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8 December 2014

# Jervois Pre-Feasibility Study update

KGL Resources is pleased to announce a Pre-Feasibility Study (PFS) update for KGL's 100% owned Jervois copper project in the Northern Territory. The studies show Jervois as a technically and commercially feasible project with strong upside from additional planned drilling and metallurgical work.

Simon Milroy, Managing Director of KGL Resources commented "Jervois has been confirmed as a viable mid-sized, multi-metal mine. However, the opportunities to add value to the project before proceeding to development are too substantial to ignore. The opportunities at Jervois are demonstrated not only by the PFS to date, but also the continuing flow of exploration results that point to the potential for a larger and more valuable asset. Our declared strategy for Jervois includes attracting an equity partner into the project. It is important therefore that the project be presented in the best possible way to attract such a partner to contribute to the project's development. We are confident the work program announced today will be important in maximising the value of Jervois to shareholders."

The additional works program is targeting \$100m - \$200m of additional free cash flow over the life of the project in an optimised pre-feasibility study. At the completion of this additional work programme, we expect improved economic parameters for the project will have been realised and will be made available to the market. The cost of the additional work programme is estimated at \$2.7m and will be funded from existing cash reserves (cash at hand was \$12.7M as at the end of September).

## **Summary of Pre-Feasibility Study work to date**

- Based on Resources of 25.3Mt containing 280kt copper, 18Moz silver, 120kt lead/zinc and 113koz gold (includes inferred resources detailed in Table 2)
- Throughput estimated at 2 Mtpa over an initial 7 year mine life (4.5 years open cut)
- Production of approximately 21,000 t/pa copper and 1 million oz/pa silver in concentrate plus gold, lead and zinc
- Capex estimated at A\$189M including \$22M in contingency.
- Estimated C1 cash costs of US\$1.51/lb \*
  - \* (After by-product credits and using an exchange rate of A\$/USD 0.845 and silver price of USD 20/oz)

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.

## Significant upside identified

The Jervois project's value can be significantly increased by further drilling and metallurgical work aimed at:

- Increasing resources/reserves and mine life
- Increasing recoveries
- Reducing operating costs and
- Reducing capital costs.

#### **Planned Work**

The PFS work to date has shown that the development of a copper mine and concentrator is technically and commercially feasible. Only exploration results received prior to July 2014 were included in the resource update used as the basis of the PFS. Since then, further high grade drill results have been received, including the highest silver grade recorded at Jervois (1m @ 2350 g/t silver from 19m Hole JOC266 at Reward) and more gold intersections (including 28m @ 2.49 g/t gold from 2m Hole JOC268 at Reward) within the proposed open pit at Reward.

Studies highlight that the project's value can be increased greatly by further drilling and metallurgical studies. Therefore, the Board has approved a further work program following which the PFS will be updated to include all of the additional improvements identified.

The program can be subdivided into:

- drilling to increase the resources and reserves in both open pit and underground areas, and
- metallurgical improvements to potentially increase the recoveries and reduce capital and operating costs.

# **Additional Resource Drilling**

The planned drilling program will incorporate the following:

- Optimising the Marshall Reward, Bellbird and Green Parrot open pits. The ore bodies
  remain open along strike and down dip in numerous areas in these pits. Further shallow
  drilling is likely to increase the size of the open pits which will increase the number of years
  that the Jervois project is an open pit only operation. Increasing the open pit mine life also
  has the secondary benefit of delaying the expenditure of the capital required to develop
  the underground mines.
- Additional shallow drilling around Rockface, Rock Hole and Cox's Find to delineate additional ore and include these resources in the mining schedule.
- Drilling in the gap between the southern end of the Marshall deposit and the Northern end of the Green Parrot deposit.
- Additional drilling around the Morley deposit.
- In-filling the gap in the resource at the southern end of the Marshall deposit. Currently high grade stopes are planned both above and below this area, hence it is likely that additional drilling will add high grade resources in this area.
- Bellbird central underground Further drilling in this area is likely to add high grade stopes.
- Further drilling at Bellbird north is likely to increase the lead–zinc resources in this area and possibly define some ore that could be mined by open pit.
- At Marshall, further drilling around the margins of the high grade stopes is likely to extend these stoping areas which would require no additional development to access them.
- The recent DHEM survey suggests that the two areas of high grade silver, lead and zinc ore
  at Marshall are likely to link up. Additional drilling between these areas is likely to increase
  the silver-lead-zinc resources.

