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Mandalay Resources - Björkdal Property
NI43-101 Technical Report

MANDALAY RESOURCES - BJÖRKDAL PROPERTY NI43-101 TECHNICAL REPORT

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MANDALAY RESOURCES LTD

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1 EXECUTIVE SUMMARY

The Björkdal Property ("The Property") is located within the Västerbotten County in northern Sweden. Mandalay Resources Corporation ("Mandalay Resources" or "Mandalay") holds 100% of the Björkdal Property through its wholly-owned subsidiaries in Sweden. The Property mining and processing facilities include the Björkdal open pit and underground mines and a processing plant with a current capacity of approximately 1.32 Mt/year of feed. The Property also includes the undeveloped Norrberget Deposit.

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, prepare the Björkdal Mineral Resource block model and take QP responsibility for the relevant sections of the 2021 Technical Report and the agreed public disclosure. Mining Plus QPs have independently reviewed the work completed on the Björkdal Mines by Mandalay Resources and take responsibility for all associated 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 Norrberget Deposit was excluded from Mining Plus's scope of work and SLR Consulting Ltd QPs continue to take responsibility for sections of the Technical Report relevant to Norrberget.

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).

Since September 30, 2020, to the data cut-off of 30 September 2021, Björkdal completed 59 drill holes totaling approximately 20,755 m in length. In addition to this, a large data contribution is available from POD and DOD drilling totalling 24,592 m was completed in line with underground mine development. The data cut-off date at Norrberget is unchanged from 30 September 2017. In addition, underground operations completed 5,988 m of on-vein development, which was mapped and sampled in detail.

Other than the normal course updating of the mineralisation wireframes to account for new drilling and sampling information, the workflow and estimation parameters used to prepare the year-end 2021 Björkdal long-term block model were largely unchanged when compared to the previous Mineral Resource.

Mineral Resources were estimated at a cut-off grade of 0.33 g/t gold for the potentially open-pittable portion of the Resource, and 0.77 g/t gold for the portion of the Resource that is potentially mineable by underground methods. These cut-offs were determined using Björkdal's 2021 production costs, using a gold price of $1,700/oz and an exchange rate of 9.0 SEK/US$.

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

Category	Tonnage (kt)	Au Grade (g/t)	Contained Au (koz)
Measured Resources			
Underground	**1,851**	**2.62**	**156**
Indicated Resources			
Underground	9,663	2.30	713
Open Pit	3,017	2.19	212
Norrberget Open Pit	144	3.29	15
Stockpile	2,532	0.61	50
Total Measured and Indicated	**17,207**	**2.07**	**1,146**
Inferred Resources			
Underground	3,484	2.12	237
Open Pit	3,326	1.13	121
Norrberget Open Pit	3	4.03	0.5
Total Inferred	**6,813**	**1.64**	**359**

Notes:

1. The Björkdal Mineral Resource is estimated using drill hole and sample data as of 30 September 2021 and depleted for production through 31 December 2021. Norrberget Mineral Resources are based on a data cut-off date of 30 September 2017.
2. CIM definitions (2014) were followed for the Mineral Resource.
3. The Mineral Resource is inclusive of the Mineral Reserve.
4. The Mineral Resource is estimated using an average gold price of $1,700/oz. and an exchange rate of 9.0 SEK/US$.
5. In situ bulk density is 2.74 t/m^3 for veins and host rock. In situ bulk density is 2.92 t/m^3 for skarn orebodies. Stockpile bulk density is 1.8 t/m^3.
6. High gold assays were capped at 60 g/t Au for the first search pass and 40 g/t Au for subsequent passes.
7. High gold assays at Norrberget were capped at 24 g/t Au.
8. Interpolation was by inverse distance cubed utilising diamond drill, reverse circulation, and chip channel samples.
9. The Björkdal open pit Mineral Resource is estimated at a cut-off grade of 0.33 g/t Au and constrained by a resource pit shell to comply with the reasonable prospects for eventual economic extraction (RPEEE) criteria.
10. The Norrberget open pit Mineral Resources are estimated at a cut-off grade of 0.35 g/t Au and constrained by a resource pit shell to comply with the RPEEE criteria.
11. The Björkdal underground Mineral Resource is estimated at a block cut-off grade of 0.77 g/t Au for all veins
12. A nominal two meter minimum mining width was used to interpret veins and comply with the RPEEE criteria.
13. The Reported Mineral Resource is depleted for previously mined underground development and stopes.
14. The Stockpile Mineral Resource is estimated based upon surveyed volumes supplemented by production data.
15. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
16. Numbers may not sum due to rounding.
17. The Mineral Resource Estimate as of 31 December 2021 for Björkdal 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. The Independent Qualified Person for Norrberget Mineral Resource estimate is Reno Pressacco, P.Geo., Principal Geologist with SLR, who is a Qualified Person as defined by NI 43-101.

Classification criteria were changed relative to previous years and are now more consistent with Mandalay's Costerfield Property. This has allowed a Measured Resource to be reported.

Other than the normal course updating of the underground long-term wireframes, and the re-optimisation of the open pits to account for the updated long-term resource model, the workflow and modifying factors used to prepare the year-end 2021 Björkdal Mineral Reserves were largely unchanged from those used during the previous year.

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

Category	Tonnage (kt)	Au Grade (g/t)	Contained Au (koz)
Proven			
Underground	1,127	2.05	74
Probable			
Underground	5,350	1.76	302
Open Pit	2,949	1.07	101
Norrberget Open Pit	162	2.80	15
Stockpile	2,532	0.61	50
Total Proven and Probable	**12,121**	**1.39**	**542**

Notes:

1. Björkdal Mineral Reserves are estimated using drill hole and sample data as of 30 September 2021 and depleted for production through 31 December 2021.
1. Norrberget Mineral Reserves are based on a data cut-off date of 30 September 2017.
2. CIM definitions (2014) were followed for Mineral Reserves.
3. Open Pit Mineral Reserves are based on mine designs carried out on an updated resource model, applying a block dilution of 100% at 0.0 g/t Au for blocks above 1.0 g/t and 100% at in-situ grade for blocks below 1.0 g/t, but above a cut-off grade of 0.37 g/t Au. The application of these block dilution factors is based on historical reconciliation data. A marginal cut-off grade of 0.37 g/t Au was applied to estimate open pit Mineral Reserves.
4. Underground Mineral Reserves are based on mine designs carried out on an updated resource model. Minimum mining widths of 3.7 m for stopes (after dilution) and 4.75 m for development (after dilution) were used. Stope dilution was applied by adding 0.6 m on each side of stopes as well as an additional 10% over break dilution. Further dilution, ranging from 5% to 50%, was added on a stope-by-stope basis depending on their proximity to other stopes. An overall dilution factor of 25% was added to development designs. Mining extraction was assessed at 95% for contained ounces within stopes and 100% for development. A cut-off grade of 0.88 g/t Au was applied to material mined within stopes. An incremental cut-off grade of 0.37 g/t Au was used for development material.
5. Stockpile Mineral Reserves are estimated at a cut-off grade of 0.37 g/t Au and are based upon surveyed volumes supplemented by production data.
6. Mineral Reserves are estimated using an average long-term gold price of US$1,500/oz, and an exchange rate of 9.0 SEK/US$. Norrberget Mineral Reserves were estimated at an average long-term gold price of US$ 1,300/oz, and an exchange rate of 9.0 SEK/US$.
7. Tonnes and contained gold are rounded to the nearest thousand.
8. Totals may not sum due to rounding.
9. The Mineral Reserve Estimate as of 31 December 2021 for Björkdal 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 Independent Qualified Person for the Norrberget Mineral Reserve estimate is Rick Taylor, MAusIMM (CP), Principal Mining Engineer with SLR, who is a Qualified Person as defined by NI 43-101.

The reporting cut-off grades for the Mineral Resources and Mineral Reserves statement were slightly increased to reflect higher processing costs. Updated operational costs and input parameters based upon 2021 actual figures, and the 2022 budget, were used in the Mineral Reserves estimation process.

Financial viability of Probable Mineral Reserves was demonstrated at a $1,500/oz Au price.

The net decrease of 2,000 ounces of gold in Total Mineral Reserves for 2021, relative to 2020, included mining depletion of 52,800 ounces of gold during 2021. Therefore, a total of 50,800 ounces of gold were added to Mineral Reserves for 2021, with an exploration expenditure spend of $2.09 million. The exploration cost of adding those Mineral Reserves was $41.24 per ounce of gold.

The QPs for the Personal Inspection and the Mineral Resource consider that the geological and assay data used as input to the Mineral Resource Estimate have largely been collected, interpreted and estimated in line with best practice as defined by the CIM (CIM 2018, 2019), with exceptions noted in section 25.1.

Data verification work showed that the geological data were suitable for use as input to the Mineral Resource Estimate and validation of the resource block model showed good agreement with the input data.

The QPs for the Personal Inspection and the Mineral Resource do 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.

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2 INTRODUCTION

Mining Plus Pty Ltd (Mining Plus) was engaged by Mandalay Resources Corporation (Mandalay) to prepare a Technical Report on the Björkdal Gold Mine (Björkdal or the Property), located in Västerbotten County in northern Sweden.

The report demonstrates the viability of continued mining and processing at the Björkdal Property and supports the updated Mineral Resource Estimate and Mineral Reserve described herein.

The Björkdal mining and processing facilities comprise the following:

- Partly completed Björkdal open-pit mine,
- Active operations at the Björkdal underground mine,
- Norrberget deposit located four kilometres southeast of the Mine,
- Processing plant with a current capacity of 1.32 Mt/year,
- Mine and mill infrastructure, including office buildings, workshops, core shed and equipment.

The purpose of this Technical Report is to support the disclosure of a Mineral Resource Estimate and Mineral Reserve Estimate (MRMR) for the Björkdal and Norrberget Deposits. MRMR are estimated with an effective date of December 31, 2021, which is the mining depletion date. The Mineral Resource was estimated based on a drill hole database with a cut-off date of September 30, 2021 for Björkdal and September 30, 2017 for Norrberget.

In 2021, Björkdal produced gold from an underground mine only supplemented with stockpile feed, as operations in the open pit mine were suspended in July 2019. Approximately 85% of plant feed for 2021 was delivered from the underground, with the balance drawn from the low grade stockpiles (15%). Total mill feed for 2021 was approximately 1.26 million tonnes (Mt). The average reconciled head grade for 2021 was 1.31 g/t Au. The Björkdal plant uses conventional crushing and grinding, followed by a combination of gravity and flotation processing techniques to recover gold to concentrates which are sold to smelters in Europe. The plant capacity is 3,700 tonnes per day (tpd) and the plant is currently operating at approximately 3,600 tpd. Gold recovery for 2021 averaged approximately 88%, and production totalled approximately 46,400 ounces (oz) of saleable gold.

The 2017 Pre-Feasibility Study for Norrberget includes an open pit mining operation feeding the existing Björkdal processing plant. No changes have been made to the underlying assumptions for the Norrberget PFS since the last Technical Report dated March 26, 2021 (SLR Consulting Ltd., 2021) except an update of the exchange rate.

Mandalay is a Canadian based publicly listed company trading on the Toronto Stock Exchange (TSX) under the symbol MND. Mandalay holds 100% of the Björkdal Property through its wholly-owned subsidiaries in Sweden. Mandalay's other operating asset is the Costerfield gold-antimony mine located in Victoria, Australia.

2.1 Terms of Reference

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 on the Björkdal Mine by Mandalay personnel, prepare the Björkdal Mineral Resource block model and assume QP responsibility for associated portions of the 2021 Technical Report and any associated public disclosure. The Norrberget Deposit was excluded from Mining Plus's scope of work and SLR Consulting Ltd. QPs continue to take responsibility for sections of the Technical Report relevant to Norrberget.

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).

The Björkdal Property is a long-standing mining and processing operation and is currently an operating site. As such, detailed operational data and reports are available that have been used as evidence of the performance against operational plans. Other sources of information include various internal and external reports, which have been prepared in the course of the site development and operation. Where appropriate, these reports are referenced in this document.

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

The Technical Report was assembled in Australia during the months of February and 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 Björkdal Property, available as of 30 September 2021 for Björkdal and 30 September 2017 for Norrberget, were used to inform the Mineral Resource Estimate.

2.3 Qualified Persons

Dr Andrew Fowler: Mining Plus Principal Geologist, PhD, AusIMM CP (Geol), reviewed all aspects of the construction of the geological models and the estimation of the Mineral Resource. 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.

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 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.

Dr Matthew Field: Mining Plus Principal Geologist, PhD, Pr.Sci.Nat. SACNASP (400060/08), reviewed all aspects of the geological data collection and storage. He conducted a personal inspection of the Property from 7 to 10 December 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.

Christopher Stinton: Zenito Principal Process Engineer, BSc (Hons), CEng MIMMM 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 from 7 to 10 December 2021. 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.

Reno Pressacco: SLR Consulting Associate Principal Geologist M.Sc.(A), P.Geo. (Reg. #939). Mr Pressacco has worked as a geologist for a total of 36 years since his graduation. Mr Pressacco reviewed all aspects of the construction of the geological models and estimation of the Mineral Resource for the Norrberget property. He conducted a personal inspection of the property in September 2016 and November 2019. 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.

Dr Kathleen Altman: SLR Consulting Associate Principal Metallurgist, Ph.D., P.E. (Reg #37556). Dr Altman has worked as a metallurgical engineer for more than 40 years since her graduation. Dr Altman did a review of the mineral processing, metallurgical testing and recovery methods for the Norrberget Property. She conducted a personal inspection of the property in September 2017. By virtue of her education, membership to a recognised professional association and relevant work experience she is an independent QP as defined by NI 43-101.

Richard Taylor: SLR Consulting Principal Mining Engineer MAusIMM, CP (Min) (Reg.# 222470). Mr Taylor has worked as a mining engineer for a total of 35 years since his graduation. Mr Taylor reviewed all aspects of the estimation of the Mineral Reserve and associated information for the Norrberget property. 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.

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:

- Åsa Corin, Geology Manager
- Mikael Bohm, Technical Service Manager
- Jose Javier Santabarbara, Senior Resource Geologist
- Helena Moosberg-Bustnes, Plant Manager
- Samuel Miller, Senior Exploration Geologist
- Heiko Friedrichs, Resource Geologist
- Samuel Roško, Senior Mine Geologist
- Sanna Naalisvaara, Production Geologist
- Anet Pizana, Infill drilling Geologist
- Lena Printzell, Environmental and Tailings Manager
- Ali Beyglou, Strategic Planning Engineer
- Dawid Wrobel, Medium term Planning Engineer
- Robert de Vahl, Mine Manager

3 RELIANCE ON OTHER EXPERTS

The Qualified Person has relied upon, in respect of legal aspects, the work of the Expert 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 was verified by Hans Lindgren, Associate Senior Consultant at GeoVista AB as being in good standing.

- Expert: Hans Lindberg, GeoVista Ab,
- Report, opinion or statement relied upon: Information on mineral tenure and status, title issues, etc,
- Extent of reliance: full reliance following a review by the Qualified Person,
- Portion of Technical Report to which disclaimer applies: Section 4.

4 PROPERTY, DESCRIPTION AND LOCATION

The Björkdal Mine Operation (the Property) is in Västerbotten County in northern Sweden, at approximately 20°35’26” E longitude and 64°56’7” N latitude (WGS84). In the Swedish coordinate system used for government maps (SWEREF99TM) the Björkdal Property is located at approximately X: 7212941 and E: 764003. The Norrberget deposit is located approximately four kilometres east of the Mine and lies approximately 28 km northwest of the municipality of Skellefteå and approximately 750 km north of Stockholm (Figure 4-1).

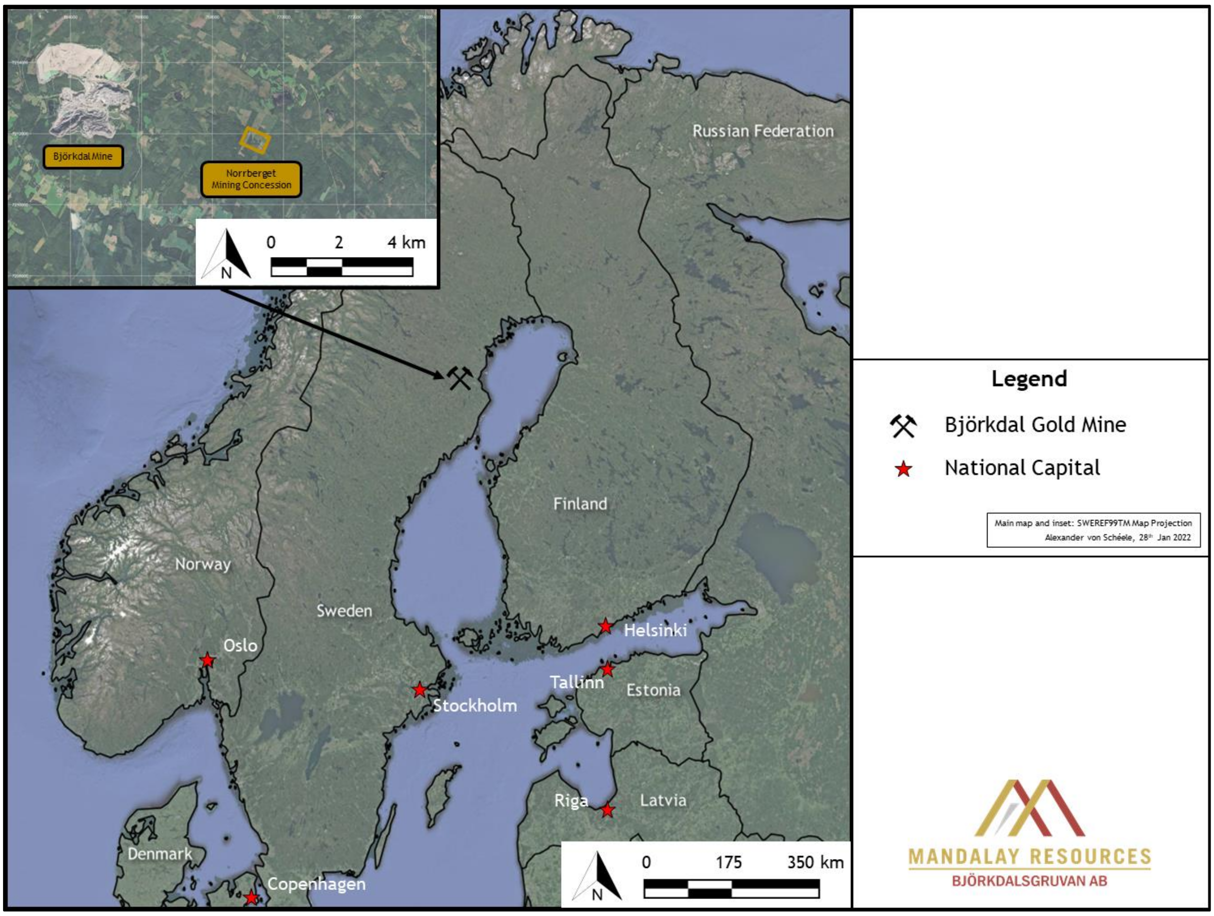


Figure 4-1: Björkdal Property Location Map

4.1 Swedish Mining Laws and Regulations

The Minerals Act (1991:45) came into force on 1 July 1992. The Mining Inspectorate of Sweden (Bergsstaten) is the agency responsible for decisions concerning permits for exploration (exploration permits) and mining (exploitation concessions). The Mining Inspectorate also carries out inspections of mines and provides information on mineral legislation and prospecting in Sweden.

On June 11, 2014, the Swedish Parliament amended the provisions of the Minerals Act (1991:45) governing exploration works. In accordance with this bill, exploration permit holders are required to provide more detailed information about their exploration works.

In March 2021, there was a change made to the Minerals Act adding one extra year to all valid exploration permits in Sweden due to the Covid-19 pandemic.

An exploration permit does not give the right to undertake exploration work in contravention of any environmental regulations applying to the area. Applications for exemption are normally submitted to the County Administration Board (Länsstyrelsen).

Acts and regulations governing exploration work include:

- Minerals Act (1991:45)
- Mineral Ordinance (1992:285)
- Environmental Code (1998:808)
- Work Environment Act (1977:1160)
- Work Environment Ordinance (1977:1166)
- The Work Environment Authority's Statute Book (AFS)
- Off-Road Driving Act (1975:1313)
- Off-Road Driving Ordinance (1978:594)
- Forest Conservation Act (1979:429)
- Forest Conservation Ordinance (1993:1096)
- Heritage Conservation Act (1988:950)
- Heritage Conservation Ordinance (1988:1188)
- Protection Act (2010:305)

4.2 Property Ownership and Land Tenure

Mandalay is a publicly listed company that effectively holds 100% of the Björkdal Property through the Swedish registered companies Björkdalsgruvan AB and its subsidiary Björkdal Exploration AB. Björkdalsgruvan AB owns eleven mining concessions on the Björkdal Property and one mining concession hosting the Norrberget deposit. An additional concession, Norrliden K nr 1, is held by Explor Björkdalsgruvan AB. The total area of the mining concessions is approximately 453.25 ha. The Property ownership includes concession (Kvarnforsliden K nr 2) which is under Application.

There are 19 exploration permits, 16 of which are owned by Björkdalsgruvan AB, two by Explor Björkdalsgruvan AB, and one by Björkdal Exploration AB. The mining and exploration concessions are listed in Table 4-1 and Table 4-2, respectively, and their locations are shown in Figure 4-2.

Table 4-1: Status of Mining Concessions as at 27 January 2022

Permit Name	Size (ha)	Expiry Date
Häbbersfors K nr 1	98.69	1 January 2031
Häbbersfors K nr 2	34.88	2 February 2025
Häbbersfors K nr 3	18.89	29 April 2027
Häbbersfors K nr 4	5.00	21 November 2025
Häbbersfors K nr 5	21.83	6 March 2034
Häbbersfors K nr 6	23.49	24 April 2038
Häbbersfors K nr 7	32.11	17 January 2042
Norrberget K nr 1	25.28	25 January 2044
Nylund K nr 1	73.47	30 January 2043
Storheden K nr 1	61.27	8 November 2043
Norrliden K nr 1*	18.51	1 January 2032
Kvarnforsliden K nr 1	6.74	9 March 2046
Kvarnforsliden K nr 2	33.09	Applied in January 2022
Sub-Total	**453.25**	

Note.

* Permit held by Explor Björkdalsgruvan AB
Source: Mandalay Resources Corporation – Björkdal Gold Mine

Table 4-2: Status of Exploration Concessions as at 27 January 2022

Permit Name	Size(ha)	Expiry Date	Remarks
Björkdal nr 28	39.53	14 October 2024	
Björkdal nr 29	1,073.89	30 November 2026	
Björkdal nr 30	64.03	23 February 2022	
Björkdal nr 31	449.1	7 November 2025	
Björkdal nr 32	2,219.60	27 November 2022	Application for Extension
Björkdal nr 33	1,409.35	19 October 2024	
Björkdal nr 34	2,520.16	9 November 2024	
Björkdal nr 35	135.43	17 October 2022	Application for Extension
Björkdal nr 36	670.4	10 April 2023	
Björkdal nr 37	378.45	28 August 2023	

Permit Name	Size(ha)	Expiry Date	Remarks
Björkdal nr 39	978.45	5 November 2023	
Björkdal nr 40	967.36	1 September 2024	
Lillträsket nr 3	246.59	17 October 2022	Application for Extension
Malånäset nr 100[1]	591.84	20 March 2024	
Malånäset nr 101[1]	687.77	28 March 2022	
Olofsberg nr 102	42.79	4 June 2024	
Sandfors nr 101	3,267.82	9 June 2022	Application for Extension
Vidmyran nr 100[2]	1,197.50	10 March 2024	
Vorsberget nr 1	804.73	25 May 2022	Application for Extension
Total	**17,744.76**		

Notes 1) Permit held by Explor Björkdalsgruvan AB

2) Permit held by Björkdal Exploration AB

Source: Mandalay Resources Corporation – Björkdal Gold Mine

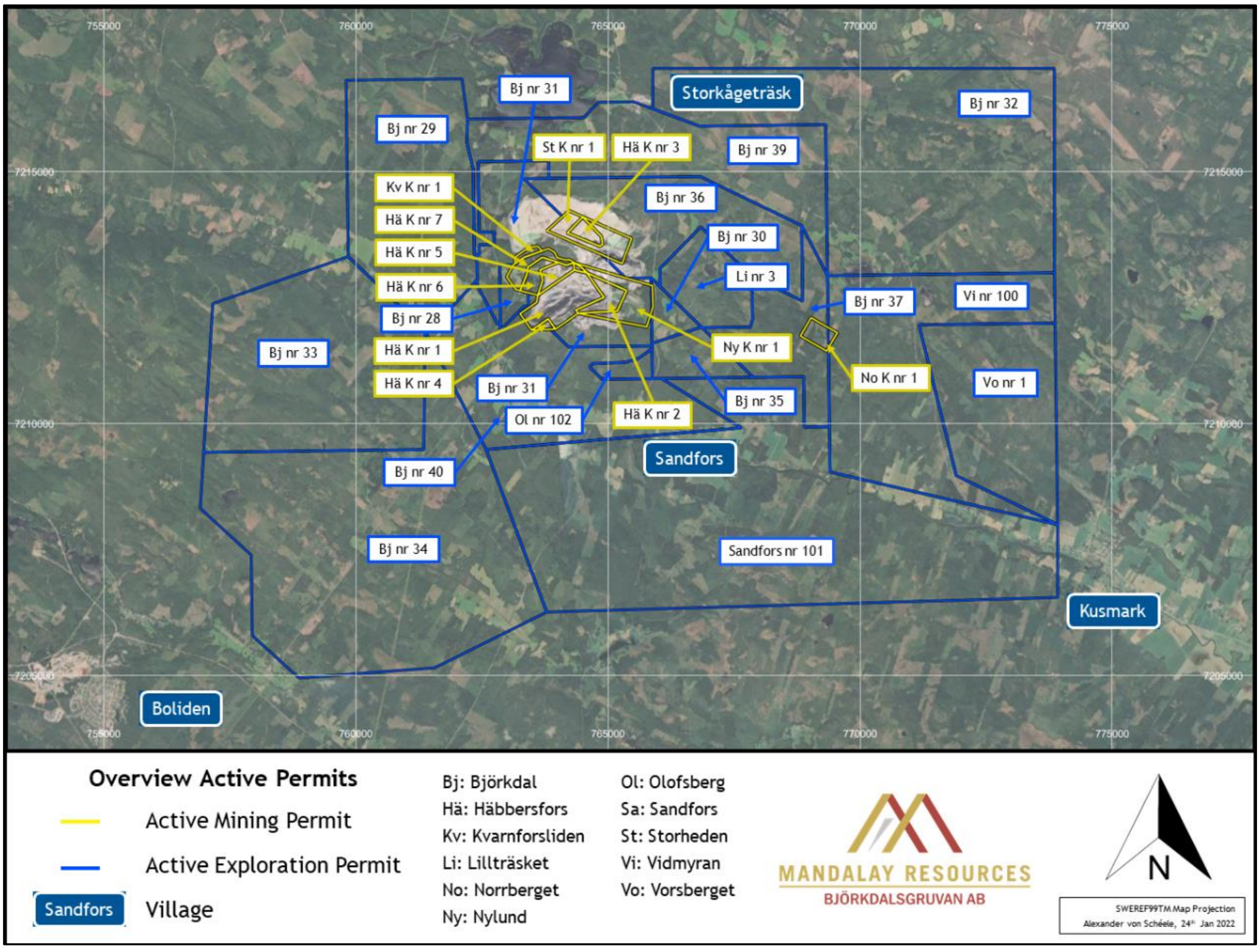


Figure 4-2: Björkdal Property location plan

Note: Malånäset nr 100 & 101 are located 70km outside of the map area

4.2.1 Exploitation (Mining) Concessions

The Björkdal deposit is located on all of the Häbbersfors and Kvarnforsliden exploitation concessions with the exception of Häbberfors K nr 3. Key facts related to mining concessions are:

- A mining concession is valid for 25 years based on an application fee.
- The concession period can be extended for ten years at a time without special application provided regular exploitation operations are in progress when the period of validity expires.
- In order to apply for a new mining concession, the exploration permit needs to contain an Indicated Resource.

4.2.2 Exploration Permits

Obligations to retain exploration permits include:

- An application fee of SEK500, or approximately US$56, per every 2,000 ha area.
- After an initial permit fee for first approval (SEK20/ha area fee for years 1-3) retention requires further permit fees. Permits that are more mature attract increased fees such that the first extension is 21 SEK/ha/year (years 4-6), second extension 50 SEK/ha/year (years 7-10) and third extension 100 SEK/ha/year (years 11-15).
- Exploration permit fees totaling approximately SEK1,332,800, or approximately US$148,100, were expended for 2022.
- Active exploration activities must take place continuously in order to be granted a permit extension.
- Compensation to landowners for damage and encroachment upon completion of the operation.

4.3 Surface Usage/Land Lease

Mandalay has all the land required for the Björkdal mining concessionsand it has been designated as accessible to the company. Some land is owned directly by Mandalay, while some remains owned by landowners with long-term surface leases held by the company. In the event that the mine activity is shut down, the land will be returned to the landowners after reclamation work has been completed.

The Björkdal Property is located in reindeer habitat belonging to the Sami village Mausjaur in the west and to the Sami village Svaipa in the east. The habitats have winter grazing areas in the vicinity however there are no current issues with the indigenous Sami population.

4.4 Environmental Liabilities and Permitting

Mandalay reports that Björkdal has been fully permitted in accordance with Swedish environmental, and health and safety legislation. An environmental permit was issued in December 2018 and remains in good standing. The permit is valid for 10 years and allows for expansion of the tailings management facility (TMF) suitable for a mill throughput of 1.7 million tonnes per annum (Mtpa). A mining permit is included within the environmental permit. During 2019, an adjustment was submitted to the environmental permit that was approved in July 2021 which included an increased underground mining permit area and changes in the construction of the K1 tailings dam.

4.5 Royalties, Back-in Rights, Payments or Other Encumbrances

The holder of an exploitation concession pays an annual minerals fee to the landowners of the concession area and to the State. The fee is 0.2% of the average value of the minerals mined from the concession, 0.15% of which is paid to the landowners in proportion to their share of ownership of the concession area. The remaining 0.05% is paid to the State to be used for research and development in the field of sustainable development of mineral resources. The fee is estimated after consideration of the amount of mined ore, the amount of minerals in the ore, and the average price of the mineral during the year or by use of an equivalent value.

4.6 Comments on Section 4

Mandalay have secured regulatory licenses and authorisations required for the Björkdal Property operations. Mandalay have indicated they have the support of the community and government organisations and hold the required environment permits to continue the project. The QP is not aware of any legal restrictions that affect access, permits or the ability to perform work on the Property.

5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 Accessibility

The Björkdal Property is located approximately 40 km by road northwest of the municipality of Skellefteå (population of 72,000) and is accessible via Swedish national road 95 or European highway route E4 followed by all-weather paved roads. The Norrberget Project is located approximately four kilometres east of the Björkdal Mine and is accessible via a forest road.

On the Björkdal Property, gravel roads link the main site gate entrance to the surface infrastructure. Gravity concentrates are transported offsite by truck from the Mine to Skellefteå where the product is loaded onto ships for delivery to smelting customers in Europe. Sulphide flotation concentrates are trucked to nearby processing facilities.

The nearest airport, located in Skellefteå, has a regular daily service to the capital Stockholm.

5.2 Climate

This area of Sweden has a subarctic climate with mild summers and cold snowy winters. The climate is, however, moderated by its proximity to the Gulf Stream, so that while winters are cold, they are much less so than winters at similar latitudes in other parts of the world. The average low temperature for January is -14°C. The short summers are also reasonably warm for latitudes near the Arctic Circle. The average daily high temperature in July is 19°C, although, in recent years, temperatures above 30°C have been recorded.

Yearly precipitation is low at less than 600 mm, with August being the wettest month at over 71 mm. Precipitation is quite low near the coast, but snow may lie on the ground for up to five months. Due to its high latitude, July is typified by an average of 21 hours of daylight while the average for December is four. Climatic conditions do not affect Björkdal's or Norrberget's exploration activities, and the Mine and processing facility are able to operate throughout the year.

5.3 Local Resources

The Västerbotten region has a long history of mining activity and Skellefteå is an industrial town. The region is home to several competence centres and two universities with the bulk of Sweden's academic and vocational units related to mining, metallurgy, and geology located within a radius of 130 km.

The region includes specialized companies, suppliers, and contractors linked to the mining industry with world-class manufacturers of mining equipment and machinery. Both experienced and general labour is readily available within the region.

The Company has hired experienced staff and personnel with mining expertise. The Property has the support of local communities as mining is accepted as a socially responsible and necessary contributor to the local economy.

5.4 Infrastructure

5.4.1 Björkdal

The Property comprises extensive surface and underground infrastructure, which includes the following:

- Well-kept gravel site roads
- An administration building with office space and kitchen facilities
- Modular buildings with office space for contractors, changing rooms, and mine dry mess
- An open pit mine with ramp access to the underground operations
- An underground mine consisting of ramps and sub-level development
- Raw ore stockpile facility with several 5,000 tonne to 7,000 tonne capacity raw ore stockpiles
- Primary jaw crushing plant with 400 tonne coarse ore stockpile
- Secondary crushing facility
- 5,000 tonne fine ore stockpile and reclaim facility
- 3,700 tpd mill, gravity gold plant, and flotation plant
- An internal metallurgical assay laboratory
- Company and contractor maintenance facilities
- A core logging facility with covered storage, sample preparation laboratory, and grade control assay laboratory
- 250 ha Tailings Management Facility (TMF)
- Fresh water supply and storage
- Water treatment plant
- Explosives magazine and mixing facilities
- Storage facilities for chemical reagents and bulk supplies
- An off-site covered core storage facility
- Swedish grid electrical power supply.

5.4.2 Norrberget

Currently, no infrastructure exists at the Norrberget deposit other than forest access roads used for forestry and hunting access to the surrounding area, and exploration drill pads. Water for drilling is obtained from surface streams or pumped from previous drill holes.

5.5 Physiography

The Björkdal Property is located at an average elevation of 140 m ASL. The terrain around the Property is relatively subdued with low hills and numerous shallow lakes. Glacial till forms the main soil cover over the area. The vegetation is dominated by managed forests of spruce and birch with some areas of cultivated land.

6 HISTORY

6.1 Ownership History

6.1.1 Björkdal

The Björkdal deposit was originally discovered in 1983 by Terra Mining AB (Terra Mining) during a till sampling program which discovered anomalous gold values in the glacial till profile. Anomalous gold values in bedrock were discovered in 1985 and a resource definition drilling program began in early 1986.

The definition drilling program included a metallurgical test work program and a Feasibility Study was completed in May 1987. The Study returned a positive outcome and Terra Mining commenced mining operations at Björkdal in July 1988. Mining of the open pit continued through 1999 by Terra Mining and its successor William Resources Ltd until the operation closed due to a low gold price. The assets were purchased by public auction in June 2001 by International Gold Exploration, which operated the mine from September 2001 until 2003 when it was acquired by Minmet plc (Minmet).

In 2006, Gold-Ore Resources Ltd. (Gold-Ore) acquired an option from Minmet to purchase the mine and on 31 December 2007, Gold-Ore exercised its option and acquired all the shares of Björkdalsgruvan AB. During exploration and development of the mine, Gold-Ore generated cash flow from gold sales. The company operated the plant at the mine fed by stockpiled material and open pit mining of new material as it became available. Underground development operations commenced on a full scale in mid-2008. In January 2009, Gold-Ore's management concluded that there were sufficient Mineral Reserves and Mineral Resources at the mine for at least a five-year mine life and declared commercial production.

In May 2012, Elgin Mining Inc. (Elgin) acquired all of the issued and outstanding common shares of Gold-Ore. Gold-Ore's common shares were delisted from the TSX and Elgin transitioned from a TSX Venture listed company to a TSX listed company.

On 4 June 2014, Mandalay entered into an arrangement pursuant to which Mandalay would acquire all the outstanding common shares of Elgin. The transaction was completed on 10 September 2014.

6.1.2 Norrberget

The Norrberget deposit was discovered by COGEMA in 1994 and drilling occurred until 1996. In 1997, COGEMA withdrew from Sweden and disposed of all assets in the region. The exploration permits around the Björkdal dome and covering the Norrberget deposit were taken up by North Atlantic Nickel.

On 28 September 2007, Gold-Ore purchased exploration permits surrounding the Björkdal Property from NAN. The Property was then acquired by Elgin and subsequently passed to Mandalay through the acquisition process described in Section 6.1.1.

6.2 Previous Mineral Resource and Mineral Reserve Estimates

The evolution of Measured and Indicated Mineral Resources for the Björkdal Property is presented in Figure 6-1. Mineral Resource and Mineral Reserve estimates during the Mandalay Resources ownership period from 2014 to 2019 were completed by Roscoe Postle Associates Inc. (RPA) and in 2020 by SLR Consulting Ltd (SLR). During 2019 SLR acquired the business of Roscoe Postle Associates Inc.

A detailed description of the Mineral Resource and Mineral Reserve estimates prepared by previous owners Minmet, Gold-Ore, and Elgin has been presented in prior Technical Reports by RPA (2015 through 2019) and by SLR in 2020.

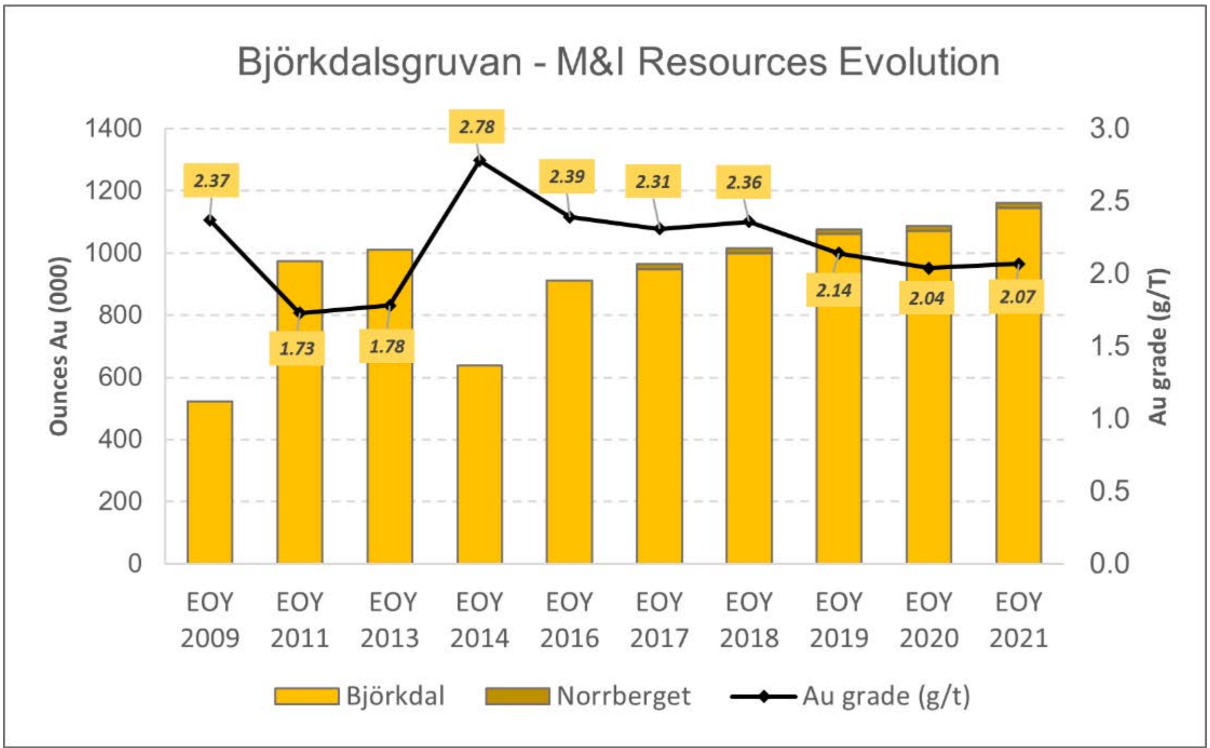


Figure 6-1: Björkdal Property Mineral Resource change over time

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 including both Björkdal and Norrberet 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.

6.3 Past Production

6.3.1 Björkdal

The Björkdal Property has a long operational history; details of past production after 1988 are presented in Table 6-1 and in graphical form in Figure 6-2.

Table 6-1: Björkdal Property annual gold production 1988 to 2021

Year	Production (kt)	Feed Grade (g/t Au)	Recovery (%)	Production (oz Au)
1988	148	2.29	89.1	9,683
1989	475	2.86	90.9	39,727
1990	613	2.56	89.9	45,350
1991	765	2.64	89.8	58,270
1992	872	2.94	89.9	74,133
1993	840	3.33	90.7	81,549
1994	877	2.62	92.0	67,980
1995	1,157	2.11	90.0	70,646
1996	1,276	2.31	91.0	86,210
1997	1,288	2.49	89.6	92,416
1998	1,317	1.77	89.7	67,227
1999	635	1.50	89.8	27,500
2000	-	-	-	-
2001	303	1.09	84.1	8,922
2002	1,190	1.02	86.4	33,723
2003	1,198	1.30	86.4	43,274
2004	1,194	0.94	85.0	30,665
2005	1,197	0.68	84.7	22,172
2006	1,210	0.61	86.8	20,591
2007	1,109	0.63	85.5	19,214
2008	1,170	0.89	87.5	29,288
2009	1,064	1.24	88.4	37,568
2010	1,155	1.23	89.0	40,729
2011	1,215	1.17	88.6	40,358
2012	1,385	1.20	87.8	46,808
2013	1,261	1.32	87.8	46,941
2014	1,318	1.24	88.2	46,292
2015	1,303	1.22	88.1	44,920
2016	1,289	1.35	87.9	49,140

Year	Production (kt)	Feed Grade (g/t Au)	Recovery (%)	Production (oz Au)
2017	1,262	1.75	89.1	63,186
2018	1,249	1.29	90.0	46,662
2019	1,289	1.43	88.8	52,514
2020	1,320	1.24	87.7	46,289
2021	1,260	1.31	87.8	46,438
Total	**35,204**	**1.36**	**88.4**	**1,536,385**

Source: Mandalay Resources Corporation – Björkdal Gold Mine

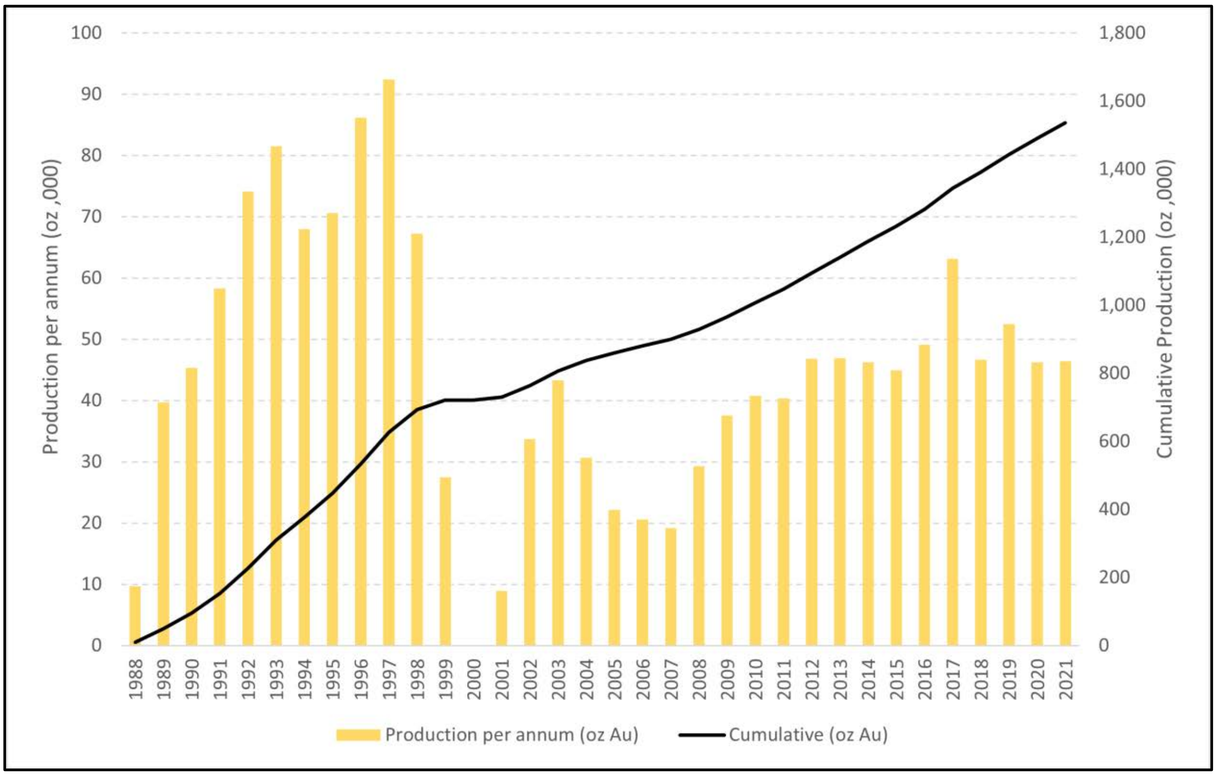


Figure 6-2: Graph showing Björkdal Property annual gold production from 1988 to 2021

6.3.2 Norrberget

There has been no production from the Norrberget deposit.

7 GEOLOGICAL SETTING AND MINERALISATION

7.1 Regional Geology

The Skellefteå region consists of Paleoproterozoic rocks hosting several world-class volcanogenic massive sulphide (VMS) copper, zinc, and lead deposits that have been worked for nearly a century. The Skellefteå district lies within a large and ancient cratonic block named the Fennoscandian Shield. The Fennoscandian Shield spans much of Finland and northwestern Russia, extending further westward throughout Sweden and Norway.

Mineralisation in the Skellefteå region is focused within and around a regionally extensive, west to northwest trending structural feature named the Skellefteå belt (Figure 7-1). The Skellefteå belt is 120 km long and 30 km wide and consists of deformed and metamorphosed volcanic, sedimentary, and igneous rocks that are all Paleoproterozoic in age. Deformation and metamorphism are attributed to the Paleoproterozoic Svecokarelian orogeny that occurred around 1.88-1.8 Ga. Metamorphism is associated with the Svecokarelian orogeny ranges in intensity from greenschist to amphibolite facies.

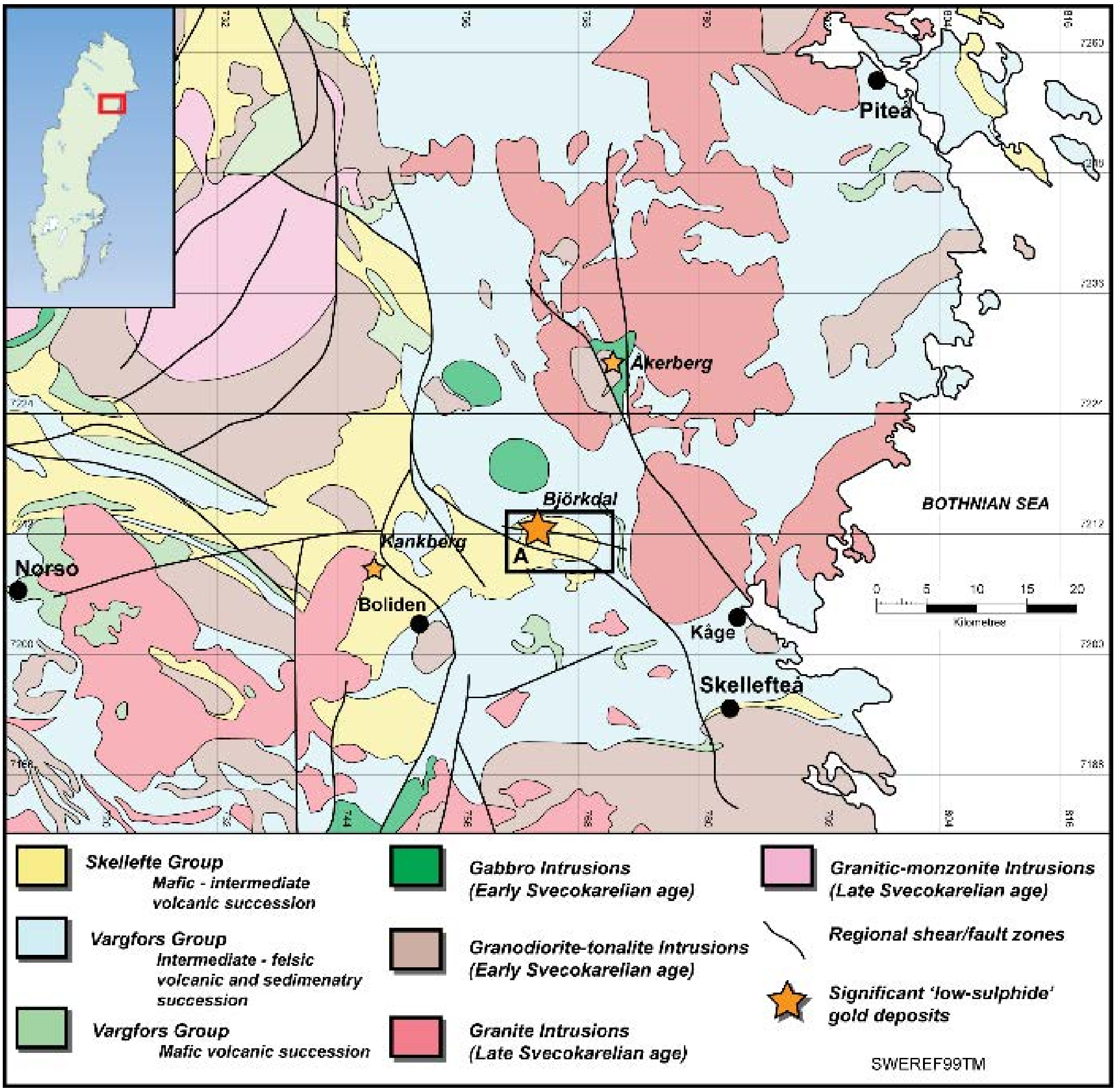


Figure 7-1: Regional geology of the Björkdal project area

7.1.1 Regional Stratigraphy

The stratigraphy in the Skellefteå area consists of Paleoproterozoic volcanic, volcanoclastic, and sedimentary rocks. The stratigraphy is divided into two large litho-stratigraphic groupings that are named the Skellefte Group (lower division) and the Vargfors Group (upper division) as defined by Allen et al. (1997). The Skellefte Group is dominated by extrusive volcanic successions that are interbedded/intercalated on a large scale with clastic sediments, with volcanic rock-types within the Skellefte Group classified as rhyolite, dacite, andesite, and basalt rock-types. Sedimentary lithologies comprise black pyritic mudstone and shale, volcanoclastic rocks, breccia conglomerates and minor carbonates.

The overlying Vargfors Group is dominated by clastic sedimentary rocks with lesser mudstone and carbonates, sporadically interbedded with thin volcanic successions. The lower portions of the Vargfors Group consist of abundant conglomerate and sedimentary breccia. Locally, rare carbonate beds are observed interbedded within these conglomerates, while the finer-grained siliciclastics may contain a carbonate-rich matrix. Total stratigraphic thickness of the entire Skellefte and Vargfors Groups is in the order of seven kilometres (three and four kilometres respectively; Allen et al., 1997).

The stratigraphic successions are locally intruded by igneous rocks thought to belong to the Jörn granitoid suite. Relative ages of these intrusive bodies are constrained through radiometric dating and field relationships indicate a contemporaneous emplacement age with the volcanic rocks belonging to the Skellefte Group, with lithic intrusive clasts found within the overlying Vargfors Group (Lundberg, 1980; Clauson, 1985; Wilson et al., 1987). Compositions of these intrusive rocks of the Jörn granitoid suite range considerably from felsic to mafic with end-member compositions respectively represented by gabbro and granites.

7.1.2 Regional Structure

The rocks of the Skellefteå belt are observed to have undergone two major shortening events and metamorphism during the Svecokarelian orogeny. The first of the major shortening events resulted in folding and shearing; folding consists of vertical to upright isoclinal folds with east to northeast striking axial planes, while shear zones are oriented sub-parallel to the axial planes of the folds. The later shortening event produced structures mainly dominated by shearing, with only minor folding coaxially overprinting the earlier generation of folding (Weihed et al., 2003).

7.2 Project Geology

Existing literature on the geological setting of the Björkdal gold deposit describes auriferous veins hosted within the outer margin of a large quartz-monzodiorite or tonalite intrusion surrounded by supra-crustal rocks. The contact between the intrusion and surrounding rocks was represented by a "major thrust duplex", which truncated the mineralised vein-system (Bergström and Weihed *in* Kathol and Weihed, 2005, and references within).

Radiometric dating of zircons extracted from Björkdal host rocks (Lundström and Anthal, 2000) returned age dates of 1,905 Ma. It was noted that many zircon forming events were apparently observed and were considered to represent the emplacement age of the intrusion.

The oldest intrusive rocks within the Skellefteå district were the Jörn granitoids documented to post-date the Björkdal intrusive rocks that date between 1,890 and 1,870 Ma (Kathol et al., in Kathol and Weihed, 2005). The 1,905 Ma emplacement age corresponded to the reported depositional age of the Bothnian Basin sediments in which the Björkdal intrusion was hosted (Claesson and Lundqvist, 1995). Therefore, the formational interpretation of geological features in the Björkdal area (such as Björkdal dome) align poorly with the regional chronological framework presented in the literature. The property-scale geological setting has been presented in Figure 7-2.

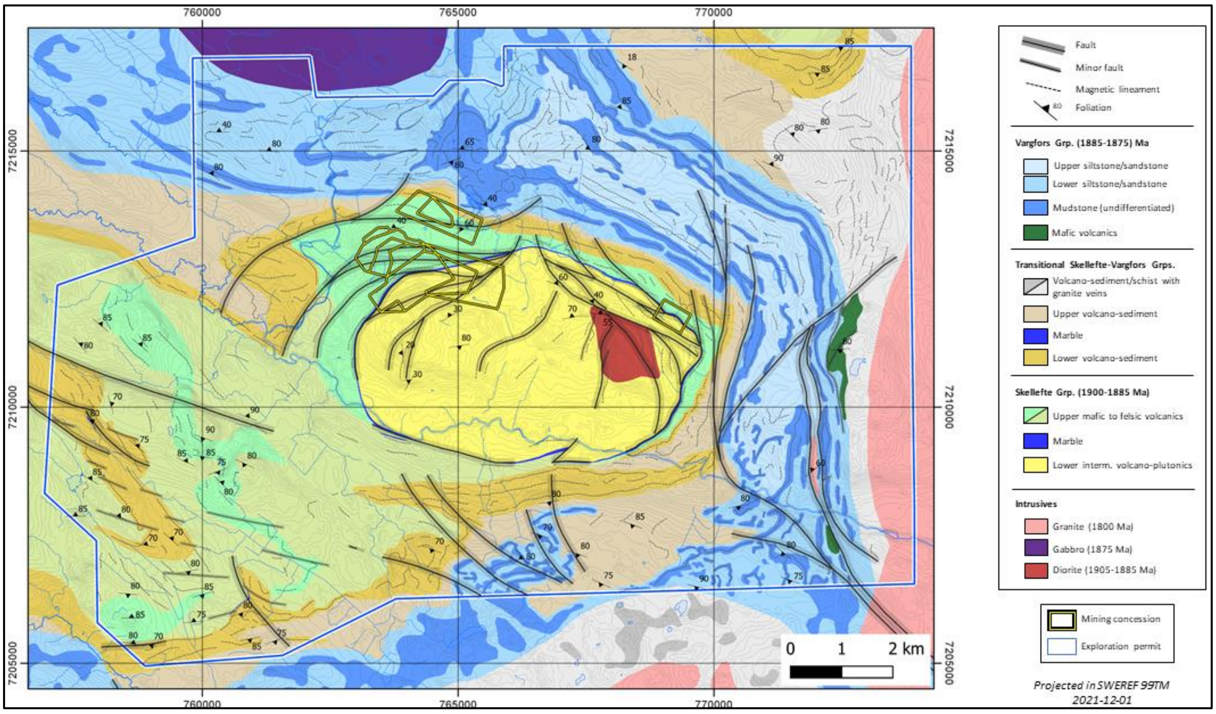


Figure 7-2: Björkdal Property geology map

7.2.1 Local Geology

Detailed litho-stratigraphic mapping, petrological observations and geochemical analysis undertaken by Mandalay/Björkdalsgruvan AB geologists have concluded that host rock geology, metamorphism and alteration styles are much more complex and variable than previously documented. Previous investigations considered the domal structure in the Björkdal area was a large, massive plutonic-type intermediate intrusion. Mandalay's investigation interpreted a variable and complex alteration signature that overprinted different rock-types including pyroclastic, volcano-sedimentary, tuffaceous, extrusive-volcanic (andesitic to basaltic compositions), sub-volcanic intrusive (andesitic compositions), and sedimentary (silici-clastics, shales and carbonates) lithologies.

Common alteration and metasomatic styles observed have included silicification, carbonatization, calc-silicate (actinolite) alteration, albitization, chloritization, potassic (biotite and K-feldspar), epidotization, pyritization and tourmalinization. Various skarn-type alteration assemblages were also noted in areas where a calcareous host rock was present (including actinolite, tremolite, pyroxene, and minor garnet).

While alteration and metasomatic zonation of these various styles was present, the spatial distribution was not clearly defined. It was considered that a major control on the alteration zonation appeared to be the host rock lithology (protolith composition) and the proximity to major fluid driven heat source (i.e. hydrothermal systems).

7.2.2 Local Stratigraphy

A litho-stratigraphic column of geologic units observed in the Björkdal area is presented in Figure 7-3. The deepest succession found in the area comprises a unit of volcaniclastic sandstones and conglomerates, interbedded with lavas, ignimbrites, tuffs, bedded sandstone, and mudstone/shales.

A large sub-volcanic intrusion (interpreted as an andesitic laccolith) has locally intruded this volcanic succession in the south and southwestern margins of the current open pit but has not yet been encountered elsewhere within the mine area.

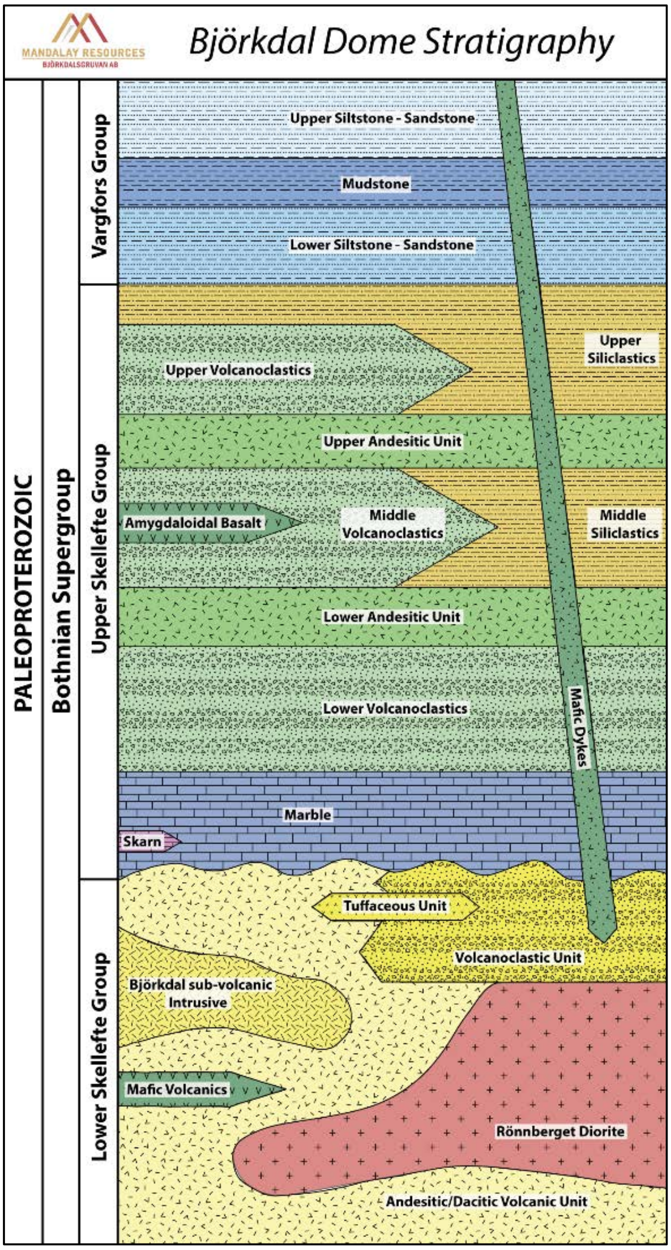


Figure 7-3: Björkdal stratigraphic profile

Source: Mandalay Resources Corporation – Björkdal Gold Mine

A unit of massive crystalline marble unconformably overlies these lower volcanic and clastic units. Overlying the crystalline marble is a thin pyroclastic unit (characterised by abundant "fiamme" clasts), which is then sharply overlain by basaltic lava containing abundant amygdales (defined by actinolite and carbonate in-fill). Above this basalt, the stratigraphy appears to become increasingly marine in genesis, with the overlying units consisting of laminated and interbedded tuffs and mudstone (basaltic geochemical composition), finely laminated mudstones and siltstone, and poorly sorted sandstone. Gradationally overlying these clastic sediments is a monotonous series of graphitic and pyritic shale (pyrite is often altered to pyrrhotite), interbedded with poorly sorted siltstone and sandstone with minor course-sand/grit beds. Partial Bouma sequences are observed within the more clastic intervals of this upper shale succession.

The local stratigraphy at the Property is related with the upper and lower portions of the Skellefte and Vargfors groups, respectively (as defined in Allen et al., 1997). The units present below the upper contact of the crystalline marble are interpreted to correlate with the upper portions of the Skellefte Group. These carbonate units are interpreted to represent the eastward, deeper-water, lateral-equivalent of Kautsky's (1957) "Menstäsk conglomerate", described as consisting of lime-cemented marine conglomerate and sedimentary breccia. As such, the upper contact of this calcareous unit is here defined as an approximate stratigraphic position of the Skellefte-Vargfors Group boundary.

7.2.3 Alteration

Alteration assemblages at Björkdal can be varied and complex with both regional and local scale alteration systems observed. The regional-scale alteration can be loosely defined on the presence of key minerals such as albite, epidote, and K-feldspar. While silica, carbonate, actinolite, chlorite, and biotite are often more abundant than albite, epidote, and K-feldspar, they are very widespread and too abundant to be used to define any clear spatial zonation.

The alteration zonation around the Björkdal structural dome can be generally described as follows: the southern portions are dominated by significant K-feldspar assemblages, the northern portion is dominated by albite, and part of the central to north-central portion of the dome contains noticeable amounts of epidote (Figure 7-4). The genetic and chronological relationships between the gold mineralisation and alteration are unclear, however, known gold mineralisation has much more intensive associated silicification, particularly in areas of faulting and shearing, suggesting a close relationship between alteration intensity and gold mineralisation.

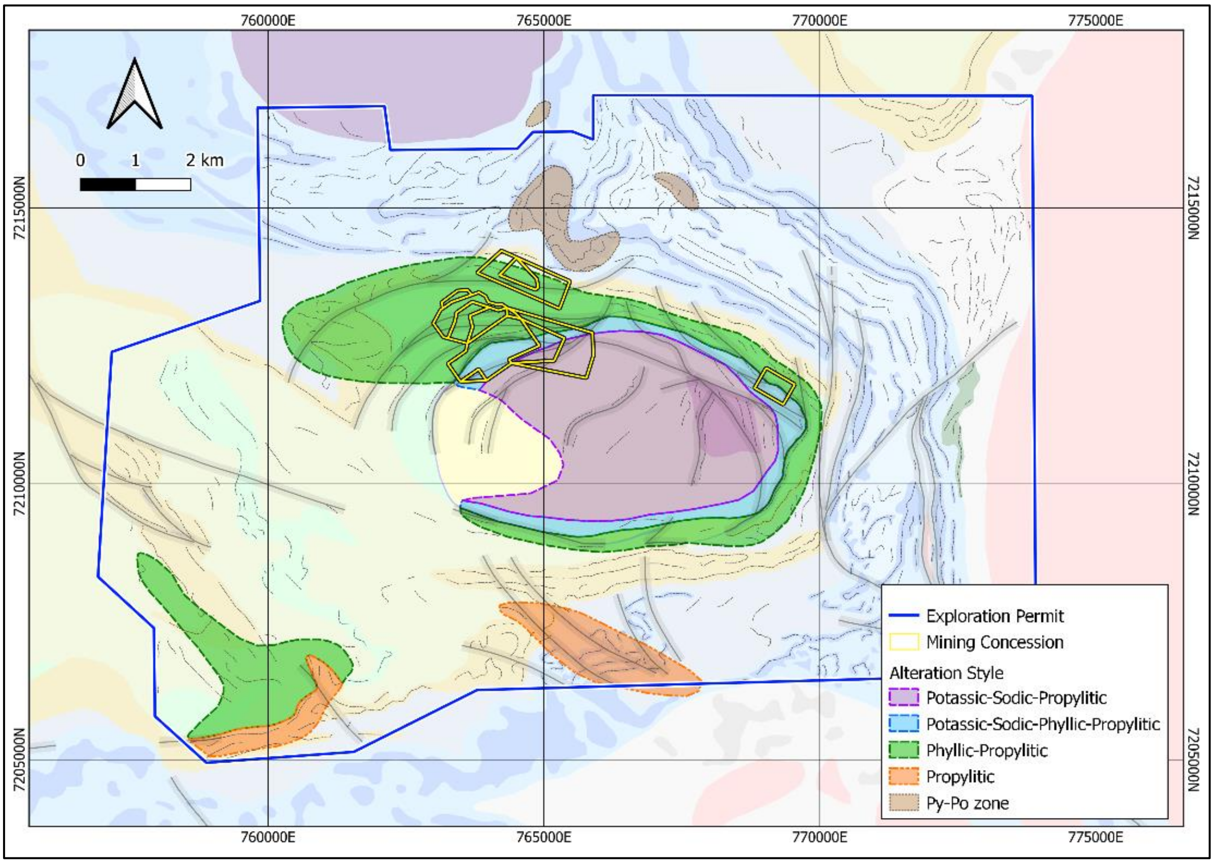


Figure 7-4: Broad Scale Alteration Map of the Björkdal Dome

Alteration at Björkdal typically consists of silicification and albitization of the wall rock that extend outwards up to one metre from the vein walls. Areas of intense silicification and albitization are observed to have completely recrystallized the wallrock in some cases. Disseminated actinolite, chlorite, sericite, and pyrite, with lesser amounts of epidote, pyroxene, garnet, and sphene occur within these vein wall alteration halos.

