small sub-pits where the ramps are designed at 11m wide.
	The assumptions made regarding geotechnical parameters (e.g. pit slopes, stope sizes, etc), grade control and pre-production drilling The major assumptions made, and the Mineral Resource model used for pit and stope optimisation (if appropriate).	Preliminary (PFS-level) geotechnical studies have been completed by Peter O'Bryan and Associates. The resultant recommended pit design parameters have been used to determine the overall pit slope angle in the pit optimisations and the wall angles in the pit designs.  Grade control will be based on additional RC drilling and pit mapping and grade control has been allowed for in the pit optimisation input costs and financial modelling.
	The mining dilution factors used The mining recovery factors used Any mining widths used.	The geological block models used as a basis for Ore Reserves are MIK recoverable resource models and as such no additional mining dilution or recovery factors have been added. A minimum mining width of 20m has been used for the bottom of pits and for minimum cutback width.
	The manner in which Inferred Mineral Resources are utilised in mining studies and the sensitivity of the outcome to their inclusion.	Inferred Resources within the pit designs contains <5% of total gold resources and Inferred Resources have not been considered for Ore Reserve estimates.
	The infrastructure requirements of the selected mining methods.	The proposed mine plan will include waste rock dumps, ROM pads, surface haul roads to processing plant, pumping infrastructure, work shop facilities, technical



CRITERIA	JORC CODE EXPLANATION	COMMENTARY
		and administration facilities, explosives storage facilities and associated mine infrastructure.
Metallurgical factors or assumptions	The metallurgical process proposed and the appropriateness of that process to the style of the mineralisation.	The ore reserve will be processed through a Single stage primary jaw crusher, Semi Autogenous Grinding, Ball milling and Pebble Crushing (SABC) comminution circuit followed by conventional gravity and carbon in leach (CIL) process.
		During Year 3 of the mine plan a gravity upgrade plant will be added to upgrade ore between 0.3g/t Au and 0.6g/t Au and provide additional high-grade feed to the carbon in leach (CIL) circuit.
	Whether the metallurgical process is well-tested technology or novel in nature.	The metallurgical process is established and commonly used by Australian and International gold producers.
	The nature, amount and representativeness of metallurgical test work undertaken, the nature of the metallurgical domaining applied and the corresponding metallurgical recovery factors applied.	Multiple progressive stages of metallurgical test work have been completed on the Woodlark project for all deposits included in the reserve. This includes test work done in 1992/1993, 1996, 2010 to 2012 and 2017. The 2010 to 2012 test work programs were done by Ammtec and managed by RW Nice and Associates. All the test work was then reviewed by IMO Metallurgy and Lycopodium with further variability test work done in 2017 by ALS Metallurgy independently managed by Lycopodium.
		Test work programs have included comminution, gravity gold and intensive leach extraction, gravity upgrade, cyanidation leach and thickening and rheology test work.  Metallurgical recoveries of 92% have been applied to ROM ore from Kulumadau, Busai and Woodlark King.
	Any assumptions or allowances made for deleterious elements.	Some arsenic material has been identified in the eastern part of Busai pit at depth, this will mainly be processed in Years 9 & 10 (i.e. at the end of the mine life) and a significantly lower metallurgical recovery (77.35%) has been assumed for this ore.
	The existence of any bulk sample or pilot scale test work and the degree to which such samples are considered representative of the orebody as a whole.	In excess of 10 tonnes of metallurgical samples have been collected by diamond core for test work.  Additional metallurgical variability test work in the 2017 program was designed to enhance the understanding of variability in metallurgical performance, with respect to the orebodies under consideration.
	For minerals that are defined by the specification, has the ore reserve estimation been based on the appropriate mineralogy to meet the specifications?	No recoverable minerals are defined by specification in this case.



