22 February 2023

Ore Reserve and Mineral Resource updates: supporting information and Table 1 checklists

Rio Tinto today announces changes in Mineral Resources and Ore Reserves to support its 2022 annual reporting, including:

- Increased Ore Reserves at the Rio Tinto Kennecott (RTK) copper operations Bingham Canyon deposit in Utah.
- Increased Mineral Resources at the Winu copper project in Western Australia.
- Revised resource classification for the Mineral Resources at the QIT Madagascar Minerals (QMM) Petriky mineral sands deposit in Madagascar.
- Revised classification for the Ore Reserves at the Richards Bay Minerals (RBM) Zulti South mineral sands deposit in South Africa.

The changes in Mineral Resources and Ore Reserves are reported in accordance with the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves, 2012 Edition (JORC Code) and the ASX Listing Rules. Supporting information relating to the changes of Mineral Resources and Ore Reserves is set out in this release and its appendices. Mineral Resources and Ore Reserves are quoted in this release on a 100 percent basis. Mineral Resources are reported in addition to Ore Reserves. The figures used to calculate Mineral Resources and Ore Reserve are often more precise than the rounded numbers shown in the tables, hence small differences may result if the calculations are repeated using the tabulated figures.

These changes will be included in Rio Tinto's 2022 Annual Report, to be released to the market on 22 February 2023 (London time) / 23 February 2023 (Melbourne time), which will set out in full Rio Tinto's Mineral Resources and Ore Reserves position as at 31 December 2022, and Rio Tinto's interests.

Rio Tinto Kennecott

Mineral Resources and Ore Reserves for the RTK Bingham Canyon open pit are presented in Table A and Table B. Ore Reserves tonnes have increased by 70% as a result of the completion of a pre-feasibility study for the Apex pit wall pushback which has enabled the conversion of Mineral Resources plus previously unclassified mineralisation to Ore Reserves. Mineral Resources have decreased as a result of this conversion.

Winu

Mineral Resources for the Winu copper project are presented in Table C. This updated Mineral Resource represents a 19% increase in tonnage, no change in copper grade, a 12% increase in gold grade, a 19% increase in contained copper metal and a 33% increase in contained gold metal. The updated Mineral Resource is supported by the advancement of mining and processing studies and additional drilling information acquired since the release of the Indicated and Inferred Mineral Resource published in the 2021 Rio Tinto Annual Report. There are no Ore Reserves reported for Winu.

Winu continues to advance agreement making with host Traditional Owners, the Martu and Nyangumarta. Planned drilling, fieldwork and study activities continue to strengthen the development pathway ahead of applications for regulatory and other required approvals.

QIT Madagascar Minerals

The Petriky Mineral Resources form part of the QMM Mineral Resources which are presented in Table D. The previously reported Petriky Mineral Resource was classified as Indicated however it was re-classified to Inferred for the 2022 reporting period. The rationale to down-grade Petriky resources from Indicated to Inferred was a combination of development risk and delays in obtaining sufficient mineralogy and geotechnical data. Government permitting to recommence drilling in the Petriky sector has been delayed, increasing the risk of future resource development of Petriky, which has been identified as one of the alternatives to replace Mandena once depleted. There are no Ore Reserves reported for Petriky; Ore Reserves for QMM are for the Mandena deposit and are presented in the Rio Tinto 2022 Annual Report.

Richards Bay Minerals

The Zulti South Ore Reserves form part of the RBM Ore Reserves which are presented in Table E. RBM Ore Reserve tonnes for 2022 include a change in classification for the Zulti South project from Proven Reserves to Probable Reserves. The change results from increased uncertainty in the modifying factors as a result of schedule delays, due to ongoing community and security challenges. The original project timelines have been affected. The project remains on full suspension. Any restart of project activities is dependent on the receipt of internal approvals, after which the classification for the Zulti South Ore Reserves would be reviewed. All Mineral Resources at Zulti South have been converted to Ore Reserves, thus there are no additional Mineral Resources reported.

Table A Rio Tinto Kennecott Copper Bingham Canyon Open Pit Mineral Resources as at 31 December 2022

	Likely mining method[1]	Measured Mineral Resources as at 31 December 2022					Indicated Mineral Resources as at 31 December 2022					Total Measured and Indicated Mineral Resources as at 31 December 2022				
		Tonnage	Grade				Tonnage	Grade				Tonnage	Grade			
Copper[2]		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)																
- Bingham Open Pit [3]	O/P	49	0.50	0.15	2.42	0.019	30	0.42	0.15	2.44	0.015	79	0.47	0.15	2.43	0.018

	Inferred Mineral Resources as at 31 December 2022					**Total Mineral Resources as at 31 December 2022**					Rio Tinto interest	Total Mineral Resources as at 31 December 2021				
	Tonnage	Grade				**Tonnage**	**Grade**					Tonnage	Grade			
Copper[2]	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)																
- Bingham Open Pit [3]	14	0.21	0.16	1.19	0.006	**93**	**0.43**	**0.15**	**2.24**	**0.016**	100.0	256	0.39	0.20	1.75	0.017

1. Likely mining method: O/P = open pit/surface.
2. Copper Mineral Resources are reported on a dry in situ weight basis.
3. Bingham Canyon Open Pit Mineral Resource molybdenum grades interpolated from exploration drilling assays have been factored based on a long reconciliation history to blast hole and mill samples.

Table B Rio Tinto Kennecott Copper Bingham Canyon Ore Reserves as at 31 December 2022

	Type of mine[1]	Proved Ore Reserves as at 31 December 2022					Probable Ore Reserves as at 31 December 2022					**Total Ore Reserves as at 31 December 2022**				
		Tonnage	Grade				Tonnage	Grade				**Tonnage**	**Grade**			
Copper[2]		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)																
- Bingham Open Pit[3]	O/P	484	0.40	0.18	2.10	0.037	395	0.35	0.17	1.82	0.029	**880**	**0.38**	**0.18**	**1.97**	**0.033**

	Average mill recovery %				Rio Tinto interest	**Rio Tinto share recoverable metal**				Total Ore Reserves as at 31 December 2021				
										Tonnage	Grade			
Copper[2]	Cu	Au	Ag	Mo	%	**Mt Cu**	**Moz Au**	**Moz Ag**	**Mt Mo**	Mt	% Cu	g/t Au	g/t Ag	% Mo
Bingham Canyon (US)														
- Bingham Open Pit[3]	87	69	72	59	100.0	**2.890**	**3.406**	**40.386**	**0.172**	541	0.44	0.17	2.22	0.029

1. Type of Mine: O/P = open pit/surface.
2. Copper Ore Reserves are reported as dry mill feed tonnes.
3. Bingham Canyon Open Pit Ore Reserve molybdenum grades interpolated from exploration drilling assays have been factored based on a long reconciliation history to blast hole and mill samples.

Table C Winu Mineral Resources as at 31 December 2022

	Likely mining method[(1)]	Measured Mineral Resources as at 31 December 2022				Indicated Mineral Resources as at 31 December 2022				Total Measured and Indicated Mineral Resources as at 31 December 2022			
		Tonnage	Grade			Tonnage	Grade			Tonnage	Grade		
Copper[(2)]		Mt	% Cu	g/t Au	g/t Ag	Mt	% Cu	g/t Au	g/t Ag	Mt	% Cu	g/t Au	g/t Ag
Winu (Australia)	O/P	-	-	-	-	222	0.45	0.35	2.73	222	0.45	0.35	2.73

	Inferred Mineral Resources as at 31 December 2022				**Total Mineral Resources as at 31 December 2022**				Rio Tinto interest	Total Mineral Resources as at 31 December 2021			
	Tonnage	Grade			**Tonnage**	**Grade**				Tonnage	Grade		
Copper[(2)]	Mt	% Cu	g/t Au	g/t Ag	**Mt**	**% Cu**	**g/t Au**	**g/t Ag**	%	Mt	% Cu	g/t Au	g/t Ag
Winu (Australia)	499	0.38	0.33	1.98	**721**	**0.40**	**0.34**	**2.21**	100.0	608	0.40	0.30	2.26

1. Likely mining method: O/P = open pit/surface.
2. Copper Mineral Resources are reported on a dry in situ weight basis.

Table D QIT Madagascar Minerals Mineral Resources as at 31 December 2022

	Likely mining method[(1)]	Measured Mineral Resources as at 31 December 2022			Indicated Mineral Resources as at 31 December 2022			Total Measured and Indicated Mineral Resources as at 31 December 2022		
		Tonnage	Grade		Tonnage	Grade		Tonnage	Grade	
Titanium dioxide feedstock[(2)]		Mt	% Ti Minerals	% Zircon	Mt	% Ti Minerals	% Zircon	Mt	% Ti Minerals	% Zircon
QMM (Madagascar)	O/P	445	4.3	0.2	398	4.0	0.2	843	4.2	0.2

	Inferred Mineral Resources as at 31 December 2022			**Total Mineral Resources as at 31 December 2022**			Rio Tinto interest	Total Mineral Resources as at 31 December 2021		
	Tonnage	Grade		**Tonnage**	**Grade**			Tonnage	Grade	
Titanium dioxide feedstock[(2)]	Mt	% Ti Minerals	% Zircon	**Mt**	**% Ti Minerals**	**% Zircon**	%	Mt	% Ti Minerals	% Zircon
QMM (Madagascar)	596	3.9	0.2	**1,439**	**4.1**	**0.2**	80.0	1,470	4.1	0.2

1. Likely mining method: O/P = open pit/surface.
2. Titanium dioxide feedstock Mineral Resources are reported as dry in situ tonnes.

Table E Richards Bay Minerals Ore Reserves as at 31 December 2022

Titanium dioxide feedstock[2]	Type of mine[1]	Proved Ore reserves as at 31 December 2022			Probable Ore Reserves as at 31 December 2022			**Total Ore Reserves as at 31 December 2022**		
		Tonnage	Grade		Tonnage	Grade		**Tonnage**	**Grade**	
		Mt	% Ti Minerals	% Zircon	Mt	% Ti Minerals	% Zircon	**Mt**	**% Ti Minerals**	**% Zircon**
RBM (South Africa)	O/P	552	1.6	0.2	732	3.1	0.4	**1,284**	**2.4**	**0.3**

Titanium dioxide feedstock[2]	Rio Tinto interest	**Rio Tinto share Marketable product**		Total Ore Reserves as at 31 December 2021		
				Tonnage	Grade	
	%	**Mt Titanium Dioxide Feedstock**	**Mt Zircon**	Mt	% Ti Minerals	% Zircon
RBM (South Africa)	74.0	10.4	2.5	1,393	2.3	0.3

1. Type of Mine: O/P = open pit/surface.
2. The marketable product (zircon at RBM and zirsil at QMM) is shown after all mining and processing losses. Titanium dioxide feedstock Ore Reserves are reported as dry in situ tonnes.

Rio Tinto Kennecott - Bingham Canyon

The RTK Mineral Resources and Ore Reserves are contained within the Bingham Canyon copper, gold, and molybdenum porphyry deposit and would be mined by a northernly expansion of the open pit located 41 km southwest of Salt Lake City, Utah (Figure 1).

The pre-feasibility study for the mine life extension comprises the addition of the Apex pushback in the north part of the current Bingham Canyon open pit. The pre-feasibility study was completed during 2022 and funds were approved to progress to the feasibility study stage. After the completion of the Apex pushback pre-feasibility study, 64% of total Mineral Resources of Rio Tinto Kennecott have been converted to Ore Reserves.

Study work to date supports the expansion of the open pit primarily to the north with some additional deepening of the pit bottom and processing to refined copper, gold, silver and molybdenum concentrates utilising current RTK integrated facilities. The pre-feasibility study, including infill drilling, refined the mineralisation, geology, structure, geotechnical and metallurgical models of this area of the pit. These additional Ore Reserves can be mined under existing agreements and approvals.

Additional tailings capacity was identified during the pre-feasibility study, allowing changes to the Apex ultimate wall. The additional tailings capacity provides for additional ore to be processed, allowing for more mining at depth and expanding the Apex cut from 250 Mt to 455 Mt. This additional ore material has lower copper grade but adds higher molybdenum grade to the Ore Reserves. Changes to Mineral Resources and Ore Reserves are shown in Table F and Table G.

Bingham Canyon operations – United States of America

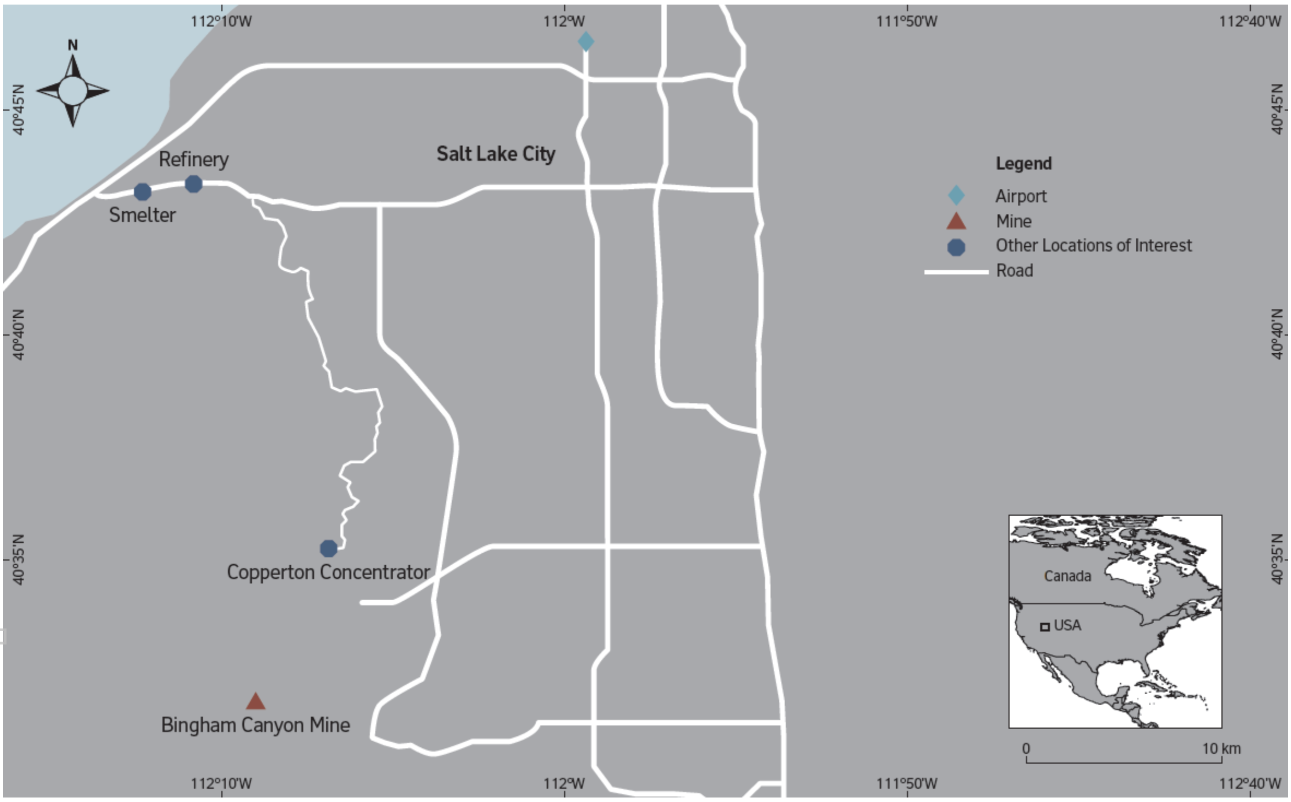

Figure 1 **Property location map – Bingham Canyon**

Table F Changes to Bingham Canyon open pit Mineral Resources

	Measured Mineral Resources					Indicated Mineral Resources				
	Mt	% Cu	g/t Au	g/t Ag	% Mo	Mt	% Cu	g/t Au	g/t Ag	% Mo
Mineral Resources at 31 Dec 2021	121	0.46	0.24	2.14	0.019	129	0.32	0.16	1.40	0.016
Additions	49	0.50	0.15	2.42	0.019	30	0.42	0.15	2.44	0.015
Depletions	121	0.46	0.24	2.14	0.019	129	0.32	0.16	1.40	0.016
Mineral Resources at 31 Dec 2022	**49**	**0.50**	**0.15**	**2.42**	**0.019**	**30**	**0.42**	**0.15**	**2.44**	**0.015**