# Metallurgy

The flow sheet was assembled from unit processes used throughout the minerals processing industry in general and commonly used in copper flotation. The process plant will utilise a conventional comminution processing line comprised of a primary crusher followed by a SAG mill operating in closed circuit with a classifying cyclone cluster (with provisions for pebble crushers being installed in the future). The flotation circuit design, consisting of rougher flotation and cleaning flotation is based on reasonable flotation test work.

The remaining unit processes in the flow sheet such as concentrate thickening, concentrate filtration, tailings thickening, tailings disposal and air and water services were typically based on design data from similar plants and are considered by AMEC to be reasonable at the level required for a PFS.

The metallurgical recoveries used in the PFS to date are shown in **Table 1**. Further metallurgical test work is expected to result in increased precious metal recoveries.

Metal	Marshall- Reward	Bellbird
Copper	92.0%	89.2%
Silver	60.0%	62.9%
Gold	53.5%	53.1%

Table 1. Metallurgical Recoveries

# **Additional Metallurgical Test work**

- Metallurgical test work to date has focussed on the recovery of copper from the ore.
   Conducting some additional test work to optimise the recovery of silver and gold through the use of precious metal specific collectors and promoter reagents is likely to enhance the recovery of precious metals to the concentrate.
- Examination of the production of a bulk lead-zinc concentrate. Currently the PFS envisages spending an additional \$35\*M in the third year of operations to modify the plant to produce separate lead, zinc and copper concentrates. Recent discussions with smelters and traders have suggested that there is demand for a mixed lead-zinc concentrate. The benefit of this is that fine grinding would not be required to separate the lead from the zinc, hence the capital and operating costs would be greatly reduced. It would also mean a substantial reduction in the additional requirement for flotation cells, storage tanks, reagents and concentrate filters.
  - If the circuit was built to produce a mixed lead-zinc concentrate, then this would be installed at the start of the operation which would have the beneficial effect of bringing forward the cash flows from the later years and defer processing of low grade stockpiles.
- Further metallurgical test work will be conducted on some fresh samples of the transitional ore which occurs near the surface. Improvements in metallurgical recoveries from this ore will add substantial additional concentrate production and revenues.

# **Geotechnical Drilling and Design**

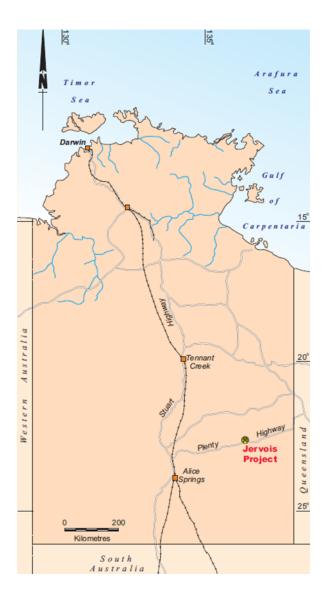
A geotechnical drilling programme will be undertaken with the aim of improving the designed open pit wall angles. Given the extensive length of the pit walls, small increases in the pit wall angle have the potential to result in substantial reductions in the volume of waste to be mined.

<sup>\*\$</sup> indicates Australian dollars throughout this announcement

The Jervois Project is located approximately 300km north east of Alice Springs (**Figure 1**). The work in the PFS to date investigates open pit mining of several deposits followed by underground mining to feed a 2 Mtpa flotation plant producing 80-100,000 tpa of copper concentrate plus separate lead and zinc concentrates.

