ASX ANNOUNCEMENT

23 May 2019

5 Mtpa Scoping Study Further Strengthens the Economic Potential of the Manono Lithium & Tin Project

Highlights

- Extended Scoping Study for 5 Mtpa further strengthens the economics potential for a world class, high margin, long life mining project.
- Includes the recently updated Mineral Resource of combined Measured and Indicated Resources of 269.0 Mt grading 1.65% Li_2O.
- Includes Independent Transport Study completed by Alistair Group.
- The potential for tin by-product credits was not taken into consideration in this analysis. These credits will be included in the DFS.

Cautionary Statements: Scoping Study Parameters

The Scoping Study referred to in this announcement has been undertaken to determine financial aspects of potential future operations at the Manono Lithium and Tin Project and to help drive future work programs. It is a preliminary technical and economic study of the potential viability of the Manono Lithium and Tin Project. It is based on low level technical and economic assessments that are not sufficient to support the estimation of Ore Reserves. Further exploration and evaluation work and appropriate studies are required before AVZ Minerals Limited (AVZ) will be in a position to estimate any Ore Reserves or to provide any assurance of an economic development case.

All costings and projections in financial modelling were prepared based on Measured Resources (26.75%), Indicated Resources (40.5%) and Inferred Resources (32.75%) as announced by AVZ on the 8th May 2019[1]. The Company has concluded that it has reasonable grounds for disclosing the economic assessment or production target that includes a modest amount of Inferred material. However, 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 Measured or Indicated Mineral Resources or that the production target or the economic assessment will be realised. Furthermore, there is no certainty that further exploration work will result in the conversion of Measured and Indicated Mineral Resources to Proven and Probable Ore Reserves.

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[1]*Announcement dated 8th May 2019: Significant Upgrade in Measured & Indicated Mineral Resource*

AVZ Minerals Limited
Level 2, 8 Colin Street
West Perth WA 6005
Australia

T: + 61 8 6117 9397
F: + 61 8 6118 2103
E: admin@avzminerals.com.au
W: www.avzminerals.com

ABN 81 125 176 703

Market Cap
$118 M

ASX Code: AVZ

The Scoping Study is based on the material assumptions tabulated below. These include assumptions about the availability of funding. While AVZ considers all of the material assumptions to be based on reasonable grounds, there is no certainty that they will prove to be correct or that the range of outcomes indicated by the Scoping Study will be achieved.

To achieve the range of outcomes indicated in the Scoping Study, funding in the order of approximately $380M to $400M ***(C5 ±35% and includes US$78m contingency)*** *will likely be required for the 5 Mtpa (Case 2).*

Investors should note that there is no certainty that AVZ will be able to raise the amount of funding for Case 2. It is also possible that such funding may only be available on terms that may be dilutive to or otherwise affect the value of AVZ's existing shares.

It is also possible that AVZ could pursue other 'value realisation' strategies such as a sale, partial sale or joint venture of the project. If it does, this could materially reduce AVZ proportionate ownership of the project.

Given the uncertainties involved, investors should not make any investment decisions based solely on the results of the Scoping Study.

SUMMARY OF FINDINGS

5 Mtpa – Case 2

- 5 Mtpa (Case 2) pre-tax, pre-royalties, NPV_{10} of approximately US$2.63 Billion (Bn) *(AVZ's 60% share is approximately US$1.55Bn)* with an estimated IRR greater than 64% based on ±35% accuracy and including US$78M in capital contingency.

- 5 Mtpa Scoping Study is based on concentrate sale price assumed at US$750 per tonne (t).

- Scope for annual production of approximately 1.1 million tonnes per annum (Mtpa) at a minimum of 5.8% Li_2O concentrate from throughput of 5 million tonnes per annum (Mtpa) (Case 2) with an average strip ratio of 0.55:1.

- The economies of scale have resulted in an even lower strip ratio of 0.55:1 and a subsequent 24% drop in mining and processing costs from US$120/t to US$91/t.

- The Scoping Study has yielded an exceptional and industry leading IRR of 64% having used a more conservative Li_20 price to reflect market changes in the last 7 months.

- F.O.B. Operating costs to Dar es Salaam estimated at approximately US$323 per tonne (t) of concentrate for 5 Mtpa.

- The preferred transport route has been updated and costs now estimated at US$223/t. The route and costs will be further refined during the DFS program. However, the scale and quality of the mining operation, with low mining and processing costs, allows the project to easily bear the estimated relatively high transport cost.

- Metallurgical test work indicates recoveries of plus 80% are achievable.

- Capex for the 5 Mtpa (Case 2) throughput estimated at approximately US$380 to $400 Million *(accurate to ±35% and includes US$78M contingency)*.

AVZ Minerals Limited (ASX:AVZ) **"AVZ"** or **"the Company"** is pleased to announce the extended results of the Scoping Study (Study) for 5 Mtpa capacity on the Manono Lithium and Tin Project (Manono Project) in the Democratic Republic of Congo (DRC).

The Independent Study was undertaken by CPC Project Design Pty Ltd (CPC). In addition, an independent economic model & financial analysis was undertaken and completed by Alan Dickson & Associates Pty Ltd (ADA). Both documents utilised Measured, Indicated and Inferred Resources as the basis for completion.

The Independent Transport Study was undertaken by Alistair Group.

AVZ Minerals Managing Director, Nigel Ferguson, said that "Not only does the results of the 5 Mtpa (Case 2) study confirm the excellent quality of the Manono Project, it further underlines the expandability of the project. Management will now turn its attention to selecting the optimal throughput level in conjunction with consultants working on the DFS."

Robust Financial Outcomes

Key outcomes of the Study for the 5 Mtpa (pre-tax and pre-royalties) NPV_{10} are based on the following parameters, as per Table 1 below. Estimates presented in Table 1 are on the basis of a 100% project interest. AVZ holds 60% of the Manono Lithium and Tin Project ("Manono Project").

Parameter Value	5 Mtpa
Potential Mine Life (Years) As Modelled	20
Measured Resources (t)	107 M
Indicated Resources (t)	162 M
Inferred Resources (t)	131 M
Annual throughput (Mtpa)	5.0
Strip ratio (t waste : t mill feed)	0.55:1
Average diluted feed grade (%Li_20)	1.51
Recovery (%)	80.9%
Annual Production Target (5.8% Li_20 concentrate - rounded down)	1.1 M
Open pit mining costs (US$/t dry concentrate)	33
Processing cost (US$/t dry concentrate)	58
Transport cost (US$/t dry concentrate)	223
Administration & sustaining capital costs (US$/t dry concentrate)	9
Average Cash Cost (US$/t concentrate)	323
Concentrate Price (US$/t)	750
Accuracy	±35%
Contingency (US$)	78M

Table 1 Study Key Operating Parameters

Notes to Table 1 Study Key Operating Parameters

1. *Estimates are based on the lithium extract operations only. The Study excludes the potential for tin by-product credits as these were not taken into consideration in this analysis.*
2. *Estimates presented in Table 1 are on the basis of a 100% project interest. AVZ holds 60% of the Manono Project.*
3. *The Mineral Resource estimate reported in accordance with the JORC Code 2012 Edition and announced on 8th May 2019 forms the basis of the mining and financial estimates referred to in this announcement.*
4. *The Scoping Study utilised the Measured, Indicated and Inferred tonnages as the basis for completion. Inferred Mineral Resources do not determine the economic viability of the Manono Project as assessed in this Scoping Study. 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.*
5. *Technical and economic estimates in the Scoping Study are based on low level technical and economic assessments.*
6. *Funding costs, taxes and royalties have not been considered in these Study figures.*

A summary of the key economic analysis results is presented below.

US$/t Concentrate		5 Mtpa *(accurate to ±35%)*	
Project Interest	*IRR*	*100% Interest*	*AVZ 60%*
-30% ($525)	33%	$1.02Bn	$0.56Bn
-20% ($600)	44%	$1.56Bn	$0.87Bn
-10% ($675)	54%	$2.09Bn	$1.22Bn
US$ 750#	**64%**	**$2.63billion**	**$1.54billion**
+10% ($825)	74%	$3.17Bn	$1.86Bn
+20% ($900)	83%	$3.71Bn	$2.20Bn
+30% ($975)	93%	$4.24Bn	$2.50Bn

Table 2 NPV_{10} on Production Targets concentrate sale prices sensitivity

 # Based on pricing achieved in China for 5.8% Li_2O concentrate (March 2019 Quarter)

Notes to Table 2 NPV_{10} on Production Target concentrate sale prices sensitivity:

1. *Net Present Value calculated after applying a 10% real discount rate.*
2. *Estimates are based on the lithium extract operations only. The Study excludes the potential for tin by-product credits as these were not taken into consideration in this analysis.*
3. *The Study utilised the Measured, Indicated & Inferred Resource tonnages as the basis for completion. Inferred Mineral Resources do not determine the economic viability of the Manono Project as assessed in this Scoping Study. 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. The company is confident that financial impact of the inclusion of Inferred Resources in this model is acceptable and would have a minimal impact on the overall project economics.*
4. *Estimate presented is based on 100% project interest. AVZ holds 60% interest in the Manono Project.*
5. *Estimate is accurate to ±35% and includes US$78M contingency for Case 2.*
6. *Technical and economic estimates in the Scoping Study are based on low level technical and economic assessments.*
7. *Funding costs, taxes and royalties have not been considered in these Study figures.*

Sensitivity Analysis

A sensitivity analysis has been completed on the cash flow model. Concentrate price, metallurgical recovery, haulage costs, mill feed grade, opex and capex were flexed between a range of -30% to +30% in increments of 10% (Figure 1). The 5 Mtpa net present value (NPV) when each parameter is flexed individually is reported in the graph below. The graph below are based on 100% project interest. AVZ holds 60% interest in the Manono Project.

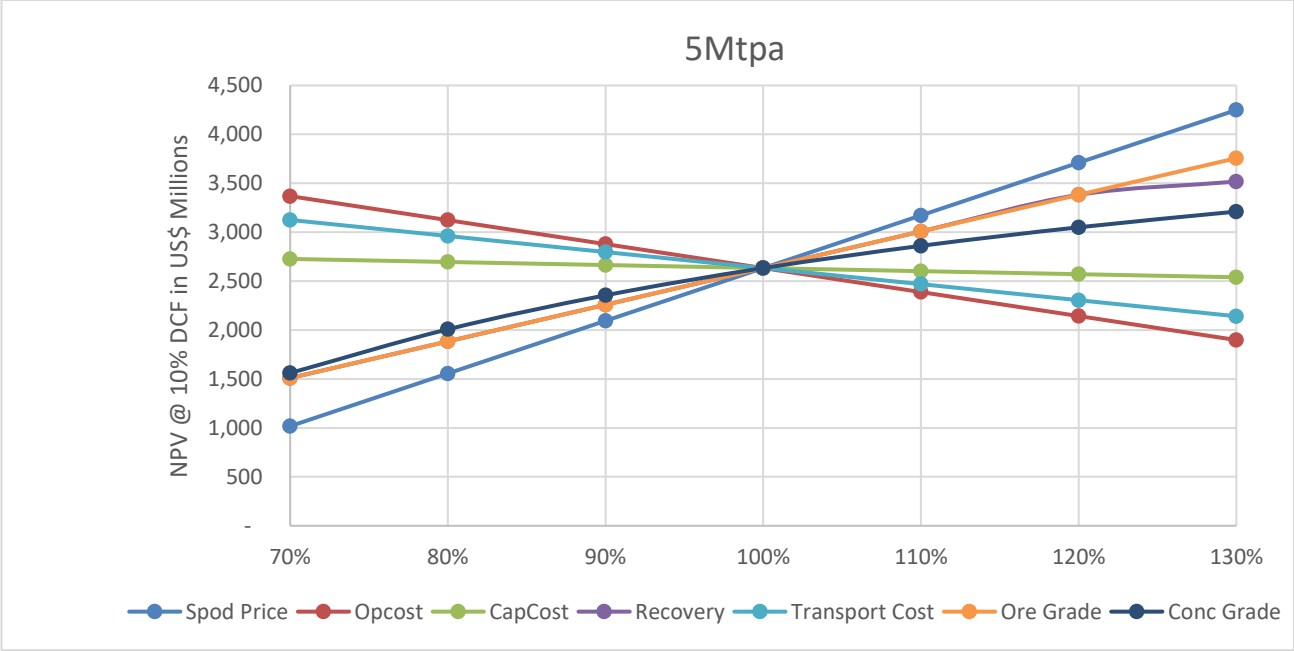


Figure 1 Single parameter sensitivity analysis for the NPV – 5 Mtpa (accurate to ±35% and includes US$78M contingency)

Transport Overview

Alistair Group was commissioned to conduct a detailed initial transport study for the purpose of completing this 5 Mtpa Scoping Study. Alistair Group is an Independent Transport Consultant based in Tanzania and has performed in country investigations to clarify the optimum transport route for the Manono Project.

The following routes were initially investigated to conduct the Study.

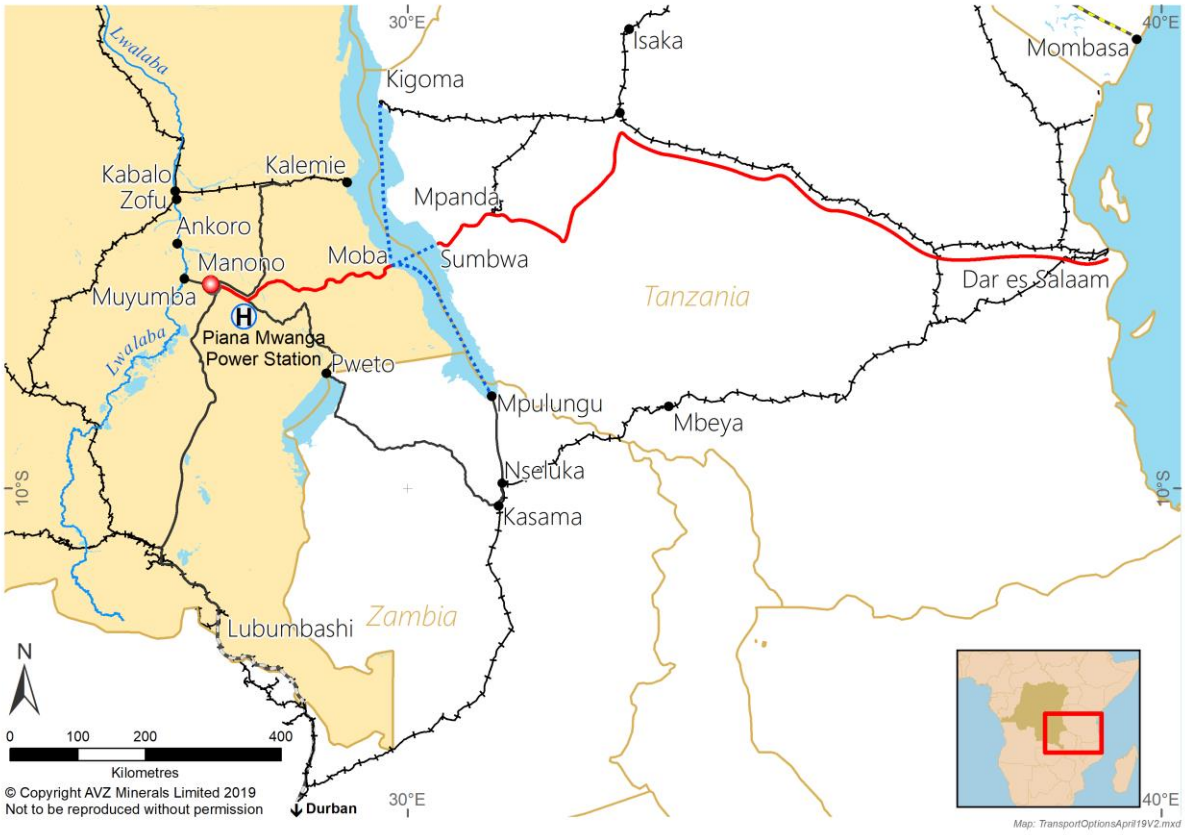


Figure 2 Transport Route Options investigated in the Study

Route 1:

Involves Road transport of loose bulk concentrate from Manono to Kalemie, storage at Kalemie then barge loading, crossing Lake Tanganyika to Kigoma, unloading and storage at Kigoma, loading train wagons in Kigoma, rail freight to Dar es Salaam, warehouse in Dar es Salaam, loading containers for transport to port for loading bulk ships in Dar es Salaam Port.