	Inferred Mineral Resources					Total Mineral Resources				
	Mt	% Cu	g/t Au	g/t Ag	% Mo	Mt	% Cu	g/t Au	g/t Ag	% Mo
Mineral Resources at 31 Dec 2021	6	0.29	0.14	1.19	0.003	256	0.39	0.20	1.75	0.017
Additions	8	0.16	0.17	1.19	0.008	87	0.44	0.15	2.31	0.017
Depletions	0	0.31	0.41	1.19	0.001	250	0.39	0.20	1.76	0.016
Mineral Resources at 31 Dec 2022	**14**	**0.21**	**0.16**	**1.19**	**0.006**	**93**	**0.43**	**0.15**	**2.24**	**0.016**

Table G Changes to Bingham Canyon open pit Ore Reserves

	Proven Ore Reserves					Probable Ore Reserves				
	Mt	% Cu	g/t Au	g/t Ag	% Mo	Mt	% Cu	g/t Au	g/t Ag	% Mo
Ore Reserves at 31 December 2021	341	0.44	0.17	2.06	0.034	199	0.44	0.19	2.50	0.019
Additions – Apex from Resource	121	0.47	0.24	2.14	0.019	129	0.32	0.16	1.40	0.016
Additions – Changes to Apex design	103	0.18	0.14	1.65	0.090	111	0.25	0.16	1.39	0.071
Depletions - Production	18	0.59	0.20	2.20	0.015	12	0.50	0.18	2.47	0.015
Depletions - Other	63	0.36	0.15	1.22	0.083	32	0.35	0.22	2.64	0.068
Ore Reserves at 31 December 2022	**484**	**0.40**	**0.18**	**2.10**	**0.037**	**395**	**0.35**	**0.17**	**1.82**	**0.029**

	Total Ore Reserves					Average mill recovery %				Product			
	Mt	% Cu	g/t Au	g/t Ag	% Mo	Cu	Au	Ag	Mo	Mt Cu	Moz Au	Moz Ag	Mt Mo
Ore Reserves at 31 December 2021	541	0.44	0.17	2.22	0.029	89	70	74	57	2.062	1.971	27.089	0.087
Additions – Apex from Resource	250	0.39	0.20	1.76	0.017	84	67	69	61	0.820	1.088	9.834	0.027
Additions – Changes to Apex design	214	0.22	0.15	1.51	0.080	84	67	69	61	0.354	0.679	6.903	0.092
Depletions - Production	31	0.55	0.19	2.31	0.015	91	70	75	48	0.155	0.134	1.733	0.000
Depletions - Other	94	0.36	0.17	1.69	0.078	84	67	69	61	0.191	0.97	1.707	0.032
Ore Reserves at 31 December 2022	**880**	**0.38**	**0.18**	**1.97**	**0.033**	**87**	**69**	**72**	**59**	**2.890**	**3.406**	**40.386**	**0.170**

Summary of information to support Mineral Resources reporting – Bingham Canyon

RTK open pit Mineral Resources are supported by the information set out in the Appendix 1 to this release and located at Resources & reserves (riotinto.com) 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.

Geology and geological interpretation

The Bingham Canyon deposit is located in the Bingham mining district southwest of Salt Lake City, Utah (Figure 1). The Bingham Canyon deposit is a classic porphyry copper deposit containing economic grades of copper, molybdenum, gold, and silver. Peripheral copper-gold skarns, lead-zinc fissures, and disseminated gold deposits are also associated with this porphyry system.

The Bingham Canyon deposit primarily consists of three nested porphyry dike bodies intruded into an earlier equigranular granitic intrusion. The latter hosts the bulk of mineralisation. The igneous bodies were emplaced into a sedimentary sequence consisting of predominantly quartzites with several thick limestone units in the lower portion of the sequence and thin silty limestones throughout the quartzite sequence.

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

The Bingham Canyon deposit is defined by 180 churn drill holes from 1910 to 1953 and 1,106 diamond core drill holes drilled from 1940 to the present comprising a total of 692,944 m of drilling. The latest pre-feasibility study was supported by 41 diamond drill holes and 18,314.7 m of drilling.

All diamond core holes since nearly the inception of core drilling (D009) have been logged in detail for lithology, structure, alteration and mineralisation. In 1980, geotechnical characterization data was systematically collected. Since 1988, all core logging was standardized to a scale of 1:50. In 2005, geologic and geotechnical logging began being captured electronically and/or on paper. After December of 2016 all information has been captured electronically.

Assays have been carried out on half core and split churn samples. Sample lengths vary from 0.3 m to 3.6 m, with 3 m being the most common. Assay techniques have varied over time but most recently use a combination of full acid digest with AES/MS finish and fire assay for gold and silver. The pre-feasibility study added 6,835 new individual assay samples from 18,314.7 m of core.

Core assayed prior to 1990 was assayed by RTK's internal laboratories. After 1990 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.

The current exploration QA/QC process was established in 1989. The control samples are as follows:

- Duplicate samples of the second half of core are inserted every 40th sample.
- Matrix matched pulp Certified Reference Materials (CRMs) are inserted every 20th sample.
- Blank samples of barren quartzite are inserted every 40th sample.
- Sample duplicates from the coarse reject material are assayed every 20th sample.

Bingham Canyon has 15 CRMs for copper and molybdenum of varying metal concentrations representing the dominant lithology units present at Bingham Canyon including quartz monzonite porphyry, skarn, monzonite and quartzite. Three samples for gold from RTK's former Barneys Canyon gold-silver mine are also used. These CRMs are inserted in the assay process for both exploration drill holes and blastholes.

Assays are received electronically from the laboratory (ALS Chemex) and loaded into the Exploration acQuire database after being validated. A monthly QA/QC report is distributed for review and any follow up action requests required from the lab to meet validation thresholds. Assay results are checked from the laboratory on a by-hole basis, plotting duplicates, blanks and standards.

Estimation methodology

The Mineral Resource estimation used as the basis of the 31 December 2022 Mineral Resource statement was completed by Rio Tinto in 2022.

Estimation has been carried out by Ordinary Kriging for economic elements. Density assignments are based on rock type and alteration domains. Grades for copper, gold, molybdenite and silver were estimated into parent blocks using Maptek™ Vulcan™ software. The model size is 15 mE x 15 mN x 15 mRL (50 foot cube).

The major domains for estimation are lithology, grade zones, and kriging spatial domains (limb zones). The lithology and grade zone models were updated with the latest drill hole information. Assay samples are composited to 8 m lengths for each of the four metals and broken on lithology. Multiple estimation passes are used with varying search distances, composite, and domains selections:

- Pass 1 and 2 - Ordinary kriging based on rock type, grade zone and limb zone.
- Pass 3 - Blocks that are not estimated after Pass 1 and Pass 2, are populated with the mean (from Pass 1 and Pass 2) for that domain.

Cut-off grades and modifying factors

Reasonable prospects for eventual economic extraction have been assessed through mining designs based on pre-feasibility open pit mining phase designs, optimised Life of Mine (LoM) production scheduling using variable economic margin cut-off grades based on performance of historical metallurgical ore types and operating cost projections and cash flow analysis including estimates for development and sustaining capital.

Criteria used for Mineral Resources classification

The starting point for Mineral Resources classification is an assessment of the assay and drilling quality. Classification is determined by drill spacing and is performed in two steps:

- Measured – Average spacing less than 91 m between drill holes.
- Indicated – Average spacing between 91 m and 182 m.
- Inferred – Average spacing greater than 182 m between drill holes.

The second step is a manual refinement to smooth the classification coding and to account for isolated inconsistencies.

Summary of information to support Ore Reserves reporting – Bingham Canyon

The addition of Ore Reserves from the Apex pushback of the Bingham Canyon deposit is based on the Mineral Resource model for the deposit along with the pre-feasibility study completed in 2022.

Ore Reserves are supported by the information set out in the Appendix 1 to this release and located at Resources & reserves (riotinto.com) 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.

Economic assumptions and study outcomes

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.

Apex pre-feasibility study mining production schedules were developed using COMET strategic planning software. Mine plan assumptions were based on historically demonstrated performance at RTK along with forward looking maintenance projections. Mine designs were reviewed by RTK geotechnical staff and an external group of technical experts (Mine Technical Review Team (MTRT)).

The central case Apex pre-feasibility study mine production schedule resulted in a positive project NPV.

Mining method and assumptions

The Bingham Canyon Ore Reserve continues to be exploited by open pit mining methods using conventional diesel/electric haul trucks and electric or hydraulic mining shovels. The Apex pushback is a brownfields mine life extension which will utilise the existing infrastructure of RTK. It is projected that heavy mobile equipment (HME) will be retired and replacements purchased to maintain current fleet capacities at the Bingham Canyon Operation. The Apex feasibility study will evaluate options to increase HME capacity to potentially accelerate waste stripping.

Processing method and assumptions

All milling is done by the Copperton Concentrator's four grinding lines consisting of three 10.4 m and one 11 m SAG mill each feeding two ball mills. Flotation is comprised of a bulk circuit having rougher, scavenger and cleaner lines feeding the Moly Plant where molybdenum disulphide concentrate is produced and bagged for toll roasting. A 25% copper concentrate is pumped 28 km to the Smelter where it is filtered and stockpiled.

The concentrate is smelted in a Flash Smelting Furnace (FSF) and then converted in a Flash Converting Furnace (FCF) operating in a single-line configuration separated by an intermediate matte stockpile. Two parallel furnaces further refine the copper and cast anodes which are railed to the Refinery. Smelter slag is milled and processed to recover metals. The Smelter converts 99.9% of the sulphur emitted from processing the copper concentrate feed into sulphuric acid which is also sold. Heat from the furnaces and the acid plant is used to co-generate about 60% of the Smelter's electric power needs.

At the Refinery, the anodes are interleaved with stainless steel cathode blanks in tank cells of acidic copper sulphate solution. Electric current is applied for about 20 days to dissolve the anodes and deposit 99.99% pure copper which is stripped from the reusable cathode and sold. Precious metals and impurities from the cathodes settle to the bottom of the cells. Gold and silver are recovered from the slimes by process of autoclaving, filtering, hydrochloric leaching and solvent extraction and cast into bars by an induction furnace.

Cut-off grades, estimation methodology and modifying factors

The Ore Reserve cut-off is based on a Waste/Ore Ranking (WOR) calculation which considers pricing, recoveries and costs. The cut-off value was determined based on an iterative approach to determine the optimum value to the deposit.

RTK mine production plans are developed with the objective of maximizing NPV based on the optimization of WOR cut-off grade and production scheduling decisions. The simultaneous optimization of these two parameters is accomplished through a production scheduling program called COMET, which uses Visual Basic linear programming in Microsoft Excel. An enterprise model capturing the material movements, plant capacity constraints, costs, and revenues from the mine through sales is used to project the cash flows and evaluate a multitude of options, while honouring limits on mining and processing constraints, with the program's algorithm ultimately leading to convergence on a solution providing the maximum NPV.

COMET dynamically recalculates WOR of the binned material based on forecasted period's cost and revenue to determine the highest value material to send to the mill as part of the optimization of the integrated mining and processing policy.

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.

Criteria used for Ore Reserves classification

The following summarizes the conversion of Mineral Resource classification to Ore Reserve classification within the Ore Reserve ultimate pit:

- Measured Mineral Resources not contained within the 0.25% MoS_2 grade zone are classified as Proved Ore Reserves.
- Measured Mineral Resources within the 0.25% MoS_2 grade zone are classified as Probable Ore Reserves.
- Indicated Mineral Resources are classified as Probable Ore Reserves.

Winu

The Winu Mineral Resource is located within the Patterson province of Western Australia (Figure 2). The updated Mineral Resource (presented in Table C at 0.2% CuEq cut-off) comprises an Indicated Mineral Resource of 222 Mt at 0.56% CuEq, and an Inferred Mineral Resource of 499 Mt at 0.47% CuEq, giving a total Mineral Resource of 721 Mt at 0.50% CuEq (0.40% Cu, 0.34 g/t Au). The Mineral Resource is constrained by a notional pit shell supported by mining studies and an economic assessment.

Included in the Mineral Resource is a higher grade component shown in Table H as a sensitivity. This portion of the Mineral Resource is tabulated at 0.45% CuEq cut-off, constrained by the notional resource pit shell. Changes to Mineral Resources at a 0.2% and 0.45% CuEq cut-off are shown in Table I.

A starter pit has also been defined as a subset of the total Mineral Resource; the starter pit is designed on a higher grade and shallower body of mineralisation that is the subject of detailed geological and geotechnical assessments and mine design and processing studies. At a 0.45% CuEq cut-off, the Mineral Resource inside the starter pit comprises 114 Mt @ 0.79% CuEq Indicated Resources and 36 Mt @ 0.78% CuEq Inferred Resources for a total of 150 Mt @ 0.79% CuEq, as shown in Table J.

Drilling to inform studies of the Winu deposit has continued with a focus on hydrogeology drilling in the last 12 months. The presence of copper, gold and silver mineralisation of a similar geological style and setting at the margins indicates that the Winu deposit remains open in several directions.

