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Mandalay Resources - Costerfield Property NI 43-101 Technical Report

MANDALAY RESOURCES - COSTERFIELD PROPERTY

NI 43-101 TECHNICAL REPORT

PROJECT COMPLETION DATE: 25 March 2022

MANDALAY RESOURCES LTD

Document Control Information

<table>
<tr><td rowspan="3">Customer
MANDALAY RESOURCES</td><td rowspan="2">Mandalay Resources - Costerfield Property NI 43-101 Technical Report</td><td colspan="2">REVISION</td></tr>
<tr><td>No.</td><td>DATE</td></tr>
<tr><td>9601 Costerfield NI43-101 TR R5</td><td>05</td><td>25/03/2022</td></tr>
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Revision Tracking

Revision	Prepared By	Reviewed By	Issued For	Approved By	Date
00	Andrew Goode	Andrew Fowler	RC	Andrew Fowler	4/03/2022
01	Andrew Goode	Gabby Kirk	RC	Andrew Goode	5/03/2022
02	Andrew Goode	Mandalay	RC	Mandalay	7/03/2022
03	Andrew Goode	Aaron Spong	QP	Aaron Spong	24/03/2022
04	Andrew Goode	Simon Walsh	QP	Simon Walsh	23/03/2022
05	Andrew Goode	Richard Buerger	QP	Richard Buerger	23/03/2022
06	Andrew Goode	Andrew Fowler	FV	Andrew Fowler	25/03/2022

Issued For: Review and Comment (RC), Information Only (IO), Implementation (IM), Final Version (FV).

Quality Control

Principal Report Compiler	ANDREW GOODE	Date	30 MARCH 2022
Principal Report Reviewer	ANDREW FOWLER	Date	14 MARCH 2022
QUALIFIED PERSONS	AARON SPONG	Date	24 MARCH 2022
	SIMON WALSH	Date	23 MARCH 2022
	ANDREW FOWLER	Date	25 MARCH 2022
	RICHARD BUERGER	Date	23 MARCH 2022
Additional Reviewers	GABBY KIRK, JOSHUA GREENE, ELAINE BELLAMY		

1 EXECUTIVE SUMMARY

The Costerfield Property ("The Property"), wholly owned by Mandalay Resources Corporation ("Mandalay Resources" or "Mandalay") is located within the Costerfield mining district, approximately 10 km northeast of the town of Heathcote, Victoria. The Property mining and processing facilities include an underground mine and a conventional flotation processing plant (Brunswick Processing Plant) with a current capacity of approximately 150,000 t/year of feed.

Mandalay Resources is a publicly listed company trading on the Toronto Stock Exchange (TSX) under the symbol MND, with the head office at 76 Richmond Street East, Suite 330, Toronto, Ontario, Canada M5C 1P1.

Mining Plus was commissioned by Mandalay to provide Qualified Persons (QPs) to undertake personal inspections of the Property, complete detailed reviews of the work completed by Mandalay personnel and take QP responsibility for the 2021 Technical Report and any associated public disclosure. Mining Plus QPs have independently reviewed the work completed by Mandalay Resources and take responsibility for all sections of this Technical Report, with some reliance placed on external experts to the extent permitted under the Canadian National Instrument 43-101 (NI 43-101).

The Mineral Resource and Mineral Reserve Statement reported herein was prepared in accordance with the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) "Definition Standards" (CIM, 2014), "Mineral Exploration Best Practice Guidelines" (CIM, 2018) and "Estimation of Mineral Resource and Mineral Reserves Best Practice Guidelines" (CIM, 2019).

During 2021, Mandalay drilled a total of 36.3 kilometres ("km") of exploration diamond core at a cost of $6.0 million. The breakdown of this significant drilling campaign is as follows:

- 27.0 km to test extensions of the Youle and Shepherd orebodies;
- 2.6 km to test other near-mine targets; and
- 6.7 km to test regional targets beyond current mine operations.

In addition to drilling, 4,585 m of on-vein development was completed within the Youle ore body, with 75 m development from October 2021, into the Shepherd ore body. Rock chip samples used in mine grade control were also included in the geological database and used in the Mineral Resources estimation process to improve Mineral Resources classification in areas accessed by development.

Drill core was logged and sampled by Costerfield geologists, who also performed mine sampling. All samples were submitted to Onsite Laboratory Services in Bendigo, Victoria, Australia for sample preparation and assay. Site geological and metallurgical personnel have implemented a QA/QC process that includes the regular submission of site specific and externally sourced standard reference materials, duplicates and blanks with drill and face samples submitted for assay. Site specific standard reference materials were both produced and certified by Geostats Pty Ltd. or ORE Research and Exploration Pty Ltd. (OREAS). Both Geostats Pty Ltd. and OREAS are Australian consultancies who specialize in laboratory quality control systems.

The acQuire™ Geoscientific Information Management ("GIM") system was used to store and validate all geological data used for the Mineral Resource Estimate. A two-dimensional ("2D") accumulation estimation method was used for all models. This method is considered most applicable for the narrow veins of Costerfield. The Datamine™ Studio RM platform supports 2D accumulation estimation and was used to complete the Mineral Resource Estimation. Validated drilling and mine sampling data were imported into Datamine and composited to true vein width. Gold accumulation, antimony accumulation (accumulation = vein true width x vein grade) and true vein width were estimated into a 2D block model for each lode using ordinary kriging interpolation. Estimated gold and antimony vein grades were back-calculated from the block estimated accumulated data and true vein width.

Where vein true widths are less than 1.2 m, vein grades were diluted to a minimum mining width of 1.2 m using dilution grades of zero g/t gold and zero percent antimony for host lithologies. Where vein true widths are greater than or equal to 1.2 m grades were not diluted.

Mineral Resources were estimated at a cut-off grade of 3.0 g/t gold equivalent ("AuEq") which was determined using Costerfield's 2021 production costs, and using a gold price of $1,700/oz, and an antimony price of $8,500/t. Cut-off grade is expressed as AuEq to allow for the inclusion and expression of the secondary metal (Sb) in terms of the primary metal (Au). AuEq is calculated using the formula AuEq= Au + (Sb x 1.58) where Sb is expressed as a percentage, and Au is in grams per tonne, both based on 1.2 m diluted grades.

Table 1-1: Mineral Resources at Costerfield, Inclusive of Mineral Reserves as of December 31, 2021

Resource Category	Tonnes (kt)	Au Grade (g/t)	Sb Grade (%)	Cont. Au (koz)	Cont. Sb (kt)
Measured Resources					
Underground	408	15.4	5.0	202	20.4
Stockpile	41	10.1	3.3	14	1.4
Indicated Resources					

Underground	938	8.6	1.9	259	17.5
Total Measured and Indicated	**1,387**	**10.6**	**2.8**	**474**	**39.3**
Inferred Resources					
Underground	**532**	**6.7**	**1.3**	**114**	**6.7**

Notes:

1. The Mineral Resource is estimated as of December 31, 2021 with depletion through to this date.
2. The Mineral Resource is stated according to CIM guidelines and include Mineral Reserves.
3. Tonnes are rounded to the nearest thousand; contained gold (oz) is rounded to the nearest thousand; contained antimony (t) is rounded to nearest hundred.
4. Totals may appear different from the sum of their components due to rounding.
5. 3.0 g/t AuEq cut-off grade over a minimum mining width of 1.2 m is applied where AuEq is calculated using the formula: AuEq = Au g/t + 1.58 * Sb %
6. The AuEq factor of 1.58 is calculated at a gold price of $1,700/oz, an antimony price of $8,500/t, and 2021 total year metal recoveries of 93% for Au and 95% for Sb.
7. Veins were diluted to a minimum mining width of 1.2m before applying the cut-off grade and peripheral mineralisation far from current development was excluded to comply with the Reasonable Prospects for Eventual Economic Extraction (RPEEE) criteria.
8. The Stockpile Mineral Resource is estimated based upon surveyed volumes supplemented by production data.
9. Geological modelling, sample compositing and Mineral Resource Estimation for updated models was performed by Joshua Greene, MAusIMM, a full-time employee of Mandalay Resources.
10. The Mineral Resource Estimate was independently reviewed and verified by Dr Andrew Fowler MAusIMM CP (Geo), a full time employee of Mining Plus. Dr Fowler fulfils the requirements to be a "Qualified Person" for the purposes of NI 43-101, and is the Qualified Person under NI 43-101 for the Mineral Resource Estimate.

The Measured and Indicated categories of Mineral Resources were used to update the mine plan using predominantly a long-hole stoping mining method with cemented rock fill. A cut-off grade of 3.8 g/t AuEq was determined from Costerfield's 2021 production costs, and minimum stoping width of 1.5 m were used, with planned and unplanned dilution at zero grade for both Au and Sb. AuEq grade for Mineral Reserves is calculated using commodity prices of $1,500/oz for Au, and $7,500/t Sb). AuEq is calculated using the formula AuEq= Au + (Sb x 1.06) where Sb is in % and Au is in grams per tonne.

Financial viability of Proven and Probable Mineral Reserves was demonstrated at metal prices of $1,500/oz Au and $7,500/t Sb.

Table 1-2: Mineral Reserves at Costerfield as of December 31, 2021

Reserves Category	Tonnes (kt)	Au Grade (g/t)	Sb Grade (%)	Cont. Au (koz)	Cont. Sb (kt)
Proven Reserves					
Underground	267	15.9	4.4	136	11.7
Stockpile	41	10.1	3.3	14	1.4
Probable Reserves					

Underground	460	10.9	1.4	162	6.5
Total Proven and Probable	**769**	**12.6**	**2.5**	**312**	**19.6**

Notes:

1. Mineral Reserve estimated as of December 31, 2021, and depleted for production through to December 31, 2021.
2. Tonnes are rounded to the nearest thousand; contained gold (oz) is rounded to the nearest thousand; contained antimony (t) rounded to nearest hundred.
3. Totals may appear different from the sum of their components due to rounding.
4. Lodes have been diluted to a minimum mining width of 1.5 m for stoping and 1.8 m for ore development.
5. A 3.8 g/t AuEq cut-off grade is applied.
6. Commodity prices applied are gold price of USD1,500/oz, antimony price of USD7,500/t and exchange rate USD:AUD of 0.71.
7. The (AuEq) is calculated using the formula: AuEq = Au g/t + 1.06 * Sb %.
8. The Mineral Reserve is a subset, a Measured and Indicated only Schedule, of a Life of Mine Plan that includes mining of Measured, Indicated and Inferred Resources.
9. The Mineral Reserve Estimate was prepared by Dylan Goldhahn, AusIMM under the direction of Daniel Fitzpatrick, MAusIMM, who are both full time employees of Mandalay Resources. The Mineral Reserve estimate was independently verified by Aaron Spong FAusIMM CP (Min) who is a full-time employee of Mining Plus. Mr Spong fulfils the requirements to be a "Qualified Person" for the purposes of NI 43-101, and is the Qualified Person under NI 43-101 for the Mineral Reserve.

The net increase of 57,000 ounces of gold in Proven and Probable Mineral Reserves for 2021, relative to 2020, consists of the addition of 113,000 ounces of gold added by Mineral Resource conversion and addition of resources to the Youle and Shepherd ore bodies and a total of 55,000 ounces of gold depleted from the 2020 Mineral Reserves through mining production in 2021. The 2,200 tonnes of antimony net decrease in Proven and Probable Mineral Reserves consist of 3,600 tonnes of antimony added by Mineral Resources conversion and addition of Mineral Resources to Youle and Shepherd and 5,800 tonnes of antimony depleted from the 2020 Mineral Reserves through mining production in 2021. The Mineral Reserves of the Youle and Shepherd ore bodies were added at an exploration cost of $30.79 per gold equivalent ounce.

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2 INTRODUCTION

Mining Plus Pty Ltd (Mining Plus) has overseen the preparation of this Costerfield Property Technical Report. The report demonstrates the viability of continued mining and processing operations at the Property and was largely compiled by Mandalay Resources personnel.

The Costerfield Property is located within the Costerfield mining district, approximately 10 km northeast of the town of Heathcote, Victoria. The Property's Augusta Mine has been operational since 2006 and has been the sole ore source for the Brunswick Processing Plant, with multiple zones, Augusta (from 2006), Cuffley (from 2013), Brunswick (from 2018), Youle (from 2019), and Shepherd (from 2021), constituting ore sources. The drilling and mining of the Youle and Shepherd Deposits has extended the current mine life of the Costerfield Operation, with mining of the Youle Deposit commencing in 2019.

The Costerfield Property mining and processing facilities are contained within Mining Lease MIN4644 and comprise the following:

- An underground mine with production from the Youle and Shepherd Lodes,
- A conventional flotation processing plant (Brunswick Processing Plant) with a current capacity of approximately 150,000 t/year of feed,
- Mine and mill infrastructure including office buildings, workshops, core shed and equipment.

Mandalay Resources is a publicly listed company trading on the Toronto Stock Exchange (TSX) under the symbol MND, with the head office at 76 Richmond Street East, Suite 330, Toronto, Ontario, Canada M5C 1P1. On 1 December 2009, Mandalay Resources completed the acquisition of AGD Mining Pty Ltd (AGD) from Cambrian Mining Limited (Cambrian), a wholly-owned subsidiary of Western Canadian Coal Corporation (WCC), resulting in AGD becoming a wholly-owned subsidiary of Mandalay Resources.

2.1 Terms of Reference

Mining Plus was commissioned by Mandalay Resources to provide Qualified Persons (QPs) to undertake personal inspections of the Property, complete detailed reviews of the work completed by Mandalay personnel and take QP responsibility for the 2021 Technical Report and any associated public disclosure. Mining Plus QPs have independently reviewed the work completed by Mandalay Resources and take responsibility for all sections of this Technical Report, with some reliance placed on external experts to the extent permitted under the Canadian National Instrument 43-101 (NI 43-101).

The Mineral Resource and Mineral Reserve Statement reported herein was prepared in accordance with the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) "Definition Standards" (CIM, 2014), "Mineral Exploration Best Practice Guidelines" (CIM, 2018) and "Estimation of Mineral Resource and Mineral Reserves Best Practice Guidelines" (CIM, 2019).

This Technical Report has been prepared in accordance with NI43-101 and Form 43-101 F1.

The Technical Report was assembled in Melbourne and Perth during the months of January to March 2022.

2.2 Effective Date

This report is dated 25th March 2022 and has an effective date of 31 December 2021.

This date coincides with the following:

- Depletion due to mining up to 31 December 2021,
- Survey of stockpiled ore that was mined and awaiting processing as of 31 December 2021.

All relevant diamond drill hole and underground face samples in the Costerfield Property, available as of 6 December 2021 for the Augusta, Cuffley, Brunswick, and Youle Deposits, and as of 17 December 2021 for the Shepherd Deposit, were used to inform the Mineral Resource Estimate.

2.3 Qualified Persons

Dr Andrew Fowler: Mining Plus Principal Geologist, PhD, MAusIMM CP (Geol), reviewed all aspects of the construction of the geological models and the estimation of the Mineral Resource. He conducted a personal inspection of the Property in December 2020. He is independent of Mandalay Resources, however has had prior involvement with the Property during 2006-2008 when he was employed by AGD Operations Pty Ltd. By virtue of his education, membership to a recognised professional association and relevant work experience is an independent QP as defined by NI 43-101.

Aaron Spong: Mining Plus Principal Mining Engineer, BEng, FAusIMM CP (Mining), reviewed all aspects of the estimation of the Mineral Reserve and associated information. He conducted a personal inspection of the Property in February 2022. By virtue of his education, membership to a recognised professional association and relevant work experience is an independent QP as defined by NI 43-101.

Simon Walsh: Mining Plus Associate Principal Metallurgist, BSc (Extractive Metallurgy & Chemistry), MBA Hons, MAusIMM CP (Met), GAICD undertook a review of the mineral processing and metallurgical testing, recovery methods and infrastructure aspects of the project. He conducted a personal inspection of the Property in September 2015. By virtue of his education, membership to a recognised professional association and relevant work experience is an independent QP as defined by NI 43-101.

Richard Buerger: Formerly Mining Plus Principal Geologist, MAIG (6031), reviewed all aspects of the geological data collection and storage. He conducted a personal inspection of the Property in September 2021. He is independent of Mandalay Resources. By virtue of his education, membership to a recognised professional association and relevant work experience is an independent QP as defined by NI 43-101.

Internal Mining Plus peer review has been completed by Andrew Goode, Principal Geologist and Gabby Kirk, Geology Manager for Mining Plus.

2.4 Acknowledgements

Mining Plus would like to acknowledge the support and collaboration provided by Mandalay Resources personnel during the completion of this project. In particular, Mining Plus would like to thank the following people:

- Chloe Cavill: Geological oversight and operational information,
- Joshua Greene: Mineral Resource estimation, and geological modelling,
- Dylan Goldhahn: Ore Reserve, scheduling, and mine design,
- Dan Fitzpatrick: Engineering and economic oversight,
- Paul Omizzolo: Mineral processing and metallurgical testwork,
- April Westcott: Geological technical report writing.

3 RELIANCE ON OTHER EXPERTS

The Qualified Person has relied upon, in respect of legal and marketing aspects, the work of the Experts listed below.

To the extent permitted under NI 43-101, the Qualified Persons disclaim responsibility for the relevant sections of the Report.

3.1 Land and Mineral Tenure

The land and mineral tenure information detailed in this report in Section 4.2 and Section 4.7 was verified by Michael Davie Smyth of Tenement Administration Services as being in good standing.

- Expert: Michael Davie Smyth, Tenement Administration Services,
- Report, opinion or statement relied upon: Information on mineral tenure and status, title issues, royalty obligations, etc,
- Extent of reliance: full reliance following a review by the Qualified Person,
- Portion of Technical Report to which disclaimer applies: Section 4.

3.2 Marketing

Marketing information for this report, specifically Section 19, relies entirely on information by Roskill Information Services Ltd. A specific marketing study was not completed for this report.

- Roskill Information Services Ltd,
- Report, opinion, or statement relied upon: Information on marketing, concentrate transport, and contractual arrangements,
- Extent of reliance: full reliance following a review by the Qualified Person,
- Portion of Technical Report to which disclaimer applies: Section 19.

4 PROPERTY, DESCRIPTION AND LOCATION

4.1 Property Location

The Costerfield Operation (the Property) is located within the Costerfield mining district of Central Victoria, approximately 10 km northeast of the town of Heathcote and 50 km east of the city of Bendigo (Figure 4-1).

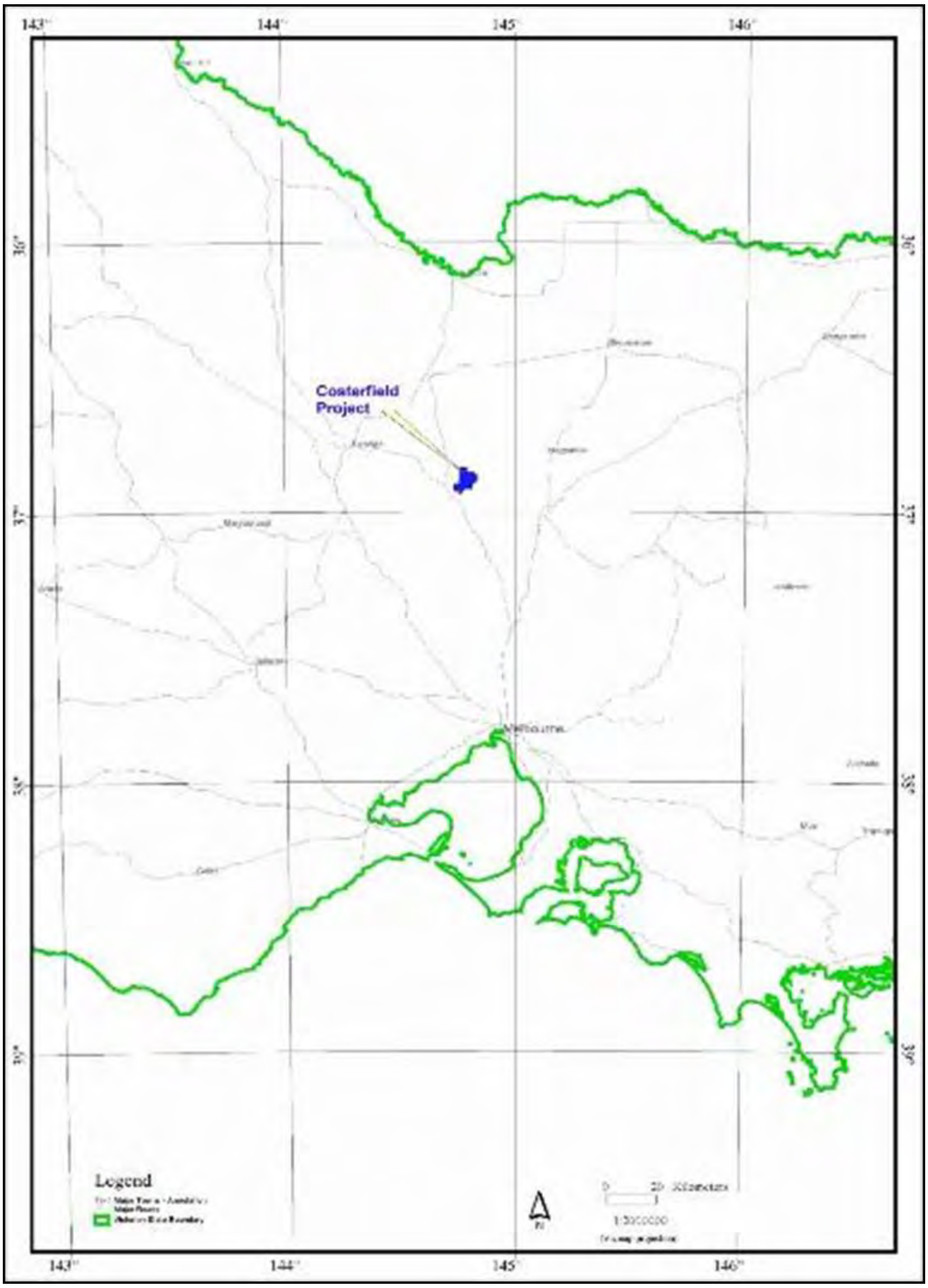


Figure 4-1: Costerfield Property Location Map

The Property encompasses the underground Augusta Mine including the Augusta, Cuffley, Brunswick, Youle and Shepherd Deposits; the Brunswick Processing Plant; Splitters Creek Evaporation Facility; Brunswick and Bombay Tailings Storage Facilities (TSF) and associated infrastructure.

The Augusta Mine (Augusta) is located at latitude of 36°52’ 27” south and longitude 144 47’ 38” east. The Cuffley Deposit is located approximately 500 m north-northwest of the Augusta workings. The Brunswick Deposit is located approximately 1.4 km north-northwest of the Augusta workings and 680 m north-northwest of the Cuffley Deposit. The Youle Deposit is located north of the Augusta workings and Cuffley Deposits approximately 2.2 km and 1.6 km respectively. The Shepherd deposit is located vertically below the Youle deposit. The Brunswick Processing Plant is located approximately 2 km northwest of the Augusta Mine.

The deposits are primarily accessed via the decline at Augusta. Ore haulage to the ROM takes place through the Brunswick portal, which opened in November 2020.

4.2 Land Tenure

Tenure information for the Costerfield Property has been detailed in Table 4-1. Information has been provided for the two Mining Licences (ML), two Exploration Licences (EL), two Exploration Licences under application (ELA), one expired Exploration License (EXEL) and two Retention Licences under application (RLA).

Table 4-1: Property Tenement Package Details

Licence	Name	Status	Company	Area	Grant Date	Expiry Date
MIN4644	Costerfield	Granted	AGD Operations P/L	1,219.3 ha	25/02/1986	30/06/2026
MIN5567	Splitters Creek	Granted	Mandalay Resources Costerfield Operations Pty Ltd	30.0 ha	21/02/2013	20/02/2023
EL5432	Peels Track	Granted	AGD Operations P/L	2.0 graticules	23/08/2012	22/08/2022
EL5519	Antimony Creek South	Granted	Mandalay Resources Costerfield Operations Pty Ltd	4.0 graticules	28/05/2015	27/05/2023
ELA6842	Costerfield West	Under Application	Mandalay Resources Costerfield Operations Pty Ltd	29.0 graticules	Submitted 2/10/2018	Pending
ELA6847	Costerfield East	Under Application	Mandalay Resources Costerfield Operations Pty Ltd	35.0 graticules	Submitted 2/10/2018	Pending

Licence	Name	Status	Company	Area	Grant Date	Expiry Date
RLA7485	Costerfield	Under Application (covers expired EL3310 area)	Mandalay Resources Costerfield Operations Pty Ltd	3,170.4 ha	Submitted 15/09/2020	Pending
RLA7492	Costerfield	Under Application (covers expired EL3310 area)	Mandalay Resources Costerfield Operations Pty Ltd	23.3 ha	Submitted 15/09/2020	Pending

NB – 1 graticule is equivalent to 1 km^2

Mandalay Resources manages the Costerfield Property and holds a 100% interest in licences MIN4644, MIN5567, EL5432, and EL5519 (Figure 4-2).

On 2 November 2018, two EL applications (ELA6847 and ELA6842) were submitted to the Department of Jobs, Precincts and Regions (DJPR). These two licences were located to the east and west of the existing Costerfield Operation tenement package and cover 64 km^2, (Figure 4-2).

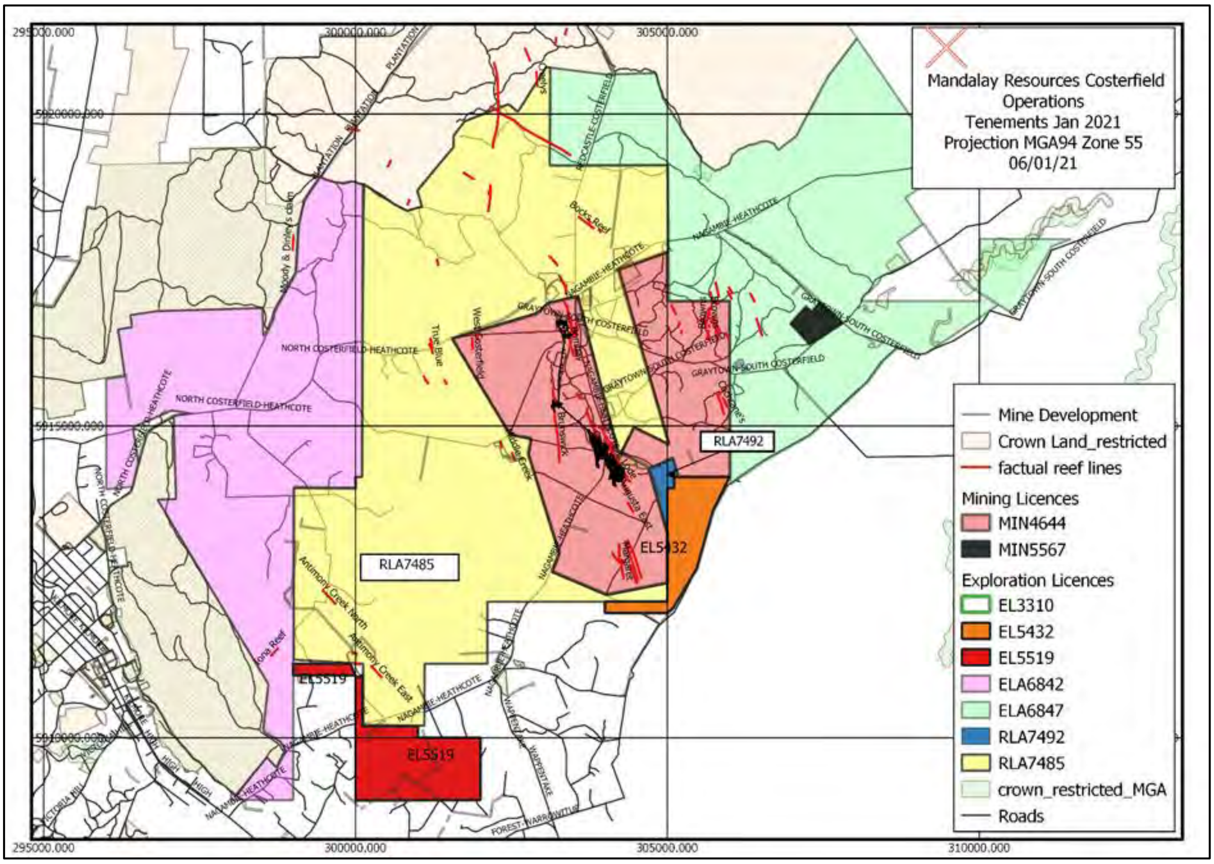


Figure 4-2: Mandalay Resources ML and EL Tenement Boundaries, displaying two EL licence applications to the east and west of the current licences and two Retention licence applications

The licence applications have undergone the Right to Negotiate process (RTN) in accordance with the Native Title Act (NTA) to allow any potential indigenous claimant/s, if they exist, to reach a Section 31 agreement with Mandalay Resources.

The native title requirements for the EL applications have now been determined and an assessment has been completed in accordance with the Traditional Owners Settlement Act 2010 (TOSA). It has now been determined that the application areas lie wholly within the Taungurung Recognition and Settlement Area.

In September 2020, Mandalay Resources indicated their intention to comply with the standard conditions outlined in Schedule 4 of the Land Use Activity Agreement (LUAA). The DPJR acknowledged receipt of correspondence consenting to the Schedule 4 conditions and the DPJR is currently assessing the remaining EL applications in accordance with the Mineral Resources Sustainable Development (MRSD) Act, 1990. As it stands currently, a recent decision of the Native Title Registrar not to register the Indigenous Land Use Agreement (ILUA) has held up the approval process. Government department Earth Resources Regulation (ERR) is currently waiting on the advice from the Department of Justice on what options are available for Taungurung in regard to the implications of the deregistration.

On 17 September 2020, tenement EL3310 expired and on 15 September 2020, Retention Licence applications (RLA7485 of 3,170.4 ha and RLA7492 of 23.3 ha, Figure 4-2) were lodged in order to retain the licence area, except for an area of National Park that will be excised on any granting of the new licence. As of December 2021, the Retention licence applications remained pending approval from ERR. As part of the Retention licence application, Mandalay Resources applied for a s16A of the MRSDA (Mineral Resources Sustainable Development Act 1990) to allow work to continue until such time that the Retention Licence application has been determined.

4.3 Underlying Agreements

The sustainable and responsible development of Mineral Resources in Victoria is regulated by the State Government of Victoria through the MRSD Act, 1990, administered by the DJPR (formally the DEDJPR), and requires that negotiation of access and/or compensation agreements with landowners affected by the work plans is undertaken between the mining licence applicant and the relevant landowner prior to an ML being granted or renewed.

In accordance with this obligation, Mandalay Resources has compensation agreements in place for land allotments owned by third party landowners that are situated within the boundaries of the ML MIN4644.

Mandalay Resources owns the land that contains the ML MIN5567 and as such no compensation agreements are required, nor are they in place.

4.4 Environmental Liability

In October 2018 a bond review was completed, and the value of the rehabilitation policy increased by AUD$224,000 to a total of AUD$4,079,000 for both ML's MIN4644 and MIN5567. The total bond of AUD$4,079,000 has been fully funded.

There are additional bonds of AUD$10,000 each that comprise three held by the DJPR for EL licences EL3310, EL5519 and EL5432, and one by Vic Roads for licences where pipelines cross roads.

The rehabilitation bond for MIN5567 which holds the Splitters Creek Evaporation Facility was calculated in October 2018 and an amount of AUD$748,000 has been set aside.

The total bond for tenement MIN4464 which incorporates the Augusta mine site and Brunswick Processing Plant was estimated to be AUD$3.331 M. This bond has increased during the latest bond review due to the addition of the Brunswick vent shaft in 2018.

Rehabilitation is being undertaken progressively at the Costerfield Operation, with the environmental bond only being reduced when rehabilitation of an area or site has been deemed successful by the DJPR. This rehabilitation bond is based on the assumption that all rehabilitation is undertaken by an independent third party. Therefore, various project management and equipment mobilisation costs are incorporated into the rehabilitation bond liability calculation. In practice, rehabilitation costs may be less if Mandalay Resources choose to utilise internal resources to complete the rehabilitation.

Other than the rehabilitation bond, the project is not subject to any other environmental liabilities. Table 4-2 presents the breakdown of the liability costs from the recent bond review.

Table 4-2: Total Rehabilitation Bond Liability Calculations, 2018

Area	AUD$
Total Rehabilitation Liability – Augusta Mine Site (MIN4644)	$1,419,000
Total Rehabilitation Liability – Brunswick Process Plant site (MIN4644)	$1,912,000
Total Rehabilitation Liability – Splitters Creek Evaporation Facility (MIN5567)	$748,000
Total Rehabilitation Liability – Costerfield Operations	$4,079,000

During 2021 Mandalay Resources was requested by the DJPR to complete a self-assessment of the rehabilitation bond using updated rates for activities provided by the regulator. Table 4-3 presents the breakdown of the liability costs from the self-assessment. This self-assessment of rehabilitation bonds remains to be accepted by the regulator.

Table 4-3: Total Rehabilitation Bond Liability Self-Assessment, 2021

Area	AUD$
Total Rehabilitation Liability – Augusta Mine Site (MIN4644)	$1,750,000
Total Rehabilitation Liability – Brunswick Process Plant site (MIN4644)	$2,563,000
Total Rehabilitation Liability – Splitters Creek Evaporation Facility (MIN5567)	$942,000
Total Rehabilitation Liability – Costerfield Operations	$5,255,000

4.5 Royalty

Royalties apply to the production of antimony and gold and are payable to the Victorian State Government through the DJPR. The royalty applies at a rate of 2.75% on the revenue realised from the sale of antimony and gold produced, less the selling costs. A royalty exemption applies on the first 2,500 oz of gold produced each year.

There are no royalty agreements in place with previous owners.

Additional royalties are payable to the Victorian State Government through the DJPR at a rate of AUD$0.87/t if waste rock or tailings is sold or provided to any third parties, since they are deemed to be quarry products.

4.6 Taxes

Mandalay Resources reports that, as at December 2021, no tax loss has been carried forward.

Income Tax on Australian company profits is currently set at 30%.

4.7 Legislation and Permitting

Mandalay Resources operates under an approved Work Plan in accordance with Section 39 of the MRSD Act, 1990. Work Plan Variations (WPVs) are required when there are significant changes from the Work Plan and it is deemed that the works will have a material impact on the environment and/or community. Various WPVs have been approved by the DJPR and are registered against the licence.

Mining lease MIN4644 includes a series of specific conditions that must be met which become the controlling conditions upon which all associated WPVs are filed with the regulatory authority.

Apart from the primary mining legislation, which consists of the MRSD Act, 1990, operations on MIN4644 remain subject to the additional following legislation and regulations, for which all appropriate permits and approvals have been obtained.

Legislation:

- Environment Protection Act 1970
- Planning and Environment Act 1987
- Environmental Protection and Biodiversity Conservation Act 1999
- Flora and Fauna Guarantee Act 1988
- Catchment and Land Protection Act 1994
- Archaeological and Aboriginal Relics Preservation Act 1972
- Heritage Act 1995
- Forest Act 1958
- Dangerous Goods Act 1985
- Drugs, Poisons and Controlled Substances Act 1981
- Public Health and Wellbeing Act 2008

- Water Act 1989
- Crown Land (Reserves) Act 1978
- Radiation Act 2005
- Conservation, Forests and Lands Act 1987
- Wildlife Act 1975

Regulations:

- Dangerous Goods (Explosives) Regulations 2011
- Dangerous Goods (Storage and Handling) Regulations 2000
- Dangerous Goods (HCDG) Regulations 2005
- Drugs, Poisons and Controlled Substances (Commonwealth Standard) Regulations 2011
- Mineral Resources Development Regulations 2002

To the best of the QP's knowledge, there is no other significant factor or risk that may affect access, title, or the right or ability to perform work on the Property.

5 ACCESSIBILITY,CLIMATE,LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 Accessibility

Access to the Costerfield Operation is via the sealed Heathcote–Nagambie Road which is accessed off the Northern Highway to the south of Heathcote. The Northern Highway links Central and North-Central Victoria with Melbourne.

The Augusta Mine site is accessed off the Heathcote–Nagambie Road via McNichols Lane, which comprises a sealed/gravel road that continues for approximately 1.5 km to the Augusta site offices.

The Brunswick Processing Plant and Brunswick Portal are located on the western side of the Heathcote–Nagambie Road, approximately 1 km further north from the McNichols Lane turnoff. The Brunswick site offices are accessed by a gravel road that is approximately 600 m long.

5.2 Land Use

Land use surrounding the Costerfield Property is mainly small scale farming, consisting of grazing on cleared land, bordered by areas of lightly timbered Box-Ironbark forest. The majority of the undulating land and alluvial flats are privately held freehold land.

The surrounding forest is largely rocky, rugged hill country administered by the DJPR as State Forest. The Puckapunyal Military Area is located on the eastern boundary of the Costerfield Property.

The Augusta Mine site is located on privately held land, while the Brunswick Processing Plant and the Brunswick Portal are located on Unrestricted Crown land.

The Cuffley Deposit, accessed via the Augusta Mine, is located beneath unrestricted Crown land that consists of sparse woodland, with numerous abandoned shafts and workings along the Historical Alison and New Alison mineralised zone.

The Brunswick Deposit is accessed via an incline ramp from the Cuffley mine and the Youle and Shepherd Deposits are accessed from the Brunswick incline.

5.3 Topography

The topography of the Costerfield Property area consists of relatively flat to undulating terrain with elevated areas to the south and west sloping down to a relatively flat plain to the north and east.

The area ranges in elevation from approximately 160 m Above Sea Level (ASL) in the east along Wappentake Creek, to 288 m ASL in the northwest. The low-lying areas are typically floodplains.

5.4 Climate

The climate of central Victoria is 'Mediterranean' in nature and consists of hot, dry summers followed by cool and wet winters. Annual rainfall in the area is approximately 500 mm to 600 mm, with the majority occurring between April and October. The annual pan evaporation is between 1,300 to 1,400 mm.

The temperature ranges from -2°C in winter (May to August) to +40°C in summer (November to February). Monthly average temperature and rainfall data from Redesdale, the nearest weather recording station to the Costerfield Property, located 39 km to the northeast, is shown in Figure 5-1. The weather is amendable to year round mining operations; however, occasional significant high rainfall events may restrict surface construction activity for a small number of days.

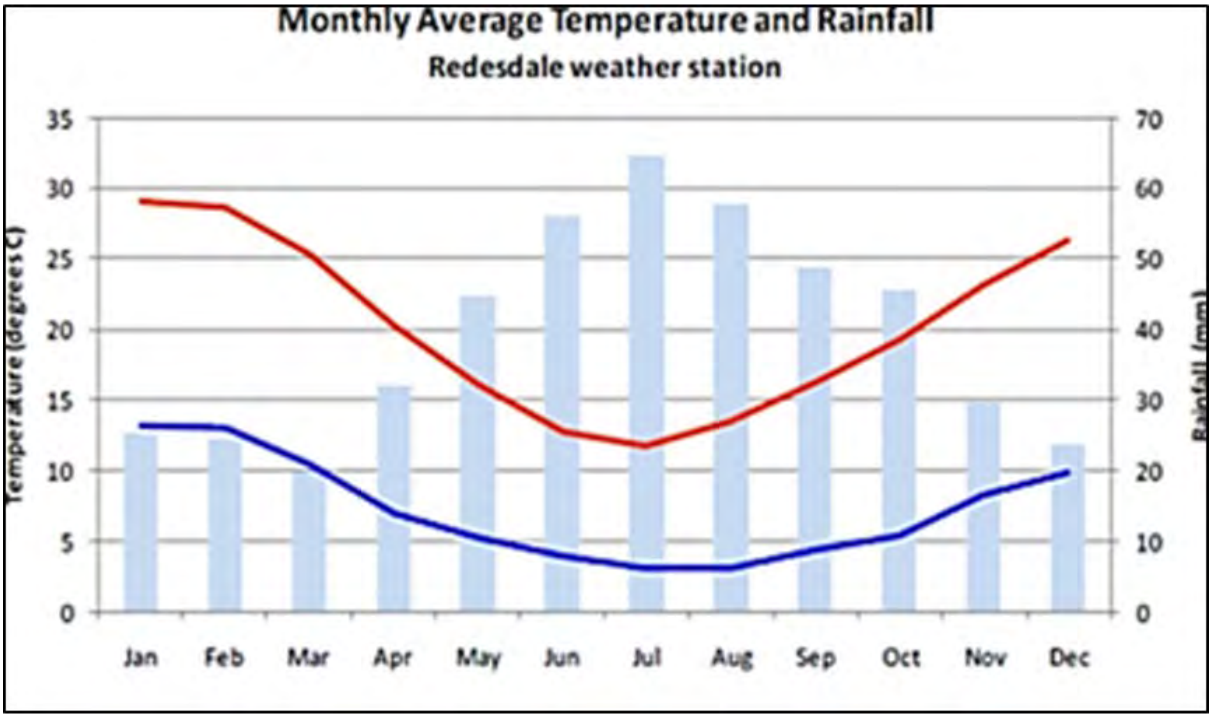


Figure 5-1: Monthly average temperature and rainfall

Source: Bureau of Meteorology

5.5 Infrastructure and Local Resources

The nearest significant population to the Costerfield Property is Bendigo, located 50 km to the west-northwest, with a population of approximately 100,000. The Costerfield Property is a residential operation with personnel residing throughout central Victoria as well as Melbourne. Local infrastructure and services are available in Heathcote.

5.5.1 Augusta Mine

The Augusta Mine site consists of a bunded area that includes site offices, underground portal, workshop facilities, waste rock storage area, settling ponds, mine dam, change house facilities and laydown area. Augusta has operated as an underground mine since the commencement of operations in 2006. The Cuffley, Brunswick, Youle and Shepherd operations use the infrastructure associated with the current Augusta operations (Figure 5-2).

Figure 5-2: Augusta mine site with Boxcut, Augusta Portal (foreground), Workshop, Offices and Evaporation Dams

On 28 July 2018, the first ore was extracted from the Brunswick Deposit and was accessed via an incline ramp from the Cuffley Mine. In December 2019 the first ore was extracted from the Youle Deposit which was accessed via capital development from the Brunswick incline. The Shepherd Deposit is accessed from the lower Youle Decline with production of first ore taking place in October 2021.

5.5.2 Brunswick Complex

The Brunswick Complex consists of the Brunswick Processing Plant, Run-of-Mine (ROM) pad, underground portal, site offices, tailing storage facilities, and the Brunswick Open Pit as shown in Figure 5-3.

Figure 5-3: Aerial View of the Brunswick Complex with Brunswick Portal (middle of image), Brunswick Processing Plant, offices and tailing storage facilities.

5.5.3 Power Supply

The Costerfield Property has a current agreement with Powercor for 3.227 mVA at a power factor of not less than 0.95 from Substation 1, the only high voltage supply point, located at the Augusta mine. The entire power requirement is supplied via this location, including the underground operations and the Brunswick Processing Plant. The site also has 750 kVAR to assist with power factor correction.

In addition, the Costerfield Property has just under 1 mVA of diesel power generation which can be automatically synchronised to connect to all the infrastructure in the event the power demand increases above the 3.277 mVA which can be provided by Powercor. During periods of high demand on the Victorian electrical network, Mandalay Resources can manually activate this power source to decrease the burden on the network and assist with the State's grid power supply.

5.5.4 Brunswick Processing Plant

The Brunswick Processing Plant consists of a 150,000 tonnes per annum (tpa) gravity-flotation gold-antimony processing plant, with additional workshop facilities, site offices, TSFs, core shed and core farm located nearby. The plant produces an antimony-gold concentrate that is trucked to the Port of Melbourne, 130 km to the south where it is transferred onto ships for export to foreign smelters.

Process water for the Brunswick Processing Plant is drawn from the brine stream of the Reverse Osmosis (RO) Plant and is supplemented by stored brine, while the Augusta Mine re-uses groundwater that has been dewatered from the underground workings.

Potable water is trucked in from Heathcote, while grey water is stored in tanks and sewage is captured in sewage tanks before being trucked off site by a local contractor.

5.5.5 Evaporation and Tailings Facilities

The Splitters Creek Evaporation Facility evaporates groundwater extracted from the operations to maintain dewatering rates from the underground workings (Section 20.1.2).

The Brunswick TSF was operational between June 2015 and December 2018, and from November 2020 to the report date. At the Bombay TSF a 2.5 m wall lift for another 140,000 m^3 of storage was completed in 2018 and the TSF was operated between December 2018 and November 2020. A feasibility study to consider an embankment raise for the Bombay facility was in progress at the report date.

6 HISTORY

Beginning with the initial discovery of the Costerfield Reef in the 1860s, until 1953, several companies have developed and mined antimony deposits within the Costerfield Property. Some underground diamond drilling is known to have occurred during the period 1934 to 1939, when Gold Exploration and Finance Company of Australia operated the Costerfield Mine, however details of these drill holes are scarce and poorly recorded.

Significant exploration of the Costerfield Property using modern exploration techniques did not occur until 1966.

6.1 Ownership and Exploration Work

This section describes the work carried out by different owners of the operation over time.

Table 6-1 provides details of the historical drilling statistics completed by each company at the Costerfield Property since 1966.

Table 6-1: Historical Drilling Statistics for the Costerfield Property

Company	Year	Diamond Core (m)	Percussion/Auger (m)
Mid-East Minerals	1966–1971	3,676.2	
Metals Investment Holdings	1971	1,760.8	
Victoria Mines Department	1975–1981	3,213.0	
Federation Resources NL	1983–2000		2,398.3
AGD/Planet Resources JV	1987–1988		1,349.2
AGD NL	1987–1988		1,680.8
	1994–1995	1,368.5	5,536.0
	1996	195.5	2,310.0
	1997		725.0
AGD Operations *NB: From 2004 drilling descriptions have been reported in double years (ie 2004-2005) due to the fact that reporting has been in keeping with the Australian fiscal year (1 July to 30 June). Please note that from 2016, descriptions, including drilling metres for exploration will be reported in calendar year	2001	3,361.1	
	2002	907.5	
	2003	1,522.0	
	2004	3,159.9	
	2005	4,793.4	
	2006–2007	4,763.4	
	2007–2008	2,207.2	
	2008–2009	2585.95	

Company	Year	Diamond Core (m)	Percussion/Auger (m)
to coincide with the Canadian fiscal year (1 January to 31 December).			
Mandalay Resources	2009-2010	574.5	547.0
	2010 -2011	9890.0	732.0
	2011-2012	18,581.4	7,295.6
	2012 -2013	25,774.8	3,838.0
	2013 - 2014	20,817.0	3,906.0
	2014 - 2015	18,439.0	2,732.0
	2016	34,678.0	
	2017	26,403.0	
	2018	34,656.0	
	2019	9,556.0	
	2020	29,080.0	
	2021	36,255.0	
	TOTAL	298,219.15	33,049.00

6.1.1 Mid-East Minerals (1968-1971)

From 1968 to 1969 the price of antimony rapidly rose from US$0.45/lb to US$1.70/lb. This encouraged Mid-East Minerals (MEM) to acquire large areas of ground around Costerfield.

Between 1969 and 1971, MEM conducted large-scale geochemical, geophysical, and diamond drilling programs. These were conducted across the south Costerfield area encompassing the Alison Mine and south towards Margaret's Lode, encompassing both the Cuffley Lode and the Augusta Mine areas. Diamond drilling for MEM was most successful at the Brunswick Mine. However, decreasing antimony prices in 1971 caused MEM to abandon the project.

6.1.2 Metals Investment Holdings (1971)

A series of diamond drill holes were completed by Metals Investment Holdings in 1971. Most drilling occurred to the north of the Alison Mine, with the exact locations of the drill holes unknown. Two drill holes were situated to the north of the Tait's Mine (north of Augusta), of which minimal information remains.

6.1.3 Victorian Mines Department (1975-1981)

A series of diamond drill holes were completed by the Victorian Mines Department in the late 1970s. Most drilling occurred to the south of the Brunswick Mine. However, two drill holes (M31 and M32), were drilled approximately 150 m to the south of the South Costerfield Shaft in the Augusta mine area and intersected a high-grade reef. This reef was interpreted as the East Reef, which was mined as part of the South Costerfield Mine.

6.1.4 Federation Resources NL (1983-2000)

Federation Resources NL undertook several campaigns of exploration in the Costerfield Property area but focused on the Browns-Robinsons prospects to the east of the Alison Mine. The exploration conducted identified a gold target with no evidence of antimony.

Federation Resources NL conducted desktop studies on the area above the Augusta mine, noting the anomalous results of the soil geochemistry programs conducted by The Victorian Mines Department and Mid-East Minerals, however they did not conduct any drilling at this location.

6.1.5 Australian Gold Development NL/Planet Resources JV (1987-1988)

Australian Gold Development NL conducted a short Reverse Circulation (RC) drilling program in 1987, in conjunction with their JV partner Planet Resources. This drilling consisted of a total of 21 drill holes for 1,235 m across the broader Costerfield Property area. Gold was assayed via Atomic Absorption Spectrometry (AAS), which compromised antimony grades. The drilling was completed using a tri-cone bit, which could have led to serious downhole contamination.

6.1.6 Australian Gold Development NL (1987-1997)

From 1987 to 1997, Australian Gold Development NL undertook several programs of exploration and mining activities predominantly focused around the Brunswick Mine. A series of RC drill holes were drilled during 1997, testing for shallow oxide gold potential to the north of the Alison Mine. Several occurrences of yellow antimony sulphides were noted but these were not followed up.

6.1.7 AGD Operations Pty Ltd (2001-2009)

In 2001, AGD Operations Pty Ltd (formerly Australian Gold Development NL) and Deepgreen Minerals Corporation Ltd entered into an agreement to form a joint venture to explore the Costerfield Property tenements. The agreed starting target was the MH Zone, now known as the Augusta Mine.

6.1.7.1 2001

The AGD Operations Pty Ltd (AGD) drilling of the MH Zone commenced on 5 April 2001. In total, 27 diamond drill holes were completed for 3,301.1 m. All drill holes were drilled with an initial PQ or HQ collar to approximately 25 m depth and then completed using an NQ drill bit, the purpose of which was to maximize core recoveries. Triple-tube drilling was also employed in areas to maximize recoveries. Cobar Drilling Company Pty Ltd, based in Rushworth, was contracted for the drilling program. Less competent rock adjacent to the mineralisation was successfully recovered during this program however core loss was still estimated to be up to 15% within the mineralised zones. All drill holes were downhole surveyed and orientated during drilling. Collar locations were surveyed by Cummins & Associates from Bendigo.

This drilling was confined to an area 180 m south of the South Costerfield Shaft and over approximately 400 m of the strike of the mineralisation.

It was identified that due to the prolonged mining and exploration completed in the Costerfield Property area, up to three different metric grids were in use. The drilling undertaken in 2001 at Augusta was drilled using the mine grid established in the late 1950s, which remains in use in present day mining and exploration activities.

6.1.7.2 2002

In 2002, AGD completed a further five drill holes at the MH Zone for a total 732.3 m, including 41.7 m of blade drilling, 309.3 m of RC hammer drilling and 381.3 m of HQ diamond drilling. Drill hole MH034 intersected a fault zone at 55 m downhole. This is hypothesised to represent the Alison line of lode towards the south.

Towards the east of the MH Zone, AGD completed two lines of soil sampling comprising 400.5 m of aircore drilling in 88 drill holes. The known MH lodes were highly anomalous, and a weak, gold-only trend was outlined 180 m east of the MH Zone. This zone was drilled by diamond drill hole MH028, which contained a large siliceous lode zone with low-grade gold values.

To the south of the MH Zone, AGD sampled two soil lines in 42 drill holes. It was later recognised that these drill holes were not drilled deep enough to sample the basement siltstones. A further line of 21 soil drill holes confirmed this theory. These drill holes picked up widespread anomalous gold geochemistry within a central strong anomaly. A total of 218 m of aircore drilling was completed.

6.1.7.3 2003

In 2003, the MH Zone was renamed the Augusta Deposit. In total, 30 diamond drill holes for 1,514 m were drilled by AGD as part of an infill and extension program to the Augusta Deposit. The main purpose of this drilling was to prove continuity of the deposit to near surface, in preparation for open-pit mining and to extend the mineralised system both north and south. Mineralisation was shown to extend north to the South Costerfield Shaft and upwards to the surface. To the south, drilling confirmed that the lode system, although being present, was not economic.

Each drill hole was logged in detail and geological lode thickness and recovered thicknesses were recorded. Core loss was estimated to be less in this drill program when compared to previous drilling programs, even though the majority of drill holes were drilled in the weathered zone.

In addition to the infill and extension program, 14 RC drill holes were drilled as part of a metallurgical test work programme. These drill holes were drilled at low angles to the lodes, specifically designed to obtain the required sample mass for the metallurgical test work.

6.1.7.4 2004/2005

Between October 2004 and April 2005, AGD completed a 26 hole diamond program at the Augusta Deposit. Apart from 5 m percussion pre-collars and 4 RC geotechnical drill holes, the drill holes were all drilled by HQ triple-tube diamond drilling.

The objectives of the diamond drilling program were:

- Improvement in mineralisation definition by increasing drill hole density
- Extension of the mineralisation model by drilling around the deposit periphery
- Increasing the Mineral Resource and Mineral Reserve.

6.1.7.5 2006/2007

AGDs drilling activities throughout 2006 and 2007 comprised grid drilling of the Brunswick Deposit and drilling of the periphery of the Augusta Deposit for a total of 7,562 m of diamond drilling. This comprised the following drill holes:

- 31 drill holes, totalling 4,994 m, drilled under the old Brunswick open pit for resource estimation
- 17 drill holes, totalling 755 m, drilled into the upper northern end of W Lode

- 20 drill holes, totalling 1,813 m, drilled north of the Augusta Mine to test E Lode's northern extent.

The Brunswick Resource definition drilling was drilled using HQ triple tube with a modified Longyear LM75 drill rig by Boart Longyear drilling. The area under the pit was drilled on a 40 m x 40 m pattern.

Due to initial difficulty with following W Lode underground, a Bobcat mounted Longyear LM30 diamond drilling rig was used to infill drill the near-surface portion of W lode. This drilling was completed using a thin-kerf LTK60 sized bit and barrel, with a total of 17 drill holes for 755 m being drilled adjacent to the Augusta box cut.

On completion of the Brunswick and W Lode drilling, both the LM75 and the LM30 rigs were used to drill north of the Augusta Mine, tracing the northern extent of E Lode towards the old South Costerfield workings. A total of 20 drill holes for 1,813 m were drilled north of the Augusta Mine.

Development of the Augusta decline commenced during the first quarter 2006. By the end of the second quarter all the surface infrastructure had been completed together with open cut mining of E and C lodes. Decline development commenced during June 2006 with underground in production by the end of the third quarter of 2006.

6.1.7.6 2007/2008

AGDs drilling activities throughout 2007 and 2008 comprised reconnaissance drilling of the Tin Pot Gully Prospect, drilling along-strike and down-dip of the existing Augusta Deposit. A total of 3,395.6 m of diamond drilling was carried out during the year. This comprised the following:

- 13 drill holes, totalling 1,188 m, drilled under the Tin Pot Gully Prospect
- 11 drill holes, totalling 2,207 m, drilled into the Augusta Deposit, particularly to test W and E Lodes.

Encouraging results highlighted down-dip and strike extensions in terms of vein widths and grades, as described below:

- W Lode: 8 of the 11 drill holes confirmed W Lode continuity down-dip, with true thicknesses ranging from 0.254 m to 0.814 m at 22.50 g/t to 89.26 g/t gold and 16.19% to 47.20% antimony.
- E Lode: 3 of the 8 drill holes confirmed E Lode continuity down-dip, with true thickness ranging from 0.074 m to 0.215 m at 4.24 g/t to 35.1 g/t gold and 3.25% to 32.2% antimony.

- N Lode: 6 of the 11 drill holes intercepted N Lode or a similar structure in the hanging wall of W lode, showing true thicknesses from 0.09 m to 0.293 m at 6.82 g/t to 46.9 g/t gold and 6.81% to 27% antimony.

Based on these results, AGD commissioned AMC Consultants to undertake a resource estimate for the Augusta Deposit, in January 2008.

Between February and June 2008 11 drill holes were completed, totalling 2,207.2 m that were drilled on the northern section of the Augusta Deposit, particularly from 4,411 mN to 4,602 mN.

The 11 surface drill holes covered an area of approximately 18,740 m^2, delineating a 120 m down-dip continuation of mineralisation below 4 Level, in the three dominant Augusta Lodes: W Lode, E Lode, and N Lode. The drill holes ranged in size from HQ to NQ and LTK46.

By June 2008, capital development had reached 7 Level (1,081 mRL). Development was completed on E Lode on 5 Level and was half way through completion on 6 Level. W Lode development was completed down to 4 Level and development on 5 Level was just commencing. Handheld airleg rise mining had begun.

6.1.7.7 2008/2009

AGDs drilling activities throughout 2008 and 2009 comprised drilling along-strike and down-dip from the existing Augusta resource. A total of 2,585.95 m of diamond drilling was completed.

Drilling during 2008 and 2009 was concentrated on the definition of the W Lode resource. Five drill holes tested the depth extent of W Lode. Another 13 drill holes were designed as infill drill holes to test ore shoots and gather geotechnical data. Drill holes ranged in size from HQ to NQ and LTK46.

By June 2009, capital development had reached 9 Level (1,070 mRL). Ore drive development was constrained to levels along E and W Lodes. Stoping along W Lode was being conducted and additional mining along E Lode using 3 different mining methods, floor benching, cut and fill and long-hole stoping was underway.

6.1.8 Mandalay Resources Corporation – trading as AGD (2009-2013)

On 1 December 2009 AGD was acquired by Mandalay Resources Corporation, however the company continued to trade as AGD Mining Pty Ltd/AGD Operations Pty Ltd up until 7 September 2013 when the company changed its trading name to Mandalay Resources Corporation.

6.1.8.1 2009/2010

Drilling from July 2009 to June 2010 comprised mainly drilling along-strike and down-dip from the existing Augusta resource (MIN 4644). In total 332.5 m of diamond drilling was undertaken targeting the Augusta resource.

In addition, 547 m of bedrock geochemistry aircore drilling was completed at Augusta South within ML MIN4644.

Outside of the main field, 120.5 m of diamond drilling was completed at the True Blue Reef prospect within EL3310 and 122.8 m of diamond drilling at Hirds Reef prospect within EL4848.

Drilling during this reporting period was concentrated on the definition of the W Lode resource. Four drill holes tested the depth extent of W lode. Another 6 drill holes were designed as infill drill holes to test ore shoots and gather geotechnical data.

From July 2009 to June 2010 capital development reached 1,020 mRL, 155 m below surface. Ore drive development was carried out on E Lode and W Lode.

6.1.8.2 2010/2011

Drilling from July 2010 to June 2011 was undertaken on two projects, the Augusta Deeps drilling project and the Brownfields Exploration project. The Augusta Deeps project was undertaken with the view to extending the Augusta resource to depth, on licence MIN4644. The objective of the Brownfields Exploration project was to find additional ore sources within Mandalay Resources tenements, in order to supplement the Augusta Deposit ore. The initial emphasis of the Brownfields Project was to identify sources of ore within 1 km of the Augusta Decline. In total 9,890.7 m of diamond drilling and 732 m of auger drilling was undertaken as part of the two projects from July 2010 to June 2011.

Capital development reached 976 mRL, 200 m below surface. Ore drive development was carried out on E and W Lodes.

6.1.8.3 2011/2012

Drilling was undertaken on four projects; the Augusta Deeps drilling project, the Alison/Cuffley drilling project, the Brownfields/Target Testing drilling project and the Target Generation – Bedrock Geochemistry auger drilling project.

The Augusta Deeps project was undertaken with the view to extending the current Augusta resource to depth and along-strike, on licence MIN4644. The Alison/Cuffley Project was undertaken to outline the recently discovered Cuffley Lode and to define an initial Inferred Resource.

The objective of the Brownfields Target Exploration project remained as per 2010/2011 and represented a more regional program.

The Bedrock Geochemistry auger drilling project revealed anomalous mineralised zones beneath shallow alluvial/colluvial cover throughout the tenements.

In total 18,581.4 m of diamond drilling and 7,295.6 m of auger drilling was undertaken as part of the four projects from July 2011 to June 2012. On 17 June 2011 drill hole MB007 intersected the Cuffley Lode, just below a flat fault that had stopped production at 5 Level in the Alison mine in 1922. Resource drilling commenced in July 2011.

The Cuffley Lode is located 500 m north-northwest of the Augusta Deposit workings and scoping studies commenced in 2011 to access the deposit from the Augusta Decline. From July 2011 to June 2012 capital development reached 926 mRL, 252 m below surface, and ore drive development was undertaken on E and W Lodes.

6.1.9 Mandalay Resources Costerfield Operations Pty Ltd (2013-present)

On 7 February 2013 AGD Operations Pty Ltd underwent a name change to Mandalay Resources Costerfield Operations Pty Ltd.

6.1.9.1 2012/2013

Drilling was undertaken on two primary projects; Cuffley Resource Drilling and Augusta Resource Drilling. In total, 25,774.8 m of diamond drilling and 3,838 m of auger drilling were undertaken from July 2012 to June 2013.

During the same period capital development reached 878 mRL, 300 m below surface, and ore drive development was carried out on E, W and N Lodes.

6.1.9.2 2013/2014

In 2013/2014 the focus was on finalising the Cuffley and Augusta Resource Drilling. In total, 20,817 m of diamond drilling and 3,906 m of auger drilling was undertaken.

During 2014, mining took place along the Augusta and Cuffley Deposits. Development on C1 and C2 lodes within the Cuffley Deposit began in January 2014. Both deposits were accessed through the Augusta portal, with Cuffley capital infrastructure exiting the Augusta Decline at the 1030 Level.

6.1.9.3 2014/2015

Exploration in 2015 was focused on extending the Cuffley and Augusta resource both along-strike and down-dip at depth. Expansion of the Cuffley resource included the commencement of drilling in the Cuffley Deeps and Sub King Cobra regions. In total, 18,439 m of diamond drilling and 2,732 m of RC drilling was undertaken during 2015.

Mining took place along the Augusta and Cuffley Deposits. Development on C1 and C2 lodes within the Cuffley Deposit began in January 2014.

6.1.9.4 2016

Mining Plus notes that from 2004, drilling descriptions have been reported in double years (ie 2004-2005) due to the fact that reporting has been in keeping with the Australian fiscal year (1 July to 30 June). However, from 2016, descriptions, including drilling metres for exploration have been reported in calendar years to coincide with the Canadian fiscal year (1 January to 31 December).

Exploration in 2016 was focussed predominantly on near mine and opportunistic targets close to the existing infrastructure and capital development, with the primary focus to extend the Life of Mine (LoM). In addition, near-mine exploration was carried out on targets within 1 km of the existing portal. In total, 34,678 m of diamond drilling was undertaken.

Throughout the year, mining took place along the Augusta and Cuffley Deposits. Within the Augusta Deposit, ore was extracted through drive development and stoping along N Lode north, with a small amount of development and stoping occurring on B and E Lodes. Development and stoping continued on the Cuffley C1 and C2 lodes.

6.1.9.5 2017

Exploration in 2017 was focused predominantly on near mine and opportunistic targets close to existing infrastructure and capital development, with the primary focus to increase immediate mine life. A strong focus for the year was infill and extension drilling of the Brunswick resource whilst also increasing in-mine resources through Opportunistic Drilling Projects. A successful target testing campaign investigated the depth continuation of mineralisation underneath the Costerfield mine. In total, 26,403 m of diamond drilling was undertaken.

Throughout the year, mining took place along the Augusta and Cuffley Deposits. Within the Augusta Deposit, ore was extracted through drive development and stoping along N Lode north and NV Lode. A small amount of development and stoping occurred on B, K, and NE Lodes. Development and stoping continued the Cuffley C1, C2 and CD Lodes.

6.1.9.6 2018

Throughout the year, the Augusta, Cuffley and Brunswick Deposits were mined, all of which were accessed through the Augusta portal with Cuffley's capital infrastructure exiting the Augusta Decline at 1,030 mRL.

Exploration in 2018 resulted in the inclusion of the high-grade Youle Lode into the Mineral Reserves. A total of 94,282 oz gold and 7,000 t antimony were added to the Mineral Reserves at grades of 11.2 g/t gold and 2.7% antimony.

Exploration also included infill and extension drilling of the Brunswick and Youle resources while also increasing in-mine resources through Opportunistic Drilling Projects. In total, 34,656 m of diamond drilling was undertaken (Refer to Drilling, Section 10).

6.1.9.7 2019

Mining continued dominantly on the Brunswick lode, with the underground access to Youle finished in Q4 and the first ore accessed. Infill drilling of Youle commenced with underground access, and additional resource definition drilling occurred at Brunswick. Throughout the year 9,556 m of diamond drilling was undertaken (Refer to Drilling, Section 10).

6.1.9.8 2020

Brunswick and Youle were dominantly mined through 2020, with minor remnant material from Augusta. The Brunswick Portal was also completed, linking underground access between sites.

With the commencement of mining on the Youle Lode in September 2019, underground Resource definition drilling continued at Youle, together with optimisation of production in areas to be mined in within 6 to 12 months. Mine geology advancement was undertaken through POD to provide confidence in grade, location of veining, geotechnical performance and viability ahead of mining. For information about drilling programs and their achievements, refer to Drilling, Section 10.

Capital access was to the 895 RL at Youle.

6.1.9.9 2021

Mining focus was dominantly on the Youle orebody, with minor material from Brunswick. The Shepherd zone was discovered in early 2021 and first access achieved at the start of October the same year. Capital access reached the 729 RL, 450m below surface and the deepest development in the Costerfield operation.

The Shepherd Lodes was the dominant focus of exploration drilling, with the successful delineation and conversion to an indicated resource of the orebody (refer to Section 14). Additional information on the individual drill programs for the year is detailed in Drilling, Section 10.

In addition to diamond drilling, a campaign of soil geochemistry was undertaken in October and November 2021. The sampled areas include the swath of ground between the Costerfield township and Browns/Robinsons Prospects (424 samples), and extension of the 2013/14 Mountain Creek/West Costerfield auger sampling to the south and east (226 samples). Further details on the technique and area of investigation are given in Soil Geochemistry, Section 9.4.2 and figures within.

Soil samples were assayed in a preliminary fashion using the company's handheld Olympus pXRF analyser, and a subset of the total samples in areas of interest dispatched for full laboratory assay analysis during 2022. A campaign of deep ground-penetrating radar using Ultramag Geophysics was planned to be conducted over much of the Costerfield tenement during the year. A pilot test conducted over known structures returned unsatisfactory results likely due to relatively saline groundwater attenuating the return signal.

6.2 Historical Resource and Reserve Estimates

Mandalay Resources has reported Mineral Resources and Reserves for the Costerfield Property from 2010 onwards. A record of the annual mineral resource and mineral reserves over this period has been provided in Table 6-2 and Table 6-3.

Technical Reports for each of the historical estimates are available for download from SEDAR by reference to their effective dates. The historical estimates are considered relevant for historical understanding of the development of the Property. They were reliable at the time of reporting as they followed similar processes of sampling, assaying, interpretation and estimation as are currently in use. The historical estimates use the same resource categories as the current estimate. The current estimate is summarised in section 1 of this Technical Report.

A qualified person is not classifying the historical estimates as current mineral resources or mineral reserves and the issuer is not treating the historical estimates as current mineral resources or mineral reserves.

Table 6-2: Historical Mineral Resources – Costerfield Property

Effective Date	USD$/ oz Au	USD$/ oz Sb	Cut-off Grade (AuEq g/t)	Measured Resource					Indicated Resource					Inferred Resource				
				Tonnes (kt)	Au (g/t)	Sb (%)	Au Ounces (koz)	Sb Tonnes	Tonnes (kt)	Au (g/t)	Sb (%)	Au Ounces (koz)	Sb Tonnes	Tonnes (kt)	Au (g/t)	Sb (%)	Au Ounces (koz)	Sb Tonnes
1/03/2010	1,000	6,000		67.2	16.9	10.0	36.4	6,749	189.6	9.6	4.6	58.4	8,683	245.7	7.8	4.2	61.5	10,202
31/12/2011	1,600	12,000	4.6	158.4	12.9	7.8	65.5	12,291	202.4	7.3	3.7	47.7	7,502	375.0	12.7	5.6	152.9	21,183
31/12/2012	1,600	12,500	4.7	167.0	8.0	4.9	42.7	8,202	367.0	10.0	3.5	117.9	12,912	610.0	7.1	3.2	139.8	19,490
31/12/2013	1,400	12,000	3.9	191.4	8.4	4.3	51.5	8,157	606.0	9.6	4.0	186.4	24,237	570.0	7.4	3.7	135.3	21,342
31/12/2014	1,400	12,000	3.8	213	9.8	4.5	67	9,600	786	6.9	3.3	175	26,300	519.0	5.3	2.6	89.0	13,700
31/12/2015	1,400	11,000	3.8	247	12.1	4.6	96	11,000	798	7.6	3.4	194	27,000	491	4.3	2.0	68.0	9,700
31/12/2016	1,400	10,000	3.5	286	9.5	4	88	11,400	812	5.9	2.5	155	20,600	611	5.5	1.5	108.0	9000
31/12/2017	1,400	10,000	3.5	290	9.2	4.2	86	12,100	971	5.7	2.5	177	23,900	379	6.6	1.1	80.0	4,000
31/12/2018	1,400	10,000	3.5	245	8.5	4.0	67	9,800	1073	8.2	2.9	283	31,000	497	8.0	1.9	128	9,500
31/12/2019	1,500	10,000	3.5	283	9.6	4.5	87	12,700	830	9.6	2.9	256	24,000	533	6.8	1.7	117	9,000
31/12/2020	1,700	8,000	3.0	360	14.1	5.7	164	20,600	798	8.5	2.4	218	18,800	473	5.8	1.3	89	6,000

Table 6-3: Historical Mineral Reserves – Costerfield Property

Effective Date	USD$/ oz Au	USD$/ oz Sb	Cut-off Grade (AuEq g/t)	Proven Reserves					Probable Reserves					Total Reserves				
				Tonnes (kt)	Au (g/t)	Sb (%)	Au Ounces (koz)	Sb Tonnes	Tonnes (kt)	Au (g/t)	Sb (%)	Au Ounces (koz)	Sb Tonnes	Tonnes (kt)	Au (g/t)	Sb (%)	Au Ounces (koz)	Sb Tonnes
1/03/2010	1,000	6,000		20.1	16.9	9.7	10.9	1,953	45.4	11.4	5.8	16.7	2,636	65.6	13.1	7.0	27.6	4,588
31/12/2011	1,600	12,000	4.6	41.9	13.2	7.9	17.7	3,300	46.5	6.4	4.0	9.6	1,860	88.4	9.6	5.8	27.3	5,160
31/12/2012	1,600	12,500	4.7	48.1	11.0	6.5	17.0	3,128	130.0	8.1	3.2	33.9	4,161	178.2	8.9	4.1	50.9	7,289
31/12/2013	1,200	10,000	5.0	71.0	8.3	4.4	18.9	3,124	350.0	9.4	3.4	106.0	11,900	421.0	9.2	3.6	124.9	15,024

Effective Date	USD$/ oz Au	USD$/ oz Sb	Cut-off Grade (AuEq g/t)	Proven Reserves					Probable Reserves					Total Reserves				
				Tonnes (kt)	Au (g/t)	Sb (%)	Au Ounces (koz)	Sb Tonnes	Tonnes (kt)	Au (g/t)	Sb (%)	Au Ounces (koz)	Sb Tonnes	Tonnes (kt)	Au (g/t)	Sb (%)	Au Ounces (koz)	Sb Tonnes
31/12/2014	1,200	10,000	5.0	98.0	10.4	4.5	32.0	4,400	333.0	7.4	3.3	80.0	11,200	431.0	8.1	3.6	112.0	15,600
31/12/2015	1,200	9,000	4.0	125	12.0	3.9	48.0	5,500	366	8.2	3.7	97.0	13,400	491	9.2	3.9	145.0	18,900
31/12/2016	1,200	8,000	4.0	184	8.1	3.5	48	6,400	434	5.7	2.6	80.0	11,100	619	6.5	2.8	128.0	17,501
31/12/2017	1,200	8,500	4.0	152	7.3	3.5	36	5,300	470	5.7	2.5	86.0	12,000	622	6.1	2.8	122.0	17,200
31/12/2018	1,200	8,500	4.0	76	8.4	4.0	20	3100	461	10.8	3.1	160.0	14,200	537	10.4	3.2	180.0	17,200
31/12/2019	1,300	7,000	4.0	114	9.5	4.8	35	5,400	360	14.6	3.4	169	12,400	474	13.4	3.8	204	17,800
31/12/2020	1,500	7,000	4.0	222	15.26	5.7	110	12,800	394	11.5	2.3	145	9,000	616	12.8	3.5	255	21,700

6.3 Historical Production

The operation of the Augusta Mine was taken over by Mandalay Resources in December 2009. At this time, the mine had been operating since early 2006, with a short three month period of closure during 2008 and 2009. Prior to Mandalay's ownership, approximately 95,000 tonnes had been extracted to produce 25,000 ounces of gold and 4,200 tonnes of antimony.

A record of mine production history for the Costerfield Property has been provided Table 6-4.

Table 6-4: Costerfield Property Mining Production History

Year	Inventory (kt)	Gold Grade (g/t)	Antimony Grade (%)	Gold Metal Ounces (k oz)	Antimony Metal (tonnes)
2010	50.7	7.4	4.2	12.0	2,140
2011	72.0	7.3	3.7	16.8	2,637
2012	96.3	8.3	4.3	25.6	4,166
2013	129.6	9.1	4.2	37.7	5,418
2014	167.1	9.1	3.8	48.8	6,345
2015	153.6	11.2	4.2	55.6	6,484
2016	158.4	9.6	3.4	49.0	5,407
2017	140.6	8.2	3.3	37.1	4,612
2018	151.6	5.7	2.4	27.6	3,572
2019	137.5	5.2	2.6	23.0	3,538
2020	164.2	12.1	4.50	64.0	7,394
2021	173.7	11.0	3.5	61.3	6,087

7 GEOLOGICAL SETTING AND MINERALISATION

7.1 Regional Geology

The Costerfield Property gold-antimony mineralisation zone is located at the northern end of the Darraweit Guim province, in the Western portion of the Melbourne Zone. In the Heathcote area of the Melbourne Zone, the Murrindindi Supergroup within the Darraweit Guim Province encompasses a very thick sequence of Siluro-Devonian marine sediments, which consist predominantly of siltstone, mudstone, and turbidite sequences (Figure 7-1).

The western boundary of the Darraweit Guim Province is demarcated by the Cambrian Heathcote Volcanic Belt and north-trending Mt William Fault, a major structural terrain boundary which separates the Bendigo Zone from the Melbourne Zone.

The Lower Silurian Costerfield Siltstone is the oldest unit in the Heathcote area and is conformably overlain by the Wappentake Formation (sandstone/siltstone), the Dargile Formation (mudstone), the McIvor Sandstone and the Mount Ida Formation (sandstone/mudstone).

The Melbourne Zone sedimentary sequence has been deformed into a series of large-scale domal folds, which tend to be upright, open folds with large wavelength curvilinear structures. The major north-trending sub-parallel folds in the Darraweit Guim Province include, from west to east:

- The Mount Ida Syncline
- The Costerfield Dome/Anticline
- The Black Cat and Graytown anticlines
- The Rifle Range Syncline.

The folds have been truncated by significant offsets along two major north trending faults, the Moormbool and Black Cat faults. The Moormbool Fault has truncated the eastern limb of the Costerfield Anticline, resulting in an asymmetric dome structure. The Moormbool Fault is a major structural boundary separating two structural subdomains in the Melbourne Zone. West of the Moormbool Fault is the Siluro-Devonian sedimentary sequence, hosting the gold-antimony lodes. The thick, predominantly Devonian Broadford Formation sequence occurs to the east of the fault and contains minor gold-dominant mineralisation.

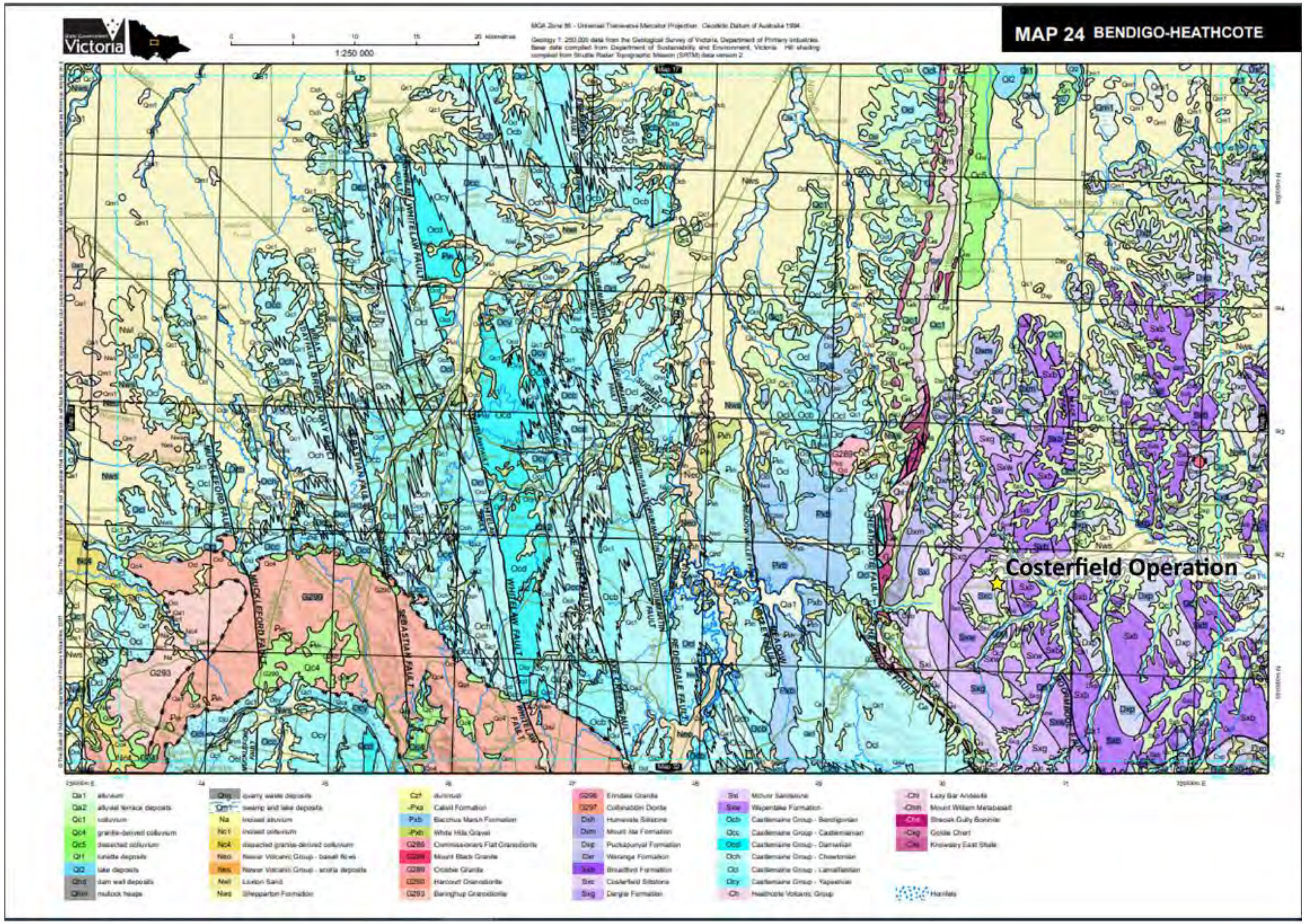


Figure 7-1: Geological map of the Bendigo - Heathcote region (Welch et al 2011)

7.2 Property Geology

The Costerfield Property gold-antimony mineralisation is located in the Costerfield Dome, which contains poorly exposed Lower Silurian Costerfield Siltstone at its core (Figure 7-2). Within the Costerfield Property, four north-northwest trending zones of mineralisation have been identified, which comprise from west to east:

- Antimony Creek Zone, approximately 6.5 km southwest of Costerfield, on the outer western flank of the Costerfield Dome.
- Western Zone, approximately 1.5 km west of Costerfield, on the western flank of the Costerfield Dome and includes the True Blue and West Costerfield Deposits.
- Costerfield Zone, near the crest of the dome, centred on the Costerfield township and hosting the major producing mines and deposits.
- Robinsons – Browns (R-B) Zone, 2 km east of Costerfield.

The Costerfield Property Siltstone-hosted quartz/sulphide lodes in the Costerfield Zone are controlled by north-northwest trending faults and fractures located predominantly on the western flank of the Costerfield Anticline. The host rocks are the Silurian Costerfield Formation siltstones and mudstones which are estimated to be between 450 m and 550 m thick and are the oldest exposed rocks in the local area.

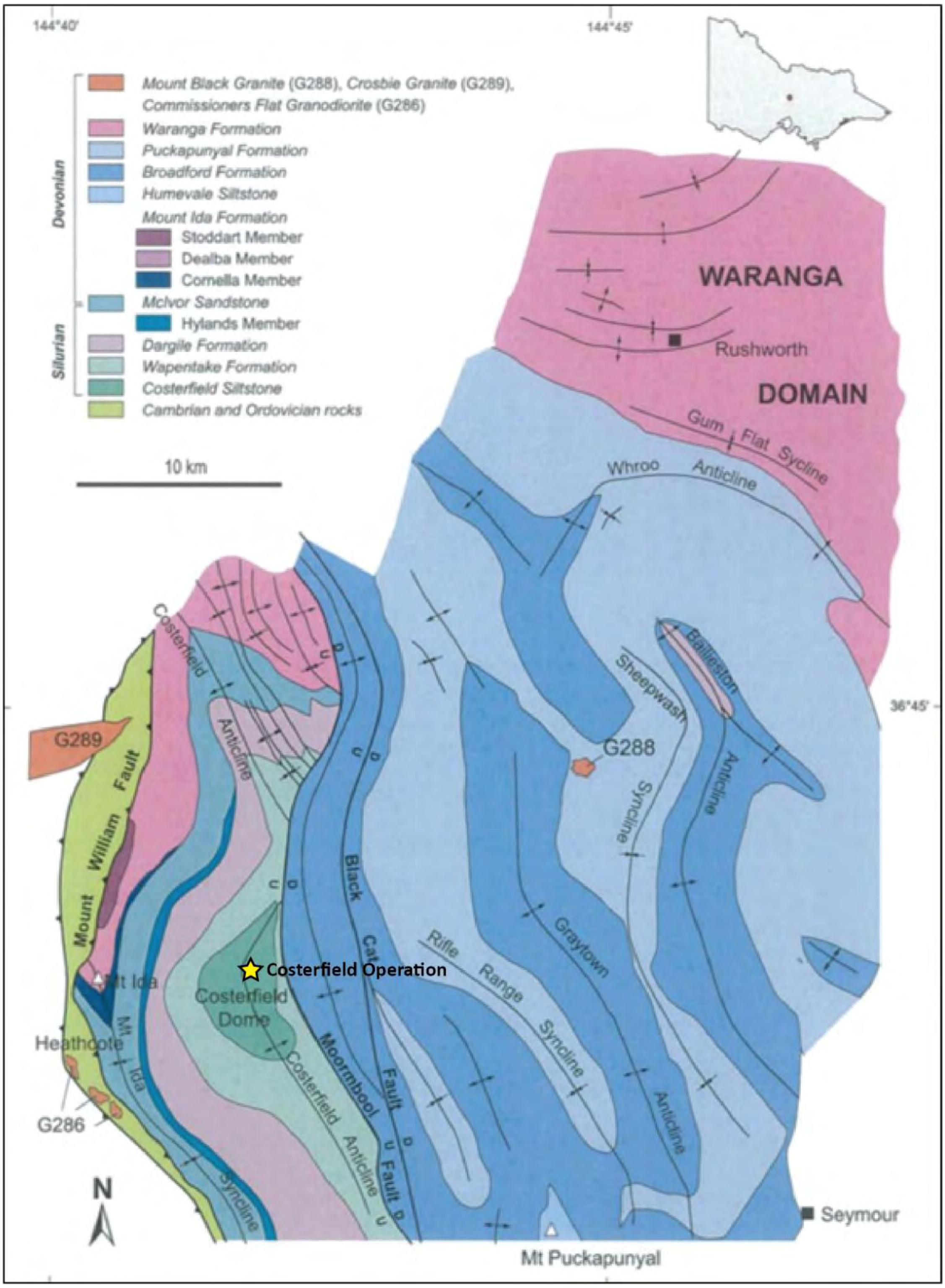


Figure 7-2: Geological map of the Heathcote – Colbinabbin - Nagambie region, modified from Vandenberg et al., 2000

Locally, the sedimentary succession of the Costerfield Property has been deformed into a broad anticlinal dome structure with numerous cross-cutting reverse thrust faults. This domal structure is thought to have resulted from two separate tectonic events, the first producing shortening in an east-west direction (folding and thrust faulting) and the second producing north-south shortening (gentle warping and mild folding). The anticlinal hinge zone of the Costerfield Anticline has been thrust over its eastern limb by the north-south trending King Cobra Fault zone (Figure 7-3).

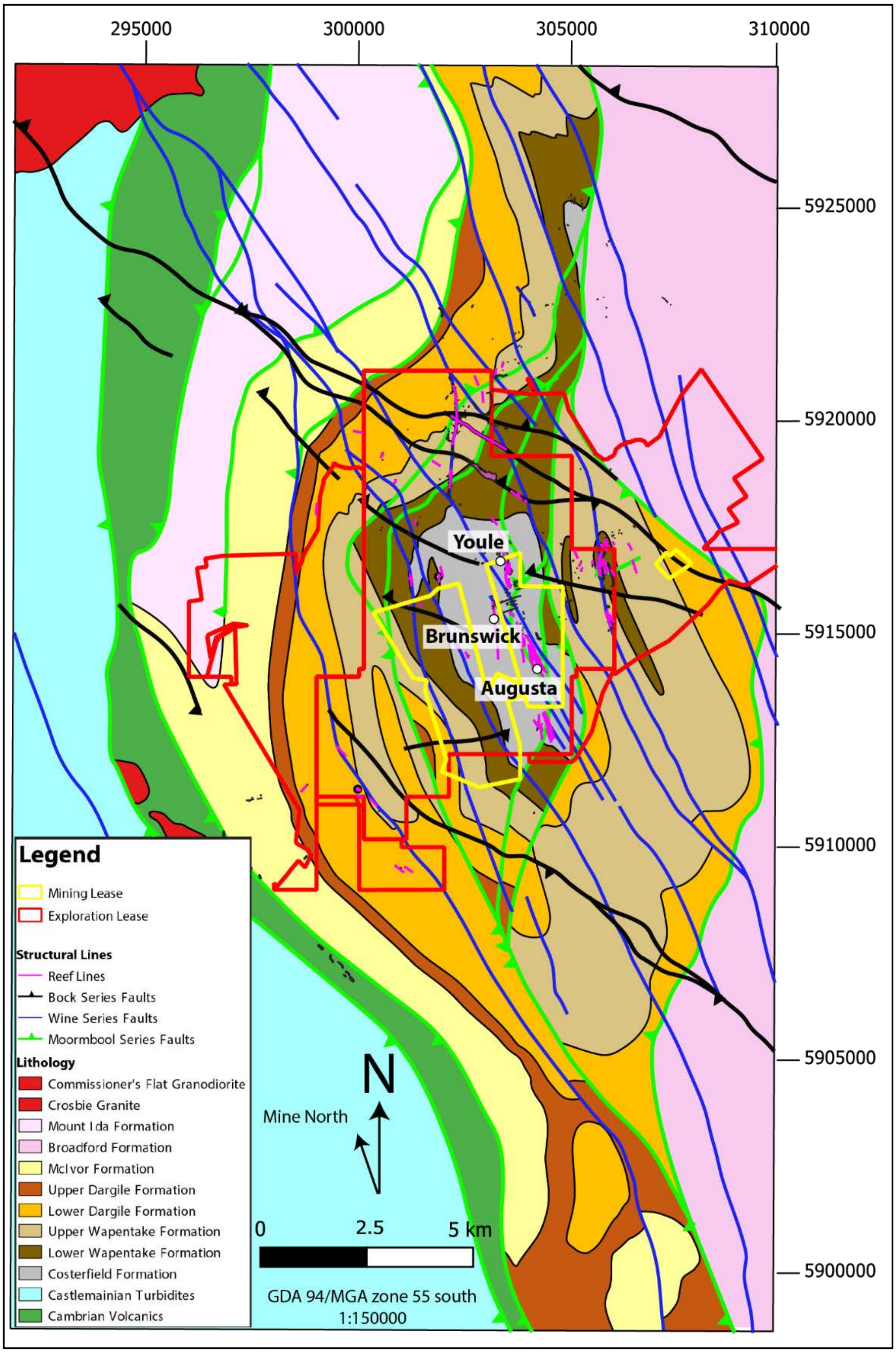


Figure 7-3: Regional geology and the Costerfield Property geology

7.3 Property Stratigraphy

Stratigraphic investigations, focused around the currently active Augusta workings within the South Costerfield area, have found many previously unrecognised stratigraphic units and structural features. Sub-surface stratigraphic mapping from drill hole data, has indicated that the local host of the mineralisation, the Costerfield Formation, is far more stratigraphically complex than previous investigations have documented.

7.3.1 The Darraweit Guim Province

The oldest outcropping strata documented in the region is the Costerfield Formation and is believed to be Lower Silurian in age (Sandford and Holloway, 2006). The Costerfield Formation, in the Costerfield area, is overlain by muddy siltstones and sandstones of the Lower Silurian aged Wappentake Formation, and Dargile Formation. Upper Silurian sedimentation is recorded in coarser silici-clastic successions of the McIvor Sandstone which is then finally overlain by the early-Devonian Mt Ida Formation. The Mt Ida Formation records the final phase of sedimentation in the greater Heathcote region.

The overall stratigraphic thickness of the Darraweit Guim Province is unknown, however estimates of the true stratigraphic thickness are in the range of 6 km to 7 km, all of which occurred without any significant depositional hiatus (Figure 7-4).

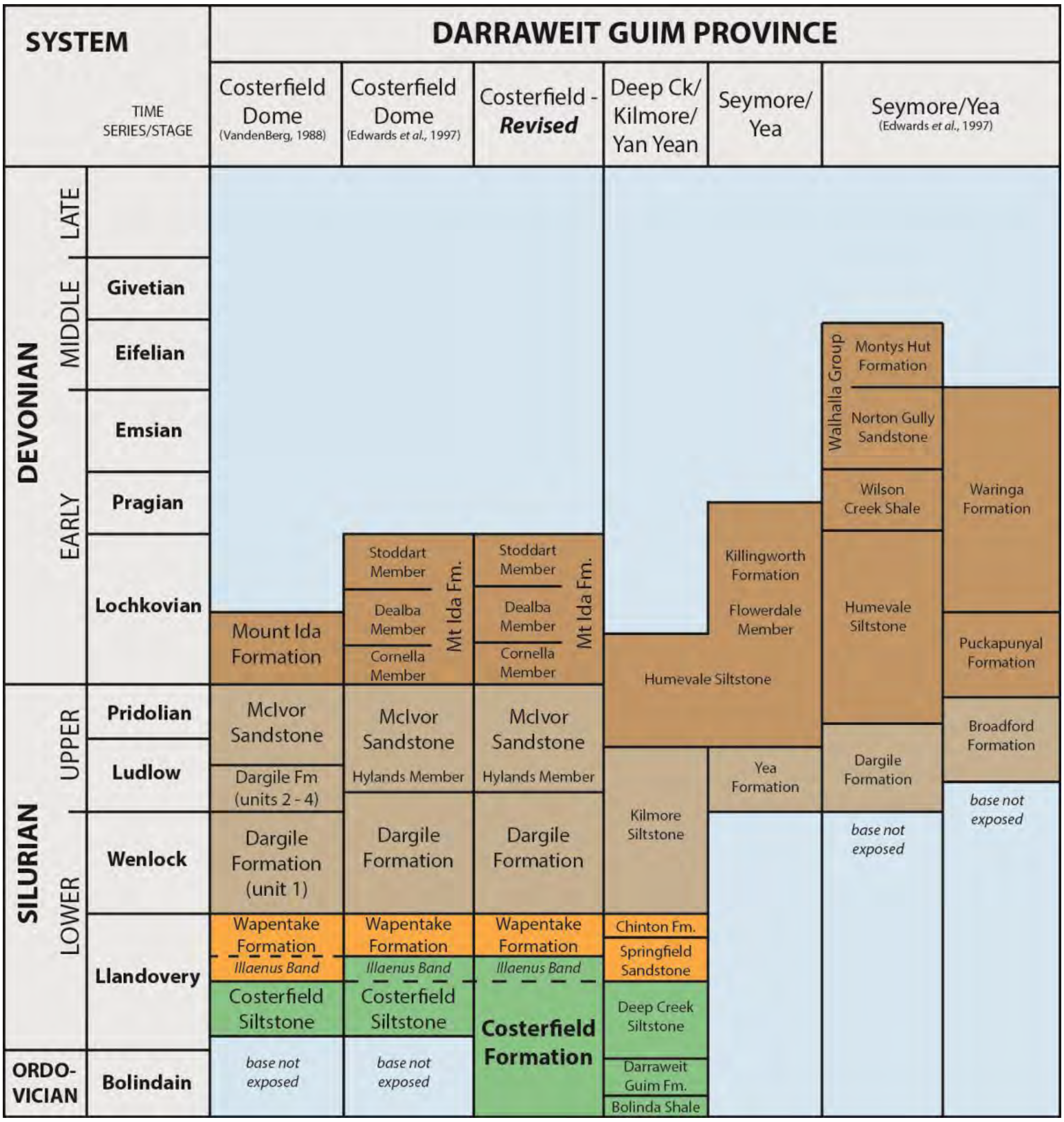


Figure 7-4: Regional stratigraphy of the Darraweit Guim Province, by locality

Modified from Edwards et al., 1998

7.3.2 The Costerfield Formation

The Costerfield Formation (as defined by Talent, 1965) is a series of thickly bedded mudstones and siltstones featuring heavy bioturbation. The 'Formation' nomenclature of Talent (1965), has been adopted for use within this report instead of the later re-assigned name of 'Costerfield Siltstone', as re-defined by Vandenburg (1988), since the formation consists of dominantly mudstone lithologies, with siltstones and sandstones representing the lesser constituents as relatively thin interbedded occurrences. It is recommended that the 'Siltstone' nomenclature be abandoned since it has become a misleading term, inferring that the unit is composed of siltstone dominant lithologies, when this is not the case.

The Costerfield Formation is dominated by weakly bedded mudstones and silty mudstones with some lesser siltstone and sandstone constituents. The Formation is informally divided into lower and upper portions based on a significant lithological change mid-way through the succession. Estimates of the true stratigraphic thickness of the Formation are made difficult due to significant faulting in the area; however, it is estimated to be in the range of 450 m to 550 m in thickness, with the lower and upper portions of the Formation being around 200 m and 300 m thick respectively.

Informal lithostratigraphic units of the Lower Costerfield Formation are named the Siliciclastic unit and Quartzite beds, while the lithostratigraphic units of the Upper Costerfield Formation are named the Lower siltstone unit, Augusta beds and the Upper siltstone unit (Figure 7-5).

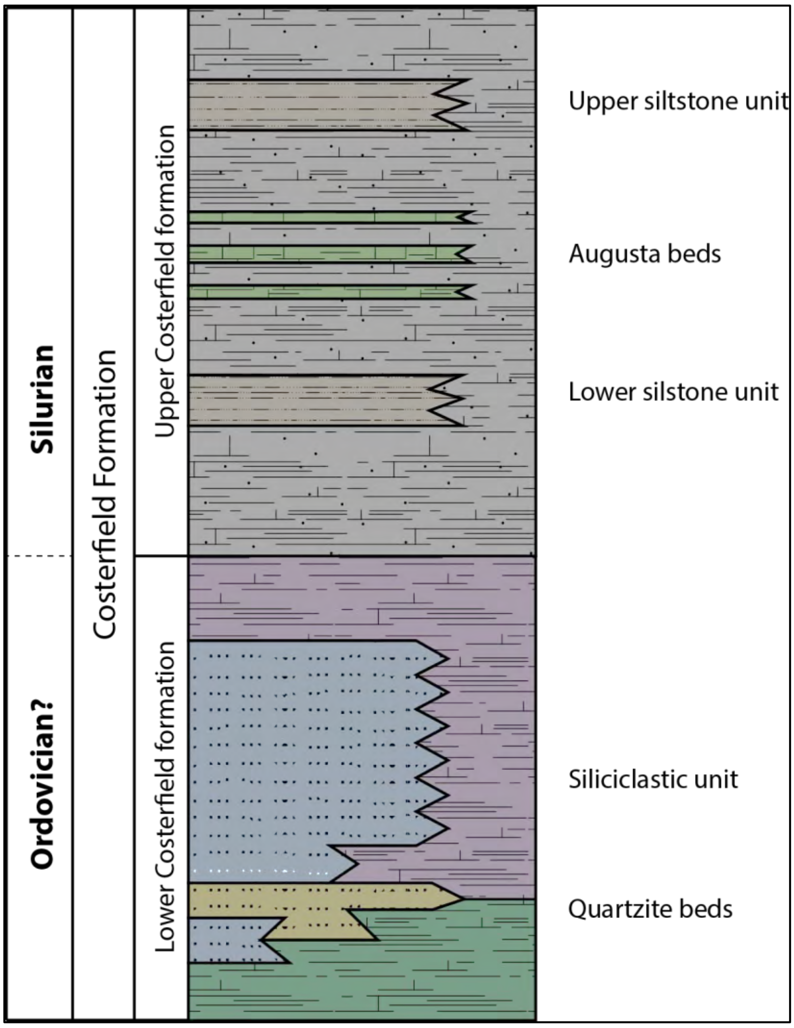


Figure 7-5: Stratigraphy of the Costerfield Formation, illustrating the relative positions of the newly defined informal stratigraphic units

7.4 Property Structural Geology

7.4.1 South Costerfield Area

Resource-definition diamond drilling for the Augusta and Cuffley Deposits has resulted in the collection of a large volume of geological data in the South Costerfield area, enabling the construction of highly refined cross-sectional interpretations. These cross-sections have revealed that the Augusta and Cuffley Deposits are bounded vertically between two large, low angle west-dipping parallel thrust faults named the Adder Fault (upper) and the King Cobra Fault (lower). The faults are typically 250 m apart in the South Costerfield area where they have been recognised.