In areas of the mine where the most intense alteration is in contact with the Björkdal marble unit, strong skarnification can be observed. This skarnified marble unit consists of silica, chlorite, amphibole, actinolite, hornblende, pyroxene, and clinopyroxene. Gold mineralisation in these areas is related to silica-pyrrhotite-actinolite clotted disseminations with diameters of one to two centimetres.

7.2.4 Mineralogy

The main type of mineralisation found in the Björkdal gold system is dominated by vertical to sub-vertical dipping quartz-filled veins. Common accessory minerals contained within these veins are (in approximate order of occurrence): tourmaline, calcite, biotite, pyrite, pyrrhotite, actinolite, scheelite, chalcopyrite, bismuth-tellurides (pilsenite and tsumoite), gold, and electrum. Gold mineralisation is most closely related to the bismuth-telluride minerals and is also more reliably encountered in veins with high abundances of pyrrhotite, pyrite, scheelite, and/or chalcopyrite.

In general, veins of pure quartz and free of the accessory minerals listed above are generally quite poor hosts for significant quantities of gold mineralisation. As such, the informal terminology of “clean veins” and “dirty veins” has been adopted at the mine site to quickly describe vein-fill characteristics. Structural analysis of these two distinct vein-fill types from the Main Zone -325 and -340 levels suggests that the “clean” veins will more often strike between 030° and 040° from true north, while the “dirty”, inclusion-rich veins are more likely to strike between 050° and 090° from true north. This structural-geochemical relationship suggests that vein development in the Björkdal deposit occurred as more than a single “vein-forming” event, and that the fluids responsible for the vein-fill and mineralisation were evolving with time.

7.2.5 Local Structure

The local structure of the Björkdal deposit is dominated by a number of shallow, north to northeast-dipping brittle-ductile faults and shears (Figure 7-5). The dominant structure, which can be traced along the full length of the Property, is referred to as the Björkdal Shear (Figure 7-6). The majority of kinematic indicators identified along these structures appear to be dominantly oblique strike-slip. The brittle structures consist of fault-gouge that has undergone sporadic re-healing and “cementation” by carbonate, silica, and sericite.

Brittle-ductile structures have a highly sheared fabric and/or rotated and boudinaged quartz veins (Figure 7-6) that may include masses of very weakly foliated biotite. This latter set of structures can be significantly mineralised in gold in economic quantities. The temporal relationship between mineralised quartz veins and the structures appears complex with numerous cross-cutting relationships which may suggest multiple phases of deformation during mineralisation emplacement.

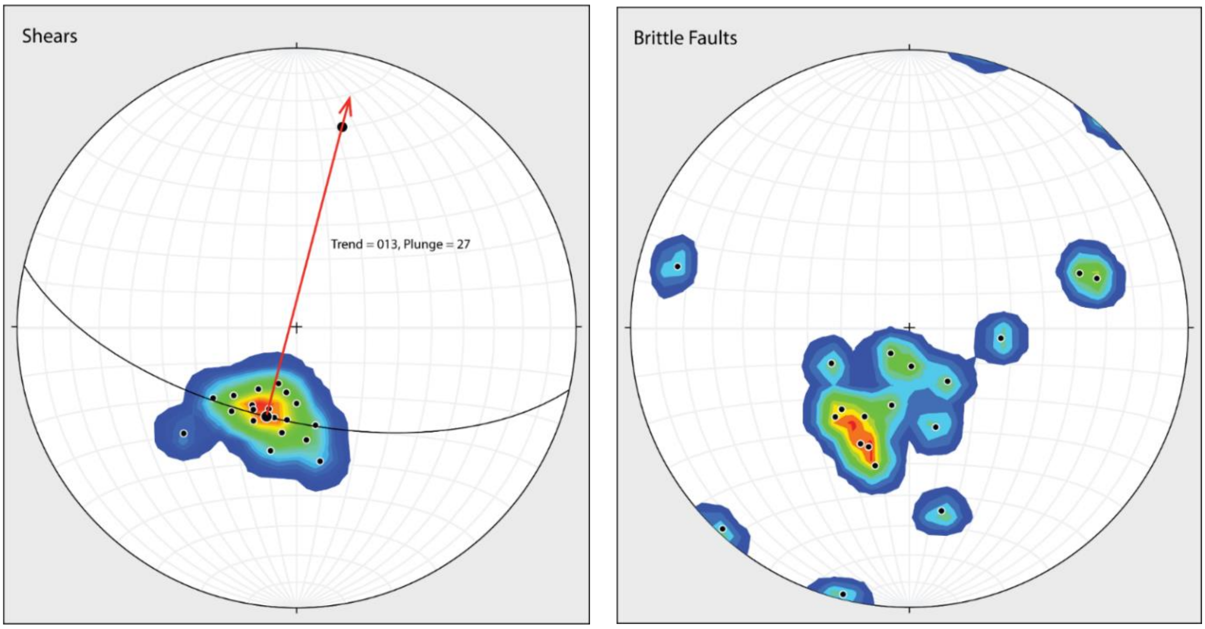


Figure 7-5: Stereonet Plots (Poles to Planes) of Shears and Brittle Faults

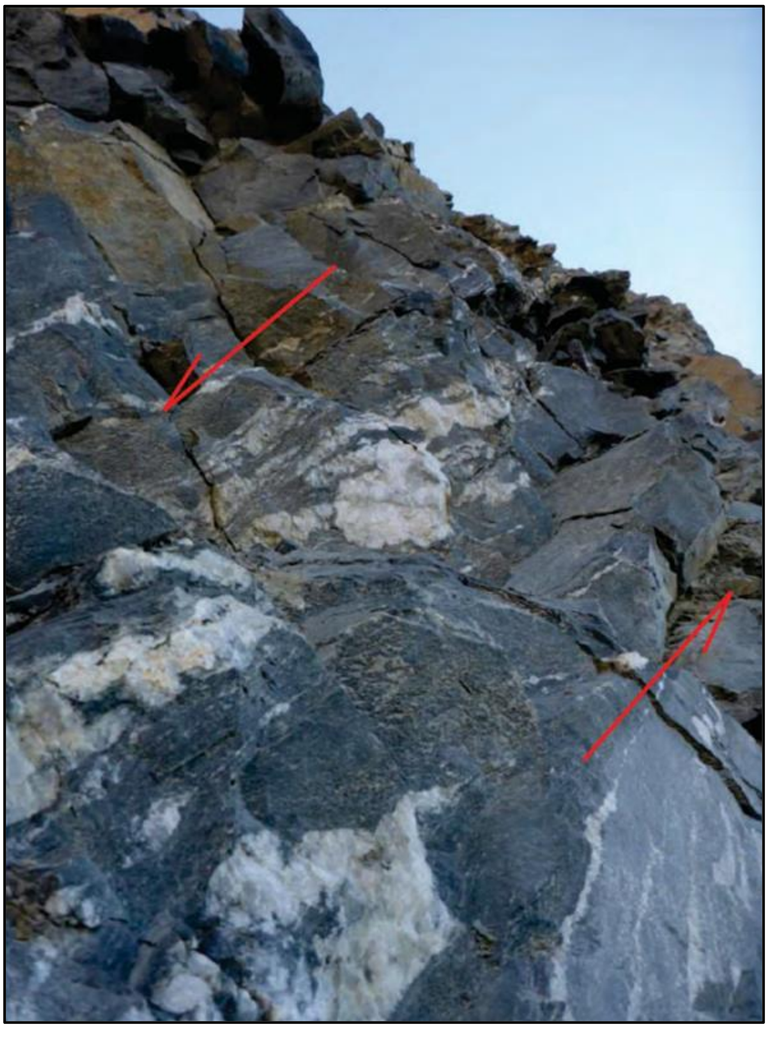


Figure 7-6: Example of the outcropping Björkdal Shear

7.3 Mineralisation

7.3.1 Björkdal Gold Mineralisation

The Björkdal gold deposit is a lode-style, sheeted vein deposit hosted within the upper portions of the Skellefte Group sediments. To date, the deposit measures roughly 2,000 m in length, 1,800 m in width and extends 600 m deep. Gold can be found within quartz veins that range in thickness from less than one centimetre to more than several decimetres. These veins are usually observed with vertical to sub-vertical dips and strike orientations between azimuth 000° and azimuth 090°. The majority of veins strike between azimuth 030° and 060°. Veining is locally structurally complex, with many cross-veining features observed and thin mineralised quartz veinlets in the wall rocks proximal to the main quartz veins (Figure 7-7).

Figure 7-7: Complex veining styles observed underground

Gold-rich quartz veins are most often associated with the presence of minor concentrations of sulphide minerals including pyrite, pyrrhotite, marcasite, and chalcopyrite. Associated non-sulphide minerals include actinolite, tourmaline, and biotite. Scheelite and bismuth-telluride compounds (i.e. tellurobismuthite and tsumoite) are also commonly found within the gold-rich quartz veins, which are typically excellent indicators of gold mineralisation.

Gold occurs dominantly as free gold, however, gold mineralisation can also be associated with bismuth-telluride minerals, electrum, and pyroxenes. Silver is observed as a minor by-product in the Björkdal processing plant, however very little is known about its deportment within the deposit, although it has been assumed to be associated with electrum in the mineralisation.

7.3.2 Björkdal Skarn Mineralisation

Skarnification occurs commonly within the Mine, especially in the limestone/marble unit where it occurs as discreet patches and lenses, these lenses typically measure 200-400 m along strike, 100-200 m down dip and are usually no more than 10 m thick. However, similar calc-silicate alteration has taken place in areas where local shearing has affected the volcanoclastic host rock. The altered rock texture appears sheared and mottled to a varying degree; locally the rock can have a folded appearance. In places where the skarnification is the strongest, the precursor rock texture has been completely overprinted. The skarnified rock has been divided to prograde and retrograde phases based on their dominant mineralogy. Prograde skarn is light green and is dominated by clinopyroxene patching with partial to complete breakdown of the pyroxene patches to amphiboles (actinolite/tremolite), chlorite, calcite, and to a minor degree serpentine and talc. The retrograde skarn is finer grained and darker green in colour than the prograde skarn and consists primarily of amphiboles, chlorite, and calcite (Figure 7-8). It is likely that the retrograde skarn represents patches of alteration where the calc-silicification did not progress as far as it did in the prograde skarn. The limestone can also be dolomitic and silicified as well as containing irregular quartz patches, quartz veins, and overprinting calcite veins.

Figure 7-8: Example of Retrograde Alteration of Lake Zone Skarn

Shearing is a known mechanism of skarnification. The skarnification here is most likely due to fluid influx where shears and faults interacted with the limestone/marble unit or calcite banded volcanoclastic rocks. The limestone/marble unit is predisposed to accommodate strain and can be exploited by structures (both large and smaller scale) due to the rheological difference between the limestone/marble and the surrounding volcanic and volcaniclastic rocks. It is more ductile, prone to folding on varying scales and the calcium carbonate is reactive enough to interact with infiltrating fluids and more importantly, provide calcium for the calc-silicification. The large-scale structures are interpreted to function as channels for the fluids that alter the host rocks in the Björkdal area. Where the Björkdal Shear or its smaller conjugate faults intersect with the limestone/marble unit, the retrograde skarnification and low-grade gold mineralisation can occur (Figure 7-9). Where two or more structures interact with each other and the limestone/marble unit, the skarnified lenses consist of prograde skarn and carry higher grades (e.g. Lake Zone north skarn lens).

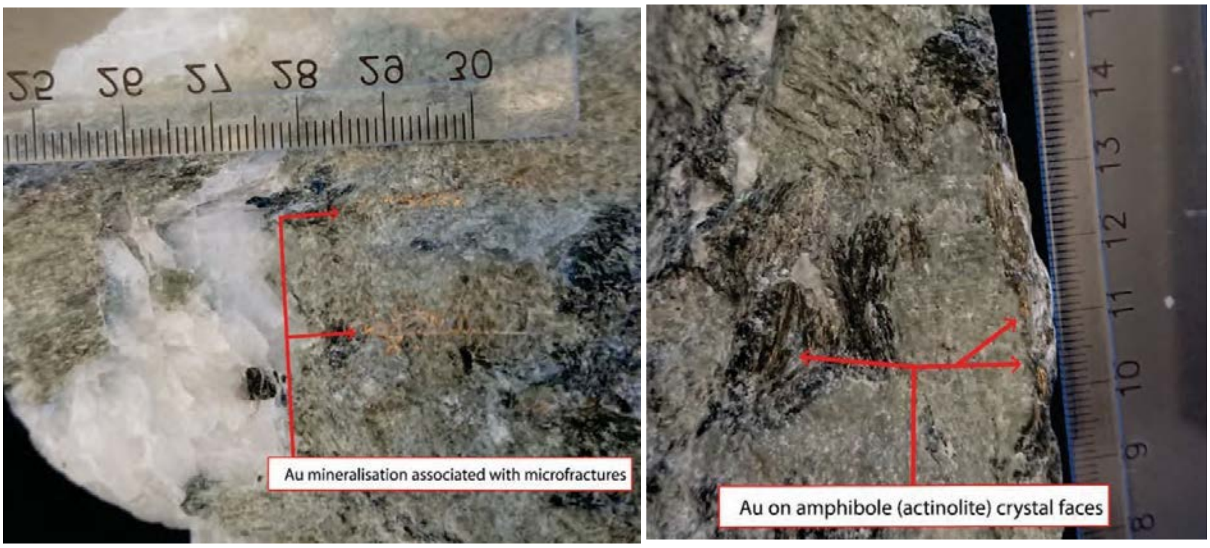


Figure 7-9: Example of Skarn-Hosted Gold Mineralisation

7.3.3 Structural Development of the Mineralisation

The relationship between mineralised veins and the local structures appears complex with various cross-cutting relationships observe in the Mine suggesting multiple phases of deformation throughout the mineralisation emplacement. A total of 25 major, north to northeast (true) dipping, strike-slip shears have been identified within the Björkdal Deposit, with numerous, localised systems observed throughout (Figure 7-10). The majority of the significant gold grades observed within the deposit are hosted in a proximal position (approximately 30 m) to the shear zones.

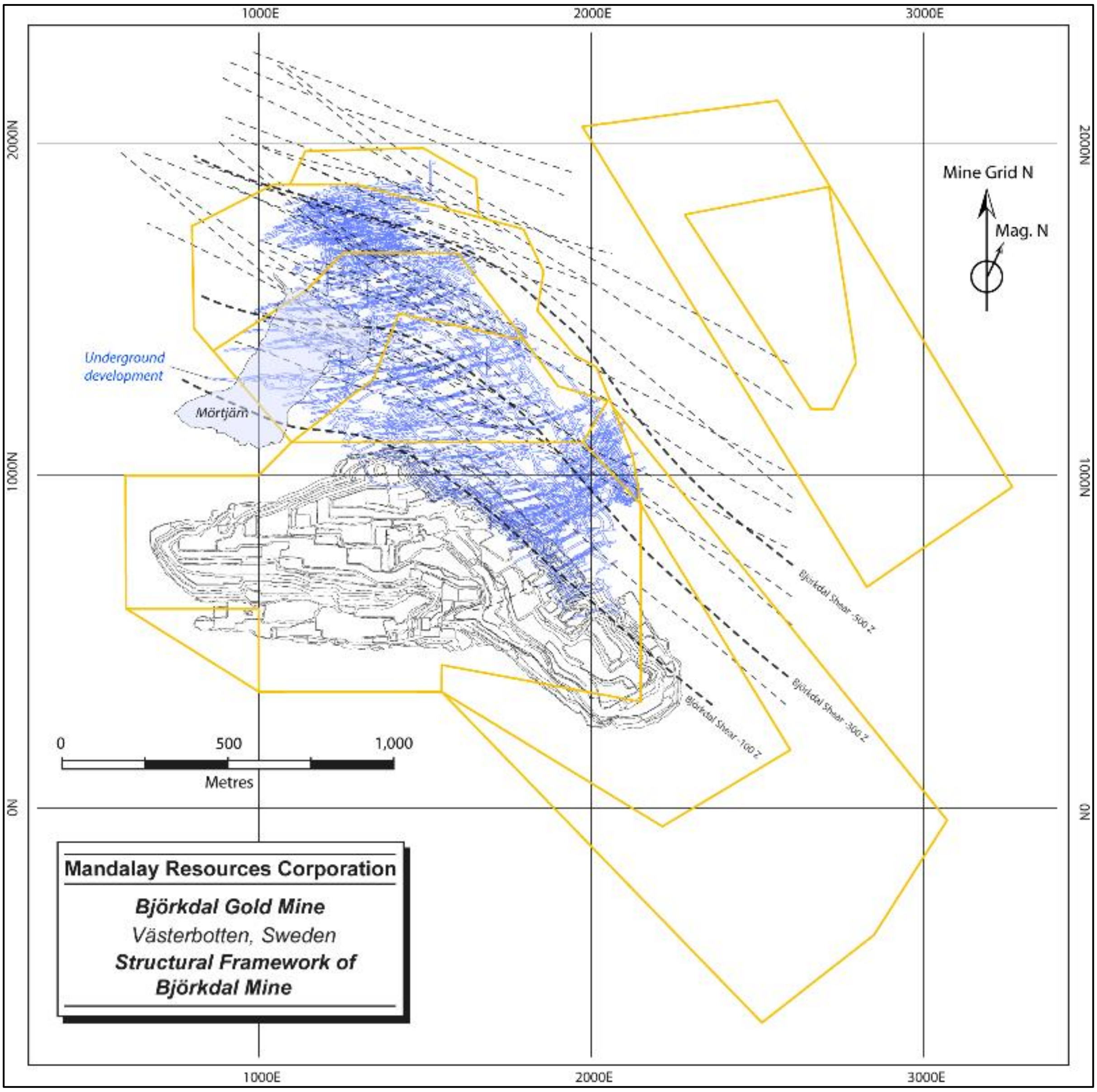


Figure 7-10: Structural Framework of Björkdal Mine

The most significant structure within the deposit is the Björkdal Shear, which can be traced along the extent of the mine and appears to form part of the larger, regional structural network. The shear is sigmoidal in nature and is observed to "kink" towards the north, allowing for the formation of a high-density fracture horizon above the marble unit. This kinematic evolution, along the strike length of the Shear has caused the relationship to the mineralisation to change. In the southern part of the mine, the Shear forms the hanging wall of the mineralisation, whereas in the north, the shear appears as the footwall of the mineralisation (Figure 7-11). Mandalay's interpretation considers that the Björkdal Shear may represent a post-mineralisation structure that has offset the gold bearing quartz veins into their current orientation by distances that are in the order of 400 m to 600 m.

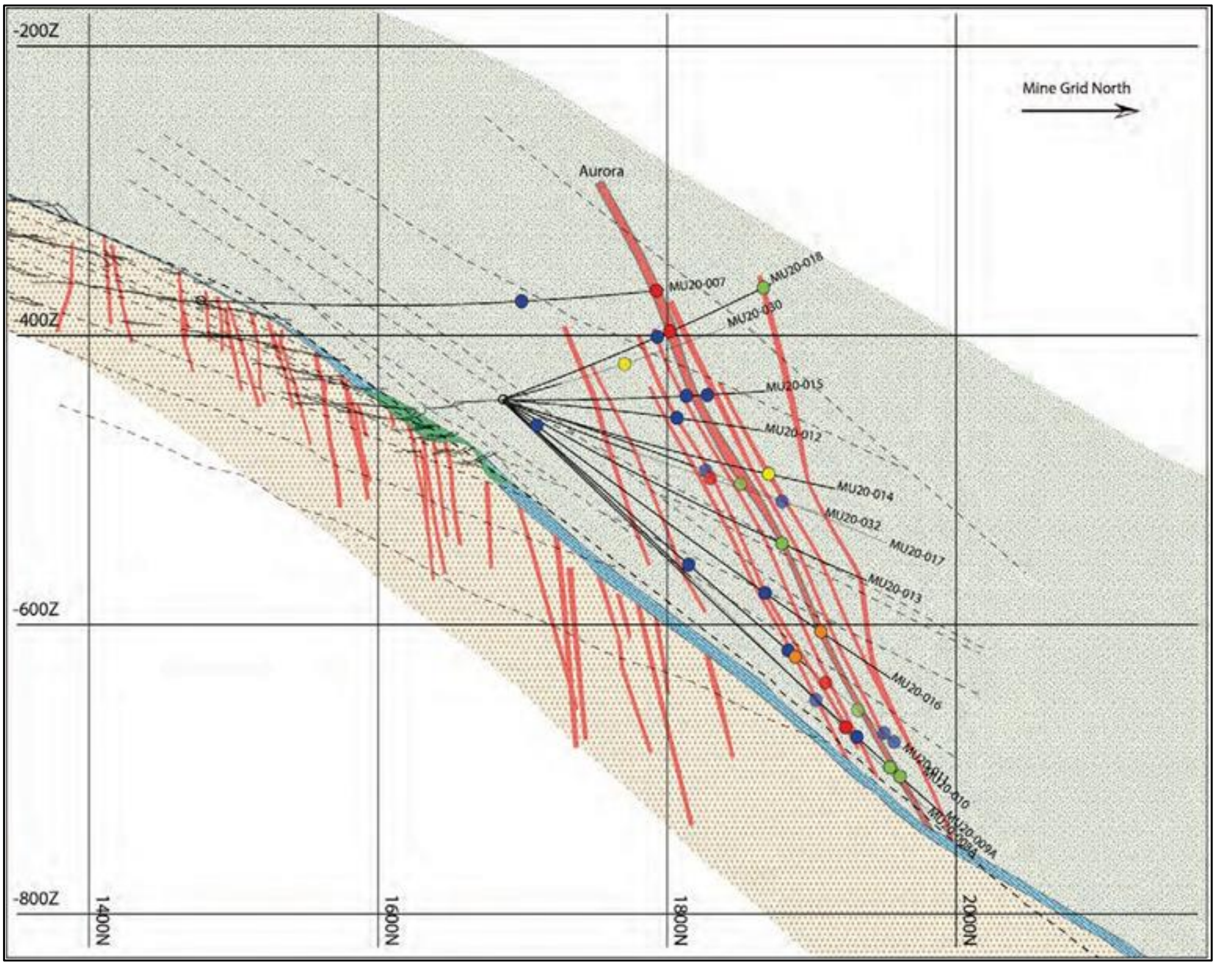


Figure 7-11: Example North-South Cross Section of the Quartz Veining and Structure

A detailed kinematic study within the deposit suggests that the smaller, more localised structures are second order structures related to the Björkdal Shear.

Veins in the Björkdal system are generally sub-vertical in dip and strike between 020° and 090° from true north. A subordinate set of veins have a similar sub-vertical dipping, but strike in a 330° from true north orientation. All vein sets appear to carry gold mineralisation to various extents, with higher grades occurring where veins of different orientations intersect one another. The slip-orientation of slickenside lineations in vein walls (030° to 090° vein set) indicates strike-slip movement, that has both sinistral and dextral features present within a single vein.

7.4 Norrberget

The mineralisation at Norrberget is stratabound within an interbedded altered volcaniclastic package that sits unconformably below a 30 m to 40 m thick marble unit. Gold mineralisation has been observed up to 50 m below this contact. Gold mineralisation is principally hosted in an amphibole-albite banded alteration and is also common where volcaniclastics are interbedded with crystalline tuff units. Theses alteration bands vary between one centimetre and 50 cm in thickness, are typically fine to medium grained and appear to be sheared. Trace sulphides and minor quartz/carbonate are associated with the bands.

Gold is also associated with the amphibole veinlets with the mafic crystalline tuff associated with carbonate and minor sulphides. Lesser amounts of gold can also be found within the heavily silicified volcaniclastics where minor amphibole is observed. Where visible gold can be identified within alteration banding, it is observed to be between or on the contact of grains.

Although veining is common, gold mineralisation is rarely associated with the quartz veins. Visible gold has been identified in veins consisting of grey fractured quartz along with amphibole, carbonate, silver, minor chalcopyrite, pyrrhotite, and galena. Veins consisting of quartz, carbonate, and albite with euhedral amphibole crystals can also carry gold mineralisation, however, the gold grade is not consistent along them. These veins can be intermixed and individual veins can continue for up to 50 m.

7.4.1 Structural Development of Mineralisation

The major controls on the mineralisation at Norrberget include the large-scale shear zone that marks the base of the marble unit, the rheological differences between different stratigraphic units, the variation in the lithological and porosity of the volcanic package, and the development of the fluid system that utilised the shear zone.

These large-scale shear zones run extensively through the area along the base of the marble unit that extends beyond the Mine and across the Norrberget deposit. The mineralisation occurs principally within a package of heterogeneous volcaniclastics containing interbedded ash falls, flows, and tuffs which have varying composition along with differing porosity and rheological characteristics.

Where the Norrberget volcaniclastics are not sheared, they are packaged conformably between metasedimentary rocks and mafic volcanic rocks above and medium grained subvolcanic intrusions and volcanic rocks below.

7.4.2 Alteration

The fluid system is believed to have utilised the shear contact at the base of the marble. A strongly silicified unit sits on top of the volcaniclastics which themselves are sheared throughout with a pervasive amphibole-albite-silica+carbonate alteration assemblage. The contact between the silicified and amphibole altered packages is gradual over a short distance. Lower in the package, K-feldspar/hematite and epidote can be observed, however, the underlying volcanic/subvolcanic rocks are not sheared to the same extent.

The evolution of the fluid system is believed to have first formed a pervasive silica-biotite+actinolite alteration that took advantage of the porous groundmass of the unaltered volcaniclastic package. The variable grain size and large angular fragments observed in drill core of the units below the lower marble contact resulted in a higher porosity and therefore a more substantial level of silicification. When additional shearing along with albite and actinolite alteration fluids were present at a later stage, the more robust silicified units were subjected to less shearing and alteration. This later stage of actinolite and albite alteration (where gold forms along their contacts) occurred primarily within the upper package of interbedded volcaniclastic rocks and crystalline tuffs, which is immediately below the upper pervasively silicified unit. The steeper quartz-amphibole veins, some of which contain gold and associated minerals, utilised the same association as the mineralised altered bands.

7.4.3 Veining

Although not as prevalent as at Björkdal, quartz veining occurs across Norrberget. A significant proportion of the veins occur in a similar orientation to the altered bands with quartz patches being associated with the alteration banding indicating that these are syngenetic to the alteration. A separate set of quartz veins can be observed to cross-cut the predominant fabric at a steeper dip between 65° and 85°, although with variable directions. A small proportion of these can be identified as being gold bearing with a limited selection containing very high grades. The high grade veins do not appear to have similar orientation to one another. The mineralogy of these steeper veins is similar to the shallower veins indicating that they were formed in the latter stages of the same fluid system.

8 DEPOSIT TYPES

8.1 Björkdal

The predominant source of ore at Björkdal is contained in a package of anastomosing, sheeted quartz-veins. This epigenetic vein network appears to be structurally controlled and consists of more than one thousand sub-parallel quartz veins that typically strike 030° to 090° from true-north (Figure 8-1 - Figure 8-3). Such strong structural-geological influences over geometry of any quartz vein hosted mineralisation clearly suggests a strong spatial and temporal relationship with orogenic/tectonic processes (i.e. mesothermal/greenstone gold systems). In contrast, the mineral associations with gold mineralisation, and the large alteration signature of the Björkdal area, could alternatively suggest that host depositional mechanisms are responsible for the mineralisation at Björkdal as there are some similarities with skarn and/or porphyry systems.

A much smaller, yet prolific source of ore at Björkdal is observed in strongly altered lenses of Skarn. Skarnification occurs commonly within the Mine, especially in the limestone/marble unit where it occurs as discreet patches and lenses, these lenses typically measure 200-400 m along strike, 100-200 m down dip and are usually no more than 10 m thick. However, similar calc-silicate alteration has taken place in areas where local shearing has affected the volcanoclastic host rock. The altered rock texture appears sheared and mottled to a varying degree; locally the rock can have a folded appearance. In places where the skarnification is the strongest, the precursor rock texture has been completely overprinted.

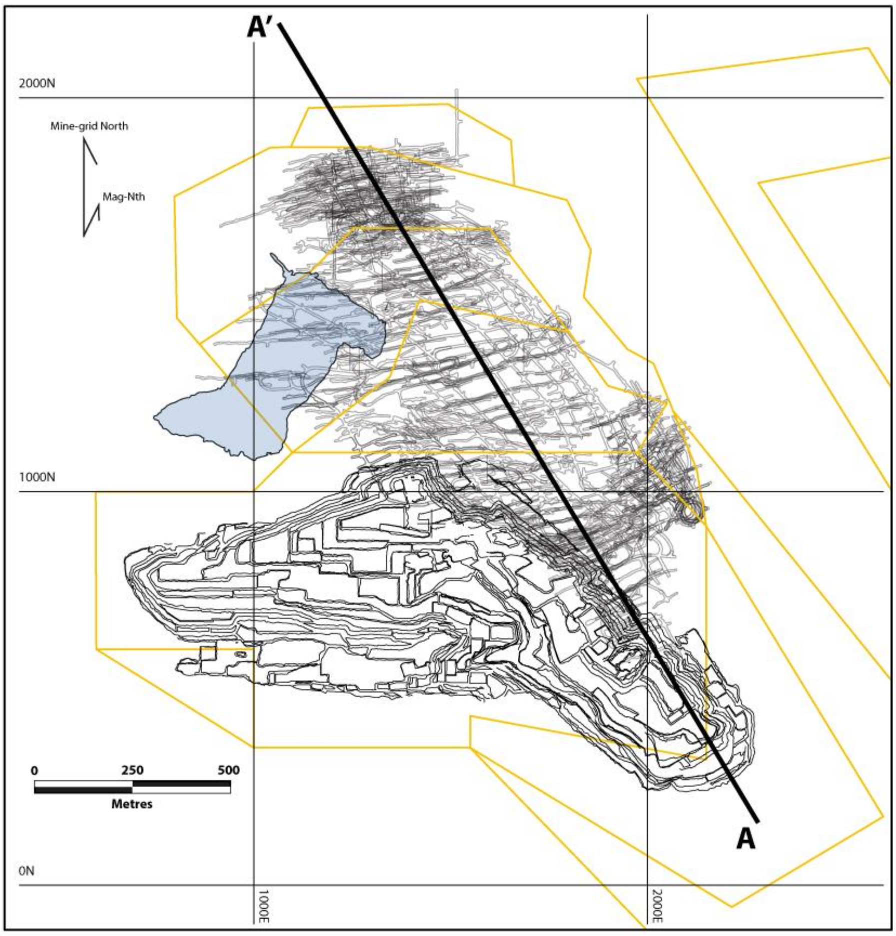


Figure 8-1: Mine Scale overvew showing the location of Section in Figure 8-2

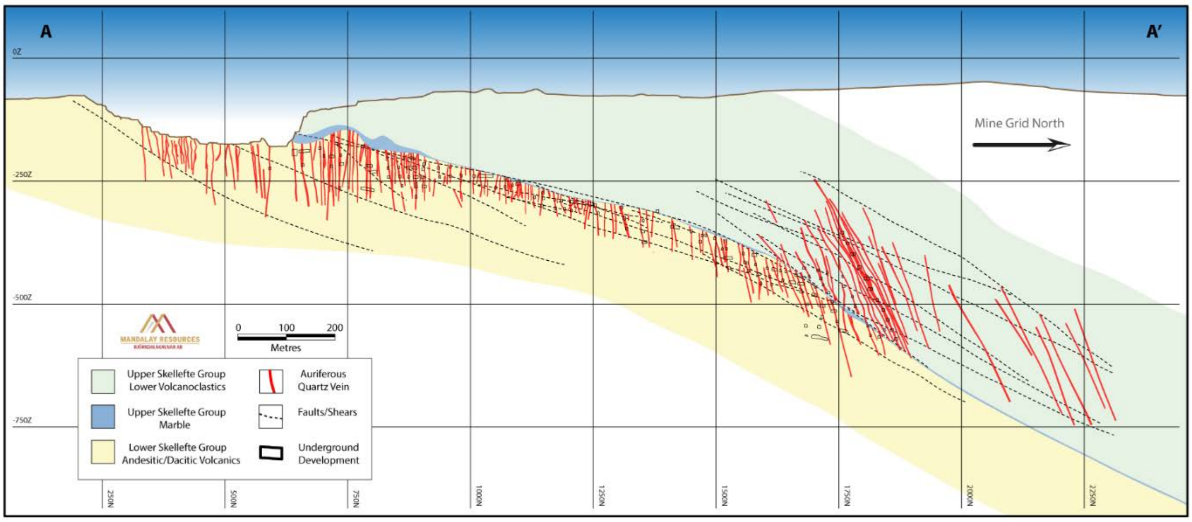


Figure 8-2: Mine Scale section showing auriferous quartz veins in relation to major faults/shears and local lithology

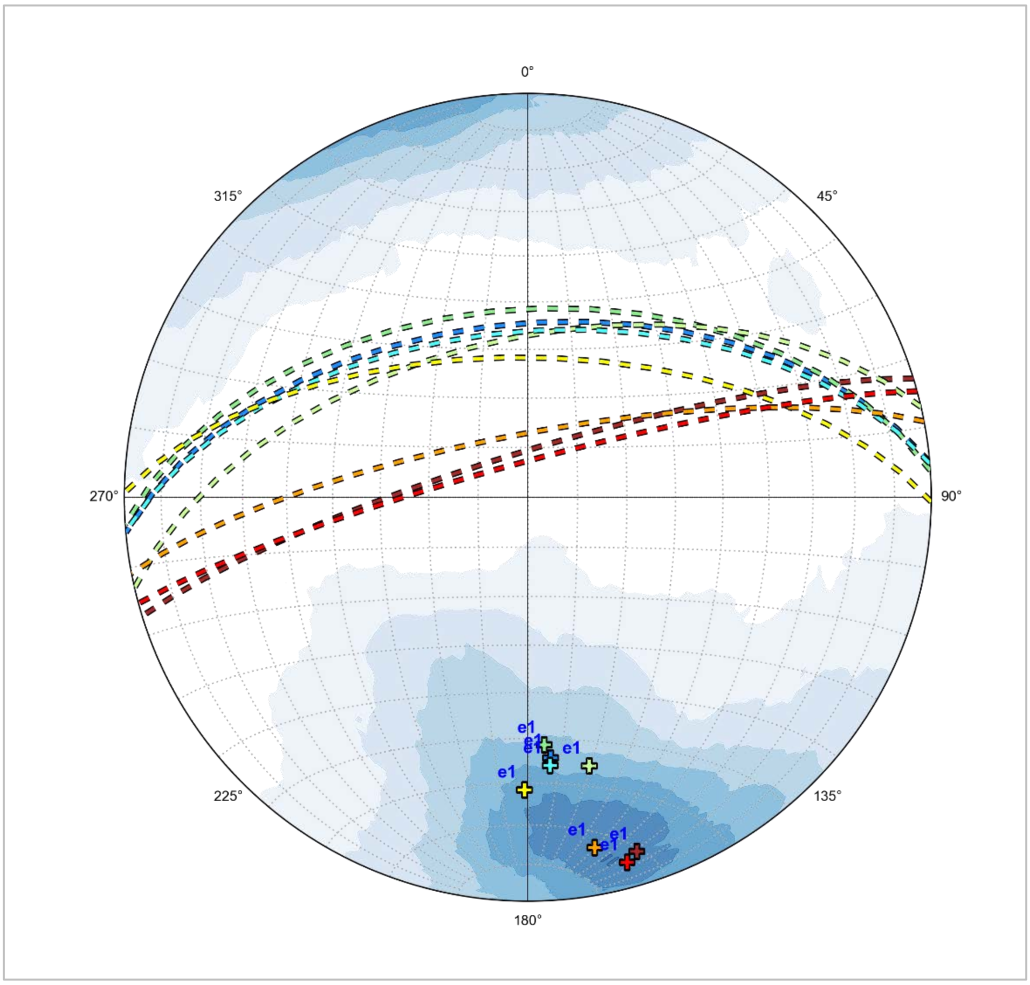


Figure 8-3: Stereo plot of quartz veins, Bingham mean

8.2 Norrberget

Primary mineralisation at the Norrberget deposit is observed to be associated with amphibole alteration bands and veinlets, and where mafic tuffs and volcaniclastic rocks are interbedded and in contrast to what is observed at Björkdal (Figure 8-4). The mineralisation is preferentially emplaced where there is a structural change to the rock such as at lithological contacts, altered bands and where shearing interacts with the interbedded sequences, due to the changing rheological characteristics of the unit. The abundance of pyrrhotite and pyrite appears to be controlled by specific lithology types within the volcaniclastic package which can indicate a differing redox based upon temperature change and fluid evolution.

The mineralisation at Norrberget is limited spatially to 50 m stratigraphically below the lower marble contact, which is believed to be a result of the cooling and redox changes of the fluid as it passes through the units.

The gold is very fine-grained and rarely visible. Where gold grains have been observed, they are found to lie on the boundary or in interstitial material between grains. Elevated gold grades are mostly found in areas with little to no pyrite.

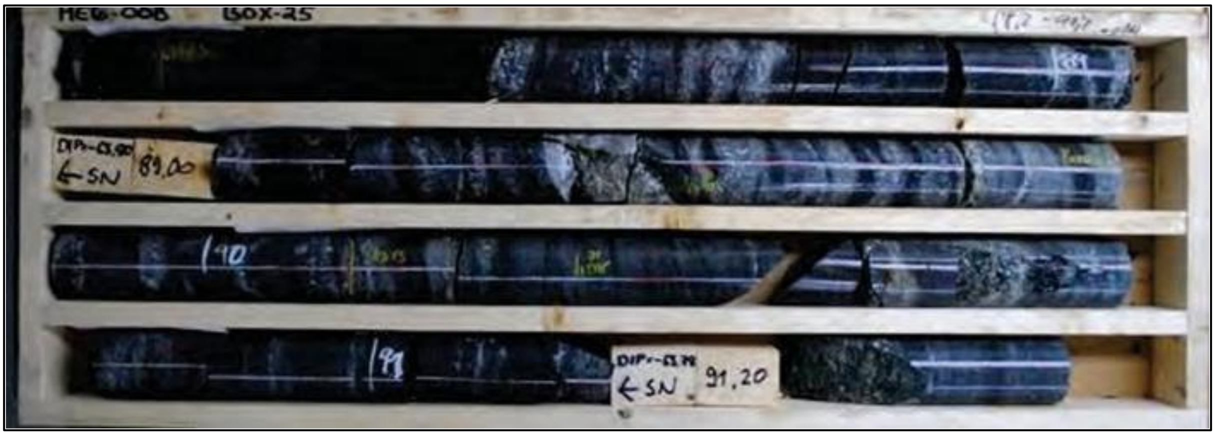


Figure 8-4: Example of Norrberget Mineralisation

9 EXPLORATION

9.1 Björkdal

Review work conducted by SLR Consulting (SLR Consulting Ltd, 2021) found that pre-Mandalay work programs had not been well documented. No significant regional exploration has been recorded in the period from the original Terra Mining ownership (ca. 1983-1999). Since acquiring ownership, Mandalay has conducted both underground and surface diamond-core and reverse circulation (RC) drilling, both within and near the active production areas, in addition to regional prospects.

Geophysical studies have also been carried out in order to identify the "geophysical fingerprint" of Björkdal-style mineralisation with the ultimate aim of developing exploration targets beneath the significant till cover that blankets the majority of the Björkdal Property. Geological mapping has also been conducted on the limited surface exposure of bedrock over the Property, in addition to compiling and assessing all known and relevant documentation and results from various exploration efforts by several past owners of the Mine and the surrounding exploration permits held by Mandalay through Björkdalsgruvan AB (and its subsidiary, Björkdal Exploration AB).

During the summer of 2019, an airborne magnetic survey was completed by Thomson Aviation over the full tenement package in collaboration with Boliden AB. Björkdalsgruvan AB received the raw data from the flyover and Geovista AB processed the results. Raw data consisted of a digital terrain model, levelled radiometric data, and levelled magnetic data. The survey direction was east-west with 50 m line spacing and 500 m tie line spacing. It has been established that areas of significant mineralisation have detectable effects on both magnetic (ground magnetics) and electrical (chargeability) properties of the host geology. As such, these surveys are being incorporated with geochemical and structural geological data with the objective of identifying highly prospective ground. Generated targets will be prioritised and systematically tested as part of the future exploration program.

9.2 Norrberget

The Norrberget area was extensively drilled from 1994 to 1996 by COGEMA before interest in the prospect declined under subsequent owners. After the area was purchased by Gold-Ore in 2007, some sporadic drilling campaigns were undertaken without significant discoveries being made.

After Mandalay acquired Elgin, a program of re-logging and re-assaying the existing core from the prospect was undertaken. This resulted in renewed interest in the area and in 2016, a 2,542 m diamond-core drilling program was completed that confirmed the historical results and extended the limits of mineralisation. A 1,400 m RC drill program of in-fill and down-dip extension drilling was completed in 2017. No further exploration drilling has since been completed at the Norrberget deposit.

9.3 Regional Exploration

Target generation completed in 2015 and 2016 consisted of geophysical surveys and reinterpretation of existing geophysical magnetic and electric surveys. These surveys ranged from regional scale airborne surveys to high resolution downhole electric logging and had the objective to establish some geophysical characteristics indicative of mineralised rock systems in the greater Björkdal exploration land package. It has been established that areas of significant mineralisation have detectable effects on both magnetic (ground magnetics) and electrical (chargeability) properties of the host geology. As such, these surveys are being incorporated with geochemical and structural geological data with the objective to identify highly prospective ground. The targets that have been generated will be prioritized and then systematically tested in the immediate future.

In 2016, ground magnetic surveys and till sampling programs were expanded across high potential areas within the tenement package. Detailed-scale outcrop mapping and sampling was also carried out to further develop the macro-scale understanding of the Property's gold bearing potential. A total of 75 till samples, spaced roughly 50-100 m apart and 65 outcrop samples were taken.

In 2017, two small scale (~5 km^2) ground magnetic surveys were carried out in highly prospective areas within the tenement package. Outcrop mapping and sampling was also carried out in the northern region of the tenement package in order to build upon the continuously growing regional geological model. A total of 40 till samples, spaced roughly 50-100 m apart and 71 outcrop samples were taken.

During summer 2019, an airborne magnetic survey was completed by Thomson Aviation over the full tenement package in collaboration with Boliden AB. Björkdalsgruvan received the raw data from the fly over and Geovista AB processed the results. Raw data consisted of a digital terrain model, levelled radiometric data and levelled magnetic data. The survey used flight lines oriented in an east-west direction with a 50 m line spacing with tie lines at 500 m.

No diamond drilling was completed during 2021 with exploration activity comprising Base of Till drilling.

During 2020 an extensive campaign of outcrop mapping and sampling was carried out across the entire tenement package, along with a small till sampling program towards the east. Complementary to the mapping and sampling campaign, a regional Base of Till (BOT) drilling campaign was carried out in 2021. Base of Till drilling is a technique widely used in areas that have undergone extensive glaciation. A small, mobile drill machine is used to drill through the surficial till cover, into the bedrock and three samples are taken:

1. ~1-2 m downhole in the C-horizon.
2. ~1 m above the till-bedrock boundary.
3. ~3 m into the bedrock.

A total of 103 holes were drilled totalling 1,415 m across three prospective targets within the tenement package. The holes were spaced between 100-200 m apart.

The data obtained during these campaigns has been incorporated into the regional geological model.

9.4 Exploration Potential

Mineralisation at Björkdal remains unconstrained towards the north and east of the current mining operation. Recent drilling results indicate that depth extensions, below the marble, along the eastern extent of the mine are moving progressively towards the northeast. This mineralisation appears to be constrained by the Björkdal Shear and the marble horizon.

Toward the north of the existing workings the mineralisation remains open, both above and below the marble horizon. In this region the Björkdal Shear strike orientation changes from NW-SE to WNW-SE (Figure 9-1). This change in strike direction has created a flexure zone, with abundant faulting above the marble unit. This flexure zone has allowed the formation of numerous auriferous veins above the historic hangingwall.

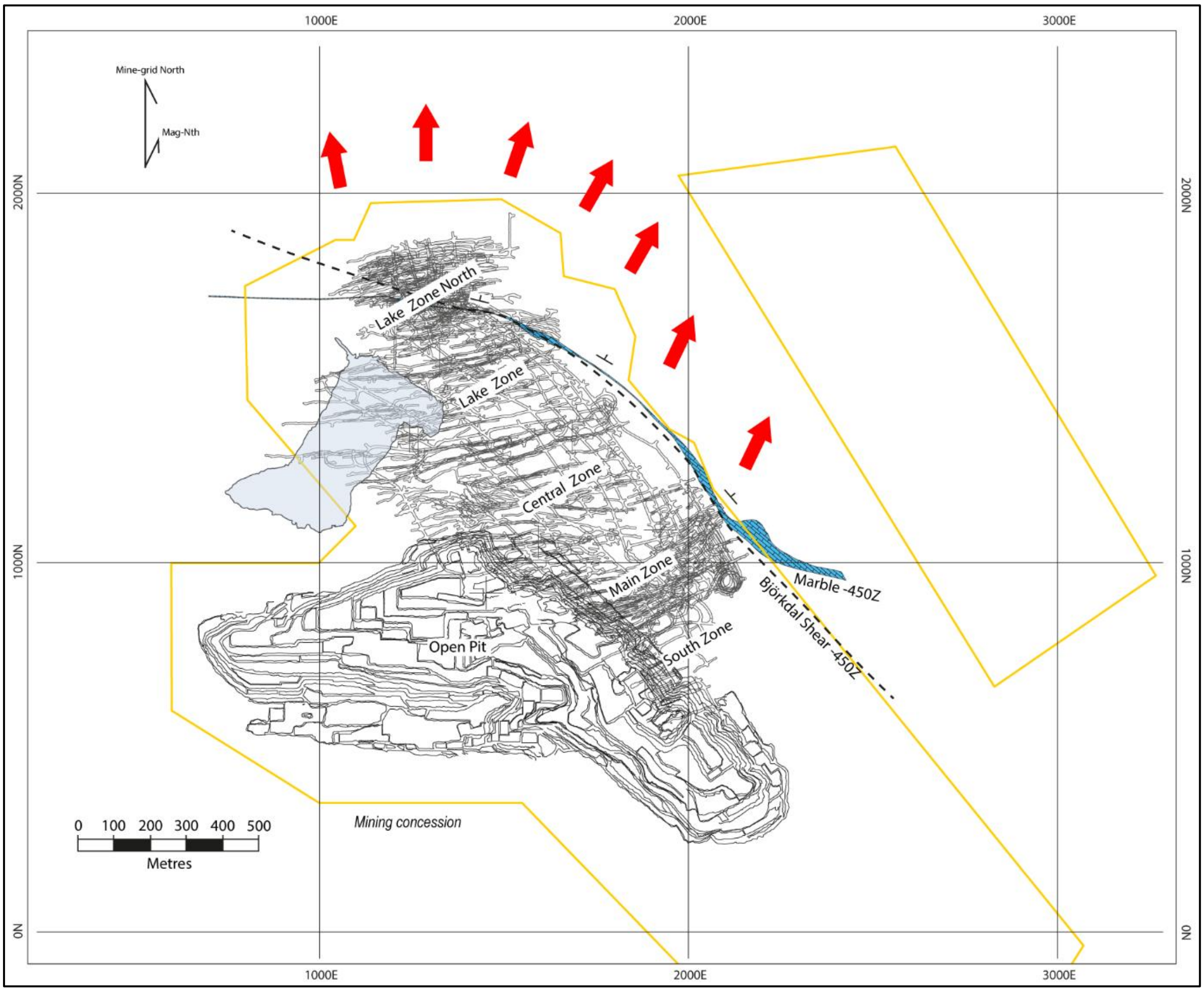


Figure 9-1: Mine Layout Showing Open Pit and Underground Areas with Exploration Target Zones

Near mine exploration in 2022 will have a strong focus on extending the mineralisation to the N-NE at depth, both above and below the intersection horizon between the marble and the Björkdal Shear.

A number of prospective regional targets have been identified through detailed desktop studies and field mapping/sampling (Figure 9-2). A campaign of mapping, field sampling, diamond drilling, Base of Till drilling, ground based magnetometry and Induced Polarization (IP) geophysics will be employed in 2022 to further investigate these highly prospective targets, and generate further targets for investigation.

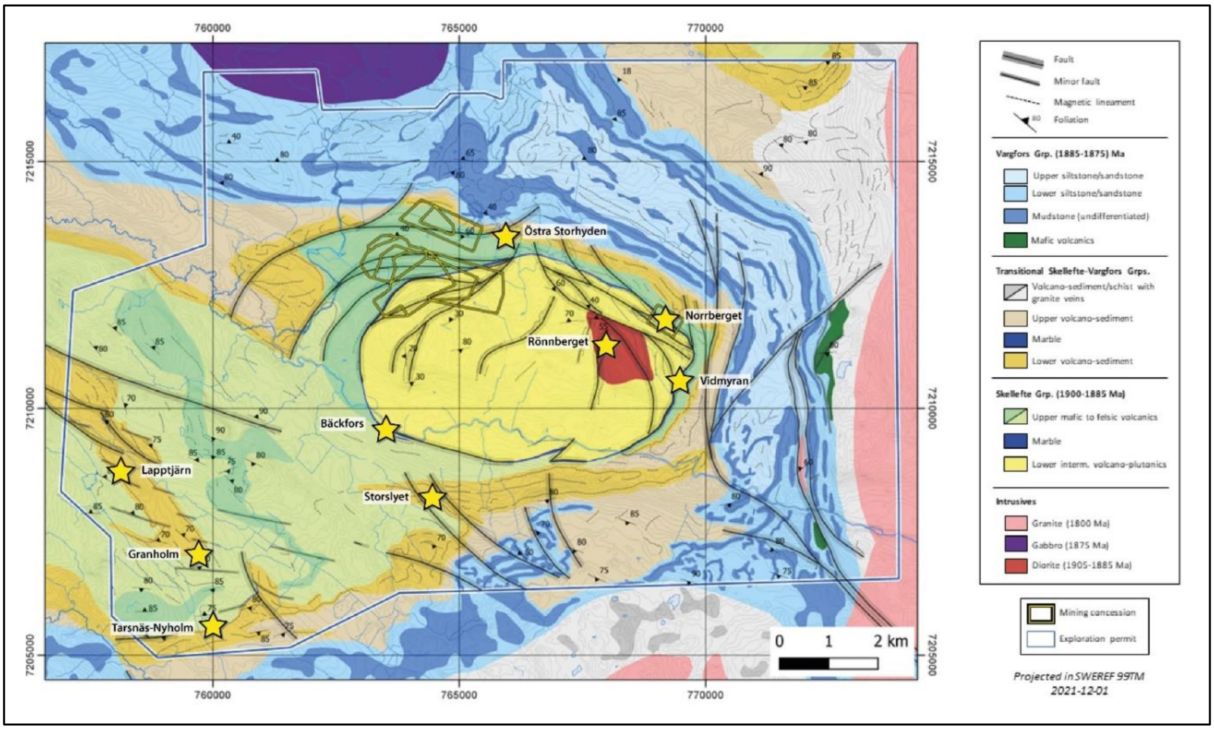


Figure 9-2: Björkdal Property Geology Map

10 DRILLING

10.1 Björkdal

Drilling has been carried out on a periodic basis by various operators as exploration and development has progressed at the mine. The Mineral Resource drill hole database cut-off date for the year-end 2021 MRMR update was 30 September 2021 and incorporated drill hole and channel sampling information collected by Mandalay. All holes completed before September 2014 were completed by previous owners.

10.1.1 Historic Drilling

10.1.1.1 1986 to 2004

It has been reported that during the period between 1986 and 2004, a total of 901 holes were completed at the Björkdal Property totalling approximately 105,883 m in length (Table 10-1).

Table 10-1: Summary of Björkdal Historical Drilling 1986 to 2004

Drill hole Type	Number of Drill holes
Diamond Drill hole	122
Reverse Circulation	779
Total	**901**

Source: Mandalay Resources Corporation – Björkdal Gold Mine

An additional 6,453 historical direct circulation (DC) grade control holes were also drilled for mine planning purposes in the open pit and were not included in the resource estimation. However, problems were identified with downhole sampling and grade contamination issues in these drill holes. Consequently, these holes have not been used in subsequent Mineral Resource Estimates.

10.1.1.2 2006 to 2014

In March 2006, Gold-Ore established a portal for the Eastern Tunnel at Björkdal. The tunnel was designed to provide access for diamond drill rigs to test for a strike extension of the ore body mined in the open pit (northern extension). Drilling from the surface was considered a less attractive option as it required drilling through several hundred metres of country rock prior to intersecting the mineralised target zones. The underground excavation also provided access for mapping, bulk sampling and some feedstock for the processing plant.

Underground diamond drilling for exploration, development, and grade control was carried out continuously from 2006 to 2014 (Table 10-2). RC drilling was initiated in 2010 in the open pit for grade control purposes.

Table 10-2: Summary of Björkdal Drilling 2006 to 2014

Year	Drill hole Type	Underground		Open Pit	
		No. of Drill holes	Metres (m)	No. of Drill holes	Metres (m)
2006	Core	91	7,954	-	-
2007	Core	109	10,454	19	3,303
2008	Core	40	2,577	-	-
2009	Core	43	5,892	9	469
2010	Core	30	5,112	37	2,756
	RC	-	-	76	2,978
2011	Core	52	10,271	15	1,325
	RC	-	-	127	3,862
2012	Core	48	8,490	34	4,685
	RC	-	-	258	9,904
2013	Core	42	9,178	14	1,631
	Core (In-fill)	43	2,812	-	-
	RC	-	-	317	10,006
	Core	43	9,218	-	-
2014	Core (In-fill)	23	2,308	-	-
	RC	-	-	225	6,982
	Core	14	3,864	3	622
Total		**578**	**78,130**	**1,134**	**48,523**

10.1.2 Mandalay Drilling 2014 to 2021

A summary of the drilling programs performed by Mandalay from September 2014 to September 2021 is provided in Table 10-3. The location of drill holes completed at the Björkdal Property during in 2021 is presented in Figure 10-1.

Table 10-3: Summary of Björkdal Drilling Completed from 2014 to 2021

Year	Drill hole Type	Underground		Open Pit	
		No. of Drill holes	Metres (m)	No. of Drill holes	Metres (m)
2014	Core (In-fill)	19	1,614		
	RC			65	2,103
	Core	12	3,302	5	632
2015	Core (In-fill)	150	11,880		
	RC			439	13,959
	Core	58	14,151	56	9,145

Year	Drill hole Type	Underground		Open Pit	
		No. of Drill holes	Metres (m)	No. of Drill holes	Metres (m)
2016	Core (In-fill)	280	32,252		
	Core			14	4,087
2017	Core (In-fill)	211	23,839		
	RC			596	24,924
	Core			13	2,377
	Core (In-fill)	211	24,309		
2018	RC			621	22,138
	Core	43	9,995	36	5,904
	Core (In-fill)	143	17,823		
2019	RC			194	10,649
	Core	36	9,089	7	1,125
2020[1]	Core (In-fill)	223	26,263		
	Core	41	14,156	8	1,243
2021[2]	Core (In-fill)	159	17,926		
	Core	43	15,293		
Total		**1,629**	**221,892**	**2,054**	**98,286**

Note

1) 2020 drilling adjusted to include drilling to December 2020.
2) 2021 drilling includes drill holes completed to 30 September 2021.

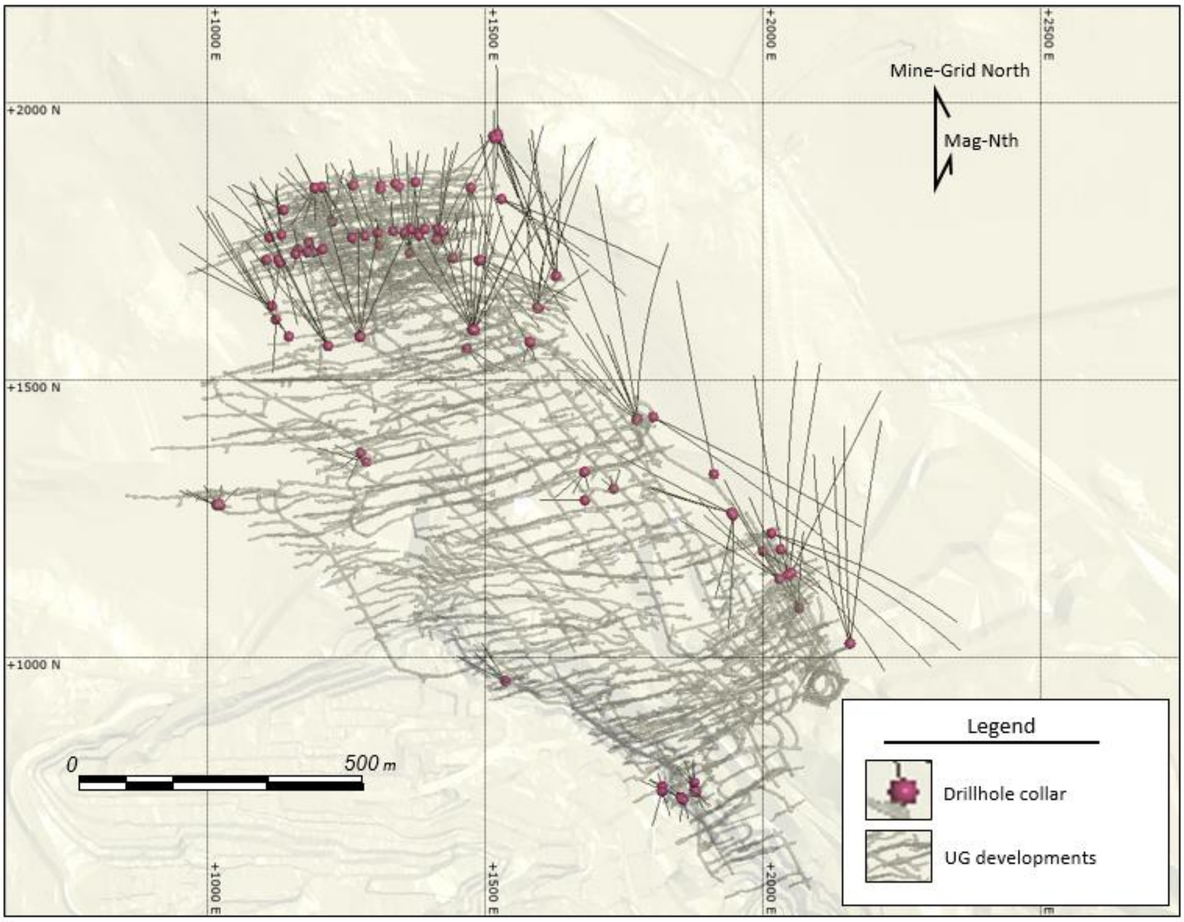


Figure 10-1: Drill hole location map showing drilling completed during 2021

Since the previous mineral resource data cutoff on 30 September 2020 to the data cut off at 30 September 2021, drilling was completed in 59 exploration holes totalling approximately 20,755 m in length. In addition, 218 POD and DOD (Production and Development optimisation) drill holes were completed totaling 24,592 m.

The main focus of drilling completed in 2021 was to extend known auriferous veining towards the east and at depth of the current underground operations.

In late 2020 a program consisting of 9 holes, totalling 3,859.15 m was completed (Table 10-4). The drilling revealed the presence of auriferous quartz veins extending at depth in the Lake Zone area of the mine. As a follow up to this drilling program along the mines North eastern flank, a program consisting of 8 holes, totalling 3,604.95 m was drilled in Q1 2021 (Figure 10-2). This program confirmed the significant grades and veining continuity shown in the original program. Some highlights of this program are; 226 g/t gold over a true width of 0.21 m within MU21-003 and 25.3 g/t gold over a true width of 1.03 m within MU21-005. Along with the initial intercepts of 2020 the strike extent of some of the veining is interpreted to be approximately 300 m and the vertical extent below the marble horizon is expected to be approximately 50 m. Veining within the Lake Zone remains unbounded towards the east and at depth.

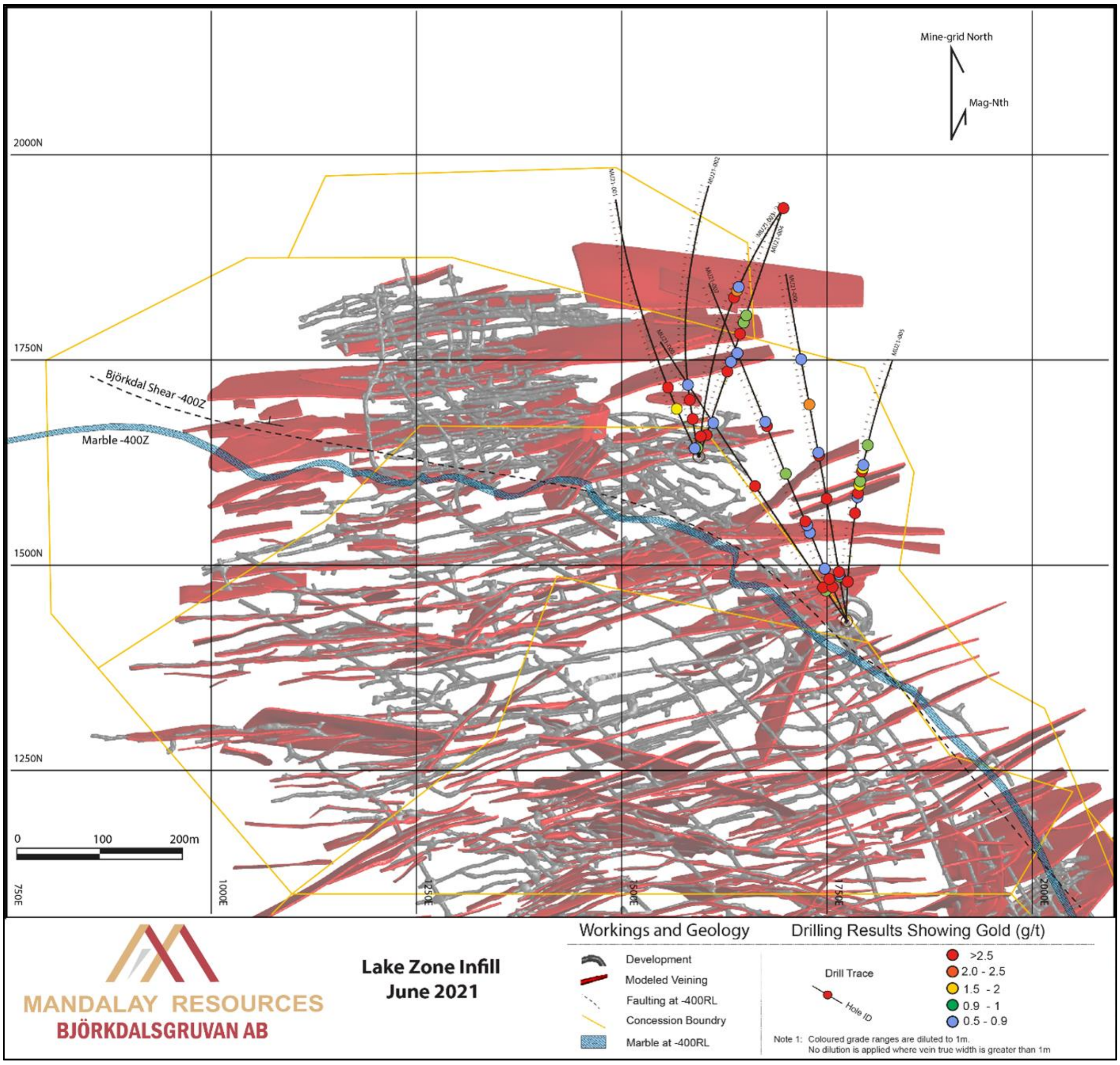


Figure 10-2: Lake Zone Infill Program

An additional program focused on the eastern, depth extension of the Main zone. Seven holes and a total of 2,720 m have been drilled from underground developments to the east in order to explore the area underneath the marble and identify vein extensions (Figure 10-3). Direct extensions to ten veins have been interpreted from the program with 63 significant intercepts within the drilling (Table 10-5). The intercept grading 174.0 g/t gold over a true width of 0.49 m within MU21-010 effectively extends veining approximately 200 m to the east. To the north more veining extensions are revealed through an intercept of 0.21 m grading 105.0 g/t gold. With significant mineralisation extending through to the eastern most reaches of the program, there is confidence that the veining remains open at depth and to the east.