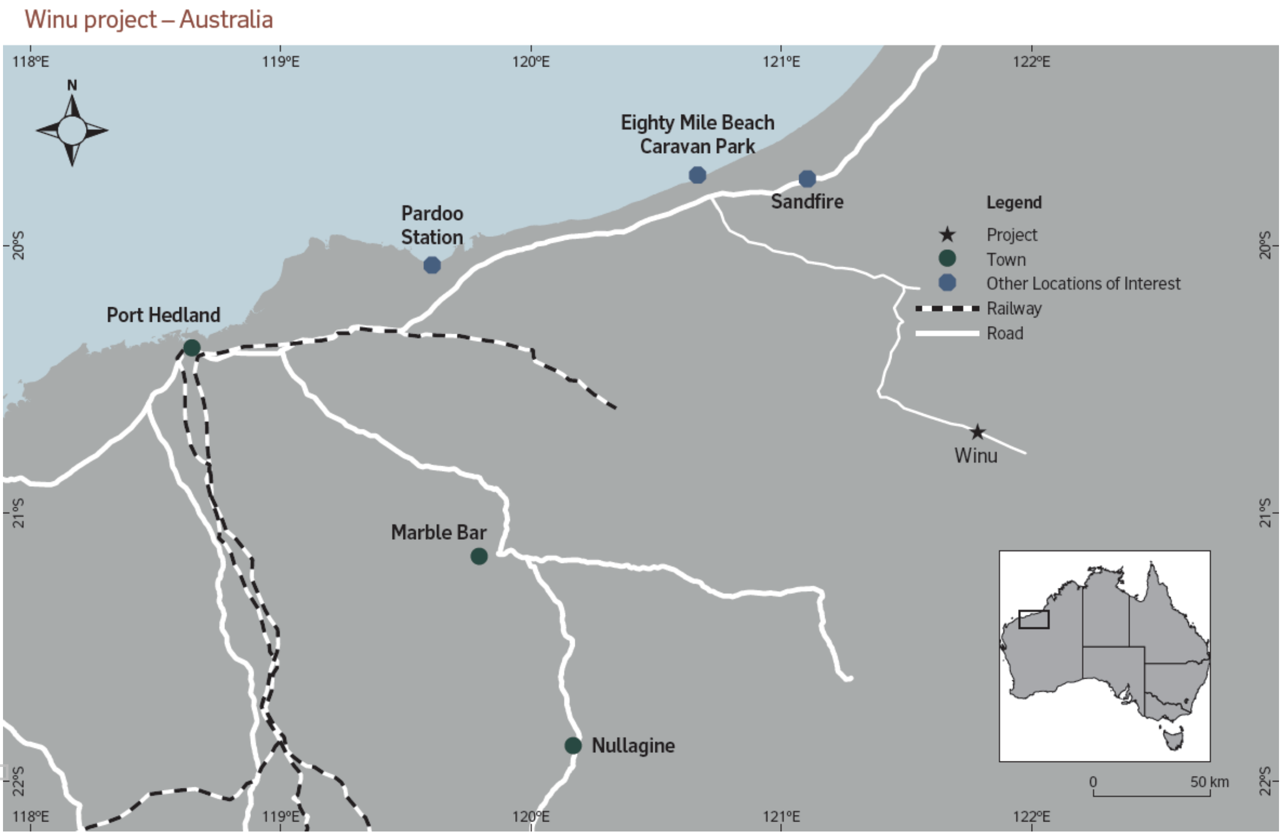

Figure 2 **Property location map - Winu**

Table H **Winu Mineral Resources as at 31 December 2022 – sensitivity reporting at a 0.45% CuEq cut-off, within the notional resource pit shell**

Resource classification	Mt	% CuEq	% Cu	g/t Au	g/t Ag
Indicated	114	0.79	0.64	0.48	3.98
Inferred	196	0.72	0.58	0.48	3.16
Total	**311**	**0.74**	**0.60**	**0.48**	**3.46**

Table I Changes to Winu Mineral Resources

0.2% CuEq cut-off	Mt	% Cu	g/t Au	Mt Cu	Moz Au
2022	721	0.40	0.34	2.90	7.78
2021	608	0.40	0.30	2.43	5.86
% change from 2021	19%	0%	12%	19%	33%

0.45% CuEq cut-off	Mt	% Cu	g/t Au	Mt Cu	Moz Au
2022	311	0.60	0.48	1.87	4.80
2021	269	0.60	0.40	1.61	3.46
% change from 2021	15%	0%	20%	16%	39%

Table J Winu Mineral Resources as at 31 December 2022 – sensitivity reporting at a 0.45% CuEq cut-off, within the starter pit

Resource classification	Mt	% CuEq	% Cu	g/t Au	g/t Ag
Indicated	114	0.79	0.64	0.48	3.98
Inferred	36	0.78	0.71	0.54	4.00
Total	**150**	**0.79**	**0.65**	**0.49**	**3.98**

Summary of information to support Mineral Resources reporting – Winu

Mineral Resources are supported by the information set out in the Appendix 2 to this release and located at Resources & reserves (riotinto.com) 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.

Geology and geological interpretation

Winu has been interpreted as a structurally controlled vein hosted Cu-Au-Ag (copper-gold-silver) deposit focused on the core of an anticline in Neoproterozoic metasedimentary rocks. There are multiple vein generations and orientations, but the veins are interpreted as being predominantly parallel to the fanned axial planes of the major and parasitic folds.

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

Drilling has been carried out using a combination of angled diamond and vertical and angled reverse circulation (RC) drilling methods, with sampling predominantly on a 1 m sample interval but honouring geological boundaries in the diamond drilled core. Assays have been carried out on half core and split RC samples using a combination of sequential leach assays, full acid digest with AES/MS finish and fire assay for gold.

RC and diamond drilling programmes in 2020 and 2021 focussed on testing and delineating copper and gold mineralisation in the central Winu zone with data acquisition for geotechnical, geometallurgical, hydrogeological and waste characterisation studies for a possible starter pit. Additional drilling acquired in 2022 has been focussed on hydrology and geotechnical assessment for the starter pit while some additional drill testing of north, south and east mineralisation extensions was also completed.

Resource drilling on the Winu deposit completed since the compilation of the Mineral Resource estimate supporting the 31 December 2021 Inferred Resource totals 137 RC and 65 diamond holes for a total increase of 70.5 km drilled length. The total amount of drilling supporting the 31 December 2022 Mineral Resource statement consists of 605 mostly vertical-near vertical RC holes (144.4 km) and 283 mostly angled diamond holes (132.4 km) for a total of 276.8 km, including holes drilled to support geotechnical and geometallurgical studies. Some holes drilled on the licence outside of the area of known mineralisation, such as sterilisation holes on proposed infrastructure footprint, are not used in the Mineral Resource estimate and not included in the meterage reported here.

Estimation methodology

Grade estimation utilises Ordinary Kriging at panel scale 40 m x 40 m x 5 m with recoverable estimation by Localised Uniform Conditioning based on 10 m x 10 m x 5 m blocks (selective mining unit (SMU) scale). The objective of the panel scale estimation is to establish a least biased global estimate, taking into account the drill hole spacing. The objective of the SMU scale estimation is to predict the grade/tonnage distribution at the time of mining.

Dry bulk density has been estimated by Ordinary Kriging on 10 m x 10 m x 5 m blocks using approximately 6,840 measurements from drill core.

Cut-off grades and modifying factors

The Mineral Resource is reported at 0.2% CuEq cut-off inside the notional resource pit shell, inclusive of material shown at a higher cut-off of 0.45% CuEq.

Copper equivalents have been calculated using the following formula:

CuEq = ((Cu% * Cu price 1% per tonne * Cu recovery) + (Au ppm * Au price per g/t * Au recovery) + (Ag ppm * Ag price per g/t * Ag recovery)) / (Cu price 1% per tonne).

Details of recoveries based on test work are shown in Appendix 2 (JORC Table 1).

The Mineral Resource is considered to have reasonable prospects for eventual economic extraction based on mining and processing studies that have been further developed in 2022. These studies indicate conventional open pit mining and processing routes will be appropriate for the exploitation of the Winu deposit.

Criteria used for Mineral Resources classification

Resource classification is based initially on the level of confidence assigned to interpretations of geology and mineralisation controls, and an assessment of the quality of fundamental assay and geological data. A specific definition of Indicated Mineral Resource is adopted and is described in Table 1. A quantitative assessment of copper grade uncertainty is made using the results of Conditional Simulation, taking into account proposed mining rates and schedule, and this forms the basis of the classification applied to the Mineral Resource.

Inferred Mineral Resources are constrained within a notional resource pit shell to a maximum depth of 740 m with sufficient support for reasonable prospects of eventual economic extraction provided by preliminary mining, processing and other studies using Rio Tinto forward-looking price assumptions.

Within the notional resource pit shell a portion of the deposit has been assessed for a starter pit option via detailed geological, mining and processing studies. The studies are indicating a starter pit mine life of 25 years. The Mineral Resource in the starter pit is classified predominantly as Indicated Mineral Resource (20 out of 25 planned ex-pit ore production years, not including pre-strip), based on assessments of expected grade variability in the proposed mine sequence at the proposed mining rate.

Mineralised material outside of the notional resource pit shell is not included in the 31 December 2022 Mineral Resource statement.

In the starter pit, which is predominantly Indicated, the mean distance between drill holes is 60 m and this is sufficient to establish geological and grade continuity and to support grades estimation at a scale appropriate to pit design and annualised scheduling.

In the region outside of the starter pit and inside the Resource pit shell, which is entirely Inferred, the mean distance between drill holes is 110 m, sufficient to establish geological and grade continuity of the mineralisation at depth and to support the evaluation of expansion cases.

A close-spaced pattern of 14 diamond holes was drilled to test geological and grade continuity at 15 m centres in the east-dipping plane of mineralisation centred on the sulphide breccia units. This set of holes provided sufficient information to support assumptions of short-range grade continuity. In the southeast corner of the known deposit, additional diamond and RC holes were drilled from north to south, or south to north, to test assumptions of the dominant mineralisation trend.

Land access limitations have prevented drilling in a northern section of the deposit; it is intended to complete drilling in this area upon the granting of land clearances.

QIT Madagascar Minerals

The Petriky Heavy Mineral Sand (HMS) deposit lies just to the southwest of the Mandena operation in Madagascar (Figure 3). Petriky contains 442 Mt Inferred Mineral Resources at 4.2% Titanium Minerals and 0.8% Zircon, and contains no Ore Reserves.

The Petriky Mineral Resource forms part of the broader QIT Madagascar Minerals (QMM) Mineral Resources as presented in Table D. In addition, there are 332 Mt Ore Reserves at 3.4% Titanium Minerals and 0.2% Zircon comprising Probable Ore Reserves of 96 Mt at 2.9% Titanium Minerals and 0.1% Zircon and Proven Ore Reserves of 236 Mt at 3.6% Titanium Minerals and 0.2% Zircon as reported in the Rio Tinto 2022 Annual Report.

Figure 3 Property location map - QIT Madagascar Minerals

Summary of information to support Mineral Resources reporting – QIT Madagascar Minerals

Mineral Resources are supported by the information set out in the Appendix 3 to this release and located at Resources & reserves (riotinto.com) 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.

Geology and geological interpretation

The Petriky HMS deposits were formed by late Pleistocene sea level transgression/regression cycles 6 to 35 thousand years ago.

Mineralised sands are found in embayments, protected by headlands, which formed under conditions of static sea level and constant supply of sediments resulting in formation of a prograding foredune/beach system. The morphology of Petriky is similar to the nearby Mandena deposit, where the QMM Mineral Separation Plant (MSP) is located.

Three distinct geological units have been recognised namely 1) Upper Sand, 2) Transitional Sand and 3) Lower Sand:

- The Upper Sand units are characteristically fine-to-medium grained and very well sorted. Individual sand grains are rounded and display frosted surfaces as a result of abrasion due to wind transport.

They represent the upper portion of the advancing foredune/beach complex; having been formed by aeolian processes. Heavy mineral concentration averages around 7 to 8% while slime content is very low (1 to 2%) and has an average thickness of 5 m.

- The Transitional Sands are representative of beach and lower dune facies with a relatively constant thickness of 3 to 6 m. The coarser grained and poorly sorted sand units are characterized by low heavy mineral (1 to 2%) and slime content. These features suggest deposition in a relatively high-energy beach environment.
- The Lower Sand forms the base of the prograding foredune/beach system and consists of foreshore sand facies, typified by finely laminated fine to medium grained sands. They contain an average of 4 to 5% heavy minerals and have slightly higher slime content (2 to 3%) than the two other sand units. Some clay lenses 1 to 2 m in thickness have been observed within the unit. Thickness averages between 10 to 12 m but exceeds 20 m in some of the outwash channels incised into underlying clay. Outwash channel facies are generally coarser grained.

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

The Petriky deposit was sampled using hand auger (HA) by US Steel in the 1970s and portable vibracore (VIB) by QMM in 1987 to 1988. Samples were collected at 1.5 m intervals down hole with 100% of sample material retrieved for laboratory analyses. A total of 949 HA holes were drilled to the water table only and therefore never tested the full depth of the deposit. Petriky was subsequently drilled to full depth at a drill spacing of 800 m x 100 m using VIB. Additional data was added using shallow HA drilled on a grid density of 200 m x 50 m.

After geological logging, samples were sent to a laboratory for drying and sub-sampling. Rotary splitter was used to ensure a representative sub-sample for heavy liquid separation. Total Heavy Mineral (THM) content was determined by Heavy Liquid Separation (HLS), using Tetrabromoethane (TBE). The THM mineralogy for the entire deposit was determined from a composite THM of 37 boreholes using CARPCO electromagnetic separation.

Estimation methodology

The Petriky resource model comprises a hybrid 2-dimensional grade thickness estimate based on combined HA and VIB borehole composites. THM, and Slimes were estimated using Ordinary Kriging into 50 m x 50 m parent cells orientated parallel to the dominant geomorphological features. Estimation was controlled using a hard boundary for the base. Tonnages were calculated using a formula where Density = 1.57 + 0.01 * %THM based on test work at the nearby Mandena deposit.

Cut-off grades and modifying factors

Estimates were constrained to geological boundaries and hence are reported at a 0% cut-off grade. Mining is assumed to be via open pit dredging as with the nearby Mandena deposit. Metallurgical factors used in Mandena are also applied to Petriky for valuation purpose as mineralogical and grain size characteristics are similar. Metallurgical factors have not yet been confirmed using Petriky samples.

The Mineral Resource is considered to have reasonable prospects of eventual economic extraction based on the studies completed at the nearby Mandena deposit.

Criteria used for Mineral Resources classification

The Petriky Inferred Resource is supported by VIB drill spacing of 800 m x 100 m. Based on experience and results of reconciliation on the current nearby Mandena operation the Competent Person judges the resource estimates to provide a sufficient global estimate to support an Inferred Resource classification.

The rationale to down-grade Petriky resources from Indicated to Inferred for 2022 reporting was a combination of development risk and delays in obtaining sufficient mineralogy and geotechnical data. Government permitting to recommence drilling in the Petriky sector has been delayed, increasing the risk of future resource development of Petriky, which has been identified to replace Mandena once depleted.

Richards Bay Minerals

The Zulti South HMS deposit lies just to the southwest of the current Zulti North operation in South Africa (Figure 4).

The Zulti South Ore Reserve forms part of the broader Richards Bay Mineral (RBM) Ore Reserves as presented in Table E. All Mineral Resources at Zulti South have been converted to Ore Reserves, thus there are no additional Mineral Resources reported.

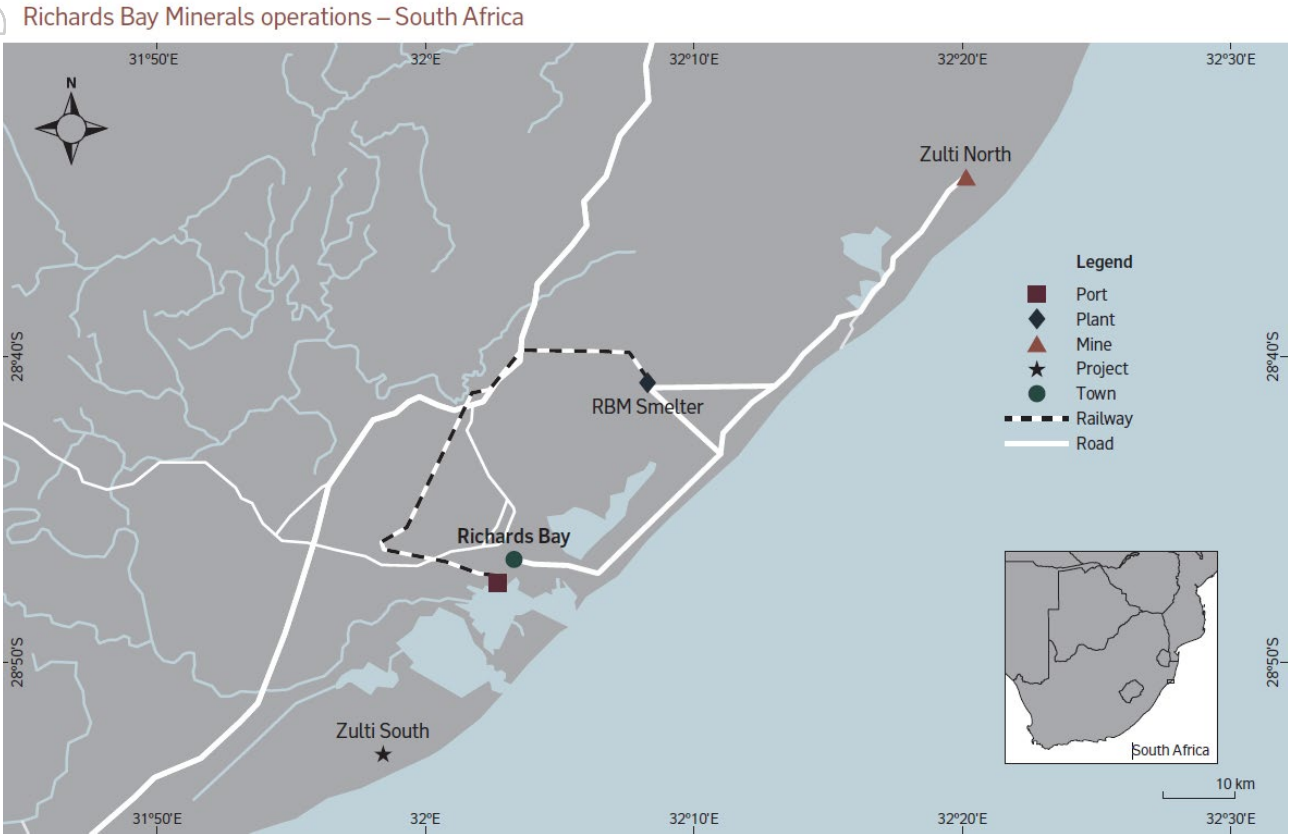

Figure 4 **Property location map – Richards Bay Minerals**

Summary of information to support Mineral Resources reporting – Richards Bay Minerals

Mineral Resources are supported by the information set out in the Appendix 4 to this release and located at Resources & reserves (riotinto.com) 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.