Route 2:

Involves Road transport of loose bulk concentrate from Manono to Kalemie, storage at Kalemie then barge loading, traversing Lake Tanganyika south to Mpulungu, unloading and storage at Mpulungu road transport to rail siding at Nseluka, storage and train loading at Nseluka, rail freight on the Tazara system to Dar es Salaam, warehouse in Dar es Salaam, loading containers for transport to port for loading bulk ships in Dar es Salaam Port.

Route 3:

Involves Road transport of loose bulk concentrate over the entire journey from Manono via Pweto, Nseluka to Dar es Salaam. Warehouse in Dar es Salaam, loading containers for transport to port for loading bulk ships in Dar es Salaam Port.

Route 4:

Involves Road transport of loose bulk concentrate from Manono via Pweto to rail siding at Nseluka, rail freight on the Tazara system to Dar es Salaam, warehouse in Dar es Salaam, loading containers for transport to port for loading bulk ships in Dar es Salaam Port.

Subsequent to commencing the field investigations, Route 3 was modified such that the road route was changed. The new route used the road from Manono to Likasi, and via existing common road route to Dar es Salaam.

The study found that transport Route 4 was the most cost effective and has minimal holding points for transport changes. The study provided CAPEX and OPEX costs for all proposals. Route 4 is explained more fully below. The independent study conducted by Alistair Group provides greater certainty for the potential to get concentrate to sea port market, and thereby commercialising the Manono Project.

AVZ has accepted as presented the Alistair Group findings however AVZ will continue to investigate other alternatives to improve the economics of transportation to port because of its importance to operational costs for the Project.

Transport Background - Route 4

The Manono Project is located approximately 500km due north of Lubumbashi in the south of the Democratic Republic of Congo (DRC) in central Africa. The project area can be accessed from Lubumbashi by a 1.5-hour flight or by road.

Traditionally, the path to market in the DRC is via Lubumbashi to Durban in South Africa, however given the project's location in Manono, this is not considered an optimal route.

The main transport road route from Lubumbashi to Manono is via Likasi and then, heading north passing through the town of Mitwaba. A sealed road exists along this northern route, from Lubumbashi to a point north of Likasi, on the road to Manono, which is about 220km long.

A Chinese funded road upgrade is currently being rehabilitated and constructed, from this point through to Manono. The committed funding is US$285M for this work. The intention is that the entire road from the Likasi turnoff will be upgraded, initially to an all-weather dirt road and then, once the dirt road has stabilised, it will be sealed, with a black top. The road traverses many river and creek crossing with a good deal of the larger river crossing bridges already fully concrete constructed. The complete road rehabilitation is expected to be completed in 2020.

The rehabilitation of this road will greatly reduce the transit time and cost for large trucks travelling to Manono from Lubumbashi. It is expected such trucks will be able to reach Manono within one day travel, with the refurbishment completion, compared to the poorly maintained and impoverished road conditions that have taken as long as 3 days in the dry season and up to 7 days in the wet season.

The Alistair Group report identified Route 4 as the most economic transport route. It utilised movement of loose bulk concentrate from Manono to a Dar es Salaam warehouse. The concentrate is loaded into trucks at Manono, traverses refurbished roads to Pweto where it then crosses the border into Zambia using roads within Zambia to access the Nseluka rail siding. At this location the concentrate is stockpiled to load onto rail wagons. The Alistair Group report has identified capital and operational costs for this portion of the transportation.

The Tazara rail line extends from Dar es Salaam (main port in Tanzania) through to Lusaka in Zambia. The Tazara rail line was constructed to a modern design in 1970's to open up Eastern Africa to the port of Dar es Salaam, using the African standard rail gauge. The rail line was designed and has the freight capacity of 5 Mtpa. It is presently underutilised, with cargo movements sub 1.5 Mtpa. It therefore has ample capacity to accommodate the concentrate movements from Manono. The Tazara rail line closest station to Manono is located at Nseluka. Which is 1,031 km rail distance from Dar es Salaam. Tazara have limited spare suitable rolling stock, however they do allow third party access to utilise the rail line infrastructure. Alistair Group have made capital and operational cost allowances for the additional necessary rolling stock. This has been reflected in the costs Alistair Group provided.

Once the concentrate arrives in Dar es Salaam it is again warehoused and stockpiled. The concentrate is then loaded into specially designed containers for loading loose material into the bulk concentrate ships in port. This method of loading loose bulk into concentrate ships is the same used by other lithium miners in Western Australia.

The Alistair Group report allows for costs to discharge the cargo FOB into ships hold for the onward journey through to offshore concentrate process facilities.

The Tanzanian government is well advanced on improvements of the Dar es Salaam port, which should have capacity for 28 Mtpa, when completed as scheduled for 2020. The port has ample capacity to accommodate this additional cargo.

Route 4 cost as presented in the Alistair Group report, when considering a moisture content of 9%, is $223/t. They have also identified CAPEX requirements for road rehabilitation, railway rolling stock and handling/warehouse facilities totalling $67.9M.

Site Access

A program of refurbishment of water drains and roads has been undertaken by AVZ utilising some 300 labourers displaced from artisanal mining activities prior to the onset of the wet season at Manono. It has greatly improved the longevity of the roads at site and around the town. Site access is easily achievable at present, but the refurbished infrastructure at site will improve this further.

Project Funding

The Board of AVZ believes there is a reasonable basis to assume the necessary funding for the Manono Lithium and Tin Project will be obtained for the following reasons.

- A mix of debt, equity and off-take financing is the Company's most likely funding model. AVZ has an active ongoing dialogue with potential financing and investment partners and continues to receive unsolicited expressions of interest with regard to assisting the Company with its financing needs. These parties include substantial mining funds and companies including global diversified Chinese companies, Chinese off-take parties and Sub Continent interests. AVZ still has live MoU's with some Chinese entities that remain in discussion with AVZ on the project.
- As at 31 March 2019, AVZ had approximately $12.06M cash on its balance sheet. In the Board's view these are sufficient funds to complete the feasibility study.
- The Company has a total of 203,649,049 listed options exercisable at 3 cents expiring 24 May 2020. Should all of the "in the money" options (the 3 cent options) be exercised by the expiry date this will raise a total of approximately A$6.1M. The Company is not reliant on the options being exercised to complete the works set out in the paragraph above.

- The Board and Management have a strong track-record in mining project financing and equity raising for numerous ASX listed companies, aside from AVZ, over the last 20 years. By way of example, funding for Moto Goldmines Limited, African Metals Corp, Alphamin Resources, Amani Gold, Taruga Minerals and Perseus Gold.
- AVZ and the Board have previously demonstrated their ability to raise exploration and development funding for the Manono Lithium Project;
  i) Completion of A$15.0M fund raising at a price of 3.8 cents each on 27 February 2019
  ii) Completion of A$15.0M fund raising at a price of 25 cents each on 28 February 2018
  iii) Completion of A$13.0M placement to strategic investor, Huayou Cobalt Group on 16 August 2017
- The Manono Project will produce a premium product having one of the lowest levels of deleterious elements of any Australian listed hardrock lithium project. This receives a price premium as it reduces the need for expensive processing to remove these impurities. The Board is confident that the Manono Project will be able to deliver an attractive economic return.
- The Company is also able to pursue other methods of value realisation to assist funding the project, such as a partial sale of the asset, long term offtake and joint venture arrangements.
- The positive financial metrics of the project and the continuous demand growth for lithium.
- Other companies at a similar stage in development have been able to raise similar amounts of capital in recent capital raisings. This includes Galaxy Resources through the sale of a portion of their Argentinian Salar del Hombre Muerto licences for US$280m to fund the remaining licences and other operations within the group; Pilbara Minerals with funding of up to US$100M of debt and or prepayments from Gangfeng Lithium and Great Wall and an equity arrangements with POSCO for A$80M and Kidman Resources entered into offtake agreements with Tesla and earlier into a Joint Venture ("JV") with SQM whereby Kidman received US$25M and the JV received US$60M of funding, and Argosy Minerals have had several financings and offtake arrangements with Qingdao Qiabyun High Tec New Material Co.
- The Company has commenced engaging with potential off-takers for advanced funding based on securing long term off-take for product given the project economics.
- Announcement of the project financial metrics in this report can now allow AVZ to advance discussions with selected potential customers. AVZ believes these advances in the Manono Project firmly underpin a more favourable climate to engage with and conclude, binding off take arrangements.
- The Company has commenced discussions with Project financiers and advisers and believes, that given the key findings of this study and ongoing uplift of the project, it is in a strong position to secure the necessary funding to place the project into production.

Next Steps

As announced previously, the Company has commenced a Definitive Feasibility Study ("DFS") on the Manono Lithium and Tin Project. As well as improving the accuracy of cost estimates, the Study will provide additional definition on the Project's infrastructure requirements such as water, power and transport.

AVZ believes there is potential to enhance the Project's economics by:

- Further optimisation of transport and logistics costings.
- Improving flowsheet design through the various feasibility test work studies.
- Investigation into the rehabilitation of the Piana Mwanga hydro facility.
- Completing further test-work on credits for tin and tantalum recovery.

- Mining selectivity studies to quantify the economic impact of realising a higher plant feed grade.

The infill and exploration drilling programs were completed at the end of 2018. These programs were designed to:

- Infill and expand the current resource base.
- Select core to be utilised in the expanded metallurgical test-work programs.
- Further upgrade the resource classification from the maiden Resource estimate.
- Confirm initial geotechnical parameters for open pit mine planning.
- Confirm plant, associated infrastructure, waste dump and tailings storage facility locations.

The metallurgical test work is expected to take 6 months to complete and planned to be available by Q4 2019. The company looks forward to updating the market regarding its progress. In parallel, the Company intends to continue engaging with potential off-takers and finance providers.

Activity	*CY2019*			*CY2020*				*CY2021*			
	Q2	*Q3*	*Q4*	*Q1*	*Q2*	*Q3*	*Q4*	*Q1*	*Q2*	*Q3*	*Q4*
Met Test Work Study											
Feasibility Study											
Transport route confirmed											
Licensing, Permitting & Environmental Approvals											
Detailed Engineering and Procurement											
Construction											
Commissioning											

Table 3 Updated Estimated Timeline to Commissioning

Extended Scoping Study provides further economic potentials for up to a 5 Mtpa open pit mine

The Study evaluated the technical, transport, power and potential economic viability of an open pit mine development at the Company's Manono Lithium and Tin Project, where a JORC Mineral Resource of 400 million tonnes (Mt) of 1.65% Li_2O has been defined[1].

All costings and projections in the financial model were prepared on all classifications of resources namely, Measured, Indicated and Inferred Resource tonnages. These Measured and Indicated portions combined, account for approximately 67.25% of the existing Mineral Resource. The Inferred category resources accounts for the remaining 32.75%. This lower categorized resource provides a lower level of confidence in the figures and reduces the reliability of the estimated returns. The Company has attempted to limit the use of Inferred Resource, however, the Company is confident that the financial impact of the inclusion of minor and limited Inferred Resources in this model is acceptable and would have a minimal impact on the overall project economics.

Various processing options were considered to optimise throughput capacity and recoveries, with consideration given to managing early stage cash flow and upfront capital costs. Mining and processing parameters were investigated at US$750/t selling price (base price based on 5.8% Li_20 concentrate).

This scoping study plan is to develop Manono as a 5 Mtpa (Case 2) high grade open pit mine to supply material to a conventional crushing, high pressure grinding, dense media separation (DMS) and flotation plant.

The estimates presented in this Scoping Study are based on 100% project interest. AVZ holds 60% interest in the Manono Lithium and Tin Project.

The 5 Mtpa capital costs for the processing plant and associated project infrastructure are estimated at approximately US$380 to $400M *(C5 ±35% and includes US$78M contingency)*.

A Resource Block Model was generated as part of the Mineral Resource Estimate. This is represented below in a series of images.