The project is forecast to produce a total of 576,000 tonnes of copper concentrate at a grade of approximately 24% copper and 240 g/t silver. This equates to approximately 21,000 tonnes per annum of contained copper and 1 million ounces per annum of contained silver. The Jervois project will also produce approximately 71,000 tonnes of lead concentrate at a grade of 65% lead and 1,440 g/t silver and 29,000 tonnes of zinc concentrate at a grade of 55% zinc over the life of mine.

Figure 1 Jervois Location Map



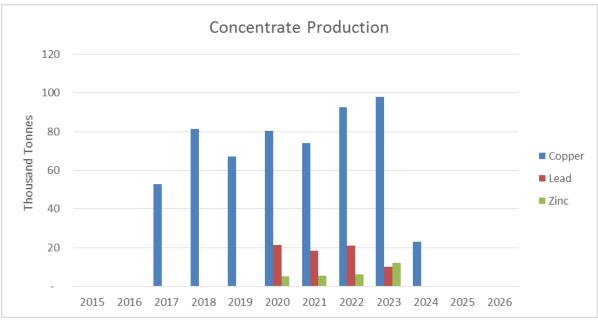


Figure 2 Jervois Concentrate Production

The following companies and consultants contributed to the PFS:

- Geology KGL Resources
- Mineral Resources H&S Consultants
- Geotechnical Peter O'Bryan & Associates
- Open Pit and Underground Mining Auralia Mining Consulting
- Metallurgy AMEC & ALS Ammtec Metallurgy
- Process plant AMEC and Lycopodium
- Infrastructure Lycopodium
- Waste rock geochemistry Knight Piesold
- Tailings management, water management and related infrastructure Knight Piesold
- Environmental, social and permitting Environ & KGL Resources
- Transport and concentrate marketing Solution Development
- Capital and operating cost estimates Lycopodium

The PFS is based on an indicated and inferred resource of 25.3 Mt containing 280,000 t copper, 18.0 Moz silver, 120,000 t lead / zinc and 113,000 oz gold. Refer to **Table 2**.

The Mineral Resources underpinning this production target have been prepared by a competent person in accordance with the requirements of Appendix 5A JORC Code. The mining inventory on which the production target is based is derived from 62.5% indicated resources and 37.5% inferred resources.

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.

The site layout of the project is shown in **Figure 3**.

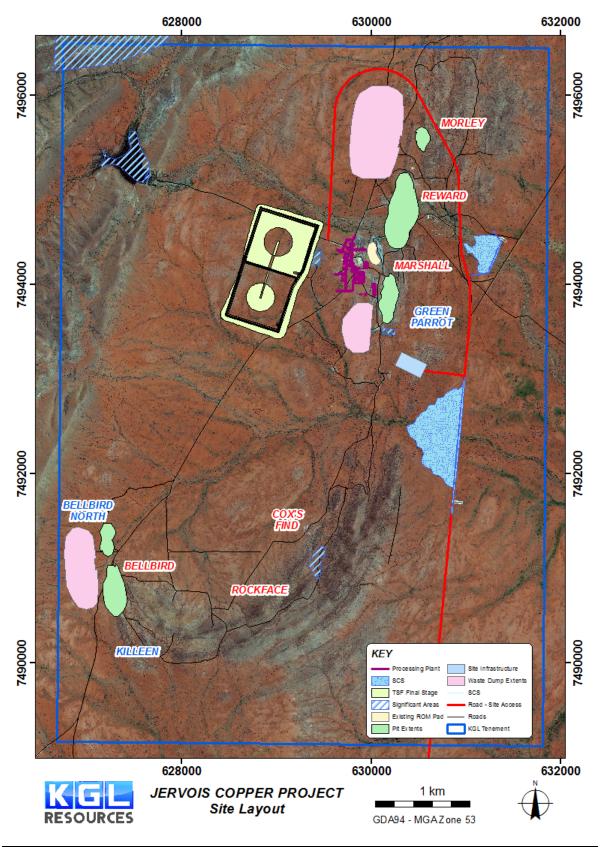


Figure 3 Site Layout

#### History

Copper was discovered at Jervois in 1929 during mustering of stray cattle. In the 1950s, leases covering the area were acquired by Kurt Johannesen, who mined copper carbonate ore on a small scale for the fertiliser industry and later as a flux in the smelting process at Mount Isa. The first modern exploration was conducted by New Consolidated Goldfields (Australasia) Pty Ltd from 1961 – 1965. Exploration continued sporadically through to 1980 when the project was acquired by Plenty River Mining.