Geology and geological interpretation

The Zulti South HMS deposit represents an unconsolidated beach placer deposit found within a belt of undulating aeolian dunes aligned roughly parallel to the coast, of Pliocene – Pleistocene and Holocene age. At present only the Holocene dunes are mined by RBM. Material mined by RBM is from the Sibayi (<10 ka) and KwaMbonambi (57 to 6 ka) Formations, which are the youngest units of the Maputaland Group, a thin veneer set on the Zululand Coastal Plain, formed in response to sea-level changes and uplift during the Neogene (25-2 Ma) and Quaternary (2 Ma to present) periods.

The geology of the deposit is well understood, and the geological interpretation is sound. Data used for geological interpretations includes geological logging descriptions and assay data.

The main geological domaining control used is the resource base. This is based on modelling a surface defined by a high slimes (greater than 12%) / low THM (less than 2%) contact.

Using assay (slimes, THM and EHM) and geology (slimes & hardness) attributes, intersection points were chosen according to the criteria above, and snapped to the drill hole traces. Cross-sections were then drawn along the drill lines using these points. The cross-sections were then wire-framed to create a resource base surface.

Grade is affected by the depositional history and resulting stratigraphy, but grade and geology generally show good continuity. Variability is greatest down hole where most changes happen within the first 5 m. Horizontal continuity is better with most change happening in a distance from 100 to 200 m.

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

Sonic drilling is the preferred method of drilling for geological and resource definition. It utilises either a 4” x 6” or 3” x 5” system in which a 4-inch or 3-inch core barrel is used for sampling. The core barrel is overridden by a 6-inch or 5-inch casing, to hold the borehole vertically open from the top dune surface to the bottom of the borehole, typically at ±5 m below ore sand – base clay boundary.

Typical horizontal grid spacing for sampling is 200 m N x 100 m E Sonic.

Between 1970 and 1989 40 RC drill holes were completed at Zulti South, followed by successive drilling campaigns until 2005. In total, 3049 RC drill holes were completed at Zulti South. Typical horizontal grid spacing for RC drilling is 200 m N x 50 m E grid. RC holes are drilled vertically using AQ (~48 mm outer diameter/ 27 mm inner diameter) rods. RC samples are collected over 3 m sample lengths from the collar of the drill hole, then 1 m sample lengths are collected within 10 m of the base of the drill hole for better basal definition.

Several flaws have been noted with RC drilling in unconsolidated to semi consolidated material, The most pertinent is the underestimation of grade by up to 50%. In addition, smearing, selective sampling/recovery and winnowing of material occurs, especially below the water table and with increasing depth. As a result, RC data is not used for resource estimation.

After logging, the complete field samples are delivered to the in-house laboratory for analysis. The sample is oven dried then processed with a rotary splitter to collect 6 ~700 g representative sub-samples. Attrition of each~700 g sub-sample over a -45 µm sieve is carried out with the +45 µm material dried and used to calculate slimes percentage. A heavy liquid, usually tetrabromoethane (TBE), is used to separate Heavy Minerals (HM) from Quartz. HM are separated with a Carpco magnetic separator into its main components based on magnetic susceptibility. These separate HM components are then separately pulverised, and pellets are moulded for XRF analysis. The sample size and sampling methodology is considered appropriate for the material being sampled.

Estimation methodology

From 2013, only Sonic data was used for resource estimation. The data were composited into 2 m lengths from the top of the drill hole.

Weakly magnetic ilmenite (unrecoverable), economic ilmenite, ‘Junk’ material, Magnetite, highly magnetic material, non magnetic fraction, rutile, zircon, slimes (fines smaller than 45 µm) and THM were estimated using Ordinary Kriging into 100 m x 50 m x 2 m parent blocks in Surpac with search neighbourhood criteria based on variograms. The resource base was the main geological domaining control. Two domains were thus identified: Above and Below resource base.

Variation between the composites and the estimated kriged attributes, as well as variation between the previous and current resource model updates, was within acceptable limits.

Cut-off grades and modifying factors

No cut-off parameters were used; the Mineral Resource is reported within the geological unit.

Zulti South consists of several ore zones of varying geometrical properties. Grade variations within the Zulti South orebody are apparent with grade in general declining from south to north as well as from the inland side of the deposit to the seaward side. Margin ranking plots of the orebody revealed that the highest value ore grade is located in the central inland portion of the orebody.

A phased approach to mining will be adopted to allow the most appropriate and beneficial exploitation of the Zulti South orebody. The mining method for Zulti South has been established as dry mining by front end loaders.

The Mineral Resource is considered to have reasonable prospects of eventual economic extraction based on the studies completed to date.

Criteria used for Mineral Resources classification

The Zulti South ore body is classified as Measured and Indicated Mineral Resources only.

Both the drill spacing and volume of resource per metre drilled are used as the basis for classification of the Mineral Resources into varying confidence categories as follows:

- Measured: ≤100 m x 200 m: ≥50 holes/km2 or <20 000 m3/metre drilled.
- Indicated: 100 m x 200 m to 200 m x 400 m: 12.5 holes/ km2 - 50 holes/ km2 or 20 000 m3 – 80000 m3/metre drilled.

Summary of information to support Ore Reserves reporting – Richards Bay Minerals

Ore Reserves are supported by the information set out in the Appendix 4 to this release and located at Resources & reserves (riotinto.com) 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.

Economic assumptions and study outcomes

The value proposition for Zulti South orebody lies in the opportunity to fill the MSP and Smelter capacity at the RBM operations. Integration of the Zulti South project with the current RBM operations will maximise MSP capacity to exploit buoyant zircon and rutile markets. The Ore Reserve estimate for the Zulti South project is based on the completed feasibility study of 2019.

Rio Tinto applies a common process to the generation of commodity prices across the group. This involves generation of long-term price curves based on current sales contracts, industry capacity analysis, global commodity consumption and economic growth trends. In this process, a price curve rather than a single price point is used to develop estimates of mine returns over the life of the project. The detail of this process and of the price point curves is commercially sensitive and is not disclosed.

Economic evaluation using Rio Tinto long-term prices demonstrates a positive net present value for the Zulti South Ore Reserves under range of price, cost and productivity scenarios.

Mining method and assumptions

The mining method for Zulti South has been established as dry mining by front end loaders. Only ore will be mined as there is no overburden or host formation that is excavated. As such the main function of geological control will be to monitor under or over digging the mining base. There are no ore classes to manage (i.e., no selective mining once the SMU is established. The process plant design allows for a wide range of ore head feed grades to be processed efficiently.

The first several years of planned mining have sufficient drilling coverage, which effectively informs the LOM reserve plan. Infill drilling may be required to inform the short-term planning, however there is no expected material impact as the drill hole density is adequate to production schedules.

Processing method and assumptions

The Heavy Mineral Concentrate (HMC) is achieved through a process of feeding a hopper with ore sand mixed with water, the slurry is pumped to a fixed land-based concentrator plant for further treatment via a series of spirals and gravity circuits. The primary stage of dealing with deleterious elements uses a two-stage magnet circuit, thereafter which the primary concentrate is achieved.

The HMC from the mine operation will be transported from the mine stockpile to the RBM smelter complex HMC handling stockpile using the positive displacement (PD) pumping system. From here the established RBM processing technique is employed and the HMC from the Zulti South project is part of the feedstock material for MSP and downstream processes.

Cut-off grades, estimation methodology and modifying factors

No effective cut-off grade is applied on the Ore Reserves at Zulti South. The grade control will be achieved by in pit monitoring of the mining base. No target plant feed grade is established or required, and grade control will be to avoid over and under digging. The extensive test work that has been conducted to verify the appropriateness of metallurgical process on the Zulti South mineralisation utilises a well-tested technology within the RBM process. The mining equipment selection for Zulti South is a proven and already existing method. All the environmental permits required for the project have been issued and approved. The Zulti South ore body comprises three leases, known as On Reserve 10, Kraal Hill 1 and Kraal Hill 2, and is located south of Richards Bay.

Criteria used for Ore Reserves classification

Ore Reserves are classified according to the Mineral Resource classification where initially all Measured Resources are converted to Proven Reserves, and all Indicated Resources converted to Probable Reserves. The conversion from Mineral Resources to Ore Reserves is done on consideration of operational and economic constraints, which includes hydrological parameters, geotechnical parameters, mining methods, mining limits, metallurgical properties, environmental factors and above all economic feasibility of mining the resource.

RBM Ore Reserve tonnes for 2022 include a change in classification for the Zulti South project from Proven Reserves to Probable Reserves. The change results from increased uncertainty in the modifying factors as a result of schedule delays, due to ongoing community and security challenges. The original project timelines have been affected. The project remains on full suspension. Any restart of project activities is dependent upon internal approvals after which the classification for the Zulti South project Ore Reserves would be reviewed.

Competent Persons' statements

Rio Tinto Kennecott
The information in this report that relates to RTK Mineral Resources is based on information compiled under the supervision of Kim Schroeder and Pancho Rodriguez, who are Members of the Australasian Institute of Mining and Metallurgy (MAusIMM). Kim Schroeder and Pancho Rodriguez have sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity to which they are undertaking to qualify as a Competent Persons as defined in the JORC Code. Kim Schroeder and Pancho Rodriguez are full-time employees of Rio Tinto and each of them consents to the inclusion in this report of Mineral Resources based on the information that they have prepared in the form and context in which it appears.

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

Winu
The information in this report that relates to Winu Mineral Resources is based on information compiled under the supervision of James Pocoe, who is a Member of the Australasian Institute of Mining and Metallurgy (MAusIMM). James Pocoe 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. James Pocoe is a full-time employee of Rio Tinto and consents to the inclusion in this report of Mineral Resources based on the information that he has prepared in the form and context in which it appears.

QIT Madagascar Minerals
The information in this report that relates to QIT Madagascar Minerals Mineral Resources is based on information compiled under the supervision of Adriaan Louw, who is a Member of the South African Council for Natural Scientific Professionals (SACNASP). Adriaan has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity to which they are undertaking to qualify as a Competent Person as defined in the JORC Code. Adriaan is a full-time employee of Rio Tinto and consents to the inclusion in this report of Mineral Resources based on the information that he has prepared in the form and context in which it appears.

Richards Bay Minerals
The information in this report that relates to RBM Mineral Resources is based on information compiled under the supervision of Anton Cawthorn-Blazeby, who is a Member of the Australasian Institute of Mining and Metallurgy (MAusIMM). Anton Cawthorn-Blazeby has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity to which they are undertaking to qualify as a Competent Person as defined in the JORC Code. Anton Cawthorn-Blazeby is a full-time employee of Rio Tinto and consents to the inclusion in this report of 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 RBM Ore Reserves is based on information compiled under the supervision of Sinetemba Mnunu, who is a Member of the Australasian Institute of Mining and Metallurgy (MAusIMM). Sinetemba Mnunu has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity to which they are undertaking to qualify as a Competent Person as defined in the JORC Code. Sinetemba Mnunu is a full-time employee of Rio Tinto and consents to the inclusion in this report of Ore Reserves 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.

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Rio Tinto Kennecott - Bingham Canyon JORC Table 1

The following table provides a summary of important assessment and reporting criteria used for the reporting of Mineral Resources and Ore Reserves 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

<table>
<tr><th>Criteria</th><th>Commentary</th></tr>
<tr><td>Sampling techniques</td><td>

Sampling techniques related to Mineral Resource estimation have been either churn or diamond drill core. Since the 1950s, all drilling has been diamond core, either as PQ, NQ, or HQ in size.
Sample intervals can range from 0.3 to 3.6 m, with 3 m being the standard length. Core is sawn in half with half the core assayed for Cu, Mo, Ag, and Au. The average core sample is 10 kg, which is then split to 1000 g for pulverization and a 100 g pulp is generated for assay (30 g for fire assay, 5 g for AA).

</td></tr>
<tr><td>Drilling techniques</td><td>

Drilling data summary:

<table>
<tr><td></td><td colspan="2">Diamond</td><td colspan="2">Churn</td></tr>
<tr><td>Year</td><td>Number of holes</td><td>Metres</td><td>Number of holes</td><td>Metres</td></tr>
<tr><td>1906-1979</td><td>246</td><td>197,369</td><td>180</td><td>49,464</td></tr>
<tr><td>1980-1999</td><td>233</td><td>103,000</td><td></td><td></td></tr>
<tr><td>2000-2009</td><td>356</td><td>201,123</td><td></td><td></td></tr>
<tr><td>2010-2018</td><td>464</td><td>193,007</td><td></td><td></td></tr>
<tr><td>2018-2021</td><td>262</td><td>83,777</td><td></td><td></td></tr>
<tr><td>Total</td><td>1561</td><td>778,276</td><td>180</td><td>49,464</td></tr>
</table>

The deposit is defined by a program of churn drilling (6%) from 1910 to 1953 and diamond core drilling (94%) drilled from 1945 to 2021. Size of diamond core is as follows: AX/BX – 12%, NX/NQ – 28%, HQ – 54%, PQ – 6%.
Since the end of churn drilling by 1980, the drilling methodology has not changed.

</td></tr>
<tr><td>Drill sample recovery</td><td>

Since 1980, the interval length and amount of core recovered has been recorded as part of the standard geotechnical data collection. Drilling methodology has been improved to maximize core recovery. Drilling methods have resulted in 90% of the core with greater than 80% core recovery.
The sample recovery methodology has not changed since 2016 when low recovery between drill runs have been assigned to a specific footage, when possible. No bias has been observed between low and full recovery zones.

</td></tr>
<tr><td>Logging</td><td>

Since the 1970s, standardised RTK logging systems have been used for all drilling which includes collection of lithology, alteration, structure, veining and mineralisation.
Since 1980, the core has been photographed and geotechnically logged; this represents 74% of cored drilled.
In 2007 34% of the holes drilled were also logged using an acoustic televiewer (ATV) for structure orientation where were had ATV data could be collected. Since 2008, all drill holes permissible for entry of the instrument are ATV l, amounting to 62% of the total holes though only in portions of the holes where the data could be collected.
The logging methodology has not changed materially since 1980.

</td></tr>
<tr><td>Sub-sampling techniques and sample preparation</td><td>

Pre 1980, core was hand split. Since 1980, core has been sawn in half. One half is sent for assay; the other half is stored at the RTK operation.
Samples are sent to a commercial lab for preparation and assay. Samples are crushed to minus 2 mm and a 1000 g sample split is pulverized to generate 4 sample pulps. These pulps are used for a Au assay, a Cu, MoS_2 and Ag assay, and a composite multi-element assay and the fourth is returned to RTK. The sample reject sample material (<2 mm) is returned to RTK.
Sampling procedures have been reviewed and audited by external sampling experts, most recently in 2010 (AMEC) with no material findings.