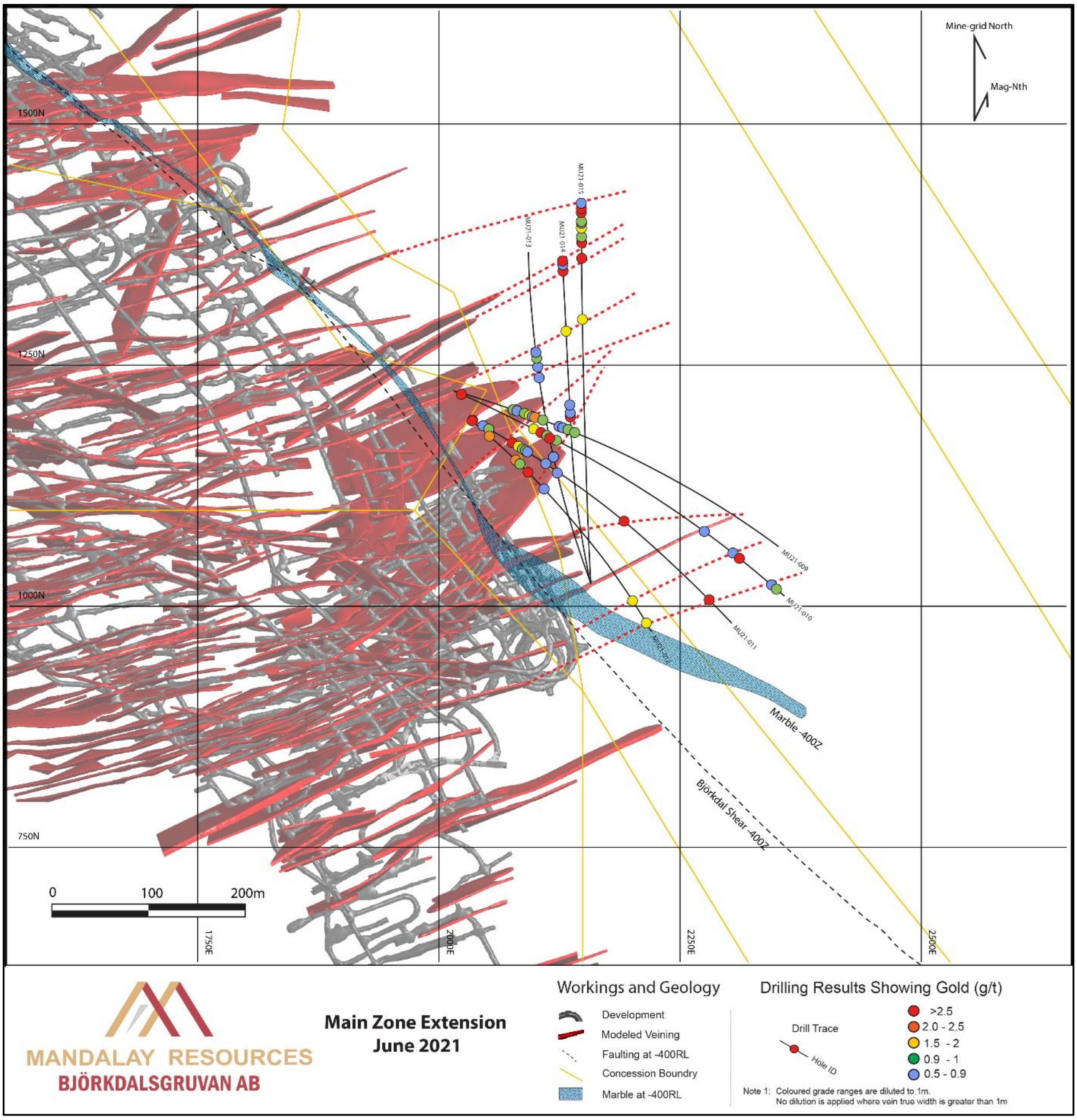


Figure 10-3: Main Zone Extension Drilling

Table 10-4: Drilling intercepts from initial drilling in Lake Zone extension program

Drill Hole ID	From (m)	To (m)	Drill Width (m)	True Width (m)	Au Grade (g/t)	Au (g/t) over min. 3m width
MU20-019	65.70	66.40	0.70	0.50	5.4	0.9
MU20-019	392.00	393.60	1.60	1.42	1.5	0.7
MU20-020A	39.45	39.80	0.35	0.25	8.8	0.7
MU20-020A	49.50	50.50	1.00	0.66	1.9	0.4
MU20-020A	62.40	63.00	0.60	0.26	2.9	0.3
MU20-020A	137.80	138.15	0.35	0.29	2.4	0.2
MU20-020A	155.95	156.25	0.30	0.14	9.3	0.4
MU20-020A	225.65	227.00	1.35	1.07	11.3	4.0

Drill Hole ID	From (m)	To (m)	Drill Width (m)	True Width (m)	Au Grade (g/t)	Au (g/t) over min. 3m width
MU20-020A	271.50	271.80	0.30	0.17	4.1	0.2
MU20-020A	339.60	346.05	6.45	2.77	1.7	1.6
MU20-020A	351.60	352.10	0.50	0.23	5.7	0.4
MU20-021	56.00	56.70	0.70	0.54	1.8	0.3
MU20-021	70.00	71.20	1.20	1.06	2.4	0.9
MU20-021	186.60	187.30	0.70	0.50	16.7	2.8
MU20-021	201.45	204.00	2.55	2.28	5.4	4.1
MU20-021	248.20	250.00	1.80	1.10	32.5	11.9
MU20-021	283.65	284.00	0.35	0.27	2.8	0.3
MU20-021	293.55	297.70	4.15	4.08	5.2	5.2
MU20-021	314.20	316.00	1.80	1.23	3.1	1.3
MU20-021	354.60	355.10	0.50	0.40	92.2	12.3
MU20-021	396.95	397.30	0.35	0.23	17.4	1.3
MU20-022	62.20	63.40	1.20	0.72	6.3	1.5
MU20-022	149.50	149.90	0.40	0.15	4.8	0.2
MU20-022	208.30	209.80	1.50	1.11	16.4	6.1
MU20-022	243.40	244.00	0.60	0.22	2.9	0.2
MU20-022	286.40	286.70	0.30	0.19	4.4	0.3
MU20-022	369.80	370.50	0.70	0.45	8.0	1.2
MU20-023	12.55	13.25	0.70	0.45	4.4	0.7
MU20-023	54.10	54.75	0.65	0.27	6.8	0.6
MU20-023	106.55	107.65	1.10	0.73	10.9	2.7
MU20-023	114.05	114.70	0.65	0.44	119.2	17.5
MU20-023	129.30	129.70	0.40	0.29	45.6	4.4
MU20-023	175.65	175.95	0.30	0.19	4.2	0.3
MU20-023	241.90	242.30	0.40	0.21	7.6	0.5
MU20-024	29.90	30.65	0.75	0.51	25.3	4.3
MU20-024	54.50	54.85	0.35	0.18	9.6	0.6
MU20-024	61.75	62.35	0.60	0.25	36.7	3.1
MU20-024	188.60	195.30	6.70	5.01	3.4	3.4
MU20-025	106.55	107.25	0.70	0.32	58.5	6.2
MU20-025	122.60	122.90	0.30	0.23	3.2	0.2
MU20-025	326.40	326.80	0.40	0.24	17.4	1.4
MU20-037	161.90	162.20	0.30	0.21	4.4	0.3
MU20-037	203.35	203.70	0.35	0.23	2.6	0.2
MU20-037	326.50	326.90	0.40	0.24	4.6	0.4
MU20-038	93.10	94.90	1.80	1.23	2.9	1.2
MU20-038	99.40	99.80	0.40	0.25	5.5	0.5
MU20-038	131.00	131.60	0.60	0.42	1.6	0.2
MU20-038	175.00	176.00	1.00	0.73	14.6	3.6
MU20-038	321.40	321.70	0.30	0.14	18.6	0.9

Notes:
1. Where True widths are greater than 3 m, grades are not diluted and are presented as the grade over the composite true width.
2. Composites that are below 0.2 g/t Au when diluted to 3 m are not reported in this table.

Table 10-5: Intercepts showing Lake Zone infill drilling and Main Zone Extension drilling

Drill Hole ID	From (m)	To (m)	Drill Width (m)	True Width (m)	Au Grade (g/t)	Au (g/t) over min. 1m width
MU21-001	13.80	14.10	0.30	0.12	6.3	0.8
MU21-001	82.80	83.20	0.40	0.29	6.3	1.8
MU21-001	118.60	120.70	2.10	1.37	4.2	4.2
MU21-002	14.40	14.70	0.30	0.18	5.8	1.0
MU21-002	61.50	61.80	0.30	0.10	40.1	4.0
MU21-002	93.20	93.60	0.40	0.08	32.7	2.6
MU21-002	117.60	118.50	0.90	0.50	1.5	0.8
MU21-003	32.60	34.00	1.40	0.85	10.9	9.2
MU21-003	269.80	270.10	0.30	0.21	226.0	47.5
MU21-003	281.00	281.55	0.55	0.23	9.0	2.1
MU21-003	287.00	287.40	0.40	0.10	6.7	0.7
MU21-003	426.55	426.90	0.35	0.32	16.6	5.3
MU21-004	37.10	37.80	0.70	0.38	31.7	12.0
MU21-004	132.20	133.00	0.80	0.48	1.2	0.6
MU21-004	147.35	148.50	1.15	0.81	4.2	3.4
MU21-004	165.05	167.25	2.20	0.38	2.1	0.8
MU21-004	208.75	216.50	7.75	4.11	4.2	4.2
MU21-004	232.80	233.10	0.30	0.29	4.1	1.2
MU21-004	245.35	245.75	0.40	0.35	3.1	1.1
MU21-005	61.70	62.40	0.70	0.54	13.3	7.2
MU21-005	99.00	99.60	0.60	0.42	2.7	1.1
MU21-005	162.80	163.25	0.45	0.33	24.6	8.1
MU21-005	186.90	187.20	0.30	0.26	2.7	0.7
MU21-005	191.65	193.60	1.95	1.33	5.4	5.4
MU21-005	203.20	203.60	0.40	0.24	7.1	1.7
MU21-005	208.50	208.80	0.30	0.19	4.9	0.9
MU21-005	220.90	224.65	3.75	2.15	6.2	6.2
MU21-005	226.90	228.20	1.30	1.10	1.6	1.6
MU21-005	229.95	230.70	0.75	0.43	1.7	0.7
MU21-005	259.45	262.00	2.55	1.28	1.4	1.4
MU21-005	365.90	366.90	1.00	0.70	0.8	0.6
MU21-006	67.35	68.10	0.75	0.68	1.3	0.9
MU21-006	69.10	69.50	0.40	0.35	2.2	0.8
MU21-006	71.75	72.50	0.75	0.57	7.1	4.0
MU21-006	182.85	183.40	0.55	0.39	10.7	4.2
MU21-006	248.20	248.90	0.70	0.70	9.2	6.4
MU21-006	251.85	252.50	0.65	0.50	1.3	0.6

Drill Hole ID	From (m)	To (m)	Drill Width (m)	True Width (m)	Au Grade (g/t)	Au (g/t) over min. 1m width
MU21-006	325.60	326.20	0.60	0.52	4.3	2.2
MU21-006	392.40	393.30	0.90	0.64	1.1	0.7
MU21-007	51.80	53.60	1.80	1.03	25.3	25.3
MU21-007	63.50	64.00	0.50	0.45	13.1	5.9
MU21-007	79.40	80.00	0.60	0.46	1.3	0.6
MU21-007	134.00	134.70	0.70	0.61	1.0	0.6
MU21-007	146.00	146.50	0.50	0.29	2.0	0.6
MU21-007	152.00	152.40	0.40	0.35	18.0	6.3
MU21-007	224.00	225.00	1.00	0.70	1.4	1.0
MU21-007	297.50	298.20	0.70	0.61	5.4	3.3
MU21-007	302.50	303.00	0.50	0.50	1.0	0.5
MU21-007	408.50	410.00	1.50	0.65	0.9	0.6
MU21-008	49.00	52.00	3.00	1.50	1.3	1.3
MU21-008	55.80	56.80	1.00	0.71	5.3	3.7
MU21-008	224.00	224.40	0.40	0.33	9.1	3.0
MU21-008	328.30	328.70	0.40	0.20	4.4	0.9
MU21-009	72.80	73.80	1.00	0.70	1.1	0.8
MU21-009	76.90	77.90	1.00	0.70	0.9	0.6
MU21-009	85.60	87.60	2.00	1.40	1.1	1.1
MU21-009	93.00	94.00	1.00	0.70	2.0	1.4
MU21-009	96.00	97.00	1.00	0.70	0.9	0.6
MU21-009	97.40	103.60	6.20	3.94	2.3	2.3
MU21-009	110.90	111.90	1.00	0.70	1.3	0.9
MU21-009	131.00	131.50	0.50	0.34	1.6	0.5
MU21-009	135.40	136.00	0.60	0.42	1.4	0.6
MU21-009	142.00	143.00	1.00	0.70	1.1	0.7
MU21-009	150.60	152.00	1.40	1.29	1.0	1.0
MU21-010	8.90	10.50	1.60	1.31	26.2	26.2
MU21-010	102.00	103.00	1.00	0.98	2.0	1.9
MU21-010	106.00	116.80	10.80	8.85	6.1	6.1
MU21-010	119.70	120.50	0.80	0.64	1.2	0.8
MU21-010	132.00	133.00	1.00	0.80	1.4	1.1
MU21-010	336.40	336.90	0.50	0.17	3.6	0.6
MU21-010	379.40	379.70	0.30	0.26	2.3	0.6
MU21-010	388.70	389.20	0.50	0.49	174.0	85.3
MU21-010	438.40	439.00	0.60	0.56	1.1	0.6
MU21-010	446.00	446.60	0.60	0.52	1.9	1.0
MU21-011	1.40	2.40	1.00	0.60	2.9	1.7
MU21-011	19.60	24.10	4.50	2.66	1.0	1.0
MU21-011	55.50	57.35	1.85	1.01	17.5	17.5
MU21-011	62.30	64.45	2.15	1.33	2.0	2.0
MU21-011	67.90	69.00	1.10	0.66	1.5	1.0

Drill Hole ID	From (m)	To (m)	Drill Width (m)	True Width (m)	Au Grade (g/t)	Au (g/t) over min. 1m width
MU21-011	71.95	73.10	1.15	0.69	1.4	1.0
MU21-011	100.70	101.15	0.45	0.24	3.6	0.9
MU21-011	213.15	213.60	0.45	0.21	13.6	2.9
MU21-011	346.60	349.30	2.70	2.59	5.8	5.8
MU21-012	1.00	2.90	1.90	1.33	3.4	3.4
MU21-012	26.40	28.70	2.30	1.61	2.2	2.2
MU21-012	65.30	65.90	0.60	0.49	4.8	2.3
MU21-012	71.50	71.95	0.45	0.32	2.4	0.7
MU21-012	83.15	85.00	1.85	1.79	5.2	5.2
MU21-012	108.95	109.60	0.65	0.61	1.2	0.7
MU21-012	269.45	270.00	0.55	0.39	3.4	1.3
MU21-012	299.45	299.85	0.40	0.28	4.8	1.4
MU21-013	124.30	124.65	0.35	0.25	2.6	0.7
MU21-013	141.50	142.20	0.70	0.54	1.5	0.8
MU21-013	161.85	163.00	1.15	1.00	2.7	2.7
MU21-013	226.50	227.30	0.80	0.80	0.9	0.7
MU21-013	237.55	238.30	0.75	0.80	0.9	0.7
MU21-013	246.55	248.50	1.95	1.83	1.1	1.1
MU21-013	252.65	253.50	0.85	0.43	1.7	0.7
MU21-013	255.20	255.55	0.35	0.80	1.2	1.0
MU21-014	185.90	186.40	0.50	0.38	28.0	10.6
MU21-014	190.00	190.30	0.30	0.23	3.6	0.8
MU21-014	198.70	199.20	0.50	0.32	2.3	0.7
MU21-014	278.70	280.10	1.40	1.27	1.8	1.8
MU21-014	343.75	344.25	0.50	0.25	56.0	14.0
MU21-014	350.50	351.20	0.70	0.35	2.1	0.7
MU21-014	354.00	355.50	1.50	1.19	5.1	5.1
MU21-015	301.95	302.40	0.45	0.23	8.0	1.8
MU21-015	371.35	374.00	2.65	1.63	14.5	14.5
MU21-015	389.50	390.55	1.05	0.74	17.8	13.2
MU21-015	395.55	396.60	1.05	0.80	1.3	1.0
MU21-015	406.00	407.20	1.20	0.85	1.9	1.6
MU21-015	411.85	412.40	0.55	0.45	1.4	0.6
MU21-015	413.65	416.10	2.45	2.12	1.3	1.3
MU21-015	423.85	424.15	0.30	0.23	22.1	5.1
MU21-015	428.70	429.00	0.30	0.21	105.0	22.1
MU21-015	434.85	435.15	0.30	0.25	3.3	0.8

Notes:
1. Where true widths are greater than 1m, grades are not diluted and are presented as the grade over the composite true width.
2. Composites that are below 0.5 g/t Au when diluted to 1 m are not reported in this table.

10.1.2.1 Diamond Drilling

All underground exploration drilling since September 2014 has been conducted with wireline diamond-core drilling methods by experienced Swedish drilling contractors Protek Norr AB, Styrud Arctic AB, and Drillcon Scandinavia AB. Drilling has been carried out with dedicated underground exploration drill rigs in the series WL66 (50.5 mm core diameter), NQ2 (50.7 mm core diameter), and WL76 (57.5 mm core diameter). All drill holes have been downhole surveyed using modern computerised gyroscopic tools at hole completion. During drilling operations regular survey checks were conducted for unexpected deviation using downhole multi-shot camera tools.

Core orientation tools are used on all holes for geologists to measure the orientation of all geological structures identified in the diamond core. Contractors work two shifts per day (ten hour shift), seven days per week and complete an average of 1,000 m of core per month.

For the period of January 2015 to September 2021, Mandalay completed a total of approximately 213,223 m of diamond-core drilling from underground stations at the mine. Prior to the discovery of the Aurora Zone, the drilling focussed mainly on outlining the strike and dip extensions of known mineralised vein systems (mostly in the Main, Central, and Lake zones).

In 2021, the drilling continued to focus on searching for the strike and dip limits of the Aurora Zone discovered in 2017, as well as defining the limits of the high grade skarn-hosted mineralisation discovered in 2018. The drilling also focussed on the eastern depth extension of the mineralised veins in the Main/Central and Lake Zone areas of the underground mine. These drilling programs have been successful in achieving their goals.

Production (POD-series) and Development (DOD-series) optimisation holes have primarily been drilled using Mandalay-owned and operated drill rigs and drilling staff. On some occasions drilling contractors (Drillcon AB and Protek Norr AB) have been used when additional capacity has been required.

Starting in 2013, in-fill underground diamond drilling programs used a WL46 drill string (28.8 mm diameter core), however this rig was later decommissioned in May 2018. In March 2016, an Atlas Copco Diamec U4 rig was purchased, followed in April 2020 by the purchase of an Epiroc Diamec U6 rig. The rigs are operated by three drillers working single shifts using a WL56/39 drill string (39.0 mm diameter core). Drilling operations are seven days a week with typical core production of 30 m per shift. During 2021, a fourth shift roster was added to the U4 rig. These rigs have been primarily used for development optimisation tasks. Surface exploration from September 2014 has used wireline diamond-core drilling methods using experienced Swedish and Finnish drilling contractors Styrud Arctic AB, Protek Norr AB, Kati OY, and Arctic Drilling Company OY. More recently experienced international drilling operator Mason & St John based in the UK has also conducted drilling operations.

Various drilling equipment sizes have been used depending on project requirements and include core sizes WL66 (50.5 mm core diameter), NQ2 (50.7 mm core diameter), and WL76 (57.5 mm core diameter).

All surface drill holes have been surveyed with modern computerised gyroscopic tools at hole completion, while also being regularly check-surveyed for unexpected deviation as the drilling progresses using modern multi-shot camera downhole tools. Core orientation tools are used on all holes for geologists to measure the orientation of all geological structures identified.

Drilling contractors work two shifts per day (12 hour shift), seven days per week with typical core production rates of 1,200 m per month. Drill holes that are collared in unconsolidated materials (i.e., soil and till) have been cased with traditional methods using either Boart Longyear or Hagby series casing rods and bits.

Due to the degree of silicification and alteration observed at the deposit and in the regional geology, measurements of rock quality are generally excellent and supported by core recovery values generally in excess of 95%.

All drilling has been designed and supervised by Mandalay/Björkdalsgruvan geologists. Drill hole layouts were designed with the aid of the GEOVIA Surpac 3D software.

Drill core is transported to Mandalay's core logging facilities located within the mine area for processing. The core is examined by trained geologists who prepare a descriptive log of the alteration, structure, and mineralisation that may have been encountered by the drill hole. The information is entered directly to computer files at the core shack and subsequently uploaded to the master drill hole database.

Logging of drill core has been carried out according to Mandalay's Standard Operating Procedure (SOP) GEO 20200331. Logging geologists examine the drill core and mark off any lengths of the core judged to hold potential for hosting significant quantities of gold mineralisation. The locations of the sample intervals, along with the sample identification numbers are entered into the computer log of the drill hole and subsequently uploaded to the master drill hole database. The drill core is then photographed by geological technicians before samples of the core are selected for assaying using the entire drill core.

For the period of January 2015 to September 2021, Mandalay has completed a total of 23,270 m of exploration diamond core drilling from surface.

In Björkdal area the surface drilling strategy remained similar to the underground exploration with priority targets around the margins of the open pit to estimate Inferred and Indicated Mineral Resources in the near-mine environment and for grade control purposes. The majority of this drilling took place in the vicinity of the Quartz-Mountain, East Pit, and Nylund areas.

In Norrberget area, a 2,542 m diamond-core drilling program was completed in 2016 that confirmed the historical results and extended the limits of mineralisation.

Additionally, during the summer months of 2015, 2,492 m of diamond-core drilling was completed around the greater Björkdal region in order to test geochemical and structural targets. Significant mineralisation was intersected in two drill holes, DDE2015-001 and DDE2015-008, in the Storheden and Morbacken areas respectively.

The potential of Storheden area was further tested with 2,136 m of diamond-core drilling in 2016 and 2017. These drilling programs have confirmed the existence of a mineralised system of shear hosted quartz veins extending below the current site of the Tailings Management Facility.

In Q1 2020, a total of 1,160 m of diamond-core drilling was completed approximately two kilometres West of the mine, in the exploration permit Björkdal 29. The target for this program was identified from airborne magnetic data completed in 2019.

10.1.2.2 Reverse Circulation Drilling

Exploration RC drilling was undertaken during the summer of 2016 in order to quickly provide in-fill information for the Nylund surface deposit. The drilling was undertaken by an experienced international drilling operator Mason & St John based in the UK, and local Swedish drilling contractors Styrud Arctic AB. Drilling was undertaken with a multi-purpose drilling rig equipped with 5.5 in RC diameter bit on six metre rods (Mason and St John drilling rigs) and 5.5 in RC diameter bit on three metre rods (Styrud Arctic AB drilling rigs). The holes were surveyed at completion with modern computerised gyroscopic tools. Samples were taken every one metre of drilling where they are split directly out of the cyclone in a cone-splitter. Two samples were collected; with one sent directly to the laboratory for analysis while the other was sieved and washed in order for geological logging to take place. A booster compressor was used on deeper holes (>150 m hole depth) to maintain dry samples when water ingress increased with depth, or where water bearing fracture networks were intercepted.

For the period of January 2015 to September 2021, Mandalay has completed a total of 102,200 m of RC drilling from surface-based setups at the Björkdal Mine. In addition, a 1,400 m RC drill program of in-fill and down-dip extension drilling was completed in 2017 at Norrberget and 1,408 m at Storheden.

RC drilling has been utilised for grade control in the open pit since 2010 to define the gold bearing quartz veins that can vary in scale from one centimetre to greater than one metre. The standard drill pattern is an approximately 7.5 m to 15 m by 18 m grid where holes are planned to intersect perpendicular to the quartz vein orientation. The number of planned drill holes is dependant on the location of historical drill holes. In the western portion of the mine, holes are drilled 0°/180° (mine grid) with a dip of -40° and in the eastern part, 330°/150° (mine grid) with a dip of -40°. This is due to the general orientation of mineralised zones (quartz veins) in these respective areas of the surface deposit. Each grade control hole generally covers three or four benches, or approximately 20 m vertical depth for a 32 m long hole. Longer holes (up to 70 m long) are occasionally drilled in order to sterilise areas by confirming that they are barren of gold mineralisation. These longer holes are surveyed at hole completion in order to ascertain their deviations.

Drilling has been performed by drill contractors Styrud Arctic AB utilising a five inch RC diameter bit on three metre rods. Drill cuttings have been sampled every one metre via a cyclone. RC drilling has been performed year-round.

All RC drill holes are planned by Mandalay/Björkdal geologists using Surpac.

10.1.2.3 Underground Chip Sampling

Each On-Vein Development (OVD) face has been mapped, photographed, and sampled in a similar manner since 2015 following the Björkdal-SOP GEO20200625 "Instruktion för Provtagning och under jord". The geologist marks up the area to be sampled with spray paint (Figure 10-4). The sampler then uses a hammer and bucket to collect representative samples from shoulder to knee height across the entire face. While this methodology does not strictly follow a channel sample line, it may provide better representativity of samples within the mineralised zone.

After the sample is collected, the sample number is recorded on the face map, together with the date and name of the OVD. The sample is then placed into a plastic sample bag and closed with a sample tag inside. The bucket is either washed out if water is available or replaced with a clean one, prior to collecting the next sample. Quality control samples including reference standards and blanks are included as every 50th sample.

The samples are delivered by the sampler directly to the on-site laboratory facility located next to the core processing facility.

The chip sample location marks are either picked up by a Hovermap (laser imaging) scan after sampling or alternatively digitised onto an existing scan that was made prior to shotcreting. On occasion the chip sample location may be digitised by the geologist using the development survey string file in Surpac. The survey file is updated after every cut via a Hovermap scan or a regular total station survey.

Sample data is entered into an Excel spreadsheet to calculate a final grade for the cut taken and later into an Access database using GeoSpark.

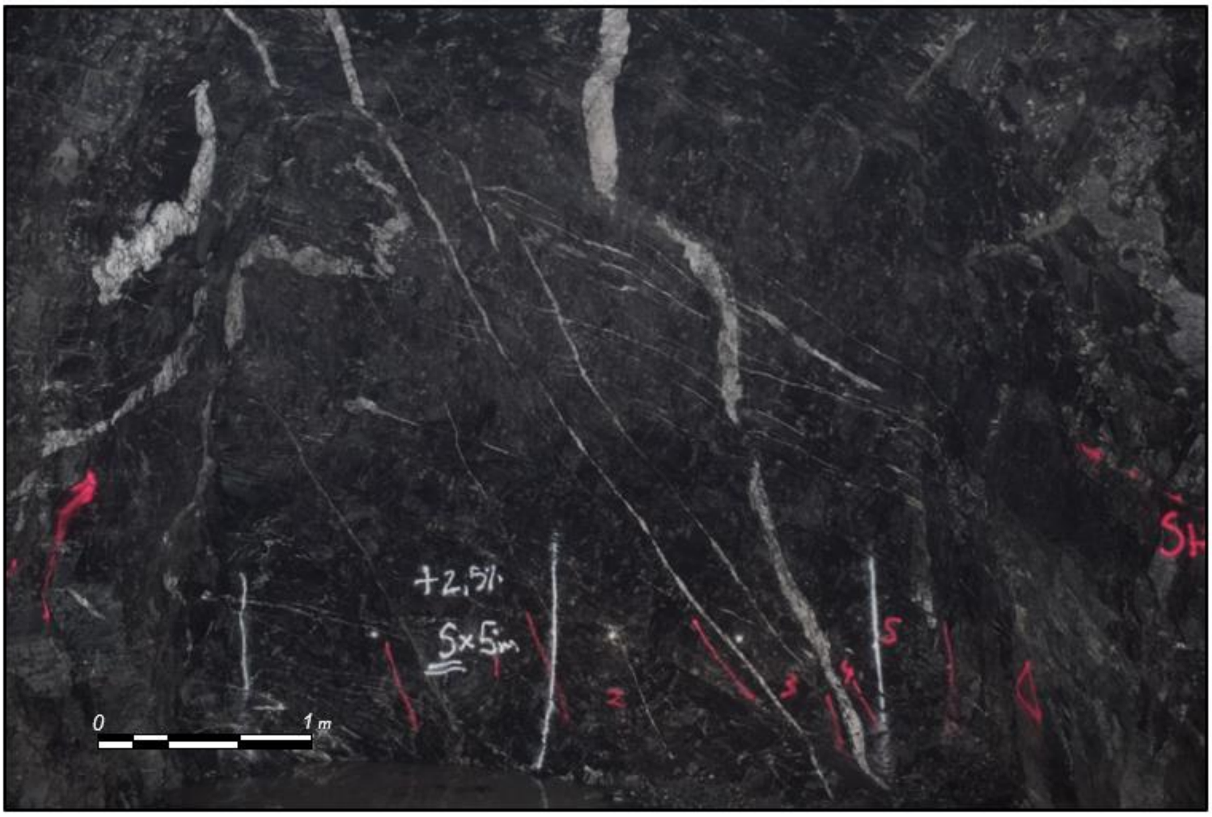


Figure 10-4: View of Underground Chip Sampling, Aurora Zone

10.1.2.4 Underground Sludge Sampling

Sludge sampling of the jumbo development drill hole cuttings (approximately 70 holes) is carried out for every round of the OVD. Sludge samples are not used for Mineral Resource estimation but are used to assist in stope design, production grade estimates, and reconciliation exercises. The sludge sampling is carried out following the SOP GEO20200625 "Instruktion för Provtagning och under jord".

After a round is drilled off, the sampler draws a line, and using a pick axe, alongside the drilled face, fills approximately one half of a bucket with the collected cuttings material (approximately 7 kg). To be as representative as possible, the sample is collected throughout the height of the sludge pile.

The sample is taken approximately one metre away from the drilled face. When rounds are drilled at +17% gradient, the drill cuttings usually flow away from the face, and when rounds are drilled at a -17% gradient, the drill cuttings flow toward the face. On such occasions, the sampler seeks to find the location where the drill cuttings are "constant" all the way from side to side. Rock fragments greater than five centimetres in diameter are removed before the cuttings are put into the bucket.

Following sampling, the bucket number is recorded including the date and name of the drive, on a patch in the bucket. The bucket is transported from the underground by the sampler and taken to the on-site laboratory.

While the underground sludge sampling is generally not useful due to reliability of the sample collection methods, the results appear to adequately identify the presence of elevated gold values in the next round.

10.1.3 Surveys

10.1.3.1 Survey Grids

The coordinate system used for daily production operations at Björkdal is the Mine Grid (SI units). The Mine Grid is rotated 29.67° west of true north. The 0 RL elevation was based upon the highest point in the vicinity of the mine ("Quartz Mountain"), an area which is now mined out. All drill hole and channel sample information is collected and entered into the database using the Mine Grid coordinate system.

10.1.3.2 Diamond Drilling

Currently, all diamond drill hole collars are surveyed using either Total Station surveying equipment for underground-based drill holes or Differential Global Positioning System (DGPS) surveying equipment. Downhole surveys are also carried out to record hole azimuth and dip of holes. Exploration drill holes are orientated and surveyed every three metres with a Gyro Smart downhole surveying tool once the drill hole has been completed.

Prior to 2010, only limited numbers of drill holes were surveyed for their down-hole deviation using a Maxibor instrument. Since 2015, downhole surveys have been carried out using a Reflex Gyro Smart tool surveying every three metres upon completion of the hole. This surveying unit initialises its orientation using a surface-referenced MEMS-Gyroscope prior to acquiring data measurements.

10.1.3.3 Reverse Circulation Drilling

All RC drill hole collars are surveyed. No downhole surveys are taken for grade control holes less than 70 m in length. All exploration drill holes are surveyed along their full length on completion of drilling.

The open pit grade control technician uses spray paint as well as wooden sticks to mark planned hole locations. The technician adjusts the X and Y positions as there will be differences in planned Z-coordinate and actual ground level. To ensure the correct azimuth, a marked wooden stick is placed approximately seven metres in front of the collar.

Upon completion of drilling, the technician measures the collar and direction of the drill hole with a Trimble TSC3 GPS controller unit. Unannounced visits to the drilling rigs were randomly performed by the supervising geologist during drilling operations to ensure that the dip and azimuth of the drill hole is correct. The azimuth is measured with total station and the reported measured deviations have not been greater than ±1°.

10.1.3.4 Underground Chip Sampling

All underground channel chip samples are based on surveyed points in relation to the Mine Grid together with observed geological or structural features present in the face. The chip sample locations are then turned into pseudo-drill holes for entry into the drilling and sampling database using a pseudo-collar location and calculated azimuth, dip and length.

Underground surveying is also used to map the trace of vein contacts along the face and backs of the sill drifts. This data is incorporated in geological mapping and vein wireframing and is captured in full three-dimensional space in Surpac.

10.2 Norrberget

Drilling at Norrberget has been carried out across three distinct periods in line with the priorities of the previous holders of the exploration concessions. The Mineral Resource drill hole database cut-off date was 30 September 2017. All holes completed before September 2014 were drilled by previous owners.

10.2.1 Historical Drilling

10.2.1.1 1994 to 1996 Drilling

The Norrberget deposit was first drilled by COGEMA in 1994 as part of a program investigating the margins of the Björkdal dome and assessing the potential for further significant gold deposits in the area. Further diamond drilling campaigns were carried out in 1995 and 1996 to define and extend the potential resource in this area (Table 10-6).

Table 10-6: Summary of Norrberget Historical Drilling Completed from 1994 to 1996

Year	Drill hole Type	Number of Drill holes	Metres
1994	Core	16	3,324
1995	Core	32	4,480
1996	Core	35	3,333
Total		**83**	**11,137**

Source: Mandalay Resources Corporation – Björkdal Gold Mine

10.2.1.2 2009 to 2014 Drilling

A hiatus in drilling occurred while the exploration concessions were under the ownership of North Atlantic Nickel; no significant work was carried out on the deposit between 1997 and 2009. After the regional tenement package was purchased by Gold-Ore, there was renewed interest in the area surrounding Björkdal. Several small diamond drilling campaigns were carried out at Norrberget and the immediate surrounds by Gold-Ore and their successors Elgin between 2009 and 2014 (Table 10-7).

Table 10-7: Summary of Norrberget Historical Drilling Completed from 2009 to 2014

Year	Drill Hole Type	Number of Drill Holes	Metres
2009	Core	11	1,028
2010	Core	1	200
2011	Core	6	1,391
2014	Core	6	1,757
Total		**24**	**4,376**

Source: Mandalay Resources Corporation – Björkdal Gold Mine

10.2.1.3 Mandalay 2015-2017 Drilling

After the 2014 acquisition of the Property by Mandalay, selected core from previous drilling campaigns was re-logged and re-assayed to confirm the accuracy of historical results and test the geological model for the area. In 2016, a diamond drilling program was undertaken to confirm the historical drilling and extend the resource. A small RC drilling campaign took place in the summer of 2017 to in-fill the known mineralisation.

A summary of the drilling programs performed by Mandalay from 2015 to September 2017 is provided in Table 10-8.

Table 10-8: Summary of Norrberget Drilling Completed by Mandalay from 2016 to 2017

Year	Drill Hole Type	Open Pit	
		Number of Drill Holes	Metres (m)
2016	Core	24	2,542
2017	RC	12	1,400
Total		**36**	**3,942**

Source: Mandalay Resources Corporation – Björkdal Gold Mine

10.2.1.4 Diamond Drilling

Diamond drilling at Norrberget since 2016 has been carried out with wireline diamond-core drilling methods by experienced Finnish drilling contractors Oy Kati AB. Drilling equipment has been appropriate to produce core to the WL76 (57.5 mm core diameter) standard. All drill holes were surveyed with modern computerised gyroscopic tools at hole completion, while also being regularly check-surveyed for unexpected deviation as the drilling progresses using modern multi-shot camera downhole tools. Core orientation tools were used on all holes in order for geologists to measure the orientation of all geological structures identified. Drill holes that are collared in unconsolidated materials (i.e., soil and till) were cased with traditional methods with either Boart-Longyear, or Hagby series casing rods and bits.

All drilling completed by Mandalay was designed and supervised by Mandalay/Björkdal geologists. Drill hole layouts are designed with the aid of Surpac mine planning software.

10.2.1.5 Reverse Circulation Drilling

Exploration RC drilling was undertaken at Norrberget during the summer of 2017 in order to quickly provide in-fill information for the deposit. The drilling was undertaken by an experienced international drilling operator, Mason & St John, based in the UK. Drilling was undertaken with a multi-purpose drilling rig equipped with 5.5 in RC diameter bit on six metre rods.

The holes were surveyed at completion with modern computerised gyroscopic tools. Samples were taken every one metre of drilling where they are split directly out of the cyclone using a cone-splitter to collect a representative sub-sample. Two samples were collected; with one sent directly to the laboratory for analysis while the other is sieved and washed in order for geological logging to take place. A booster compressor was used on deeper holes (>150 m hole depth) to maintain dry samples when water ingress increases with depth, or where water bearing fracture networks were intercepted.

All RC drill holes are planned by Mandalay/Björkdal geologists using Surpac.

10.2.2 Survey Control

10.2.2.1 Survey Grids

The survey coordinate system used at Norrberget is SWEREF99TM.

10.2.2.2 Diamond Drilling

All diamond drill hole collars were surveyed using Differential GPS surveying equipment. Downhole surveys were completed to record the hole azimuth and dip. Exploration drill holes were orientated using a Reflex EZ Shot tool. Their down-hole deviations were determined using the EZ Shot single shot survey tool as they were being drilled. Their final downhole deviations were measured every three metres using a Gyro Smart downhole surveying tool.

Prior to 2010, only limited numbers of drill holes were downhole surveyed, using a Maxibor instrument. From 2015 onwards, downhole surveys were carried out using a Gyro Smart surveying tool at a 3 metre spacing upon completion of the hole.

10.2.2.3 Reverse Circulation Drilling

All RC drill hole collars are surveyed. All holes are surveyed along the full length of hole at completion with modern computerised gyroscopic tools.

11 SAMPLE PREPARATION, ANALYSES AND SECURITY

Samples from Björkdal and Norrberget are prepared and analysed at CRS Laboratories Oy (CRS), an independent laboratory located in Kempele, Finland and with a subsidiary laboratory on-site at Björkdal. CRS is currently certified according to the International Organisation for Standardisation (ISO) ISO9001:2008 standard and accredited by FINAS Finnish Accreditation Service, ISO 17025:2017 (T342) standard, and is independent of Mandalay. Samples are also analysed by ALS Minerals, an ISO accredited commercial laboratory located in Piteå, Sweden, which is independent of Mandalay. The ALS laboratory is accredited by SWEDAC for several analytical methods (reg nr 2030) and compliant with international standard ISO 17025.

Whole core samples and RC samples are sent directly to the laboratories for sample preparation and assaying. Assaying is conducted utilising the PAL1000 test machine and the LeachWell process. Quality assurance and quality control (QA/QC) systems include the use of certified reference material (CRM) standards, blanks, duplicates, repeats, and internal laboratory quality assurance procedures employed by the assaying laboratory. It is understood by Björkdal personnel that the PAL method reports the cyanide soluble portion of gold within a sample. Checks have been conducted on residue material remaining after PAL assaying to confirm the completeness of the digestion stage and the transfer of gold to solution. The checks typically demonstrate that Björkdal mineralised material behaves well with this method and returns residue values of between 0.6 to 1% of the reported gold assay value.

Underground chip and sludge samples are collected by geological technicians and delivered directly to the on-site laboratory. The on-site laboratory, which utilises a PAL1000 unit, was established in June 2016 and was run by Minlab AB, a subsidiary of CRS, until April 2018. From May 2018 to April 2020 the on-site laboratory was run by ALS Minerals. Since May 2020, the on-site laboratory has been run by Minlab AB.

Underground sludge samples have been submitted to the site laboratory for analysis for production purposes, however these assay results have not been used in the Mineral Resource Estimation.

The Mandalay standard operating procedures (SOPs) are applied to both the Björkdal and Norrberget sample preparation, assay analysis, and sample security.

11.1 Diamond Drill Core Processing, Logging and Sampling

The standard Björkdal sampling procedure is documented in Mandalay's SOP GEO 20200527. This SOP requires diamond drill rig personnel to place the recovered drill core into wooden trays labelled at the drill site with the drill hole number and meterage values. End-of-run meterage markers are placed in the core tray between the end and start of each recovered drill run. For underground drilling, the core trays are placed on a pallet containing up to 12 boxes, strapped, and then transported to surface where they are delivered to the Björkdal on-site core processing facility. During surface drilling operations, the core is delivered each day to the Björkdal on-site core processing facility by the drilling company.

Upon receipt, the boxes are sorted out sequentially by hole number and the core is oriented on an orientation rack. The core is cleaned with fresh water, measured to check meterage and each core box is labelled with the core meterage values of the contents. Any discrepancies are reported back to the drill foreman for confirmation.

The geologist generally logs twelve boxes at a time. The core is visually inspected, logged for rock quality designation (RQD), structure, lithology, alteration, and sampling, where samples are separated and bounded by geological contacts such as lithological, alteration, and veining contacts. The criteria for selecting sampled intervals include:

- All veins are sampled (quartz, carbonate, sulphides, tourmaline, calc-silicates, etc.). Sampling intervals either side of the veined material are taken based on geology and are typically between 0.30 m and 1.2 m in length.
- Sample to lithological and alteration contacts.
- Sample all faults and fault gouge material.
- Highly fractured or altered portions, and other geologically interesting portions such as areas with abundant sulphides.

Core logging data is captured directly into a local GeoSpark master database located on logging laptops. The database software ensures that entered data is restricted to a valid range of accepted codes. The geological data collected includes:

Lithology:

- Rock code, grain size, foliation, texture type and intensity, and general description.

Alteration:

- Types and degree of alteration.

Veining:

- Descriptions of visible minerals observed, such as the presence of sulphides, visible gold, tsumoite, tourmaline, etc., are recorded for quartz veins greater than 5 cm in width as well as the number of veins in the interval.
- For veins less than 5 cm in width, this information is captured by an entry in the structural table using a zero width.

Structures:

- Type of structure, such as bedding, foliation, fault, vein, shearing, etc.
- Alpha and beta data is measured from oriented core.

Geotechnical:

- Calculation of RQD for a maximum length of one metre.

After every table of boxes is logged, digital photographs of the wet core is taken and images stored on the Björkdal file server. Sample tags are placed in the boxes before photography to ensure they do not move before sampling. The minimum sample length varies by core diameter, from 15 cm for WL66 and NQ2 core to 30 cm for WL46 and WL56 core in order to ensure reasonable minimum sample volumes for analysis. The maximum sample length is 1.2 m.

11.1.1 Core Sampling

All cores are sampled as whole core apart from WL76 holes, which are halved then sampled. A geological technician samples the core, breaking the core with a hammer at the marked sample locations. The samples are placed into plastic bags with a sample tag and sample number written on each bag with a permanent marker pen. The plastic bags are twisted closed and sealed with a zip tie. The sample is then placed into a wooden palletized box which contains a Fabrene bailer bag for transport to a laboratory.

11.1.1.1 QA/QC Sampling Scheme

The Björkdal analytical QA/QC program includes the insertion of Blanks and CRM standards into the sample stream in accordance with SOP GEO202003126 “Rutin för Standards, blanks och duplikater”. The protocol requires Blanks to be inserted into the sample stream at a rate of nominally one in 20 samples and after every sample containing visible gold. A 500 g Blank is routinely inserted into all sample batches. Blank sample material has been sourced from a dimension stone outlet (Granitti Natursten AB of Piteå, Sweden) that supplies material from a granite quarry in Finland. The Blank material although not obtained from a commercial supplier has been assayed more than 7,000 times with grades not reporting above the detection limit. The company remains confident that the supplied Blank material is suitable for use as a QA/QC check in sample batches as it contains no gold or silver grades.

In accordance with the SOP the Björkdal geology team includes 100 g CRM standards at a rate of one in 20 samples into each sample batch. The bulk CRM standards have been purchased from Geostats Pty Ltd, Western Australia. The geological technician weighs and bags the CRM standard at the sample preparation laboratory (SPL).

The blanks and CRM standards are inserted into the bailer bags stream prior to shipment to the assaying laboratory. Once full, the bailer bag is tied shut with security tags, and thick plastic is then draped and stapled shut over the top of the box in order to protect it from the elements during loading and transport.

11.2 RC Logging and Sampling

11.2.1 Exploration RC Holes

Exploration RC drilling consists of 5.5 inch diameter RC holes that are sampled every metre. Drill cuttings are dropped through a cyclone into a cone splitter at the completion of a onemetre drilling interval. Two samples are collected from the cone splitter comprising one sample of approximately three to four kilograms in a single calico bag (sample split), and the remaining material collected in a large green nylon bag (sample residual). Field duplicates are taken from the cone splitter when required. Bags have sample numbers written on them, and a ticket number is placed inside each bag in order to identify them. The calico bag samples are placed within a boxed pallet for transport directly to the laboratory, while the larger nylon bags are neatly placed in an ordered row for later chip sampling from a site geologist.

The RC chips are sieved, washed, and placed in chip-trays for later lithological, alteration, and mineralogy logging. Data from the logging is entered directly into the GeoSpark master database program. CRM standards and blanks are alternately inserted approximately every 20 samples into small, sealed plastic bags, and then within numbered calico bags, with their corresponding numbered sample tag, and inserted among the samples that are placed within the boxed pallet.

11.2.2 Grade Control RC Holes

RC drilling when trequired in the open pit for grade control uses 5 inch diameter holes on approximately 15 m spacing with 7.5 m in-fill spacing where possible. Samples are collected at one metre intervals. Drill cuttings pass into a cone splitter and collected in calico bags and a sample tag added after removal from the drilling rig. The amount of sample collected is approximately three to four kilograms. An additional sieved sample is collected and added to the RC Lithology Sample Tray. The RC chips are then logged in the same method as the exploration RC samples. No RC drilling has taken place in the open pit since August 2019.

11.3 Diamond Drill Core Sample Preparation and Analysis

Prior to April 2018, the majority of the samples were assayed by CRS in Kempele, Finland. CRS collaborates with MSALABS in Canada and acts as their representative in Finland. MSALABS are certified according to the ISO 9001:2008 standard and their laboratory in Vancouver, Canada is also accredited by IAS according to the ISO 17025:2017 (TL-736) standard. CRS's main laboratory is located in Kempele, Finland, directly east of Björkdal across the Baltic Sea, approximately 410 miles by road.

In April 2018, ALS Minerals took over operation of the on-site laboratory in Björkdal from Minlab AB (CRS) and performed analyses until May 2020.

Since May 2020, operation of the Björkdal on-site laboratory has been performed by Minlab AB (CRS). The on-site laboratory mainly analyses grade control samples such as chip samples and sludge samples, and drill core samples from development and production optimisation drilling.

Samples collected from exploration drilling programs are analysed by CRS at their laboratory facilities located in Kempele, Finland.

11.3.1 Sample Preparation and Analysis

11.3.1.1 CRS Procedures – prior to April 2018

The sample preparation procedures carried out consist of the following:

- Weighing (received weight) and listing preparation of received samples.
- Drying of wet samples in drying ovens.
- Crushing of samples to P80 <2 mm. The crusher is cleaned with pressurized air after every sample and flushed with barren rock between batches.
- Splitting to 500 g subsample with rotating sample splitter. The sampler splitter is cleaned with pressurized air between every sample. There are two duplicate split samples in a PAL1000 pulverization run.
- Analysis by PAL1000.

11.3.1.2 ALS Procedures – April 2018 to May 2020

The sample preparation procedures carried out on Björkdal's diamond drill core samples at the Piteå facility consisted of the following:

- Logging each sample upon arrival in the LIMS system and attaching a bar code label.
- Drying of wet samples in drying ovens.
- Fine crushing of samples to P70 <2 mm.
- Splitting sample using rotary splitter.
- Pulverizing a sample split of up to 1,500 g to P85 <75 µm.
- Analysis by LeachWell.

11.3.1.3 CRS – May 2020 to current

The majority of drill core is analysed at the CRS laboratory in Kempele, Finland using PAL1000 with an AAS finish (Figure 11-1). The PAL1000 analysis method has a lower detection limit of 0.05 g/t Au and an upper detection limit of 300 g/t Au, or a lower limit of 0.01 g/t Au if the gold from the sample solution is extracted into Di-Isobutyl Ketone (DIBK) prior to the AAS-read, which is the usual method for exploration core analysis.

The PAL1000 machine contains 52 steel pots, each having the maximum capacity of 1,000 g sample, 1,000 mL water, and grinding media (steel balls). Samples are completely pulverized, typically to P90 <75 µm, and simultaneously leached with cyanide.

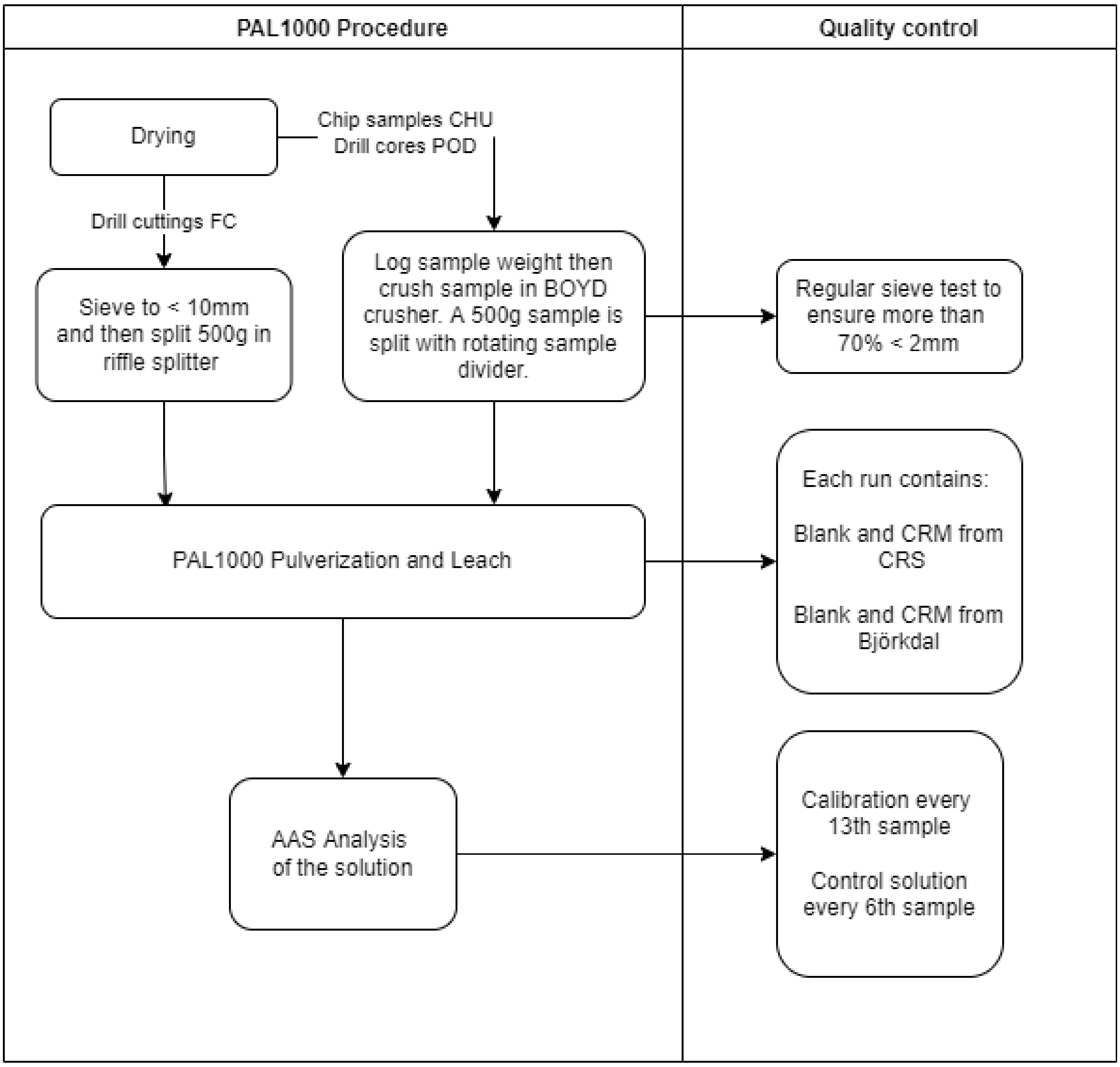


Figure 11-1: CRS Sample Preparation Flowsheet

The PAL1000 analysis is performed according to the following steps:

1. The 500 g sample is placed in a numbered plastic sample container.
2. The sample is inserted into the PAL1000 machine jars together with a cyanide pill and 500 mL of water.
3. The jars are sealed and the machine is run for 1.5 hours.
4. 10 mL of fluid is extracted from the jars with a single use pipette into a numbered single-use test-tube in a rack. The single use pipette is discarded after use.
5. The rack with the test-tubes is moved to the AAS machine.
6. Analysis of the solution is performed by AAS.

Blank tests are performed in every PAL run throughout the process in order to rule out the possibility of contamination in any of the various analysis steps. Blanks are inserted both by the laboratory following their own internal QA/QC and by Björkdal personel in the sample stream according to SOP GEO 202003126_"Rutin för Standards, blanks och duplikater". The AAS analysis is calibrated every 13th sample with standard solutions of known gold grades and checked every 6th sample with a standard solution. After the completion of AAS analysis and the laboratory introduced QA/QC has passed the PAL machine can be cleaned with water.

11.3.1.4 Umpire Checks

Umpire check assaying is completed in order to evaluate the level of precision, accuracy, and analytical errors present at the primary assay laboratory. Sample batches are re-analysed if the results of the QA/QC samples for a batch fail the required standards, such as a CRM standard result that is more than three standard deviations from the expected value.

11.4 Reverse Circulation Sample Preparation and Analysis

11.4.1 Sample Analysis

Historically, RC samples were sent to ALS Piteå for LeachWELL assaying. In 2014, Björkdal sent a limited number of RC samples to the Svartliden Mine Laboratory (Svartliden), located approximately 200 km west of Björkdal. Between 2015 and 2019, RC samples from grade control drilling were assayed at the on-site laboratory using PAL1000 equipment.

Samples were placed in a large, boxed pallet and transported to the on-site laboratory, where the samples were poured onto a metal tray and dried at 90°C until the samples were dry, approximately 24 hours. The samples were then placed in numbered plastic bags.

QA/QC samples were inserted into the bailer bags prior to shipment at a rate of one CRM standard and one blank sample for each hole. Once full, the bailer bag was secured with a security zip tie.

All RC rejects are stored for one year after all assays have been received, checked, and inserted into the master database (GeoSpark Source) by the database geologist. After one year, 90% of the rejects are discarded.

All RC data was reviewed and then stored in the secure network GeoSpark drill hole database system.

No RC-drilling has taken place since August 2019.

11.4.2 Umpire Checks

Check assaying was conducted to evaluate the level of precision, accuracy, and analytical errors that may be present at the primary assay laboratory. Samples were reanalysed if the results of the QA/QC for a particular batch was deemed to have failed. No umpire checks have been completed recently since open pit RC drilling stopped in August 2019.

11.5 Chip and Sludge Sample Preparation Procedures

11.5.1 Chip Sample Preparation

The in-mine chip samples are prepared and analysed at the Björkdal on-site assay laboratory. The chip samples, which are approximately five kilograms in weight, are transferred onto a tray and dried at 100°C until the sample is dry taking approximately three hours. The entire sample is then crushed in a jaw crusher to achieve P70 <2 mm. The jaw crusher is cleaned with barren rock and compressed air after every sample.

The sample is then split into a 500 g subsample with a rotary splitter and the residual sample is stored. The samples are placed into numbered plastic containers and transported to the laboratory. After one year, 90% of the rejects are discarded.

11.5.2 Sludge Sample Preparation

The in-mine sludge samples are prepared and analysed at the Björkdal on-site assay laboratory. The collected drill cutting sample is poured on a tray and dried at 100°C until the sample is dry, approximately six hours. The sample is split into a 500 g subsample with a rotary splitter and the residual sample is stored. The rotary splitter is cleaned with compressed air after each sample. Samples are then placed into numbered plastic bags and transported to the laboratory. After one year, 90% of the rejects are discarded.

While the gold content of mine sludge samples is determined for production planning purposes, the results are not used for Mineral Resource Estimation.

11.5.3 Chip and Sludge Sample Analysis

Assaying of the in-mine chip and sludge samples are conducted at the Björkdal on-site laboratory using the PAL1000 method. During the procedure samples are completely pulverized, typically to P90 <75 µm, while being leached with cyanide. The resulting solution is analysed for gold by AAS. Assay limits range from a lower detection limit of 0.05 g/t Au to an upper detection limit of 300 g/t Au.

The samples are assayed using PAL1000 cyanide leaching with the jars cleaned with quartz sand and water after every run.

The standard procedure for PAL1000 analysis is described in Section 11.3.1.3 and is undertaken for mine chip and sludge samples at the Björkdal on-site laboratory.

11.5.3.1 Umpire Checks

Check assaying is undertaken in order to evaluate the level of precision, accuracy, and analytical errors that may be present at the primary assay laboratory. Samples are reanalysed if the results of the QA/QC samples for a batch are deemed unsatisfactory.

11.6 QA/QC Scheme and Results

No QA/QC data is available for the historical drilling completed prior to 2004. RC drilling for grade control purposes carried out from 2006 to 2013 and assayed at ALS did not include any QA/QC samples into the sample batches.

From 2013 to 2014, CRM standard and blank samples were inserted into the sample stream with one blank and one CRM standard sample inserted per RC drill hole.

A full description of the details and results of the QA/QC programs carried out prior to Mandalay's acquisition of the Mine in 2014 can be found in reference document Roscoe Postle Associates Inc., 2015.

Following Mandalay's acquisition in 2014, the QA/QC protocols were updated to include the regular insertion of Blanks and multiple CRM standards at a ratio of one in 30 samples within each batch, and a blank sample was inserted after every sample containing visible gold.

The following review of the QA/QC sample results includes:

- Regional exploration drilling data,
- Underground and near-mine surface Exploration drilling data,
- Grade control data from 2015 and January to September 2021.

A summary of the Björkdal submitted QA/QC samples from 2015 to 30 September 2021 is provided in Table 11-1.

Table 11-1: Summary of Björkdal submitted QA/QC Sampling – 2015 to 30 September 2021
Mandalay Resources Corporation – Björkdal Gold Mine

Year	Blanks	CRM Standards	Other	Total
2015	114	538	-	652
2016	1,832	2,456	233	4,521
2017	1,936	2,525	222	4,683
2018	1,992	2,724	243	4,959
2019	2,392	2,348	167	4,907
2020	3,263	3,149	-	6,412
2021[1]	2,430	2,398	334	5,162

Note: 1. Statistics for 2021 include to 30 September 30

Mandalay manages the QA/QC program by compiling all assay results from the blank samples and CRM standards into an Excel spreadsheet where the grades of particular samples are compared to the second and third standard deviation results by QA/QC sample type.

11.6.1 Certified reference materials

Mandalay Resources has implemented the use of commercial certified reference materials (CRM) produced by Geostats Pty Ltd (Geostats) in order to control and measure the quality and accuracy of laboratory analyses at Björkdalsgruvan during the end of the 2020 and 2021. The CRM reference values range from low to high grades to reflect the grade range observed for the Björkdal deposit (Table 11-2).

Table 11-2: Certified Reference Materials and certified assay methods

CRM Name	Material source	Certifying Lab	Method1	Method 2
G313-2	Commercial	Geostats	AquaRegia	Fusion/XRF
G315-2	Commercial	Geostats	AquaRegia	Fusion/XRF
G915-2	Commercial	Geostats	AquaRegia	Fusion/XRF
G917-2	Commercial	Geostats	AquaRegia	Fusion/XRF
G917-9	Commercial	Geostats	AquaRegia	Fusion/XRF

With sampling of diamond core, one CRM standard is submitted with every 20 samples, typically using different CRMs in each batch. For underground channel sampling, at least one standard is incorporated into each submitted batch.

A standard assay result is considered to be acceptable when it falls inside three standard deviations (SD) of the CRM certification grade. If the result of the CRM fails or is unsatisfactory (i.e. more than 3 standard deviations), the significant mineralised assayed samples in the batch are re-assayed if they may have an impact in the future resource estimates. All the outcomes of the QA/QC are recorded in the database with appropriate comments.

A review of the CRM results for the reporting period has been presented below:

- CRM standard G313-2 Reference value Au = 2.07 g/t.

  Relatively good compliance with mostly negative bias during the second half of the period. A few outliers outside the ±3SD limits in the later half of the period, were due to mixed up standard identification inserted by Mandalay sample technicians (Figure 11-2).

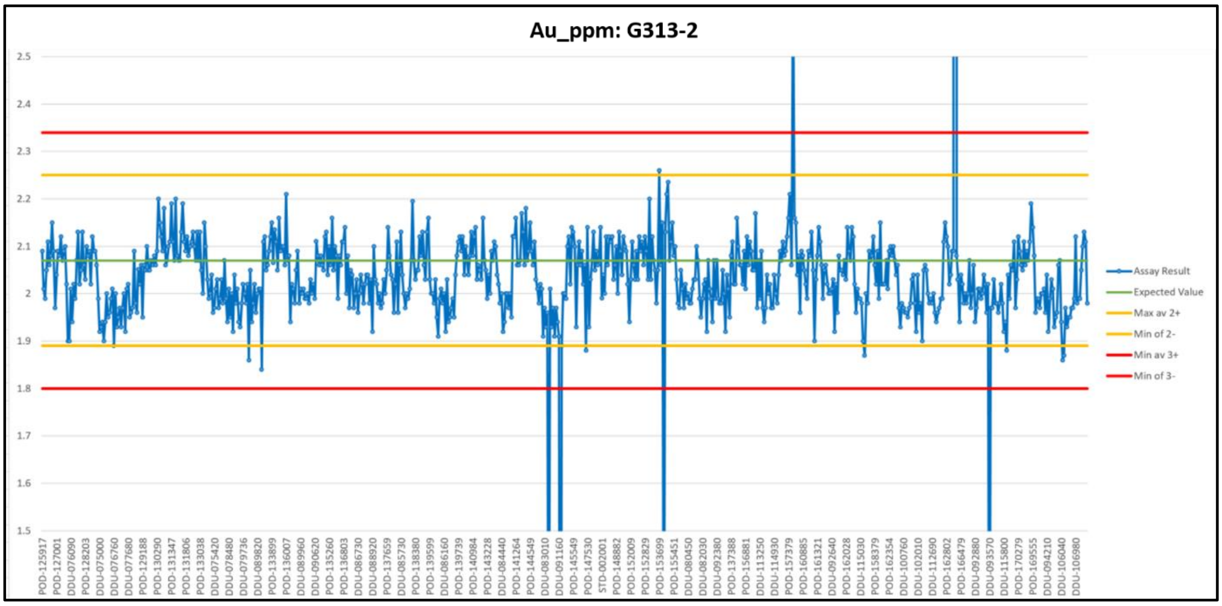


Figure 11-2 CRM G313-2 performance chart

- CRM standard G315-2 Reference value Au = 0.98 g/t.

  Low compliance. Several results are outside of ±3SD and ±2SD through out the period. Four of the standards that are outside of the detection limit ±3SD are because of mixed up standards inserted by Mandalay sample technicians (Figure 11-3).

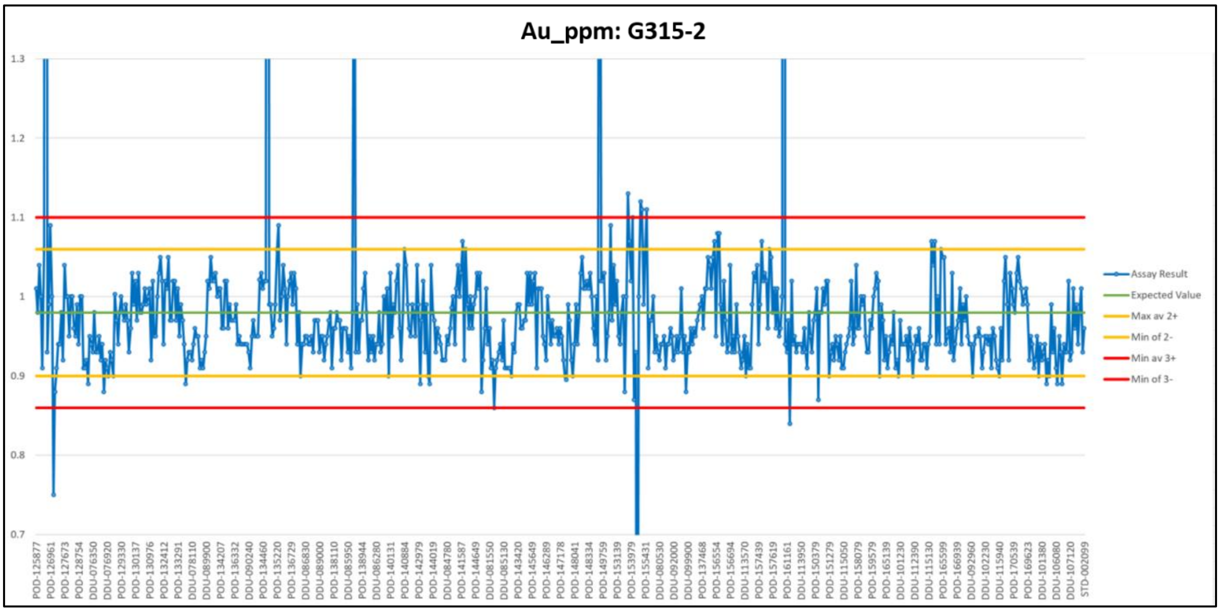


Figure 11-3: CRM G315-2 performance chart

- CRM standard G915-2 Reference value Au = 4.94 g/t.

