

Rio Tinto Kennecott Mineral Resources and Ore Reserves

20 June 2023

Rio Tinto has approved a \$498 million¹ investment to commence underground mining at scale, in an area known as North Rim Skarn² (NRS) at its Kennecott copper operation near Salt Lake City, Utah.

The NRS has updated Indicated and Inferred Mineral Resources of 18.5 Mt at 3.02% copper, 1.10 g/t gold, 46.26 g/t silver, and 0.007% molybdenum identified based on additional drilling and an initial Probable Ore Reserve of 3.0 Mt at 2.39% copper, 1.77 g/t gold, 18.59 g/t silver, and 0.010% molybdenum.

These Mineral Resources and Ore Reserves are reported in accordance with the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves, 2012 (JORC Code) and the ASX Listing Rules. Supporting information relating to the Mineral Resources and Ore Reserves is set out in this release and its appendix. Mineral Resources and Ore Reserves are quoted in this release on a 100 percent basis. Mineral Resources are reported in addition to Ore Reserves.

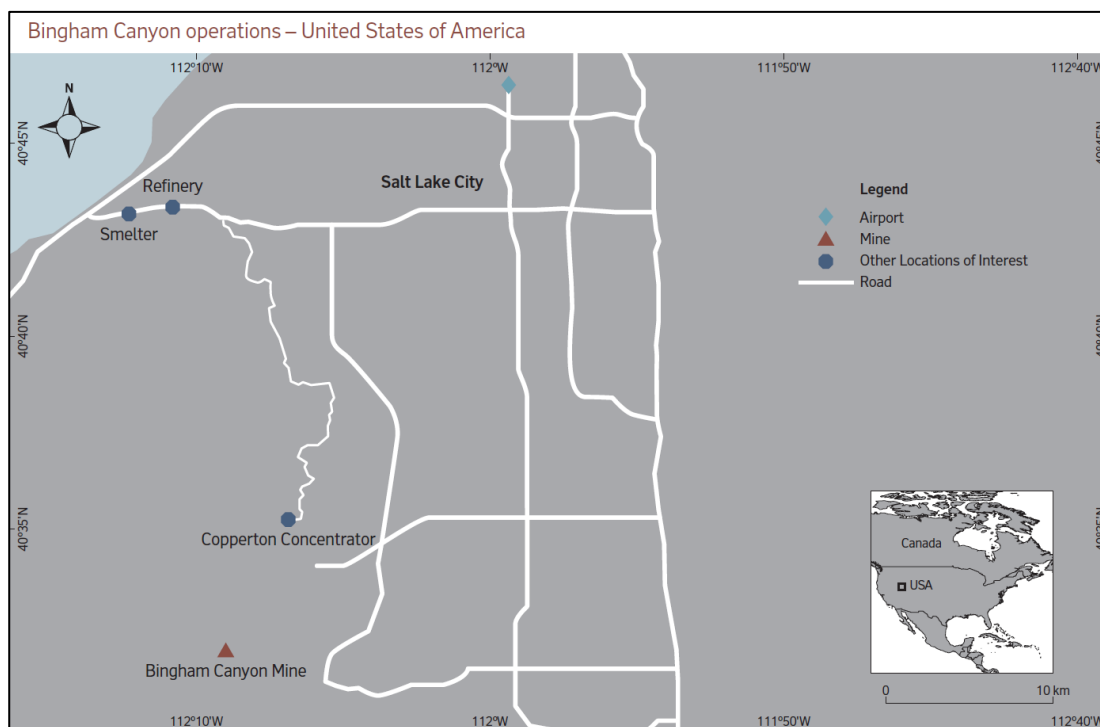


Figure 1 Property location map

¹ All dollar values are in USD.

² The NRS Mineral Resources and Ore Reserves, together with the Lower Commercial Skarn (LCS) Mineral Resources and Ore Reserves, form the Underground Skarns Mineral Resources and Ore Reserves.

Mineral Resource declaration

A tabulation of the updated underground Mineral Resources at the Kennecott Copper operation taking into account the updated estimate for the NRS is provided in Table A. Changes to the NRS Mineral Resource are summarised in Table C.

Table A Rio Tinto Kennecott Underground Skarn Mineral Resources as at 31 March 2023

Copper ^(b)	Likely mining method ¹	Measured Mineral Resources as at 31 March 2023					Indicated Mineral Resources as at 31 March 2023					Inferred Mineral Resources as at 31 March 2023					Total Mineral Resources as at 31 March 2023					Rio Tinto Interest
		Tonnage		Grade			Tonnage		Grade			Tonnage		Grade			Tonnage		Grade			
		Mt	% Cu	g/t Au	g/t Ag	% Mo	Mt	% Cu	g/t Au	g/t Ag	% Mo	Mt	% Cu	g/t Au	g/t Ag	% Mo	Mt	% Cu	g/t Au	g/t Ag	% Mo	
- Bingham Canyon (US) - Underground Skarns																						
- Lower Commercial Skarn	U/G	0.2	2.52	1.27	10.56	0.056	1.1	2.08	0.72	9.43	0.029	6.2	1.84	0.86	11.62	0.011	7.5	1.89	0.84	11.26	0.015	100.0
- North Rim Skarn	U/G	-	-	-	-	-	10.8	2.93	1.20	65.97	0.008	7.7	3.13	0.96	18.41	0.005	18.5	3.02	1.10	46.26	0.007	100.0
Total Underground Skarns		0.2	2.52	1.27	10.56	0.056	12.0	2.85	1.15	60.58	0.010	13.9	2.56	0.91	15.37	0.008	26.0	2.69	1.03	36.16	0.009	

¹ Likely mining method: U/G = underground.

² Copper Mineral Resources are stated on a dry in situ weight basis.

Ore Reserve declaration

A tabulation of the updated underground Ore Reserves at the Kennecott Copper operation due to the initial Probable Ore Reserve for the NRS is provided in Table B.

Table B Rio Tinto Kennecott Underground Skarn Ore Reserves as at 31 March 2023

Copper ²	Type of mine ¹	Probable Ore Reserves as at 31 March 2023					Total Ore Reserves as at 31 March 2023					Average mill recovery %				Rio Tinto Interest	Rio Tinto share Recoverable Metal							
		Tonnage		Grade			Tonnage		Grade			Cu		Ag			Mt Cu		Moz Au		Moz Ag		Mt Mo	
		Mt	% Cu	g/t Au	g/t Ag	% Mo	Mt	% Cu	g/t Au	g/t Ag	% Mo													
Bingham Canyon (US) - Underground Skarns																								
- Lower Commercial Skarn	U/G	1.7	1.90	0.71	10.07	0.044	1.7	1.90	0.71	10.07	0.044	90	71	76	71	100	0.030		0.028		0.421		0.001	
- North Rim Skarn	U/G	3.0	2.39	1.77	18.59	0.010	3.0	2.39	1.77	18.59	0.010	93	69	64	45	100	0.066		0.117		1.149		0.000	
Total Underground Skarns		4.7	2.21	1.39	15.50	0.022	4.7	2.21	1.39	15.50	0.022						0.096		0.144		1.569		0.001	

¹ Type of mine: U/G = underground.