The area between these two large structures is also heavily faulted, resulting in a defined zone of intense brittle deformation. Three significant second-order faults occur within the fault zone, the Flat, Red Belly and Tiger Faults, which are interpreted as having listric geometry, most likely mimicking the larger structure of the Adder and King Cobra Faults.

The faults are all observed to be extremely brittle structures. The large-scale Adder and King Cobra Faults are typically represented by a 1 m to 2 m zone of fault pug, associated with several metres of extremely heavily fractured and sheared lithologies in both the footwall (FW) and hangingwall (HW) blocks, which is regarded as representing regional scale thrust faults or a thrust zone. This zone has been informally named the Costerfield Thrust.

Mandalay Resources interprets the Costerfield Thrust to be the southern extent of the historically recognised Costerfield Fault. Stratigraphic interpretations suggest that the overall shortening and stratigraphic displacement across the Costerfield Thrust is in the order of approximately 1 km.

An additional series of brittle faults are observed within this thrust system, striking in a north-northeast direction, such as the East Fault. These faults have a sub-vertical dip and are generally observed as 1 m to 2 m thick zones of unconsolidated breccia with minor pug on the fault plane itself. The lateral extent of these faults is uncertain, however they appear to be localised structures as the interpretation of these structures between drilling sections is highly difficult. Offsets across these steep dipping faults appears to mostly represent strike-slip and overall vertical movement, estimated to be on the scale of less than 50 m. Lateral offset on the faults is presently unknown.

Ductile deformation of the Costerfield Formation occurs as a broad anticlinal structure with a wavelength estimated in the range of 1.5 km to 2 km. Smaller parasitic folds are observed to have a northerly striking fold-axis that dips slightly to the east and are assumed to mimic the larger scale folding of the area. Ductile to semi-ductile veining and/or faulting is evident within the Costerfield Formation and occurs as 20 mm to 100 mm laminated quartz veins. They are typically bedding parallel, although laminated veins cross-cutting stratigraphy are not uncommon. Displacement across these faults/veins is uncertain as their bedding-parallel characteristics make the determination of displacement through stratigraphic observations difficult. The veins that cross-cut the bedding, however, do appear to record displacement in the range of 10 m to potentially hundreds of metres.

7.4.2 Brunswick Area

Resource-definition diamond drilling of the Brunswick Deposit has resulted in the collection of a large volume of geological data, particularly below the previously mined Brunswick Lode. The Brunswick Deposit is located northwest of the current Cuffley workings, proximal to the Brunswick Processing Plant. Drilling completed in 2008, confirmed that the deposit is composed of a single main thrust structure, which occurs as a strongly sheared, well-mineralised pug zone as well as a large stibnite-bearing quartz vein/lode.

Since late 2015, the conceptual structural model of the Brunswick Lode evolved from a relatively linear single plane fault, into a series of thrusted panels, progressively separated by low-angle thrust faults. The flat dipping thrust faults have the effect of transposing each lode panel above several metres toward the east (Figure 7-6). Flat faults bisect the lode structures in many other places throughout the field, including Alison-Cuffley, Costerfield (the Kendall system), Margaret and Margaret East, and N Lode to varying degrees.

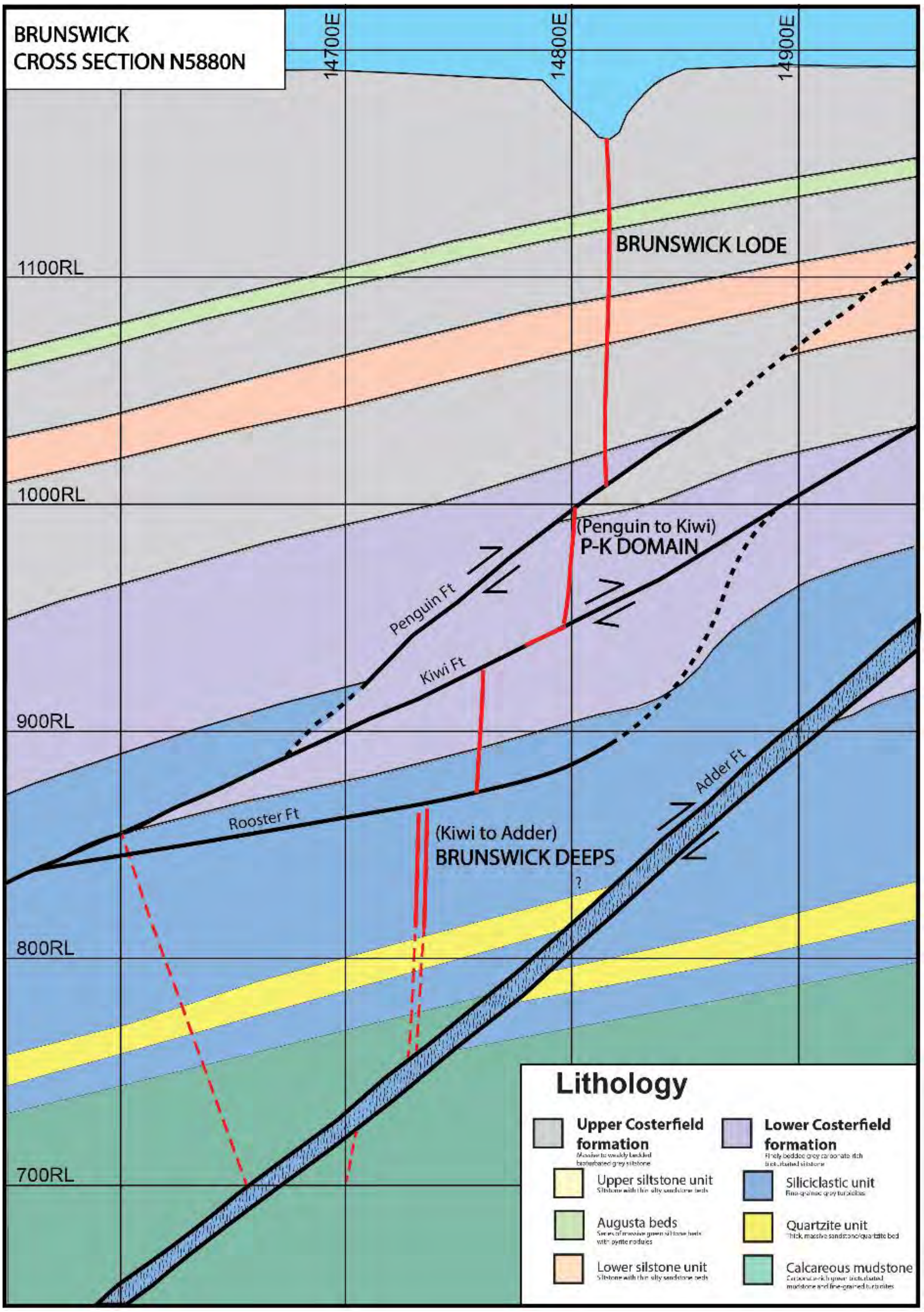


Figure 7-6: Cross-section 5,880N, through the Brunswick System

The Penguin to Kiwi (PK) panel, located between 900 mRL and 1000 mRL, is the first down-dip, major offset of the Brunswick Lode, with an apparent displacement of around 15 m to the west. The panel is separated into two portions in the north by a HW splay of the Penguin

Fault. Most drill holes in the splay-bound portion of the PK panel are low grade, although typically they are close to the bounding faults and potentially reflect fault blanks.

The Brunswick Emperor to Kiwi Panel is bounded down-dip by the FW plane of the Kiwi Fault and is interpreted to dip predominantly to the west with proximity to the fault plane.

The Brunswick Kiwi to Rooster Panel is bounded up-dip by the HW plane of the Kiwi Fault. A duplex of the Kiwi Fault is seen to the west of the Emperor to Kiwi Panel and is interpreted to be an indicator of post mineralisation movement on the Kiwi Fault. The complex relationship between the FW and HW blocks of the Kiwi Fault is now interpreted to represent both pre-syn and post Brunswick Shear mineralisation. This interpretation is key to identifying the presence of mineralisation on the different bounding fault planes. The continuity of mineralised shoots across the flat thrust faults, such as the Kiwi Fault, highlight the potential for mineralisation to continue at depth below the Kiwi Fault.

7.4.3 Costerfield – Youle Area

The Youle Lode, named after one of the original prospectors in the district, dips west and is identified as the down-dip continuation of the vertical Kendall Lode, which has been offset westward over the west dipping No.4 thrust fault (Figure 7-7). The Youle Lode extends over a strike length of approximately 600 m in horizontal length and has a vertical length of approximately 150 m.

Mineralisation exists at the surface and is vertically continuous in one plane until the intersection with a flat fault (Whitelaw back) where mineralisation switches planes to the west (Section 8). Historically, both the east dipping Costerfield Reef and west dipping Kendal Reefs were mined underground to a depth of approximately 270 m below surface (Figure 7-7).

Mandalay Resources drilled the historic Costerfield Mine area in three campaigns during 2011, 2014 and 2017-2018. The Company reported significant early results from the Youle drilling program in July 2017 and in April 2018. Drilling was accelerated in late 2017 after Mandalay Resources committed to developing the Brunswick Lode as the access to Youle, utilising the Brunswick decline. In September 2019, Mandalay Resources commenced development of the Youle Lode, which lies approximately 800 m north of the Brunswick Lode. Mine development of the Shepherd Zone commenced in October 2021, with 75 m of development completed over 2 levels to the report date.

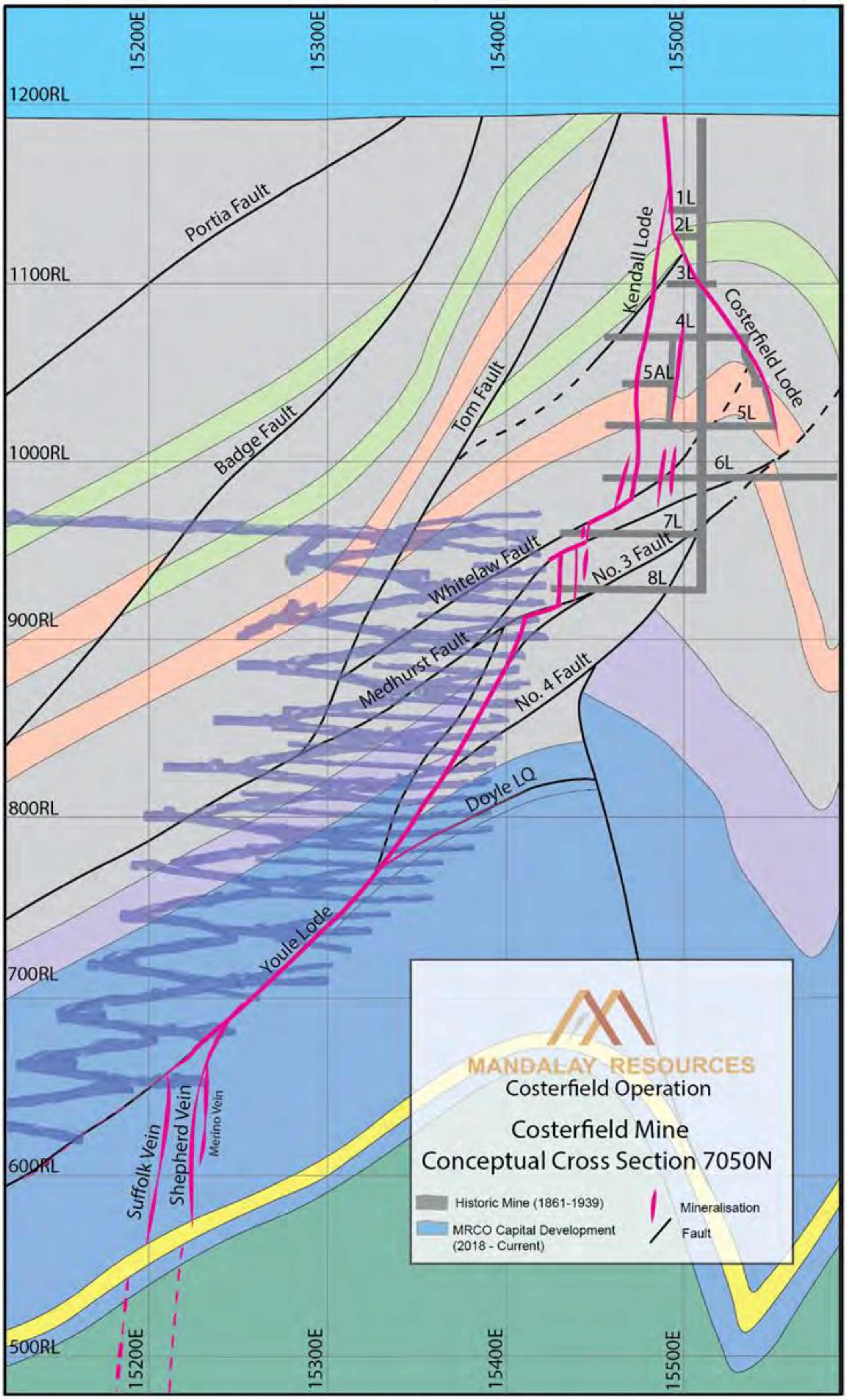


Figure 7-7: Cross section 7,030N through the Costerfield – Youle System

The Shepherd Zone is a recently discovered swarm of mineralised veins proximal to and underlying the Youle orebody (Figure 7-8). Parallel, subvertical to east dipping quartz veins exhibit coarse gold with intense sulphide alteration surrounding the veins. The Shepherd Zone extends approximately 550 m in strike and 150 m vertically.

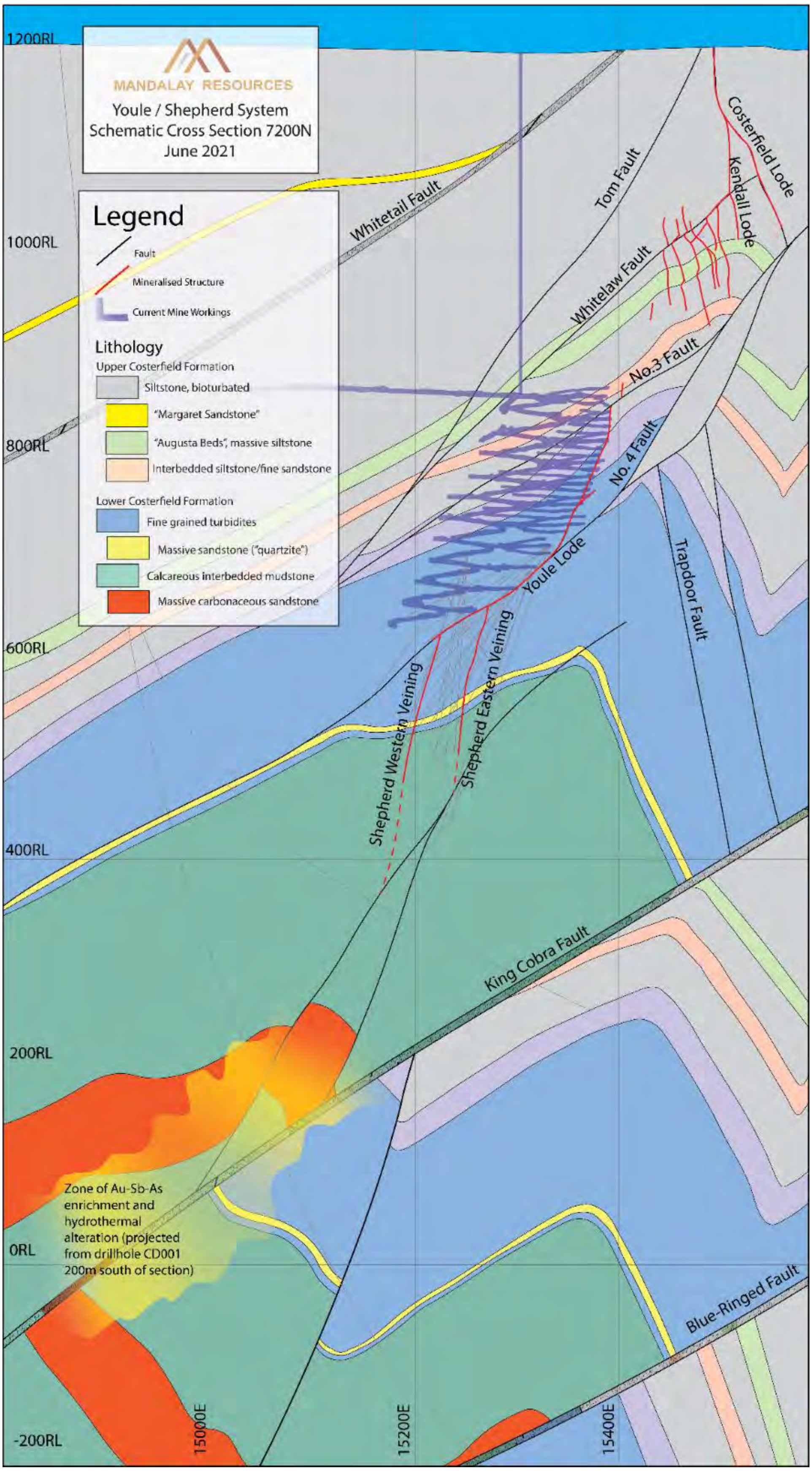


Figure 7-8: Cross-section 7,200N, through the Costerfield – Youle-Shepherd System

7.5 Property Mineralisation

Significant portions of the local area are obscured by alluvium and colluvium deposits, which have been washed over the surrounding flood plains by braided streams flowing east off the uplifted Heathcote Fault Zone. Some of this alluvial material has been worked for gold but workings are small-scale and limited in extent. Most of the previously mined hard rock deposits were found either out-cropping or discovered by trenching within a few metres of the surface.

The Augusta Deposit was discovered late in the history of the field (1970) by bedrock geochemistry, buried less than 2 m to 6 m below the alluvium, which was deposited at the meandering Mountain Creek/Wapentake Creek confluence.

The mineralised structures in the Costerfield Zone, which typically dip steeply east or west (Augusta, Brunswick, Kendall), or moderately west (Youle) are likely to be related to the formation of the Costerfield Dome and the subsequent development of the Moormbool Fault. The main reef system(s) appear to be developed in proximity to the axial planar region of the Costerfield Dome or hosted in reactivated west-dipping thrust faults.

The economic mineralisation at the Costerfield Property occurs in a north-south corridor that includes the Costerfield, Brunswick and Augusta zones. The moderately west to steeply-dipping quartz-stibnite-gold lodes have thicknesses ranging from several millimetres to one metre, and extend over a strike of at least four kilometres. The lode system is centred in the core of the doubly-plunging Costerfield Anticline and is hosted by Costerfield siltstones. Individual lodes can persist for up to 800 m along-strike and 300 m down-dip.

The mineralogy of the vein contents and mineral proportions differ from vein to vein throughout the Augusta, Cuffley, Brunswick and Youle lodes. However, the texture and chronological order of each vein/mineral generation remains remarkably consistent across all lodes.

A diagrammatic illustration of the paragenesis of the Augusta and Cuffley Deposits is illustrated in Figure 7-9. The overall paragenetic sequence is ordered as follows:

- Laminated quartz,
- Fibrous carbonate (siderite and ankerite),
- Crystalline quartz (rhombic quartz),
- Stibnite,
- Opaline quartz,

- Milky quartz.

Acicular stibnite and botryoidal calcite are not generally associated with the main quartz-stibnite vein structures, and are therefore regarded as post-mineralisation mineralogical occurrences, most likely associated with meteoric events.

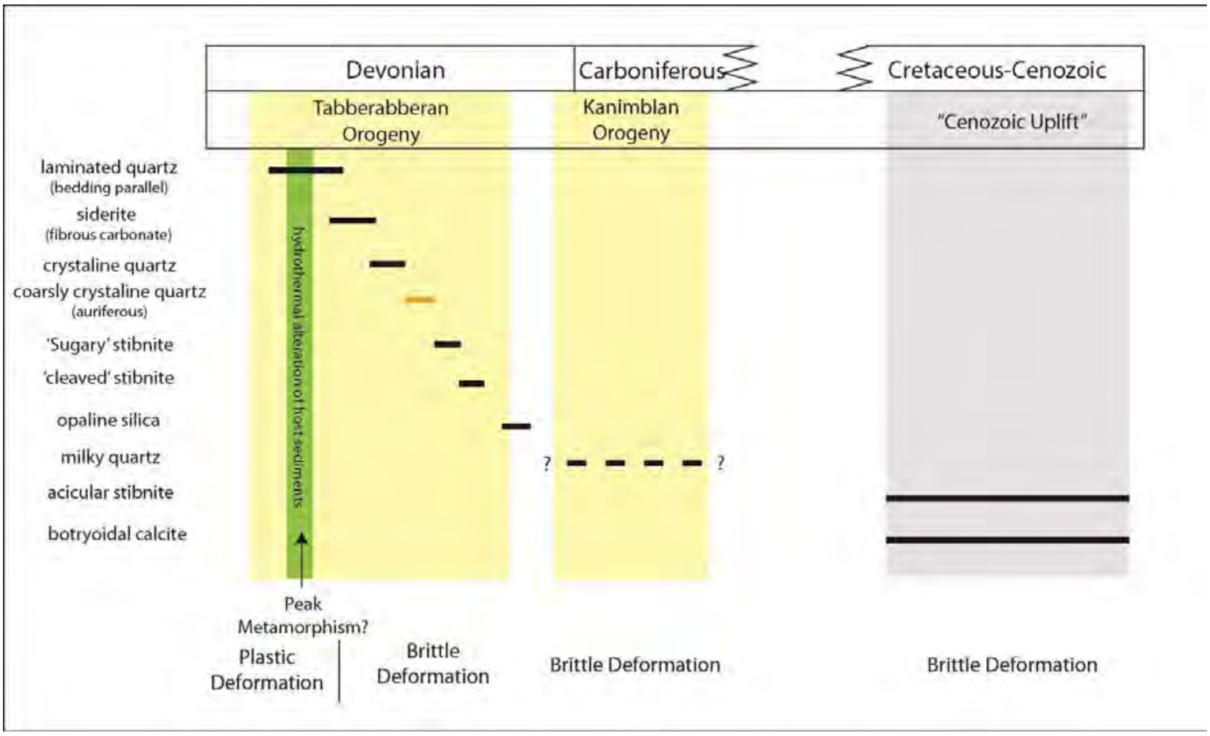


Figure 7-9: Paragenetic history and vein genesis of the Costerfield region

The Costerfield Property lodes are typically anastomosing, en-echelon style, narrow-vein systems, which dip from 25° to 70° west to 70° to 90° east. Mineralised shoots are observed to plunge to the north, when structurally controlled, and south when bedding controlled.

The mineralisation occurs as single lodes and vein stockworks associated with brittle fault zones. These bedding and cleavage parallel faults, that influence the lode structures, range from sharp breaks of less than 1 mm to dilated shears up 3 m wide that locally contain fault gouge, quartz, carbonate and stibnite.

Cross faults, such as those seen offsetting other Costerfield Property lodes, have been identified in both open-pit and underground workings.

The mineralised lodes vary from massive stibnite with microscopic gold to quartz-stibnite, with minor visible gold, pyrite, and arsenopyrite. The stibnite is clearly seen to replace quartz, and gold can also be hosted by quartz.

A photograph of typical mineralised Youle Lode within an underground development face heading has been displayed in Figure 7-10. This vein averaged 0.29 m at 143 g/t Au and 22.6% Sb, with a diluted average face grade of 24.1 g/t AuEq.

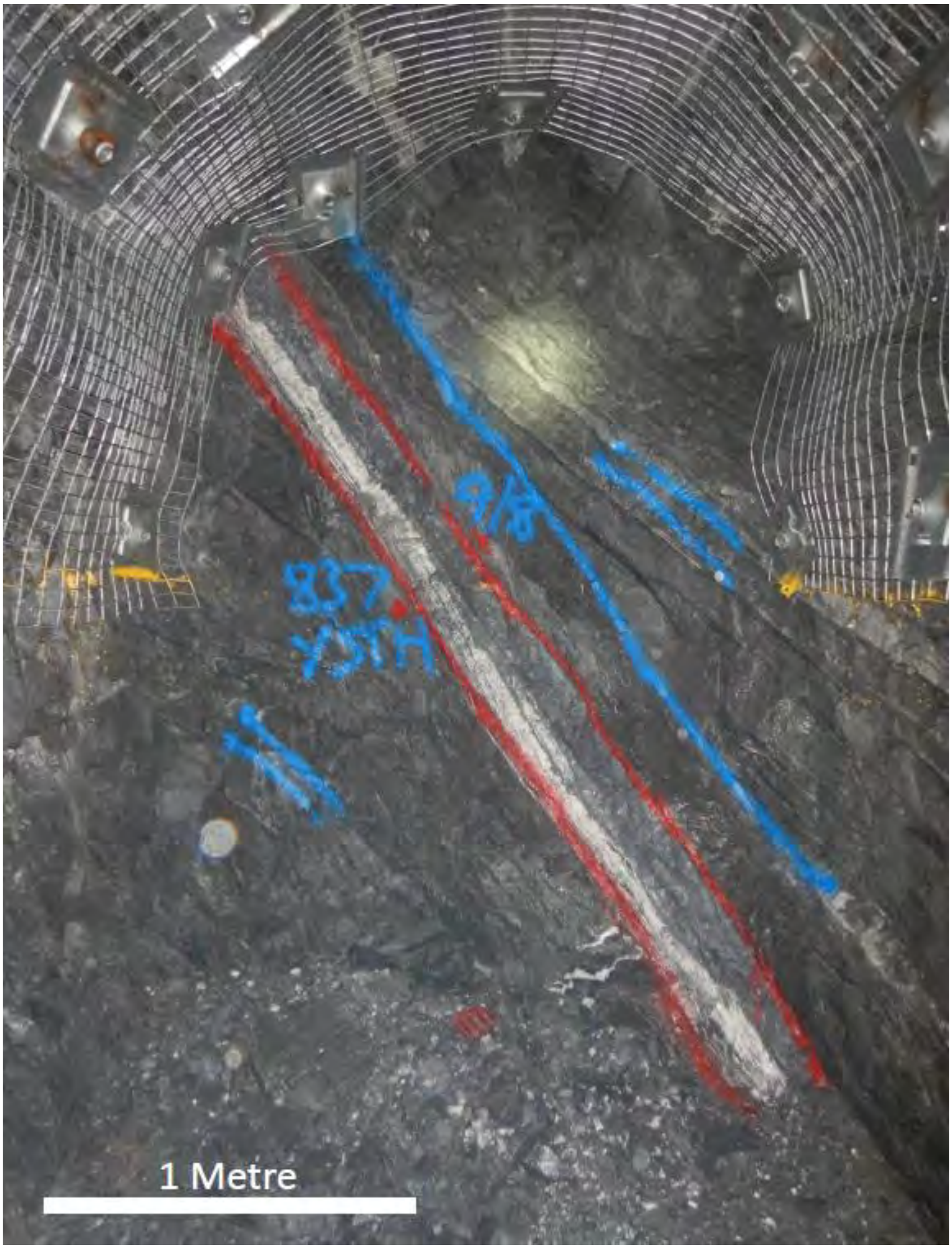


Figure 7-10: Typical Youle vein in 837 level on cross-section 6,955N

7.6 Deposit Mineralisation

Mandalay Resources has estimated Mineral Resources within the Augusta, Cuffley, Sub King Cobra, Brunswick and Youle Deposits at the Costerfield Property.

Each deposit consists of multiple lodes that are within close proximity of each other as outlined in Table 7-1 and shown in Figure 7-11.

Table 7-1: Individual Lodes at the Costerfield Property separated by deposit

Augusta	Cuffley	Sub King Cobra	Brunswick	Youle Zone	Shepherd Zone
E Lode	CM Lode	SKC C	Brunswick Main	Youle Main Lode	Shepherd
B Lode	CE Lode	SKC CE	Brunswick KR	Youle East	Ryeland
B Splay	CD Lode	SKC LQ		Kendal Splay (North Splay)	Merino
W Lode	CDL Lode	SKC W		Peacock Vein	Dorset
N Lode	AS Lode			Youle South Splay	Suffolk
NS 48				Peacock Splay	Drysdale
NW Lode					
P1 Lode					
K Lode					
C Lode					

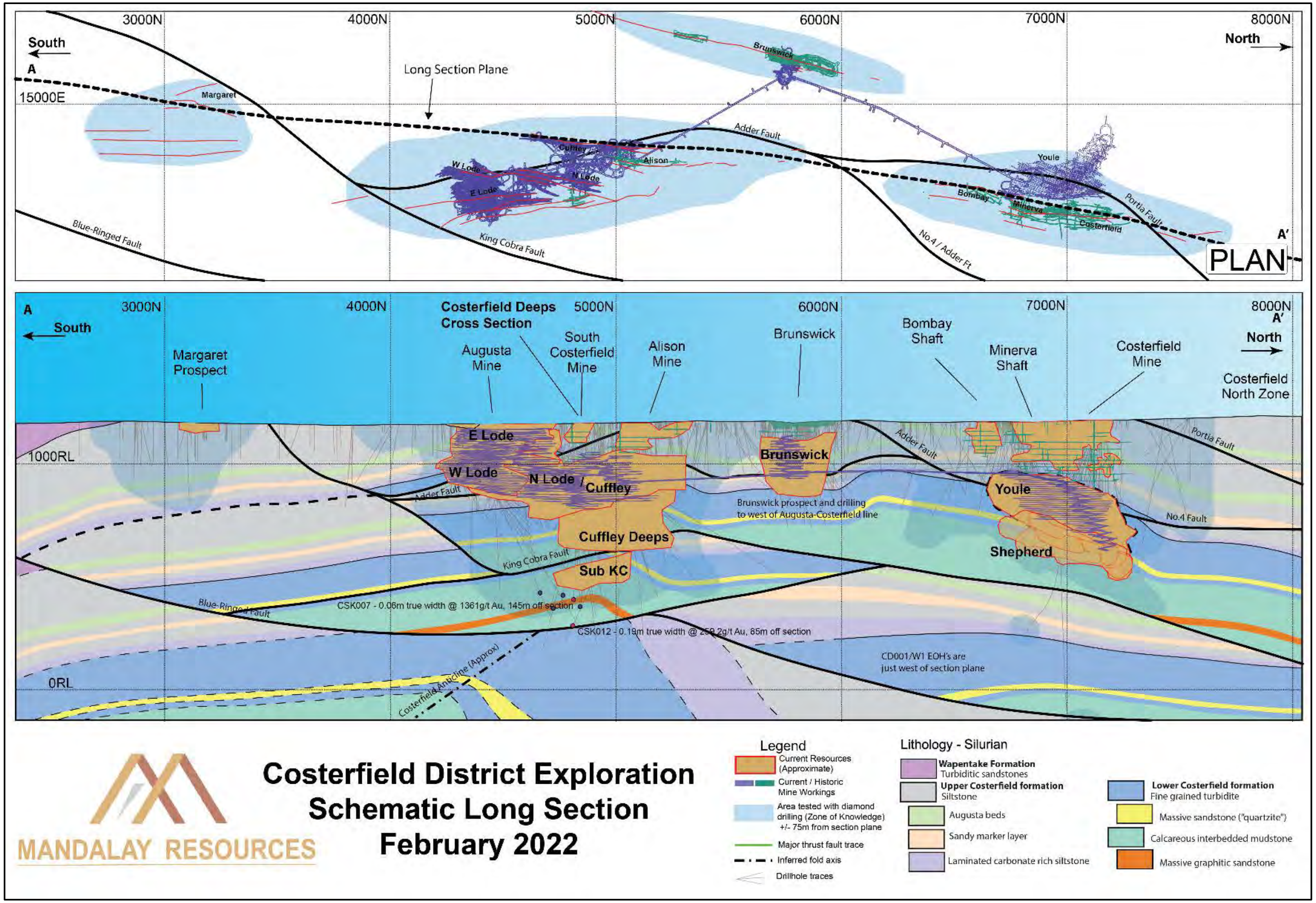


Figure 7-11: Schematic long-section and plan view of Augusta, Cuffley, Brunswick and Youle Lodes

8 DEPOSIT TYPES

The Costerfield Property lies within a broad gold-antimony province mainly confined to the Siluro-Devonian Melbourne Zone of Victoria. The narrow quartz-stibnite-gold veins of the Melbourne Zone are mesothermal to orogenic in nature and are a product of a 380 Ma to 370 Ma tectonic event. Gold in Central Victoria is believed to have been derived from the Cambrian greenstones that underlie the entire province at depth, however the origin of the associated antimony has been less studied.

The mineralisation at Costerfield occurs as narrow veins or lodes, typically less than 50 cm wide and hosted within unmetamorphosed (anchizone) mudstone and siltstone of the Lower Silurian Costerfield Formation.

Typical lode material at Costerfield consists of gold-bearing quartz and carbonate with massive stibnite either as the latest stage vein fill or segregated to one contact of the vein. The average grade of this material is approximately 9 g/t Au (often greater than 20 g/t) and 4% antimony (Fromhold et. al. 2017). A variety of accessory minerals are associated with the mineralisation, including pyrite, arsenopyrite, aurostibite, pyrrhotite, muscovite, sphalerite and galena within the vein. Wallrock alteration minerals are dominantly pyrite, arsenopyrite and ferroan carbonate spotting, surrounded by a broader, visually cryptic halo of muscovite replacing phengite. Small crystals of barite and bournonite are often seen in chlorite-coated joints near the lodes.

The character of the ore material does vary between the different Costerfield lodes in a broad sense. For example, the Augusta C, D, E Lodes, N Lode, Cuffley and Youle generally contain the ‘typical’ quartz-stibnite material described above. The Brunswick Lode is notable for containing proportionally less quartz than usual and the lode material usually comprising sheared host rock with massive stibnite as either solid vein fill or as breccia matrix with lesser quartz infill.

The Shepherd veins are unusual in a local context for containing relatively little stibnite and the mineralisation encountered to date has comprised simple coarse gold in quartz-carbonate veining. The southern portions of the Shepherd veins have displayed a more consistent stibnite component in the completed exploration drilling.

Mineralised shoots at the Costerfield Property known to date are understood to be structurally controlled, typically by the intersection of the lodes with major cross-cutting, gouge filled fault structures and shears. Exploration at the property is guided by projections of where these fault/lode intersections might be located using data from structural/geological mapping, diamond drill hole logging and 3D computer modelling utilising Leapfrog Geo software.

Notable west to northwest dipping thrust faults typically bound the mineralisation packages at the Costerfield Property but can become significantly mineralised themselves along the fault planes. Shallower and dominantly west dipping thrust faults, typically at very low angles or even parallel to bedding with a laminated quartz component, link between the larger order thrust faults. The link faults can also offset the vertical lode structures up to 50 m in an east-west sense.

These flat dipping structures have influenced the lifespan of some historic mining at Costerfield. The Alison Mine, where lodes were initially discovered in 1863, ceased mining a depth extension in 1871 because the lodes were truncated against a flat west-dipping fault. A crosscut established below the 'slide' unsuccessfully passed back into the hangingwall of the fault before any lode continuation was located. Intermittent mining finally ceased at the Alison mine in 1922 after strike extensions were finally exhausted.

Drilling of the Allison Lodes in 2011 successfully intersected a westerly-displaced lode below the truncating fault. This continuation was named Cuffley Lode and became a major source of ore for the Costerfield mine for several years, no doubt eclipsing the production of the overlying historic mine by a significant margin.

9 EXPLORATION

The exploration work that led to the discovery of the Augusta, Cuffley, Brunswick, Youle, and Shepherd Deposits has included predominantly diamond drilling of interpreted geological targets complimented by geological mapping, geophysical and geochemical analysis. Geochemical exploratory methods have proven to be applicable in detecting gold-antimony mineralisation.

9.1 Costeans/Trenching

Previous owners have undertaken trenching at the Costerfield Property, however records of these exploration activities were inconsistent and have not been relied upon for quantitative means.

9.2 Petrophysical Analysis

In 2006, AGD submitted 22 whole-rock and mineralised samples from all known deposits around the Costerfield Property for testing by Systems Exploration (NSW) Pty Ltd. The aim of the work was to determine the petrophysical properties of the mineralisation and identify the most effective geophysical exploration methods that could be used at the project to detect similar styles of mineralisation. The breakdown of the 22 samples submitted is:

- 13 mineralised samples sourced from Augusta, Margaret, Antimony Creek, Costerfield, Bombay, Alison and Brunswick.
- 2 weathered mineralised samples sourced from Augusta.
- 7 unmineralised samples.

The following petrophysical measurements were completed:

- Mass properties
- Dry bulk density
- Apparent porosity
- Grain density
- Wet bulk density
- Inductive properties:
- Magnetic susceptibility

- Diamagnetic susceptibility
- Electromagnetic conductivity
- Galvanic properties:
- Galvanic resistivity
- Chargeability

Although measurable differences in the physical properties of the mineralised and non-mineralised material at the Costerfield Property was identified, the contrast proved to be marginal at best, and it was deemed unlikely that these differences would deliver clear geophysical signatures.

The only field geophysical techniques recommended for trialling were ground-based magnetics, ground-based gravity and induced polarisation (IP) profiling.

9.3 Geophysics

Several programs of geophysical surveys were completed at the Costerfield Property.

9.3.1 Ground Geophysics

Based on the results of the petrophysical testing, a limited program of ground-based magnetics, gravity and IP profiling, with optimal measurement parameters, was carried out across the Augusta Deposit. None of the techniques were found to be effective at detecting the known mineralisation at Augusta.

9.3.2 Airborne Geophysics

A low-level detailed airborne magnetic and radiometric survey was undertaken in 2008 by AGD over their tenements, including both Augusta and Cuffley. The airborne survey was conducted on east-west lines spaced 50 m apart, with a terrain clearance of approximately 50 m. Survey details are included in a logistics report prepared by UTS (UTS, 2008).

Magnetic data was recorded at 0.1 second intervals and radiometric data was recorded at 1 second intervals. Additional processing was undertaken by Greenfields Geophysics.

The interpretation of the radiometric and magnetic data resulted in the generation of regional lineament trends across the tenements, which assisted in interpreting the local buried structures.

9.4 Geochemistry

Geochemical exploration has been undertaken extensively at the Costerfield Property.

9.4.1 Mobile Metal Ion (MMI)

Based on historic geochemical surveys over the Augusta Deposit, as described by Stock and Zaki in 1972, and informal recommendations by Dr G McArthur of McArthur Ore Deposit Assessments Pty Ltd (MODA), it was decided in 2005 to trial Mobile Metal Ion (MMI) analytical techniques on samples collected from traverses across the Augusta Lodes.

Utilising two geophysical traverse lines across the Augusta Deposit, 5 m spaced samples were collected from the soil horizon and submitted to Genalysis Laboratory Services for MMI analysis of gold, arsenic, mercury, molybdenum, and antimony via Inductively Coupled Plasma (ICP).

While the other elements showed no correlation to the underlying mineralisation, the gold and antimony results appeared to show a broad anomaly across the mineralisation, indicating that the technique could be useful for regional exploration.

9.4.2 Soil Geochemistry

In October 2017, a soil geochemistry program was conducted at Brunswick South to verify historical sample lines along the southern strike of the Brunswick Lode. A mechanical hand-held auger was used to take 28 samples over two traverse lines at an average depth of 720 mm. This program successfully verified the historical assay data and demonstrated a possible strike extension to the Brunswick lode.

In September 2021, a soil geochemistry campaign was conducted to cover the areas south of True Blue and the eastern corridor (Brown and Robinson Prospects). A mechanical hand-held auger was used to take 854 samples over 200 m spaced traverse lines with samples spaced at 50 m intervals (Figure 9-1).

Samples were first analysed using a portable X-Ray Fluorescence (XRF) and followed up by aqua regia digest ICP-MS analysis. The work aimed at producing a large surface geochemical dataset and to aid target generation along known mineralised corridors.

Data interrogation and analysis was ongoing at the time of writing with assay results pending.

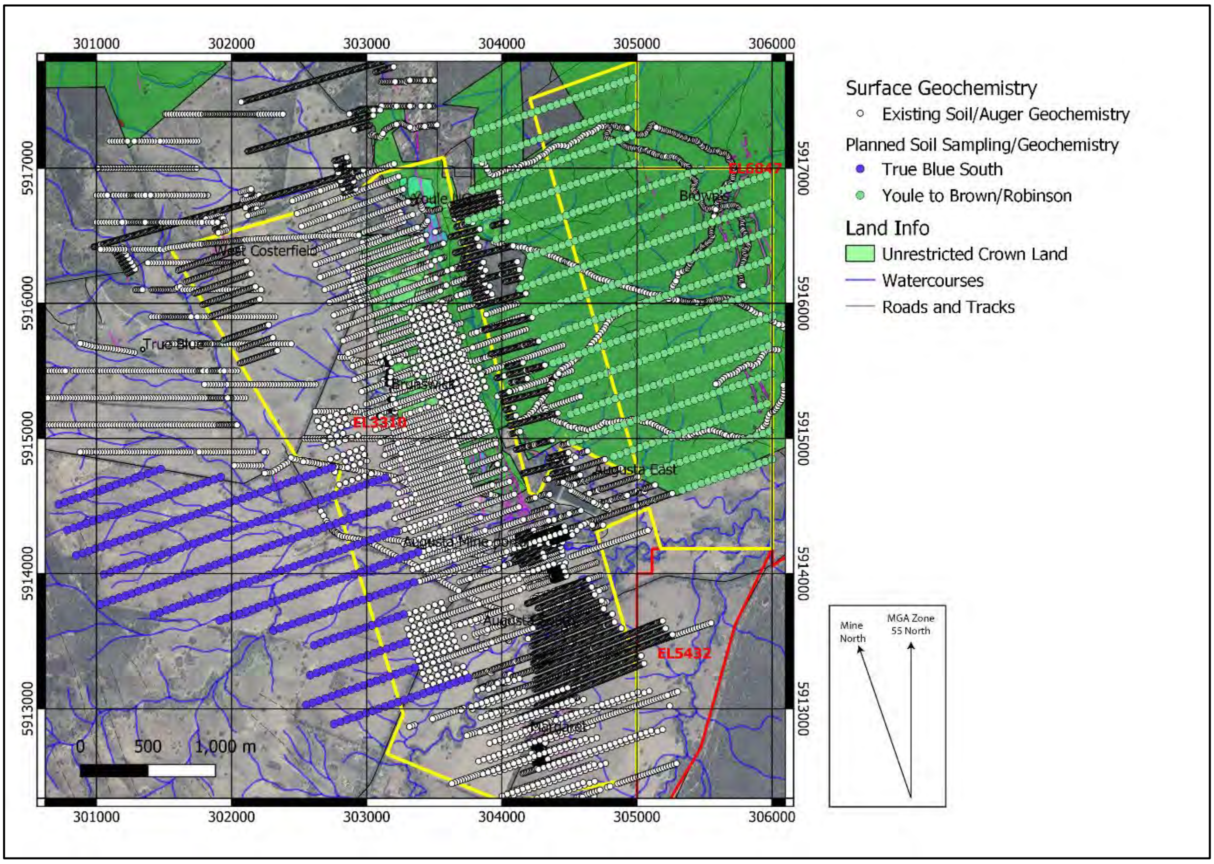


Figure 9-1: Surface Topography and Mining Lease Overlaid with the Existing Geochemical Lines and Acquired 2021 Soil Sampling Lines

9.4.3 Bedrock Geochemistry – Auger and Aircore Drilling

The effectiveness of bedrock geochemistry was demonstrated by MEM in 1968 to 1970, when a grid south of the South Costerfield/Tait's Shafts was sampled. What is now known as the Augusta Deposit was highlighted by the resultant anomalies.

Although MEM drilled three shallow diamond drill holes, which ranged from 22 m to 57 m, to test the anomalies and intersected stibnite stringers, they did not proceed any further. Both conventional surface soil and drilled-bedrock samples were collected to compare techniques; although the surface samples were anomalous and cheaper to collect, the drilled-bedrock samples defined the lodes more precisely.

A geochemical aircore drilling program was carried out during March 2010 to test the zone between Augusta South and the Margaret Mine, south of the operating Augusta Mine. The three east-west traverses were completed across cleared grazing paddocks, south of Tobin's Lane, Costerfield. A total of 104 aircore drill holes were drilled for a cumulative total of 547 m, with the average drill hole depth being 5.2 m. The identified antimony halo was subdued in areas where the high-grade lode was greater than 50 m below the top of bedrock, considered to infer that either a low-grade lode existed at shallow depth or a high-grade lode existed at depth.

From December 2011, Mandalay Resources engaged Starwest Pty Ltd to undertake the Augusta East Auger drilling program. A total of 2,615 auger drill holes were drilled for 7,295.6 m between December 2011 and June 2012. The survey revealed three anomalous zones (Figure 9-2).

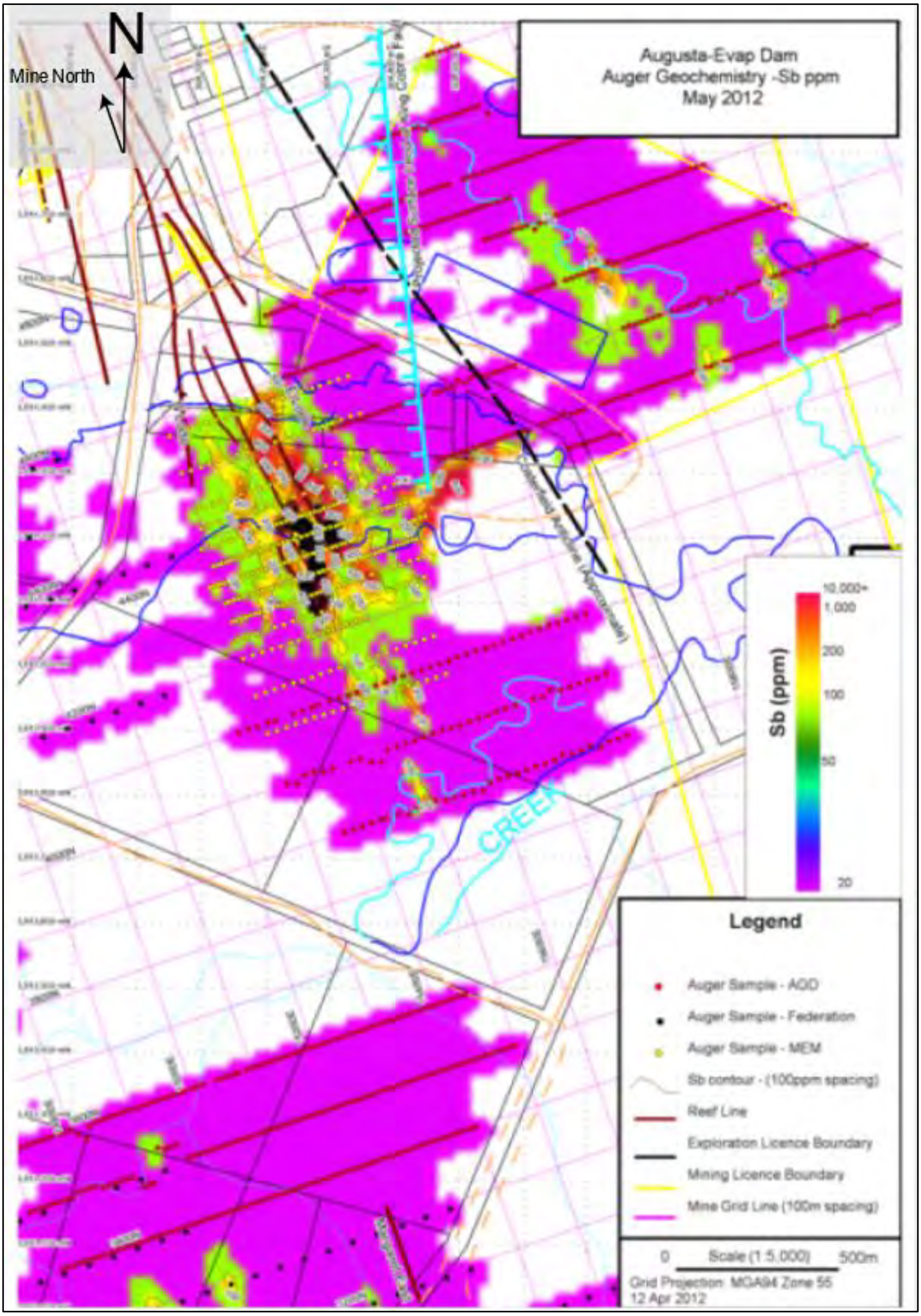


Figure 9-2: Auger Drilling Geochemistry Results for Antimony

A total of 1,375 auger drill holes were then drilled by Mandalay Resources from 15 April 2014 to June 2014 for 3,906 m. Drill holes were completed on exploration leases EL3310 and EL5432 and mining lease MIN4644 covering six of the prospect areas comprising Augusta, Cuffley, Brunswick, West Costerfield and Margaret's Reef.

9.4.3.1 Cuffley

76 drill holes were drilled on two lines over the underground Cuffley Deposit to test the relationship between bedrock geochemistry and known gold-antimony ore bodies below surface. The Cuffley orebody does not outcrop at surface due to termination of the vein system by a flat fault approximately 100 m below surface. The depth to the ore zone explained the low to moderate level of anomalism displayed in the auger drilling. The anomaly covered a broad zone that approximated the Cuffley orebody at depth.

9.4.3.2 Augusta Mine Extension

To the east, west and south of the existing Augusta mine site, 124 drill holes were drilled to explore for extensions of the known underground orebodies. The auger drilling to the east and west detected no elevated levels of either gold or antimony, and no further work was planned in these areas.

The two lines drilled to the south displayed a narrow zone of high-grade anomalism, which correlated directly to extensions of known ore bodies. Diamond drilling between this area and the mine intersected no economic mineralisation and therefore this area was downgraded to a low priority drilling target.

9.4.3.3 Brunswick

To the west and south of the Brunswick open cut, 247 drill holes were drilled to test for extension of the known ore body. No elevated anomalism was detected to the west, however a narrow high-grade intersection was returned from drilling 500 m south of the Brunswick pit suggesting an extension of the orebody.

In 2017, soil sampling was conducted over two lines where bedrock geochemistry had been previously completed, in order to test the effectiveness of soil sampling. The results of the soil sampling indicated anomalism broadly corresponding to the anomalism in the bedrock geochemistry data. No further testing of the appropriateness of this method has been completed to date.

9.4.3.4 Margaret's Reef

Margaret's Reef auger drilling was carried out on private property 1 km south of the current Augusta mining operations with a total of 536 drill holes being completed. Previous auger drilling in this area was done on a wider sample spacing of 40 m and was not considered deep enough to provide consistent results, therefore the lines were re-drilled. Sample spacing of 10 m over the previous anomalous results gave a clearer indication of the mineralised structures at depth.

Margaret's Reef appears to be composed of several reef/vein systems as suggested from previous RC and diamond drilling. The veins strike approximately northwest, which is a similar vein orientation to those seen underground at Augusta and Cuffley and may represent a fault-displaced extension of one of these systems. The close proximity to the King Cobra Fault to the east appears to have structurally complicated the vein systems, which explains the discontinuous nature of the anomalism identified. Broad zones of high anomalism were seen to correlate with known historic workings over the reef. The highest grade result present in drill holes distal to the mining operations at the time, was received from the northern most line at Margaret's Reef, returning grades of 5.42 g/t gold and 3.25% antimony, suggesting the presence of economic mineralisation at surface.

Several high-priority diamond drill targets were planned, including a target beneath the above mentioned high-grade result, in order to provide further structural information on the mineralised vein system. However, recent diamond drilling failed to follow up on a high-grade intersection in drill hole MM001, drilled in 2001, of 1 m at 33 g/t gold and 14% antimony. Further diamond drill holes are planned to determine if an economic resource exists in this area.

9.4.3.5 West Costerfield

A total of 336 auger drill holes were drilled in 2014 at West Costerfield, designed to test areas near historic workings to the east and determine mineralisation continuity to the south of the previous auger program, which delineated the True Blue anomaly to the west however only the northern portion of the West Costerfield reef was explored at the time.

A broad anomaly was defined over the West Costerfield reef and was identified to continue south with high gold values and moderate antimony results. The anomaly is located along the Mountain Creek drainage zone to the south, but widens and changes orientation slightly towards the north, near the small historic pits that define the West Costerfield reef. Although the antimony anomalism identified was subdued in contrast to the high gold, the interpreted gold-antimony veins below surface are considered to be similar in style to those intersected in the single diamond drill hole into True Blue.

In 2015, a follow up program of 38 RC drill holes was drilled to test the anomaly identified in the 2014 Auger drilling program. The RC drilling resulted in the identification of mineralisation that has not yet been drilled by diamond drilling.

9.5 Aerial Photogrammetry Survey

AGD commissioned Quarry Survey Solutions of Healesville, and United Photo and Graphic Services Pty Ltd of Melbourne, to organise and complete aerial photogrammetry of the Costerfield Property tenement package and the Augusta Mine Site in 2005.

A high-level photo survey was completed in November 2005 at 24,000 ft. This was followed by low-level photo survey over the Augusta Mine Site in January 2006 at 8,000 ft.

A second low-level photo survey was completed in April 2006 at a height of 4,000 ft, at the time of maximum surface excavation, prior to the commencement of backfilling of the E Lode Pit.

The various photo surveys were subsequently used to generate a digital terrain model (DTM) and a referenced ortho-photographic scan of the Costerfield central mine area. This area essentially extended from Costerfield South to the Margaret's Reefs area, thereby encompassing most of ML MIN4644.

In 2019, Mandalay Resources engaged AAM Group to carry out a detailed Light Detection and Ranging (LiDAR) aerial survey over a 175 km^2 area, covering the entire tenement package. This survey generated a highly accurate and detailed photographic model of the surface with accuracy to +/- 10 cm. The survey had a two-fold benefit both for Mandalay Resources Future Ore project and the Youle in-rush risk assessment. The LiDAR survey provided an accurate topographical surface that assisted the company to undertake flood simulation studies in order to plan for any 100-year flooding events at the Costerfield Property.

9.6 Surface Mapping and 3D Geological Modelling

The Mandalay Resources Future Ore project continued throughout 2021, with the ongoing collection of surface geological information from traverse mapping and continued refinement of a comprehensive regional three-dimensional (3D) model using Leapfrog Geo implicit 3D software (Figure 9-3 and Figure 9-4).

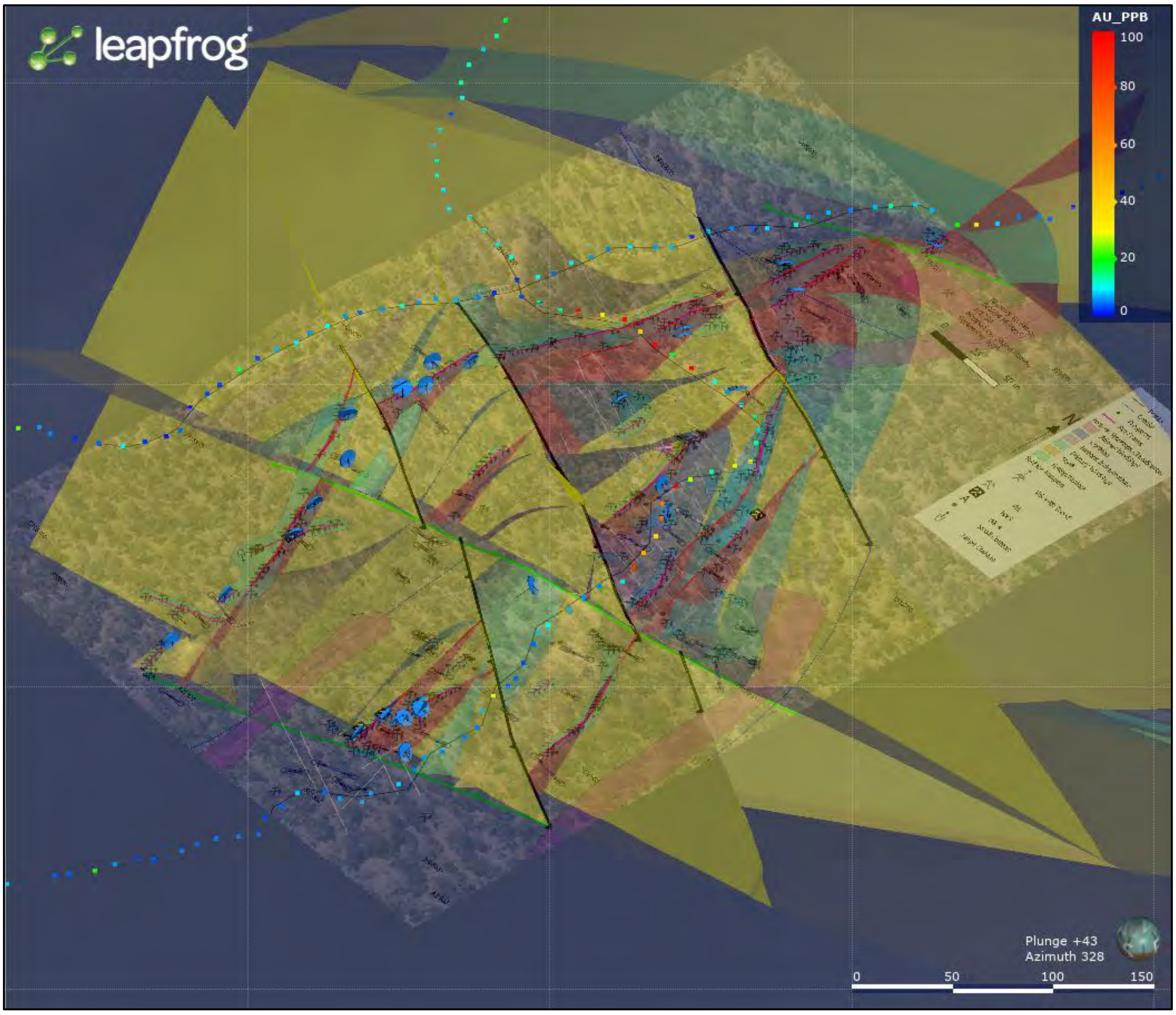


Figure 9-3: Perspective view to the northwest: Leapfrog Geo Geological Model, Regional Geology

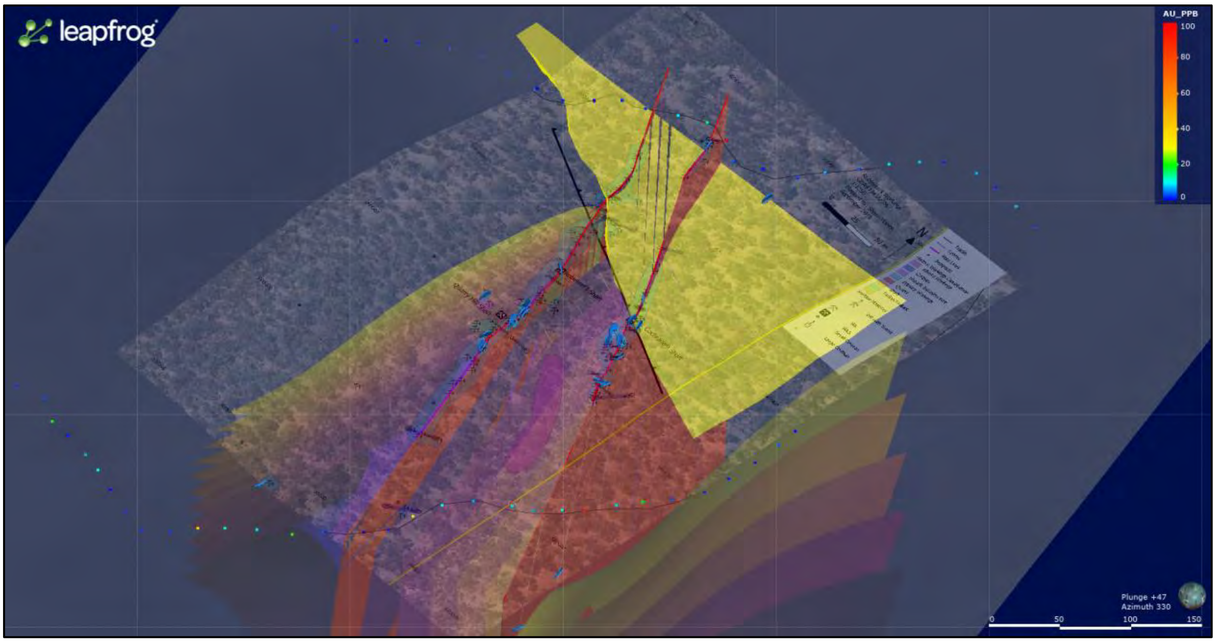


Figure 9-4: Perspective view to the northwest: Leapfrog Geo Geological Model, Robinsons Prospect

Traverse mapping and compilation of geological data onto comprehensive geological maps of the Costerfield Property has been completed since 2018.

10 DRILLING

Drilling at the Costerfield Property is undertaken in line with industry best practices including:

- Drilling is undertaken by reputable drilling contractors, with modern drilling equipment.
- The accurate location of Mandalay Resources drill hole collars by differential GPS or theodolite surveying methods, either by external Surveyors or Mandalay Resources Surveyors.
- Measurement of downhole surveys at 30 m intervals.
- Transporting of diamond core in stacked core trays and secured in a dedicated facility.

10.1 Mandalay Resources (2009 to Present)

On 1 December 2009, Mandalay Resources took over the Costerfield Operations from AGD and continued with exploration across tenements MIN4644, EL3310, and EL4848.

As of December 2021, Mandalay Resources held tenements MIN4644, MIN5567, EL5519 and EL5432. Tenement applications ELA6847 and ELA6842 are pending, along with Retention Licence applications RLA7485 and RLA7492.

A summary of drilling completed by Mandalay Resources from 2009 to 2021 has been outlined in Table 10-1.

Table 10-1: Drill Hole Summary

Year	Diamond Core (m)	Percussion/Auger (m)
2009	458.9	547.0
2010	4,032.0	Nil
2011	13,515.0	Nil
2012	18,581.4	7,295.6
2013	24,329.0	3,838.0
2014	20,817.0	3,906.0
2015	18,439.0	2,732.0
2016	32,995.0	Nil
2017	27,827.0	Nil
2018	34,656.0	Nil
2019	9,556.0	Nil
2020	29,080.0	Nil
2021	36,255.0	Nil
TOTAL	**270,541.3**	**18,318.6**

10.1.1 2009 to 2010

Drilling from 1 July 2009 to 30 June 2010 mainly consisted of drilling along-strike and down-dip from the existing Augusta Resource. In total, 458.9 m of diamond drilling was undertaken.

In addition, 547 m of bedrock geochemistry aircore drilling was completed within MIN4644 at Augusta South.

Augusta drilling during from 1 July 2009 to 30 June 2010 concentrated on the definition of the W Lode Resource. Four drill holes tested the depth extent of W Lode, while another six drill holes were designed as infill drill holes to test mineralised shoots and gather geotechnical data.

10.1.2 2010 to 2011

Exploration from 1 July 2010 to 30 June 2011 was undertaken on two projects, the Augusta Deeps project and the Brownfields Exploration project. The Augusta Deeps project was undertaken with the view to extending the existing Augusta Resource to depth.

Augusta drilling concentrated on the infill and extension beneath Augusta to further define the Resource below 1,000 mRL. In total, 10,622.7 m of drilling was completed beneath the Augusta mine workings and resulted in the definition of further Indicated and Inferred Mineral Resources.

10.1.3 2011 to 2012

Exploration from 1 July 2011 to 30 June 2012 was undertaken on four projects; the Augusta Deeps drilling project (W Lode and N Main Lode), the Alison/Cuffley drilling project, the Brownfields/Target Testing drilling project and the Target Generation/Bedrock Geochemistry auger drilling project.

In total 18,581.4 m of diamond drilling and 7,295.6 m of auger drilling were undertaken over the four projects. All drilling was carried out by Starwest Pty Ltd using one LM75 diamond drill rig, two LM90 diamond rigs, one Kempe underground diamond drill rig and a modified Gemco 210B track-mounted auger rig.

10.1.3.1 Augusta Deeps

Drilling of the Augusta Deposit from 1 July 2011 to 30 December 2012 was undertaken with the view to extend the W Lode, E Lode and N Main Lode Inferred and Indicated Mineral Resource, and give confidence in the structural continuity of W Lode and N Main Lode.

A total of 78 drill holes were drilled from surface and underground, totalling 16,170.4 m of drilling.

10.1.3.2 Cuffley

The Alison/Cuffley drilling project was designed to infill drill a portion of the lode and upgrade it to the Indicated Resource category, and to extend the limits of the lode in the Inferred Resource category.

The Cuffley Lode resource drilling programme began in July 2011 with the AD series of drill holes, following the MB007 discovery. As a follow-up programme, four drill holes were drilled (AD001-ADD004). AD004 intersected the fault blank and AD003 appeared to have only intersected the Alison Lode above the Adder Fault in the vicinity of some old stopes. From drill hole AD005 onwards, the drilling strategy involved drilling at least two drill holes on each mine grid cross-section, at an approximate spacing of 80 m to 100 m. Drill holes were drilled on both west to east and east to west orientations, depending on the site logistics.

One deep drill hole, AD022, on the 5,025N cross-section, intersected the Cuffley Lode at 700 mRL, 490 m below the surface with results of 1.04 m at 59.7 g/t Au, 0.37% Sb returned. This drill hole provided confidence in the depth continuity of the lode to Inferred Resource category.

A portion of the drilling in 2011 to 2012 was infill drilling, 100 m below the Alison Shaft 5 level, at a spacing of 40 m, in order to define the lode to Indicated Resource category where the planned access decline was expected to first intersect the lode.

10.1.4 2012 to 2013 – Cuffley Lode Drilling

From 1 July 2012 to 30 June 2013 Mandalay Resources drilled 24,329 m of diamond drilling, targeting the Cuffley Lode from surface. These drill holes focussed on infill drilling the central, high-grade portion of the Cuffley Lode in order to convert a portion of the Inferred Mineral Resources to the Indicated category.

10.1.5 2014 – Cuffley and N Lode Drilling

In 2014 the focus was on finalising the Cuffley and Augusta Resource Drilling. The goals achieved included:

- Expanding the existing Inferred Resource of the Cuffley Lode, both along-strike and at depth.
- Increasing the confidence of the central portion of the Cuffley Lode to aid mine development and stoping of the Cuffley Lode.
- Expanding the existing Inferred Resource of the Augusta Deposit, specifically targeting N Lode along-strike from the existing N Lode development.

- Infill and extension of the Cuffley resource to the north and south along with Cuffley Shallows in between the flat fault and the Adder fault.

In total, 20,817 m of diamond drilling and 3,906 m of auger drilling was undertaken. A total of 5,735 m was drilled for the purposes of target testing, 9,390 m for resource expansion and resource conversions, and 5,692 m for resource infill drilling.

All drilling activity was conducted by Starwest Pty Ltd using two Boart Longyear LM90s, one Boart Longyear LM75, one pneumatic Kempe U2 rig and a modified Gemco 210B Track-mounted Auger.

10.1.6 2015 – Cuffley, N Lode, Cuffley Deeps and Sub King Cobra Drilling

Drilling in 2015 was focused on extending the Cuffley and Augusta Resources, both along-strike and at depth. The expansion of the Cuffley resource included the commencement of drilling in the Cuffley Deeps and Sub King Cobra regions. The goals achieved included:

- Expanding the existing Inferred Resource of the Cuffley Lode along-strike and definition of a resource below the Cuffley Lode at depth.
- Commencement of drilling at depth below the Cuffley Deposit into the Cuffley Deeps and Sub King Cobra areas.
- Increased the confidence of the central portion of the Cuffley Lode to aid mine development and stoping.
- Expanding the existing Inferred Resource of the Augusta Deposit, specifically targeting N Lode along-strike from the existing N Lode development.
- Infill and extension of the Cuffley resource to the north and south along with Cuffley Shallows in between the flat fault and the Adder fault.
- Follow up RC drilling at West Costerfield to test the geochemical anomaly identified in 2014 by the Auger Bedrock drilling program.

In total, 18,439 m of diamond drilling and 2,732 m of RC drilling was undertaken. The majority of drilling was conducted by Starwest Pty Ltd using two Boart Longyear LM90s, one Boart Longyear LM75 and one pneumatic Kempe U2 rig. The RC drilling was conducted by Blacklaws Drilling utilising a Hanjin surface rig.

10.1.7 2016 – Cuffley Deeps, Cuffley South, M Lode, New Lode, Sub King Cobra, Margaret and Brunswick Drilling

Exploration from January to December 2016 was focused on extending and upgrading the Cuffley and Augusta Resources to extend the life of mine plan, replace the mined portion of the Mineral Resource and explore near-mine targets in close proximity to existing underground infrastructure.

The expansion of the Cuffley resource included the continuation of drilling in the Cuffley Deeps, Cuffley South and Sub King Cobra regions, along with the addition of new target areas. The goals achieved included:

- Expanding the existing Inferred Resource in the Cuffley Lode, and further defining the Cuffley Deeps and Sub King Cobra Resources below the Cuffley Lode at depth.
- Infill and exploration drilling of the Cuffley Deeps and Sub King Cobra areas, leading to a resource expansion in Cuffley Deeps and an Inferred Resource at the Sub King Cobra area.
- Infill drilling of Cuffley Deeps delineated further prospective zones and a new ore system, namely Mid Lode (M Lode) located between the Cuffley line of lode and N Lode.
- Further development on the Cuffley Lode informed the understanding of, and increased confidence in the Cuffley Deeps Deposit at depth and along-strike.
- Infill and extension of the Cuffley resource to the north and south along with Cuffley Shallows in between the flat fault and the Adder fault.
- Recommencement of drilling on Brunswick and further testing of the deposit to the south and at depth.
- Brownfields drilling on the Margaret Reef identified the Margaret East mineralisation.

In total 32,995 m of diamond drilling was undertaken. All drilling activity was conducted by Starwest Pty Ltd using four Boart Longyear LM90s, one Boart Longyear LM75 and one pneumatic Kempe U2 rig.

10.1.8 2017 – Brunswick, K Lode and N Lode

Exploration from January to December 2017 was focused on extending and upgrading the Brunswick Resource with the aim to convert as much to Reserve as possible. The focus in the second half of 2017 was also on extending the Resource around Cuffley and Augusta to extend the life of mine plan, replace the mined portion of the Mineral Resource and explore near-mine targets in close proximity to existing underground infrastructure. The goals achieved included:

- Expanding and increasing the existing Indicated Resource of the Brunswick Lode, and further definition and testing of Brunswick at depth and Brunswick South.
- Expanding the geological knowledge of and resource in the near mine environment, in particular the extension and infill of the K Lode and N Lode splays, including the N Lode East in the Augusta system.
- Definition and grade increase of C Lode.

In total 26,403 m of diamond drilling was undertaken. All drilling activity was conducted by Starwest Pty Ltd using four Boart Longyear LM90s, one Boart Longyear LM75 and one pneumatic Kempe U2 rig.

10.1.9 2018 – Youle and Brunswick

Exploration from January to December 2018 was predominantly focused on extending, defining and upgrading the Youle Mineral Resource. A total of 20,847 m was devoted to resource expansion and conversion drilling, with the remaining 13,809 m invested in target generation.

Additionally, the focus for the second half of 2018 was on increasing the Resource around Brunswick and Augusta to extend the life of mine, replace the mined portion of the Mineral Resource and explore near-mine targets in close proximity to existing underground infrastructure. The goals achieved included:

- Defined the Youle Lode, a west-dipping, high-grade ore body, identified as a continuation of Kendall-style mineralisation.
- Delineated an Indicated Resource around Youle, which could be integrated into the life of mine plan.
- Completed further definition and testing of Brunswick at depth.
- Expanded the geological knowledge of and resources in the near mine environment. This included the extension and infill of Cuffley North Lode (1,272 m), D Lode (240 m) and Cuffley line drilling (335 m).
- Brownfields drilling was also undertaken at Augusta East (1,479 m) looking for the southern extension of the Augusta Deposit, and Mountain Creek (1,253 m) testing to the south of the Brunswick Deposit.

In total, 34,656 m of diamond drilling was undertaken. All drilling activity was conducted by Starwest Pty Ltd using five Boart Longyear LM90s, one Boart Longyear LM75 and one pneumatic Kempe U2 rig.

10.1.10 2019 Youle and Brunswick

Drilling from January to December 2019 was predominantly focused on extending, defining and upgrading the Youle Resource. This drilling involved both infill and extensional drilling, designed to delineate the high-grade Youle zone to the north and define mineralisation near current and planned development. A total of 3,863 m was devoted to resource expansion and resource conversion drilling, with the remaining 5,693 m designed for target generation. The main focus of the target generation drilling was the close proximity to the Youle Resource, in particular the northern extension of Youle and the McDonald's Prospect to the north.

In May 2019, Mandalay Resources kicked off the Costerfield Property deep drilling program, targeting below the Youle orebody. One parent drill hole and wedge were drilled as part of this program totalling 2,510 m.

With the commencement of mining on the Youle Lode, underground resource definition drilling continued at Youle together with the extensional drilling of production areas to be mined in the next six to twelve months. Further confirmation of capital development was undertaken through production optimisation drilling (POD), in order to provide confidence in the grade, location of veining, geotechnical performance and viability of the mineralisation ahead of mining.

As Mandalay Resources continued with the Youle expansion program, it also commenced deep target testing of the Costerfield line of lode with the view to testing and understanding the gold enrichment environment. This drilling program provided additional context for previous deep high-grade gold intercepts at Augusta.

In 2019, the goals achieved included:

- Commencement of mining to the Youle Lode in September 2019.
- Initiation of the northern Youle extension program, aimed at extending the Youle Resource to the north and at depth.
- Expanding and increasing the existing Indicated Resource of the Youle Lode.
- Regional target generation by conducting extensive surface mapping, drill hole database integration, soil geochemistry and evaluation of geophysical data. This work aided in the generation of a three dimensional Leapfrog Geo integrated structural and geological model of the Costerfield Property region.

- Expanding the orebody knowledge and resource tonnage in the near mine environment, in particular the extension and infill of the Brunswick mineralised system.

In total 9,556.0 m of diamond drilling was undertaken. All drilling activity was conducted by Starwest Pty Ltd using five Boart Longyear LM90s, one Boart Longyear LM75, one pneumatic Kempe U2 rig and one LM30 rig.

10.1.11 2020 Youle, Brunswick, Minerva, Browns/Robinsons, True Blue, Damper Gully, Costerfield Deeps, and Minerva Testing.

Exploration drilling during 2020 was predominantly focused on extending, defining and upgrading the Youle Resource. It involved both infill and extensional drilling designed to delineate the high-grade Youle zone to the north, south, down-plunge, and above the orebody in areas of historical mining, adjacent to current and planned development.

The focus of target generation was near the Youle Resource, in particular the northern extension and at depth. Throughout 2020, 29,080 m of diamond drilling was undertaken, the goals achieved included:

- Continued extensional drilling at depth, north and south of Youle, allowing the definition of a high-grade gold domain at depth, as well as another emerging high-grade plunge extension to the north at depth.

- Expansion of the existing Indicated Mineral Resource of the Youle Lode.

- Drilling above Youle to investigate instances of veining that were not extracted during the historic mining at the Costerfield Property, suggesting the potential for further undiscovered mineralisation around the historic workings that could be accessed from the Youle infrastructure.

- A series of regional diamond testing programs (Browns, Robinsons, Damper Gully and True Blue prospects) were designed and executed with the intent of testing the potential around the Costerfield Property that could add to the life of the operation.

- Continued generation of the Leapfrog Geo integrated structural and geological model of the Costerfield region.

- Expansion of the Youle orebody knowledge and resource tonnage in the near-mine environment.

- Installation of the Brunswick portal.

A four drill hole program testing the line of lode, designed to develop the understanding of the gold mineralisation system, was completed for 1,977 m and provided additional geological context for the previously intersected deep high-grade intercepts at Augusta.

With the commencement of mining on the Youle Lode in September 2019, underground resource definition drilling continued at Youle, together with extensional drilling of production areas to be mined in the next six to twelve months.

A series of regional diamond drilling programs were executed in Browns/Robinsons (6,123 m), True Blue (695 m) and Damper Gully (561 m). Near-mine drilling, designed to drill-test areas immediately adjacent to the current mining operations that could add to the life of mine plan, included Kendell Upper (4,579 m), Youle Growth, Youle North, Youle South extension drilling (13,990 m), and Minerva Testing (1,253 m).

In addition, Brunswick KR panel definition drilling (315 m) was undertaken in an attempt to define mineralisation in the Kiwi to Rooster panel below the existing Brunswick mine workings.

10.1.12 2021 Youle Plunge, Shepherd, Brunswick, Margaret Deeps, Browns, Cuffley Deeps, Fox Fault, Bogong.

In total, 36.2 km of exploration drilling was completed during 2021 at Costerfield. A majority (26.4 km) of this drilling focussed on the testing and conversion of mineralisation at the Youle and newly identified Shepherd orebodies. The following was achieved:

- Down-plunge northern extension of the Youle orebody was realised, along with the identification of a new series of gold-rich veins intersecting the footwall of Youle early in the year (Shepherd zone).
- The Shepherd zone was then tested and expanded in all dimensions, resolving into several discrete veins. A considerable amount of material was brought into the Reserve, with scope to continue expansion drilling into 2022.
- A significant portion of the down-dip central portion of Youle with sparse drilling (the “Youle Bight”) was infilled and converted.
- A deep hole (Shepherd Deeps, CD003) was drilled from underground at Youle, aimed to locate a significant down-dip continuation of the Shepherd veining in the hangingwall of the King Cobra Fault as delineated by the earlier CD001 deep testing hole.
- An attempt to infill and upgrade the Cuffley Deeps mineralisation panel was made.
- Surface drill testing of the Fox Fault and associated mineralisation known from historic Cuffley Deeps drilling, immediately down-dip of Cuffley Deeps.

- Down-dip testing of the Brunswick system, between the Rooster and Adder Faults was initiated.
- Continued testing of several different targets at Browns Prospect. The deep Swallowtail thrust fault target was found to be mineralised in several drill holes, although narrow and of moderate grade. The Bogong vein testing was completed early in the year with mixed results, and earned a follow-up program to extend the highest-grade portion identified in the previous program. The final drill hole of the Browns Bogong follow-up program resulted in the highest grade intercept on the lode system to date.
- Deep drilling at the Margaret Prospect was undertaken to test a newly generated model of the area suggesting the zone of mineralisation at depth had not been adequately tested with previous drilling.

Significant intercepts recovered for the Youle Lode have been presented in longitudinal projection view in Figure 10-1 and Figure 10-2, and in cross-sectional view in Figure 10-3.

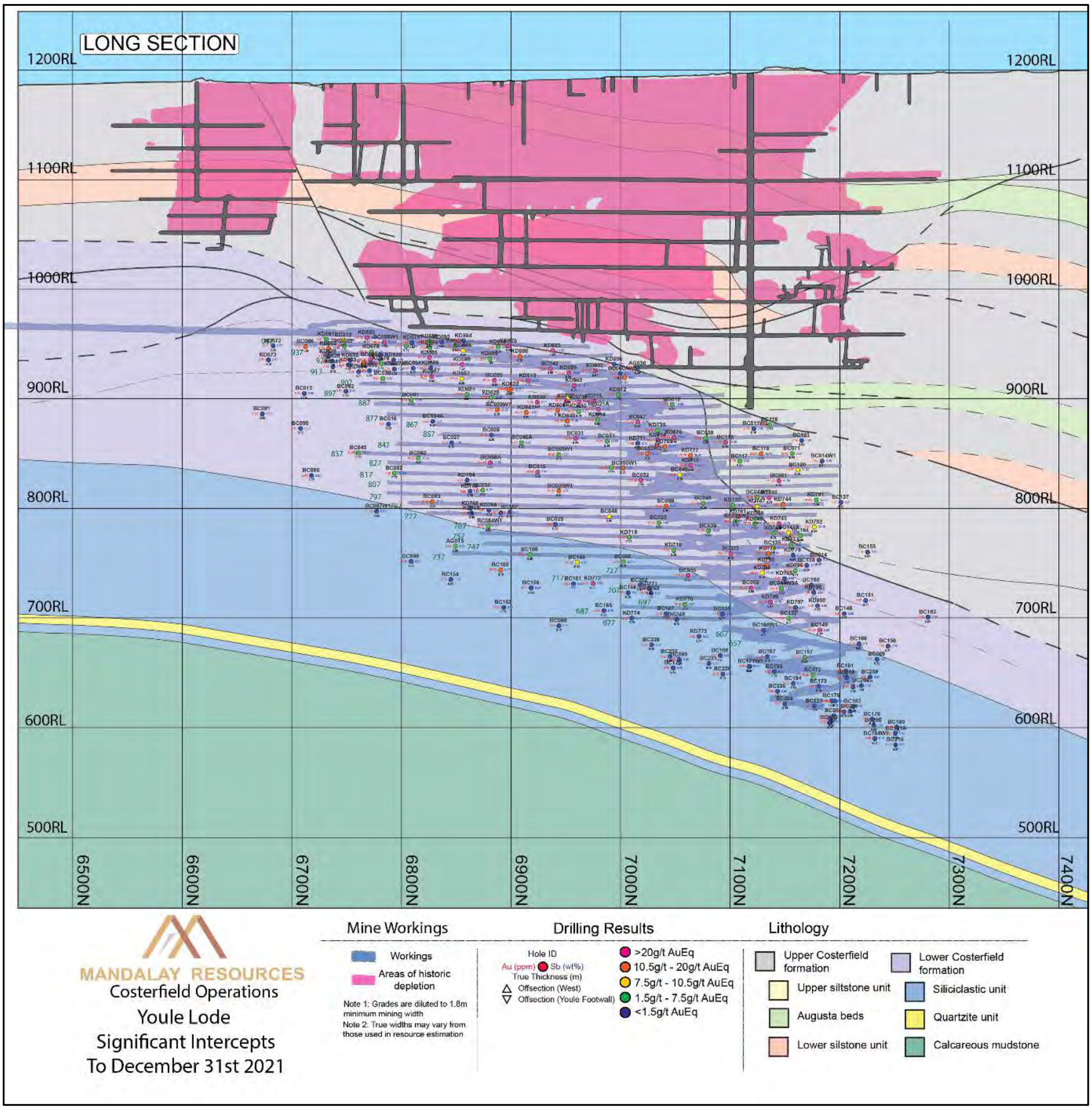


Figure 10-1: Longitudinal Projection Displaying Significant Intercepts in the Youle 2021 Drilling (BC drill holes)

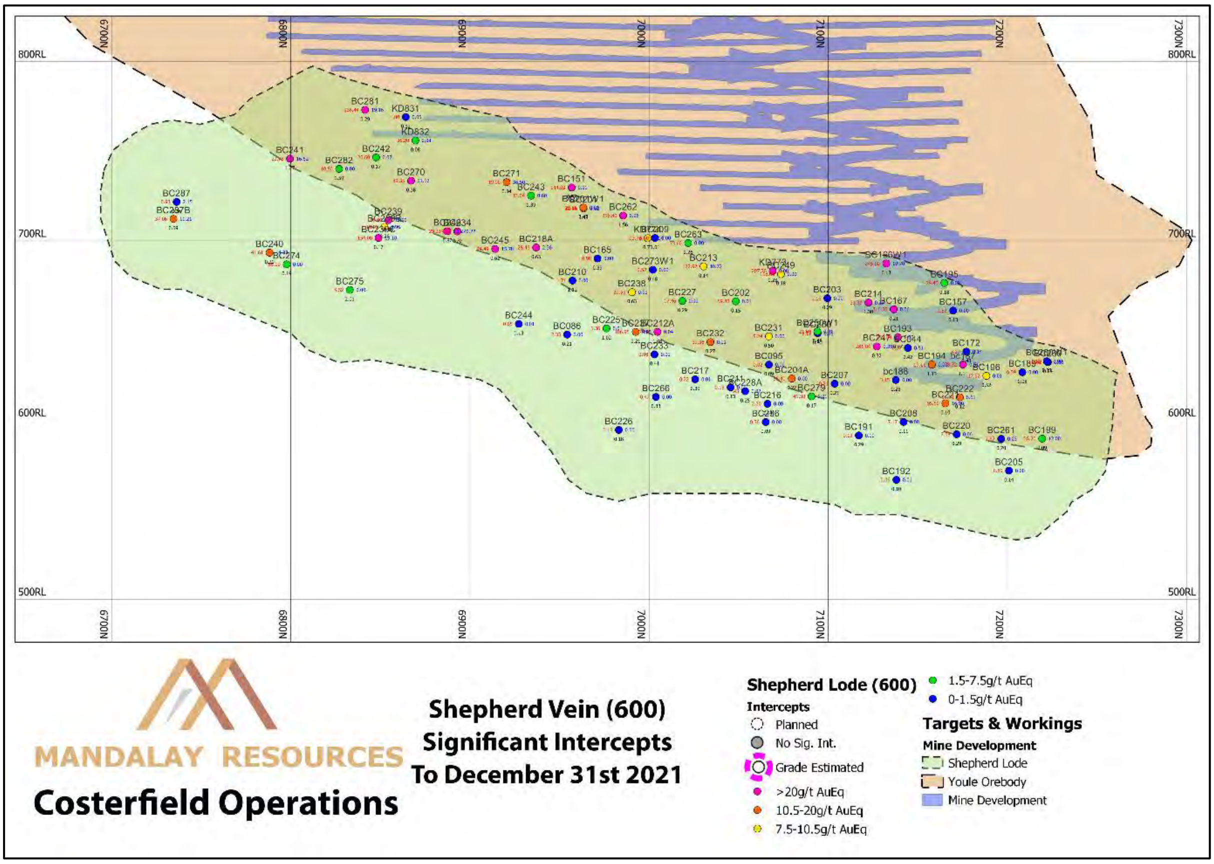


Figure 10-2: Longitudinal Projection of the Shepherd (600) Vein Showing Significant Intercepts to 31 December 2021

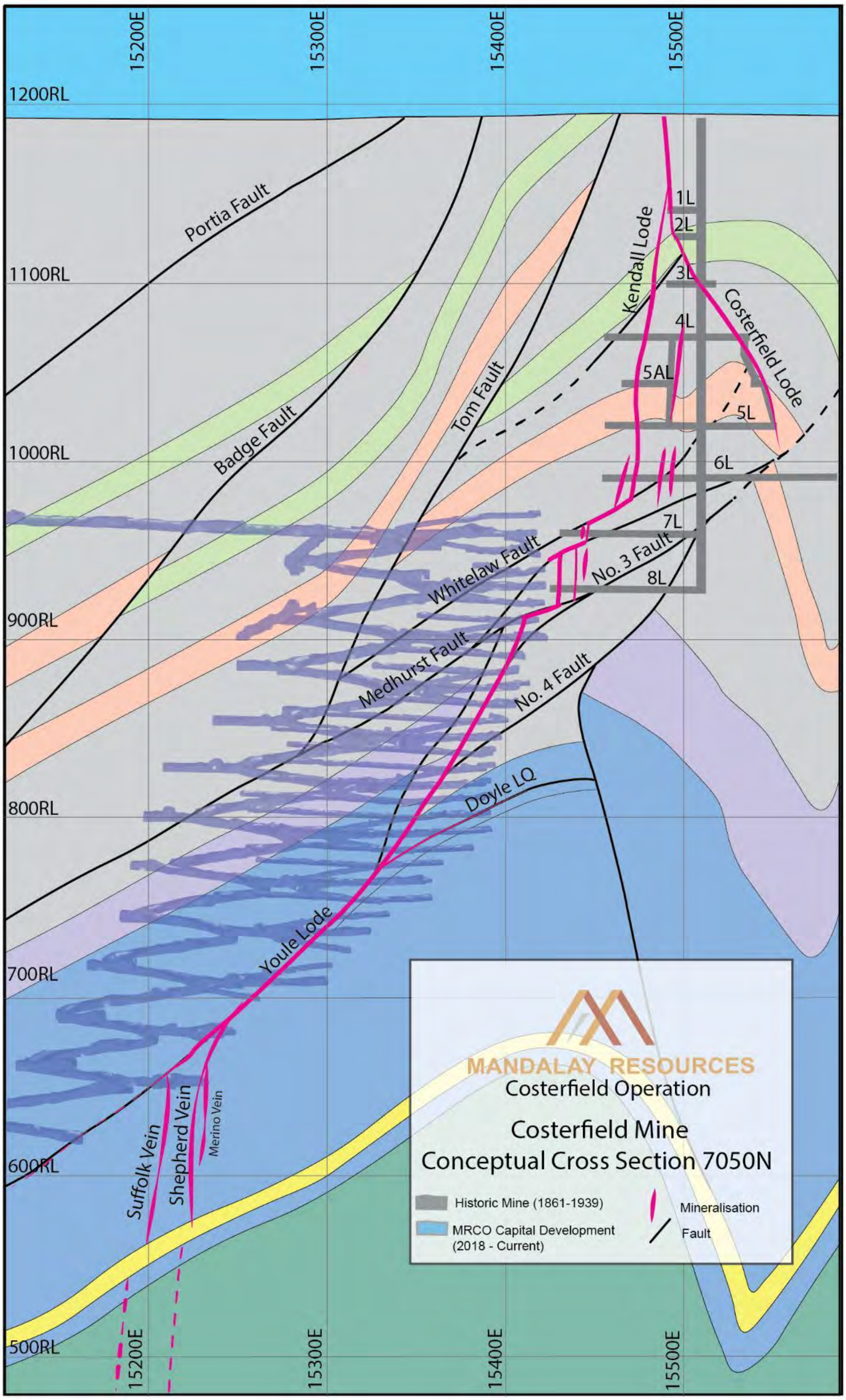


Figure 10-3: Cross Section at 7,050N Displaying the Relationship Between the Youle and Shepherd Zone Veins

10.2 Drilling Methods

The Augusta Deposit has been subject to ongoing development and diamond drilling since commencement of mining operations in 2006. The current Mineral Resource estimates are completed using all historic drilling and then depleted for areas already mined.

Between 2006 and 2011, several drilling companies were contracted to provide both surface and underground drilling services at the Costerfield Property. To ensure consistent results and quality of drilling, Starwest Drilling Pty Ltd was selected as the preferred drilling services supplier in 2011 and has been operating on site since.

Prior to 2011, various sized drill holes and drilling methods were used, including HQ2, HQ3, NQ2, LTK60, LTK48 diamond core sizes, and 5”1/8’ to 5”5/8’ RC hammers. Details of these drill holes were not always recorded, however, because the majority of this drilling was in areas that have now been depleted by mining, any risk associated with this drilling is considered to be low.

Since 2011, underground diamond drilling has been completed predominantly using an LM90 drill rig in HQ2 or NQ2 sized diamond drill holes. Underground Grade Control (UGGC) drilling has been completed by either a Kempe or Diamec drill rig producing LTK48-sized diamond core. Data collected from these drill holes has provided both structural and detailed grade information.

In 2019, a LM30 drill rig, drilling BQ™TK, was utilised underground for additional UGGC drilling. Surface drilling was undertaken using HQ2 and NQ2 sized core barrels, with HQ3 used in zones of poor ground conditions or for noise reduction reasons.

10.3 Collar Surveys

Between the late 1990s and 2001, the majority of drill holes appear to have been located using a Global Positioning Survey (GPS) survey instrument, while drill hole collar locations prior to the 1990s were usually sighted by tape and compass. Where possible, historic drill holes were surveyed in 2005 by Adrian Cummins and Associates, but this was not always possible.

Collars surveyed after 2001 have been recorded in the acQuire™ drill hole database as being surveyed, while unsurveyed/unknown drill holes have been recorded as being surveyed by either GPS or an unknown method, and have been given an accuracy of within 1 m.

In 2006, drill hole collars began being surveyed using the Costerfield Property Mine Grid, and were surveyed either by Mandalay Resources surveyors or by GWB Survey Pty Ltd. In addition, between 2006 and 2011, Adrian Cummins & Associates provided surveying of both underground and surface collar locations.

Currently, initial collar locations are sighted and pegged using a hand-held GPS, with drilling azimuths set-out by compass. Drill holes are then surveyed by Mandalay Resources surveyors on completion. In some instances, drill hole collar data is modified to account for known and quantified survey error within the mine.

10.4 Downhole Surveys

Between 2001 and 2018, all drill holes have been downhole surveyed by either electronic single-shot or film single-shot survey methods. Prior to 2001, survey information exists for the majority of drill holes, however the method of collection and records of these surveys are no longer available.

The exclusive use of an electronic, single-shot survey tool has been in place since 2011. An initial check survey is completed at 15 m to ensure that the collar set-up is accurate. Thereafter, surveys are conducted at 30 m intervals, unless ground conditions are unsuitable to conduct a survey, in which case the survey is completed when suitable ground conditions are re-encountered.

In 2021, the IMDEX Hub-IQ™ system for recording, storing and transferring downhole survey measurements was implemented onsite. This system removed the need for transcription of surveys between the tool and the database.

Coinciding with the implementation of IMDEX Hub-IQ™, the REFLEX EZ-TRAC™ down hole survey tool replaced all Reflex EZ-Shot™ single-shot downhole tool. The REFLEX EZ-TRAC™ provided the ability for direct interfacing with IMDEX Hub-IQ™ and to complete multi-shot surveys, which became routine for end of hole surveys in 2021. Multi-shot surveys are completed at 3 m intervals unless ground conditions or magnetic interference is unsuitable.

10.5 Data Management

In November 2016, Mandalay Resources Exploration purchased the Geoscientific Information Management software acQuire™, due to the high rate of data collection occurring at the Costerfield Property.

The installation of acQuire™ has improved the overall efficiency of the data collection and handling systems, and the improved data integrity by minimising the likelihood of human error.

10.6 Logging Procedures

The following information only relates to drilling completed after 1 January 2010 and below the 1,000 mRL in the Augusta and Cuffley Deposits. Details of the full procedures are captured in the internal SOP *EXG_EXP_3007_PRC_Diamond Drilling Core Logging Procedure.*

Augusta diamond core is geologically logged at the core preparation facility located at the Brunswick Complex. Core is initially brought to the facility by either the drill crews at the end of shift or by field technicians who work in the core preparation facility. Core is generally stored on pallets while waiting for processing.

Field technicians initially orientate all core using the orientation line provided by the drill crews through the use of an electronic core orientation device during drilling. The orientation line is transferred down along the length of the core run, where possible. If no orientation is recorded by the drill crews, the core is simply rotated to a consistent alignment of bedding or cleavage, with no orientation mark made on the core.

Downhole depths are marked on the core at one-metre intervals using a tape measure, taking into account core loss and any over-drill. If core loss is encountered, a block is placed in the zone of core loss and the core loss is recorded.

Field technicians collect rock quality designation (RQD) data directly onto a digital tablet device using acQuire™ software. RQD data is collected corresponding to drill runs and includes the from-depth, to-depth, run length in metres, the recovered length in metres, the recovery as a percentage, the length of recovered core greater than or equal to 10 cm, and the number of fractures. From this data, an RQD value is calculated. This data is logged directly into acQuire™ via a Toughbook computer and stored on the company server.

After depth marks are placed on the core, site geologists log the lithology, structural data, geotechnical data (if applicable) and mark the sampling intervals, all of which is then uploaded directly to the acQuire™ database.

All measurements of structural features, such as bedding, cleavage, faults, and shears are collected using an orientated core, wrap-around protractor for measuring beta angles and a standard protractor for measuring alpha angles. If no orientation line is available, only alpha measurements are collected. Measurements are recorded directly into the acQuire™ database via the Toughbook computer, and are also scribed onto the core using a wax pencil.

After geological logging has been completed and the core marked up, all core trays are photographed before sampling. Once sampling is completed, the trays are placed on pallets and moved to the permanent core storage area.

10.7 Drilling Pattern and Quality

10.7.1 Augusta

Drilling completed prior to 1 January 2010 informed areas of the resource that have largely been mined, therefore, the following discussion relates to drilling completed after 1 January 2010 and below the 1,000 mRL.

Drilling is generally conducted at a spacing of approximately 40 m by 30 m in the dip plane. Since most drilling at Augusta is now competed from underground, the pattern and density achieved on N Main Lode can vary greatly.

Where increased geological confidence is required, infill drill holes specifically targeting NE Lodes or E Lodes have been drilled at a nominal 40 m spacing.

Surface drilling, targeting depth extensions of the Augusta Deposit, is generally conducted on 100 m sections along-strike, with intersections spaced at 80 m to 100 m in the dip plane.

10.7.2 Cuffley

Initial drilling of the Cuffley Lode was intended to be done in a dice-five pattern on an approximate 50 m by 50 m offset grid. This pattern started with AD001 through to and including AD004, however in order to aid interpretation, the drill spacing was expanded to a 100 m grid based on mine grid northings, with 50 m to 80 m between drill holes on each section. This change of drill pattern enabled the interpretation to be completed on mine northing sections.

Infill drilling between the 820 mRL and 1,020 mRL used a dice-five pattern to maximize information in the strike direction. This infill drilling was conducted on a nominal 30 m (RL) by 40 m (Northing) grid.

10.7.3 Brunswick

Drilling post 2010 has been conducted by defining and infilling the existing Inferred Resource, based on the updated fault interpretation. Extension within the Penguin to Kiwi fault panel used an initial dice-five pattern, which was then infilled using daughter wedge drill holes.

The Kiwi to Rooster fault panel was also drilled using a dice-five pattern with an approximate spacing of 40 m.

10.7.4 Youle

Drilling was completed on an initial spacing of approximately 100 m to define the extent of the mineralisation and determine an Inferred Resource. The infill drill hole spacing accomplished was approximately 40 m to 50 m, using a combination of parent and daughter wedge drill holes. Several drill holes were twinned by daughter wedge drill holes in order to obtain metallurgical samples and duplicates of several high-grade gold zones.

A combination of west to east, and east to west drill holes were used to test both west-dipping Youle style mineralisation, and Augusta/Brunswick style vertical mineralisation, however the dominant drill hole orientation in the infill program at Youle was drilled west to east.

Youle underground drilling was completed to provide increased geological confidence ahead of mining, and for near mine exploration along-strike and down-dip of the Youle Lode.

10.8 Interpretation of Drilling Results

Drilling results are initially interpreted on paper cross-sections, which are then scanned and geo-referenced in the mine planning software package Surpac™ or Leapfrog Geo™. The scanned sections are then used to generate wireframes (Figure 10-4). Mappable stratigraphic units have been represented by various colours, while faults and mineralised lodes have been marked with heavy black lines.