Good compliance with a slight negative bias at the beginning and toward the end of the period. A few samples are falling below of the ±3SD limit and two samples are above the ±3SD limit which was due to mixed up standards inserted by Mandalay sample technicians (Figure 11-4).

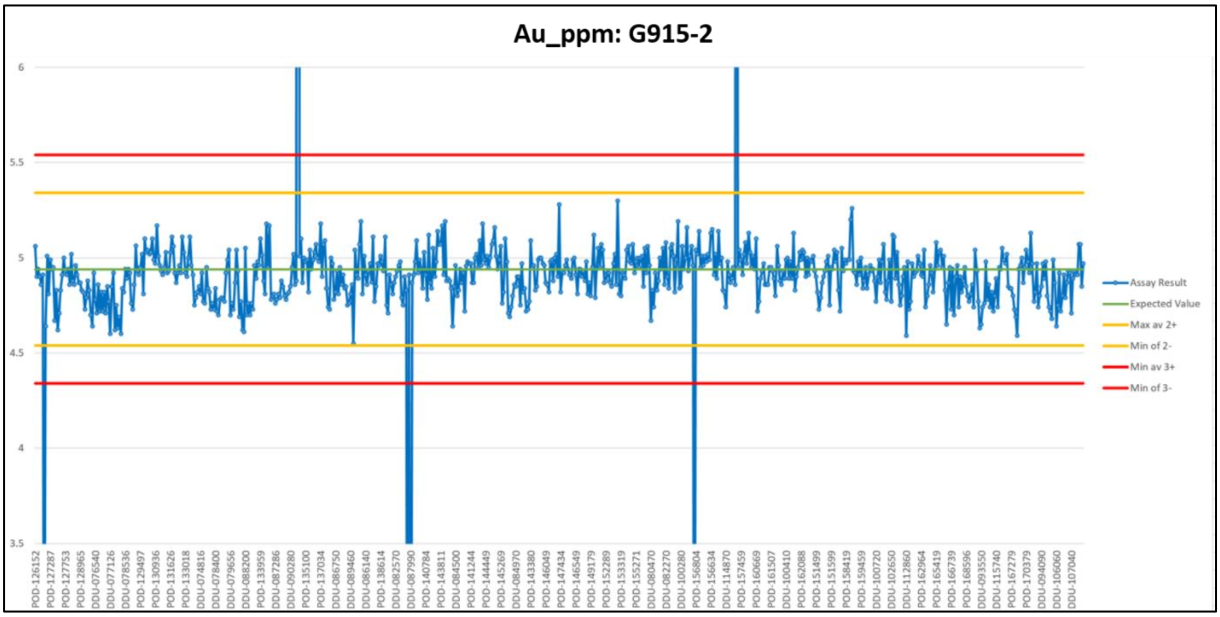


Figure 11-4: CRM G915-2 performance chart

• CRM standard G917-2 Reference value Au = 24.47 g/t.

Good compliance for the period with a slight negative bias and a few samples below the ±3SD limits. This was likely because of mixed up standards inserted by Mandalay sample technicians (Figure 11-5).

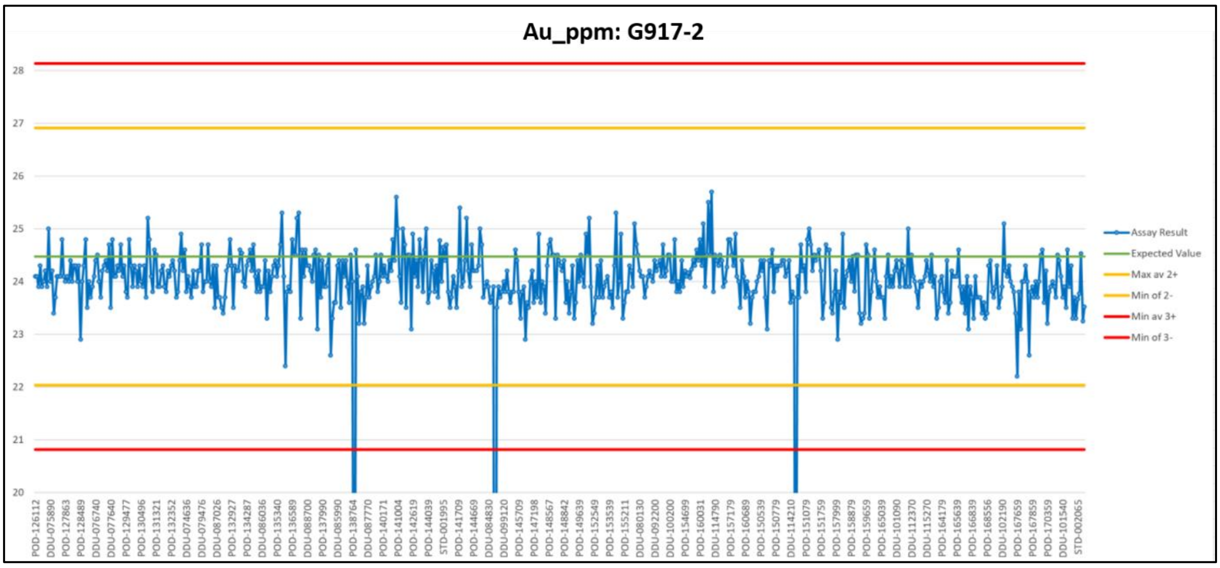


Figure 11-5: CRM G917-2 performance chart

• CRM standard G917-9 Reference value Au= 12.05 g/t.

Good compliance and accuracy with slight negative bias at the beginning and towards the end. Only one standard is just above ±2SD and the remaining outliers were due to mixed up standards (Figure 11-6).

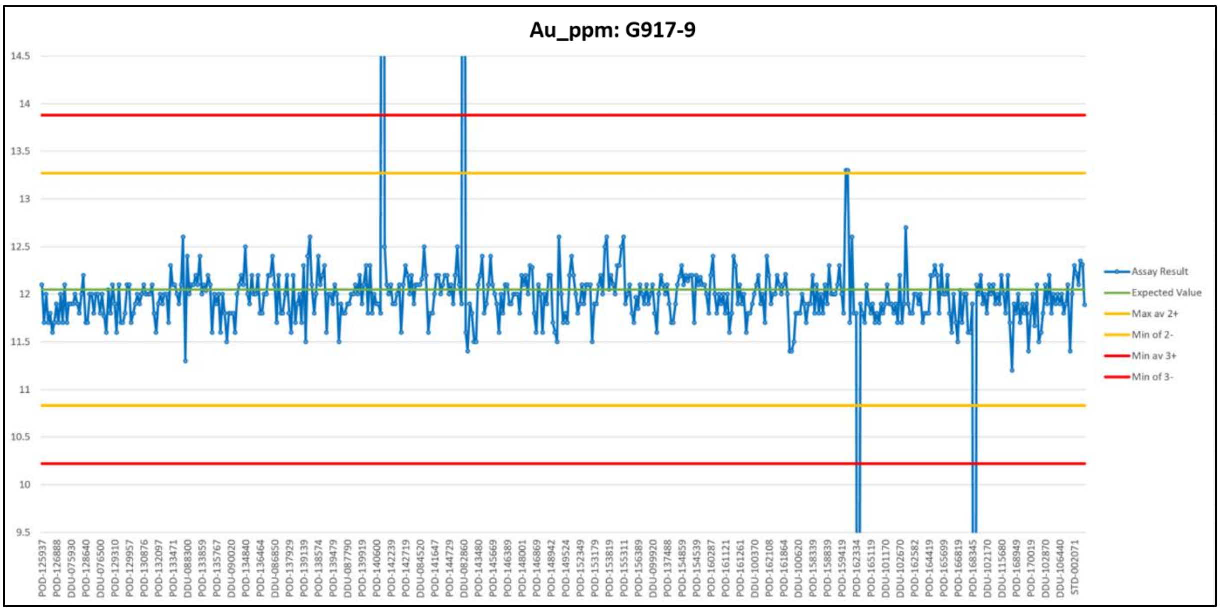


Figure 11-6: CRM G917-9 performance chart

11.6.2 CRM Discussion

Most of the failures in the CRMs have been due to mixed up standards identification by the employees at Björkdal. In order to fix this issue, new routines have been implemented in the preparation lab. In addition, the standards that failed under the ±2SD limits should be monitored by the laboratory in charge to avoid failures as much as possible. However, the majority of the results have been satisfactory.

11.6.2 Blanks

Mandalay Resources submitted crushed samples as blank material into assay sample lots, to test for contamination during sample preparation. The blank material is bought from ALS laboratories in Piteå and derives from a non-auriferous granite quarry outside Piteå, Sweden (Granitti Natursten AB of Piteå).

A blank in the diamond core sampling is submitted every 20 samples to measure the level of contamination that may occur during the sample preparation procedure for each batch. An extra blank (flush) sample is also submitted after each sample with visible gold as an extra check for contamination due to the high variance of the gold grades.

The expected value of the blanks is 0.01 g/t and the failure threshold was set to 0.05 g/t (PAL 1000 detection limit). The blanks results displayed in Figure 11-7 indicate 99% passing rate. Only 10 gold failures with grades over 0.05 g/t were registered. Four of these samples were contaminated due to a high grade sample before analysing the blank. The other six sample failures are very close to the detection limit set which were not considered as a problem.

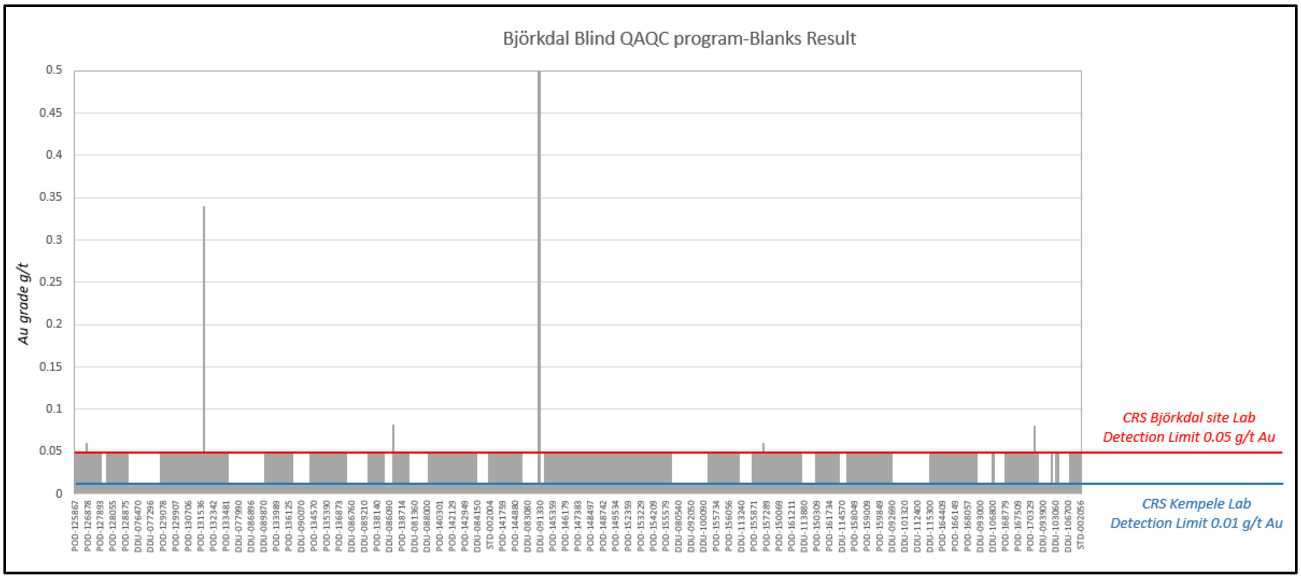


Figure 11-7: Björkdal Blind QA/QC program - Blank Result

11.6.3 Reject duplicates

A total of 299 reject duplicate assays have been completed by CRS laboratory for gold from 30 September 2020 to 30 September 2021 (Table 11-3). The duplicates are assayed as separate samples in different batches from both exploration drill core samples and mine face/wall channel samples.

Table 11-3: Reject duplicates

Description	Au CRS lab Original	Au CRS lab Duplicate
Number of samples	299	299
Mean	7.30	7.52
Maximum	301.9	279.4
Minimum	0.05	0.04
Population Standard Deviation	22.36	22.20
Coefficient of variation	3.06	2.95
Bias	-3.02%	
Correlation of Coeficient	0.99	
Percent of samples <30%RPD	66%	

Scatter plot of the reject duplicate results is presented in Figure 11-8. No clear bias between the original and duplicate has been observed and despite the dispersion observed, the trend line R^2 remains close to 1.

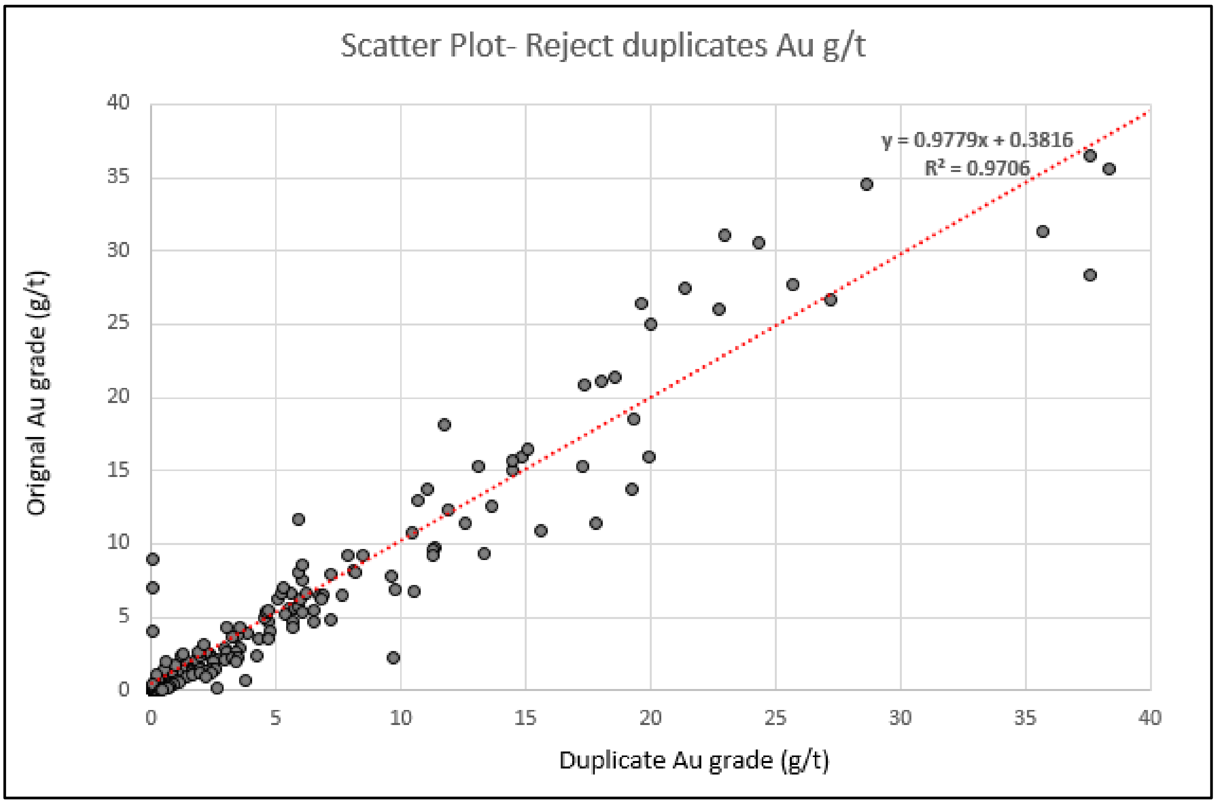


Figure 11-8: Scatter Plot - Reject duplicates Au g/t

Relative paired difference (RPD) plot is utilised in the determination of precision between paired datasets, such as original assay results and reject duplicate results as presented in Figure 11-9.

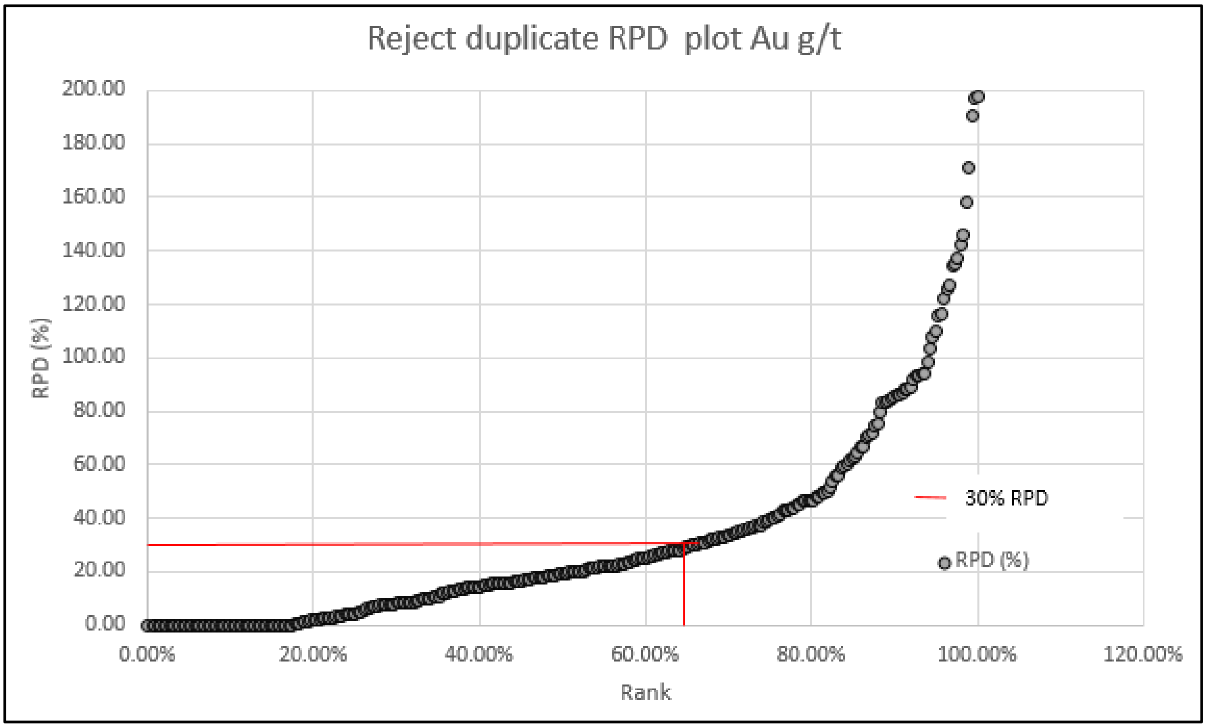


Figure 11-9: Reject duplicate RPD plot Au g/t

11.6.3 Umpire checks- Pulp duplicates

One pulp umpire check assay program wasconducted during 2021 on pulp samples assayed by CRS Kempele laboratory (original laboratory). Selected pulp samples were dispatched to MSALABS (umpire laboratory) for re-analysis, the results of which are detailed in Table 11-4. MSALABS used the CN 01 assay method for their analysis which is a BLEG test using cyanide on a 500 g sample. Biases less than 5% are considered acceptable, however the results in this case showed a bias around 7%, with the umpire laboratory returning higher values than the original. Mandalay plans to conduct several programs with different laboratories to identify possible sources of this bias during 2022, however it notesthat the causes could be related to the highly nuggety gold distribution, the different assay methods employed by the two laboratories and/or the low number of samples submitted for umpire analysis.

Table 11-4: Umpire checks CRS Kempele vs MSALABS

Description	Au CRS Kempele (PAL 1000)	Au MSALABS (Au CN01)
Number of samples	35	35
Mean	14.82	15.87
Maximum	92.2	135.0
Minimum	1.17	0.84
Population Standard Deviation	19.45	25.98
Coefficient of variation	1.31	1.64
Bias	7.11%	
Correlation of Coeficient	0.97	
Percent of samples <20%RPD	57.1%	

A scatter plot of the umpire pulp duplicate results is presented in Figure 11-10. No clear bias between the original and duplicate has been observed due to the lack of samples, however the correlation appears to be better for lower grades (0.5 to 10 g/t Au) and deteorates at higher grades.

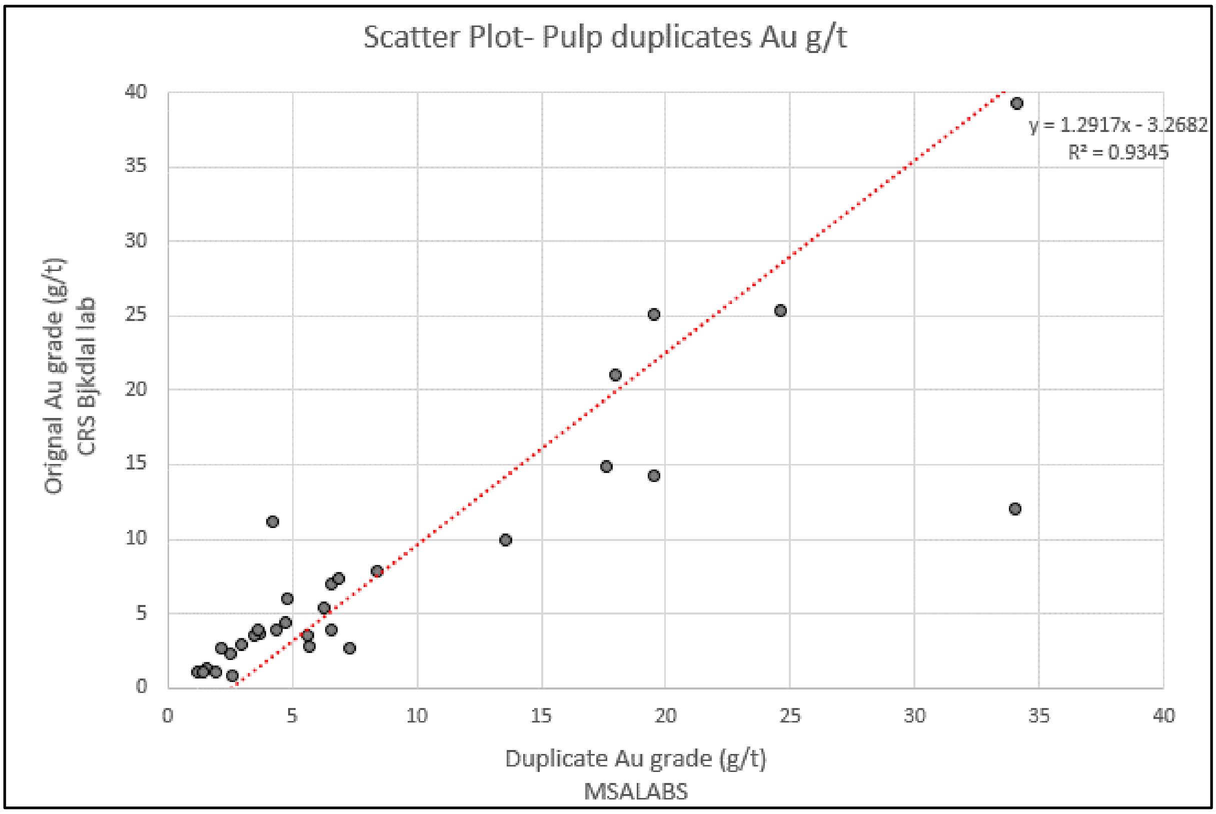


Figure 11-10: Scatter Plot of pulp duplicates for Aug/t

A relative paired difference (RPD) plot is utilised in the determination of precision between paired datasets, such as original assay results and reject duplicate results. In Figure 11-11, the gold RPD plot demonstrates that only 57% of all umpire check duplicate pairs are less than 20% RPD when compared to the original (CRS lab) assay result. This is considered to be a poor result that may improve if a larger number of duplicates are involved in future studies.

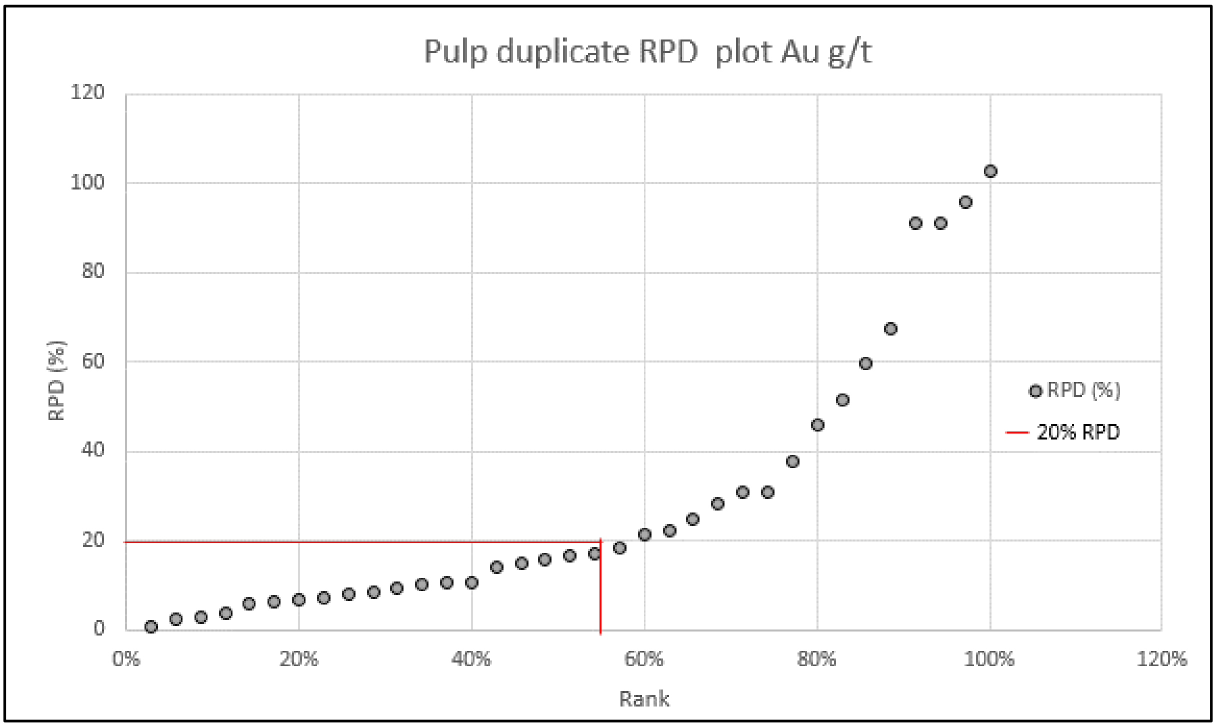


Figure 11-11: Pulp duplicate RPD plot Au g/t

The QP considers that the QA/QC results for the reporting period demonstrate that the sampling and assaying procedures are sufficiently reliable for the data to be used as input to the Mineral Resource Estimate.

11.7 Security

Björkdal drill hole and mine chip samples, as well as Norrberget exploration samples, are transported from to the Björkdal on-site core logging and sample preparation facility, which is located within a secure area. All diamond drill core is logged into laptop versions of the GeoSpark drill hole database system. The stand-alone logging laptop computers are typically backed up on a daily basis. The GeoSpark database is located on the Björkdal server, with daily backups and access restrictions based on user level.

Only authorised persons permitted by Björkdal are allowed to handle the samples.

Commercial freight companies are used to transport the samples to the appropriate independent sampling and assaying laboratories. Sample shipment dispatch lists are emailed to the assay laboratory and the laboratory provides a confirmation receipt of the sample shipment.

12 DATA VERIFICATION

12.1 Björkdal

In fulfilment of the NI43-101 requirements, Mining Plus Principal Geologist and Qualified Person, Dr Matthew Field completed a personal inspection of the Björkdal Property between 7 and 9 December 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 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 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 measurements and data recording processes,
- Drill core logging and sampling processes including:
  - Core processing procedures from initial mark-up through to sample selection and sampling,
  - 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,
  - QA/QC reports and raw results.
- Underground inspection to review face mapping and sampling processes,
- Discussion of the geological interpretation
- Review of some typical drill hole intersections from the Björkdal orebodies.

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.

- The system for recording, storing and transferring downhole survey measurements is 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. Björkdal have an effective validation procedure that flags potential errors in the measurements immediately as the data is loaded into the database. This means that errors can be checked before the drill rig moves off the drill collar.
- Full-core sampling of the drill hole intercepts is considered appropriate given the style of mineralisation at Björkdal, and the analytical method using the PAL1000 system has proven to be highly effective at obtaining repeatable duplicate results in a high-nugget gold deposit. These results are the direct consequence of the PAL1000 system being able to process 0.5 kg samples as opposed to typical 50 g samples used for fire assay.
- Check assays have been made on the PAL1000 results by assaying 326 tailings samples from the process using traditional fire assaying methods. The results demonstrate very low residual Au content found in these tails, averaging 6% (range 0% to 6.8%) of the sample grades obtained. The percentage residues are highest in low-grade samples, generally below 0.2 g/t Au, with a few minor exceptions up to 0.9 g/t Au. An exceptionally high-grade sample of 428 g/t Au from PAL1000 assaying produced 0.0 g/t Au in its tailings. This confirms that the Au in the Björkdal deposit is not refractory and that the leaching of gold by the cyanide solution is effective at recovering sample grades that can be used for Mineral Resource Estimation.
- The adoption of digital data capture for face mapping and sampling locations underground using the Hovermap scan system is considered to be a significant improvement in recording and capturing the mineralisation grades and changes in thickness in strike drive development. Since the previous Technical Report, a clipping precedence has been established that should deal with the issue of cross-cutting veins that are appropriate for Mineral Resource Estimation.
- The chain of custody protocols currently in place for transporting both the drill core and underground channel samples to the off-site, third-party laboratory is industry standard.
- The communication with the analytical laboratory is good with regular QA/QC reports and meetings held between the two parties.
- The number of new density measurements added to the database during 2021 is 24, which seems low given the number of assays conducted during the same period. A systematic density measurement for each sample assayed is common practice in the industry, especially on drill core samples. Measurements are made using the water immersion method which is an industry standard. 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 personnel on-site gave confidence that the geological understanding of the mineralisation has and continues to underpin its ongoing success.

In general, the Mining Plus QP considers that the qualitative and quantitative geological data used to inform the Björkdal 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.

Notwithstanding the above, Mining Plus makes the following recommendations with respect to the data verification activities undertaken:

- That cavity monitoring system (CMS) measurements continue to be used to establish the true volumes of historical mining excavations at Björkdal, so that these can be appropriately depleted from the Mineral Resource block model. This is an ongoing process, but at the time of the site visit not all historical excavations had been surveyed. Thus, the Mineral Resource as quoted may have some uncertainty with regard to resource depletion although the potential impact is not considered to be material.

- Undertake test work using oven dried core samples to determine the moisture content ranges for different rock types, mineralisation grades and in different oxidation conditions to determine the likely impact on the bulk density measurements. These adjustments should then be made to the bulk density values used in the Mineral Resource Estimate.

- In discussions with the Björkdal geological team it is apparent that they have or are addressing most of the recommendations listed in the previous technical report. The most challenging issues relate to reconciliation. Overall the reconciliation process is complicated by assumed grades for nominated B-ore which is made up material from stockpiles and underground. The low-grade stockpiles from open pit mining have an assumed grade of 0.64 g/t Au. From annual data in the period 2018 to 2021 this grade seems reasonable. However, there is also underground B-ore that is assumed to have a grade in the range 0.35 to 0.5 g/t Au that is derived from on-vein development (about 60%) and from scaling and mucking (making up 40%). Tracking of this ore is difficult, and plant records show that the average annual grades between 2019 and 2021 is 0.68 g/t Au. So, for reconciliation purposes the mine uses an average of 0.64 g/t Au for underground B-ore. Whilst it may be useful to run additional reconciliations on older block models it is the QP's opinion that any reconciliation challenges relate more to uncertainties and assumptions regarding underground B-type ore than the estimation of A-type ore.

12.2 Norrberget

SLR carried out a site visit to the Norrberget site on 24 September 2017. SLR reviewed the drill program and inspected the drill rig and pad setup. No drilling was underway at Norrberget during the site visit, although active drilling was observed at Björkdal.

SLR received the Norrberget dataset in July 2017 as an Access database that contained all drilling up until the completion of the 2016 exploration program. Additional drilling was completed in 2017 and appended to the drill hole database later that year. The cut-off date for the drilling is 30 September 2017.

SLR validated the database using standard software tools to check for errors within the database. One sample (un-mineralised) was observed as having an identical From and To value. This sample was reviewed by Björkdal staff and edited to reflect the true intercept width from neighbouring samples.

SLR also compared a selection of the values within the database assay table to the original certificates.

A check was undertaken to ensure that the drill hole elevation was comparable with the digital terrain model (DTM) surface. No material discrepancies were observed.

The QP is of the opinion that the Norrberget drill hole data are adequate for the purposes of Mineral Resource estimation.

13 MINERAL PROCESSING AND METALLURGICAL TESTING

13.1 Björkdal

The mineral processing plant at Björkdal commenced operation in 1989. Since that time, it has processed approximately 35.2 Mt of ore from open pit and underground sources and produced approximately 1.54 million ounces of gold (Moz Au).

The original plant design was based on pilot plant data that was generated in 1987. Since then, numerous studies and metallurgical test programs have been carried out by mine staff, third party consultants, and Ph.D. students from the Mineral Engineering department at the University of Luleå. This work has included mineralogical characterisation studies of the tailings, work index and abrasion index studies, and numerous internal studies on grinding/liberation/recovery relationships.

Since the plant has been operating for an extended period of time, processing ore supplied from both the open pit and the underground mines, the historical data provides the best estimate of anticipated plant performance in the future. Figure 13-1 provides an overview of the plant recovery data for the gravity, flotation, and total plant recovery starting in 2005. Open Pit operations were suspended mid-year 2019 after which only low grade stockpiled material from the pit has been blended into the feed. The majority of the feed for 2020 and 2021 was sourced from the UG operations.

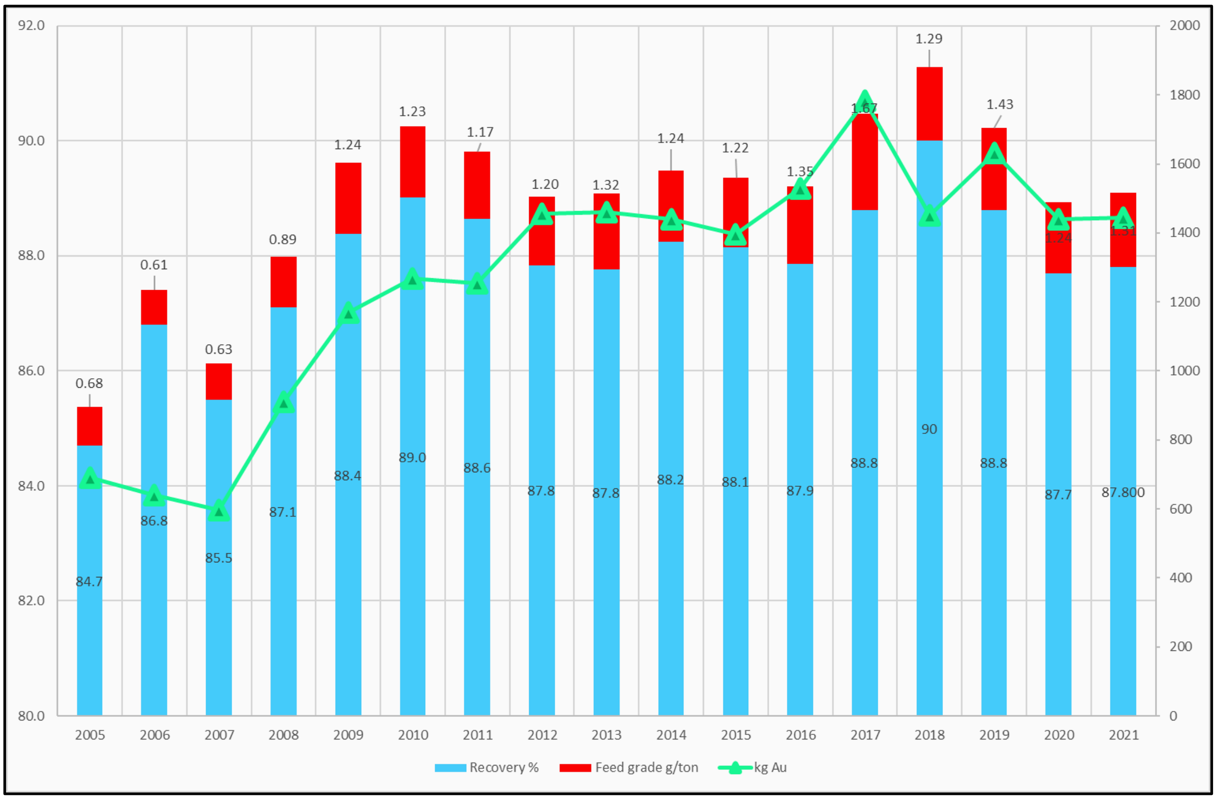


Figure 13-1: Plant Recovery and Feed Grade Data 2005 to 2021

A specialised plant project designed to increase flotation retention time and install larger scavenger cells and a second stage of cleaner flotation was completed in 2017. In 2018, an Expert Process Control System was installed. In 2021 a G-max cyclone battery was installed.

Ore processed in the mill is blended from different stockpiles in order to maintain a high throughput and to achieve good recovery. The budgeted recovery has been estimated based on historical data regarding the behaviour of different material types when they have been run as separate milling campaigns (Figure 13-2). The budgeted tonnes and grade from the production plan have been used to calculate the estimated recovery for the year. Typically UG stope material has a recovery in the range of 87-90.5% while UG development ore is between 86-89.5% and OP Stockpile material between 83-89%. Inclusion of marble material or skarn in the blend affects the flotation reducing the recovery to typically between 83-86%, however this material constitutes a smaller amount throughout the year.

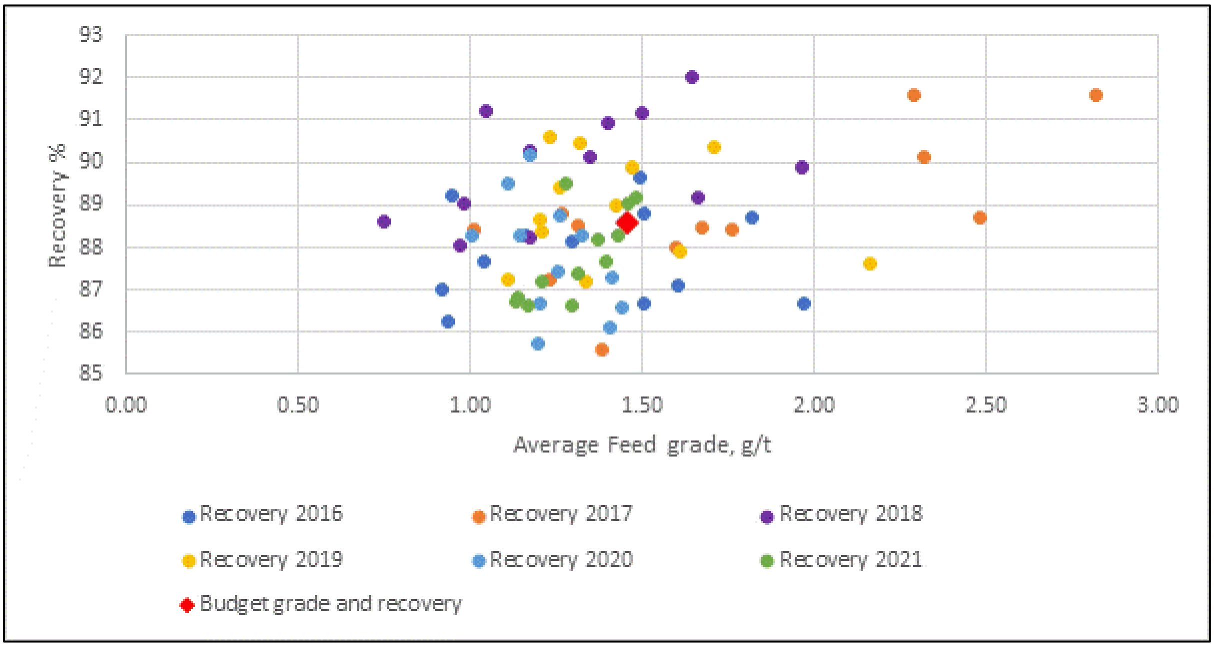


Figure 13-2: Historical Plant Grade-Recovery Data

The correlations between feed grade and tailings grade for the total plant recovery have been presented in Figure 13-3.

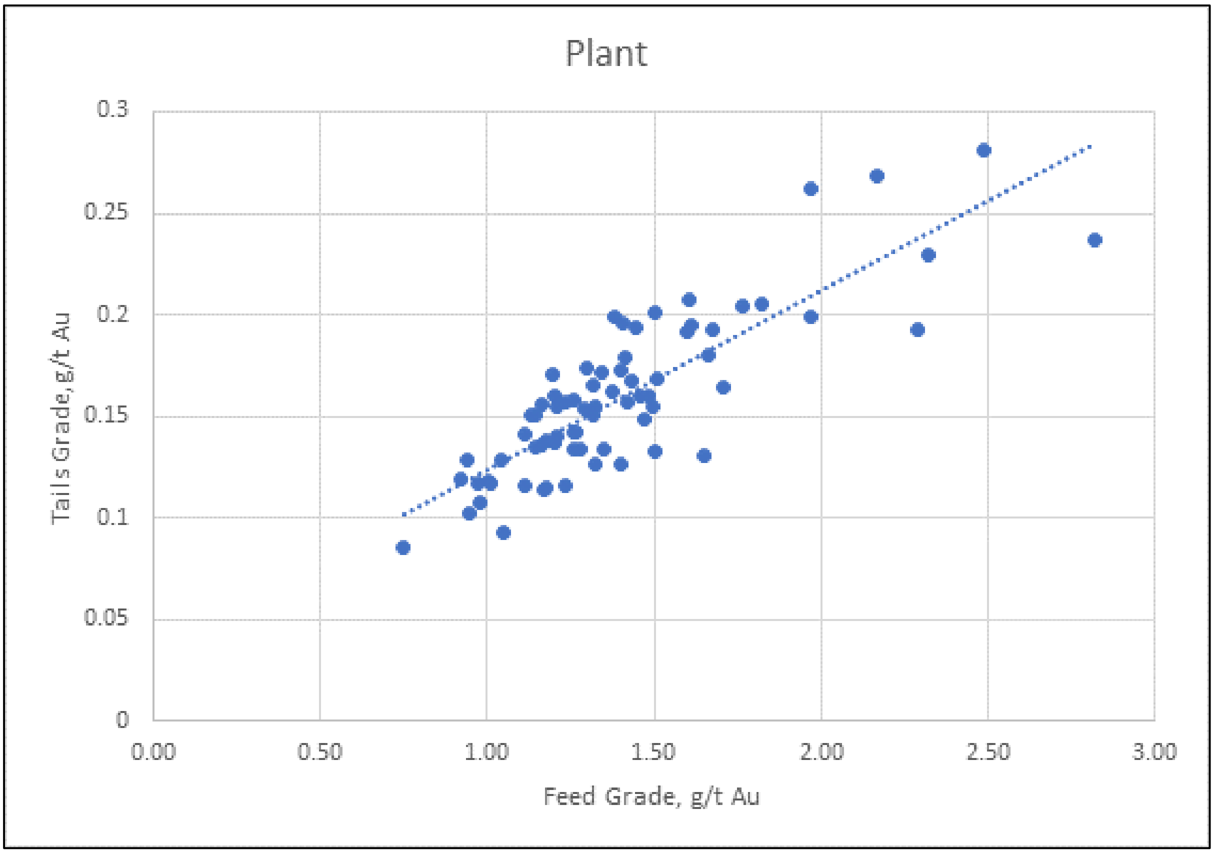


Figure 13-3: Tailings grade relations ship for 2016 to 2021

Figure 13-4 provides the monthly average tonnages and feed grades for 2016-2021 in support of typical feed grades and tonnage.

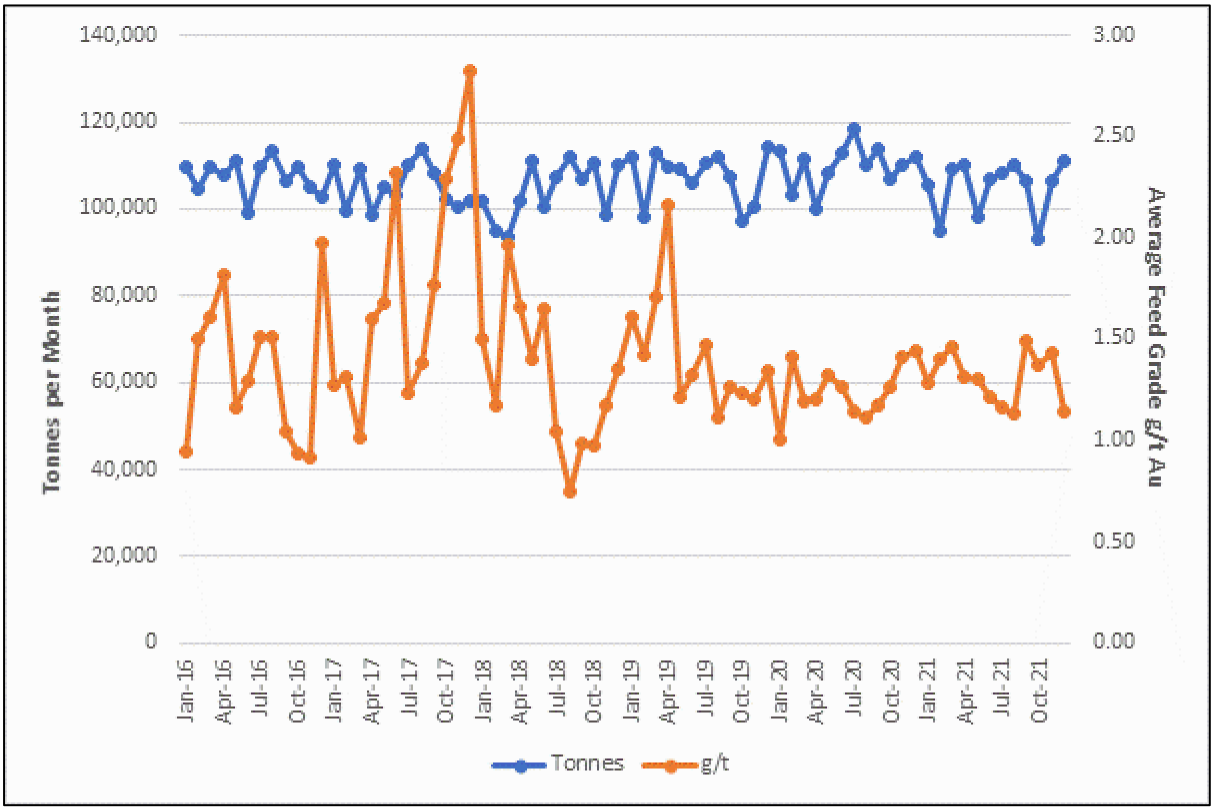


Figure 13-4: Plant operating performance 2016 to 2021

Figure 13-5 compares the 2021 recoveries for the various products with the 2022 LOM budget. Based on this data, the budgeted recovery is a reasonable projection.

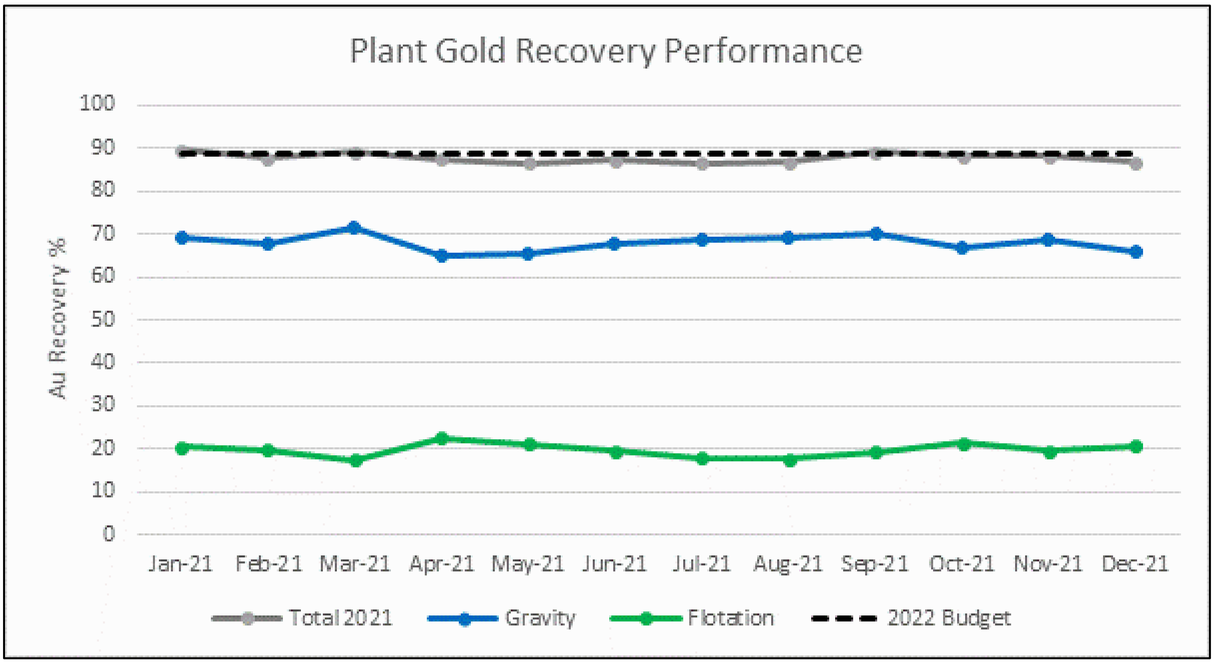


Figure 13-5: Plant gold recovery performance for 2021

Figure 13-6 compares the 2022 budget to the 2021 averages for tonnage and grade. The average budgeted tonnage for 2022 is approximately 108,333 tonnes per month compared to an average of 104,996 tonnes per month in 2021. The average budgeted head grade in 2022 is 1.46 g/t Au compared to an average of 1.31 g/t Au in 2021.

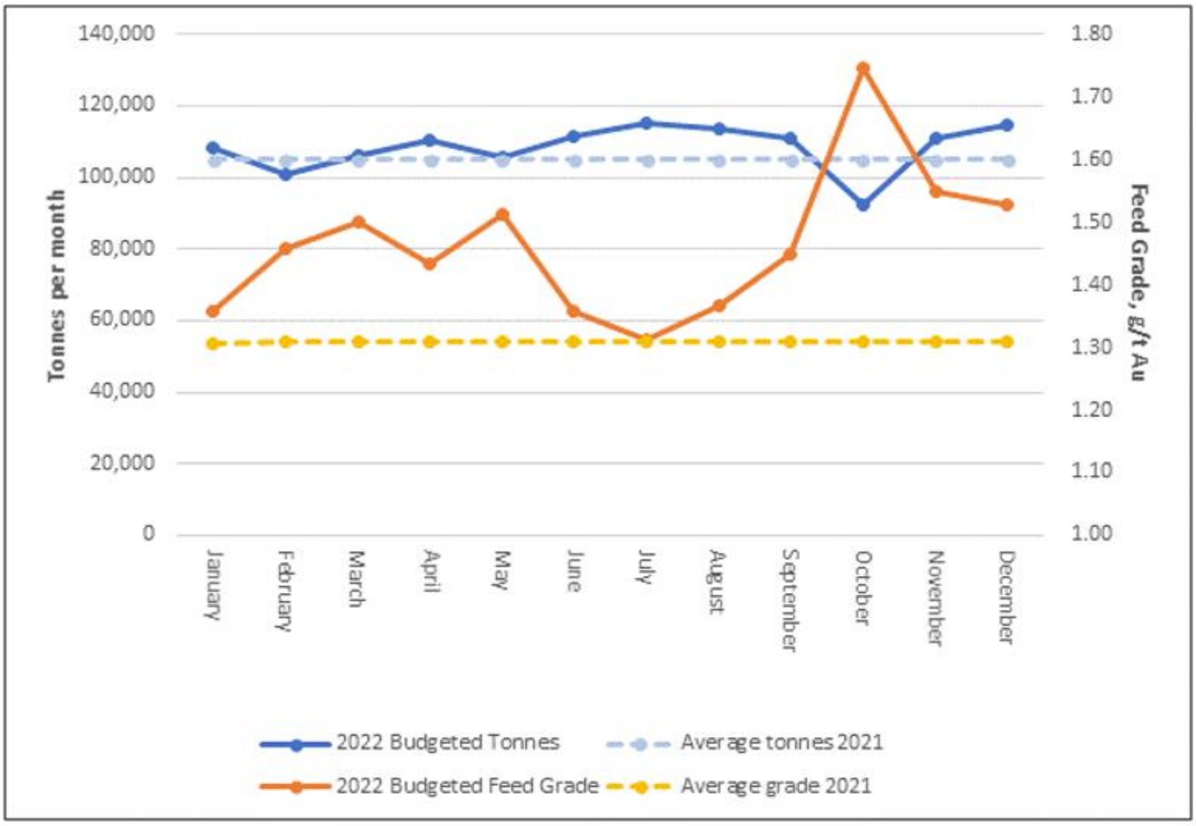


Figure 13-6: Comparison 2022 budget to 2021 actual plant performance

In the QP's opinion, the budgeted tonnages and recoveries for 2022 appear to be reasonable based on historical operating data.

The QP is of the opinion that utilising historical data to predict future performance in the processing plant is appropriate.

The QP is not aware of any processing factors or deleterious elements that could have a significant effect on economic extraction.

13.2 Norrberget Metallurgical Testwork Program

ALS Kamloops was commissioned in September 2017 to conduct a pre-feasibility level metallurgical testing program to support the Norrberget MRMR estimates for this Technical Report.

During the September 2017 site visit, SLR (RPA at the time), selected samples to complete the testing program using available quarter drill core. It was hoped that additional sample material would be available from the RC holes that were being drilled at the time of the site visit, however, upon review of the drill hole locations, it was determined that they are located outside of the areas that are expected to be mined. SLR selected material for three samples based on the grade distribution of the assay data base for samples above the cut-off grade, as shown in Figure 13-7, however, some of the material was below the cut-off grade because the intervals of lower grade material were small and it is anticipated that it will be mined since it is surrounded by higher grade material.

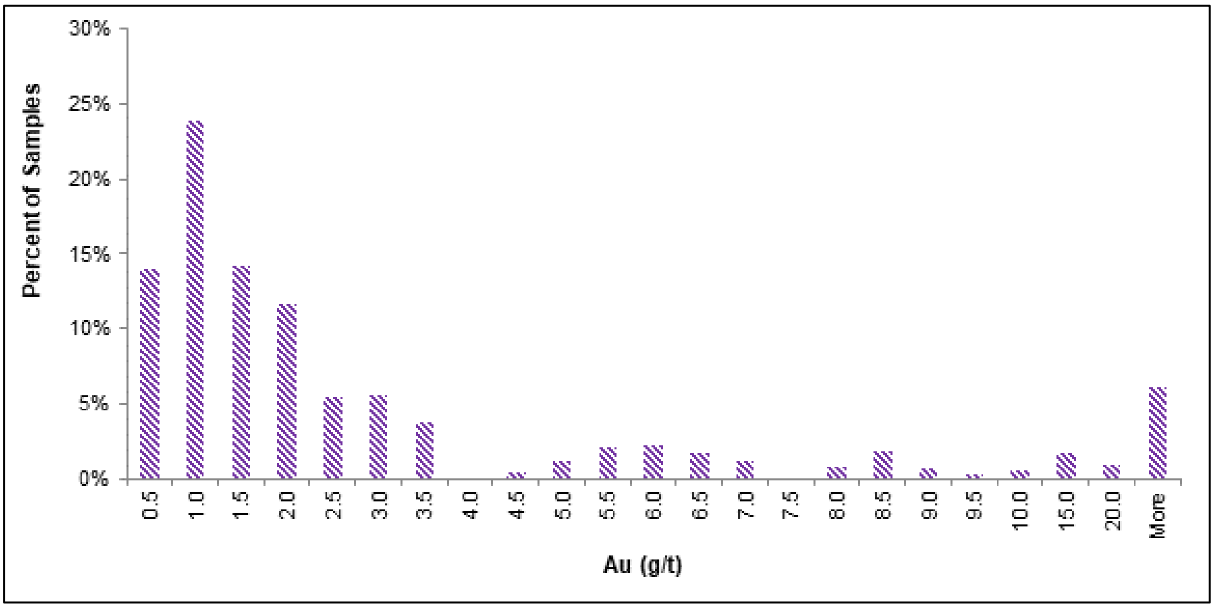


Figure 13-7: Norrberget deposit grade distribution data

The samples were selected based on the gold grades at the time the work was completed. They included a Master Composite sample that was estimated to be approximately the average grade of the deposit (i.e., 2.0 g/t Au), a low-grade sample that was estimated to be near the cut-off grade for the Mineral Resource (i.e. 0.5 g/t Au), and a high-grade sample that was estimated to be approximately 5.0 g/t Au. Sample selection criteria would change based on current grades.

The locations of the drill holes are shown in Figure 13-8.

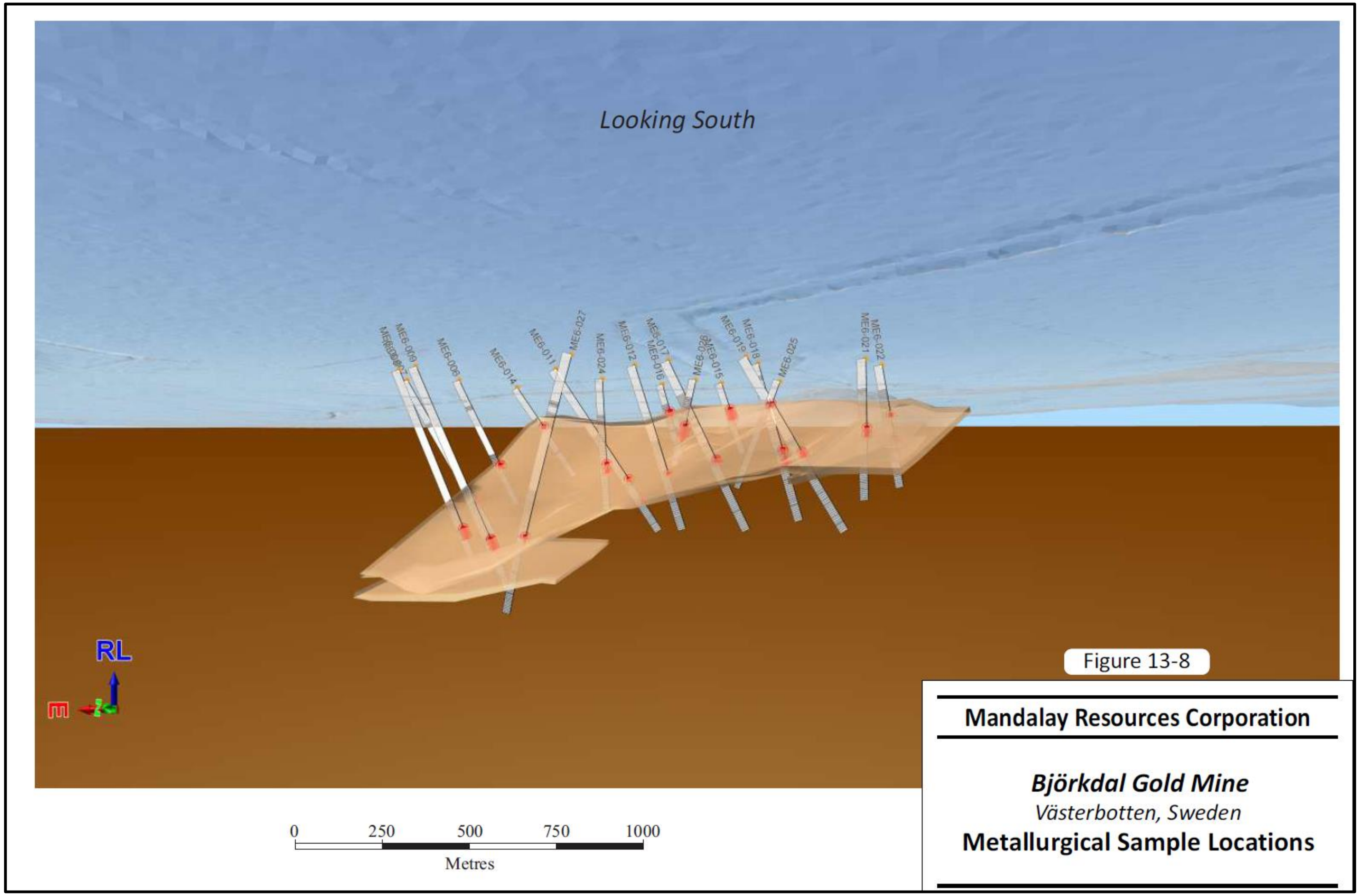


Figure 13-8: Perspective view showing metallurgical sample locations

13.2.1 Head Grades

The composite samples were assayed by fire assay. The results are shown in Table 13-1.

Table 13-1: ALS Composite Sample Assays

Sample	Au (g/t)	Fe (%)	S (%)
Master	6.17	1.90	0.08
Low Grade	0.79	1.77	0.07
High Grade	6.22	2.70	0.07

The Master Composite gold grade was three times higher than estimated from the geological data for the drill core intervals that were used. Given that material from Björkdal is consistently difficult to assay due to the presence of coarse gold, it is anticipated that the calculated head grades from the metallurgical tests will be more accurate. Table 13-2 compares the assay data with the calculated head grades from the tests that have been completed at the date of this Technical Report.

Table 13-2: ALS Master Composite head grade comparisons

Data Source	Au (g/t)
Estimated	1.93
Assayed	6.17
KM5489-01	5.36
KM5489-02	5.17
KM5489-03	5.18
KM5489-04A	5.01
KM5489-05A	5.21
KM5489-06B	7.77
KM5489-07B	5.19
KM5489-08A	4.80
KM5489-09A	5.28
KM5489-12A	5.67
KM5489-20A	4.75
KM5489-21A	5.16
Assayed by Size Fraction	6.52

The calculated head grades are somewhat lower than the assayed head grades but still significantly higher than the estimated head grade. The assay procedure used by the Björkdal geological staff for drill-hole assays is the Cyanide Extractable Gold Using LeachWELL accelerant on 500 g samples, which has historically been more accurate than traditional fire assays due to the larger sample size. In order to evaluate whether the large difference between estimated grade and actual grade of the Master Composite was a sample preparation problem or an analytical problem, splits of the sample were sent to CRS and ALS in Piteå Sweden for analysis using the LeachWELL procedure. CRS completed the geological assays for Norrberget. The results are shown in Table 13-3.

Table 13-3: Master composite head grade analysis using LeachWELL

Laboratory	Au (g/t)
CRS	6.95
ALS Piteå	5.61
ALS Piteå QC	5.58

13.2.2 Bond Ball Mill Work Index

One Bond ball mill work index test was completed using the Master Composite sample. The result is 12.2 kWh/t, which is similar to the Björkdal ore that is currently being processed.

13.2.3 Gravity Gold Recovery

Gravity gold recovery tests were completed using three grind sizes to determine whether there is any relationship to gravity gold recovery and grind size. The results of the three tests and a fourth test that was used to prepare feed for a flotation test are provided in Table 13-4.

Table 13-4: ALS Master Composite gravity gold recovery data

Test	K_{80} (µm)	Calculated Head (g/t Au)	Recovery (%)
KM5489-01	244	5.36	48.2
KM5489-02	180	5.17	50.5
KM5489-03	172	5.18	51.1
KM5489-04A	193	5.01	51.3

The gravity gold recovery is approximately 50% and appears to be independent of the particle size. Based on these results, the decision was made to conduct further tests at the standard Björkdal particle size of 80% passing (K80) 206 µm. Due to some discrepancies with the grind calibrations, this was subsequently changed to K80 193 µm.

13.2.4 Flotation Tests

A series of flotation tests was conducted using the Master Composite sample in order to evaluate optimum flotation conditions for the Norrberget material. Four gravity plus rougher flotation tests and five gravity plus rougher-cleaner flotation tests were conducted. Following the optimisation phase of the test program, one gravity plus rougher flotation test and one gravity plus cleaner flotation test was conducted using the high-grade sample and the low-grade sample. The results are shown in Table 13-5. The selected conditions were used for tests KM5489-12A and KM5489-20A.