² Copper Ore Reserves are reported as dry mill feed tonnes.

Table C Changes to NRS Mineral Resources

	Indicated Mineral Resources					Inferred Mineral Resources					Total Mineral Resources				
	Mt	% Cu	g/t Au	g/t Ag	% Mo	Mt	% Cu	g/t Au	g/t Ag	% Mo	Mt	% Cu	g/t Au	g/t Ag	% Mo
Mineral Resources at 31 Dec 2022	12.6	2.93	1.44	59.50	0.008	7.2	3.13	0.96	18.71	0.005	19.8	3.01	1.27	44.70	0.007
Additions	1.0	1.67	0.98	26.09	0.008	0.5	1.85	0.96	15.01	0.005	1.5	1.73	0.97	22.21	0.007
Conversion to Ore Reserves	2.8	2.92	2.12	22.19	0.008						2.8	2.92	2.12	22.19	0.008
Mineral Resources at 31 March 2023	10.8	2.93	1.20	65.97	0.008	7.7	3.13	0.96	18.41	0.005	18.5	3.02	1.10	46.26	0.007

Summary of information to support Mineral Resources reporting

The Rio Tinto Kennecott NRS Mineral Resources are supported by the information set out in the Appendix to this release in accordance with the Table 1 checklist in the JORC Code. The following summary information is provided in accordance with rule 5.8 of the ASX Listing Rules.

This declaration of updated Mineral Resources follows completion of orebody knowledge drilling in the NRS deposit and a feasibility study.

Geology and geological interpretation

The NRS deposit is located in the Bingham mining district southwest of Salt Lake City, Utah (see Figure 1). The Bingham mining district is dominated by the Bingham Canyon copper-molybdenum-gold porphyry system, which consists of the Eocene monzonite-quartz monzonite Bingham Stock and deformed siliciclastic and carbonate country rock of the Paleozoic Bingham Mine Formation. The NRS deposit is hosted in mineralized skarn of the Lower Jordan Limestone (LJLS) unit of the Lower Bingham Mine Formation. This unit is proximal to the Bingham Canyon porphyry system and has been altered to copper-gold hosting calc-silicate skarn through prograde metasomatism with localized retrograde massive sulphide and clay. This unit has been variably folded and faulted prior to mineralisation, resulting in fold thickening and repetition of the units across faults.

Drilling techniques; sampling and sub-sampling techniques; and sample analysis method

Drilling in the NRS region spans several decades and multiple drilling programs totalling 241 drill holes collared from surface and underground between 1958 and 2021. As a collective whole, the drill hole dataset establishes comprehensive controls on the extents, geometry, geologic structure, mineralogy, and metal mineralisation for the NRS and adjacent areas.

The 2021 drilling program carried out during the prefeasibility and feasibility studies totals 25 holes and 9,628 m of coring, utilizing comprehensive geoscientific core logging, select downhole acoustic borehole imaging, geomechanical testing, hydrogeologic measurement, and geochemical assay to inform geologic interpretation, geotechnical characterization, and resource estimation. This coring infills historic drilling and targets the upper elevations of the resource. Nominal drill hole spacing within the initial mining area of the NRS deposit is less than 60 m (Indicated). Drill hole spacing in the NRS deposit varies with depth below this region, with 58% of the entire Mineral Resource drilled to less than 60 m (Indicated), with the remainder at a nominal spacing of 91 m (Inferred). Drilling in 2023 is planned to infill and upgrade the initial mining area as well as the lower regions of the deposit.

Drill core is sampled on 3 m intervals for assay by default, unless notable geologic character defines a smaller or slightly larger interval. Typical sample intervals during the 2021 prefeasibility through feasibility study drilling programs averaged 2.7 m. The prefeasibility through feasibility study drilling and sampling programs generated 1,267 new assay samples in the NRS deposit, with 3,392 m of core assayed. Core assayed prior to 1990 were assayed by Kennecott's internal laboratories, following this all assays were completed by outside laboratories with documented internal and external quality assurance and quality control (QA/QC) procedures maintained to present. Assays and their origin laboratory are stored in the Rio Tinto acQuire™ database. Original assay certificates are stored on Rio Tinto network servers.

Bingham Canyon assay sample QA/QC procedures established in 1990 apply to all holes following 1990 as follows:

- Duplicate samples are generated from the remaining half core every 40th sample.
- Duplicate samples are generated from the crushed duplicate material every 20th sample.
- Matrix matched pulp standards are inserted every 20th sample.
- Five percent of pulps are randomly selected for assay validation at a second lab.

Given the short hole lengths and focused targeting for the 2021 drilling program, the automatic footage-based creation and insertion of duplicates and standards was replaced with the following manual process:

- One to three core sample duplicates are manually selected from the target zone in each hole.
- One to three crushed sample duplicates are manually selected from the target zone in each hole.
- One to three matrix-matched pulp standards are inserted for manually selected sample intervals from the target zone in each hole.
- One sample blank is inserted in each hole.

Results for duplicates and standards are checked, flagged, retested, or resampled if deemed necessary, and stored via automated reporting from the acQuire™ database, providing confidence in the accuracy of the sampling and assaying procedures, with fit-for-purpose precision on the assay values.

Estimation methodology

The block model designed for grade interpolation has block dimensions of 7.6 m x 7.6 m x 7.6 m, with subcells down to 1.5 m to reflect the granularity and precision of the wireframe geologic model. Samples are composited at 3 m intervals, breaking on lithological boundaries.

Detailed exploratory data analyses (EDA) are completed for all estimated variables. Estimation domains are controlled by grade shells (high, low, waste) within lithology wireframes, with statistics indicating good stationarity for silver (Ag), gold (Au), copper (Cu) and molybdenum (Mo). Contact plots indicate a mix of hard and soft boundary conditions.

Variography is completed for all domains by estimation variable. All domains utilize locally varying anisotropy to honour the observed greatest continuity parallel to the modelled geology. Correlograms utilize a spherical model with a nugget and three structures.

Ordinary Kriging is used to estimate Ag, Au, Cu, and Mo, with sulphur (S) co-Kriged with Cu. Density is estimated using inverse distance squared methods within detailed lithologic wireframe domains. Estimation is performed by nested searches (four progressively larger ellipses tied to percentages of each domain's variogram sill) for all variables.

Estimate validations for all variables include visual checks, global statistics by domain, swath plots for local statistics, change of support analyses, and statistical consideration of estimation passes. Validations indicate good agreement between composite, nearest-neighbour estimate, and Ordinary Kriged grades, and good control of the estimates within and across estimation domains. 90% of Indicated blocks are estimated in the first estimation pass.

Cut-off grades and modifying factors

Cut-off grade for Mineral Resources is determined on a Net Smelter Return (NSR) basis for total contained metal and recoveries through the Rio Tinto Kennecott concentrator, smelter, and refinery, with associated processing and handling costs. Metal prices for Cu, Au, Ag, and Mo are provided by the Rio Tinto Economics team, using internal analyses and projections. Recovery values are developed from the established performance of the Rio Tinto Kennecott processing plants and targeted metallurgical testing completed during prefeasibility and feasibility studies. Processing and handling costs are developed from demonstrated internal cost performance.