[1] *Announcement dated 8th May 2019: Significant Upgrade in Measured & Indicated Mineral Resource*

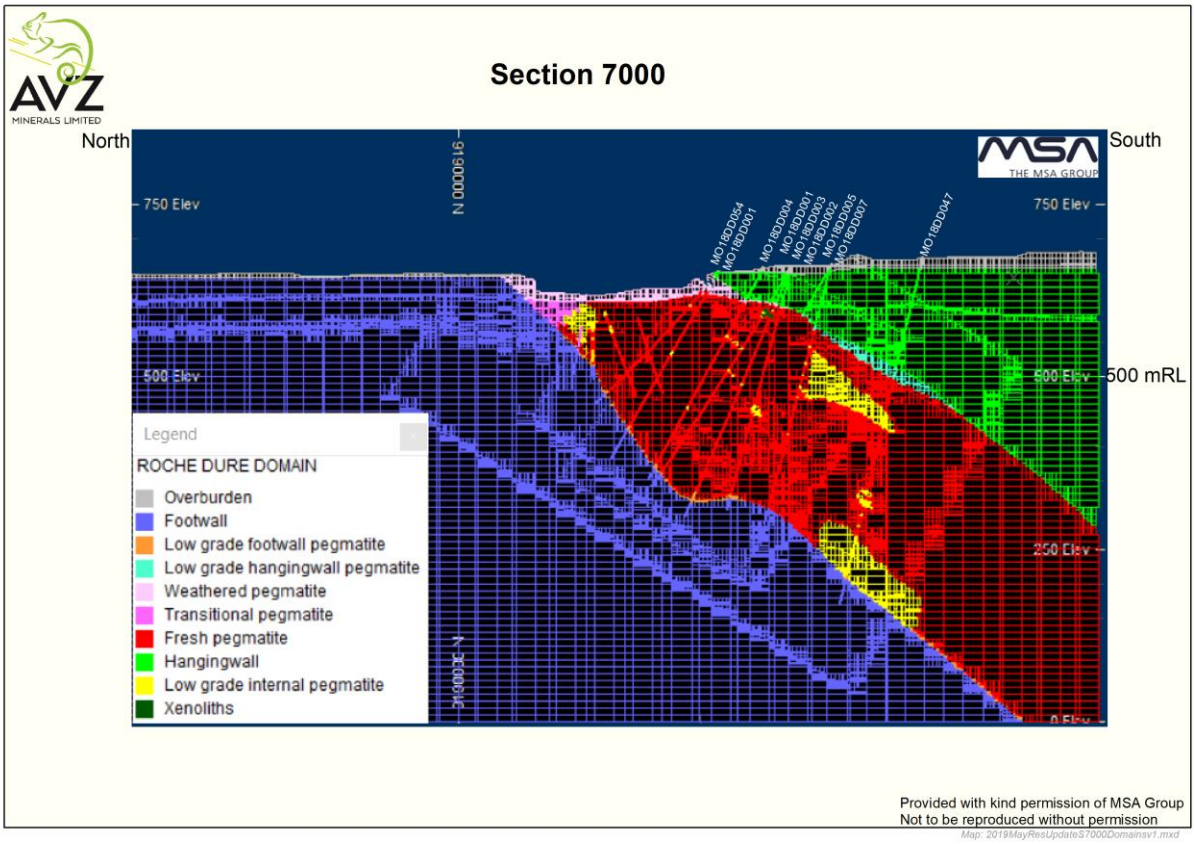


Figure 3 Roche Dure Geologic Domain Block Model

The figure above, highlights the strength of the geological domain block model with little variation between the main pegmatite (red) the weather and altered pegmatite (pink and orange) and the wall rocks shown in blue and green. Note the flooded pit shown in pale blue at the surface directly above the weathered (pink) pegmatite. The Company is confident that the area immediately below the historic pit represents an area of low 'resource' risk and that the reason it currently reports to a lower resource category is the inability to site a drill rig to inform the area, once data is achieved from this zone The Company believes it will be able to convert the area directly below the flooded pit into a higher resource category given sufficient pierce points are achieved. There is no guarantee that this is achievable and thus Inferred resources may not be uprated into Indicated or Measured category.

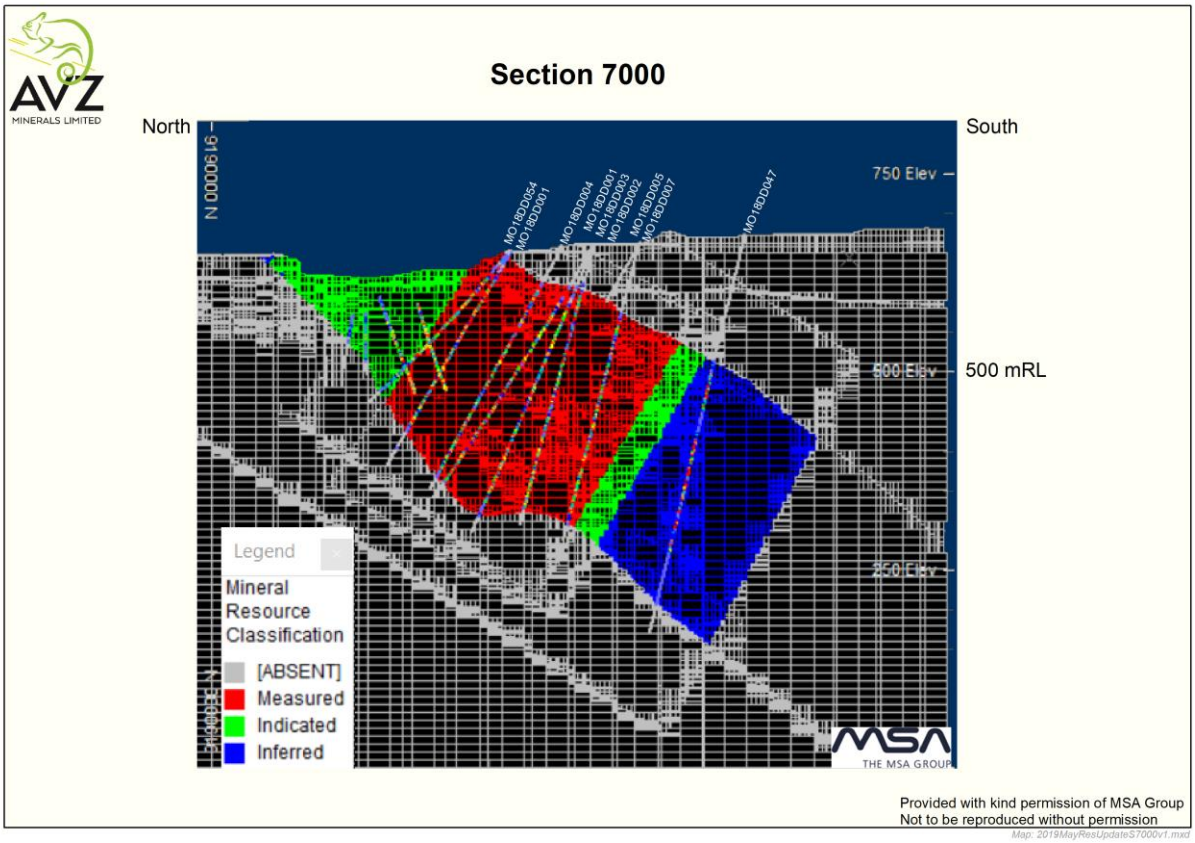


Figure 4 Roche Dure – Resource Block Model

The figure above shows the resource block model by category with Measured (red), Indicated (green) and Inferred (blue) as constructed and reported by The MSA Group.

The Mineral Resources currently identified at Manono amount to: Measured 107Mt at 1.68% Li_20, Indicated 162Mt at 1.63% Li_20 and Inferred 131Mt at 1.66% Li_20 for a total of 400Mt at 1.65% Li_20.

The drilling has been restricted to areas where there has been ready access. The proposed mine encompasses a previous open pit mine that has closed and is now flooded to a depth up to about 20m (See Figure 3 and 4 above). To intersect the orebody to achieve an appropriate level of data support around the pit has been challenging and hence a substantial portion of the Resource has been classified as Inferred. This can be seen on Figure 5 cross-section through the orebody showing the Measured (red), Indicated (green) and Inferred (blue) blocks on that section.

It is proposed to dewater the existing Roche Dure pit to gain access for further drilling. In the mean-time shallow dipping holes were completed including holes drilled back towards the South East to confirm the resource in further detail as close to the base of the flooded pit as can be achieved using conventional diamond drilling techniques. These results have been included in the revised Mineral Resource Estimates.

At this stage of the project, no further guidance can be given as to the probability of the current Inferred Resource being converted to Indicated and Measured classifications without dewatering the pit and completing further drilling.

At this early stage of the project, no detailed mine planning or scheduling has been carried out. To facilitate other studies initial unoptimised pit designs have been developed to target Measured and Indicated Resource material in early years of operation to help manage resource risk. The initial Roche Dure pit designs have been done on the basis of 'staged' pits to take advantage of early cashflow and to defer material of a lower resource category to later in the life of the operations.

The current schedule attempts to maximise the amount of Measured and Indicated Resources mined early on in the project life with of lower category material being mined later and beyond the current 20 year mine life based on a production rate of 5 Mtpa of mill feed. These nominal pit shells are shown on the Figure 8.

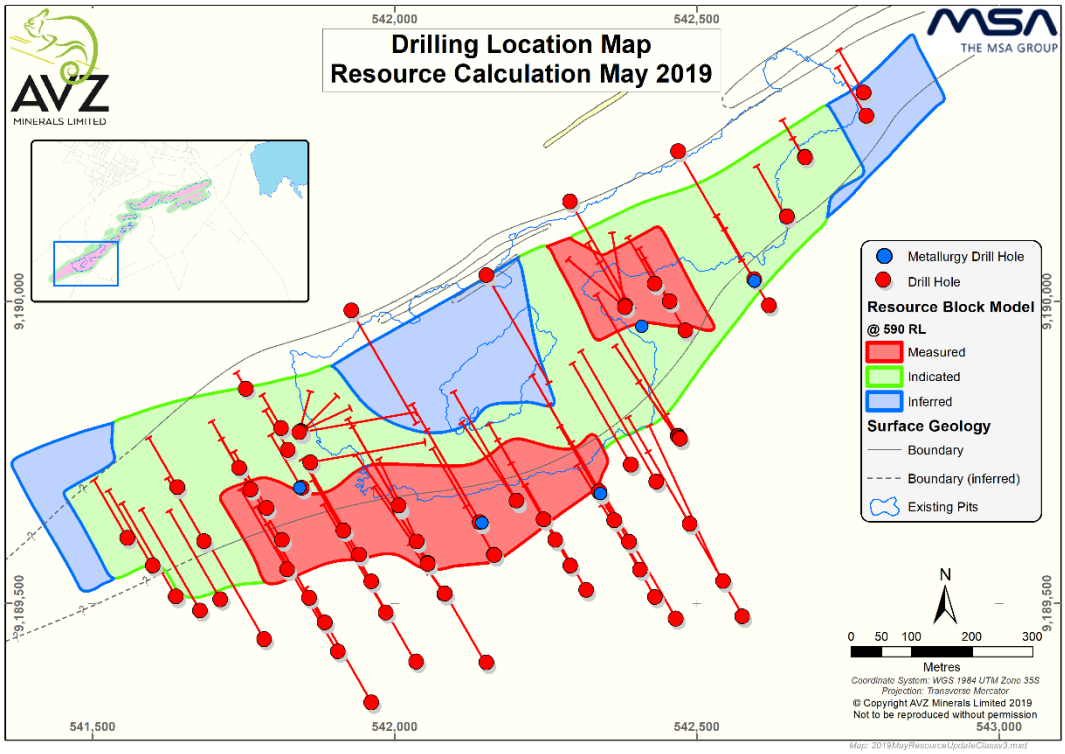


Figure 5 Roche Dure – Schematic of Drill Hole Locations at Roche Dure used in the Resource Estimation and Classification Categories at 590m elevation

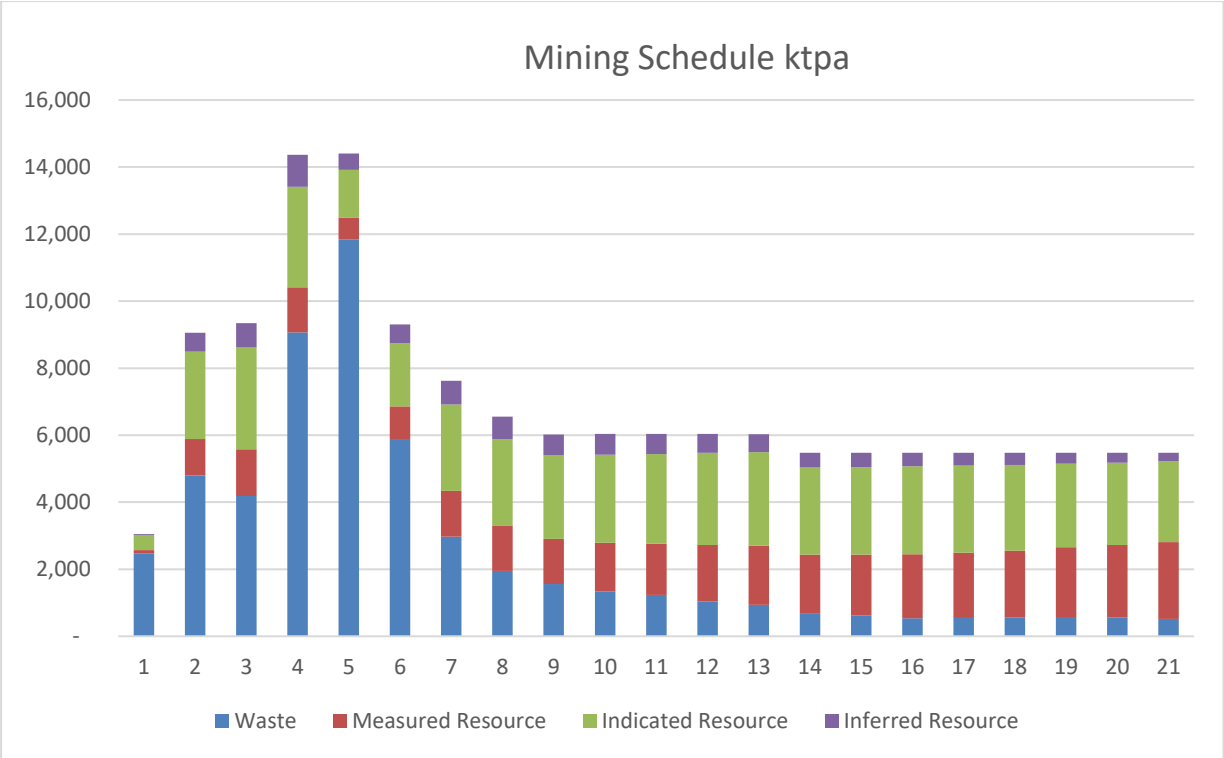


Figure 6 Production Schedule (5 Mtpa)

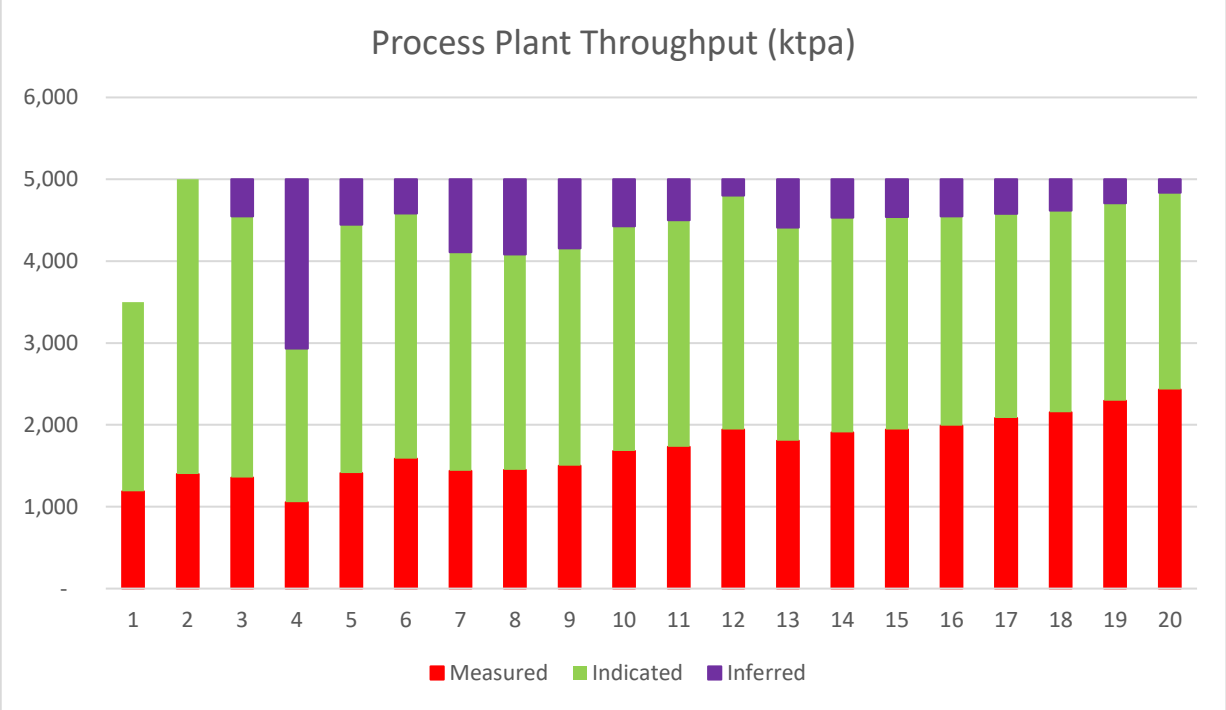


Figure 7 Production Schedule by Resource Category (5 Mtpa)

The estimated capital costs and LOM cash costs based on the design outlined in this report are presented in Table 4 and Table 5. The costs are based on 100% of project interest. AVZ holds 60% interest in the Manono Project.