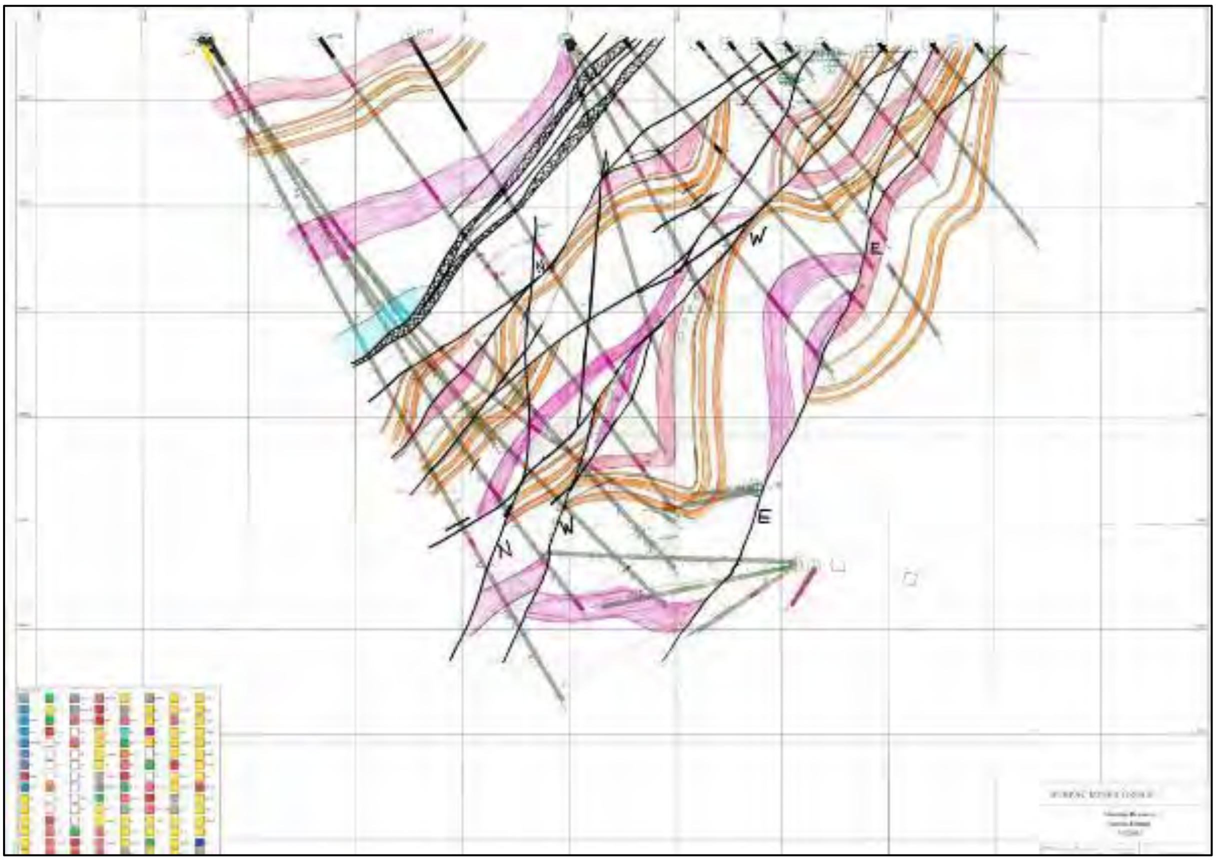


Figure 10-4: Example Cross-section of the Augusta Deposit at 4,300 mN, Post Drilling and Geological Interpretation

Mandalay Resources have recently implemented the use of the implicit software package Leapfrog Geo to assist in the structural, geological and geochemical interpretation of drill hole data and surface mapping in 3D space.

10.9 Factors that could Materially Impact the Accuracy of the Results

The factor that has the greatest potential to materially impact the accuracy of drilling results is the core recovery. Historically, this was an issue for all methods of drilling in the Augusta area. Mandalay Resources has employed methods of drilling and associated procedures to ensure the highest recovery of sample possible. Where sample recovery is poor (typically

>0.1 mcore loss, or when there is clear textual evidence), a repeat drill hole is completed by drilling a daughter wedge drill hole.

Information gained from historical drilling has been used in resource estimation of the Augusta and Brunswick deposits, however, as much of the historically drilled area has now been depleted by mining, the risk associated with these historical holes was considered minimal.

Surveys of the collar location and downhole surveying methods applied at the Costerfield Property follow industry best practice. The location of each drill hole is surveyed within millimetre accuracy.

Sampling is of a consistent and repeatable nature, with appropriate QAQC sampling methodologies employed, and the assay method used is considered to be appropriate for the style of mineralisation.

11 SAMPLE PREPARATION, ANALYSES AND SECURITY

The sample preparation and analysis processes detailed in this section of the Technical Report has been in place for several years and are considered by the QP to be adequate for use in the estimation of a Mineral Resource.

11.1 Sampling Techniques

Samples were routinely collected and analysed from diamond drill core and channel samples from the ore development drive faces.

Sample weights for samples used in the 2021 MRE are summarised in Table 11-1, contrasting the two primary sample methods of diamond drilling and face sampling.

Table 11-1: Summary of Sample Weights in the 2021 MRE for the re-estimated 2021 Models

	Diamond Drill Hole Samples	Underground Channel Samples	All Samples Combined
Count	843	3221	4064
Mean (kg)	1.22	2.22	2.0
Standard Deviation (kg)	0.79	0.92	0.98
Minimum (kg)	0.17	0.20	0.17
Maximum (kg)	5.81	8.58	8.58

11.1.1 Diamond Core Sampling

The mineralisation style at the Costerfield Property is now well-understood and the geological controls on mineralisation well-established. Sampling intervals were based on geological characteristics and marked on the diamond drill core by Mandalay Resources geologists. Mineralisation was always clearly visible and therefore, systematic sampling of complete drill holes was not required.

The general rules that were followed in the selection of sample intervals were:

- All stibnite-bearing veins were sampled,
- Intersections of stockwork veins, laminated quartz veins or massive quartz veins were routinely sampled,
- Waste samples were collected from either side of the mineralized vein in order to determine the grade of the waste material immediately adjacent to the mineralisation. These waste samples ranged from 0.3 m to 1 m in downhole length,

- Siltstone was sampled where disseminated arsenopyrite was observed,
- Fault gouge zones were sampled at the discretion of the geologist.

Diamond core sampling intervals were standardised wherever possible and ranged from 5 cm to 1 m in length. The average sample length for drill core samples within the 2021 Youle and Shepherd drilling program was approximately 0.35 m.

Where there was a definitive lithological contact that marked the boundary of a sample, the sample was cut along the contact. If by doing this, the sample was less than 5 cm in length, the boundary of the sample was taken at a perpendicular distance from the centre of the sample, which achieved the 5 cm minimum sample length requirement.

A Mandalay Resources exploration field technician undertook the sampling of the diamond drill core. To obtain consistent samples for analysis and retention, the diamond drill core was cut perpendicular to the core axis at the downhole sampling points and then cut in half (where half core sampling was completed) lengthways with an Almonte automated diamond saw. In response to the visible gold in Shepherd, whole core samples were taken through the Shepherd orebody.

Drill holes that were designed for metallurgical analysis were sampled in intervals up to 2 m in length.

11.1.2 Underground Channel sampling

Ore drive face channel samples (face samples) were taken by Mandalay Resources geologists at a frequency of between 1.8 m and 5 m along the drive. The data was collected on portable handheld computers (iPad) utilising the digital capture software RockMapper™. The following method was used:

- The face was marked up by the sampler to show the contacts of the mineralisation, the bedding angle, and any geological structures that may offset the lode,
- Sample locations were determined so that the sample was collected perpendicular to the dip of the mineralisation, from the FW to the HW,
- The face size and sample lengths were measured,
- Each sample was collected as a channel sample using a geological hammer or pneumatic chisel, and placed into pre-numbered sample bag with a unique ID,
- Care was taken to obtain a sample considered representative by the sampling geologist,

- Where there were two or more mineralised structures in the face, samples were also taken of the intervening waste,
- Sample lengths ranged from 5 cm to 1.5 m across the mineralisation, and typically weighed between 1 kg and 3 kg,
- The face was labelled with the heading, dated and photographed into RockMapper™,
- The area of lode and waste was drawn onto the photo in RockMapper™,
- Key features were sketched digitally directly onto the RockMapper™ software and sampling and structural data recorded,
- On completion, data from the RockMapper™ files were automatically uploaded to the drill hole database,
- A record of the face photos, annotations, and sampling files was saved on the Mandalay Resources server,
- The location and orientation of the face was derived using the distance from survey marks and the survey pickup of the drive using Surpac™ and RockMapper™ to produce a georeferenced face photo.
- The coordinates, orientation and dip of the channel were derived from the georeferenced face photo using RockMapper™ with the resulting data stored in the drill hole database.
- The face photo and channel data were validated against the survey pickup.
- A digital mesh derived from photogrammetry by RockMapper™ had the drive photo overlayed and were then displayed in Leapfrog for validation against the channel sample.

Wall channel samples were rarely taken at the Costerfield Property and where they were taken the procedure followed the same process as above.

11.2 Data Spacing and Distribution

Within the Augusta, Cuffley, Brunswick and Youle Deposits, the distance between drill hole intercepts was approximately 40 m by 40 m. This was reduced to 20 m by 20 m in areas of structural complexity. For the Shepherd Zone the distance between drill hole intercepts was set at a nominal spacing of 40 m.

11.3 Assaying Laboratories

Routine assaying of the diamond drill core and face samples was completed by On Site Laboratory Services (On Site) in Bendigo, which is independent of Mandalay Resources and holds current ISO/IEC 17025 accreditation.

Mandalay Resources dispatch samples to On Site after which the On Site assay laboratory's personnel completed sample preparation and chemical analysis. Results were returned to Mandalay Resources staff, who validated and loaded the assay data into the relevant databases.

ALS Global Brisbane and Bureau Veritas Perth have been used to verify the accuracy of assays completed by On Site through the completion of quarterly umpire check analyses of selected samples (Section 11.6.1).

11.4 Sample Preparation

The following sample preparation activities were undertaken by Mandalay Resources staff for both diamond drill core and underground channel samples:

- Sample information and characteristics were measured, logged, in the case of drill core, and recorded in the acQuire™ database and a unique sample ID assigned,
- Sample material was placed into a calico bag previously marked with the unique sample ID,
- Calico bags were loaded into plastic bags such that the plastic bags weighed less than 10 kg,
- An assay submission sheet was generated and placed into the plastic bag,
- Plastic bags containing samples were sealed with a metal tie and transported to On Site in Bendigo via private courier or Mandalay Resources staff.

The following sample preparation activities were undertaken by On Site staff:

- Samples were received and checked for labelling, missing samples etc. against the submission sheet,
- If the sample batch matched the submission sheet, sample metadata was entered in the On Site's Laboratory Information Management System (LIMS). In the event that discrepancies were noted, Mandalay Resources was contacted by On Site to resolve the discrepancy prior to further work commencing. Records of all discrepancies and corrective actions taken are recorded by the Mandalay database administrator,

- A job number was assigned, and worksheets and sample bags prepared,
- Samples were placed in an oven and dried overnight at 106°C,
- Samples were weighed and recorded,
- The entire dried sample was crushed using a Rocklabs Smart Boyd Crusher RSD Combo[1] with a jaw closed side setting of 2mm,
- If the dried sample weight was less than 3 kg, the entire sample was retained for pulverisation. If the dried sample weight was greater than 3kg, the sample was spilt to 3kg using the rotary splitter that is incorporated in the Boyd crusher,
- Rejects from greater than 3 kg splits were retained as coarse rejects in labelled calico bags and returned to Mandalay Resources,
- The 3kg sample was then pulverized in an Essa® LM5 Pulverising Mill[2] to 90% passing 75µm,
- The 3kg pulverised samples were then subsampled to take a 200g split for assay by a manual scooping procedure across the full width and depth of the mill bowl and loaded sequentially into labelled pulp packets,
- For every 21 primary samples, two samples are randomly selected by the Laboratory Information Management System (LIMS), and a duplicate 200g split was taken, loaded into labelled pulp packets, and submitted for analysis using the same analytical procedure as the primary sample,
- The remaining pulp was returned to its sample bag and then returned to Mandalay Resources for retention following the completion of assay.

The percentage of sample passing < 75µm was checked as part of the 2021 screen fire assay campaign. A mean of 93.5% was achieved (Table 11-2) which is within the target 90% passing < 75µm.

Table 11-2: Statistics for percentage passing a 75µm grind size; target is 90%

	Percentage Passing 75µm
Mean	93.5%

1 https://www.scottautomation.com/assets/Resources/Smart-BOYD-RSD-Brochure-English.pdf
2 https://flsmidth-prod-cdn.azureedge.net/-/media/brochures/brochures-products/sampling-preparation-and-analysis/essa-lm5-pulverising-mill.pdf

Median	92.9%
Standard Deviation	3.6%
Minimum	85.6%
Maximum	99.9%

11.5 Sample Analysis

Diamond drill core and face/wall channel samples were routinely assayed by On Site for gold, antimony, arsenic, and iron.

11.5.1 Gold Analysis

Gold grades were determined by Fire Assay (FA) with an Atomic Absorption Spectroscopy (AAS) finish.

A campaign of Screen Fire Assays (SFA) was used in the Shepherd deposit throughout 2021 in response to an observed increase in visible gold.

SFA analysis was completed at On Site using the entire core sample mass and 75µm meshes. The greater than 75µm was fired to extinction and two samples taken from less than 75µm component. Homogenisation of the less than 75µm sample component (N=482, mean of 22g/t Au) was excellent with an observed correlation coefficient of 0.998.

In total, 449 sample pairs were completed by an initial FA and base metal report, before SFA was completed on the remainder. The relationship shown in Figure 11-1 demonstrated the strong agreement between the two sample sets. It was interpreted by Mandalay Resources and the QP from this relationship that both FA and SFA were suitable for the resource estimation of the Shepherd mineralisation.

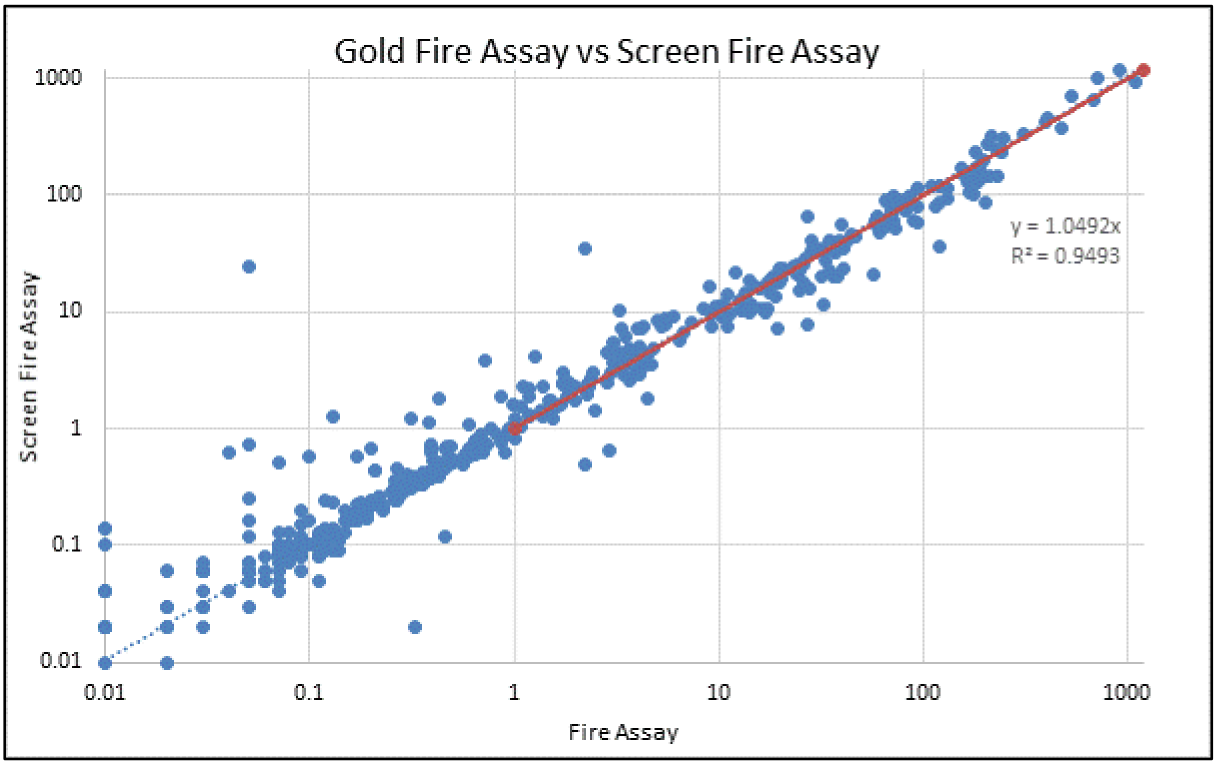


Figure 11-1: Analysis for gold via Fire Assay or Screen Fire Assay, illustrating a comparison of 449 pairs on a logarithmic scale

11.5.2 Antimony Analysis

Antimony concentrations were determined using an aqua regia based acid digest with an ICP-OES finish at low-detection levels, and with an AAS finish at high antimony levels (>0.6% Sb).

11.5.3 Arsenic, and Iron Analysis

Arsenic and iron were prepared as above with aqua regia digestion and an AAS or ICP-OES finish.

11.6 Laboratory Reviews

Mandalay Resources personnel have conducted periodic visits to the On Site facility in Bendigo and met regularly with the laboratory managers to review laboratory performance. During 2021 the scheduled in-person visits were suspended due to COVID19 restrictions.

Tours of the laboratory were normally completed in the presence of On Site's Laboratory Manager, Mr Rob Robinson. Notes and minutes from laboratory visits and meetings with laboratory staff have been maintained as records on the Mandalay Resources server.

11.6.1 Umpire Check Analyses

Mandalay Resources have conducted umpire check analysis programs quarterly. This process involved obtaining pulp sample splits from On Site and submitting a pulp-duplicate sample to two different laboratories for umpire analysis (Section 11.7.4). The process used to split the samples for analysis by umpire laboratories is consistent with Method C Standard Practice in ASTM Designation C702 C702M-11 (ASTM, 2011), with a 50g aliquot of pulverized material being extracted per sample for each umpire laboratory.

11.7 Assay Quality Assurance/Quality Control

The following sections relate to the Quality Assurance/Quality Control (QAQC) samples submitted and returned to Mandalay Resources from 1st January 2021 to 31st December 2021.

A detailed review of the QAQC from previous drilling programs informing the 2021 year-end block models can be found in the following previously issued NI 43-101 Technical Reports:

Youle Block Models (500 series):

- 2020 Youle Ongoing Extension (MP, 2021),
- 2019 Youle Mining and Expansion Program (SRK, 2020),
- 2018 Youle Infill Program (SRK, 2019),
- 2017 Youle Exploration Program (SRK, 2018).

Brunswick Block Model (310):

- 2019 Brunswick Development (SRK, 2020),
- 2018 Brunswick Mining and Extension Drill Program (SRK, 2019),
- 2017 Brunswick Conversion Drill Program (SRK, 2018),
- 2016 Brunswick Recommencement Program (SRK, 2017).

QAQC results of pre-2021 block models that were not re-estimated as part of this Mineral Resource and Mineral Reserve update can be found in the previous NI 43-101 Technical reports. For the relevant report years, the reader is referred to the drilling summary (Section 10.1).

In total, four project specific certified reference materials (CRM) produced from Costerfield Property ore and two commercial CRMs were routinely inserted into dispatches during 2021 to monitor the performance of assay quality and accuracy (Table 11-3).

The four project specific CRMs, MR-C2, MR-F2, MR11-01 and GSB-02, have been prepared from ore grade material collected from the Augusta and Brunswick Deposits. The homogenisation, analysis and certification of these CRMs was performed and/or coordinated by Geostats Pty Ltd (Geostats). Mandalay Resources also used two commercially available CRMs from ORE Research and Exploration Pty Ltd (OREAS).

Table 11-3: Certified Reference Materials and certified assay methods

CRM Name	Material Source	Certifying Laboratory	Au Method	Sb Method 1	Sb Method 2
MR-C2	Costerfield – Ore	Geostats	Fire Assay	4AD/ICP	Fusion/ICP
MR-F2	Costerfield – Ore	Geostats	Fire Assay	4AD/ICP	Fusion/ICP
MR11-01	Costerfield – Concentrate	Geostats	Fire Assay	4AD/ICP	Fusion/ICP
GSB-02	Commercial	Geostats	Fire Assay	Fusion/ICP	Fusion/XRF
OREAS239	Commercial	OREAS	Fire Assay	Aqua Regia/ICP	NA
OREAS247	Commercial	OREAS	Fire Assay	4AD/ICP	NA

At least one CRM was submitted with every batch of diamond core samples and typically at a rate of 1 standard per 25 samples. CRMs were submitted at a similar rate in the underground face/wall channel sample batches, which typically included two different CRMs per batch.

An assay result for a CRM was considered acceptable when the returned assay fell within three standard deviations (SD) of the CRM certification grade. Outside this range, the CRM assay was considered to have failed and all significant mineralised samples within the batch were re-assayed, where significant grades were defined as mineralised samples that may have a material-impact in future resource estimates. All actions or outcomes were recorded as comments in the QAQC register.

11.7.1.1 Antimony analysis precipitation issues

The geochemical analysis of antimony may suffer from two key issues:

- Precipitation issues as an antimony-chloride in the presence of hydrochloric acid (HCl) that is used in an aqua regia and four-acid digestion (4AD; Hu and Qi, 2014),
- Volatilisation as an antimony fluoride in 4AD (Hu and Qi, 2014).

The precipitation issue of antimony chloride may extend to fusion digestion methods if the fusion bead is dissolved by hydrochloric acid (HCl) for nebulisation in ICP analysis, but with the reduced acid dilution factors to dissolve the bead relative to 4AD, and active observation for evidence of precipitation this issue can be managed.

The routine lab, On Site Laboratory, have considerable experience in the analysis of high-grade antimony samples typical of the Costerfield Property and other regional operations, and it follows a proprietary assaying method that has been developed to report ore-grade level antimony values. On Site uses an Aqua Regia style preparation to negate analytical technique issues encountered with antimony chloride precipitation and is finished with an ICP-OES (low-level detection limit) or an AAS finish (high-level detection limit).

Umpire lab checks of quarterly results were undertaken by fusion digestion with an XRF finish. The use of an XRF finish negated the issues associated with dissolution and chloride precipitation and are considered by Mandalay and the QP to be the most reliable.

To address the uncertainty in the CRM performance described in the 2021 NI43-101 Technical Report (MP, 2021), where MR-C2 and MR-F2 were observed to have a high bias, the following work was undertaken:

- All CRM certificates were reviewed.
- An internal review of the On Site (routine lab) assay results versus the certified values.
- Additional CRM material sent with the quarterly umpire check-assay programs.

MR-C2 and MR-F2 were found to have been reported against the 4AD values for the 2021 NI43-101 (MP, 2021) and were corrected to the Fusion/ICP certification values, which were assessed by Mandalay and the QP as performing adequately to ensure quality control in routine analysis. Refer also to the routine antimony control plots in Figure 11-18 (MR-C2) and Figure 11-19 (MR-F2) for discussion of analysis by On Site.

Umpire lab check assay results for the CRMs are presented in the following Section 11.7.1.2 and the primary check-assay results in Section 11.7.4. Table 11-4 details the performance of the CRMs in use at Costerfield relative to the umpire labs, the routine lab, certification, and the internal value derived from the year’s routine analysis.

11.7.1.2 Umpire Check Assay Program – CRMs

As part of the CRM improvement work, additional CRMs were added to the umpire checks through each quarter to verify antimony certifications utilising Fusion/XRF. A total of 105 CRMs were submitted during this process, divided between the three participating laboratories. Table 11-4 details the results of this study. The final column in the table also displays the mean value, after removal of outliers, of all Sb assay results reported by On Site during the reporting period. These results are subsequently referred to as the “Sb Internal Values”. The detection limit for Sb analyses was 0.01.

Table 11-4: Results for CRMs submitted to participating labs for umpire checks

CRM by Lab	Number Submitted	Average Au Value g/t	Average Value Sb %	Au cert. Value g/t	Sb cert. Value %	Sb Internal Value % (N)
GSB-02	**21**	**23.95**	**30.43**	**23.64**	**31.08**	**31.04 (484)**
ALS	7	23.07	29.81	23.64	31.08	
BV	7	23.70	30.63	23.64	31.08	
OSLS	7	24.94	30.86	23.64	31.08	
MR11-01	**15**	**115.61**	**55.54**	**116.00**	**54.50**	**55.14 (75)**
ALS	5	115.20	56.00	116.00	54.50	
BV	5	116.03	55.66	116.00	54.50	
OSLS	5	115.60	54.96	116.00	54.50	
MR-C2	**15**	**75.89**	**53.25**	**76.70**	**53.25**	**53.99 (215)**
ALS	5	74.58	52.42	76.70	53.25	
BV	5	77.12	53.08	76.70	53.25	
OSLS	5	75.98	54.26	76.70	53.25	
MR-F2	**18**	**12.13**	**3.89**	**12.15**	**3.96**	**3.98 (325)**
ALS	6	11.77	3.83	12.15	3.96	
BV	6	12.59	4.00	12.15	3.96	
OSLS	6	12.05	3.86	12.15	3.96	
OREAS239	**18**	**3.54**	**0.10**	**3.55**	**0.05**	**0.05 (781)**
ALS	6	3.47	0.07	3.55	0.05	
BV	6	3.61	0.16	3.55	0.05	
OSLS	6	3.54	0.06	3.55	0.05	
OREAS247	**18**	**39.98**	**0.39**	**42.96**	**0.33**	**0.35 (214)**
ALS	6	40.75*	0.41	42.96	0.33	
BV	6	42.60	0.42	42.96	0.33	
OSLS	6	42.93	0.35	42.96	0.33	

** Two outliers removed for gold, OREAS247*

The umpire lab check assays of the CRMs confirm that all bar two of the CRMs in use at the Costerfield Operation are performing well against their certification. This includes MR-C2 and MR-F2 that were of concern in the 2021 NI43-101 (MP,2021).

MR11-01 (FUS/ICP) and OREAS 247 (4AD/ICP) indicated higher results in both routine analysis and umpire check program, likely for the reasons described above (see Section 11.7.1.1). The routine analysis control plots for MR11-01 and OREAS247 are presented in Figure 11-16 and Figure 11-23, with both the certification and the Sb Internal Values indicated. Both CRM results display a visual high bias, with MR11-01 results falling within +/-3σ of the certification, and the spread of OREAS247 falling outside +/-3σ.

Due to the agreement between the routine analysis, the umpire labs, and with an understanding of the analysis issues, the Sb Internal Values were relied on for routine quality control of OREAS 247 and MR11-01 antimony values.

The graphical control plots of the average CRM results by lab have been provided in Figure 11-2 to Figure 11-12 below. They show comparable results against the certified values for gold, with two removed outliers and a lower overall ALS result for OREAS247 being the exception. The antimony results, as discussed above, display good accuracy for all CRMs except for OREAS247 and MR11-01. OREAS247 (Figure 11-12) and MR11-01 (Figure 11-11) certified values are displayed in addition to the routine analysis derived internal statistics. These plots show departure from the certification for both the umpire lab and routine analysis results, which Mandalay and the QP consider acceptable.

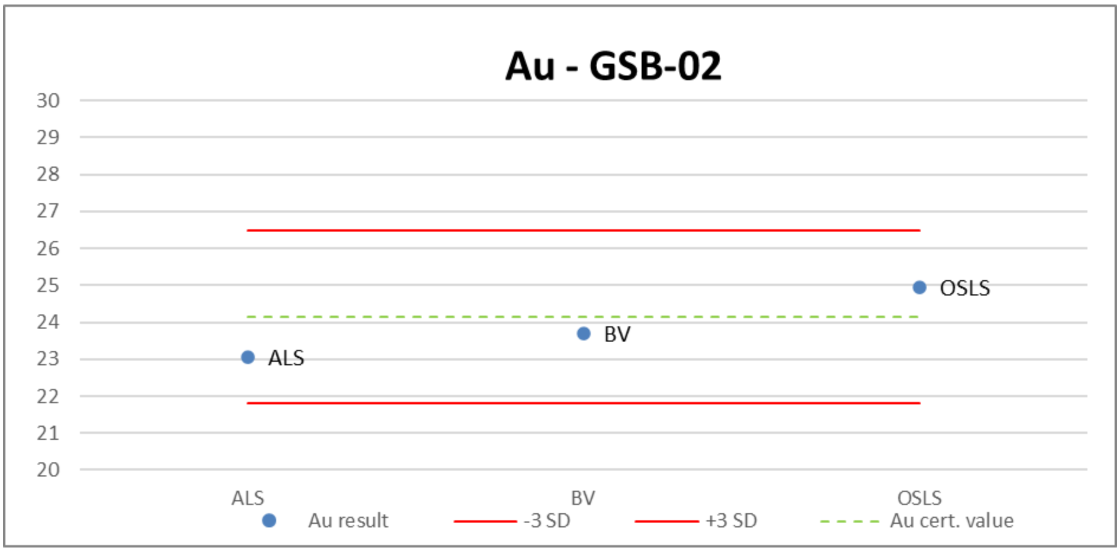


Figure 11-2: CRM GSB-02, umpire check assay batches, Au

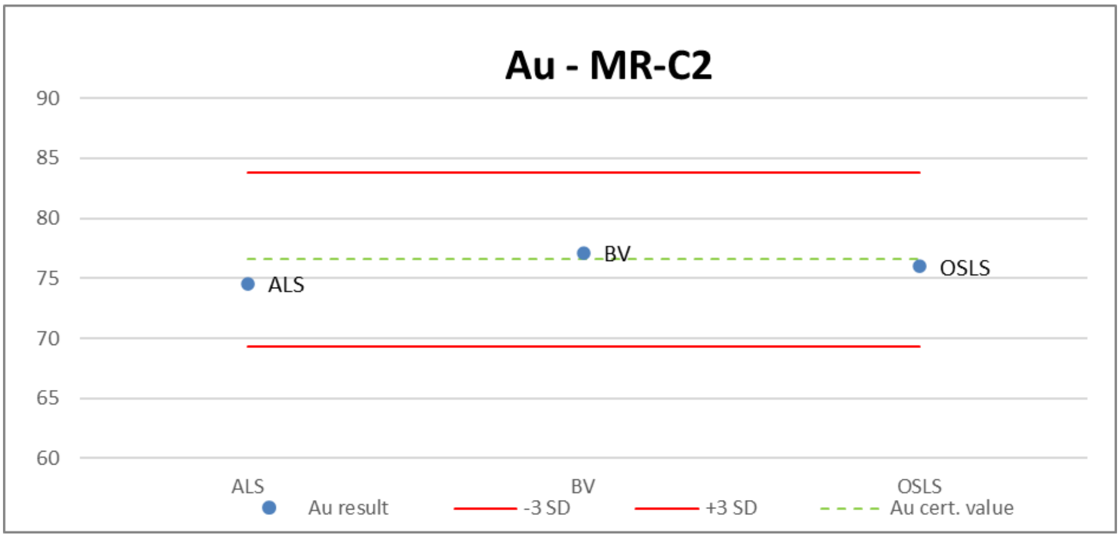


Figure 11-3: CRM MR-C2, umpire check assay batches, Au

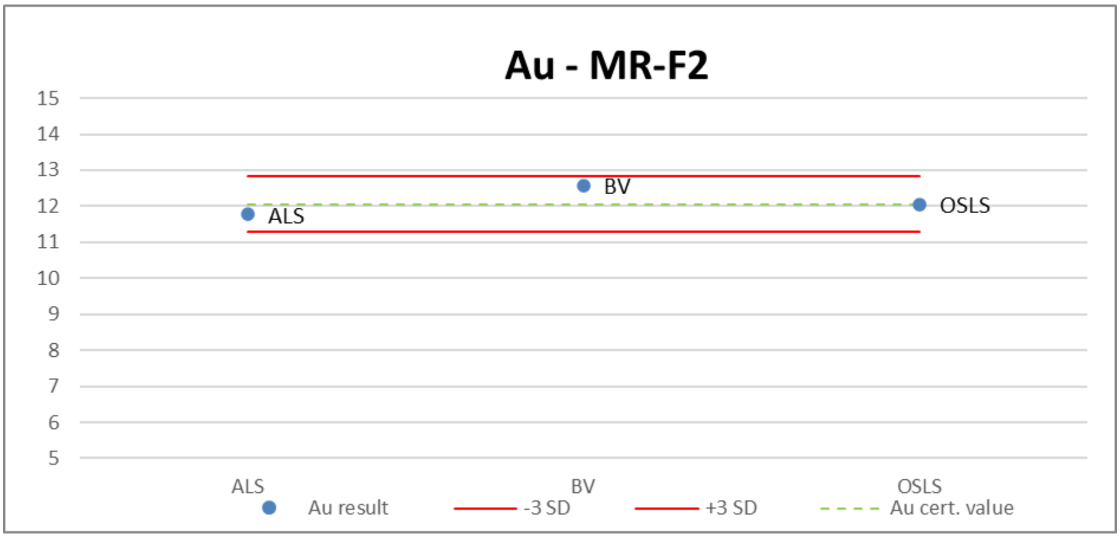


Figure 11-4: CRM MR-F2, umpire check assay batches, Au

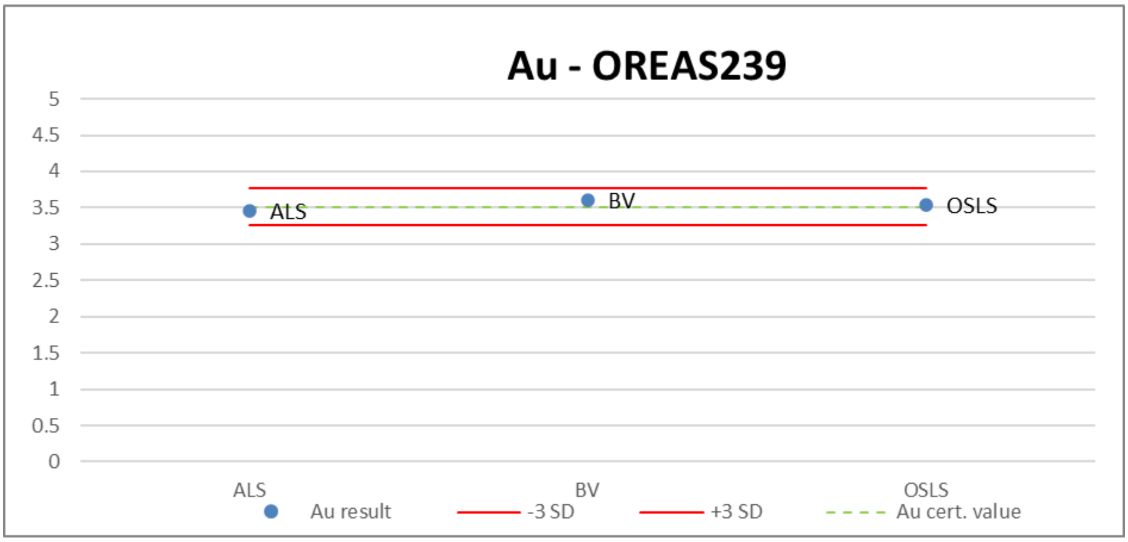


Figure 11-5: CRM OREAS239, umpire check assay batches, Au

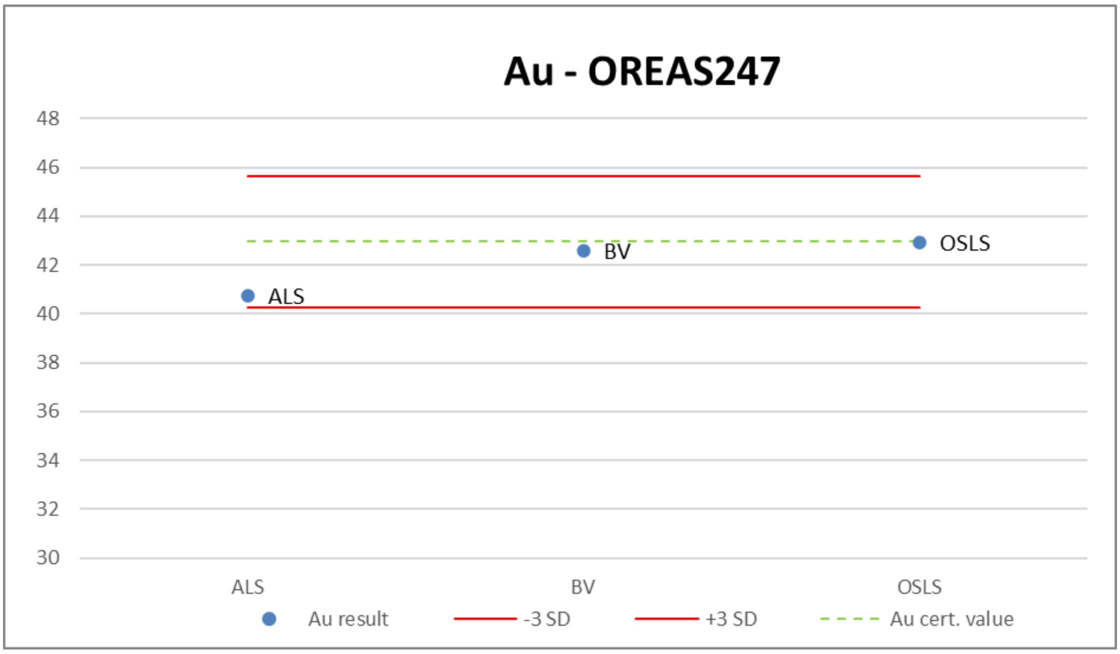


Figure 11-6: CRM OREAS247, umpire check assay batches, Au

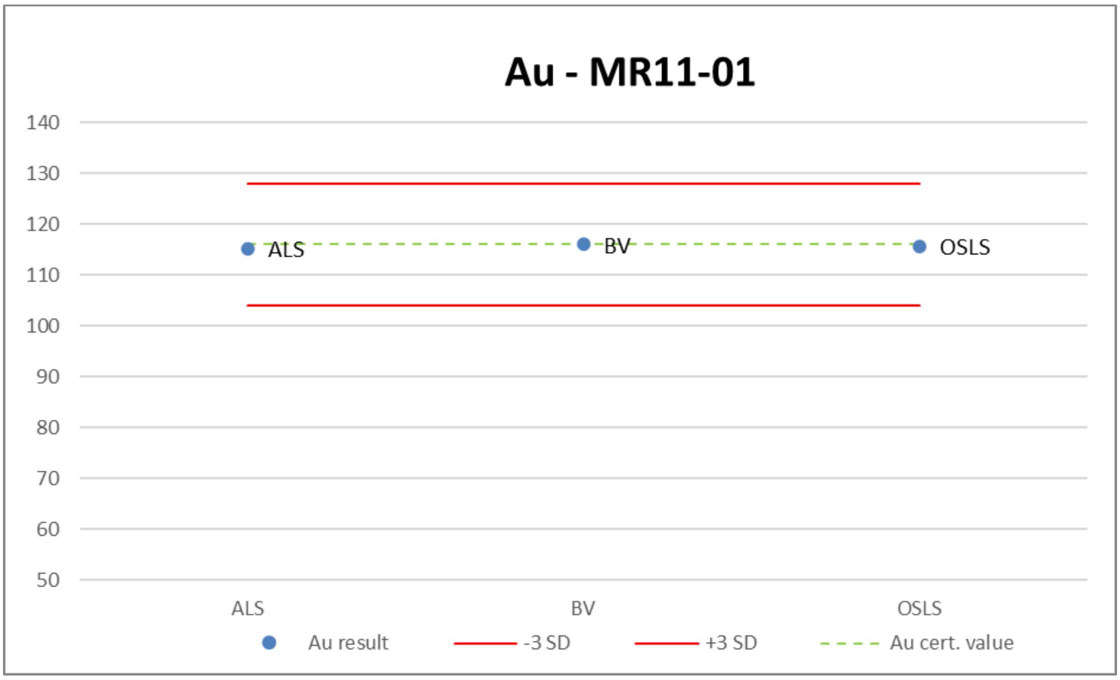


Figure 11-7: CRM MR11-01, umpire check assay batches, Au

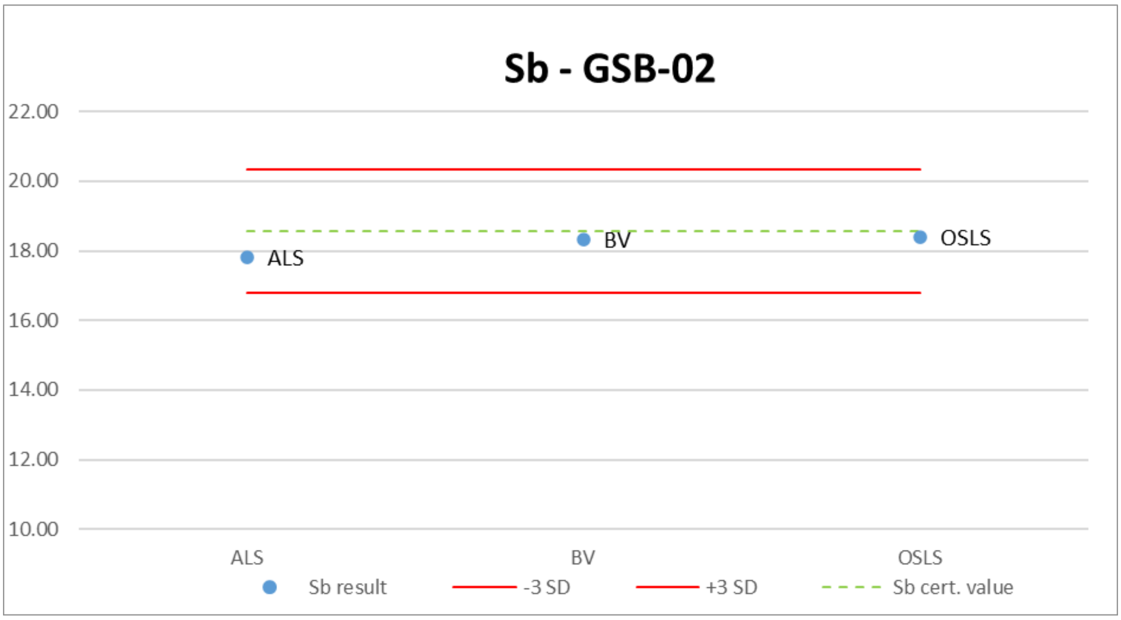


Figure 11-8: CRM GSB-02, umpire check assay batches, Sb

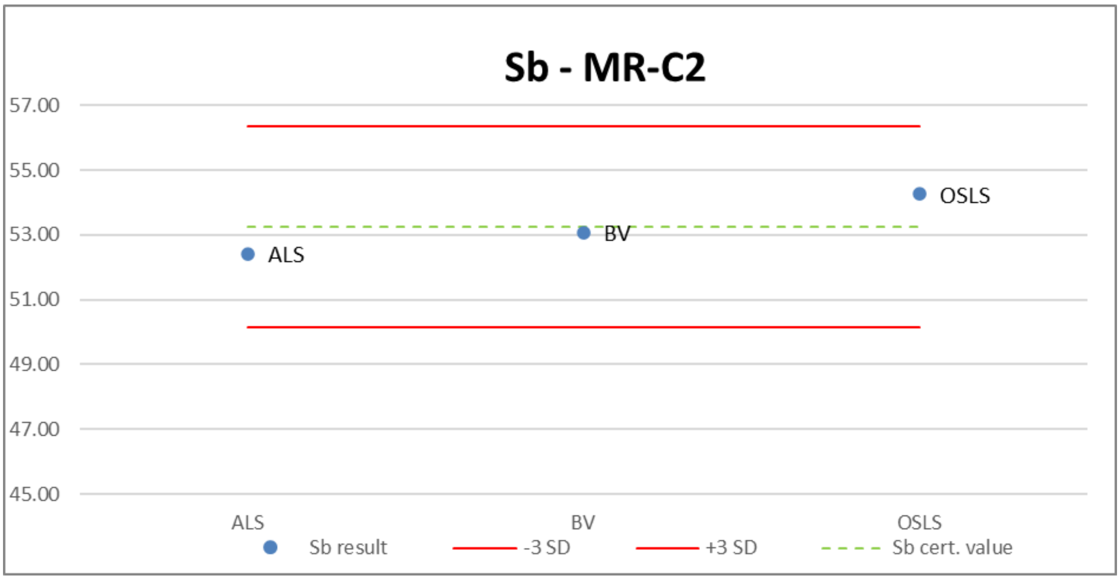


Figure 11-9: CRM MR-C2, umpire check assay batches, Sb

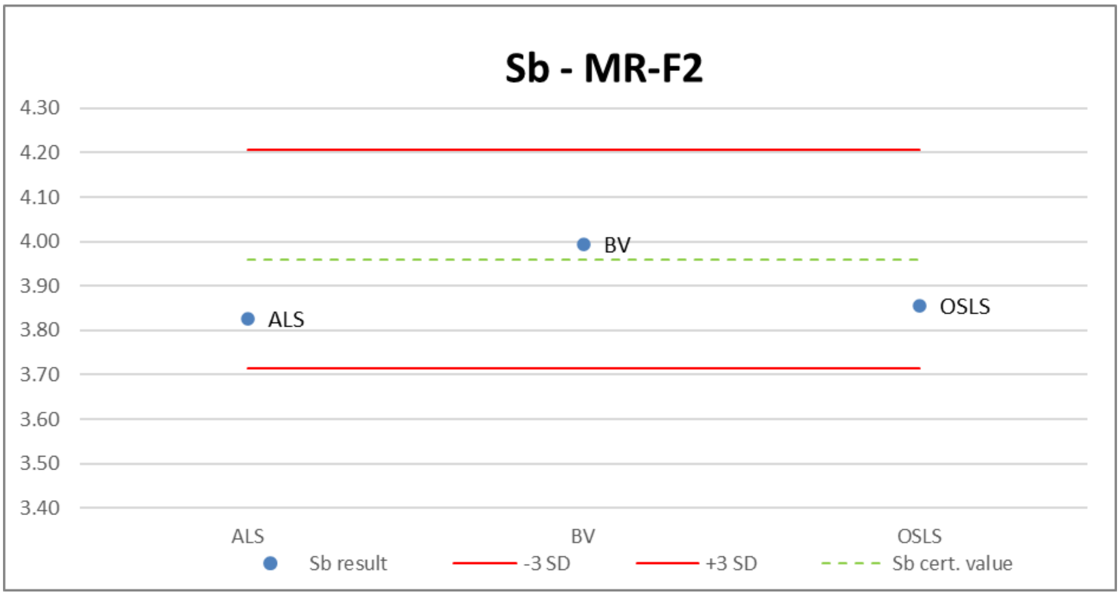


Figure 11-10: CRM MR-F2, umpire check assay batches, Sb

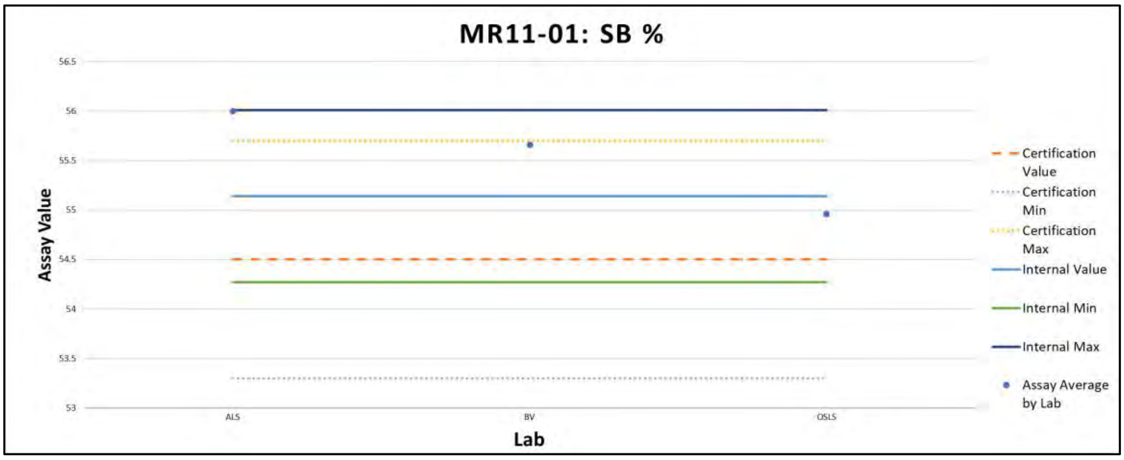


Figure 11-11: MR11-01, umpire check assay batches, Sb, plotted against certification and the internal statistics from routine analysis

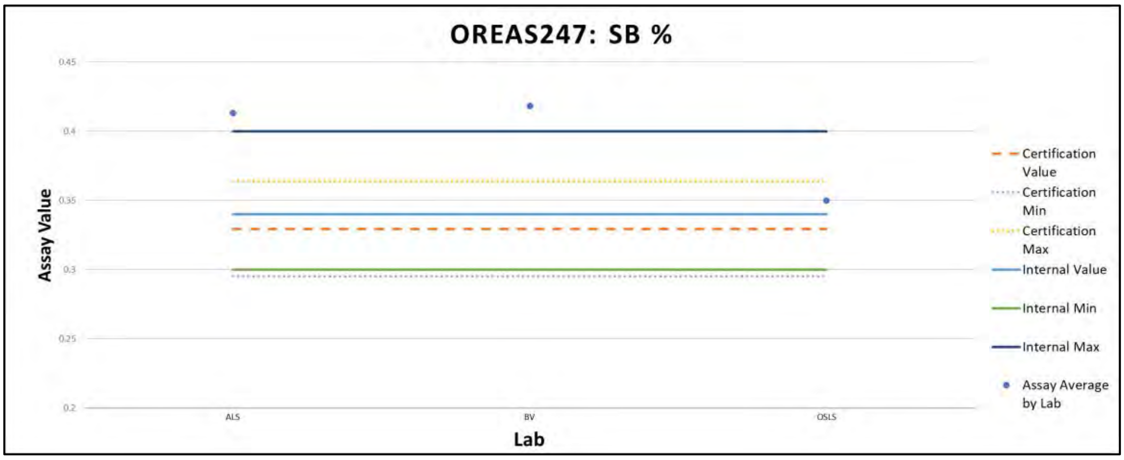


Figure 11-12: OREAS247, umpire check assay batches, Sb, plotted against certification and the internal statistics from routine analysis

11.7.1.3 CRM Results

The assay results for the reporting period are presented in the below control plots against certification values. Comparisons are made relative to the routine-derived internal values for antimony results of OREAS-247 and MR11-01 for the reasons described in the preceding sections. Bias and trends were visually assessed via the control plots and calculated when observed.

A review of the CRM results for the reporting period indicated the following:

- GSB-02: CRM Certified Result 23.64 g/t Au and 31.08% Sb
  - o Au +2.2% bias describing a routine-analysis mean of 24.15 g/t Au for the reporting period with consistent precision. This bias is being followed up with the routine laboratory. (Figure 11-13).

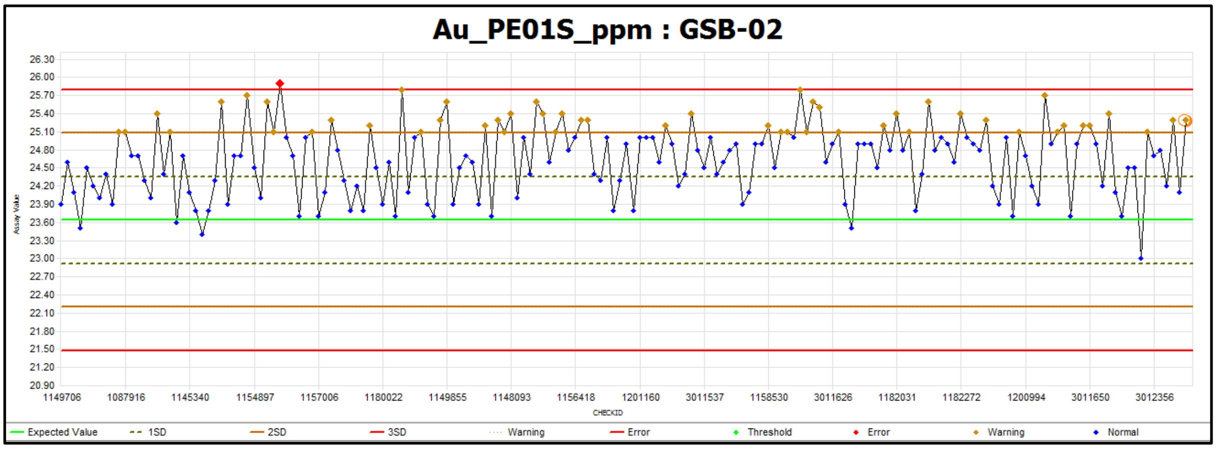


Figure 11-13: GSB-02 gold standard CRM control plot

- o Sb: Slight positive trend at the start of the period that nor malised to good compliance for the remaining period (Figure 11-14).

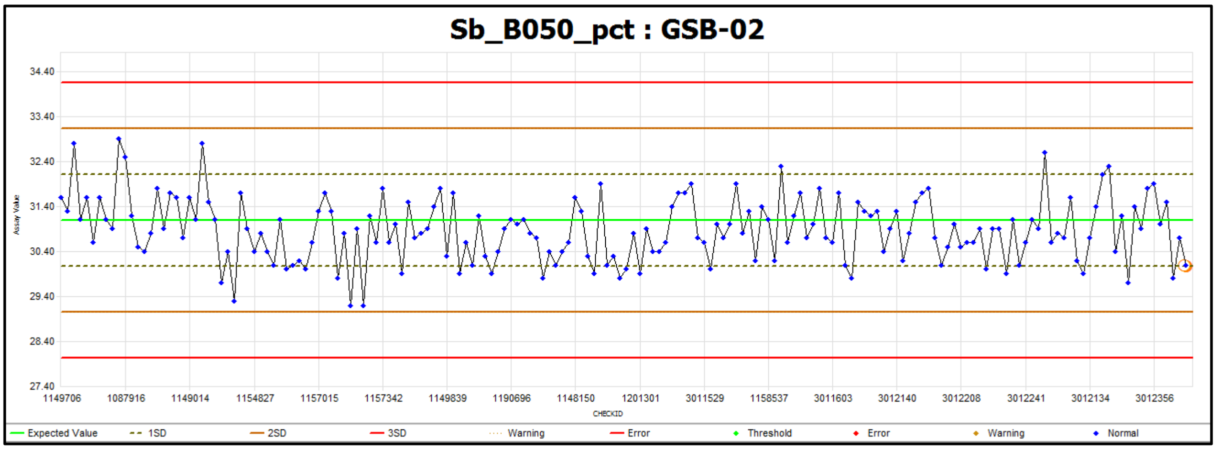


Figure 11-14: GSB-02 antimony standard CRM control plot

- MR11-01: CRM Certified Result 116.04 g/t Au, 54.5% Sb; Internal Value: 55.14% Sb (N=75)
  - o Au: Good compliance with a tight precision (Figure 11-15).

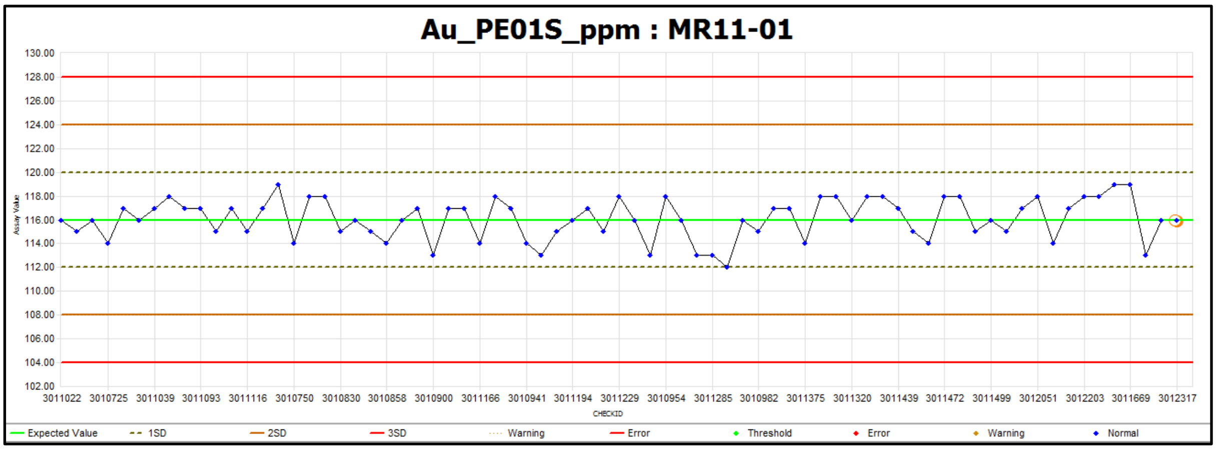


Figure 11-15: MR11-01 gold standard CRM control plot

  - o Sb: Good compliance with the internal mean value and range. +1.2% bias against certification with routine analysis performing within +3σ of certification. Umpire lab analysis utilising Fusion/XRF supports the higher internal value obtained through the reporting period and indicates this bias is not of concern. Both the CRM and internal values, as well as respective standard deviations, are presented in Figure 11-16.

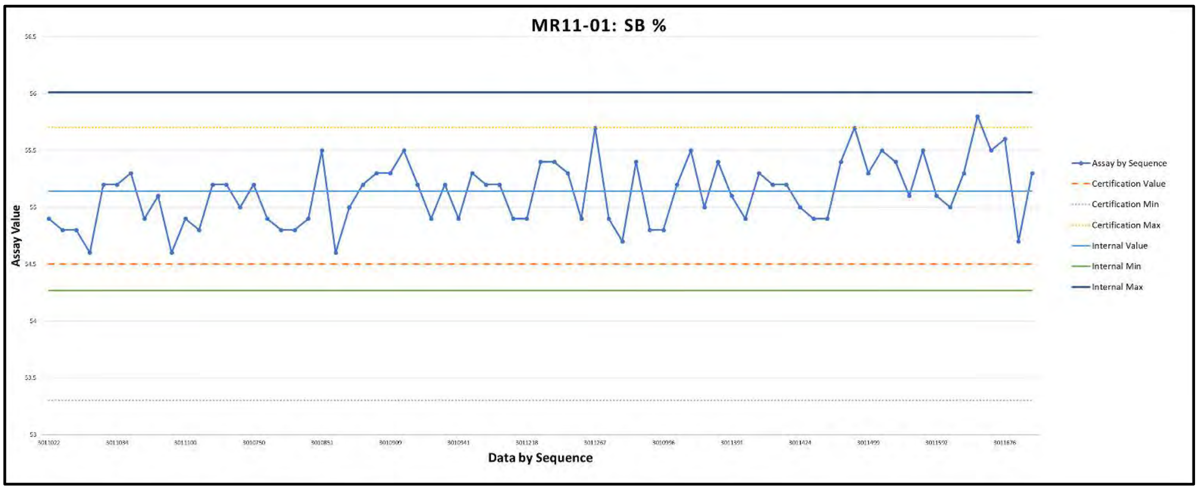


Figure 11-16: MR11-01 antimony standard CRM control plot, with routine analysis derived internal statistics illustrated showing a high bias to the certification

- MR-C2: CRM Certified Result 76.7/t Au and 53.25% Sb
  - Au: Good compliance with a slight upward trend towards the end of the period. One outlier returned over ±2σ (Figure 11-17).

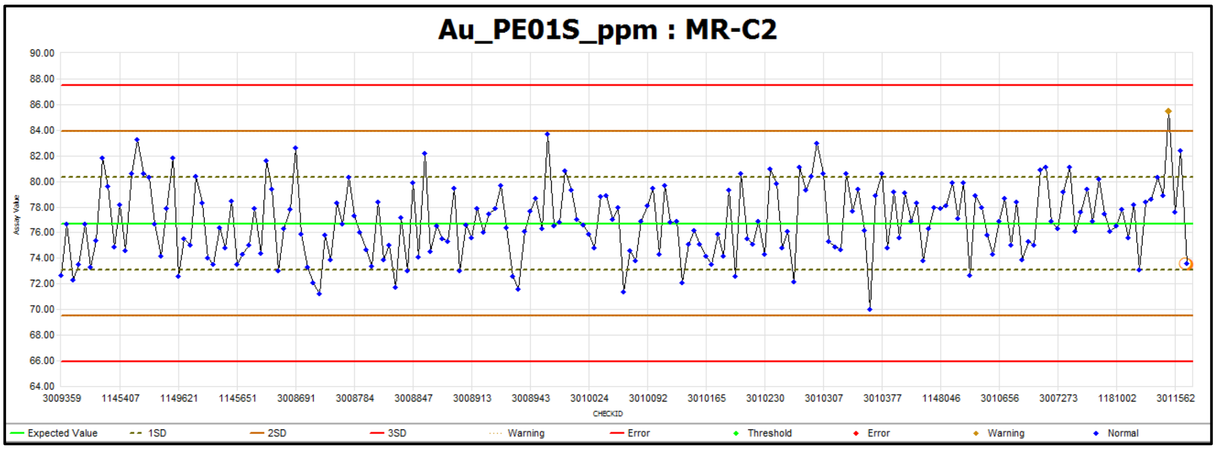


Figure 11-17: MR-C2 gold standard CRM control plot

  - Sb: Good compliance to certification with a slight high bias and tight precision (see Figure 11-18).

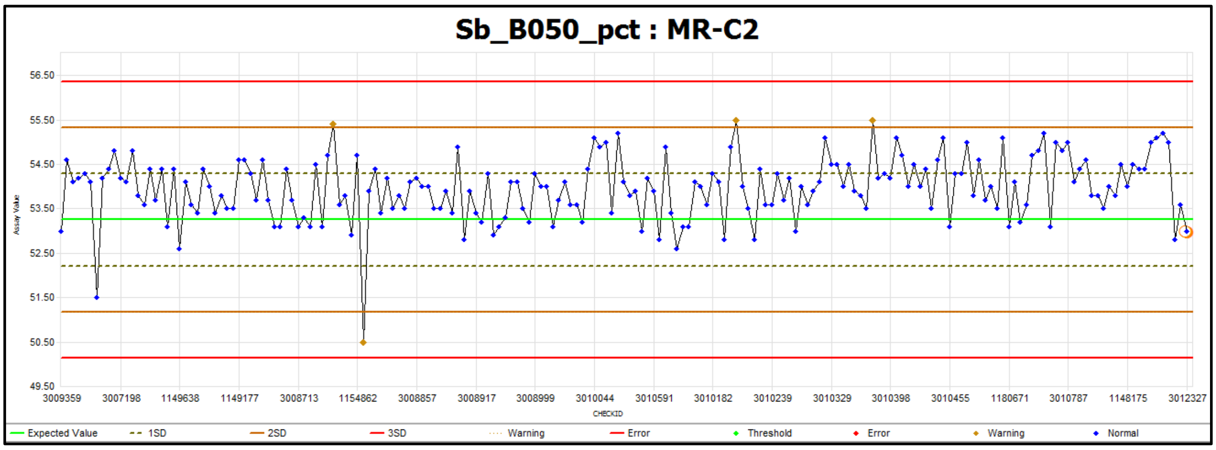


Figure 11-18: MR-C2 antimony standard CRM control plot

- MR-F2: CRM Certified Result 12.15 g/t Au and 3.96% Sb
  - Au: slight low trend in first half of the period but otherwise good compliance (Figure 11-19).

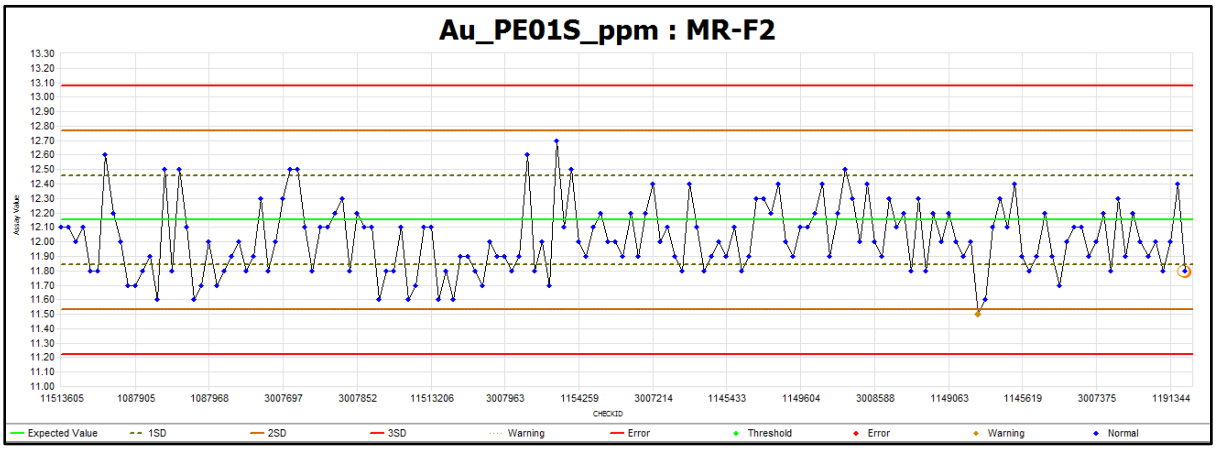


Figure 11-19: MR-F2 gold standard CRM control plot

  - Sb: Good compliance through the period. Two low failures outside +3SD. Of the two failures, one was accepted due to the immaterial Sb grades and the second failure was accepted due to the potential under-call being immaterial to the high-grade antimony present in the face sample batch (Figure 11-20). MR-F2 was removed from grade-control use as a result.

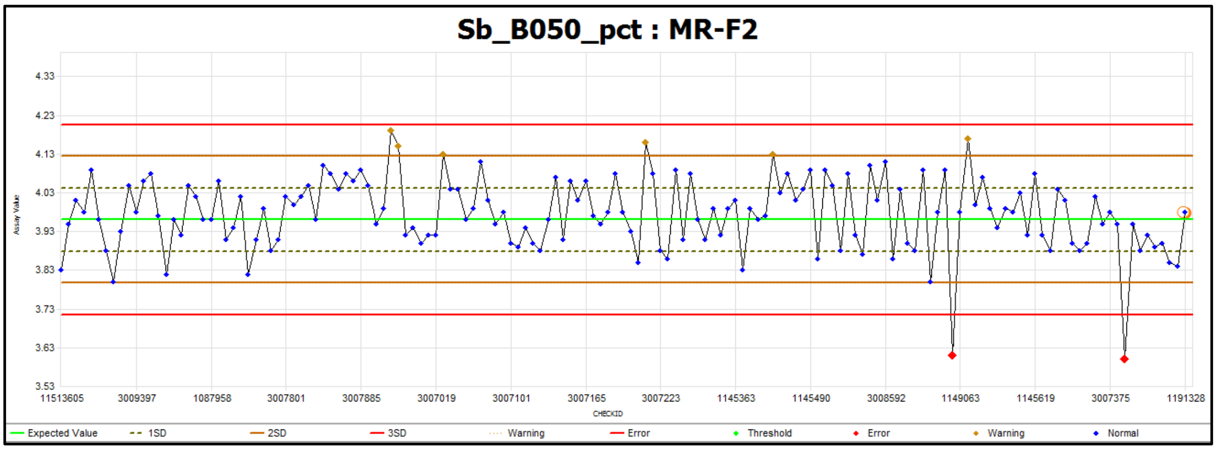


Figure 11-20: MR-F2 antimony standard CRM control plot

- OREAS239: CRM Certified Result 3.55 g/t Au and 0.05% Sb
    - Au: Moderate compliance with undulating trends throughout the period (Figure 11-21). This CRM was utilised predominantly for regional exploration drilling programs.

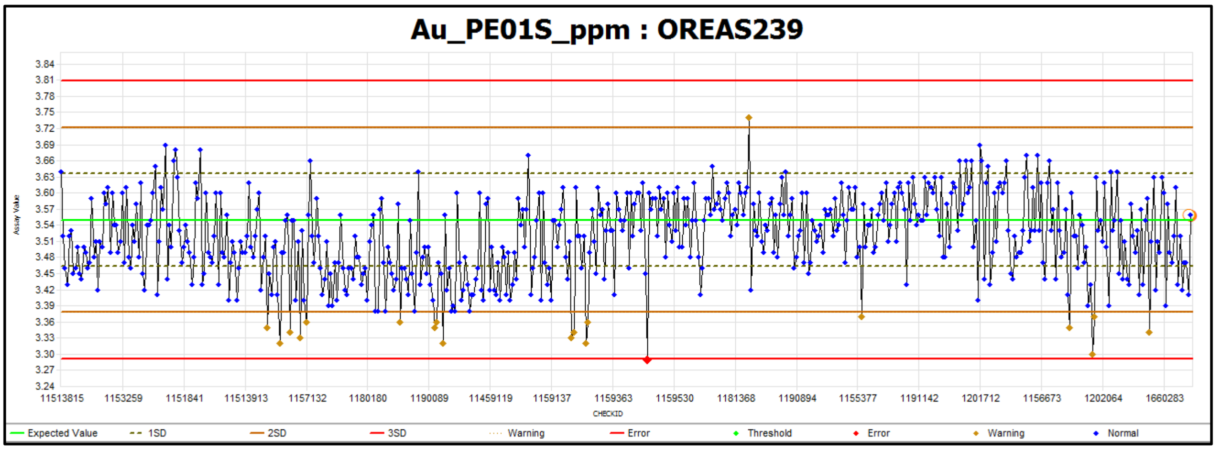


Figure 11-21: OREAS239 gold standard CRM control plot

-
    - Sb: The reference value for this CRM was below the range of interest and this standard has been treated as a gold only CRM in dispatches and paired with a higher-grade additional Sb CRM.

- OREAS247: CRM Certified Result: 42.96 Au g/t and 0.33% Sb. Internal value of 0.35% Sb (N=214)
    - Au: Good compliance for the first half of the period before a solitary high and then low trend in the second half (see Figure 11-22). There was one high failure and two

low failures, which were accepted due to immaterial primary results in the batch and/or additional supporting CRMs.

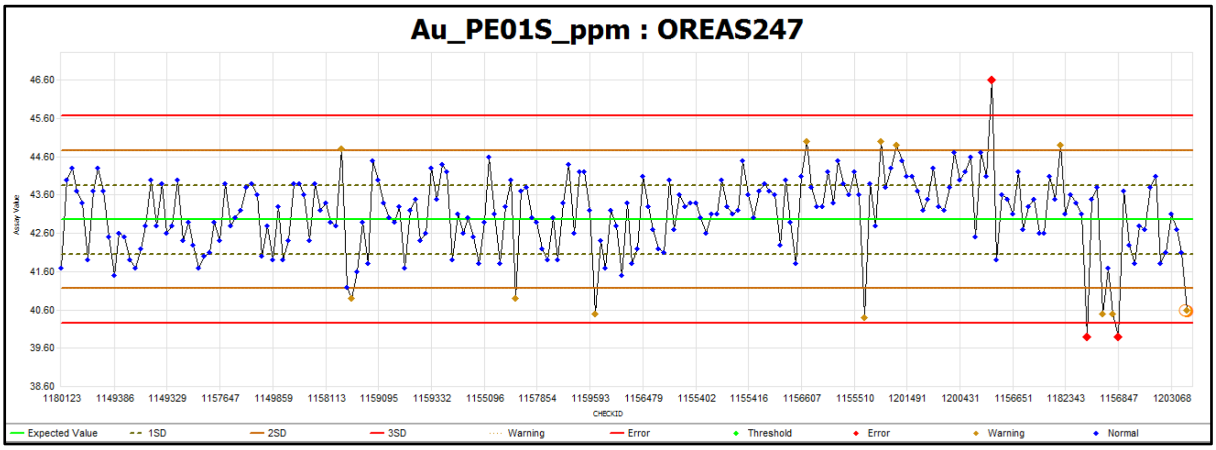


Figure 11-22: OREAS gold standard CRM control plot

- Sb: Relative to the certification value the routine analysis (Figure 11-23) shows a +6.2% bias and performed in part outside +3σ a due to the precipitation issues affecting the 4AD/ICP method. Relative to the internal statistics derived from routine-analysis there is good compliance with the internal mean and deviation, with a trend to low results appearing towards the end of reporting. One failure at the end of the reporting period in a gold-only assay batch was accepted due to being non-material.

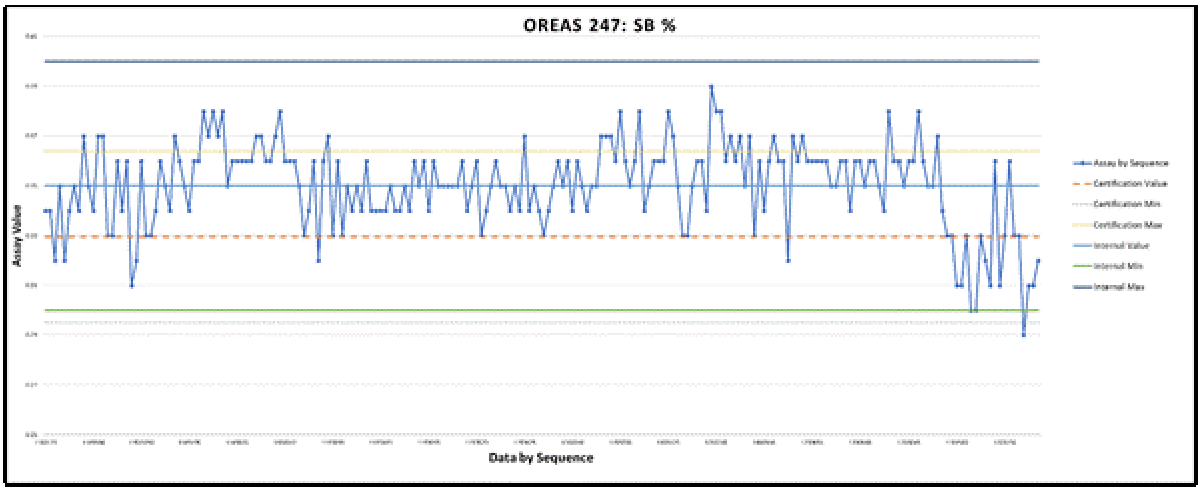


Figure 11-23: OREAS247 antimony standard CRM Plot with routine analysis derived internal statistics illustrated showing a high bias to the certification

11.7.1.4 CRM Results Discussion

The routine analysis undertaken by On Site is deemed by Mandalay Resources and the QP to be performing well relative to the CRMs used for the 2021 period. This represents an overhaul in the CRM performance relative to the 2021 NI43-101 (MP, 2021) and meets the QP's recommendations from the previous report.

In general, tight precision was obtained for the gold and antimony CRM results through the period with only minor trends. Accuracy was generally good, with a minor bias observed in GSB-02 (2.2%) for gold and MR-C2 (1.4%) for antimony. These biases are not deemed material when considered with the umpire lab results for the routine analysis duplicates (Section 11.7.4).

OREAS247 and MR11-01 illustrated certification issues, discussed in Sections 11.7.1.1 and 11.7.1.2, with the CRM value found to be under-calling during both routine and umpire lab analysis. The routine analysis derived internal values for both OREAS247 and MR11-01, supported by the umpire lab checks, is deemed to be adequate for routine quality control. In the case of MR11-01 this internal mean and routine results still fall within 3σ of the certified value.

Additional CRMs are being prepared to replace MR-C2, MR11-01, MR-F2 and GSB-02, and are scheduled to be available Q1 of 2022. The CRMs will have Fusion/XRF and Aqua Regia based certifications to permit tighter quality control.

11.7.2 Blanks

Mandalay Resources submitted uncrushed samples of basalt as Blank material sourced from GeoStats into assay sample lots, at a rate of 1 in every 30 samples, to test for contamination during sample preparation. Additionally, quartz washes were added after every material sample to prevent contamination from high grade gold for all samples assayed in the 2021 period (Figure 11-26).

Measures to control contamination at On Site include cleaning of the mill pulverisers and the crusher with a high-pressure air gun as well as each mill pulveriser being placed in venting cabinets with high-power extraction fans and the use of quartz washes between samples

The failure threshold for gold is 0.10 g/t, which was chosen since it represents ten times the detection limit of 0.01 g/t for AAS. The failure threshold for antimony is 0.05%, which was chosen for being five times the detection limit of 0.01% for AAS.

The Blank results, as displayed in Figure 11-24 and Figure 11-25, demonstrated a 99% passing rate for gold blanks and a 99% pass for antimony blanks. There were two gold failures, which were accepted due to assayed quartz washes included in the batch confirming contamination had been limited to the Blank samples. There was one antimony failure which was accepted due to being deemed a non-material fail relative to the low tenor of face grades of the submission.

The quartz wash analyses (N=472) displayed in Figure 11-26 illustrated good hygiene of the routine analysis at On Site, with a mean of 0.07g/t Au and only 17 samples above 0.2g/t Au. One outlier was present, at 8.9g/t Au, with the remainder non-material to the grade of the veins being analysed.

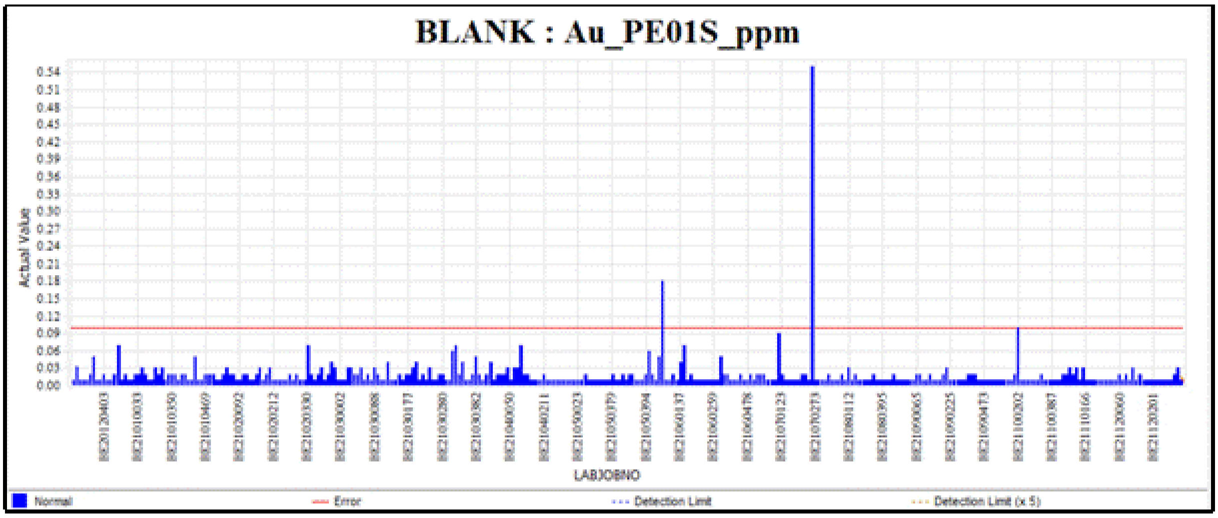


Figure 11-24: Gold Blank assay control plot

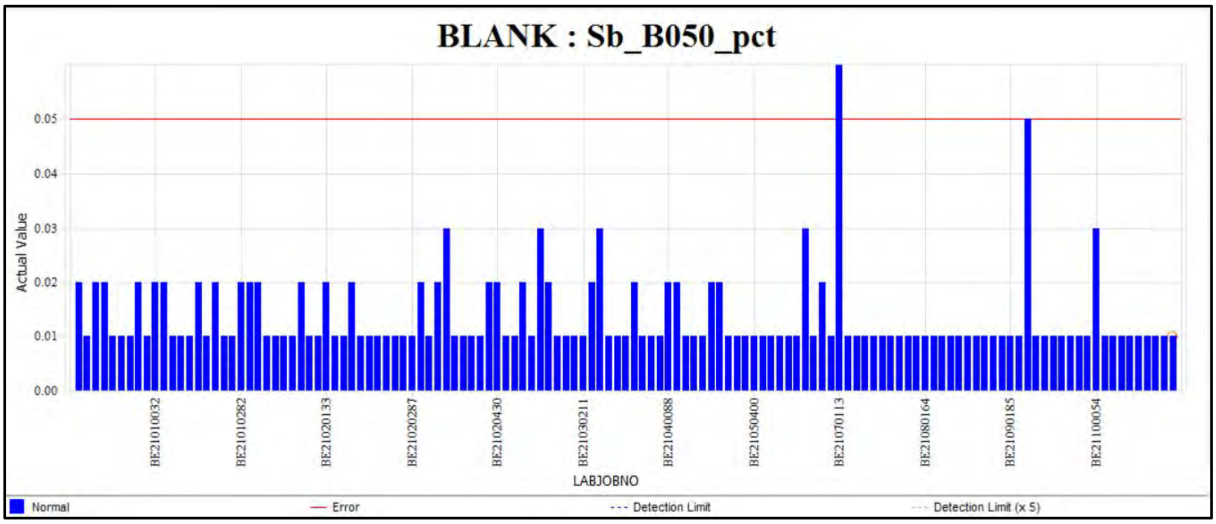


Figure 11-25: Antimony Blank assay control plot

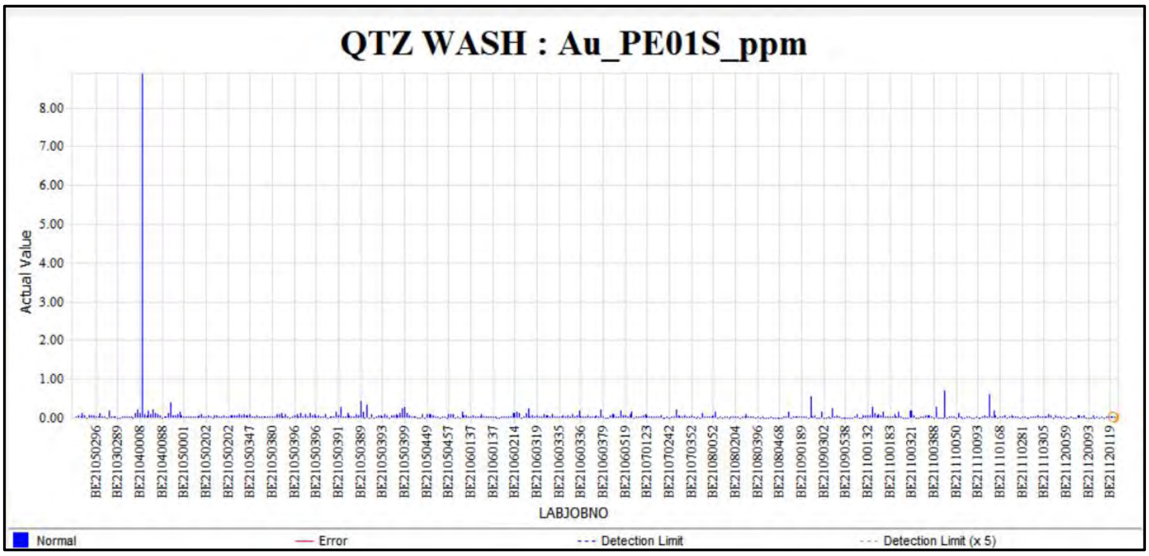


Figure 11-26: Gold quartz washes control plot

11.7.3 Pulp Duplicates

A total of 735 results for pulp duplicated with > 0.16 Au g/t have been completed by On Site for gold and 353 over > 0.16 Sb % for antimony (Table 11-5 and Table 11-6). The duplicates were assayed as separate aliquots from the same sample pulp from both exploration drill core samples and mine face/wall channel samples.

Table 11-5: Pulp duplicate gold statistics

Description	Original	Duplicate
Number of samples	735	735
Mean	51.71	51.61
Maximum	1,350	1,160
Minimum	0.16	0.12
Population Std Dev	112.74	111.74
Coefficient of Variation	2.18	2.17
Bias	0.18%	
Correlation Coefficient	0.98	
Percentage of samples < 10% Relative Paired Difference	**75.65**	

Table 11-6: Pulp duplicate antimony statistics

Description	Original	Duplicate
Number of samples	353	353
Mean	19.7	19.8
Maximum	67.5	65.4
Minimum	0.16	0.14
Population Std Dev	16.50	16.75
Coefficient of Variation	0.84	0.85
Bias	-0.68%	
Correlation Coefficient	.99	
Percentage of samples < 10% Relative Paired Difference	**92.39**	

11.7.3.1 Pulp Duplicate Results

Scatter plots of the pulp duplicate results have been presented in Figure 11-27 and Figure 11-28, and display no significant bias between the original and duplicate assays in either gold or antimony.

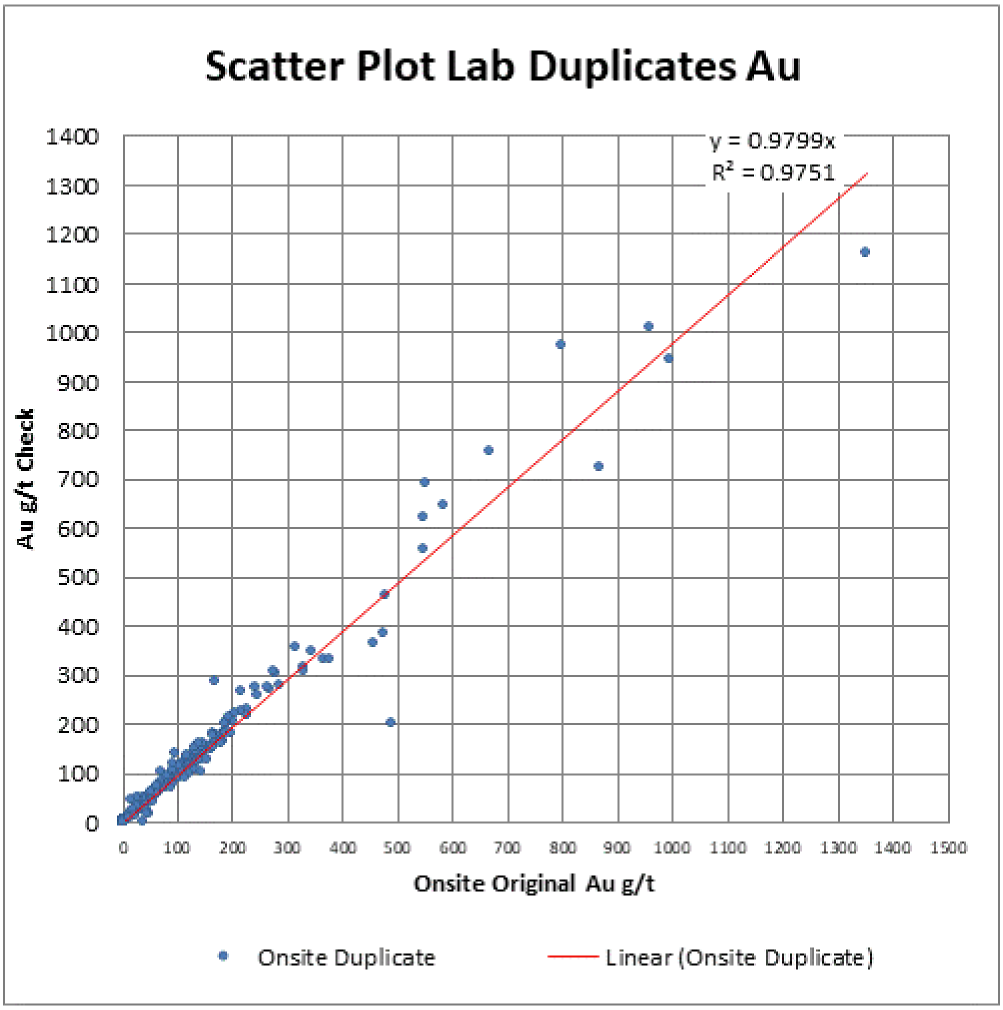


Figure 11-27: Scatter plot of On Site gold pulp duplicates (g/t)

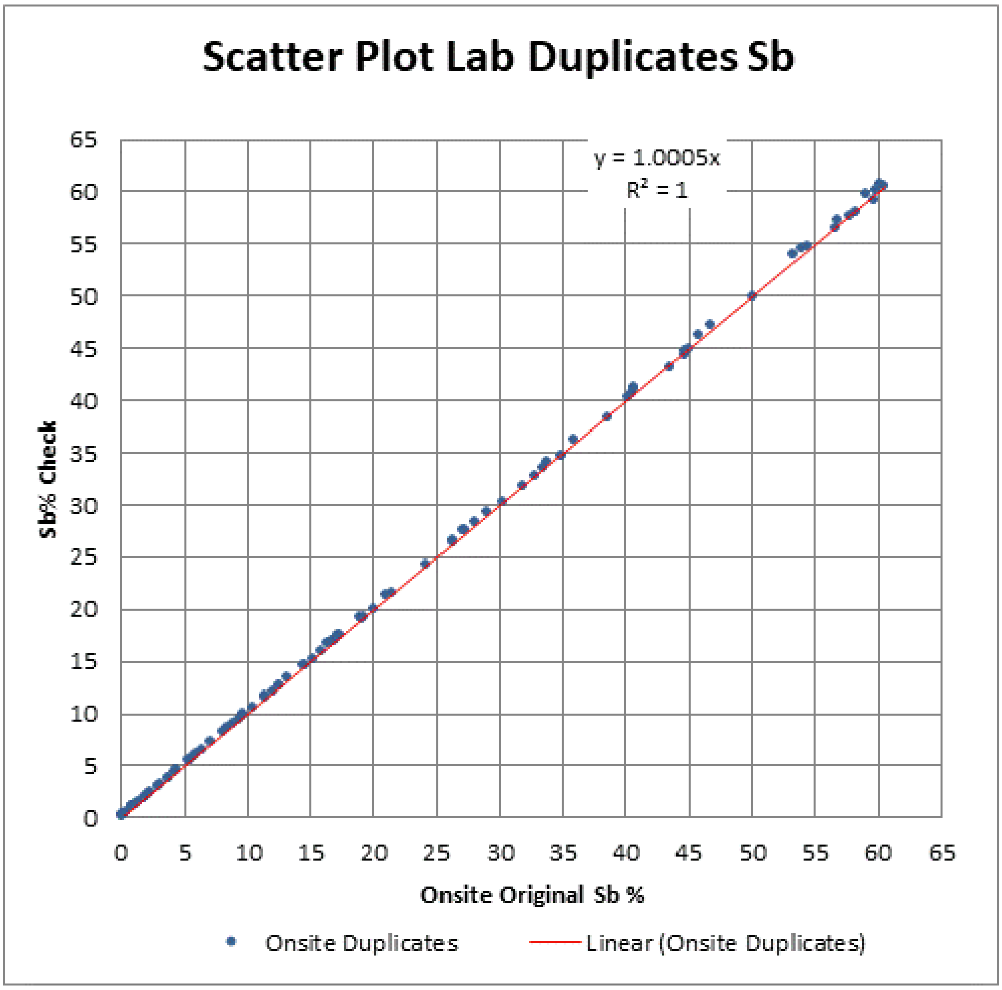


Figure 11-28: Scatter plot of On Site antimony duplicates (%)

Relative paired difference (RPD) plots are utilised in the determination of precision between paired datasets, such as original assay results and pulp duplicate results (Figure 11-29 and Figure 11-30). It is desirable to achieve 90% of pairs at less than 10% RPD in the same sample batch, or less than 20% in different batches or from different laboratories (Stoker, 2006).

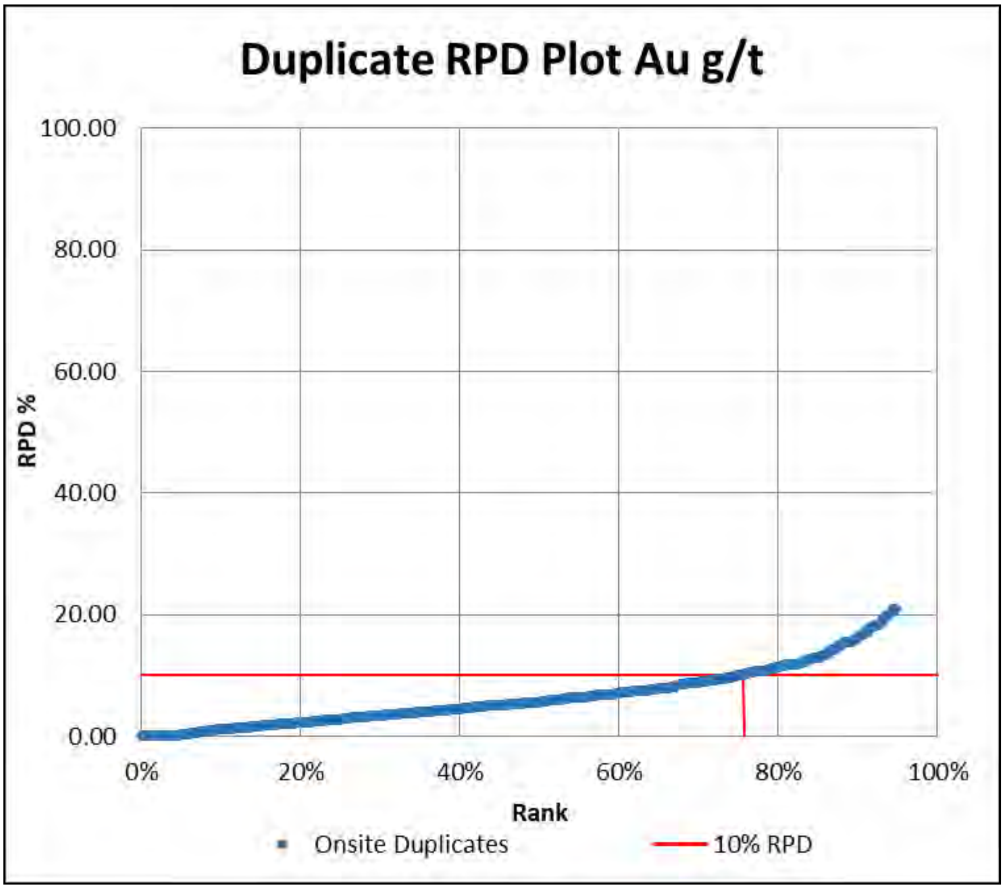


Figure 11-29: Relative paired difference plot, gold pulp duplicates (g/t)

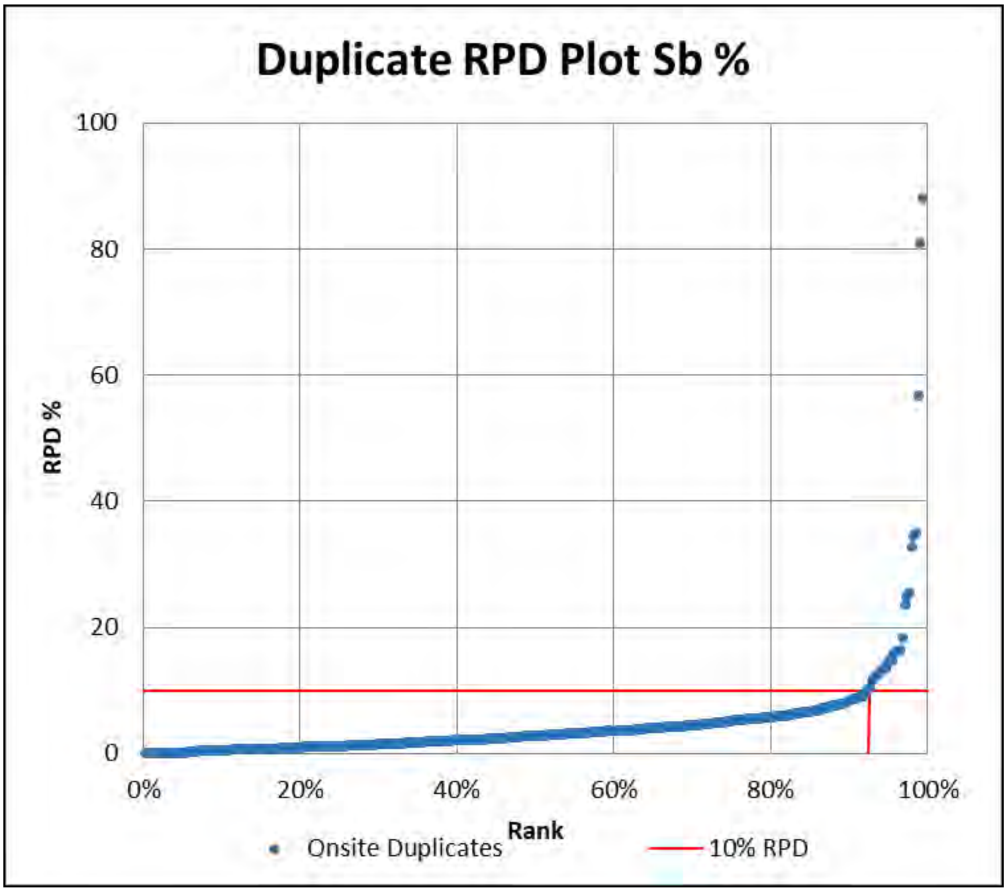


Figure 11-30: Relative paired difference plot, antimony pulp duplicates (%)

The pulp duplicate gold dataset achieved 75.65% of pairs at less than 10% RPD and 93.74% of pairs at less than 20% RPD, which demonstrated acceptable precision for gold assays returned by On Site.

The pulp duplicate antimony dataset achieved 92. 39% of pairs less than 10% RPD, which is comparable to results from 2020 of 93.89%, and was considered acceptable.

11.7.4 Umpire Check Assay Program – pulp samples

Quarterly pulp umpire lab check assay programs were conducted for the reporting period in Q1, Q2, and Q3 2021 for the routine pulp samples assayed by On Site. Selected pulp samples were dispatched to ALS Global Brisbane (ALS) and Bureau Veritas Perth (BV) for re-analysis of gold and antimony. Results from the umpire checks have been summarised in Table 11-7 and Table 11-9.

Q2 check assay program included three samples that were clear outliers in reference to the On Site primary and duplicate results. As both umpire labs antimony and gold results were in agreeance, these are interpreted as manual sample labelling issues and have been removed from the analysis.

Low level gold (< 20 g/t) and antimony (< 5 %) results were also analysed and are detailed in Table 11-8 and Table 11-10.