A treatment plant designed to treat Green Parrot lead-zinc-copper-silver ore was completed in early 1982 but was placed on care and maintenance within 12 months following a sharp decline in the lead price. Over the next 20 years a succession of companies conducted exploration at Jervois including Normandy Poseidon and MIM Exploration. In 2004, the project was acquired by Reward Minerals who sold it to Jinka Minerals (a 100% owned subsidiary of KGL) in 2011. KGL has conducted drilling programs each year since the acquisition and has steadily increased the resource.

#### Geology

The Jervois project is located on two Mineral Licences (ML 30180 and ML 30182) located within EL 25429. Base metal mineralisation at Jervois is hosted by a lower-to-middle amphibolite grade metasedimentary sequence of the Bonya Schist. The Bonya Schist is a unit in the Aileron Province of the Palaeoproterozoic eastern Arunta Region. The base metal mineralisation at Jervois is stratabound and contained within steeply dipping lenticular bodies (lodes) of calc-silicate, garnet-chlorite-magnetite rock and garnet magnetite quartzite, within a thick succession of spotted andalusite-cordierite schist and quartzsericite- magnetite schist. The mineralised sequence has a strike length of some 12 km and a stratigraphic thickness up to about 600 m.

#### Resource

H&S Consultants Pty Ltd (H&SC) completed resource estimates for the project in August 2014 (**Table 2**). A total of five deposits comprise the resource, Marshall-Reward, Green Parrot, Bellbird including Bellbird North, Rockface, and Cox's Find. The updated resource estimates are derived using historical drilling data in combination with new data generated during the 2013 – 2014 drilling campaign which comprised 282 holes for +40,000 m of RC and diamond drilling. The new drilling focussed on extending the resource and delineating oxidised and non-oxidised zones within the resource.

Modelled gold grades have been included as part of the Marshall-Reward and Bellbird (including Bellbird North) resource estimates. The amount of historical gold data is limited and as a result, the gold resource estimate is classed as Inferred. A global gold inferred resource for the two deposits stands at 21.4 Mt at 0.16 g/t totalling 113,000 oz for a copper cut-off of 0.5%.

Exploration potential exists peripheral to the new resource estimates within the current interpreted mineral wireframes. The Exploration Target for the combined Bellbird and Marshall-Reward zones for a 0.5% Cu cut-off is of the order of 5-12 Mt at 1-1.3% Cu, 12-20 ppm Ag for 50,000 to 150,000 tonnes of copper, and 2-7 Moz of Ag (**Figure 4**)\*.

<sup>\*</sup>The potential quantity and grade of the Exploration Potential is conceptual in nature, and there has been insufficient exploration to define a Mineral Resource in these areas.

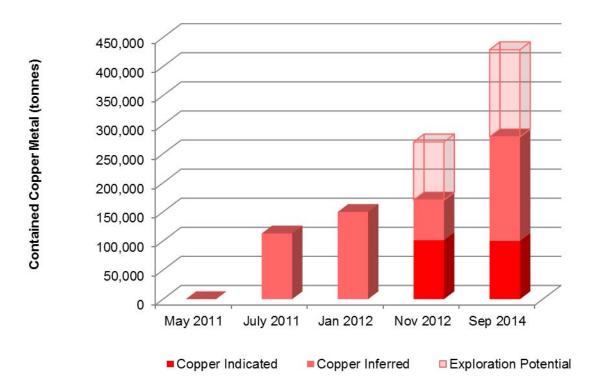


Figure 4 . Growth in Contained Copper at Jervois

The deposits are open at depth, and there are additional targets along strike based on isolated drill hole information and interpretations from the SAM EM geophysical survey.