Consideration of reasonable prospects for eventual economic extraction aims to define reasonably contiguous regions of economic value given the project's general mining and economic assumptions.

Prospective extractability is defined in three steps:

1. Break even stopes are generated iteratively using variations in level origins, with the results merged into a single volume.

2. Any isolated volumes or stopes otherwise deemed unreasonable are manually removed.
3. The region is manually wireframed for additional smoothing.

The resulting volume represents a contiguous region where all material above cut-off is considered to have reasonable prospects for eventual economic extraction.

Criteria used for Mineral Resources classification

The NRS is classified by drill hole spacing, with consideration of the continuity and predictability of the fundamental geologic controls on the mineralisation, and with consideration of reasonable prospects for eventual economic extraction given general mining assumptions and a drill hole spacing study using established industry practices. Nominal drill hole spacing by category is as follows:

- Inferred spacing - 91 m (defined by variogram range)
- Indicated spacing - 61 m

In addition:

- Areas of high geologic uncertainty are manually excluded from the resource.
- Early generation drill holes (pre-1980) are excluded from the spacing calculation.
- Manual wireframing is used to define contiguous areas and exclude isolated blocks.

Summary of information to support Ore Reserves reporting

The addition of the Ore Reserve estimate for the NRS is based on the Mineral Resource model for the deposit along with the feasibility study completed in 2022. A recent in-depth internal review of the feasibility study has been completed which has validated the project conclusions. The economic cut-off methodology has been developed in order to maximise value within the deposit while reducing risk.

Ore Reserves are supported by the information set out in the Appendix to this release in accordance with the Table 1 checklist in the JORC Code. The following summary information is provided in accordance with rule 5.9 of the ASX Listing Rules.

Cut-off grades, mining method and modifying factors

The Ore Reserve cut-off is based on an NSR calculation which considers pricing, recoveries and costs. The \$150 NSR cut-off value selected for use was determined based on an iterative approach to determine the optimum value to the deposit. An additional selection criterion was applied to exclude high risk stopes in areas of the mineralisation where rock quality is modelled as poor, or where they come too close to existing infrastructure.

The NRS estimate is based on a sub-level, long hole open stoping mining method, using a primary secondary sequence with cemented aggregate backfill. Detailed geotechnical analysis has informed the mining method and mining dimensions using information gained from resource drilling. Modifying factors have been applied to the estimate, the first being a stope shape factor (92.5%) to deduct areas of the stope which cannot be practically drilled such as the stope "shoulders". External waste dilution (10% for secondaries, 2.5% for primaries) has been applied to the estimate at zero grade based on an evaluation of the geotechnical parameters with established industry empirical dilution guidelines. Finally, a mining recovery factor (90%) to account for drilled and blasted material or dilution which cannot be extracted from the stope. All these factors have been established as part of the feasibility study.

There are no material impacts from other Ore Reserve modifying factors, such as: governmental, tenure, environmental, cultural heritage, social or community. Appropriate agreements and approvals are in place to enable operation of the assets.

Processing method and assumptions

Underground ore from the NRS will be processed through the existing Kennecott facilities established as part of the open pit operation. Expected metal recovery and quality from downstream processing has been assessed through laboratory scale test work of samples generated from resource drilling, and the response of this material when blended with open pit ore.

Economic assumptions and study outcomes

Incremental cash flow is generated due to the addition of NRS ore to the open pit feed. This includes consideration of revenue generated from low-grade ore from underground which is above the open pit cut-off, deductions for material rehandling, pit ore deferral, and deleterious elements.

Rio Tinto applies a common process to the generation of commodity price assumptions across the group. This involves generation of long-term price forecasts based on current sales contracts, industry capacity analysis, global commodity consumption and economic growth trends (this includes the bonus / penalty adjustments for quality). Exchange rates are also based on internal Rio Tinto modelling of expected future country exchange rates. Due to the commercial sensitivity of these assumptions, an explanation of the methodology used to determine these assumptions has been provided, rather than the actual figures.

Criteria used for Ore Reserves classification

There are no Measured Resources within the NRS. All Probable Ore Reserves were converted from Indicated Resources. Any Inferred Mineral Resources within the Ore Reserve boundaries have been included within the Probable Ore Reserve tonnage as dilution with zero grade.