Table 11-7: Gold: Summary of On Site original, On Site duplicate, ALS, and BV umpire check statistics

Description	On Site Original	On Site Duplicate	ALS Umpire	BV Umpire
Number of samples	202	202	202	202
Mean	60.20	60.74	71.78	71.65
Maximum	729.00	692.00	2280.00	2112.30
Minimum	0.01	0.04	0.02	0.02
Population Std Dev	92.00	92.14	183.67	175.70
Coefficient of Variation	1.53	1.52	2.56	2.45
Bias	-0.90%		-19.25%	-19.02%
Correlation Coefficient	0.91		0.57	0.61
Percent of samples < 20% RPD	**81.91**		**71.36**	**70.35**

Table 11-8: Low-level gold (< 20 g/t): Summary of On Site original, On Site duplicate, ALS, and BV, umpire check statistics

Description	On Site Original	On Site Duplicate	ALS Umpire	BV Umpire
Number of samples	84	84	84	84
Mean	7.39	9.13	9.72	8.93
Maximum	19.80	85.40	95.10	91.70
Minimum	0.01	0.04	0.02	0.02
Pop Std Dev.	5.69	10.92	12.40	11.62
CV	0.77	1.20	1.28	1.30
Bias	-23.61%		-31.64%	-20.90%
Correlation Coefficient	0.31		0.55	0.61
Percent of samples < 20% RPD	**80.25**		**61.73**	**62.96**

Table 11-9: Antimony: Summary of On Site original vs On Site duplicate, ALS, BV, umpire check statistics

Description	On Site Original	On Site Duplicate	ALS Umpire	BV Umpire
Number of samples	202	202	202	202
Mean	18.77	19.27	18.30	18.67
Maximum	65.20	66.40	67.10	69
Minimum	0.01	0.01	0.03	0.075
Population Std Dev	16.37	16.82	16.32	16.53

Coefficient of Variation	0.87	0.87	0.89	0.89
Bias	-2.71%		2.48%	1%
Correlation Coefficient	0.99		0.99	0.99
Percent of samples < 20% RPD	**100.00**		**89.64**	**89.12**

Table 11-10: Low-level (< 5 %) antimony: Summary of On Site original vs On Site duplicate, ALS, BV, umpire check statistics

Description	On Site Original	On Site Duplicate	ALS Umpire	BV Umpire
Number of samples	58	58	58	58
Mean	2.24	2.41	2.39	2.48
Maximum	4.96	5.53	7.07	7.36
Minimum	0.01	0.01	0.03	0.075
Population Std Dev	1.65	1.80	1.84	1.88
Coefficient of Variation	0.74	0.75	0.77	0.76
Bias	-7.84%		-6.93%	-11%
Correlation Coefficient	1.00		0.98	0.98
Percent of samples < 20% RPD	**100.00**		**83.67**	**77.55**

11.7.4.1 Umpire Check Assay Program Results

The results of the 2021 umpire check assay program are detailed below:

Gold check assay results:

- A comparison of results between On Site and the umpire labs, BV and ALS, using the complete gold dataset showed a negative bias that suggested a relative under call of gold results by On site in their routine analysis. Further investigation was considered necessary.

- The gold RPD plot (Figure 11-31) demonstrated that on average 74% of all umpire check duplicate pairs were at less than 20% RPD when compared to the original On Site assay result, which is decrease on 79% from the 2020 data but considered satisfactory.

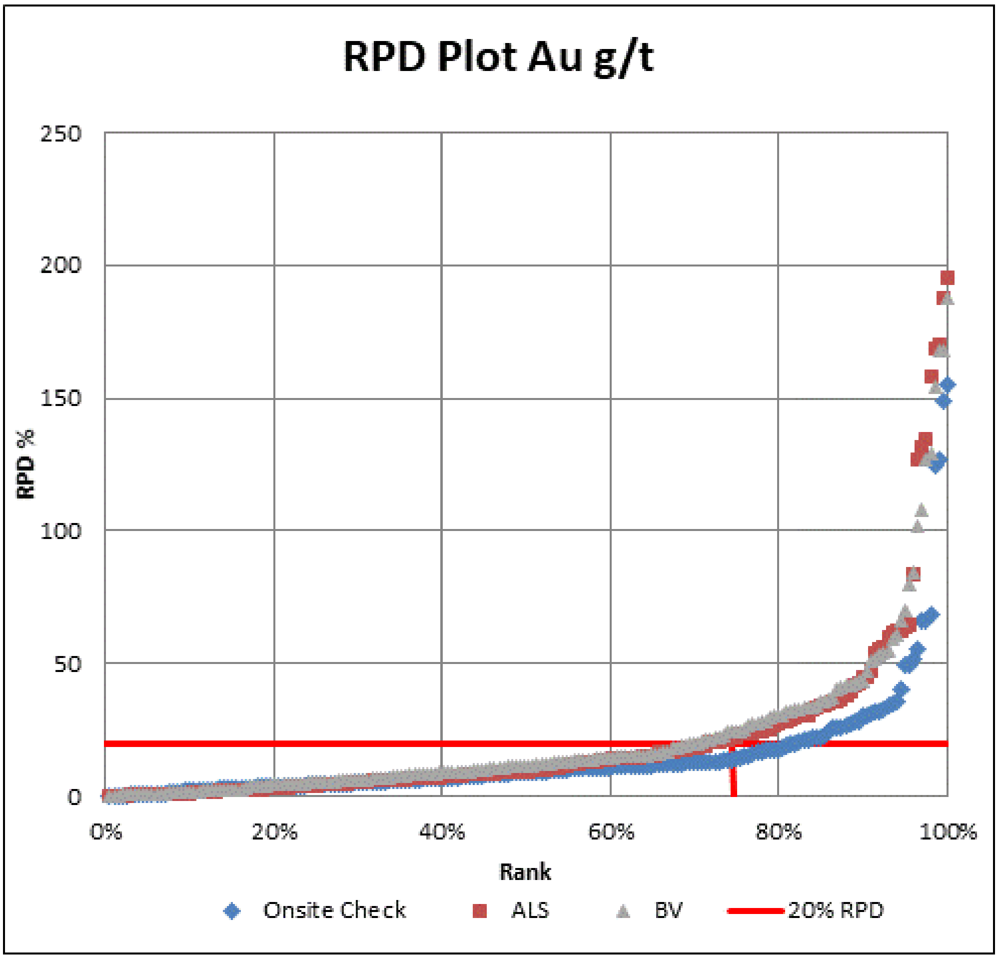


Figure 11-31: Relative paired difference plot, original vs umpire checks, gold (g/t)

- The gold scatter plot of this data (Figure 11-32) demonstrated an increased range of scatter for samples greater than 60 g/t, while grade comparisons below 60 g/t displayed no significant difference between laboratories.

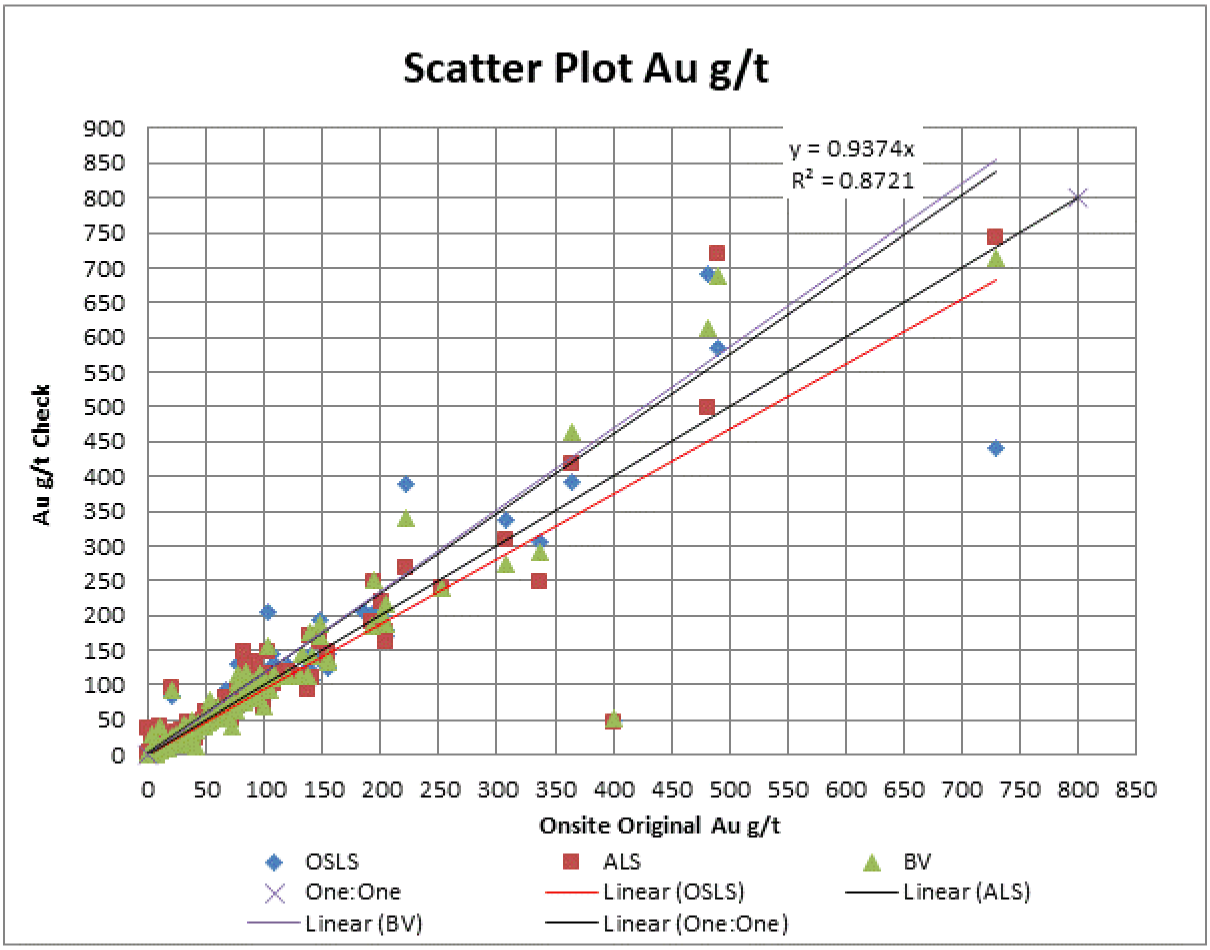


Figure 11-32: Scatter plot original vs umpire check duplicates, gold (g/t)

On Site performed at a lower RPD than ALS and BV, which were more closely grouped.

Low level gold (< 20 g/t) check assay results:

- Biases observed using the low-level gold dataset were more pronounced than the complete dataset, which suggested an under call of gold results by Onsite in their routine analysis and required further investigation.

- Low level gold RPD plot (Figure 11-33) also demonstrated an average of 68% of all umpire check duplicate pairs were at less than 20% RPD, which illustrated the poor performance at the lower gold grade.

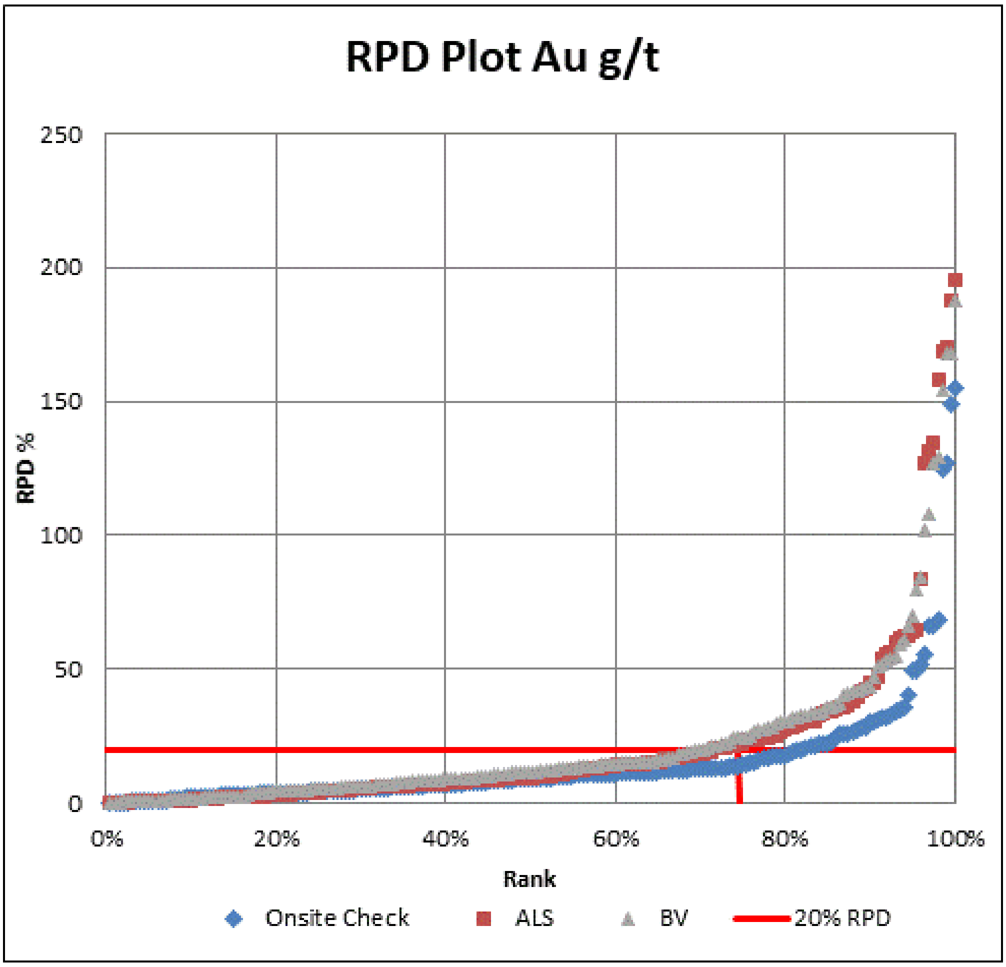


Figure 11-33: Relative paired difference plot, original vs umpire checks, low level gold (< 20 g/t)

- Low level gold scatter plot (Figure 11-34) demonstrated a generally strong correlation below 10 g/t. One series of outliers, at 85-95 g/t Au, plotted outside the graph. Several other samples plotted as outliers in the check results and caused the negative bias relative to the originals.

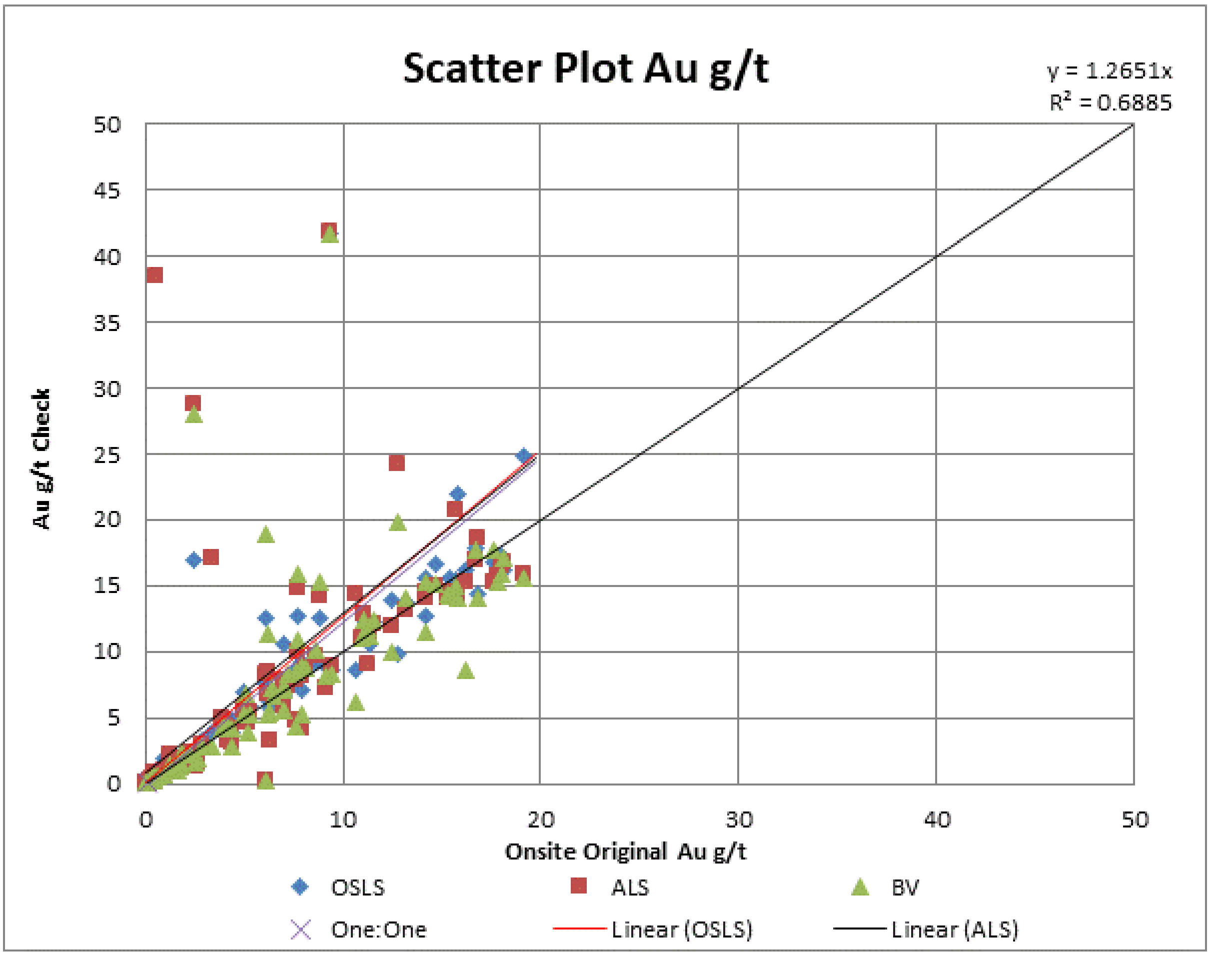


Figure 11-34: Scatter plot for On Site original vs umpire checks, low level gold (< 20 g/t)

Antimony check assay results:

- Biases observed between On Site, ALS and BV using the complete antimony dataset were considered acceptable,
- The antimony statistics from On Site had a consistently lower RPD compared to ALS and BV (Figure 11-35), both which utilise Fusion/XRF. Overall the batches met 89% of pairs at less than 20% RPD. This was considered an acceptable result.

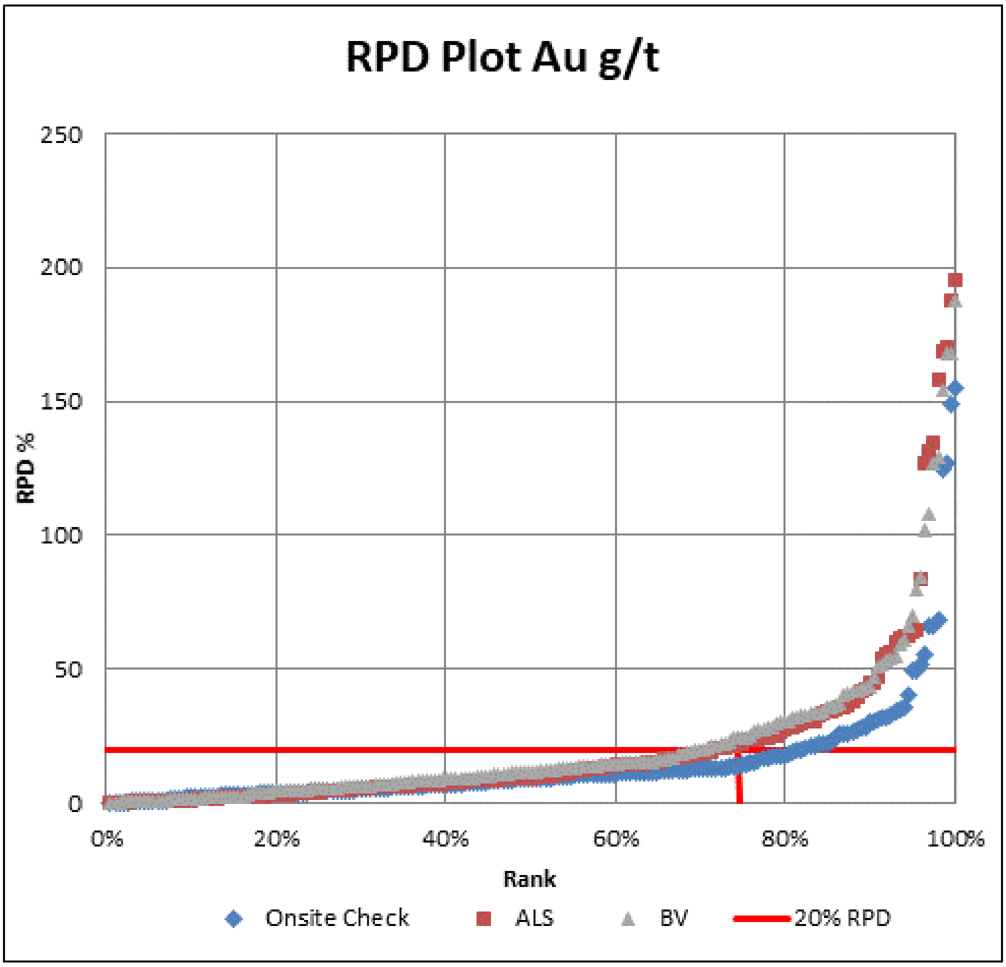


Figure 11-35: Relative pair difference plot for On Site original vs umpire checks, antimony (%)

- The antimony scatter plot (Figure 11-36) demonstrated good agreement through the low range to 20% Sb, with increased scatter above this level. On Site demonstrated a partial high bias on the second analysis through this range.

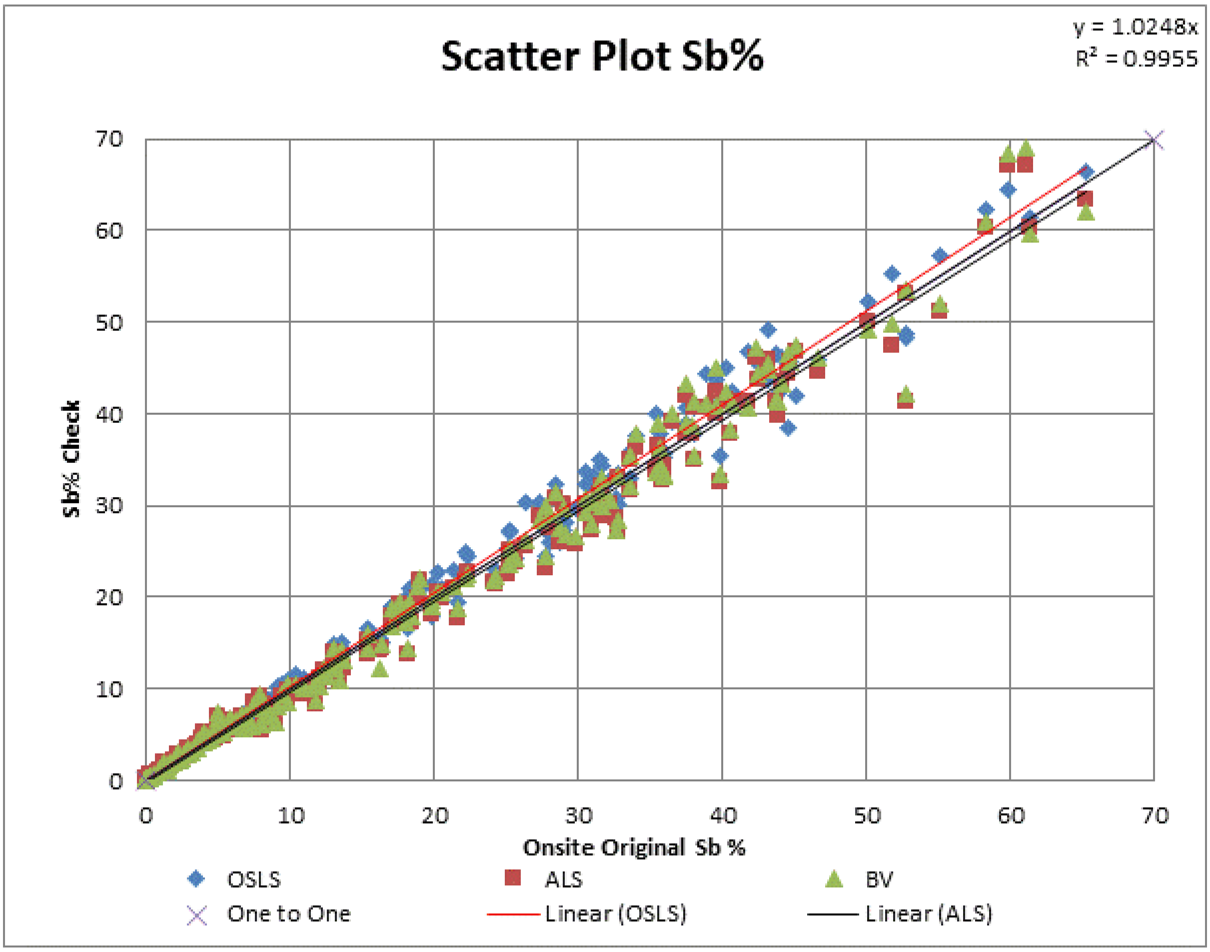


Figure 11-36: Scatter plot comparing On Site original vs Umpire checks for antimony (%)

Low level antimony (< 5 %) check assay results:

- The observed bias between On Site, ALS and BV for the low-level antimony dataset was considered acceptable,
- The low level antimony RPD plot (Figure 11-37) also meets of desirable range at 87% of pairs at less than 20% RPD. This is supported in the scatter plot (Figure 11-38), which displays a tight linear scatter.

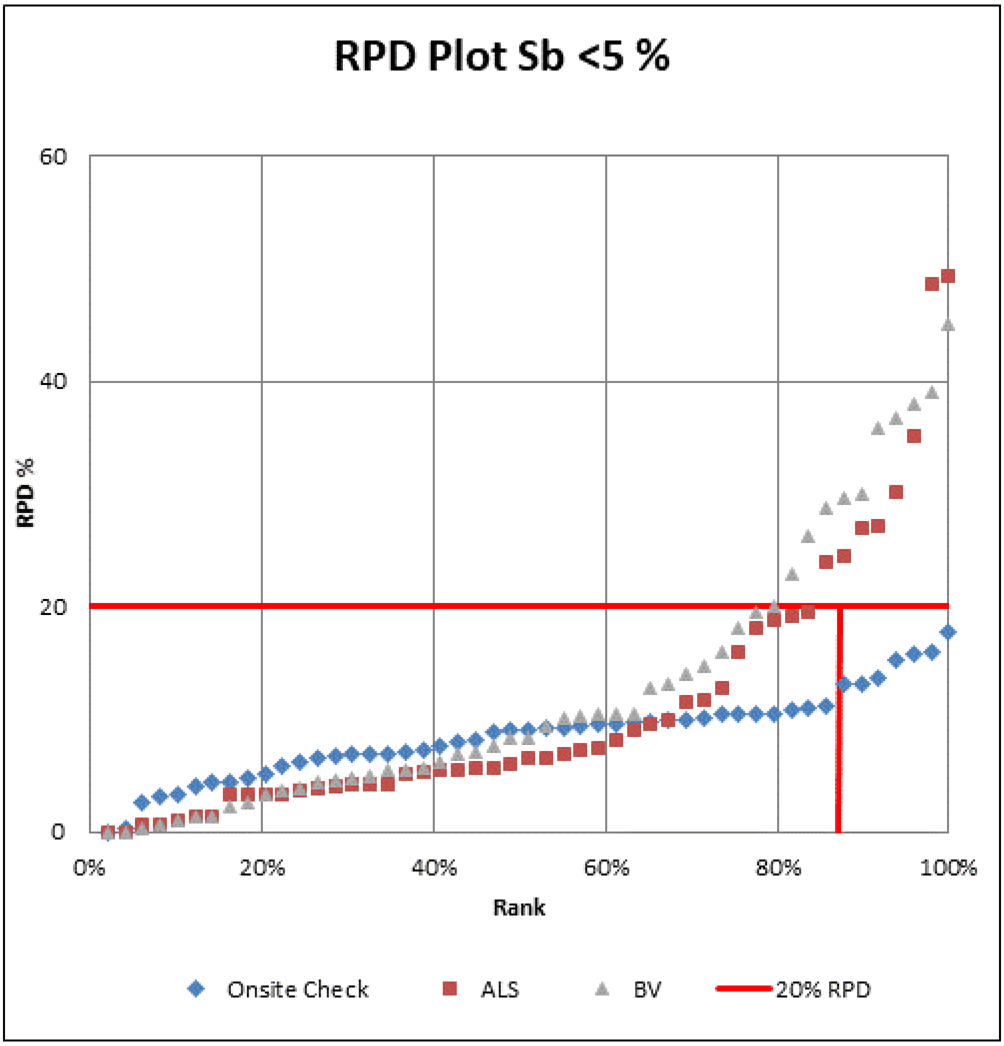
- 

Figure 11-37: Relative pair difference plot for On Site original vs umpire checks, low level antimony (< 5%)

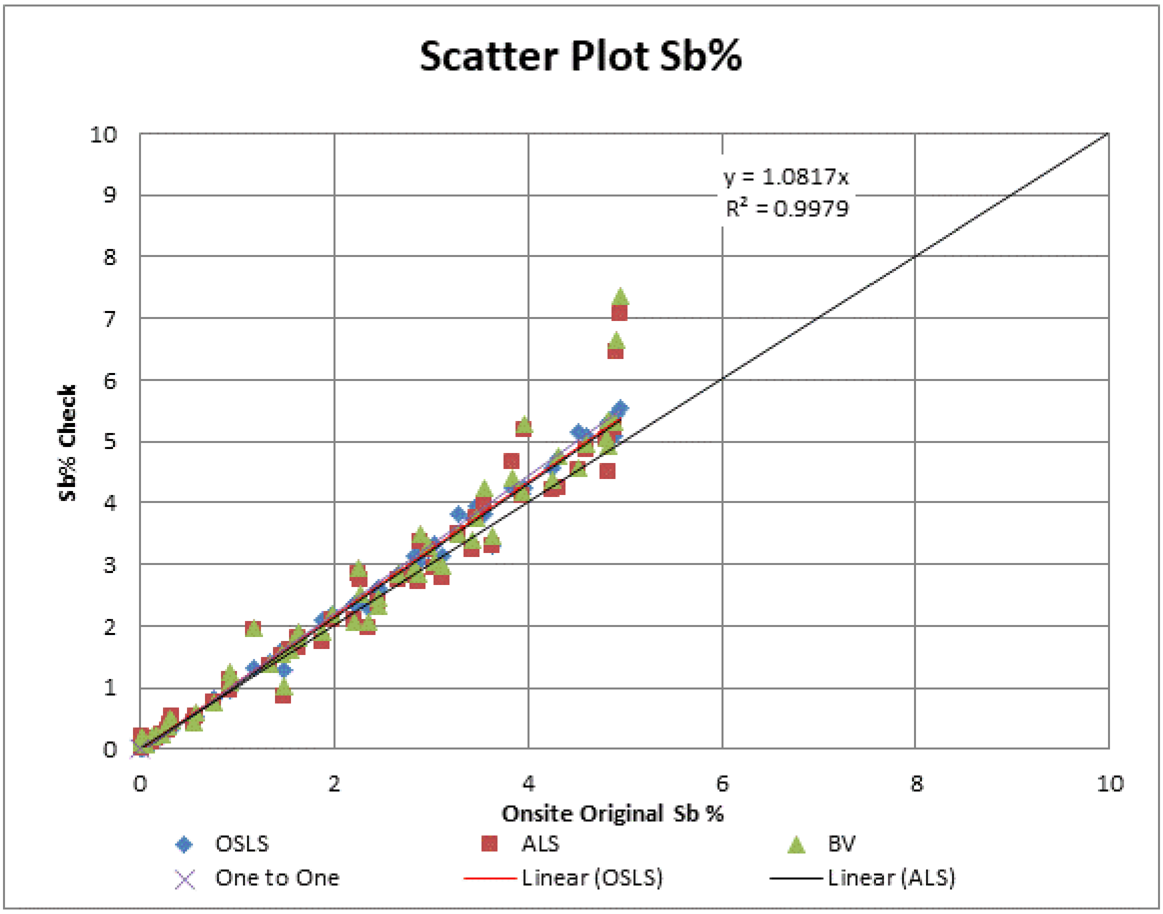


Figure 11-38: Scatter plot for On Site original vs umpire checks, low level antimony (< 5 %)

11.8 Sample Transport and Security

In 2021, Brunswick and Augusta sites were securely gated, with video surveillance, and time stamped swipe card access. This included areas used for storage and collection of drill and face samples.

All sample bags that contained sampled material were placed in heavy duty plastic bags, along with the sample submission sheet. The plastic bags were sealed with a metal twisting wire or heavy-duty plastic cable ties. This process was applied to both underground channel samples and diamond drill core samples.

Samples were delivered by a private contractor or directly by Mandalay Resources staff on a daily basis to On Site in Bendigo, where they were accepted by On Site laboratory personnel. A delivery consignment note system was enacted at the end of Q3 2021 which includes signed confirmation on pickup and on delivery of the samples to the laboratory.

Returned sample pulps from the On Site laboratory for 2021 remained in a secure On Site warehouse with a scheduled return to Mandalay Resources for storage in secured and monitored shipping containers, wrapped in plastic.

11.9 Qualified Persons Opinion

The analysis of the CRM certifications for antimony satisfies the recommendation in the previous Technical Report for the Property that the antimony standards be completely overhauled. The QP considers that the assay QAQC results, when taken together, demonstrate the reliability of the assays for the reporting period, and that they are suitable for use in Mineral Resource Estimation.

12 DATA VERIFICATION

In fulfilment of the NI43-101 requirements, Mining Plus Principal Geologist and Qualified Person, Richard Buerger completed a personal inspection of the Property on 23 September 2021. The Property inspection focused on a review of the geological setting and mineralisation style, as well as the processes and procedures in place to ensure that they are at an acceptable standard for the mineralisation style, with the resultant information being suitable for use in the upcoming Mineral Resource estimation work.

The QP completed the following activities during the Property inspection or immediately following the visit:

- Source data validation checks for 10% of the drill holes completed within the 12 months since the last MRMR, with a focus on verifying the Au and Sb assays, bulk density measurements and locational data (collar and downhole surveys).
- Locational data storage and management processes including:
  - Collar and downhole survey methods, storage and data entry processes.
  - Downhole survey camera calibration certificates and test bed results.
- Drill core logging and sampling processes including:
  - Core processing procedures from initial mark-up through to sample selection and sampling.
  - Inspection and verification of some significant Shepherd lode intercepts for the year.
  - Storage and security of the core processing facility.
  - Chain of custody process for core samples to the laboratory.
- Assay and bulk density data accuracy, precision and data management process including:
  - Bulk density measurement methods and data storage.
  - Sampling and analytical protocols in place.
  - QAQC reports and raw results.
- Underground inspection to review face mapping and sampling processes.

- Discussion of the geological interpretation and key changes since the discovery of the Shepherd lode
- Review of some typical drill hole intersections from the Shepherd Lode.

The following observations have been made from the Property inspection and subsequent data checks:

- Source data checks of the assays revealed no errors for the 10% of the samples checked.
- The digital collar survey records supplied by the surveyors were consistent with the database entries apart from very minor errors in the X and Y coordinates identified in two drill holes – these errors are <1 mm difference and are considered to be most likely due to rounding errors.
- The IMDEX Hub-IQ™ system for recording, storing and transferring downhole survey measurements has been implemented during 2021, with this new system considered industry best practice as it removes the potential for transcription errors from the drillers and geologists. The source data checks for the downhole surveys identified no errors for the drill holes checked.
- The change to full-core sampling of the drill hole intercepts is considered appropriate given the style of mineralisation at Costerfield and the change in analytical method. The procedure for sampling of drill core is appropriate. This change to full-core sampling of significant intercepts removes many of the issues surrounding sample security for the most recent drilling.
- The change in analytical method from Fire Assay to full-sample Screen Fire Assay for all drill core intercepts is considered to be in line with industry best practice for this style of mineralisation.
- The adoption of digital data capture for face mapping and sampling underground using the Rock Mapper system is considered to be a significant improvement in recording and capturing the mineralisation grades and changes in thickness in strike drive development.
- The chain of custody protocols in place at the time of the visit were inadequate.
- The communication with the analytical laboratory has improved significantly with regular QAQC reports and meetings held between the two parties.

- The implementation of systematic and routine bulk density measurements using the water immersion method is considered a key improvement. However, the QP noted that the current procedure does not measure true dry bulk density as the core being used has not been dried either in an oven or by sunlight. Therefore, the bulk density values derived cannot be considered as representative of the true bulk densities as the moisture content within the core samples has not been taken into consideration.

- The QP's discussions with key people on-site gave confidence that the geological understanding of the mineralisation has, and continues to underpin its ongoing success. The potential for increased complexity around the intersection of the Youle and Shepherd lodes is understood and steps are being taken to update procedures and methods for testing and estimating the grade of this area.

After the visit, the QP made several recommendations, which were acted on by Mandalay. The following improvements were made to its processes in response to the recommendations:

Collar Data:

Underground drill holes up to the present have been compiled on the server and Pre-June surface drill holes have likewise been compiled, with extracts from personal emails.

Chain of Custody:

The Chain of Custody System have been improved with consignment notes created for all Exploration and Mining assay submission. The con-note is signed on pickup by the delivery driver and counter-signed by the lab on receipt. The number of bags with tamper-tags delivered is checked at each stage. This system was enacted 30/9/2021.

In addition:

- All 2022, 2021 and the majority of 2020 pulps, covering most of the Youle project, remain at the secure storage warehouse of On Site Laboratory Services.

- Single Door shipping containers have been delivered to site as secure storage for returned pulps.

Bulk Density:

Bulk density test work has been undertaken to determine if moisture is a factor in the semi-dry density determination method employed at site. Stibnite samples between 5-80% stibnite, averaging 40% (visual), were taken from the ROM and washed, drip dried (overnight) and then tested for bulk density using the immersion method. These were then taken to OSLS and heated at 106°C for 14 hours. The samples were then returned to site and kept dry, with the immersion bulk density technique repeated with the same setup.

Table 12-1: Bulk density test results

Description	Value
Count of BD-dry	60
Average of BD	3.059
Average of BD-dry	3.065
StdDev of BD	0.56
StdDev of BD-dry	0.57

Note: BD = Drip Dry, BD-Dry = Oven Dried

The moisture content was determined from more competent samples (N=42) based on the weight changes as an average 0.16%. As a result, the moisture content is not deemed material and the semi-dry method employed on core is closely related to an oven-dry bulk density reading.

Shepherd – Youle Complexity

The Shepherd to Youle interaction point continues to be investigated. Additional infill drill holes have been put in place and priority given to mine development that will cross-cut the lodes for greater understanding prior to active development. Some Shepherd like veins have been encountered in southern ore-drives and their interaction have been as modelled with a solid vein structure peeling off the Youle fault. This has given some confidence in the modelled vein systems.

QP opinion

In general, the Mining Plus QP considers that the qualitative and quantitative geological data used to inform the Costerfield Property Mineral Resource estimates have been collected, validated and stored in line with industry best practice as defined in the CIM Mineral Exploration Best Practice Guidelines (CIM, 2018) and the CIM Estimation of Mineral Resource and Mineral Reserves Best Practice Guidelines (CIM, 2019). Although some very minor issues have been identified, the QP considers that the data are suitable for use in the estimation of Mineral Resources.

13 MINERAL PROCESSING AND METALLURGICAL TESTING

13.1 Metallurgical Testing

Over the years, extensive metallurgical testwork has been undertaken on samples taken from the Augusta deposit from 2004, the Cuffley deposit from 2012, the Brunswick deposit from 2016 and most recently, the Youle deposit from 2018. Historical operating data now validates the testwork from each of these deposits. No additional testwork was done in 2021 on the Youle deposit as it is now superseded by processing this feed.

When required, mill feed blend characterisation and metallurgical tests are routinely undertaken by Mandalay in order to verify the expected behaviour of new domains, lithology types, lodes, or deposits. The following reputable, accredited, and appropriately experienced metallurgical laboratories have been involved with various aspects of the original metallurgical evaluation and ongoing testwork:

- ALS Metallurgy – New South Wales (previously Metcon Laboratories)
- Amdel Mineral Services Laboratory (now Bureau Veritas Minerals) – South Australia
- Australian Minmet Metallurgical Laboratories (AMML) – New South Wales

The Brunswick Processing Plant has been operated by Mandalay since late 2009, with several years of operating data on the Cuffley/Augusta ore blend, on the Brunswick ore from Q3 2018 and Youle underground ore from late Q3 2019. The Youle samples exhibited similar metallurgical behaviour to the Cuffley/Augusta ores during testwork and operations so initially used historic Cuffley and Augusta production data for forecasting purposes. The Youle deposit now provides the sole feed to the plant. As a result, the metallurgical testwork on all deposits, including the most recently tested Youle ore, has been replaced by actual plant performance. The use of comprehensive historical operating data is considered to be a more accurate basis upon which to forecast future metallurgical behaviour when processing similar ores.

The Youle underground deposit, was first processed in September 2019. It was initially processed in separate campaigns, i.e. not in a blend, to confirm the expected metallurgical behaviours. Youle became the predominant mill plant feed from July 2020, steadily displacing the Brunswick underground ores, since the start of the same year. The Youle underground ore will remain the dominant feed for the forward Life of Mine (LoM) production schedule. This body of standalone Youle operating data now provides a much better understanding of the processing behaviour expected on these and similar ores. Youle also exhibits similar metallurgical behaviours to the Cuffley/Augusta ores. This historical operating data can also be used to expand the Youle dataset if required.

This data allows antimony and gold recovery relationships to be developed and used to forecast future recoveries as well as forecasting plant throughput capacity.

13.1.1 Metallurgical Testwork Summary

A summary of metallurgical characterisation testwork is provided in Table 13-1. This testwork remains valid. Testing of the Brunswick Main ores had indicated a decrease in gravity gold recovery, flotation antimony and gold recovery and flotation kinetics. The full extent of the recovery impacts of the Brunswick ores are now understood after processing this ore as part of the overall feed blend between 2018 and 2020. The Brunswick ores had been largely depleted by the end of 2020; only small parcels have been processed since. The 2022 forecast is for 153,398 t of Youle ore and 1,531 t of Brunswick ore. Brunswick will continue to represent a very small percentage of the feed, representing approximately 1% of the blend. The metallurgical testwork and historical performance of the Youle deposit is of the most importance to the production forecast.

Metallurgical testwork was undertaken on two areas of the Youle deposit designated as 'Youle High Grade', and 'Youle Low Grade'. The location of these samples is provided in Figure 13-1 and Figure 13-2. This testwork showed that the Youle ores would demonstrate similar metallurgical behaviour to the Cuffley and Augusta ores historically fed to the plant. Both antimony and gold recoveries were high and reflected historical plant levels. It was expected that with further optimisation of the testwork conditions, the recoveries could be increased further. Plant operating data from late 2020 confirms this, with significantly improved plant performance on a predominantly Youle feed blend, particularly after flotation circuit upgrades were completed.

The two Youle Bond Ball Mill Work Index (BBMWi) tests returned similar values; 16.1 kWh/t for the low-grade sample and 15.2 kWh/t for the high-grade sample. These were similar when compared against the ore types previously processed, i.e. Cuffley at 16.0 kWh/t and Augusta at 15.5 kWh/t. The two Brunswick samples tested were softer at 14.3 kWh/t and 12.9 kWh/t. During actual operations, the Youle throughput has not been limited by grindability. A higher-than-average feed throughout was achieved in the latter part of 2020 on a predominantly Youle plant feed blend (refer to Figure 13-3) which supports this moderation in hardness. The drop in the first quarter of 2021 was associated with a mill reline and prioritisation of recovery over throughput.

Historical testwork results for the Youle metallurgical testwork are provided in Table 13-1 alongside testing for the other deposits. As expected, recoveries were higher for the high-grade sample compared to the low-grade sample. Testwork antimony recoveries were higher for both samples when compared to historic plant values. Flotation testing has shown the Youle recoveries to be relatively insensitive to a grind size between 38 µm and 75 µm and stable across a range of reagent addition regimes. The average gold recovery for both Youle samples was marginally higher than historic production records. These benchscale test results were initially moderated back to historic plant recovery levels for forecasting purposes in order to adopt a more conservative position. The gravity gold recovery was increased slightly in the LoM model to 45% (from 40%) to account for the higher percentage of Youle ore in the blend from 2021 onwards.

Table 13-1: Historic Metallurgical Testwork

Variable	Brunswick Main	Brunswick Penguin to Kiwi	Cuffley LG 0358-1	Cuffley HG M2569	Youle Low Grade	Youle High Grade
BBMWi	12.9	14.3	16.0	16.0	16.1	15.2
Feed Au g/t	8.65	11.9	9.0	17.7	4.89	13
Feed Sb %	3.31	3.88	3.00	7.98	2.56	5.1
Feed As %	0.50	0.13	0.12	0.07	0.02	0.03
Concentrate As %	3.20	0.87	0.98	0.002	0.22	0.25
Gravity Au Rec. %	22.1-25.5	30.0	41	54	43	57
Recovery Au %	87.1	93.7	98	95	96	97
Recovery Sb %	98.3	99	99	95	99	99

Compared to the Brunswick ores, Youle has lower arsenic grades and therefore, elevated arsenic grades in the antimony-gold concentrate are not considered to be an issue to saleability or payability of the product. In the current off-take agreement, there are no arsenic penalties below 0.5% in the concentrate. Arsenic grades between 0.5% - 2.0% incur a penalty of US$2/t concentrate for each 0.1% above 2.0%. This increases to US$2.5/t between 2.0% arsenic and 3.0% but it remains saleable. As a gold/antimony concentrate, it is not subject to the same arsenic grade importation limits that some base metal concentrates are imposed with. With proper management, the penalty element payments can be minimised and are not a risk to the ongoing operation.

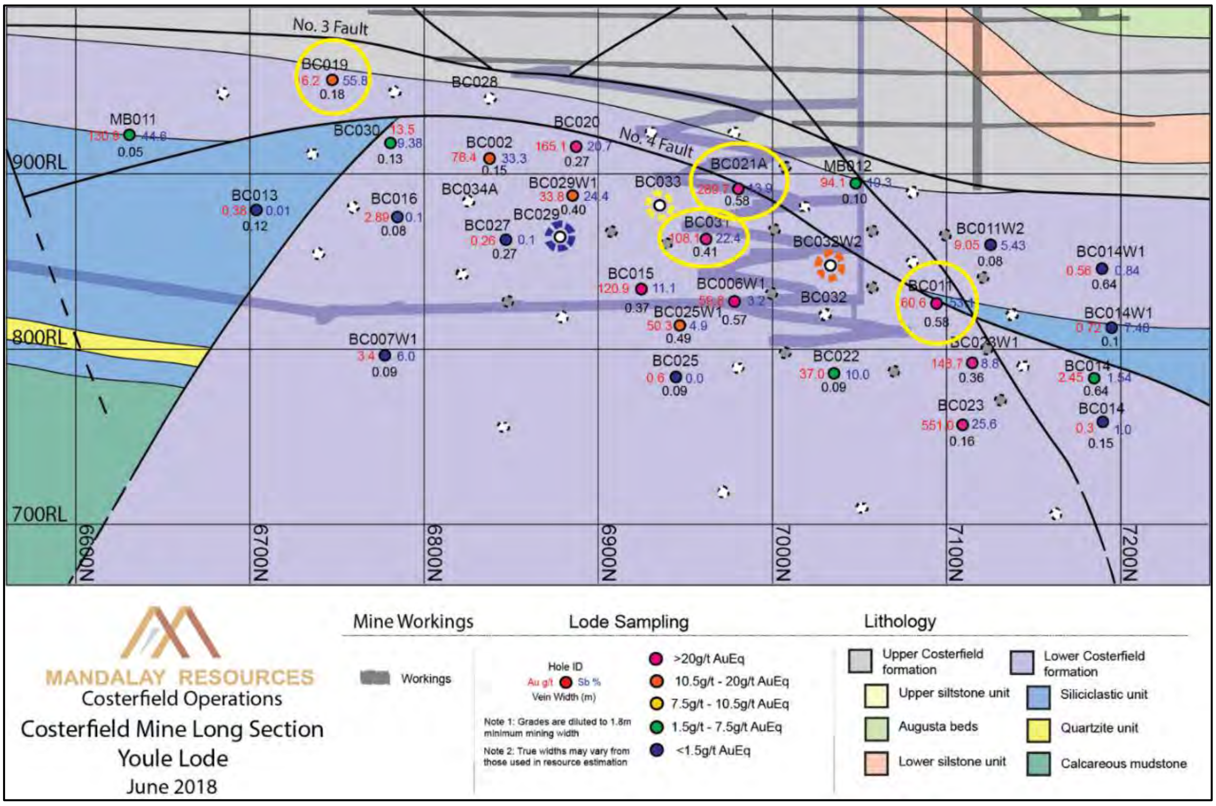


Figure 13-1: Youle High Grade Testwork Sample Locations

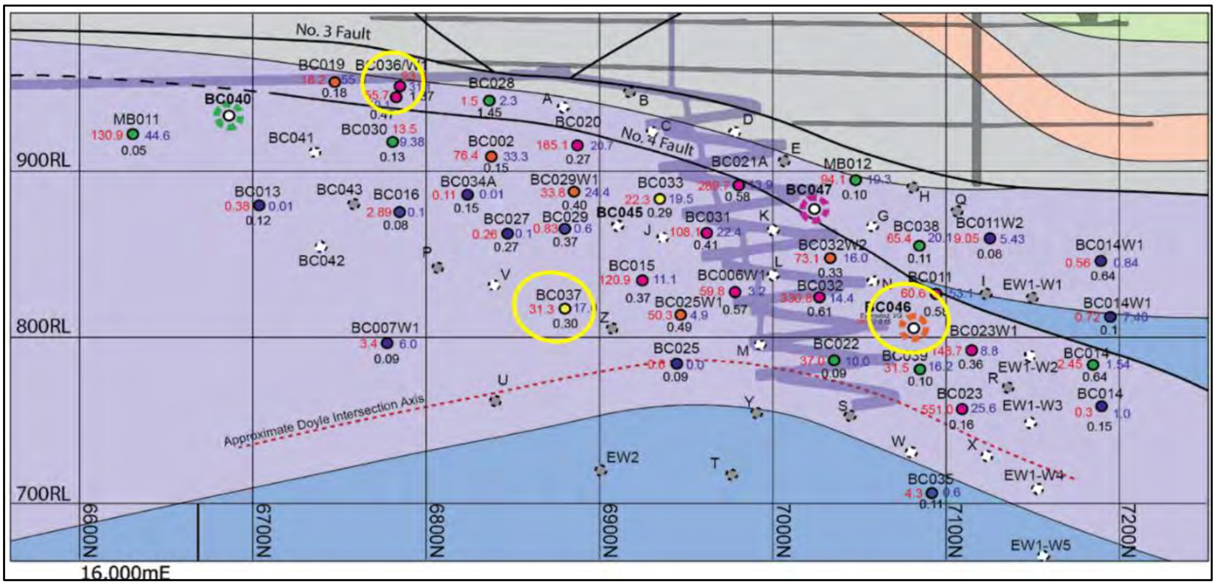


Figure 13-2: Youle Low Grade Testwork Sample Locations

13.2 Ore Blend Effect on Throughput and Recovery Forecasts

From January 2014, Cuffley ores were processed in a blend with Augusta ores. Prior to this, only Augusta ore was processed. The Cuffley ores and remaining Augusta ores were depleted by January 2020, replaced gradually by Brunswick feed. The proportion of Brunswick ores reduced significantly from the beginning of 2020 and continues to represent only a small fraction (~1%) of the mill feed (refer to Figure 17-2). Since this time, Youle has dominated the feed blend. The historic blend ratios of Augusta, Cuffley, Brunswick and Youle ores and the proposed forward LoM blend are summarised below:

- 2014: 44% Augusta and 56% Cuffley
- 2015: 42% Augusta and 58% Cuffley
- 2016: 52% Augusta and 48% Cuffley
- 2017: 64% Augusta and 36% Cuffley
- 2018: 72% Augusta, 21% Cuffley and 7% Brunswick (Brunswick from Q3)
- 2019: 38% Augusta, 5% Cuffley, 47% Brunswick and 10% Youle
- 2020: 14% Brunswick and 86% Youle
- 2021: 1% Brunswick and 99% Youle
- 2022: 1% Brunswick and 99% Youle
- LoM 2022: Principally Youle mill feed

Over the same period, plant throughput has been relatively consistent, i.e. it has been robust to changes in the feed blend. On this basis, throughput (and recovery) data from 2016 – 2021 has been used to predict mill performance, given the similar (marginally superior) performance of the Youle samples in both testwork and actual plant performance.

It is noted that during 2019 there was a deterioration in metallurgical performance, particularly for gold recovery. This was due to the introduction of Brunswick ore as the dominant component of the mill feed blend. The moderate decline of the plant gold recovery performance from the start of 2019 through to mid-2020 is shown in Figure 13-4 and Figure 17-2. This period is considered to represent outlying behaviour associated with Brunswick ores and has been excluded from the data used to develop the gold recovery algorithm. Instead, operating data from when the mill has been fed with predominantly Youle ore has been used to develop the current recovery equations.

13.3 Throughput

Historical throughput is considered to be the best indicator of future forecast throughput when processing similar ores. Through ongoing optimisation and relatively minor, low capital cost debottlenecking projects, the capacity of the Brunswick Concentrator has been increased to the current capacity which can consistently exceed 13,000 t/month and has regularly approached 14,000 t/month. Annual production data from 2015 to 2021 demonstrates this rate can be consistently achieved as presented in Figure 13-3.

The reduction in plant throughput in the latter half of 2019 was not process related, i.e. it was not a mill constraint. It was related to constrained underground mine production and as a result of the historical scats stockpile being depleted (it had previously provided up to 400 tonnes per month in 2018). In respect to the February 2021 drop in throughput, it is explained by the Ball Mill #2 being relined and afterwards, mill throughput was intentionally slightly constrained. This was due to excellent mill feed grades resulting in a focus on maintaining grind and recovery rather than maximising throughput. The budget 2022 mill throughput has remained the same as for 2021 at 152.3 kt.

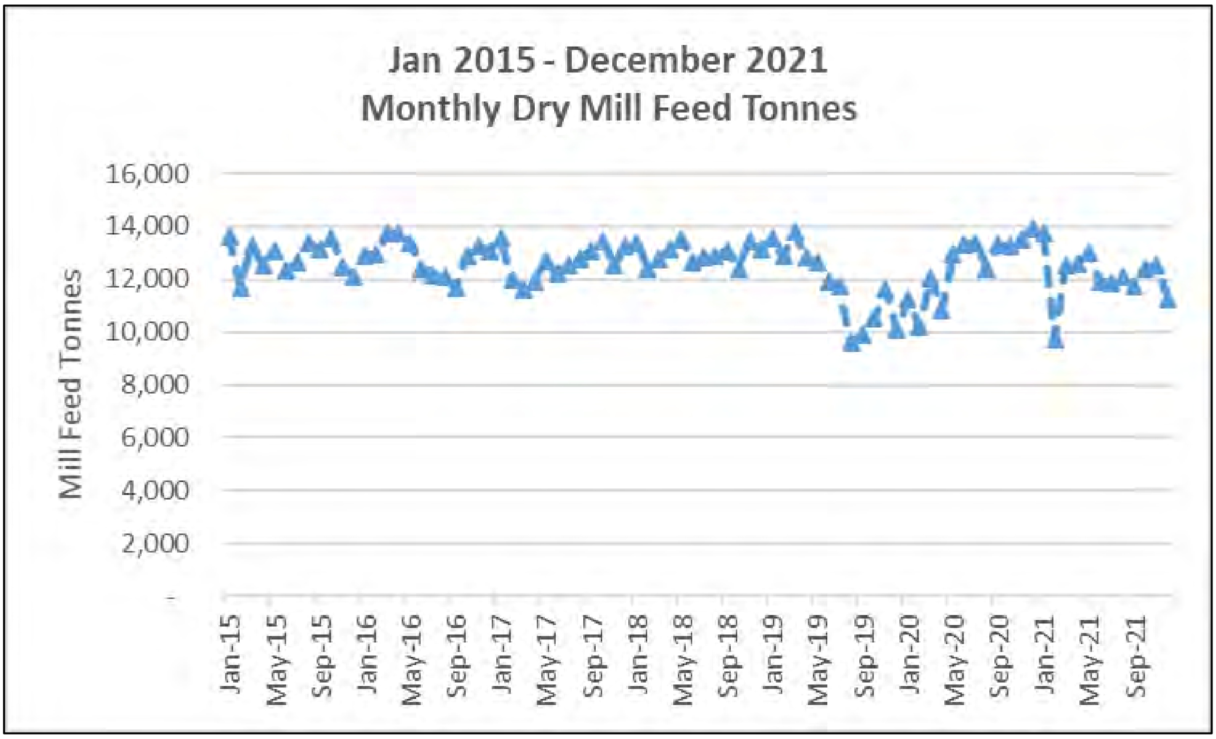


Figure 13-3: Historic Brunswick Processing Plant Throughput – 2015 to 2021

With mining production rates marginally exceeding processing throughput over the last 24 months, there is currently approximately 40,000 tonnes stored on the ROM pad. A conscious decision has been made to maintain a stockpile around this level. It provides a comfortable buffer for any disruption to mining and allows for more stable mill operations. Budgeted mine production is matched to mill throughput for 2022 in order to maintain these ROM stocks.

The mill capacity still exceeds the forecast LoM production rate of 12,700 t/month. The forecast processing rates are therefore considered to be justified and are well supported by historical production. No other changes are expected that would impact the scheduled throughput such as increasing ore hardness or a reduction to the target grind size P_{80} of

60 µm. At this rate, the plant will be operating marginally below maximum capacity. This provides potential modest production upside if mining production rates increase.

13.4 Metallurgical Recovery

There is a relationship between the plant feed head grade and the recovery for both gold and antimony. This is a common occurrence across flotation type concentrators as it is a function of having a relatively constant tail grade. Over the years, the Costerfield operation has shown these relationships to be generally robust and effective in predicting both the antimony and total gold recovery.

Forecast antimony and gold recoveries used for LoM planning, budgeting and economic modelling are based on historical feed grades and metallurgical recovery relationships developed using historical production data. This is the best method of forecasting recovery when processing a similar feed blend. These algorithms are updated annually. The latest update uses the recovery data between April 2021 – December 2021.

A period of lower gold recovery is highlighted in Figure 13-4. This deterioration was a direct result of introducing the Brunswick underground ore into the feed blend. The subsequent improvement was due to the depletion of Brunswick ores and the introduction of Youle into the mill feed blend, particularly from mid-2020 (see Figure 17-2). The Brunswick ore had a lower gold feed grade, lower gravity recovery and presented further challenges to the gold recovery due to the gold mineral associations including those with arsenopyrite and slower flotation kinetics.

The 2021 end of year (EOY) reconciled plant recoveries were 94.6% and 93.1% for antimony and gold respectively. There was a significant improvement again on gold recovery from 90.6% in 2020 to 93.1% in 2021, which can be mainly attributed to improvements in the flotation circuit and the installation of the CavTube® columns, which were commissioned in April 2021.

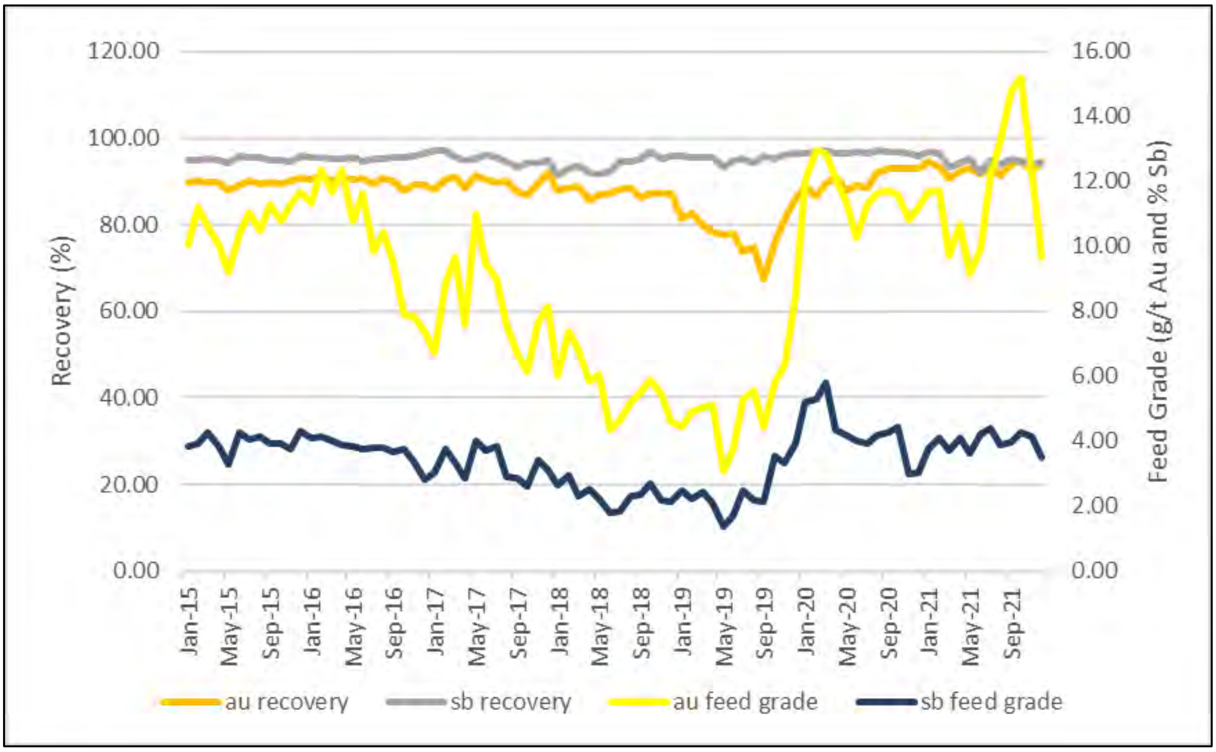


Figure 13-4: Antimony and Gold Grade versus Recovery Trends – January 2015 to December 2021

13.4.1 Youle Ores

With the addition of the Youle ores into the LoM plan, additional confirmatory testwork was undertaken in 2018. This ensured the metallurgical behaviour of the new underground deposit reflected historical performance and confirmed the Youle ores were amenable to processing through the Brunswick concentrator.

Subsequent batch campaigns of Youle underground development ore of approximately 1,500 tonnes and 2,200 tonnes, processed in October and November 2019, confirmed the expected higher gravity recoverable gold component and improved gold flotation recoveries and hence, total gold recovery of approximately 89%. The Youle trial campaign performance was considered more akin to the Cuffley ores.

The Youle deposit became the dominant mill feed source from mid-2020 as shown in Figure 17-2. Plant performance since on a predominantly Youle feed, particularly through the latter part of 2020 and 2021, has shown the modelled recovery predictions to be conservative, especially for gold, in the order of up to a few percent. The higher gravity gold recovery is the main contributing factor.

Actual Youle operating performance has now been incorporated into the recovery algorithms used to forecast the LoM antimony and gold recoveries. Due to flotation circuit upgrades in April 2021, data between April and December 2021 were used to formulate the gold recovery relationship.

13.4.2 Antimony Recovery

The antimony recovery forecast is based on algorithms based on the relationship between the antimony feed grade and metallurgical recovery using historic operating data. The most recent algorithm incorporates daily plant operating data from January 2021 – December 2021. The antimony recovery algorithm used for mine planning, and process budgeting and forecasting is provided below:

Sb recovery = (0.0039 x Sb head grade) + 0.9299

The linear model is capped at 99% recovery at feed grades of 7% antimony or above to account for high grade ore block anomalies in the ore reserve and probable mine inventory. Previous algorithms have utilised a more extensive operating period but this is now less appropriate as the feed is almost entirely from the Youle deposit and plant upgrades have resulted in improved antimony recovery performance.

Recent historical and forecast antimony recoveries for the LoM were/are:

- 2016 actual Sb recovery = 95.4% at a 3.7% Sb feed grade
- 2017 actual Sb recovery = 95.3% at a 3.3% Sb feed grade
- 2018 actual Sb recovery = 93.8% at a 2.3% Sb feed grade
- 2019 actual Sb recovery = 95.3% at a 3.9% Sb feed grade
- 2020 actual Sb recovery = 96% at a 3.03% Sb feed grade
- 2021 actual Sb recovery = 94.6% at a 3.97% Sb feed grade
- 2022 (modelled) Sb recovery = 94.1% at a 2.74% Sb feed grade

It is noted that the average antimony concentrate grade dropped marginally to 52.4% in 2017, 52.2% in 2018 and further to 51.4% in 2019, due to falling antimony feed grade. This lower concentrate grade was targeted intentionally, in order to maintain recovery. However, in 2020, the antimony in concentrate grade returned to the long-term target of 54% Sb due to the higher head grade and installation of a new StackCell® in a rougher flotation cell duty. In 2021 the antimony concentrate grade was 52.4% and this was due to concentrate produced from the CavTubes® which is at a lower Sb concentration than the main plant.

A marginally lower flotation concentrate grade of 51.5% Sb is incorporated in the LoM plan. The operating aim going forward is to maximise recovery from the CavTubes® whilst ensuring that the concentrate grade stays above 50% as this is the minimum grade in the concentrate offtake agreements. The forward forecast concentrate grade is 51.5% Sb remains the budgeted target. This provides a buffer against discrepancies between internal concentrate analysis and customer analysis.

There is a high degree of confidence in the relationship and the associated antimony recovery algorithm across a range of feed grades. It is supported by historical operating data and verified by metallurgical testwork. It provides the most reliable method of estimating the antimony recovery at variable head grades assuming a constant final Sb concentrate grade of 51.5%, the value used in the forward LoM plan.

13.4.3 Gold Recovery

The gold in feed reports to the gravity gold concentrate and to the flotation concentrate, together making up the overall gold recovery. Historically, the total gold recovery has been relatively consistent and independent of gravity recovery, i.e. the gold not recovered initially through the gravity circuit is recovered through flotation. Therefore, the difference in the calculated gravity gold recovery and overall recovery is apportioned to the flotation circuit.

The recent installation of CavTubes® was done in order to increase total gold recovery across the plant. Pilot testwork had shown the potential to reduce the gold in final tailings by approximately 30%. Significant improvement in gold recoveries have been realised with their installation and because of this, an update to the gold recovery algorithm was warranted for the 2022 forecast. It was determined that the most appropriate time period for the updated algorithm would be from the time the columns were commissioned (April 2021) until the end of 2021. A logarithmic relationship was used for gold recovery as it plateaus at higher grade, drops at lower grades, and has a better correlation than a linear relationship. The updated relationship is presented below:

$$\text{Au recovery} = (0.0609 \times \ln(\text{Au feed grade})) + 0.7727$$

This is used to calculate the total gold recovery for any given feed grade. The gold recovery data used to develop the algorithms for LoM recovery forecasting for 2022 is provided below:

- 2021 April to December
- Total gold recovery 93.0%
- Gravity recovery 47.3%
- 10.7 g/t Au head grade.

The LoM modelled forecast gold recovery weighted averages are:

- Model (2022) 92.7% at a 12.56 g/t head grade

- Model (2022) fixed gravity deportment at 45%

The gravity gold recovery shows a level of variability but is typically between 40 – 55% Au (absolute). This gravity gold trend has continued with the predominantly Youle feed blend. A nominal gravity gold recovery factor is used for forecasting purposes as the operating data variability complicates the application of a more sophisticated gravity gold recovery relationship.

The annual gold recovery has been consistent over many years and there is a high degree of confidence in the gold recovery algorithm across a range of feed grades in forecasting the annual gold recovery. It is supported by historical operating data and verified by metallurgical testwork. It provides the most reliable method of estimating the gold recovery at variable head grades. It is likely to be conservative.

13.4.4 Circuit upgrades

Two flotation circuit upgrades were completed in 2021 with a material increase in gold recovery realised as a result. The planned circuit upgrades for 2022 include new filtration technology for the flotation concentrates, and the crushing circuit being upgraded to two-stage crushing from current single stage crushing operation. Both upgrades aim to increase redundancy across the plant and will contribute to less overall plant downtime. Crushing a finer mill feed may also lead to increased mill throughput, although this has not been forecast into the LoM plan. Neither of these upgrades are envisaged to improve either gold or antimony recoveries.

14 MINERAL RESOURCE ESTIMATES

Gold and antimony grades, and lode thicknesses were estimated using the two-dimensional (2D) accumulation estimation method for all lodes. This method has been discussed in Bertoli et. Al., 2003, and is considered by the QP to be more suitable for modelling narrow vein systems than conventional three-dimensional (3D) block grade estimation due to its ability to more accurately model thin tabular geometry. The 2D accumulation method has remained the preferred Mineral Resource estimation methodology for the Costerfield Property lodes since 2008 (AMC, 2008), and is often called a seam-model estimation method.

The 2D accumulation method requires that gold and antimony grades are multiplied by the true thickness of the intersection in order to generate variables referred to as accumulations or accumulated grades, measured in gram/metres or percent/metres. This method assigns weights to composites of different lengths during estimation. Estimated gold and antimony block grades are then back-calculated from the estimated accumulated block grade by dividing by the estimated true vein thickness.

Only those lode models that feature new drilling, face sampling and assay data and/or revised geological interpretation have been re-estimated for the production year 2021. The focus of mining, exploration and the estimations were Youle (500 series models) and Shepherd (600 series models) with additional drill information and re-estimation on the KR Model (310) at Brunswick.

A summary of the changes made to the lode models within this Mineral Resource Estimate are summarised in Table 14-1.

Table 14-1: List of changes made to lodes at year-end 2021

Lode	Zone Code	New data captured during 2021	New Estimation	New Resource Classification	Depleted during 2021	Reported above cut-off	Removed from Resource
E Lode	10	No	No	No	No	Yes	No
B Lode	15	No	No	No	No	Yes	No
BSP Lode	16	No	No	No	No	Yes	No
W Lode	20	No	No	No	No	Yes	No
C Lode	30	No	No	No	No	Yes	No
NM Lode	40	No	No	No	No	Yes	No
NW Lode	47	No	No	No	No	Yes	No
NSP 48 Lode	48	No	No	No	No	Yes	No
P1 Lode	55	No	No	No	No	Yes	No
K Lode	60	No	No	No	No	Yes	No
CM Lode	210	No	No	No	No	Yes	No
CE Lode	211	No	No	No	No	Yes	No

Lode	Zone Code	New data captured during 2021	New Estimation	New Resource Classification	Depleted during 2021	Reported above cut-off	Removed from Resource
CD Lode	220	Yes[3]	No	No	No	Yes	No
CDL Lode	225	No	No	No	No	Yes	No
AS Lode	230	No	No	No	No	Yes	No
Brunswick	300	No	No	No	Yes	Yes	No
Brunswick KR	310	Yes	Yes	Yes	No	Yes	No
SKC CE	400	No	No	No	No	Yes	No
SKC LQ	405	No	No	No	No	Yes	No
SKC C	410	No	No	No	No	Yes	No
SKC W	420	No	No	No	No	Yes	No
Youle	500	Yes	Yes	Yes	Yes	Yes	No
Youle East	501	No	No	No	No	Yes	No
Kendal Splay	503	Yes	Yes	Yes	Yes	Yes	No
Peacock	508	Yes	Yes	Yes	Yes	Yes	No
Youle South Splay	525	Yes	Yes	Yes	Yes	Yes	No
Peacock Splay	531	Yes	Yes	Yes	Yes	Yes	No
Shepherd	600	Yes	Yes	Yes	Yes	Yes	No
Ryeland	604	Yes	Yes	Yes	Yes	Yes	No
Merino	605	Yes	Yes	Yes	No	Yes	No
Dorset	606	Yes	Yes	Yes	No	Yes	No
Suffolk	620	Yes	Yes	Yes	No	Yes	No
Drysdale	621	Yes	Yes	Yes	No	Yes	No

14.1 Diamond Drill Hole and Underground Face Sample Statistics

The resource estimation was undertaken on full-length composites of vein intercepts with no residuals for both face samples and drill hole samples. Raw sample intervals were weighted by bulk density when compositing, with stibnite (SG = 4.63) percentage having the dominant influence on bulk density of a raw sample. This represented a change from the pre-2021 models and has not been retrospectively applied to the reconciled historic models in this resource estimate.

Refer to Section 14.6.1 for more information on the mineralised density and regression formula based on antimony percent applied.

[3] Additional drilling was completed on the Cuffley Deeps Lode (220) that is not material to the existing resource and is the focus of ongoing exploration

Statistics for composited gold grades, antimony grades, and true thickness for the Shepherd, Youle, and KR lodes are presented in Table 14-2.

Table 14-2: Raw face and diamond drilling sample statistics; uncapped

Lode	Zone	Type	Variable	No. of Samples	Min	Max	Mean	CV
KR-Brunswick	310	Drill Hole	Au (g/t)	41	0.01	155.4	16.5	1.7
			Sb (%)		0.001	25.1	5.3	1.2
			Vein Width (m)		0.06	2.8	0.56	1.0
Youle	500	Drill Hole	Au (g/t)	241	0.001	540.2	35.7	1.8
			Sb (%)		0.001	56.6	9.9	1.3
			Vein Width (m)		0.009	1.9	0.4	0.9
		Face Sample	Au (g/t)	2,435	0.001	2480.0	97.3	1.5
			Sb (%)		0.001	67.1	27.2	0.7
			Vein Width (m)		0.005	3.7	0.3	1.2
Peacock	508	Drill Hole	Au (g/t)	41	0.001	52.3	15.1	1.2
			Sb (%)		0.001	50.3	13.1	1.1
			Vein Width (m)		0.059	1.5	0.3	1.1
		Face Sample	Au (g/t)	158	0.1	1950.0	95.7	1.9
			Sb (%)		0.001	62.3	33.1	0.5
			Vein Width (m)		0.02	1.8	0.3	1.0
Youle South Splay	525	Drill Hole	Au (g/t)	6	0.09	264.0	57.6	1.6
			Sb (%)		0.14	28.6	14.3	0.8
			Vein Width (m)		0.139	0.4	0.2	0.3
		Face Sample	Au (g/t)	97	0.29	582.0	65.1	1.2
			Sb (%)		0.21	59.9	25.1	0.5
			Vein Width (m)		0.03	0.5	0.2	0.5
Peacock Splay	531	Drill Hole	Au (g/t)	3	0.11	10.2	3.6	1.3
			Sb (%)		1.4	10.9	4.7	0.9
			Vein Width (m)		0.073	0.5	0.2	0.8
		Face Sample	Au (g/t)	22	0.431	263.0	37.5	1.5
			Sb (%)		0.01	50.6	19.2	0.7
			Vein Width (m)		0.02	1.2	0.2	1.4
Shepherd	600	Drill Hole	Au (g/t)	84	0.02	817.5	57.3	1.9
			Sb (%)		0.001	36.5	3.5	2.2
			Vein Width (m)		0.059	1.7	0.5	0.8
		Face Sample	Au (g/t)	12	2.02	196.0	54.8	1.0
			Sb (%)		0.11	49.8	15.6	1.0
			Vein Width (m)		0.12	1.1	0.4	0.7
Ryeland	604	Drill Hole	Au (g/t)	18	0.001	657.0	66.9	2.2
			Sb (%)		0.001	4.8	0.3	3.6
			Vein Width (m)		0.046	1.2	0.2	1.2
			Au (g/t)	4	47.7	196.0	102.9	0.6

Lode	Zone	Type	Variable	No. of Samples	Min	Max	Mean	CV
		Face Sample	Sb (%)		29.9	36.6	34.4	0.1
			Vein Width (m)		0.09	0.1	0.1	0.1
Merino	605	Drill Hole	Au (g/t)	21	0.001	120.6	20.6	1.7
			Sb (%)		0.001	1.0	0.1	3.4
			Vein Width (m)		0.073	1.0	0.3	0.8
Dorset	606	Drill Hole	Au (g/t)	9	0.001	124.0	30.0	1.3
			Sb (%)		0.001	0.0	0.0	1.3
			Vein Width (m)		0.04	0.5	0.2	0.9
Suffolk	620	Drill Hole	Au (g/t)	50	0.001	308.0	36.4	1.8
			Sb (%)		0.001	10.5	0.6	3.3
			Vein Width (m)		0.04	1.3	0.3	0.8
Drysdale	621	Drill Hole	Au (g/t)	10	0.001	115.0	24.7	1.5
			Sb (%)		0.001	13.5	1.7	2.4
			Vein Width (m)		0.043	0.2	0.1	0.5

The tabulated data indicates that the unweighted average gold and antimony grades are higher within the face sample data than the drill holes. This is attributed to the following factors:

1. Face sample data is collected representatively within ore drives, however, these ore drives exist only in areas of the deposit that are deemed economically viable. Therefore, the average grade of these samples is higher than that of the drilling data which includes intercepts within areas that are sub-economic.

2. Separation between face samples can be as little as a production cut of 1.8 m versus the ~40 m indicated spacing for drilling, leading to highly clustered data in economic areas.

3. Drill core is sampled at an angle perpendicular to the long axis of the core rather than along the boundary of the targeted vein. The sample is taken so that the entire vein is within the sample, and therefore, there is invariably a wedge of waste rock that is included with the lode sample. During face sampling the material is only collected within the vein boundary. This difference in sampling manifests as proportional lower average grades and higher average widths within drill data when compared to face sample data.

The Shepherd Lode system (600 series) shows a marked difference to the Youle Lode system (500 series) in the prevalence of gold relative to antimony, with zones of little to no antimony in many of the grade domains and lodes. This agrees with visual observations of the drillcore, which show increased and dominant quartz percentages in the gangue, as well as the increase in visible gold.

A comparison of face samples and drill holes was completed for the dominant mining area at Youle (500), by restricting the face sample dataset to only include face samples within 10 m of a drill hole intersection. Results showed face sampling had a positive bias in low-grades in both Au-Accumulation and Sb-Accumulation (Figure 14-1), with a decreasing bias above the resource cut-off grade (3.0 g/t Au Equivalent diluted to a 1.2 m resource width, corresponding to 3.6 Au Accumulation and 2.4 Sb Accumulation independently).

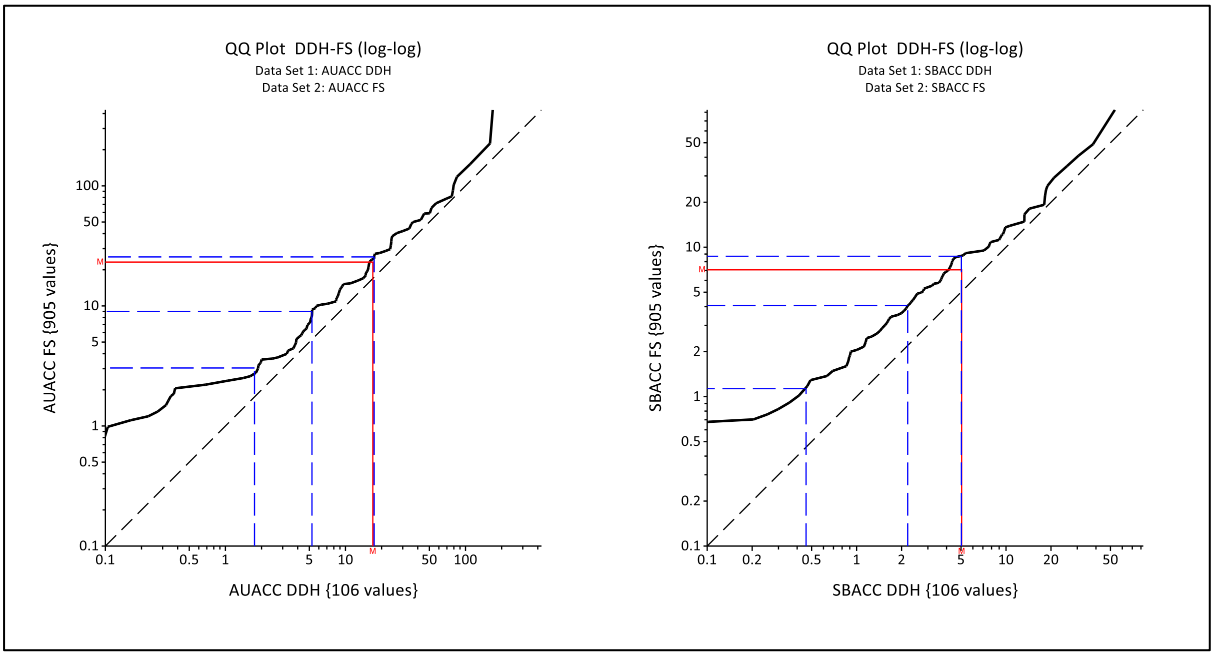


Figure 14-1: Log Q-Q plot of Sb-Accumulation and Au-Accumulation comparisons of drill hole data and face sample data, showing all data (500 block model). 40x40x40 cell declustering applied

True thickness of intersections displayed the reverse bias, for the reasons outlined in point 3 above, with a positive bias at low widths, changing to a negative bias at a true thickness above one metre thickness (Figure 14-2).

The log probability of this face sample and drill hole subset indicates that a large degree of the discrepancy exists below the cut-off grades (Figure 14-3, Figure 14-4 and Figure 14-5). Refer also to Section 14.15 for a discussion on the performance of the models against production when reconciled.

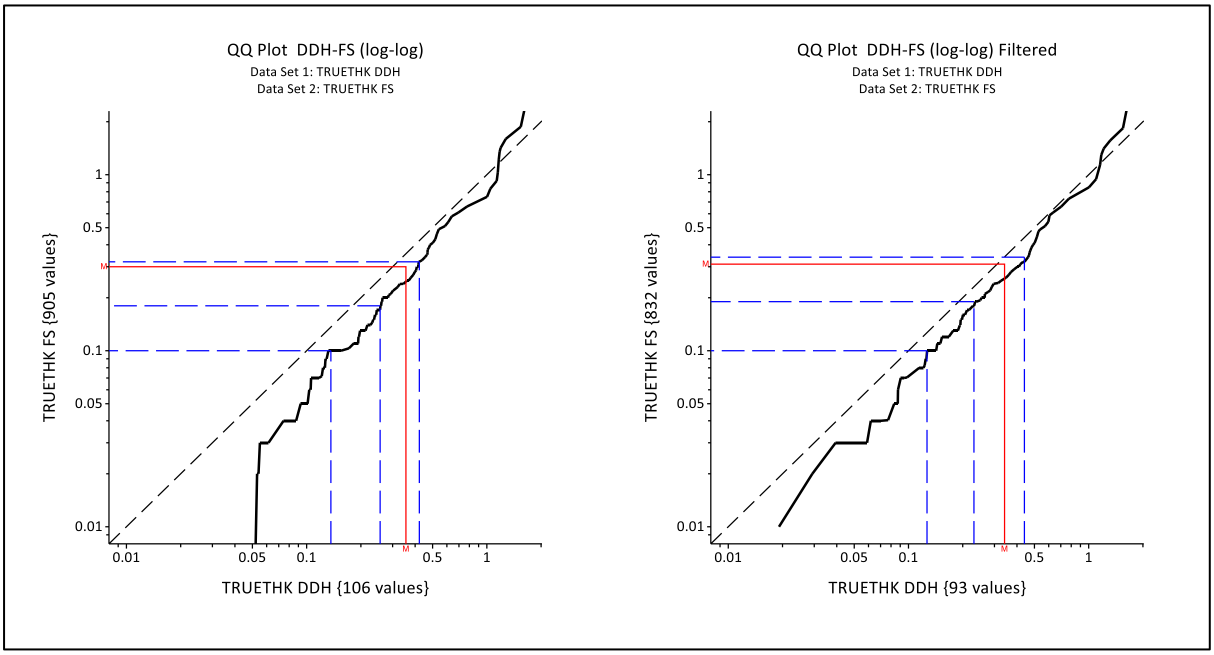


Figure 14-2: Log Q-Q plot of true-thickness comparisons of drill data and face sample data (500 block model). Left hand side shows all data, right hand side the filtered subset as above

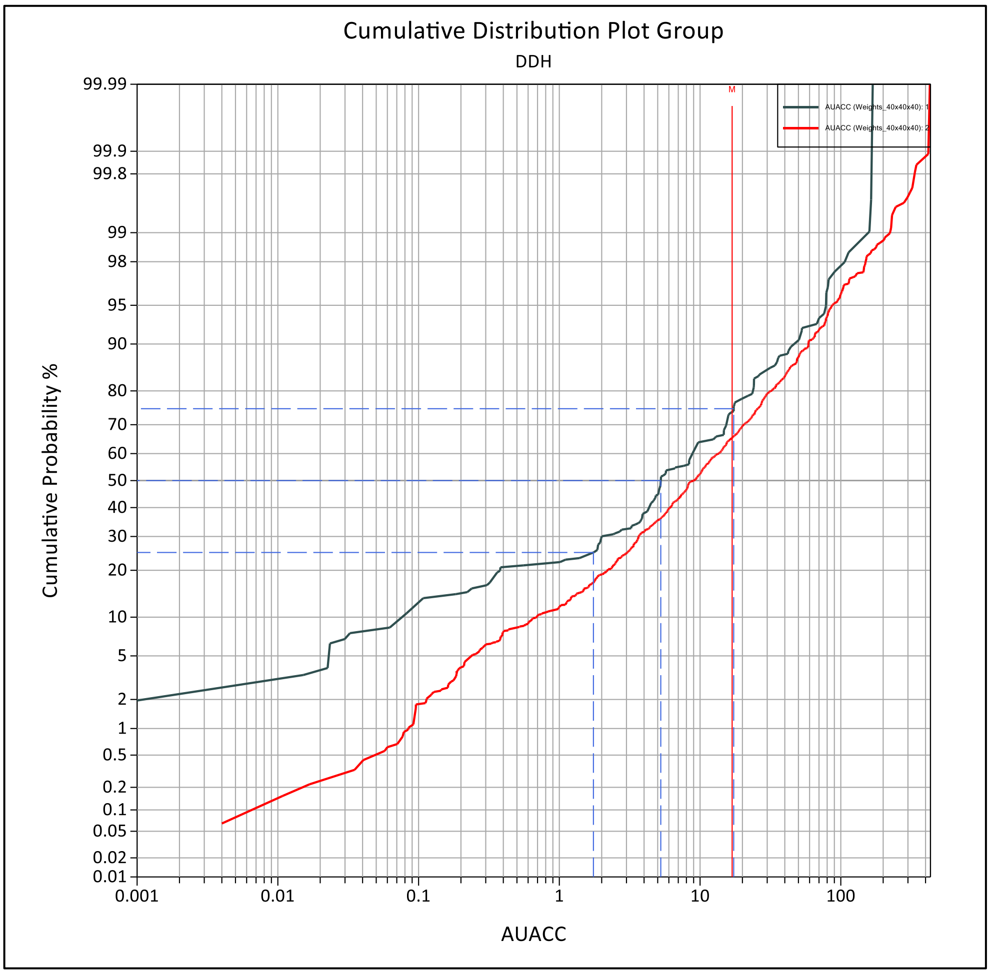


Figure 14-3: Log probability plot of Au-Accumulation, drill hole data in black and face sample data in red

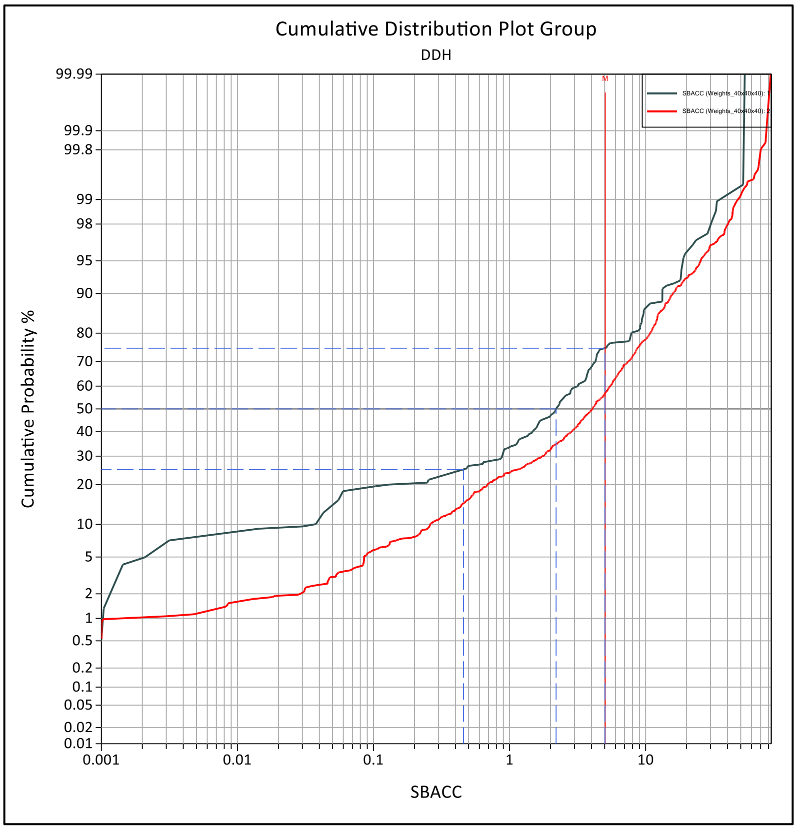


Figure 14-4: Log probability plot of Sb-Accumulation, drill hole data in black and face sample data in red

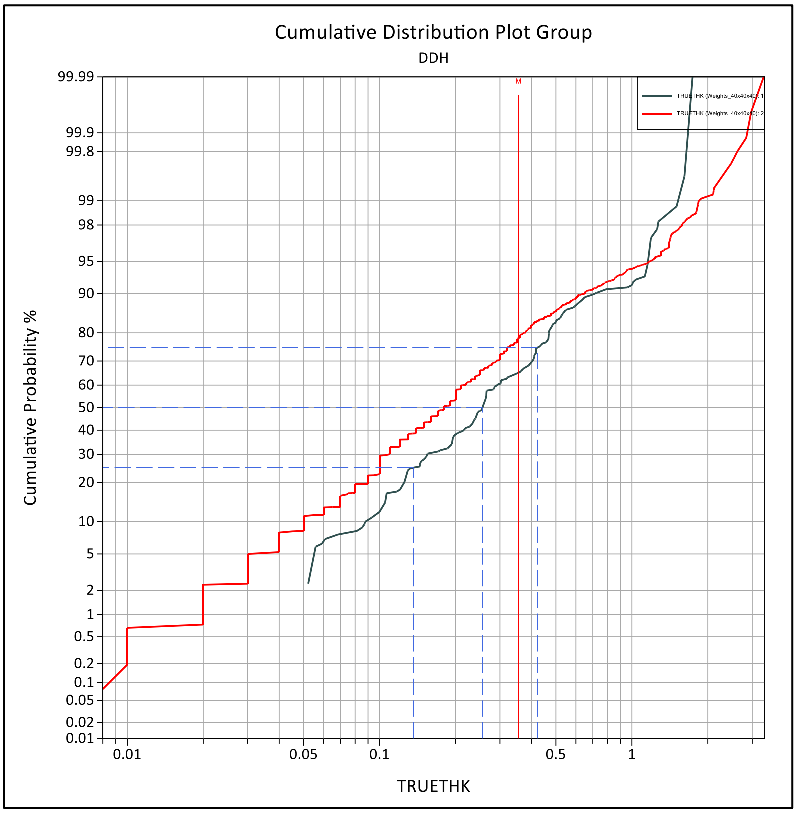


Figure 14-5: Log probability plot of true thickness, drill hole data in black and face sample data in red

The QP considers that, at grades and thicknesses of economic interest, the small positive biases seen in the grade accumulation variables and negative bias seen in thickness variable in the face samples relative to the drill hole samples are not material and support the combination of these two datasets for the purposes of Mineral Resource Estimation.

14.2 Geological Interpretation and Domaining

Data and observations from drill logs, core photography, underground face mapping, georeferenced face photography and backs mapping were considered during the process of wireframe modelling. The identified intervals within both drill hole data and underground face sample data are incorporated into the wireframe of each lode structure. This wireframe is then used to flag the selected data with the corresponding zone code. Each lode structure has been modelled separately and assigned a unique numeric zone code. The assays have been composited over the full width of the intersections (including any intervening waste), by lode.

Grade domaining on each lode/zone code was driven by geological interpretations of the structural context and grade-tenure. Grade domains were used on both the Youle 500 series and Shepherd 600 series models (Table 14-3) in order to separate high-grade and low-grade populations to an acceptable degree, and to further limit data trends of grade-shoots.

Table 14-3: Number of grade domains used in 2021 resource models

Youle series models	Model #	Num. Grade Domains	Shepherd series models	Model #	Num. Grade Domains
Youle	500	6	Shepherd	600	2
Peacock	508	4	Ryeland	604	1
Youle Splay	525	1	Merino	605	1
Peacock Splay	531	1	Dorset	606	1
			Suffolk	620	3
			Drysdale	621	1

Where there was limited data attributed to a lode, a single grade domain coincident with the model boundary string was used. The KR Lode (310) is the only new estimate outside of Youle and Shepherd that utilised >1 grade domain.

Domains for the Youle Lode, including sample locations, are displayed in Figure 14-6 as an example, with a brief description of the domains and their geological context outlined in Table 14-4.

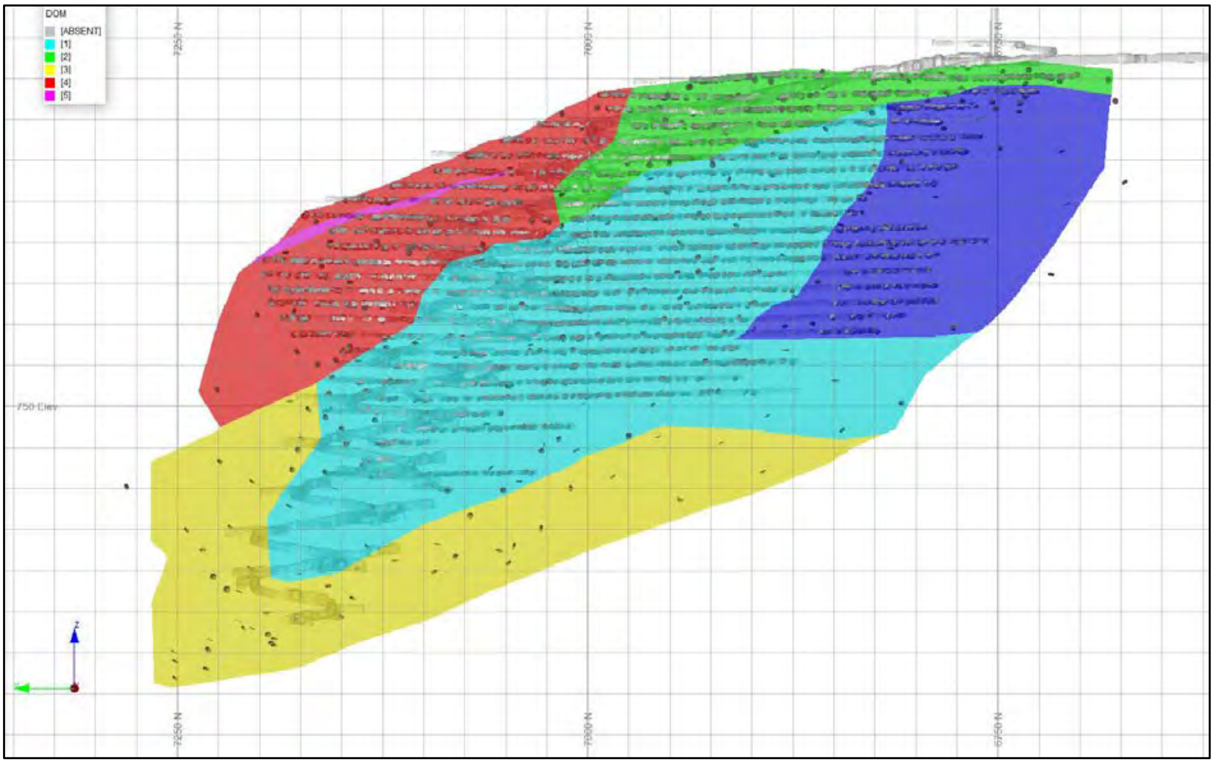


Figure 14-6: Longitudinal projection of the Youle Lode, displaying domains determined by grade and structural controls on mineralisation

Table 14-4: Youle estimation domains and geological context

Domain Description	Domain Code	Description
Youle – shallow dip	1	~50 degree dip. Reactivated and mineralised west-dip thrust
Youle – steep dip	2	High-grade upper domain, steeper dip than lower Youle
Youle – shallow – lower grade	3	Waste domain after major grade drop-off of Youle. Structure Only, shallowing down-dip
Kendal Style	4	Sub-vertical Au-Sb extension veining as Youle flattens over the anticline to the East. Connects with historical workings
Vulture Fault	5	Fault disruption. Thin and low-grade
South Zone	6	Southern ore pod driven by a structural flex to a more north-east strike that interacts between the Doyle hangingwall and footwall

14.3 Grade Capping

Grade capping was conducted as a part of the estimation process to mitigate the disproportionally large influence of extremely high grades on the estimated mean grade. Statistical analysis of each domain for all lodes included in the 2021 Mineral Resource Estimation was completed using Datamine Supervisor (formerly Snowden) software to identify statistical outliers that may cause over-estimation of grade.

Although true thickness is a physical measurement of the lode geometry rather than chemical assay, it is also subject to grade capping to ensure that instances of the effects of significant localised dilation of the lode, or blowouts, are minimised in the same way that disproportionately high gold and antimony grades are capped.

Histograms, log probability plots, disintegration plots and cumulative metal plots were utilised to determine the appropriate grade caps for gold accumulation (AUACC), antimony accumulation (SBACC) and true thickness (TT). Examples of statistical plots generated with the Datamine Supervisor package, and used in this process, are provided in Figure 14-7 to Figure 14-9 for Youle Domain 2. Figure 14-10 provides an example of a disintegration plot and has been completed following the method of Glacken (2020).