Table 2 2014 Jervois Resource Estimate

Jervois	Category	Tonnes	Copper	Silver	Lead	Zinc	Copper	Silver	Lead	Zinc	Cut-off
<b>Copper Resources</b>		Mt	%	g/t	%	%	kt	Moz	kt	kt	Cu%
Marshall	Indicated	1.2	1.52	38.7			18	1.5			0.5
Copper	Inferred	0.4	1.18	26.2			5	0.3			0.5
Reward	Indicated	3.7	1.11	24.8			41	3.0			0.5
Copper	Inferred	6.8	1.08	26.5			73	5.8			0.5
East Reward	Inferred	2.3	1.01	8.3			23	0.6			0.5
Bellbird	Indicated	3.2	1.21	7.8			39	0.8			0.5
	Inferred	4.0	1.25	7.8			50	1.0			0.5
Cox's Find	Inferred	0.7	0.87	2.8			6	0.1			0.5
Rock Face	Inferred	0.7	0.82	3.1			6	0.1			0.5
<b>Green Parrot Cu</b>	Inferred	0.2	1.49	44.3			3	0.3			0.5
TOTAL	Indicated	8.1	1.21	20.1			98	5.3			
	Inferred	15.0	1.10	16.9			165	8.2			
	TOTAL	23.2	1.14	18.0			263	13.4			
Jervois	Category	Tonnes	Copper	Silver	Lead	Zinc	Copper	Silver	Lead	Zinc	Cut-off
Lead/Zinc Resources		Mt	%	g/t	%	%	kt	Moz	kt	kt	Cu%
Marshall-Reward	Indicated	0.3	0.71	63.7	6.33	0.94	2	0.6	18	3	None
Lead/Zinc	Inferred	0.5	0.58	75.7	7.09	1.18	3	1.3	38	6	None
<b>Green Parrot Pb</b>	Inferred	0.9	0.90	85.3	1.91	1.21	8	2.3	16	10	0.3
Bellbird North	Inferred	0.5	0.65	21.3	2.30	3.38	3	0.3	11	17	0.2
TOTAL	Indicated	0.3	0.71	63.7	6.33	0.94	2	0.6	18	3	
	Inferred	1.9	0.75	65.9	3.49	1.76	14	4.0	66	33	
	TOTAL	2.2	0.74	65.6	3.87	1.65	16	4.6	84	36	
20110 1: 1		27.2	l				200	10.0		2.0	
2014 Combined	TOTAL	25.3					280	18.0	84	36	
2012 Combined	TOTAL	13.7					170	11.2	26	22	
2014/2012	% Variance	85%					64%	61%	225%	63%	

<sup>\*</sup>These tables may contain minor rounding errors

#### Mining

Open Pit Mining is proposed in three locations - Marshall-Reward, Green Parrot and Bellbird, as shown in **Figure 5**. The life of mine waste to ore stripping ratio for the open pits is 6.5 : 1. Open pit mining continues for the first four and a half years of the mine life as shown in **Figure 5**.

The surface mining schedule utilises a 150 t truck fleet and a 90 t truck fleet for the first 15 months of mine life, after which the 150 t fleet is decommissioned and the remainder of the open pit mining inventory is mined using the 90 t fleet. Mining has been scheduled to start three months prior to process plant commissioning to ensure sufficient ore stock is available to maintain a throughput rate of 2.0 Mt/a.