Production Rate	US$M	Accuracy %	Contingency
Case 1 – 2 Mtpa throughput*	150-160	±35%	US$36M
Case 2 – 5 Mtpa throughput	380-400	±35%	US$78M

**Refer to ASX announcement on 9th October 2018: Scoping Study Highlights Strong Economic Potential of Manono*

Table 4 Capital Cost Summary, Accuracy and Contingency

Cost Centre	US$/t feed 2Mtpa*	US$/t concentrate 2Mtpa*	US$/t feed 5Mtpa	US$/t concentrate 5Mtpa
Mining	12	56	7	33
Processing	14	64	12	58
Transport	49	221	47	223
Admin and Sust. capital	3	14	2	9
Total Operating Costs	**78**	**355**	**68**	**323**

**Refer to ASX announcement on 9th October 2018: Scoping Study Highlights Strong Economic Potential of Manono*

Table 5 Operating Costs Estimates for 2 Mtpa and 5 Mtpa

Financial Analysis

Introduction

The Financial Analysis Model has been prepared on a Microsoft Excel spreadsheet to industry standards. The model has been developed by Alan Dickson & Associates Pty Ltd, an independent consultant to AVZ Minerals Limited, using inputs supplied by CPC and Alistair Group. Other consultants employed on the project included The MSA Group for the Mineral Resources, Nagrom for metallurgical testing, Peter Spitalny on the drilling results and interpretation and Geosure on initial pit designs.

The Financial Model has been built with flexibility in order to allow sensitivity studies to be carried out to determine the main project drivers.

Basis of Economic Analysis

The principal method adopted to carry out the valuation is that of Net Present Value (NPV) and Internal Rate of Return (IRR) on Real (non-escalated), rather than Nominal (escalated) costs and revenue. Discount Factors of 10% per annum (pa) and 15% pa have been assessed. The financial modelling is carried out by an independent financial expert and selected based on their experience and expert determination. In the case of Manono, the 10% discount factor is considered to be industry standard and comparable to other mining companies operating in Africa (Ivanhoe Mines NPV_8 – Kipushi Zinc Project in DRC, Birimian Limited NPV_{10} – Goulamina Lithium Project in Mali) and by peers in Australia (Kidman Resources NPV_{10} – Earl Grey Lithium Project, Altura Mining Limited NPV_8 – Pilgangoora Lithium Project, Pilbara Minerals Limited NPV_{10} – Pilgangoora Lithium and Tantalum Project).

The analysis is based on a base case production rate of 5 Mtpa of mill feed to the plant, the costs for this case have been developed to a scoping study level of detail.

The estimate has a base date of Q4 2018 for costs and does not apply any escalation to those costs between that date and the completion of the project. Revenue figures are based on Q1 2019 pricing.

Summary of Results

The estimates presented in this Scoping Study are based on 100% project interest. AVZ holds 60% interest in the Manono Project.

The 5 Mtpa case provides a pre-tax, pre-royalty NPV at 10% DCF of approximately US$2.63Bn and at a 15% DCF of US$1.63Bn *(AVZ's 60% share is US$1.54bn and US$0.94Bn respectively)*. The IRR has been assessed at greater than 64%.

The basis for Case 2 are: Throughput 5 Mtpa, Production Life 20 years, Price US$750/t of concentrate at 5.8% Li_2O, based on an average mill feed grade of 1.51% Li_2O and metallurgical recovery of 80.9% of the Li_2O. All costs have been assumed to occur in the period of activity and the revenue has been deferred 3 months from the time of processing on site.

More Detailed Description of 5 Mtpa (Case 2)

The 5 Mtpa case has a construction period of 4 quarters and then gradually builds-up to the full production rate of 5 Mtpa. It is assumed the former workings which are now flooded will be pumped out, during the feasibility study stage, sufficiently to allow preparation for confirmation resource drilling and mining prior to the start of plant construction. One aim in this case has been to target the Measured and Indicated Resource tonnages, these as can be seen on Figure 7. It is expected as that once the area is drilled, more resources will come into the Measured and Indicated categories. Mining would commence in this area potentially lowering the initial strip ratio in the early years. Two basic pit shapes have been developed to mine successively as stages with early stages focussing on the Measured and Indicated Resources with the balance to be mined beyond the 20 year mine life at a production rate of 5Mtpa of mill feed. These nominal pit shells are shown on the Figure 8.

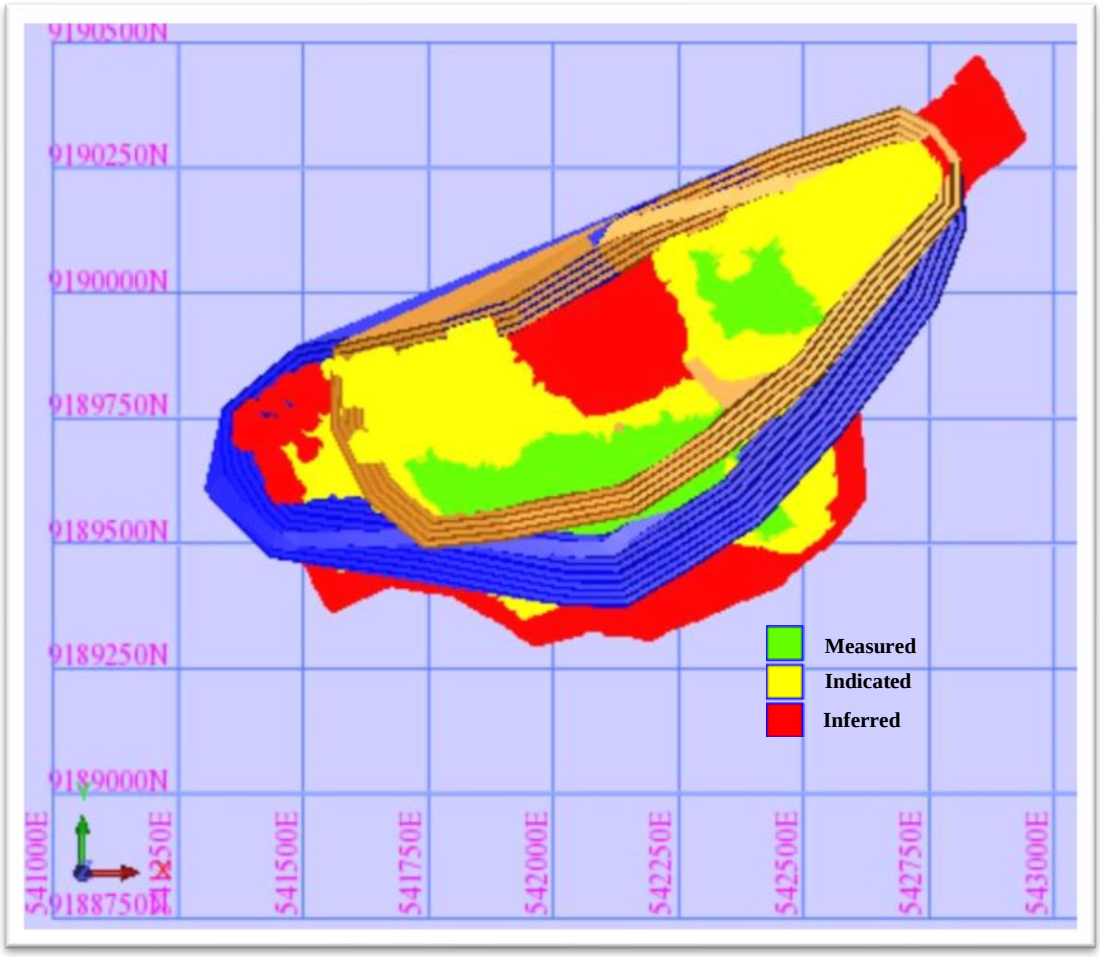


Figure 8 Nominal Pit Shells for 5 Mtpa (Light Brown Stage 1 & Blue Stage 2)

The production scenario for 5 Mtpa has been based on the initial metallurgical testwork carried out by Nagrom on two composite mineralised samples sourced from the drilling program. The grades of these samples were 1.762% and 1.397% Li_2O respectively for an average grade of 1.58% Li_2O, some 0.06% below the current average Mineral Resource calculated grade.

The Mineral Resource grades determined by The MSA Group were: Measured 107Mt at 1.68% Li_2O, Indicated 162Mt at 1.63% Li_2O and Inferred 131Mt at 1.66% Li_2O *(Refer [1])* for a total of 400Mt at 1.65% Li_2O. The production scheduling has been based on creating a 5.8% Li_2O concentrate at 80.9% recovery but adjusting product tonnages by the metal content of the plant feed. Note in the early stages the plant feed head grade is lower than the overall average head grade. The average grade of the production has been estimated at 1.51% Li_2O assuming that there is a grade reduction, of 5%, in the plant feed, based on dilution. This is a conservative estimate, suitable for a scoping study, and well below the resource grades quoted.

The Mineral Resource is reported in Table 6 below at a cut-off grade of 0.5% Li_2O and has been classified as Measured, Indicated or Inferred Resources in accordance with the guidelines of the JORC Code (2012).[1]

Category	Tonnes (Millions)	Li_2O %	Sn ppm	Ta ppm	Fe_2O_3 %	P_2O_5 %
Measured	107	1.68	836	36	0.93	0.31
Indicated	162	1.63	803	36	0.96	0.29
Inferred	131	1.66	509	30	1.00	0.28
Total	**400**	**1.65**	**715**	**34**	**0.96**	**0.29**

Table 6: Manono Roche Dure – Mineral Resource at a 0.5% Li_2O cut-off

The Study utilised all Resource categories as the basis for the study.

The recovery factor based on Nagrom's testwork was 93.04% at a 5.8% Li_2O concentrate grade (Sample 1) and 58.85% at a 5.9% Li_2O concentrate to give an average recovery of 80.9% at 5.8% Li_2O. Even at a recovery of only 59% the NPV_{10} is US$1.62Bn *(AVZ's 60% = US$0.91 Bn)*.

The 5 Mtpa has been assumed to operate nominally for 20 years. If for example the 5 Mtpa case had a reduced production life of 10 or 15 years, the NPV_{10} is reduced to US$1.70 Bn and US$2.27Bn respectively *(AVZ's 60% share = US$0.98Bn and US$1.33Bn respectively)*.

The capital costs of the project have been primarily estimated by CPC. Other capital costs such ROM pad building have been conservatively made in conjunction with AVZ technical personnel. The transport costs of the project have been provided by the Alistair Group.

The operating estimates have been made by a combination of personnel. The mining operation costs are based on estimates provided by contractors Teichmann, a South African firm already operating in the DRC. The process plant operation, including power generation and the mine accommodation camp by CPC Engineering, labour costs including flight costs were supplied by AVZ, and include the operating estimates for miscellaneous staff associated with the operation such as General Manager, Accounts, Human Resources, Environmental Management, Community Relations and Security teams. The operating estimates for concentrate haulage to the port at Dar es Salaam in Tanzania were provided by Alistair Group.

A provision of US$1M annually has been allowed for a trust to assist the local community.

The concentrate is assumed to be shipped at a moisture content of 9%.

[1] *Announcement dated 8th May 2019: Significant Upgrade in Measured & Indicated Mineral Resource*

Key Assumptions

A number of key assumptions have been made in the financial assessments; the main ones are:

- The geological interpretation, block modelling and grade estimation are according to JORC guidelines and standards of accuracy as reported by The MSA Group.
- The mining rate proposed and build-up in production is achievable.
- The process plant can achieve the average recovery and concentrate grade scheduled, even though this has only been based on the average of a two (2) sample metallurgical test-work program. For the Definitive Feasibility Study stages further test-work will be completed and some of this will target where the early plant feed will be sourced.
- The production head grade varied as per the block model and the mining schedule. It was assumed that recovery and concentrate grade remained constant and the tonnages of concentrate varied with mining head grade. The average grade of the production has been estimated at 1.51% Li_2O.
- The bulk of the labour required for the project can be sourced in Manono and the DRC, and that expat staff can be sourced from other African and/or European nations. No allowance has been made to import staff on a FIFO basis from Australia.
- The proposed concentrate haulage method and costs are achievable.
- Sufficient detail has been incorporated for the study to achieve a Scoping Study status.

Key Variables

The Key Variables are those variables that are believed to have the greatest impact on the economic value of the project. These items are: Concentrate Sale price; project production life; transport costs of the Concentrate; Ore Grade and metallurgical recovery. The other operating and capital costs are not major value drivers for this project.

Concentrate Sale Price

Concentrate sale prices have been highly variable over the last few years. The base case (2 Mtpa - Case 1) adopted a price of US$800/t concentrate based on a 5%Li_2O grade and then added US$15 for each 0.1% Li_2O increase in grade (US$950/t).

The concentrate sale price has since reduced, and for the 5 Mtpa Scoping Study, a price of US$750/t for 5.8% Li_2O concentrate was adopted.