</td></tr>
</table>

	• The sub-sampling methodology has not changed since 1980 when core sawing began.
Quality of assay data and laboratory tests	• Current QA/QC procedures have been in place since 1990. The acQuire data management database system has been used since 2000. • Duplicate samples of the second half of core are generated for every 40th sample. • Matrix matched pulp CRM are inserted every 20th sample. • A sample duplicated for the coarse reject material is assayed every 20th sample. For every 20 coarse reject pulp assays, a matrix matched standard is inserted. • Cu, MoS_2 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. • The assay methodology has not changed since 2015. Prior to 2015, Cu, MoS_2 and Ag detection was by AAS, since 2015 detection for these metals has been by ICP-AES. Au assaying has been consistent through this period, by 30 g fire assay. • Analysis of the performance of certified standards, duplicates, blanks and third-party check assaying has indicated an acceptable level of accuracy and precision with no significant bias or contamination.
Verification of sampling and assaying	• For all intercepts above certain thresholds (2% Cu, 0.4%, MoS_2, 2.83 g/t Au, 2.83 g/t Ag) an additional sample pulp is generated and assayed from the coarse reject material. • Mineral Resource and Ore Reserves standard operating procedures (SOP) documents are used for data handling, processing, storage and validation processes. • There is no adjustment to drill hole 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. • The sample validation methodology remains unchanged since at least 1994.
Location of data points	• Since 1998, GPS survey is used to locate drill hole collars. Between 1940 and 1998, traditional survey instruments were used to determine collar locations. A local grid system (Bingham Mine grid) is used throughout the mine. The local grid has a counter-clockwise rotation of 31.98 degrees from true north. • Down hole surveys are currently completed by two to three methods: • Since the 1960s, a single shot or multi shot tool is used to survey all drill holes at 61 m intervals. • Beginning in 2006, selected holes were also surveyed with a magnetometer accompanying an Acoustic Televiewer (ATV) instrument. Since 2008 most holes are also surveyed by ATV. • Since 1995, a gyro survey tool is used to complete a survey for the entire drill hole length after the drill hole is completed. All surveys are reviewed and generally the gyro method is selected unless the other method(s) indicate that they gyro survey is erroneous. In the latter case the next most accurate survey method is selected and loaded into the database. • Pit topography is kept updated by local surveys that track daily mining advances.
Data spacing and distribution	• Drill spacing is approximately 90 m to 100 m. • Assay intervals are composited to 8 m for model estimations. • The data spacing and distribution is deemed sufficient by the Competent Person to establish geological and grade continuity appropriate for the Mineral Resource classification that has been applied.
Orientation of data in relation to geological structure	• Both vertical and angled drilling are used to delineate mineralisation. Porphyry mineralisation is disseminated and does not display a strong preferred orientation or structural control. • Drill hole orientations are designed to best delineate mineralisation, though collar placement is dependent on mine accessibility and must be oriented accordingly.
Sample security	• Laboratory samples are cut and placed onto crates or pallets and transported by locked trucks to a commercial lab for sample preparation and assay. • A Bolt Seal Chain of Custody form is filled out on-site and includes date, bolt seal number, driver, and any relief drivers. A copy of the Bill of Lading (BOL) and chain of custody form are made and sent with the driver. • Upon receipt of cargo, the lab manager confirms the date and time received, whether the bolt seal is unbroken, and bolt seal number. The lab receiver signs the Chain of Custody and emails a copy to RTK. • Individual samples are weighed before shipment and by the receiving commercial lab. Sample weights are cross checked and verified by RTK. • Retention of the one half of core and assay pulps are retained in a secure core warehouse in Salt Lake City, Utah
Audits or reviews	• The following reviews have been completed on sampling:

	○ External resource model audit by CRM-SA LLC (2022). ○ Rio Tinto Corporate Assurance Internal Audit of Resources and Reserves (2015). ○ Review on the Copper Reconciliation Process at Bingham Canyon Mine (2011). ○ Sampling procedures have been reviewed and audited by external sampling experts, most recently in 2010 (AMEC). ○ Review of Sampling, Sample Preparation and the Central Analytical Laboratory (2009). • No material findings were made, and these reviews concluded that the fundamental data collection techniques are appropriate.

Section 2: Reporting of Exploration Results

Criteria	Commentary
Mineral tenement and land tenure status	• The Bingham Canyon Mine is wholly owned by Rio Tinto Kennecott Copper (RTK's legal name is Kennecott Utah Copper LLC). • RTK has the authority to mine the Mineral Resources and Ore Reserves identified in this document under existing agreements. RTK also acquired several mineral leases and unpatented lode mining claims located in Tooele, Salt Lake and Utah Counties from Kennecott Exploration Company in 2021.
Exploration done by other parties	• No exploration by other parties has been done in the core area of Bingham Canyon. • 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 ore body knowledge. • Since 2009, Rio Tinto Exploration has performed brownfield exploration in and near the deposit.
Geology	• The Bingham Canyon deposit is a classic porphyry copper deposit containing economic values of copper, molybdenum, gold, silver, and historic lead and zinc production. Peripheral copper-gold skarns, lead-zinc fissures, and disseminated and placer gold deposits are also associated with this copper porphyry system. The most recent publication devoted to this deposit is contained in the Society of Economic Geologist, Inc, 2012, Special Publ. # 16, pp. 127-146. The deposit has been extensively studied both economically and academically over the past 100 years and is considered as a deposit that defines copper porphyry systems.
Drill hole Information	• A summary of the drill hole data used for Mineral Resource estimation is provided in Section 1 of this table.
Data aggregation methods	• Not applicable as no Exploration Results are being reported.
Relationship between mineralisation, widths and intercept lengths	• Down hole intercepts are reported as true width due to disseminated mineralisation that has no preferred orientation.
Diagrams	• RTK location and facilities are shown in Figure 1 in the body of this release. • Figure 5, Figure 6 and Figure 7 below show a plan view of the drill holes, an example cross section through the deposit with the addition highlighted, and a plan view of the additional mining cut respectively.

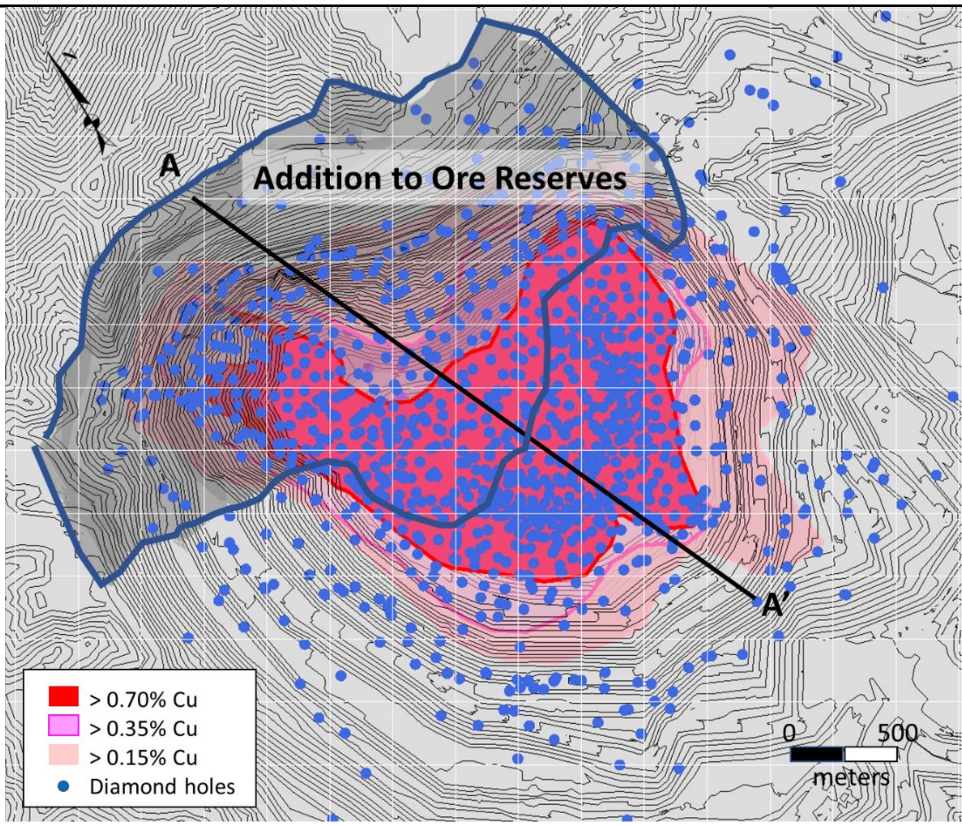


Figure 5 Current pit drill hole intersections including those contained within Apex Ore Reserve

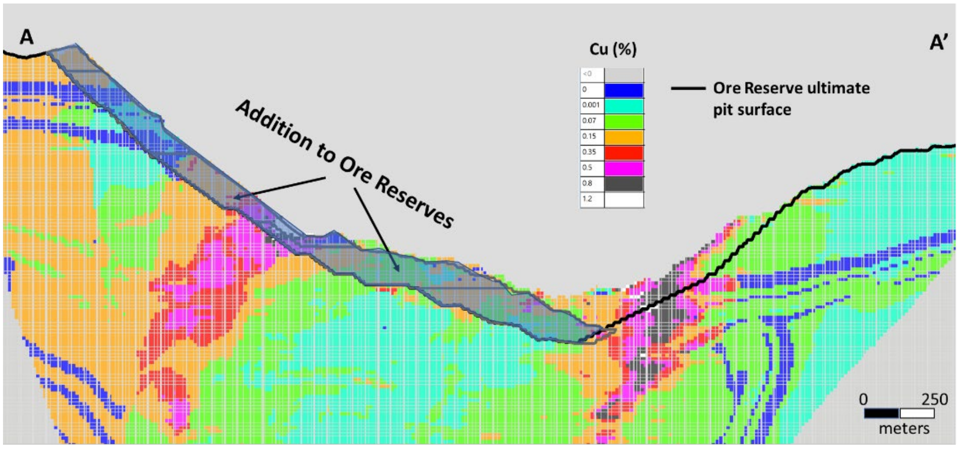


Figure 6 Cross section A-A' through the Bingham Canyon orebody showing copper mineralisation

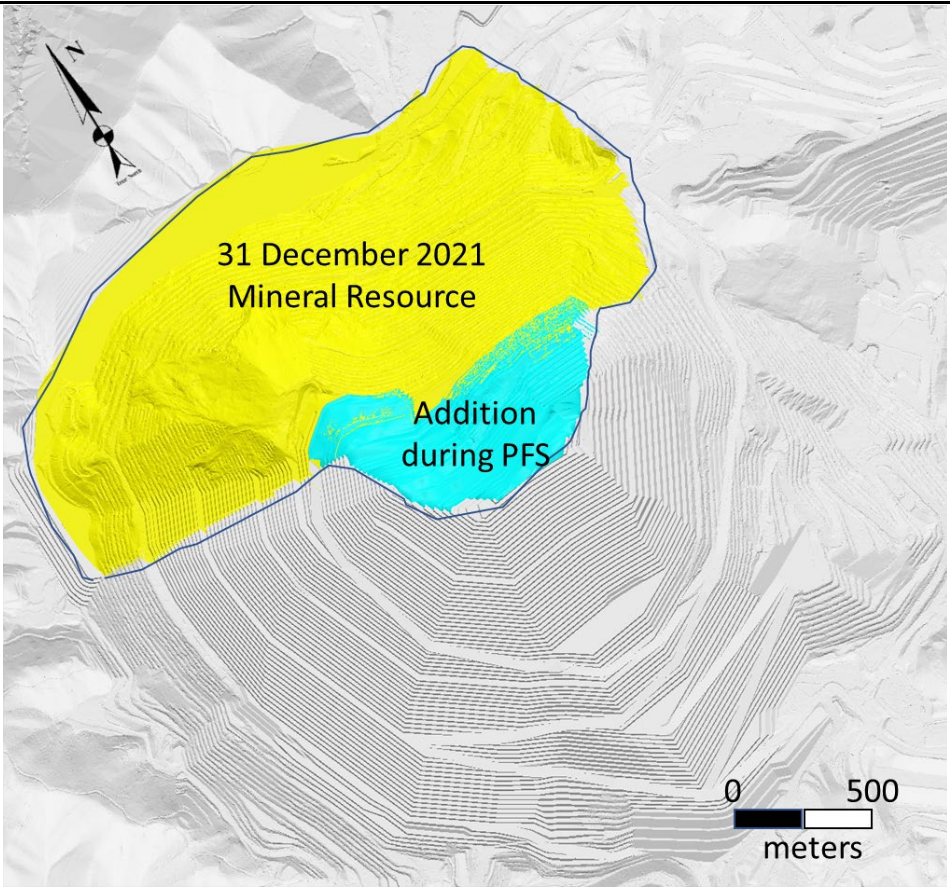


Figure 7 Apex mining cut added to Ore Reserves

Balanced reporting	• Not applicable as no Exploration Results are being reported.
Other substantive exploration data	• No additional exploration data to report.
Further work	• The Apex pushback is currently in feasibility stage of study. Studies continue to evaluate the potential to mine the extensive porphyry and skarn mineralisation beyond currently reported Mineral Resource and Ore Reserve ultimate pit.

Section 3: Estimation and Reporting of Mineral Resources

Criteria	Commentary
Database integrity	• All drilling data is securely stored in acQuire, a geoscientific information management system managed by a dedicated team within RTK. The system is backed up daily. • Estimation data is digitally compared to the data extracted for the previous model to check data integrity. • All collar, survey, assay and geology data loaded to the database are manually verified against original documents. Validation is documented with signoff documents and included as part of the annual Mineral Resource model documentation. • The database access is controlled and managed by the Geology department. • The database includes data validation for text-based and numeric fields.
Site visits	• Mineral Resource Competent Persons are located on site.
Geological interpretation	• There is high confidence in the geologic interpretation. Past mining has created over 1.3 km of vertical geologic exposures. Geologic mapping has been collected since 1926. • Drilling and pit mapping is used to build the geologic model. • Grade estimation is controlled by domains defined based on six geology domains and four grade zone domains for each metal. It also uses seven limb zones for Cu, Au, and Ag. For MoS_2, six limb zones are used. Blast hole assay values, where available, are used to help define the grade zone domains.

Dimensions	• The deposit is contained within a 4.5 km x 4.5 km area with a maximum thickness of 900 m and average overburden cover of 800 m.