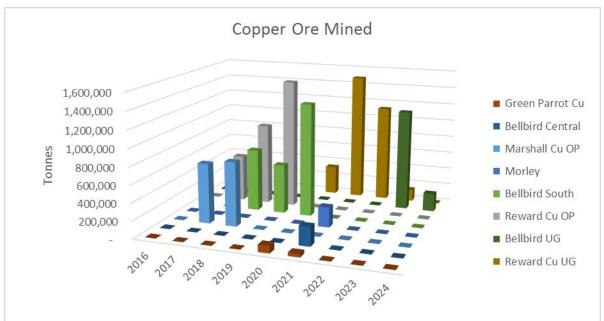


Figure 5 Copper Ore Mining Schedule

Underground mining is scheduled to commence in the fourth year of operations. Long Hole Open Stoping (LHOS) was selected as the most suitable method to mine the underground deposits at the Jervois Project. Other mining methods investigated during the PFS work included Sub-Level Open Stoping (SLOS) and Benching. Both of these mining methods may still be suitable to exploit specific areas of the underground reserve and as such will be considered during future work. The nominal level spacing is 30 m from floor to floor. Stope heights range from 20 to 40 m in a few select stopes (Figure 6 and Figure 7).

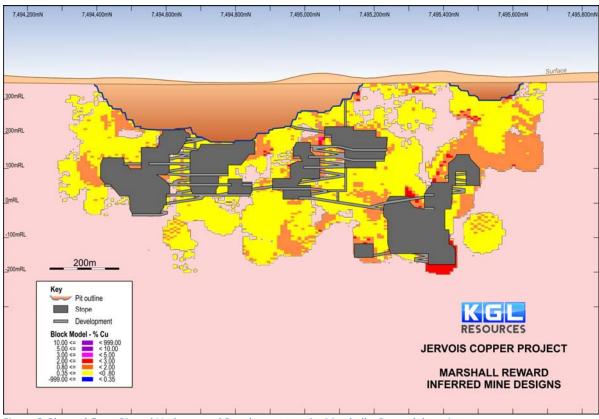


Figure 6 Planned Open Pit and Underground Development at the Marshall – Reward deposit

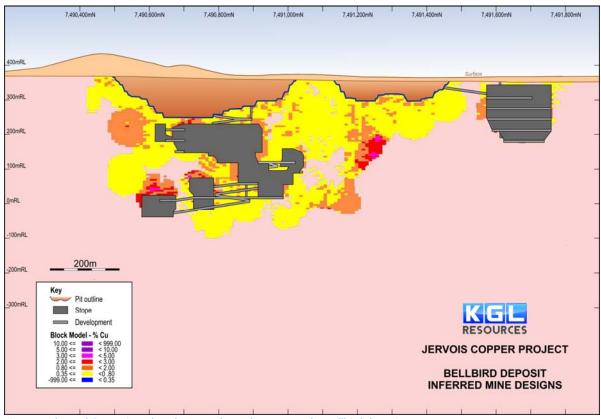


Figure 7 Planned Open Pit and Underground Development at the Bellbird deposit

The Jervois Project will utilise standard underground mining equipment. The scale of the project leads to the selection of larger equipment with twin boom jumbos used to develop all headings. 17 t LHDs will be used to remove blasted rock from all development headings and stopes. Where required, these LHDs will also be used to backfill stopes with aggregate fill and potentially

cemented fill. 50 – 60 t trucks will be required to transport the broken rock from underground to the surface stockpile or waste dump.

A large long-hole rig will be used to drill all production holes. The primary production fleet will be supported by a dedicated charge-up unit, integrated tool carriers and a grader. Ground control in the proposed stopes will come via a combination of installed ground support in the form of cable bolts, pillars being left in the narrower or lower grade areas of stopes and backfill, and either cemented or aggregate fill depending on the location of stopes.

Stoping will generally commence from the upper stopes and progress down, although this process may be reversed in certain stoping areas to allow backfill, or due to other operational constraints. Overall stope ore losses are expected to be 9% (from island and sill pillars and some stope under break). Mining dilution of 10% is expected during the underground mining operations.

#### Silver-Lead-Zinc Ore

In addition to the copper ore, silver-lead-zinc ore is also present and is mined during the open pit and underground operations as shown in Figure 8.