The concentrate sale price has been calculated using pricing assumptions as outlined below. The general consensus of external price studies (Benchmark Minerals & market experts[1]) in the market is that the long-term lithium carbonate price will range from US$12,000 to US$14,000.

It should be noted that Manono Project will produce a premium product having one of the lowest levels of deleterious elements of any Australian listed hardrock lithium project. This should receive a price premium as it reduces the need for expensive processing to remove these impurities. No premium has been added in this study for the concentrate quality.

1. Based on this Scoping Study, Manono Project will be producing a 5.8% Li_2O or potentially higher lithium concentrate which receives a material premium above the 5% Li_2O price. Galaxy Resources[2] (ASX: GXY) publicly stated that a US$15 applied for each 0.1% lithium grade higher than 5.0% Li_2O. Therefore, at a 5.8%+ Li_2O grade, the additional 0.8% would receive a further US$120/t or US$750/t in total (US$630/t + US$120/t) assuming the 5% Li_2O price is US$630/t.

2. In addition, Mineral Resources (ASX: MIN) announced on 6 February 2019 advising that the sale price for 6% Spodumene concentrate from their Mt Marion Lithium Project has been revised to US$791.84/t for the March quarter 2019. This revised price will be effective for the quarter March 2019.

[1]*Benchmark Minerals link* ***https://investingnews.com/daily/resource-investing/energy-investing/lithium-investing/lithium-outlook/***
[2]*Refer to Galaxy Resources Limited ASX announcement date 14th December 2016*

As quoted on Asian Metal* (AM), the 5% lithium concentrate average price for the month of March 2019 was US$674.29 (low) and US$704.29 (high).

**The Asian Metals link is http://www.asianmetal.com/LithiumPrice/Lithium.html*

AVZ believes that there is significant upside for lithium concentrate pricing in the long-term. However, it is the Company's view that the Manono Project must be economically viable in low priced market conditions. AVZ has therefore used a price of US$750/t for the purpose of this 5 Mtpa Scoping Study.

The sensitivity looked at prices for the 5.8% Li_2O concentrate from US$525 to US$975/t ***(Refer Figure 1 and Table 2)***.

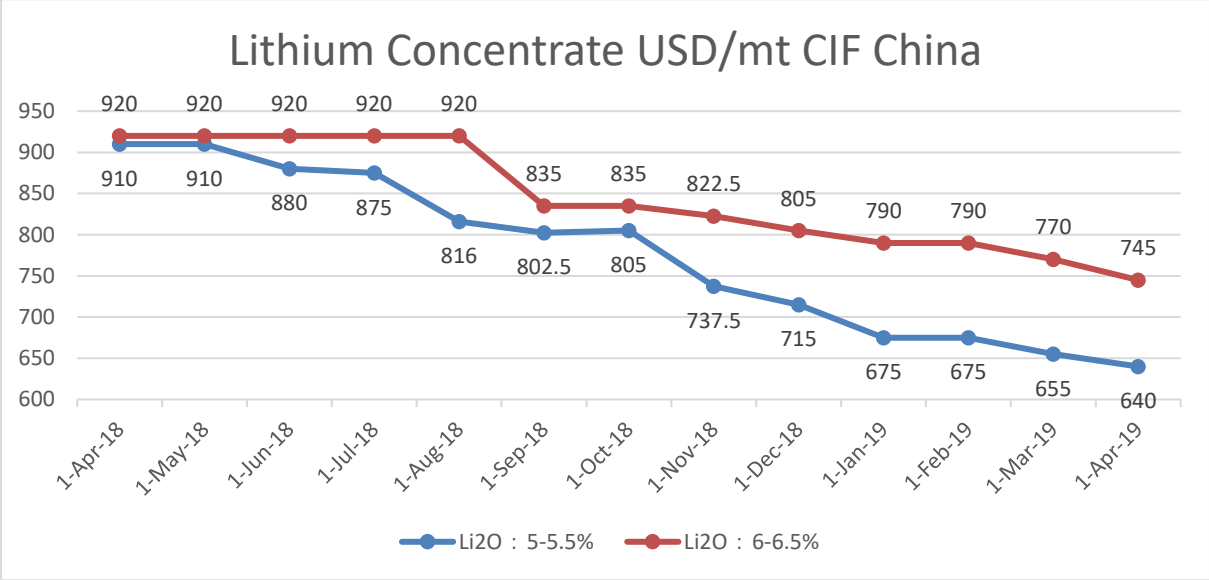


Figure 9 Trends in Lithium Concentrate pricing in the last 12 months

Project Life

For all scenarios studied for the sensitivities, the IRR was generally very high at over 50%; because the payback period tends to be quite short and generally within 3 years of production commencing. Thus, high positive cash flows in the future do add to the NPV, but this impact reduces by time as can be seen on the graph below.

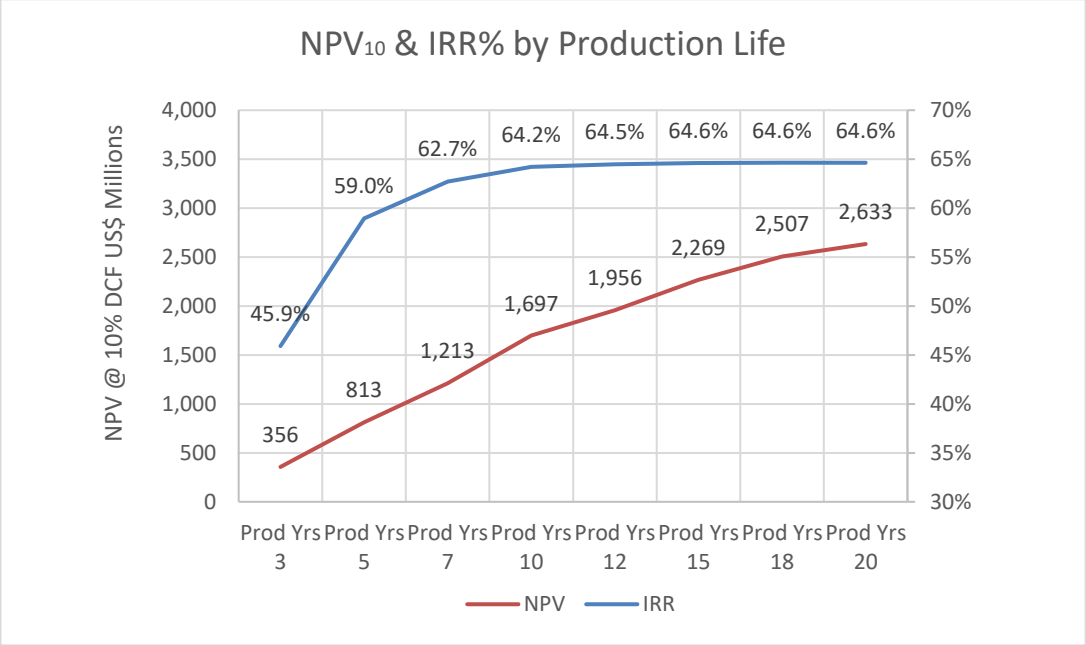


Figure 10 Impact of Changing Production Life
(Estimate based on 100% project interest. AVZ holds 60% interest in the Manono Project)

Transport Costs of Concentrate

The proposed transport route is Route 4 in the Alistair Group report. This transports loose bulk concentrate into trucks loaded at site, traveling to Nseluka in Zambia and then transferring to rail, on Tazara line to Dar es Salaam, some 1,031 km away. This cost represents the largest operating cost amounting to some US$223/t of concentrate which assumes a 9% moisture content, representing about 69% of all operating costs for the 5 Mtpa (Case 2).

Refer to Figure 1 for sensitivity analysis on NPV_{10} on transport costs.

Metallurgical Recovery and Grade Background

Metallurgical test work completed by consultants, Nagrom, a privately owned independent Western Australian company, and was completed on two drill hole samples of pegmatite ore from the Roche Dure deposit. From the 83 samples received by Nagrom, totalling approximately 262kg of material, two composites were created (MO17DD001 Comp and MO17DD002 Comp). The initial characterisation test work completed by Nagrom was released to the market. These samples do not fully represent the entire orebody but given the orebodies lack of variability and its homogenous nature, the two samples are considered to be representative for the accuracy of this level of study.

Sample ID	Mass (kg)	Li_{2O} (ppm)	Fe_2O_3 (%)	Al_2O_3 (%)	SiO_2 (%)
MO17DD001 Comp	151	17620	0.953	16.050	74.305
MO17DD002 Comp	111	13970	0.902	16.006	73.589

Table 7. Mass and head grades of the two samples for initial characterization test work

The two drill holes, from which material was sourced are located within the Roche Dure pegmatite body, approximately 400m apart, were drilled through the thickest section of the Roche Dure pegmatite where it is thought initial mining may take place.

Further test work is due to commence with the metallurgical drill hole program. This complementary data will form the basis of the metallurgical test work for the expected full feasibility study of Roche Dure. This sampling process will be more spatially representative of the first 20 years of the expected mining life.

Nagrom developed two flowsheets and processed a sub-sample for each of the two composite samples through each methodology. Flowsheet A (processing via Batch Reflux, DMS and flotation) was tested and compared against Flowsheet B (processing a whole of ore via cyclone deslime and flotation) to evaluate potential Li_2O recoveries and grades.

MO17DD001 had the highest circuit grade and recovery via Flowsheet B with a combined concentrate grade of Li_2O of 58001ppm (5.8% Li_2O) with a recovery of 93.04% and mass yield of 28.76% with the selected circuit summary units.

MO17DD002 had the highest circuit grade via Flowsheet B with a combined concentrate grade of Li_2O of 59050ppm (5.91% Li_2O) with a recovery of 58.85% and mass yield of 14.25% with the selected circuit summary units.

Given that the test work detailed within this report was conducted by experienced personnel at Nagrom's Kelmscott Metallurgical Facility under the supervision of the senior metallurgist and senior management team with extensive experience within the lithium industry in Australia and abroad, Flowsheet A was the selected treatment process.

The test-work program identified that both MO17DD001 and MO17DD002 were amenable to Density Separation with successful Silica rejection into a SG 2.7 Overflow stream. MO17DD001 Comp displayed 73.34% of the Li_2O reported to the SG 2.95 Underflow fraction at a grade of 63120ppm (6.31% Li_2O) and mass yield of 24.09%. MO17DD002 Comp displayed 66.44% of the Li_2O reported to the SG 2.95 Underflow fraction at a grade of 63490ppm (6.35% Li_2O) and mass yield of 17.85%.

The test work program identified that both MO17DD001 and MO17DD002 were amenable to flotation with only a cyclone deslime separation stage upfront to reject silicates and fines. The highest flotation Li_2O grade was achieved where the grind size was P80 0.18mm and Flotinor 7801 was used. Test 1 reported 81.49% of the Li_2O was recovered to the combined concentrate fraction at a grade of 51212ppm (5.12% Li_2O) and mass yield of 22.47%. Test 5 reported 64.18% of the Li_2O was recovered to the combined concentrate fraction at a grade of 51538ppm (5.15% Li_2O) and mass yield of 15.91%.

The average grade of the concentrates produced from the two composite samples is 5.8% Li_2O and this has been adopted for this report until further met test work can be completed on additional sample material. In addition, metallurgical recovery for the two samples averages 80.9% and this too has been adopted as a conservative recovery figure on which this Study has been based.

The available metallurgical test work results have been combined with standard industry practice and CPC's experience to develop the process plant flowsheet and design criteria. Further details on Grade and Metallurgical Recovery are detailed below.

Grade

The grade adopted for the metallurgical study was based on the average grade of the two metallurgical samples used to design the process plant flow sheet. The two samples were at grades of 1.76% and 1.40% Li_2O. The results from these samples gave quite different recoveries even if the final concentrate grades were fairly close at 5.8% and 5.9% Li_2O with the first sample achieving a yield of 25.33% of the feed to concentrate, whereas the second sample only achieved a yield of 19.1%. The first sample achieved a Li_2O recovery to concentrate of 84% whereas the second sample only achieved 77%. It may be important that the higher grade of material achieved considerably better results. The sensitivity analysis shown on Figure 1 above assumes the average recovery of 80.9%.

Metallurgical Recovery

The test-work completed by Nagrom indicated recoveries of 84.33% for sample 1 and 77.56% for sample 2. The study has adopted an 80.9% recovery. The project is robust enough to stand a sharp drop in recovery. Even at 50% recovery the NPV_{10} for the base 5Mtpa case is US$1.20 Bn and an IRR greater than 37%. Recovery has to drop to 24% for the NPV_{10} break-even for the 5Mtpa case.

Refer to Figure 1 for sensitivity analysis on impact of metallurgical recovery on the NPV_{10}.

Process Plant

The 5 Mtpa plant flowsheet are based on unit operations that are well proven in industry, including three stage crushing, dense media separation, milling, magnetic separation and flotation. The key criteria for equipment selection are suitability for duty, reliability and ease of maintenance. The plant layout will provide ease of access to all equipment for operating and maintenance requirements whilst maintaining a compact footprint that will minimise construction costs.

The process plant will operate continuously (24 hours per day, 365 days per year) with a mechanical availability of 65% for the crushing plant and 85% for the treatment plant. Shutdowns for routine maintenance will occur as required.

A high-level Process Design Criteria (PDC) was developed based on the test work and CPC in-house experience on similar projects.

The supporting documents for the design include:

- process design criteria
- simplified process flow diagram
- mechanical equipment list
- preliminary process facility layout
- preliminary site plan

In more detail the plant design consists of a 5 Mtpa DMS, flotation spodumene plant and consists of the following unit operations:

- Three stage crushing and screening circuit utilising an HPGR as the tertiary crusher to produce a final crushed product with a P_{100} of 10 millimeter (mm)
    - Note: Nagrom testwork was based P_{100} of 3.35mm, this is standard practice for an initial laboratory sighter test, where the 3.35mm top size represents the HPGR product. HPGR top size in typical site operation is usually 10mm or more, and for the purpose of this study report the 10mm top size will be noted.
- A scalping screen to separate crushed ore to ±0.5 mm
- Two stage DMS cyclone circuits on the +0.5 mm material to produce the following streams:
    - 2.7 SG DMS floats (reporting to tailings)
    - 2.95 SG DMS floats (combining with the -0.5 mm material in the milling circuit)
    - DMS sinks (forming part of the final concentrate).
- Ball milling and classification circuit, with a final grind size of P80 of 180 µm.
- Magnetic separation circuit, removing waste magnetic material before flotation.
- Magnetic separation circuits, removing waste magnetic material on the DMS sinks final concentrate.
- Rougher, cleaner and recleaner flotation cells producing a spodumene flotation concentrate.
- Concentrate thickener and belt filter for reducing moisture in the spodumene flotation concentrate prior to shipping offsite.
- Reagents storage, mixing and dosing and water storage to support the process.