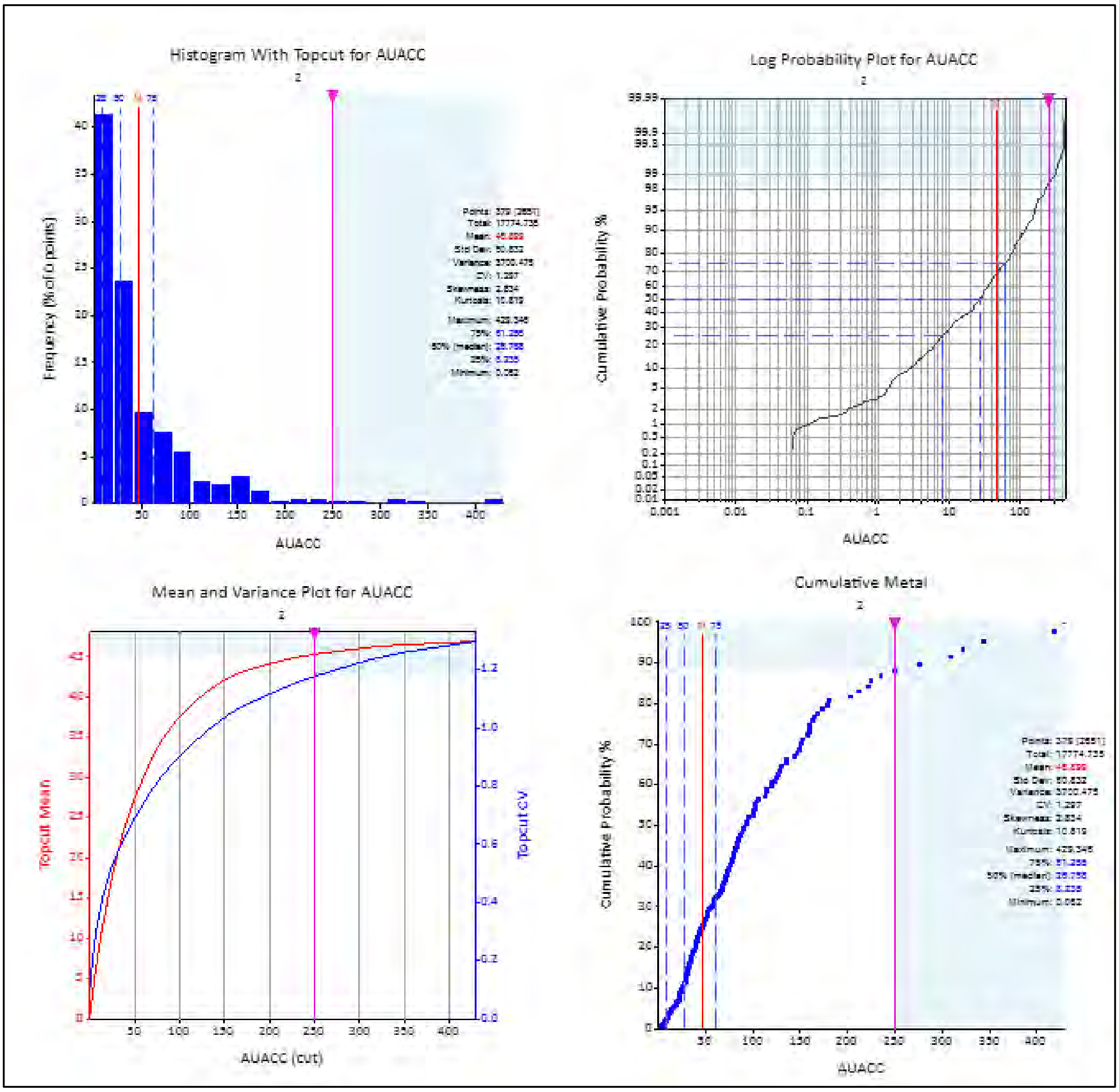


Figure 14-7: Youle Domain 2 – Grade capping statistical plots for Au-Accumulation

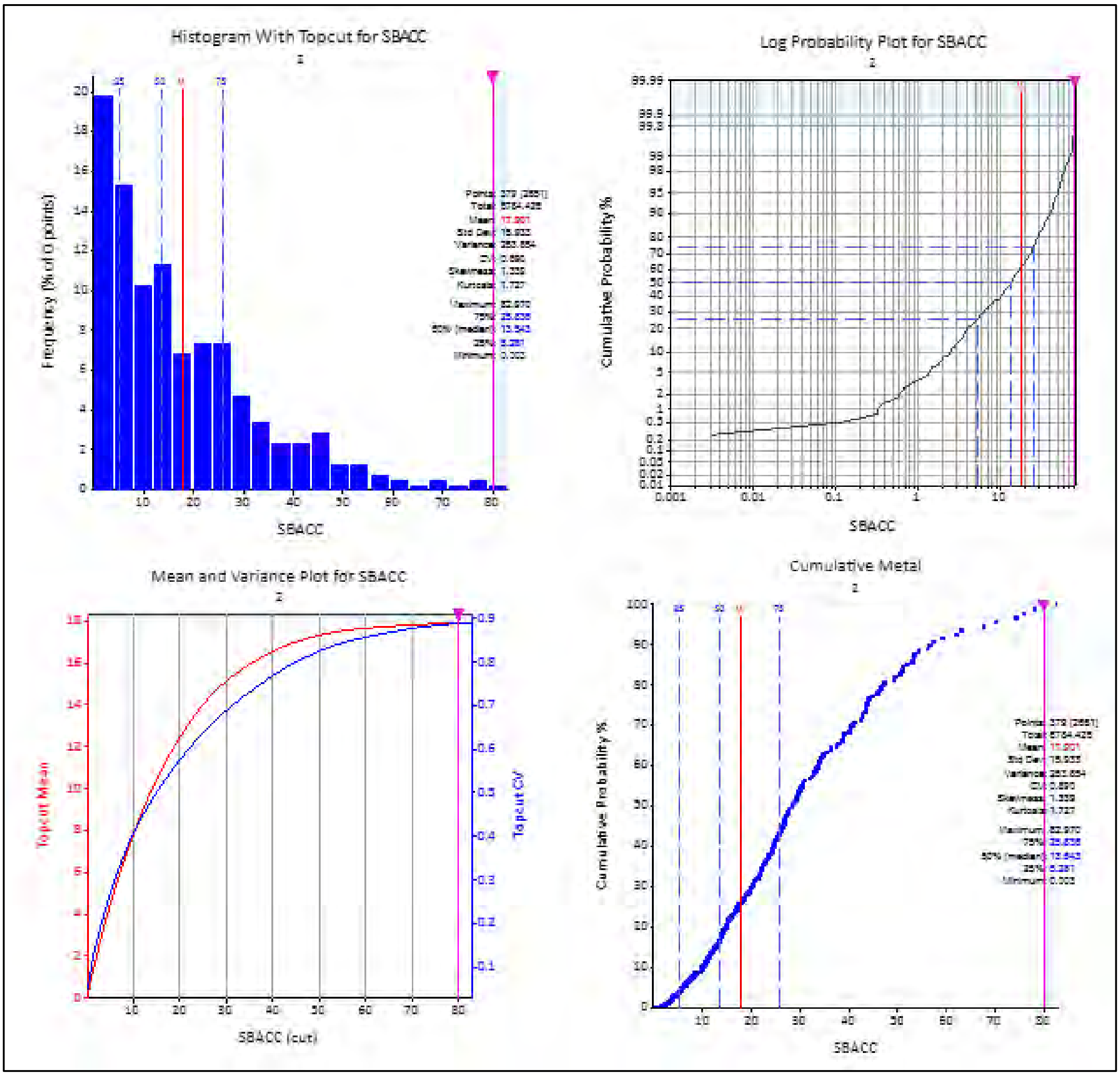


Figure 14-8: Youle Domain 2 – Grade capping statistical plots for Sb-Accumulated

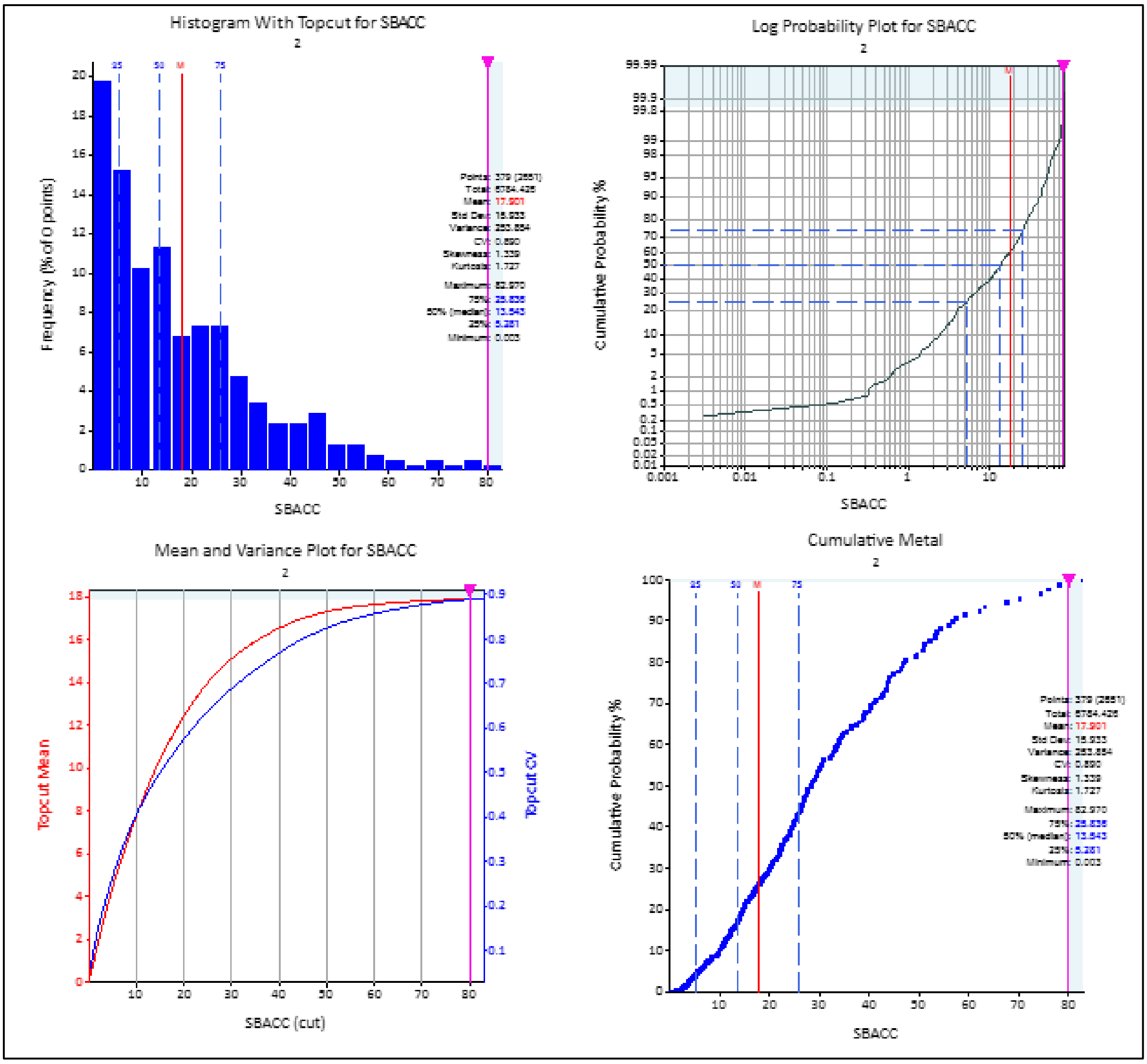


Figure 14-9: Youle Domain 2 – Grade capping statistical plots for true thickness

# of Values	379	DOMAIN 2 AUACC
Cut Value	250	
Percent Rank of Cut	98.1%	
Disintegration %	5%	Way of Viewing with conditional formating

	Avg	%Diff	StdDev	CV	Cv% Diff
Uncut Avg	46.90		60.83	1.30	
Cut Avg	45.31	3.4%	53.34	1.18	9.2%

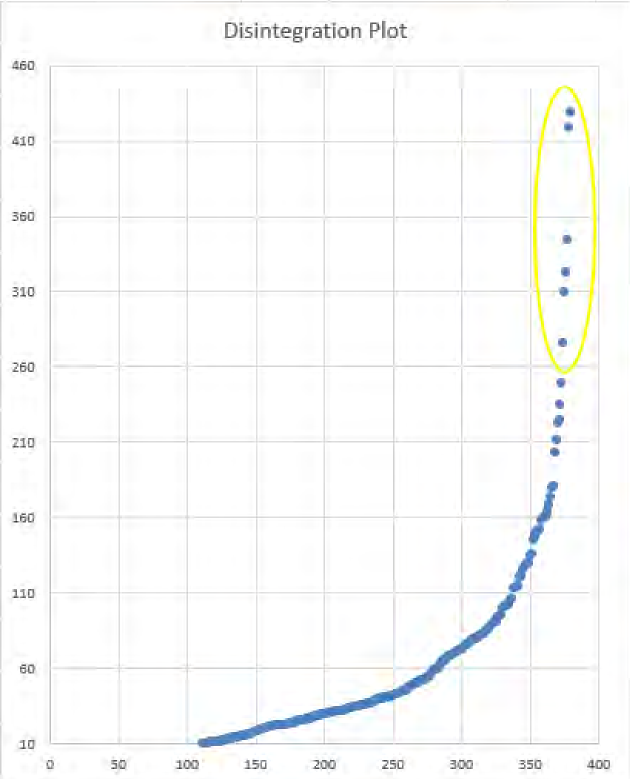


Figure 14-10: Example of a disintegration plot, used in data heavy Au-accumulation domains

The uncapped and grade capped values, and the effect of grade outliers on the overall sample statistics for the 2021 models are provided in Table 14-5.

Table 14-5: Sample statistics for the 2021 models, before and after grade caps

Model	Variable	Domain	Number of Samples		Mean Grade			Capping Value	Standard Deviation		Coeff of Variation		Max Un-capped Grade	Capped %ile
			Un-capped	Capped	Un-capped	Capped	Diff (%)		Un-capped	Capped	Un-capped	Capped		
KR (Brunswick) – 310	AUACC	1	37	1	5.14	4.92	-4%	32.5	7.83	6.78	1.52	1.38	46.54	97.3%
		2	4	0	66.3	-	-	-	71.6	-	1.08	-	182	100.0%
	SBACC	1	37	0	2.28	-	-	-	3.95	-	1.73	-	17.74	100.0%
		2	4	0	12.4	-	-	-	10	-	0.8	-	26.7	100.0%
	TT	1	37	2	0.53	0.5	-6%	1.5	0.48	0.37	0.91	0.75	2.78	94.6%
		2	4	0	0.73	-	-	-	0.31	-	0.42	-	1.17	100.0%
YOULE – 500	AUACC	1	1421	2	33.26	33.11	0%	405	51.78	50.39	1.56	1.52	603	99.9%
		2	379	6	46.9	45.31	-0.0339	250	60.83	53.34	1.3	1.18	429.35	98.4%
		3	53	1	0.03	0.03	0	0.3	0.1	0.07	3.04	2.51	0.66	98.1%
		4	490	1	13.6	13.3	-0.02206	135	20.86	17.87	1.53	1.34	280.72	99.8%
		5	10	2	3.53	0.58	-84%	1.5	7.72	0.59	2.18	1.02	25.98	80.0%
		6	324	3	4.61	4.46	-0.03254	26	6.17	5.41	1.34	1.21	50.64	99.1%
	SBACC	1	1421	2	6.89	6.86	0%	70	8.83	8.56	1.28	1.25	94.6	99.9%
		2	379	1	17.9	17.89	-0.00056	80	15.93	15.9	0.89	0.89	82.97	99.7%
		3	53	2	0.02	0.02	0	0.2	0.08	0.05	3.41	2.98	0.47	96.2%
		4	490	4	7.15	7.06	-0.01259	38	7.69	7.22	1.08	1.02	55.61	99.2%
		5	10	2	0.52	0.28	-46%	0.55	0.71	0.21	1.37	0.72	2.48	80.0%
		6	324	2	3	2.94	-0.02	17	3.74	3.42	1.25	1.16	28.44	99.4%
	TT	1	1421	3	0.31	0.31	0%	2.6	0.34	0.33	1.1	1.08	3.04	99.8%
		2	379	3	0.67	0.67	0	3	0.62	0.61	0.92	0.91	3.7	99.2%
		3	53	1	0.27	0.25	-0.07407	0.95	0.28	0.2	1.06	0.81	1.86	98.1%

Model	Variable	Domain	Number of Samples		Mean Grade			Capping Value	Standard Deviation		Coeff of Variation		Max Un-capped Grade	Capped %ile
			Un-capped	Capped	Un-capped	Capped	Diff (%)		Un-capped	Capped	Un-capped	Capped		
		4	490	5	0.21	0.2	-0.04762	1.2	0.23	0.21	1.11	1.04	1.75	99.0%
		5	10	2	0.1	0.09	-10%	0.16	0.08	0.06	0.78	0.69	0.23	80.0%
		6	324	3	0.21	0.2	-0.04762	1.2	0.2	0.19	0.98	0.92	1.52	99.1%
PEACOCK – 508	AUACC	1	91	2	42.92	30.87	-28%	235	133.14	46.28	3.1	1.5	1268.75	97.8%
		2	74	2	8.24	7.25	-0.12015	35	13.05	8.68	1.58	1.2	78.3	97.3%
		3	9	1	0.06	0.04	-0.33333	0.1	0.08	0.04	1.42	1.01	0.26	88.9%
		4	25	1	0.96	0.56	-0.41667	1.5	1.54	0.5	1.6	0.89	5.27	96.0%
	SBACC	1	91	0	8.66	-	-	-	6.97	-	0.8	-	34.79	100.0%
		2	74	0	3.92	-	-	-	3.52	-	0.9	-	13.22	100.0%
		3	9	1	0.02	0.01	-50%	0.02	0.05	0.01	2.29	0.98	0.16	88.9%
		4	25	1	5.08	3.5	-0.31102	10	7.24	3.32	1.42	0.95	24.71	96.0%
	TT	1	91	3	0.32	0.31	-0.03125	1	0.3	0.23	0.93	0.76	1.8	96.7%
		2	74	1	0.21	0.16	-0.2381	0.65	0.32	0.15	1.53	0.91	1.53	98.6%
		3	9	1	0.39	0.38	-3%	0.8	0.27	0.25	0.7	0.66	0.94	88.9%
		4	25	3	0.27	0.22	-0.18519	0.45	0.24	0.16	0.9	0.73	0.76	88.0%
Youle South Splay – 525	AUACC	1	103	2	12.24	11.86	-3%	80	17.32	15.53	1.41	1.31	101.43	98.1%
	SBACC	1	103	1	4.4	4.38	-0.00455	11.5	3.1	3.06	0.7	0.7	13.18	99.0%
	TT	1	103	2	0.19	0.19	0	0.45	0.1	0.09	0.52	0.5	0.51	98.1%
531	AUACC	1	18	0	4.64	-	-1	-	4.63	-	0.95	-	18.4	100.0%
		2	18	0	3.24	-	-100%	-	2.49	-	0.77	-	8.96	100.0%
	SBACC	1	18	0	0.304	-	-1	-	0.362	-	1.19	-	1.2	100.0%
		2	7	0	0.139	-	-100%	-	0.159	-	1.143	-	0.38	100.0%
	TT	1	7	0	0.34	-	-1	-	0.3	-	0.87	-	0.8	100.0%

Model	Variable	Domain	Number of Samples		Mean Grade			Capping Value	Standard Deviation		Coeff of Variation		Max Un-capped Grade	Capped %ile
			Un-capped	Capped	Un-capped	Capped	Diff (%)		Un-capped	Capped	Un-capped	Capped		
		2	7	0	0.06	-	-1	-	0.038	-	0.63	-	0.12	100.0%
600	AUACC	1	34	0	21.87	-	-	-	19.63	-	0.9	-	103.62	100.0%
		2	62	1	22.52	20.03	-11%	160	50.23	35.95	2.23	1.8	375.01	98.4%
	SBACC	1	34	1	6.69	6.47	-0.03288	25	7.85	7.07	1.17	1.09	41.58	97.1%
		2	62	6	0.18	0.05	-72%	0.32	0.53	0.1	3.02	2.16	3.18	90.3%
	TT	1	34	0	0.6	-	-	-	0.47	-	0.78	-	1.72	100.0%
		2	62	0	0.41	-	-	-	0.33	-	0.8	-	1.37	100.0%
604	AUACC	1	22	2	9.47	7.51	-21%	30	14.62	9.5	1.54	1.26	50.71	90.9%
	SBACC	1	22	5	0.76	0.05	-93%	0.25	1.78	0.09	2.35	1.98	5.93	77.3%
	TT	1	22	1	0.19	0.19	0%	0.45	0.1	0.09	0.52	0.5	0.51	98.1%
605	AUACC	1	21	1	8.5	5.18	-39%	25	20.36	7.9	2.39	1.52	94.72	95.2%
	SBACC	1	21	1	0.01	0.01	0%	0.05	0.02	0.01	2.15	1.89	0.09	95.2%
	TT	1	21	1	0.3	0.29	-3%	0.8	0.24	0.21	0.82	0.74	1.04	95.2%
606	AUACC	1	9	1	7.18	4.32	-40%	30	17.41	8.2	2.42	1.9	63.98	88.9%
	SBACC	1	9	0	0	-	-	-	0	-	1.58	-	0	100.0%
	TT	1	9	1	0.14	0.12	-14%	0.3	0.13	0.08	0.91	0.64	0.52	88.9%
620	AUACC	1	23	1	13.96	13.01	-7%	80	25.6	22.35	1.83	1.72	111.71	95.7%
		2	12	0	15.41	-	-	-	17.2	-	1.12	-	49.53	100.0%
		3	15	0	0.22	-	-	-	0.33	-	1.51	-	1.02	100.0%
	SBACC	1	23	1	0	0	0%	0.02	0.01	0.01	2.09	1.62	0.04	95.7%
		2	12	0	0.5	-	-	-	0.73	-	1.48	-	2.26	100.0%
		3	16	1	0	0	-	0.01	0.01	0	1.89	1.36	0.03	93.8%

Model	Variable	Domain	Number of Samples		Mean Grade			Capping Value	Standard Deviation		Coeff of Variation		Max Un-capped Grade	Capped %ile
			Un-capped	Capped	Un-capped	Capped	Diff (%)		Un-capped	Capped	Un-capped	Capped		
	True Thickness (TT)	1	23	0	0.33	-	-	-	0.21	-	0.64	-	0.84	100.0%
		2	12	0	0.43	-	-	-	0.4	-	0.94	-	1.29	100.0%
		3	15	0	0.3	-	-	-	0.2	-	0.67	-	0.78	93.3%
621	AUACC	1	10	0	2.58	-	-	-	4.25	-	1.65	-	13.9	100.0%
	SBACC	1	10	1	0.18	0.08	-56%	0.4	0.44	0.15	2.41	1.98	1.47	90.0%
	TT	1	10	0	0.12	-	-	-	0.06	-	0.5	-	0.23	90.0%

14.4 Estimation Domain Boundaries

Structural controls on mineralisation have been identified through underground mapping and structural interpretation of drill core. These relationships have been used to guide estimation domain boundaries, which are dominantly hard boundaries. One soft boundary has been estimated between the 500 and 525 models, which show a strong grade relation, with mineralisation alternating between proximal structures. Grade domain boundaries are shown for the major Youle 500 (Figure 14-6), Shepherd 600 (Figure 14-11), and Suffolk 620 lodes (Figure 14-12). Refer also to Section 14.2 for the Youle 500 example tied back to geological interpretation.

In both the 600 and 620 models, a strong flexure divides the lode into a distinct north and south zone, and is spatially correlated with a change in antimony and gold grades in the lodes (see figures and tables in Vein Orientation Domains 14.5).

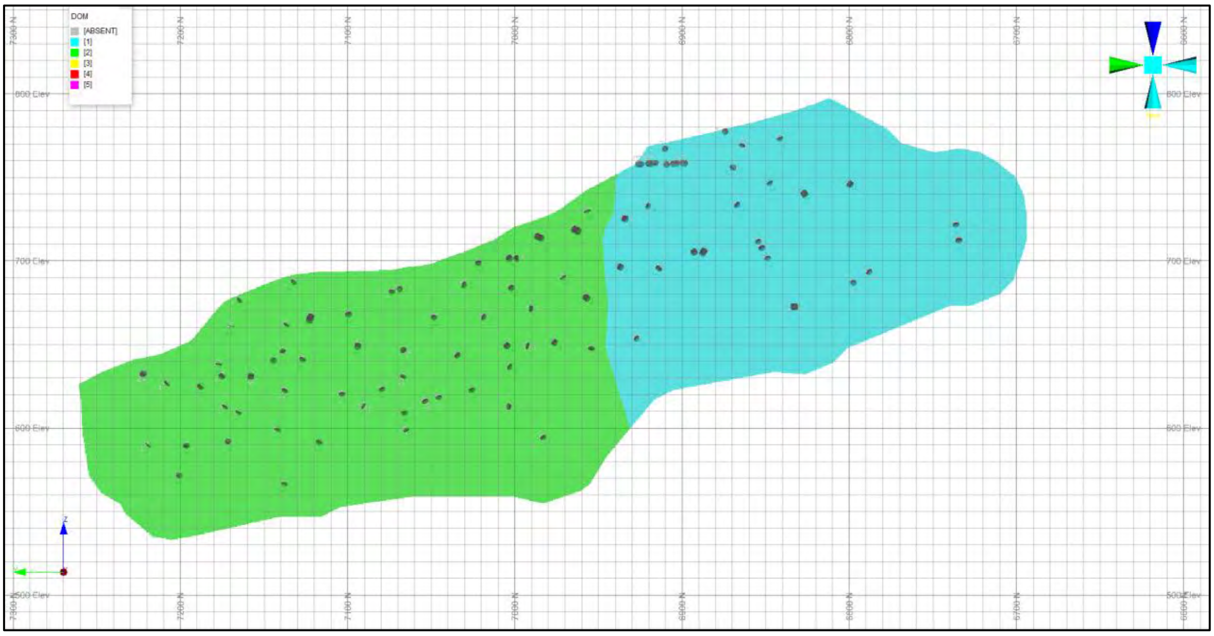


Figure 14-11: Shepherd-600 Lode estimation domain boundaries

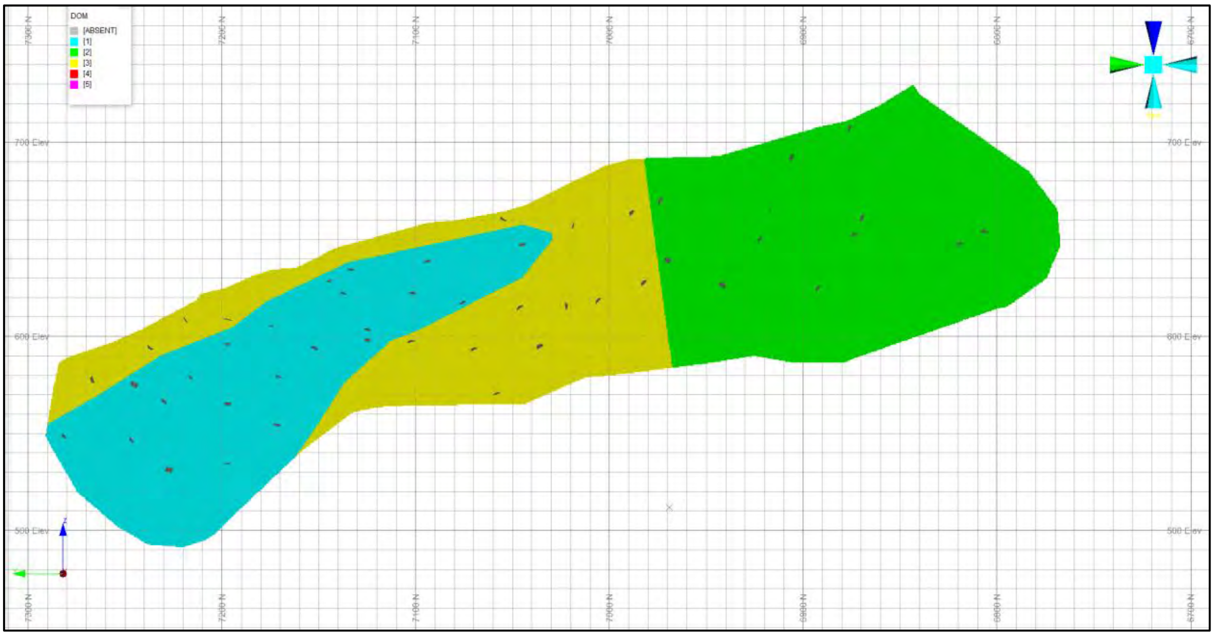


Figure 14-12: Suffolk-620 Lode estimation domain boundaries

14.5 Vein Orientation Domains

In order to use the 2D accumulation method to estimate true thickness from the drill hole intersections and convert the 2D tonnes and grade estimates to 3D tonnes and grade estimates, dip and dip-direction domains were interpreted in long section, identified visually from the wireframe of each lode structure.

The dip and dip-direction of each domain was determined by adjusting a plane of best fit to the dip and dip-direction of the domain. The details of this plane were then coded into the drill data associated with the domain.

A check of true thickness derived from this methodology was completed on Shepherd using the vein alpha of the intercept in drill core. The drill core alpha-derived true thickness was compared to the dip-domain derived true thickness and in the case of the 600, 605, and 620 models a bias between 20-30% was observed between alpha to dip-domain true thickness (example Figure 14-13).

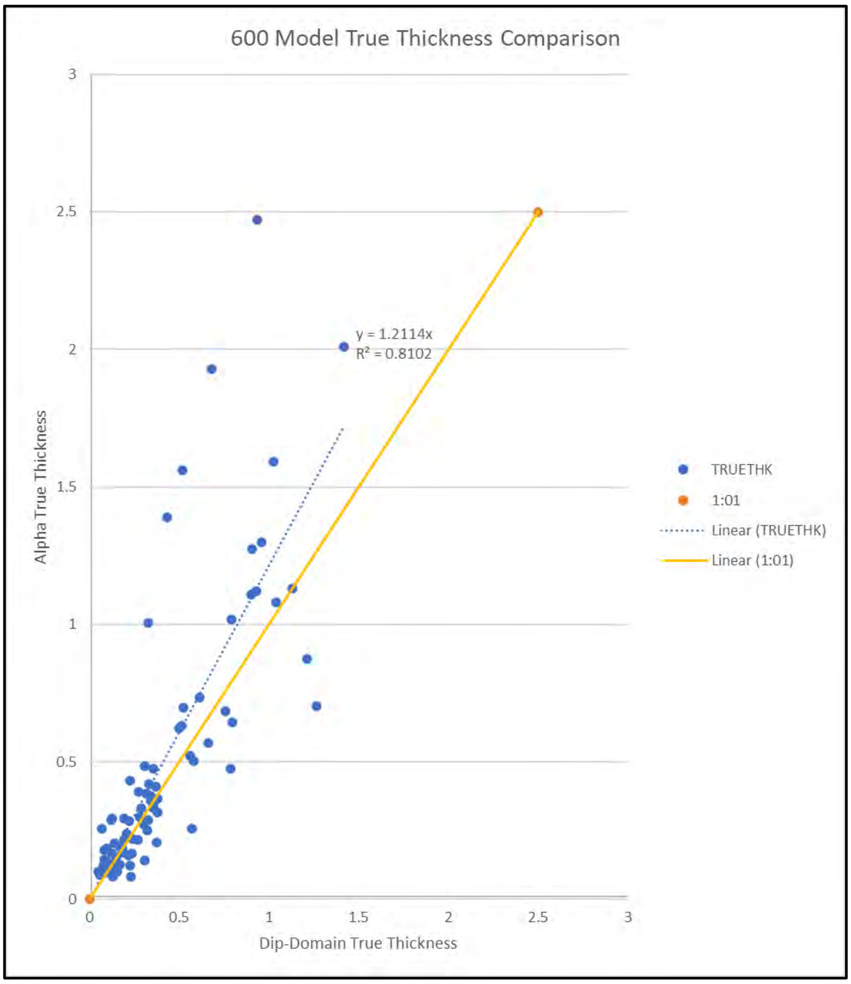


Figure 14-13: Shepherd 600 alpha true-thickness versus the dip-domain true thickness, highlighting the undercall of true thickness by the more global dip-domains

The variance between the true-thickness values was interpreted to be due to the presence of minor lode offsets by west-dipping apparent thrust faults and lode flexures that were unable to be resolved in the resolution of exploration drilling. This led to a smoothed west-dipping wireframe when the lode orientation was more sub-vertical between the apparent fault panels. This geology interpretation was consistent with areas of sub-vertical mineralisation mined at Youle, such as in the north domain 4 on the 500 model.

As the alpha true thickness was more representative in those cases, an alpha true-thickness correction factor based on a linear regression of the dip-domain and alpha true thickness datasets was applied to derive the final true-thickness used in the estimation. The process workflow is summarised in Figure 14-14.

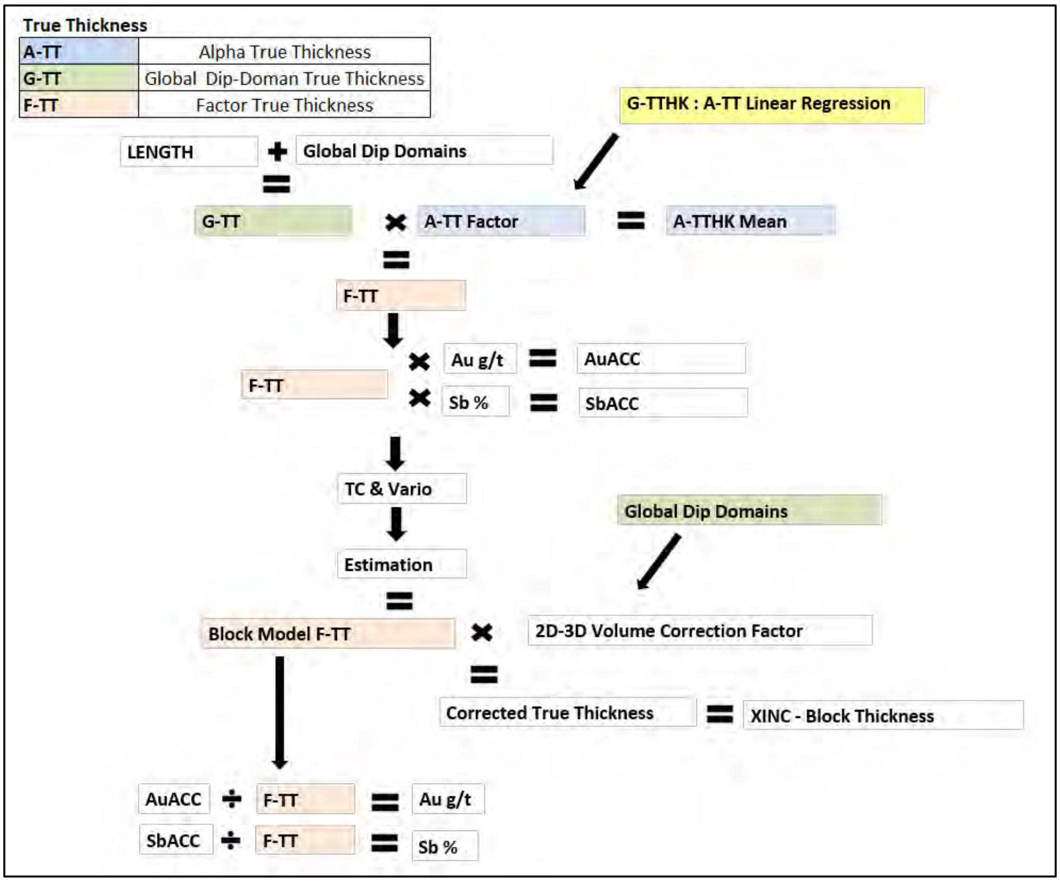


Figure 14-14: Flow map of true thickness calculations in the resource estimation for the 600, 605, 620 Shepherd series models, illustrating the correction for drill core alpha derived true thickness

In using an alpha true-thickness correction factor, the relationship between the global dip-domain derived block model volume correction factors and true thickness was maintained.

The dip and dip-direction domains have been used to create volume correction factors for 2D to 3D conversion within the Z and Y directions using the following formula:

Z Correction Factor = 1/ sin (dip)

Y Correction Factor = Absolute (1/ sin (dip-direction)).

Volume Correction Factor = Z Correction Factor × Y Correction Factor.

The vein orientation domain examples are given for the major Youle 500 in Figure 14-15 and Table 14-6, for Shepherd 600 Lode in Figure 14-16 and Table 14-7, for Suffolk 620 Lode in Figure 14-17 and Table 14-8.

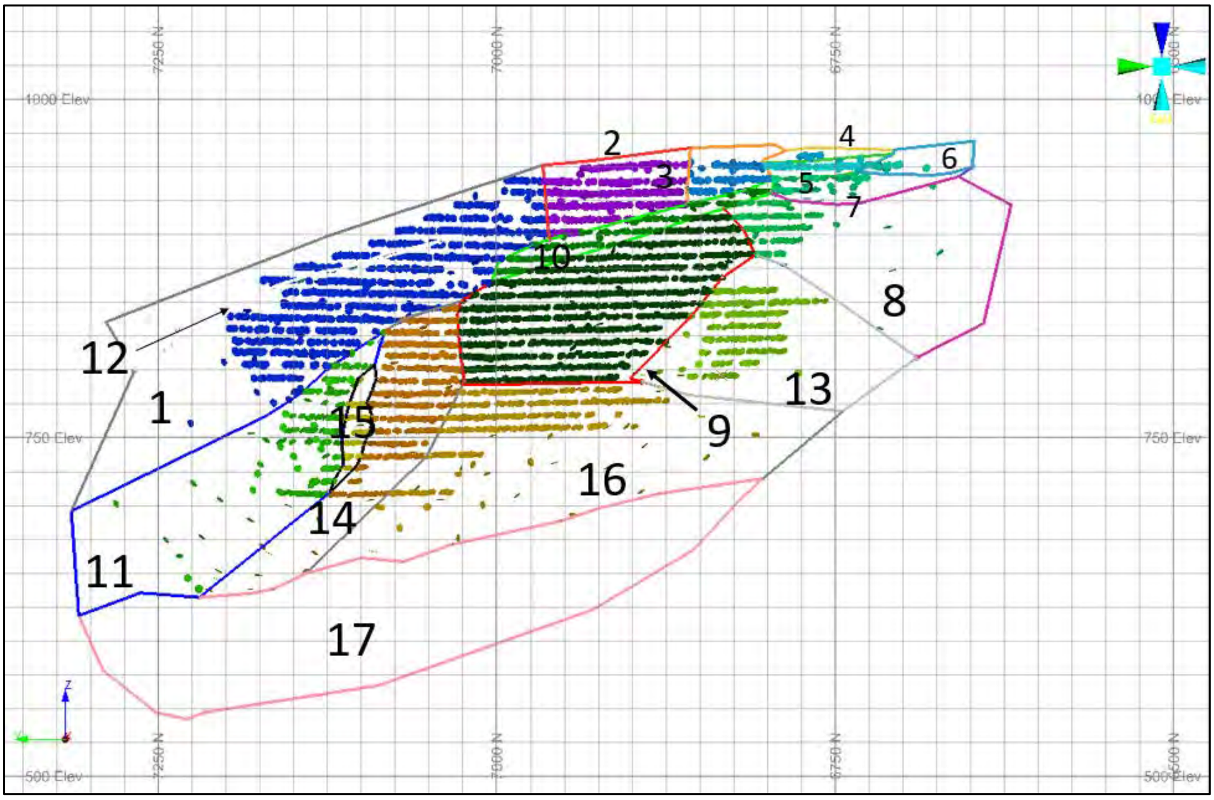


Figure 14-15: Youle-500 Lode dip and dip-direction domains

Table 14-6: Youle-500 Lode dip domains – dip and dip direction

Dip Domain	Dip (degrees)	Dip-Direction (degrees)
1	85	272
2	70	280
3	65	275
4	31	278
5	65	278
6	80	288
7	35	280
8	44	281
9	53	291
10	43	293
11	52	305
12	25	312
13	53	304
14	49	286
15	55	256
16	46	292
17	27	317

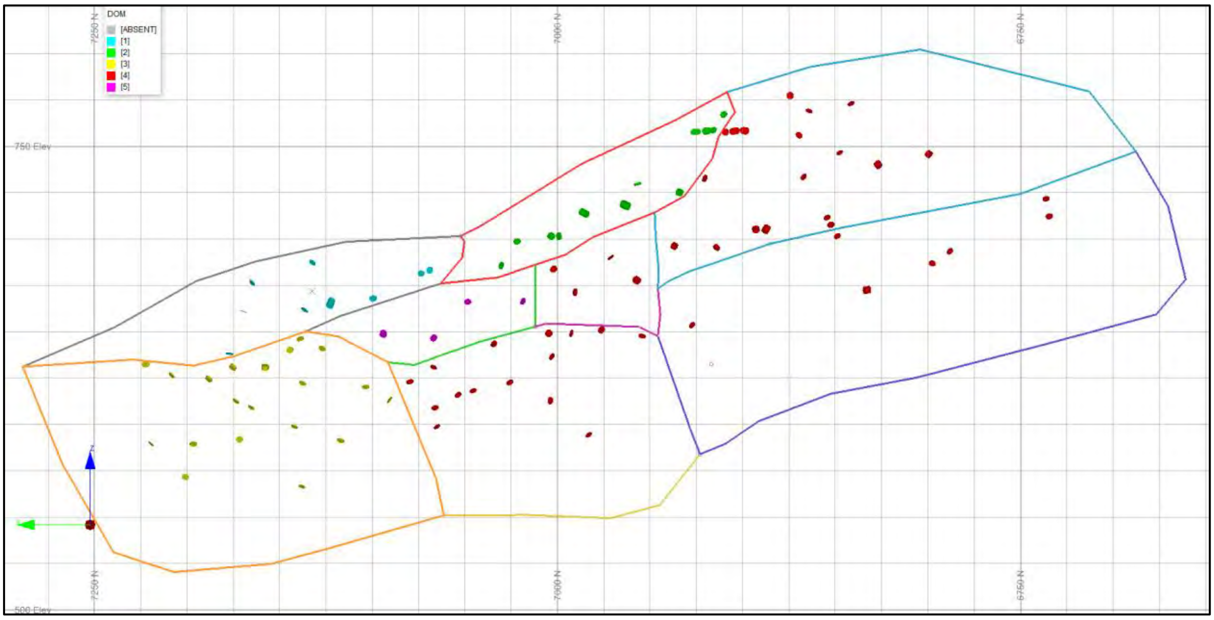


Figure 14-16: Shepherd-600 Lode dip and dip-direction domains

Table 14-7: Shepherd-600 Lode dip domains – dip and dip direction

Dip Domain	Dip (degrees)	Dip Direction (degrees)
1	57	292
2	52	284
3	85	291
4	88	274
5	68	282
6	82	267
7	85	271
8	66	273

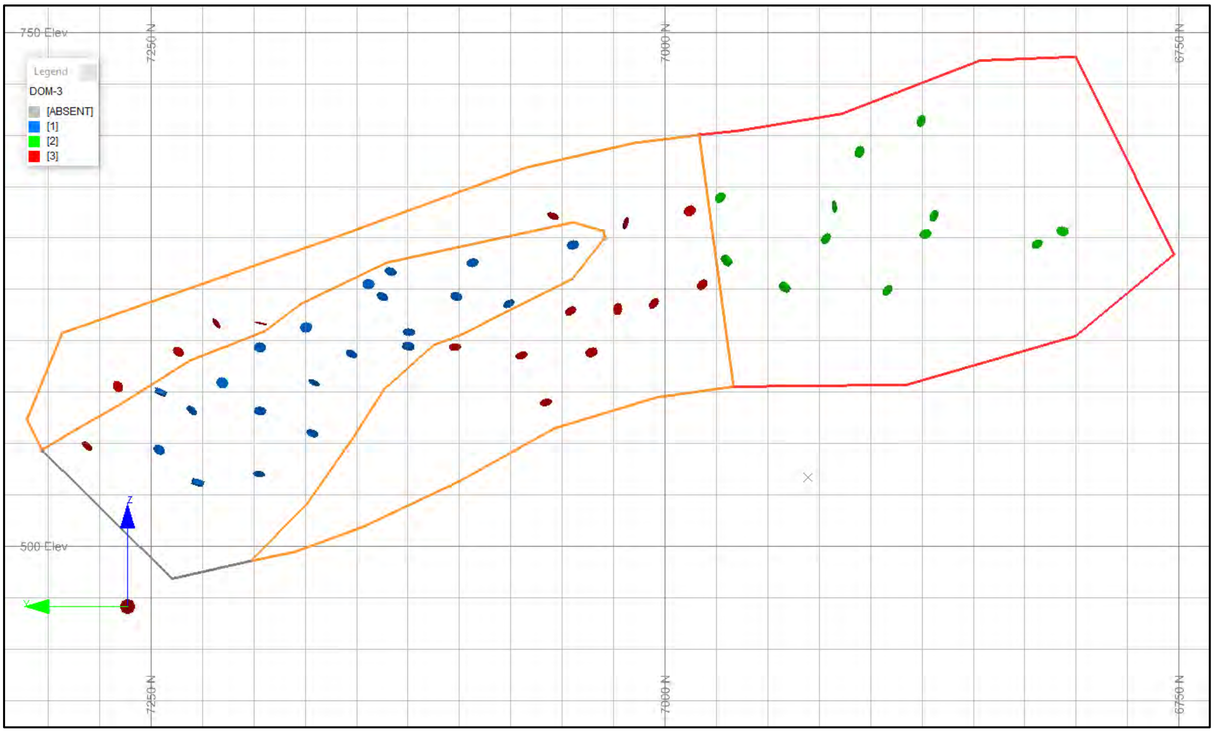


Figure 14-17: Suffolk-620 Lode dip and dip direction domains

Table 14-8: Suffolk-620 Lode dip domains – dip and dip direction

Dip Domain	Dip (degrees)	Dip Direction (degrees)
1	81	262
2	85	278
3	83	270

14.6 Bulk Density Determinations

Bulk density was assessed in underground and drill core samples during 2021 throughout the Youle and Shepherd Lode systems. The determinations were from whole-core samples, which were aligned with assay sample intervals.

The determinations were completed utilising a Dynamics G-Ex Bulk Density weighing station with an Adam Equipment Cruiser CKT 8H scale using a variation of the water immersion method 3 calculation as described in Lipton and Horton (2014):

$$Dry\ Bulk\ Density = \frac{Sample\ Dry\ Mass}{Sample\ Dry\ Mass - Sample\ Mass\ in\ Water}$$

The standard procedure employed by Mandalay differs from Lipton and Horton's (2014) water immersion method 3 that recommends oven-drying, as Mandalay only air-dried the samples. Oven-drying was not employed and samples were not coated in wax. The scales were monitored daily with A.C.M Laboratory PTY. LTD. Certified 0.5 kg, 1 kg and 2 kg weights.

As the samples were not oven-dried following the Lipton and Horton (2014) procedure, the impact of air-drying only was tested. Testing was undertaken by measuring bulk density as per the air-dry method, oven-drying at 106°C for 14 hours at On Site Laboratory, and then returning the samples to site and completing the bulk density utilising the same method on the oven-dried samples. A total of 60 samples ranging between 5-80% stibnite with an average of 40% stibnite were completed. Gangue was dominantly quartz with minor siltstone.

The summary statistics from this test work is presented in Table 14-9. The results show that there is no material difference in the bulk density determination by the air-dry or oven-dry methods, and therefore, the QP considers that the air-dry method is acceptable.

Table 14-9: Descriptive statistics of semi-dry versus oven-dry bulk density determination in lode material

Statistic	Value
Mean BD, Semi-dry (g/cm3)	3.059
Mean BD, Oven-dry (g/cm3)	3.065
SD, Semi-dry	0.56
SD, Oven-dry	0.57
Count	60
Correlation Coeff.	1.00
Avg. Moisture (n=42)	0.16%

Estimation of bulk density was assessed using two methods for mineralised and unmineralised material as follows.

14.6.1 Mineralised Material

A summary of the bulk densities applied to mineralised material in the resource models is given in Table 14-10. Stibnite concentration continued to have the dominant effect on bulk density, and the formulas retain the stoichiometric based formula, except in Shepherd (Equation 3) where quartz occurred as the dominant gangue mineral in some locations.

Table 14-10: Summary of the 3 derivations of the bulk density formula in use for the mineral resource estimate

Models	Equation No.	Equation
Augusta, Cuffley, Brunswick Lodes	1	$BD = ((1.3951 * \mathrm{Sb\%}) + (100 - (1.3951 * \mathrm{Sb\%})))/(((1.3951 * \mathrm{Sb\%})/4.56) + ((100 - (1.3951 * \mathrm{Sb\%}))/2.74))$
Youle 500 Series Lodes	2	$BD = ((1.3951 * \mathrm{Sb\%}) + (100 - (1.3951 * \mathrm{Sb\%})))/(((1.3951 * \mathrm{Sb\%})/4.56) + ((100 - (1.3951 * \mathrm{Sb\%}))/2.69))$
Shepherd 600 Series Lodes	3	$If\ (Sb\% > 1)\ BD = ((1.3951 * \mathrm{Sb\%}) + (100 - (1.3951 * \mathrm{Sb\%})))/(((1.3951 * \mathrm{Sb\%})/4.56) + ((100 - (1.3951 * \mathrm{Sb\%}))/2.69))$ $If (Sb\% < 1)\ BD = (0.05661 * \mathrm{Fe\%}) + 2.5259$

14.6.1.1 Augusta, Cuffley and Brunswick Models

The bulk density (BD) for all Augusta, Cuffley and Brunswick lodes have historically been estimated using a stoichiometric formula which uses the assayed antimony grade as the principal variable, and the BD of waste rock set as a constant value as displayed below, using Equation 1.

$$Eq\ 1 - BD = ((1.3951 * Sb\%) + (100 - (1.3951 * Sb\%)))/(((1.3951 * Sb\%)/4.56) + ((100 - (1.3951 * Sb\%))/2.74))$$

Where:

- Empirical formula of stibnite: Sb_2S_3
- Sb%: Antimony assay as a percentage by mass
- Molecular weight of Antimony (Sb): 121.757
- Molecular weight of Sulphur: (S): 32.066
- 1.3951 is a constant calculated by 339.712/243.514 where 339.712 is the molar mass of Sb_2S_3, and 243.514 is the molar mass of antimony contained in one mole of pure stibnite
- BD of pure stibnite: 4.56
- BD of unmineralised waste: 2.74

This method of bulk density estimation for mineralisation was developed and implemented in the 2005 Mineral Resource Estimate conducted by McArthur Ore Deposit Assessments Pty Ltd ("MODA") (MODA, 2005), and has continued to be used in the estimation of the Augusta, Cuffley and Brunswick mineralisation since that date. Equation 1 was applied to the Brunswick-KR (310) estimate.

14.6.1.2 Youle Models

The bulk density (BD) for all Youle and Shepherd lodes in presence of stibnite has been estimated using a variation of the stoichiometric formula presented in Equation 1, with an adjustment to gangue constant to create Equation 2:

$$Eq\ 2 - Youle\ BD = ((1.3951 * \mathrm{Sb}\%) + (100 - (1.3951 * \mathrm{Sb}\%)))/(((1.3951 * \mathrm{Sb}\%)/4.56) + ((100 - (1.3951 * \mathrm{Sb}\%))/2.69))$$

Where:

- Empirical formula of stibnite: Sb_2S_3
- Sb%: Antimony assay as a percentage by mass
- Molecular weight of Antimony (Sb): 121.757
- Molecular weight of Sulphur: (S): 32.066

- 1.3951 is a constant calculated by 339.712/243.514 where 339.712 is the molar mass of Sb_2S_3, and 243.514 is the molar mass of antimony contained in one mole of pure stibnite
- BD of pure stibnite: 4.56
- BD of unmineralised gangue: 2.69, representing a ratio of 1:3 siltstone to quartz

Gangue density has decreased due to the increase in quartz percentage relative to siltstone in the lodes at Youle and Shepherd, with the observation of an average of 75% quartz in gangue material in Youle face samples. Figure 14-18 highlights the improved fit of Equation 2 to the observed bulk density data at Youle and Shepherd relative to the Equation 1 gangue constant. The predicted and observed bulk density for Equation 2 is presented against antimony in Figure 14-19. Equation 2 was used for all Youle Lodes.

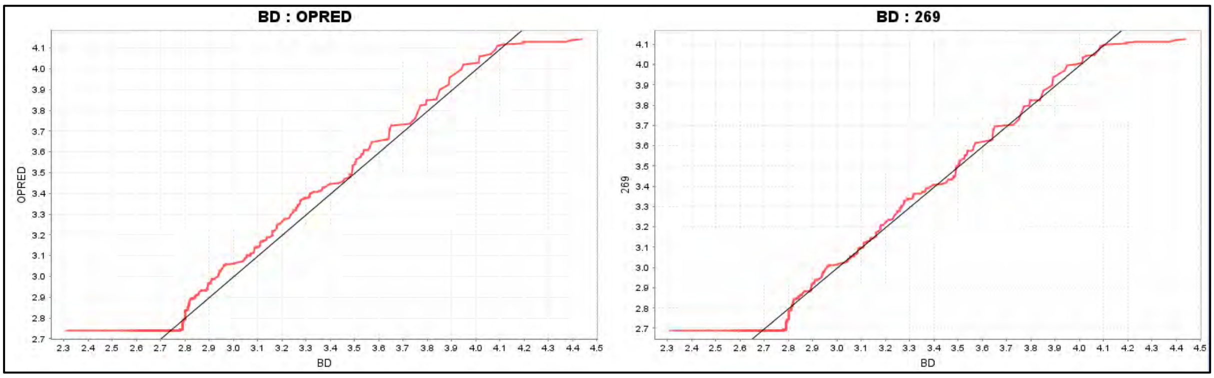


Figure 14-18: Q-Q Plots of A) the original bulk density formula (OPRED, Equation 1) against measured BD from the 2021 Youle and Shepherd testwork and B) Equation 2 with 2.69 gangue constant (269) against measured BD

14.6.1.3 Shepherd Models

Gold-only grade domains have been interpreted in the Shepherd deposit where the dominant gangue material was quartz. These lodes often contained <1% antimony rendering an antimony-based equation unsuitable at this low grade.

In the bulk density measurements on Shepherd drill core with grades less than 1% antimony, iron (Fe%) analysis had a 0.72 correlation with the measured bulk density. This is interpreted to be due to decreasing silt or carbonate gangue while quartz increases and bulk density falls. The weight percent decrease of iron also occurs at high antimony concentrations as stibnite becomes prevalent, rendering a linear multivariate regression unsuitable. An iron-based regression formula (R^2= 0.73) was applied to all Shepherd Lodes when antimony was <1% (Equation 3 and Figure 14-20).

$$Eq\ 3 - Shepherd\ BD$$

$$If(Sb\% > 1)BD = ((1.3951 * \text{Sb\%}) + (100 - (1.3951 * \text{Sb\%})))/(((1.3951 * \text{Sb\%})/4.56) + ((100 - (1.3951 * \text{Sb\%}))/2.69))$$

$$If\,(Sb\% < 1)\; BD = (0.05661 * \text{Fe\%}) + 2.5259$$

Where:

- As noted in Eq 2
- Fe%: Iron assay as a percentage by mass

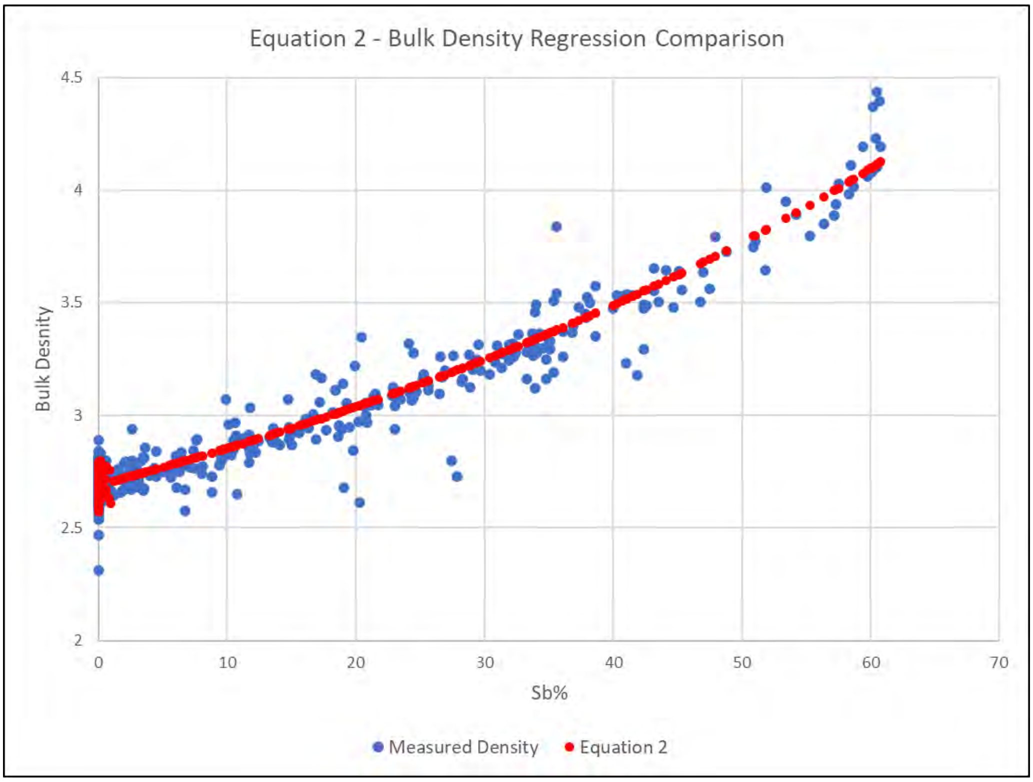


Figure 14-19: Comparison of the 2021 bulk density test work for Youle and Shepherd against the new gangue constant in Equation 2

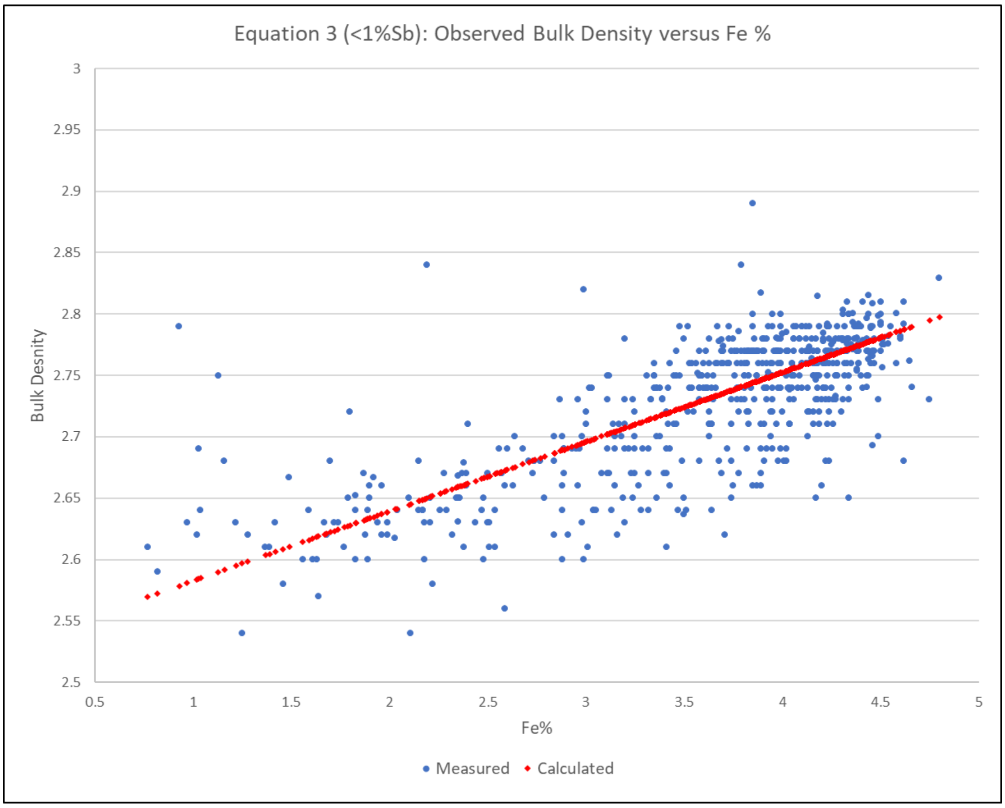


Figure 14-20: Bulk Density test work for samples below 1% antimony versus the predicted bulk density from the linear Fe regression in equation 3

14.6.2 Unmineralised Material

14.6.2.1 Augusta, Brunswick and Cuffley

The unmineralised rock bulk density of 2.74 g/cm^3 has been averaged from 1,060 samples of drill core measured using the water immersion method during 2014.

The basic statistics for this series of samples has been shown in Table 14-11 and demonstrates very little variability in the waste material bulk densities. Waste rock density remained unchanged for pre-2021 models and has been maintained in the KR-Brunswick 310 estimate.

Table 14-11: Descriptive statistics of bulk density in waste material, Augusta, Brunswick, Cuffley

Statistic	Bulk Density (g/cm^3)
Mean	2.74
Median	2.77
Mode	2.80
Standard Deviation	0.11
Sample Variance	0.01
Range	1.23
Minimum	2.01
Maximum	3.24

Count	1,060

14.6.2.2 Youle and Shepherd

Testwork on the bulk density of unmineralised Youle and Shepherd underground samples and drill core was completed during 2021. Summary statistics for waste material with <5% quartz have been presented in Table 14-12 and Figure 14-21; these showed very little variation around the mean of 2.76 g/cm^3. Therefore, 2.76 g/cm^3 has been applied to waste material in the 2021 Youle and Shepherd estimates.

Table 14-12: Descriptive statistics of bulk density in waste material, Youle-Shepherd

Statistic	Bulk Density (g/cm^3)
Mean	2.76
Median	2.76
Mode	2.78
Standard Deviation	0.03
Sample Variance	0.01
Range	0.27
Minimum	2.62
Maximum	2.89
Count	368

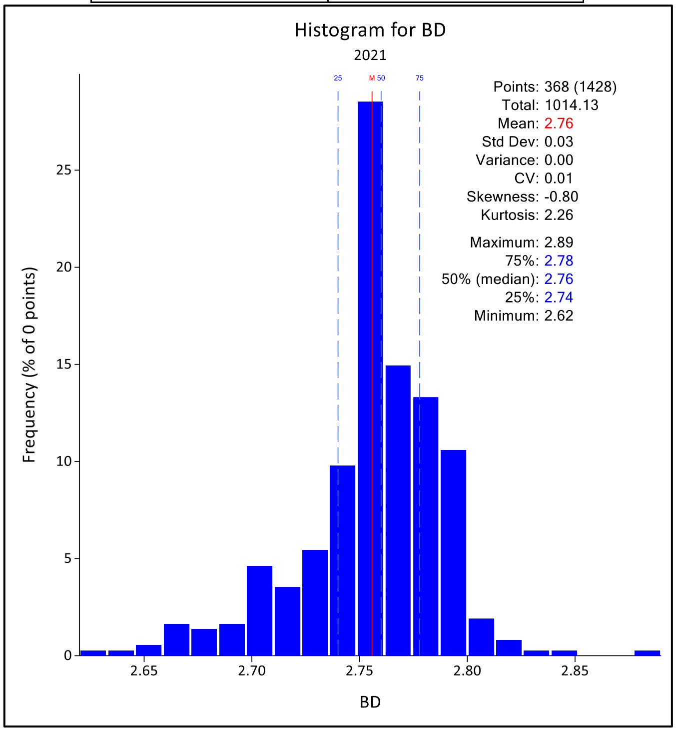


Figure 14-21: Histogram of unmineralised rock bulk density values at Youle-Shepherd

14.6.3 Bulk Density Discussion

The effect on the MRE of the two changes in the application of bulk density for Youle and Shepherd when compared to previous estimations has been investigated. The two changes were the following:

- Bulk density weighting during compositing.
- The use of Equation 2 and Equation 3.

The materiality of these changes is given below in a case study of the Youle 500 model (Table 14-13). The 500 model contributes most of the material in the 2021 MRE and contains the greatest antimony endowment. As demonstrated in Table 14-13, the two changes in the application of bulk density in the MRE partially counteracted each other, with an overall minor increase to contained metal pre-depletion.

Table 14-13: Case study on the effect of bulk density changes on Youle 500 model, pre-depletion

Model	Tonnes	AuEq. Oz	Δtonnes	Δtonnes %	Δ AuEq. Oz	Δ AuEq. Oz %
Youle (500) 2021	397,769	276,185				
Youle (500) Unweighted Sample Composite	395,210	271,145	- 2,559	-0.64%	- 5,040	-1.82%
Youle (500) BD Eq 1	399,324	279,558	1,554	0.39%	3,373	1.22%

Note: Gold equivalent ounces (AuEq. Oz) was determined by applying the ratio of resource metal prices ($8500/$1700) to antimony percentage and adding to gold ounces.

In addition, the MRE was not sensitive to the waste rock bulk density change from 2.74 g/cm^3 to 2.76 g/cm^3 with a decrease in gold-equivalent ounces of 0.01% (93 AuEq. ounces) and an increase in tonnes of 0.12% across all Youle and Shepherd depleted models.

14.7 Variography

A variographic analysis was carried out on the combined composited face and drill hole samples for true thickness, gold accumulation and antimony accumulation. The aim was to identify principal directions of continuity of both grade and thickness, and to assist in the selection of search ranges for subsequent estimation. Variography was undertaken in two dimensions after projecting the data onto a constant easting.

Anisotropic normal score variograms were modelled on individual and grouped domains where required. Variograms were produced using Supervisor v8.12 software after grade capping of the grade accumulation and true thickness variables had taken place. The variogram models were back-transformed prior to importing into Datamine software for the estimate.

The nugget value was estimated using omnidirectional variograms with a short lag, as downhole variograms cannot be calculated on this dataset due to the samples being composited to the full width of the mineralisation. Therefore, the omnidirectional variogram with short lag most closely represents the small-scale geological and/or sampling grade variability of the data.

Example experimental normal scores variograms and fitted models for the Youle (500) and Shepherd (600) Lodes showing gold and antimony accumulation, and lode true thickness are displayed in Figure 14-22 to Figure 14-27. Where a model lacked sufficient pairs to produce meaningful variograms, variograms were borrowed from other domains of similar geological character and controls on mineralisation.

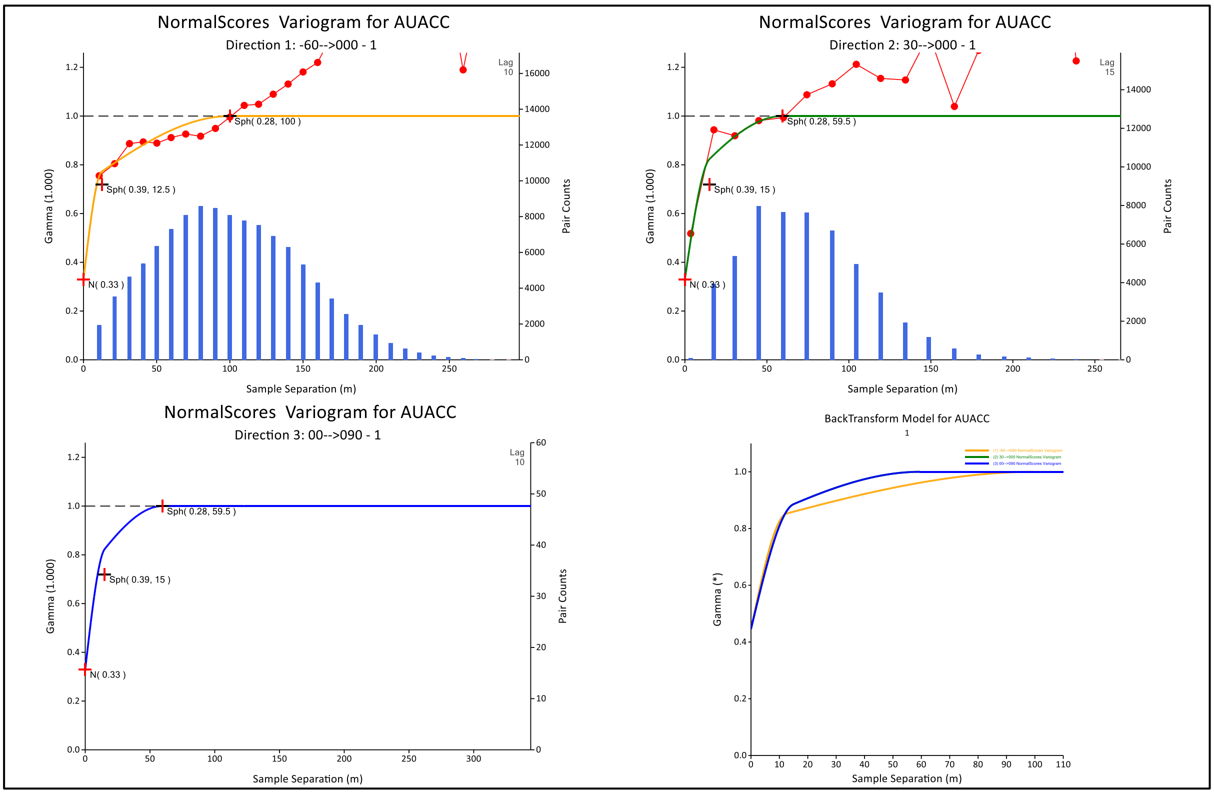


Figure 14-22: Youle 500 domain 1 Au-Accumulation (AUACC) variograms

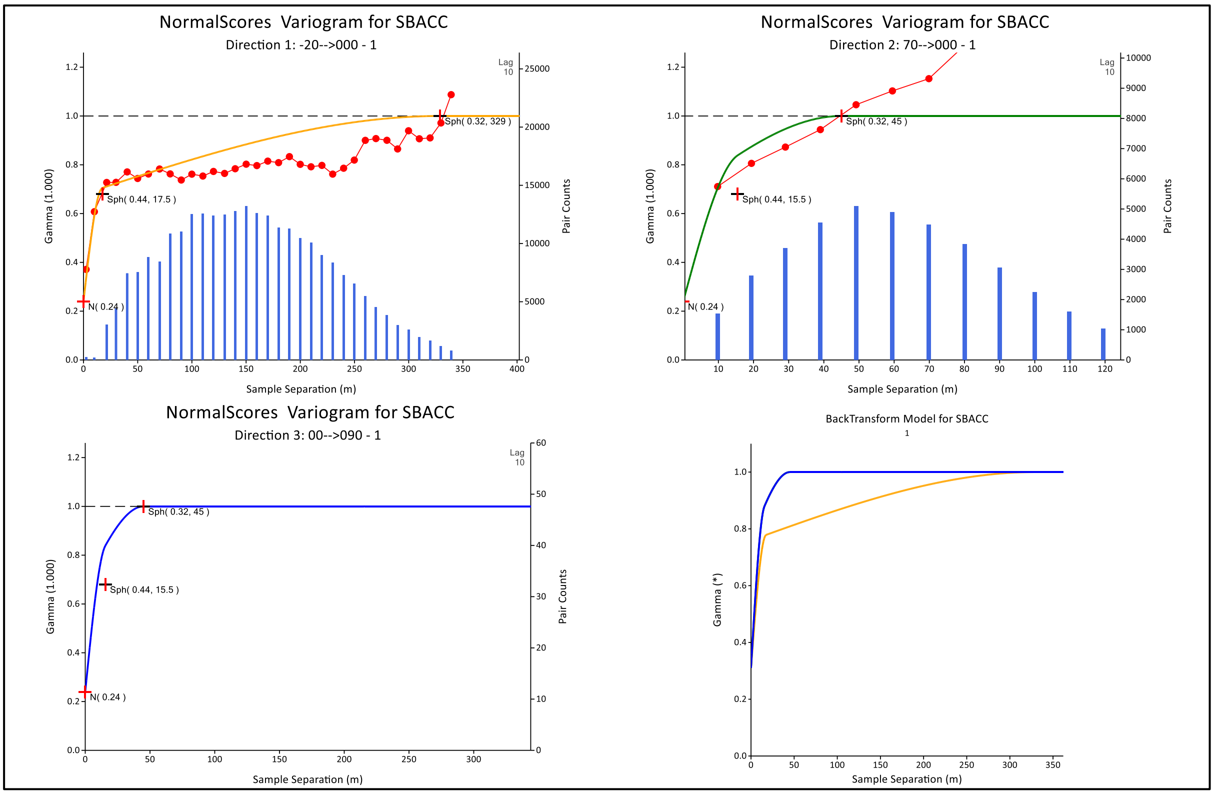


Figure 14-23: Youle 500 domain 1 Sb-Accumulation (SBACC) variograms

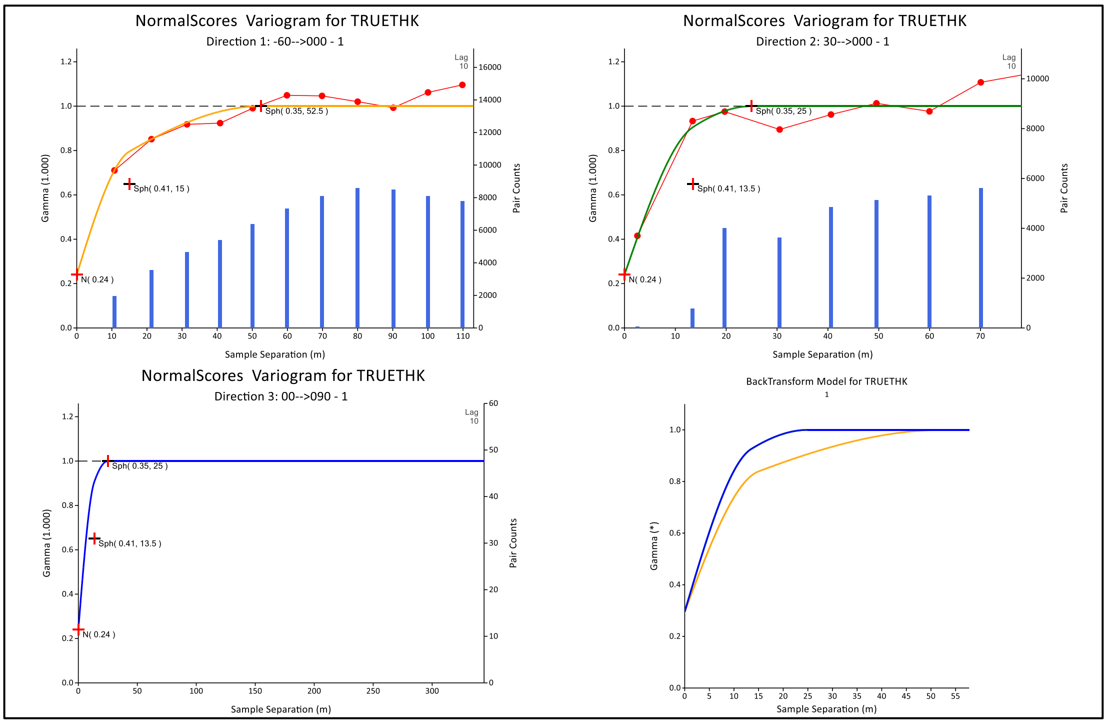


Figure 14-24: Youle 500 domain 1 true thickness (TT) variograms

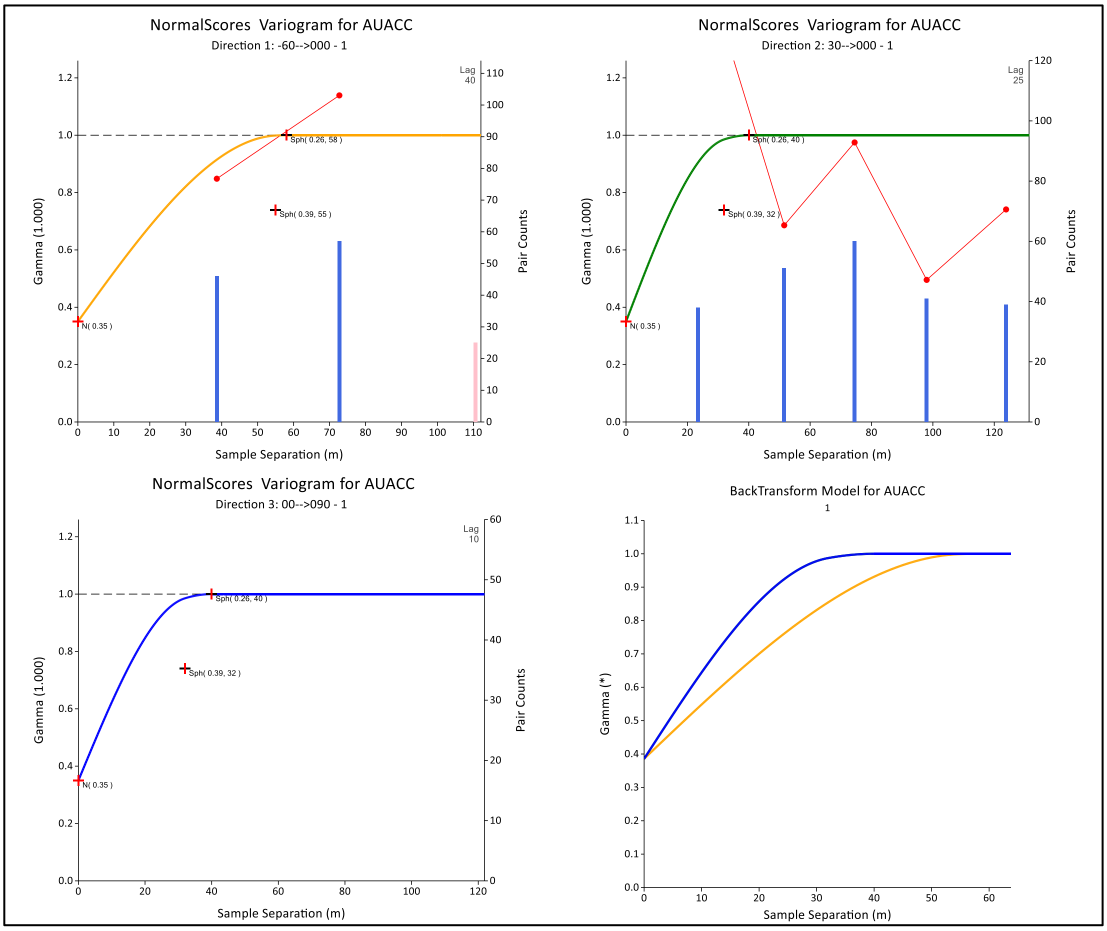


Figure 14-25: Shepherd 600 domain 1 Au-Accumulation (AUACC) variograms

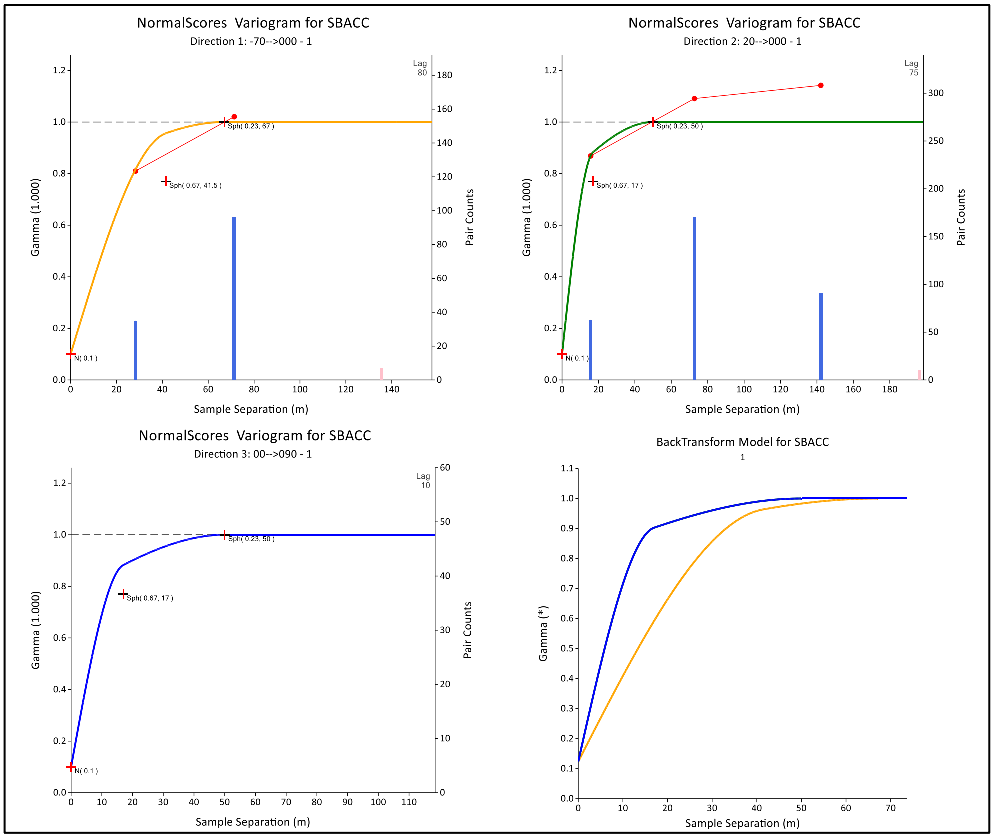


Figure 14-26: Shepherd 600 domain 1 Sb-Accumulation (SBACC) variograms

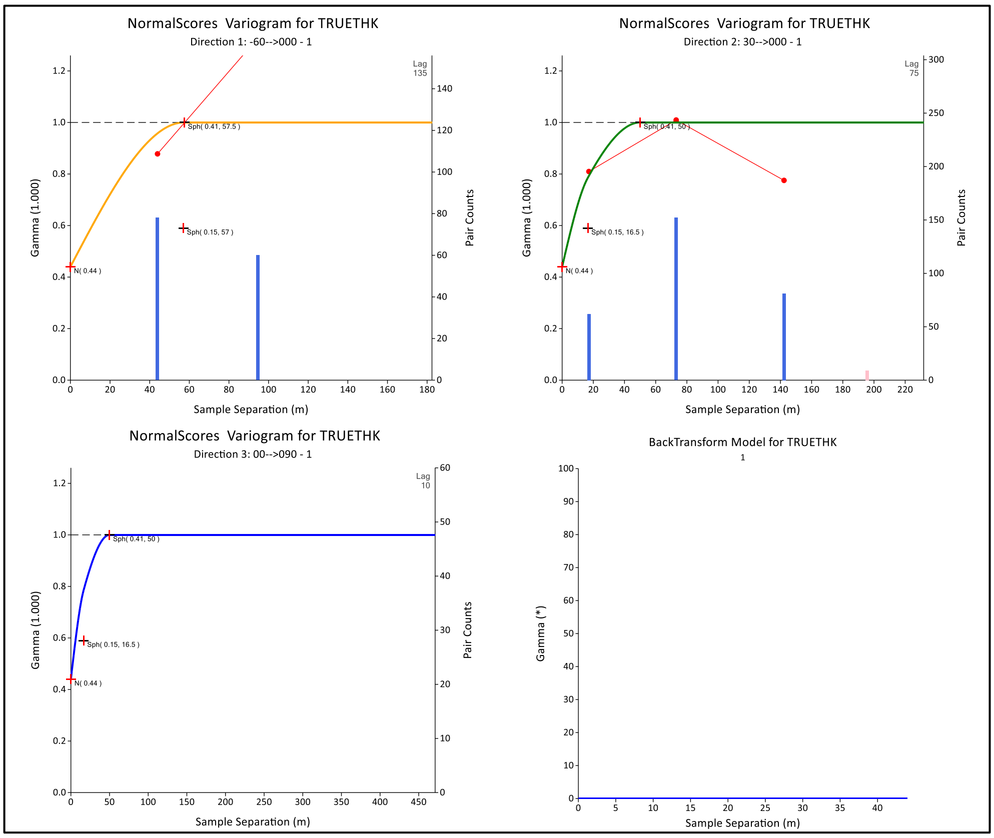


Figure 14-27: Shepherd 600 domain 1 true thickness (TT) variograms

The orientation of the best grade continuity was selected based on the variographic analysis, and was verified by observations made during underground mapping, logging and geological modelling. The orientations and ranges identified during the variographic analysis were used to generate 3D ellipsoid wireframes, which were validated against the composite values in longitudinal projection (examples, Figure 14-28 and Figure 14-29).

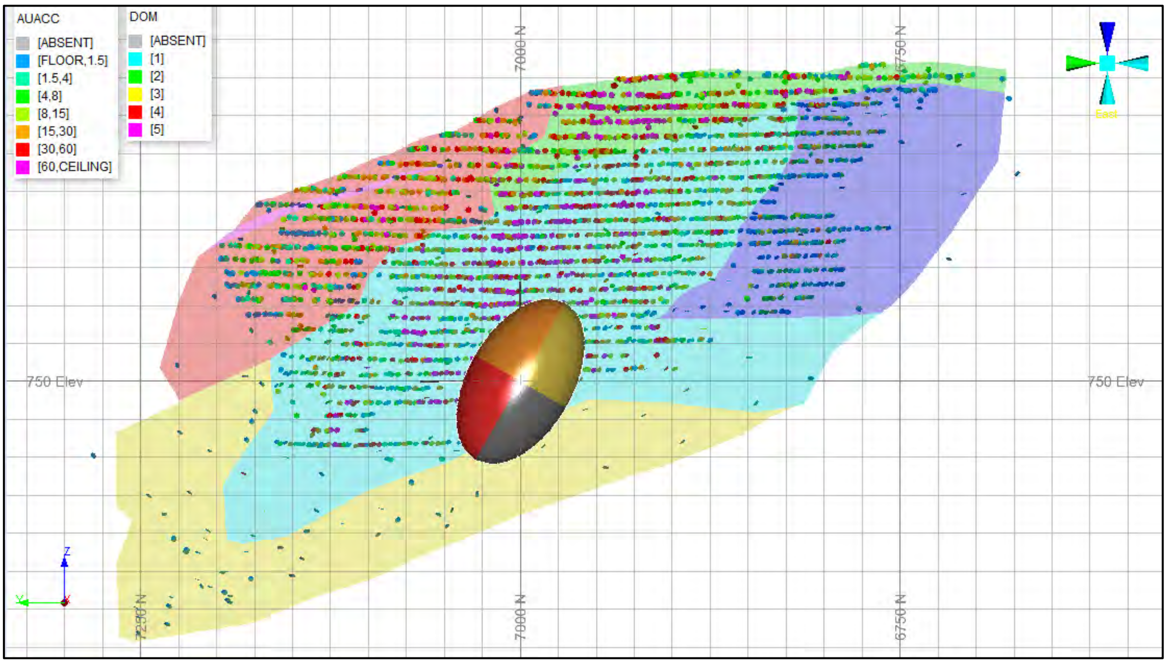


Figure 14-28: Youle long-section with grade domains and Au-Accumulation for intercepts shown with the Domain 1 search ellipse for Au-Accumulation

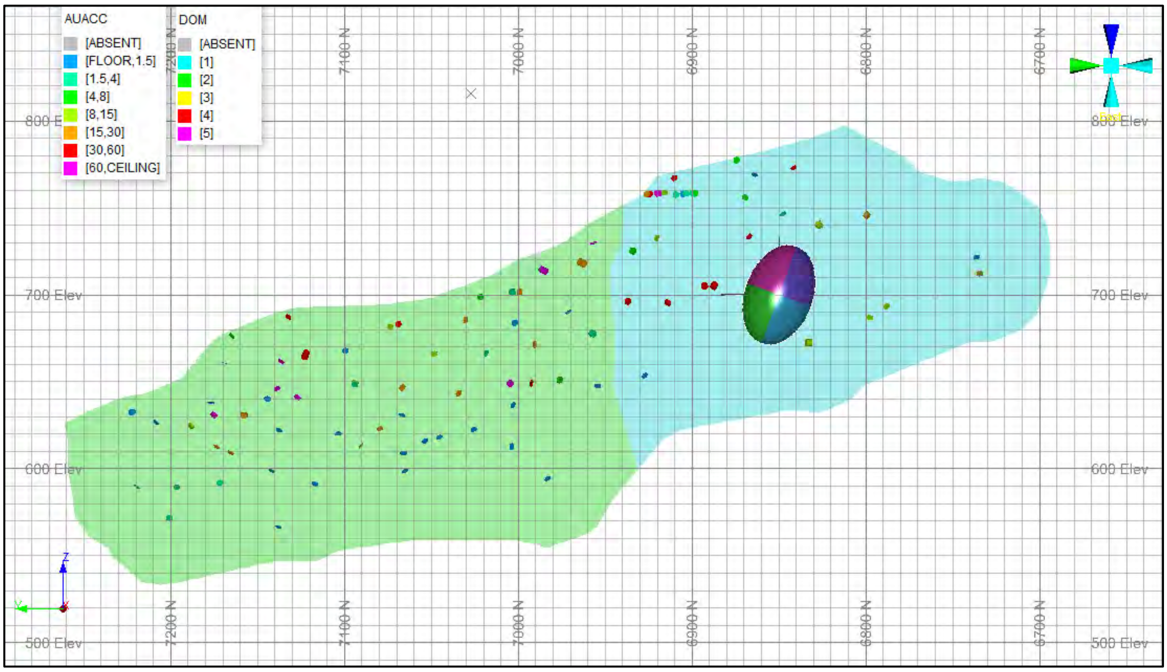


Figure 14-29: Youle long-section with grade domains and Au-Accumulation for intercepts shown with the Domain 1 search ellipse for Au-Accumulation

The variographic parameters determined for the Youle 500 and Shepherd 600 Lodes are detailed in Table 14-14 and Table 14-15.

Table 14-14: Youle 500 variogram model parameters

Model	Domain	Element	Variogram Orientations			Datamine Rotations			Variographic parameters						
			Dir 1	Dir 2	Dir 3	Dir 1	Dir 2	Dir 3	C0	C1		A1	C2		A2
Youle 500	Domain 1	AuACC	90	90	-120	Z	X	Z	0.45	Dir 1	0.37	13	Dir 1	0.18	100
										Dir 2		15	Dir 2		60
										Dir 3		15	Dir 3		60
	Domain 1	SBACC	90	90	-160	Z	X	Z	0.31	Dir 1	0.45	18	Dir 1	0.24	329
										Dir 2		16	Dir 2		45
										Dir 3		16	Dir 3		45
	Domain 1	TT	90	90	-120	Z	X	Z	0.30	Dir 1	0.43	15	Dir 1	0.28	53
										Dir 2		14	Dir 2		25
										Dir 3		14	Dir 3		25
	Domain 2	AuACC	90	90	-130	Z	X	Z	0.30	Dir 1	0.37	17	Dir 1	0.32	39
										Dir 2		17	Dir 2		34
										Dir 3		17	Dir 3		34
	Domain 2	SBACC	90	90	-120	Z	X	Z	0.27	Dir 1	0.53	28	Dir 1	0.20	43
										Dir 2		28	Dir 2		29
										Dir 3		28	Dir 3		29
	Domain 2	TT	90	90	-160	Z	X	Z	0.22	Dir 1	0.62	13	Dir 1	0.16	32
										Dir 2		19	Dir 2		20
										Dir 3		19	Dir 3		20
	Domain 3	Utilises Domain 1 Variogram													
	Domain 4	AuACC	90	90	-140	Z	X	Z	0.45	Dir 1	0.44	28	Dir 1	0.12	74
										Dir 2		28	Dir 2		59
										Dir 3		29	Dir 3		59
	Domain 4	SBACC	90	90	-150	Z	X	Z	0.26	Dir 1	0.60	29	Dir 1	0.14	77
										Dir 2		31	Dir 2		60
										Dir 3		31	Dir 3		60
	Domain 4	TT	90	90	-150	Z	X	Z	0.39	Dir 1	0.11	5	Dir 1	0.50	29
										Dir 2		4	Dir 2		26
										Dir 3		4	Dir 3		26
	Domain 5	Utilises Domain 4 Variogram													
	Domain 6	AuACC	90	-110	Z	X	Z	0.3	0.34	Dir 1	0.53	19	Dir 1	0.13	118
										Dir 2		22	Dir 2		23
										Dir 3		22	Dir 3		23
	Domain 6	SBACC	90	90	-120	Z	X	Z	0.26	Dir 1	0.45	12	Dir 1	0.29	53
										Dir 2		29	Dir 2		30
										Dir 3		20	Dir 3		40

Model	Domain	Element	Variogram Orientations			Datamine Rotations			Variographic parameters						
			Dir 1	Dir 2	Dir 3	Dir 1	Dir 2	Dir 3	C0	C1		A1	C2		A2
	Domain 6	TT	90	90	-110	Z	X	Z	0.36	Dir 1	0.53	11	Dir 1	0.11	44
										Dir 2		11	Dir 2		22
										Dir 3		11	Dir 3		22

Dir 1: Major, Dir 2: Semi-Major, Dir 3: Minor, C0: nugget variance, C1 & C2: sills of autocorrelated variance, A1 & A2: Range of spatial dependence

Table 14-15: Shepherd 600 variogram model parameters

Model	Domain	Element	Variogram Orientations			Datamine Rotations			Variographic parameters						
			Dir 1	Dir 2	Dir 3	Dir 1	Dir 2	Dir 3	C0	C1		A1	C2		A2
Shepherd 600	Domain 1	AuACC	90	90	-120	Z	X	Z	0.39	Dir 1	0.38	55	Dir 1	0.23	58
										Dir 2		32	Dir 2		40
										Dir 3		32	Dir 3		40
	Domain 1	SBACC	90	90	-110	Z	X	Z	0.12	Dir 1	0.69	42	Dir 1	0.19	67
										Dir 2		17	Dir 2		50
										Dir 3		17	Dir 3		50
	Domain 1	TT	90	90	-120	Z	X	Z	0.49	Dir 1	0.14	57	Dir 1	0.37	58
										Dir 2		17	Dir 2		50
										Dir 3		17	Dir 3		50
	Domain 2	AuACC	90	90	-100	Z	X	Z	0.62	Dir 1	0.26	34	Dir 1	0.12	60
										Dir 2		55	Dir 2		60
										Dir 3		55	Dir 3		60
	Domain 2	SBACC	90	90	-105	Z	X	Z	0.62	Dir 1	0.27	41	Dir 1	0.11	66
										Dir 2		43	Dir 2		51
										Dir 3		45	Dir 3		51
	Domain 2	TT	90	90	-110	Z	X	Z	0.56	Dir 1	0.34	65	Dir 1	0.09	75
										Dir 2		62	Dir 2		75
										Dir 3		62	Dir 3		75

Dir 1: Major, Dir 2: Semi-Major, Dir 3: Minor, C0: nugget variance, C1 & C2: sills of autocorrelated variance, A1 & A2: Range of spatial dependence

14.8 Search and Estimation Parameters

True thickness, gold accumulation, and antimony accumulation were estimated into the block model for each lode. The models were oriented north-south and were one block wide in the east-west direction. This type of block model is subsequently referred to as a two-dimensional (2D) seam block model. All search ellipses used for this method were parallel with the north-south block model orientation.

The following summarises the estimation process:

- Drill hole and face samples for each lode were projected into an arbitrary north-south oriented vertical plane.
- The orientation and anisotropy of the search ellipsoid for each lode was guided by the grade and thickness continuity modelled in the variographic analysis.
- The variogram parameters for the Youle and Shepherd Lodes are detailed above in Section 14.7. Where the variogram lacked sufficient data pairs to produce meaningful variograms, variograms were borrowed from the adjacent lode domains that have a comparable geological setting. For example, the 508 Peacock borrowed the 500 Youle variograms and the 620 Suffolk the 600 Shepherd variograms.
- Each estimate involved three search passes:
    - The first search pass dimensions were approximately equivalent to half of the gold accumulation variogram model range.
    - The second was twice the first pass in all three directions.
    - The third pass was six times the first pass in all three directions.
- Where grade sub-domains were present, the estimation was completed separately within each sub-domain with the sub-domains having hard boundaries in most cases to divide high and low-grade domains. In some cases, soft boundaries were employed as noted in Section 14.4.
- The estimation was undertaken using a combined dataset of face sample and drill hole data. A limit to the number of face samples was applied to the regions of the estimate with low sample density (exploration drilling) zones. These regions correspond to the large blocks in Table 14-18. The face sample limit was imposed by giving all face samples the same drill hole name and setting the maximum number of samples from one drill hole.

The estimation parameters applied to the estimation of the Youle 500 and Shepherd 600 models are detailed in Table 14-16and Table 14-17. As iron percentage (Fe%) was required for density determinations (Equation 3, section 14.6.1.3) in the Shepherd deposit, iron-accumulation was calculated using the antimony-accumulation estimation parameters.