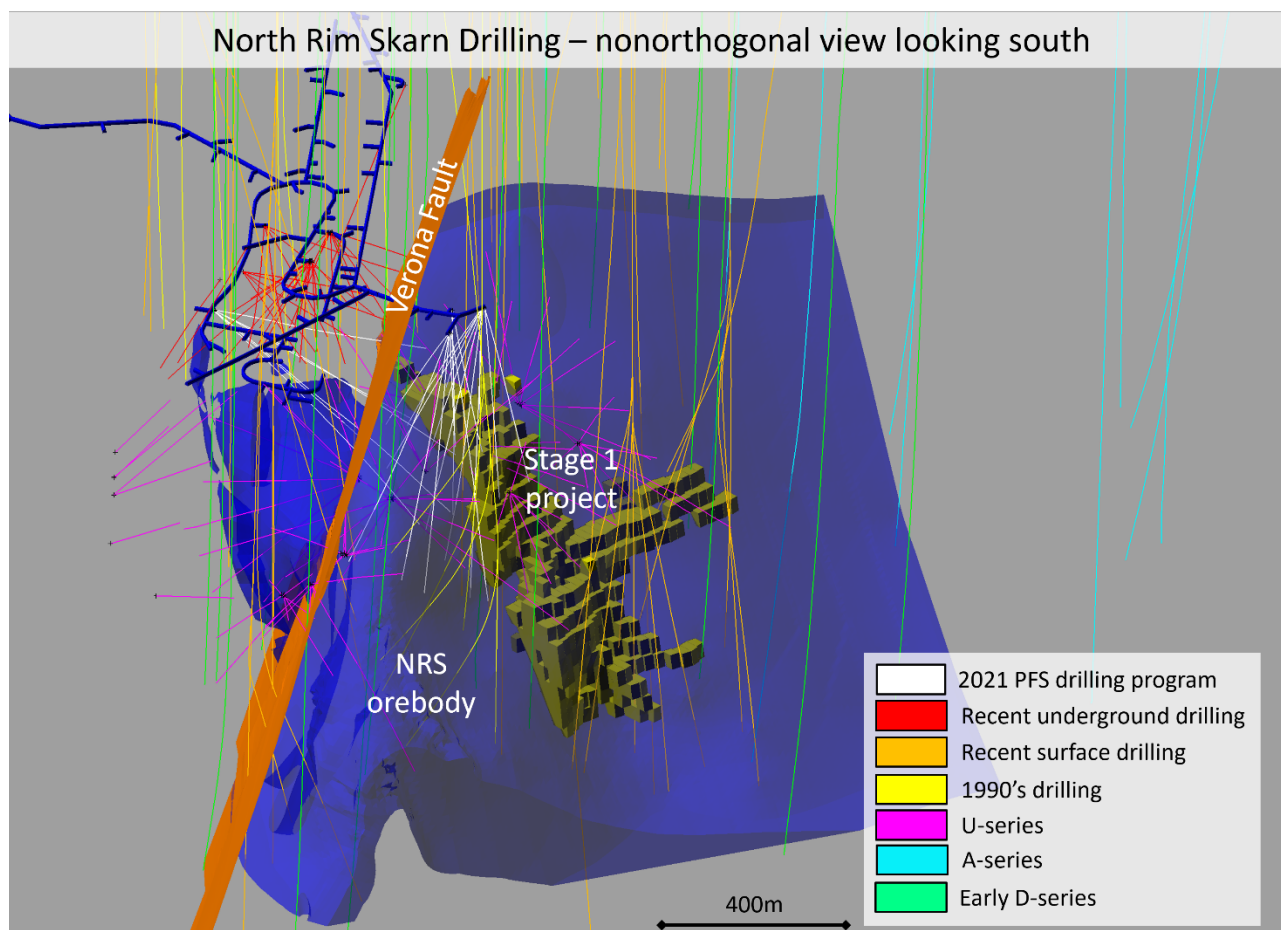


Figure 2 NRS drilling

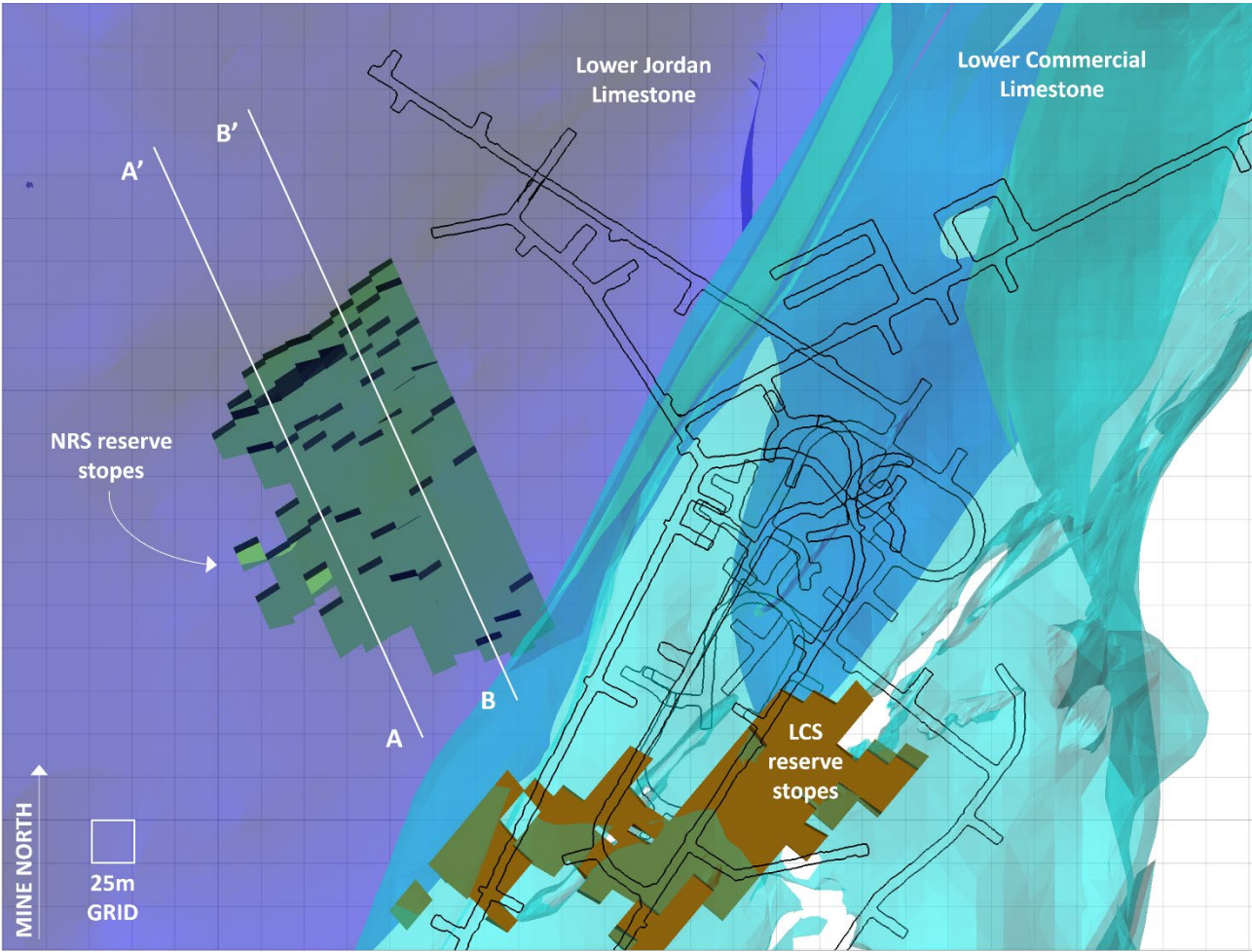


Figure 3 NRS geology and mine design plan view

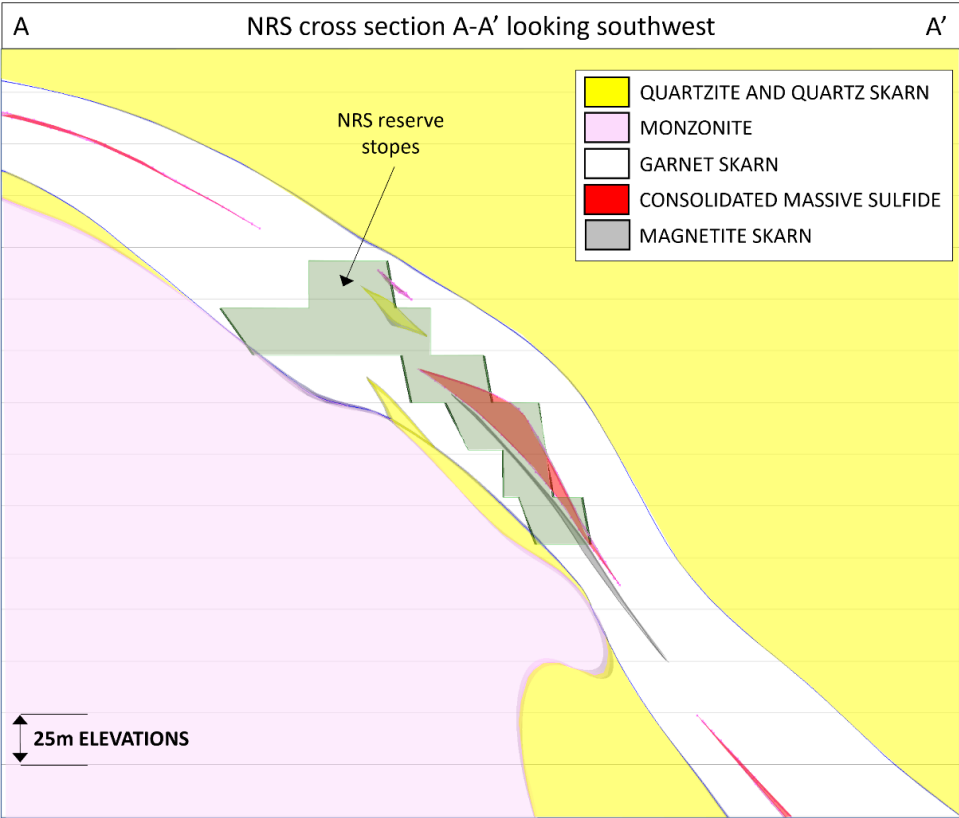


Figure 4 NRS geology cross section - slice A

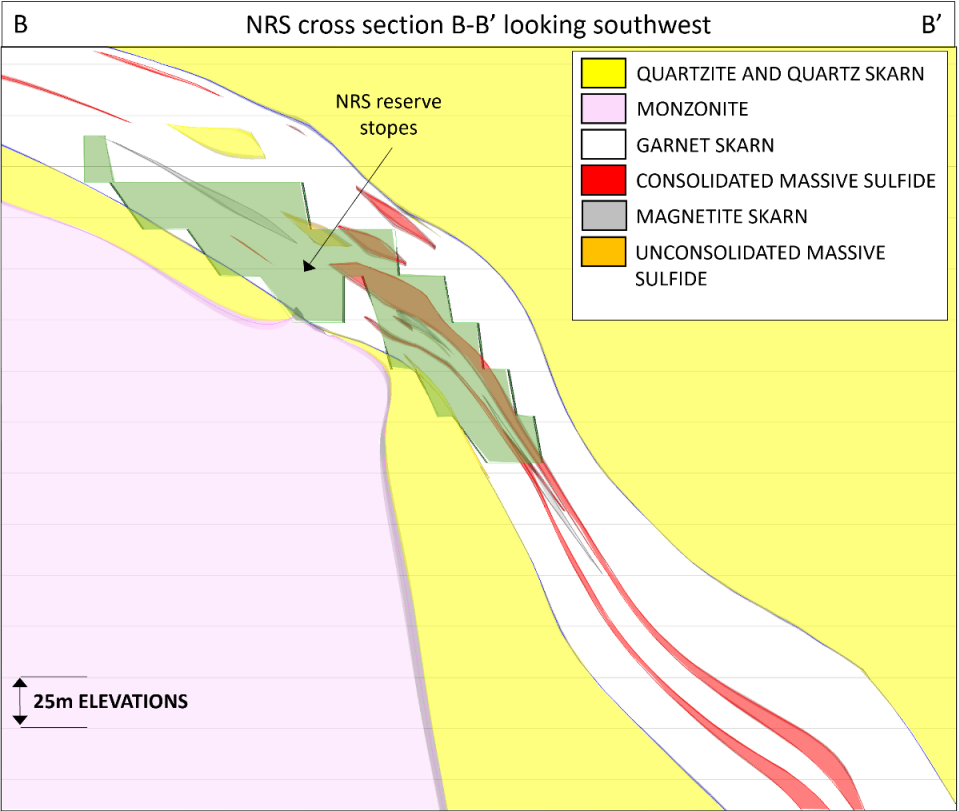


Figure 5 NRS geology cross section - slice B

Competent Persons' Statement

The information in this report that relates to Mineral Resources is based on information compiled under the supervision of Mr Ryan Hayes, who is a Member of the Australasian Institute of Mining and Metallurgy (MAusIMM). Mr Hayes has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity to which he is undertaking to qualify as a Competent Person as defined in the JORC Code. Mr Hayes is a full-time employee of Rio Tinto and consents to the inclusion in this report of Rio Tinto Kennecott Mineral Resources based on the information that he has prepared in the form and context in which it appears.

The information in this report that relates to Ore Reserves is based on information compiled under the supervision of Mr Stephen McNerney who is a Member of the Australasian Institute of Mining and Metallurgy (MAusIMM). Mr McNerney has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity to which he is undertaking to qualify as a Competent Person as defined in the JORC Code. Mr McNerney is a full-time employee of Rio Tinto and consents to the inclusion in this report of Rio Tinto Kennecott Operations Copper Ore Reserve based on the information that he has prepared in the form and context in which it appears.

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This announcement is authorised for release to the market by Steve Allen, Rio Tinto's Group Company Secretary.

North Rim Skarn JORC Table 1

The following table provides a summary of important assessment and reporting criteria used at North Rim Skarn for the reporting of Mineral Resources in accordance with the Table 1 checklist in *The Australasian Code for the Reporting of Exploration Results, Mineral Resources and Ore Reserves, 2012 Edition (The JORC Code)*. Criteria in each section apply to all preceding and succeeding sections.

Section 1: Sampling Techniques and Data

Criteria	Commentary
Sampling techniques	- Samples supporting resource estimation are taken from split diamond drill core of HQ and NQ diameters. - Samples are split from whole core on 3 m standard intervals, with smaller intervals as dictated by the logging geologist. - Half-core samples are sent for assay, with the other half remaining on site.
Drilling techniques	- Drilling techniques are standard diamond drill coring and wireline retrieval with standard NQ and HQ tubes from surface and underground. - All holes drilled since 2015 are cored using triple-tube techniques.