Table 13-5: ALS flotation test data

Test	Gravity				Rougher Flotation Recovery (%)	Cleaner Flotation Recovery (%)	Concentrate Grade (g/t Au)	Total Recovery (%)
	K_{80}, (µm)	Calculated Head (g/t Au)	Recovery (%)	Con Grade (g/t Au)				
Master Composite								
KM5489-04A	193	5.0	51.3	167.2	23.8		57.2	75.0
KM5489-05A	193	5.2	51.2	185.7	24.8		34.7	76.0
KM5489-06B	90	7.8	60.6	320.0	25.1		66.8	85.7
KM5489-07B	140	5.2	53.0	204.9	26.6		43.5	79.6
KM5489-08A	193	4.8	47.2	158.0		27.1	64.2	74.3
KM5489-09A	193	5.3	63.2	221.3		8.00	62.1	71.2
KM5489-12A	193	5.7	52.4	199.7		25.3	40.6	77.7
KM5489-20A	193	4.7	42.2	153.7		32.6	29.6	74.8
KM5489-21A	47	5.2	54.6	183.1		37.1	20.7	91.8
Average		**5.4**						
Low Grade								
KM5489-11A	214	0.57	38.2	14.8	29.5		5.4	67.7
KM5489-13A	214	0.66	41.1	17.5		26.1	4.7	67.2
Average		**0.62**						
High Grade								
KM5489-10A	189	5.9	37.7	140.7	25.2		52.6	62.9
KM5489-18A	189	6.9	37.6	157.0		37.7	52.3	75.3
Average		**6.4**						

13.2.5 Estimated Recovery

The Norrberget deposit has a metallurgical response that is different from the Björkdal ore. In order to realise a gold recovery that was consistent with Björkdal ore, it will be necessary to grind to a particle size K80 of approximately 47 µm. Due to the small size of the Norrberget deposit, it is not anticipated that it would be cost effective to modify the grinding circuit to achieve this recovery. Since it is expected that there is a relationship between grade and recovery, SLR analysed the limited data that is available to estimate the recovery at the average grade that will be processed over the LOM (i.e. 2.8 g/t Au). The data used for this estimate is provided in Table 13-6. SLR chose the results from KM5469-12A for the Master Composite and did not use the results from KM5489-20A because the calculated head grade was much lower than the calculated head grades for the majority of the tests.

Table 13-6: Test data used to estimate recovery

Sample	Au (g/t)	Recovery (%)	Gravity (%)	Flotation (%)
Master	5.7	77.7	52.4	25.3
Low Grade	0.66	67.2	41.1	26.1
High Grade	6.9	75.3	37.6	37.7

Figure 13-9 shows the graphical results of the recovery estimate.

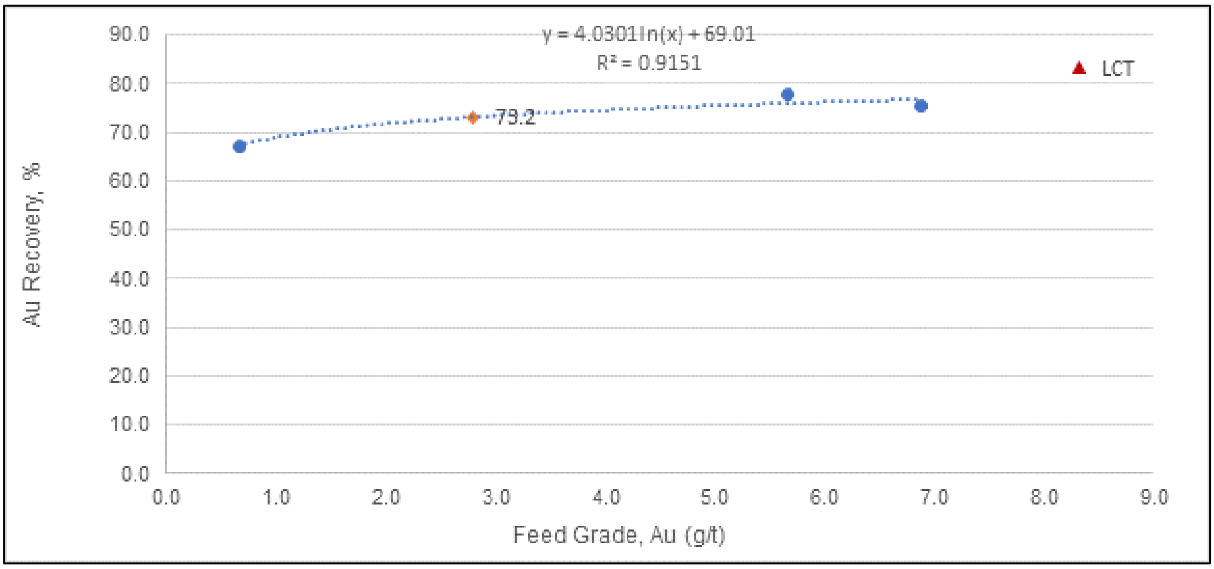


Figure 13-9: Recovery estimate for Norrberget

As shown in Figure 13-9, a locked cycle test (LCT) using the Master Composite sample was also conducted by ALS. In general, LCT data is more accurate in estimating plant performance than the open circuit flotation tests and LCT recoveries are somewhat higher than recoveries from open circuit tests. In this case, the calculated head grade was excessively high, which, in SLR's opinion, skews the data. Based on the evaluation using limited data, SLR estimates that the average gold recovery will be a total of approximately 75% with approximately 45% of the gold recovered in the gravity circuit and the remaining 30% recovered in the flotation circuit.

13.2.6 QEMSCAN and Diagnostic Leach

In order to evaluate the differences in the mineralogy between Björkdal and Norrberget, diagnostic leach tests and QEMSCAN bulk mineral analysis (BMA) and trace mineral search (TMS) were completed using the bulk concentrate from test 20.

The diagnostic leach tests showed that the majority of the gold was cyanide leachable, which indicates that it was exposed. Very little of the gold was encapsulated in silicates. It is theorized that the particles may be too small to be recovered by flotation.

The mineral composition from the BMA is provided in Table 13-7 and the sulphide deportment is provided in Table 13-8: ALS sulphur deportment of Bulk Concentrate.

Table 13-7: ALS Mineral Composition of Bulk Concentrate

Mineral	Mineral Content (wt. %)
Chalcopyrite	1.4
Molybdenite	0.1
Sphalerite	0.1
Galena	<0.1
Pyrrhotite	17.3
Pyrite	2.0
Iron Oxides	0.3
Feldspars	32.5
Amphibole	19.4
Quartz	9.1
Micas	6.2
Carbonates	3.9
Chlorite	1.8
Epidote	2.3
Sphene (Titanite)	1.7
Apatite	0.6
Bismuth Telluride	0.4
Others	0.8
Total	**100**

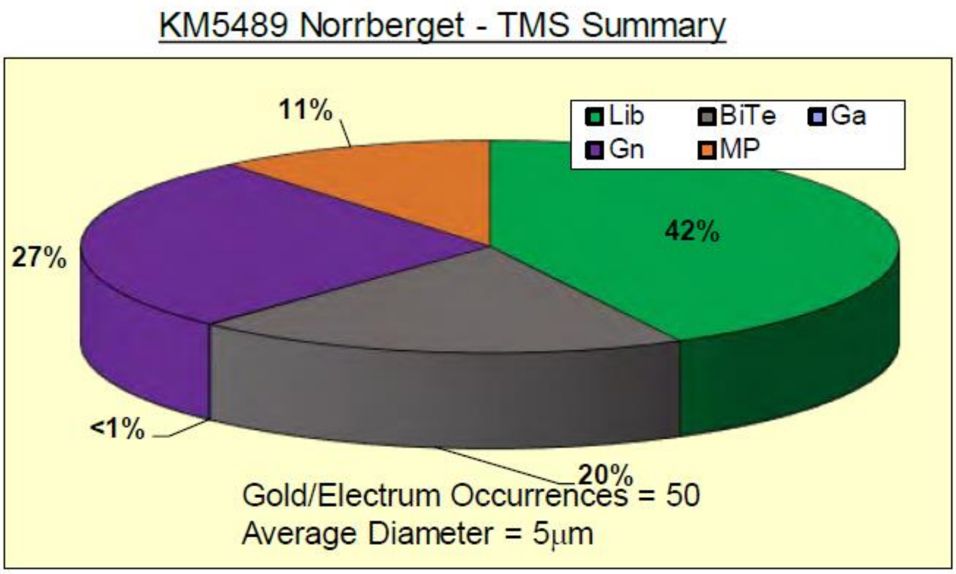
Notes:
1. Chalcopyrite includes trace amounts of Bornite, Chalcocite/Covellite and Tennantite/Enargite.
2. Iron Oxides includes Magnetite, Hematite and Goethite/Limonite.
3. Feldspars includes Feldspar Albite, Plagioclase Feldspar and K Feldspar.
4. Micas includes Biotite/Phlogopite and trace amounts of Muscovite.
5. Carbonates includes Calcite and trace amounts of Ankerite.
6. Others includes Nickel Iron Sulphide, Cobaltite(?), Gold/Electrum and unresolved mineral species.
7. A Particle Mineral Analysis was used for the data.

Table 13-8: ALS sulphur deportment of Bulk Concentrate

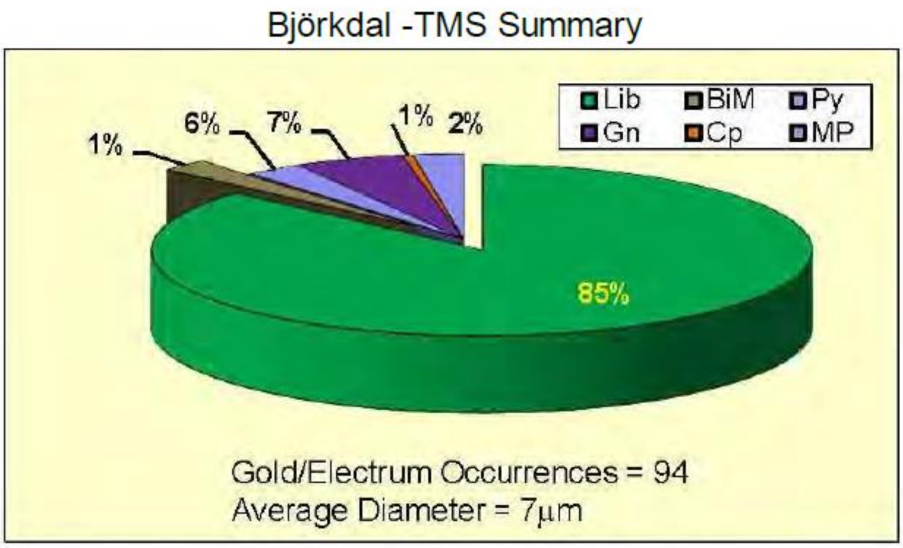
Mineral	Test 20 Bulk Concentrate (%)
Chalcopyrite	6.2
Molybdenite	0.6
Sphalerite	0.3
Galena	0.1
Pyrrhotite	79.6
Pyrite	12.9
Other Sulphur Bearing Minerals	0.5
Total	**100**

Notes:
1. Chalcopyrite includes trace amounts of Bornite, Chalcocite/Covellite and Tennantite/Enargite.
2. Other Sulphur Bearing Minerals includes Nickel Iron Sulphide and Cobaltite(?).

Figure 13-10 compares the results of the TMS for Norrberget with results from an earlier Björkdal study. Fifty gold bearing particles were assessed. The electrum particles measured on average >80% gold per the x-ray spectra. From the figure it can be seen that the gold/electrum occurrences identified for the Norrberget bulk concentrate appear to be more complex. A lower percentage of the gold surface area was identified as liberated gold/electrum particles, whereas a higher percentage was associated with either bismuth-telluride particles, non-sulphide gangue particles, or in multiphase form. The average mean projected diameter of gold bearing particles was also somewhat finer than that for the Björkdal bulk concentrate, at 5 µm versus 7 µm. SLR is not aware of any processing factors or deleterious elements that could have a significant effect on potential economic extraction.



Note: Lib - Liberated Gold particle; BiTe - Gold particle with Bismuth-Telluride;
Ga - Gold particle with Galena; Gn - Gold particle with Non-sulphide Gangue;
MP - Gold particle in Multiphase.
Data above is shown on an adjusted gold particle surface area basis,
where particles greater than 50 percent area are considered liberated.



Note: Lib - Liberated Gold particle; Cp - Gold particle with Chalcopyrite;
Py - Gold particle with Pyrite; Gn - Gold particle with Non-sulphide Gangue;
FeOx - Gold particle with Iron Oxides; MP - Gold particle in Multiphase.
Data above is shown on an adjusted gold particle surface area basis,
where particles greater than 50 percent area are considered liberated.

Figure 13-10:QEMSCAN TMS Results for Norrberget and Björkdal

14 MINERAL RESOURCE ESTIMATES

14.1 Summary

Mining Plus has prepared the Mineral Resource Estimate (MRE) for the Björkdal Deposit with an effective date of 31 December 2021. Due to a satisfactory reconciliation performance of the previous estimate in the previous year, Mining Plus has, where appropriate, used the same estimation parameters as the previous estimate (SLR, 2021). The Norrberget MRE has not been updated by Mining Plus and has an effective date of 30 September 2017 completed by Roscoe Postle Assoicates Inc. who was later acquired by SLR Consulting.

The Björkdal drill hole database contains 20,418 drill holes comprising face channels, grab/chip sampling, diamond and reverse circulation drilling. The geology, mineralisation, topography and as-built wireframes have been generated by Mandalay and exported for use in the MRE using Datamine v1.10.69.

The resource database has been flagged with unique mineralisation domain codes and then composited into nominal 1 m lengths using the variable composite length option in Datamine. The composites have been analysed in Snowden's Supervisor v8.13 software for the existence of extreme values and top-cuts have been applied in line with the previous estimation.

A block model has been created with the following three parent block sizes:

- 2.5 mE by 2.5 mN by 5 mRL block size - used for mineralised veins.
- 5 mE by 5 mN by 10 mRL - used for the mineralised waste model.
- 10 mE by 10 mN by 20 mRL model - for where only assigned values are used.

All block sizes utilise sub-blocks of 1.25 mE by 1.25 mN by 2.5 mRL.

Gold grades have been estimated into the mineralised domains in three search passes with each subsequent pass using an increased search size and a decreased minimum number of samples required to populate a block with grade. The estimation of the mineralised waste has been undertaken in one search pass. All domains have been estimated using an inverse distance cubed (ID^3) interpolation method consistent with the previous estimate.

Final grade estimates have been validated by statistical analysis and visual comparison to the input composite data. The estimation has been depleted using valid three-dimensional representations of the open pit and underground workings at Björkdal.

The definitions for resource categories used in this Technical Report are consistent with CIM (2014) definitions and adopted by NI 43-101. The resource classification has been applied to the MRE based on the confidence of the input data, the data spacing, and the grade and geological continuity.

The resource has been classified on the following basis:

- The mineralisation estimated in the first pass with face sample data but not chip sample data have been classified as high confidence**.**

- The mineralisation that has been estimated using an average distance to three drill holes of less than 25 m has been classified as moderate confidence.

- The mineralisation that has been estimated using an average distance to three drill holes of more than 25 m and less than 35 m using at least 2 drill holes has been classified as low confidence.

- Blocks that are outside of these criteria remain unclassified.

Mining Plus has applied a smoothing operation to the confidence categories in order to generate, as close as possible, contiguous resource category regions. This process necessarily smooths across veins boundaries where two veins either intersect or are within one cell of each other.

After the smoothing operation, those blocks coded as high confidence have been classified as a **Measured Resource** while those classified as moderate confidence have been classified as an **Indicated Resource** and those blocks coded as low confidence have been classified as **Inferred Resource.** Additionally, the surrounding waste has been classified as an **Inferred Resource**.

Table 14-1 presents a summary of the Björkdal and Norrberget Mineral Resource Estimates as of 31 December 2021.

Table 14-1: Combined Björkdal and Norrberget Mineral Resources

Mineral Resources at the Björkdal Mine and Norrberget Deposit as of 31 December 2021														
Location	Domain	Cut-Off	Measured			Indicated			Measured & Indicated			Inferred		
		Au (g/t)	Tonnes (kt)	Grade (Au g/t)	Au (kOz)	Tonnes (kt)	Grade (Au g/t)	Au (kOz)	Tonnes (kt)	Grade (Au g/t)	Au (kOz)	Tonnes (kt)	Grade (Au g/t)	Au (kOz)
Björkdal	Open Pit	0.33				3,017	2.19	212	**3,017**	**2.19**	**212**	3,326	1.13	121
	Underground	0.77	1,851	2.62	156	9,663	2.30	713	**11,514**	**2.35**	**869**	3,484	2.12	237
	Stockpile	0.32				2,532	0.61	50	**2,532**	**0.61**	**50**			
	Sub Total	-	1,851	2.62	156	12,681	2.27	925	**17,063**	**2.06**	**1,131**	6,810	1.63	357
Norrberget	Open Pit	0.35				144	3.29	15	**144**	**3.29**	**15**	3	4.03	0.5
	Total	**-**	**1,851**	**2.62**	**156**	**12,825**	**2.28**	**940**	**17,207**	**2.07**	**1,146**	**6,813**	**1.63**	**358**

Notes:

1. The Björkdal Mineral Resource is estimated using drill hole and sample data as of 30 September 2021, and depleted for production through 31 December 2021. Norrberget Mineral Resources are based on a data cut-off date of 30 September 2017.
2. CIM definitions (2014) were followed for the Mineral Resource.
3. The Mineral Resource is inclusive of the Mineral Reserve.
4. The Mineral Resource is estimated using an average gold price of $1,700/oz. and an exchange rate of 9.0 SEK/US$.
5. In situ bulk density is 2.74 t/m^3 for veins and host rock. In situ bulk density is 2.92 t/m^3 for skarn Mineralisation bodies. Stockpile bulk density is 1.8 t/m^3.
6. High gold assays were capped at 60 g/t Au for the first search pass and 40 g/t Au for subsequent passes.
7. High gold assays at Norrberget were capped at 24 g/t Au.
8. Interpolation was by inverse distance cubed utilising diamond drill, reverse circulation, and chip channel samples.
9. The Björkdal open pit Mineral Resource is estimated at a cut-off grade of 0.33 g/t Au and constrained by a resource pit shell to comply with the reasonable prospects for eventual economic extraction (RPEEE) criteria.
10. The Norrberget open pit Mineral Resources are estimated at a cut-off grade of 0.35 g/t Au and constrained by a resource pit shell to comply with the RPEEE criteria.
11. The Björkdal underground Mineral Resource is estimated at a block cut-off grade of 0.77 g/t Au for all veins.
12. A nominal two meter minimum mining width was used to interpret veins and comply with the RPEEE criteria.
13. The Reported Mineral Resource is depleted for previously mined underground development and stopes.
14. The Stockpile Mineral Resource is estimated based upon surveyed volumes supplemented by production data.
15. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
16. Numbers may not sum due to rounding.
17. The Mineral Resource Estimate as of 31 December, 2021 for Björkdal 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. The Independent Qualified Person for Norrberget Mineral Resource estimate is Reno Pressacco, P.Geo., Principal Geologist with SLR, who is a Qualified Person as defined by NI 43-101.

The QP is not aware of any environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors that could materially affect the Mineral Resource estimate.

14.2 Björkdal

14.2.1 Database

Mandalay provided the database to Mining Plus in the form of an access database ***Master_database – Bjorkdal.mdb***. The Björkdal database contains 38,289 drill holes of varying types (Table 14-2). Mining Plus has undertaken a high-level validation of the drill hole data, including checking for overlapping intervals, non-matching end-of-hole records and obvious collar location issues. No issues have been identified.

Table 14-2: Summary of drill holes separated by hole type

Hole Type	Description	Number of Holes
CH	Chip (Face) Samples	24,023
GP/GC	Grab Samples	7,259
DDH	Diamond Drill Hole	2,566
RC	Reverse Circulation	4,441
Total		38,289

Raw sample intervals have been backflagged in Surpac by Mandalay and included in the database export provided to Mining Plus. These intervals have been imported into Datamine for analysis and compositing.

14.2.1.1 Kink Check

Mining Plus evaluated the deviation of the dip and azimuth at a specific depth versus previous measurements obtained in the same drill hole. A kink check tolerance of 3° within 10 m has been applied, which is considered an extreme deviation rate under normal operating conditions (not navigational drilling). If a drill hole bends more than this tolerance, a downhole survey error has been suspected.

This analysis generated 116 results for investigation representing approximately 1.7% of all DDH/RC drill holes. Mining Plus found three different types of results:

1. True instrumental error characterised by large changes in azimuth or dip in an isolated reading (18).
2. Top of hole survey errors characterised by the use of planned or incorrectly converted coordinates (16).

3. Large deviations, likely caused by geology (82).

Category 1 and 2 results have been rectified within the database before estimation. Category 3 results have been checked against modelled geological shapes to provide support for the interpretation that they were caused by geology.

Excluded drill holes

Mandalay has assigned confidence values to different drill hole types in recognition of the varying quality of sample collection (Table 14-3).

Table 14-3: Confidence value descriptions

Confidence	Sampling Description
20	Grab or face sample of vein material only
30	Wall/Cross-cut sampling performed to industry standard
40	Face sampling performed to industry standard
50	Diamond or RC sampling

Mining Plus has reviewed each the confidence types and their handling in previous estimates. Mining Plus considers that confidence 20 material has not been sampled to industry standard. Previous estimations have mathematically diluted this material to 2.5 m (the wireframing minimum thickness) and this approach has yielded satisfactory reconciliation results. Notwithstanding its reconciliation performance, Mining Plus considers this material inferior to material sampled at industry standard. As a result, Mandalay have removed all confidence 20 material where higher confidence material is present prior to delivery of the database to Mining Plus. The collection protocol of confidence 30 and 40 material was put in place during 2017 and therefore, almost all confidence 20 material from 2018 onwards has been able to be removed.

14.2.2 Geology and Mineralisation Wireframes

A total of 1,077 mineralisation, geology and topography wireframes have been provided by Mandalay Resources, which have been used in the MRE. Mineralisation wireframes have been grouped by location (Table 14-4).

Table 14-4: Number of wireframes provided by the group

Wireframe Group	Number of Wireframes	Type	Code
Central Zone	134	Mineralisation	CZ
Eastern Pit	57	Mineralisation	EP
Lake Zone	158	Mineralisation	LZ
Lake Zone Above Marble	86	Mineralisation	LZA
Main Zone	160	Mineralisation	MZ
Nylunds	93	Mineralisation	NYL
Quartz Mountain	150	Mineralisation	QM
Shears	6	Mineralisation	SHS
Skarns	17	Mineralisation	SKS
Southern Zone	42	Mineralisation	SZ
Western Pit	137	Mineralisation	WP
Faults	33	Geology	
Lithology	3	Geology	
Topography	1	Topography	
Grade-limiting	1	Geology	

14.2.2.1 Mineralisation Wireframes

Mandalay have generated wireframe models of the mineralised veins at Björkdal. Modelling has been completed in both Surpac and Leapfrog Geo software. Surpac wireframes have been created using sectional interpretation over a minimum of two metres. Leapfrog wireframes have been generated using the vein tool over a minimum of two metres. Those wireframes found mostly in the mined pit have been generated using a threshold of 0.3 g/t Au while those mined underground have been generated using a threshold of 0.5 g/t Au. Mining Plus notes that due to the structural and geological complexity of the deposit, not all instances of economic gold can be included in wireframes. Gold occurrences outside of the mineralisation wireframes most likely represent veins with limited strike or with an uncommon orientation. Mining Plus recommends trialling the use of implicit modelling for these gold occurrences in order to better represent the mineralised waste.

The close proximity of veining as well as numerous veining orientations at Björkdal has resulted in significant overlapping of modelled mineralised veins. To address the overlapping nature of the wireframes, Mining Plus and Mandalay have developed a series of priorities that allow vein superposition to occur in a repeatable way. Priority values have been determined based on vein orientation and overprinting relationships observed within the mine (Table 14-5). Veins with a higher priority overprint and replace those with a lower priority. The same prioritisation has been applied to the sample selection process.

Table 14-5: Wireframe superposition priorities

Priority	Strike Range	Comment
0	all	Skarn and shear hosted mineralisation
1	070-080°	
2	060-070°	
3	080-090°	
4	090-140°	
5	020-060°	
6	all	Non skarn/shear hosted mineralisation outside of ranges above

Mining Plus recommends overlapping veins be addressed in the wireframing process using Leapfrog's inbuilt vein termination functionality in future iterations of the MRE.

The mineralisation wireframes in currently active mining areas have been modelled in Leapfrog and Mandalay is in the process of converting all wireframes to Leapfrog before mining. Mining Plus notes that the current process does not snap directly to the data. In particular, as a result of using a minimum width and not enforcing snapping to face sample data, there are considerable portions of the mineralisation wireframes that do not agree with the sample locations in 3D. Mining Plus has not quantified the volume impacted, however it considers the disagreement between sample widths and locations with the wireframe widths and locations to be incorrect. As illustrated in Figure 14-1 the wireframe has not been snapped to the width of the sampled face and therefore contains volume that is unsupported by sampling.

In the figure, the grid is at 0.5m spacing, the grey line is the mineralisation wireframe, and the samples are coloured by gold grade (legend displayed). This issue is not localised to any part of the deposit but is particularly prevalent in the Aurora Zone where the mineralisation wireframe is wider than the width of the developed drive. To address this issue, Mining Plus has inserted low-grade dummy values where required on either side of face samples that do not reach the wireframe contacts (Figure 14-2). In limited cases where applying this dilution would result in overlapping real and dummy samples or unrealistic sample lengths, no dilution has been applied.

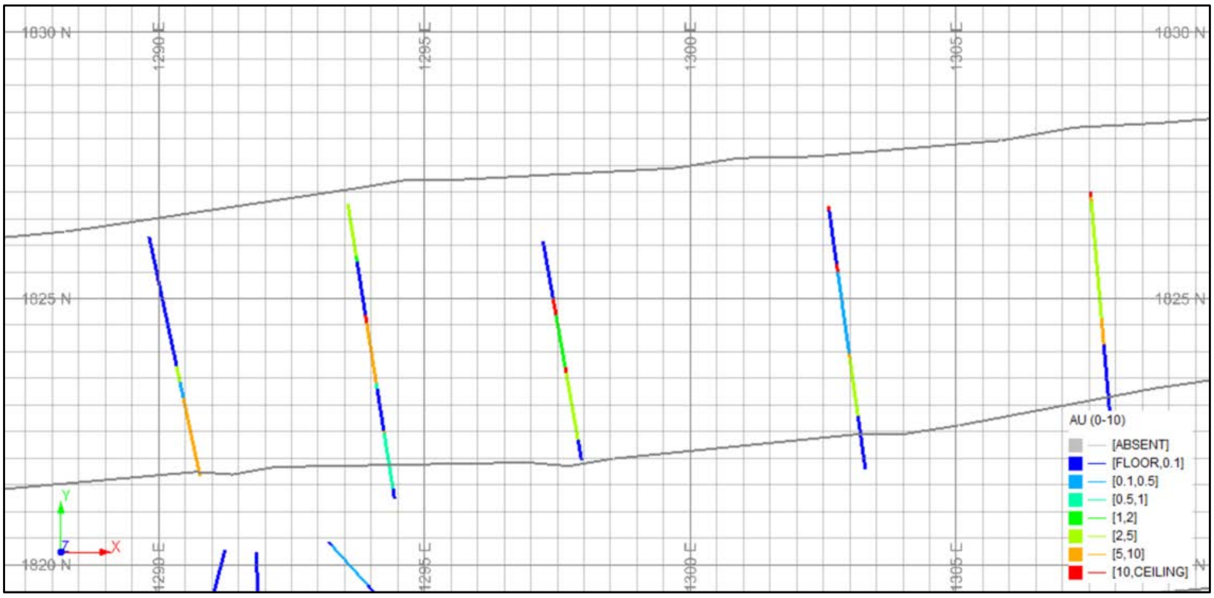


Figure 14-1: Plan section of modelled vein showing unsupported volume on northern side

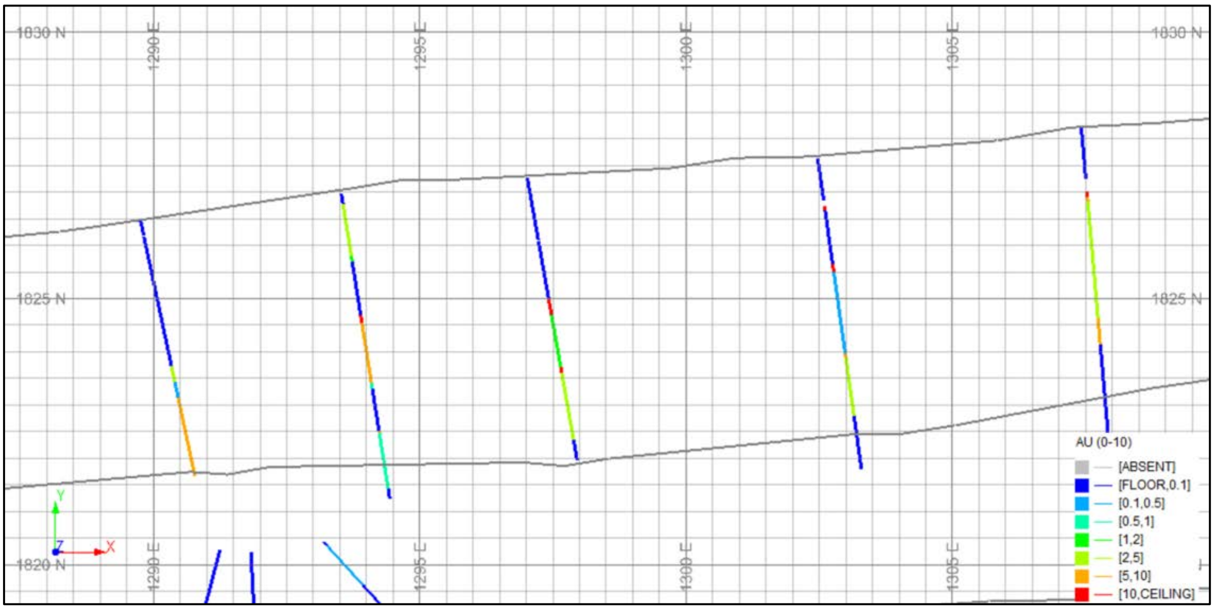


Figure 14-2: Plan section of modelled vein showing added dummy values

Mining Plus recommends the minimum wireframe width be removed from the wireframing process to allow for wireframe veins to accurately represent the mineralisation, to avoid the unnecessary inclusion of waste and improve stationarity of the mineralised domains. In addition, all wireframes should be updated to snap directly to the data where appropriate to avoid any issues with unsupported volumes. In some cases, the face samples do not encompass the complete width of mineralisation, such that snapping to the face samples is not representative of the vein volume. In these cases, the vein volume is supported by local diamond drilling and the use of face samples may introduce a grade bias. Mining Plus recommends a study to investigate the most appropriate method of wireframe interpretation for each mineraliastion style that considers the best way to spatially align the input samples with the wireframe and that improves stationarity of the estimation domains.

14.2.2.2 Geology Wireframes

The marble lithology unit has been previously understood as the upper limit of known veins. However, constant improvement of the geological model at Björkdal has resulted in the identification of new key structures within the mine. The current interpretation indicates that the lower limits of the mineralised veins in the Aurora Zone are defined by the Björkdal Fault which appears to closely follow the marble unit. This fault zone also serves to truncate the upper limits of the quartz veins in the upper portion of the mine. As a result, the current view is that a significant degree of displacement may have occurred that is in the order of several hundred metres in distance. The sense of movement along the fault is not clearly understood, as limited stratigraphic marker units are present in the mine with which to gauge the magnitude and sense of movement across this fault. The initial interpretations are of oblique, strike-slip faulting with a sinistral sense of movement. Due to the grade-limiting nature of this fault, it has been used in the model to truncate mineralisation wireframes, reflecting its observed effect within the mine.

Three-dimensional models of the marble and till units have been constructed from available drill hole and geological mapping information, using the knowledge and understanding gained in recent years. This three-dimensional volume was then used to code the block model.

14.2.3 Topography and As-built Wireframes

Mandalay carried out a LiDAR survey in July 2016, which was subsequently edited by Mandalay to incorporate the topographic surface of the open pit mine following cessation of mining activities in the open pit on 1 August 2019. No changes have been made to the surface as of 31 December 2021. The resulting integrated wireframe model of the topographic surfaces has been provided to Mining Plus in a digital format that was suitable for use in coding the block models.

The excavated volume of development headings is determined by Mandalay staff on a daily basis using a hand-held Hovermap scanner that is able to measure the excavated volume of a given advance using reference survey points that have been painted onto the walls of a drive. The raw digital data that is produced from the initial survey is processed using the software package that accompanies the Hovermap unit, then downloaded into the Surpac software package, which is used to construct a three-dimensional wireframe model of the new excavation and merge with the existing excavation wireframe model. The resulting merged wireframe model is checked for validity and was provided to Mining Plus to code the block model for the excavated material.

An area of uncontrolled subsidence has occurred in the upper portion of the underground mine such that access to this area is no longer possible. A simple generalised wireframe model has been created to encompass this area. All blocks within this volume have been coded as depleted volumes for the long-term block model. As the mine staff consider that any mineralised wireframes within this volume have the potential for being recovered by means of open pit mining methods, this subsidence area was not considered as excavated for the open pit mining surface.

Mandalay uses a hand-held Hovermap scanner to generate a surveyed volume of their stopes. The raw digital data that is produced from the initial survey is processed using the software package that accompanies the Hovermap unit, then downloaded into the Surpac software package, which is used to produce a reasonable three-dimensional digital shape of the mined-out volume. This data exported into the Surpac file format has been provided to Mining Plus for coding into the model for the excavated material.

Topographic surveys of 2021 active stockpile areas were conducted towards the end of 2021 using drone-mounted LiDAR surveying methods. The bases of the stockpiles were taken from earlier topographic surfaces that were completed prior to the commencement of building these piles. The volumes of the stockpiles were reported from the resulting merged surfaces and the tonnages were estimated using a bulk density of 1.80 t/m^3, representing a swell factor of approximately 50%. The resulting tonnages were reconciled against the stockpile material flows for 2021. The stockpiles have been depleted for 2021 activity using updated end-of-year surveyed volumes.

14.2.4 Statistical Analysis

14.2.4.1 Bulk Density analysis

A bulk density data review has been undertaken on 242 bulk density measurements collected on-site from 2013 to 2021. Bulk density determinations are conducted annually on 20 to 30 samples to identify any spatial variability in lithologies and mienralisation types. Samples taken for bulk density analysis have been geologically logged and the analysis has been performed separately based on logged lithology (Table 14-6).

Table 14-6: Summary of statistics of bulk density data (g/cm^3) by lithology

Lithology	Weathering	No. of Samples	Minimum	Maximum	Mean	SD	CV
GRDR SG	Fresh	48	2.24	3.32	2.74	0.11	0.04
LMST SG	Fresh	20	2.69	2.87	2.74	0.05	0.02
MARBLE SG	Fresh	35	2.71	3.13	2.78	0.08	0.03
MVOL SG	Fresh	10	2.72	2.75	2.73	0.01	0.01
QUARTZ SG	Fresh	53	2.64	2.77	2.65	0.02	0.01
SKARN SG	Fresh	13	2.75	3.1	2.92	0.09	0.03
VOLC SG	Fresh	63	2.62	2.94	2.76	0.08	0.03

Figure 14-3 contains a box and whisker plot showing the distribution of bulk density values across all lithologies. GRDR, MVOL and VOLC all show similar bulk density values while skarn, quartz and marble show distinct separate populations.

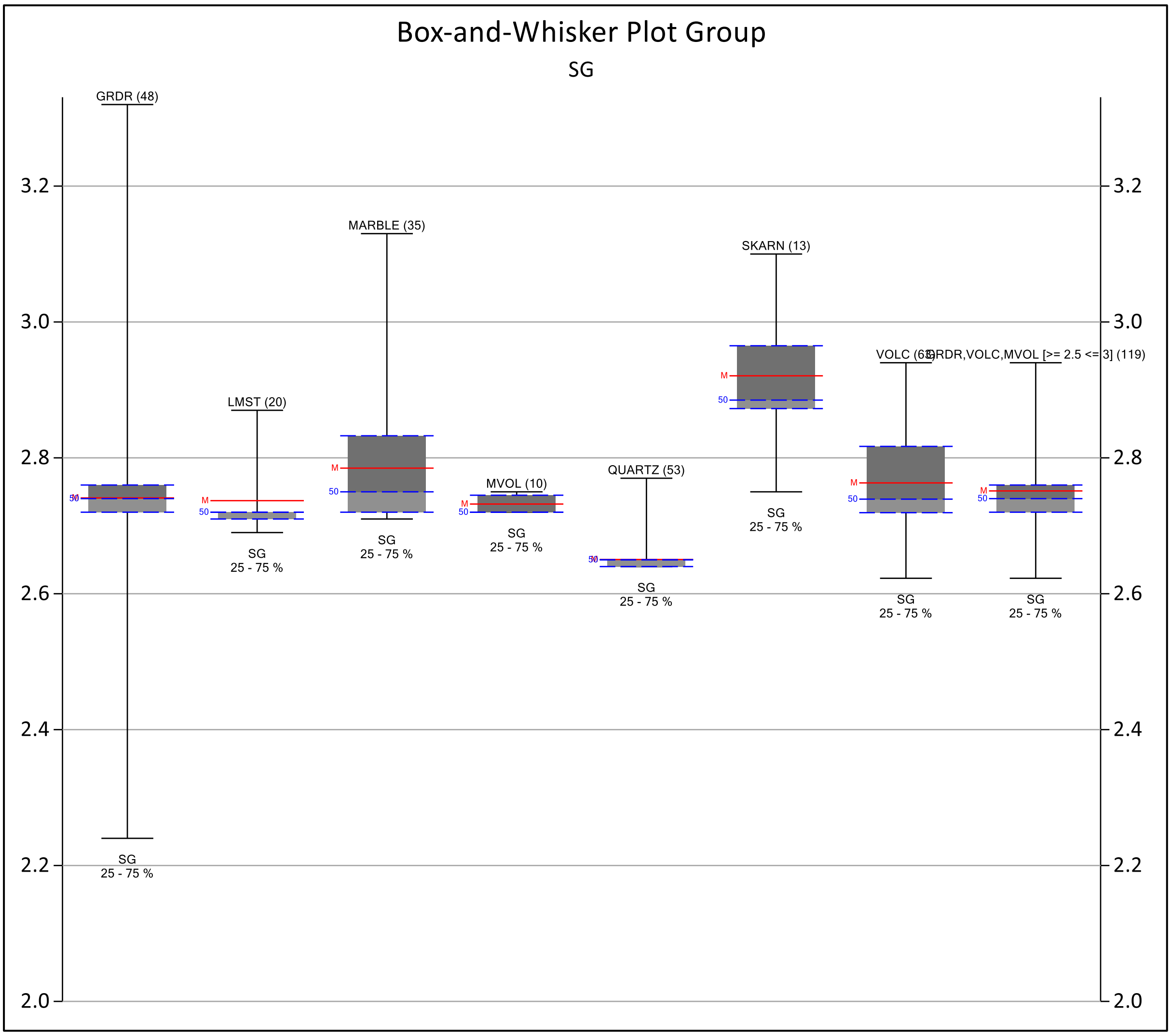


Figure 14-3: Bulk density data box and whisker plot by lithology

14.2.4.2 Drill Hole Sample Length

Analysis of the raw sample lengths within the mineralised domains identified that 92% of the sample lengths are 1 metre or less with 1 metre being the most common length (Figure 14-4).

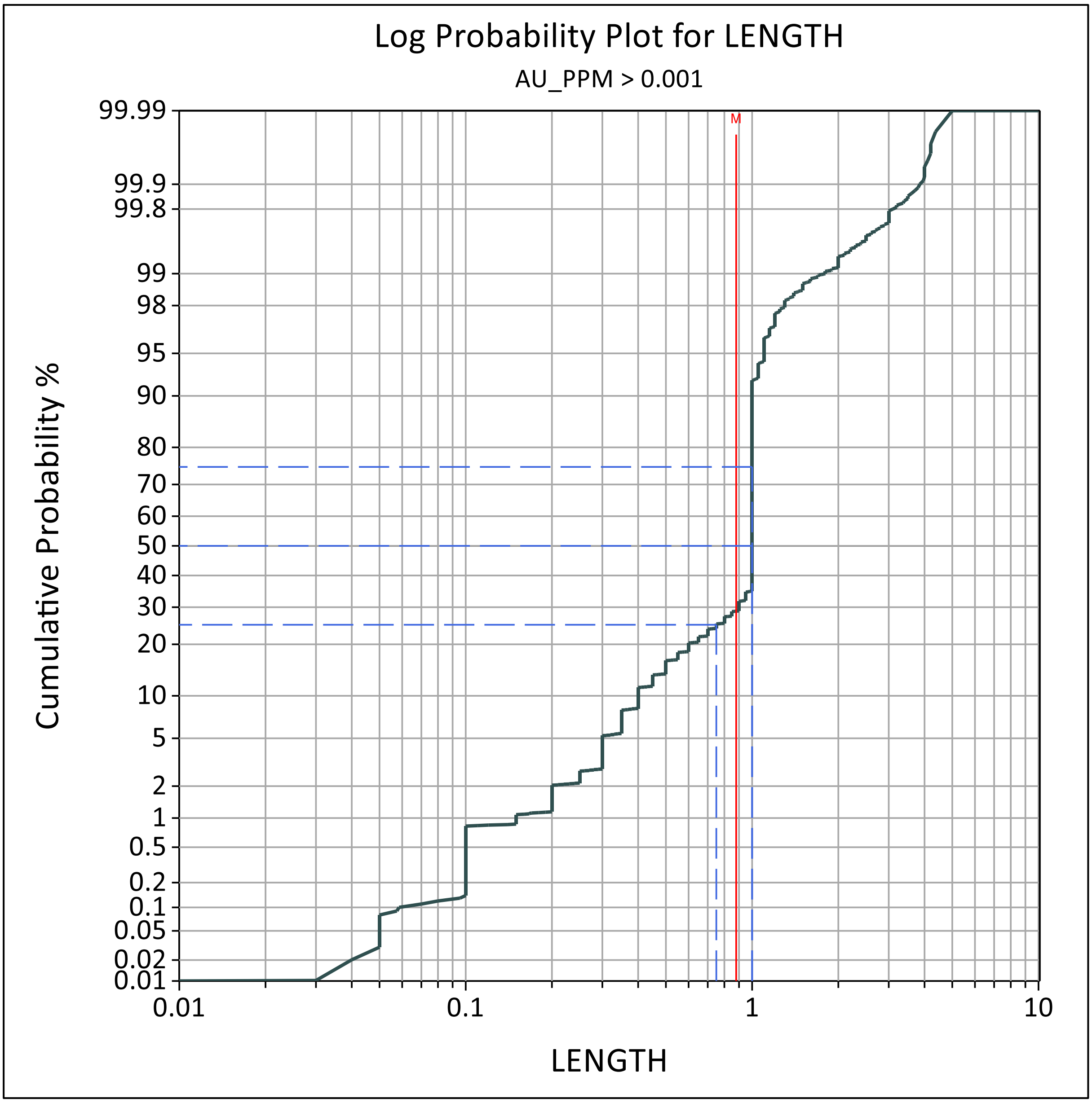


Figure 14-4: Log probability plot of length for all samples within the mineralisation domains

14.2.4.3 Sample Compositing

A nominal 1 m composite length with variable lengths from 0.5 m to 1.5 m has been selected in order to minimise any bias due to inconsistent sample length. Residuals less than 0.5 m have been removed from the estimation. No sub-domaining for weathering state is required as no oxidised or transitional material is present at the deposit.

The composites inside the domain wireframes have been coded with the individual domain codes for geostatistical analysis. Table 14-7 contains the summary statistics for each grouped area within the deposit.

Table 14-7: Summary statistics of length weighted raw and composited samples by area

Area	Number of Samples		Mean Grade			Std Dev	
	Raw	Composite	Raw	Composite	% Diff	Raw	Composite
CZ	18,490	12,429	1.63	1.65	1%	11.7	9.22
EP	13,519	10,554	0.9	0.91	1%	7.37	7.10
LZ	27,973	19,096	1.55	1.57	1%	16.4	11.9
LZA	39,662	26,856	1.02	1.03	1%	9.23	5.31
MZ	34,613	24,327	2.43	2.41	-1%	21.1	18.9
NYL	3,103	2,768	0.59	0.59	0%	3.05	2.97
QM	16,502	13,911	1.64	1.64	0%	18.6	16.8
SHS	7,538	5,695	0.64	0.65	2%	11.2	6.80
SKS	5,624	4,808	1.72	1.74	1%	13.2	11.3
SZ	8,451	6,279	1.68	1.65	-2%	26.0	22.4
WP	12,889	10,477	1.3	1.3	0%	12.5	12.2

14.2.4.4 Top Cutting

Previous year-end Mineral Resource estimations (Roscoe Postle Associates Inc., 2019 and SLR, 2020) employed three top cut values at 30 g/t in the open pit portions of the block model, and 40 g/t and 60 g/t Au in the underground portions of the block model. Following a review by Mandalay, the separation into underground and open pit estimations is not supported by geological evidence, as there is no change in the geological domains between the two mining environments.

Mining Plus has reviewed each top cutting strategy by comparing the Log histograms, log-probability and mean-variance plots on grouped domains to identify appropriate top-cuts and determine the impact of applying each top-cut to that population (Table 14-8).

Mining Plus and Mandalay consider the use of the previously established underground top cutting strategy to be appropriate for use in this MRE as the previous long-term Mineral Resource block models have been yielding satisfactory reconciliation results compared to the production data for the same period (see section 14.2.13). In the previous estimate, the first pass was completed using the composite data top cut to 60 g/t Au while the second and third passes used the composite data top cut to 40 g/t Au to limit grade smearing.

Table 14-8: Summary statistics of composited top cut samples

Domain	Number of Samples			Mean Grade		
	Un-Cut	Top-Cut 40	Top-Cut 60	Un-Cut	Top-Cut 40	Top-Cut 60
CZ AU_PPM	12,429	85	56	1.65	1.32	1.43
EP AU_PPM	10,554	26	16	0.91	0.75	0.78
LZ AU_PPM	19,096	126	80	1.57	1.16	1.26
LZA AU_PPM	26,856	75	38	1.03	0.93	0.97
MZ AU_PPM	24,327	252	156	2.41	1.58	1.74
NYL AU_PPM	2,768	3	2	0.59	0.57	0.58
QM AU_PPM	13,911	74	54	1.64	1.01	1.1
SHS AU_PPM	5,695	10	5	0.65	0.52	0.54
SKS AU_PPM	4,808	45	22	1.74	1.29	1.42
SZ AU_PPM	6,279	38	19	1.65	0.99	1.08
WP AU_PPM	10,477	48	33	1.3	0.95	1.02

14.2.4.5 Variography

Mining Plus completed variographic analysis on the waste domain in order to determine the search anisotropy. Figure 14-5 shows the resulting variograms. Mining Plus notes the anisotropy shown in the variogram model is broadly in line with the plunge of the deposit.

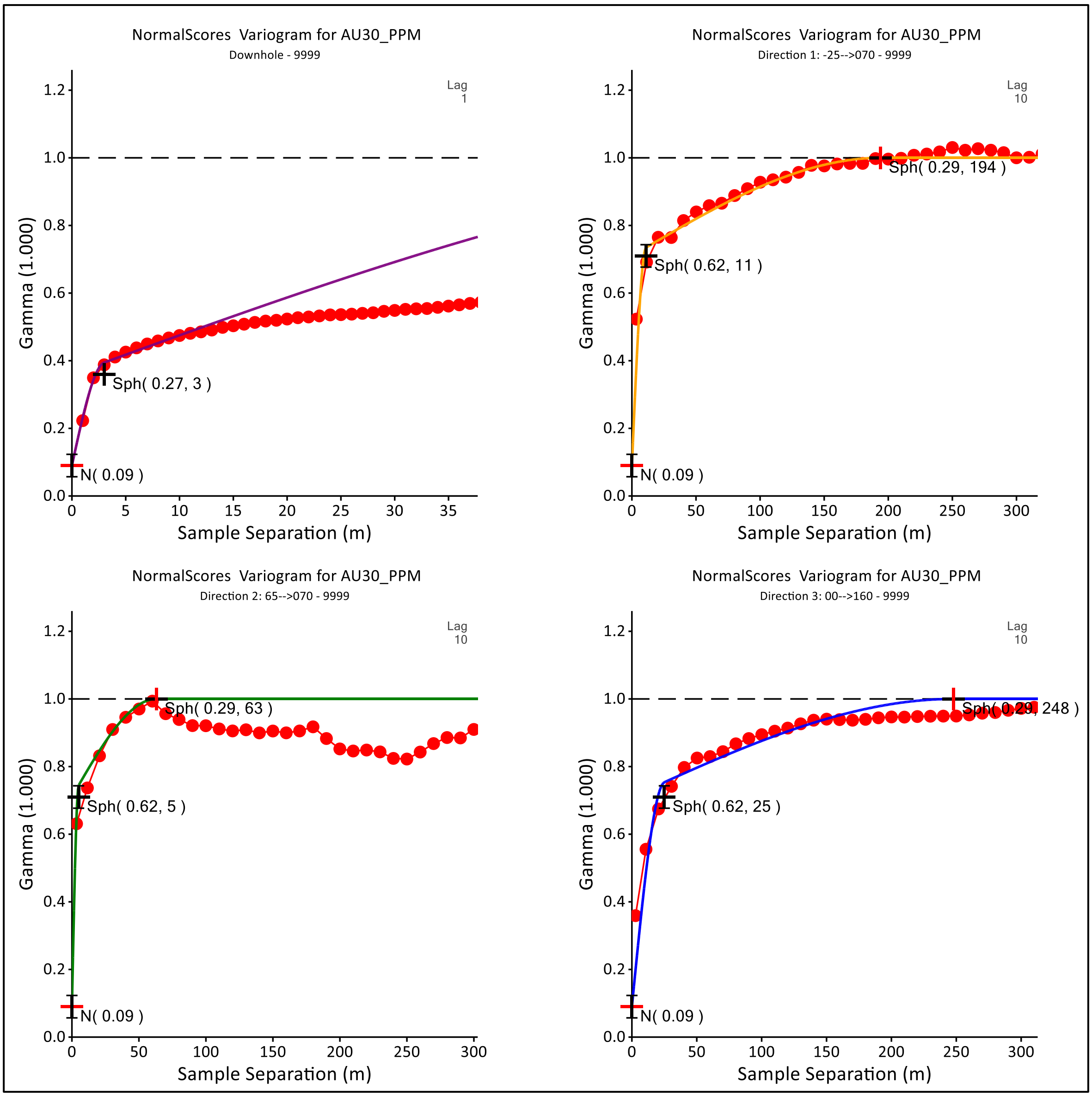


Figure 14-5: Waste variograms

Variographic analysis on the mineralised domains has not been conducted as Mining Plus intends to use an isotropic inverse distance cubed estimation methodology, as is standard for Björkdal.

14.2.5 Block Model Construction

The prototype used for the construction of the block model **Bjorkdal_mod_20220214.dm** is summarised in Table 14-9 with variables as per Table 14-10.

Table 14-9: Block model Bjorkdal_mod_20220214.dm prototype parameters

	Block Model Origin			Block Model Maximum			Parent Block Size			Sub-Cell Block Size		
Scheme	X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z
Mineralisation	290	-500	-860	3,000	2,490	50	2.50	2.50	5	1.25	1.25	2.50
Estimated Waste	290	-500	-860	3,000	2,490	50	5	5	10	1.25	1.25	2.50
Assigned Waste	290	-500	-860	3,000	2,490	50	10	10	20	1.25	1.25	2.50

Table 14-10: Block model variables for Bjorkdal_mod_20220214.dm

Variable	Description
TOPO	0 = air, 1 = fresh rock
TILL	1 = Till
ESTDOM	Unique estimation domain code
OBJ_NUM	Object number
AREA_C	Area code
VEIN	Vein ID
LITH	Lithology Code 1=Volcanics 2=Marble, 3=Till
DENSITY	bulk density estimate/assignment
RESCAT	1 = Measured, 2 = Indicated, 3 = Inferred, 4 = Unclassified
MINED	0 = un-mined (in situ), 1 = mined OP/UG development, 2 = mined stopes, 3 = UG sterilised, 4 = Failure zone
FZONE	Failure Zone
AU_PPM_UG	Estimated Grade - Gold - Underground
AU_PPM_W	Estimated Grade - Gold -Waste
AU_UG_PASS	Underground Estimation Pass number
AU_UG_NUMSAM	Underground Estimation number of samples
NBH_UG	Underground Estimation number of drill holes

Sub-blocking has been utilised to more precisely represent the wireframe volumes. The estimation of the sub-blocks has been completed at the parent block scale, therefore all sub-blocks within a parent block have the same grade.

The final block model has been named **Bjorkdal_mod_20220214.dm**.

14.2.6 Grade Estimation

Gold estimations have been undertaken in Datamine v1.8.37.0 using inverse distance cubed (ID^3) within hard boundaries for each domain. No sub-division for weathering state has been required since there are no oxide or transitional layers at Björkdal.

Grade estimations have been completed in two separate ways (Table 14-11). The estimation of modelled mineralisation (AU_PPM_UG) has been completed using three search passes with successively larger isotropic search radii and less restrictive estimation criteria. The first pass was completed using the composite data top cut to 60 g/t Au while the second and third passes used the composite data top cut to 40 g/t Au. The surrounding waste estimation (AU_PPM_W) has been completed in one pass using the composite data top cut to 30 g/t Au. The search anisotropy direction for the waste domain has been derived from the variography. Search distances for all domains have been derived from the previous estimation. Mining Plus and Mandalay consider the use of the previously established estimation parameters to be appropriate for use in this MRE as the previous long-term Mineral Resource block models have been yielding satisfactory reconciliation results compared to the production data for the same period (see section 14.2.13).

Table 14-11: Estimation parameters for gold

	First Pass						Second Pass						Third Pass					
Domain	**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**
Underground	15	15	15	10	20	4	35	35	35	10	20	8	70	70	70	4	24	8
Waste	60	45	35	5	15	5												

14.2.7 Model validation

Volume comparison

A selection of domain wireframe volumes has been compared against the block model volume by domain to ensure that the blocks represent the mineralisation volume appropriately. In total the comparison returned a difference of 1% (Table 14-12) which Mining Plus considers acceptable.

Table 14-12: Wireframes and block model volume comparison

Domain	Wireframe Volume	Block Model Volume	% Difference
903 - LZA1	1,639,650	1,625,258	-1%
460 - LZA43	656,418	630,168	-4%
845 - MZ53	32,813	32,828	0%
651 - MZ51	101,066	99,051	-2%
993 - CZ1	153,788	163,367	6%
896 - LZA23	345,018	342,176	-1%
869 - MZ5	153,788	153,895	0%
972 - CZ62	241,504	240,668	0%
1013 - SHS1	860,234	844,531	-2%
494 - LZ101	258,117	255,387	-1%
Total from above	**4,442,396**	**4,387,328**	**-1%**

Global comparisons

The final grade estimates for each domain have been validated statistically against the input drill hole composites utilised in the estimation. The input composites have been declustered to remove undue influence from face sample data. Table 14-13 contains a comparison for AU_PPM_UG for 10 important domains that account for approximately 25% of the contained gold in the underground resource.

Table 14-13: Block model global validation statistics by estimation domain

Domain	Estimated Tonnes	Estimated Grade (cut)	No. of Composites	Composite Grade (cut)	Declustered Composite Grade (cut)	Tonnes per composite	% Diff Est Grade vs Composite	% Diff Est Grade vs DC Composite
903 - LZA1	4,120,946	1.18	6,398	1.58	1.43	644	-25%	-17%
460 - LZA43	1,718,663	0.53	1,382	0.63	0.56	1,243	-16%	-5%
845 - MZ53	89,621	2.26	191	2.30	2.37	469	-2%	-5%
651 - MZ51	270,409	2.67	713	3.28	2.56	379	-19%	4%
993 - CZ1	445,992	1.88	657	1.89	1.79	678	-1%	5%
896 - LZA23	934,140	0.85	1,252	1.05	0.80	746	-19%	6%
869 - MZ5	420,132	2.66	704	2.74	2.79	596	-3%	-5%
972 - CZ62	630,897	1.56	521	1.61	1.52	1,210	-3%	3%
1013 - SHS1	2,101,354	0.34	3,524	0.65	0.42	596	-48%	-19%
494 - LZ101	657,205	0.85	960	1.87	1.17	684	-55%	-27%

Many of the large domains with a large number of composites validated well against the declustered composites, whereas domains that validated poorly generally were informed by very few samples and/or irregular sample spacing with clustering issues (Figure 14-6 and Figure 14-7). The poor validation typically identifies domains where a small number of input samples informed a relatively large number of cells.

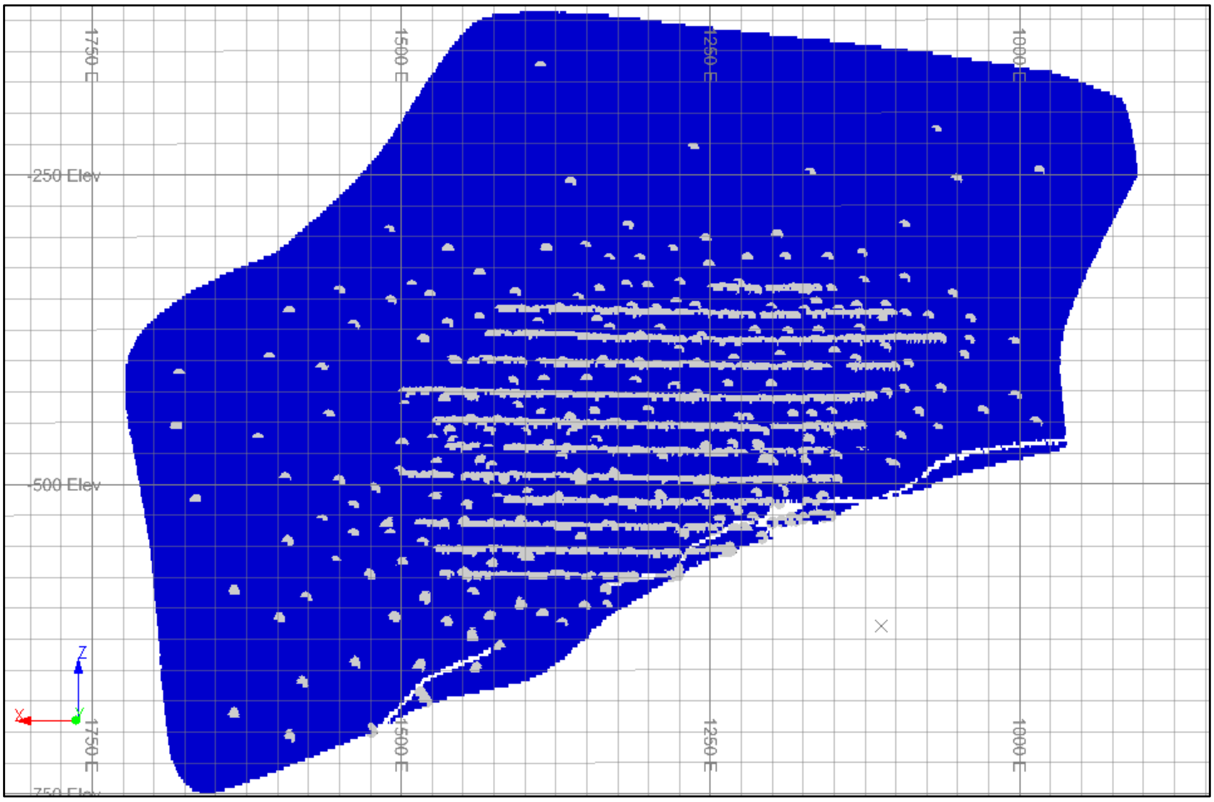


Figure 14-6: Longitudinal section of LZA1 model showing clustering of input samples (white)

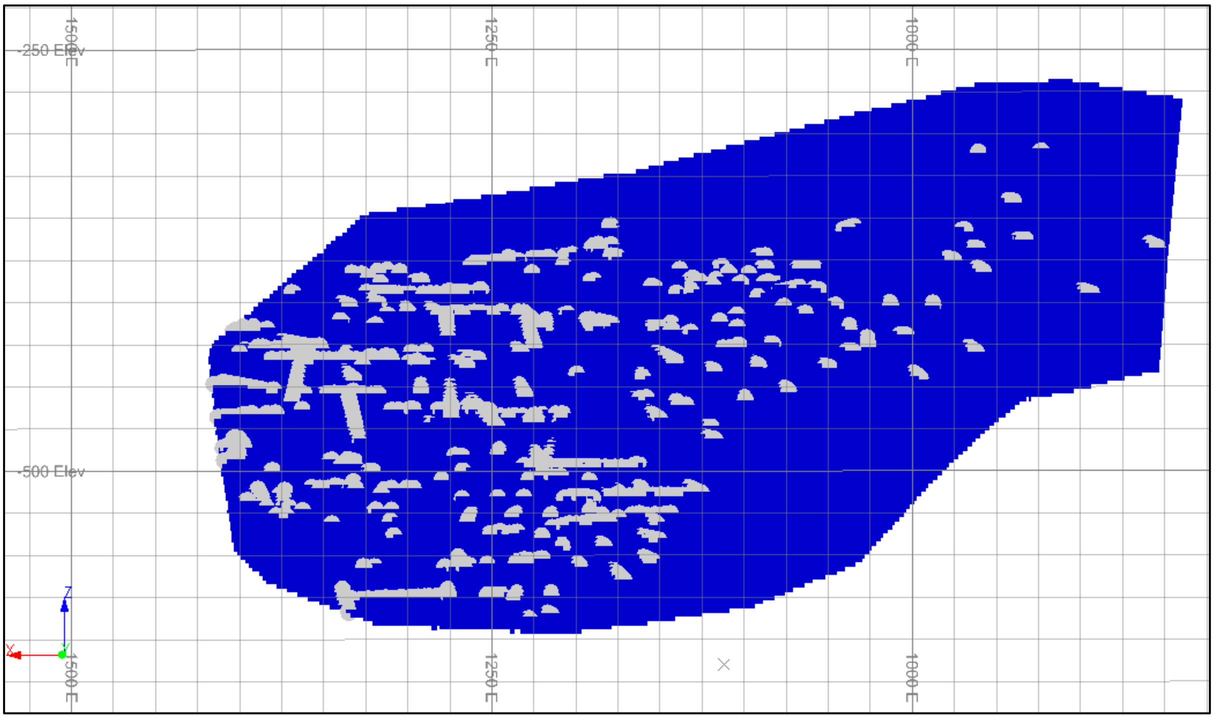


Figure 14-7: Longitudinal section of SHS1 model showing clustering of input samples (white)

Mining Plus notes that the cell-declustering method employed for the comparison is often inadequate for vein-style mineralisation, and therefore, the swath plot analysis and visual validation were also relied upon to show that, while statistically performing poorly, the estimated grades spatially reflected the input composite grades.

Swath Plots

Representative sectional validation graphs or swath plots have been created to compare the estimated grades to the mean of the naïve (non-declustered) and declustered input grades within block model slices (bins) on Easting, Northing and Reduced Level (RL). The graphs also display the number of input composites on the right axis, thereby giving an indication of the data support within each bin.

The gold swath plots for the 10 mineralised domains listed above are detailed in Figure 14-8 to Figure 14-17. All graphs display the naïve composite mean (red), declustered composite mean (blue), AU_PPM_UG estimate mean (black).