Table 14-16: Youle block model search parameters

Resource Class	Domain	Variable	First Pass						Second Pass						Third Pass					
			Search			# Samples		DH	Second Pass			# Samples		DH	Third Pass			# Samples		DH
			Major	Semi-Major	Minor	Min	Max	Limit	Major	Semi-Major	Minor	Min	Max	Limit	Major	Semi-Major	Minor	Min	Max	Limit
MEASURED	1 & 3	AuACC	50	30	30	2	8	-	100	60	60	2	10	-	300	180	180	1	15	-
		AUTT	50	30	30	2	8	-	100	60	60	2	10	-	300	180	180	1	15	-
		SbACC	50	30	30	2	8	-	100	60	60	2	10	-	300	180	180	1	15	-
		SBTT	50	30	30	2	8	-	100	60	60	2	10	-	300	180	180	1	15	-
		TT	50	30	30	2	8	-	100	60	60	2	10	-	300	180	180	1	15	-
	2	AuACC	20	15	15	2	8	-	40	30	30	2	10	-	120	90	90	1	10	-
		AUTT	20	15	15	2	8	-	80	30	20	2	10	-	240	90	60	1	10	-
		SbACC	20	15	15	2	8	-	40	30	30	2	10	-	120	90	90	1	10	-
		SBTT	20	15	15	2	8	-	40	30	30	2	10	-	120	90	90	1	10	-
		TT	20	15	15	2	12	-	40	30	30	2	12	-	120	90	90	1	10	-
	4	AuACC	35	30	30	2	6	-	70	60	60	2	10	-	210	180	180	1	10	-
		AUTT	35	30	30	2	6	-	60	50	20	2	10	-	180	150	60	1	10	-
		SbACC	35	30	30	2	6	-	70	60	60	2	10	-	210	180	180	1	10	-
		SBTT	35	30	30	2	6	-	70	60	60	2	10	-	210	180	180	1	10	-
		TT	35	30	30	2	6	-	70	60	60	2	12	-	210	180	180	1	12	-
	5	AuACC	35	30	30	2	8	-	70	60	60	1	10	-	210	180	180	1	10	-
		AUTT	35	30	30	2	8	-	70	60	60	1	10	-	210	180	180	1	10	-
		SbACC	35	30	30	2	8	-	70	60	60	1	10	-	210	180	180	1	10	-
		SBTT	35	30	30	2	8	-	70	60	60	1	10	-	210	180	180	1	10	-
		TT	35	30	30	2	12	-	70	60	60	1	12	-	210	180	180	1	10	-
	6	AuACC	25	15	15	2	8	-	50	30	30	1	10	-	150	90	90	1	10	-
		AUTT	25	15	15	2	8	-	50	30	30	1	10	-	150	90	90	1	10	-
		SbACC	25	15	15	2	8	-	50	30	30	1	10	-	150	90	90	1	10	-
		SBTT	25	15	15	2	8	-	50	30	30	1	10	-	150	90	90	1	10	-
		TT	25	15	15	2	8	-	50	30	30	1	12	-	150	90	90	1	10	-
INDICATED & INFERRED	1 & 3	AuACC	50	30	30	2	8	2	100	60	60	2	10	2	300	180	180	1	15	2
		AUTT	50	30	30	2	8	2	100	60	60	2	10	2	300	180	180	1	15	2
		SbACC	50	30	30	2	8	2	100	60	60	2	10	2	300	180	180	1	15	2
		SBTT	50	30	30	2	8	2	100	60	60	2	10	2	300	180	180	1	15	2
		TT	50	30	30	2	8	2	100	60	60	2	10	2	300	180	180	1	15	2
	2	AuACC	20	15	15	4	8	2	40	30	30	2	10	2	120	90	90	1	10	2
		AUTT	20	15	15	4	8	2	40	30	30	2	10	2	120	90	90	1	10	2

Resource Class	Domain	Variable	First Pass						Second Pass						Third Pass					
			Search			# Samples		DH	Second Pass			# Samples		DH	Third Pass			# Samples		DH
			Major	Semi-Major	Minor	Min	Max	Limit	Major	Semi-Major	Minor	Min	Max	Limit	Major	Semi-Major	Minor	Min	Max	Limit
		SbACC	20	15	15	4	8	2	40	30	30	2	10	2	120	90	90	1	10	2
		SBTT	20	15	15	4	8	2	40	30	30	2	10	2	120	90	90	1	10	2
		TT	20	15	15	4	12	2	40	30	30	2	12	2	120	90	90	1	10	2
	4	AuACC	50	30	30	3	8	2	100	60	60	2	10	2	300	180	180	1	15	2
		AUTT	50	30	30	3	8	2	100	60	60	2	10	2	300	180	180	1	15	2
		SbACC	50	30	30	3	8	2	100	60	60	2	10	2	300	180	180	1	15	2
		SBTT	50	30	30	3	8	2	100	60	60	2	10	2	300	180	180	1	15	2
		TT	50	30	30	3	8	2	100	60	60	2	10	2	300	180	180	1	15	2
	5	AuACC	35	30	30	4	8	2	70	60	60	2	10	2	210	180	180	1	10	2
		AUTT	35	30	30	4	8	2	70	60	60	2	10	2	210	180	180	1	10	2
		SbACC	35	30	30	4	8	2	70	60	60	2	10	2	210	180	180	1	10	2
		SBTT	35	30	30	4	8	2	70	60	60	2	10	2	210	180	180	1	10	2
		TT	35	30	30	4	6	2	70	60	60	2	12	2	210	180	180	1	12	2
	6	AuACC	25	15	15	2	8	2	50	30	30	2	10	2	150	90	90	1	10	2
		AUTT	25	15	15	2	8	2	50	30	30	2	10	2	150	90	90	1	10	2
		SbACC	25	15	15	2	8	2	50	30	30	2	10	2	150	90	90	1	10	2
		SBTT	25	15	15	2	8	2	50	30	30	2	10	2	150	90	90	1	10	2
		TT	25	15	15	2	8	2	50	30	30	2	12	2	150	90	90	1	12	2

Table 14-17: Shepherd 600 block model search parameters

Resource Class	Domain	Variable	First Pass						Second Pass						Third Pass					
			Search			# Samples		DH	Second Pass			# Samples		DH	Third Pass			# Samples		DH
			Major	Semi-Major	Minor	Min	Max	Limit	Major	Semi-Major	Minor	Min	Max	Limit	Major	Semi-Major	Minor	Min	Max	Limit
MEASURED	1	AuACC	30	20	20	2	8	-	60	40	40	2	10	-	180	120	120	1	15	-
		SbACC	30	20	20	2	8	-	60	40	40	2	10	-	180	120	120	1	15	-
		TT	30	20	20	2	8	-	60	40	40	2	10	-	180	120	120	1	15	-
INDICATED & INFERRED	1	AuACC	30	20	20	2	8	3	60	40	40	2	10	3	180	120	120	1	15	3
		SbACC	30	20	20	2	8	3	60	40	40	2	10	3	180	120	120	1	15	3
		TT	30	20	20	2	6	3	60	40	40	2	10	3	180	120	120	1	15	3
	2	AuACC	30	20	20	2	8	3	60	40	40	2	10	3	180	120	120	1	15	3
		SbACC	30	20	20	2	8	3	60	40	40	2	10	3	180	120	120	1	15	3
		TT	30	20	20	2	6	3	60	40	40	2	10	3	180	120	120	1	15	3

Iron-accumulation (FeACC) calculated utilising the antimony-accumulation (SbACC) parameters

14.9 Block Model Definitions

Grade accumulation and true thickness were estimated using Ordinary Kriging (OK) into 2D block models, whose cell centroids were projected onto an arbitrary easting. The 2D estimates were run with all data, including face samples and diamond drill hole samples, for two different cell sizes resulting in two models with small and large block sizes respectively. The block sizes were selected based on the sample spacing of each area.

Areas of high sample density contain face samples collected in mineralisation during mine development, while areas of low sample density are usually from drill intercepts only ranging from 20 m to 80 m spacing.

The small block estimation was overprinted onto the large block estimation in order to generate a final combined block model. Both the small and large block models were then regularised to a common sub-cell size of 0.5 mY by 0.5 mZ in order to facilitate merging and to better define the mining depletion and domain boundaries.

The block model origins and number of cells are specific to each modelled lode. The common specifications for the block models are detailed in Table 14-18. The block model discretisation was updated to align with the 2D data by adjusting from 3,2,1 (XYZ) to 1,3,3 (XYZ) in the 2021 models and ensuring the 2D data on an easting coincided with the mid-point of the estimated block.

Table 14-18: Block model dimensions

	High Sample Data Density (Face samples)		Low Sample Data Density (Drilling Only)	
	Block Dimensions (m)	Discretization	Block Dimensions (m)	Discretization
X	1	1	1	1
Y	2.5	3	10	3
Z	5	3	10	3

After the block models have been depleted and Mineral Resource categories applied, the block models were repositioned into true 3D space by projecting the western edge of each block onto the western contact of the relevant lode.

The east-west dimension (XINC) of each block was then converted to the horizontal thickness derived from the estimated true thickness multiplied by the Volume Correction Factor (see 14.5) to produce a 3D block model where:

$$XINC = Corrected\ Thickness$$

$$Corrected\ Thickness = True\ Thickness \times Volume\ Correction\ Factor$$

14.10 Block Model Validation

The grade and thickness estimates were validated by:

- Visual comparison of the sample thicknesses, accumulated grades, and back-calculated grades with the estimated model grades in longitudinal projection,
- Global statistical comparisons by domain of the declustered input composites with the corresponding estimated variables: Au-Accumulation, Sb-Accumulation and True Thickness,
- Local validation using Y and Z swath plots, comparing the declustered and I composites against estimated values.

Declustering was required for all block models due to the strong clustering of the face samples along the ore-drives. The input composite declustering was completed using the polygonal declustering process in Datamine software, constrained by the model boundary. Model dimensions for declustering were 10 mX x 1 mY x 2.5 mZ. This process resulted in some samples receiving a zero value weight due to closely spaced data, and these were corrected to a nominal 0.001 weighting. These zero value weights were encountered in 3.8% of 500 Youle samples, and 1% of the 508 Peacock. No zero weights were recorded in other model validations.

Visually, the estimation shows good agreement with the plunge and continuity of the grades evident in the face samples, and the degree of smoothing is considered acceptable. The influence of the high-density face sampling on the areas of diamond drilling was appropriately limited in accordance with the search parameters.

An example of the global statistical comparison by domain for the Youle and Shepherd Lodes is detailed in Table 14-19 and Table 14-20. A percentage difference less than 10% between the declustered samples and estimated grades is considered acceptable.

Domain 6 global validation displays a positive bias (Table 14-19). This was further investigated, and it was concluded from the swathe plots, visual long section, and a secondary declustering performed on the Measured Resource material that the estimate was reasonable and that several low-grade samples between domain 1 and domain 6 were having undue influence on the sample statistics.

Domain 5 of the Youle Lode returned a poor validation result (>10% threshold), however the QP considers that result immaterial for the MRE as this lode has low tonnage and a low composite count.

Table 14-19: Global validation of Youle 500 block model by domain against composites and polygonally declustered composites

			Block Model-Mean	***Composite Mean Comparisons***			***Declustered Composite***
Variable	**Domain**	**No. Comps**	**Estimated Grade**	**Composite Grade (TC)**	**Polygonal Declustered Composite Grade (TC)**	**%Diff Est. Grade to Composite**	**%Diff Est. Grade to Declustered Composite**
Au-Accumulation	Global	2676	15.88	26.97	15.91	-41%	**-0.2%**
Sb-Accumulation	Global	2676	4.36	7.82	4.49	-44%	**-2.9%**
True Vein Thickness	Global	2676	0.28	0.33	0.29	-14%	**-2.1%**
Au-Accumulation	1	1420	26.71	33.12	28.28	-19%	**-5.6%**
Au-Accumulation	2	379	43.61	45.31	40.34	-4%	**8.1%**
Au-Accumulation	3	53	0.02	0.03	0.02	-26%	**-9%**
Au-Accumulation	4	490	10.62	13.30	10.31	-20%	**3.0%**
Au-Accumulation	5	10	0.37	0.58	0.76	-35%	**-50.8%**
Au-Accumulation	6	324	2.46	4.46	2.23	-45%	**10%**
Sb-Accumulation	1	1420	5.05	6.86	5.33	-26%	**-5.3%**
Sb-Accumulation	2	379	16.68	17.89	16.40	-7%	**1.7%**
Sb-Accumulation	3	53	0.01	0.02	0.01	-18%	**8%**
Sb-Accumulation	4	490	5.94	7.06	5.60	-16%	**6.1%**
Sb-Accumulation	5	10	0.22	0.28	0.34	-23%	**-36%**
Sb-Accumulation	6	324	1.62	2.94	1.46	-45%	**11.1%**
True Vein Thickness	1	1420	0.29	0.31	0.30	-6%	**-3.0%**
True Vein Thickness	2	379	0.66	0.67	0.72	-1%	**-7.7%**
True Vein Thickness	3	53	0.25	0.25	0.25	-2%	**-2%**
True Vein Thickness	4	490	0.19	0.21	0.18	-6%	**9.0%**
True Vein Thickness	5	10	0.11	0.09	0.07	19%	**48.6%**
True Vein Thickness	6	324	0.21	0.20	0.21	1%	**0%**

Table 14-20: Global validation of Shepherd 600 block model by domain against composites and polygonally declustered composites

			Block Model-Mean	*Composite Mean Comparisons*			*Declustered Composite*
Variable	**Domain**	**No. Comps**	**Estimated Grade**	**Composite Grade (TC)**	**Polygonal Declustered Composite Grade (TC)**	**%Diff Est. Grade to Composite**	**%Diff Est. Grade to Declustered Composite**
Au-Accumulation	Global	96	18.97	21.96	17.82	-14%	**6.4%**
Sb-Accumulation	Global	96	2.67	2.31	2.76	16%	**-3.3%**
True Vein Thickness	Global	96	0.53	0.48	0.54	11%	**-1.7%**
Au-Accumulation	1	34	19.71	23.13	18.72	-15%	**5.3%**
Au-Accumulation	2	62	18.30	21.32	17.01	-14%	**7.6%**
Sb-Accumulation	1	34	5.57	6.43	5.78	-13%	**-3.6%**
Sb-Accumulation	2	62	0.04	0.05	0.04	-8%	**4.8%**
True Vein Thickness	1	34	0.65	0.56	0.69	16%	**-5.9%**
True Vein Thickness	2	62	0.42	0.43	0.41	-2%	**4.2%**

Swathe plots were generated in the north-south (Y) and vertical (Z) directions for the complete lode (global) and for each domain at a nominal spacing of 20 m. The naïve composite (red lines) and declustered composite (blue lines) mean grades of the accumulation variables are compared with the estimated accumulation variables within the block models (black lines). The Youle 500 and Shepherd 600 block model swathe plots are provided as examples of the validation methodology applied (Youle: Figure 14-30 to Figure 14-32, Shepherd: Figure 14-33 to Figure 14-35). Youle domains 3 and 5 are not material with limited samples and are not presented.

The declustered means presented in the swathe plots are generated by Supervisor using the cell declustering method and therefore are different to the declustered means presented in Table 14-19. The QP considers that the means generated by the polygonal declustering method in Datamine are more reliable than the cell declustering means generated by Supervisor and therefore, preference is given to the table over the swathe plots where there is an apparent discrepancy.

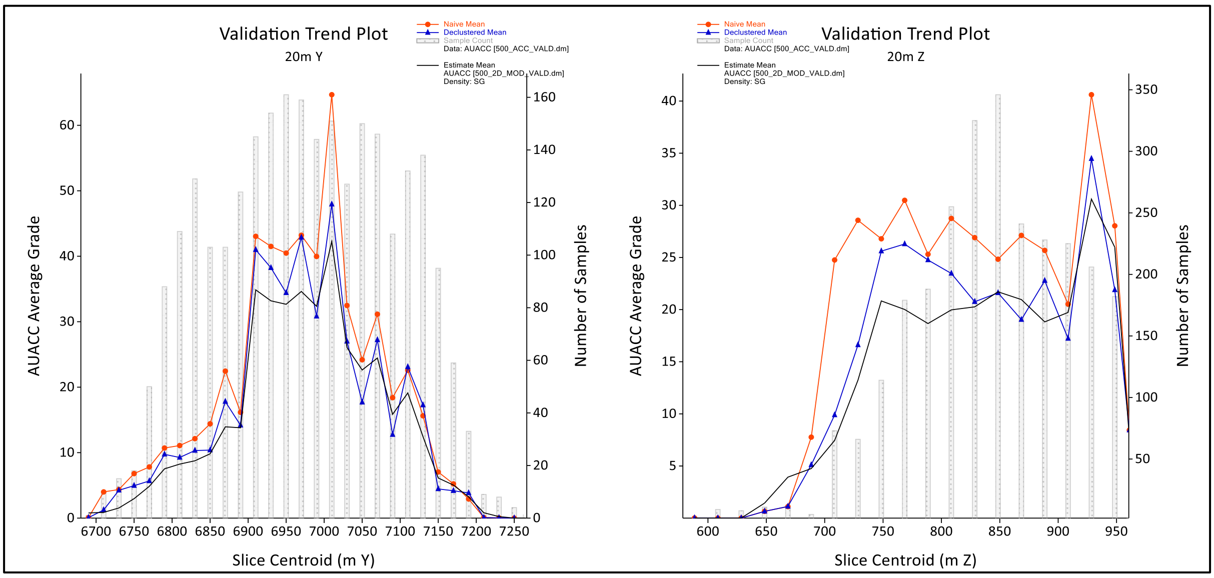


Figure 14-30: Youle 500 global Au-Accumulation swathe plot by Northing and Elevation

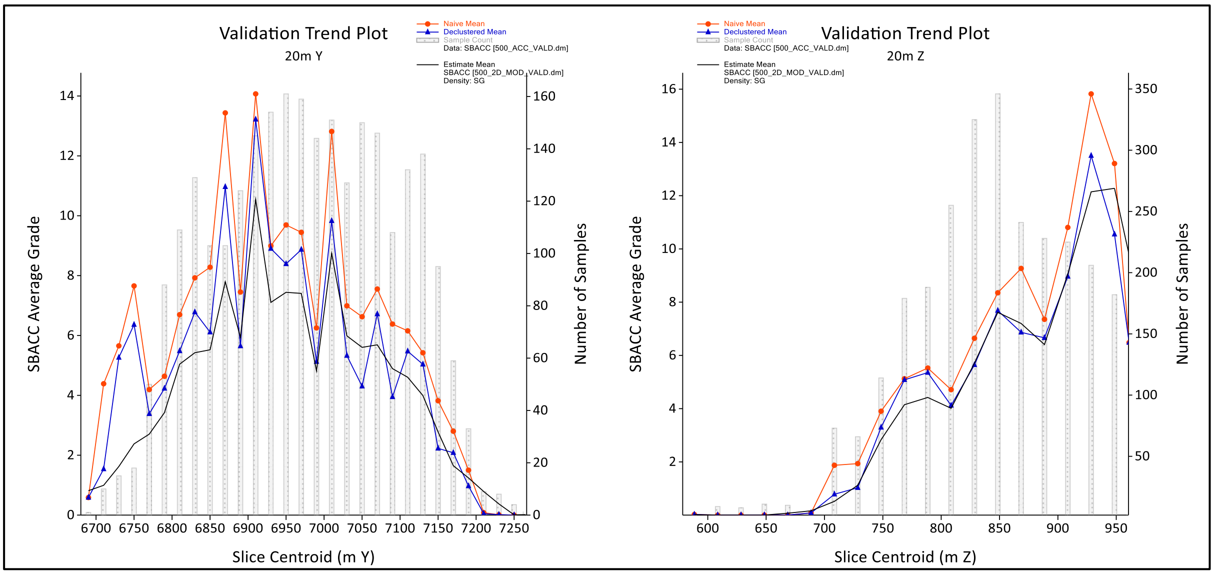


Figure 14-31: Youle 500 Global Sb-Accumulation swathe plot by Northing and Elevation

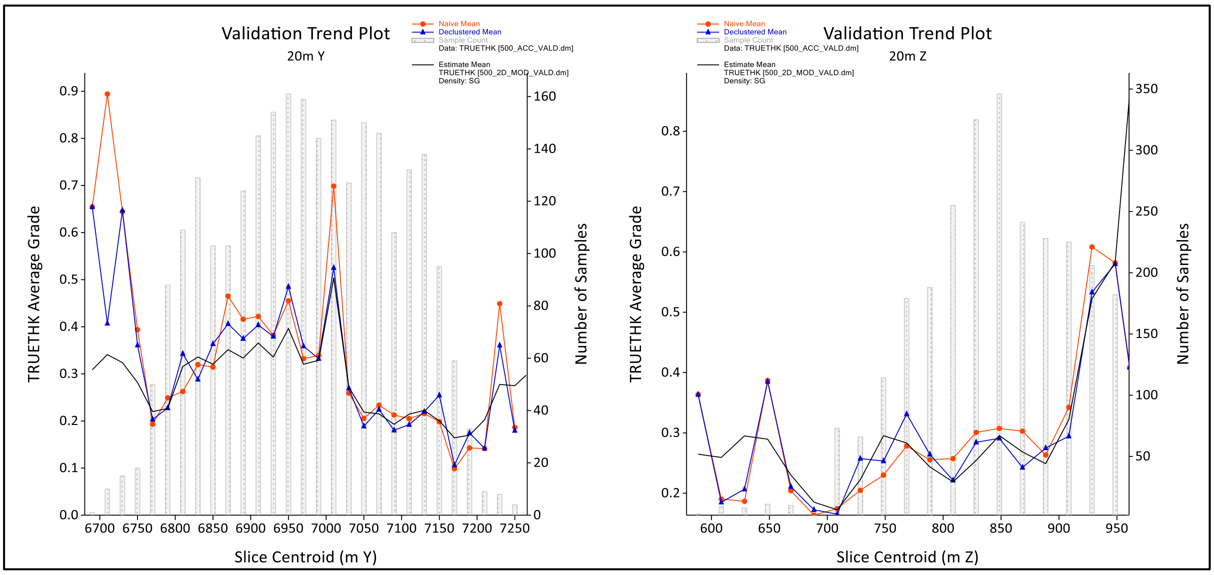


Figure 14-32: Youle 500 Global True Thickness swathe plot by Northing and Elevation

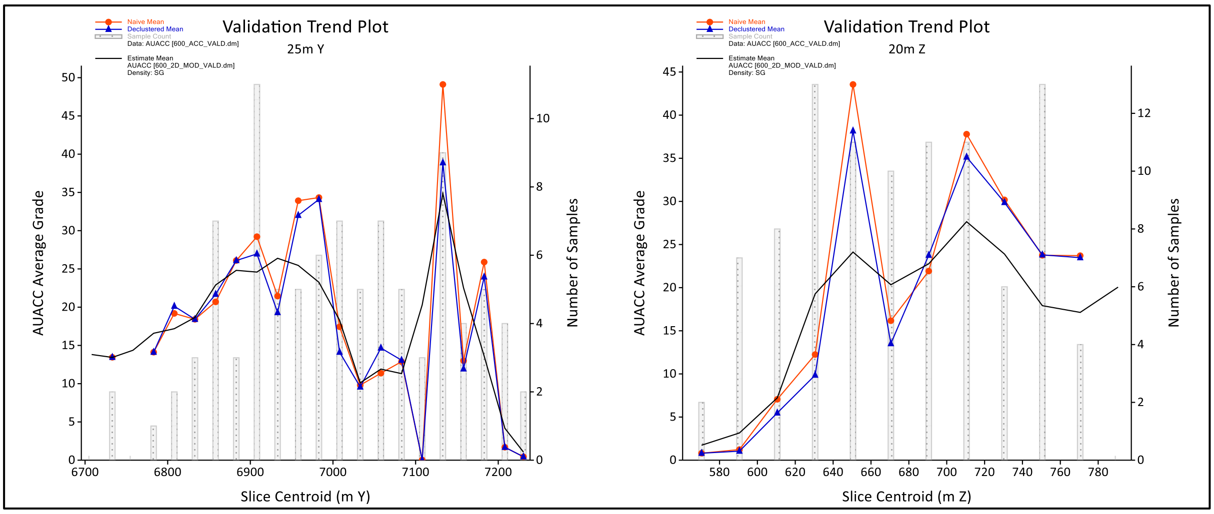


Figure 14-33: Shepherd 600 Global Au-Accumulation swathe plot by Northing and Elevation

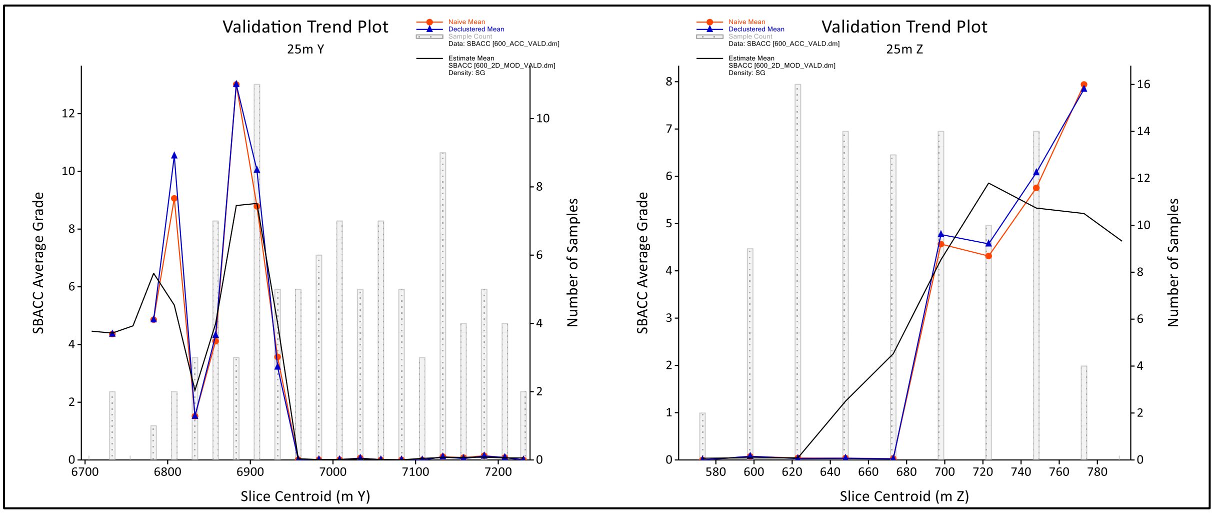


Figure 14-34: Shepherd 600 Global Sb-Accumulation swathe plot by Northing and Elevation

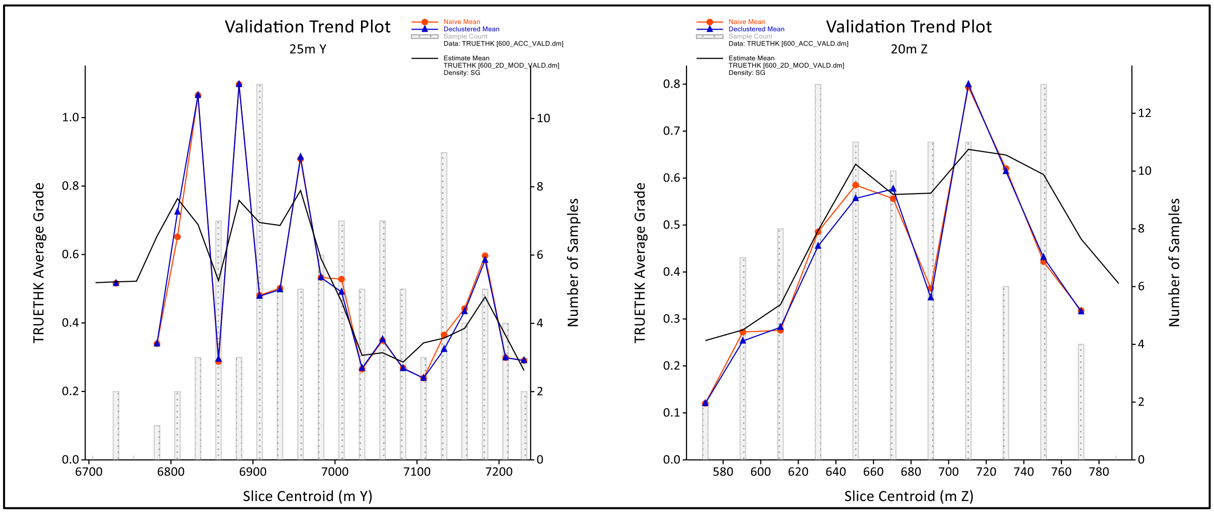


Figure 14-35: Shepherd 600 Global True Thickness swathe plot by Northing and Elevation

14.11 Mineral Resource Classification

Classification of the MRE takes into account Mandalay Resources' experience in mining the deposit, the satisfactory reconciliation observed over many years and the well-established sampling, assaying, interpretation and estimation processes in place.

Mandalay Resources' ongoing mining experience continues to improve the geological confidence and understanding of the controls on the mineralisation, which guides decisions made during the construction of the geological model and the block models.

The classification criteria include the following:

- The Measured Resources are located within, and are defined by, the developed areas of the mine. This criterion ensures the block model estimate is supported by close-spaced underground face sampling, at approximately 2 m to 5 m spacing, and mapping.
- The Indicated Resources are located where the drill hole spacing in longitudinal projection is on a nominal 40 mN by 40 mRL grid, and where there is high geological confidence in the geological interpretation and the block model estimations.
    - The Slope of Regression (SoR) is used to assess the quality of the estimate and natural breaks are referenced to inform confidence boundaries, with a confidence of greater than 0.5 SoR used to guide the Indicated category.
    - The 1st search pass is used as an additional guide, related to sample density, which means that the majority of zones in the Indicated category are limited to approximately half the range of variogram for each domain.

- The Inferred Resource has irregular or widely-spaced drill hole intercepts that display geological continuity but limited or patchy grade continuity,
    - The SoR is typically below 0.5 and the blocks have been estimated in search pass of 2 or 3.

The classification criteria are consistent with the previous Mineral Resource Estimate reported in March 2021 (MP, 2021).

14.12 Mineral Resources

The Mineral Resources are stated here for the Augusta, Cuffley, Brunswick and Youle Deposits with an effective date of 31 December 2021. This date coincides with the following:

- Depletion due to mining up to 31 December 2021.
- Survey of stockpiled ore that was mined and awaiting processing as of 31 December 2021.

All relevant diamond drill hole and underground face samples in the Costerfield Property, available as of 6 December 2021 for the Augusta, Cuffley, Brunswick, and Youle Deposits, and as of 17 December 2021 for the Shepherd Deposit, were used to inform the Mineral Resource Estimate.

The in-situ Augusta, Cuffley, Brunswick, Youle and Shepherd Deposits consist of a combined Measured and Indicated Mineral Resource of 1,387,000 tonnes at 10.6 g/t gold and 2.8% antimony, and an Inferred Mineral Resource of 532,000 tonnes at 6.7 g/t gold and 1.3% antimony.

Stockpiles retained at the Brunswick Processing Plant represent a Measured Mineral Resource of 41,000 tonnes at 10.1 g/t gold, and 3.3% antimony. Stockpile tonnage balances were calculated using drone acquired survey pickups, bulk density factors, and grades from production movements. For the Mineral Resource Estimate, only surface stockpiles with accurate surveyed volumes were included.

The Mineral Resources are reported at a cut-off grade of 3.0 g/t gold equivalent (AuEq), after diluting to a minimum mining width of 1.2 m.

The gold equivalence formula used is calculated using recoveries achieved at the Costerfield Property Brunswick Processing Plant during 2021, and is as follows:

$$\mathrm{AuEq} = \mathrm{Au}\ (\mathrm{g/t}) + 1.58 \times \mathrm{Sb}\ (\%)$$

Where the AuEq factor of 1.58 is calculated:

- *at a gold price of $1,700/oz*

- *an antimony price of $8,500/t*
- *2021 total year metal recoveries of 93% for Au and 95% for Sb.*

Commodity prices used in the equivalence formula are USD$1,700/ounce gold and USD$8,500/tonne for antimony. Refer to Market Studies and Contracts, Section 19, for an explanation on the source of the prices.

The 2021 Mineral Resource is detailed in Table 14-21.

Table 14-21: Mineral Resources at the Costerfield Property, inclusive of Mineral Reserves, as at 31 December 2021

Category	Inventory (t)	Gold Grade (g/t)	Antimony Grade (%)	Contained Gold (koz)	Contained Antimony (kt)
Measured (Underground)	408,000	15.4	5.0	202	20.4
Measured (Stockpile)	41,000	10.1	3.3	14	1.4
Indicated	938,000	8.6	1.9	259	17.5
Measured + Indicated	**1,387,000**	**10.6**	**2.8**	**474**	**39.3**
Inferred	532,000	6.7	1.3	114	6.7

Notes:

1. The Mineral Resource is estimated as of December 31, 2021 with depletion through to this date.
2. The Mineral Resource is stated according to CIM guidelines and include Mineral Reserves.
3. Tonnes are rounded to the nearest thousand; contained gold (oz) is rounded to the nearest thousand; contained antimony (t) is rounded to nearest hundred.
4. Totals may appear different from the sum of their components due to rounding.
5. 3.0 g/t AuEq cut-off grade over a minimum mining width of 1.2 m is applied where AuEq is calculated using the formula: AuEq = Au g/t + 1.58 * Sb %
6. The AuEq factor of 1.58 is calculated at a gold price of $1,700/oz, an antimony price of $8,500/t, and 2021 total year metal recoveries of 93% for Au and 95% for Sb.
7. Veins were diluted to a minimum mining width of 1.2m before applying the cut-off grade and peripheral mineralisation far from current development was excluded to comply with the Reasonable Prospects for Eventual Economic Extraction (RPEEE) criteria.
8. The Stockpile Mineral Resource is estimated based upon surveyed volumes supplemented by production data.
9. Geological modelling, sample compositing and Mineral Resource Estimation for updated models was performed by Joshua Greene, MAusIMM, a full-time employee of Mandalay Resources.
10. The Mineral Resource Estimate was independently reviewed and verified by Dr Andrew Fowler MAusIMM CP (Geo), a full time employee of Mining Plus. Dr Fowler fulfils the requirements to be a “qualified person” for the purposes of NI 43-101, and is the Qualified Person under NI 43-101 for the Mineral Resource Estimate.

Longitudinal projections of the Youle Lode and Shepherd Lode block models are displayed in Figure 14-36 to Figure 14-39 where drill hole intersections are displayed as black dots. Figure 14-36 displays diluted AuEq while Figure 14-37 displays Mineral Resource categories for the Youle Lode. Figure 14-38 displays diluted AuEq while Figure 14-39 displays Mineral Resource categories for the Shepherd Lode.

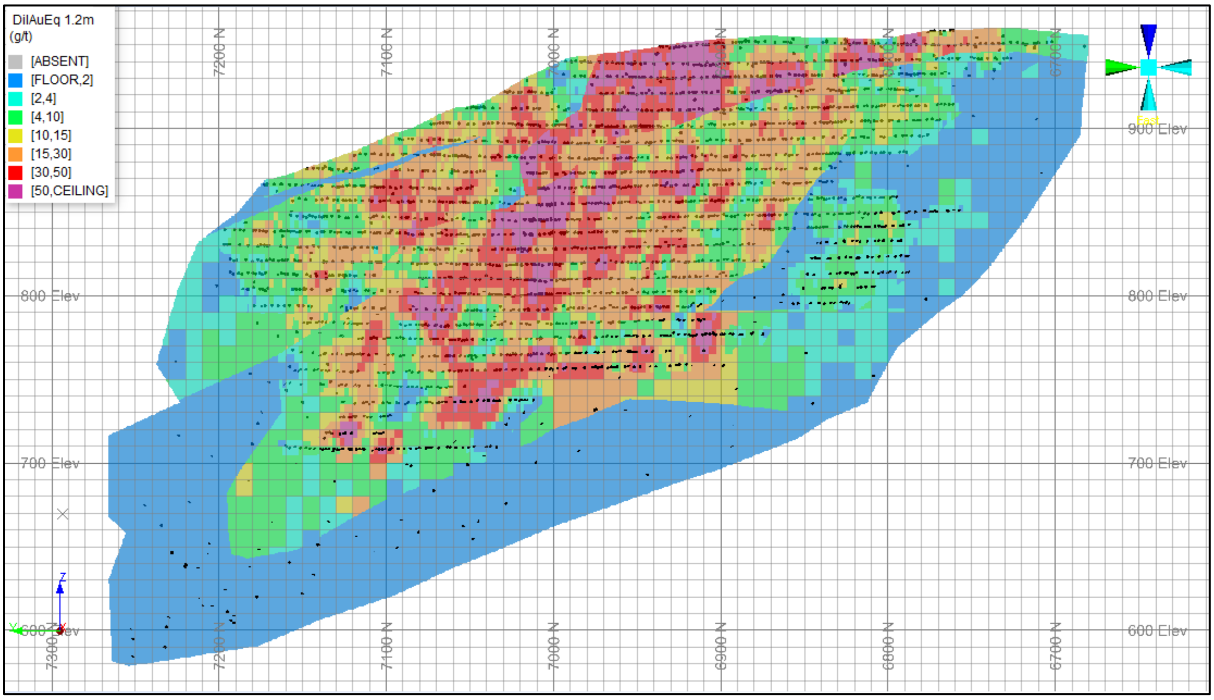


Figure 14-36: Youle 500 Block Model showing model grade in gold equivalent g/t diluted to resource width of 1.2 metres

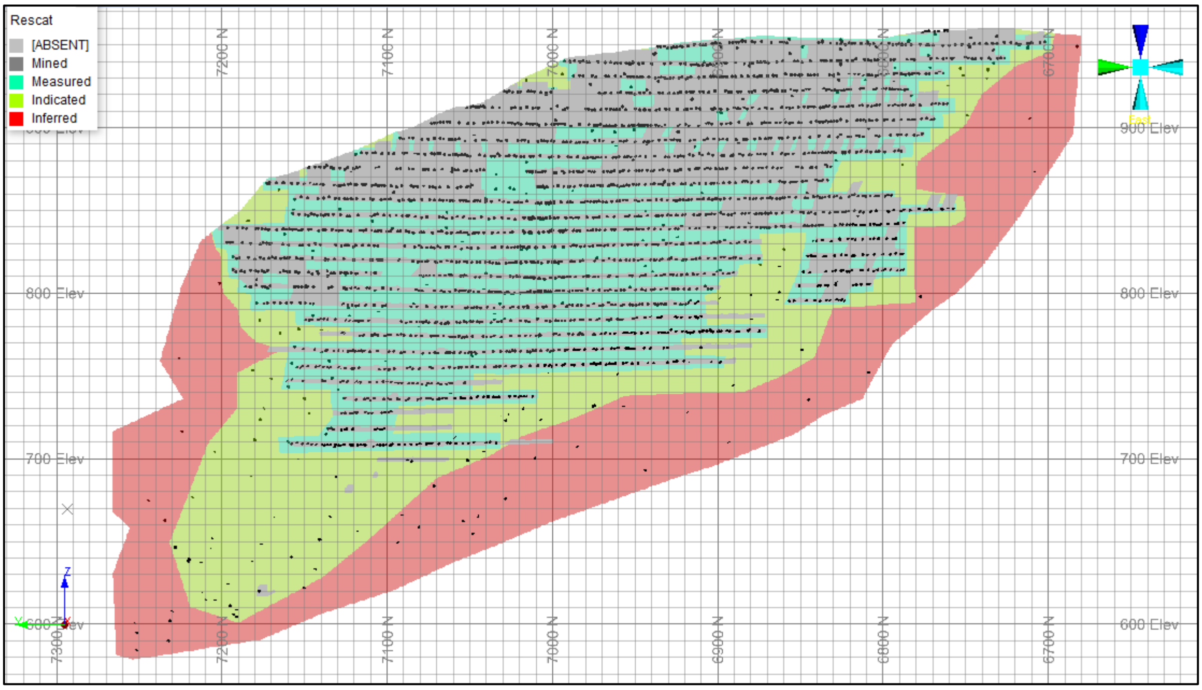


Figure 14-37: Youle 500 Block Model with Resource Category Boundaries

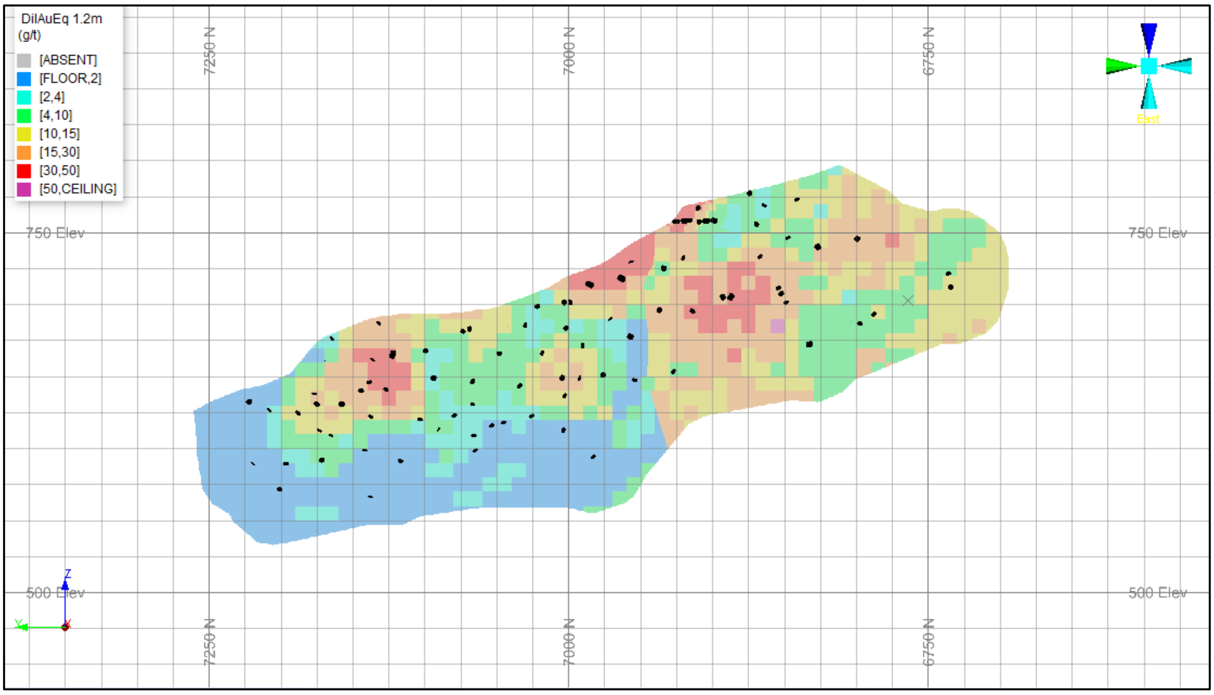


Figure 14-38: Shepherd 600 Block Model showing model grade in gold equivalent g/t diluted to resource width of 1.2 metres

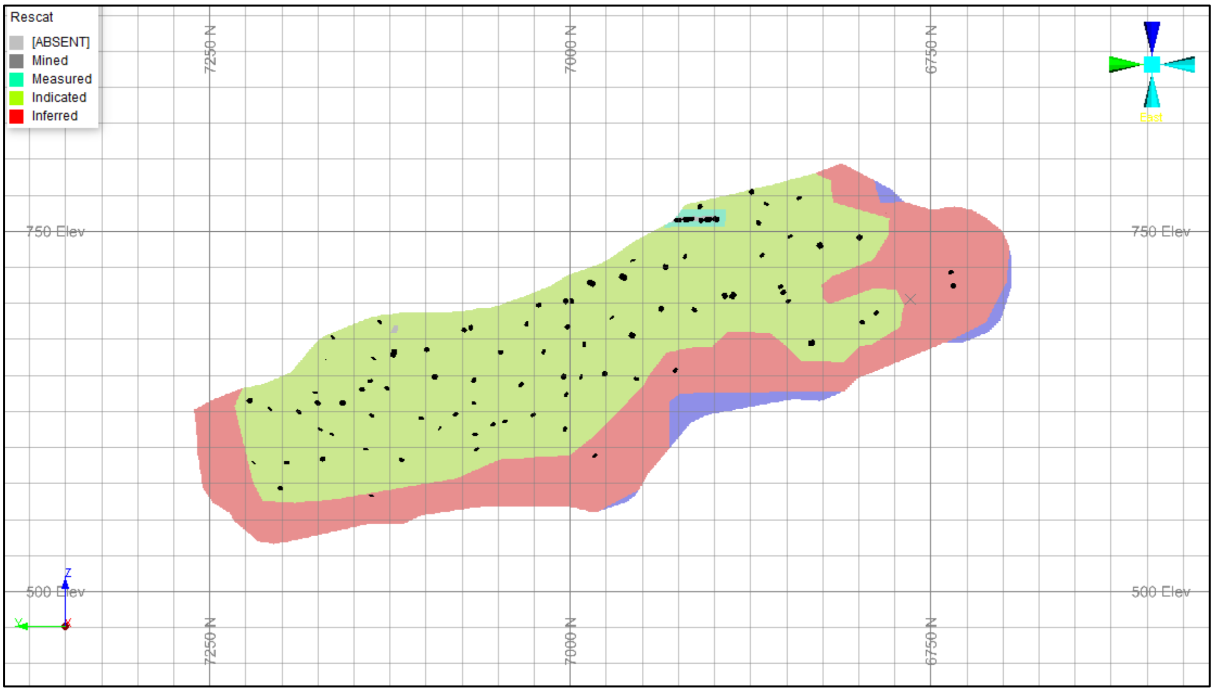


Figure 14-39: Shepherd 600 Block Model with Resource Category Boundaries – note that blue is unclassified and not reported

Details of the in-situ Augusta, Cuffley, Brunswick, Youle and Shepherd Mineral Resources, by area and lode are outlined in Table 14-22.

Table 14-22: Summary of in-situ Augusta, Cuffley, Brunswick, Youle and Shepherd Mineral Resources, inclusive of Mineral Reserves

Deposit	Lode Name	Resource Category	Tonnes	Au (g/t)	Sb (%)	Au (oz)	Sb (t)
Augusta Deposit	E Lode	Measured	50,000	9.5	6.0	15,300	3,000
		Indicated	70,000	3.8	2.3	8,600	1,600
		Inferred	21,000	2.7	1.3	1,800	300
	B Lode	Measured	8,000	5.6	2.3	1,500	200
		Indicated	30,000	5.2	1.8	5,000	500
	B Splay	Measured	3,000	3.3	2.6	300	100
		Indicated	3,000	6.8	1.6	700	0
		Inferred	16,000	3.7	1.1	1,900	200
	W Lode	Measured	28,000	9.8	5.5	8,700	1,500
		Indicated	36,000	5.3	2.4	6,100	800
		Inferred	35,000	3.2	1.4	3,600	500
	C Lode	Indicated	62,000	5.1	2.5	10,100	1,600
	N Lode	Measured	51,000	10.0	4.5	16,400	2,300
		Indicated	65,000	4.3	1.9	8,900	1,300
		Inferred	50,000	3.7	1.4	5,900	700
	NW Lode	Measured	1,000	6.0	3.7	100	0
		Indicated	3,000	4.7	3.3	400	100
	NS 48	Measured	2,000	3.5	2.8	200	0
		Indicated	4,000	4.9	2.9	700	100
	P1 Lode	Measured	11,000	0.0	0.0	3,500	300
		Indicated	9,000	9.6	2.4	2,700	200
	K Lode	Measured	10,000	5.1	2.4	1,600	200
		Indicated	64,000	3.2	1.9	6,500	1,200
		Inferred	25,000	3.9	2.1	3,100	500
Cuffley Deposit	CM Lode	Measured	41,000	9.6	3.4	12,500	1,400
		Indicated	48,000	6.5	2.7	10,000	1,300
		Inferred	4,000	7.1	2.2	900	100
	CE Lode	Measured	10,000	13.2	5.0	4,200	500
		Indicated	14,000	6.7	2.2	2,900	300
	CD Lode	Measured	10,000	12.0	4.7	3,700	400
		Indicated	56,000	5.6	1.7	10,000	900
		Inferred	16,000	3.5	0.8	1,800	100
	CDL Lode	Inferred	30,000	6.9	0.1	6,600	0
	AS Lode	Measured	1,000	19.4	1.6	700	0
		Indicated	30,000	5.6	1.6	5,500	500
		Inferred	6,000	6.3	1.5	1,100	100
Brunswick Deposit	Main Lode	Measured	30,000	7.1	3.5	6,800	1,000
		Indicated	65,000	4.2	1.9	8,700	1,300
	KR Lode	Indicated	35,000	4.5	2.2	5,100	800
		Inferred	7,000	6.9	1.9	1,500	100
Sub King Cobra	SKC CE	Inferred	23,000	2.1	1.0	1,500	200
	SKC LQ	Inferred	9,000	9.3	0.3	2,800	0
	SKC C	Inferred	83,000	5.7	1.2	15,200	1,000
	SKC W	Inferred	68,000	9.9	0.0	21,600	0
Youle Deposit	Main Lode	Measured	128,000	27.0	6.0	111,200	7,700
		Indicated	75,000	13.4	1.7	32,400	1,300
		Inferred	27,000	3.3	1.8	2,900	500

Deposit	Lode Name	Resource Category	Tonnes	Au (g/t)	Sb (%)	Au (oz)	Sb (t)
	South Splay	Measured	1,000	3.8	3.7	100	0
		Indicated	2,000	3.3	2.3	200	0
	Kendal Splay	Measured	1,000	49.2	18.2	1,600	200
	Peacock Vn	Measured	13,000	21.3	7.3	8,900	1,000
		Indicated	18,000	2.1	3.2	1,200	600
		Inferred	1,000	3.2	2.4	100	0
	Youle South Splay	Measured	8,000	11.1	4.4	2,900	400
	Peacock Splay	Measured	1,000	4.3	2.7	100	0
		Indicated	1,000	6.3	1.7	200	0
Shepherd Deposit	Shepherd Lode	Measured	1,000	24.9	6.5	1,000	100
		Indicated	143,000	20.2	2.1	92,900	3,000
		Inferred	53,000	14.0	3.8	24,000	2,000
	Ryeland Splay	Measured	1,000	8.9	0.2	100	0
		Indicated	21,000	8.5	0.1	5,700	0
		Inferred	7,000	4.3	0.0	900	0
	Merino Splay	Indicated	25,000	7.7	0.0	6,200	0
	Dorset Splay	Indicated	5,000	6.4	0.0	1,100	0
	Suffolk Lode	Indicated	48,000	16.6	0.2	25,500	100
		Inferred	47,000	10.8	0.5	16,300	300
	Drysdale Splay	Indicated	8,000	4.6	0.2	1,200	0
		Inferred	2,000	3.6	0.1	200	0
		Measured and Indicated	1,345,000	10.6	2.8	460,000	37,900
		Inferred	532,000	6.7	1.3	114,100	6,700

Refer to notes for Table 14-21

14.13 Comparison to 2020 Mineral Resource

A high-level comparison between the 2020 and 2021 Mineral Resource Estimates has been undertaken (Figure 14-40). In order to demonstrate areas of variance between the two reporting periods, the gold and antimony grades have been converted into AuEq values determined using the equation:

$$AuEq\ (oz) = Au\ (oz) + (Sb\ (t) \times (Sb\ price/t\ /\ Au\ price/oz))$$

Where Sb price = USD$8,500/t and Au price = USD$1,700/oz

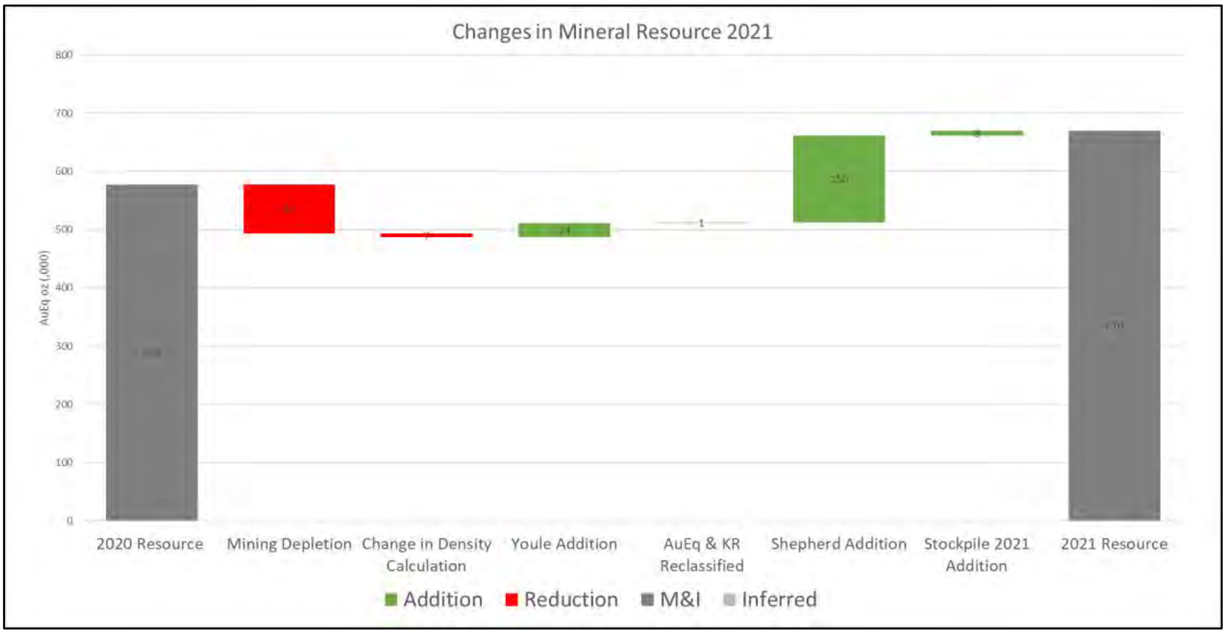


Figure 14-40: Comparison between 2020 and 2021 Mineral Resource Estimates

Key areas of variance between the two Mineral Resources are:

- The Mineral Resource was depleted by 84 koz AuEq, with majority from the Youle 500 series models.
- The Youle models increased by 24 koz AuEq, as a result of higher grades in the lower ore drives than previously estimated, density weighting of interval composites and additional exploration testing.
- The Shepherd block models were added to the MRE containing 150 koz AuEq, as a result of the 2021 exploration program.
- The density regression was refined at Youle and Shepherd leading to a 7 koz AuEq decrease (see Section 14.6 Bulk Density Determinations)
- Stockpiles continued to increase throughout 2021, adding 8 koz AuEq.
- The AuEq factor was increased from 1.5 to 1.58 due to stronger antimony resource prices and when combined with the KR 310 model re-estimation contributed to 1 koz AuEq.

14.14 Reasonable Prospects of Eventual Economic Extraction

The reasonable prospects for eventual economic extraction (RPEEE) have been satisfied by applying a minimum mining width of 1.2 m and ensuring that isolated blocks above cut-off grade, which are unlikely to ever be mined due to distance from the main body of mineralisation, were excluded from the Mineral Resource.

The width of 1.2 m is the practical minimum mining width applied at the Costerfield Property for stoping. For blocks with widths less than 1.2 m, diluted grades were estimated by adding a waste envelope with zero grade and 2.74 t/m^3 (Augusta, Brunswick and Cuffley) or 2.76 t/m^3 (Youle and Shepherd) bulk density to the lode.

A 3.0 g/t AuEq cut-off grade over a minimum mining width of 1.2 m has been applied. The cut-off has been derived by Mandalay Resources based on cost, revenue, mining and recovery data from the year ending 31 December 2021, and updated commodity price forecasts and exchange rates. This remains the same as the previous Mineral Resource cut-off grade of 3.0 g/t AuEq used in the Mineral Resource Estimate effective 31 December 2020 (MP, 2021).

Pillars and remnant material that is above 3.0 g/t AuEq has been included in the Measured Resource. From 2017 onwards, extraction of these areas has been an ongoing success due to the use of remote loaders and recovered Au (oz) and Sb (t) reconcile well with the Resource block model. Due to this success, these areas are now considered viable under RPEEE.

14.15 Reconciliation

2021 production consisted of stopes and development from the Youle Lode system (500 series models) with minor contributions from Brunswick (300) and the Shepherd (600) and Ryeland (604) Lodes on Shepherd. The greatest proportion of ore mined during 2021 was produced from the Youle Lode (96%) with the balance of 4% being sourced from the Brunswick Lode (3%) and from Shepherd (1%). There were no Augusta remnants mined for the period.

Run-of-mine (ROM) ore is currently stockpiled according to grade bins rather than by named mining area or mining level, therefore reconciliation by individual named deposit is not possible. The reconciliation presented below is therefore combined for the Brunswick and Youle lodes.

Mine production has been defined using the conservation of mass equation below, for both tonnes and metal content.

$$\textit{Mine Production} = \textit{Milled Production} + \textit{Change } (\Delta) \textit{ in Stockpile Inventory}$$

End of month stockpile tonnage balances are estimated using drone acquired survey pickups and bulk density factors. The bulk density of the stockpiles is based on the results of a series of measurements collected in September 2013 where 15 truckloads of ore were hauled by rigid bodied road truck and weighed at a weighbridge located at the old service station, later demolished in 2016, at 55-57 High Street, Heathcote Vic 3523. Ore was subsequently hauled and dumped at a pre-surveyed pad at the Augusta process plant. The final stockpile was surveyed using a Trimble Total Station, and the difference between the two surfaces used to determine stockpile volume.

The moisture content, combined dry mass and surveyed volume of the stockpile were used to calculate the moisture as well as wet and dry bulk density. A fixed moisture content of 3.42% is used for all stockpile calculations. This is derived from, and validated against, the daily moisture content for ROM material reported daily by the Brunswick Processing Plant for 2021. Bulk density of stockpiled material is estimated by this methodology as 1.93 t/m^3 (dry), and 1.99 t/m^3 (wet).

Wet and calculated dry weights of each load measured are detailed in Table 14-23.

Table 14-23: Trucked payload wet and calculated dry weights

Load No	Truck	Wet Weight (Weighed) (t)	Dry Weight (Calculated) (t)	Moisture (t)
1	XCU	15.1	14.6	0.5
2	NNP	15.0	14.5	0.5
3	NNP	15.2	14.8	0.5
4	XCU	14.4	13.9	0.5
5	NNP	15.7	15.2	0.5
6	XCU	14.5	14.1	0.5
7	NNP	13.7	13.3	0.4
8	XCU	13.6	13.2	0.4
9	NNP	14.2	13.8	0.5
10	XCU	14.0	13.5	0.4
11	NNP	13.4	13.0	0.4
12	XCU	13.9	13.4	0.4
13	NNP	14.0	13.5	0.4
14	XCU	14.9	14.4	0.5
15	NNP	13.8	13.3	0.4
	TOTAL	**215.4**	**208.5**	**6.9**

Stockpile grades are populated from production movements using a combination of assay and block model estimated data.

Stockpile inventories increased 25.2 kt from 16.2 kt at the beginning of the year to 41.4 kt. Closing grades of the stockpiles were 10.1 g/t Au and 3.3% Sb for a contained metal content of 13.5 koz gold and 1.4 kt antimony. Figure 14-41 illustrates the change in stockpile inventories from 2020-2021.

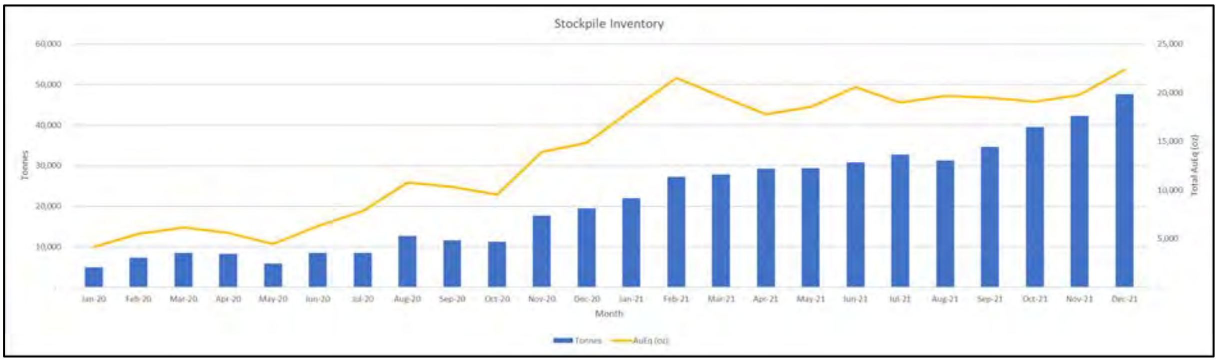


Figure 14-41: Costerfield Property stockpile inventory – 2020 to 2021

The current 2022 block model estimate was reconciled against the year-end 2021 production according to the following process:

- A string was digitised in longitudinal projection for each of the relevant lodes to outline areas that were mined each month during 2021.
- The mined material was then coded into the 2022 2D diluted block models for each lode so that tonnes, grades and contained metal could be reported by type, month and level.
- These values were reconciled against tonnes, grades and produced metals reported by the Brunswick Processing Plant.

Tonnage and grades reported by the Brunswick Process Plant were 173,726 tonnes grading at 11.0 g/t Au and 3.5% Sb for 61,307 ounces of contained gold and 6,088 tonnes of antimony (Table 14-24). The Brunswick Processing Plant production data is considered authoritative for tonnages since it is measured and validated using belt weightometer and Loadrite scales on-board the loader that feeds the process plant. ROM tonnages are provided for guidance only as they are based on visual estimates of mining dimensions and grade. They include the increase in stockpiles as listed above, and an additional 2,995 t in unsurveyed material in underground stockpiles and the boxcut.

Table 14-24: ROM tonnes and Brunswick Processing Plant production – year ended 31 December 2021

Production Year 2020	ROM*	Plant Feed**	Produced Metal	
Month	Dry Tonnes	Dry Tonnes	Au (oz)	Sb (t)
Jan	16,382	13,779	7,323	762
Feb	14,988	9,766	5,524	691
Mar	13,107	12,516	2,795	315
Apr	14,003	12,596	3,043	399
May	13,187	13,006	4,235	543
Jun	13,333	11,946	5,013	671
Jul	13,771	11,846	4,473	234
Aug	10,665	12,109	5,041	539

Production Year 2020	ROM*	Plant Feed**	Produced Metal	
Month	Dry Tonnes	Dry Tonnes	Au (oz)	Sb (t)
Sep	15,119	11,752	5,576	432
Oct	17,334	12,422	6,019	458
Nov	15,229	12,509	5,356	577
Dec	16,607	11,233	6,909	467
Total	**173,726**	**145,480**	**61,307**	**6,088**

Notes:
**ROM tonnes are based on visual estimates of mining dimensions, grade, and bulk density of ore and waste as set out in Section 14.6 of this document. The figure includes the increase in stockpiles and an estimated additional 2,995 t in unsurveyed material in underground stockpiles and the boxcut.*
***Feed tonnes at the mill are weighed and validated by belt weightometer and Loadrite scales onboard the loader that feeds the process plant*

In order to achieve a direct tonnage comparison against processed ore, the estimated resource tonnes were diluted by the production widths of 2.6 m for ore-drive development and 2.0 m for stopes, which represented the weighted average of observed mining widths for 2021, summarised in Table 14-25.

Table 14-25: Parameters used for average mining width estimation

Mining Method	Mining Width Estimation Method	Production %	Width (m)
Development	Average observed width for development weighted by height x advance	50.3%	2.6
Stoping	Average observed width weighted by 2D stope area height x strike	49.7%	2.0
Average for 2021			2.3

The reconciliation is presented below as a comparison by quarter of the previous 2020 Resource models with the current 2021 models to understand the performance of the estimation method with all available 2021 data. Figure 14-42 displays a comparison between the combined and diluted 2020/2021 resource block models tonnes and 2021 produced tonnes, while Figure 14-43 and Figure 14-44 display the comparison between the actual and predicted ounces of gold and tonnes of antimony respectively. Figure 14-45 and Figure 14-46 display the comparison between actual and predicted gold and antimony grade respectively.

Figure 14-42: Reconciliation of the 2020 and 2021 Mineral Resource versus 2021 mine production – tonnes

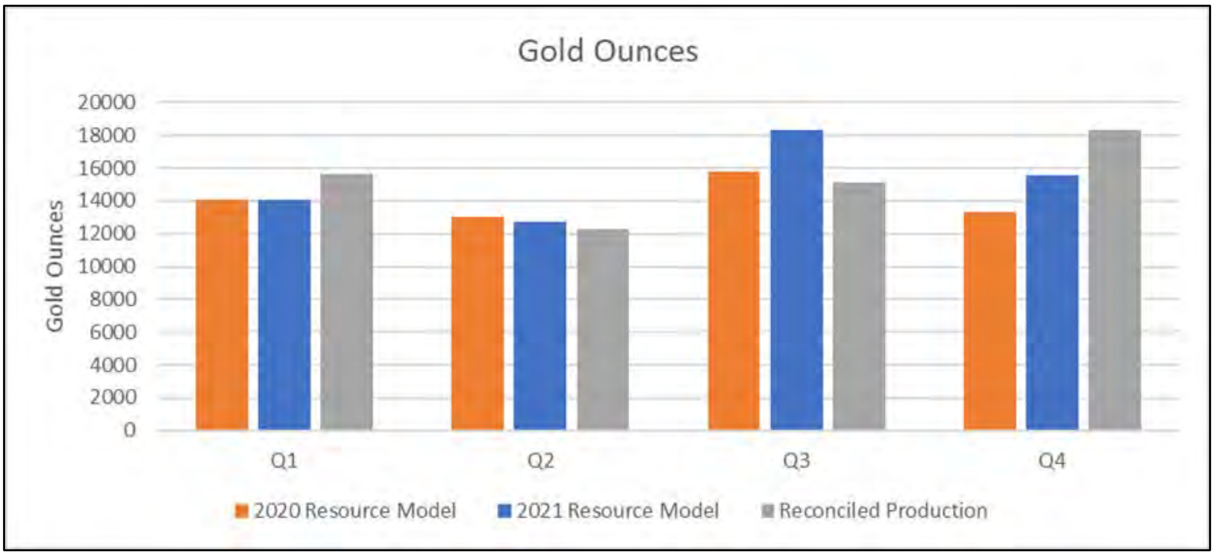


Figure 14-43: Reconciliation of the 2020 and 2021 Mineral Resource versus 2021 mine production – gold ounces

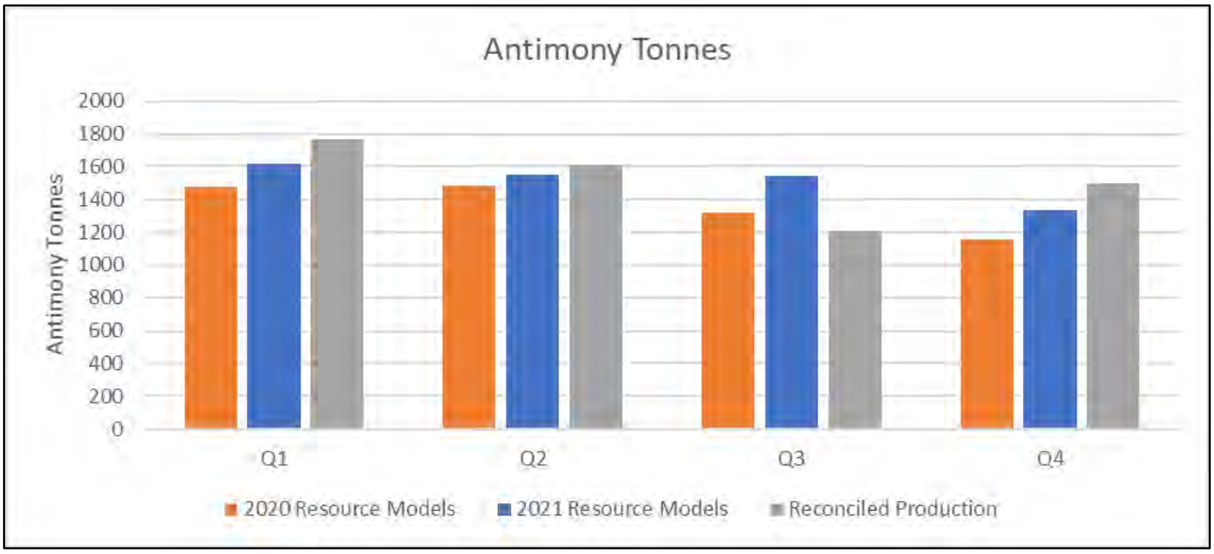


Figure 14-44: Reconciliation of the 2020 and 2021 Mineral Resource versus 2021 mine production – antimony tonnes

Figure 14-45: Reconciliation of the 2020 and 2021 Mineral Resource versus 2021 mine production – gold grade

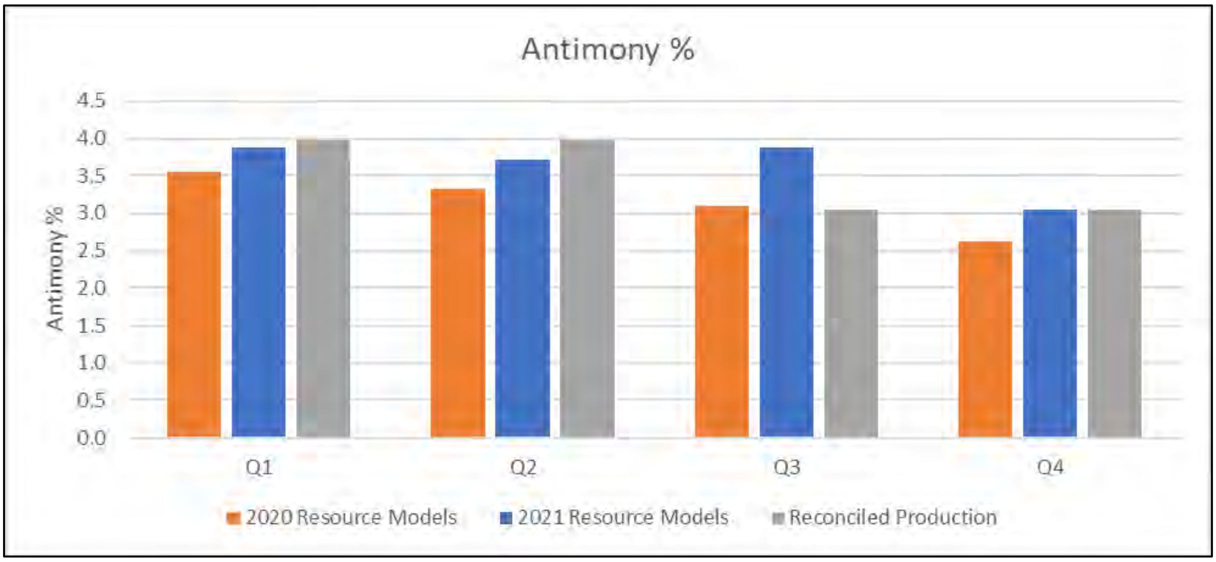


Figure 14-46: Reconciliation of the 2020 and 2021 Mineral Resource versus 2021 mine production – antimony grade

14.15.1 Review of 2020 Resource Models

The previous 2020 resource models (MP, 2021) selected inside the 2021 depletion wireframes report 173,726 tonnes at 10.1 Au g/t and 3.1 Sb % for an estimated contained 56,178 ounces of gold and 5,437 tonnes of antimony (Table 14-26 to Table 14-28). The reconciliation of the 2020 resource model is summarised against the 2021 mine production by tonnes, metal and grade in Figure 14-42 to Figure 14-46. The breakdown of the 2020 resource models by resource category for the 2021 production in both tonnage and gold-equivalent metal is presented in Table 14-29.

Table 14-26: Tonnage Reconciliation of 2020 Mineral Resource versus 2021 mine production

Production Year 2021	Tonnes Reconciliation (t)		
Month	2020 Mineral Resources, dmt	Produced, dmt	Tonnage Variance (%)
Q1	41,566	44,478	-6.5%
Q2	44,641	40,524	10.2%
Q3	42,713	39,554	8.0%
Q4	44,153	49,170	-10.2%
Total	**173,073**	**173,726**	**-0.4%**

Table 14-27: Metal Reconciliation of 2020 Mineral Resource versus 2021 mine production

Production Year 2021	Metal Reconciliation					
Month	2020 Resource Au (oz)	Produced Au (oz)	Au Variance (%)	2020 Resource Sb (t)	Produced Sb (t)	Sb Variance (%)
Q1	14,079	15,642	-10.0%	1,477	1,768	-16.5%
Q2	12,997	12,291	5.7%	1,483	1,613	-8.1%

Production Year 2021	Metal Reconciliation					
Month	2020 Resource Au (oz)	Produced Au (oz)	Au Variance (%)	2020 Resource Sb (t)	Produced Sb (t)	Sb Variance (%)
Q3	15,809	15,090	4.8%	1,320	1,205	9.6%
Q4	13,294	18,284	-27.3%	1,157	1,501	-22.9%
Total	**56,178**	**61,307**	**-8.4%**	**5,437**	**6,088**	**-10.7%**

Table 14-28: Grade Reconciliation of 2020 Mineral Resource versus 2021 mine production

Production Year 2021	Grade Reconciliation					
Month	2020 Resource Au (g/t)	Produced Au (g/t)	Au Variance (%)	2020 Resource Sb (%)	Produced Sb (%)	Sb Variance (%)
Q1	10.5	10.9	-3.7%	3.6	4.0	-10.6%
Q2	9.1	9.4	-4.0%	3.3	4.0	-16.5%
Q3	11.5	11.9	-3.0%	3.1	3.0	1.5%
Q4	9.4	11.6	-19.0%	2.6	3.1	-14.2%
Total	**10.1**	**11.0**	**-8.0%**	**3.1**	**3.5**	**-10.3%**

Table 14-29: 2020 Resource Models breakdown by resource category for the 2021 production

2020 Resource Models		
Resource Category	% Tonnes	% AuEq Ounces
Measured	45%	57%
Indicated	48%	40%
Inferred	7%	10%

14.15.2 Performance of 2021 Resource Models

The 2021 resource models selected inside the 2021 depletion wireframes report 167,149 tonnes at 11.3 g/t Au and 3.8% Sb for an estimated contained 60,737 ounces of gold and 6,055 tonnes of antimony. The reconciliation of the 2021 resource model is summarised against the 2021 mine production by tonnes, metal and grade in Table 14-30 to Table 14-32. See also Figure 14-42 to Figure 14-46 above.

Table 14-30: Tonne Reconciliation of 2021 Mineral Resource versus 2021 mine production

Production Year 2021	Tonnes Reconciliation (t)		
Month	2020 Mineral Resources, dmt	Produced, dmt	Tonnage Variance (%)
Q1	41,764	44,478	-6.1%
Q2	41,858	40,524	3.3%
Q3	39,835	39,554	0.7%
Q4	43,692	49,170	-11.1%
Total	**167,149**	**173,726**	**-3.8%**

Table 14-31: Metal Reconciliation of 2021 Mineral Resource versus 2021 mine production

Production Year 2021	Metal Reconciliation					
Month	2021 Resource	Produced	Au Variance (%)	2021 Resource	Produced	Sb Variance (%)
	Au (oz)	Au (oz)		Sb (t)	Sb (t)	
Q1	14,098	15,642	-9.9%	1,621	1,768	-8.3%
Q2	12,695	12,291	3.3%	1,554	1,613	-3.7%
Q3	18,348	15,090	21.6%	1,545	1,205	28.2%
Q4	15,595	18,284	-14.7%	1,334	1,501	-11.1%
Total	**60,737**	**61,307**	**-0.9%**	**6,055**	**6,088**	**-0.5%**

Table 14-32: Grade Reconciliation of 2021 Mineral Resource versus 2021 mine production

Production Year 2021	Grade Reconciliation					
Month	2021 Resource	Produced	Au Variance (%)	2021 Resource	Produced	Sb Variance (%)
	Au (g/t)	Au (g/t)		Sb (%)	Sb (%)	
Q1	10.5	10.9	-4.0%	3.9	4.0	-2.4%
Q2	9.4	9.4	0.0%	3.7	4.0	-6.7%
Q3	14.3	11.9	20.7%	3.9	3.0	27.3%
Q4	11.1	11.6	-4.0%	3.1	3.1	0.0%
Total	**11.3**	**11.0**	**3.0%**	**3.6**	**3.5**	**3.4%**

14.15.3 Reconciliation Discussion

The review of the 2020 Resource models has demonstrated the suitability of the estimation methodology and drill testing over the twelve-month period. It is the opinion of Mandalay Resources staff and the QP that the variance of -8.4% for gold ounces and -10.7% for antimony tonnes is an acceptable result considering that 55% of the Mineral Resource extracted for the period came from Indicated and Inferred categories.

The 2021 Resource models reconciled particularly well with the 2021 production with a variance of -0.9% and -0.5% for gold and antimony. This indicates that the estimation methodology is performing well at representing reconciled production. This is an improvement on the reconciliation work of the 2020 resource models (MP, 2021) which had shown a variance of 4.90% for gold, and 9.95% for Antimony. Refinements to the bulk density calculations through a detailed sampling campaign in 2021 (Section 14.6.3), as well as incorporation of bulk density weighting in composite files is attributed to this improvement.

As highlighted in the data presented in Table 14-26 to Table 14-32, there remains a degree of variation from quarter to quarter. This fluctuation has become more pronounced with the increase in stockpiles, now representing over 3 months of mill feed. Additional improvements in stockpile tracking and grade management are currently underway to improve resolution by area and lode.

14.16 Other Material Factors

Mining Plus is not aware of any environmental, permitting, legal, title, taxation, socio-economic, marketing, or political factors that could materially influence the Mineral Resources other than the modifying factors already described in other sections of this report.

15 MINERAL RESERVE ESTIMATES

A mine plan was prepared from the 2021 Mineral Resource, based only on Measured and Indicated Resource blocks, mined primarily using a long-hole stoping mining method with cemented rock fill (CRF). The minimum stoping width of 1.5 m was used, with planned and unplanned dilution at zero grade for both Au and Sb.

A gold equivalent (AuEq) grade for Mineral Reserve has been calculated using commodity prices of USD $1,500/oz Au and USD $7,500/t Sb. AuEq grade is calculated using the formula:

$$AuEq = Au + (Sb \times 1.06)$$

Where Sb is in % and Au is in grams/tonne

The cut-off grade of 3.8 g/t AuEq was determined from the Costerfield Property 2021 production costs.

The financial viability of Proven and Probable Mineral Reserve was demonstrated at metal prices of USD $1,500/oz Au and USD $7,500/t Sb. Refer to Market Studies and Contracts, Section 19, for an explanation on the source of the prices.

The 2021 Mineral Reserve is detailed in Table 15-1.

Table 15-1: Mineral Reserve at the Costerfield Property, as at December 31, 2021

Category	Tonnes (kt)	Gold Grade (g/t)	Antimony Grade (%)	Contained Gold (koz)	Contained Antimony (kt)
Proven Underground	267	15.9	4.4	136	11.7
Proven Stockpile	41	10.1	3.3	14	1.4
Probable	460	10.9	1.4	162	6.5
Proven + Probable	**769**	**12.6**	**2.5**	**312**	**19.6**

Notes:

1. Mineral Reserve estimated as of December 31 2021 and depleted for production through to December 31, 2021.
2. Tonnes are rounded to the nearest thousand; contained gold (oz) Rounded to the nearest thousand and contained antimony (t) rounded to nearest hundred.
3. Totals may appear different from the sum of their components due to rounding.
4. Lodes have been diluted to a minimum mining width of 1.5 m for stoping and 1.8 m for ore development.
5. A 3.8 g/t Au Equivalent (AuEq) cut-off grade has been applied.
6. Commodity prices applied are; gold price of USD $1,500/oz, antimony price of USD $7,500/t and exchange rate AUD:USD of 0.71.
7. The Au Equivalent value (AuEq) is calculated using the formula: AuEq = Au g/t + 1.06 * Sb %.
8. The Mineral Reserve is a subset, a Measured and Indicated only Schedule, of a Life of Mine Plan that includes mining of Measured, Indicated and Inferred Resources.
9. The Mineral Reserve Estimate was prepared by Dylan Goldhahn, MAusIMM under the direction of Daniel Fitzpatrick, MAusIMM, who are both full-time employees of Mandalay Resources. The Mineral Reserve estimate was independently verified by Aaron Spong FAusIMM CP (Min) who is a full-time employee of Mining Plus. Mr

Spong fulfils the requirements to be a Qualified Person for the purposes of NI 43-101 and is the Qualified Person under NI 43-101 for the Mineral Reserve.

There is a net increase of 57 koz of gold in the Proven and Probable Reserve for 2021, relative to 2020, this consists of the addition of 113 koz of gold added by Resource conversion and addition of resources to the Youle and Shepherd ore bodies. A total of 55 koz of gold has been depleted from the 2020 Reserve through mining production in 2021.

The net decrease of 2,200 tonnes of antimony in the Proven and Probable Reserve for 2021 consists of 3,600 tonnes of antimony added by Resource conversion, and additional resources to Youle and Shepherd ore bodies. A total of 5,800 tonnes of antimony has been depleted from the 2020 Reserve through mining production in 2021.

15.1 Modifying Factors

The modifying factors of mining dilution and recovery have been taken into account when generating the Mineral Reserve. The modifying factors applied based on mining method, lode type and structural considerations.

15.1.1 Mining Dilution

Jumbo development, long-hole stoping with CRF, long-hole half-upper stoping with no backfill (HUS) and remnant pillar slash stopes are the current mining methods utilised at the Costerfield Property for the extraction of underground Mineral Reserve.

Due to the narrow width of mineralisation at the Augusta, Cuffley, Brunswick, Youle and Shepherd Lodes, the Mineral Reserve includes a portion of planned mining dilution, since the Mineral Reserve is reported to conform to a minimum 1.5 m mining width. Where the lode width is greater than 1.2 m, the minimum mining width is the lode width plus a total of 0.3 m planned dilution from the HW and FW. Unplanned dilution includes waste rock from outside the planned drive profile or stope limits which is loaded and hauled to the mill. Unplanned dilution is generally the sum of overbreak caused by excessive explosive energy and/or geotechnical failures due to unfavourable ground conditions.

Surveys of the mined development drives and stopes to date are consistent with the recovery and dilution factors applied to the generation of the Mineral Reserve (Table 15-2).

Table 15-2: Costerfield Property mine recovery and dilution assumptions

Mining Method	Planned Width (m)	Unplanned Dilution (%)	Tonnage Recovery Factor (%)
Ore Development	1.8 to 4.5	5 to 20	100
Long-hole CRF	1.5 to 4.5	10 to 33	95

Long-hole Half Upper Stopes	1.5 to 2.0	10 to 33	93
Remnant Pillar Slash Stopes	1.5 to 1.6	10 to 33	70

The long-hole overbreak and dilution factors are consistent with operational results since there is adequate reconciliation between forecast tonnes and actual tonnes. These factors are based on stope inspections as well as stope scans that produce a 3D model of the open void which is then interrogated using mine planning software to generate the final void volume. Development dilution is based on the end of month survey reports which compare actual drive volume against the designed volume.

Both planned and unplanned dilution has been considered for establishing the production schedule. Planned dilution includes waste rock that will be mined and is not segregated from the design. Sources of planned dilution include:

- Waste rock that is drilled and blasted within the drive profile and the overall grade of the blasted material is economically justified,

- Waste rock within the confines of the stope limits, including FW and/ or HW material that has been drilled and blasted to maximise mining recovery and/or maintain favourable wall geometry for stability.

Operating practices attempt to mine the stope as close to the lode width as possible, in order to limit the amount of planned and unplanned dilution reporting to the stope drawpoint. All planned and unplanned mining dilution is assumed to have a grade of zero.

15.1.2 Mining Recovery

The tonnage recovery factors (Table 15-2) represent the recovered portion of the planned mining areas for the different mining methods and include in-situ ore plus dilution material.

In stoping areas, visual inspections are carried out to estimate the stope void volume and determine if any ore is left in the stopes, which is recorded on the stope inspection sheets. Stope volumetric scans are also conducted to confirm the qualitative data captured during the stope inspections. This data is used in combination to estimate the recovery factors applied to the Mineral Reserve.

The remnant pillar slash stoping method is applied on a minor portion of the Mineral Reserve. This mining method has a reduced mining recovery in comparison to other long-hole stoping methods, having a recovery factor of 70% estimated. This value considers the factors of limited remote loader access when extracting ore from the remnant drive/draw point and unfavourable ground conditions around draw points that may potentially limit the recovery of material.

15.2 Cut-off Grade

The cut-off grade determined for Mineral Reserve is based on the 2021 operating costs, operational data and the Mineral Reserve economic parameters.

Parameters input into the cut-off grade calculation are:

- Gold price of USD $1,500/oz,
- Antimony Price of USD $7,500/t,
- AUD:USD exchange rate of 0.71,
- Process recoveries are the weighted average recoveries of the 2022 LoM Budget,
- Product payables are the weighted average payables of the 2022 LoM Budget,
- The production schedule is sourced from the Mineral Reserve LoM plan,
- Unit costs for mining are based on 2021 operating cost data,
- Variable mining cost per tonne is the weighted average of development and stoping from 2021 operating cost data,
- Mining costs are in AUD and commodity prices are in USD,
- The cut-off grade determination does not include sustaining or planned capital costs.

The resulting operating and incremental cut-off grades determined for the Mineral Reserve is summarised in Table 15-3, along with the values utilised in the determination of each cut-off grade.

Table 15-3: Mineral Reserve cut-off grade variables and cut-off grades

	Operating COG	Incremental COG
Mining Cost (AUD$/t)	172.07	84.28
Processing Cost (AUD$/t)	64.73	37.75
G&A Cost (AUD$/t)	66.87	20.52
Gold Price (USD$/oz)	1,500	1,500
AUD:USD conversion value	0.71	0.71
Au Payable & Recovery	86.12%	86.12%
Cut-off grade (g/t AuEq)	5.2	2.4

Based on the cut-off grade determination of operating and incremental categories, an average cut-off grade of 3.8 g/t AuEq was selected for Mineral Reserve design and reporting.

15.3 Mine Design and Planning Process

The mine design work is completed using Deswik.CAD™ and Deswik.ASD™. The Mineral Reserve Life of Mine (LoM) scheduling is completed through Deswik.AdvUGM™ and Deswik.IS™.

The Mineral Reserve is calculated from mine designs applied to 2021 Mineral Resource block models, which have been depleted for the production through to 31 December 2021.

The mine design methodology considers the Mineral Reserve cut-off grade, mining feasibility and economic assessment of individual mining blocks, and comprises the following general methodology:

- Determination of the mining method applied to individual areas, based on access options, geological grade distribution, geometry of the lode, historic mining shapes and geotechnical constraints,
- Design of ore development and stope mining shapes in order to capture the geological block model using manual design (Deswik.CAD) and optimization packages (Deswik.ASD),
- Assessment and validation of the output mining shapes and apply adjustments as required,
- Determination of the mining dilution and recovery factors to apply to design shapes,
- Interrogation of the mining shapes against 3D geological block models in Deswik.IS to calculate and assign ore tonnes and grade,
- Mining shapes of Measured and Indicated material above the cut-off grade are identified for further design and assessment,
- Assessment and design of the waste development required to access ore development and stope blocks,
- Economic assessment of individual ore development and stope blocks on a level-by-level basis, based on variable mining costs applicable to the mining method and is inclusive of waste access, haulage, processing, selling, royalty, and administrative costs,
- Economically viable areas are included in the Mineral Reserve LoM schedule. Uneconomic areas are removed or may be re-designed and included in the plan if re-assessment proves to be profitable,
- Dependency rules, mining rates and schedule constraints are applied to the design shapes to link the mining activities in a logical manner within the Deswik.IS scheduling project,

- The resulting Reserve LoM schedule is exported for further economic validation through the financial model.

16 MINING METHODS

The Augusta Mine is serviced by a decline haulage system developed from a portal within a box-cut. The Augusta decline dimensions are primarily 4.8 m high by 4.5 m wide at a gradient of 1:7 down. The majority of the decline development has been completed with a twin-boom jumbo; however, development of the decline from the portal to 2 Level was completed with a road-header, this section of decline has dimensions of 4.0 m high by 4.0 m wide. The Augusta decline provides primary access for personnel, equipment and materials to the underground workings.

The Brunswick Incline development was mined to breakthrough into the Brunswick Open pit, establishing the Brunswick Portal during the second half of 2020. The Brunswick Incline has the dimensions 4.8 m high by 4.5m wide at a gradient of 1:7 up and was mined with a twin-boom jumbo. The Brunswick Open Pit was prepared for the portal breakthrough with a pushback completed by a combination of road-header and drill and blast supported by a twin-boom jumbo. The first 20 m advance of Brunswick Portal was completed by a road-header with the dimensions 5.0 m high by 5.0 m wide at a gradient of 1:25 up. The establishment of the Brunswick Portal provides an additional means of egress from the mine and is the primary material haulage route from underground to the Brunswick Mill for ore processing and waste storage.

Mill feed is produced from three different mining methods: full-face jumbo development, long-hole CRF stoping and half upper stoping. All mined ore material is hauled from the underground working areas to the Brunswick ROM via the Brunswick Incline and Portal. Waste material produced from mining is stored underground for use as stope backfill.

The Cuffley Decline extends as a branch off the Augusta Decline at 1028 mRL and continues down to approximately 895 mRL. At the 935 mRL, the Cuffley Incline extends off the Cuffley Decline and accesses mineral resources from the 945 mRL to the 1,050 mRL. This incline was used to extract N and NV lodes. Mining in the Cuffley incline is complete and it is now the location of the High Explosive (HE) Magazine. A second decline within Cuffley, known as the 4800 decline, accesses the southern part of the Cuffley Lode which is positioned south of the East Fault. This decline commences at the 960 mRL and extends to 814 mRL. The Mineral Reserve in the 4800 decline consists of remnant pillars from past stoping and long-hole HUS and CRF stopes.

The Mineral Reserve LoM Plan, based on the December 2021 Mineral Resource model, predominantly includes mining of the Brunswick, Youle and Shepherd Deposits. The Brunswick access, 5.5 m high by 4.5 m wide development, starts from the 925 mRL on the Cuffley Decline and accesses the Brunswick Deposit at 955 mRL. The Brunswick Incline continues from 955 mRL up to the Brunswick Portal. The Youle access, 5.5 m high by 5.5 m wide, extends from the Brunswick Incline at 961 mRL and accesses the Youle Deposit at 957 mRL. From this level, the Youle Decline, 4.8 m high and 4.5 m wide, continues down to 617 mRL, accessing both the Youle and Shepherd deposits, and is planned to extend down to 580 mRL.

A schematic of the Augusta, Cuffley, Brunswick and Youle underground workings is presented in Figure 16-1 and the designed Reserve stope shapes are presented in Figure 16-2 to Figure 16-4.

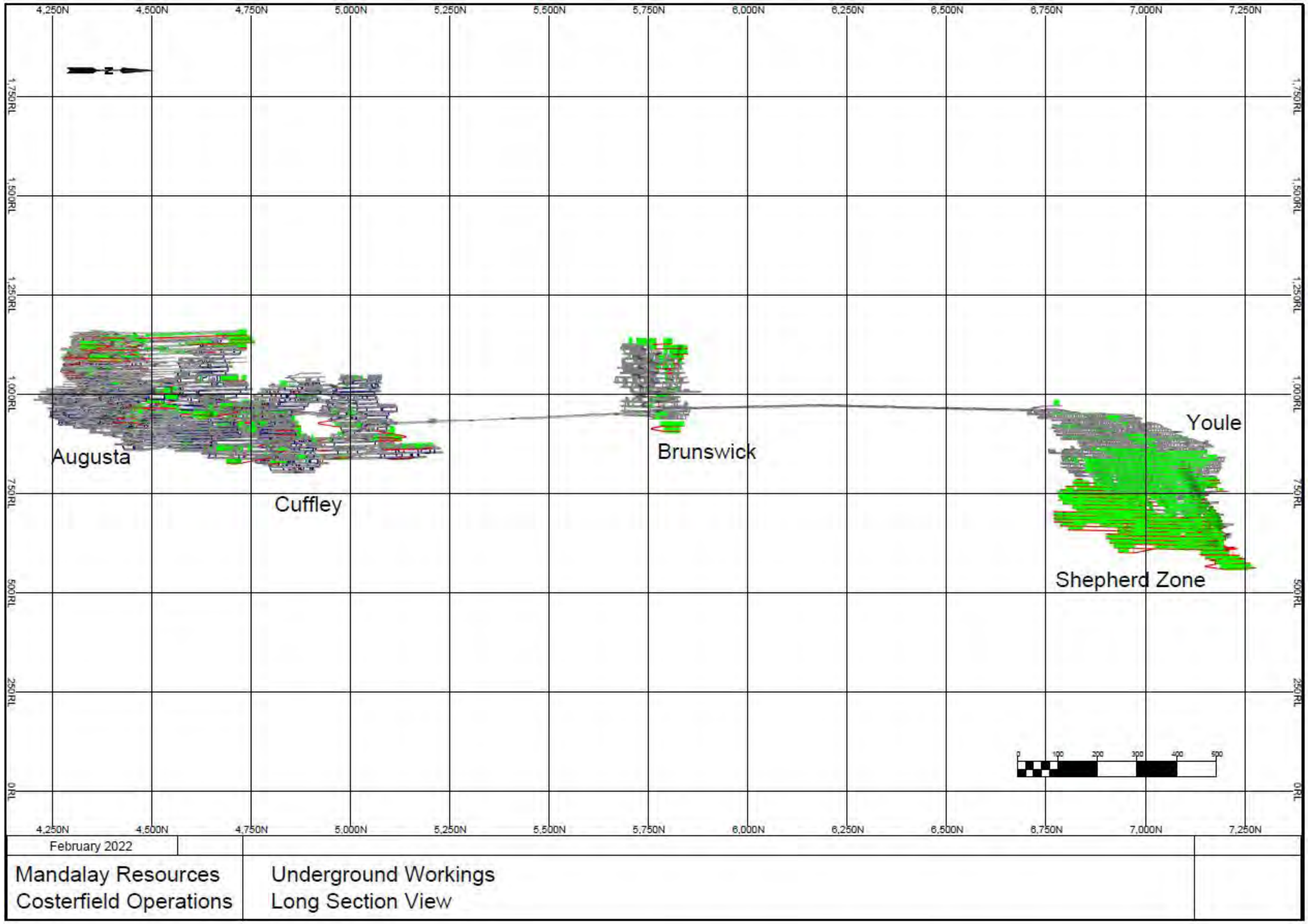


Figure 16-1: Long-section of the as-built and Mineral Reserve des–gns - Augusta, Cuffley, Brunswick and Youle (Red – planned development, green– planned production, grey – depleted workings)

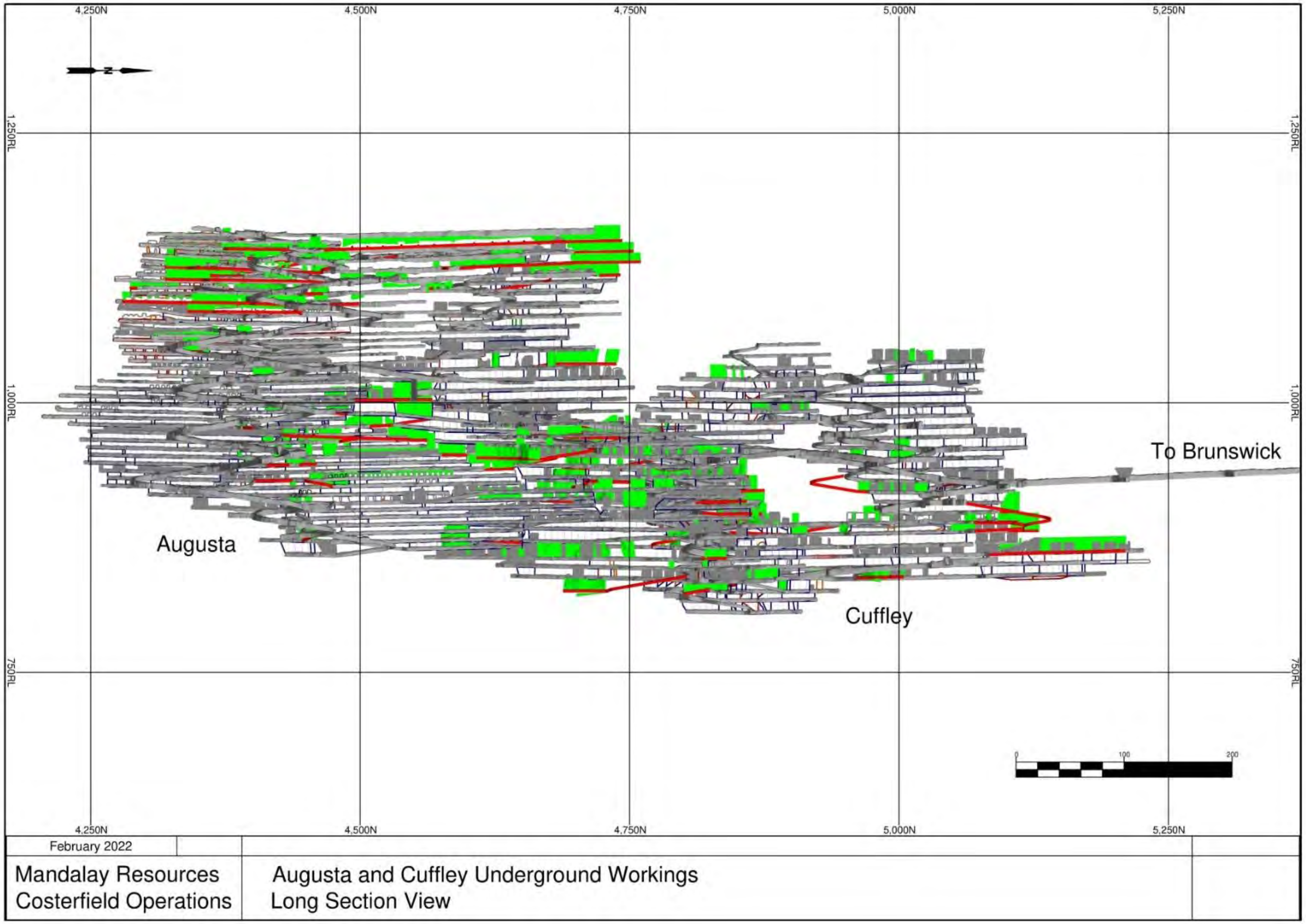


Figure 16-2: Long-section of Cuffley & Augusta Mineral Reserve mine design (Red - planned development, green - production, grey – depleted workings)

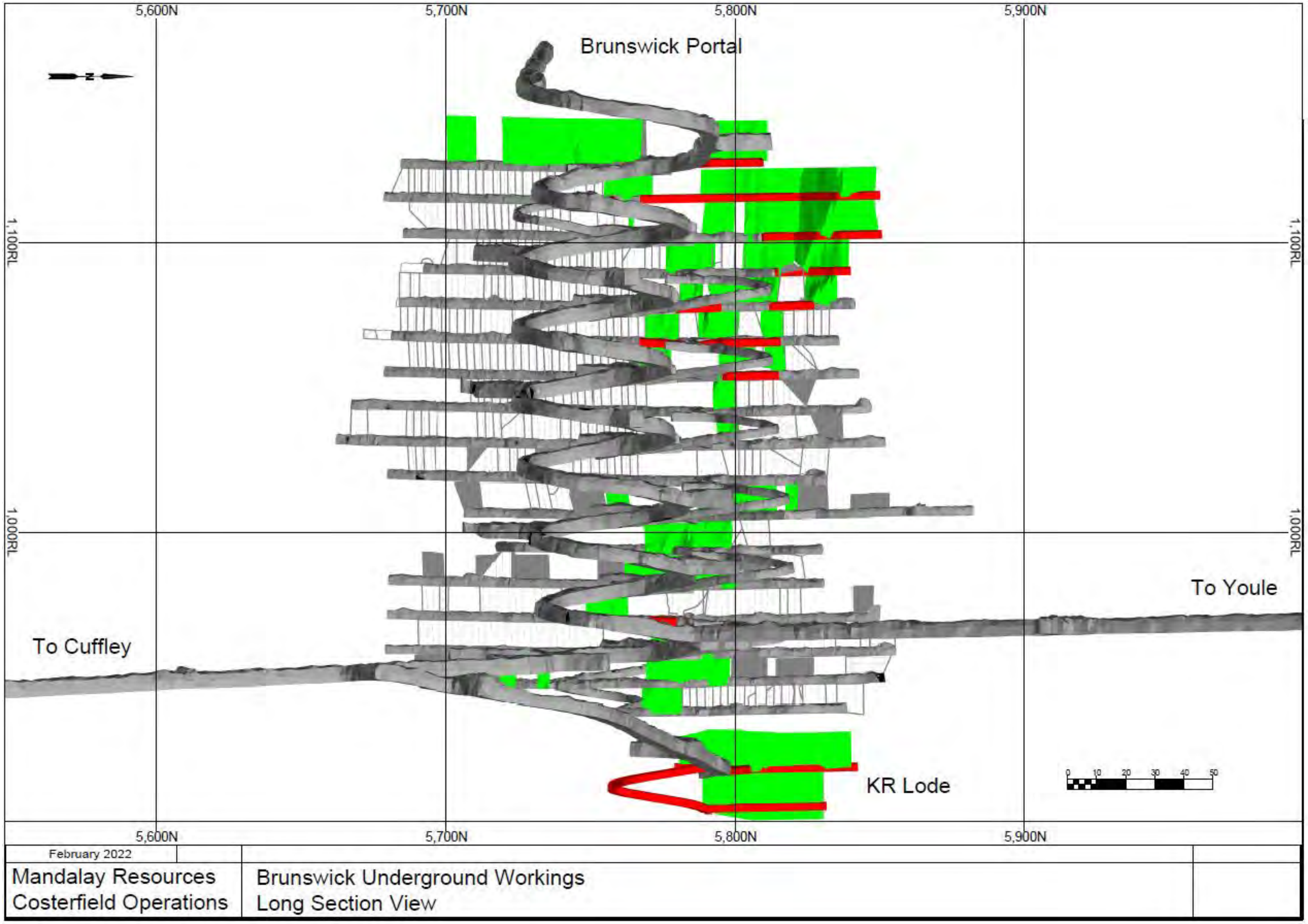


Figure 16-3: Long-section of Brunswick Mineral Reserve mine design (Red - planned operating development, green – planned stoping, grey – as built)

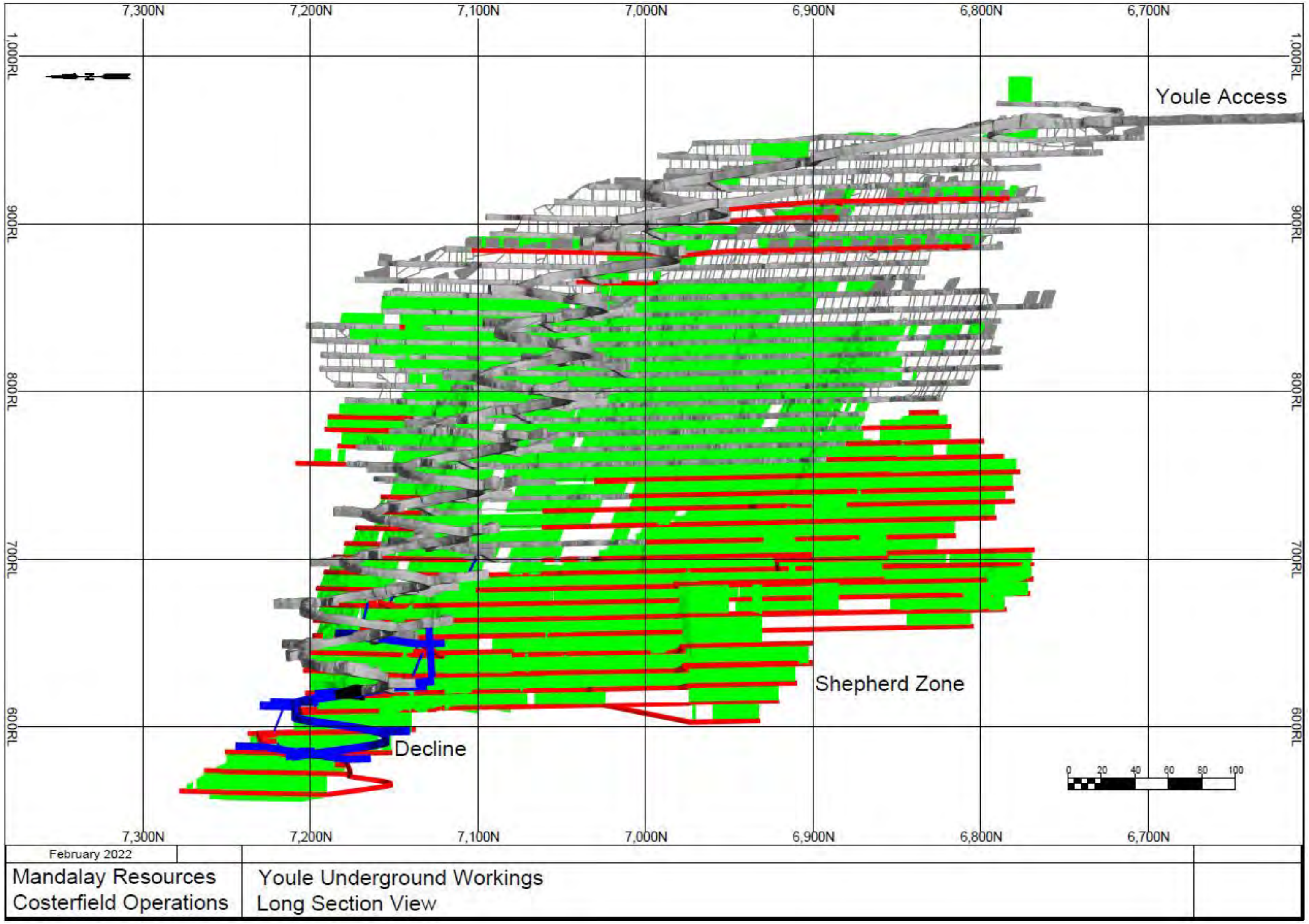


Figure 16-4: Long-section of proposed Youle mine design on Youle and Shepherd lodes (Blue – planned capital development, red-planned operating development, green – planned Youle stoping, yellow – planned Shepherd stoping and grey – as built)

16.1 Geotechnical

16.1.1 Rock Properties

16.1.1.1 Lithology and Structures

Active underground mine workings are hosted within weakly metamorphosed siltstones of the lower Silurian-aged Costerfield Formation. Underground operations target the north-northwest striking, mineralised structures which are typically less than 500 mm in true width.