Estimation and modelling techniques	• For variography estimation domains of grade zone, limb zones (mineralisation trends) and rock type are recombined as necessary to provide spatial continuity analyses based on statistical similarity; the typical approach is to recombine grade zones and limb zones, leaving rock type as the consistent limiting variable. Domain boundaries except for the limestone rock type are treated as soft, meaning that composites from adjacent grade zones can be used in estimation.
	• Copper, molybdenite, gold and silver are estimated by a pass of Ordinary Kriging (OK) followed by a "fill-in" pass of simple kriging (SK) that uses a localised, declustered mean. Blocks that are not estimated after this secondary pass are populated with the mean estimated (from pass 1 and 2) for that domain.
	• Search ellipses were determined by calculating the range at specified percentages of the variogram sill and using the orientation of the anisotropic ellipse. For the OK pass, 95% of the sill is used. An SK pass is used at the range of the sill, beyond which any estimation will be using uncorrelated data and hence is assigned the average estimated grade.
	• The data had been composited to 8 m for Mineral Resource estimation to reduce grade variability and reflect the massive style of mineralisation.
	• Outlier analysis was completed on the grade zone/rock type breakdown to determine the most appropriate (spatially and statistically) thresholds. Outliers are preferentially controlled by a "High Yield Restriction" ellipse. The range at 60% of the sill is used for high grade restriction, beyond which a sample cannot be used for a block's estimation.
	• Grade behaviour across modelled geology contacts is assessed to inform how estimation domains are grouped for variogram selection and for estimation.
	• Estimation is into parent blocks of 15 mE × 15 mN × 15 mRL (50 foot cube).
	• Blastholes are also used to define the four grade zones for each metal but not for estimation.
	• Talc, arsenic, clay, bismuth and sulphur are also estimated for mine planning purposes.
	• Historically, a bias has been observed between Mo grades estimated from exploration sample assays and mill sample assays. An adjustment is applied to resource model grades based on historical reconciliations. The adjustment for 2022 is (Mo*1.668 -0.0033)/0.8255 when Mo grades are greater than 0.017%.
	• The following validation was carried out on the 2022 model and processes used for the 2022 resource modelling and shows that the modelling process validates well against the input data and historical production. All spatial and geostatistical validation is performed against a declustered model (nearest neighbour estimation) and includes:
	  o Swath plot analysis to check for trends in data/estimates and evaluate smoothing.
	  o Histogram comparison to check on variance of data versus estimation (smoothing).
	  o Cumulative frequency comparison to evaluate smoothness of the model, variance, and bias.
	  o Grade-tonnage curves to assess metal-at-risk.
	  o QQ plots to evaluate bias in models versus the declustered database.
	  o Validation is focused on four separate volumes:
	    ▪ Within the Ore Reserve pit shell.
	    ▪ A "proxy" slice volume; an ore volume designed to mimic the present pushbacks but within historic mining to provide a contextual as-mined/backwards-looking comparison. To be evaluated against a blast-block-average model to establish predictive capability relative to the more closely spaced blast hole data model.
	    ▪ Monthly reconciliation polygons processed from actual mining. These values are compared against monthly concentrator reporting to evaluate the accuracy of the models within ore shapes.
	    ▪ New Mineral Resource pit shell.

Moisture	• All Mineral Resource tonnages are estimated and reported on a dry basis.
Cut-off parameters	• Optimised Life of Mine production scheduling of phased mining designs using variable economic marginal cut-off grades based on performance of historical metallurgical ore types, product metals, operating cost projections and metal prices produces an average approximately equal to a 0.25 CuEq%. • 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 resources statement. The detail of this process and of the price points selected are commercially sensitive and are not disclosed. • Operating costs are informed by current operations. • It is the company's opinion that all the elements included in the metal equivalent calculation have a reasonable potential to be recovered by RTK's milling, smelting and refining facilities and sold. • Average grades for the individual metals included in the metal equivalent calculation are shown in the Mineral Resource tabulations. • Copper equivalents have been calculated using the formula CuEq% = Cu% + (((Au g/t * Au price per gram * Au_recovery) + (Mo% * Mo price per tonne * Mo_recovery) + (Ag g/t * Ag price per gram * Ag_recovery)) / (Cu price per tonne * Cu_recovery).
Mining factors or assumptions	• The estimate assumes the continuation of open pit mining using the existing mining fleet. • Reasonable prospects for eventual economic extraction have been assessed through mining designs based on Order of Magnitude open pit mining phase designs, optimised Life of Mine (LoM) production scheduling using variable economic marginal cut-off grades based on performance of historical metallurgical ore types and operating cost projections and cash flow analysis including estimates for development and sustaining capital. • Based on historical performance, no recovery and dilution factors are applied in the estimation.
Metallurgical factors or assumptions	• The metallurgical processes have been developed and optimized based on the long operating history of the deposit. • All process performance parameters (recoveries, concentrate grades including deleterious elements) are based on historical metallurgical test performance of 44 ore types. • Several decades of mineralogy characterisation work concludes that the deposit continues to be of a similar nature to the existing operation. • Average metallurgical recoveries for the resource additions used to calculate CuEq%: %Cu %Au %Mo %Ag 89 70 71 74
Environmental factors or assumptions	• The Bingham Canyon mine is an historical operation managed under Utah regulatory approval. All approvals and permits necessary to mine the Mineral Resources have been obtained and are expected to be maintained.
Bulk density	• Specific gravity/bulk density is determined by using the displacement method using sealed core, volumetric of dry core samples, and gridded rock sampling across the pit. • Average density values for each rock type are assigned to the resource model. • Yearly mining reconciliation show calculated tonnage from volume surveys to be within 5% of mine production. • Density estimates were updated in 2022 with 51 additional samples.
Classification	• Mineral Resources are classified after consideration of understanding of the genetic model, assay and drilling quality and confidence in estimation parameters. Classification criteria based on drill spacing is done in two steps: o Measured – Average spacing less than 91 m between drill holes. o Indicated – Average spacing between 91 m and 182 m. o Inferred – Average spacing greater than 182 m between drill holes. • The second step is a refinement of the classification done by: o Creating shells for each classification. o Reinterpreting and manually creating classification contours at each bench elevation. o Coding the block model based on the contours. • The Competent Persons are satisfied that the stated Mineral Resource classification reflects the relevant factors of the deposit.
Audits or reviews	• Mineral Resource audits/reviews that have been complete in the past seven years: o External resource model audit by CRM-SA LLC (2022). o Internal database audit of 2021 model completed February 2022. o Fundamental Data – Extraction and Quality review of the resource database (2017). o Long Range Model (Resource model) Cu EDA (2017). o Rio Tinto Corporate Assurance Internal Audit of Resources and Reserves (2015). o Copper Group Peer Review (2015). o Rio Tinto internal review of RTK's Integrated Studies Investment Committee requests for the South Pushback (2014 & 2015). o Review of the Mineral Resource and Ore Reserve procedures (2013).

	○ External review of molybdenum grade adjustments (2014). • No material issues were raised in the reviews.
Discussion of relative accuracy/ confidence	• Bingham Canyon open pit mine has been in operation since 1906. The Mineral Resource data collection and estimation techniques used are supported by reconciliation of actual production since 1989. • Reconciliation of actual production with the Mineral Resource estimates for the existing operational are generally within 10% for tonnage and copper grades.

Section 4: Estimation and Reporting of Ore Reserves

Criteria	Commentary
Mineral Resource estimate for conversion to Ore Reserves	• The Ore Reserve model was based on the 2022 Mineral Resource model. • Mineral Resources are reported additional to Ore Reserves.
Site visits	• The Competent Person is located near the mine site and regularly visit the mine and plant sites.
Study status	• The 2022 estimate is based on the pit slope design from the Apex pre-feasibility study including the most current results of ongoing updates to geotechnical assessments and mine plans and considering all material Modifying Factors.
Cut-off parameters	• Optimised Life of Mine production scheduling of phased mining designs is carried out using variable economic marginal cut-off grades based on performance of historical metallurgical ore types, product metals, operating cost projections and metal prices • 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 resources statement. The detail of this process and of the price points selected are commercially sensitive and are not disclosed. • Operating costs are informed by current operations. • It is the company's opinion that all the elements included in the metal equivalent calculation have a reasonable potential to be recovered by RTK's milling, smelting and refining facilities and sold. • Copper equivalents have been calculated using the formula CuEq% = Cu% + (((Au g/t * Au price per gram * Au_recovery) + (Mo% * Mo price per tonne * Mo_recovery) + (Ag g/t * Ag price per gram * Ag_recovery)) / (Cu price per tonne * Cu_recovery).
Mining factors or assumptions	• The Bingham Canyon Ore Reserve continues to be exploited by open pit mining methods using conventional diesel/electric haul trucks and electric or hydraulic mining shovels. • The estimate assumes the continuation of open pit mining using the existing mining fleet. • As the deposit is well disseminated, ore boundaries are generally diffused; hence no recovery and dilution factors are applied in the estimation. This is supported by historical performance. • The Ore Reserve production schedule was derived with Inferred Mineral Resources (~1% of total) using an economically optimized mining sequence based on detailed phase designs and cut-off policy determined by constrained linear programming algorithms with the objective to maximise NPV. • Other than sustaining equipment replacements, mining infrastructure required to produce the Ore Reserve currently exists.
Metallurgical factors or assumptions	• The metallurgical processes have been developed and optimized based on the long operating history of the deposit. • All milling is done by the Copperton Concentrator's four grinding lines consisting of three 10.4 m and one 11 m SAG mill each feeding two ball mills. Flotation is comprised of a bulk circuit having rougher, scavenger and cleaner lines feeding the Moly Plant where molybdenum disulphide concentrate is produced and bagged for toll roasting. A 25% copper concentrate is pumped 28 km to the Smelter where it is filtered and stockpiled. • The concentrate is smelted in a Flash Smelting Furnace (FSF) and then converted in a Flash Converting Furnace (FCF) operating in a single-line configuration separated by an intermediate matte stockpile. Two parallel furnaces further refine the copper and cast anodes which are railed to the Refinery. Smelter slag is milled and processed to recover metals. The Smelter converts 99.9% of the sulphur emitted from processing the copper concentrate feed into sulphuric acid which is also sold. Heat from the furnaces and the acid plant is used to co-generate about 60% of the Smelter's electric power needs.

	• At the Refinery, the anodes are interleaved with stainless steel cathode blanks in tank cells of acidic copper sulphate solution. Electric current is applied for about 20 days to dissolve the anodes and deposit 99.99% pure copper which is stripped from the reusable cathode and sold. Precious metals and impurities from the cathodes settle to the bottom of the cells. Gold and silver are recovered from the slimes by process of autoclaving, filtering, hydrochloric leaching and solvent extraction and cast into bars by an induction furnace • All process performance parameters (recoveries, concentrate grades including deleterious elements) are based on historical performance of 44 ore types. • Several decades of mineralogy characterization work concludes that the deposit continues to be of similar nature.
Environmental	• Expansion of the existing Markham waste dump complex will be required for Apex waste material storage. Topsoil will be salvaged for closure and reclamation purposes before waste rock is dumped. • All approvals and permits necessary to mine the Ore Reserves have been obtained.
Infrastructure	• No significant changes to the existing infrastructure are required to mine the Apex Ore Reserves. • The mine's power network, 44kV and associated power poles, will require relocation prior to major mining activities beginning. • The east tailings impoundment will be expanded to buttress the east abutment. • Other services will continue to be provided by the existing infrastructure. • The in-pit crusher was relocated ex-pit in April 2021 with an overland conveyor to deliver ore to the Copperton Concentrator.
Costs	• Development capital costs are based on the Apex pre-feasibility study. Sustaining capital costs are based on estimates derived for each operating plant. Both estimates utilise historical plant 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 pre-feasibility study estimates. • There are no royalty obligations. The estimate includes an allowance for Utah state severance tax cost of 2.5% of revenue.
Revenue factors	• Revenue projections are based on projected mill head grades, process recovery losses and product prices. • Bingham Canyon applies consensus pricing in the determination of Ore Reserves and Mineral Resources. This involves generation of long-term price points 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 reserves and resources statement. 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	• 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 of using Rio Tinto long-term prices demonstrates a positive NPV for the Bingham Canyon Ore Reserves under range of price, cost and productivity scenarios.
Social	• The mining tenure is wholly owned, and all permits necessary to mine the Ore Reserve have been obtained.
Other	• Semi-quantitative risk assessments have been conducted throughout the various technical studies and for each operating plant.
Classification	• Mineralisation tends to be reasonably well disseminated for copper, but molybdenum varies from disseminated to highly variable veins in higher grade areas. This difference occurs when grades are 0.25% MoS_2 or greater. • Measured Mineral Resources not contained within the 0.25% MoS_2 grade zone are classified as Proved Ore Reserves. • Measured Mineral Resources within the 0.25% MoS_2 grade zone are classified as Probable Ore Reserves. • Indicated Mineral Resources are classified as Probable Ore Reserves.

Audits or reviews	• An external review was completed by the Rio Tinto Corporate Assurance Group in 2015 and all finding mitigating actions were completed in 2016. • An independent Mineral Resource and Ore Reserves audit was last completed in 2010 and resulted in low-level findings regarding documentation of procedures. • An external review of the Mineral Resource and Ore Reserve estimating processes and documentation was conducted in 2013 and concluded that the fundamental processes are appropriate. All audit findings have been fully addressed.
Discussion of relative accuracy/ confidence	• Historically, reconciliation of actual annual production with the Ore Reserve estimate is generally within 5% for tonnage and copper and gold grades. Prior to 2014, molybdenum could exceed 10% high but a regression analysis and adjustment to the molybdenum grade has resulted in reconciliation performance similar to copper and gold. Silver grade estimates can be in excess of 10% below mined grade due to the nature of mineralisation and drill spacing. • These results are indicative of a robust Ore Reserve estimation process. • Accuracy and confidence of modifying factors are generally consistent with a deposit with a long operating history or with pre-feasibility level studies

Winu JORC Table 1

The following table provides a summary of important assessment and reporting criteria used 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 used in the Mineral Resource estimate were obtained using either reverse circulation (RC) or diamond (DD) drilling. • RC drilling samples were collected from a static cone splitter on a cyclone at 2 m or 1 m intervals depending on drill hole purpose. The samples consisted of 12% and 8% respectively of the drilled metre with an average sample weight of 3.64 kg. • Most pre-collars for diamond drill holes were destructively drilled with either tri-cone rock rollers or mud rotary PCD techniques to a depth determined by the local geology in which Quaternary and Tertiary sand cover is penetrated, enabling safe installation of casing through the sand profile. Once through the sand cover, standard diamond coring techniques commence. • Several diamond holes were pre-collared utilising RC rigs. • All diamond core drilling is drilled using 3 m triple tube assemblies. • All drilling has been carried out under Rio Tinto supervision by experienced drilling contractors. • Core is cut using an automated core-cutter and a half core sample was collected on intervals ranging from 0.1 m to 1.3 m length.
Drilling techniques	• RC drilling is from surface using reverse circulation with face sampling bit. RC holes are predominantly east to west at a -85 to -75 degree dip and are cased between 50 m and 70 m. • Diamond drilling is from surface, commencing with either tri-cone rock rollers or mud rotary PCD through sand cover, enabling safe installation of casing through the sand profile. The drill holes are generally cased to 30 m. • Once through the sand cover, triple tube diamond coring techniques are utilised. Reduction from PQ to HQ is at 160 m on average, with depth varying from hole to hole. Most diamond drilling is inclined at approximately -60 degrees; some west to east scissor holes and north-south oriented diamond holes have also been drilled. • Diamond core was oriented using an ACT III RD tool. At the end of each run, the low side of the core was marked by the driller and this was used at the site for marking the whole drill core run with a reference line.
Drill sample recovery	• RC primary and duplicate samples were weighed upon collection at the rig and all RC samples were weighed upon arrival at the ALS Perth sample preparation facility. • Beyond the depth that RC samples cannot be recovered dry, two additional 6 m rods were drilled. Drilling of the hole was stopped if these samples were wet. • Some wet RC samples drilled prior to 2020 were excluded from the resource database as recorded sample mass was considered too low for the drilled interval, and the representivity of those samples could not be assured. Changes made to RC sampling processes in early 2020 resulted in representative sampling throughout the hole length. • Core recovery was measured and recorded continuously from the start of core drilling to the end of the hole for each drill hole. The end of each run was marked by a core block which provided the depth, core length drilled and core recovered from block to block. • Core sample intervals were selected predominantly at 1 m length, with modification by the geologist according to mineral/vein/contact. Intervals did not consider drilling recovery except when core loss was greater than 0.4 m. • Sampling recovery, independent of drilling recovery, is not detailed in the logging procedure, however it will be included in the next procedure edition.
Logging	• The logging of the RC chips was completed after sieving and washing of representative material collected from the cyclone. • Detailed descriptions of core were logged qualitatively for lithological composition and texture, structures, veining and alteration. Visual percentage estimates were made for some minerals, including Cu-oxides and Fe-, Mo-, Zn-, and Bi-sulphides. • Structural measurements (orientations of structures such as fault contact, fault fabric, bedding, veins and stratigraphic contacts recorded) as well as geotechnical summary logging was completed. Holes with specific geotechnical purpose had comprehensive geotechnical logging completed, with associated orientations measured. All DD holes were logged before sampling. • All recovered core was logged in detail. • The core was photographed both dry and wet inside the core trays. • All logging information was uploaded into an acQuire database.