Professional Cost Consultants (PCC) were engaged by CPC to determine the factors to be used for developing the capital costs for this option due to their expertise with similar mineral processing projects and their local region experience.

The estimate covers the design and construction of the process plant and some site infrastructure. The estimate has a base date of the fourth quarter Q4 2018 (4Q18), is reported in US dollars (US$) and is based on the supply and installation of new equipment.

The basis of estimate for the cases 5 Mtpa is in accordance with the CPC Project Design Guidelines for Capital and Operating Cost Estimates. An equipment factored estimating method was used to achieve a Class 5 estimate with an accuracy of ±35%.

An equipment factored estimate is based on a limited level of information and project definition. The mechanical supply costs are estimated with factors then applied to this amount to derive the other associated discipline costs.

Discipline factors were provided by PCC based on their experience on a combination of two projects located within the DRC and two Australian based lithium projects.

Environmental Updates

Prior to work commencing at Manono, a Programme of Assessment and Adjustment of Mitigation and Rehabilitation Measures (PAR) was compiled and lodged on the Joint Venture's behalf by Cominière SARL, the DRC joint venture partner of AVZ on the Manono Lithium and Tin Project.

The PAR, which is a basic summary of existing environmental and flora and fauna conditions, was lodged with the relevant authorities in May 2017 and the subsequent granting of the PAR with the DRC Mines Department allowed AVZ to receive an authority to commence formal exploration activities on the concession in June 2017.

In April 2018, AVZ sub contracted local environmental specialists Congo Environment and Mining Consulting SARL (CEMIC), to carry out a baseline environmental study on PR13359. CEMIC are a long-established exploration and mining environmental consultancy with many large mining companies as clients including several non-Congolese companies both past and present.

These foreign clients include Banro Corporation and SMK Anvil Mining as well as many large DRC domiciled mining companies including the state government copper and cobalt company Gécamines. As such they are well versed in the complexities of the Congolese environmental law.

The baseline study report can be used to determine the initial characterization of the environmental baseline and the quantification of impacts and development of management plans. Field surveys or seasonal measurement of relevant parameters in the fields of hydrology, soils, air quality, noise, aquatic ecology and terrestrial flora and fauna have been completed and this initial report will be used to gauge the effectiveness of ongoing rehabilitation and future changes to the environment of the mining concession.

To further record the local situation, AVZ are in the process of establishing an on-site weather station as well as using CEMIC to assist AVZ in regular sampling of the various environmental aspects including the water and soil quality as well as gathering data on the socio-economic impact of AVZ's presence in Manono.

These data will be used for regular reporting to the Government environmental regulatory authorities and as a basis for developing future management plans. Through a planned process of census survey and public consultation, the refinement of social impact management plans will be established.

Government Engagement Updates

AVZ Minerals Limited is the most recent exploration company to arrive in Manono. Various government departments have actively sought to enter into discussions regarding AVZ's presence and future plans. AVZ have had active talks with the DRC Customs authorities regarding the taxes paid to bring drilling equipment and consumables into the country, the DGM or Immigration Department concerning the status of expatriate workers, the tax authorities to ensure AVZ remains in compliance regarding tax laws and payments as well as the Mines Departments at both federal and provincial levels.

In June 2018, discussions were held with the Governor of Tanganyika Province, the Honourable Mr. Richard Kitangala at the government offices in the provincial capital of Kalemie. Following on from a successful 2 days site visit in early June attended by the Provincial Minister for Mines, Mr. Erick Banza, AVZ was invited to meet with the Tanganyika Governor and his staff to brief the Governor on the progress being made at Manono.

The Governor was pleased with the Company's progress and agreed to assist with the development of the project by allowing access to his staff to provide us with information on potential haul routes for export of product. He also made several suggestions regarding putting aside sole use lands for product handling at both Kalemie and Moba ports for our consideration to ensure smooth product handling to Tanzania and the railheads located there.

Site visit by Provincial Mines Minister Mr Erick Banza (centre)

Community Involvement

AVZ recognises the importance of the involvement with community programmes. Manono is home to many foreign NGOs ranging from the Red Cross, CONCERN, Medicine Sans Frontiers, to PACT, an American organisation that tracks the source of tin, tantalum and tungsten used in the American electronics industry. It is AVZ's intention to assist these organisations where possible in simple humanitarian activities until the mine is re-established. The region suffers from chronic unemployment as well as health issues caused by endemic malaria as well as other diseases.

The most effective source of assistance is by way of employment and by the end of March 2018 it is estimated that AVZ had employed over 600 local people on a casual basis and distributed over US$340,000 to the local people by way of wages. The current team consists of just over 70% local employees. The Company prioritises on hiring local people wherever possible as well as encouraging ethnic minorities to apply for positions including women.

AVZ recently paid for the logistical support on a recent polio vaccination scheme in the greater Manono district. It is estimated that slightly over 95% of the local children in and around Manono who were targeted in the programme received their vaccination.

Registering day for casual employment opportunities (above) and local workers working at site (below)

AVZ has recently provided safe casual employment to approximately 320 artisanal workers who were illegally mining alluvial tin and tantalum on the Company concession to rehabilitate the main road that leads from the town to the Company camp site. This work is ongoing and is providing regular employment for 320 workers who are providing a vital community service by fixing the main road and its drainage system ahead of the coming rainy season.

AVZ plans to establish a Foundation Trust to transparently and fairly assist the local community to allocate royalties from mining. The current DRC Mining Law ensures that a portion of future production will be set aside for community programmes and the AVZ Foundation Trust will ensure these funds will be allocated and utilised accordingly.

Tin Opportunity

The MSA Group defined total Measured, Indicated and Inferred Mineral Resources of 400Mt grading 1.65% Li_2O. The combined total of Measured and Indicated Lithium Resource of 269Mt at 1.65% Li_2O also includes tin and tantalum at 816 ppm Sn (200kt Sn in cassiterite) and 36 ppm Ta (9.6kt Ta as Ta_2O_5)[1].

Nagrom completed spodumene concentration test work on drill hole samples of pegmatite ore from the Roche Dure deposit. From the 83 samples received by Nagrom, two composites were created (MO17DD001 Comp and MO17DD002 Comp) as per instructions from AVZ. *(Refer to announcement dated 21st May 2018: "Positive metallurgical test work results for Manono" and the Nagrom Metallurgical Report available on www.avzminerals.com)*

The head assays for the two composite samples are shown in the table below:

Sample ID	Mass (kg)	Li_2O (ppm)	Fe_2O_3 (%)	Al_2O_3 (%)	SiO_2 (%)	SnO_2 (%)
MO17DD001 Comp	151	17620	0.953	16.050	74.305	0.126
MO17DD002 Comp	111	13970	0.902	16.006	73.589	0.101
Average	-	15795	0.928	16.028	73.947	0.114

Table 8 Composite Sample Head Assays

The composite samples were split into two charges and tested via Flowsheet A and Flowsheet B, of which Flow Sheet A was selected and is discussed further in the following paragraphs.

Tin and tantalum recoveries to the final concentrate of Flowsheet A were recorded as SnO_2 and Ta_2O_5 as shown below.

Sample ID	Mass Yield to Concentrate (%)	SnO_2 Calculated Feed Grade (%)	SnO_2 (%)	SnO_2 (% recovered)	Ta_2O_5 Calculated Feed Grade (%)	Ta_2O_5 (%)	Ta_2O_5 (% recovered)
MO17DD001	25.33	0.152	0.500	83.3	0.003	0.010	84.4
MO17DD002	19.10	0.092	0.370	76.8	0.003	0.012	76.4

Table 9 Flowsheet A SnO2 and Ta2O5 Overall Recovery and Grade

Further test work was conducted on the tin and tantalum recovery with a sighter wet table test conducted on the P100 1 mm cyclone underflow material from the MO17DD001 composite sample to investigate the recovery of tin (as SnO_2) and tantalum (as Ta_2O_5). Mass deportments and grades are shown in the table 10.

[1] *Announcement dated 8th May 2019: Significant Upgrade in Measured & Indicated Mineral Resource*

Product Fraction	Mass Yield (%)	SnO_2 (%)	SnO_2 (distribution %)	Ta_2O_5 (%)	Ta_2O_5 (distribution %)
Cut 1	2.58	2.655	51.10	0.055	49.59
Cut 2	10.07	0.341	25.56	0.005	17.56
Cut 3	18.89	0.056	7.88	<0.01	0.00
Cut 4	21.05	0.026	4.08	0.002	14.69
Cut 5	15.66	0.023	2.68	<0.01	0.00
Cut 6	12.88	0.030	2.88	0.002	8.99
Cut 7	5.71	0.022	0.93	<0.01	0.00
Cut 8	0.01	0.022	0.00	<0.01	0.00
Slimes	13.14	0.050	4.89	0.002	9.17
Calculated Head	100	0.134	100	0.003	100

Table 10 Tin and Tantalum Recoveries from a Sighter Wet Table Test

The combined cut 1 and cut 2 fractions recovered 76.66% of the SnO_2 at a grade of 0.814% and 67.15% of the Ta_2O_5 at a grade of 0.015% with a mass yield of 12.65%.

As can be seen from the preliminary test work a significant tin recovery can be achieved using conventional gravity recovery techniques. This has significant potential benefit to the project and it is the company's intention to complete further test work to determine the optimum processing route for tin recovery.

This testwork will be undertaken on the 13 tonnes of PQ core samples forwarded to Western Australia for testwork at Nagrom.

Cautionary Notes: Forward Looking Statements

The findings contained in this study reflect an ongoing analysis and therefore there is no certainty that all the conclusions reached in this study will be realised. This report contains forward-looking statements. All statements, other than statements of historical fact, that address activities, events or developments in respect of which it is believed, expected or anticipated will or may occur in the future (including, without limitation, statements regarding estimates and/or assumptions in respect of production, revenue, cash flow and costs, estimated project economics, mineral resource and mineral reserve estimates, potential mineralization, potential mineral resources and mineral reserves, projected timing of possible production and exploration and development plans and objectives) are forward-looking statements.

These forward-looking statements reflect current expectations or beliefs based on information currently available. Forward-looking statements are subject to a number of risks and uncertainties that may cause the actual results of AVZ to differ materially from those discussed in the forward-looking statements, and even if such actual results are realized or substantially realized, there can be no assurance that they will have the expected consequences to, or effects on AVZ.

Factors that could cause actual results or events to differ materially from current expectations include, among other things: uncertainties relating to the availability and costs of financing needed in the future; uncertainty of estimates of capital and operating costs, production estimates and estimated economic return; the possibility that actual circumstances will differ from the estimates and assumptions used in the Manono Scoping Study; failure to establish estimated mineral resources or mineral reserves; fluctuations in lithium and tin prices and currency exchange rates; inflation; metal recoveries being less than those indicated by the metallurgical test work carried out to date (there can be no assurance that lithium and tin recoveries in small scale laboratory tests will be duplicated in large tests under on-site conditions or during production); changes in equity markets; political developments in the DRC; lack of infrastructure; failure to procure or maintain, or delays in procuring or maintaining, permits and approvals; lack of availability at a reasonable cost or at all, of plants, equipment or labour; inability to attract and retain key management and personnel; changes to regulations affecting AVZ's activities; the uncertainties involved in interpreting drilling results and other geological data; and the other risks disclosed under the heading "Risk Factors" and elsewhere in the Company's public documentation.

Any forward-looking statement speaks only as of the date on which it is made and, except as may be required by applicable securities laws, any intent or obligation to update any forward-looking statement, whether as a result of new information, future events or results or otherwise, is disclaimed. Although it is believed that the assumptions inherent in the forward-looking statements are reasonable, forward-looking statements are not guarantees of future performance and accordingly undue reliance should not be put on such statements due to the inherent uncertainty therein.

The mineral resource figures referred to in this report are estimates and no assurances can be given that the indicated levels of lithium will be produced. Such estimates are expressions of judgment based on knowledge, exploration and mining experience, analysis of drilling results and industry practices. Valid estimates made at a given time may significantly change when new information becomes available. While it is believed that the resource estimates included in this report are well established, by their nature resource estimates are imprecise and depend, to a certain extent, upon statistical inferences which may ultimately prove unreliable. If such estimates are inaccurate or are reduced in the future, this could have a material adverse impact on AVZ.

Mineral resources are not mineral reserves and do not have demonstrated economic viability. There is no certainty that mineral resources can be upgraded to mineral reserves through continued exploration.

Due to the uncertainty that may be attached to inferred mineral resources, it cannot be assumed that all or any part of an inferred mineral resource will be upgraded to an indicated or measured mineral resource

as a result of continued exploration. Confidence in the estimate is insufficient to allow meaningful application of the technical and economic parameters to enable an evaluation of economic viability worthy of public disclosure (except in certain limited circumstances).

For further information, visit www.avzminerals.com.au or contact:

Mr. Leonard Math
Company Secretary
AVZ Minerals Limited
Phone: +61 8 6117 9397
Email: admin@avzminerals.com.au

Media Enquiries:
Mr. Luke Forrestal
Media + Capital Partners
Phone: +61 411 479 144

Competent Person Statement

The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the 'JORC Code') sets out minimum standards, recommendations and guidelines for Public Reporting in Australasia of Exploration Results, Mineral Resources and Ore Reserves. The Information contained in this announcement has been presented in accordance with the JORC Code.

The information in the document that relates to the geology of the Roche Dure pegmatite is based upon information compiled by Mr Michael Cronwright, who is a fellow of The Geological Society of South Africa (GSSA) and is a registered professional with the South African Council for Natural Scientific Professions (SACNSAP). Mr Cronwright is a Principal Consultant with The MSA Group (Pty) Ltd (an independent consulting company). Mr Cronwright has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity he is undertaking to qualify as a Competent Person as defined in the 2012 edition of the JORC Code.

The Mineral Resource estimate has been completed by Mrs Ipelo Gasela (BSc Hons, MSc (Eng.)) who is a geologist with 14 years' experience in mining geology, Mineral Resource evaluation and reporting. She is a Senior Mineral Resource Consultant for The MSA Group (an independent consulting company), is registered with the South African Council for Natural Scientific Professions (SACNASP) and is a Member of the Geological Society of South Africa (GSSA). Mrs Gasela has the appropriate relevant qualifications and experience to be considered a Competent Person for the activity being undertaken as defined in the 2012 edition of the JORC Code.

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, in the case of estimates of Mineral Resource or Ore Reserves, 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 has not been materially modified from the original market announcement.

Summary Extract from CPC Scoping Study Report

CPC Project Design Pty. Ltd. (CPC) was retained by AVZ Minerals Limited to manage and complete a scoping study on the proposed Manono Lithium and Tin Project processing facilities and all non-process infrastructure. CPC has developed the process plant engineering design, operating cost and capital cost estimates for the project. The Alistair Group provided a report on transporting the concentrate from Manono to FOB Dar es Salaam. AVZ sourced several additional quotes for various other items required to complement the study outcomes and these have been incorporated into the study results.