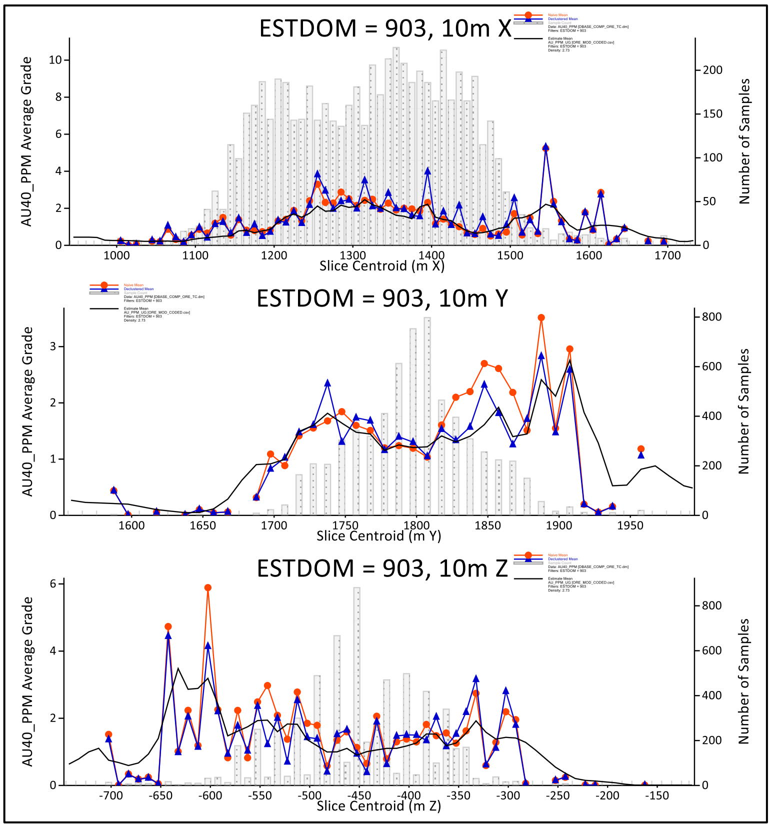


Figure 14-8: Au ppm Easting (X), Northing (Y) and Elevation (Z) Swath Plot, Domain 903 - LZA1

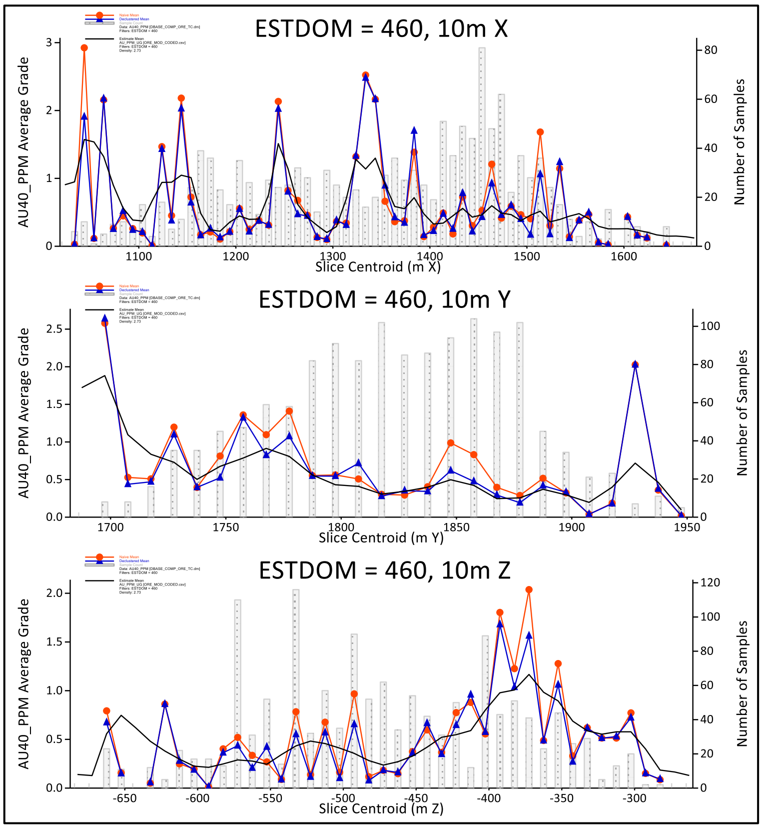


Figure 14-9: Au ppm Easting (X), Northing (Y) and Elevation (Z) Swath Plot, Domain 460 - LZA43

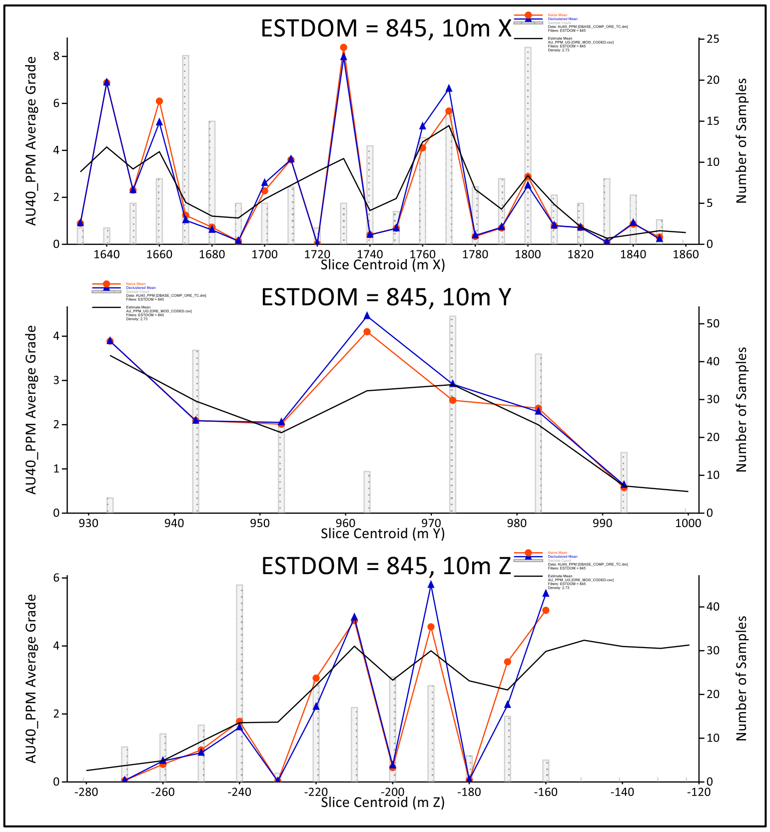


Figure 14-10: Au ppm Easting (X), Northing (Y) and Elevation (Z) Swath Plot, Domain 845 - MZ53

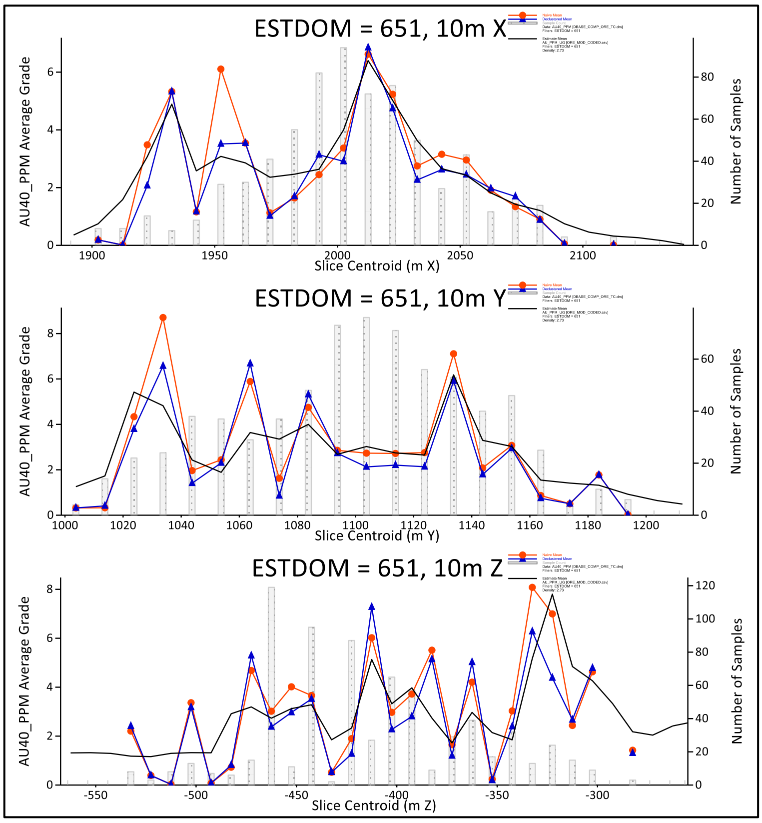


Figure 14-11: Au ppm Easting (X), Northing (Y) and Elevation (Z) Swath Plot, Domain 651 - MZ51

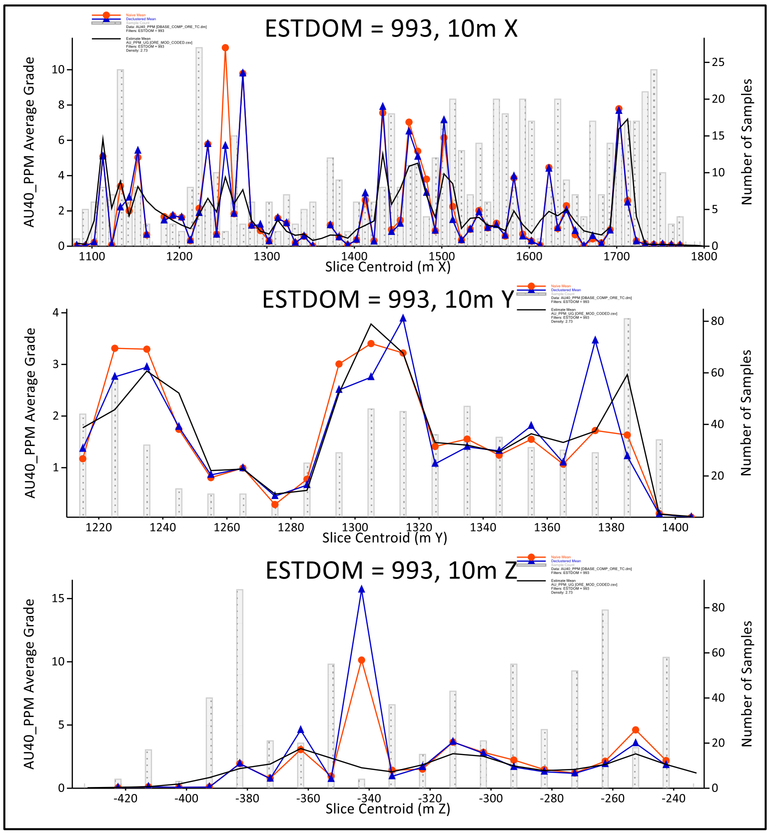


Figure 14-12: Au ppm Easting (X), Northing (Y) and Elevation (Z) Swath Plot, Domain 993 - CZ1

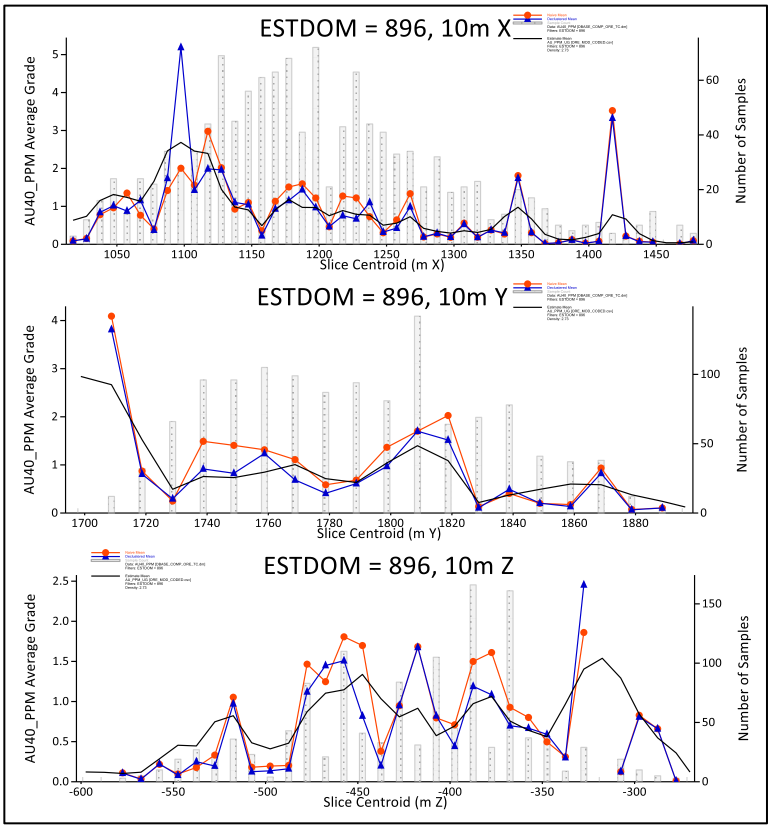


Figure 14-13: Au ppm Easting (X), Northing (Y) and Elevation (Z) Swath Plot, Domain 896 - LZA23

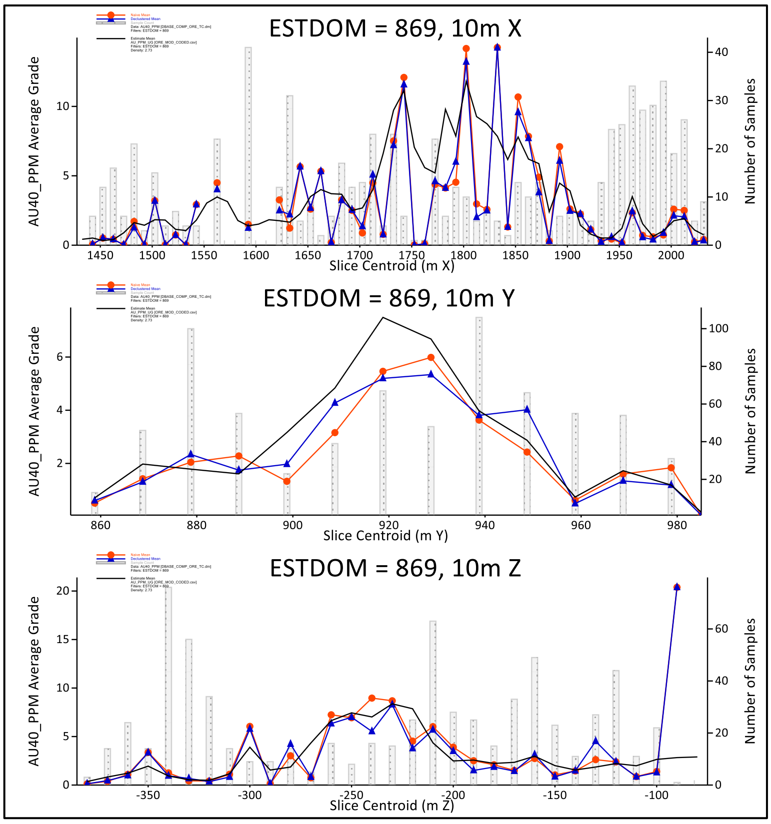


Figure 14-14: Au ppm Easting (X), Northing (Y) and Elevation (Z) Swath Plot, Domain 869- - MZ5

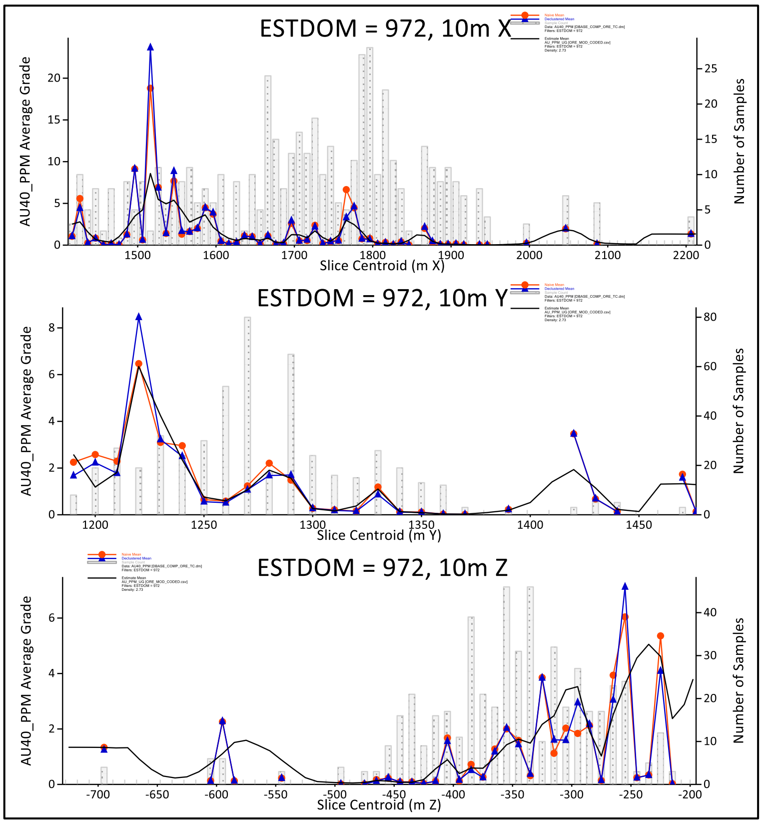


Figure 14-15: Au ppm Easting (X), Northing (Y) and Elevation (Z) Swath Plot, Domain 972 - CZ62

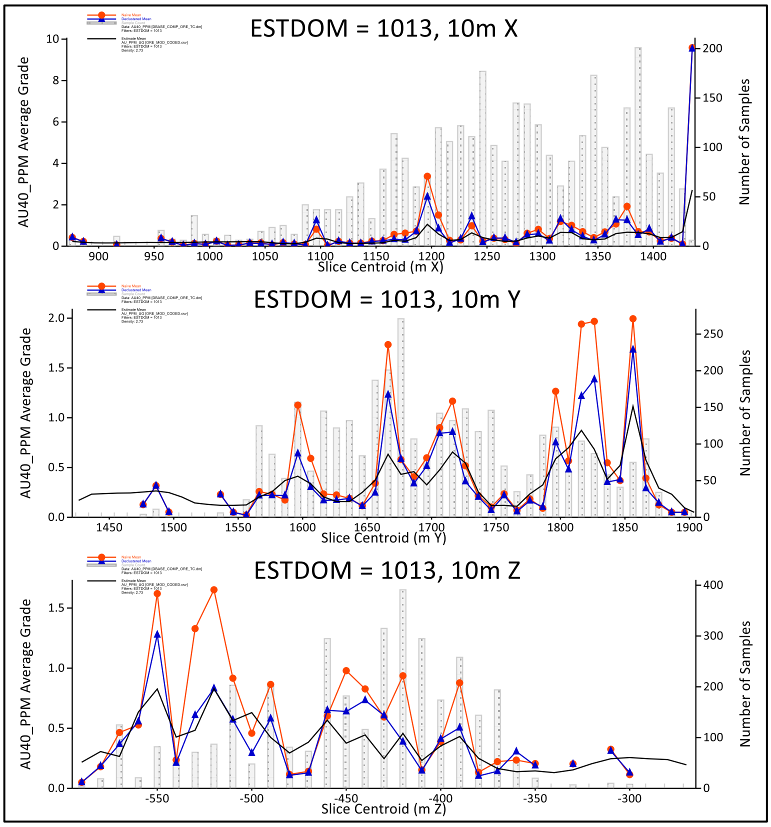


Figure 14-16: Au ppm Easting (X), Northing (Y) and Elevation (Z) Swath Plot, Domain 1013 - SHS1

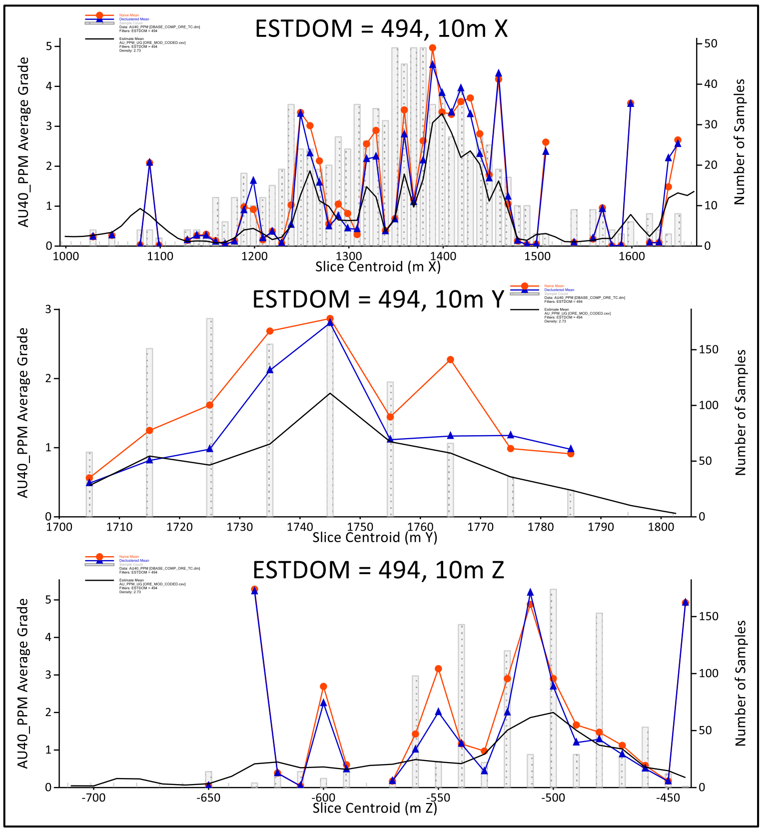


Figure 14-17: Au ppm Easting (X), Northing (Y) and Elevation (Z) Swath Plot, Domain 494 - LZ101

14.2.8 Bulk Density

Mining Plus has undertaken an analysis of the bulk density by lithology at Björkdal (14.2.4.1) and has found no significant difference in bulk density values used in comparison to previous years. Because previous bulk density values have been validated through mining operations, Mining Plus has elected to retain the bulk density values previously applied, Table 14-14.

Table 14-14: Björkdal assigned bulk density by lithology

Lithology	Bulk Density Assigned
Mineralisation/Background	2.74
Skarn Mineralisation	2.92
Marble	2.77
Till	1.8

14.2.9 Resource Classification

The definitions for resource categories used in this Technical Report are consistent with CIM (2014) definitions and adopted by NI 43-101. The resource classification has been applied to the MRE based on the confidence on the input data, the data spacing, and the grade and geological continuity. As previously stated, there are several sample types at Björkdal with different levels of confidence. Mining Plus considers those face sample data with a confidence of 30 and 40 are adequate to support a measured resource while those data with a confidence of 20 are not. To model the impact of these different confidence values on the model, an indicator estimation has been undertaken for both confidence 20 and confidence 30/40 material. This allowed classification of the resource to account for the quality of the input data.

The resource has been classified on the following basis:

- The mineralisation estimated in the first pass with confidence 30/40 data but not confidence 20 data have been classified as high confidence.
- The mineralisation that has been estimated using an average distance to three drill holes of less than 25 m has been classified as moderate confidence.
- The mineralisation that has been estimated using an average distance to three drill holes of more than 25 m and less than 35 m using at least 2 drill holes has been classified as low confidence.
- Blocks that are outside of these criteria remain unclassified.

Mining Plus has applied a smoothing operation to the confidence categories in order to generate, as close as possible, contiguous resource category regions. This process necessarily smooths across veins boundaries where two veins either intersect or are within one cell of each other.

After the smoothing operation, those blocks coded as high confidence have been classified as a **Measured Resource** while those classified as moderate confidence have been classified as an **Indicated Resource** and those blocks coded as low confidence have been classified as **Inferred Resource**. Additionally, the surrounding waste has been classified as an **Inferred Resource**.

14.2.10 Depletion

Mandalay have depleted the year-end model using their established method where all parent blocks and sub-blocks that are either completely within excavated asbuilt development and stope models have been coded as MINED=1 or 2 respectively. Blocks abutting stope excavation models are considered sterilised for underground mining purposes and have been coded as MINED=3. The failure zone has also been coded as depleted (MINED=4). Coding of the depletion has been undertaken in Surpac and imported to Datamine (Figure 14-18).

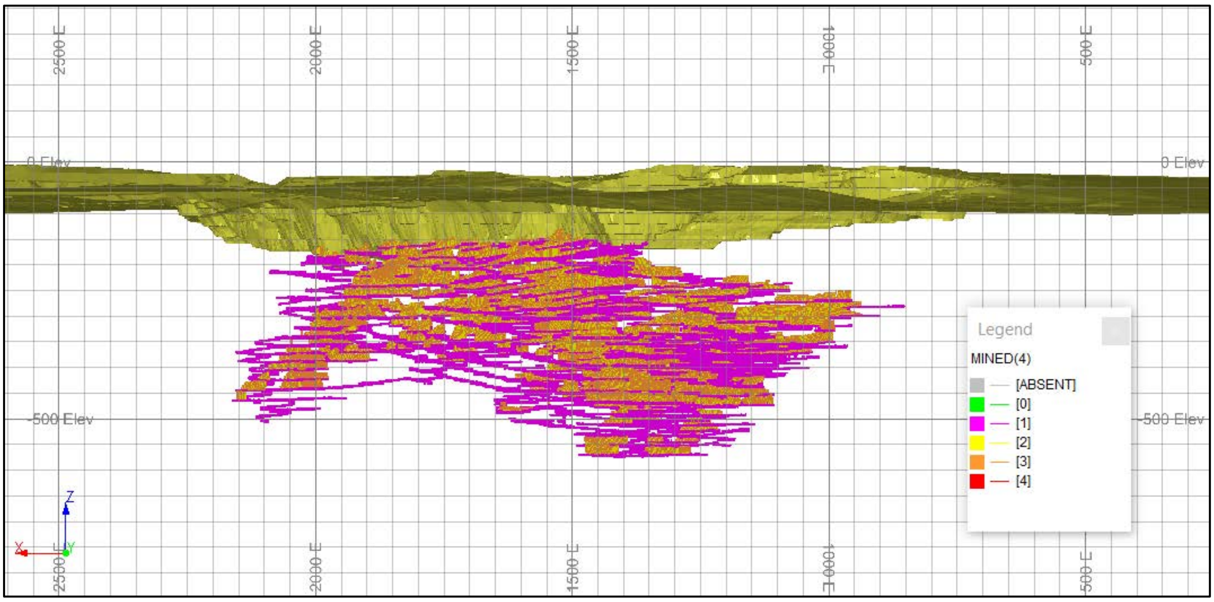


Figure 14-18: Depletion model longitudinal projection looking south

14.2.11 Grade-Tonnage Reporting

Separate cut-off grades have been developed for reporting the underground and open pit Mineral Resources. Each cut-off grade has been developed using the January to September 2021 actual cost information along with a gold price of US$1,700 per ounce and an exchange rate of 9.0 SEK/US$. The cut-off grade for reporting of Mineral Resources has been determined to be 0.77 g/t Au within the underground mine and 0.33 g/t Au for the open pit mine.

Metal prices used for reserves are based on consensus, long-term forecasts from banks, financial institutions, and other sources. For resources, metal prices are slightly higher than those used for reserves.

To fulfil the CIM (2014) definitions requirement of "reasonable prospects for eventual economic extraction (RPEEE)" with respect to the open pit Mineral Resources, Mandalay prepared a preliminary open pit resource shell using the Whittle parameters reported in Section 0 and based on a US$1,700/oz gold price.

The criteria used to report the Mineral Resources within the open pit mine included:

- All blocks located above the resource pit surface, excluding those coded as excavated.
- Within either a mineralised wireframe model or the mineralised waste domain model.
- Having estimated block grades greater than 0.33 g/t Au.
- Having a Mineral Resource category of either Measured, Indicated or Inferred.
- Any Measured material within the pit has been downgraded to Indicated.

The criteria used to report the Mineral Resources within the underground mine included:

- All blocks within a mineralised wireframe.
- Located below the open pit reporting shell.
- Not depleted for mining.
- Having estimated block grades greater than 0.77 g/t Au.
- Having a Mineral Resource category of either Measured, Indicated or Inferred.

To fulfil the CIM (2014) definitions requirement of RPEEE with respect to the underground Mineral Resource RPEEE, Mining Plus considers the current wireframing process sufficiently dilutes mineralisation to the minimum mining width, and that this adequately fulfils appropriate RPEEE requirements. Nevertheless, Mining Plus strongly recommends that future reporting is completed using Minable Shape Optimiser (or similar) to generate stoping panels for the purpose of RPEEE in line with industry best practice.

Table 14-15: Björkdal Mineral Resource as of 31 December 2021

Mineral Resource Estimate for the Björkdal Deposit as of December 31, 2021													
Domain	Cut-Off	Measured			Indicated			Measured & Indicated			Inferred		
	Au (g/t)	Tonnes (kt)	Grade (Au g/t)	Au (kOz)	Tonnes (kt)	Grade (Au g/t)	Au (kOz)	Tonnes (kt)	Grade (Au g/t)	Au (kOz)	Tonnes (kt)	Grade (Au g/t)	Au (kOz)
Open Pit	0.33				3,017	2.19	212	**3,017**	**2.19**	**212**	3,326	1.13	121
Underground	0.77	1,851	2.62	156	9,663	2.30	713	**11,514**	**2.35**	**869**	3,484	2.12	237
Stockpiles	0.32				2,532	0.61	50	**2,532**	**0.61**	**50**			
Total	-	1,851	2.62	156	12,681	2.27	925	**17,063**	**2.06**	**1,131**	6,810	1.63	357

Notes:
1. The Björkdal Mineral Resource is estimated using drill hole and sample data as of 30 September 2021 and depleted for production through 31 December 2021. Norrberget Mineral Resources are based on a data cut-off date of 30 September 2017.
2. CIM definitions (2014) were followed for the Mineral Resource.
3. The Mineral Resource is inclusive of the Mineral Reserve.
4. The Mineral Resource is estimated using an average gold price of $1,700/oz. and an exchange rate of 9.0 SEK/US$.
5. In situ bulk density is 2.74 t/m^3 for veins and host rock. In situ bulk density is 2.92 t/m^3 for skarn Mineralisation bodies. Stockpile bulk density is 1.8 t/m^3.
6. High gold assays were capped at 60 g/t Au for the first search pass and 40 g/t Au for subsequent passes.
7. High gold assays at Norrberget were capped at 24 g/t Au.
8. Interpolation was by inverse distance cubed utilising diamond drill, reverse circulation, and chip channel samples.
9. The Björkdal open pit Mineral Resource is estimated at a cut-off grade of 0.33 g/t Au and constrained by a resource pit shell to comply with the reasonable prospects for eventual economic extraction (RPEEE) criteria.
10. The Norrberget open pit Mineral Resources are estimated at a cut-off grade of 0.35 g/t Au and constrained by a resource pit shell to comply with the RPEEE criteria.
11. The Björkdal underground Mineral Resource is estimated at a block cut-off grade of 0.77 g/t Au for all veins
12. A nominal two meter minimum mining width was used to interpret veins and comply with the RPEEE criteria.
13. The Reported Mineral Resource is depleted for previously mined underground development and stopes.
14. The Stockpile Mineral Resource is estimated based upon surveyed volumes supplemented by production data.
15. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
16. Numbers may not sum due to rounding.
17. The Mineral Resource Estimate as of 31 December 2021 for Björkdal 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. The Independent Qualified Person for Norrberget Mineral Resource estimate is Reno Pressacco, P.Geo., Principal Geologist with SLR, who is a Qualified Person as defined by NI 43-101.

The QP is not aware of any environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors that could materially affect the Mineral Resource Estimate. Figure 14-19 and Figure 14-20 show the grade tonnage curve for the open pit and underground resources respectively.

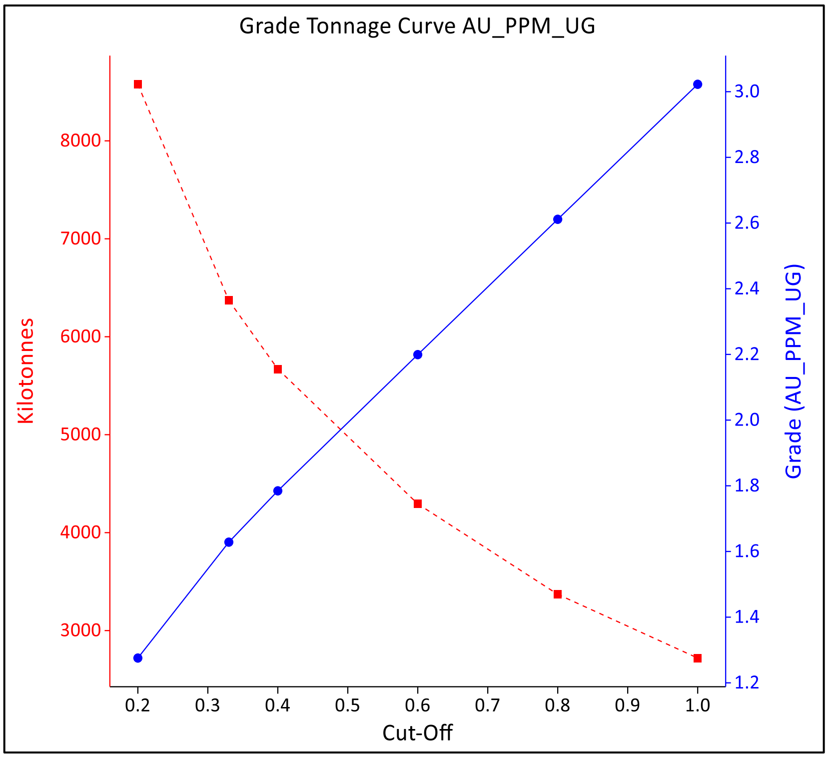


Figure 14-19: Grade Tonnage curve for the open pit – Indicated and Inferred

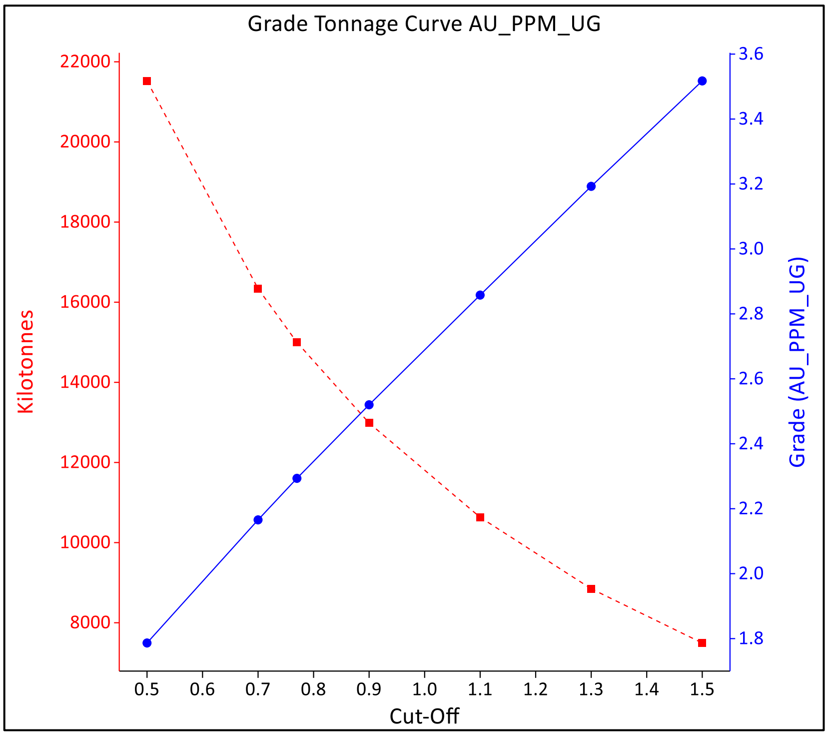


Figure 14-20: Grade Tonnage curve for underground – Measured, Indicated and Inferred

14.2.12 Comparison to Previous Estimate

Table 14-16 below shows the comparison between the previous (2021) and current estimate.

Table 14-16: 2021 vs 2022 Mineral Resource comparison

Mineral Resource Estimate for the Björkdal Deposit as of 31 December 2021													
Domain	Cut-Off	Measured			Indicated			Measured & Indicated			Inferred		
	Au (g/t)	Tonnes (kt)	Grade (Au g/t)	Au (kOz)	Tonnes (kt)	Grade (Au g/t)	Au (kOz)	Tonnes (kt)	Grade (Au g/t)	Au (kOz)	Tonnes (kt)	Grade (Au g/t)	Au (kOz)
Open Pit	0.33				3,017	2.19	212	**3,017**	**2.19**	**212**	3,326	1.13	121
Underground	0.77	1,851	2.62	156	9,663	2.30	713	**11,514**	**2.35**	**869**	3,484	2.12	237
Total		1,851	2.62	156	12,681	2.27	925	**14,531**	**2.31**	**1,081**	6,810	1.63	357

Mineral Resource Estimate for the Björkdal Deposit as of 31 December 2020													
Domain	Cut-Off	Measured			Indicated			Measured & Indicated			Inferred		
	Au (g/t)	Tonnes (kt)	Grade (Au g/t)	Au (kOz)	Tonnes (kt)	Grade (Au g/t)	Au (kOz)	Tonnes (kt)	Grade (Au g/t)	Au (Oz)	Tonnes (kt)	Grade (Au g/t)	Au (kOz)
Open Pit	0.28				2,383	2.10	161	2,383	2.10	161	3,515	1.44	163
Underground	0.77				11,482	2.32	858	11,482	2.32	858	2,322	2.06	154
Total					13,865	2.29	1,019	13,865	2.29	1,019	5,837	1.69	317

Comparison													
Domain	Cut-Off	Measured			Indicated			Measured & Indicated			Inferred		
	Au (g/t)	Tonnes (kt)	Grade (Au g/t)	Au (kOz)	Tonnes (kt)	Grade (Au g/t)	Au (kOz)	Tonnes (kt)	Grade (Au g/t)	Au (Oz)	Tonnes (kt)	Grade (Au g/t)	Au (kOz)
Open Pit					27%	4%	32%	27%	4%	32%	-5%	-22%	-26%
Underground					-16%	-1%	-17%	0%	1%	1%	50%	3%	54%
Total					-9%	-1%	-9%	5%	1%	6%	17%	-3%	13%

Mining Plus notes a significant change in contained gold in the Indicated and Inferred categories has occurred within the open pit. However, the total number of ounces in the pit has not changed significantly. Mining Plus considers the changes are due to the change in estimation of the open pit resource this year and as a result, the Mineral Resource classification. Mining Plus also notes a material increase in the underground Inferred material. This increase is attributable to additional drilling, re-wireframing and changes to the resource classification methodology.

14.2.13 Reconciliation to production statistics

Reconciliation results are presented comparing the tonnages, grades, and contained metal from the year-end 2020 long-term block model against the short-term grade control (GC) block models updated throughout 2021 and quarterly plant production data for 2021. The GC model was constructed using the same parameters as the long-term model and updated more frequently as additional sample information became available.

Reconciliation processes also included identification of the mineralised material that was initially included in the mine schedule but ultimately, was not excavated (non-recovered). Additionally, mineralised material has been identified that had not been modelled in the long-term model but was subsequently discovered during on-vein development. The identification and quantification of the non-recovered and additional mineralised material mined is important to achieve a correct reconciliation with the plant production data.

Stope volumes have previously been generated using traditional CMS, and recently Hovermap, scans. Where scans have not been possible, the design volume has been used and a dilution factor applied for likely overbreak. Development volumes have formerly been generated from monthly survey pick-ups, recently from daily Hovermap scans. Mandalay have developed a grade control program whereby low-grade material (less than 0.35 g/t Au) is not sent to the mill. As a result, not all development tonnes are milled.

A comparison of the tonnage, grade and contained gold between the previous long-term model (SLR, 2021) and the 2021 grade control model to plant production statistics have been completed (Table 14-17 and Table 14-18).

Table 14-17: 2021 model to mill stope reconciliation

	Stope Reconciliation											
	Long Term BM (SLR, January 2021)			GC BM (2021)			Mined			Actual Milled 2021		
	Predicted Tonnes	Predicted Grade (g/t)	Predicted Au (oz)	Predicted Tonnes	Predicted Grade (g/t)	Predicted Au (oz)	Trucked Tonnes	Predicted Diluted Grade (g/t)	Predicted Au (oz)	Actual Tonnes	Actual Grade (g/t)	Actual Au (oz)
Q1	**139,359**	1.88	**8,424**	**140,408**	1.90	**8,584**	**163,878**	1.61	**8,457**	**149,786**	1.69	**8,137**
Q2	**123,809**	1.83	**7,279**	**125,442**	1.84	**7,403**	**158,522**	1.56	**7,941**	**145,519**	1.54	**7,196**
Q3	**119,724**	1.66	**6,393**	**119,417**	1.70	**6,509**	**154,102**	1.72	**8,536**	**137,408**	1.66	**7,347**
Q4	**153,462**	1.29	**6,350**	**151,105**	1.50	**7,264**	**179,790**	1.67	**9,672**	**160,346**	1.54	**7,952**
Total	**536,354**	**1.65**	**28,447**	**536,372**	**1.73**	**29,761**	**656,292**	**1.64**	**34,606**	**593,059**	**1.61**	**30,633**

Table 14-18: 2021 model to mill development reconciliation

	Development Reconciliation											
	Long Term BM (SLR, January 2021)			GC BM (2021)			Mined			Actual Milled 2021		
	Predicted Tonnes	Predicted Grade (g/t)	Predicted Au (oz)	Predicted Tonnes	Predicted Grade (g/t)	Predicted Au (oz)	Trucked Tonnes	Predicted Diluted Grade (g/t)	Predicted Au (oz)	Actual Tonnes	Actual Grade (g/t)	Actual Au (oz)
Q1	**182,730**	0.68	**4,008**	**184,837**	0.67	**4,008**	**178,451**	0.84	**4,846**	**202,351**	0.78	**5,085**
Q2	**186,075**	0.61	**3,659**	**184,821**	0.57	**3,414**	**183,887**	0.88	**5,203**	**192,195**	0.84	**5,216**
Q3	**172,327**	0.45	**2,514**	**173,161**	0.67	**3,730**	**158,134**	0.80	**4,081**	**172,427**	0.78	**4,344**
Q4	**196,956**	0.33	**2,110**	**197,282**	0.53	**3,372**	**197,322**	0.63	**3,968**	**201,079**	0.62	**4,015**
Total	**738,088**	**0.52**	**12,291**	**740,101**	**0.61**	**14,524**	**717,793**	**0.78**	**18,097**	**768,053**	**0.76**	**18,660**

The stope reconciliation data shows good agreement between the tonnages, grades and contained metal across both models. The development reconciliation data shows an undercall across both models with the grade control model performing slightly better, especially in the second half of the year. Mining Plus considers that these additional contained ounces are likely to be the result of:

- Additional strike or dip extensions of the actual veins as compared with the wireframe interpretation.
- New mineralisation discovered during on vein development, following grade control procedures.
- Additional gold ounces may be recovered in the plant because of processing material from the stockpiles. Further gold may be recovered that is non-cyanide leachable gold that was not observed by the PAL analysis method.

In spite of the apparent undercall by the long-term model, Mining Plus considers that the satisfactory reconciliation performance validates the estimation parameters of the previous estimation and has therefore sought to use a comparable estimation method and parameters where appropriate, despite the use of different software.

14.2.14 Key Recommendations

Mining Plus recommends the following work be undertaken prior to the next year-end MRE:

- Review the use of minimum width in wireframing with a view to optimising alignment to sample intervals.
- Review all wireframes and ensure all drill holes are currently snapped to.
- Review all wireframes and ensure overlapping sections are removed.

Mining Plus also strongly recommends the use of MSO (or similar) as a means of reporting the resource during the next year-end MRE to align with industry best practice.

14.3 Norrberget

The following description for Norrberget was taken from the 2018 Technical Report (Roscoe Postle Associates Inc., 2018). No changes have been made to the Mineral Resource estimate since the underlying assumptions have not changed materially.

14.3.1 Topography Model

A DTM generated from Surpac software was provided to clip the block model. The drill hole collars within the resource database were checked against the DTM elevation and all were within 0.03 m difference except drill hole 2009610, which was less than 0.30 m.

14.3.2 Description of the Database

RPA received the Norrberget dataset in July 2017 as an Access database that contained all drilling up until the completion of the 2016 exploration program. Additional drilling was completed in 2017 and appended to the drill hole database later this year. The cut-off grade of the database is 30 September 2017, and no drilling has been carried out since that date.

The database was imported into Micromine v 2016.1 (SP 2) geological modelling software for data validation and modelling. The database contained 167 drill holes, however, 107 of these drill holes were flagged as occurring significantly outside the licence area of Norrberget 300. The remaining 72 drill holes were used for the resource database and block model interpolation. A summary of the resource database is provided in Table 14-19.

Table 14-19: Summary of Norrberget Mineral Resource Database

Item	Record Count/Details
Drill Holes	72
Total Length (m)	6,972.10
Downhole Survey	1,607
Lithology	480
Assay Values	5,526
Assay Length (m)	5,385.10

The imported data was validated to check for issues such as duplicate drill holes, survey issues, typos, samples beyond end of hole, etc. One assay sample was identified as being invalid as a result of the From and To depths being the same value. This sample was well below cut-off grade and the depths were corrected to match the neighbouring intercepts. Nine drill holes did not have a collar survey; however, the first downhole survey measurement was taken at a three metre depth. The resource database is considered by SLR (previously RPA) to be sufficiently reliable for grade modelling and Mineral Resource estimation.

14.3.3 Lithology and Mineralisation Wireframes

The Norrberget mineralisation occurs within bands of veinlets and alteration containing amphibole in a package of interbedded mafic tuffs and volcaniclastics. RPA, now SLR, reviewed the geological logging and was not able to differentiate suitably the grade from waste rock using the lithology and alteration logging. RPA reviewed the assay data statistically and spatially and observed a second gold grade population at approximately 0.4 g/t Au. RPA's wireframes were built based on an approximately 0.4 g/t Au wireframe cut-off grade. The raw gold assay histogram is shown in Figure 14-21.

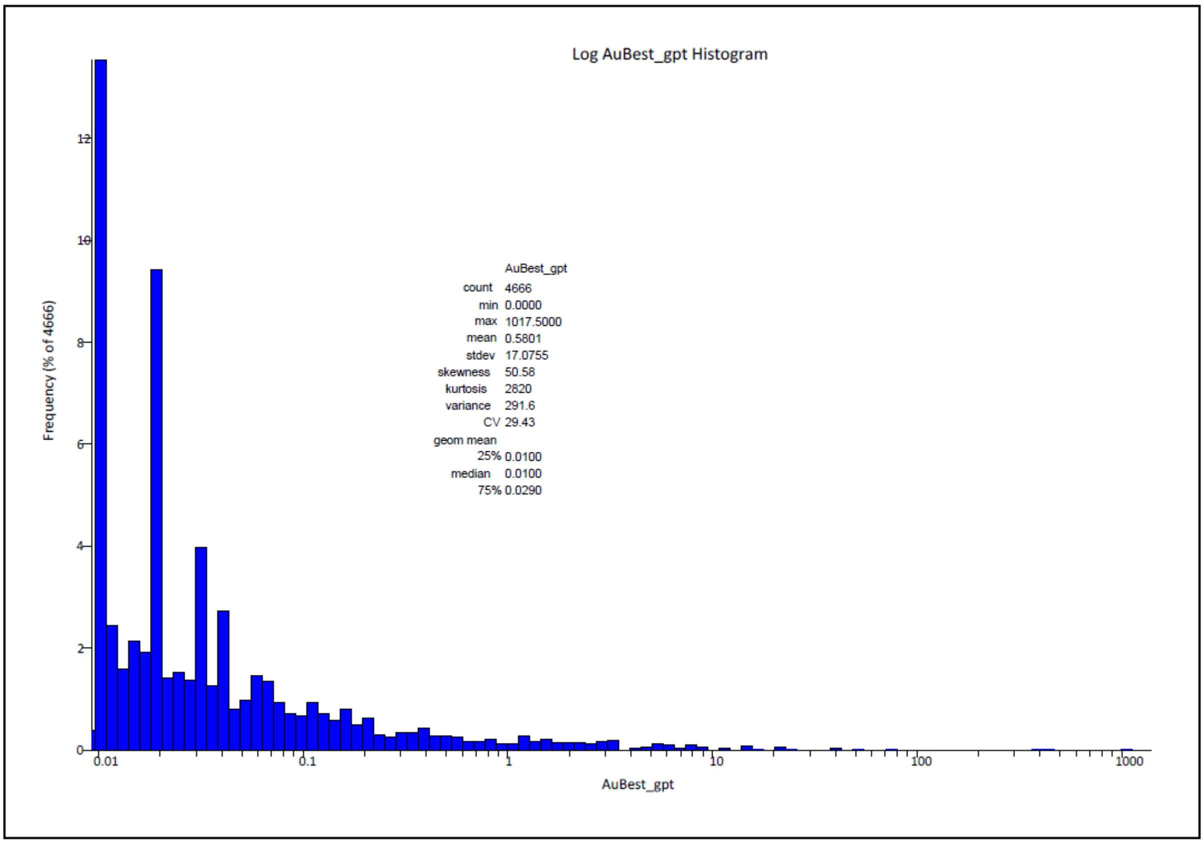


Figure 14-21: Raw Au Data Histogram, Norrberget

Fourteen cross sections were created on a 20° azimuth across the strike of the deposit to match the main direction of drilling. As the drill hole spacing and direction were not constant, these sections were created between 6 m and 40 m apart, although most were between 20 m and 25 m apart. Due to the variable cross section spacing, each cross-sections window of view extended half the distance to the next cross section to cover the entire deposit. Polylines were generated around the mineralisation and as the mineralisation has been observed to be fairly continuous these shapes were extrapolated. A two metre minimum mining width was applied which had the result of bringing some waste material into the model in small intercepts. Some mineralisation below the 0.4 g/t Au cut-off grade was included within the model to allow for geological continuity. The sectional polylines were joined together in three dimensions to form valid and closed wireframes that contained the mineralisation along the length of the deposit. In total three mineralisation wireframes were created, one main wireframe that ran the length of the deposit, and two small footwall wireframes that occur at either end. Other above cut-off intercepts occurred in both the hanging and footwall, however these could not be traced to adjacent sections without significant waste material being incorporated and were therefore rejected. A bedrock surface was generated from contouring the depth of the first bedrock intercept downhole and creating a DTM of the contours. The bedrock surface was used to clip the top of the mineralisation wireframes. The final volumes of the mineralisation wireframes are:

- Min_1 = 187,642 m^3
- Min_2 = 11,909 m^3
- Min_3 = 14,733 m^3

Figure 14-22 illustrates an orthogonal view of the mineralisation wireframes (Pink = Min_1, Orange = Min_2, Red = Min_3) below the topographic surface (brown) supplied by Mandalay. Additional surfaces were generated through contouring the boundary intercept between the volcanics and mafics and between the volcanics and limestone for the purposes of flagging density values to the block model.

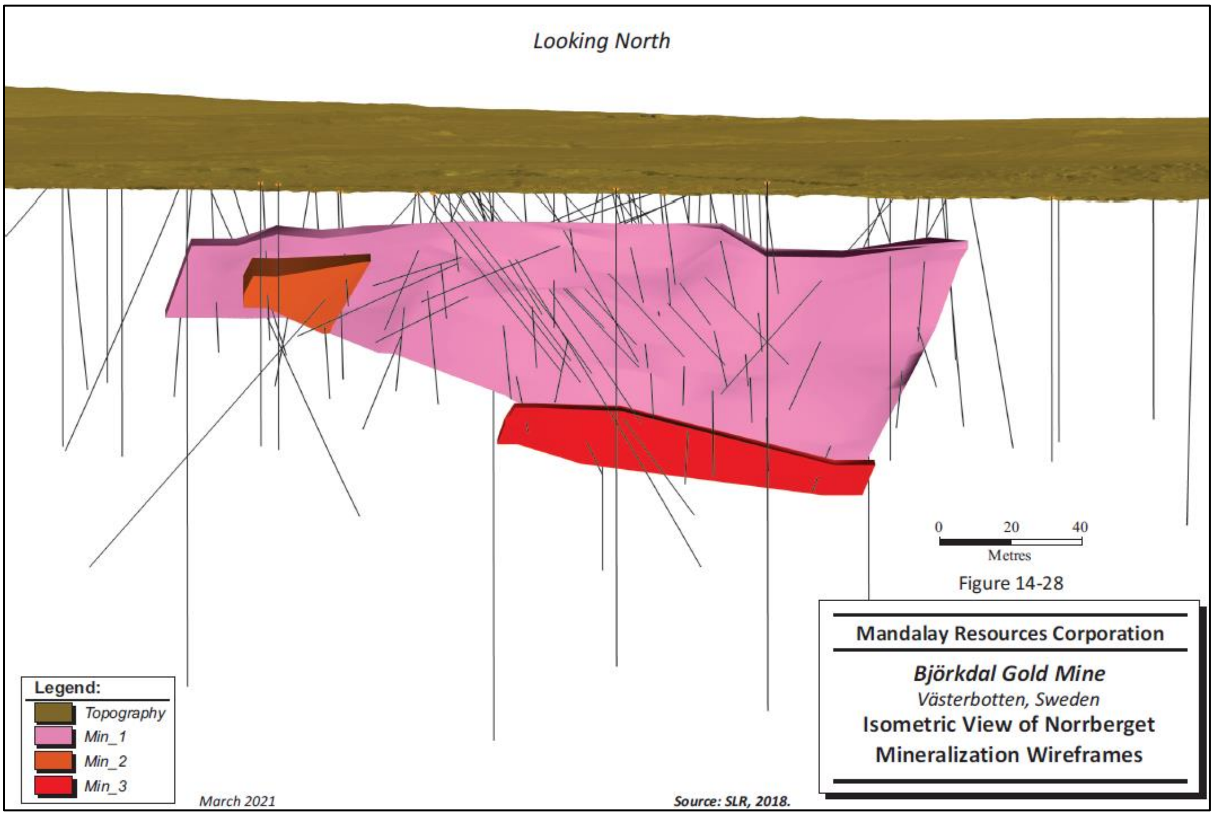


Figure 14-22: Isometric view of Norrberget mineralisation wireframes

14.3.4 Compositing Methods and Grade Capping

Samples within the domain wireframes were flagged with the domain name. Statistics for samples in the entire dataset and within the domain only are presented in Table 14-20.

Table 14-20: Summary of Norrberget Sample Statistics

Data	No. of Samples	Min (g/t Au)	Max (g/t Au)	Mean g/t Au)	Var. (g/t Au)	StDev. (g/t Au)	CV (g/t Au)
All	8,519	0.00	1,017.50	0.36	167.21	12.93	35.79
Within Domains	327	0.00	1,017.50	7.75	4,115.79	64.15	8.28

14.3.4.1 Grade Capping

Gold projects are often susceptible to nugget effect where anomalous high grades can be encountered during assay analysis. Erratic high grade values can be over-represented during block model interpolation, resulting in significant over-estimation of the local gold grade. Gold values were observed as high as 1,017.5 g/t Au within the Norrberget resource dataset. To remove the influence of these high grade samples, a top-cut (capping) level is applied where the grade is observed to become erratic. Histograms, probability plots and decile analysis were reviewed for all gold samples contained within the combined mineralisation wireframes. The domains were not analysed separately due to the small sample numbers in domains Min_2 and Min_3. The gold capping analysis is illustrated in Figure 14-23. Table 14-21 outlines the capping values and statistics for the combined mineralised domain.

Table 14-21: Summary of Norrberget Gold Grade Capping

Metal	Unit	Dataset	Cap	No. of Samples	Min	Max	Mean	StDev	CV	No. of Caps	Metal Loss
Au	g/t	Uncapped	24	311	0.00	1,017.50	7.38	65.55	8.88	7	74%
		Capped			0.00	24.00	1.95	4.66	2.39		

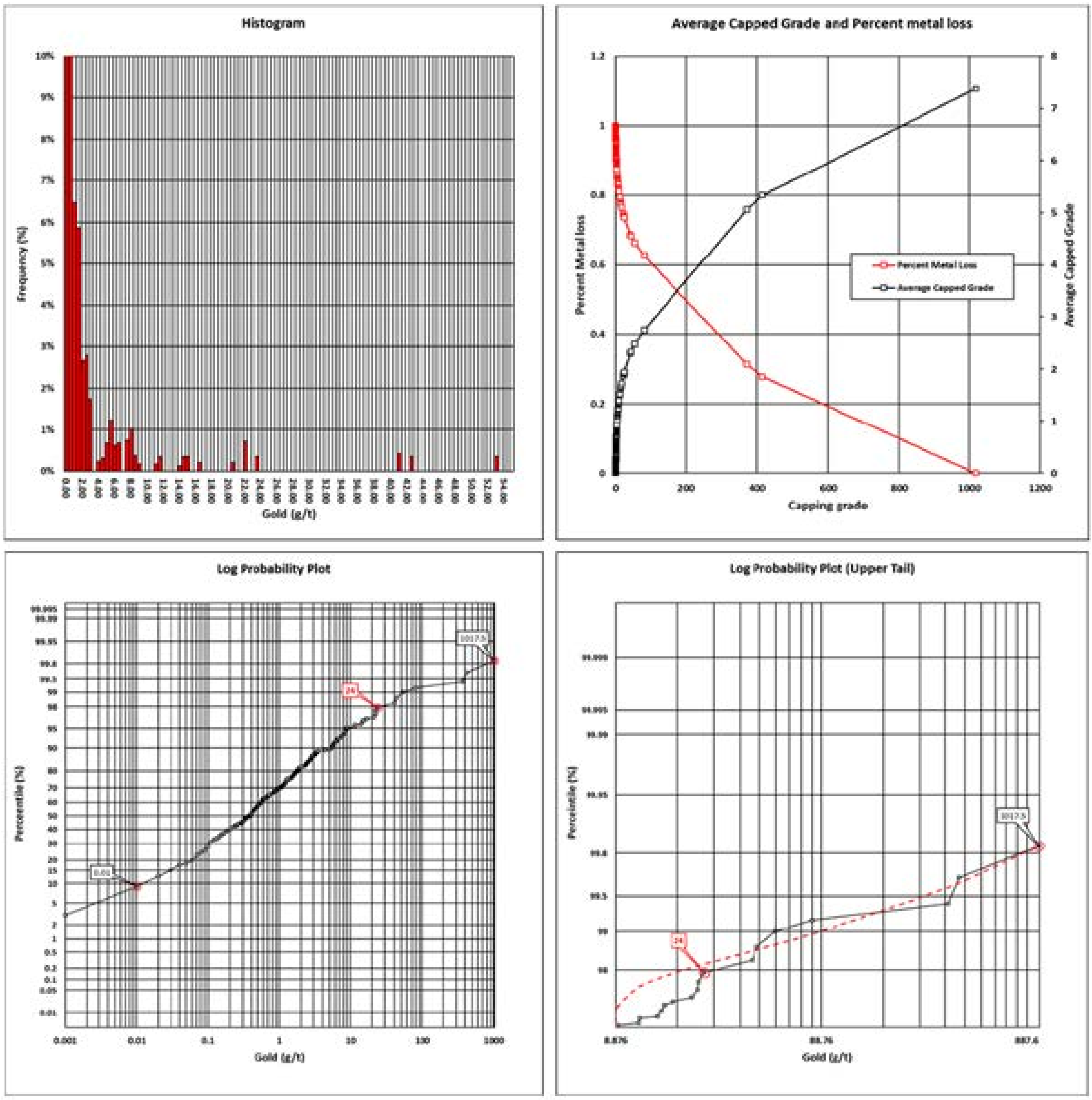


Figure 14-23: Capping Analysis of Gold within Vein Domains, Norrberget

14.3.4.2 Compositing

Sample lengths within the mineralised domains ranged between 0.35 m and 1.86 m, with over 50% occurring at 1.00 m ± 0.05 m (Figure 14-24). The samples within the mineralised domain wireframes were composited on a one metre interval. Intercepts that were less than 0.50 m after compositing were removed from the estimation database to ensure that they did not overly influence the resource estimation.

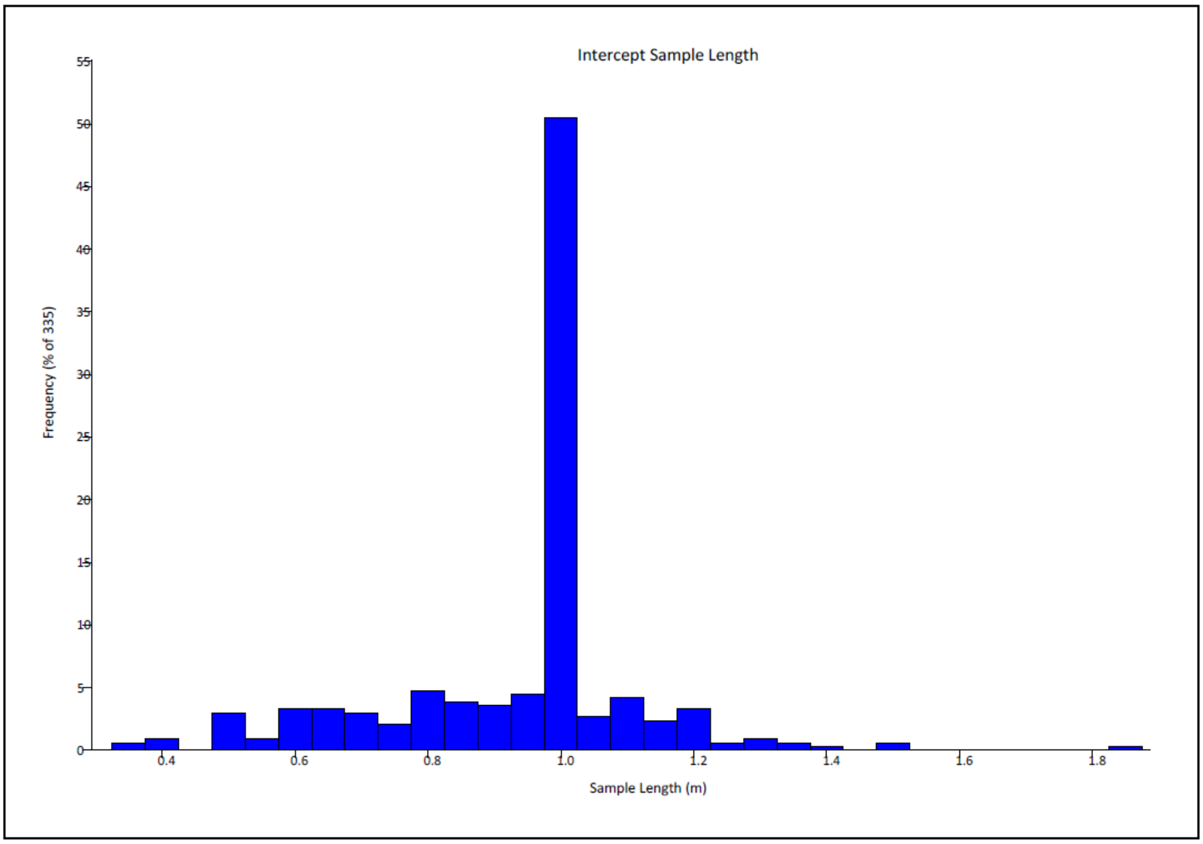


Figure 14-24: Histogram of Sample Lengths within Vein Domains, Norrberget

14.3.5 Bulk Density

Density measurements were taken during a previous exploration program that collected 358 samples from four diamond drill holes. Sample densities were calculated using Archimedean principles of measuring a sample in air and immersed in water. An average bulk density for each lithology is presented in Table 14-22.

Table 14-22: Norrberget Mean Bulk Density by Lithology

Lithology	Density (g/cm^3)
Overburden	1.80
Mafic Tuff	2.78
Mineralisation	2.78
Mafic Volcaniclastic	2.72
Limestone	2.76

14.3.6 Variography

The capped and composited intercepts were loaded into Snowden Supervisor v8.6 for continuity analysis and semi-variogram modelling. Due to the low sample numbers present within the wireframed domains it was not possible to model meaningful semi-variograms. To review the continuity analysis, the data was loaded into Leapfrog Geo and the gold grade values contoured, which defined a trend for the high grade zone that matched a trend observed in Snowden Supervisor. These trends were used to inform the interpolation parameters.

14.3.7 Block Model Construction

An empty block model was created of sufficient size to encompass the three mineralised domains and allow suitable waste for a pit shape that would be required to constrain the Mineral Resource. A parent block size of 6 m by 4 m by 4 m in the X, Y, and Z directions was used, providing 85 blocks in the X direction, 80 blocks in the Y direction and 34 blocks in the Z direction. The blocks were rotated by 105° from north to match the strike of the mineralisation. The block model has been clipped below the DTM surface supplied by Mandalay. In total, the block model contains 240,291 blocks.

Sub-blocking was applied along the boundaries of the mineralised domains to a minimum of 2.0 m in all directions. The blocks were flagged with each mineralised domain separately so that a hard boundary could be applied. A summary of the block model dimensions is provided in Table 14-23.

Table 14-23: Norrberget Block Model Dimensions

Origin			Block Model length (m)			Parent Block Dimension (m)			Minimum Sub Block Size (m)	Block Model Rotation (°)
X	Y	Z	X	Y	Z	X	Y	Z	X, Y or Z	
768,900	7,211,600	0	470	350	130	6.0	4.0	4.0	2.0	105

The block model attributes are outlined in Table 14-24.

Table 14-24: Norrberget Block Model Attributes

Variables	Default	Type	Description
EAST	0	Real	X Position
NORTH	0	Real	Y Position
RL	0	Real	Z Position
_EAST	0	Float	X Block Size
_NORTH	0	Float	Y Block Size
_RL	0	Float	Z Block Size
SG	0	Real	Specific Gravity
Run	0	Character	Search Pass Number

Variables	Default	Type	Description
Class	0	Character	Block Classification
Domain	0	Character	Mineralisation Domain Name
RPA_Cap_Au	0	Real	Capped Au Grade
AuBest_gpt	0	Real	Uncapped Au Grade
POINTS	0	Short	Number of Samples Used
STD_DEV	0	Real	Standard Deviation
Hole Count	0	Short	Number of Drill Holes Used
AVERAGE DISTANCE	0	Float	Average Distance of Samples
CLOSEST DISTANCE	0	Float	Closest Sample Distance
NN_RPA_Cap_Au	0	Real	Nearest Neighbour Au Grade

The block model was flagged using ID3 for the blocks as no meaningful variograms could be modelled. A simultaneous Nearest Neighbour (NN) interpolation was undertaken using the same parameters to provide a check against the ID3 model. The orientation and radius of the search ellipse were calculated using the parameters observed during the continuity analysis. The continuity analysis highlighted a perceived strong 15° plunge to the deposit. Three passes of a search ellipsoid were undertaken during interpolation, each run having an increasing search radius and a decreasing minimum number of interpolants to ensure that all blocks were interpolated with an estimated grade. All domains were estimated using a hard boundary. The parameters used for the ID3 interpolation are outlined in Table 14-25.

Table 14-25: Norrberget Block Model Interpolation Parameters

Run	Axis 1 Radius (m)	Axis 2 Radius (m)	Axis 3 Radius (m)	Max Samples	Max Samples Per Hole	Min Points (Total)	Min Holes	Search Ellipse		
								Azi (°)	Plunge (°)	Dip (°)
1	33.3	16.6	16.6	12	2	3	3	5	15	5
2	50	25	25	8	2	3	2	5	15	5
3	100	25	25	8	2	1	1	5	15	5

14.3.8 Block Model Validation

SLR reviewed the interpolated block model to ensure that it is representative of the input data. This validation used the following methodologies:

- Volumetric comparison between domain wireframes and flagged block model.
- Visual comparison of composite grade to interpolated block grades in plan and long/cross section.