Drill sample recovery	- Core recovery is recorded as part of standard logging procedures. - Triple tube drilling techniques are used in contemporary drilling to preserve in-situ conditions. - Modern ore recovery is typically greater than 80%, with varying historic rates.
Logging	- All core intersecting the deposit is logged for geologic character, including lithology, alteration, mineralogy, veining, and structure. - Geotechnical logging is completed for RQD and Q.
Sub-sampling techniques and sample preparation	- Core is manually sawn into halves according to intervals selected by the logging geologist, with care taken to split mineralisation equally. - Core duplicate samples are created using the remaining half-core, at intervals specified by the logging geologist, with one to three core duplicate samples per orebody intercept. - Samples are prepared and assayed by an external lab, where they are crushed, then split and pulverized into four pulps. The crushed sample reject material is returned to Rio Tinto Kennecott. - Pulps are assayed for Au, Cu, Mo, Ag, and a suite of other elements. - Sampling procedures have been reviewed and audited by external sample experts, most recently in 2010 (AMEC), with no material findings.
Quality of assay data and laboratory tests	- Cu, Mo and Ag are assayed by HNO₃-HClO₄-HF-HCl digestion and ICP-AES analysis. Au is assayed by fire assay fusion with an AAS finish for one assay-ton. - Duplicate samples are generated from the crushed reject material and assayed at intervals specified by the logging geologist, with one to three duplicates per orebody intercept. - Matrix matched pulp standards are inserted at intervals specified by the logging geologist, with one to three standards per orebody intercept. - Blank sample material is inserted at intervals specified by the logging geologist, with one to three blanks per orebody intercept. - Current QA/QC procedures have been in place since 1990. The acQuire™ data management database system has been used since 2000. - Historic assays that have been tested by more than one lab are ranked, and the most appropriate assay stored as the primary assay. - The results indicate acceptable levels of precision and accuracy for Mineral Resource estimation with no material biases.
Verification of sampling and assaying	- Results are evaluated for overall grade, performance of standards, blanks, core duplicates, and lab duplicates, and re-tested when out of specification. - Mineral Resource and Ore Reserves standard operating procedures (SOPs) document data handling, processing, storage, and validation. - There is no adjustment to drillhole assays. There is a lab ranking for samples assayed by more than one lab and the most appropriate assay is stored as the primary assay.
Location of data points	Surface and underground drill hole collars are located using traditional survey instruments and techniques, or GPS survey.