Targeted sub-vertical mineralised structures within the Cuffley and Augusta orebodies are bounded up-dip and down-dip by the Adder and King Cobra thrust faults respectively. The King Cobra fault is observed as separate HW and FW structures filled with strongly deformed siltstone and quartz horsetails. The zone of deformation within the King Cobra fault can be up to 10 m wide, and the offset across the King Cobra fault is unknown. The Adder fault is also filled with quartz and rubble and varies in width from less than 0.3 m to greater than 2 m.

The sub-vertical Brunswick lode sits above the HW of the Adder fault. It is offset by shallow west dipping faults by over 20 m. The Kiwi fault is one of the shallow dipping structures, which is characterised by strong shearing and lode offset in the vicinity of the Brunswick lode and shows minor shearing, in the order of less than 0.5 m, distal to the lode.

Significant second order structures include the northeast striking, northwest dipping faults that offset lode mineralisation (East Fault, Brown Fault, Kiwi and Penguin) as shown in cross-section (Figure 16-5). There are other significant second order structures that can contain strongly associated shearing when intercepting the lodes (Flat, Krait, Red Belly, Bushmaster Tiger, Emperor and Cassowary).

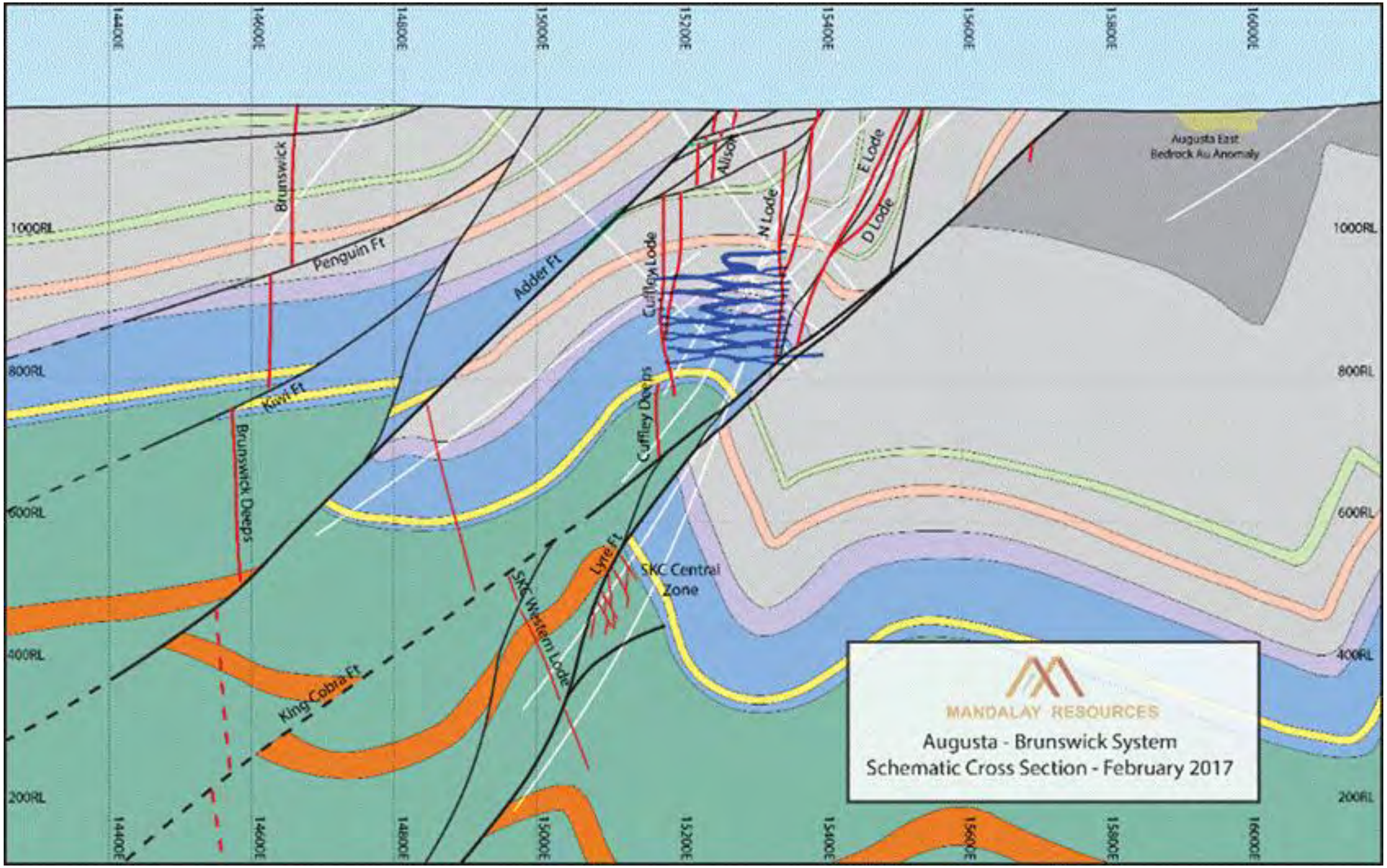


Figure 16-5: Cross-section of the Augusta, Cuffley and Brunswick systems

The steeply East-West dipping Youle lode sits below the No.3 fault and at the point of intersection with the No.4 fault, starts running along the No.4 becoming a shallower dipping mineralised structure as was shown in the cross-section Figure 7-7. The No.4 fault is characterised as a laminated quartz structure with a large lithology offset.

Significant second order structures include the low angle west dipping Doyle Fault and the Youle lode sub-parallel Peacock Fault which generally contain strongly associated shearing when in close proximity (~10 m) of the lode.

The Shepherd lode consists of sub-vertical East and West mineralised veins splaying off the Youle with the extents currently unknown.

Significant second order structures (not pictured in Figure 7-7) are currently unnamed however consist of shallow east-west dipping crosscutting LQ structures which generally contain strongly associated shearing when in proximity to the lode or each other.

A 3D structural model of all intersected mine scale faults is maintained and is a key driver of pre-emptive ground control strategies.

16.1.1.2 Rock Strength

The Costerfield Formation siltstone has had a total of 84 Unconfined Compressive Strength (UCS) tests carried out since 2009. Test results indicate that intact rock strength increases with depth due to sustained weathering in the upper strata. At levels less than 100 m below surface, intact rock strength exceeds 80 MPa.

16.1.1.3 Rock Stress

In-situ stress measurements have been undertaken at the Costerfield Property in proximity to the Youle lode, utilising the Deformation Rate Analysis (DRA) technique on core samples at 520 m and 903 m below the surface.

At 520 m below the surface, the maximum principal stress is orientated at 300º/43º (trend/plunge) with a magnitude of 25 MPa, the intermediate principal stress is oriented at 184°/25° with a magnitude of 12.6 MPa and the minimum principal stress is oriented at 074°/36° with a magnitude of 8.3 MPa.

At 903 m the maximum principal stress is oriented at 346°/5.2° and a magnitude of 30 MPa, the intermediate principal stress is oriented at 091°/71° with a magnitude of 19.6 MPa and the minimum principal stress is oriented at 018°/15° with a magnitude of 15 MPa.

In-situ stress in levels below 895 mRL in Cuffley, and 936 mRL in Brunswick has caused minor convergence, or squeezing ground, in isolated areas around major fault zones. In the Youle at around 880mrL there has been an isolated case where induced stress has caused squeezing ground as stoping retreated in close proximity to the drive access. In both cases the magnitude of this squeezing is small enough to be contained by dynamic support.

In October 2021 stress modelling for the LoM extraction of the Youle was completed. The modelling did not identify any areas where mining induced stress would cause regional instability. However due to the complex nature of the rock mass isolated cases of converging ground may occur from either in-situ or induced stresses.

16.1.1.4 Rock Mass Alteration

Rock mass in the vicinity of mineralised structures is heavily fractured with multiple joint orientations, often with a portion of clay fill and smooth planar joint surfaces. In waste rock, away from mineralised lodes and discrete structures, the rock mass improves with lower fracture frequency and rough tightly healed joint surfaces present.

16.1.1.5 Hydrogeology

The regional hydrogeology is comprised of two main aquifers, the Shallow Alluvial Aquifer (SAA) and the Regional Basement Aquifer (RBA).

- The SAA is comprised of silts, sands and gravels, and is a perched groundwater system occurring across the site and within the confines of the creek and valley floors. There is clear evidence that this aquifer is perched, is laterally discontinuous and is less common in the area,
- The RBA is comprised of Silurian metasediments and forms the basement aquifer, where groundwater mainly occurs within and is transmitted through fracture systems beneath the upper weathered profile, at depths of greater than 20 m below the natural surface.

Dewatering of underground workings, in Augusta, Cuffley and Brunswick, is achieved via controlled drainage to an underground pump station in the 4800 decline that pumps to the Cuffley 945 pump station. Dewatering of Youle and Shepherd is achieved by pumping from two linked pump stations straight to the Cuffley 945 pump station. From the Cuffley pump station Rising Main, water is fed to the Augusta mine dam and distributed for treatment at the RO facility or Splitters Creek evaporation facility. Recently water inflow has been approximately 1.5 ML per day.

16.1.2 Mine Design Parameters

16.1.2.1 Mining Methods

The dominant mining method is longitudinal long-hole stoping filled using CRF, with stope panels generally consisting of three to four operating levels mined bottom-up over CRF with a longitudinal retreat to a quasi-central access. Several other mining methods are applied to access and optimise the extraction of ore at the Costerfield Property:

- Capital development with twin-boom jumbo,
- Operating development with single boom jumbo. (Note: in 2020 the usage of the airleg hand-held drill were limited to specialised projects thus are no longer used for operating development),
- Blind up-hole longitudinal long-hole open stoping ('half uppers'),
- Floor benching of level ore development,
- Downhole vertical crater retreat (VCR),
- Avoca stoping with CRF ('reverse fill'),
- Avoca stoping with rockfill ('reverse fill'),
- Overhand cut and fill (Flat backing ore level development),
- Air leg rise mining.

Mining methods are selected to suit ore drive/lode geometry and maximise ore recovery while minimising unplanned dilution.

16.1.2.2 Development Geometry

Standard development profiles adopted at the Costerfield Property include:

- 1.8m wide x 3.0m high ore drives,
- 2.0m wide x 3.0m high access drives,
- 3.5m wide x 4.0m high access drives,
- 3.5m wide x 4.2m high access drives,
- 4.5 m wide x 4.8m high decline/incline,
- 5.5 m wide x 5.5m high decline/incline,
- 5.0 m wide x 4.8m high level access,
- 5.0 m wide x 6.5m high truck tips,
- 4.5 m wide x 4.8m high ore stockpiles,
- 6.5 m wide x 4.8 m high vent rise access drives.

Non-standard development profiles may be mined for major infrastructure, such as pump stations, explosives magazines, fan chambers etc., or for variations to the applied mining methods, such as flat-backing, and floor benching etc. Development spans and associated ground support are designed using empirical data to ensure the stability of mined spans.

16.1.2.3 Stope Geometry

In response to observed ground conditions and production drill capability, inter-level spacing at the Costerfield Property is variable. Stope strike length varies based on the applied mining method, observed ground conditions and machinery capability. Stope geometry parameters include:

- Stope height: Up to 17 m,
- Stope strike length: Depends on ground conditions generally 2.7 m – 13 m but some 'HUS' have recently extended beyond 20 m,
- Stope design width: 1.5 m,
- Stope dip: 45-90^0.

Non-standard stope geometry may be mined to maximise ore extraction under unique circumstances, such as remnant mining, flat dipping ore bodies and geological complexity. The empirical stope performance chart is consulted to ensure that designed stope spans will allow safe efficient extraction of target mineralisation.

16.1.2.4 Pillars and Offsets

In mine design and planning, the following pillars and offsets are observed to ensure the stability of mined excavations:

- Decline development is designed and mined with a 30 m offset to target mineralised structures; to date stope production blasting has not influenced decline stability having applied the 30 m offset. This distance has been maintained as a minimum for the Brunswick, Youle and Shepherd lode,
- The minimum inter-level pillar width to height ratio is 1:2, for example for 1.8 m wide ore drives, the minimum inter-level spacing is 3.6 m,
- Minimum horizontal clearance between sub-parallel ore drives is 2 m,
- The minimum pillar strike between unfilled blind up-hole longitudinal open stopes or half-upper stopes is 3 m.

16.1.2.5 Backfill

CRF is the most commonly used backfill at the Costerfield Property. CRF is exposed vertically in the longitudinal retreat of CRF filled long-hole open stopes, and horizontally in the mining of sill pillars at the toe of blind up-hole longitudinal open stopes (half uppers). Loose rockfill is used where vertical and horizontal exposures to filled voids are not required, such as in level close out stopes and adjacent to waste pillars.

Previously Cement Aggregate Fill (CAF) was primarily used in areas where re-access is required through or adjacent to the filled stope however as the Youle lode has required the mining of shallow dipping stopes, with dips less than 50^0, the usage of CAF over CRF has become more prominent in the Youle.

16.1.3 Ground Support

16.1.3.1 Development Ground Support

Ground support elements installed in standard development profiles include:

- 3.0 m 25 mm Dia. galvanised resin bolts,
- 2.4 m 25 mm Dia. galvanised resin bolts,
- 2.4 m 20 mm Dia. galvanised resin bolts,
- 2.1 m 20 mm Dia. galvanised resin bolts,
- 2.4 m 47 mm Dia. galvanised friction bolts,
- 1.5 m 33 mm Dia. galvanised friction bolts,
- 1.8 m 33 mm Dia. galvanised friction bolts,
- 2.4 m x 3.6 m 5.6 mm Dia. gauge galvanised mesh,
- 2.4 m x 4.2 m 5.6 mm Dia. gauge galvanised mesh,
- 2.4 m x 3.0 m 4.0 mm Dia. gauge galvanised mesh,
- 2.4 m x 1.5 m 4.0 mm Dia. gauge galvanised mesh

When spans exceed 5.5 m in development intersections or in response to deteriorating ground conditions and discreet structures, cement grouted single strand or twin strand, non-galvanised, bulbed, 4.5 m – 6.0 m cable bolts are installed and tensioned to ensure the stability of development profiles.

Additional ground support may be installed to support non-standard development profiles or in response to poor ground conditions. Fibrecrete, resin injection, spiling, sets and straps have been installed in the past to support poor ground, development/stoping interactions and faults/shear zones. In addition, 2.4 m and 1.8 m yield lok bolts are installed in areas where squeezing ground is expected.

16.1.3.2 Stoping Ground Support

Additional support for designed stopes is installed on an as required basis in response to compromised stope geometry, poor rock mass, interactions with faults/shears or interactions with other stopes and development. Single strand, non-galvanised, bulbed, 4.5 m – 6 m cable bolts are generally installed as secondary support for stopes.

Other forms of ground support including resin bolts, friction bolts, mesh, fibrecrete, resin injection and straps may also be installed to provide secondary support for designed stopes.

16.2 Mine Design

16.2.1 Method Selection

Long-hole CRF stoping has been selected as the preferred mining method for the Mineral Reserve on the Youle and Shepherd lodes. This is based on the orebody geometry and current production fleet, as well as the experience gained through the application of this method during mining of Cuffley and Brunswick.

The long-hole CRF stoping method allows for a 'bottom-up' mining sequence with the benefit of minimizing the number of crown/sill pillars required to remain in place. The location of the crown and sill pillars is determined by the grade distribution of the orebody and the local mine stability requirements. Recovery of the pillars is planned to be undertaken with the use of half-upper production stoping and remnant pillar extraction where grade and ground conditions permit.

16.2.2 Method Description

Mining within the Augusta Mine has targeted several individual lodes, including W, NM, E, K and Cuffley Lodes, which vary in width from 0.1 m to 1.5 m and dip between 45° to 85°. This lode geometry is favourable for long-hole CRF and half-upper stoping when using mechanised mining techniques. However, in the past ore was also extracted using air-leg CRF and half upper stoping methods.

The current Mineral Reserve in the Augusta Mine is planned to be extracted using various mechanised methods depending on the ore location, access requirements, and the proximity to previously mined areas. The majority of Augusta Mineral Reserve is planned to be extracted using long-hole half upper stoping due to limited development access for fill drives. Areas that have access for both an extraction and fill drive utilize long-hole CRF stoping method.

Remnant pillar slashing is the planned method for areas where half-upper stoping has previously been undertaken. This method involves developing a waste access parallel to the original production drive, with draw points breaking through to the ore zone. Production slash-holes are drilled into the remnant rib pillars to be fired and the ore extracted with remote loading operations. Areas of remnant ore are individually assessed and those deemed both economically viable and safe to extract remotely have been included in the Mineral Reserve.

Throughout the Cuffley lodes, a sub-level spacing of 10 m floor to floor, or 7 m backs to the floor, and has been established to ensure stable spans, acceptable drilling accuracies and blast-hole lengths. A sub-level spacing of 15 m was developed for two select areas. This involved drilling up from the lower level to 8 m and drilling and firing the remainder from the upper level using down-holes. Whilst this has been a success it has not been implemented elsewhere in the mine.

The Brunswick orebody has applied a sub-level spacing of 12 m floor to floor, or 9 m backs to the floor. This has been established due to improved drill accuracy, steep lode geometry and the wider orebody, with the average diluted stope width of 2.0 m vs 1.5 m in Cuffley and Augusta. Brunswick has primarily been mined with long-hole CRF stoping due to it being accessed and developed from the bottom-up. The Brunswick Mineral Reserve consists of the remaining level closeout stopes, ore development and CRF/HUS stoping on northern extents, and remnant extraction of pillars left in place for localised ground stability.

The Youle orebody has been mined with a sub-level spacing of 9 m floor to floor, or 6 m backs to the floor vertically and 6 m to 13 m backs to the floor along the dip of the ore body. This sub-level spacing has been implemented in order to minimise dilution and improve recovery in the flatter dipping Youle ore. It also allows for stable vertical spacing between levels and optimal stope height for drilling accuracy. The ore body dip varies greatly in Youle between 38° to 85°, which is dependent on the influence of major structures interacting with the Youle lode. In areas where the dip of the ore is below 40°, extraction drives are widened to steepen the footwall of the stope to ensure full recovery. Stope HWs designed less than 45° require backfill with CAF rather than CRF to ensure fill confinement and stability of the HW.

The Shepherd ore deposit consists of multiple lodes that are positioned in the footwall of the Youle structure which range from moderately flat dipping (~55°) to sub vertical between 70°-90° dip. The Shepherd deposit was first mined in the second half of 2021 on the extents of the southern Youle lode at 757 mRL. The Youle mine predominantly accesses the sub-vertical Shepherd deposit below 650 mRL. Here the sub-level spacing has been increased to 11-12 m floor to floor to account for the sub-verticality of the lodes. The increased level spacing ensures that final stope height is optimised within the limits of the mining method, as well as improving design efficiency by reducing overall ore and waste development. The Shepherd deposit is designed to be extracted primarily by a long-hole CRF stoping method on each of the individual lodes. Where separate lodes run parallel and the separation between the lodes does not allow individual ore drives or stope panels, ore drives and stopes have been designed to capture the mineralisation up to a width of 4.5 m. This method has been used successfully on the Youle lodes by stripping the development out to the required width on retreat with stoping.

The production cycle for long-hole CRF/CAF stoping, as illustrated by Figure 16-6, comprises the following:

- Develop access to the orebody,
- Establish bottom sill drive and upper fill drive,
- Drill production blast-holes in a minimum 2 hole per ring pattern, depending on the ore width. The nominal stope design width is 1.5 m,
- Fire the blast of 2.7 m to 13 m strike and extract ore with a tele-remote loader,
- Place rock bund at the brow of the empty stope and place mesh tubes in the stope. Mesh tubes are tightly rolled steel mesh placed in the leading edge of stope prior to filling and eliminates the need for boring reamer holes in next stoping panel,
- Place CRF into the stope,
- Remove rock bund at the brow of the stope,
- Commence extraction of adjacent stope once the CRF has cured for 24 hours.

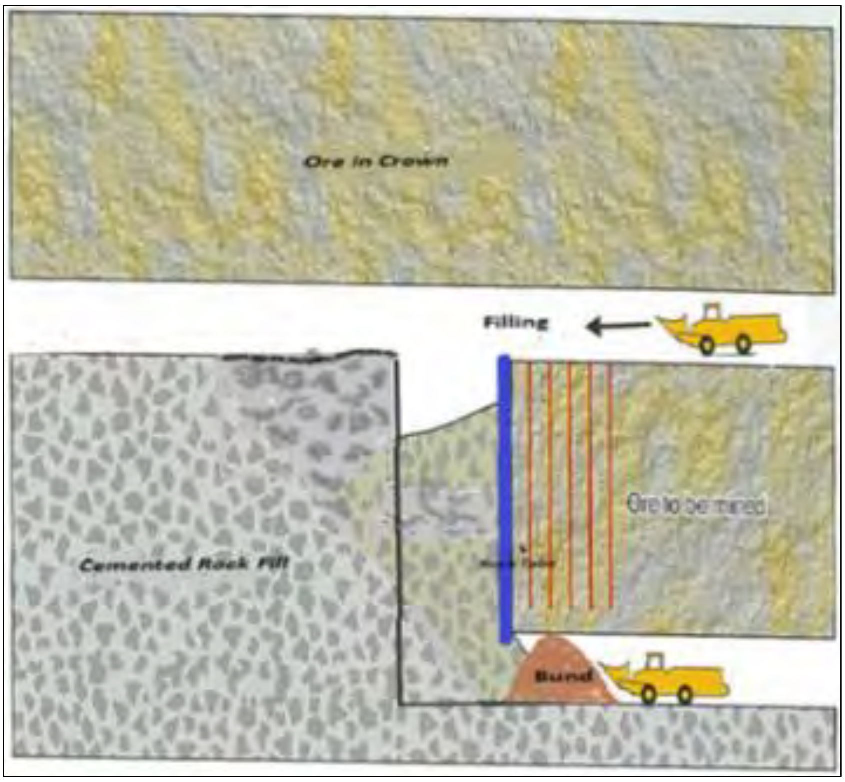


Figure 16-6: Long-hole CRF stoping method (Source: Potvin, Thomas, Fourie, 2005)

The half upper stope method is similar to CRF stope method however, it is implemented where there is no access to a fill drive. The mining cycle comprises the following:

- Drill up to 13 m length blind production long-holes for a strike length of 3 to 13 m,
- Fire stope and extract ore with a tele-remote loader,
- Leave a 3 m strike rib pillar where required by ground conditions,
- Commence the next stope.

16.2.3 Materials Handling

Since the completion of the Brunswick Portal, all underground ore is trucked to the surface via the Brunswick Incline. Once on the surface, the ore is transferred to the Brunswick ROM pad where it is stockpiled, screened, blended and crushed prior to being fed into the Brunswick processing plant.

Waste material from development headings is trucked internally underground and used for backfill or trucked to the surface and stockpiled at the Bombay Waste Rock Storage Facility. Small portions of suitable waste material is screened on the surface and trucked underground to be utilised as road base and CAF fill. In times of reduced underground waste production, trucks are backloaded on the surface with stockpiled waste to haul underground and use in stope filling.

16.3 Mine Design Guidelines

The mining schedule follows a predominantly bottom-up stoping sequence where possible, mining from the northern and southern extents retreating toward the central access. This sequence enables a consistent production profile to be maintained because it allows for dual development headings on each level.

Brunswick is mined using a bottom-up sequence with primarily CRF stopes that do not include any crown pillars.

The current and planned sequence for the Youle and Shepherd orebodies utilises crown pillars at various intervals to allow for a consistent production profile and optimized recovery of ore.

16.3.1 Level Development

Production drive development is mined to ensure the ore is positioned in the face for maximum recovery and feasible long-hole production drilling. Production development is mostly directed under geology control and sometimes survey control where stand-off/pillars need to be maintained. Production drives are excavated and supported with a single boom jumbo and are loaded with a manual or tele-remote operated LHD.

16.3.2 Vertical Development

Vertical development at the Costerfield Property exists in the way of primary ventilation shafts, return/fresh ventilation rises and escapeway ladders. Throughout Cuffley, ventilation rises of 3.5 m x 3.5 m have been excavated between levels to extend the existing primary exhaust system both above and below the Cuffley fan chamber and exhaust shaft. The Brunswick Mine utilised a 3.5 m diameter shaft to supply fresh air to the workings and act as a second means of egress. Since the Brunswick Portal breakthrough, the Brunswick shaft has been decommissioned and the portal is now the fresh air intake. The Youle ventilation shaft has a diameter of 4.0 m, exhausting air from Youle workings and a providing secondary means of egress. The Youle primary exhaust system is extended with 4.0 m x 4.0 m ventilation rises between the levels as development progresses below the ventilation shaft and fan chamber. Ladder rising with a diameter 0.8 m to 1.2 m has been developed for the installation of escape ways providing a second means of egress between working levels.

16.3.3 Stoping

The strike length of stopes is determined using a case-by-case assessment of the overall mining sequence, ore orientation, geological considerations and geotechnical stability. All blasted material is assumed to have a swell factor of 30% and non-mineralised material is allocated a default relative density of 2.74 t/m3. The relative density of mineralised material is estimated within the geological resource block model.

16.3.4 Mine Design Inventory

The planned mining inventory for each lode is summarised in Table 16-1.

Table 16-1: Mineral Reserve inventory by lode

Lode	Ore Tonnes	Au g/t	Sb %
YOULE	226,253	17.2	3.3
YOULE 501	824	2.5	2.2
YOULE 503	1,425	33.9	10.6
YOULE 508	17,459	11.0	4.6
YOULE 525	6,067	7.1	2.8
YOULE 531	1,325	3.8	1.6
SHEPHERD 600	209,285	13.4	1.4
SHEPHERD 604	15,490	6.6	0.1
SHEPHERD 605	13,489	6.9	0.0
SHEPHERD 606	1,477	4.3	0.0
SHEPHERD 620	56,024	12.0	0.1
BRKR	7,253	5.0	3.1
BRUNSWICK	31,643	5.6	2.8
AS	500	3.1	2.4
BOB	4,055	5.3	3.0
BOBSPL	2,245	5.7	1.8
C	11,117	4.6	2.9
CD	2,651	10.0	3.4
CE	2,600	13.3	1.6
CM	34,817	9.3	3.3
E	32,126	8.1	5.1
K	4,053	6.1	2.9
NM	25,352	10.5	4.5
NSP48	883	6.2	4.0
NW	1,228	5.2	3.6
P1	9,027	8.5	2.0

Lode	Ore Tonnes	Au g/t	Sb %
W	8,962	9.8	6.1
TOTAL	**727,631**	**12.8**	**2.5**

16.4 Ventilation

The current Costerfield Property mine ventilation circuit is comprised of fresh air being sourced from four surface intakes, these being:

- The Augusta portal, and the Augusta ladder ways, where fresh air enters the ladder ways via a 20 m shaft from the surface,
- The Augusta Fresh Air Rise (FAR),
- The Brunswick Portal and a small amount of airflow entering the mine through the Brunswick FAR, regulated to 98%, which services the 1056 Fresh Air Base (FAB). This airflow is pulled into the mine via two separate underground primary chambers that exhaust air out of the mine via the Cuffley return airway (RAW) at a flow rate of $54m^3/s$ and the Youle RAW, at $103m^3/s$.

16.4.1 Primary Ventilation Circuit – Augusta/Cuffley

At Augusta/Cuffley fresh air travels to the bottom of the old Augusta workings via internal rises and enters the Augusta side of the mine at the 900 mRL, at which point it flows back up the Augusta decline where it enters the Cuffley decline and joins the primary flow entering the mine from the Augusta portal. This airflow travelling down the Cuffley decline, splits at the 4800 decline and the Cuffley incline, with the remaining airflow continuing towards the Brunswick access. At the Brunswick access, the airflow splits and travels towards the Youle via the Brunswick straight ($24m^3/s$), with the remaining airflow ($34m^3/s$) reporting to the Cuffley 915 RAW, where it will exhaust via the Cuffley RAW.

The Cuffley incline is also where the current HE magazine is located. Primary airflow in the 4800 decline and Cuffley incline reports to the Cuffley RAW where it exhausts to surface.

The primary ventilation circuit for Augusta is presented in Figure 16-7 below. Fresh air intakes through the Augusta FAR and ladder ways (in blue), with primary flow continuing to the Cuffley decline.

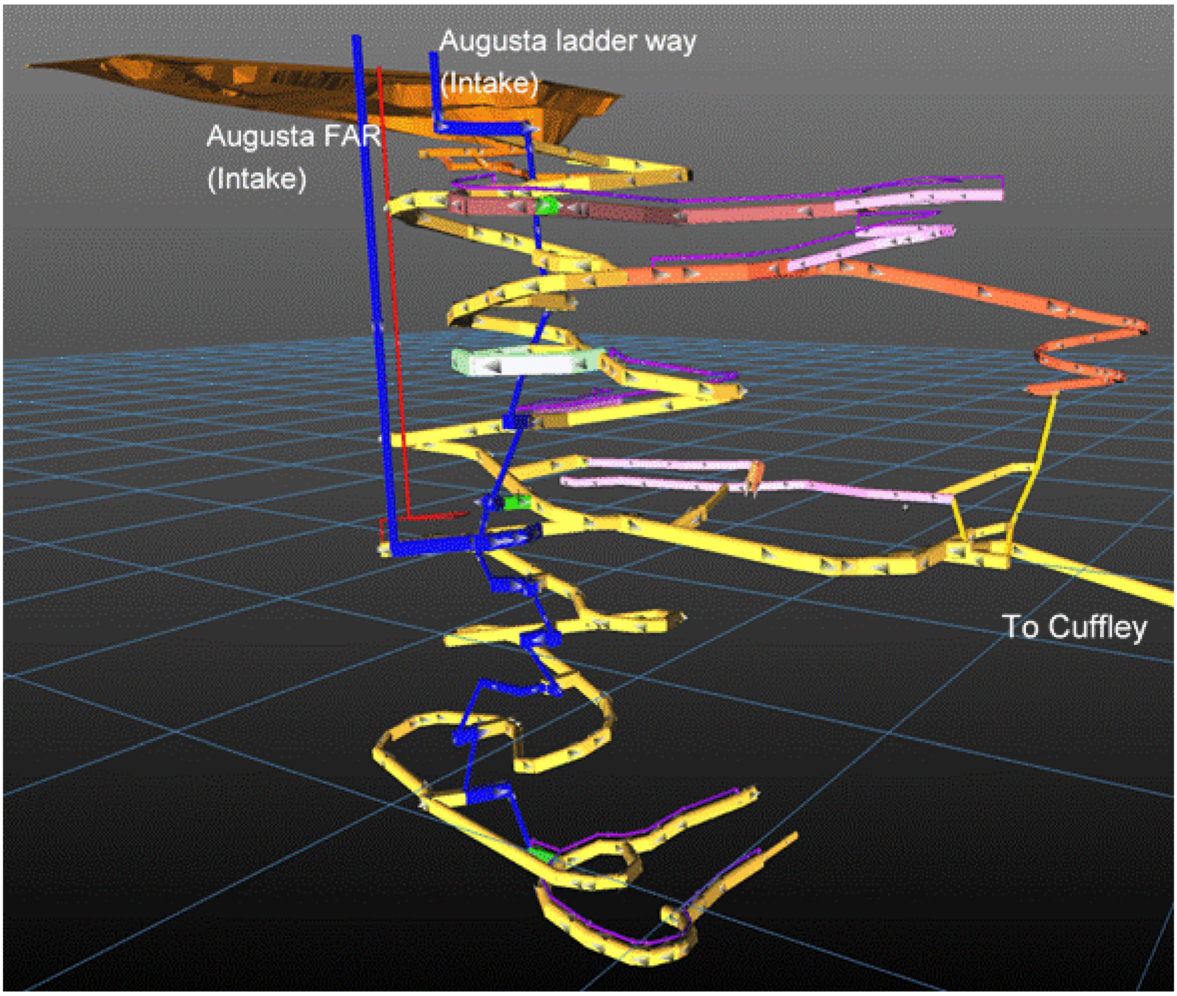


Figure 16-7: Augusta primary ventilation circuit

The primary ventilation circuit for Cuffley is presented in Figure 16-8 below. Fresh air is drawn through the Cuffley decline from Augusta and return air (in red) is exhausted through the Cuffley RAR by either the 4800 decline or 915 RAW.

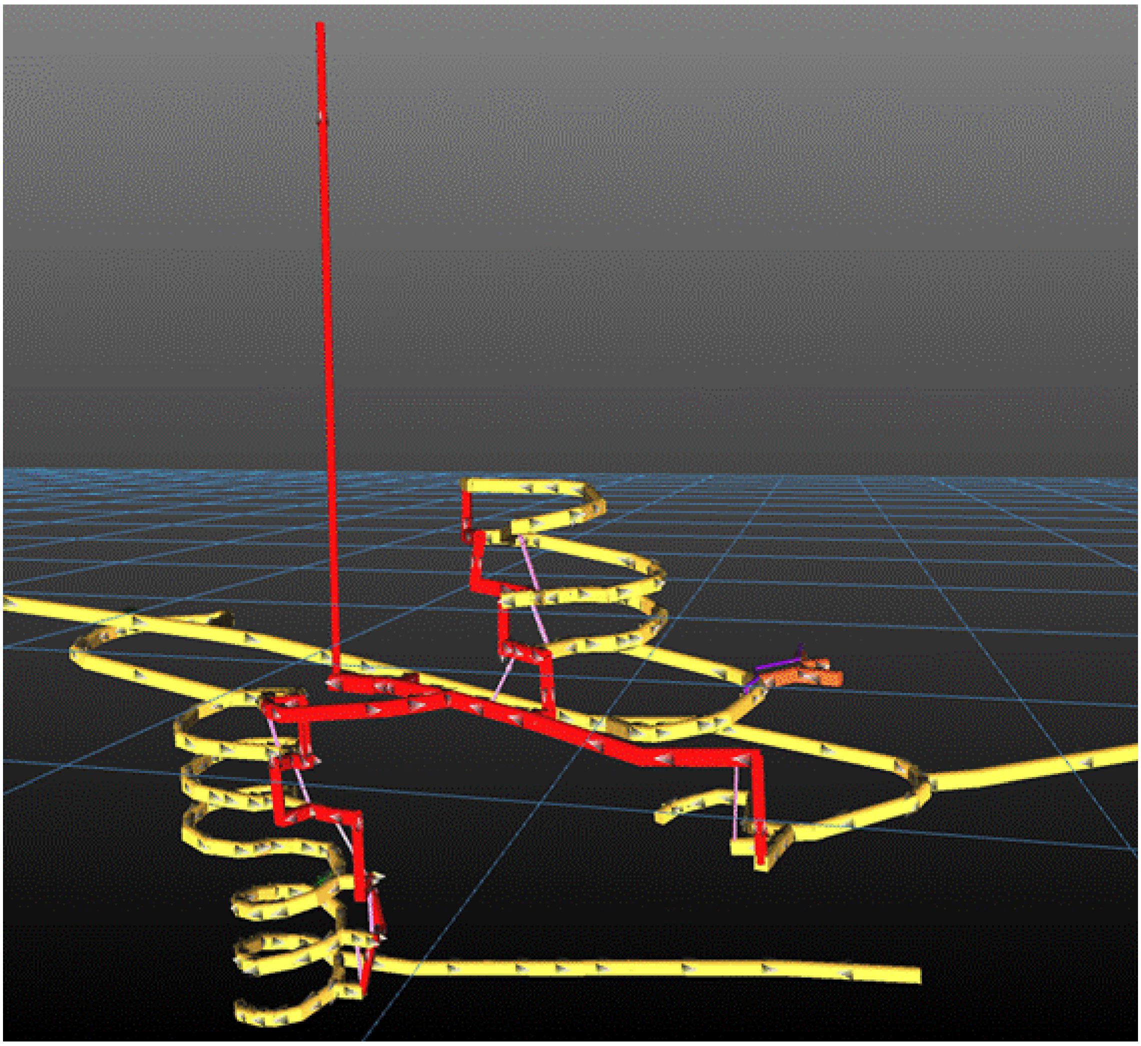


Figure 16-8: Cuffley primary ventilation circuit

16.4.2 Primary Ventilation Circuit – Brunswick/Youle

The Brunswick workings are supplied primary airflow from the Brunswick portal (80m³/s), while the Youle workings are currently supplied fresh air from the Brunswick portal (80m³/s) and primary airflow from the Augusta/Cuffley side of the mine (24m³/s). The Youle working levels are supplied airflow via the use of secondary ventilation fans.

The primary ventilation circuit for Brunswick is presented in Figure 16-9 below. Fresh air is drawn through the Brunswick Portal and Brunswick FAR which joins the primary flow from Cuffley at the bottom of the Brunswick Incline and continues to Youle.

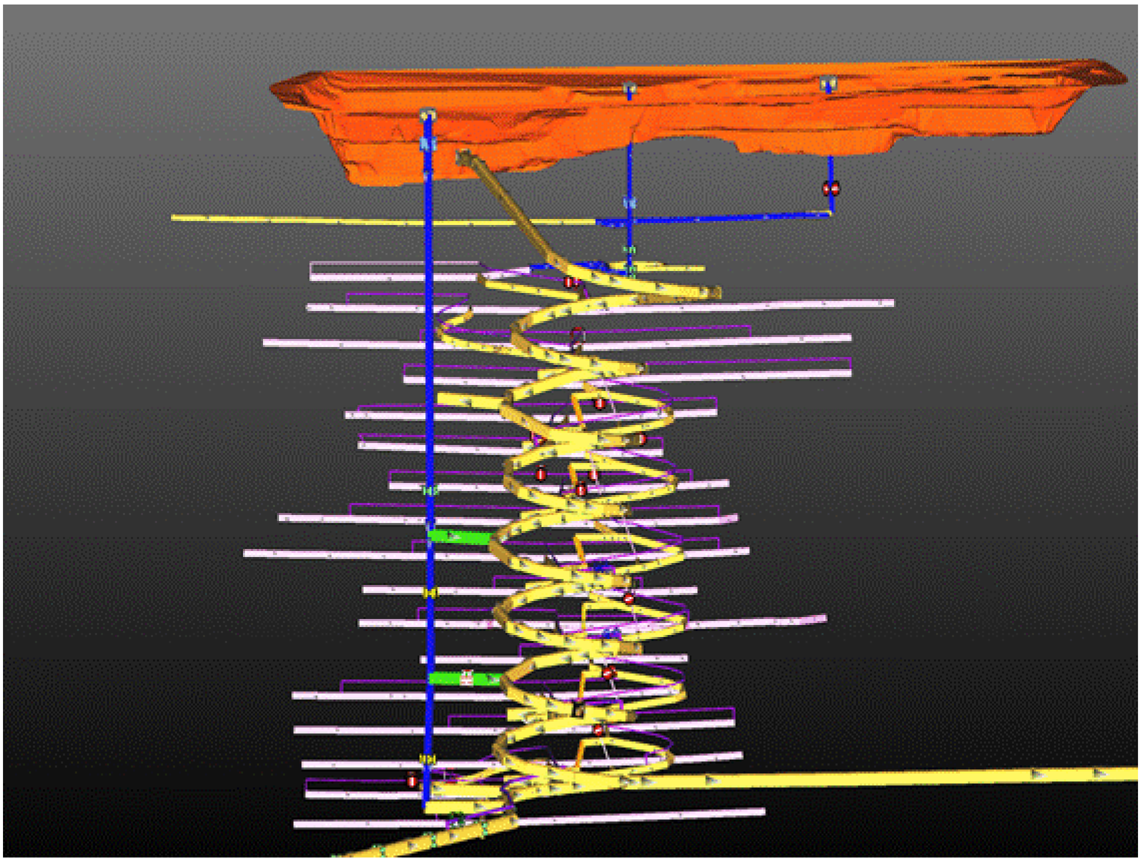


Figure 16-9: Brunswick primary ventilation circuit

The Youle primary ventilation circuit is presented in Figure 16-10 below. Fresh air is drawn through the Youle Access and down the Youle Decline to the 657 RAW. From the 657 RAW,air is exhausted through the Youle RAW system to the Youle 957 RAR shown in red.

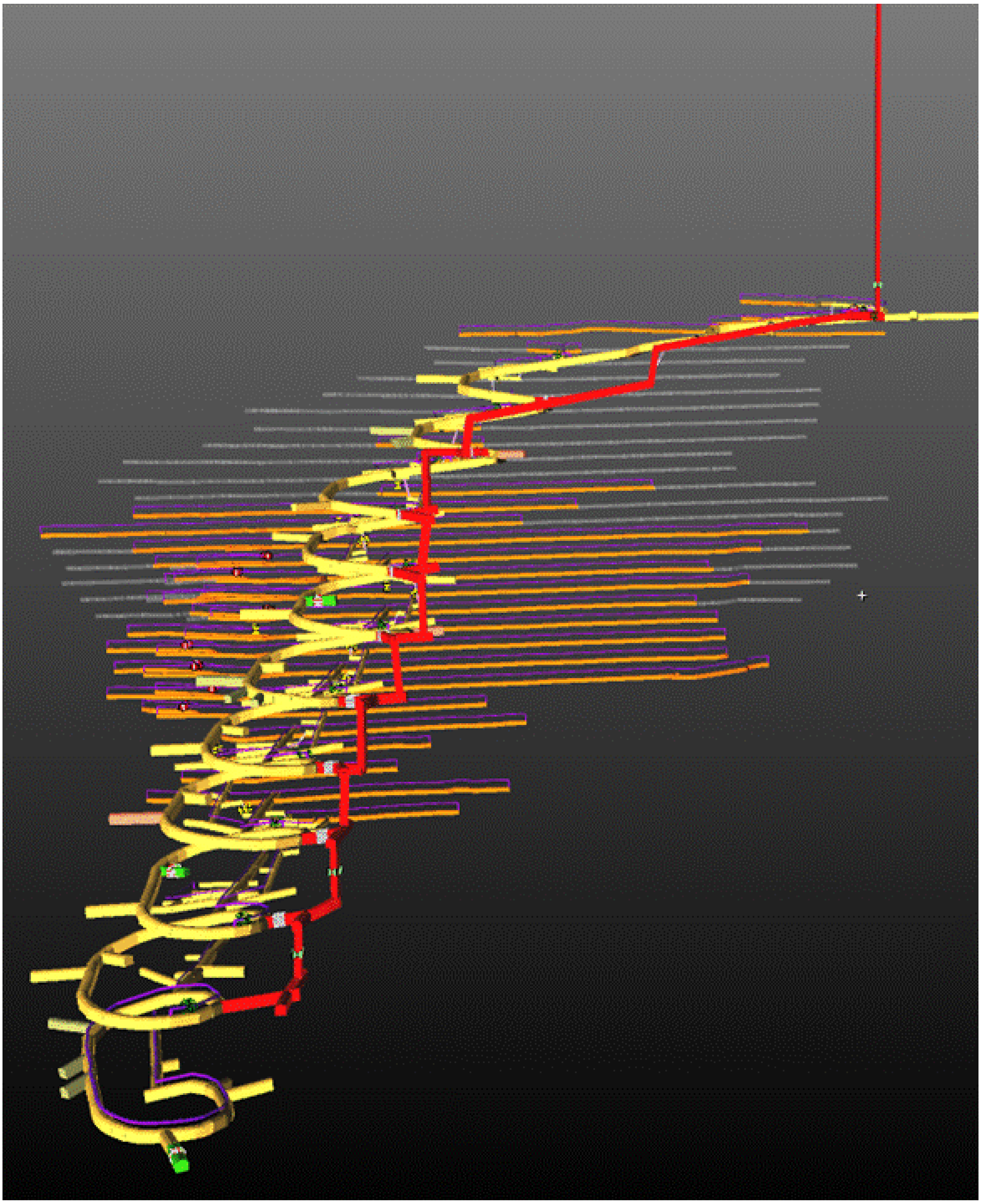


Figure 16-10: Youle primary ventilation circuit

16.4.3 Primary Ventilation Rises and Fans

The specifications of the existing Augusta, Cuffley and Youle ventilation rises are as follows:

- Augusta Ladder Rise (surface to 900 mRL), 2.4 m diameter,
- Augusta FAR (1020 mRL to the surface), 3.0 m diameter,

- Cuffley RAR (950 mRL to the surface), 3.0 m diameter,
- Cuffley RAR (above the 955mRL – From the 1010 level), 3.5 m x 3.5 m diameter,
- Cuffley RAR (below the 955mRL – From the 814 level), 3.5 m x 3.5 m diameter,
- Brunswick FAW (1056 mRL to the surface) – 3.5 m diameter – Regulated Shaft,
- Youle RAW (Current) 957 mRL – 4.0 m diameter.

Three single stage 110 kW axial fans have been built into a bulkhead at the 950 mRL Cuffley RAW, however only one fan is currently operational. This was designed as to lower resistance along the Brunswick straight, whilst still providing adequate airflow to the 4800 decline and the Cuffley incline where the HE magazine is located, ensuring that the HE magazine ventilation reports directly to the Cuffley RAW. There are no current working levels in the 4800 decline.

The Cuffley primary ventilation fan has been designed with a final duty of $54 m^3/s$. One of the primary 110kW fans in the Cuffley ventilation chamber will be re-located to the Youle primary chamber to increase airflow in the Youle as mining gets deeper.

The existing Cuffley primary fan is a Clemcorp CC1400 MK4 single stage 110 kW axial fan installed in a bulkhead on the 950 mRL. The operating parameters of this fan are:

- Current operating fan total pressure of 343 Pa for 56 m^3/s,
- Maximum operating fan static pressure of 2,350 Pa at 30 m^3/s.

The Youle primary fans comprises of two Clemcorp CC1400 MK4 single-stage fans, located at the 957mRL Youle RAW. These two fans are installed in parallel in a fit for purpose bulkhead, capable of running four primary fans. The operating parameters of two fans in parallel are:

- Current operating fan total pressure of 975 Pa for $103 m^3/s$,
- Maximum operating fan total pressure of 2,600 Pa for $31 m^3/s$ per fan.

A summary of the primary ventilation fan statistics are detailed in Table 16-2 below.

Table 16-2: Primary ventilation fan details

Fan Location	Fan Type	Quantity	Installation Type	Operating Pressure (Pa)	Total Airflow (m^3/s)	Fan Shaft Power (kW)
950 Cuffley RAW	Clemcorp CC1400 MK4 110kW	1	Parallel	343	56	110
957 Youle RAW	Clemcorp CC1400 MK4 110kW	2	Parallel	975	103	110

16.4.3.1 January 2022 Ventilation Survey

The latest ventilation survey, conducted in January 2022, measured total primary airflow at 162m^3/s within the Costerfield Property underground mine. This survey was conducted with a total of 3 primary fans operating:

- One in Cuffley at a fan total pressure of 343 Pa,
- Two primary fans in Youle, which recorded a fan total pressure of 975 Pa.

All airflow velocities measured throughout the mine are currently measuring under 6m/s. There were also no temperature readings recorded above 27° wet bulb, showing that the primary circuit has no areas of concerns due to heat.

Figure 16 11 below details the airflow measurements from the ventilation survey conducted in January 2022. This demonstrates how the primary circuit is split between the different areas of the mine throughout Augusta, Cuffley, Brunswick and Youle with a balance between the intakes and exhausts.

Table 16-3: Primary ventilation records, January 2022 survey

				Temp		Measured Velocity				Vent Bag		Air Flow	
Date	Survey Station	Location	Area (sq.m)	Dry	Wet	V 1 (m/s)	V 2 (m/s)	V 3 (m/s)	V Average (m/s)	No & size	x sectional area	Q (cu.m/s)	
26/01/2022	VS1	Below Portal	14.38	25.4	20.0	3.83	3.83	3.86	3.84			55	
26/01/2022	VS2	1 Lvl XC	13.67	24.4	18.7	0.25	0.25		0.25			3	
26/01/2022	VS14	Below 5 Level FAR	17.10	23.3	18.8	3.57	3.63		3.60			62	
26/01/2022	VS37	Decline below 1040 RAR	25.56	21.5	18.4	1.95	1.98		1.97			50	
26/01/2022	VS38	Decline above 1020 XC	23.70	20.1	17.9	0.69	0.7		0.70			16	
26/01/2022	VS40	1020 RAR (SUB STN)	19.67	20.3	19.0	0.27	0.27		0.27			5	
26/01/2022	VS52	1 Level FAR	7.05	25.2	20.1	1.00	1.05	1.09	1.05			7	
26/01/2022	VS54	Below 1020 MAG	19.46	20.0	18.7	0.47	0.45		0.46			9	
26/01/2022	VS55	Cuffley Dec above 4800	23.90	20.9	16.5	3.25	3.34		3.30			79	
26/01/2022	VS56	Cuffley Dec below 4800	25.00	19.8	17.0	3.12	2.76	3.06	2.98			75	
26/01/2022	VS63	1030 Decline Straight	23.29	21.3	17.7	3.07	3.08		3.08			72	
26/01/2022	VS64	915 Cuffley Decline (RAW)	19.80	20.9	18.1	1.62	1.64		1.63			32	
26/01/2022	VS66	Cuffley Incline Below 975 RAW	22.30	20.4	17.3	0.81	0.82		0.82			18	
26/01/2022	VS72	4800 Decline Below 884 RAW	25.50	22.0	20.3	0.5	0.46	0.45	0.47			12	
26/01/2022	VS79	5L Xcut	19.70	23.2	20.0	0.83	0.89	0.81	0.84			17	
26/01/2022	VS80	925 Cuffley Decline	21.20	19.8	16.2	2.61	2.67		2.64			56	
26/01/2022	VS81	Brunswick SP#1	24.47	21.3	18.4	1	1.08	1.03	1.04			25	
26/01/2022	VS86	Cuffley Dec below 1005 O/P	19.80	19.4	17.5	4.1	3.98	4	4.03			80	
26/01/2022	VS96	Youle SP5	25.40	20.6	17.7	3.96	4.09	3.85	3.97			101	
26/01/2022	VS98	Brunswick Portal	25.30	20.8	17.4	3.21	3.25		3.23			82	
												162	Intakes
												163	Returns

16.4.4 Secondary Ventilation Auxilliary Fans

The Costerfield Property is currently adopting a secondary ventilation strategy utilising single and twin stage Clemcorp and Zitron fans no larger than 1200 mm diameter. Secondary fan selection is determined by:

- The dimensions of the excavation,
- The rate of extraction,
- Diesel equipment requirement,
- The length of ventilation ducting,
- The primary airflow available,
- Maintaining a minimum air velocity of 0.5m/s where diesel equipment operates.

The secondary ventilation ducting used at the Costerfield Property consists of ventilation bag with diameters of:

- 1,400 mm,
- 1,220 mm,
- 1,075 mm,
- 605 mm twin duct.

Generally, 55 kW single or twin stage fans are utilised to ventilate level access and ore drives. Twin stage fans are used when ore drives are scheduled to extend further than typical development. Capital decline development is ventilated by a 75 kW twin stage fan and 1,400 mm diameter ducting.

A standard secondary ventilation installation for an operating level in Youle is shown in Figure 16-11. The installation includes a fan placed in primary flow above a working level access which ventilates three ore drive levels and six ore drive headings. Ventilation chokers are utilised in all levels for when additional flow may be required in other areas on the same secondary system. The return air from the ore drives joins the primary flow on the decline and continues to the Youle RAW.

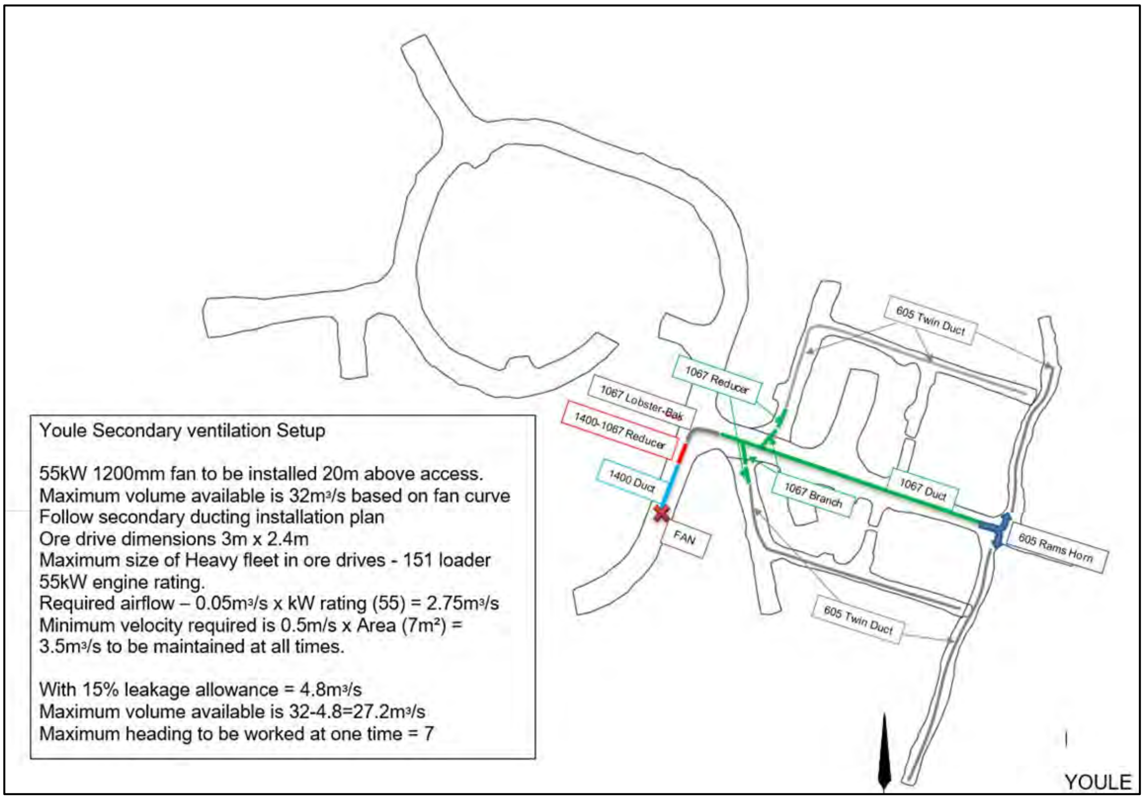


Figure 16-11: Standard secondary ventilation installation for Youle level access

16.5 Mine Services

16.5.1 Compressed Air

Compressed air is generated for the underground workings by the surface compressed air plant, which is comprised of three 593 cfm compressors for an overall plant capacity is 840L/s (1779 cfm).

Compressed air is delivered underground via a 4” HDPE ‘poly’ pipe run through the mine development, with each level supplied from the decline via 2” HDPE piping. Air receivers have been placed at the Brunswick 1,006 mRL and Stockpile 5 Youle to increase the system efficiency. Compressed air is used to power pneumatic equipment and/or activities including:

- Airleg drills for miscellaneous bolting activities,
- Pneumatic ammonium nitrate-fuel oil (ANFO) loaders,
- Blast-hole cleaning/prepping for development rounds,
- Diaphragm air pumps,
- Long-hole cleaning/prepping.

16.5.2 Raw Mine Water

Raw mine water is sourced from the Augusta Mine Dam located on the Augusta site, and water is delivered to the underground workings through two separate supply lines. The Augusta and Cuffley areas of the mine are suppled from header tanks at the Augusta portal via 4" HDPE pipe run through mine development. Youle and Brunswick are supplied via a service-hole connected to a header tank on surface at the Brunswick site. Pressure reducer valves are installed in the water supply lines at 60 m vertical intervals to manage the water pressure underground.

The Augusta Mine Dam is fed directly from the rising main that extends from the Cuffley 945 Pump Station.

16.5.3 Dewatering

Dewatering of the underground workings is managed through a series of collection sumps that report to various pump stations throughout the mine. From the intermediate pump stations and sumps, ground water reports to the bottom of the 4800 decline Settlement Sump via gravity for silt management. From the 4800 decline the water is pumped to the underground Cuffley 945 Pump Station where it is discharged via the Rising Main to the surface storage dams.

16.6 Backfill

The practice of placing CRF in stope voids has been undertaken in Cuffley, Augusta, Brunswick and Youle to improve local ground stability, reduce unplanned dilution and improve mining recoveries. CAF fill is also selectively utilized as an alternative to CRF in Youle for improved confinement and stability in flat dipping stopes. Loose rockfill is placed as backfill in stopes where the filled void will not be exposed by an adjacent stope. Loose sand fill is used on a limited basis where a low slump material is required to fill voids that cannot be filled adequately with CAF or CRF. The use of paste fill was also considered as a possible alternative, but it was found that the tailings from the Brunswick Processing Plant were unsuitable for backfill purposes due to the high moisture, clay content and cost considerations.

The CRF uses waste rock sourced from development with the addition of a cement slurry mix that results in a final product composing of 4% cement. CAF uses waste rock that is screened to a smaller diameter aggregate, with the addition of a cement slurry to form a final product composing of 8% cement.

Dry cement is stored on surface at the Brunswick site in a cement silo on contract by Mawson Concrete. The dry cement is delivered underground to mixing bays via an Iveco Acco 2350 cement truck. At the mixing bay, the dry cement is hydrated and dumped by the cement truck to be mixed with waste rock in varying size batches using a Caterpillar 1700G loader.

Once mixed, the cemented fill is trammed to the fill point of the open stope using a Toro 151 or Sandvik LH203 loader. A bund is placed at an appropriate distance from the top of the stope to minimise potential for loader to overbalance or drive into the stope void. Care is taken during placement of the fill that the mesh tube is not displaced which is secured by chains during the filling process.

The quality of the cemented fill is ensured by the use of a PLC control at the cement batching plant and standardised bucket filling of the waste rock. Records are kept of batch quantities for all batches.

The nominal curing time before firing the adjacent stope is 24 hours. After 12 hours, the rock bund placed at the brow of the stope can be removed in preparation for drilling and/or charging the adjacent stope panel.

The cemented fill methods have proved effective in minimising dilution during subsequent panel extraction as well as providing better ground stability and has improved recovery by eliminating the requirement for rib pillars.

16.7 Mineral Reserve Schedule Assumptions

The Mineral Reserve schedule was completed using the assumed mining rates shown in Table 16-4. Total development and production rates are constrained by the combination of development headings or stoping fronts available at the one time and the resources available.

Table 16-4: Schedule assumptions

Description	Value
Operating Dev m advance/cut	1.8
Max. Operating Dev m/mth/heading	40
Max. Total Operating Dev m/mth	350
Capital Dev m advance/cut	3.7
Max. Capital Dev m/mth/heading	170
Max. stope tonnes/mth/heading	700-1,000
Max. Total stope tonnes/ mth	10,000

16.7.1 Equipment Requirements

The existing development, production and auxiliary underground equipment fleet will continue to be used, where applicable, with additional equipment purchased to meet the planned replacement schedule or meet increased production demands.

The existing mobile equipment fleet is summarised in Table 16-5.

Table 16-5: Underground mobile equipment fleet

Equipment Type	Equipment Model	Existing Fleet
Single-Boom Jumbo	Resemin Muki FF	3
Production Drill	Resemin Muki LHBP 2R	2
LHD - Loader	CAT R1700G	2
LHD - Loader	Toro 151-D	3
LHD - Loader	Sandvik LH203	4
Haulage Truck	Atlas Copco MT436	1
Haulage Truck	Epiroc MT42	1
Cement Agi	Jacon Transmixer 5003	1
Cement Truck	Iveco Acco 2350	1
Telehandler	Dieci 33.11	2
Service Tractor	Carraro TN5800	5
Light Vehicle	Toyota Land Cruiser	14
Light Vehicle	Kubota 4x4 Utility	7
Total		**46**

16.7.2 Personnel

An existing core group of management, environmental, technical services (Engineering, Survey, Geology), administration, maintenance, supervisory, and production personnel continue to operate at the Costerfield Property. As a residential operation, all employees commute daily from their place of residence.

Level access capital development in Youle is currently completed by a contractor using their own twin-boom jumbo and Normet charge rig.

16.7.2.1 Shift Schedule

The Costerfield Property functions a continuous mining operation, 24 hours a day, 365 days per year. Operators and maintenance personnel work 11-hour shifts, seven days on, seven days off, alternating between dayshift and nightshift.

Augusta support staff work a standard Australian working week of five days on, two days off, eight-hours per workday.

All on-costs for annual/ sick leave and training have been estimated in the direct and indirect operating costs respectively.

16.7.2.2 Personnel Levels

All equipment has been assigned with one operator per crew per machine where applicable. Cross-training occurs for all operators, ensuring that each shift panel is adequately multi-skilled to cover for any unplanned sickness, annual leave and general absenteeism.

The current personnel numbers for the Mandalay Resources workforce totals 218 employees.

16.8 Schedule Summary

A summary of the key physicals in the Mineral Reserve schedule is presented in Table 16-6.

Table 16-6: Summary of schedule physicals

Description	Units	Quantity
Capital Development	m	797
Operating Development (Waste)	m	9,852
Operating Development (Ore)	m	9,378
Development Ore Tonnes	tonnes	173,318
Development Ore Grade Au	g/t	7.5
Development Ore Grade Sb	%	0.8
Stoping Ore Tonnes	tonnes	590,069
Stoping Ore Grade Au	g/t	13.5
Stoping Ore Grade Sb	%	2.8
Total Ore Tonnes	tonnes	763,386
Total Ore Grade Au	g/t	12.2
Contained Au	ounces	298,295
Total Ore Grade Sb	%	2.4
Contained Sb	tonnes	18,235
Opening Stocks		
ROM Ore Tonnes	tonnes	41,443
ROM Ore Grade Au	g/t	10.1
ROM Ore Grade Sb	%	3.3

Note:

Ore tonne totals differ from reported Reserve tonnes. The Reserve schedule includes mining of inferred and below cut-off grade development (assigned zero grade) to access proven and probable material.

17 RECOVERY METHODS

17.1 Brunswick Processing Plant

The Brunswick Processing Plant treats an antimony and gold rich sulphide ore through a conventional comminution and flotation style concentrator. It has been operating since 2007, and by Mandalay Resources since late 2009. Since then, several plant upgrades have resulted in production capacity increases to the current rate of approximately 13,000 t/month over the 2015 to 2021 calendar years. The concentrator operates 24 hours per day, 7 days per week, while crushing operates under noise restriction guidelines during extended dayshift hours.

The surface crushing and screening facility processes underground feed down to a particle size range suitable for milling through a two-stage, closed circuit ball milling circuit. Centrifugal style gravity concentrators are used on the combined primary milling product and secondary mill discharge to recover a gold-rich gravity concentrate. This is upgraded further over a shaking table and sold as a separate gold concentrate product which is transported to local refineries.

Secondary milled products are classified according to size and processed through a simple flotation circuit comprising of two StackCell® roughers, two additional rougher tank cells followed by the original flotation train rougher, scavenger and single stage cleaning. Two CavTube® flotation columns were added to the tailings end of the existing flotation circuit and were successfully commissioned in April 2021.

The flotation concentrate is dewatered through thickeners and with filtration to produce a final antimony-gold concentrate product which is bagged, packed into shipping containers and shipped to customers overseas. The flotation tailings are thickened before being pumped to one of two tailings storage facilities (TSFs) with one located to the east and one to the north of the Brunswick Processing Plant.

The Brunswick Processing Plant flowsheet is a simple, conventional, well-proven circuit with more than 14 years of operation and is suited to processing of the Costerfield ores remaining in the Life of Mine (LoM) plan. A summary processing flowsheet has been provided in Figure 17-1.

Further incremental plant upgrades scheduled for 2022 include a second filter press (or an alternate filtration technology) in order to build redundancy around concentrate filtration. A third impact crusher (Finlay I-140RS) is to be purchased in early 2022 and thereafter crushing will become a two-stage operation as opposed to the current single stage configuration. These upgrades have not yet been initiated.

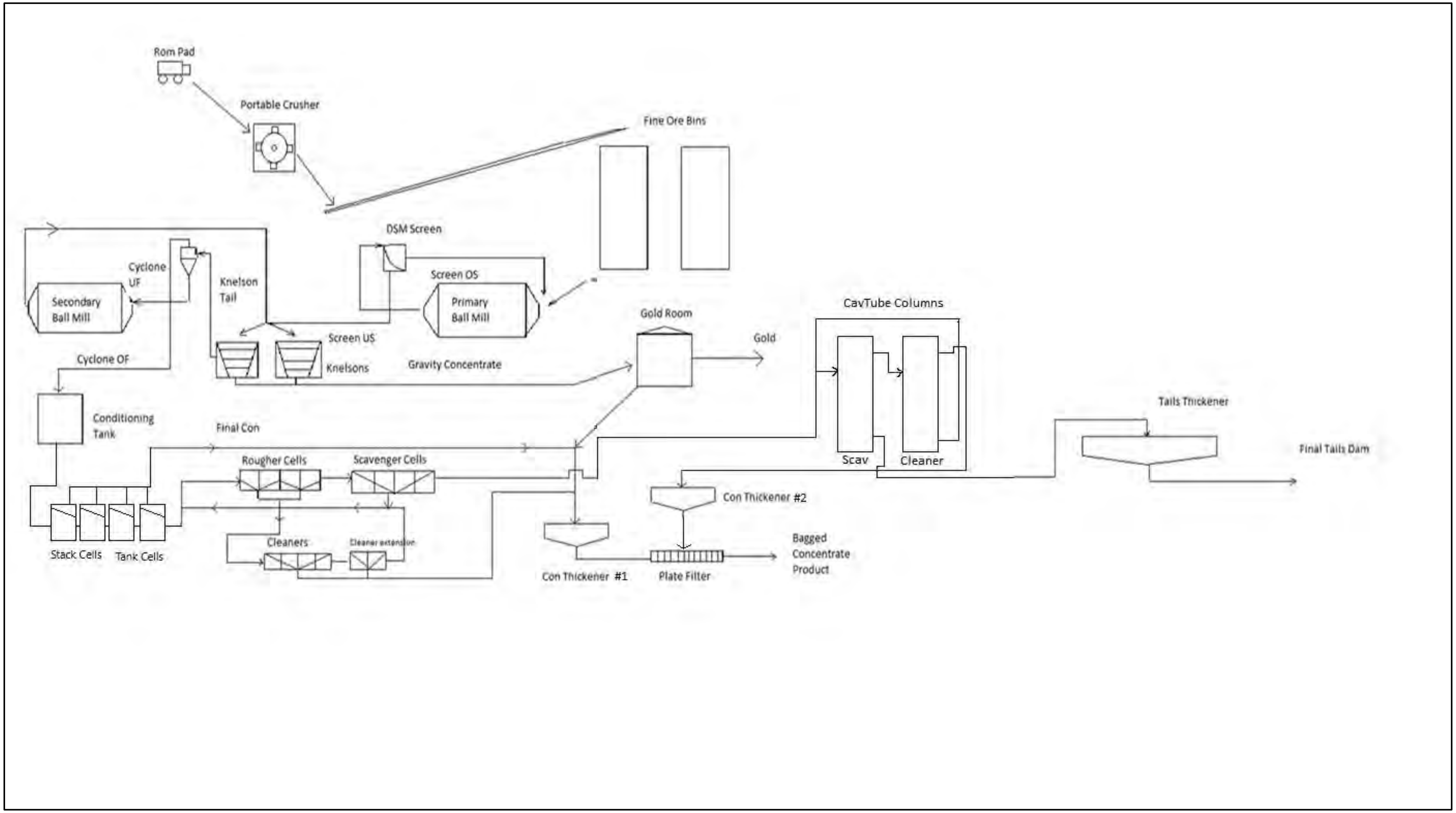


Figure 17-1: Brunswick Processing Plant Summary Flowsheet

17.1.1 Crushing and Screening Circuit

The crushing and screening plant consists of a primary crushing circuit in closed circuit with a 12 mm vibrating screen. It uses a duty and a standby diesel-powered Finlay I-130RS mobile impact crusher. Having two crushing units provides additional capacity and crushing circuit redundancy. Crushed ore is conveyed to two 120 tonne fine ore bins operating in parallel. The crushing and milling circuit have a demonstrated average throughput capacity of 13,000 dry metric tonnes (dmt) per month.

17.1.2 Milling Circuit

Crushed ore is reclaimed from the fine ore bins which both discharge onto the primary mill feed conveyor and feed into the milling circuit. The milling circuit comprises two ball mills in series, both operating in closed circuit. The primary mill operates in closed circuit with a Dutch State Mines (DSM) screen, with the screen oversize returning to the primary mill for further grinding and the screen undersize being fed to a centrifugal style gravity concentrator. This recovers a small mass of high-grade gold concentrate that is sent to the gold room for further gravity upgrading using a shaking table. The final gravity concentrate is sent directly to a local gold refinery as a separate saleable product. The gravity gold production varies but recoveries from the Youle feed are typically around 40 to 50% and can be as high as 55% of the gold delivered in the feed. The gravity tailings are pumped to classifying hydrocyclones (cyclones) with the overflow going to feed for the flotation plant. The underflow is returned to the secondary ball mill for further grinding. The milling circuit has a target grind size P_{80} of 60 µm. The secondary ball mill discharge is combined with the DSM screen undersize so is also fed to the centrifugal gravity concentrator.

17.1.3 Flotation Circuit

The flotation circuit is designed to recover an antimony-gold rich sulphide concentrate. The flotation circuit is fed from the secondary ball mill cyclone overflow. The cyclone overflow is fed to a conditioning tank where lead nitrate, an activator and potassium amyl xanthate (PAX), (a collector), are added. The conditioning tank feeds two 48 inch flotation StackCells® currently operating in series with two site fabricated rougher tank style flotation cells again in series. The StackCell® and rougher tank cell concentrates are combined with the final cleaner concentrate as the final product.

The rougher tank cell tailings flow to the original flotation circuit. This consists of eight square Denver DR100 cells for the remaining rougher and scavenging duties, followed by six Denver DR15 cells used for cleaning duties. The concentrate from the Denver rougher flotation cells is pumped to the cleaner flotation cells while the tailing becomes feed for the scavenger flotation cells. The concentrate from the scavenger flotation cells is recycled to the feed of the Denver rougher flotation cells while the scavenger tailing is pumped to the tailings thickener. The concentrate from the cleaner flotation cells is pumped to the concentrate thickener while the cleaner tailing is also recycled to the rougher flotation cells.

Following the Denver scavenger cells, rougher and cleaner CavTube® column flotation cells have been installed. These were supplied by Eriez and were commissioned in April 2021. They produce a separate low-grade antimony-gold concentrate. The first stage of this circuit, the rougher column tail, has now become the final tail stream. The flotation circuit effectively recovers the antimony and any gold not collected in the gravity gold circuit.

17.1.4 Concentrate Thickening and Filtration

Product from the Final Concentrate, the combined StackCell® and tank rougher cell products and the Cleaner flotation products are all pumped to Concentrate Thickener 1. Product from the CavTube® cleaner concentrate is pumped to Concentrate thickener 2. The thickened underflow is pumped directly to a plate and frame pressure filter for final dewatering.

The concentrate filter cake is discharged directly into concentrate bags. The filtrate is recycled to the concentrate thickener while the concentrate thickener overflow is recycled back to the plant as process water to maximise water re-use and minimise concentrate losses. An additional smaller concentrate thickener was installed in late 2019 to increase the dewatering capacity of the flotation plant concentrate.

17.1.5 Tailings Circuit

The flotation circuit tailings are settled in a thickener. The tailings thickener overflow is recycled back to the plant as process water and the thickened solids are pumped to a TSF where it is discharged via a conventional spigot system. Any additional water from the tailings is decanted and pumped back to the plant for use as recycled process water.

17.1.6 Throughput

The Brunswick Processing Plant has a throughput capacity of up to 14,000 dmt/month but typically averages closer to 13,000 dmt/month. Since operations commenced, the plant has demonstrated ongoing production creep, from around 5,000 t/month achieved in January 2012 to its current status.

Annual plant throughput has been matched to mining rates in recent years as the underground mine production has at times limited the available mill feed. Average plant throughput budgeted for 2022 is 12,688 dmt/month. The forecast production rates are well supported by consistent historical production over several years as well as ongoing plant upgrades and debottlenecking projects. Average throughput was 12,867 dmt/month, 12,647 dmt/month, 12,979 dmt/month, 11,900 dmt/month, 12,536 dmt/month and

12,123 dmt/month between 2016 and 2021 respectively. The moderate fall in 2019 was largely due to restrictions in plant feed supply.

There is currently approximately 40,000 dmt of feed on the ROM pad, and for 2022 mining volumes will be maintained at similar levels to milling volumes so as to maintain a ROM of approximately the same size throughout the year.

Further discussion of historical production and forecast LoM plant throughput on the current ore feed blend is provided in Section 13.

17.1.7 Metallurgical Recovery

Simple head grade versus recovery relationships have been developed for both antimony and gold using plant operating data (Figure 17-2). The gold head grade versus tailings grade recovery relationship has used the 2021 daily production data, although this can generate some daily fluctuations associated with gravity gold content. The data set used is between April 2021 and December 2021. Previously a more expansive data set has been used, as far back as 2015, however with the changes made to the flotation circuit completed in April improving the plant performance and enhanced gold recovery, particularly the StackCell® and CavTube® flotation cells, and the treatment of Youle-only feed, it is justified to remove the older Brunswick ore data from 2015 to 2020 that had previously been included.

Similarly, the antimony recovery algorithm has been updated due to the circuit modifications and processing of Youle ores only. The daily operational data for January to December 2021 has been used. The difference between the full year dataset and April to December 2021 is arbitrary.

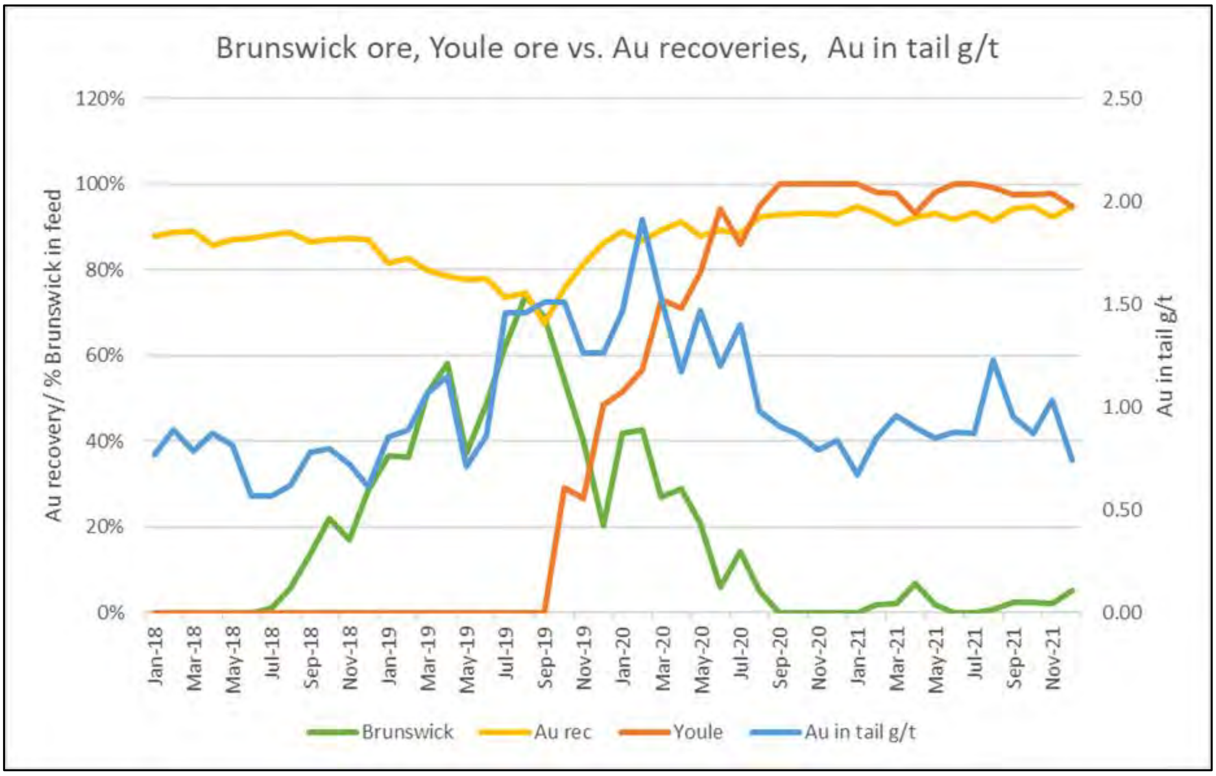


Figure 17-2: Plant Gold Recovery Improvement with Changing Feed Source from Brunswick to Youle – 2018 to 2021

Forecast antimony and gold recoveries used for LoM planning, budgeting and economic modelling are based on these recovery relationships. This is the best method of forecasting recovery when processing a similar feed blend. These algorithms are updated annually. Based on these algorithms, the forecast average LoM 2022 recoveries are 94.1% and 92.7% for antimony and gold respectively. These are not dissimilar to the 2021 end of year (EOY) reconciled plant recoveries of 94.6% Sb and 93% Au.

The recovery relationships are well understood and are appropriate for metallurgical recovery estimation purposes. They are supported by historic concentrator recoveries at similar feed grades and compare well to previous grade/recovery relationships on Youle feed and other similar ores. Further recovery confidence is provided by the consistent recoveries of both antimony and gold achieved over a number of years across a range of feed grades. Full details have been provided in Section 13 of this report.

17.2 Services

17.2.1 Water

The water services at the Brunswick Processing Plant consist of the raw water, process water and excess water disposal systems. The process water supply consists of concentrate thickener overflow, tailings thickener overflow and TSF decant return water.

Most of the raw make-up water is provided by dewatering of the underground operations at approximately 1.5 ML/day to 2 ML/day. The plant operates with a positive water balance with excess water requiring disposal. Mandalay constructed a 2 ML/day permeate reverse osmosis (RO) plant at the Brunswick Processing Plant in 2014. The 2 ML/day plant has remained in operation as per regulatory approvals. A pre-treatment plant to feed the RO plant was installed in 2017. This has enhanced the robustness of the RO operation, limiting downtime and reducing consumables consumption.

The Splitters Creek evaporation facility has the capacity to treat approximately 104 ML/year net (evaporation minus rainfall) and treats the bulk of the excess water. Aquifer Recharge (AR) is being used as an additional water disposal method and has been trialled successfully during 2017 through to 2021.

The TSF and process water is stored in and distributed from a dedicated tank system. As the site has a positive water balance due to underground dewatering, adequate process water supplies are available to meet the LoM requirements.

17.2.2 Air

The Brunswick Processing Plant requires both low pressure (LP) and high pressure (HP) air supplies. Currently, three separate LP blowers supply the rougher, scavenger and cleaner cells, with the existing tank cells running off HP air.

The HP air supply was upgraded to a variable speed compressor in 2017 in order to increase the capacity and availability of high-pressure air and reduce the shock load on the power supply on start-up of the fixed speed compressor units. The pressure filter also runs off high pressure air.

The processing facility has adequate air to meet the LoM requirements and no current upgrades are required or planned.

17.2.3 Power

Due to the need for additional electrical power for the development of the Brunswick and Youle underground orebodies, upgrades to the power supply and reticulation circuits were completed in 2019. This involved consolidating three separate incoming sources of electrical supply into a single supply source and distributing electrical power from that single point. This has allowed for greater efficiencies through minimising losses from each supply point and also allows additional local site back-up generation to occur from a single point.

This has simplified starting and stopping of supplementary site diesel fired power depending on the demand. The mill and RO plant will continue to be powered from this single point.

There is also provision for additional power demand for the mill up to 2 kVA (refer to Section 18).

Further improvements to electrical switchboard controls have been ongoing in order to remove local power boards and relocate them to a central location. This electrical consolidation work will continue in 2022 in parallel with the inclusion of extra plant mechanical equipment such as another filter press for concentrate filtering.

17.3 Plant Upgrades

The major plant upgrade in 2021 included the installation and commissioning of a second StackCell® as well as rougher and cleaner CavTube® columns in the flotation circuit. For 2022 the budgeted major plant upgrades will include the installation of a second filter press or alternative concentrate filtration technology, as well as the purchase of another impact crusher.

Further details of recent plant upgrades in each processing circuit are provided in the following sub-sections.

17.3.1 Crushing and Screening Circuit

A mobile crusher trial in 2012 identified significant improvements to the throughput of the Brunswick Processing Plant. A larger portable crushing unit later become a permanent component in the process flowsheet configuration. Another mobile crusher was purchased in 2015 to allow for a duty and standby arrangement for additional capacity and redundancy. This addition enabled average throughput to increase to over 13,500 t/month and peak capacity of over 14,000 t/month to be reliably maintained.

In early 2022 a Finlay I-140RS mobile Impact Crusher is scheduled to be delivered to site. The configuration of how the new crusher fits into the existing crusher circuit remains to be determined after delivery with the new crusher initially being positioned ahead of the existing crushers and oversize from the new crusher being fed to one of the existing crushers. A key consideration in the configuration will be how best to manage wear through the crushing circuit and benefit throughput during wetter months when crushed feed can become crusher capacity constrained.

17.3.2 Milling Circuit

The milling circuit remains unchanged. The finer crushed ore feed size allows the target throughput to be achieved. No further major work has been planned.

17.3.3 Flotation Circuit

An additional flotation cell was commissioned in November 2018 and a second cell in July 2021. The two 48-inch diameter StackCell® units supplied by Eriez Flotation are installed in front of the existing rougher tank cells. They are fed directly from the flotation conditioning tank. The new cells increase the overall residence time and promote flotation kinetics through their hydrodynamic design. By doing so, recoveries from the slower floating sulphide minerals are improved. The StackCell® units have a nominal capacity comparable to that of the existing, larger 8 m^3 to 9 m^3 tank cells #1 and #2.

Rougher and cleaner CavTube® column flotation cells were installed and commissioned on the flotation tail in April 2021. This new flotation circuit on the tailings stream produces a separate low-grade antimony-gold concentrate, which has been blended with existing plant concentrate and sold to customers in regular shipments. The rougher column tail from this additional circuit is the final plant tail. The new columns are sized for the full tailings slurry capacity.

17.3.4 Concentrate Thickening and Filtration

In anticipation of higher antimony feed grades from the Youle deposit, an additional 2.4 m^3 capacity concentrate thickener with rake and lift was purchased second-hand. It was installed in the plant along with its own Verderflex product pump. An additional froth pump has been installed to allow separate loading of the new thickener.

The additional concentrate thickener operates in parallel with current 4 metre diameter concentrate thickener. The splitting of concentrate produced from the front StackCell® and tank cells and the Denver cleaner cells provides an appropriate mass split between each thickener.

Both thickeners feed the pressure plate and frame filter press in parallel. Loading and pressing time for the filter press is not a bottleneck for production, whereas settling capacity in the concentrate thickener can be a bottleneck at higher metal production rates and needs to be carefully managed.

The new lower grade concentrate produced by the CavTube® column style flotation circuit treating the tailings is dewatered on a campaign basis through the existing filter press.

17.3.5 Tailings Circuit

The tailings thickener has sufficient capacity to meet the current throughput and allows for the changes associated with the CavTube® flotation column upgrade project. The average tails thickener underflow solids density will be maintained at approximately 50% w/w solids (+/- 10%).

The increased capacity provided by the 2018 lift of the Bombay TSF was exhausted in August 2020. The Brunswick TSF returned to service as the replacement storage facility following the completion of a hybrid wall lift and was used as the primary storage facility during 2021. Capacity of the Brunswick TSF is anticipated to be exhausted in April 2022.

The Bombay facility has been undergoing pre-work for a wall lift and is planned to be available for deposition during February/March 2022. Studies are continuing to determine the most effective way to further increase tailings capacity through future TSF lifts to meet the full LoM plan. Further details have been provided in Section 18.

17.3.6 Reagent Mixing and Storage

No upgrade work is required for the reagent mixing and storage area.

18 PROJECT INFRASTRUCTURE

The infrastructure associated with the Costerfield Property consists of surface, underground, tailings storage, power and water supply, waste rock storage, diesel storage, explosives storage, maintenance and housing facilities.

18.1 Surface Infrastructure

The Costerfield Property's surface infrastructure facilities are typical of a conventional flotation style concentrator and underground mining operation of this size.

18.1.1 Augusta Mine Site

The Augusta Mine site comprises the following infrastructure which is also referenced in Figure 18-1:

- Office and administration complex, including change house,
- Store and laydown facilities,
- Heavy underground equipment workshop,
- Evaporation and storage dams,
- Temporary surface waste rock stockpile area,
- Augusta Mine box-cut and portal,
- Ventilation exhaust raise,
- Ventilation intake raises,
- Mine water recirculation dam and silt settlement channel,
- Exploration drilling contractor offices and workshop; and
- Capital development contractor workshop.

Figure 18-1: August Mine Site – aerial view

18.1.2 Brunswick Mine Site

The Brunswick site comprises the following infrastructure, refer to Figure 18 2:

- Gold-antimony processing plant and associated facilities;
- Central administration complex;
- Process plant workshop;
- Tailings storage facilities;
- Run of Mine (ROM) stockpiles;
- Waste rock stockpiles;
- Reverse Osmosis (RO) Plant capable of treating 2 ML of water per day;
- Previously mined Brunswick Open Pit;
- Brunswick mine portal and backfill cement silo;
- Brunswick Primary Ventilation Raise;
- Youle Primary Ventilation Raise and

- Exploration Geology offices, Core farm and core processing facility.

Figure 18-2: Brunswick Mine Site – aerial view

18.1.3 Splitters Creek Evaporation Facility

The Splitters Creek Evaporation Facility is situated on a 30 ha parcel of land that is located approximately 3 kilometres from the Augusta site and lies within mining lease MIN 5567. The Facility facilitates the evaporation of a combination of groundwater extracted from the Costerfield Property mines and brine which is a bi-product of Reverse Osmosis (RO) filtration plant. The Facility enables underground dewatering rates to be maintained ahead of mining operations.

The evaporation facility site comprises the following:

- 150 ML storage dam;
- 40 ML evaporation terraces;
- Recirculation pumping system that directs water from the storage dam to the evaporation terraces;
- Splitters Creek rising main that feeds water from the Augusta Mine Dam to the evaporation terraces; and
- Leakage detection system on the Splitters Creek rising main.

In 2020 permits were amended and approved to allow brine to be discharged to the Splitters Creek Evaporation Facility.

18.1.4 Margarets Aquifer Recharge Borefield

The Margarets Aquifer Recharge Borefield is located approximately 1km south of the Augusta operations. Aquifer recharge infrastructure at the Margarets borefield includes two injection bores that are licensed to dispose of 730 ML of mine wastewater via injection into the Margaret's Aquifer over an operational period of 24 months.

18.2 Underground Infrastructure

The underground infrastructure at the Costerfield Property is typical of an underground mining operation.

18.2.1 Secondary Means of Egress

The secondary means of egress consists of a ladderway system that connects all underground workings to the surface in parallel with the main development declines. The ladderway system comprises:

- The Augusta ladderways from Surface to the 900 mRL within the Augusta underground workings;
- The Cuffley ladderways extend from the Cuffley Incline, Cuffley Decline and 4800 Decline to the 945 mRL. From the 945 mRL level, extraction is performed via the Cuffley Primary Ventilation Shaft in an emergency gig.
- The Brunswick ladderways which are mined between every second operating level cross-cut allowing a secondary means of egress parallel to the main decline travel way to the 1056 Fresh Air Base, where the emergency gig can be landed for final extraction to surface
- The Youle ladderways are mined between every operating level of the Youle development with the exception of the 947, 957 and 967 Levels. These ladderways allow a secondary means of access to the bottom of the Youle Primary Ventilation Shaft. The 947, 957 and 967 levels have secondary access to the bottom of the Youle Primary Ventilation Shaft via the Youle decline and parallel return airway development. The emergency gig can also be operated in the Youle Primary Ventilation Shaft to allow extraction of personnel from this point if required.
- The emergency gig attaches to a standard crane hook and hoists personnel in an emergency up and down the Cuffley Primary Ventilation Shaft using a 200-tonne

mobile crane as the hoist. The emergency jig is capable of evacuating 5 persons or 600 kg (120 kg per person) at a time;

18.2.2 Refuge Chambers and Fresh Air Bases

Six underground refuge chambers and two permanent fresh air bases (FABs) are strategically placed within the mine to mitigate hazards posed by irrespirable atmospheres and entrapment.

The capacity of the refuge chamber required is dictated by the number of personnel planned to be working in the immediate vicinity serviced by the refuge chamber. The position of the refuge chamber facilities enables all personnel to be within 750 metres of a refuge chamber, as recommended in the Western Australian 'Refuge Chambers in Underground Metalliferous Mines' Guideline (Department of Mine and Petroleum, 2013).

It is not intended for refuge chambers to substitute a secondary means of egress, but to provide refuge during an incident where the underground atmosphere is irrespirable or when ladderways may be inoperative or inaccessible.

The refuge chambers and FABs are located in:

- The Brunswick workings has a 10-man refuge chamber located at stockpile #4 in the Brunswick access, a 16-man refuge chamber on the 1006 level (RL) and a FAB at the 1056 Vent Access.

- The Youle workings has a 20-man refuge chamber located at stockpile 10, a 16-man refuge chamber located at the 807 Refuge Chamber Cuddy and a 20-man refuge chamber at the 687 Refuge Chamber Cuddy.

- The 4-man refuge chamber is a travelling chamber that may be positioned in areas not serviced by fixed refuge chambers if the need arises.

18.2.3 Compressed Air

The existing compressed air plant comprises three 593 cfm compressors. The overall plant capacity is 840 L/s (1779 cfm). Compressed air is delivered underground via a 4-inch HDPE 'poly' pipe. Each level is then supplied from the decline via 2-inch HDPE piping.

Air receivers have been placed at the Brunswick 1006 mRL and stockpile 5 Youle to increase the system efficiency. Compressed air is used to power pneumatic equipment and/or activities including:

- Airleg drills;

- Pneumatic Ammonium Nitrate-Fuel Oil (ANFO) loaders;
- Blasthole cleaning/prepping for development rounds;
- Diaphragm air pumps; and
- Long-hole cleaning/preparation.

18.2.4 Ventilation System

The primary ventilation infrastructure currently consists of five fresh air intakes and two primary exhaust shafts. The fresh air intake system consists of the following :

- Augusta Portal which has 56 m^3/s (of air) entering the portal,
- Augusta Fresh Air Intake (FAI) which is a series of air leg rises from the surface to the 1020 Level (RL) in the Augusta workings, contributing 12 m^3/s of air flow,
- The Augusta Fresh Air Rise (FAR) is a 150 m vertical raisebore shaft from surface to the 1020 Level in the Augusta workings. The Augusta FAR is 3m diameter and approximately 11 m^3/s of fresh air enters the mine through this shaft,
- Brunswick Fresh Air Rise (FAR) is a 230m, 3.5m diameter, vertical raise bore shaft from the surface to the 956m RL in the Brunswick workings. The shaft is currently backfilled with waste rock up to the 1056m RL. Approximately 3m^3/s enters the mine through the Brunswick FAR, which is currently regulated to 98% closed. The air flow through the Brunswick FAR supplies adequate air flow to the 1056 FAB which serves as a refuge point in the event of an emergency.
- Brunswick Portal is a 5mW x 5mH arched profile which reduces to 4.5mW x 4.8mH after approximately20m of development. The Brunswick Portal allows 83m^3/s of fresh air to enter the mine under the current configuration.

The Return Air Rise (RAR) system includes:

- Cuffley RAR is a 230m, 3m diameter, vertical raise bore shaft from surface to the 950 Return Air Way (RAW). The Cuffley primary fan chamber is positioned at the bottom of this shaft, which is capable of running three single stage Clemcorp CC1400 Mk4 fans driven by 110kW motors. The three fans are installed in a fan bulkhead in parallel. Currently, the primary ventilation is configured such that only one of the three primary fans at the Cuffley primary fan chamber is required to operate. The Cuffley RAR exhausts 54 m3/s from the mine workings.

- Youle RAR is a 232m, 4m diameter, vertical raise bore shaft from surface to the 957 RAW. The Youle primary fan chamber is positioned at the bottom of this shaft which is capable of housing four single stage Clemcorp CC1400 Mk4 fans driven by 110kW motors. The four fans are installed in a fan bulkhead in parallel. Currently, the primary ventilation is configured such that only two of the four primary fans at the Youle primary fan chamber are required to operate. The Youle RAR exhausts 103m^3/s.

The primary ventilation flow is distributed through the mine using secondary fans positioned in areas of primary air flow that force ventilate the active development and stoping levels as required.

***18.2.5* Dewatering System**

The process of dewatering in advance of the mining level development is achieved by leaving diamond drill holes drilled from underground open to drain. Due to the fractured nature of the aquifer, the groundwater inflows are not predictable. Total mine inflow for the active workings is approximately 1.5 ML per day.

In order to manage silt, all inflowing ground water is pumped, or gravity fed to the 4800 Decline Silt Settlement Sump. Clarified water is transferred from the 4800 Pump Station (comprising two duty and one standby WT084 Wear Tuff Mono Pumps), to the 945 Pump Station and Rising Main infrastructure (comprised of four WT088 Wear Tuff Mono Pumps) where it is discharged to surface storage and transfer dams.

The Cuffley, 4800 and Augusta workings are all gravity fed systems to feed the 4800 Decline silt settlement sump.