- Statistical comparison between raw, composite, and interpolated block grades.
- Swath plots comparing the interpolated block grades (ID3 and NN) against composite sample grades.

14.3.8.1 Comparison of Composite Samples to Block Model

A comparison between the wireframe volume and the resultant flagged block model volume is presented in Table 14-26.

Table 14-26: Norrberget Wireframe Volumes versus Block Model Volumes

Domain	Wireframe Volume (m^3)	Block Model Volume (m^3)	Difference	
			(m^3)	(%)
Min_1	187,643	186,272	-1,371	-0.73%
Min_2	11,909	12,128	219	1.84%
Min_3	14,734	16,088	1,354	9.19%
Total	**214,286**	**214,488**	**202**	**0.09%**

The results show that although there are some significant differences between the wireframe volumes in Min_2 and Min_3, it is most likely a result of the limited volume of these domains resulting in a higher chance that the centroid of the block will occur near the edges of the wireframe. The main mineralised domain (Min_1), however, has a much smaller volume difference (-0.73%). When compared overall, the difference between the wireframe volumes and the block model volumes are negligible. This indicates that the trade-off between the block size and minimum practical block size for Mineral Resource estimation purposes is at an acceptable level. Table 14-27 summarises the statistical properties of the ID3 Norrberget block model.

Table 14-27: Norrberget Block Model Statistics

Data	Count	Min (g/t Au)	Max (g/t Au)	Mean g/t Au)	Variance	StDev.	CV
Min_1	7,740	0.00	18.01	1.50	3.63	1.91	1.27
Min_2	358	0.00	4.23	0.80	1.33	1.15	1.44
Min_3	910	0.03	3.32	0.96	0.78	0.88	0.92

Table 14-28 outlines the minimum, maximum and mean grade for the capped assays, composited intervals and the block model.

Table 14-28: Comparison of Norrberget Au Statistics

Domain	Capped Assay (g/t Au)			Composites (g/t Au)			Block Model (g/t Au)		
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
Min_1	0.00	24.00	2.09	0.00	24.00	2.03	0.00	18.01	1.50
Min_2	0.00	5.62	0.64	0.00	5.62	0.67	0.00	4.23	0.80
Min_3	0.02	5.05	1.34	0.02	5.05	1.34	0.03	3.32	0.96

14.3.8.2 Visual Comparisons

Figure 14-25 and Figure 14-26 illustrate a visual comparison of the block grade versus the composite grade in section and plan, respectively. These images show that the block grade is appropriate to the local scale composite grade and that it does not appear that the block model is over smoothed. The intersection appears significantly smaller than the blocks in Figure 14-25 as a result of the steep drill hole angle and relatively shallow domain relative to the plan view.

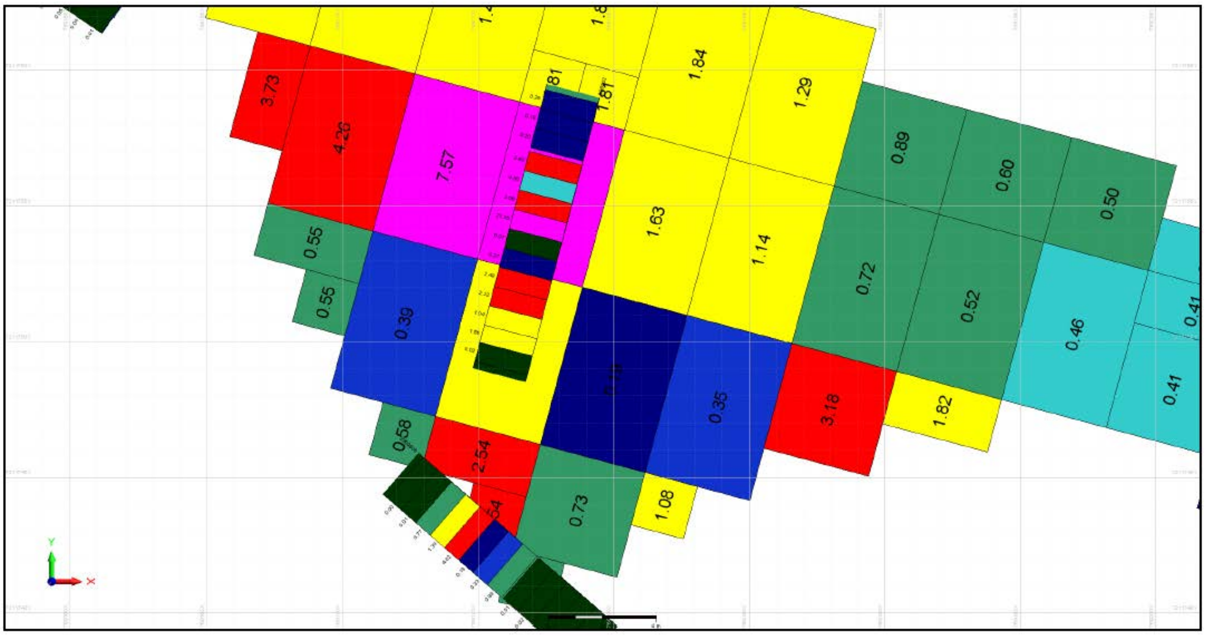


Figure 14-25: Norrberget Cross Section of Block Grade versus Composite Grade

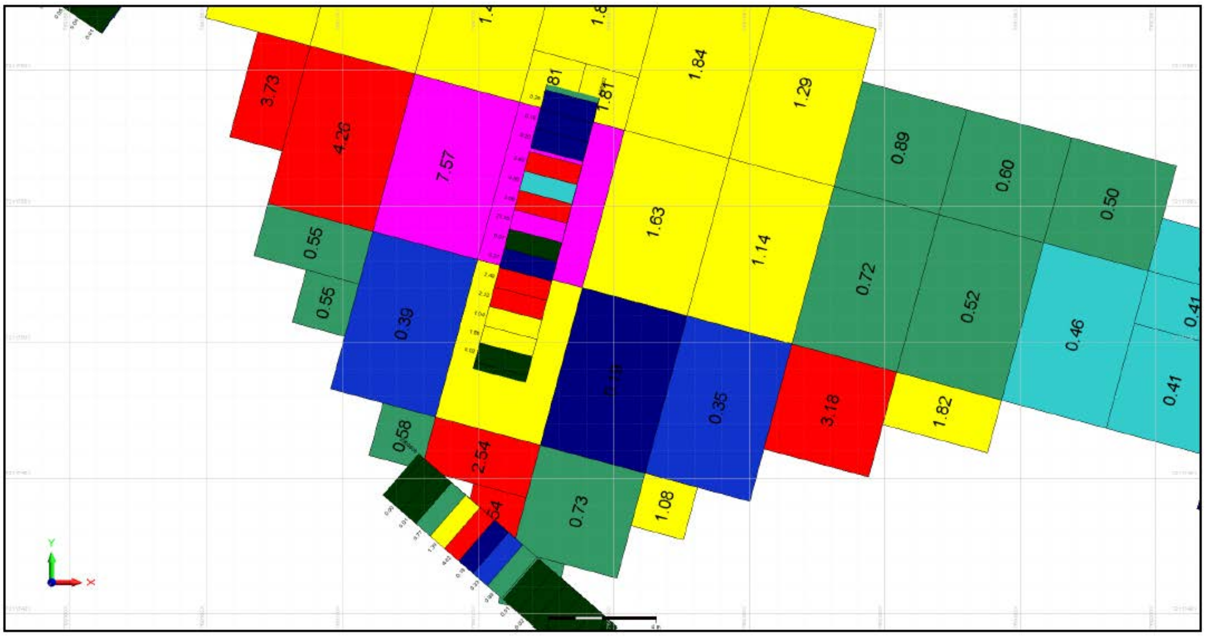


Figure 14-26: Norrberget Plan of Block Grade versus Composite Grade

14.3.8.3 Swath Plots

The trend (swath) plots presented in Figure 14-27 to Figure 14-29 compare the capped composite grades against the ID3 and NN interpolations along a particular orientation. These plots indicate that the ID3 block model is supported by the underlying data and that the grade is not overly smoothed. These results indicate that the block model grade is reflective of the input capped and composited sample grades.

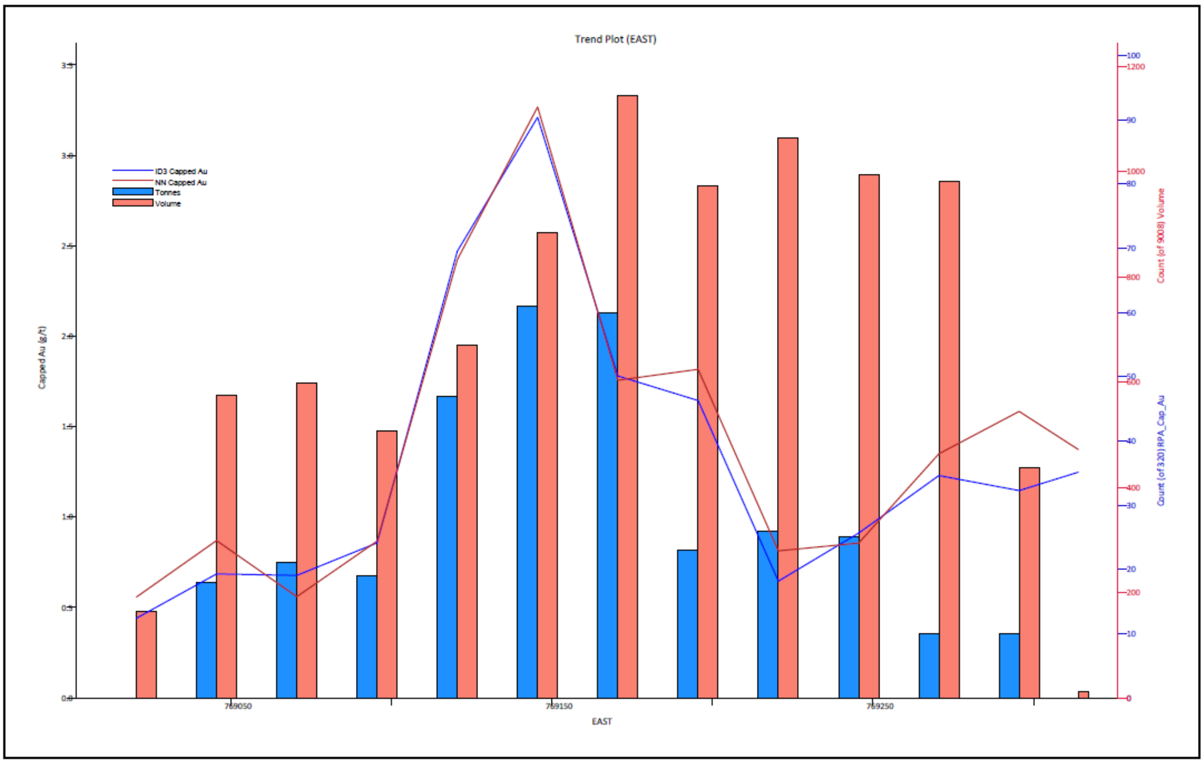


Figure 14-27: Trend Plot (East) Analysis of ID3 and NN Analysis versus Composite Samples, Norrberget

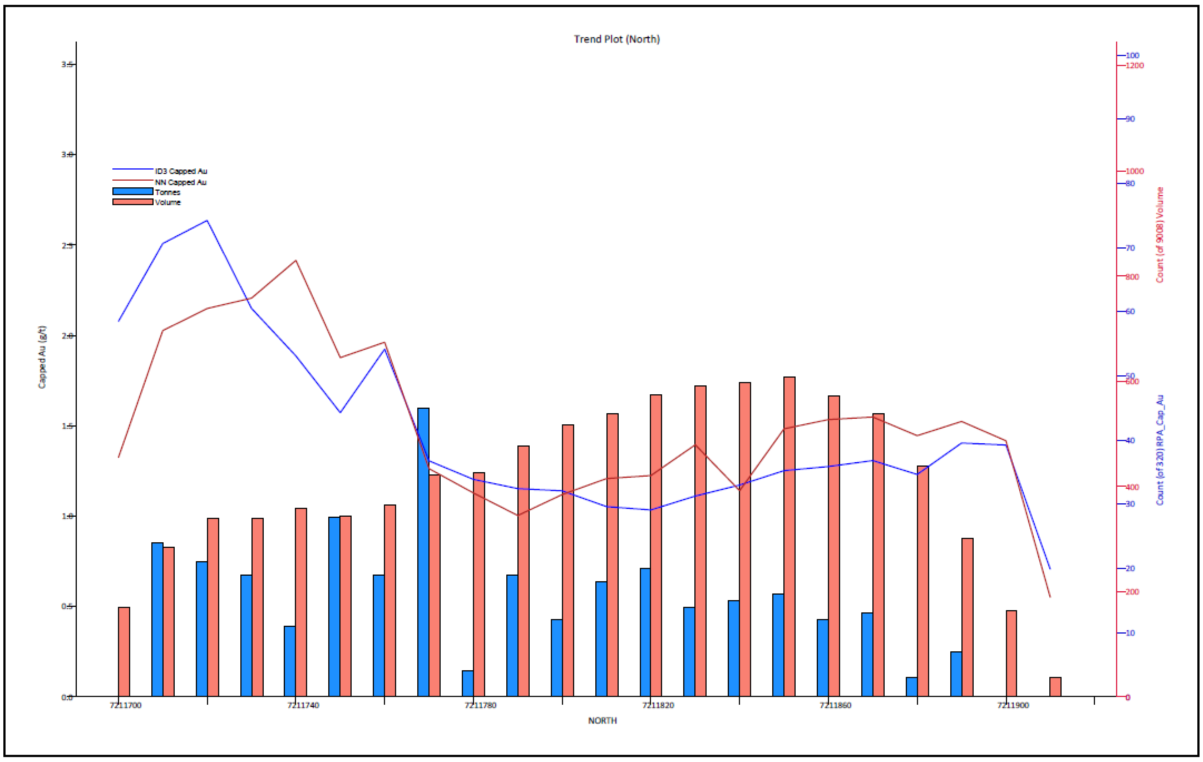


Figure 14-28: Trend Plot (North) Analysis of ID3 and NN Analysis versus Composite Samples, Norrberget

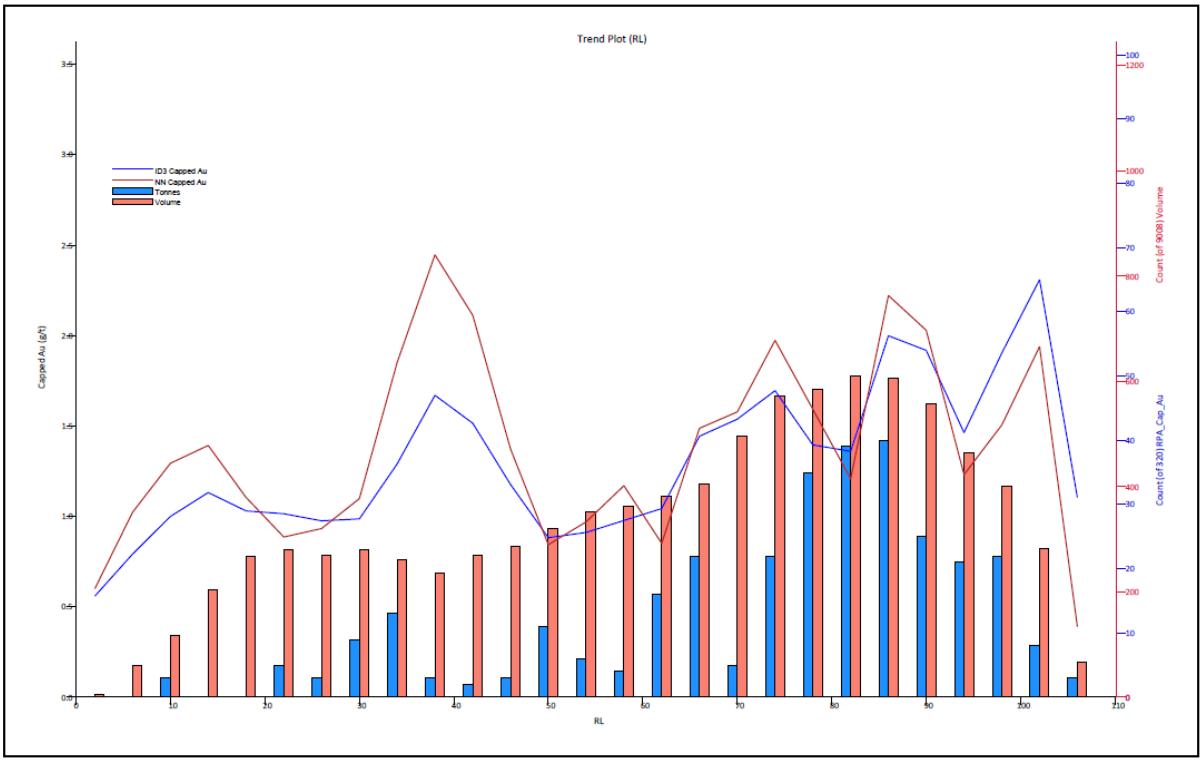


Figure 14-29: Trend Plot (Elevation) Analysis of ID3 and NN Analysis versus Composite Samples, Norrberget

14.3.9 Mineral Resources Classification Criteria

Definitions for resource categories used in this Technical Report are consistent with CIM (2014) definitions and adopted by NI 43-101. It has previously been reported by Geovista in March 2017 that no drill holes prior to 2004 have QA/QC data available for them. This was taken into account when classifying the Mineral Resource. Wireframes were created to surround areas of potential similar classification to ensure that the classification was contiguous and no spotted dog classification was applied. Some blocks were included within the classification wireframes that may not meet the criteria for the purposes of continuity. Indicated blocks were those which were interpolated by drill holes that had an average spacing of less than 40 m for drill holes completed since 2004, interpolated primarily within pass one or two and are within domain Min_1. Inferred blocks were blocks that did not meet the classification parameters for Indicated and all blocks within the two smaller domains (Min_2 and Min_3) due to their limited number of interpolants. Inferred material included blocks that were primarily interpolated using pre-2004 drill holes.

14.3.10 Responsibility for the Estimate

The estimate of the Mineral Resources for Norrberget presented in this Technical Report was prepared by Mr. Jack Lunnon, CGeol, under the supervision of Reno Pressacco, P.Geo., both of whom are Qualified Persons as defined in NI 43-101, and are independent of Mandalay.

14.3.11 Cut-Off Grade and Resource Reporting Criteria

The cut-off grade for the Norrberget deposit was developed using the January to September 2017 actual cost information along with a gold price of US$1,400 per ounce and an exchange rate of 9.0 SEK/US$. The cut-off grade for reporting of Mineral Resources was determined to be 0.35 g/t Au. To fulfil the NI 43-101 requirement of “reasonable prospects for eventual economic extraction”, Mandalay prepared a preliminary open pit resource shell using the Whittle parameters used in Section 15 and based on a gold price of US$1,400 per ounce. The criteria used to report the Mineral Resources at Norrberget included:

- All blocks located above the resource pit surface.
- All blocks with a grade above 0.35 g/t Au.
- A Mineral Resource category of either Indicated or Inferred.

14.3.12 Norrberget Deposit Mineral Resource Estimate

Table 14-29 presents the Norrberget Mineral Resource estimate as of 30 September 2017.

Table 14-29: Summary of Norrberget Mineral Resources as of 30 September 2017

Category	Tonnage (kt)	Grade (g/t Au)	Contained Au (koz)
Measured	-	-	-
Indicated	144	3.29	15
Total Measured + Indicated	**144**	**3.29**	**15**
Inferred	3	4.03	0.5

Notes:
1. Norrberget Mineral Resources are estimated using drill hole and sample data as of 30 September 2017.
2. CIM (2014) definitions were followed for Mineral Resources.
3. Mineral Resources are inclusive of Mineral Reserves.
4. For Norrberget, a nominal two metres minimum mining width was used to interpret veins using diamond drill and reverse circulation drill samples.
5. Bulk density is 2.74 t/m^3.
6. High gold assays at Norrberget were capped at 24 g/t Au.
7. Interpolation was by inverse distance cubed.
8. Open pit Mineral Resources are estimated at a cut-off grade of 0.35 g/t Au and constrained by a resource pit shell.
9. Mineral Resources are estimated using an average gold price of US$1,400/oz and an exchange rate of 9.0 SEK/US$.
10. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
11. Numbers may not add due to rounding.

The QP is not aware of any environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors that could materially affect the Mineral Resource estimate.

15 MINERAL RESERVE ESTIMATES

15.1 Summary

The Mineral Reserves estimated by Mandalay, with an effective date of 31 December 2021, are listed in Table 15-1. The total Mineral Reserve estimate for the Björkdal Mine and Norrberget deposit is 12.12 Mt at a grade of 1.39 g/t Au, for a total of 542 koz Au. The Mineral Reserve estimate for Norrberget is 162,000 tonnes at a grade of 2.80 g/t Au, for a total of 15 koz Au.

Table 15-1: Summary of Mineral Reserves at the Björkdal Mine and Norrberget Deposit as of 31 December 2021

Category	Tonnage (kt)	Au Grade (g/t)	Contained Au (koz)
Proven			
Underground	1,127	2.05	74
Probable			
Underground	5,350	1.76	302
Open Pit	2,949	1.07	101
Norrberget Open Pit	162	2.8	15
Stockpile	2,532	0.61	50
Total Proven + Probable	**12,121**	**1.39**	**542**

Notes:

1. Björkdal Mineral Reserves are estimated using drill hole and sample data as of 30 September 2021 and depleted for production through 31 December 2021.
2. Norrberget Mineral Reserves are based on a data cut-off date of 30 September 2017.
3. CIM definitions (2014) were followed for Mineral Reserves.
4. Open Pit Mineral Reserves are based on mine designs carried out on an updated resource model, applying a block dilution of 100% at 0.0 g/t Au for blocks above 1.0 g/t and 100% at in-situ grade for blocks below 1.0 g/t, but above a cut-off grade of 0.37 g/t Au. The application of these block dilution factors is based on historical reconciliation data. A marginal cut-off grade of 0.37 g/t Au was applied to estimate open pit Mineral Reserves.
5. Underground Mineral Reserves are based on mine designs carried out on an updated resource model. Minimum mining widths of 3.7 m for stopes (after dilution) and 4.75 m for development (after dilution) were used. Stope dilution was applied by adding 0.6 m on each side of stopes as well as an additional 10% over break dilution. Further dilution, ranging from 5% to 50%, was added on a stope-by-stope basis depending on their proximity to other stopes. An overall dilution factor of 25% was added to development designs. Mining extraction was assessed at 95% for contained ounces within stopes and 100% for development. A cut-off grade of 0.88 g/t Au was applied to material mined within stopes. An incremental cut-off grade of 0.37 g/t Au was used for development material.
6. Stockpile Mineral Reserves are estimated at a cut-off grade of 0.37 g/t Au and are based upon surveyed volumes supplemented by production data.
7. Mineral Reserves are estimated using an average long-term Au price of US$1,500/oz, for Björkdal, US$1,300/oz for Norrberget, and an exchange rate of 9.0 SEK/US$.
8. Tonnes and contained Au are rounded to the nearest thousand.
9. Totals may not sum due to rounding.
10. The Mineral Reserve Estimate as of 31 December 2021 for Björkdal 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 Independent Qualified Person for the Norrberget Mineral Reserve estimate is Rick Taylor, MAusIMM (CP), Principal Mining Engineer with SLR, who is a Qualified Person as defined by NI 43-101.

15.2 Björkdal

15.2.1 Open Pit Optimisation

Potential pits were evaluated using the Deswik software package, which employs the Pseudoflow pit optimisation algorithm. The parameters used to derive the selected pit optimisation are presented in Table 15-2. The pit optimisation was completed in 2021. As the open pit mining was stopped in 2019 and deferred to 2025, the economic parameters will need to be updated again at a later stage.

Overall pit slopes of 45° and 50° were determined using actual pit slope angles achieved in the main pit. The overall pit slopes for Nylunds were approximately 42° after accounting for ramps which had a larger impact on overall slope angles since the Nylund pits are much smaller than the main pit. Operating costs and mill recovery are based on actual operating data from 2020 and 2021.

A Selective Mining Unit (SMU) of 5 m x 2.5 m x 2.5 m was used in the block model but was re-blocked in Deswik to 10 m x 10 m x 10 m to improve processing time.

Table 15-2: Optimisation Parameters

Parameter	Unit	Input
Pit Slopes (Main Pit)	degrees	45 to 50
Pit Slopes (Nylunds)	degrees	42
Pit Slopes (Overburden)	degrees	18
Mining Cost (Rock)	SEK/t	24.00
	US$/t	2.67
Process and General & Administration Cost	SEK/t	146.60
	US$/t	16.29
Process Recovery	%	88.6
Mining Extraction	%	100
Mining Dilution	%	100
Base Gold Price	US$/oz Au	1,500
Exchange Rate	SEK/$US	9.0
Block Size	m	5x2.5x2.5
Block Size (re-blocked)	m	10x10x10

Several pit shells were run with results confirming the majority of ore tonnage captured by the pit optimisation is located in the crown pillar along the north wall of the pit. This pillar contains the two main portal accesses to the underground operation and associated infrastructure and mine services.

15.2.2 Dilution and Extraction

15.2.2.1 Open Pit

Historically, the mining parameters and loading equipment allowed for reasonably good selectivity, however, dilution levels are much higher than typical open pit parameters given the thin veined nature of the Björkdal deposit.

The open pit contains “A-ore”, which is ore with a grade greater than 1.0 g/t Au, while “B-ore” has a grade of 0.37 g/t Au to 1.0 g/t Au. Historically, the bulk of the lower grade ore was stockpiled, which resulted in a large stockpile inventory, which has been processed when there is spare capacity.

A comparison was made between more than one year (2018 to 2019) of reconciled open-pit A-ore production and the modelled tonnes and grade on a blast-by-blast basis. While the contained ounces of the A-ore reconciled well with the model, the tonnage was significantly understated. This was due to material previously reported using a block cut-off grade rather than a mining shape. The compiled data supports the use of a block dilution of 100% at zero grade for blocks above 1.0 g/t Au.

Based on the historical reconciliation data, a tonnage dilution factor of 100% at the estimated grade was applied to all blocks between 0.37 g/t Au and 1.0 g/t Au. As a result, a significant amount of low grade dilution, as well as additional tonnes of low grade material that was not in the mineral reserve estimate, was actually mined.

15.2.2.2 Underground

A detailed underground reconciliation exercise was completed in 2021 which compared mine design against actual stope production, with estimates for overbreak and underbreak. The stope reconciliation indicated an average overbreak of 33% and an average underbreak of 12% compared to the designs. These values are in line with the factors used in the mine design.

For the long-term design, dilution was applied in the Deswik software package and was assigned to the stope shapes as 0.6 m on the footwall and 0.6 m on the hanging wall. The minimum mining width is 2.5 m, which results in a final minimum width of 3.7 m after dilution is applied. Additionally, general dilution of 10% was added to each stope. Further dilution, ranging from 5% to 50%, was added on a stope-by-stope basis depending on a stope’s proximity to other stopes.

A mining recovery rate of 95% was applied to stope ore tonnes. No mine recovery loss was applied to development ore.

15.2.3 Cut-off Grade

15.2.3.1 Open Pit

Based on the reconciliation exercise between the 2018 block model and the 2018 mill data explained in Section 14, an additional block dilution factor of 100% was applied in Deswik during optimisation, which accounts for both planned and unplanned dilution. The inclusion of dilution in the optimisation process increases the effective cut-off grade and results in a smaller pit shell since ore blocks will have to carry a higher grade to offset the additional dilution material that would be processed.

In the 31 December 2021 Mineral Reserve estimate, a final pit design was carried out based on the selected optimised shell, revenue factor (RF) = 0.94.

Mining solids were created from the final pit designs and the resource block model was used to report tonnes and grade for all blocks above the in-situ 0.37 g/t Au cut-off grade. The in-situ cut-off grade is calculated as a pit discard cut-off using processing, and part of the overhead costs (G&A, Maintenance, TCRC), for the operating costs. It is assumed that once the material is mined, it will either be sent to the mill or the LOM stockpile for processing at the end of the operation. The blocks above the cut-off grade were then reported as Mineral Reserves and form the basis of the LOM plan.

15.2.3.2 Underground

The cut-off grade for underground mining was calculated based on several criteria. Consideration was given to the type of mining activity on which the cut-off parameter would be applied. The cut-off grades apply to the run-of-mine (ROM) head grade and are not in-situ grades as they include dilution and losses. For stopes, a cut-off grade of 0.88 g/t Au was derived, while for development, a lower cut-off grade of 0.37 g/t Au was calculated.

The stoping cut-off grade is based on the direct stoping cost average from 2020 and 2021, and excludes all development, making it a marginal cut-off grade. Based on the inclusion of the full cost of mining in 2021, a full cost cut-off grade is approximately 1.22 g/t Au.

Underground optimisation was carried out in three stages:

- Individual stope optimisation.
- Stope and access development combined.
- Optimisation on an area basis.

All development cost has thus been accounted for in the various cut-off grade calculations.

The 0.37 g/t Au cut-off grade is the grade at which processing the development material becomes economically viable. As this material will be mined anyway to access the stopes, the only costs to consider when determining whether it should be processed or discarded are the processing costs.

The 0.37 g/t Au cut-off grade for development material is consistent with the pit discard calculation for open pit mining. The cut-off grade calculation is shown in Table 15-3.

Table 15-3: Björkdal Underground Cut-off Grade Calculation

Parameter	Unit	Value
Metal Price	US$/oz	1,500
Exchange Rate	SEK/US$	9.0
Process Recovery	%	88.6
Net Payable	%	98.35
Stoping Cost	US$/t	16.77
Process Cost	US$/t	9.13
G&A Cost	US$/t	6.03
Maintenance Cost	US$/t	3.83
Transport and Refining Cost	US$/t	1.04
Cut-Off Grade Cost	US$/t	36.81
Cut-Off Grade	g/t Au	0.88
Incremental Cut-Off Grade	g/t Au	0.37

Costs were based on Björkdal's actual stoping and associated costs for 2020 and 2021.

Metal prices used for Mineral Reserves are based on consensus, long-term forecasts from banks, financial institutions, and other sources. The metal prices used for Mineral Resources are slightly higher than those for Mineral Reserves.

15.3 Norrberget

15.3.1 Open Pit Optimisation

The following description for Norrberget was taken from the 2018 Technical Report (Roscoe Postle Associates Inc., 2018). No changes have been made to the Mineral Reserve estimate since the underlying assumptions have not materially changed (Table 15-4) with the exception of the exchange rate.

Table 15-4: Norrberget Mineral Reserve Open Pit Optimisation Parameters
Mandalay Resources Corporation – Björkdal Gold Mine

Parameter	Unit	Input
Pit Slopes (South West Wall)	degrees	36
Pit Slopes (Northwest and Northeast Walls)	degrees	52
Pit Slopes (Overburden)	degrees	25
Mining Cost (Overburden)	US$/t	1.55
Mining Cost (Solid Waste)	US$/t	2.50
Mining Cost (Ore)	US$/t	2.97
Process Cost	US$/t	7.63
General and Administrative Cost	US$/t	6.65
Process Recovery	%	75
Mining Extraction	%	100
Mining Dilution	%	15
Base Gold Price	US$/oz Au	1,200
Block Size	m	6x4x4

Pit slopes were determined based on a geotechnical assessment carried out by SRK Consulting (SRK) in October 2017 (Di Giovinazzo, 2017). The northwest and northeast wall sectors have slope angles of 52° while the southwest (footwall) sector has a slope angle of 36°.

A dilution factor of 15% and extraction factor of 100% was added based on reconciled production data from mining shallow dipping structures at Björkdal.

The pit optimisation was carried out at the parent block size of 6 m x 4 m x 4 m.

Mining costs were based on actual 2017 mining costs at Björkdal, the higher cost of mining ore (increase of approximately 19%) is due to the longer trucking distance to the Björkdal Mill. An overall gold recovery of 75% was used at the time.

15.3.2 Dilution and Extraction

As no production has taken place at Norrberget, a reconciled dilution and extraction factor cannot be obtained. A dilution factor of 15% and extraction factor of 100% has previously been drawn out of reconciled production data from mining shallow dipping structures at the Björkdal open pit, and therefore it is reasonable to assume that the similar conditions at Norrberget will yield similar results.

15.3.3 Cut-off Grade

After the pit optimisation was completed, a final pit design was carried out based on the selected optimised shell. Mining solids were created from the final pit design shells and the resource block model was used to report tonnes and grade for all blocks above the in-situ 0.4 g/t Au cut-off grade for Björkdal. The in-situ cut-off grade is calculated as a pit discard cut-off using only the processing and G&A costs as operating costs, since it is assumed that once the material is mined, it will either be sent to the mill or the waste dump. The blocks above the cut-off grade were then reported as Mineral Reserves and form the basis of the LOM plan.

SLR recommends that the Norrberget pit be re-optimised based upon any additional drilling information prior to the planned commencement of mining operations in 2029. Additionally, hauling marginal ore from Norrberget to the Björkdal Mill will be expensive and it is recommended that the Norrberget marginal cut-off grade be re-evaluated.

16 MINING METHODS

The current environmental permit limits the total Björkdal production capacity to 1.70 Mtpa. In 2021, 1.26 Mt of ore was processed and 1.30 Mtpa has been planned for 2022. Prior to 2021, production was split between the underground mine and the open pit. In 2019, mining of the open pit was stopped for economic reasons and this production was replaced with ore from the low grade stockpile and an increase in underground production. The remaining open pit material remains economically viable, however, the low grade stockpile realises more value, so open pit mining has been deferred for several years until the stockpile is diminished and open pit production is needed to offset reducing underground production.

During 2021, 1,085,000 tonnes of ore were mined from underground, all of which was processed. An additional 175,000 tonnes of mill feed came from stockpiles for a total mill throughput of 1,260,000 tonnes. The open pit did not produce any ore during 2021.

The current production strategy is to maximise the underground extraction and delivery to the processing plant with any additional feed requirements sourced from stockpiles. Underground production for 2022 is planned to be 1,162,000 tonnes which is derived from the updated Mineral Reserves. The current 2022 Mining Budget includes additional material and was derived from the previous Resource Model. No production from the open pit is planned in 2022. Instead, 138,000 tonnes of ore will be drawn from the stockpile to make up the balance of the mill feed.

As presently envisaged in the LOM plan, open pit pre-stripping and production will be restarted in 2025 to supplement the decrease in production from the underground mine.

16.1 Björkdal

16.1.1 Mine Design

16.1.1.1 Open Pit

During 2021, potential for expanding the current open pit at Björkdal was re-evaluated using the Deswik software. The parameters used to derive the selected pit optimisation have been presented in Table 15-2. Several pit optimisations were run and the results demonstrate that the majority of ore tonnage is located in the crown pillar along the north/east wall of the pit. A final pit design was constructed based on the selected optimised shell.

Mining solids were created from the final pit designs and the resource block model was used to report tonnes and grade for all blocks above the in-situ 0.37 g/t Au cut-off grade. The in-situ cut-off grade is calculated as a pit discard cut-off using processing, and part of the overhead costs (G&A, Maintenance, Refining charges), for the operating costs. It is assumed that once the material is mined, it will either be sent to the mill or LOM stockpile for processing at the end of the operation. The blocks above the cut-off grade were then reported as Mineral Reserves and form the basis of the LOM plan.

A pit design was generated from the selected optimisation shell produced from the use of Deswik mine planning software. The final pit outline, along with the mid-2021 final topography, when open pit mining was halted, is presented in Figure 16-1.

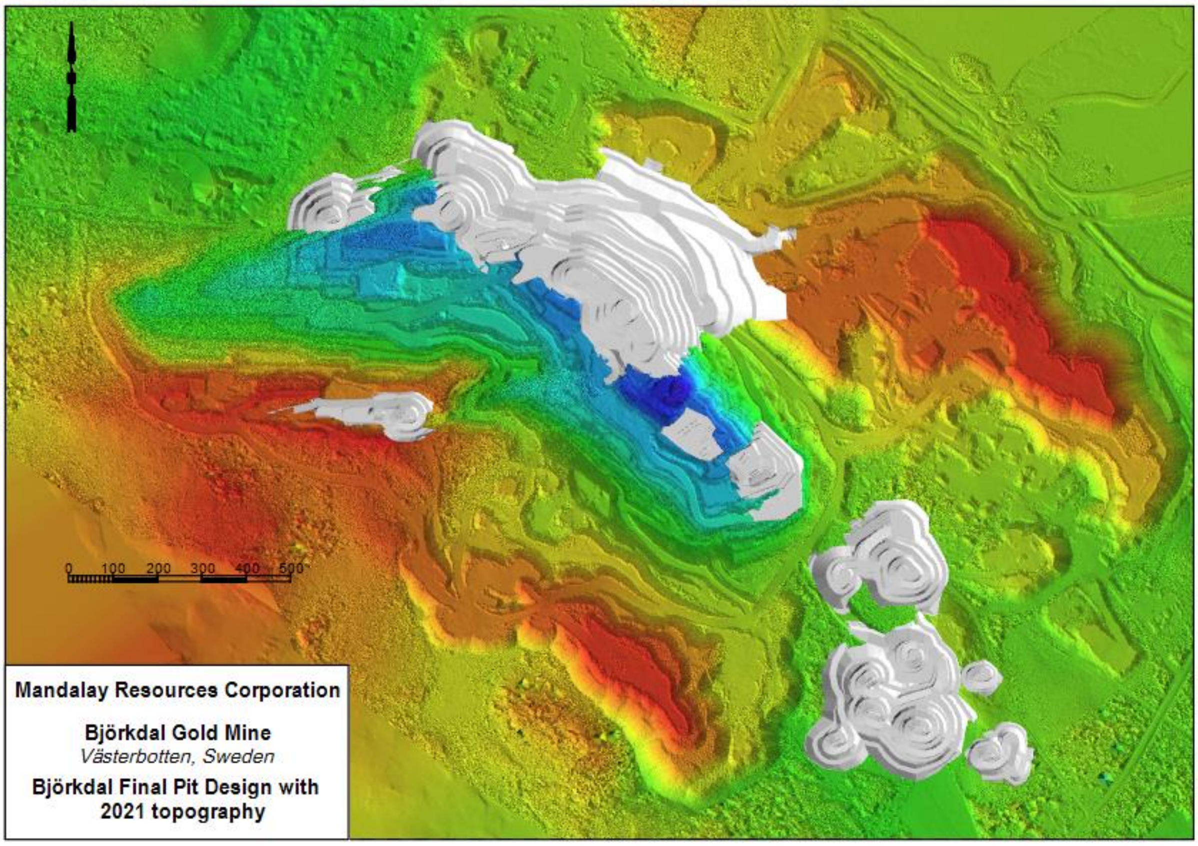


Figure 16-1: Björkdal Final Pit Design with Topography

The final pit bottom in the crown pillar area is at the -215 level. Single ramps, with widths of 15 m, are used in the first series of benches to access ore at the bottom of the crown pillar area. These single ramps converge into a double ramp at the -140 level pit and finish at the northeast side of the pit rim. The pit is designed slightly wider than the optimised shell in order to achieve a reasonable mining width to operate the equipment. While there is currently no fleet in operation it was considered that the 30 to 40 m minimum mining width was appropriate for the size of mining fleet envisaged.

Benches will be 5 m high, and are taken in groups of two to four with an 8 to 10 m wide berm every 10 to 20 m. A 72° to 85° bench face angle has been used to deliver an overall pit slope angle of 42° to 52°.

The pit design parameters used are shown in Table 16-1.

Table 16-1: Björkdal Pit Design Parameters

Parameter	Unit	Input
Overall Slope Angle	degrees	42-52
Bench Face Angle	degrees	72-85
Berm Width	m	8-10
Bench Height	m	5
Benches per Berm	#	2-4
Double Ramp Width	m	24
Single Ramp Width	m	15
Ramp Slope	%	10

16.1.1.2 Underground

Measured and Indicated Mineral Resource blocks greater than 0.78 g/t Au were used as the basis for initial stope designs generated by Auto Stope Designer, an automated layout function within Deswik software. Stope design parameters have been presented in Table 16-2.

Table 16-2: Björkdal Underground Stope Design Parameters

Parameter	Unit	Input
On-Vein Development Size	m	3.8 m wide x 5.0 m high
Maximum Stope Height	m	25
Undiluted Minimum Mining Width	m	2.5
Allowance for Overbreak	m	0.6 x 2
Diluted Minimum Mining Width	m	3.7
Maximum Mining Width	m	12
Minimum Inter-Vein Pillar Width	m	5
Stope Mining Extraction	%	95
On-Vein Mining Extraction	%	100
Block Size	m	5 x 2.5 x 5
Design Cut-off Grade based on US$1,500/oz Au	g/t Au	0.88

The resulting stopes were evaluated manually and adjustments made where necessary. Stopes were evaluated based on size, grade, and relative distance to existing development. Stopes that were not economically viable were removed from the reserves. Most stopes that were within five metres of each other were combined into larger stopes and dilution was applied based on the additional internal waste captured in the new stope. The five metre pillar requirement is based on actual mining conditions experienced at Björkdal. The current long-term stope designs do not incorporate localised geotechnical and geological considerations including detailed knowledge of hangingwall and footwall contacts, fault zones, and structural features such as folding.

16.1.2 Mining Method

16.1.2.1 Open Pit

The open pit has currently been halted and is planned to be restarted in 2025, however this could be delayed further in the event of additional underground reserves being identified. The planned method is standard truck and shovel mining, as done historically. Details will be redefined closer to the restart date.

16.1.2.2 Underground

The known Björkdal underground deposit lies within a footprint of approximately 1,600 m x 600 m and has a vertical extent of approximately 480 m. Descriptions of the geology and styles of mineralisation have been provided in Sections 7 and 14.

The long-term LOM underground production rate is planned to average 1,135,000 tpa up until 2024, and 648,000 tpa thereafter until production tails off in 2029. On vein development (OVD) will be carried out over approximately four years and stope production will be carried out over approximately eight years. A decrease in production is planned after 2025, when the underground output reduces. The balance of tonnage required for the processing plant will comprise open pit and stockpile material.

Primary access to the underground operation is via ramp systems originating from two portals located in the wall of the existing open pit. Open pit mining and removal of the crown pillar in the north/east wall will disrupt this access as well as the supply of other services such as emergency egress, electrical, ventilation, and mine drainage systems. Open pit ore mining will therefore commence at Nylunds initially until underground operations cease, with limited pre-stripping only above the underground access and infrastructure in the crown pillar area.

Studies are continuing to investigate the economic viability of constructing an additional portal access prior to open pit mining when the existing portals become inaccessible. A replacement portal access will maintain continuity in the supply of all necessary services to the underground mine. An alternative portal would allow mining of the crown pillar to commence at an earlier date, although the current strategy is to extend the underground mine life as far as possible in preference to bringing lower grade open pit ore tonnes further forward in the LOM plan.

The underground mining method used at Björkdal is longhole stoping with a sub-level spacing of 15 m to 20 m, depending on the zone. Cross-cuts are established perpendicular to the vein system. Veins are then developed by drifting on each sub-level from the cross-cut. All pre-production vein, cross-cut, and ramp development is drilled and blasted using conventional trackless mining equipment.

The underground mine design has been presented in Figure 16-2.

Stoping blocks are drilled with approximately 15 m long and 70 or 76 mm diameter up-holes connecting to the bottom of the overlying stope using Epiroc Simba drill rigs. When production drilling has been completed, initial slot raises are developed and drill lines blasted in groups of three to five rings using a burden of 1.5 m and retreating towards the hangingwall. The material is removed between blasts, which allows a void for each successive blast. Remotely operated scoops are used to muck the stopes to nearby rehandle areas or directly into trucks.

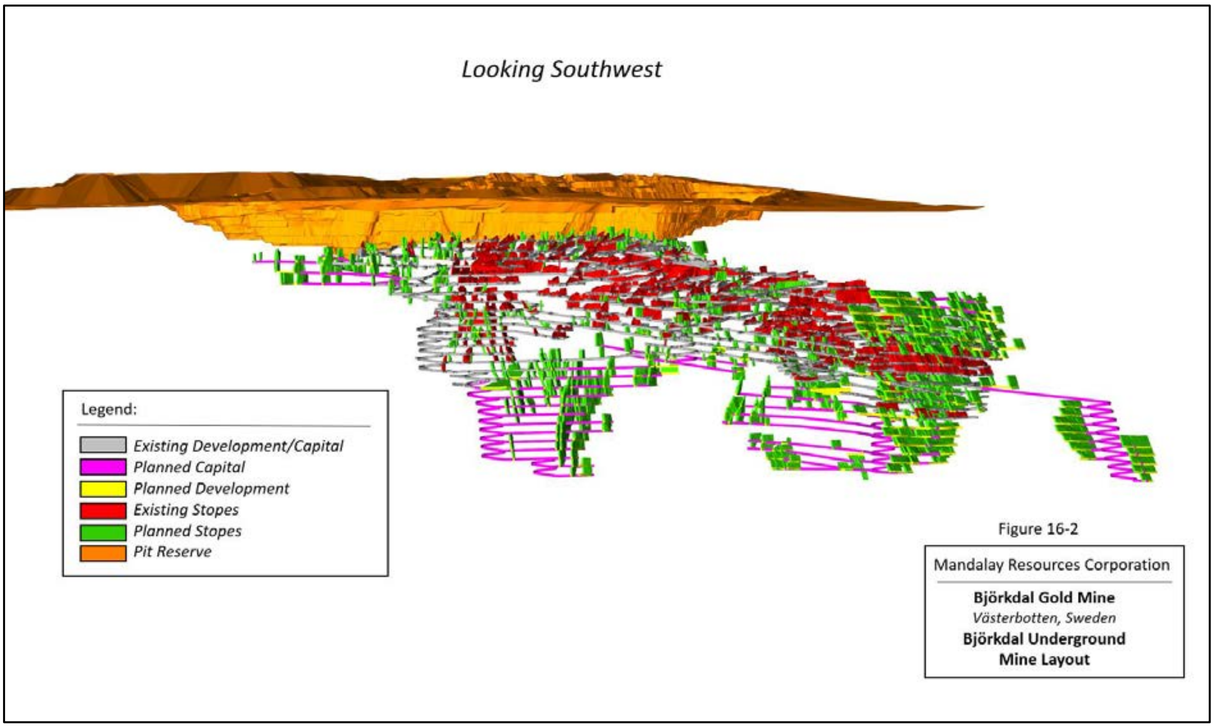


Figure 16-2: Björkdal Underground Mine Layout

The majority of waste mined underground from capital development is placed directly into voids as unconsolidated backfill. If insufficient voids are available underground, waste is occasionally hauled to surface for temporary storage and backhauled underground at a later date for placement as fill. Generally, more waste is required for fill placement than is produced from development underground and therefore, suitable additional material is sourced from surface and transported underground by trucks returning from hauling ore to surface.

All underground material is loaded by Volvo L180 front end loaders (FELs) or Sandvik 514 load-haul- dumpers (LHDs) and hauled to surface by a contractor using 26 t Scania R520 XT highway tipper trucks. The objective of the current materials handling strategy is as follows:

- Development material from cross-cuts and ramps above a grade of 0.37 g/t Au is hauled to a B-ore stockpile at the mill.
- OVD material is hauled to the OVD production ROM stockpile where it is classified as waste or ore and sent to the appropriate location.
- All stope production, regardless of grade, is hauled to the stope production stockpile.

In consideration of the variable vein geometry and existing equipment configuration, 3.7 m has been measured as the average minimum mining width. This includes a base 2.5 m minimum width plus an allowance for 0.6 m for overbreak on both the hangingwall and footwall sides of the stope. An additional 10% dilution is added for planning purposes.

Most of the mined out stopes are left open without any backfill, however the relatively new Aurora Zone will have stopes that will be wider, longer, and higher than in other areas. In these areas, the stopes are planned to be mined and backfilled with unconsolidated fill. This will allow pillars to be reduced and will increase the extraction ratio.

A prefeasibility study to determine the mining method of this area was completed by Itasca Consultants AB (Itasca) in 2019, which recommended a mining method, stope and pillar dimensions, as well as future support. Rill (or Avoca) mining with unconsolidated fill was determined to be the most cost effective option. Mining Plus considers that as mining is already taking place in the Aurora Zone these results are appropriate.

The current top-down footwall to hanging wall retreat system results in the placement of ramp development outside the marble contact, while cross-cut pillars are within the ore zone.

A portion of remnant material above cut-off grade immediately adjacent to previously mined out stopes has been excluded from the underground Mineral Reserves. It is recommended that extraction of these remnants warrants further evaluation. Some recovery of ore contained in pillar areas has been planned at the end of mine life, however, this material has not been included in the Mineral Reserve estimate.

Stope grades are evaluated using an internal grade control model and the sludge grades from OVD are used to cross reference the grade control model. Stope tonnages are estimated from the stope design volume and are tracked by equipment bucket and truck count. A CMS survey instrument is used to confirm actual mined stope volumes.

The nature of the mining method is such that OVD comprises not more than 30% of the total underground tonnage production. In OVD development, the current ore cut-off grade is

0.37 g/t Au which is consistent with the open pit cut-off grade. All OVD is mined, hauled to a surface ROM stockpile. When assay sample data is available and exceeds a grade of 0.37 g/t Au, the material can be sent to the process plant. While efforts are made to identify discrete areas of waste development, a portion of cross-cut and ramp material is combined and hauled to a low-grade surface stockpile and processed as B-ore.

16.1.2.3 Low Grade Stockpiles

Selective open pit mining at Björkdal commenced in 2009 with ore greater than 1.0 g/t Au being separated and milled as A-ore and material between 0.3 g/t Au and 1.0 g/t Au being stockpiled as B-ore.

Batch milling experience from these stockpiles has indicated that mill feed averages 0.61 g/t Au. Approximately 2.5 Mt of B-ore has been classified as Indicated Mineral Resource at a grade of approximately 0.61 g/t Au.

Stockpiled ore will be fed continuously throughout the LOM to make up shortfalls in mill feed from the underground operations, and later, the open pit mines.

Rehandling will be carried out with a small equipment fleet. Using an estimated rehandling cost for stockpiled material results in a cut-off grade between 0.3 g/t Au and 0.4 g/t Au.

16.1.3 Geotechnical and Stope Stability

16.1.3.1 Open Pit

A structural and kinematic inter-ramp slope stability analysis for the Björkdal open pit was completed by SRK in October 2012 (Saiang, 2012). At the time the proposed inter-ramp slope angle of 70° and an inter-ramp height of 40 m were validated and showed a minimum factor of safety of 1.48. Water or pore pressure was not accounted for and required monitoring to determine if it may be a concern.

Structural analysis showed that the dominant joint sets have similar orientations to the gold bearing quartz veins and dip steeply either parallel or sub-parallel to quartz veins. As a result, the hangingwall side is less prone to any major instability because the intersections of joints do not daylight at the slope face. This behaviour is clearly evident at Björkdal where the hangingwall side of the pit remains very stable even though slope angles are near vertical. On the footwall side, however, potential instabilities have been observed. Structural and kinematic analyses show that there is no major risk from instability of the footwall slopes or pit walls.

The rock mass at Björkdal is of very high quality. Testwork carried out at Björkdal has shown that Geological Strength Index (GSI) was estimated to be between 70 and 80, and intact strength exceeded 200 MPa. This data is supported by the fact that approximately 50% of the entire underground development excavations are unsupported, neither with shotcrete nor rock bolts. Visual inspection of open pit slopes confirms stable slopes in near-vertical to vertical benches with narrow stable berms.

In 2016, SRK carried out an additional slope design review (Di Giovinazzo, 2016). The outcome of the review highlighted the opportunity for the potential of 25 m high benches (5 m benches in sets of five) with the potential to maintain the Bench Face Angles (BFA) at 75°, and reduce the berm width to eight to ten metres. The 2017 open pit design incorporated these changes. The review also highlighted the differing geotechnical character of various geographical and geological sectors within the mine. These geotechnical sectors have been used to assign varying BFAs (from 70° to 85°), bench heights (from 10 m to 20 m), and localised face azimuths to avoid planar failure in specific areas.

16.1.3.2 Underground

Rock mechanic consultants have made several visits to the Björkdal underground mine since the start of operations in 2009. In general the rock quality and ground conditions have been assessed as extremely good. The most recent work was carried out by Itasca in August 2019. Approximately 50% of the underground development requires ground support and simple standard procedures have been established.

Mechanical scaling of all development is carried out immediately following blasting. Shotcrete and resin rebar are used in the pre-production OVD on an as-required basis and shotcrete followed by systematic resin bolting is used for permanent development such as ramps and cross-cuts. Longer bolts are installed in wider intersections with unfavourable structure orientations. Permanent development is also re-scaled every 12 months.

In some areas of the mine, the spacing between the parallel vein systems is small and the resulting pillar between the mined stopes has collapsed. Itasca has made a general recommendation that a minimum 10.0 m pillar is required around permanent development.

Ground control mining equipment at Björkdal includes an Atlas Copco Scaletec, three Jama 8000 scalers, a Sandvik DS411 bolting machine, an Epiroc Boltec bolting machine, a Normet 7110 and a Normet 8100 Shotcrete units supported by the delivery of concrete directly to the face by a local supplier.

Development is ongoing in the Aurora Zone, which comprises several thin and closely spaced veins (a so-called “stringer zone”). These areas, which are larger and more extensive than elsewhere, were the focus of the 2019 Itasca report, which analysed potential stopes, pillars, and the related stress regimes in some detail, with the following conclusions:

- Unconsolidated backfill is required to limit the stope back length to 60 m.

- Sill pillars between 15 m and 10 m are required.
- Some stope backs should be supported with shotcrete.
- Permanent accesses should be 25 m in the hangingwall and will need protection pillars of 10 m where they pass through the ore body.
- Cable bolts are recommended but can be reconsidered depending on the acceptable level of risk.

As part of an ongoing collaboration with Itasca, new mining areas are continuously evaluated during the design phase. FLAC models are utilised to ensure geomechanical stability of specific areas, such as Skarn, which are also inspected on a weekly basis.

16.1.4 Infrastructure

The underground mine workings are accessed by two ramps located in the wall of the existing open pit. The ramps cut through the ore body and connect to cross-cuts that run perpendicular to the vein structure. All material mined underground is hauled to the surface via these two ramps by a contractor using rigid trucks.

A layout of the 2022 underground infrastructure has been presented in Figure 16-3.

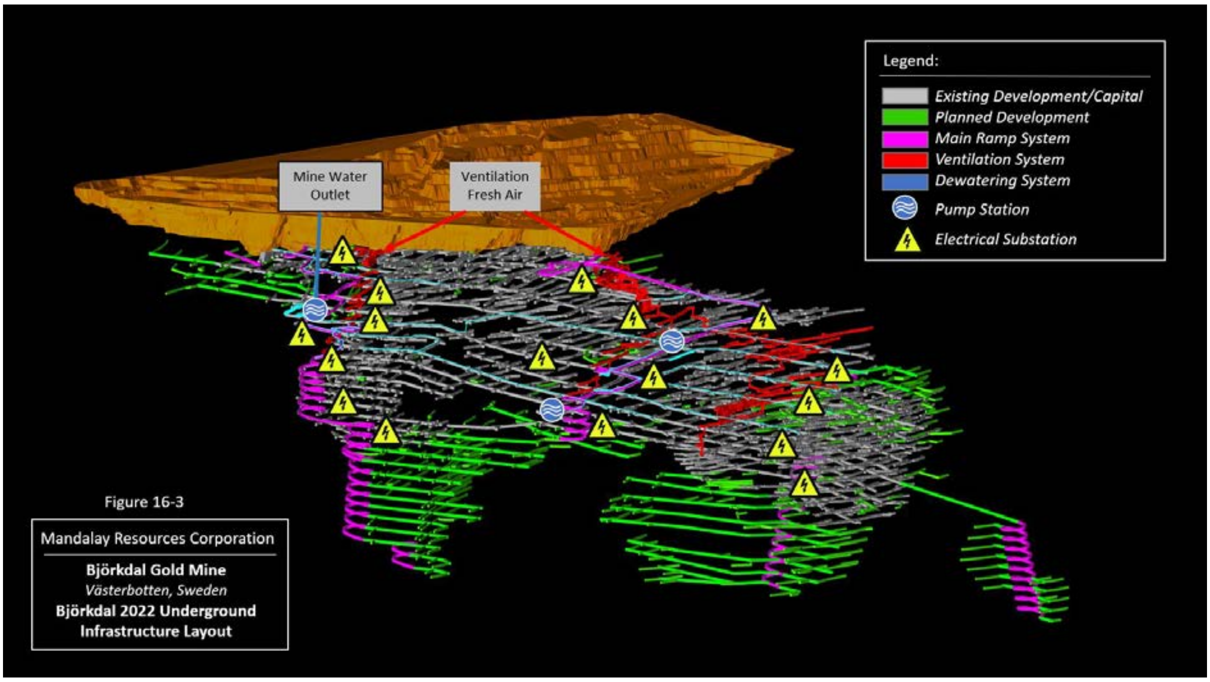


Figure 16-3: Björkdal Underground Infrastructure Layout

16.1.4.1 Dewatering

Heavy storm events can result in a substantial influx of water into the underground mine via high permeability fault systems that connect with the open pit. The site operations have been upgrading the pumping system.

The 340/Ramp 2 pump station will handle all water from production and groundwater inflows in the Lake Zone and Central Zone. Water pumped from the working faces with submersible pumps is lifted to the 340/Ramp 2 pump station. The 340/Ramp 2 pump station pumps the water using two large submersible pumps (2 x 90 kW) in one horizontal 800 m section in two 150 mm diameter pipes to the Main Zone pump station. The water flow from this area varies between 10 m^3/h and 70 m^3/h, depending on the level of production activities and the season.

The Main Zone pump station, located on the 265 level, delivers all underground pump water to the surface using three centrifugal pumps (3 x 75 kW) with a total capacity of 180 m^3/hr. Water is transported in one vertical lift of 200 m to surface in a 250 mm diameter steel pipe. The mine water then flows in a ditch to a clear water basin where the water is treated to remove suspended solids and nitrates.

The pump water that comes to the Main Zone pump station is mainly from the Lake Zone 340 ramp pump station, but also from the working faces in the deeper levels of the Main Zone, which is pumped with submersible pumps similar to Lake Zone.

Total annual pumped water from underground to surface is approximately 750,000 m^3.

16.1.4.2 Ventilation

The underground ventilation system is simple and effective. Fresh air is introduced into the mine via two primary intake air shafts located adjacent to the open pit and is distributed to the working areas by means of 23 secondary fans installed throughout the mine. Fresh air is drawn through old stopes to avoid the need for heating during the winter months. The return air is exhausted via two main ramp systems into the open pit.

16.1.4.3 Electrical

The Björkdal mine has combined 400 V/1,000 V electrical sub-stations as well as single 400 V and 1,000 V sub- stations. Separate cables for both 1,000 V and 400 V are used.

All underground mining equipment requires electrical power to operate on 1,000 V while pumps and fans operate on 400 V. Electrical sub-stations are placed in strategic locations, close to fresh air ventilation shafts and near production faces.

Underground communication uses a digital leaky feeder system that covers the entire mine. Communication between personnel is conducted using Motorola two-way radios.

16.1.5 Mine Equipment

16.1.5.1 Open Pit

The open pit is not currently being mined. Some surface equipment is however being used to rehandle the low grade stockpile into the primary crusher.

16.1.5.2 Underground

With the exception of materials handling, haulage to the surface, and road maintenance, the remaining underground mining activities are completed by Björkdal personnel. The underground mining equipment used at Björkdal has been presented in Table 16-3.

Table 16-3: Björkdal Underground Mining Equipment

Make	Model	Machine Type	Purpose	Owner	Units
Epiroc	Boomer E2C	Face Drilling	Production	Björkdal	1
Epiroc	Boomer M2C	Face Drilling	Production	Björkdal	2
Epiroc	Simba	Longhole Drilling	Production	Björkdal	4
Atlas Copco	Scaletec MC	Scaler	Production	Björkdal	1
Gia	UV211	Charging Unit	Production	Björkdal	1
JAMA	8000	Scaler	Production	Björkdal	3
Normet	Charmec	Charging Unit	Production	Björkdal	1
Normet	7110	Shotcreting	Production	Björkdal	1
Normet	8100	Shotcreting	Production	Björkdal	1
Sandvik	DS411	Bolter	Production	Björkdal	1
Epiroc	Boltec	Bolter	Production	Björkdal	1
Sandvik	LH410	RC Loader	Production	Björkdal	1
Sandvik	LH514	RC Loader	Production	Björkdal	2
Scania	R520 XT	Haul Truck	Production	Renfors	7
Volvo	FMX	Concrete Mixer	Production	Björkdal	2
Volvo	L150	Wheel Loader	Production	EPC	1
Volvo	L120H	Wheel Loader	Production	Björkdal	1
Volvo	A25D	Water Dumper	Production	Björkdal	1
Volvo	A25G	Water Dumper	Production	Björkdal	1
Volvo	L180H	Wheel Loader	Production	Björkdal	3
Komatsu	WA80	Wheel Loader	General	Björkdal	1

Make	Model	Machine Type	Purpose	Owner	Units
Volvo	L110H	Wheel Loader	General	Björkdal	1
Volvo	L90H	Wheel Loader	General	Renfors	2
Volvo	L90F	Wheel Loader	General	Björkdal	2
Volvo	L90H	Wheel Loader	General	Björkdal	2

16.2 Norrberget

Norrberget is planned to supply approximately 162,000 tonnes of ore over 2029 and 2030. Given the volume is a relatively small proportion of the total and will be mined at a later stage than the rest of the operation, the details of the mine plan are summarised here.

16.2.1 Mine Design

A pit design for Norrberget was created based on the Whittle output shell using Deswik mine planning software. The pit design parameters used are shown in Table 16-4 and based on operating practices at the Björkdal open pit.

Table 16-4: Norrberget Pit Design Parameters

Parameter	Unit	Input
Overall Slope Angle	degrees	36-52
Bench Face Angle	degrees	70-75
Berm Width	m	5
Bench Height	m	5-10
Benches per Berm	#	1
Single Ramp Width	m	15
Ramp Slope	%	10

16.2.2 Mining Method

At Norrberget, open pit mining will be carried out by a contractor, using trucks and excavators. This production will be part of an integrated mining contract for both Björkdal and Norrberget.

The mining schedule at Norrberget is integrated into the Björkdal open pit schedule to minimise potential production shortfalls and to provide added flexibility to the deliverable mill feed.

Waste mined during the life of the open pit will be placed on the north side of the open pit and will contribute to sound attenuation from the operation of the pit.

16.2.3 Geotechnical and Slope Stability

In July 2017, SRK was engaged to carry out a geotechnical assessment of the Norrberget deposit. The assessment included the following:

- analysis of drill core from existing logs and photographs
- intact rock strength
- jointing and structure
- kinematic analysis
- SBlock analysis
- recommendations for slope designs to be used in for pit optimisation and pit design.

The review recommended that the pit design be split into two distinct sectors: the southwest (footwall to the ore) and the northeastern sector (hanging wall). The southwest sector has been designed with an overall slope angle of 36° and a BFA of 70°. The northeastern sector has been designed with an overall slope angle of 52° and a BFA of 75°. The shallower design of the southwest sector does not significantly raise the strip ratio of the Norrberget mine as the recommended overall slope angle closely mirrors the dip of the ore body.

16.2.4 Hydrological Studies

In 2016, Golder Associates AB (Golder) was commissioned to carry out a hydrological study of the Norrberget area. Water handling at Norrberget will be integrated into the water management plan for Björkdal. Water quality of discharge from the mine and existing surface waterways will be monitored by Björkdal staff to comply with local regulations and the operating conditions of the environmental permit.

Golder concluded that the groundwater level at Norrberget is 115 MASL and the existing topography at the site averages 120 MASL. At an expected pit depth of 57 MASL (60 m below surface) the expected groundwater infiltration rate is 800 m^3 per day and the expected contribution of surface run-off and rainfall is 450 m^3 per day. This leads the analysis to conclude that pumping requirements at Norrberget should not exceed 1,250 m^3 per day. The estimated area of influence on the local groundwater system has been assessed to have a radius of approximately 450 m to 500 m from the centre of the pit.

Pumping is planned to use portable pumps to dewater the workings, as required, and waste water will be discharged to the sedimentation dam northwest of the Norrberget pit.

The proposed open pit design is located at the confluence of two minor streams. Stream diversion trenches will be dug north and south of the planned pit to steer water from these two streams around the open pit and reconnect with the original drainage east of the pit design. A further trench will be constructed on the gently sloping west side of the designed pit to redirect surface water drainage away from the proposed pit and into the northern stream channel.

16.2.5 Mine Equipment

Mine equipment for Norrberget will be provided by mining contractors as needed. As the Norrberget pit is scheduled to be mined in 2029, equipment details have not yet been determined.

16.3 Consolidated Life of Mine Plan

The LOM plan for Björkdal comprises production from Björkdal underground, open pits at Björkdal and Norrberget, and historic stockpiles and is shown in Table 16-5.