	- With the exceptions of UD0004 and UD0005, all surface and underground downhole surveys since 2006 have been completed gyroscopically. All others were surveyed magnetically. Magnetic survey intervals (pre-2006) vary from 3 to 60 m typically. Gyroscopic survey intervals in surface holes (2006 – 2009) are typically 3 to 6 m. Gyroscopic survey intervals in targeted underground drilling since 2015 are 7.5 m. - Deviation in the current underground drill holes has been very minimal due to typically short hole lengths of 250 m or less, with very good geologic coherence between holes. Where rare disagreement between longer surface or historic holes and the current drilling is found, geologic interpretation and wireframes are controlled by the current drillholes. - Collar surveys for all holes are documented and are checked against pit geographic and underground as-built surveys. In the absence of misalignment between a collar and surface topography or underground as-built, all collars are assumed to be accurate. - All locations are referenced to the local Bingham Mine grid.
Data spacing and distribution	- Data spacing within the NRS orebody varies depending on location. - The NRS deposit is defined by 242 drill holes. - Underground drill holes occur at a variety of angles from flat to vertical. Surface drill holes are vertical to subvertical. - Nominal drill hole spacing in the NRS deposit is less than 60 m for the majority of the Mineral Resource (Indicated), with the remaining resource at a nominal spacing of 90 m (Inferred). 30 early historic drill holes (prior to 1974) are excluded from drill hole spacing calculations due to uncertain survey control. - Data spacing and grade continuity are directly assessed in the NRS Mineral Resource estimate and resulting Mineral Resource classification. - All assay data in the Mineral Resource estimate is composited to 3 m intervals.
Orientation of data in relation to geological structure	- Hole orientations vary between vertical, horizontal, and angled. - With few exceptions, drill holes pierce the full width of the tabular sub-horizontal orebody. - Angled and sub-horizontal drill holes provide good control of sub-vertical geologic structures such as the Verona fault. - Hole orientation introduces no material bias to the final Mineral Resource estimate.
Sample security	- Current sample security procedures include bolt seal chain of custody documentation tracking samples from the site to the laboratory. - Sample weights are cross checked between the site and the lab. - Half core and assay pulps are retained in a secure warehouse on site.
Audits or reviews	A comprehensive external review of the NRS resource model was completed in November 2022 by Wood Group USA, with no key issues identified.

Section 2: Reporting of Exploration Results

Criteria	Commentary
Mineral tenement and land tenure status	The NRS deposit is within the current operations of the Bingham Canyon Mine, owned and licenced to Rio Tinto Kennecott Copper (RTK's legal name is Kennecott Utah Copper LLC). Kennecott Utah Copper LLC, and indirect wholly owned subsidiary of Rio Tinto plc.
Exploration done by other parties	- Various companies since 1870 have worked around the core of the RTK holdings. As properties were acquired, exploration information was obtained and incorporated into the current database. - Since 2009, Rio Tinto Exploration has performed brownfield exploration in and near the deposit.
Geology	- The NRS deposit is located in the Bingham mining district southwest of Salt Lake City, Utah. The Bingham mining district is dominated by the Bingham Canyon copper-molybdenum-gold porphyry system, which consists of the Eocene monzonite-quartz monzonite Bingham Stock and deformed siliciclastic and carbonate country rock of the Palaeozoic Bingham Mine Formation. The NRS deposit is hosted in mineralized skarn of the Lower Jordan Limestone (LJLS) unit of the Lower Bingham Mine Formation. This unit is proximal to the Bingham Canyon porphyry system and has been altered to copper-gold hosting calc-silicate skarn through prograde metasomatism with localized retrograde massive sulphide and siderite. This unit has been variably folded and faulted prior to mineralisation, resulting in fold thickening and repetition of the units across faults. - The NRS deposit lies in the footwall of the southwest dipping Midas thrust fault, west of the older northeast striking and steeply dipping oblique transverse Verona fault. The NRS is bounded to the south by the Bingham Canyon porphyry monzonite and the Midas fault, open to the north at

	depth. Palaeozoic country rock within the NRS is folded in an asymmetric anticline, slightly overturned to the east, with a gentle plunge to the north.		
Drillhole Information	The NRS deposit is defined by 241 surface and underground diamond drill holes, drilled between 1958 and 2021. The current (2020 – 2021) feasibility drilling program totals 25 holes and 1,267 new assays.		
	Campaign (years)	# of holes	location
	1958 - 1973	30	surface
	1980s	89	underground
	1990's	13	surface
	2000 - 2013	46	surface
	2012 - 2018	38	underground
	2020 - 2021	25	underground
	TOTAL	241	
Data aggregation methods	Exploration results have not been reported separately; therefore, this criteria category is not applicable.		
Relationship between mineralisation, widths and intercept lengths	- Hole orientations vary between vertical, horizontal, and angled. - Orebody and mineralisation geometry are well defined. - Drill holes pierce the full width of the orebody and mineralised structures. - Hole orientation introduces no material bias to the final Mineral Resource estimate.		
Diagrams	See body of release for diagrams.		
Balanced reporting	Exploration results have not been reported separately; therefore, this criteria category is not applicable.		
Other substantive exploration data	No additional exploration data to report.		
Further work	Studies continue to upgrade the remaining Mineral Resources and develop additional Ore Reserves.		

Section 3: Estimation and Reporting of Mineral Resources

Criteria	Commentary
Database integrity	- All drilling data are securely stored in an acQuire™ geoscientific information management system managed by a dedicated team within RTK. The system is backed up daily. - All collar, survey, assay and geology data loaded to the database are manually verified against original documents.
Site visits	The Mineral Resource Competent Person is located on site.
Geological interpretation	- There is high confidence in the geological interpretation of the primary controls on mineralisation and the ore/waste boundaries of the NRS deposit. - The mineralised host is stratigraphically controlled, and fault-bounded, with clearly distinguishable gangue mineralogy. - The northern fold hinge and overturned limb are poorly drilled and excluded from the Mineral Resource. - Verona fault models are reinterpreted and updated local to the NRS deposit, and the existing fault wireframe for the Midas fault is carried forward unchanged. - Targeted drilling at multiple orientations provides the primary control of the geologic interpretation. - The geologic interpretation honours the drill hole data and is stratigraphically and structurally coherent. - Wireframes representing primary geologic domains provide the primary control of Mineral Resource estimation domains.
Dimensions	- The NRS Mineral Resource is contained within a roughly tabular zone dipping moderately northwest, approximately 50 m to 100 m thick, extending 1000 m along strike, and 900 m down dip. - The NRS Mineral Resource is located beneath the Bingham Canyon Mine open pit, at approximately the 3200 level, immediately adjacent to the active underground drainage gallery workings.