Alan Dickson and Associates Pty Ltd (ADA) was retained by AVZ Minerals Limited to complete the financial modelling of the project. This too has been incorporated into the study results.

Scoping of processing facilities and all non-process infrastructure studies were undertaken on the current Measured, Indicated and Inferred Mineral Resource tonnages. Results from the initial characterisation metallurgical test work of the ore at Roche Dure were used to determine metallurgical recoveries and determine the processing flow sheet. Infrastructural and site services were refined for the project.

An economic model and financial analysis were also undertaken and completed by ADA, again only utilising Measured and Indicated Mineral Resource tonnages.

The results of the study encompass:

- Design is for a 5 Mtpa (Case 2) spodumene processing facility producing both DMS and flotation lithium oxide (Li_2O) concentrates which are combined for transporting offsite.
- A proposed processing circuit including crushing, DMS via DMS cyclones, ball milling, rougher/cleaner/recleaner flotation, concentrate thickening and filtration, reagents and tailings pumping
- Design is based on an average 1.51% lithium oxide (Li_2O) feed grade.
- Assessment of four concentrate transport route options. This study uses the most economical option identified by the report.

Property Description

The project is situated adjacent to the town of Manono, Tanganyika Province, approximately 500 km north of Lubumbashi, the capital of the Haut Katanga Province in the DRC. The area is centred on 7°19' south latitude, 27°25' east longitude. The project site covers approximately 188 km^2.

It is possible to reach the project area by road from Lubumbashi although sections of the road are in poor condition. Using a four-wheel drive vehicle in the dry months, the trip can be completed in a day. During the wet months trucks may take up to 10 days to complete the distance. This road is currently the subject of a US$285M refurbishment as part of the "Belt & Bridges" project with phase 1 expected to be completed within 18 months.

A local airline conducts regular flights between Manono and Lubumbashi with a flying time of approximately 1.5 hours.

Exploration and Geology

Exploration commenced in January 2017 and were completed by December 2018. The updated Mineral Resource reported on 8th May 2019 includes assay data from 86 drill holes on 1,600m of strike length, and geological data from a further 5 drill holes to enable the interpretation of a geological model. Drill holes MO18DD001-MO18DD83 were completed in 2018 and 4 holes which were drilled in 2017. A total of 27,466m of diamond core drilled was used in the Mineral Resources estimate.

The exploration programme included the extensive geological mapping along the +12.5 kilometre long pegmatite outcrop strike, which hosts the two principal zones of Kitotolo and Manono. Lithium and tin mineralisation is hosted in Lithium Caesium Tantalum ("LCT") pegmatites which have intruded a sequence of chlorite schist along the margins of a major granite filled anticlinal structure.

The historic Manono Mine was mined for its tin content between 1919 and 1982, during which time a total of 100 million cubic metres (Mm3) (approximately 150 million tonnes) of ore were processed to produce 185,000 tonnes (t) of cassiterite concentrate, sourced mainly from eluvial and weathered pegmatite from which was recovered an average of 1,850 gram of cassiterite concentrate per cubic metre (g/m3) (0.185%) or approximately 1,330 g/m3 tin. (0.133%)

Except for some exploration work carried out on the old mine dumps, aimed at determining cassiterite and spodumene grades, little prospection has taken place since 1960.

Mining

A conventional open pit shovel and truck method will be used for the mining of sufficient ore to supply 5 Mtpa of ore throughput respectively. It has been assumed that the mining functions of the operation will be carried out by contract miners. Equipment required will include three excavators, up to 15 dump trucks, associated dozers and graders and support equipment. Ore will be blasted and loaded into trucks for transport to the process plant which will be located within 1.5km of the main pit.

At this early stage of the project, no detailed mine planning or scheduling has been carried out. To facilitate other studies initial unoptimised pit designs have been developed to target Measured and Indicated Resource material in early years of operation to help manage resource risk. The initial Roche Dure pit designs have been done on the basis of 'staged' pits to take advantage of early cashflow and to defer material of a lower resource category to later in the life of the operations.

The current schedule attempts to maximise the amount of Measured and Indicated Resources mined early on in the project life with of lower category material being mined later and beyond the current 20 year mine life based on a production rate of 5 Mtpa of mill feed. These nominal pit shells are shown on the Figure 8.

AVZ will engage in more detailed mine planning and scheduling around pit optimisation studies as part of the full feasibility study to be undertaken. Modelled mine life has been kept to a maximum of 20 years which is well within the current total defined JORC compliant resource tonnages of 269.0Mt for Measured and Indicated categories.

Metallurgical Testing & Process Plant

Nagrom, a privately owned independent Western Australian company was engaged to perform metallurgical test work on drill hole samples of pegmatite mineralisation from the Roche Dure deposit. Composite samples were created based on instructions from AVZ and tested against two proposed standard flowsheets.

Flowsheet A (Figure 11) was the selected treatment process which resulted in an average recovery of approximately 81% and an average mass yield of approximately 22% from the two composite samples. The average grade of the concentrates produced from the two composite samples is 5.8% Li_2O.

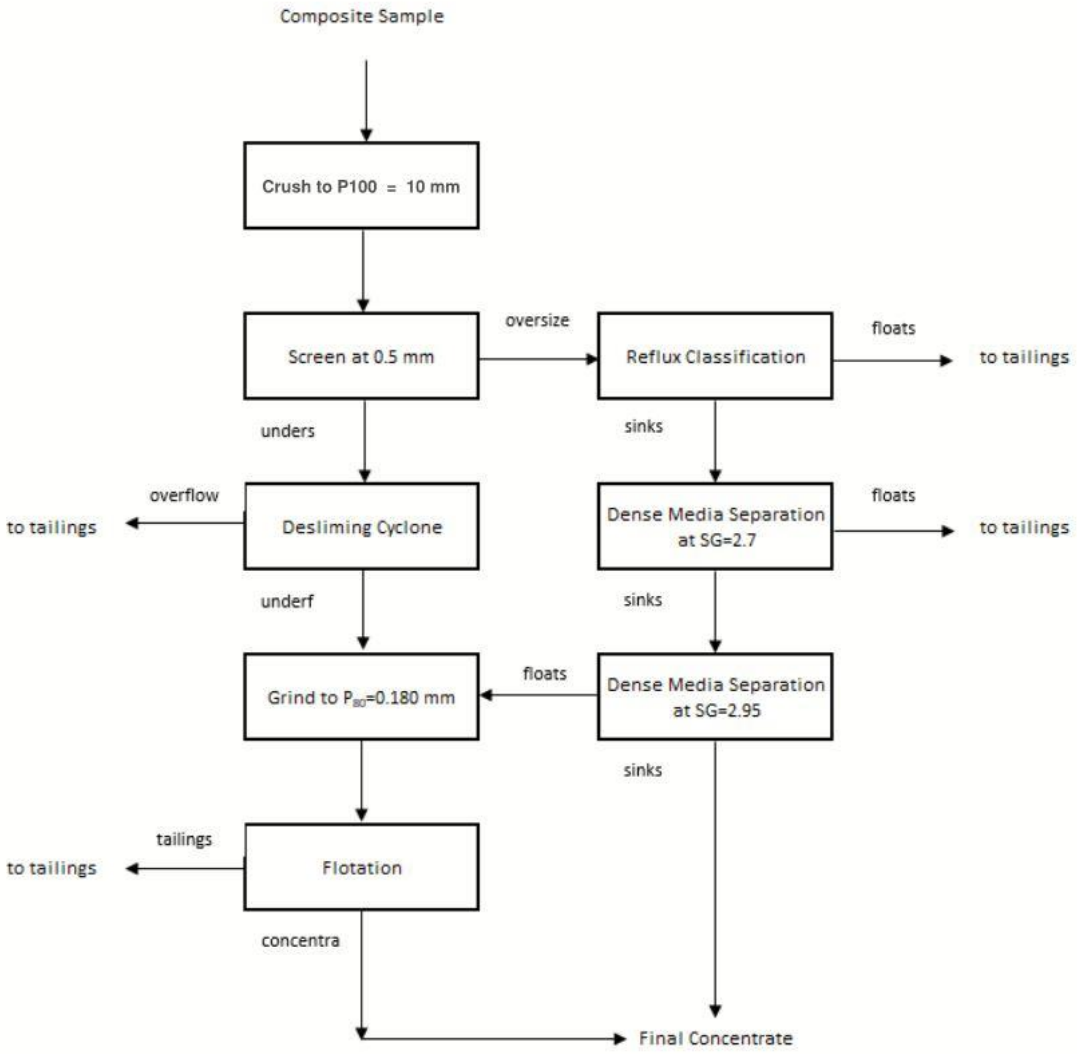


Figure 11 Flowsheet A

Preliminary test work indicates that significant tin recovery can be achieved using conventional gravity recovery techniques as a benefit to the project. Further test work should be considered to determine the optimum processing route for this recovery.

Process Plant

The 5 Mtpa study includes DMS, flotation spodumene plant and consists of the following unit operations:

- Three stage crushing and screening circuit utilising an HPGR as the tertiary crusher to produce a final crushed product with a P_{100} of 10 millimeter (mm)

  Note: Nagrom testwork was based P_{100} of 3.35mm, this is standard practice for an initial laboratory slighter test, where the 3.35mm top size represents the HPGR product. HPGR top size in typical site operation is usually 10mm or more, and for the purpose of this study report the 10mm top size will be noted.
- A scalping screen to separate crushed ore to ±0.5 mm
- Two stage DMS cyclone circuits on the +0.5 mm material to produce the following streams:
  - 2.7 SG DMS floats (reporting to tailings)
  - 2.95 SG DMS floats (combining with the -0.5 mm material in the milling circuit)
  - DMS sinks (forming part of the final concentrate).
- Ball milling and classification circuit, with a final grind size of P80 of 180 µm.
- Magnetic separation circuit, removing waste magnetic material before flotation.
- Magnetic separation circuits, removing waste magnetic material on the DMS sinks final concentrate.
- Rougher, cleaner and recleaner flotation cells producing a spodumene flotation concentrate.
- Concentrate thickener and belt filter for reducing moisture in the spodumene flotation concentrate prior to shipping offsite.
- Reagents storage, mixing and dosing and water storage to support the process.

Concentrate Transport

Traditionally, the path to market in the DRC is via Lubumbashi to Durban in South Africa however given the project's location in Manono, this is not considered an optimal route.

Through ongoing consultation and collaboration with local and regional government officials in the DRC and more recently with their counterparts in Tanzania, AVZ has determined that transport to Dar es Salaam in Tanzania is a more viable option for the project and is both shorter in distance and is expected to have lower costs than via road/rail to Durban. This has been validated by the Alistair Group report which identified viable transport costs using road and rail transportation from Manono to Dar es Salaam.

Optimum Transport Route

Alistair Group have provided a report investigating options for transporting the concentrate from Manono through to Dar es Salaam. The findings of this report concluded the most economic route is to road freight the loose bulk concentrate from the mine through to a rail siding at Nseluka in Zambia. From there the loose bulk concentrate is loaded on rail wagons and freighted via the Tazara rail facility to Dar es Salaam. In Dar es Salaam the concentrate is unloaded into a warehouse and then loaded on to bulk ships using ship loading techniques used elsewhere in Western Australia for lithium concentrate.

Route	Transport Method	Distance
Route 4		
Manono to Nseluka	Road	801
Nseluka to Dar es Salaam	Rail	1,031
Total		**1,832**

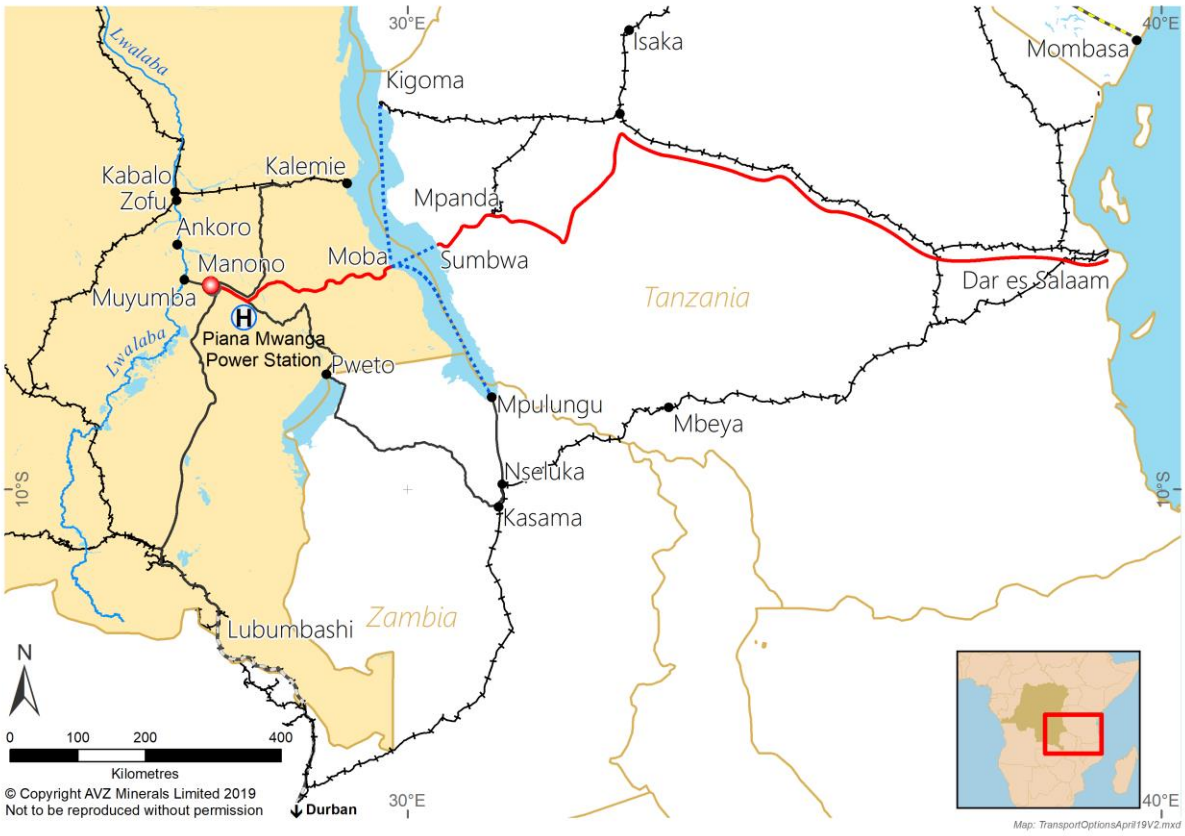


Figure 12 Optimum Transport Route for 5 Mtpa

Concentrate Loadout

Spodumene concentrate will be loaded by FEL and transported from site by truck. The concentrate will be transported to Dar es Salaam as outlined in the section above.