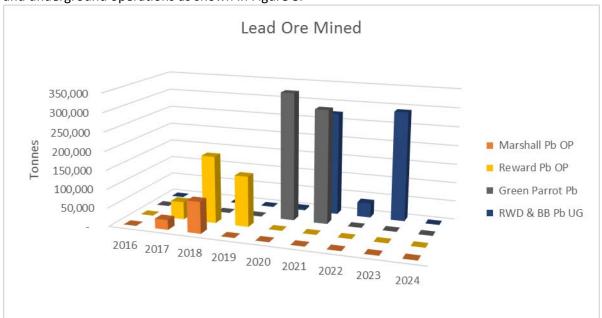


Figure 8 Silver–lead–zinc Mining Schedule

The PFS assumes that the silver - lead - zinc ore will be stockpiled until the additional plant facilities required to process this ore type have been commissioned in Year 4. During the life of the project a total of 100,000 tonnes of lead and zinc concentrates are produced.

#### Metallurgy

The proposed flow sheet utilises unit processes commonly used in copper ore flotation operations (Figure 9). The process plant will comprise primary crusher followed by a SAG mill operating in closed circuit with classifying hydro cyclones (with provision for installation of a pebble crusher in the future). Following size reduction, copper concentrate is produced in a flotation circuit comprising rougher and cleaner flotation. Copper concentrate is thickened and filtered while final tailings is thickened before it is pumped to the tailings storage facility.

Provision of ancillary services such as air and water are based on design data from similar plants. The remaining unit processes in the flow sheet such as concentrate thickening, concentrate filtration, tailings thickening, tailings disposal and air and water services were typically based on design data from similar plants and are considered by AMEC to be reasonable at the current study's level of accuracy.

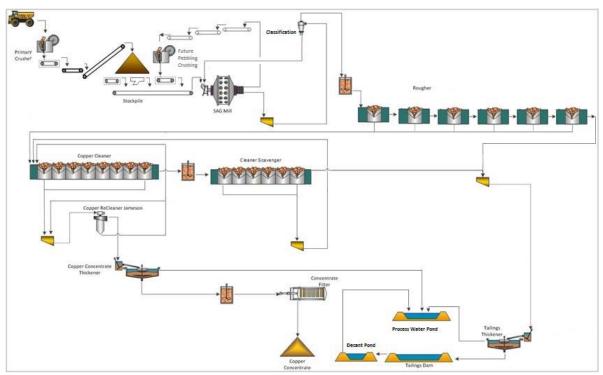


Figure 9 Flow sheet for the copper concentrator

The proposed plant feed schedule is shown in Figure\_10.

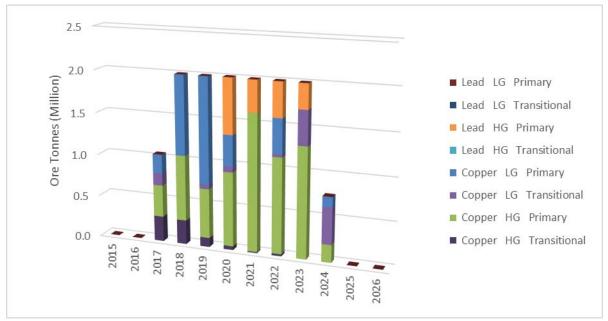


Figure 10 Plant Feed Schedule

#### **Permitting**

Project referral documents were submitted in 2013 to the Federal Department of the Environment and the Northern Territory Environmental Protection Agency (EPA) to determine the impact assessment process for the project. The Jervois Copper Project will be assessed at the level of Environmental Impact Statement (EIS) by the NT EPA. No matters of national environmental significance were deemed likely to be impacted by the project and as such, there will be no federal involvement in the impact assessment process.

Project specific Terms of Reference for the EIS have been issued by the NT EPA. Baseline studies for the Jervois Project area have been undertaken. Additional baseline information continues to be collected as part of the project development process.

Discussions are taking place with the Central Land Council regarding land access, future relationships with the local communities and benefits arising from the project including commitments to local indigenous employment and contracting opportunities.