Estimation and modelling techniques	- The block model designed for grade interpolation has parent block dimensions of 7.6 m square, with sub-blocks to 1.5 m used to reflect the granularity of the geology models. - Samples are composited on 3 m intervals, breaking on lithological boundaries. Composite length is chosen to match the granularity of the block model, the maximum assay size and the general observed grade and geological variation downhole. - Detailed statistical analyses, exploratory data analysis (EDA), are completed for all economic and deleterious variables. Box plot analyses are completed for all estimated variables with a breakdown by lithology. Contact plots are completed for Ag, Au, Cu, Mo, to determine boundary conditions and univariate statistics compiled and evaluated for similarities. Capping of high grade statistical outliers is applied within each estimation domains. - Variography is completed for all domains by estimation variable. - Ordinary Kriging is selected as the primary interpolation method for all variables as it is statistically a robust method that realistically reflects grade trends, especially in areas of dense data. S is co-Kriged with Cu. - Estimation is performed by nested searches of four progressively larger ellipses tied to percentages of each domain's variogram sill. - The block model grade distribution has been visually validated by comparing the drill hole composite grades with the estimated grade in the block model, with good agreement. - Differences observed between the nearest-neighbour and Ordinary Kriging means for each domain are considered acceptable. - Swath plots show good agreement between the raw composites, declustered composites, the nearest-neighbour estimate, and the Ordinary Kriging estimate. - Change of support analyses indicate that, for material above the cut-off, the model underestimates grades by 3% and tonnage by 2%. These differences are considered acceptable, indicating that estimate is not over-smoothed with respect to the theoretical selective mining unit (SMU) and the estimate is slightly conservative. 90% of Indicated blocks are estimated in the first estimation pass.
Moisture	All Mineral Resource tonnages are estimated and reported on a dry basis.
Cut-off parameters	- Cut-off grade for Mineral Resources is determined on a NSR basis for total contained metal and recoveries through the Rio Tinto Kennecott concentrator, smelter, and refinery, with associated processing and handling costs. - Metal prices for Cu, Au, Ag, and Mo are provided by the Rio Tinto Economics team, using internal analyses and projections. - Recovery values are developed from the established performance of the Rio Tinto Kennecott processing plants and targeted metallurgical testing completed during prefeasibility and feasibility studies. - Processing and handling costs are developed from demonstrated internal cost performance. - All material above cut-off is considered to have reasonable prospects for eventual economic extraction.
Mining factors or assumptions	- The assumed mining method is sub-level, long hole open stoping, using a primary secondary sequence with cemented backfill. This is a well-known and proven mining method used extensively within the industry and can be applied effectively within this deposit given the recommended geotechnical limitations. - Geotechnical parameters have been established using detailed, and validated core logging results in conjunction with geophysical surveys. These have been evaluated against established industry empirical stoping guidelines, along with detailed numerical modelling to generate recommended stable dimensions.
Metallurgical factors or assumptions	- Metallurgical assumptions are developed from the established performance of the Rio Tinto Kennecott processing plants and targeted metallurgical testing completed during prefeasibility and feasibility studies. - Metallurgical testing and modelling assume a blended feed of North Rim Skarn and open pit ore.
Environmental factors or assumptions	- The Mineral Resource estimate assumes a small footprint established in the bottom of the existing open pit, with all other major development to occur underground. - All waste rock and tails will be handled with the open pit waste rock and tails. - All tails from the NRS will be contained within the existing Tailings Storage Facility. - All approvals and permits necessary to mine the Ore Reserves have been obtained.
Bulk density	Density samples are taken from whole core at 15 m intervals.

	- Specific gravity is determined by using an immersion method using sealed core and using volumetric calculations of dry core samples. - Density is estimated by inverse distance and nearest neighbour methods for each lithology domain.
Classification	- Resource classification criteria are based on geologic confidence in the predictable continuity of mineralisation, with consideration for reasonable prospects for eventual economic extraction. - Classification by nominal drill hole spacing reflects the following: - Measured category resource is 20 m drill spacing, which is predictable with $\pm 15\%$ relative precision at the 90% confidence level on a quarterly production interval. - Indicated category resource is 61 m drill spacing, which is predictable with $\pm 15\%$ relative precision at the 90% confidence level on an annual production interval. - Inferred category resource is 91 m drill spacing, as defined by the range of the variogram within regions of geologic continuity. - Blocks are coded with nominal drill hole spacing using the average distance of the closest three holes. - Classification volumes are created around contiguous blocks at the stated spacing categories, with consideration for the stated mining method and scale, excluding isolated discontinuous regions. - The classification criteria are deemed fit-for-purpose and are typical of those in use at other skarn-hosted deposits.
Audits or reviews	A comprehensive external review of the NRS resource model was completed in November 2022 by Wood Group USA, with no key issues identified.
Discussion of relative accuracy/confidence	- Single-block Kriging analysis of sample spacing supports the confidence intervals described for Mineral Resource classification. - Confidence in geological boundaries has not been quantified but has evolved with and withstood subsequent drilling campaigns. The Competent Person has taken into consideration the maturity of the geological model in determining that the continuity of geological features associated with mineralisation is sufficient to support the classification of the Mineral Resource.

Section 4: Estimation and Reporting of Ore Reserves

Criteria	Commentary
Mineral Resource estimate for conversion to Ore Reserves	- The NRS Ore Reserve estimate was based on the 2022 Mineral Resource model. No material changes have been made (or are available) to the resource model since this date, except for updates to metal prices and mining costs. - Mineral Resources are reported exclusive of Ore Reserves.
Site visits	The Ore Reserve Competent Person is located near the mine site and periodically visits the mine and plant sites.
Study status	The 2023 Ore Reserve estimate is based on a 2022 feasibility study, as well as a recent review of geotechnical and mining parameters, along with metal prices, and costs.
Cut-off parameters	- The cut-off grade for the estimate has been based on a NSR calculation which uses the best understanding of metal prices, recoveries, and mine operating costs. - A \$150 NSR cut-off grade was selected based on an evaluation of the optimized Life of Mine production schedule with a series of NSR cut-off values to determine that which generated the highest relative net present value (NPV) within areas of high resource confidence. - Metal prices used are provided by Rio Tinto Economics and are generated based on industry capacity analysis, global commodity consumption, and economic growth trends. A single long term price point is used in the definition of ore and waste and in the financial evaluations underpinning the Mineral Resource and Ore Reserve statement. The detail of this process and of the price points selected are commercially sensitive and are not disclosed. - Metallurgical testing has been done in conjunction with historic understanding of RTK's milling, smelting, and refining facilities. - Mine operating costs are informed either from current operations or from a first principal cost build-up using recently tendered market rates.
Mining factors or assumptions	- The conversion of Mineral Resources to Ore Reserves has been done using a detailed mine design, based on an in-depth evaluation of geotechnical, and operational parameters. - The selected mining method is bottom up, sub-level, long hole open stoping, using a primary secondary sequence with cemented backfill. This is a well-known and proven mining method and can be applied effectively within this deposit given the recommended geotechnical limitations.