Sub-sampling techniques and sample preparation	• RC samples split by static cone splitter on a cyclone were sent to an ALS Limited laboratory. • PQ3 (83 mm) and HQ3 (61.1 mm) diamond core was sawn into two, and half was collected in a bag and submitted for analysis, the other half was kept in the tray and stored. The diamond half core was sent to ALS Limited laboratory in Perth. • At the laboratory, all samples were dried and crushed to 70% passing 2 mm and then split using a rotary splitter to produce a 750 g sub-sample. The crushed sub-sample was pulverised with 85% passing 75 µm using a LM2 mill and a 100 g pulp was then subsampled for ICP and 30 to 50 g for fire assay. • A portion of the 2 mm sized material was used for VNIR/SWIR spectral readings, which were sent to aiSIRIS International for interpretation. • Preparation techniques and samples sizes are considered appropriate for the style of mineralisation.
Quality of assay data and laboratory tests	• 51 elements were analysed using 4-acid digestion followed by ICP-OES/MS measurements, including qualitative Au, Pt and Pd. • For Au, a 30 g sample was used for analysis by fire assay with AAS finish. • Portable XRF analysis on pulp for Cr, Nb, S, Si, Ta, Ti, Y and Zr was performed with a Delta and Vanta Olympus instrument. • Quality control samples consisted of field duplicates (3 per 100), crush duplicates (1 per 55), pulp duplicates (1 per 55), blanks (3 per 100) and certified reference materials (CRM; 3 per 100). All the results were checked in the acQuire database before being used, and the analysed batches regularly reviewed to ensure they performance within acceptable accuracy and precision limits for the style of mineralisation. Failures during this quality control process triggered re-analysis of the batch prior to acceptance into the database. • Long term CRM performance is consistent across relevant grade ranges for payable metals, showing acceptable levels of accuracy. • A systematic analysis of duplicate samples was carried out at each stage of sampling including field, crush and pulp duplicates. The results from the duplicates indicate an acceptable level of precision for this type of mineralisation and the classification of the resource. The results from blanks did not indicate contamination during the laboratory procedure. The quality control process indicates acceptable levels of precision.
Verification of sampling and assaying	• All sample intervals were visually verified using high quality core photography and some selected samples were taken inside the mineralised interval for optical and petrographic microscopy by qualified petrographers. • No adjustments were made to the assay data that were electronically uploaded from the laboratory to the database. • The drill core logging data was managed by a computerised system and strict validation steps were followed. • The data are stored in a secured database with restricted access. • Several studies have identified small bias and precision differences between RC and DD where paired data exist. The Competent Person considers the bias to be in an acceptable range. • Documentation of primary data, data entry procedures, data verification and data storage protocols have all been validated by a third-party audit.
Location of data points	• Drill hole collar locations were surveyed after drilling utilising a handheld Garmin GPS with accuracy of 5 m, and on a campaign basis by an independent survey contractor using a Leica Viva GS15 GNSS base and rover system operating in RTK mode to a stated accuracy of +/- 20 mm. • The data for the collars are provided in the Geocentric Datum of Australia (GDA94 zone 51). • Downhole surveys were completed every 10, 25 or 50 m using a Reflex EZ Gyro or Reflex SPRINT-IQ. Some RC drill holes could not be completely surveyed due to downhole blockages. • The topography is relatively flat with average elevation of 240 m. The basis for the topography surface used in the model is a Lidar survey completed at 1 m centres in 2019. A 5 m x 5 m gridded surface was imported into Vulcan software and used to limit the top of the resource model.
Data spacing and distribution	• Combined RC and diamond hole spacing after 2022 drilling is irregular with distances between holes ranging from 15 to 150 m with an average of approximately 60 m inside the starter pit shell and 110 m outside the starter shell and inside the nominal resource shell. • A pattern of 14 diamond holes at 15 m spacing north-south and east-west was completed as a part of the drilling included in this report. This close-spaced drilling targeted a representative section of the main mineralised corridor and supports the interpretation of important contacts between supergene and hypogene units and informs the choice of variogram model used in the kriging and recoverable estimation methodology. • The current drilling provides sufficient information to support classification at Indicated Mineral Resource status for a significant portion of the starter pit. • All material outside the starter pit and inside the larger nominal Resource pit shell is classified at Inferred status. • The mineralisation remains open to the north and east and at depth.

Orientation of data in relation to geological structure	• The majority of the drilling is orientated to the west, perpendicular to the orientation of the trend of the highest grade Cu mineralisation which strikes north-northwest and dips moderately (56 degrees) to the east-northeast (080 degrees). • It is recognised that there are multiple mineralisation events and possible overlapping styles of mineralisation. Approximately 35% of drill holes have been oriented other than west, to address any sampling bias, particularly in locations where north-northwest is not the dominant mineralised orientation.
Sample security	• Samples in calico bags were stored on site in enclosed Bulka-bags before being transported via road via Port Hedland to an ALS Limited laboratory in Perth. • Unique sample numbers were generated directly from the database. • Each sample was given a barcode at the laboratory and the laboratory reconciled the received sample list with physical samples. Barcode readers were used at the different stages of the analytical process. • The laboratory uses a LIMS system that further maintains the integrity of the results. • All sample pulps are stored in a secure warehouse facility.
Audits or reviews	• The database containing the Winu data was independently checked by a third party in August 2019 and shown to be accurate. • No independent database reviews were conducted in 2022.

Section 2: Reporting of Exploration Results

Criteria	Commentary
Mineral tenement and land tenure status	• All Rio Tinto tenements are managed in accordance with legislated obligations including minimum expenditure. The Winu project is located within Exploration Licence E45/4833, which is 100% owned by Rio Tinto Exploration and expires on 12 of October 2027.
Exploration done by other parties	• No exploration had been carried out in the immediate Winu area prior to Rio Tinto work which commenced in 2016.
Geology	• The prospect is located on the Anketell Shelf of the Yeneena Basin, a Neoproterozoic sequence of metasedimentary rocks and granitoids (basement) that were truncated by an angular unconformity before being entirely covered by Phanerozoic sediments (mostly Permian) that range from 50 to 100 m thick in the Winu area. The basement sediments have been folded and faulted both syn and post deposition in numerous tectonic events, and the mineralisation at Winu is located proximal to the hinge of the Winu anticline. • The main lithologies intercepted by the current drilling at Winu include metasedimentary rocks (quartzites, metasandstones, and metasiltstones), unmetamorphosed sedimentary cover rocks (conglomerates, gritstones, sandstones and mudstones) and mafic intrusions. Host rocks to Cu-Au mineralisation are fine to medium-grained sub-arkosic metasandstones and biotite-rich metasiltstones. • The mineralisation is predominantly vein and breccia controlled chalcopyrite and chalcocite with associated pyrite, pyrrhotite, molybdenite, scheelite, bismuthinite and wolframite. Several generations of veins and breccias are identified and characterised by different mineralogical assemblages and textures. The mineralisation associated with the main hydrothermal event is veins with quartz-potassium feldspar-sulphide-dolomite and dominantly potassium feldspar, muscovite, biotite and/or chlorite wall rock alteration. • Primary sulphide mineralisation is overlain by a supergene blanket containing secondary Cu minerals as well as native Cu in places. Minor secondary Cu minerals are present in the hypogene where oxidation of mineralisation has occurred through preferential weathering within structures and areas of high fracture frequency of rock as conduits.
Drill hole Information	• Summary of drilling used for the Winu Mineral Resource estimate:

Drill type	Number of holes	Total metres
RC	605	144,385
DD	283	132,384
Total	888	276,769

Data aggregation methods	• Not applicable as no Exploration Results are being reported.
Relationship between mineralisation, widths and intercept lengths	• Previous public releases have reported intersections as apparent widths. • No individual drilling results are included in this release.
Diagrams	• Figure 2 in the body of this release shows the property location.

- Figure 8 shows a plan view of the drill hole collars and Figure 9 and Figure 10 show two example cross sections through the deposit.

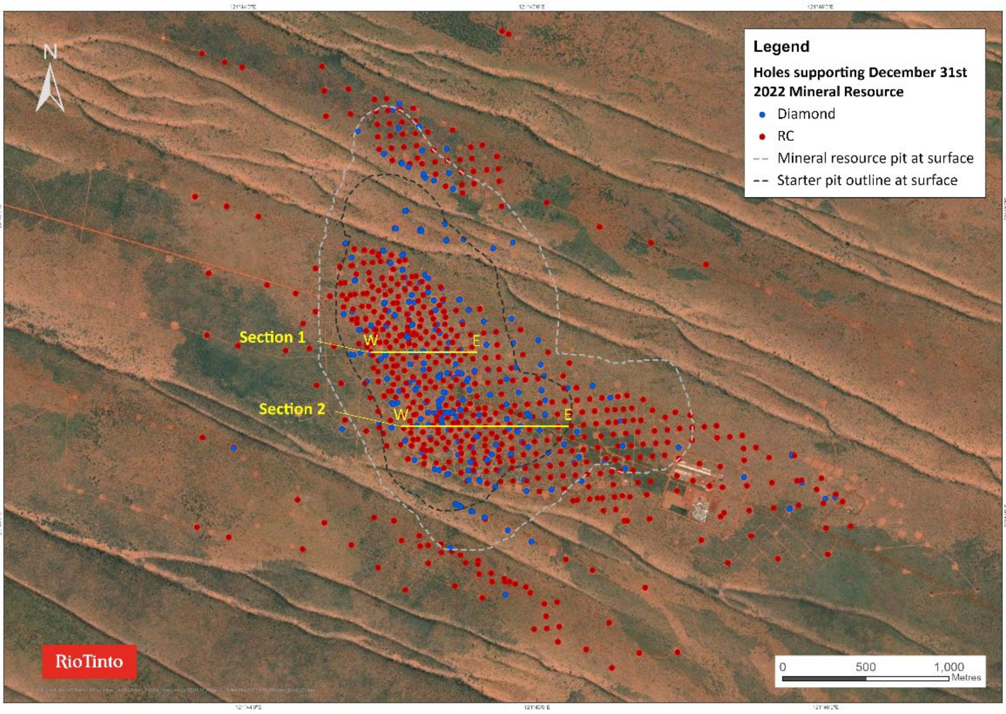


Figure 8 Drill hole collar location plan for all Winu holes used in the 31 December 2022 Mineral Resource evaluation with cross section line locations indicated

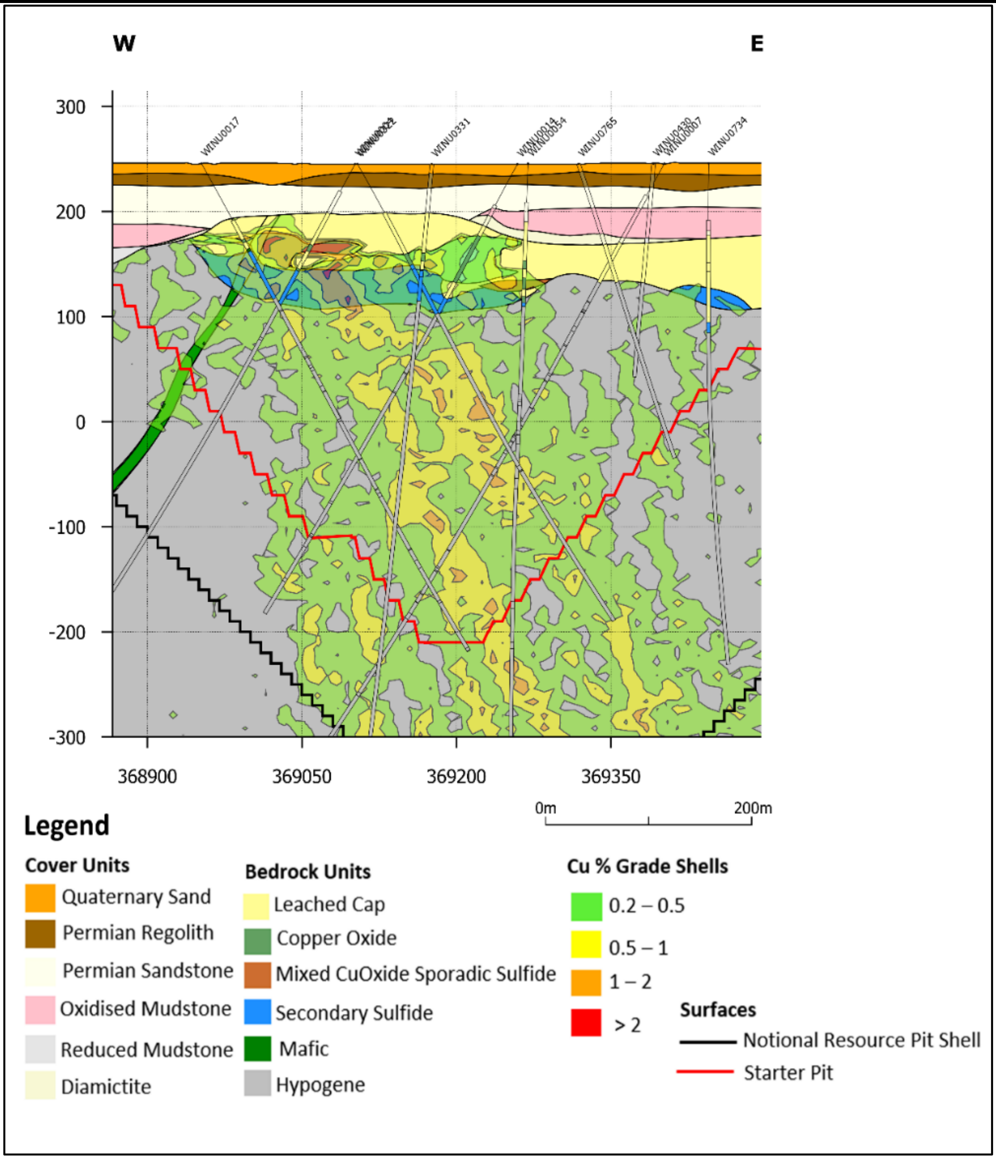


Figure 9 Cross section 1 through the Winu orebody showing the geological model and copper assay intercepts