Table 16-5: Life of Mine Production Plan

	Units	Average/ Total	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
MINING PRODUCTION - UNDERGROUND												
Total Rock	kt	6,654	1,205	1,232	1,070	837	599	508	723	479		
Waste	kt	176	43	31	28	48	27					
Ore	kt	6,478	1,162	1,201	1,042	789	572	508	723	479		
Stope Tonnes	kt	4,959	693	713	704	570	568	508	723	479		
Development Tonnes	kt	1,519	470	489	338	219	4					
Grade	g/t Au	1.81	1.62	1.67	1.60	1.79	1.96	1.93	2.20	2.22		
Gold Mined	k oz	376	60	64	54	45	36	31	51	34		
Capital Development	m	13,785	2,812	3,099	3,041	2,995	1,838					
MINING PRODUCTION - OPEN PIT												
Total	kt	31,303				3,617	6,713	6,644	6,596	4 211	3,522	
Waste	kt	28,192				3,316	6,312	6,311	6,314	3,471	2,467	
Ore	kt	3,111				301	401	332	283	740	1,055	
Grade	g/t Au	1.16				0.96	1.09	0.86	1.37	1.25	1.22	
Gold Mined	k oz	116				9	14	9	12	30	41	
Strip Ratio	W:O	9.1	-	-	-	11.0	15.7	19.0	22.3	4.7	2.3	-
MINING PRODUCTION - STOCKPILE												
Ore	kt	2,532	138	99	258	213	308	497	278	63	259	421
Grade	g/t Au	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61
Gold Mined	k oz	50	3	2	5	4	6	10	5	1	5	8

	Units	Average/ Total	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
TOTAL												
Ore	kt	12,121	1,300	1,300	1,300	1,300	1,300	1,300	1 300	1,300	1,300	421
Grade	g/t Au	1.39	1.51	1.59	1.40	1.41	1.36	1.18	1.66	1.57	1.10	0.61
Gold	k oz	542	63	66	59	59	57	49	69	66	46	8
PROCESSING FEED												
Underground												
Ore	kt	6,478	1,162	1,201	1,042	789	572	508	723	479		
Grade	g/t Au	1.81	1.62	1.67	1.60	1.79	1.96	1.93	2.20	2.22		
Open Pit												
Ore	kt	3,111				298	420	295	299	758	1,041	
Grade	g/t Au	1.16				0.97	1.10	0.85	1.33	1.24	1.22	
Stockpile												
Ore	kt	2,532	138	99	258	213	308	497	278	63	259	421
Grade	g/t Au	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61
Total												
Ore	kt	12,121	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	421
Grade	g/t Au	1.39	1.51	1.59	1.40	1.41	1.36	1.18	1.66	1.57	1.10	0.61
Gold	k oz	542	63	66	59	59	57	49	69	66	46	8
Recovery	%	0.883	0.883	0.883	0.883	0.883	0.883	0.883	0.883	0.883	0.883	0.883
Gold Recovered	k oz	479	56	59	52	52	50	43	61	58	41	7

16.3.1 Norrberget Open Pit

The LOM plan for Norrberget is integrated into the LOM at Björkdal and provides incremental high grade feed of 162,000 tonnes to the mill over a six to seven month period. Stripping of surface overburden is scheduled to commence in 2029, which will offset a shortfall of supply from the main Björkdal pit.

17 RECOVERY METHODS

17.1 Introduction

The original Björkdal plant was designed and built by Davy McKee in 1987 for Terra Mining. Numerous changes have been made to the processing circuit with the primary objective of increasing plant throughput while maintaining gold recovery. The modifications completed since construction have been summarised in Table 17-1.

Table 17-1: History of Björkdal process plant modifications

Year	Modifications
1989	Plant commenced operation
1990	New 750 kW regrind mill installed
1992	Sala 6.6 m^3 flotation cell installed
1993	Two 75 kW Sala Agitated Mills (SAM) installed ahead of the flotation circuit
1994	Sorting plant and new mill facility constructed and commissioned in December 1994
2005	Knelson CD12 and a small regrind mill (7.5 kWh) installed in the gravity section
2009	Knelson XD30 installed before flotation
2013	Reichert cones replaced by Rougher spirals. An Outotec SkimAir SK240 flash flotation cell and a new double deck screen installed in the grinding circuit
2017	Flotation expansion installed and commissioned, increased flotation capacity and increased recovery
2018	Expert Process Control System installed (Mintek), commissioning ongoing
2021	G-max cyclone battery installed in gravity circuit

17.2 Process Description

A simplified process flowsheet has been provided in Figure 17-1, Figure 17-2 and Figure 17-3.

The Björkdal concentrator includes primary, secondary and tertiary crushing; primary and secondary grinding; a series of gravity concentration steps; regrinding and flotation to produce three gravity concentrates and a flotation concentrate.

Ore is delivered to a series of small stockpiles that are utilised to separately campaign ore through the processing facility and provide reconciliation data for particular parts of the mine. From the stockpiles, a front-end loader feeds a jaw crusher with the discharge reporting to a screen. The screen undersize is nominally minus 8 mm which is conveyed to a 5,000 tonne fine ore bin or to an emergency stockpile. Screen oversize is stored in a 400 tonne stockpile which can be reclaimed as feed for a secondary cone crusher. Discharge from the cone crusher is conveyed to a second screen. Undersize from the screen is combined with the undersize from the first screen and stored in the fine ore bin or the emergency stockpile. Oversize from the second screen is fed to a tertiary cone crusher. The discharge from the tertiary crusher is combined with the discharge from the secondary cone crusher and fed to the second screen. The ore travels in a closed circuit through the tertiary cone crusher until it meets the required product size (i.e., minus 8 mm).

Crushed ore reclaimed from the fine ore bin is passed across a series of two screens prior to being fed to the primary grinding circuit (Figure 17-1). The screen oversize is directed to an oversize material stockpile. The screen undersize is split and fed to the primary ball mill and primary rod mill that are operated in parallel. Discharge from the primary mills is fed to a classifying screen. The screen oversize is returned to the primary ball mill for additional grinding. Screen undersize has a particle size of approximately 80% passing (P80) 560 µm. The slurry is pumped to hydrocyclones for additional classification.

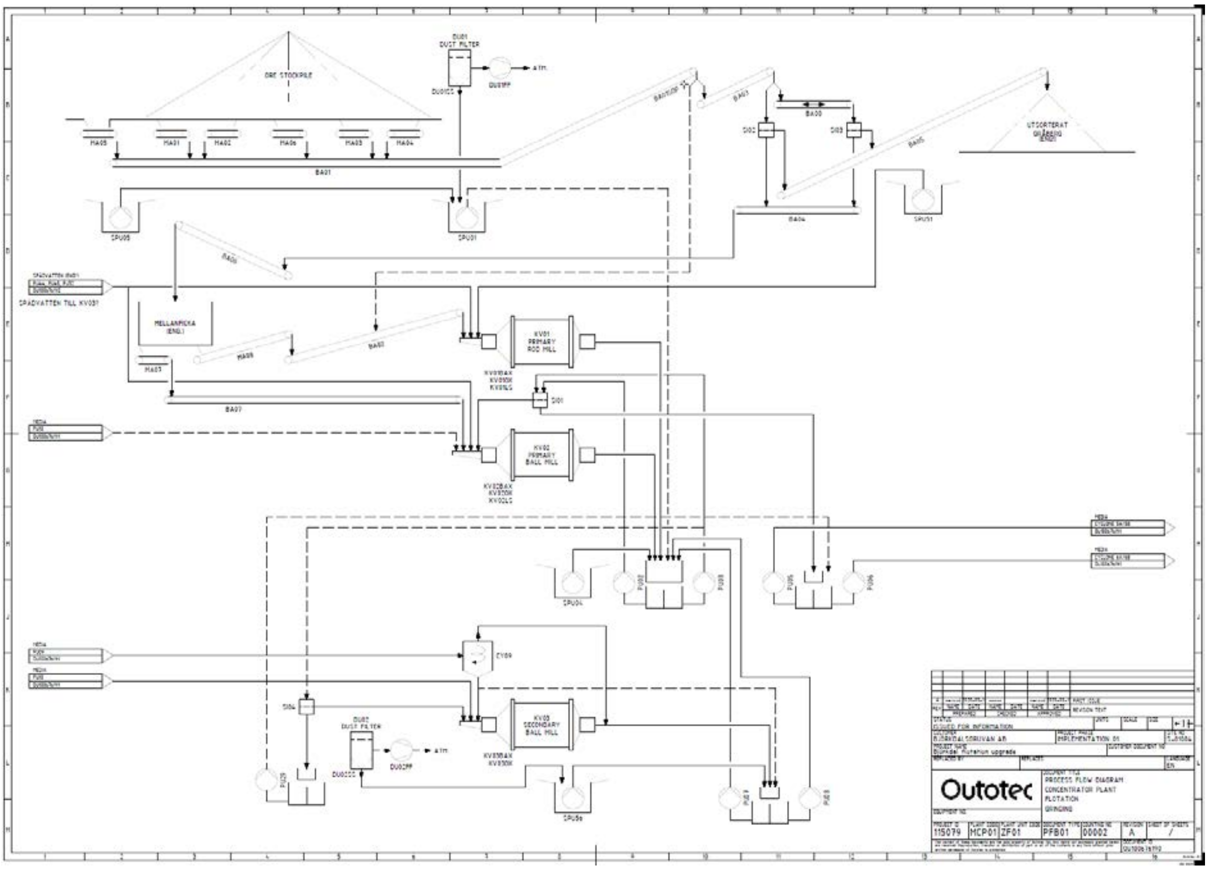


Figure 17-1: Björkdal process plant grinding circuit flowsheet

The cyclone underflow (P80 800 µm) is fed to rougher spiral concentrators (Figure 17-2). Tailings from the rougher and cleaner spirals are returned to the secondary ball mill number 3 with a discharge P80 475 µm. From the discharge of mill number 3, the slurry is pumped to combine with the discharge from ball mills 1 and 2. The discharge from the three mills is pumped to the classifying screen.

Concentrate from the rougher spirals is fed to the cleaner spiral classifiers. Tailings from the cleaner spirals are combined with the tailings from the rougher spirals and processed in the regrind secondary ball mill number 3 circuit. Concentrate from the cleaner spirals is cleaned on shaking tables. Tailings from the shaking tables are fed to a Knelson centrifugal gravity concentrator. Tailings from the Knelson concentrator are combined with the tailings from the rougher and cleaner spiral concentrators and processed in the regrind secondary ball mill circuit. Concentrate from the shaking tables and the Knelson concentrator are fed to the cleaner shaking table where two concentrate grades are produced. The gravity concentrate contains approximately 60% gold and the middlings from the cleaner shaking table has a concentration of approximately 1,500 g/t Au.

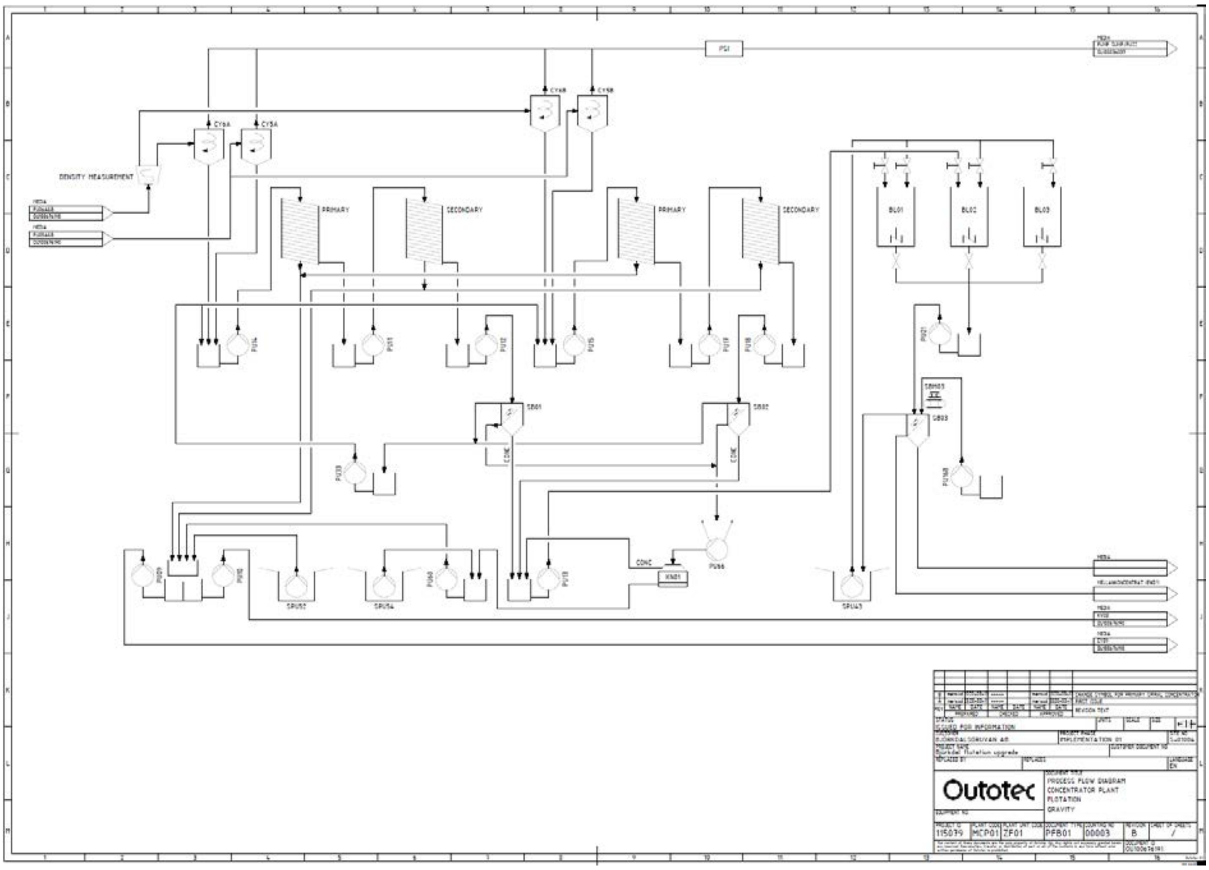


Figure 17-2: Detailed plant flow diagram for spirals and gravity

Overflow from the cyclone that follows the classifying screen (P80 230 µm) is further classified in the flotation cyclones (Figure 17-3). The flotation cyclone underflow (P80 410 µm) is fed to a Knelson concentrator. The Knelson tail is fed to a single SkimAir flash flotation cell. The SkimAir flotation concentrate reports to the final flotation product thickener, while the tailings from the SkimAir cell are combined with the flotation cyclone overflow (P80 125 µm) as feed to three banks of conventional rougher flotation cells that operate in series. Tailings from the rougher flotation circuit feed the scavenger flotation circuit that contains three conventional flotation cells. Concentrate from the scavenger flotation circuit is recombined with the feed to the rougher flotation circuit. Tailings from the scavenger flotation circuit represent the final tailings exiting the plant. Rougher flotation concentrate is cleaned in the first cleaner flotation circuit that consists of one bank of four conventional flotation cells and the second cleaner flotation circuit that consists of one tank flotation cell. Tailings from the first cleaner flotation circuit are returned to the feed of the rougher flotation circuit and tailings from the second cleaner flotation circuit are returned to the feed of the first cleaner flotation circuit. The second cleaner flotation concentrate is collected in the final flotation product thickener along with the SkimAir flotation concentrate. The flotation concentrate is dewatered in the flotation concentrate thickener and filtered prior to shipment.

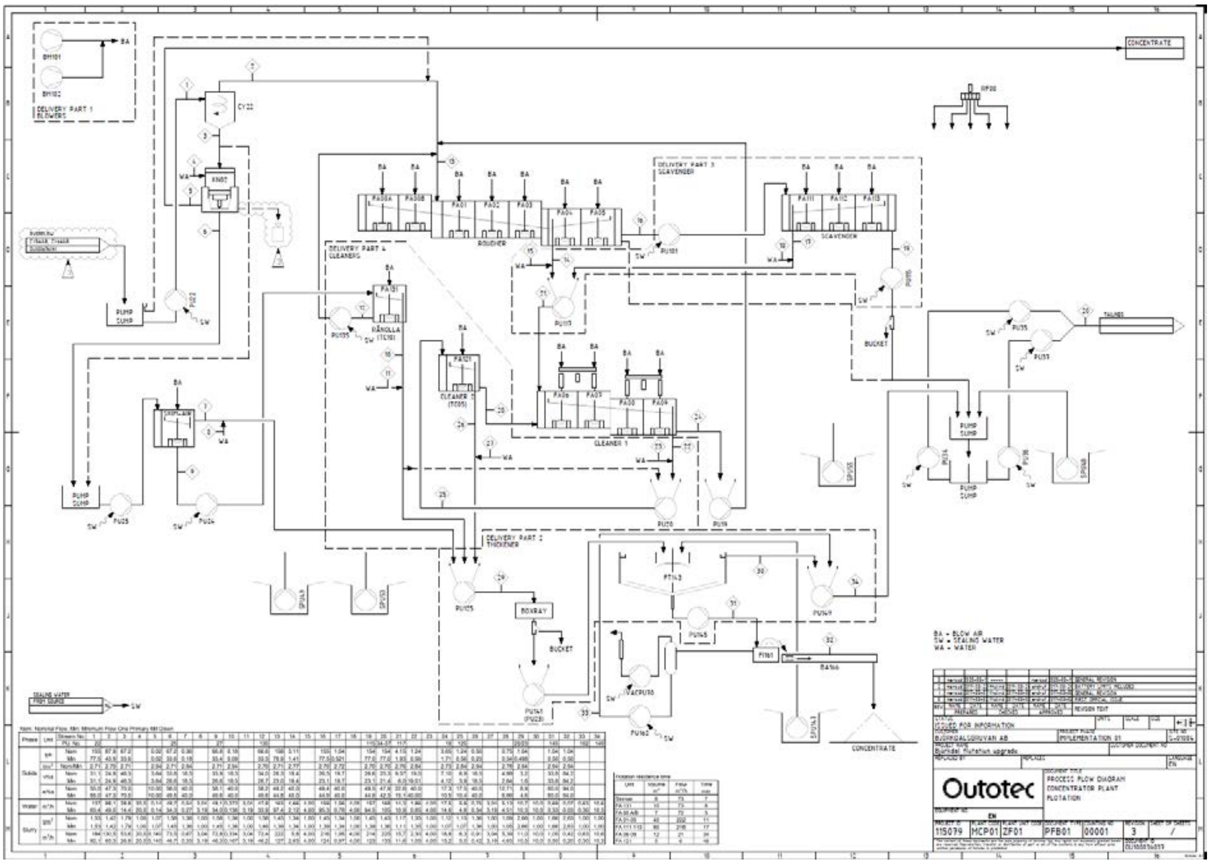


Figure 17-3: Plant flow diagram for the concentrator flotation section

18 PROJECT INFRASTRUCTURE

18.1 Björkdal

A surface plan based on an aerial LIDAR survey was conducted for the Björkdal Property in June 2020 which showed the extent of the mining operation and infrastructure. The aerial image is presented in Figure 18-1.

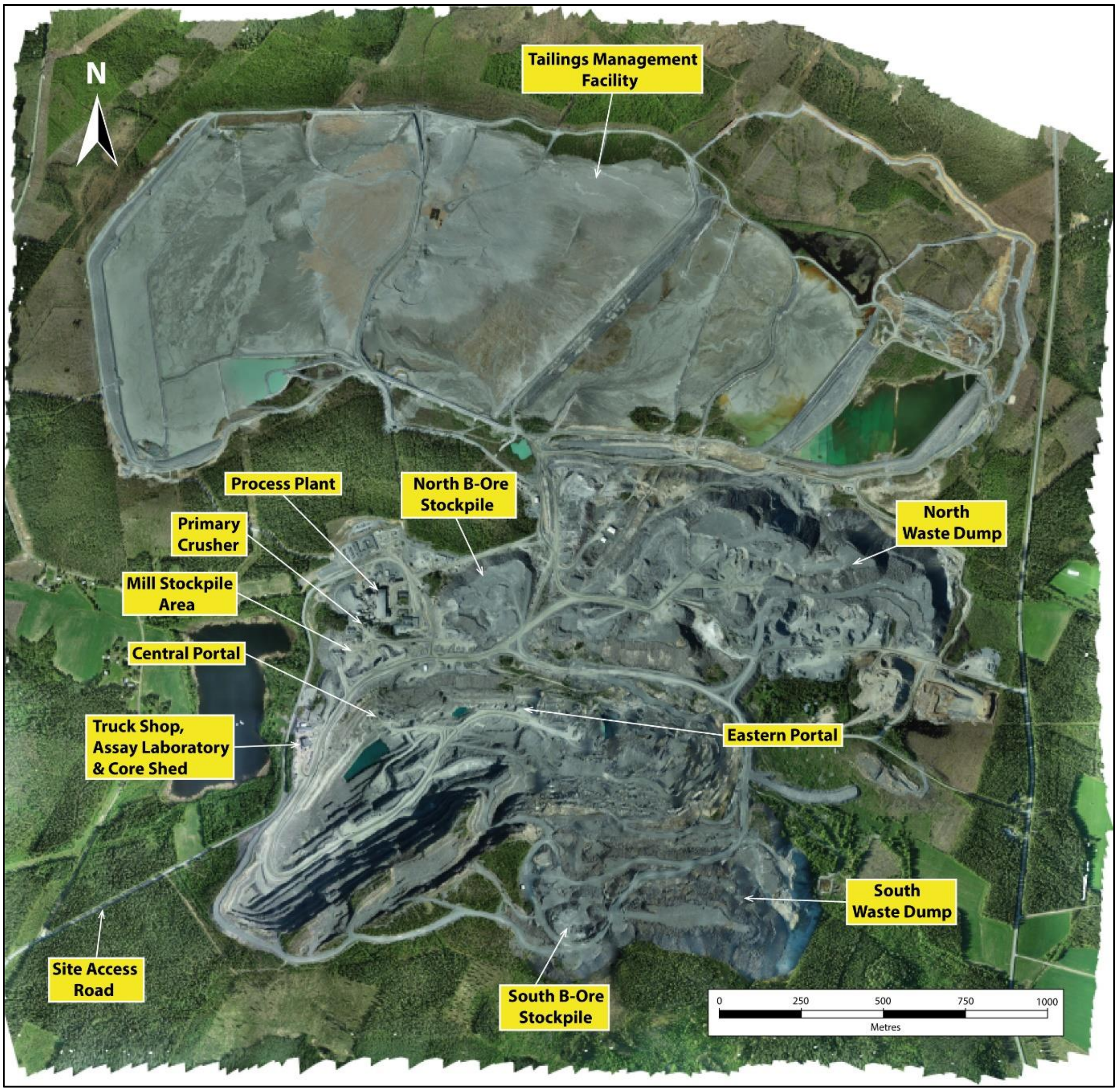


Figure 18-1: Björkdal site infrastructure layout

18.1.1 Tailings Management Facility

The Tailings Management Facility (TMF) is located in an area of gently undulating relief approximately 1.5 km north of the processing plant.

The current TMF will reach full capacity in the winter of 2022/2023. Expansion of the TMF has been approved under the latest environmental operating permit that was received on 3 December 2018 and will remain valid for a period of ten years.

TMF expansions have been designed by independent consultants, Tailings Consultants Scandinavia (TCS).

During 2019 the Western Barrier Dam was raised by 2.5 m. During 2021 the northern part was raised, and during 2022 the southern part will be raised to meet production requirements. This planned expansion will provide sufficient tailings capacity to the end of 2023.

Raising of Dam K1 will be carried out in two stages with the Stage 1 raise, initiated during 2020, planned to be completed by the end of 2023. Stage 2 is scheduled to be completed during 2025. At the planned plant throughput of 1.3 Mtpa, this will provide sufficient tailings storage capacity for eight more years of mine life up to and including year 2031.

18.1.2 Process Water Supply

Water for the process plant is supplied from two sources. Two submersible pumps located at the Kåge River supply approximately 700,000 m^3 of raw water annually to plant water tanks via two pipelines. Existing water permits allow the Björkdal Property to withdraw up to 50 L/s, equivalent to 180 m^3/h and 1.58 million m^3/yr. A second pump station located at the TMF recycles cleared water to the processing plant. Approximately 59% of the process water is recycled from the tailings system and the remaining 41% is drawn from the Kåge River.

At present, the mine is diverting approximately 800,000 m^3 per year of water from the underground and open pit mines to the TMF and this allows a 59:41 ratio to prevail throughout the year. The result is that less water is discharged from the tailings system and less fresh make-up water is required. During 2021, a total of 1,478,499 m^3 of water was pumped from the underground and open pit mines.

18.1.3 Power Supply

The power supply for the site is provided by Skellefteå Kraft AB, the local power company. The electricity is sourced from relatively low-cost hydro power and is delivered to Björkdal via the Swedish power grid.

18.1.4 Communications

On-site communications include mobile services, internal radio communication, and internet service. Back-up of the Björkdal computer servers is completed automatically through high speed internet to a service company in Skellefteå.

18.1.5 Waste Rock Dumps

The waste rock from open pit mining and low grade ore stockpiles currently amount to more than 60 Mt. An additional overburden moraine stockpile contains more than one million tonnes.

Previous characterisation studies conducted confirm that waste rock contains very low levels of heavy metals and sulphur and concluded that the waste was considered inert.

There are currently two active waste dump areas which comprise the North and South waste dumps, as shown in Figure 18-1. Under the new operating permit application, the final capacity of the waste rock dumps has been expanded to over 53 Mt which will be sufficient for the current mine life.

18.1.6 Surface Facilities

The Björkdal Property has all the facilities required for an open pit and underground mining operation including the items listed below:

- Gravel site access roads.
- An administrative building including office space, conference rooms and kitchen facilities.
- Modular style office space for contractors, changing rooms and mine dry mess.
- An open pit that includes ramp access to the underground operations.
- Raw ore stockpile facility containing a number of 5,000 tonne to 12,000 tonne capacity raw ore stockpiles.
- Primary jaw crushing facility with 400 tonne coarse ore stockpile.
- Secondary crushing facility.
- 5,000 tonne fine ore stockpile and reclaim facility.
- 3,700 tpd mill, gravity gold plant, and flotation plant.
- An internal metallurgical assay laboratory.
- Company and contractor maintenance facilities.
- A core logging facility with covered storage, sample preparation laboratory, and grade control assay laboratory.

- 250 ha TMF.
- Fresh water supply and storage.
- Water treatment plant.
- Explosive storage magazine and mixing facilities.
- Storage facilities for chemical reagents and bulk supplies.
- An off-site covered core storage facility.
- Swedish grid electrical power.

18.2 Norrberget

Currently, there is no infrastructure at the Norrberget deposit other than forest access roads, currently used for forestry and hunting access to the surrounding area, and exploration drill pads. Water for drilling is obtained from surface streams or pumped from previous drill holes. Given the small size of the deposit and short mine life, it is envisaged that the bulk of the required infrastructure will be able to be somewhat temporary in nature.

18.2.1 Mine Water Supply

Water to support Norrberget mining operations is planned to be sourced from Lillträsket, a small surface lake approximately two kilometres northwest of the proposed operation. Lillträsket is planned to be used as a sedimentation clearing pond for the Björkdal TMF and appropriate land purchases have been made to facilitate its conversion to this use. As the pit progresses deeper, it is expected that much of the water required for mining can be recycled from dewatering operations.

A pipeline is planned to follow the existing track between Lillträsket and the deposit as this will obviate the need to construct a dedicated maintenance track. The pipeline will be constructed to service both the dewatering discharge needs of the Mine and the supply of mining operations water.

Fresh water supply for drinking and washing is planned to be trucked in. On the Mine site, fresh water is provided from an on-site drill hole and this may prove to be the most economical option for fresh water supply at Norrberget as well. No investigations as to water quality for this purpose have yet been carried out.

18.2.2 Power Supply

The power supply for Norrberget is planned to be an extension of the existing Swedish electricity grid from Nylunds (approximately 3.5 km east). The major power supplier in the region is Skellefteå Kraft AB; the energy supply mix is dominated by locally sourced hydro power and is relatively low cost.

The planned route for the cable extension follows the course of the existing access road and a small sub- station is planned to service the operation of the site.

Other options for site power supply are being further investigated by Björkdal staff; this may provide opportunities to reduce required capital investment or unlock operational benefits.

18.2.3 Communications

A system of three radio repeater stations is planned to integrate the Norrberget site into the larger Björkdal radio system. This system is required for safe operations to be overseen by management and technical staff and will allow ore haulage trucks to operate around the existing open pit.

In addition to the radio system, cellular phone signal is available in the area. A GPS base station will be installed to facilitate surveying of the surface mine and allow GPS excavator control and communication. This can be integrated into the current system at Björkdal.

18.2.4 Waste Rock Dumps

Based on the current Mineral Reserves, it is forecast that approximately 0.5 Mt of loose glacial cover and approximately 1.45 Mt of solid waste rock will be removed from the Norrberget open pit. This material is planned to be stockpiled on both the north and south sides of the designed open pit. These piles will be designed to function as sound attenuation barriers to reduce the impact on the amenity of the small village of Norra Bastuträsk, approximately 1.7 km to the northeast of the proposed workings.

18.2.5 Surface Facilities

There is little requirement for permanent surface facilities at Norrberget. The short mine life and proximity to existing facilities at Björkdal minimise the need for any extensive construction. Office space for technical and management staff will be accommodated within the existing buildings at the mine. Portable units are planned to be used to supply the required toilet/shower block, change house and heated muster room.

Other surface infrastructure that would typically be required will be shared with the Björkdal site.

18.2.6 Ore Haulage Road

The existing forest access track will be widened and upgraded to a standard suitable for heavy vehicle access from Route 870 (Fällfors Road) to the deposit at Norrberget, a stretch of approximately 3.5 km. Existing access tracks will be suitable for ore haulage from Route 870 to the primary crusher stockpile area.

Construction of the road upgrade will require culverts in three places, to allow the passage of a surface stream and for two of the surface water diversion trenches described in Section 16.

19 MARKET STUDIES AND CONTRACTS

19.1 Markets

The principal commodity at the Björkdal Property is gold, which is freely traded at prices that are widely known, so that the prospects for the sale of any production are virtually assured.

19.2 Contracts

The Björkdal Property produces four saleable gold products that comprise a gravity concentrate, a middlings concentrate, a Knelson concentrate, and a flotation concentrate. The sales agreements relevant to each product have been summarised in Table 19-1.

Table 19-1: Summary of Björkdal Property concentrate sales agreements

Product	Counter Party	Gold Payable (%)	Silver Payable (%)
Gravity Concentrate	Aurubis	99.75	98.50
Middlings Concentrate	Aurubis	98.00	97.00
Knelson Concentrate	Aurubis	98.00	97.00
Flotation Concentrate	Boliden	95.00	95.00

The sales agreements described in Table 19-1 include an allowance for a concentrate treatment charge, refining charges for gold and silver, and minor penalty provisions for any excessive concentrations of bismuth, tellurium or fluorine contained in the concentrates.

Other contracts that exist between the Björkdal Property and suppliers include those listed below:

- PEAB Anläggning AB: Tailings dam construction work.
- Renfors AB: provides underground ore transport and is responsible for material haulage to the surface of all underground mined material and haulage from low grade stockpiles to crusher.
- Skellefteåbränslen AB: supplies diesel and gas to site.
- Blasting: EPC Sverige AB for the supply of emulsion explosives and blast hole loading for underground.
- Byggbetong AB: Shotcrete for underground mining operations.
- Skellefteå Kraft: Electrical power supply.

- Sandvik Mining & Constructions Sverige AB, Epiroc Sweden AB: Provision of spare parts for mining equipment.
- Exploration Diamond Drilling: Contracted with companies as required.
- Rexel/Selga: supply of electrical components and cables.
- Minlab AB: provide on-site assay laboratory services.
- Variety of leased mining equipment.

20 ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT

20.1 Environmental Studies

An annual environmental report is submitted to the authorities in Sweden for approval. The report summarises compliance to the terms stated in the environmental permits and water usage permit.

The Björkdal mining operation typically has a low sulphide content and, as a result, no acid rock drainage (ARD) potential exists. Gold is recovered by mechanical and gravity processes with no use of cyanide. There are no harmful elements associated with the tailings material and they have been declared as non-toxic by the authorities. Previous characterisation studies have demonstrated that waste rock from the mine contains very low levels of heavy metals and sulphur and have concluded that the waste should be considered inert.

Water quality is monitored on a regular basis at eight strategically placed monitoring stations. Monitoring points in the Upper Lillträsk Creek, Upper Kåge River and Upper Vidmyr Creek stations are located upstream of the mining area and provide reference water quality data. One station on the Property monitors discharge water quality from the TMF (PP2) and four additional stations have been located in Lillträsk Creek, Lower Lillträsk Creek, Kåge River, and Lower Röjmyr Creek to monitor any changes in the receiving watershed.

Sampling is performed by certified samplers and the protocol includes analyses for a suite of twenty-two metals, pH, temperature, and contents of ammonium-nitrogen, phosphates and phosphorus, nitrogen, nitrates and nitrites, oil and total suspended solids (TSS).

Historically, the Björkdal Property has reported that the discharge water quality from both the mine water management system (PP1) and the TMF (PP2) has exceeded permissible levels for nitrates and TSS. Elevated levels of phosphorus and phosphates have also been noted at PP1.

Since 2018, and following several studies conducted by the Björkdal Mine to establish the cause of the elevated levels, all mine discharge water has been discharged to the TMF through PP2, and PP1 removed from the control and monitoring system. Mine discharge water is no longer released from PP1. This change has been approved by the environmental court and is anticipated to resolve all issues with elevated nitrites and TSS. While ongoing measures are being implemented to continually reduce levels, Björkdal's suggested long-term solution is the raising of Dam K1 embankment to support degradation of nitrogen with increased residence time and dilution.

The raising of Dam K1 was approved during 2021 (M2945-19). The supporting Environmental Impact Assessment (EIA) was completed in 2019 and included the extension of the underground mine. No significant impacts were identified during the EIA process.

20.2 Permitting

The Björkdal Property has been fully permitted in accordance with Swedish environmental, health and safety legislation.

The prevailing Environmental Permit (M 771-17) was granted in December 2018 and remains valid for a period of ten years for the TMF (dam and related water discharge) and until 5 October 2067 for all other aspects of the operations. The Environmental Permit includes an expansion of the TMF to meet a mill throughput rate of 1.7 Mtpa.

Building Permit M 2945-19 for TMF Dam K1 was granted in May 2020. A Change Permit submitted in October 2019 was approved and gained legal force in July 2021. The Change Permit effectively replaces the Building Permit as the prevailing permit document. The approved Change Permit included an extension of the underground mine. The application submitted in November 2019 for designated land associated with the construction of Dam K1 received approval on 4 February 2021.

Under the existing long-term water-use permit, the Björkdal Property has been permitted to use the Kåge River as a water source for the processing plant, with the permitted limit being 50 L/s (180 m^3/h). The plant uses approximately 150 m^3/h of which half of the water is recycled from the TMF. Water used at the mine site for purposes other than the processing plant has been sourced from a drill hole.

The Norrberget project has not been included in the current Environmental Permit and an environmental permit that incorporates the project will need to be submitted prior to the commencement of mining.

The prevailing permits in place for the Björkdal Property have been presented in Table 20-1.

Table 20-1: Björkdal Property permit details

Permit	Valid from Date	Valid to Date	Permit Type
M 2945-19	2021-07-15	2067-10-05	Change Permit
M 771-17	2018-12-03	2028-10-05 for TSF 2067-10-05 for other operations	Environmental Permit
VD DVA 9/87	1987-05-26	No expiry date	Water-use Permit

20.3 Social and Community Requirements

Personnel at the Björkdal Property report that there are no issues with community impact. The Björkdal Property is located in a part of Sweden that has experienced a long history of mining activity and mining is accepted as a socially responsible and necessary contributor to the local economy. Engagement and information sharing with nearby residents takes place on an annual basis.

The Björkdal Property is located in an area where the Svaipa Sami village (the local indigenous group) retains winter grazing rights for their reindeer herds. A compensation agreement for lost grazing land and increased operating costs for the reindeer herders was signed in April 2017. This agreement remains valid for the planned operating life of the mine. The EIA completed in 2019 in support of the Change Permit application noted that no further impact on the reindeer industry was expected to arise due to the activities applied for, as no new above ground areas would be required outside the contract area established with the Sami village.

The Norrberget deposit is not covered by the above agreement. A mining concession has been granted that includes the Norrberget project which is valid until January 2044. Current planning has made provision for the mining of Norrberget in 2029 and 2030.

During 2021 the Björkdal Property increased its sponsorship program that supports the local community including investment in a new playground for the preschool and the leisure centre.

20.3.1 Health and Safety Management Plan

Management at the Björkdal Property reports a strong focus on the safety of all personnel employed at, or visiting, the Property and is committed to the following fundamental objectives:

- No personnel employed by Björkdal or its contractors should suffer either injury or illness arising from being employed at the Björkdal site.
- All personnel, contractors, service providers, and suppliers must rate safety and the protection of the environment as core values.

Safety meetings to discuss workplace Occupational Health and Safety (OHS) issues are conducted by relevant department or contractor supervisors and presented to individual work groups. Safety meetings are held weekly and are attended by all members of the work group.

All managers and employees at Björkdal have completed a comprehensive program focused on safety culture and improving attitudes towards safe work habits. The program was carried out during 2017/2018 by a specialised safety consultancy, RMS Switzerland and was incorporated as part of the general induction for new employees.

Other safety related initiatives being, or having been, introduced in 2020/2021 include:

- The introduction of self-rescuers for all personnel working or entering the underground mine.
- Risk assessment training for all managers and safety representatives.
- An employee bonus scheme that focuses on increasing the number of risk observations and reports to potentially reduce the number of hazards.
- General induction training days that include company safety culture.
- A new system of pre-start procedures for light vehicles and a campaign of pre-start checks for heavy vehicles.
- Emergency preparedness training conducted regularly during the year.
- A project aimed to change from general workwear to personal workwear.
- A Safety Day for managers and safety representatives will be introduced.
- Provision of a specialised ambulance (Figure 20-1) equipped to drive into the mine and handle accidents underground.

Figure 20-1: Specialised ambulance equipped to handle underground emergencies

The safety statistics reporting adopted for the Björkdal Property uses the following frequency rate measures:

- Medical Treatment Injury Frequency Rate (MTIFR)
- Lost Time Injury Frequency Rate (LTIFR)
- Total Reportable Injury Frequency Rate (TRIFR)

The incident classification is presented in Table 20-2. Statistics for MTIFR and LTIFR during the period 2015 to 2021 have been presented in Table 20-3.

Table 20-2: Björkdal Property Incident Classification

Incident Classification	Statistical Grouping		
	TFIFR	MTIFR	LTIFR
First Aid	✓	✓	-
Medical Treatment	✓	✓	-
Restricted Duties	✓	-	-
Lost Time	✓	-	✓
Fatality(s)	✓	-	✓

Table 20-3: Björkdal Property Incident Statistics for MTIFR and LTIFR

Year	MTIFR	LTIFR
2015	22.24	16.68
2016	0	12.28
2017	9.73	12.97
2018	13.91	6.94
2019	13.75	12.16
2020	16.88	2.11
2021	7.63	1.91

The Björkdal health and safety statistics for 2021 are summarised in Table 20-4.

Table 20-4: Björkdal Property Health and Safety Statistics for 2021

Class	Value
Fatalities	0
Lost Time Incidents (LTI)	1
Restricted Work Incidents (RW)	0 (1)
Medical Treatment (MT)	4
Total Hours, Contracted Time Björkdal	371,996

Class	Value
Total Hours, Worked for Contractors	152,225
Total Recordable Incident Rate (TRIFR)	9.54
Medical Treatment Incident Rate (MTIFR)	7.63
Lost Time Incident Rate (LTIFR)	1.91

20.4 Mine Closure Requirements

Mine closure and reclamation plans have been submitted and approved as an annex to the Environmental Permit. The approved closure plan provides an overview of reclamation requirements that follow the July 2004 European Commission guidelines for Best Available Practice for the management of tailings and waste rock in mining activities.

Mandalay has indicated that the Change Permit approval received during 2021 required an additional payment of SEK 350,000 into the secured reclamation account. Pending regulatory approval, Mandalay has submitted an update of its closure and reclamation plan during autumn 2021. Thereafter an update needs to be submitted every five years or earlier if necessary. A final detailed remediation and closure plan must be submitted to the authority in good time before the activity ceases.

The 2018 environmental permit includes an updated closure and reclamation plan. Mandalay presently has US$4.82 million (SEK 43.35 million) in a secured reclamation account held by the Swedish authorities.

21 CAPITAL AND OPERATING COSTS

21.1 Capital Costs

21.1.1 Basis of Estimate

The Björkdal Property is an on-going operation with the facilities, equipment, and manpower in place to produce gold products. The basis for the LOM plan is the Proven and Probable Mineral Reserve estimate outlined in Section 15. The majority of the capital cost estimates contained in this Technical Report are based on quantities generated from the open pit and underground development requirements and data provided by Björkdal.

A summary of capital requirements anticipated over the LOM has been summarised in Table 21-1.

Table 21-1: Björkdal Property Capital Cost Estimate

Description	Value (US$000)
Sustaining Capital Fixed Assets	63,545
Capital Development Underground	39,200
Pre-Strip Open Pit	45,850
Total Sustaining Capital	**148,595**
Growth Capital Fixed Assets	9,113
Total LOM Capital Expenditure	**157,708**

21.1.2 Sustaining Capital

The sustaining capital estimate provides for the periodic addition of capital required to maintain the operations at its existing levels. Sustaining capital has been divided across three areas: spending on fixed assets, ongoing underground development, and open pit pre-stripping. Pre-stripping costs account for the removal of approximately 19.1 Mt of open pit waste rock and overburden, while underground development includes the advancement of 13,785 m of cross-cuts and ramps to facilitate access to future mining areas. Costs are estimated based on actual cost history at Björkdal. The fixed asset estimate includes provision for equipment replacement; maintenance of the underground ventilation, electrical distribution, and mine water management systems; equipment replacement in the process plant and the replacement of items associated with tailings disposal, water treatment and other general items.

21.1.3 Growth Capital

The Company has indicated that the majority of the growth capital reported relates to expenses for expansion of tailing dams (more than 60% of the total amount) and comes directly from the 2022 budget.

21.2 Operating Costs

21.2.1 Basis of Estimate

The Björkdal Property maintains detailed and comprehensive operating cost records that provide an excellent basis for estimates of future operating costs. Mandalay produced a cash flow estimate based on the budgeted costs for 2022. This estimate was checked against the 2017 to 2020 costs provided by Mandalay. The majority of operating costs at Björkdal are expended in Swedish Kronor. All costs have been converted to US dollars using an exchange rate of 8.79 SEK/US$.

Unit costs used to estimate LOM operating costs are summarised in Table 21-2.

Table 21-2: Björkdal Property Unit Cost Inputs

Activity	Units	Value
Open Pit Mining	US$/t waste moved	2.73
Open Pit Mining	US$/t ore moved	2.73
Underground Mining	US$/t ore	24.69
Stockpile Mining	US$/t moved	0.69
Processing and refining	US$/t processed	9.32
G&A	US$/t processed	8.92
Total Cost	**US$/t processed**	**33.14**

21.2.2 Life of Mine Operating Costs

Björkdal unit costs have been used to estimate LOM operating costs. Average LOM plan operating costs are shown in Table 21-3.

Table 21-3: Björkdal Property Life of Mine Operating Costs

Description	LOM (US$000)	Annual Average (US$000)	Unit Cost (US$/t processed)
Mining and Rehandle	210,705	19,155	14.9
Processing	131,787	11,981	9.32
G&A	126,194	11,472	8.92
Total Operating Cost	**468,686**	**42,608**	**33.14**

The LOM has been prepared on the basis that all planned mining activities can be carried out using the existing Björkdal manpower. It was assumed that current contract prices remain unchanged for mining activities performed by the contractor such as open pit mining and underground rock haulage.

Cost inputs have been priced in real Q4 2021 dollars, without any allowance for inflation or consideration to changes in foreign exchange rates.

22 ECONOMIC ANALYSIS

This section of the report is not required to provide this Item as the Property is in production. Mandalay is a producing issuer, and there is no material expansion of current production. Mining Plus has verified the economic viability of the Mineral Reserves via cash flow modelling, using the inputs discussed in this Technical Report.

23 ADJACENT PROPERTIES

There are no adjacent properties relevant to this Technical Report.

24 OTHER RELEVANT DATA AND INFORMATION

No additional information or explanation is necessary to make this Technical Report understandable and not misleading.

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

25.1.1 Björkdal

The Skellefteå region consists of Paleoproterozoic rocks that host several world-class volcanogenic massive sulphide (VMS) copper, zinc, and lead deposits that have been worked for nearly a century. Mineralisation in the Skellefteå region is focused within and around a regionally extensive, west to northwest trending structural feature named the Skellefteå belt. The Skellefteå district lies within a large and ancient cratonic block named the Fennoscandian Shield. The Fennoscandian Shield spans much of Finland and northwestern Russia, extending further westward throughout Sweden and Norway.

The Björkdal Deposit is a lode-style, sheeted vein gold deposit hosted within the lower and upper Skellefte Group Volcanics, Volcanoclastics and meta-sediments. Gold can be found within quartz veins that range in thickness from less than one centimetre to more than several decimetres. These veins are usually observed with vertical to sub-vertical dips and strike orientations between azimuth 000° and azimuth 090°. The majority of veins strike between azimuth 030° and 060°. Veining is locally structurally complex, with many cross-veining features observed and thin mineralised quartz veinlets in the wall rocks proximal to the main quartz veins.

Since 30 September 2020, to the data cut-off of 30 September 2021, Björkdal completed 59 drill holes totaling approximately 20,755 m in length. The data cut-off date at Norrberget remains the same as previous years; 30 September 2017. In addition, underground operations completed 5,988 m of on-vein development, which was mapped and sampled in detail according to the grade control protocols.

Other than the normal course of updating the mineralisation wireframes to account for new drilling and sampling information, the workflow and estimation parameters used to prepare the year-end 2021 Björkdal long-term block model were largely unchanged when compared to the previous Mineral Resource.

Mineral Resources were estimated at a cut-off grade of 0.33 g/t gold for the potentially open-pittable portion of the Resource, and 0.77 g/t gold for the portion of the Resource that is potentially mineable by underground methods. These cut-offs were determined using Björkdal's 2021 production costs, using a gold price of $1,700/oz and an exchange rate of 9.0 SEK/US$.

Classification criteria were changed relative to previous years and are now more consistent with Mandalay's Costerfield Property. This has allowed a Measured Resource to be reported.

The Mineral Resource is estimated as of 31 December 2021, with depletion through to this date.

The in-situ Björkdal and Norrrberget Deposits plus stockpiles consist of a combined Measured and Indicated Mineral Resource of 17,207 kt at a grade of 2.07 g/t and an Inferred Mineral Resource of 6,813 kt at a grade of 1.64 g/t.

The QPs for the Personal Inspection and the Mineral Resource consider that the geological and assay data used as input to the Mineral Resource Estimate have largely been collected, interpreted and estimated in line with best practice as defined by the CIM (CIM 2018, 2019), with exceptions noted below.

A review of the wireframing process should be undertaken to optimise the alignment to sample intervals, which will in turn make the estimation process more auditable. The QP recognises that, in some cases, the ore body wireframe is wider than a drive and so face sampling does not cover the width of the ore body. In these cases, the wireframe volume is supported by local diamond drilling. The use of minimum width modelling should also be reviewed and likely dropped as unwarranted dilution degrades the stationarity of the estimation domains.

The reporting process should also be improved before the next update to the Mineral Resource Estimate to ensure that the RPEEE criteria are met for the underground portion of the Resource and to bring it in-line with the CIM best practice guidelines (CIM 2019). Towards this end, the Mineable Shape Optimiser (MSO) software process was run over the deposit, however, due to large number of veins and variable mining methods, insufficient time was available to complete a realistic set of optimised shapes for resource reporting purposes. As a result, the current estimate is reported with a minimum mining width of 2 m, which is in-keeping with previous estimates. Nevertheless, the poor resource-to-reserve conversion rate suggests this may be inadequate to ensure RPEEE criteria are met. The QP recommends that sufficient time is allocated to prepare a realistic set of MSO shapes for reporting the next Mineral Resource. The impact of this change has not been quantified by Mining Plus.

Data verification work showed that the geological data were suitable for use as input to the Mineral Resource Estimate and validation of the resource block model showed good agreement with the input data.

The QPs for the Personal Inspection and the Mineral Resource do not consider any other significant risks or uncertainties that could reasonably be expected to affect the reliability or confidence in the exploration information or Mineral Resource Estimate.

25.1.2 Norrberget

The primary gold mineralisation at Norrberget is contained within bands of veinlets and alteration containing amphibole in a package of interbedded mafic tuffs and volcaniclastics.

Mineralisation wireframes were generated using a 0.4 g/t Au cut-off grade and a two metre minimum horizontal width. The wireframes represented a primary band of continuous mineralisation and two limited footwall bands of mineralisation.

Samples within the Norrberget domains were capped at 24 g/t Au, affecting seven out of the 311 samples within the mineralized domains. Intercepts within the domain were composited to 1.0 m lengths with a minimum sample length of 0.5 m.

Bulk density applied to the block model was based on average densities for each lithology. The mineralisation has an average density of 2.78 g/cm^3.

The low number of mineralized samples at Norrberget necessitated the use of inverse distance weighted interpolation rather than the ordinary kriging method. Continuity analysis of grade contours was reviewed to help define high grade trends that were used to inform the interpolation parameters.

25.2 Mining, Mineral Reserve and the Mining Schedule

Underground Mineral Reserves were determined using a cut-off grade of 0.88 g/t Au for stoping and an incremental cut-off grade of 0.37 g/t Au for development. The combined Underground Proven and Probable Mineral Reserves at Björkdal are 6.48 Mt at 1.81 g/t for an estimated 376,000 oz Au.

Mineral Reserves held in stockpiles comprise 2.53 Mt grading 0.61 g/t Au for 50,000 oz Au estimated at a cut-off grade of 0.37 g/t Au.

Open pit Mineral Reserves for the Björkdal pit comprise Probable Reserves of 2.95 Mt at 1.07 g/t using a cut-off grade of 0.37 g/t.

At Norrberget the Probable Open Pit Mineral Reserve is 162,000 tonnes at 2.80 g/t Au for a total of 15,000 oz Au.

The reporting cut-off grades for the Mineral Resources and Mineral Reserves were slightly increased compared with the previous year to reflect higher processing costs. Updated operational costs and input parameters based upon 2021 actual figures, and the 2022 budget, were used in the Mineral Reserves estimation process.

25.3 Mineral Processing and Metallurgical Testwork

For 2022 US$1.17M has been budgeted to maintain and sustain the mill operation. No further metallurgical testwork is planned for 2022 as the mill has been operating on Björkdal ore for 33 years.

The largest processing related capital investment for 2022 is the embankment raising for Dam K1 at the TMF (US$4.70M).

Preliminary metallurgical tests using samples from Norrberget show that the mineralogy is more complex and the gold grain sizes are smaller, which requires a finer grind size to achieve liberation. Since the deposit is small, it is not anticipated that modifications to the existing processing plant will be cost effective. Therefore, the data indicates that the average gold recovery for Norrberget will be approximately 75%.

In future metallurgical tests for Norrberget, use variability samples with a range of head grades from throughout the deposit, using test conditions that evaluate what the metallurgical response will be in the existing processing facility.

25.4 Environmental, Permitting and Social or Community Considerations

The prevailing Environmental Permit (M 771-17) granted in December 2018 remains valid for a period of ten years for the TMF (dam and related water discharge) and for all other aspects of the operation is valid until 5th October 2067. The environmental permit includes an expansion of the TMF to meet a mill throughput of 1.7 Mtpa.

A Building Permit was granted in May 2020 for TMF Dam K1. A subsequent Change Permit approved in July 2021 replaces the Building Permit and includes an extension of the underground mine. The application submitted in November 2019 for designated land associated with the construction of Dam K1 received approval on 4 February 2021.

The Norrberget deposit is not covered by the aforementioned agreement. A new mining concession has been granted that covers Norrberget and is valid until January 2044. Mining of Norrberget is planned for 2029.

The 2018 environmental permit includes an updated closure and reclamation plan with funds held by the Swedish authorities.

26 RECOMMENDATIONS

26.1 Geology

The Björkdal Property is an advanced operation and Mandalay Resources has a history of successful exploration and mining on the Property.

Ongoing exploration work program targeting additions to the Mineral Resource are planned in 2022 at the Björkdal Property by Mandalay Resources. A total of US$4.5M has been allocated in the budget for 36,000 diamond drill metres for exploration in 2022 in support of both near-mine and regional target testing.

Near Mine Exploration:

It is recommended that mine extension targets continue to be developed and tested along the Björkdal Shear for mineralisation proximal to existing infrastructure.

Near mine, underground exploration will be strongly focused on extending the mineralised package towards the North, above the Marble horizon. Drilling along the Eastern extent of the current underground mine will focus on additional testing and infilling at depth, under the marble.

Regional Exploration:

The Björkdal Property covers several kilometres of area around the current operation that is prospective for additional Au mineralisations and VMS style deposits. 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 higher than previous years and will allow the development of additional regional targets in close proximity to the current operations.

SLR recommends to carry out additional drilling to delineate the mineralisation at depth and along strike at Norrberget.

Operational:

A review of the wireframing process should be undertaken to optimise the alignment to sample intervals, which will in turn make the estimation process more auditable. The QP recognises that, in some cases, the ore body wireframe is wider than a drive and so face sampling does not cover the width of the ore body. In these cases, the wireframe volume is supported by local diamond drilling. The use of minimum width modelling should also be reviewed and likely dropped as unwarranted dilution degrades the stationarity of the estimation domains.

The reporting process should also be improved before the next update to the Mineral Resource Estimate to ensure that the RPEEE criteria are met for the underground portion of the Resource and to bring it in-line with the CIM best practice guidelines (CIM 2019). Towards this end, the Mineable Shape Optimiser (MSO) software process was run over the deposit, however, due to large number of veins and variable mining methods, insufficient time was available to complete a realistic set of optimised shapes for resource reporting purposes. As a result, the current estimate is reported with a minimum mining width of 2 m, which is in-keeping with previous estimates. Nevertheless, the poor resource-to-reserve conversion rate suggests this may be inadequate to ensure RPEEE criteria are met. The QP recommends that sufficient time is allocated to prepare a realistic set of MSO shapes for reporting the next Mineral Resource. The impact of this change has not been quantified by Mining Plus.

26.2 Mining

Mining Plus makes the following recommendations regarding the mining operations:

- Continue to work with actions that reduce dilution in underground stoping.
- Investigate any bottlenecks at the operation to identify opportunities to increase the profitability of the mine.
- Follow through with the planned construction of the new underground pump station to secure dewatering capacity of the mine for the duration of the mine life. A budget of US$511K has been allocated for 2022 as pre-study with work to continue in 2023.
- Follow through with the installation of the planned primary fans in the central fresh-air bellow to increase ventilation capacity to deeper levels (US$341K Budgeted for 2022).
- Increase versatility and reduce production disturbances by utilising a boulder hammer in cases of structural failures and blockages in stopes (US$250K Budgeted for 2022).
- SLR recommends to review the 2017 Norrberget Mineral Reserves in light of recent changes in gold price, subject to the inclusion of any additional drilling information into the resource model.

26.3 Mineral Processing & Metallurgical Testwork

SLR recommends to use variability samples with a range of head grades from throughout the deposit, using test conditions that evaluate what the metallurgical response will be in the existing processing facility, in future metallurgical tests for Norrberget.

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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, Leve 17, 127 Creek Street, Brisbane, Queensland, Australia;
2. This certificate applies to the Technical Report titled “Mandalay Resources – Björkdal 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 have not completed a personal inspection of the Property;
5. I am responsible for Items 2 to 11, excepting items 5.4.2, 6.1.2, 6.3.2, 7.4, 8.2, 9.2 and 10.2, which relate to the Norrberget Deposit; Item 14 excepting item 14.3, which relates to the Norrberget Deposit; Item 23 and 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 no prior involvement with the property;
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 2022

(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 – Björkdal 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 10 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 not visited the Björkdal Project site, but a virtual site visit has been undertaken and site activities verified by Mining Plus personnel;
5. I am responsible for Items 15 and 16 and Items 18 to 22, excepting Items 15.3, 16.2 and 18.2 which relate to the Norrberget Deposit; and 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 no prior involvement with the property;
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 2022

(Signed) Aaron Spong, B.Eng. (Mine Engineering), FAusIMM CP (Min)

Certificate Of Qualified Person

I, Matthew Field, PhD, Pr.Sci.Nat., do hereby certify that:

1. I am currently employed as a Principal Geology Consultant for Mining Plus UK Ltd of 2 Redcliffe Way, Bristol, BS1 6NL;
2. This certificate applies to the Technical Report titled “Mandalay Resources – Björkdal 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 Rhodes University, Grahamstown, South Africa with BSc (1983), BSc Hons (1984) and MSc (1986) degrees in Geology and from the University of Bristol, United Kingdom in 2009 with a PhD in Earth Sciences. I have worked continuously in the exploration and mining industry for over 35 years since I graduated with an MSc degree. I am registered with the South African Council for Natural Scientific Professions (SACNASP), I am a Fellow of the Geological Society of South Africa and a Fellow of the Geological Society of London. Through my education and working experience I am a qualified person for the purposes of this Technical Report;
4. I completed a personal inspection of the property from 7 to 10 December 2021;
5. I am responsible for Item 12 and sections pertaining thereto in Item 1 and Items 25 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 no prior involvement with the property;
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: 31 March 2022

(Signed) Matthew Field, PhD, Pr.Sci.Nat.
SACNASP Natural Science Practitioner (400060/08)

MINING PLUS

CERTIFICATE OF QUALIFIED PERSON

I, Christopher Stinton, BSc(Hons), CEng MIMMM, do hereby certify that:

1. I am currently employed as a Principal Process Engineer with Zenito Limited of 27 Old Gloucester Street, London, WC1N 3AX, United Kingdom;
2. This certificate applies to the Technical Report titled "Mandalay Resources – Björkdal 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 with an Honours of Bachelor of Science in Mineral Engineering from the Birmingham University, United Kingdom in 1979. I am a Chartered Engineer (CEng) registered with the Engineering Council UK and a Member of the Institute of Materials, Minerals and Mining (MIMMM). I have been working in minerals engineering since 1979 and have had experience in process design and engineering, plant operations and management. 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 7 to 10 December 2021;
5. I am responsible for Items 13 and 17 excepting Item 13.2 which is related to the Norrberget Deposit, and sections pertaining thereto in Item 1 and Items 25 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 no prior involvement with the property.
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: 24 March 2022

(Signed) Christopher Stinton, BSc (Hons), CEng MIMMM

SLR Consulting (Canada) Ltd
55 University Avenue, Suite 501,Toronto, ON M5J 2H7

CERTIFICATE OF QUALIFIED PERSON

I, Reno Pressacco, M.Sc(A)., P.Geo., as an author of this report entitled "Mandalay Resources – Björkdal Property, NI43-101 Technical Report", prepared for Mandalay Resources Corporation and dated March 25, 2022, do hereby certify that:

1. I am an Associate Principal Geologist with SLR Consulting (Canada) Ltd, of Suite 501, 55 University Avenue, Toronto, Ontario, M5J 2H7;
2. I am a graduate of Cambrian College of Applied Arts and Technology, Sudbury, Ontario, in 1982 with a CET Diploma in Geological Technology, Lake Superior State College, Sault Ste. Marie, Michigan, in 1984, with a B.Sc. degree in Geology and McGill University, Montreal, Québec, in 1986 with a M.Sc.(A) degree in Mineral Exploration;
3. I am registered as a Professional Geologist in the Province of Ontario (Reg. #939). I have worked as a geologist for a total of 36 years since my graduation. My relevant experience for the purpose of the Technical Report is :
   - Preparation, reviews and reporting as a consultant for Mineral Resource estimates on numerous exploration and mining projects around the world.
   - Numerous assignments in North, Central and South America, Europe, Russia, Armenia and China for a variety of deposit types and in a variety of geological environments; commodities including Au, Ag, Cu, Zn, Pb, Ni, Mo, U, PGM, REE, and industrial minerals.
   - Vice president positions with Canadian mining companies.
   - A senior position with an international consulting firm, and
   - Performing as an exploration, development, and production stage geologist for a number of Canadian mining companies.
   - Preparation of Mineral Resource estimates for open pit and underground mines for the three prior years.
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 fulfill the requirements to be a "qualified person" for the purposes of NI 43-101;
5. I visited the Björkdal Gold Mine on September 20 to 22, 2016 and most recently on November 18 to 21, 2019;
6. I am responsible for Items 5.4.2, 6.1.2, 6.3.2, 7.4, 8.2, 9.2, 10.2 and 14.3 which are relevant to the Norrberget Deposit and form part of the Technical Report;
7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101;
8. I have previously prepared Technical Reports dated March 29, 2018, March 28, 2019, March 26, 2020, and March 26, 2021 and public domain Mineral Resource estimates for the property that is the subject of the Technical Report;

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. At the effective date of the Technical Report and the date of this certificate, to the best of my knowledge, information and belief, Items 5.4.2, 6.1.2, 6.3.2, 7.4, 8.2, 9.2, 10.2 and 14.3 of this Technical Report for which I am responsible contain 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 2022

(Signed & Sealed) ***Reno Pressacco***

Reno Pressacco, M.Sc.(a), P.Geo.

SLR Consulting Ltd
6 Victory House, Dean Clarke Gardens, Exeter, EX2 4AA, UK

CERTIFICATE OF QUALIFIED PERSON

I, Richard C. Taylor, MAusIMM, CP, as an author of this report entitled "Mandalay Resources – Björkdal Property, NI43-101 Technical Report", prepared for Mandalay Resources Corporation and dated March 25, 2022, do hereby certify that:

1. I am Principal Mining Engineer with SLR Consulting Ltd, 6 Victory House, Dean Clarke Gardens, Exeter, EX2 4AA, United Kingdom;
2. I am a graduate of North Staffordshire Polytechnic in 1987 with a B.Eng. degree in Mining Engineering;
3. I am registered as a Chartered Professional in Australia with the AusIMM (Reg.# 222470). I have worked as a mining engineer for a total of 35 years since my graduation. My relevant experience for the purpose of the Technical Report is:

- Review and report as a consultant on many mining operations and projects globally for feasibility study, due diligence and regulatory requirements.
- Operational experience as Senior Planning Engineer and Technical Services Manager at six mines in South Africa, Australia, Central Asia and UK, both open pit and underground.
- Manager at three mining consultant companies in South Africa and Australia.
- Planning and operational experience in coal, gold, copper, nickel, diamonds, tungsten and PGMs.

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 fulfill the requirements to be a "qualified person" for the purposes of NI 43-101;
5. I did not complete a personal inspection of the property;
6. I am responsible for Items 15.3, 16.2, and 18.2 which are relevant to the Norrberget Deposit and form part of the Technical Report;
7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101;
8. I have prepared a previous Technical Report dated March 26, 2021 on the property that is the subject of this Technical Report;
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. At the effective date of the Technical Report and the date of this certificate, to the best of my knowledge, information and belief, Items 15.3, 16.2, and 18.2 of this Technical Report for which I am responsible contain 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 2022

(Signed and Sealed) ***Richard C. Taylor***

Richard C. Taylor, MAusIMM, CP

SLR International Corporation
1658 Cole Blvd, Suite 100, Lakewood, CO 80401

CERTIFICATE OF QUALIFIED PERSON

I, Kathleen A. Altman, Ph.D., P.E., as an author of this report entitled "Mandalay Resources – Björkdal Property, NI43-101 Technical Report", prepared for Mandalay Resources Corporation and dated March 25, 2022, do hereby certify that:

1. I am an Associate Principal Metallurgist with SLR International Corporation of 1658 Cole Blvd, Suite 100, Lakewood, CO, 80401;
2. I am a graduate of the Colorado School of Mines in 1980 with a B.S. in Metallurgical Engineering. I am a graduate of the University of Nevada, Reno Mackay School of Mines with an M.S. in Metallurgical Engineering in 1994 and a Ph.D. in Metallurgical Engineering in 1999;
3. I am registered as a Professional Engineer in the State of Colorado (Reg. #37556). I have worked as a metallurgical engineer for more than 40 years since my graduation. My relevant experience for the purpose of the Technical Report is:
    - Review and report as a metallurgical consultant on numerous mining operations and projects around the world for due diligence and regulatory requirements.
    - I have worked for operating companies including the Climax Molybdenum Company, Barrick Goldstrike and FMC Gold in a series of positions of increasing responsibility.
    - I have worked as a consulting engineer on mining projects for approximately 25 years in roles such as process engineer, process manager, project engineer, area manager, study manager, and project manager. Projects have included scoping, prefeasibility and feasibility studies, basic engineering, detailed engineering and start-up and commissioning of new projects.
    - I was the Newmont Professor for Extractive Mineral Process Engineering in the Mining Engineering Department of the Mackay School of Earth Sciences and Engineering at the University of Nevada, Reno from 2005 to 2009.
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 fulfill the requirements to be a "qualified person" for the purposes of NI 43-101;
5. I visited the Björkdal Gold Mine from September 22 to 25, 2017;
6. I am responsible for Item 13.2 which is relevant to the Norrberget Deposit and forms part of the Technical Report;
7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101;
8. I have prepared previous Technical Reports dated January 16, 2017, March 29, 2018, March 28, 2019, March 26, 2020, and March 26, 2021 on the property that is the subject of the Technical Report;
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. At the effective date of the Technical Report and the date of this certificate, to the best of my knowledge, information and belief, Item 13.2 of this Technical Report for which I am responsible 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 2022

(Signed & Sealed) ***Kathleen A. Altman***

Kathleen A. Altman, Ph.D., P.E.