	• Geotechnical parameters have been established using detailed, and validated core logging results in combination with geophysical surveys. These have been evaluated against established industry empirical stoping guidelines to generate recommended stable dimensions. Detailed numerical modelling has also been completed to confirm global mine stability and validate the mining sequence. • The most recent resource model has been used for stope generation and optimisation with an effort to maximize NPV and minimize high risk material. In some cases, stope dimensions have been reduced, or stopes have been removed where geotechnical recommendations have shown that variable ground conditions could negatively impact the ability to mine these areas. • Stope dimensions are set at 22.9 m high, 15.2 m wide, and a variable length between 15.2 to 9.1 m. Permanent development needed to access the deposit will be 5.9 m high by 5.5 m wide, reducing to 4.9 m high by 5.5 m wide. Stope ground support has been accounted for to aid in stability and is planned for the backs and sides of the upper drift, as well as the brow from which mucking will occur. • External dilution (10% for secondaries, 2.5% for primaries) has been applied to the estimate at zero grade based on an evaluation of the geotechnical parameters with established industry empirical dilution guidelines. Given the arrangement of the mine, the majority of waste dilution is estimated to take place within secondary stopes from the adjacent backfilled primaries with a small amount within primaries from the stope in front. • Ore dilution is expected to occur within primary stopes from the adjacent secondaries with an overall net zero change in ore tonnes. This material has not been addressed within the Ore Reserve but has been accounted for within material movements. • Two distinct recovery factors have been applied to the estimate, the first being a stope shape factor (92.5%) to deduct areas of the stope which cannot be practically drilled such as the stope “shoulders”. The second being a mining recovery factor (90%) to account for drilled and blasted material or dilution which cannot be mucked out from the stope. Both of these factors have been established based on the experience of the personnel on site with these mining methods and have been validated via internal and external reviews. • Minimum mining widths have been established and applied to the mine design which underpins the estimate. These are based on the dimensions of the existing mechanized mining fleet, and the expected additional equipment needed to operate the mine (Including allowance for Battery Electric Vehicle (BEV) equipment size). • The mine production schedule for the feasibility study was derived using Inferred Mineral Resources (<1% of total). The deduction of these resource volumes has proven to make no material impact to the outcome of the overall economic evaluation. • The mining method relies on the establishment of a Cemented Aggregate Fill (CAF) plant. This plant is currently in construction during 2023.
Metallurgical factors or assumptions	• The metallurgical processes has been developed and optimized based on the long operating history of the existing onsite concentrator, along with targeted metallurgical testing over several campaigns assessed through laboratory scale test work of samples generated from the resource drilling process. The results of this work informed the performance of the plant when NRS ore is added to the open pit feed, and the ultimate metal recovery of the underground ore component. • All process performance parameters used in the estimate (recoveries, concentrate grades including deleterious elements) are based on the results of both this testing campaign, and historical performance. (Processing recoveries are as follows, 92.7% Cu, 68.6% Au, 64.4% Ag, and 45.1% Mo)
Environmental	• The estimate assumes a small footprint established in the bottom of the existing open pit, with all other major development to occur underground. • All by-products from the material processed can be contained within the existing Tailings Storage Facility with no changes needed to accommodate the NRS. • All approvals and permits necessary to mine the Ore Reserves have been obtained.
Infrastructure	• Much of the required infrastructure for the estimate is already available via existing site facilities. This includes mechanical and electrical infrastructure operating within an established drainage gallery tunnel which is currently used to dewater the existing open pit. • Decline development will be extended from the existing drainage gallery tunnel to access the NRS and establish ventilation connections. • An additional CAF Plant will be constructed adjacent to the portal, and an upgraded underground ventilation facility will be established to achieve required airflows. • All personnel and materials will access the operation via the open pit and operations will be integrated with the existing drainage gallery maintenance. • Ore material will be rehandled at the drainage gallery portal using open pit equipment and hauled to the open pit crusher to be blended with open pit material.

	All downstream processing will be done with the existing on-site infrastructure with the exception of a shotcrete fibre mitigation installation which is scheduled for construction at the processing plant during 2023.
Costs	- Development capital costs are based on estimates developed for the feasibility study. - Operating costs are based on a first principle estimate derived for each additional underground activity. Both estimates utilize recent site-actual cost data where available. - Estimates of prices for consumables are based on historical pricing and global commodity consumption and economic growth trends. - Transportation and treatment charges for existing facilities are based on historical and projected estimates. - There are no royalty obligations. The financial modelling includes an allowance for Utah state severance tax. - Due to the commercial sensitivity of these assumptions, an explanation of the methodology used to determine these assumptions has been provided, rather than the actual figures.
Revenue factors	- Revenue projections are based on combined open pit and underground mill head grades, process recovery losses and product prices. - The revenue analysis includes other factors within the calculation such as the processing of low-grade ore from underground which is above the open pit cut-off, and the sale of sulphuric acid. - The NRS project uses metal prices provided by Rio Tinto Economics that are generated based on industry capacity analysis, global commodity consumption, and economic growth trends. A single long term price point is used in the definition of ore and waste and in the financial evaluations underpinning the Mineral Resource and Ore Reserve. The detail of this process and of the price points selected are commercially sensitive and are not disclosed.
Market assessment	All Ore Reserve products, other than molybdenum, are sold on open markets with no long-term contract commitments. Molybdenum is sold through contracts with roaster facilities.
Economic	- The economic analysis for the NRS is based on the incremental cash flow that is generated through the existing ore processing facilities as a result of the additional mineralized material from the NRS which is added to the open pit mine feed. - This economic calculation includes other factors such as the cost of material rehandling, the cost of pit ore deferral, and the impact of deleterious elements. - Economic inputs such as carbon pricing, inflation and discount rates are also generated internally at Rio Tinto. The detail of this process is commercially sensitive and not disclosed. - Economic evaluation using Rio Tinto long-term prices demonstrates a positive net present value for the NRS Ore Reserves. - The resulting economics for NRS are sound with healthy cashflow due to the size and duration of the project. The NRS also complements other underground projects and provides a significant amount of infrastructure and fixed costs from which additional projects can leverage.
Social	The mining tenure is wholly owned, and all permits necessary to mine the Ore Reserve have been obtained.
Other	- Ongoing project risk assessments have been conducted throughout the duration of the feasibility study, and project development. - The estimate leverages the existing established licence to operate for the open pit mine operating area.
Classification	- The basis for the Ore Reserve classification is the established Mineral Resource confidence categories for the deposit along with the consideration of all modifying factors. - Proved Ore Reserves have not been included due to the lack of Measured Mineral Resources within the NRS geological model. - Indicated Mineral Resources within the Ore Reserves boundaries are classified as Probable Ore Reserves. - Any Inferred Mineral Resources within the Ore Reserves boundaries (<1% of total) have been included within the Probable Ore Reserves volume at zero grade; constituting internal dilution. The deduction of these resource volumes has proven to make no material impact to the outcome of the overall economic evaluation.
Audits or reviews	A comprehensive formal external review of the NRS resource was completed in 2022 by Wood Group USA, with no key issues identified.

Discussion of relative accuracy/ confidence	• The accuracy of the Ore Reserves estimate is based on the results of the feasibility study and an assessment of economic factors. • The build-up of the geotechnical assumptions which underpin the stope sizes, mining methods and dilution is based on sound data which has been validated and peer reviewed, but no operational data is available to corroborate these assumptions. • Similarly, operating costs for the NRS to operate within the open pit are also developed using sound basis but are yet to be demonstrated. • It is expected that as stoping operations continue, modifying factors such as stope dimensions, dilution, mining recovery, productivity and cost assumptions will be better understood and refined based on actual observed / measured data.
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