CRITERIA	JORC CODE EXPLANATION	COMMENTARY
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.	Environmental approval for the project, including the deep-sea tailings disposal option, was granted in 2014 by the PNG Department of Environment and Conservation (now the Conservation and Environment Protection Authority Department) with a validity of 20 years (expires 2034).  This followed completion of an Environmental and Social Impact Assessment prepared by Coffey Environments Pty Ltd underpinned by a range of studies completed by various subject matter experts addressing all environmental and social aspects of the project.  Studies include (but not limited to) surface water and groundwater, terrestrial, aquatic and marine ecology, geochemistry and acid mine drainage, meteorology, cultural heritage and archaeology, health, and social characterisation.  Environmental and social impacts were considered using a risk-based approach and mitigation plans developed.  An Environmental Management System is currently being developed and implemented in line with the requirements of ISO 14001.
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 is located on Woodlark Island.  The mining license area and easements for infrastructure have been granted.  Infrastructure to be constructed includes a wharf, roads, village relocation, accommodation camp, reverse osmosis and waste water treatment plants, workshops, technical and administration offices and power station.  Workforce will be made up of local islanders, fly-in fly-out (FIFO) PNG nationals and expatriate staff. Flights to Woodlark are expected to be scheduled commercial flights.
Costs	The derivation of, or assumptions made, regarding projected capital costs in the study.	The capital cost estimate has been developed by Mincore Pty Ltd through the collation of a number of first principle estimates on the completion of sufficient design works to provide bills of material to estimators, quotations from equipment providers and contracting companies and estimates carried out directly by the owner's team.  All capital costs have been estimated to a PFS level of confidence +/-25%.



CRITERIA	JORC CODE EXPLANATION	COMMENTARY
	The methodology used to estimate operating costs.	Mining operating costs were built up from first-principles by Mining Plus Ltd where the operating hours of all equipment were established and then costs applied for maintenance, tyres, labour and consumables. The mining operating costs over the life of the mine plan also include sustaining capital for replacement of equipment when required.
		Processing operating cost estimate was developed on a 'first principle basis', derived for the metallurgical data. The main cost drivers are the required power, labour and reagent consumption rates.
		All process operating costs have been estimated to a PFS level of confidence +/-25%.
	Allowances made for the content of deleterious elements.	No additional cost allowances have been made for arsenic material other than the lower assumed Au recovery of 77.35% for this ore.
	The source of exchange rates used in the study.	A USD:AUD exchange rate of 0.75 has been derived from corporate guidance and independent advice from reputable financial institutions.
	Derivation of transport charges.	Transportation costs have been estimated from a reputable bullion shipment organisation.
	The basis for forecasting or source of treatment and refining charges, penalties for failure to meet specification, etc.	Off-site transport and refining costs and PNG royalties have been allowed for in the overall gold price and selling cost assumptions. The PNG royalty is calculated as 2.25 % of revenue less transport and refining costs.
	The allowances made for royalties payable, both Government and private.	As above.
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.	Production and recovery for revenue calculations was based on detailed mine schedules, mining factors and cost estimates.
	The derivation of assumptions made of metal or commodity price(s), for the principal metals, minerals and coproducts.	A gold price of A\$1,650/oz has been used as the basis for the Ore Reserve. Revenue factors within the optimisation process were used to produce a range of nested optimisation shells to assist in the analysis and shell selection for pit design.
		Solely for the purposes of the Joint Venture between Geopacific Pty Ltd and Kula Gold Pty Ltd, a gold price derived from Consensus Economics using the average forecast gold price of the next eight quarters and the average exchange rate between USD and AUD also over the next eight quarters was used to determine a gold price of A\$1,694/oz to be used as the basis of reserve