Brunswick has a series of sumps connected by gravity fed drain holes that feed into the decline sump at the 956mRL, a 20kW pump transfers water from this sump to the 4800 Decline Silt Settlement Sump.

Youle has a series of sumps connected by gravity fed drain holes that feed into two linked pump stations, (each comprising one duty and one standby WT084 Wear Tuff Mono Pump), located at the 897mRL and 777 mRL pump stations. A third pumping station at Youle is under construction at 657mRL. It also comprises two WT084 wear tuff mono pumps in duty/standby configuration.

The Rising Main extends to the mine dam. From here water is distributed, to the RO water treatment facility or to the Splitters Creek evaporation facility.

18.2.6 Other Underground Infrastructure

An underground crib room is positioned at the 957 mRL Youle and the underground magazine is positioned at the 955 mRL Cuffley Incline. The magazine allows for the safe storage of mine explosives.

In addition to fixed plant, Mandalay owns, operates and maintains a full underground mining equipment fleet including production drills, loaders, trucks, jumbos and ancillary equipment required to undertake ore development and production operations.

18.3 Tailings Storage

Two tailings dams are currently in operation comprising the Bombay Tailings Storage Facility (TSF) and the Brunswick TSF.

Both TSFs were constructed based on a conventional turkeys nest type design with earthen embankments.

Tailings are currently deposited in the Brunswick TSF, which currently has capacity to allow tailings to be deposited until Q2 2022. Tailings storage beyond Q2 2022 will be facilitated with the following:

- An additional lift is permitted and planned to take place on the Bombay TSF facility. Construction of this lift is planned to commence in Q1 2022. The Bombay lift will provide tailings storage through to Q4 2023.

- Tailings storage beyond Q4 2023 will require permitting and construction of a new TSF facility.

18.4 Power Supply

The Costerfield Property's electrical power is supplied by grid power and supplemented on site, by on demand diesel fired generator sets. This is comprised of High Voltage (HV) 22 kV, 11 kV and low voltage (LV) 415 V systems.

The HV infrastructure is supplied via a 22 kV feeder from Powercor (the grid network provider). The system then steps down this power on site to 11kV using transformers. The 11kV power is dispersed to six (6) HV substations via a network of HV cable. At the six (6) 11kV transformers, power is stepped down further to 1kV and 415V.

The 11 kV system extends from the underground operations back to the surface to supply the Brunswick Processes Plant where it is stepped down to 415 V from 11 kV.

The majority of site electrical power demand is provided by 3 MVA of network power with the remainder provided through synchronised diesel fired generation on site if needed. The system's power quality is also supported by means of an 11 kV Power Factor Correction Unit (PFCU).

The main power system equipment on site consists of:

- Overhead powerlines,
- High Voltage substations,
- High Voltage RMU's (Ring main units),
- High Voltage transformers,
- High Voltage PFCU,
- Three (3) synchronised generators, one (1) island mode generator,
- Site electrical power reticulation.

The operations uses between 3 MVA to 3.5 MVA of demand at any given time. The summary Costerfield electrical power reticulation diagram is presented below in Figure 18-3.

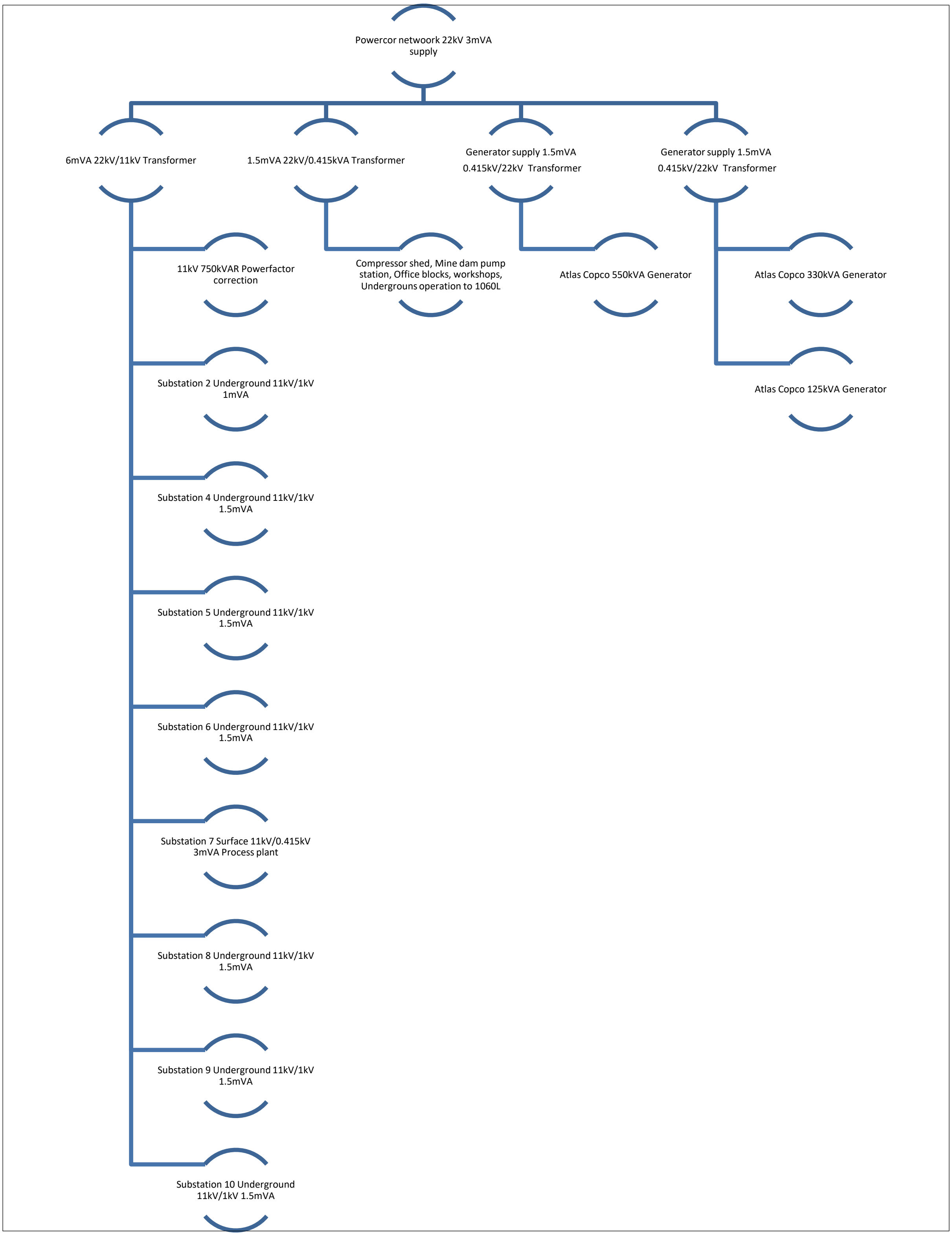


Figure 18-3: Costerfield Power Reticulation Diagram

18.5 Water Supply

Water for underground and surface operations is sourced from the Augusta Mine Dam which is fed directly from the rising main that extends from the Cuffley 945 Pump Station to surface, i.e. raw water is sourced from underground dewatering.

The Brunswick Processing Facility sources water from a number of sources including recycled process water from the Brunswick and Bombay TSFs.

Potable water is trucked to site by a private contractor and is placed in surface holding tanks for use in the change house and office amenities. Potable water for drinking is provided in 15 litre containers.

Water disposal is discussed in Section 20.1.2.

18.6 Water Management

Groundwater is currently pumped from the underground workings to the Mine Dam at a rate of approximately 1.5 ML per day. Mine water is then pumped from the Mine Dam to either the Splitters Creek Evaporation Facility, or a series of water treatment and disposal facilities (located at the Brunswick site.

The Augusta Evaporation Facility comprises of three dams with a total storage capacity of 137 ML. Total site water storage capacity including smaller catchment and operational dams at Splitters Creek, Brunswick and Augusta, is approximately 289 ML.

The water services at the Brunswick Processing Plant consists of the raw water, process water and excess water disposal systems. The process water supply consists of concentrate thickener overflow, tailing thickener overflow and Brunswick TSF decant return water. Whilst the process plant utilises water from a closed circuit, make-up process water is required to supplement water evaporated at the Brunswick TSF.

Total evaporation and water disposal capacity including discharge of RO treated water and from the Splitters Creek Evaporation Facility and is currently estimated at 555ML per year, assuming the long term average Heathcote climatic conditions.

Aquifer Recharge trials have been successful and the Costerfield Property has established the Margarets Aquifer Recharge Borefield, located approximately 1km South of the Augusta operations. The Aquifer Recharge infrastructure at Margarets includes two injection bores and is licensed to dispose of a maximum 730 ML of mine wastewater via injection to groundwater in the Margarets Aquifer over an operational period of 24 months.

18.7 Waste Rock Storage

Waste from underground capital and operating waste development is hauled to surface at the Brunswick site via the Brunswick portal. Surface haulage trucks shift waste from intermediate stockpiles predominantly to the Bombay Waste Stockpile, where it is stored for future use in Cemented Rock Fill (CRF), capital projects (e.g. Tailings dam construction) and for rehabilitation purposes.

A small percentage of waste material hauled to surface is screened or crushed, to be used for road base underground and Cemented Aggregate Fill (CAF). Further detail is provided in Section 20.1.3.

18.8 Surface Ore and Waste Haulage

The completion of the Brunswick Portal Project in 2020 allowed a significant reduction in the requirement to haul ore and waste in road registered trucks along Heathcote-Nagambie Rd. Underground trucks now haul directly to the Brunswick Pit where a surface haulage contractor manages the load, haul, dump operations for both Ore and Waste rock to their respective final stockpiles.

18.9 Diesel Storage

A self-bunded diesel storage tank of 68,000 L capacity exists at the Augusta Mine site. This diesel storage caters for all underground and surface diesel needs for Augusta.

The Brunswick site is catered by a self-bunded diesel storage tank of 65,000 L capacity.

18.10 Explosives Storage

All storage, import, transport and use of explosives is conducted in accordance with the WorkSafe Dangerous Goods (Explosives) Regulations 2011.

Mandalay utilises its own licenced personnel and equipment to handle, store, transport and use explosives on the Augusta site. The designated explosives supplier produces all the explosives products off site. The ANFO is supplied in 20 kg bags, while the emulsion is supplied as a packaged product. ANFO is primarily used for development and production purposes, with emulsion used when wet conditions are encountered.

The current Underground Magazine is located at the 955 mRL and is operated under the control of the designated ‘black ticket holder’ on behalf of Mandalay Resources who is the licensee. The current Augusta Magazine licence allowances are summarised in Table 18-1.

Table 18-1: Current Augusta Licence Maximum Quantities and Types of Explosives

Class Code	Type of Explosive	Maximum Quantity
1.1D	Blasting Explosives	40,000 kg
1.1D	Detonating Cord	10,000 m
1.1B	Detonators	21,000 items

18.11 Maintenance Facilities

Maintenance facilities at the Costerfield Property comprise:

- A surface mine maintenance workshop facility is located adjacent to the box-cut at Augusta. This workshop is capable of servicing all mobile UG equipment both electrically and mechanically. The surface mine maintenance workshop also includes a bay for an on-site boiler maker, facilities for an auto-electrician and mobile fleet parts stores are also incorporated into this facility.

- A mine electrical workshop allows electrical maintenance of all electrical assets, including fixed, mobile, Low Voltage and High Voltage.

- The Brunswick Processing Plant is equipped with under-cover maintenance facilities capable of servicing fixed and mobile processing plant, including the Finlay primary crushers. This facility also allows for fabrication works where necessary.

18.12 Housing and Land

Mandalay owns fourteen land allotments surrounding the Augusta, Brunswick and Splitters Creek Evaporation Facility sites. Of these properties, seven have residential dwellings. The remaining seven consist of vacant land. The residential dwellings are used as temporary housing for company employees.

The land allotment located on Peels Lane and Costerfield South, acts as an offset area for the Mandalay's mining and processing activities. It has been identified that the Peels Lane Offset has 'the potential to generate a total of 4.35 habitat hectares' and associated large trees (Biosis Research, 2005).

The Peels Lane Offset was purchased as part of the Work Plan for MIN 4644 and acted as an offset for the vegetation loss due to the construction of the Augusta Mine Site. The offset site has also been used to meet the offset requirements for the Brunswick TSF.

19 MARKET STUDIES AND CONTRACTS

The following market studies and contracts have been undertaken and/or are in place.

19.1 Antimony

19.1.1 Concentrate Transport

The concentrate is discharged directly into 1.5 tonne capacity bulk bags ready for transportation by road train to the Port of Melbourne, for shipping to overseas markets. The average payload of each road train is approximately 42 tonnes, and sea shipments are scheduled at least once per month on a Cartage, Insurance, Freight (CIF) basis to the destination port.

A third-party haulage company collects the concentrate from the Brunswick site, transports, stores and loads the concentrate at the port.

All logistics and shipping documentation services are provided by Minalysis Pty Ltd.

19.1.2 Contracts

The antimony-gold concentrate produced from the Costerfield Property is sold directly to smelters capable of recovering both the gold and antimony from the concentrates, such that Mandalay Resources receives payment based on the concentration of the antimony and gold within the concentrate.

The terms and conditions of commercial sale are not disclosed, pursuant to confidentiality requirements and agreements.

19.1.3 Markets

The antimony price is determined through the Metals Bulletin as outlined in the contractual agreement with the customer, in US dollars. The payable factor is dependent on the quality and form of antimony product sold.

19.1.3.1 Global Outlook

The comments in this section are based on a review of market reports by Roskill (recently bought out by Wood Mackenzie) and other sources as stated.

Globally, world antimony mine production in 2021 was estimated to have been between 110,000 tonnes and 120,000 tonnes of contained antimony. A further 70,000 to 80,000 tonnes is sourced through recycling product (Roskill, 2020).

China continues to be the largest mining country but at a declining rate. Mining of antimony in Russia has been steadily increasing where they are targeting up to 15% of global output (Reuters, 2018; Figure 19-1).

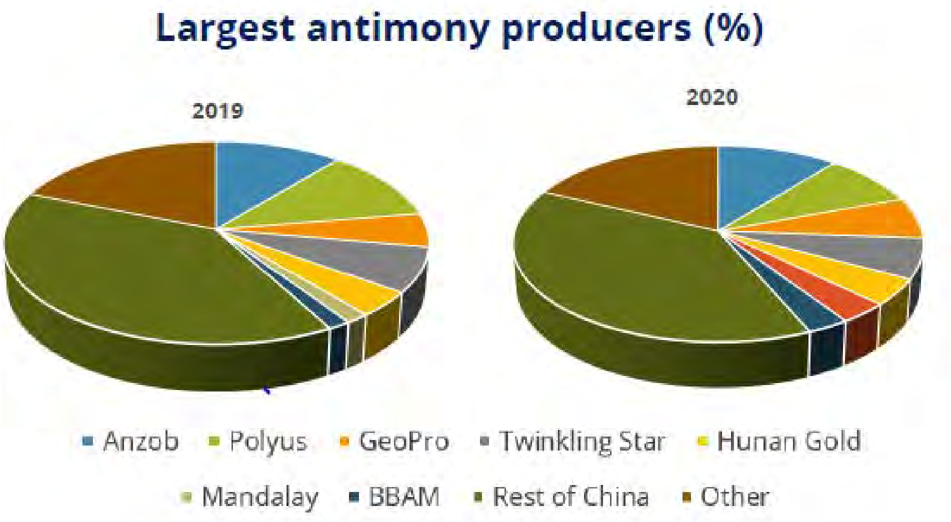


Figure 19-1: Largest Antimony Producers (Roskill, 2020)

Antimony can be processed into two forms allowing the product to be used in two different ways. In one form the metal is used metallurgically in various alloys. Because antimony has a rare characteristic of expanding on solidifying, it can be used for strengthening of the alloy as it increases the hardness. The addition of antimony to an alloy, even in small quantities allows it to be used in batteries, in bullets, covering for cables, and in equipment such as pumps and tanks. Antimony's use in batteries comprises around 80-90% of use.

As a non-metallurgical product, antimony is used as a flame retardant and in other antimony compounds used as paint pigments (Britannica, 2022). Non-metallurgical applications account for around 60% of the annual consumption of antimony (Figure 19-2).

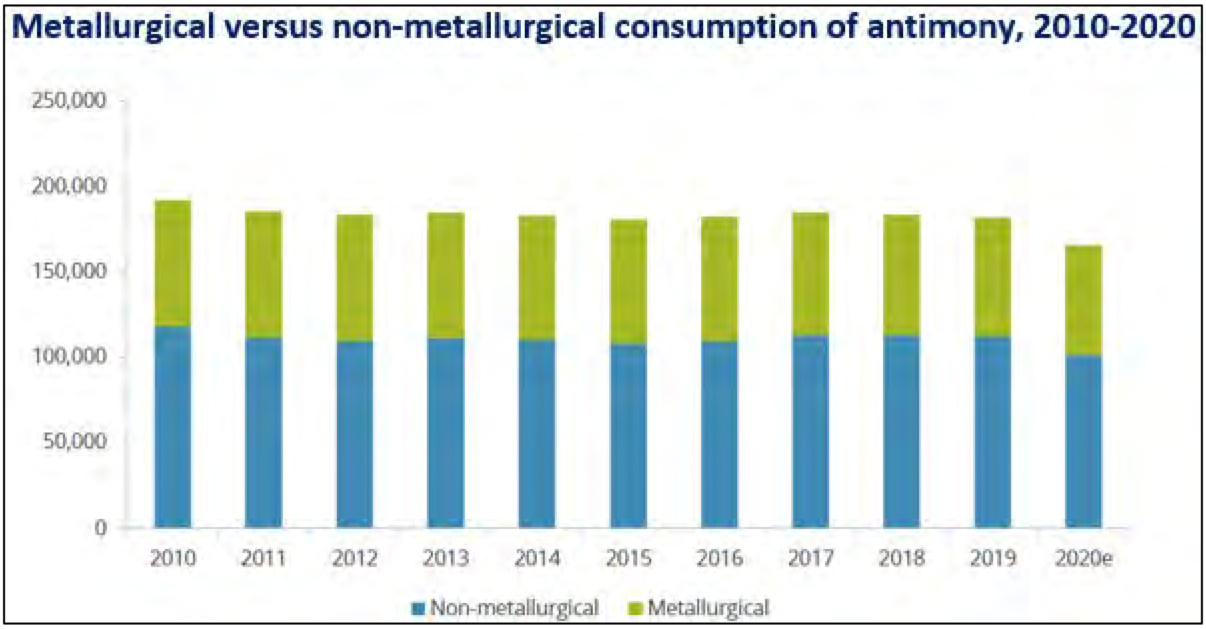


Figure 19-2: Metallurgical versus Non-Metallurgical Consumption of Antimony (Roskill, 2020)

There has been little change in the consumption of non-metallurgical applications, with the percentage of consumption remaining consistent over several years. The consumption chart presented in Figure 19-3 is for the 2019 year however it remains basically the same as information gathered in 2016.

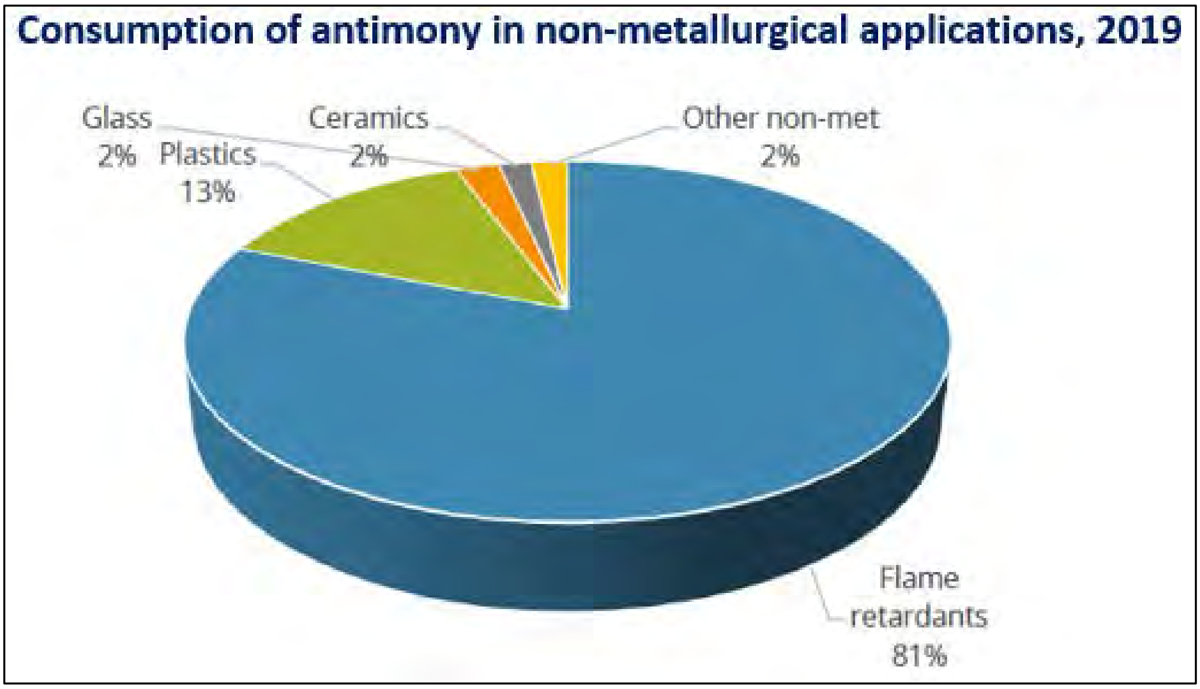


Figure 19-3: Consumption of Antimony in Non-Metallurgical Applications (Roskill, 2020)

Whilst consumption has remained stable, prices saw a steady increase during the latter part of 2020, and have stabilised at the higher price during 2021 (Figure 19-4 and Figure 19-5). According to a spokesperson with Fastmarkets Metals Bulletin these price increases have been driven by "logistic-related supply constraints" due to COVID-19 coupled with potential mine closures due to environmental and licencing impacts in China. The COVID-19 pandemic has had considerable impact on the supply of antimony and the supply chain and with relatively flat demand prices have increased.

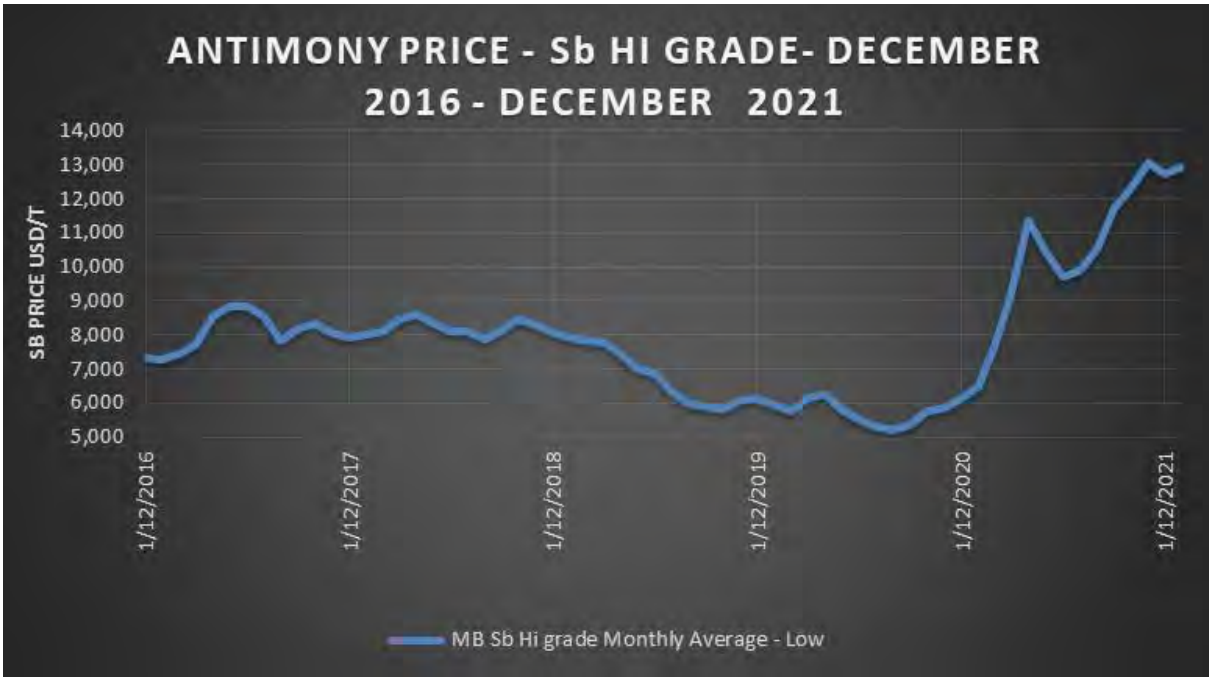


Figure 19-4: Antimony Price Low monthly average over 5 years [Source: Fastmarkets Metals Bulletin[4]

[4] https://dashboard.fastmarkets.com/w/g2vYKvLrTyutgZAYuebxV8/antimony

Figure 19-5: Antimony Price Low actual price over 1 year [Source: Fastmarkets Metals Bulletin[5]

19.2 Gold

19.2.1 Markets

The gold price is determined through Transamine website. There are two forms of gold product sold, one in concentrate form which is sold to overseas customers, the other a purer form of concentrate which is sold within Australian borders. Each customer has different payable terms stated in the contract, all of which is contingent on the quality of the concentrate sold.

The terms and conditions of commercial sale are not disclosed, pursuant to confidentiality requirements and agreements.

19.2.2 Global Outlook

Gold is a widely available and traded commodity. Information on global outlook is altered daily and is readily available through expert reports. It is not the intent of this report to review all information out there an validate information readily available.

There are many different sources on the global outlook for the price of gold. The trend in the gold price over the last 5 years has followed a steady increase (Figure 19-6) with prices remaining relatively stable over the last year (Figure 19-7), in comparison to the previous 5-year movement.

[5] https://dashboard.fastmarkets.com/w/g2vYKvLrTyutgZAYuebxV8/antimony

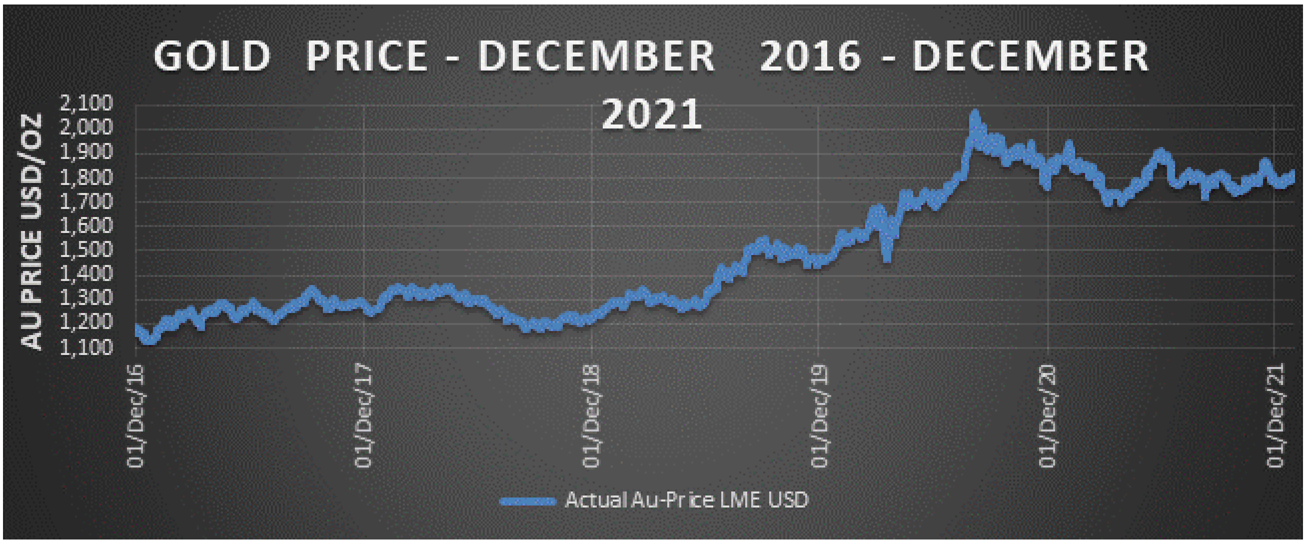


Figure 19-6: Gold Price AM monthly average over 5 years [Source: www.transamine.com[6]]

Figure 19-7: Gold Price AM actual price over 1 year [Source: www.transamine.com[7]]

19.2.3 Resource and Reserve Pricing

This report has relied on pricing obtained from the sources stated above. For the Mineral Reserve the gold price used is between the 3 and 5 year trailing average while for the Mineral Resource the gold price used is the rounded sum of the Mineral Reserve price + 15%. This calculation is also representative of the 2-year trailing average (figure 19.8).

For antimony the Mineral Reserve price is the 5-year training average, and for the Mineral Resource is the Mineral Reserve price +15%. This calculation also is indicative of currently

[6] https://www.transamine.com/price-and-review.html
[7] https://www.transamine.com/price-and-review.html

observed price increases (Table 19-1). Antimony is not traded as regularly on any markets and therefore less data is available, hence the reliance on a 5-year trailing average.

Year End 2021 R&R Metal Prices (US$) with reference to 2020YE Prices (US$)

Table 19-1: Gold and Antimony prices used for Resource and Reserve

	2020 YE Resource Price Used	2020 YE Reserve Price Used	2021YE Resource Price	2021YE Reserve Price
Gold	*$1,700*	*$1,500*	**$1,700**	**$1,500**
Antimony	*$8,000*	*$7,000*	**$8,500**	**$7,500**

20 ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT

20.1 Environment and Social Aspects

20.1.1 Mine Ventilation

Ventilation shafts have been installed in the Cuffley, Brunswick and Youle mines to maintain suitable air quality and volumes within the expanded underground mine.

The Cuffley ventilation shaft is located on freehold land owned by Mandalay Resources and is an exhaust air outlet.

The Brunswick ventilation shaft is located on crown land nearby the Brunswick Processing Plant and is a fresh air intake.

The Youle ventilation shaft is located on freehold land owned by Mandalay Resources and is an exhaust air outlet.

20.1.2 Water Disposal

The disposal of groundwater extracted from the mine workings is a critical aspect of the Costerfield Property. The current approved Work Plan does not allow for off-site disposal of groundwater or surface water.

The climate in Central Victoria enables water to be removed through evaporation. Average pan evaporation is 1,400 mm per year according to the nearest Bureau of Meteorology monitoring station at Tatura, 65 km north-west of Costerfield. Mean rainfall in the area is 576 mm per year, recorded at the Bureau of Meteorology monitoring station at Heathcote, with the highest annual rainfall recorded in 1973 as 1,048 mm. The average rainfall by year in the Heathcote area between 2013 and 2019 is detailed in Table 20-1.

Table 20-1: Rainfall Measurements from 2013 to 2021

Year	Rainfall (mm)	Above/Below Average
2013	554	Below
2014	510	Below
2015	299	Below
2016	687	Above
2017	504	Below
2018	379	Below
2019	350	Below

2020	675	Above
2021	590	Above

The Costerfield Property currently operates a series of water storage and evaporation dams, including the following major storage facilities:

- Splitters Creek Evaporation facility, comprising 20 terraces and a HDPE lined storage dam,
- Three HDPE lined evaporation and storage dams at the Augusta site.

A Reverse Osmosis (RO) plant was installed in 2014 at the Brunswick processing plant in order to treat ground water pumped to surface for mine dewatering purposes. In 2017, an actiflow unit was also installed as a pre-treatment to the RO plant, which is used to decrease the antimony and dissolved solid levels prior to RO treatment.

The treated water is licenced to be discharged into a neighbouring waterway, to be provided to local community members for stock watering or gardening or can be used for dust suppression purposes on roads around the site. The creek discharge is licenced by the EPA, and permits up to 360 ML/year of RO treated permeate to be discharged into the Mountain Creek South diversion, which feeds into the Wappentake creek at a maximum rate of 2.0 ML/day.

The waste product from the RO plant, known as brine, contains concentrated levels of salt, antimony and other elements removed from the groundwater. The RO plant brine is stored in the plastic lined evaporation dams at Augusta, discharged to the Splitter Creek Evaporation Facility or reused in the Brunswick Processing Plant or evaporated in the tailing storage facilities.

The Splitters Creek Evaporation Facility, completed in 2015, has the capacity to treat 104 ML/year net (evaporation minus rainfall). The purpose of the facility is to evaporate water surplus to the operations needs that is extracted from the Costerfield Property and thereby allow continued dewatering from the underground workings. The facility consists of a series of shallow evaporation terraces that follow the natural topographic contours. Groundwater is pumped from the Augusta mine site and discharged to the terraces. The water cascades down the slope via the terrace spillways to the Storage Dam at the lowest point. A water pump reticulates water from the Storage Dam back up to the terraces, in order to enable the evaporation terraces to be filled from the Storage Dam as evaporation rates allow.

Current evaporation, RO plant processing and re-use capacity is calculated to be approximately equivalent to the current dewatering rates, however additional complementary treatment options are being investigated and trialled to ensure adequate capacity in the future.

20.1.3 Waste Rock

Waste rock that is surplus to underground backfilling requirements is stockpiled on the surface in various locations. Testing of the waste rock has confirmed that the material is non-acid generating and therefore does not pose an acid-mine drainage risk.

Waste rock is currently stockpiled next to the Augusta Mine box-cut, with the maximum height and shape of the stockpile prescribed in the approved Work Plan. The approved Work Plan requires that this stockpile will be removed on closure in order to return the land to the prior use as grazing pasture. The waste rock will ultimately be used to fill the box-cut and cap the TSFs.

Waste rock has also been transported to both the Bombay and Brunswick TSF to increase the height of the TSF's and was used for construction of the Splitters Creek Evaporation Facility.

A portion of waste rock is screened and utilised in backfilling of the underground stopes, however, sufficient waste rock will need to be retained in order to fulfil rehabilitation and TSF expansion requirements.

20.1.4 Tailings Disposal

The tailings thickener has sufficient capacity to handle the current throughput. The average tailings thickener underflow solids density continues to be maintained at around 50% (+/-10%).

Mandalay Resources have two operational TSF's, being the Brunswick TSF and the Bombay TSF, and has conditional approval to raise the height of the Bombay TSF an additional 2.7 m has been gained, since the capacity provided by the 2018 lift of the Bombay TSF was exhausted in August 2020.

The Brunswick TSF returned to service as the replacement storage facility after the completion of a hybrid wall lift and remained the primary storage facility for 2021.

Studies are underway to determine the most effective way to further increase tailings capacity to meet the LOM plan (Section 18).

20.1.5 Air Quality

The approved Environmental Monitoring Plan for the Augusta Mine includes an air quality monitoring programme, consisting of dust deposition gauges located at various places surrounding the Costerfield Property, and five dust deposition gauges at the Splitters Creek Evaporation Facility.

The monitoring data is provided to the regulatory authorities and Community Representatives through the quarterly Environmental Review Committee (ERC) meetings.

Control measures currently in place to manage dust emissions from the operations include:

- Road watering programme with treated groundwater,
- Proactive monitoring of dust with portable Dust Trak monitors,
- Moisture control of mill feed during processing,
- Sealing of sections of haul roads,
- Maintaining moisture on TSFs and waste rock stockpiles.

Ventilation shafts emission detection reports are carried out bi-annually and indicate that the ventilation shafts are not a significant source of dust emissions. These results are communicated quarterly at the ERC meetings.

20.1.6 Groundwater

A conceptual hydrogeological model was developed for the Costerfield Property in 2014 based on current groundwater monitoring data, which indicated that the Augusta and Cuffley, Brunswick and Youle Deposits are located in the regional groundwater aquifer.

Key aspects of the groundwater for the reporting year include the following :

- Dewatering from the mine totalled 559 ML in 2021.
- The current groundwater extraction licence of 700 ML/year has been approved by Goulburn-Murray Water and is up for renewal in June 2034.

The groundwater model was reviewed in 2021 to confirm the current impact on groundwater levels by dewatering from the mine as the underground workings extended laterally and vertically. The model shows a cone of depression in the bedrock aquifer trending in a north to south orientation, parallel to the deposits (Figure 20-1).

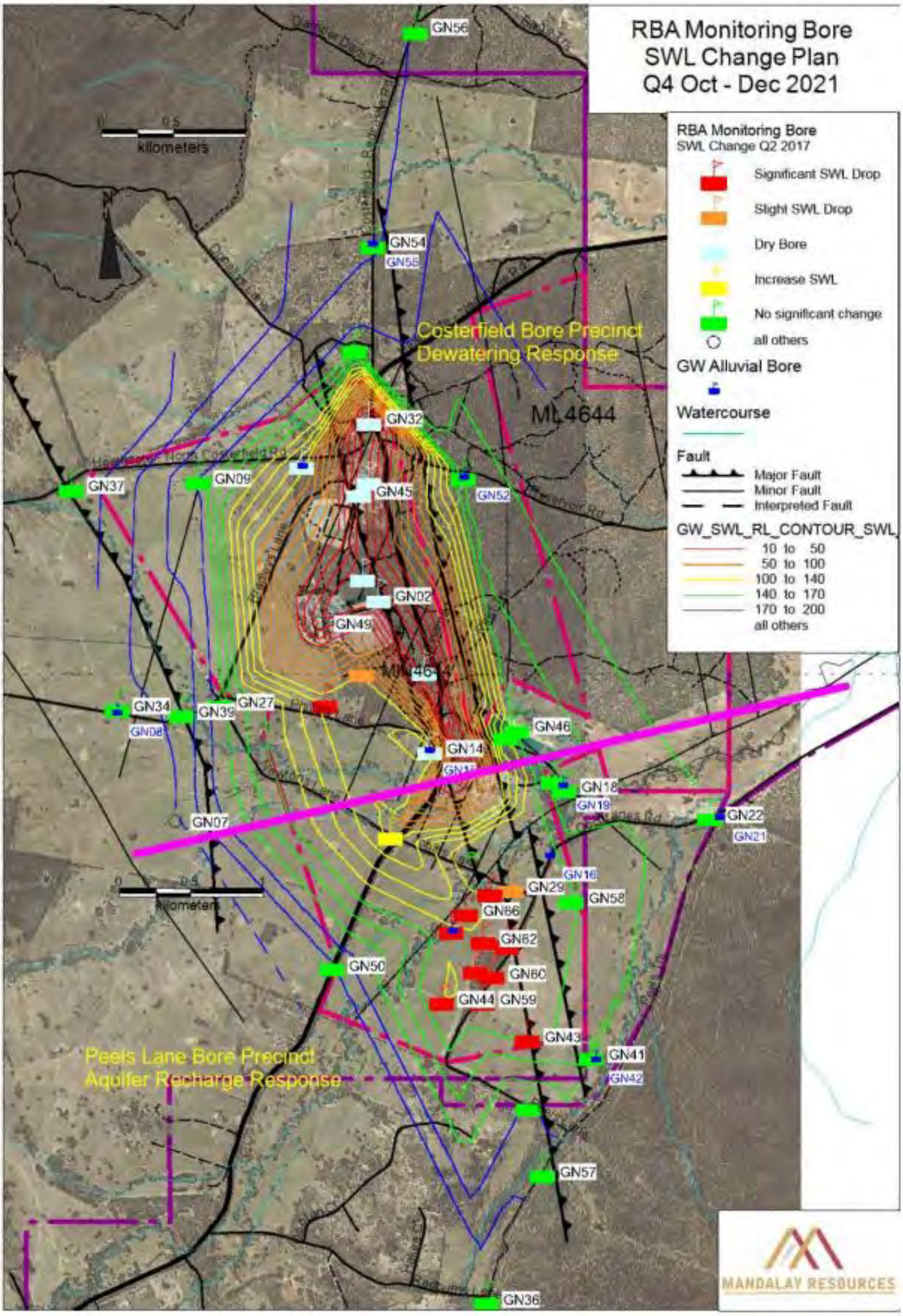


Figure 20-1: Groundwater elevation contour map of the areas surrounding the Augusta Mine, as at December 2021

The regional groundwater aquifer is confined to semi-confined, and is comprised of Silurian siltstones and mudstones, with groundwater flow occurring within fractures and fissures in the rock. This is overlain by a perched alluvial aquifer comprised of recent gravels, sands and silt, which is connected to the surface water system.

Based on the monitoring data and the conceptual hydrogeological model, it appears that the current dewatering activities at Augusta do not affect the alluvial aquifer. Therefore, there is no impact to local landowners or the surface water system.

20.1.7 Noise

The approved Environmental Monitoring Plan for the Costerfield Property includes a noise monitoring program which comprises routine attended and unattended noise monitoring at six locations, and reactive monitoring at sensitive receptors in the event of complaints or enquiries. Monitoring is carried out in accordance with Environmental Protection Agency (EPA) Victoria's SEPP N1 policy.

Noise from the Costerfield Property is a sensitive issue for nearby neighbours, and Mandalay Resources operates a 24-hour, 7 days a week complaints line in order to deal with noise complaints or any other issues from members of the public. The Mandalay Resources Complaints Procedure includes processes to record complaints, identify and implement immediate and longer term actions. All complaints are discussed at the quarterly Environmental Review Committee meetings.

The current Costerfield Property is not expected to significantly change the nature of noise emissions from the site. Construction of new waste rock storage, TSF or evaporation facilities may require some additional noise monitoring which will be identified as part of the WPV approval process.

During construction, an additional 10 dBA of noise is permitted to be generated. Existing resources and procedures are adequate to accommodate any required modifications to the noise monitoring program.

20.1.8 Blasting and Vibration

The DJPR prescribes blast vibration limits for the protection of buildings and public amenities. Mandalay Resources undertakes constant blast vibration monitoring in order to assess compliance with the prescribed limits and reports this information to the ERC quarterly.

20.1.9 Native Vegetation

The Costerfield Property has been developed and is operated with the aim of avoiding and minimising impacts on native vegetation. Where native vegetation has been impacted, Mandalay Resources has obligations to secure native vegetation offsets.

Mandalay Resources has purchased approved native vegetation offset at Peels Lane in Costerfield to fulfil obligations relating to Victoria's Native Vegetation Management – A Framework for Action, associated with the original clearing of native vegetation at the Augusta Mine site and the Bombay TSF. The Peels Lane offset site has been assessed as containing 4.35 habitat hectares of various Ecological Vegetation Classes (EVCs) and associated large trees, in accordance with the framework guidelines.

Expansion of the Costerfield Operation through construction of the Splitters Creek Evaporation Facility, Brunswick TSF and Bombay TSF has had a minimal impact on the native vegetation and the Peel Lane site has sufficient offset credits to meet the site's foreseeable future needs.

20.1.10 Visual Amenity

The key aspect of the Costerfield Operation that may affect visual amenity was the construction of the Splitters Creek Evaporation Facility.

Community consultation took place as part of the planning for the facilities, and mitigation measures were implemented where appropriate. Screening vegetation was planted, in consultation with the relevant land manager and nearby neighbours.

20.1.11 Heritage

A heritage survey of the South Costerfield Shaft, Alison and New Alison surface workings was completed by LRGM Consultants in the first quarter of 2012. The purpose of this survey was to identify and record cultural heritage features in the areas of interest that exist within the current ML (MIN4644). The Taungurung Clans Aboriginal Corporation is the Registered Aboriginal Party designated as the traditional owners of the land on which Mining Licence MIN4644 is located.

The survey identified that no features of higher than local cultural heritage significance were identified, with the following features of local cultural heritage significance being noted:

- South Costerfield (Tait's) Mine Shaft,
- Old Alison Mine Shaft,
- New Alison Mine Shaft.

The expansion of the mining operations did not result in any disturbance of historic mine workings or other heritage features.

20.1.12 Community

The Costerfield Operation is one of the largest employers in the region and is a significant contributor to the local economy. Mandalay Resources preferentially employs appropriately skilled personnel from the local community and sources goods and services from local suppliers wherever possible.

Mandalay Resources has developed and implemented the Costerfield Property's Community Engagement Plan, which has been approved by the DJPR in accordance with the requirements of the MRSD Act 1990. This Plan sets the framework for communication with all of the business' stakeholders in order to ensure transparent and ongoing consultative relationships are developed and maintained.

The Community Engagement Plan includes processes to manage community inquiries and complaints to ensure timely and effective responses to issues affecting members of the community. The current Community Engagement Plan is considered an appropriate framework to address the needs of stakeholders through the planning and implementation of the proposed mine expansion.

In early 2016, Mandalay Resources initiated regular community reference meetings under the auspices of the ERC. This forum, the Community Reference Sub-Committee, gives community members the opportunity to find out about current and future issues at the mine, to provide their input and ask questions.

20.1.13 Mine Closure and Revegetation

The MRSD Act 1990 requires proponents to identify rehabilitation requirements as part of the Work Plan approvals process, and ensures that rehabilitation bonds are lodged in the form of a bank guarantee to cover the full cost of rehabilitation up front, prior to commencing work. Rehabilitation bonds are also reviewed on a regular basis to ensure that unit cost assumptions and the scope of work is kept up to date. WPVs also trigger a review of the rehabilitation bond if the work to be carried out affects final rehabilitation.

Mandalay Resources has developed a Mine Closure Plan, which provides an overview of the various aspects of closure and rehabilitation that have been included in the rehabilitation bond calculation, and reflects the rehabilitation requirements described in the approved Work Plans and Variations.

The Mine Closure Plan describes how the Augusta site, including the box-cut, waste rock storage, office area and evaporation dams, will be rehabilitated back to the former land use as grazing pasture. The mine decline will be blocked and the portal backfilled with waste rock, with the box-cut being levelled back to its original surface contours. Topsoil and subsoil have been stored on site to facilitate the final revegetation.

The rehabilitation plan for the Brunswick Complex includes removal of all plant and infrastructure, returning the disturbed area back to native forest, and to create a safe and stable landform that can be used for passive recreation. The TSFs will be dried out, capped with waste rock and topsoil, and planted with native vegetation. The plan includes provisions for monitoring the TSFs post closure.

The rehabilitation plan for the Splitters Creek Evaporation Facility includes evaporation of the remaining stored groundwater and removing the clay lining from the terraces, which is placed back into the HDPE line storage dam. The liner in the storage dam will be folded back over the clay and capped with waste rock, clay and topsoil, and planted with grasses. Topsoil and subsoil has been stored on site to enable this final vegetation.

20.2 Regulatory Approvals

20.2.1 Work Plan Variation

Future changes to mining activities, such as potential changes to waste rock storage facilities, will require a risk based Work Plan Variation (WPV) to be approved. The DJPR facilitates this approval process and will engage with relevant referral authorities, as required. The DJPR may prescribe certain conditions on the approval, which may include amendments to the environmental monitoring programme. The Work Plan approval process involves a thorough consultation process with regulatory authorities, and any conditions or proposed amendments requested to the WPV are generally negotiated to the satisfaction of both parties.

All onsite and offsite risks must be assessed in the new Work Plan review process and adequate controls and monitoring programs implemented to mitigate any negative impacts.

20.2.2 Other Permitting

In addition to the approval of a WPV, any future expansion of the current Costerfield Operation will require a number of other potential consents, approvals and permits (Table 20-2).

Table 20-2: Permit requirements

Stakeholder	Instrument
Private Landholders	Consent/compensation agreement with owner of the land on which the mine is located.
City of Greater Bendigo	Planning Permit required modification to existing and new TSFs.

DEWLP	Compliance with Native Vegetation Management Framework for removal of native vegetation associated with the power supply, evaporation facility and expansion of TSF footprints.
EPA	EPA consent to discharge reverse osmosis treated water to a local waterway.

21 CAPITAL AND OPERATING COSTS

The capital and operating cost estimates for the Costerfield Operation, described in the following section have been derived from a variety of sources, including:

- Historic production from the Costerfield Property, predominantly the past 12 to 36 months completed by Mandalay Resources.
- Manufacturers and suppliers.
- First principle calculations, based on historic production values.
- Costs including allowances for power, consumables, labour and maintenance.

All cost estimates are provided in 2021 Australian dollars (AUD) and are to a level of accuracy of ± 10%. Escalation, taxes, import duties and custom fees have been excluded from the cost estimates.

21.1 Capital Costs

The estimated total capital requirements for the Costerfield Operation are outlined in Table 21-1.

A detailed breakdown of the individual capital items included in the Economic Model was sourced from the 2022 budget document. Sustaining capital costs listed in the 2022 budget are extended out through the duration of the reserves in the life of mine.

Table 21-1: Costerfield Operation – capital cost estimate

Area	Total	CY 22 (AUD$ M)	CY 23 (AUD$ M)	CY 24 (AUD$ M)	CY 25 (AUD$ M)	CY 26 (AUD$ M)	CY 27 (AUD$ M)
Capital Development	5.1	5.1	0.0	0.0	0.0	0.0	0.0
Processing Plant	13.7	3.8	3.6	3.3	1.3	1.3	0.5
Admin	1.7	1.1	0.2	0.2	0.2	0.0	0.0
Environmental	3.6	0.4	0.9	0.8	0.6	0.6	0.3
OH&S	0.4	0.1	0.1	0.1	0.1	0.1	0.0
Operational Geology	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Exploration	0.3	0.2	0.1	0.1	0.0	0.0	0.0
Mining	12.3	5.3	3.9	2.6	0.3	0.1	0.1
Total Capital Cost	**37.5**	**16.4**	**8.7**	**7.0**	**2.4**	**2.1**	**0.9**

Note: Totals may not sum due to rounding.

21.1.1 Processing Plant

Mandalay Resources has identified and estimated the capital costs associated with the maintenance of the Brunswick Processing Plant and other mill site related initiatives including:

- Bombay TSF embankment raise,
- Installation of secondary filter press or alternative filtration technology to provide redundancy to existing filter press,
- Purchase of I-140RS Terex Finlay Impact Crusher to complement the 2 existing I-130RS Terex Finlay Impact Crushers,
- Refurbishment of existing plant and key components,
- Purchase of critical spares,
- Miscellaneous upgrades to surface facilities.

The main processing plant infrastructure cost items are the I-140RS Terex Finlay Impact Crusher and secondary filter press as well as works associated with the raise on the Bombay TSF. All associated costs are based on tendered rates.

21.1.2 Administration

Administration related capital costs include optic fibre to site internet upgrade, a forklift for mine stores, software improvements and IT infrastructure including a server room upgrade.

21.1.3 Environmental

Capital costs related to environment activities will include drilling and installation of additional ground water monitoring bores, equipment for environmental monitoring, tailings management strategy permitting and other tailings storage investment expenses.

21.1.4 Occupational Health and Safety

OH&S planned capital expenditure includes upgrading of the Emergency Response Team breathing apparatus equipment, a site entry breathalyser and undercover parking infrastructure for the Emergency Response fire truck.

21.1.5 Mining

Mining related capital costs consist of sustaining capital to ensure production rates are achieved, and project capital that further improves the efficiency of the mining process.

Planned costs will include additional expenditure on safety initiatives including tele-remote loader upgrades and vehicle and personnel tracking systems.

Sustaining capital allows for replacement of light vehicles, LH 203 loaders, production drills and development drills.

The cost estimates have been based on recent quotations or agreements from appropriate suppliers.

21.1.6 Capital Development

Decline development quantities have been based on the mine designs prepared for the project. The lateral development quantities are based on each production level in the mine being accessed by the decline system with allowance for stockpiles, level access, sumps, refuge chamber cuddies, vent accesses, truck tips and CRF mixing bays.

The unit cost for lateral development has been based on a combination of the agreed development rates with the mining contractor undertaking the capital development and historical costs for consumables (explosives, fuel, ground support and rehab) and services. The Contractor development rates include an allowance for the haulage of waste rock to the surface and also haulage, handling and stockpiling of waste once it is on surface.

21.1.7 Closure

Closure costs are estimated using a calculation tool to estimate rehabilitation bonds. Bond amounts are reviewed when major changes are made to the operation, for example construction of a tailings storage facility. Closure costs are expected to be refunded by the current rehabilitation bonds held by the regulatory authorities; hence no additional closure costs have been included in reserves economic analysis.

21.2 Operating Costs

Operating costs are derived from tracked historic expenditure under opex cost codes; financial analysis split costs using a combination of mining and milling physicals; along with mining operations timesheet and payroll data. This method ensures an accurate split of operational costs for estimating purposes.

The operating cost estimates applied in this Technical Report are summarised in Table 21-2 and described further in the following sections.

Table 21-2: Costerfield Property Operating cost inputs

Description	Unit	AUD$	Data Source
Jumbo Operational Development	AUD/m	3,115	2021 average
Stoping	AUD/t	131	2021 average
Mining Admin	AUD/day	13,398	2021 average
Geology	AUD/day	5,667	2021 average
ROM Haulage	AUD/t	3	2021 average
Processing Plant	AUD/t milled	65	2021 average
Site Services	AUD/day	5,862	2021 average
General and Administrative	AUD/day	14,929	2021 average
Selling Expenses excluding Royalty	AUD/t con	137	2021 average

Royalty costs are calculated in accordance with royalty payment structures. Sb royalty is paid at a rate of 2.75% of *revenue less selling costs*. Au royalty is also paid at 2.75% of *revenue less selling costs* with 2,500 of saleable Au ounces exempt from royalty payment.

21.2.1 Lateral Development

The estimated unit cost for lateral development has been developed from 2021 average costs for labour, equipment, consumables, services, as well as achieved development physicals. An allowance for the haulage to surface has also been included.

The lateral development (operating) for Augusta, Cuffley, Brunswick and Youle will continue to be undertaken on an owner-operator basis.

The required lateral development is summarised in Table 21-3.

Table 21-3: Summary of lateral development requirements

Description	Metres
Capital Development	797
Operating Development (Waste)	9,852
Operating Development (Ore)	9,378

The direct operating costs related to lateral development include:

- Direct labour including superannuation, workers compensation, payroll tax and partial allowances for leave accrual.
- Drilling consumables, such as drill steel, bits, hammers, etc.
- Explosives.

- Ground support supplies.
- Direct mobile plant operating costs for fuel and lubricants, tyres and spare parts.
- Services materials including poly pipe, ventilation bag and electrical cables
- Reallocation of costs associated with maintenance, ventilation, power supply, compressed air supply, dewatering, water supply and underground communications.
- Miscellaneous materials required to support development activities.

21.2.2 Production Stoping

The direct costs for stoping have been developed from 2021 average costs for direct labour (including superannuation, workers compensation, payroll tax and partial allowances for leave accrual), consumable materials, equipment operating and maintenance as well as achieved productivities associated with the following:

- Installation of secondary ground support,
- Drilling, loading, and blasting long-holes by Mandalay Resources employees,
- Production from the stope with an underground loader (remote or manual) and tramming to a stockpile or truck loading area,
- Loading haul trucks from stockpile (if required),
- Backfill preparation and placement,
- Reallocation of costs associated with maintenance, ventilation, power supply, compressed air supply, dewatering, water supply and underground communications.

21.2.3 Mining Administration

Mining administration includes costs associated with mining management, supervision and technical services, such as Mining Engineering, Survey, Geotechnical Engineering and Mine Geology. These costs have been estimated from actual Mandalay Resources 2021 mining administration costs.

21.2.4 Geology

Geology includes costs associated with resource estimation, resource definition drilling, sampling, assaying, and laboratory expenses as well as associated management and labour. These costs have been estimated from actual Mandalay Resources 2021 geology costs.

21.2.5 ROM Haulage

The cost of trucking from the Brunswick Pit ROM to the Brunswick Processing Plant ROM pad has been calculated based on the average of the 2021 total costs of this short distance surface haulage. Costs calculated include indirect costs and profit.

21.3 Processing Plant

The Brunswick Processing Plant costs include:

- Tailings disposal.
- ROM management.
- Ball mill crushing and grinding.
- General operating and maintenance.
- Reagent mixing, thickening and flotation.
- Gold room expenses.
- All flocculants and reagent chemicals.
- Plant maintenance and reallocated electrical costs associated with Plant operation.

The processing costs have been estimated from 2021 average processing costs.

21.4 Site Services

Site service costs refer to indirect costs related to Health and Safety, Environment and Community Relations, as well as costs related to the water treatment plant, water disposal and the reverse osmosis plant. Compensation expenses are also included in this cost item.

These costs have been estimated from actual Mandalay Resources 2021 site services costs.

21.5 General and Administrative

The general and administrative costs refer to site-wide operational costs rather than costs directly associated with operational departments. This cost includes General Site Management, including all staff costs, Human Resources, Finance and Administration.

These costs have been sourced from Mandalay Resources actual 2021 general and administration costs.

21.6 Selling Expenses

Mandalay Resources utilises a third-party company to arrange the sale and transport of concentrate from the Brunswick Processing Plant to the smelter in China. The Mandalay Resources portion of the selling expenses is calculated from historical costs and comprises road transport from the Brunswick Processing Plant to the Port of Melbourne, shipping from Melbourne to China, shipment documentation, freight administration and assay exchange/returns.

22 ECONOMIC ANALYSIS

The Costerfield Mine Technical-Economic Model (TEM) was developed by Mandalay Resources based on the production schedule including only Measured and Indicated Resources and assumptions described in the earlier sections. All costs are in 2022 AUD with no provision for inflation or escalation. The annual cash flow projections were estimated over the project life based on capital expenditures, operating costs and revenue assumptions. The financial indicators examined included pre-tax cash flow, after tax cash flow and Net Present Value (NPV).

22.1 Principal Assumptions

The key project criteria and assumptions used in preparation of the cash flow analysis have been listed in Table 22-1.

Table 22-1: Project criteria

Description	Units	Quantity
Proven + Probable Reserves Tonnes and Grade	Tonnes (t)	769,074
	Gold grade (g/t)	12.61
	Antimony grade (%)	2.55
Project Life	months	58
Average Production Rate	t/mth	12,628
Maximum Mining Rate	t/mth	12,960
Metallurgical Recovery*	Gold (Total) (%)	88.7 – 94.7
	Antimony (%)	93.34 – 95.05
	Gravity gold (% of	45
Concentrate Grade**	Gold (g/t)	Variable
	Antimony (%)	51.5
Concentrate Selling	AUD$/dmt	137
Exchange Rate	AUD:USD	0.71
Commodity Prices	Gold USD$/oz	1,500
	Antimony USD$/t	7,500

* Recoveries for Gold and Antimony are variable in the TEM, with dependence on mill feed grades. Gravity gold recovery is expressed as a percentage of total recovered gold.

**Concentrate gold grade is variable with dependence on total metallurgical recovery and gravity gold percentage.

22.1.1 Metal Sale Prices

Sale prices of metals are based on analysis of metal price prediction and the review of current and historical prices. A sensitivity analysis demonstrates the expected financial returns at a range of gold and antimony prices. Further information regarding the selected metal sale prices is provided in Section 19.

22.1.2 Concentrate and Gold Sales

The TEM assumes that concentrate shipments and gold sales are made at the end of each month. The payables of the shipments and gold sales, as well as associated selling expenses, are assumed to occur at the time of production and shipping in the economic model.

The payable metal terms adopted in the economic model are consistent with the current sales contract terms for the gold and antimony concentrate grades and quality as at December 31 2021.

22.1.3 Exchange Rate

The economic model has assumed an exchange rate of AUD:USD 0.71 for the entire project life.

22.1.4 Taxes

The Australian government taxes on Mandalay Resources Costerfield Operations include:

- A Goods and Services Tax (GST) at a rate of 10%, as levied by the federal government on purchases by individuals and corporations on non-exempt goods and services. Businesses can claim back GST on most business inputs. It is assumed that all of the product sales will be to overseas customers, therefore no GST is applicable.

- Company tax, payable at a rate of 30%, which is calculated on the profits generated by the operation.

As at the end of December 2021, Mandalay Resources Costerfield Operations had zero carried forward tax losses.

22.1.5 Royalties/Agreements

Under the Mineral Resources Development (Mining) Amendment Regulation 2010 of the Victorian State Government, royalties apply to the sale of antimony and gold. This royalty is applied at 2.75% of the revenue realised from the sale of antimony and gold sold, less the selling costs. The Victorian Government amended the above stated legislation to include gold effective from the 1st of January 2020. This amendment excludes the first 2,500 gold ounces from the royalty calculation. All financials and forecasting are aligned with Government Regulations. There are compensation agreements in place with land holders and neighbouring residents which are affected by the Costerfield Property. It has been assumed that the current agreements will remain in place for the remaining project life and that no new agreements will be required as the Augusta and Brunswick site footprint will remain largely unchanged. Both the royalties and compensation agreements have been factored into the financial model as an indirect cost and calculated monthly.

22.1.6 Project Financing

No assumptions have been made about project financing in the TEM.

22.2 Economic Summary

A summary of the economic factors associated with the project are presented in Table 22-2.

Table 22-2: Project economics

Description	Units		Units	
Proven + Probable Tonnes Milled	Tonnes	769,074		
Contained gold	Ounces	311,796		
Contained Antimony	Tonnes	19,592		
Recovered Gold	Ounces	297,688		
Recovered Antimony	Tonnes	18,121		
Payable Gold	Ounces	287,720		
Payable Antimony	Tonnes	18,302		
Payable (Saleable) Metal, Au Eq	Oz Eq[1]	379,230		
Operating Cost	AUD$ M	272.1	USD$ M	193.2
Operating Cost per Payable ounce	AUD$/Oz	718	AUD$/Oz	509
Capital Cost	AUD$ M	37.5	USD$ M	26.6
Net Revenue (less selling costs and	AUD$ M	660.7	USD$ M	469.1
Pre-tax cash flow	AUD$ M	351.0	USD$ M	249.2
After Tax Cash Flow	AUD$ M	268.3	USD$ M	190.5
Pre-tax NPV discounted at 5%	AUD$ M	310.9	USD$ M	220.7
After-tax NPV discounted at 5%	AUD$ M	233.2	USD$ M	165.6

1. Oz Eq = Gold Ounces + (Antimony Price / Gold Price) * Antimony Tonnes, Tonnes and Ounces rounded to nearest thousand, dollars rounded to the nearest hundred thousand.

22.2.1 Cash Flow Forecast

The estimated cash flow forecast has been provided in Table 22-3.

Table 22-3: Estimated pre-tax cash flow summary

			2022				2023				2024				2025				2026				2027		
		Total	2022 Q1	2022 Q2	2022 Q3	2022 Q4	2023 Q1	2023 Q2	2023 Q3	2023 Q4	2024 Q1	2024 Q2	2024 Q3	2024 Q4	2025 Q1	2025 Q2	2025 Q3	2025 Q4	2026 Q1	2026 Q2	2026 Q3	2026 Q4	2027 Q1	2027 Q2	2027 Q3
PHYSICALS																									
Development																									
Capital Development	m	**797**	149	107	426	114	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Operating Development	m	**19,230**	1,051	1,051	1,051	1,050	961	961	961	960	959	959	942	901	900	902	900	899	901	900	902	901	218	0	0
Vertical Development	m	**124**	14	9	56	24	6	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Underground Ore																									
Proven + probable mined	t	**727,631**																							
Total Ore Mined (includes inferred and below cut-off grade material assigned zero grade)	t	**762,238**	38,671	38,759	38,729	38,713	38,731	38,783	38,723	38,745	38,716	37,223	33,966	34,802	34,811	31,539	30,960	32,445	32,213	31,390	33,824	33,248	30,498	15,080	1,669
Mined Grade Au	g/t Au	**12.15**	10.37	12.41	14.31	12.31	10.03	13.17	14.01	14.51	15.84	13.61	10.81	11.97	10.80	11.66	15.88	13.78	7.86	11.67	11.80	8.25	10.19	8.96	11.07
Mined Au	ounces	**297,688**	12,888	15,463	17,820	15,316	12,485	16,420	17,441	18,072	19,713	16,285	11,808	13,397	12,091	11,819	15,806	14,375	8,139	11,774	12,832	8,816	9,989	4,346	594
Mined Grade Sb	% Sb	**2.38**	2.77	2.79	2.68	2.17	2.47	2.93	2.62	1.88	2.22	2.45	1.96	1.36	1.12	1.93	2.56	2.71	1.72	2.49	2.09	2.69	3.50	3.96	4.47
Mined Sb	tonnes	**18,121**	1,070	1,080	1,039	839	958	1,137	1,013	730	860	913	665	473	389	609	792	878	554	780	706	893	1,069	597	75
Stockpile Ore																									
Proven ROM Stockpile mill feed	tonnes	**41,000**	2,729	2,641	2,671	2,687	2,669	2,617	2,677	2,655	2,684	4,177	7,434	5,358	0	0	0	0	0	0	0	0	0	0	0
Proven ROM Stockpile grade Au	g/t Au	**10.13**	10.13	10.13	10.13	10.13	10.13	10.13	10.13	10.13	10.13	10.13	10.13	10.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Proven ROM Stockpile grade Sb	% Sb	**3.27**	3.27	3.27	3.27	3.27	3.27	3.27	3.27	3.27	3.27	3.27	3.27	3.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
METALLURGY																									
Proven and probable mill feed	t	**769,074**																							
Total Mill Feed (includes inferred and below cut-off grade material assigned zero grade)	t	**803,238**	41,400	41,400	41,400	41,400	41,400	41,400	41,400	41,400	41,400	41,400	41,400	40,160	34,811	31,539	30,960	32,445	32,213	31,390	33,824	33,248	30,498	15,080	1,669
Feed Grade Au	g/t	**12.04**	10.35	12.26	14.04	12.16	10.03	12.97	13.76	14.22	15.46	13.25	10.68	11.72	10.80	11.66	15.88	13.78	7.86	11.67	11.80	8.25	10.19	8.96	11.07
Feed Grade Sb	%	**2.42**	2.80	2.82	2.72	2.24	2.53	2.96	2.66	1.97	2.29	2.54	2.20	1.62	1.12	1.93	2.56	2.71	1.72	2.49	2.09	2.69	3.50	3.96	4.47
Metallurgical Recovery Au	%	**92.42%**	91.50%	92.53%	93.36%	92.48%	91.31%	92.88%	93.23%	93.44%	93.95%	93.01%	91.70%	92.26%	91.76%	92.23%	94.11%	93.25%	89.83%	92.23%	92.30%	90.12%	91.41%	90.63%	91.91%
Metallurgical Recovery Sb	%	**93.94%**	94.08%	94.09%	94.05%	93.86%	93.98%	94.14%	94.03%	93.76%	93.88%	93.98%	93.85%	93.62%	93.43%	93.74%	93.99%	94.05%	93.66%	93.96%	93.80%	94.04%	94.36%	94.53%	94.73%
Payable Gold	ounces	**287,720**	12,604	15,103	17,446	14,972	12,192	16,040	17,071	17,692	19,338	16,408	13,041	13,965	11,095	10,900	14,875	13,404	7,311	10,859	11,844	7,945	9,130	3,939	546
Payable Gravity Gold	ounces	**129,474**	5,672	6,796	7,851	6,737	5,486	7,218	7,682	7,961	8,702	7,384	5,869	6,284	4,993	4,905	6,694	6,032	3,290	4,887	5,330	3,575	4,109	1,772	246
Payable Gold in Concentrate	ounces	**158,246**	6,932	8,306	9,595	8,235	6,706	8,822	9,389	9,730	10,636	9,024	7,173	7,681	6,102	5,995	8,181	7,372	4,021	5,973	6,514	4,370	5,022	2,166	300
Payable Antimony	tonnes	**18,302**	1,092	1,099	1,060	871	983	1,152	1,036	766	891	988	855	608	363	571	745	825	519	733	663	840	1,009	564	71
Payable Gold Equivalent	AuEq ounces	**379,230**	18,062	20,595	22,748	19,325	17,106	21,800	22,251	21,524	23,792	21,345	17,314	17,006	12,911	13,756	18,598	17,531	9,905	14,525	15,157	12,145	14,173	6,761	899
REVENUE																									
Payable Au (gravity)	%	**100.0%**	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Payable Au (concentrate)	%	**86.4%**	86.4%	86.4%	86.4%	86.4%	86.4%	86.4%	86.4%	86.4%	86.4%	86.4%	86.4%	86.4%	86.4%	86.4%	86.4%	86.4%	86.4%	86.4%	86.4%	86.4%	86.4%	86.4%	86.4%
Payable Sb	%	**62.5%**	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Price Au	$/oz	**1,500**	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Price Sb	$/t	**7,500**	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500
Exchange Rate	AUD:USD	**0.71**	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
CAPITAL COSTS																									
Plant	AUD M	**13.7**	2.8	0.7	0.3	0.0	2.6	0.3	0.3	0.3	1.3	0.3	0.3	1.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.1
Admin	AUD M	**1.7**	0.3	0.6	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Environment	AUD M	**3.6**	0.2	0.1	0.1	0.0	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.0
OH & S	AUD M	**0.4**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Geology	AUD M	**0.1**	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Exploration	AUD M	**0.3**	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mining	AUD M	**12.3**	2.2	1.6	1.1	0.3	3.0	0.3	0.3	0.3	0.9	1.1	0.4	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total PPE	AUD M	**32.0**	5.8	3.0	1.7	0.4	6.1	0.9	0.8	0.8	2.6	1.6	1.0	1.8	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.3	0.1
Capital Development	AUD M	**5.1**	1.0	0.7	2.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vertical Development	AUD M	**0.3**	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Capital Cost	AUD M	**37.5**	6.8	3.7	4.7	1.2	6.1	0.9	0.8	0.8	2.6	1.6	1.0	1.8	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.3	0.1

			2022				2023				2024				2025				2026				2027		
		Total	2022 Q1	2022 Q2	2022 Q3	2022 Q4	2023 Q1	2023 Q2	2023 Q3	2023 Q4	2024 Q1	2024 Q2	2024 Q3	2024 Q4	2025 Q1	2025 Q2	2025 Q3	2025 Q4	2026 Q1	2026 Q2	2026 Q3	2026 Q4	2027 Q1	2027 Q2	2027 Q3
OPERATING COSTS																									
Mining	AUD M	**179.0**	7.6	8.0	7.9	7.9	7.8	7.9	8.2	8.4	8.4	8.7	8.7	8.6	8.6	8.6	8.6	8.6	8.5	8.5	8.6	9.5	7.1	3.7	0.4
Processing	AUD M	**52.0**	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.6	2.3	2.0	2.0	2.1	2.1	2.0	2.2	2.2	2.0	1.0	0.1
Site Services	AUD M	**11.6**	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.3	0.5	0.2
G&A	AUD M	**29.5**	1.3	1.4	1.4	1.4	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.4	1.4	1.4	1.3	1.4	1.4	0.9	0.9	1.4	0.5
Total Operating cost	AUD M	**272.1**	12.2	12.5	12.5	12.5	12.4	12.5	12.8	13.0	13.0	13.3	13.3	13.1	12.7	12.6	12.5	12.6	12.5	12.5	12.7	12.9	10.3	6.6	1.2
Total Operating cost per payable ounce	AUD/Oz	**718**	675	609	551	649	725	573	574	604	546	622	769	770	985	913	672	718	1,261	859	837	1,061	728	979	1,329
CAPITAL COST + OPERATING COST	AUD M	**309.6**	19.0	16.3	17.2	13.7	18.5	13.4	13.6	13.8	15.6	14.9	14.3	14.9	13.4	13.2	13.1	13.1	13.0	13.0	13.2	13.4	10.8	6.9	1.3
	AUD /oz Au Eq	**817**	1,052	790	757	709	1,082	617	612	640	655	698	826	878	1,036	958	706	747	1,314	895	871	1,104	765	1,017	1,426
Gross Revenue	AUD M	**683.4**	31.9	36.8	41.1	35.0	30.3	39.0	40.2	39.6	43.7	38.6	31.1	31.3	24.1	25.1	34.0	31.7	17.7	26.1	27.5	21.1	24.5	11.4	1.5
Selling expenses	AUD M	**4.9**	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.2	0.0
Royalty	AUD M	**17.9**	0.9	1.0	1.0	1.0	0.8	1.1	1.0	1.1	1.2	1.1	0.7	0.9	0.7	0.7	0.8	0.9	0.5	0.7	0.6	0.6	0.7	0.3	0.0
Net Revenue	AUD M	**660.7**	30.7	35.5	39.8	33.8	29.2	37.6	39.0	38.4	42.2	37.3	30.2	30.3	23.3	24.3	33.0	30.6	17.1	25.2	26.7	20.3	23.6	11.0	1.5
PRE-TAX CASHFLOW																									
Quarterly	AUD M	**351.0**	11.7	19.2	22.6	20.1	10.7	24.1	25.4	24.6	26.7	22.4	15.9	15.4	10.0	11.1	19.9	17.5	4.1	12.2	13.5	6.9	12.7	4.1	0.2
Cumulative	AUD M		11.7	30.9	53.6	73.7	84.4	108.6	133.9	158.5	185.2	207.6	223.5	238.9	248.8	259.9	279.8	297.3	301.4	313.5	327.1	334.0	346.7	350.8	351.0
NPV																									
Discount rate	% p.a	**5.0%**																							
PV quarterly cashflow	AUD M		11.6	18.7	21.8	19.2	10.1	22.4	23.3	22.3	23.9	19.8	13.9	13.2	8.5	9.3	16.5	14.3	3.3	9.7	10.7	5.4	9.8	3.1	0.2
NPV	AUD M	**310.9**																							

22.2.2 NPV

The estimated after-tax NPV discounted at 5% interest has been calculated at AUD$233.2M.

22.2.3 Sensitivity

The pre-tax NPV sensitivities have been determined to +/-20% for gold price, antimony price, AUD:USD exchange rate, metallurgical gold recovery, metallurgical antimony recovery, mill feed gold grade, mill feed antimony grade, capital costs and operating costs. Sensitivity analysis is presented in Table 22-4 and Figure 22-1.

Table 22-4: Project NPV sensitivity summary

	-20% (AUD M)	-10% (AUD M)	Base (AUD M)	+10% (AUD M)	+20% (AUD M)
Gold Price	236.3	273.6	310.9	348.1	385.4
Antimony Price	295.3	303.1	310.9	318.6	326.4
Mill Feed Tonnes	188.6	249.5	310.9	372.5	434.5
Exchange Rate	457.6	376.1	310.9	257.5	213
Metallurgy Gold Recovery	214.3	262.6	310.9	359.1	407.4
Metallurgy Antimony Recovery	291	300.9	310.9	320.8	330.7
Mill Feed Gold Grade	208.6	259.5	310.9	362.5	414.4
Mill Feed Antimony Grade	290.8	300.8	310.9	320.9	331
Capital Cost	317.8	314.3	310.9	307.4	303.9
Operating Cost	358.3	334.6	310.9	287.1	263.4

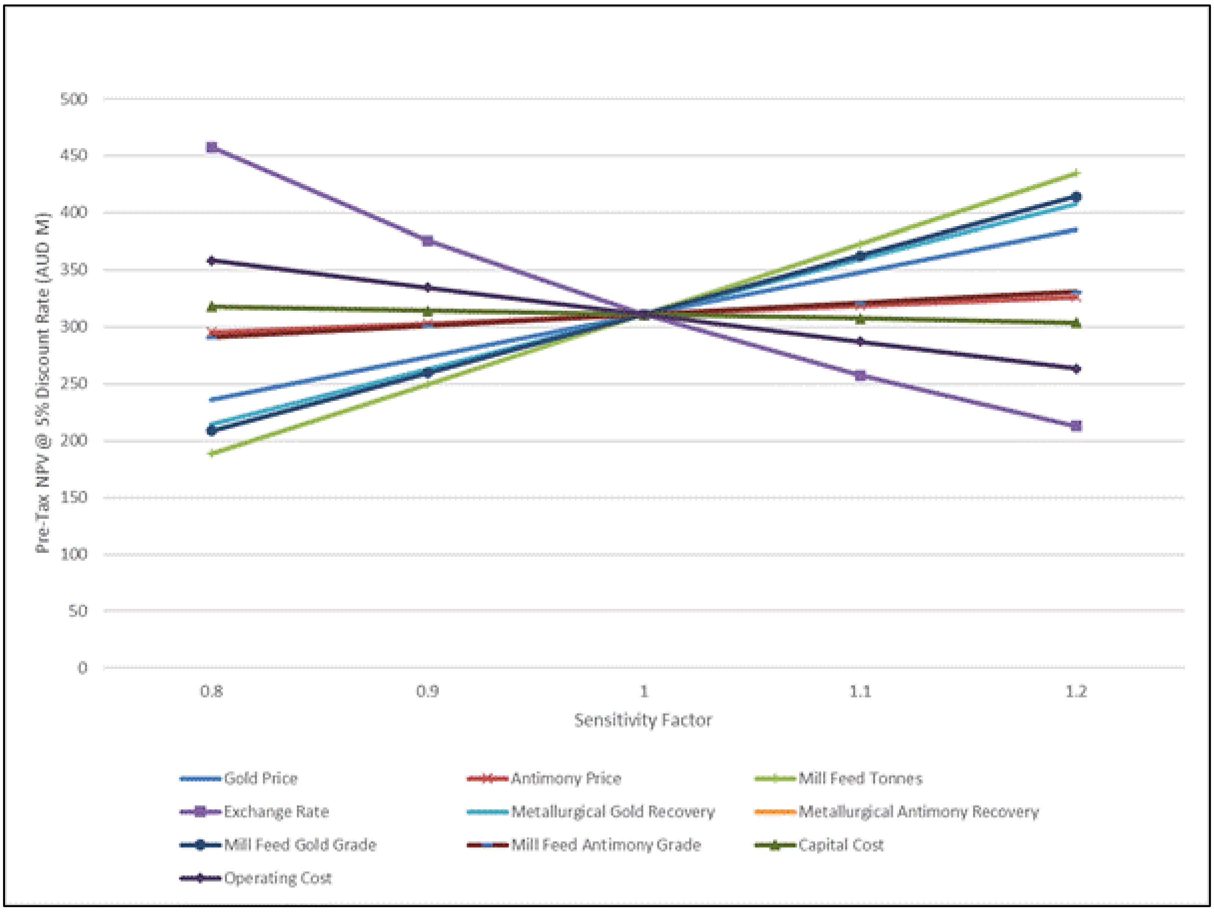


Figure 22-1: Sensitivity analysis

Cashflow is most sensitive to mill feed tonnes, exchange rate, metallurgical gold recovery and mill feed gold grade.

23 ADJACENT PROPERTIES

Mandalay Resources manages the Costerfield Operation and holds a 100% interest in licences MIN4644, MIN5567, EL5432, and EL5519, which comprise the Property. There are no advanced projects in the immediate vicinity of the Property, and there are no other Augusta-style antimony-gold operations in production within the Costerfield district.

Exploration on adjacent tenements (EL5546, EL006504, EL006280, EL5490, EL006001, EL6951, EL7352, EL007348, EL007366, EL007382, EL007498, EL007499 and EL007481), are shown in Figure 23-1. The ownership and status of each of the surrounding ELs are detailed in Table 23-1.

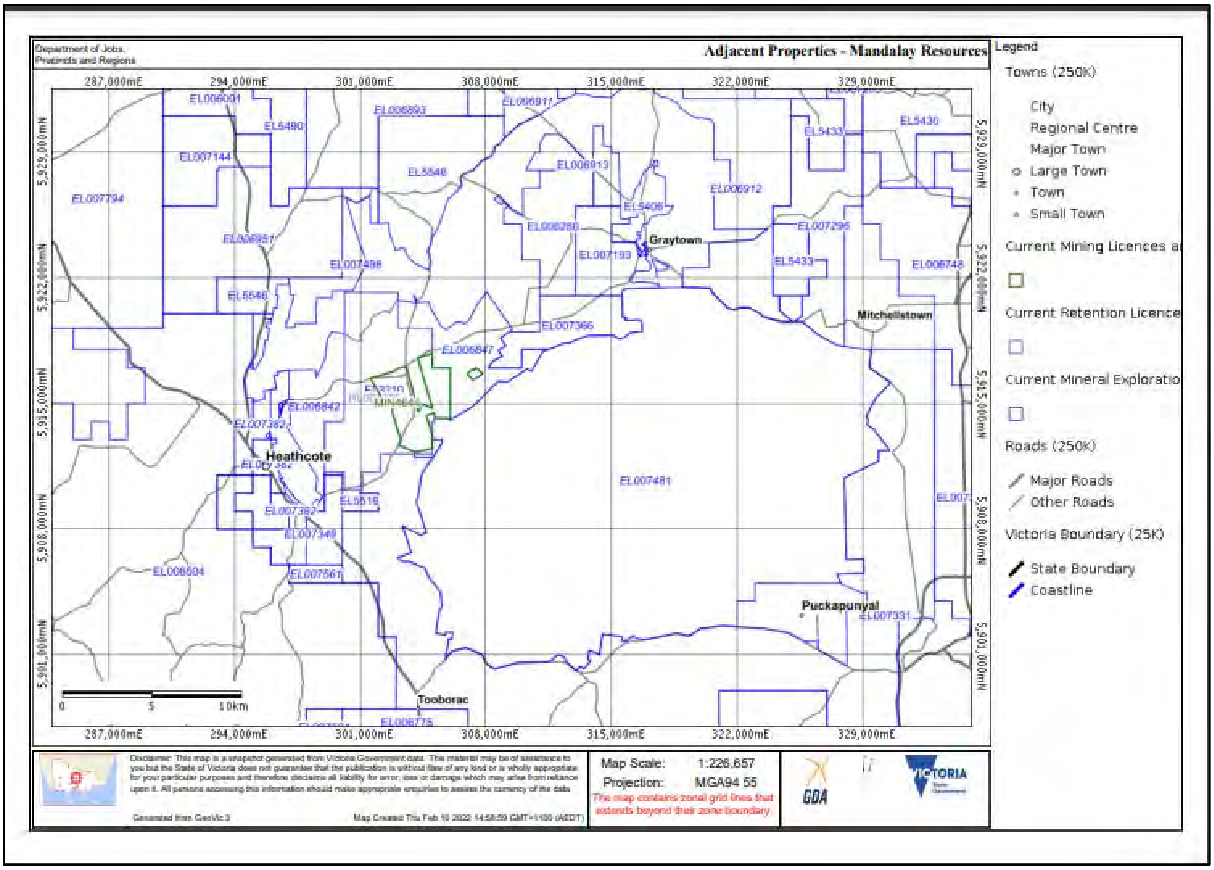


Figure 23-1: Augusta Mine adjacent properties (Geovic, 2022)

Table 23-1: Ownership details – Augusta Mine adjacent properties

Title	Owner	Status	First Granted	Expiry
EL5490	Golden Camel Mining Pty Ltd	Current	23/08/2013	5/12/2023
EL006504	Kirkland Lake Gold	Current	19/03/2018	19/03/2023
EL007352	Fosterville Gold Mine Pty Ltd	Under Application		
EL007348	Syndicate Minerals Pty Ltd	Under Application		
EL007382	Syndicate Minerals Pty Ltd	Under Application		
EL007498	Nagambie Resources Ltd	Current	28/05/21	27/05/26
EL007499	Nagambie Resources Ltd	Current	28/05/21	27/05/26
EL007481	Torrens Gold Exploration Ltd	Under Application		
EL007366	Torrens Gold Exploration Ltd	Granted	15/03/21	14/03/26
EL5546	Nagambie Mining	Current	8/05/2017	7/05/2022
EL006001	AIS Resources Aust Pty Ltd	Current	01/10/2015	30/09/2025
EL006280	Mercator Gold Australia Pty Ltd	Current	11/07/2017	10/07/2022
EL6951	Petrartherm Ltd	Under Application		

24 OTHER RELEVANT DATA AND INFORMATION

There is no other relevant data or information material to the Costerfield Property that has not been documented in the other sections of this Technical Report.

25 INTERPRETATION AND CONCLUSIONS

The QPs summarise here the results and interpretations of the information and analysis being reported on.

25.1 Geology and the Mineral Resource

The Costerfield Property is contained within a broad gold-antimony province mainly confined to the Siluro-Devonian Melbourne Zone. The mineralisation occurs as narrow veins or lodes, typically less than 50 cm wide and hosted within mudstone and siltstone of the Lower Silurian Costerfield Formation.

Gold mineralisation of greater than 20 g/t with an average grade of approximately 9 g/t is typically hosted within and/or alongside veined stibnite that contains approximately 4% antimony.

Mineralised shoots at the Costerfield Property are structurally controlled by the intersection of the lodes with major cross-cutting, puggy, and sheared fault structures. Exploration in the Property is guided by predictions of where these fault/lode intersections might be located using data from structural/geological mapping, diamond drill hole logging and 3D computer modelling.

During 2021, Mandalay drilled a total of 36.3 kilometres of exploration diamond core at a cost of $6.0 million. The breakdown of this significant drilling campaign is as follows:

- 27.0 km to test extensions of the Youle and Shepherd orebodies;
- 2.6 km to test other near-mine targets; and
- 6.7 km to test regional targets beyond current mine operations.

In addition to drilling, 4,585 m of on-vein development was completed within the Youle ore body, with 75 m development from October 2021, into the Shepherd ore body. Rock chip samples used in mine grade control were also included in the geological database and used in the MRE process to improve resource classification in areas accessed by development.

All relevant diamond drill holes and underground face samples in the Costerfield Property, available as of 6 December 2021 for the Augusta, Cuffley, Brunswick, and Youle Deposits, and as of 17 December 2021 for the Shepherd Deposit, were used to inform the MRE. The Mineral Resource is estimated as of December 31, 2021, with depletion through to this date.

The in-situ Augusta, Cuffley, Brunswick, Youle and Shepard Deposits plus stockpiles consist of a combined Measured and Indicated Mineral Resource of 1,387,000 tonnes at 10.6 g/t gold and 2.8% antimony, and an Inferred Mineral Resource of 532,000 tonnes at 6.7 g/t gold and 1.3% antimony.

The MRE is reported at a cut-off grade of 3.0 g/t gold equivalent (AuEq), after diluting to a minimum mining width of 1.2 m.

The gold equivalence formula used is calculated using recoveries achieved at the Costerfield Property Brunswick Processing Plant during 2020, and is as follows:

$$AuEq = Au\ (g/t) + 1.58 \times Sb\ (\%)$$

Commodity prices used in the equivalence formula are USD$1,700/ounce gold and USD$8,500/tonne for antimony, and 2021 total year metal recoveries of 93% for Au and 95% for Sb.

The reasonable prospects for eventual economic extraction (RPEEE) has been satisfied by applying the minimum mining width of 1.2 m and ensuring that isolated blocks above cut-off grade, which are unlikely to ever be mined due to distance from the main body of mineralisation, were excluded from the Mineral Resource.

The width of 1.2 m is the practical minimum mining width applied at the Costerfield Property for stoping. For blocks with widths less than 1.2 m, diluted grades were estimated by adding a waste envelope with zero grade and 2.76 t/m^3 bulk density (Youle and Shepherd) to the lode.

The QP for the Mineral Resource considers that the geological and assay data used as input to the Mineral Resource Estimate have been collected, interpreted and estimated in line with best practice as defined by the CIM (CIM 2018, 2019). Data verification work showed the geological data are suitable for use as input to the Mineral Resource Estimate. Validation of the MRE block model showed good agreement with the input data. A retrospective reconciliation exercise showed good agreement between 2021 production tonnes and grades with the equivalent tonnes and grades reported out of the current block model.

Additionally, the QP for the Mineral Resource considers that the key risk to the operation is being able to maintain the resource base to stay ahead of ongoing mining depletion, and does not consider any other significant risks or uncertainties could reasonably be expected to affect the reliability or confidence in the exploration information or Mineral Resource Estimate.

25.2 Mining, Ore Reserve and the Mining Schedule

Mining Plus makes the following observations regarding the mining operations:

- Inferred resources have not been included in the economic evaluation,

- There has been a history of conversion of Inferred to Indicated Resources resulting in additional Resources from outside the Mineral Reserve being included into the life of mine plans that have the potential to improve the project economics.
- Mandalay Resources has demonstrated an ability to improve the mining method and productivity based on continuing to increase and improve the geological information and thus mine designs and planning.

25.3 Mineral Processing & Metallurgical Testwork

Mining Plus makes the following observations regarding the processing aspects of the operation:

- The Brunswick Concentrator is a conventional flotation style concentrator incorporating a gravity gold recovery circuit. It has a well demonstrated production record of consistent throughput and metallurgical recoveries across a range of feed types. The forecast LoM feed is similar to the ores historically processed and the metallurgical behaviours of the Youle ores are not expected to materially change. Mining Plus consider that the processing facility is, and will remain, amenable to processing the LoM ores.

- The updated antimony and gold feed grade versus metallurgical recovery algorithms used for the 2022 Mineral Reserve Estimation, budgeting and forecasting purposes utilises a much smaller operational dataset from the 2021 calendar year, but better reflects the forecast LoM Youle dominated feed and incorporates the recovery enhancement projects completed in the period. Mining Plus endorses its use for the purposes of the Mineral Reserve Estimation.

- The forecast throughput and associated processing costs reflects the historical capacity of the plant and are appropriate for use as metallurgical modifying factors for the Mineral Reserve Estimate.

26 RECOMMENDATIONS

26.1 Geology

The Costerfield Property is an advanced operation and Mandalay Resources has a history of successful exploration and mining on the Property. The QP for the Mineral Resource Estimate has observed that the degree of technical competency evident in the work performed by Mandalay Resources geologists is high, particularly in the structural analysis of the local geology.

Improvements made in 2021 have addressed recommendations made in the 2021 NI43-101 report. No further technical geology recommendations are required at this point.

Ongoing exploration work programmes targeting additions to the Mineral Resource are planned in 2022 at the Costerfield Property by Mandalay Resources. A total of approximately $8M USD for 40k diamond drill metres is budgeted for exploration in 2022 in support of both near-mine and regional target testing.

Near Mine Exploration:

It is recommended that near-mine targets continue to be developed and tested along the Augusta-Cuffley-Brunswick-Youle-Shepherd corridor for mineralisation proximal to existing infrastructure.

The Shepherd deposit series of lodes were major exploration additions to the MRE in 2021 and remains open in almost all directions. Additional testing and infilling of the vein system is recommended to identify potential upsides along strike and at depth.

Regional Exploration:

The Costerfield Property covers several kilometres of area around the current operation that is prospective for additional Au-Sb and Au-only styles of mineralisation and includes extensive historical workings. It is recommended that a pipeline of targets should continue to be conceptualised and explored for by the exploration team.

This proposed workplan and budget is in-line with previous years in which resource addition has outpaced resource depletion and therefore, the QP considers that it should be sufficient to sustain the Costerfield Mine operation.

26.2 Mining

Mining Plus makes the following recommendations regarding the mining operations:

- Mining Plus recommends that Mandalay Resources continually reviews the activity cost centres to optimise the cut-off grades to enhance the value generation of the project the review.
- Investigate the practicalities of an analysis of the mine economics through a Net Smelter Return (NSR) value, this will allow for greater flexibility the mine design and identify higher value material to process.
- Investigate the bottlenecks at the operation to identify opportunities to increase the profitability of the mine.

26.3 Mineral Processing & Metallurgical Testwork

Mining Plus recommends that Mandalay continue to update the gold and antimony metallurgical recovery algorithms annually based on actual production data. These relationships should then be applied to any mineral reserve estimate and LoM production schedule updates.

This is particularly relevant this 2022 calendar year in order to expand the operating dataset, as the feed blend will continue to be dominated by the Youle underground ore for the full 12 months, and will incorporate the recovery benefits now being realised through the completion of the two upgrade projects; the additional StackCell® primary rougher flotation cells, and the installation of additional CavTube® flotation cells on the final tailings.

Mandalay has reliably undertaken annual metallurgical recovery algorithm updates. This exercise has contributed to the reliable forecasting of antimony and gold recoveries over many years.

27 REFERENCES

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MINING PLUS

CERTIFICATE OF QUALIFIED PERSON

I, Andrew Fowler, Ph.D., MAusIMM, CP(Geo), do hereby certify that:

1. I am currently employed as a Principal Geologist with Mining Plus, Level 17, 127 Creek Street, Brisbane, Queensland, Australia;
2. This certificate applies to the Technical Report titled “Mandalay Resources – Costerfield Property, NI43-101 Technical Report” (the “Technical Report”) prepared for Mandalay Resources (“the Issuer”), which has an effective date of 31 December 2021 – the date of the most recent technical information;
3. I am a graduate of the University of Melbourne (Ph.D., 2004). I am a Chartered Professional in the discipline of Geology and a registered member of the Australasian Institute of Mining and Metallurgy. I have practiced my profession continuously since November 2004. My relevant experience includes two years as Exploration Geologist with a junior greenfields explorer, Mithril Resources, two years as Project Geologist/Head Geologist with the Costerfield gold-antimony mine operated by AGD Operations, eight years as a Senior Geologist with AMC Consultants Pty Ltd, one year as Manager of Mineral Resources at MMG Las Bambas, and three years as Principal Geologist at Mining Plus. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfil the requirements to be a "qualified person" for the purposes of NI 43-101;
4. I completed a personal inspection of the Property from the 17 to 18 December 2020;
5. I am responsible for Items 2 to 12, Items 14, 20 and 23 and for sections pertaining thereto in Item 1 and Items 24 to 27;
6. I am independent of the Issuer and related companies applying all of the tests in Section 1.5 of the NI 43-101;
7. I have had prior involvement with the property that is the subject of the Technical Report in my role as Project Geologist/Head Geologist from 2006 to 2008 at the Costerfield gold-antimony mine, which was then operated by AGD Operations;
8. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1;
9. As of the effective date of the Technical Report and the date of this certificate, to the best of my knowledge, information and belief, this Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Effective Date: 31 December 2021
Signing Date: 25 March 2021

(Signed) Andrew Fowler, Ph.D., MAusIMM, CP(Geo)

MINING PLUS

CERTIFICATE OF QUALIFIED PERSON

I, Aaron Spong FAusIMM CP(Mining), do hereby certify that:

1. I am currently employed as a Principal Mining Consultant and Manager – Underground Mining with Mining Plus Pty Ltd, Level 14, 500 Collins Street, Melbourne, Victoria 3000, Australia;
2. This certificate applies to the Technical Report titled "Mandalay Resources – Costerfield Property, NI43-101 Technical Report" (the "Technical Report") prepared for Mandalay Resources ("the Issuer"), which has an effective date of 31 December 2021 – the date of the most recent technical information;
3. I graduated from University of Ballarat in 2001 with a Bachelor Degree in Engineering (Mining). I am a member and Chartered Professional (Mining) in good standing with the Australasian Institute of Mining and Metallurgy (Membership No: 307001). I have practiced professionally since graduation in 2001. In that time, I have been directly involved in the construction of infrastructure at the Telfer Gold mine and the Leinster Nickel mine. I have also been directly in involved in the operation of the Agnew Gold mine for 5 years. I have been employed Mining Plus Pty Ltd for the last 12 years and have contributed to relevant studies in gold, copper and nickel. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfil the requirements to be a "qualified person" for the purposes of NI 43-101;
4. I have visited the Costerfield Project site;
5. I am responsible for Items 15, 16, 18, 19, 21 and 22 and for sections pertaining thereto in Item 1 and Items 25 to 27 of the Technical Report;
6. I am independent of the Issuer and related companies applying all of the tests in Section 1.5 of the NI 43-101;
7. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1;
8. As of the effective date of the Technical Report and the date of this certificate, to the best of my knowledge, information and belief, this Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Effective Date: 31 December 2021
Signing Date: 24 March 2022

(Signed) Aaron Spong, BEng (Mining), FAusIMM CP (Min)

CERTIFICATE OF QUALIFIED PERSON

I, Simon Walsh, BSc (Extractive Metallurgy), MBA Hons, MAusIMM CP(Met), GAICD, do hereby certify that:

1. I am currently employed as a Principal Metallurgist and Director with Simulus Engineers with a business address of 82 John St, Welshpool, Western Australia, 6106, and have been engaged by Mining Plus, Level 17, 127 Creek Street, Brisbane, Queensland, Australia, 4000;
2. This certificate applies to the Technical Report titled "Mandalay Resources – Costerfield Property, NI43-101 Technical Report" (the "Technical Report") prepared for Mandalay Resources ("the Issuer"), which has an effective date of 31 December 2021 – the date of the most recent technical information;
3. I am a graduate of Murdoch University and Curtin University, Western Australia. I am a Chartered Professional member in good standing of the Australasian Institute of Mining & Metallurgy (MAusIMM CP(Met), member number 226023). My relevant experience is over 25 years in mineral processing, process engineering and extractive metallurgy. Of particular relevance for the study in support of the practical experience, I have spent the past 16 years in consulting roles at Simulus Engineers in a similar capacity. Furthermore, I have undertaken the annual technical review of this site since 2015 and am familiar with the operation;
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfil the requirements to be a "qualified person" for the purposes of NI 43-101;
5. My most recent personal inspection of the Property was on 1 September 2015;
6. I am responsible for Items 13 and 17, and sections pertaining thereto in Item 18 that form part of the Technical Report;
7. I am independent of the Issuer and related companies applying all of the tests in Section 1.5 of the NI 43-101;
8. I have no prior involvement with the property that is the subject of the Technical Report other than that stated;
9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1;
10. As of the effective date of the Technical Report and the date of this certificate, to the best of my knowledge, information and belief, this Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading;

Effective Date: 31 December 2021
Signing Date: 23 March 2022

(Signed) Simon Walsh, BSc (Extractive Metallurgy), MBA Hons, MAusIMM CP(Met), GAICD

MINING PLUS

CERTIFICATE OF QUALIFIED PERSON

I, Richard Buerger, MAIG, BSc., do hereby certify that:

1. I am the Manager – Resources with Navarre Minerals Ltd and previously employed as Manager – Geology with Mining Plus;
2. This certificate applies to the Technical Report titled "Mandalay Resources – Costerfield Property, NI43-101 Technical Report" (the "Technical Report") prepared for Mandalay Resources ("the Issuer"), which has an effective date of 31 December 2021 – the date of the most recent technical information;
3. I graduated in 1997 from the University of WA with a Bachelor of Science degree with Honours majoring in Geology. I have worked as a geologist in the field of mineral exploration, resource estimation and underground and open pit production mine geologist for over 20 years, specialising in gold, nickel sulphide and base metal deposits;
4. I am a Member of the Australian Institute of Geoscientists (MAIG);
5. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfil the requirements to be a "qualified person" for the purposes of NI 43-101;
6. My most recent personal inspection of the Property was 23rd September 2021;
7. I am responsible for Item 12 and those sections of items 1 and 25 to 27 pertaining thereto;
8. I am independent of the Issuer and related companies applying all of the tests in Section 1.5 of the NI 43-101;
9. I have had prior involvement with the property having completed a number of site inspections and QAQC training courses in late 2020 and early 2021;
10. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1;
11. As of the effective date of the Technical Report and the date of this certificate, to the best of my knowledge, information and belief, this Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading;

Effective Date: 31 December 2021
Signing Date: 25 March 2021

(Signed) Richard Buerger, MAIG, BSc.