At the wharf the loose concentrate is loaded into the shipping vessel using similar loading techniques used in Western Australia for ship loading.

Transport Costs

Alistair Group provided a detailed report on four different transport routes. They concluded the most cost effective route was Route 4.

Route 4 is the selected option for this study and the capex and opex costs for this route have been included in this study.

Publicly released data from Ivanhoe Mines Kipushi Mine[1] located in the DRC which transports concentrate in similar quantities and distance, shows a back calculated transport cost of US$232/t which is comparable to the costs shown by Alistair Group for Route 4.

[1] https://www.ivanhoemines.com/news/2017/ivanhoe-mines-announces-an-outstanding-pre-feasibility-study-for-the-rebirth-of-the-historic-kipushi-zinc-copper-silver/

Tailings and Water Management

Tailings

The TSF will be located within a short distance of the processing facility. The most likely location will be an area between the existing waste dumps from the earlier mining operations. Further detailed studies will be undertaken during the Definitive Feasibility Study and will allow for safe confinement of the LOM process waste.

Water Supply

Raw water supply will be sourced from the nearby Lake Lukushi which has an existing dam. Raw water will be transferred from the dam, via a pump station, to a raw water pond located at the plant site through approximately 8 km of polyethylene pipe installed on the surface to ensure water supply during the dry season.

Infrastructure and Logistics

Airstrip

There is an existing airstrip in the township of Manono, approximately 8 km from the proposed plant location. The airstrip is serviced regularly by local airlines.

No allowance has been made to upgrade airstrip facilities and infrastructure.

Accommodation Village

Accommodation on site will be provided for the expat and technical workforce and will be constructed as part of the project. A 50-man camp already exists on site and when upgraded can be utilised for ramp up and construction purposes.

Administration Facility

The site administration offices will be located at the entry to the process plant and include a medical treatment facility adjacent to the complex. Offices, meeting rooms, a training facility, lunch rooms and toilets will be included in the administration facility complex which will be a transportable style building.

Existing administration blocks are already refurbished and operational on site. These will provide sufficient office space for management of operations, supplemented by demountable site offices as required.

Image of the Refurbished Office Complex at Site

Workshop, Stores and Laboratory

The workshop and stores facilities will be located at the process plant site and consist of a series of containers, domes and structural clad buildings. The following facilities will be provided:

- workshop, tooling area and store
- truck maintenance bay, oil storage and filter store
- light vehicle maintenance bay, tyre fitting area and light vehicle stores
- workshop office, crib room and ablution facilities
- store area and store office
- mobile equipment washdown facility.
- A laboratory will be constructed to provide analyses of both mining and metallurgical samples. The building will be air-conditioned and comprise a dry lab, offices, storage areas and semi-enclosed wet and dry areas and will be equipped with standard laboratory testing equipment, sample preparation equipment and consumables.

Some additional refurbishment of historic buildings and steel framed buildings may provide cost savings to the operations and remove the need for new construction of buildings as noted above.

Refurbished Core yard and logging facilities including diesel storage tanks (100,000lts capacity)

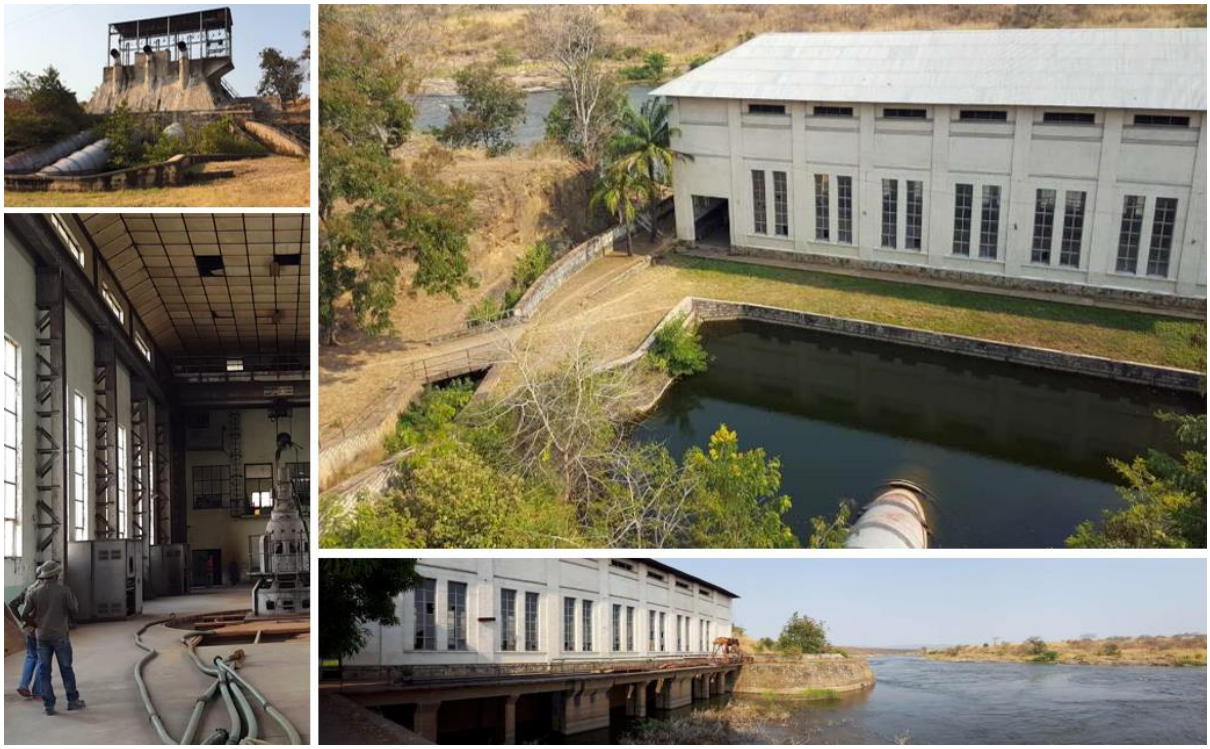
Power Supply and Distribution

The 5 Mtpa (Case 2) requires an estimated 16 megawatt (MW) maximum demand of electricity. The electricity is required to satisfy the estimated electrical energy requirement of the processing plant and non-process infrastructure.

Power will be supplied by diesel generators which will be located on site by AVZ and operated by a contractor. A local fuel storage facility will be constructed with diesel procured locally and delivered via tankers on a periodic basis.

Initial investigations into the potential of a stand-alone hydroelectric power generation for the Piana Mwanga project have been undertaken by AVZ Engineers. These investigations have indicated that the development of a hydroelectric facility to supply power to the Manono project is most probably feasible and viable, assuming government approvals obtained.

The initial study is based on a 34 MW, run-of-river hydroelectric scheme on the Luva River (some 85 km from Manono site), utilising a natural drop in the river over approximately 2 kilometres. Further studies are required to fully understand the feasibility and implications of this hydro facility on the Manono Project.



Images of the Piana Mwanga 32Mw Hydro Facility

Communications

A satellite link (with limited bandwidth but sufficient for voice and internet services) is proposed with a dish antenna linked to an onsite mobile network, servicing mobile phones.

The satellite and mobile tower facilities will be integrated into the site wide telecommunications network consisting of optical fibre cabling with built in redundancy running between key site locations.

The onsite telephone system will be a Voice Over Internet Protocol (VOIP) system utilising the site internet services and router to the site satellite and mobile tower service.

Image of the Communications Tower within the Camp Site

Environmental Assessment

Baseline studies of the site have been completed as well as a full assessment of the hydrology and water quality. A full ESIA is now being planned to determine the quantification of impacts and development of management plans. Field surveys or seasonal measurement of relevant parameters in the fields of hydrology, soils, air quality, noise, aquatic ecology and terrestrial flora and fauna will need to be undertaken by appropriate specialists.

AVZ are in the process of establishing an on-site weather station and regular sampling of these environmental aspects will include the air quality and noise impacts of the project. Socio-economic studies including development of a social baseline and impact assessment, and a health and safety study, will form basis for developing management plans. Through a planned process of census survey and public consultation, the refinement of social impact management plans will be completed and included in the ESIA.

Capital and Operating Cost Estimate

The capital and operating costs estimate was developed for a 2 Mtpa and 5 Mtpa throughput shown in Table 13 and Table 14 respectively. The costs are based on 100% of project interest. AVZ holds 60% interest in the Manono Lithium and Tin Project.

Production Rate	US$M	Accuracy %	Contingency
Case 1 – 2 Mtpa throughput*	150 - 160	±35%	US$36M
Case 2 – 5 Mtpa throughput	380 - 400	±35%	US$78M

**Refer to ASX announcement on 9th October 2018: Scoping Study Highlights Strong Economic Potential of Manono*

Table 13 Capital Cost Summary, Accuracy and Contingency

Cost Centre	US$/t feed 2Mtpa*	US$/t concentrate 2Mtpa*	US$/t feed 5Mtpa	US$/t concentrate 5Mtpa
Mining	12	56	7	33
Processing	14	64	12	58
Transport	49	221	47	223
Admin and Sust. capital	3	14	2	9
Total Operating Costs	**78**	**355**	**68**	**323**

**Refer to ASX announcement on 9th October 2018: Scoping Study Highlights Strong Economic Potential of Manono*

Table 14 Operating Costs Estimates for 2Mtpa and 5Mtpa

The Opex includes costs for:

- contract mining preliminary and generals (P&G's)
- contract mining unit rates for drill and blast and haulage
- processing labour
- flights and accommodation for non-local personnel
- power
- reagents and consumables
- process maintenance
- concentrate transport from Manono FOB Dar es Salaam
- mobile vehicles for the process operations
- other direct general and administrative (G&A) costs relative to the process plant and non-process infrastructure.

Opportunities and Recommendations

Caution needs to be exercised in utilising the outputs of this study. The design is based on selected design parameters from minimal metallurgical test work, with aspects of the selected flow sheet not fully laboratory tested

The metallurgical test work was completed on two composite samples to produce a simplistic process flowsheet, further future test work campaigns should be undertaken in all areas to fully understand the behaviour of the ore. Such as variability data to determine how the process plant will perform over the life of the project, for example, ore significantly harder than design will cause the throughput rates to reduce below nameplate capacity

The metallurgical test work had all initial sample crushed to 100% passing 3.35 mm. This is standard practice for an initial laboratory sighter test (where the 3.35mm top size, represents the HPGR product). HPGR top size in typical site operation is usually 10mm or more. This means that the coarse spodumene and test work is not truly representative

Investigation into tin and potentially tantalum recovery should be undertaken to determine the optimal processing route given that potential recoveries have been indicated in the preliminary test work program

Risks to OPEX are more significant due to the major impact of reagent consumption on costs, and limited test work regarding reagent dosages required. In addition, several OPEX cost inputs (e.g. diesel) are based on international goods that are historically price volatile and are impacted by foreign exchange rates

Investigation into alternative power sources should be reviewed as this is currently a major contributor to the process OPEX and a reduction in unit cost could positively impact the project financials. In Piana Mwanga, approximately 85 km from site, there is a hydroelectric power facility that was in operation until 1999 and while some work would be required for upgrading/updating of the plant, there may be considerable cost savings should hydro power be available

A detailed logistics study should be completed to further refine the costs of transporting the concentrate and backhauling of supplies as this is a large portion of the operating cost

Further investigation into downstream processing options for spodumene concentrate may be considered. A cost benefit analysis should be completed for each potential option as they each have unique advantages and drawbacks. Pyrometallurgical processing is energy intensive process while hydrometallurgical processing is mainly driven the chemicals costs

The transport of the wet spodumene concentrate (9% moisture) is a significant cost to the study. Lowering the moisture content of the spodumene concentrate will translate into lower transport costs, and can be achieved by a variety of means including solar drying, use of a rotary dryer etc.

A trade-off/cost benefit analysis comparing the different dewatering and drying options for lowering the moisture content of the spodumene concentrate should be considered to identify potential savings. This may include future filter testwork to reduce moisture level and refine equipment selection between belt filter versus plate and frame trade-off

Maintenance cost of hard-rock spodumene concentrate plants was identified to be above industry norms of typical mineral processing plants, future studies should further investigate similar operational maintenance costs

Secondary crushing circuit is based on single circuit cone crusher design, future studies should consider the benefit of dual or triple circuit cone crusher design with consideration to equipment selection and availability/maintenance benefits in line with in industry design

Ore sorting testwork – Ore sorting is separating an ore into constituent parts. Often used in industrial mineral mines, diamond mines and base metal mines. Ores are sorted to increase the efficiency of the

next stage of processing, such as Beneficiation then to Flotation or DMS, by reducing the amount of material to be processed while simultaneously increasing its purity (Head grade).

Main interest/benefits to incorporate “Ore sorting” includes:

- Pre-concentrate mill feed into high-grade and low-grade fractions
- Beneficiation, removing waste components and other deleterious elements.
- Manage ore blending programs more effectively
- Sort high-grade ore out from low-grade stockpiles
- Reduce mill power consumption
- Optimize multiple process streams
- Send appropriate ore directly to the mill.

A metallurgical test work program can be designed to select and optimise the different types of Ore Sorting Technology available.

Down Stream processing – future opportunities may study the benefits of processing the spodumene concentrates locally to lithium carbonate, lithium hydroxide and/or lithium chloride. The spodumene concentrates, recovered from the physical beneficiation, is used as the feedstock to produce high value lithium chemicals, including lithium carbonate, lithium metal, lithium chloride, lithium hydroxide. The lithium in the spodumene concentrate is extracted via pyrometallurgical and/or hydrometallurgical processing to produce lithium chemicals. Converting the spodumene concentrate into lithium chemicals would reduce the transportation cost and presents an opportunity to improve the project value through the higher selling price of the lithium chemicals.

Next Phase Testwork program considerations:

- Requires Geo-Metallurgy considerations
- Mineralogy types, Lithology, PSD variances, rock density variances, weathering, oxidation state, feed grade variances etc.
- The Core sections selected, must be representative of future ROM Ore that is involved in the Design and optimization of the Process Plant
- The Hanging Wall and Foot Wall domains, must be considered to be included, if these are part of Mining schedules and LOM plan, to be carried through to future production Plans.

Definitions

Terms	Definition
AVZ	AVZ Minerals Limited. Also referred to as the Company
ADA	Alan Dickson & Associates Pty Ltd
Bn	Billion
CPC	CPC Project Design Pty Ltd
DMS	Dense Media Separation
FOB	Free On Board
IRR	Internal Rate of Return
LOM	Life of Mine
Mt	Million tonnes
Mtpa	Million tonnes per annum
NPV_{10}	Net Present Value with 10% discount rate
NPV_{15}	Net Present Value with 15% discount rate
ROM	Run of Mine
tpa	tonnes per annum
Case 1	2 million tonnes per year throughput
Case 2	5 million tonnes per year throughput