CRITERIA	JORC CODE EXPLANATION	COMMENTARY
		calculations for determining whether the Joint Venture incentive target has been achieved.  No allowance has been made for revenue from any coproduct.
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.	There is a transparent quoted market for the sale of gold. The market for gold is well established and liquid and the price has varied in the past six months from a high of around A\$1,705/oz in February 2018 to a low around AU\$1,623/oz in October 2017. The spot price of gold has been around AU\$1,676/oz since mid-December 2017.
	A customer and competitor analysis along with the identification of likely market windows for the product.	No customer and competitor analysis were carried for the gold market.
	Price and volume forecasts and the basis for these forecasts.	No formal market assessment or forecast for the gold price has been undertaken.
	For industrial minerals the customer specification, testing and acceptance requirements prior to a supply contract.	No industrial minerals have been considered.
Economic	The inputs to the economic analysis to produce the net present value (NPV), the source and confidence of these economic inputs estimated inflation, discount rate, etc.	The initial Ore Reserve estimate is based on a PFS level of accuracy with inputs for mining, processing, sustaining capital and contingencies scheduled and costed to generate the initial Ore Reserve cost model.
	NPV ranges and sensitivity to variations in the significant assumptions and inputs.	The initial Ore Reserve returns a positive NPV based on assumed commodity price and the Competent Person is satisfied that the project economics that make up the initial Ore Reserve retains a suitable profit margin against reasonable future commodity price movements.
Social	The status of agreements with key stakeholders and matters leading to social licence to operate.	There has been extensive and ongoing community engagement over a number of years, including the completion of specialist studies as part of the Environmental and Social Impact Assessment process. A Compensation Agreement has been finalised and signed by all affected stakeholders, as has a Relocation Agreement for those people whose land will be impacted during project development. Geopacific enjoys a strong relationship with the communities on Woodlark Island and are committed to a local employment strategy and working with communities to ensure the project benefits extend beyond direct employment.
Other	To the extent relevant, the impacts of the following on the project and/or on the estimation and classification of the Ore reserves:	Water management will be crucial as the project is in a high rain fall area, this will need to be managed appropriately to prevent any flooding.



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	Any identified material naturally occurring risks.	
	The status of material legal agreements and marketing arrangements.	No material contracts or marketing arrangements are in place.
	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 regulations will be received within the timeframe anticipated in the Prefeasibility 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 permitted by the PNG Government, subject to meeting the conditions of the licence.  There are reasonable grounds to expect that future Government approvals will be granted and maintained within the necessary time frames for successful implementation of the project.
Classification		It is the opinion of the Competent Persons for Ore Reserves that the results are an appropriate reflection of the deposit.
	Whether the result appropriately reflects the Competent Person's view of the deposit.	Measured and Indicated Mineral Resources within the final pit design (which has been derived by applying appropriate Modifying Factors as described above) have been classified as Proven and Probable Ore Reserves
	The proportion of Probable Ore Reserves that have been derived from Measured Mineral Resources (if any).	respectively.
Audits or reviews	The results of any audits or reviews of Ore Reserve estimates.	No audits or reviews of the Ore Reserves estimate have been conducted to date.
Discussion of relative accuracy / confidence	Where appropriate a statement of the relative accuracy and confidence level in the Ore Reserve estimate using and 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.	<ul> <li>A current Mineral Resource estimate with approximately 95% of the plant feed inventory tonnage inside the final pit Mineral Resource classification inside the final pit designs being Measured or Indicated; this is considered sufficient to support a PFS.</li> <li>There are no unforeseen modifying factors at the time of this statement that will have any material impact on the Ore Reserve estimate.</li> <li>Geotechnical assessment is considered sufficient for a PFS, and allows progression to feasibility level</li> </ul>



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CHILLIA	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.  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.	<ul> <li>study, with more detailed geotechnical assessment to be completed in the next stage of study.</li> <li>The mine planning and scheduling assumptions are based on current industry practice, which are seen as globally correct at this level of study; with further work in the next level of study to understand any periodic cost fluctuations.</li> <li>The cost estimates and financial evaluation have been estimated by the project team with specialist consultants and team members, which are considered sufficient to support this level of study. The accuracy of the cost estimate is -25% to +25% and is in line with a Class 4 estimate under the AACE International Cost Estimate Classification guidelines.</li> <li>As part of the ongoing FS works, the project team will also engage with potential contractors in PNG to further confirm construction, mining and logistics costs, and to assist with the project execution planning.</li> </ul>