#### **Concentrate Transport**

The concentrate transport study concluded that the use of sealed half height containers was the cheapest and safest method to transport the concentrate from site to Darwin. The sealed half height containers will be trucked to Alice Springs and then transported by rail to either Darwin or Adelaide for export to Asian smelters. This process will eliminate the need for any intermediate enclosed warehousing at both Alice Springs and at the export port.

#### **Concentrate Marketing**

The copper concentrate produced at Jervois is expected to contain approximately 24% copper, with the only significant penalty element being bismuth. Contained bismuth is likely to attract a minor penalty of approximately \$1M/pa.

## **Capital Cost**

The initial capital cost for the project is \$189M as detailed in Table 3.

	\$M
Processing Plant	101.8
Infrastructure	21.8
Tailing Storage Facility	10.5
EPCM	20.9
Owners Costs (Incl. First Fill and Spares)	11.4
Contingency	22.6
Total	189

Table 3 Capital Cost

In addition to the initial capital cost, expenditure of an additional \$34.6M is planned in year 3 of the operation to install additional equipment required to process lead-zinc-silver ore.

# **Operating Cost**

The estimated C1 cash cost over the life of the mine is US\$1.51/lb copper.

(After by-product credits and using an exchange rate of A\$/USD 0.845 and silver price of USD 20/oz)

The estimated processing and administration operating cost is \$21.69/tonne of ore with a breakdown of the costs shown in **Table 4**.

Operating Costs	A\$/ year	A\$/ Tonne of Ore
Power	\$17.57M	8.79
Labour	\$7.70M	3.85
Consumables	\$7.28M	3.64
Maintenance	\$3.60M	1.80
G&A	\$5.03M	2.51
Laboratory	\$2.20M	1.10
Total	\$43.38M	21.69

Table 4 Operating Cost per tonne of ore

The further work programme is expected to deliver a considerable uplift in the project economics through the addition of high grade resources, increases in metallurgical recoveries, reductions in

capital and operating costs and the reduction in total waste mined. Full economics for the project will be released at the completion of the additional work programme. This program is targeting an additional free cash flow of \$100m -\$200m over the life of the project.

A power cost of \$0.27/kWh has been estimated, based on vendor proposals received for a 15 MW compressed natural gas-fired power station operating under a build own operate agreement.

Water will be supplied from a bore field near the site.

## Schedule

The project schedule is shown in Figure 11. Commencement of construction is envisaged in mid 2016 followed by commissioning of the project in the 4<sup>th</sup> quarter of 2017.

Activity		2014			2015				2016				2017			
		Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Resource Drilling (Phases 2, 3 & 4)																
Resource Updates			•			<b>♦</b>										
PFS																
Environ & Statutory Approvals																
Metallurgical Drilling																
Additional Metallurgical Testwork & DFS Definition																
DFS																
FEED																
EPC																
Pre-strip / Mining Production																
Commissioning																
Start-up																

Figure 11 Project Schedule

#### For further information contact:

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# **About KGL Resources**

KGL Resources Limited is an Australian mineral exploration company focussed on increasing the high grade Resource at the Jervois Copper-Silver-Gold Project in the Northern Territory and developing it into a multi-metal mine.

# **JORC Compliance Statement**

The Jervois Resources information was first released to the market on 15 September 2014 and complies with JORC 2012. The company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. The company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement.'

The Jervois Exploration data in this report is based on information compiled by Martin Bennett, who is a member of the Australian Institute of Geoscientists and a full time employee of KGL Resources Limited.

Mr. Bennett has sufficient experience which is relevant to the style of the mineralisation and the type of deposit under consideration and to the activity to which 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. Bennett has consented to the inclusion of this information in the form and context in which it appears in this report.

Add additional competent persons statements.

The following drill holes were originally reported on the date indicated and using the JORC code specified in the table. Results reported under JORC 2004 have not been updated to comply with JORC 2012 on the basis that the information has not materially changed since it was last reported.

Hole		Date originally Reported	JORC Reported Under
JOC	266	24/11/2014	2012
JOC	268	24/11/2014	2012