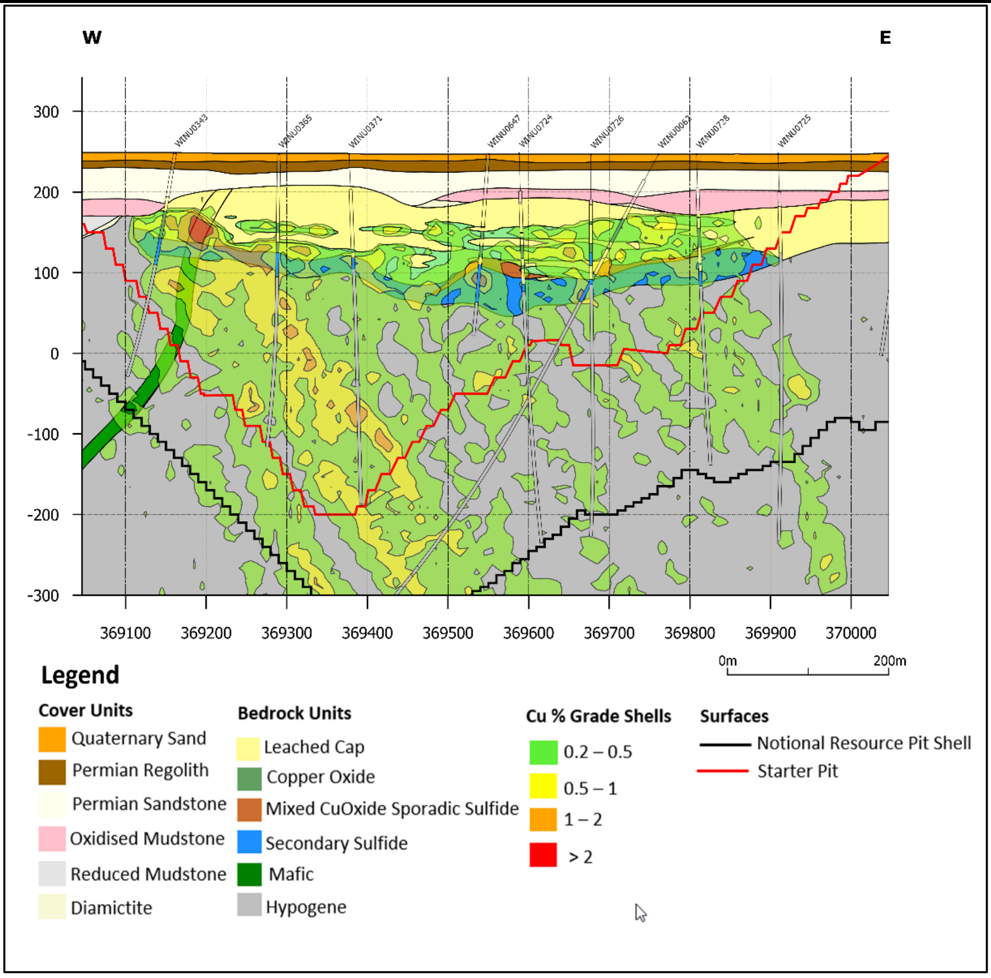


Figure 10 Cross section 2 through the Winu orebody showing the geological model and copper assay intercepts

Balanced reporting	• Not applicable as no Exploration Results are being reported.
Other substantive exploration data	• Hyperspectral and high-resolution core imagery was collected using a CoreScan Hyperspectral Core Imager. Historical Winu core from 2018 and 2019 was imaged as half core. Holes drilled in 2020 or later were whole core imaged prior to sample cutting. • Magnetic susceptibility was measured for each sample using KT-10 (kappameter) instrument. • Geophysical surveys were carried out over the deposit area including airborne electromagnetics, ground gravity, induced polarisation/resistivity, passive seismic, and downhole density, gamma, conductivity, resistivity, induced polarisation, magnetic susceptibility, BMR, sonic and optical and acoustic televiewer. • Geometallurgical characterisation was conducted on numerous holes since the project commenced and has informed an early understanding of the potential metal recovery. This work continued throughout 2022. • LiDAR imagery was acquired to help in better planning and reporting of the exploration programme.
Further work	• Rio Tinto will continue to evaluate and interpret the results from all historical work programmes at Winu. • Drilling is ongoing to define the extents of the mineralisation. The results presented here indicate the mineralisation is not closed off by drilling to date. • Metallurgical test work is ongoing. • Geotechnical drilling and logging is ongoing. • Installation of water bores and water monitoring points is ongoing. • Rio Tinto has conducted exploration within the broader Paterson Province on its wholly owned licences and joint venture licences during 2022.

Section 3: Estimation and Reporting of Mineral Resources

Criteria	Commentary
Database integrity	• All drilling data is stored in the Rio Tinto Copper Winu Project acQuire drill hole database. • All data previously stored in the Rio Tinto Exploration acQuire drill hole database was migrated to the Rio Tinto Copper database in 2021 in a process managed by Rio Tinto IS&T. The migration included all aspects of ore body knowledge data sets and applications. • The system is backed up daily to physical and cloud servers. • All newly acquired data was transferred electronically and is checked prior to upload to the database. • In-built validation tools were used in the acQuire database and data loggers were used to minimise keystroke errors, flag potential errors and validate against internal library codes. Data found to be in error was investigated and corrected where possible. Data that was not corrected was removed from the data set used for resource modelling and estimation. Routine checks of raw assay data against the database were implemented. • Drill hole collars were visually validated and compared to planned locations. Downhole trends and sectional trends were validated and outliers checked. Statistical analysis of assay results by geology domains were checked for trends and outliers. Ongoing comparison with earlier work was undertaken. • The drill hole database used for the resource estimation was validated. Methods included checking of QA/QC data, extreme values, zero values, negative values, possible miscoded data based on location within a geology domain and assay value, sample overlaps, and inconsistencies in length of drill hole surveyed, length of drill hole logged and sampled and sample size at laboratory.
Site visits	• The Competent Person worked closely with the Winu site and Perth-based project teams since 2020 and is familiar with drill data acquisition procedures and QA/QC system, geological logging, geological data and its interpretation, and geological model development. • The Competent Person visited the Winu site in December 2021. The site visit allowed the Competent Person to gain familiarity with and confidence in field procedures, in particular those impacting drilling, sampling and logging data acquisition.
Geological interpretation	• Data supporting the geology interpretation includes drill cores, RC chips, geological logs, borehole geophysical logs, ground and airborne geophysical surveys, core imaging, borehole imaging, and chemical analyses. • The orebody is not yet exposed by mining. • Sequences of cover, supergene zones and hypogene zones are well defined at the scale of the drill grid. Details of geology are discussed in Section 2 of this table. • The geological genesis model for Winu is that the primary mineralisation is contained in sets of veins with various orientations potentially related to granite intrusion in the structural setting of the 550 Ma Paterson Orogenic event causing deformation to the host rocks. Paterson deformation resulted in a prominent fold structure at Winu. • At deposit scale, Cu and Au grade continuity within the broad mineralised central zone of the deposit is well supported by available drilling data. Several breccia units have been identified in the centre of the deposit and highlight the highest Cu grades. These units are mappable between drill holes along strike and down dip. Minor late fault offsets are interpreted although not explicitly modelled). Individual veins are narrower and show less persistence along strike and down dip and cannot be confidently mapped between drill holes. • A supergene zone consisting of Cu oxides, leached cap and mixed secondary and primary sulphides has been modelled with available data including sequential Cu analyses and mineralogy. Differentiation of units in the supergene zone is primarily reflective of differing metal recovery (geometallurgical) characteristics. Primary mineralisation is remobilised into the supergene zones that are discordant to the axial planar fabric. • Geological differentiation within the hypogene zone is limited to identified sulphide breccia units and proximal quartz-sulphide veins that are associated with most of the Cu, Au and Ag. mineralisation. Several narrow marker units have been identified in the metasediments as well as a pre-mineral mafic sill, and several post-mineral mafic dykes. • Some stratigraphy-parallel veins have been identified, as well as sets of veins which appear to be strata-bound, perpendicular to stratigraphy and contained within zones of stratigraphy which shows preferential characteristics for hosting veining. It is currently acknowledged that these veins do not make up the primary mineralisation when in proximity to the sulphide breccia but could add value distal to the breccia. • In the southeast corner of the proposed starter pit and extending into the notional resource pit shell, Au-dominant (low Cu) mineralisation hosted in east-west trending near vertical quartz veins have been intersected in RC and diamond drilling. This is a different style of mineralisation to that seen in the main central mineralisation zone and more drilling is required to test grade and extent and to understand the geological controls. Geological work is planned to review the continuity of veining within zones of stratigraphy which could host more volumetrically significant mineralised veins rather than strike or dip continuous.

	• The geology has been modelled in 3D by implicit modelling to suit the specific geometries and spatial continuity for lithology and geometallurgical units. The modelled units are used to control estimation. • The purpose of the recent model update was to increase the reliability of the geological models to adequately reflect the current geological knowledge of the project.
Dimensions	• The drilled extent of continuous anomalous (>0.2%) Cu mineralisation strikes approximately north-northwest to south-southeast with a strike extent of 3,000 m. This feature has a width ranging from approximately 130 m in the southern end, 100 m in the northern end, and up to 400 m in the centre of the hypogene mineralisation. Supergene Cu mineralisation is up to 700 m wide. Copper mineralisation occurs from approximately 80 m to approximately 740 m below surface. • A zone of Au-dominant mineralised veins in the southeast corner of the known mineralisation has an approximately east-west orientation with strike extent of 1000 m and up to 150 m true thickness.
Estimation and modelling techniques	• Cu, Au, Ag, Bi and S grades are estimated by a combined method consisting firstly of Ordinary Kriging (OK) onto 40 x 40 x 5 m panels followed by Uniform Conditioning by kriged panel grade (UC) and finally a localisation (LUC) onto blocks of 10 x 10 x 5 m. • A suite of additional elements including As, C, soluble Cu, Na_2O, K_2O, Al_2O_3, CaO, Fe_2O_3, Sb, MgO, SiO_2, MnO, Pb, Zn for ore and waste characterisation are estimated onto 10 x 10 x 5 m blocks by either LUC or directly by OK. • Raw RC and diamond assay samples, mostly at 1 m, are length weighted to regular 2 m composites prior to data analysis and estimation. • The supergene zone is divided into several discrete domains on the basis of sequential Cu and mineralogy data and the domains are used to constrain grades estimation. • A low grade Cu grade shell is used to limit grades estimation within the hypogene zone. The shell is defined at a low (0.2%) Cu grade and is modelled as an Indicator by kriging onto blocks. A probability threshold of 0.5 was applied to the kriged indicator on blocks. • In the southeast corner of the deposit, a low grade Au shell is modelled to constrain estimation of Au and Bi. The shell is defined at 0.1 ppm Au and is modelled as an Indicator by kriging onto blocks. A probability threshold of 0.25 was applied to the kriged indicator on blocks. • Exploratory data analysis was conducted to evaluate domain boundary conditions, establish variogram models, and define interpolation parameters. • The distribution of Cu and Au grades within each domain is typically skewed to the right. A small number of high grade samples are deemed to be unrepresentative outliers and those values were trimmed back to better-supported grade values prior to use in estimation. The sensitivity of the trimming of outlier values has decreased with each iteration of the estimate with the addition of drilling data. • No other modifications are made to the composite data used for analysis and estimation. • The raw Cu, Au, Ag, Bi and S values were transformed to Normal distributions for data analysis and to choose variogram models. The Normal variogram models were back-transformed to raw grade scale prior to use in estimation. • Data analysis, kriging and recoverable resource estimation are completed using Isatis geostatistical software. Final block models are prepared using Vulcan software. • Grade estimation was completed in two passes, with the majority of blocks inside starter pit and notional resource pit shell estimated in the first pass. Searches were orientated to the primary interpreted mineralisation trend. The first search utilised distances of 350 x 250 x 20 m in the major, semi major, and minor orientations for hypogene and secondary sulphide domains. For the oxide domains search utilised were 200 x 200 x 32 m in the major, semi major, and minor orientations, respectively. • Validation of grade, metal and tonnage estimates is by visualisation along with statistical comparison to input data, geological models and previous estimates. Block estimates are consistent with sample values and observed geology. Local differences between previous and current estimates are consistent with changes to geological model and/or additional drilling. • Grade and metal estimates by LUC on 10 x 10 x 5 m blocks are compared to 40 x 40 x 5 m kriged panel scale estimates to confirm global unbiasedness, and to global change of support estimates to confirm the distributions are appropriately modelled.
Moisture	• All tonnages and grades are presented on a dry basis.
Cut-off parameters	• The cut-off parameters used as the basis of this Mineral Resource are on a CuEq. A CuEq unit is defined as: ((Cu_pct *Cu (price 1%/tonne) * Cu recovery) + (Au_ppm * Au($/t) * Au recovery) + (Ag_ppm * Ag ($/t) * Ag recovery)) / (Cu (price 1%/tonne)). • All elements included in the metal equivalent calculation have a reasonable potential to be recovered and sold. • Metal prices applied 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 resources statement. The detail of this process and of the price points

- selected are commercially sensitive and are not disclosed.
- Average recoveries for each of the supergene and hypogene domains are derived from metallurgical test work and detailed mineralogy studies using drill core acquired from purpose-drilled metallurgical and resource drill holes. Average recoveries are shown in the table below.

P80 = 106 µm	Flotation Recovery / %			Gravity Recovery / %	Total Recovery / %
	Copper	Gold	Silver	Gold	Gold
Primary (bulk)	IF (110 * %Cu^0.14<95, 110*%Cu^0.14, 95)	54.5	48.0	7.2	61.7
Primary Mafic (bulk)	IF (110 * %Cu^0.14<95, 110*%Cu^0.14, 95)	50.1	27.7	8.0	58.1
Secondary Sulphide A (bulk)	86.5	60.6	61.1	3.8	64.4
Secondary Sulphide B (bulk)	58.9	50.8	49.2	4.2	55.0
Secondary Sulphide Mafic (bulk)	78.0	56.7	58.0	3.0	59.7
Mixed Secondary Oxide (bulk)	36.3	34.4	42.6	5.8	40.2
Copper Oxide 0 (no malachite) - NaHS	8.8	58.4	19.1	5.0	63.4
Copper Oxide 1 (low malachite) - NaHS	29.5	75.5	33.2	5.0	80.5
Copper Oxide 2 (medium malachite) - NaHS	52.7	83.6	36.2	5.0	88.6
Copper Oxide 3 (high malachite) - NaHS	74.6	92.4	76.8	5.0	97.4

Mining factors or assumptions

- Surface mining is the most likely method to be used in the extraction of this orebody.
- Mining studies have advanced through 2022 and form the basis of the reasonable prospects of eventual economic extraction test applied to the Mineral Resource.

Metallurgical factors or assumptions

- Metallurgical studies have advanced through 2022. The basis for predictions of metallurgical performance is the ongoing comminution and flotation test work conducted on samples composited from geometallurgical zones from numerous geometallurgical and resource diamond holes.
- The studies confirm that the mineralisation is amenable to processing through conventional crushing, grinding, and flotation circuits.
- The current assumption is that there will be a specific conventional processing pathway for Au.

Environmental factors or assumptions

- Closure studies continue to progress in preparation of approvals submission.
- Environmental geochemistry assessments have been conducted in accordance with industry standards. The majority of waste is expected to be non acid-forming, however some potentially acid-forming waste rock and tailings will be present. A management strategy has been developed to minimise the risk for acid and metalliferous drainage. This strategy includes the encapsulation of potentially acid-forming waste rock and de-sulphurisation of tailings. A desktop and basic survey have been undertaken for subterranean fauna. The assessment indicates it is unlikely that subterranean fauna occurs in most geological units of the study area. The assessment was supported by a sampling program which recorded no troglobitic or stygobitic specimens. Additional survey effort will be undertaken as additional water bores are established.
- Flora and fauna surveys have been conducted across the project area, with additional surveys planned as required.

Bulk density

- Specific gravity measurements were taken on 20 cm lengths of solid core every 10 or 20 m, representing different lithology and mineralised intervals. The measurement used the hydrostatic/gravimetric method (Archimedes Principle of buoyancy).
- Some variability exists between material types in the supergene zone. Dry bulk density values have low variability in the hypogene zone.
- Dry bulk density is estimated directly onto 10 x 10 x 5 m blocks by Ordinary Co-Kriging using dry bulk density as primary data and downhole geophysics derived density measurements as secondary data.

Classification

- The Competent Person considers that the classification reflects the style of mineralisation and confidence in the understanding of the mineralisation controls and drill hole sampling quality.
- The adopted definition of Indicated Resources is +/-15% variation in metal terms with a 90% confidence interval on an annual basis, inside the starter pit.
- A quantitative assessment of Cu grade uncertainty was made using the results of Conditional Simulation, taking into account proposed mining rates and schedule. This forms the basis for Indicated classification for a portion of the Mineral Resource.
- Only mineralisation that is considered to have reasonable prospects of eventual economic extraction has been reported as Inferred or Indicated Mineral Resource.
- Material outside the starter pit and inside the notional resource pit shell is classified Inferred.
- Mineralised material outside of the notional resource pit shell is excluded from the Mineral Resource.

Audits or reviews

- The 2022 estimation workflow used to produce the current Mineral Resource estimate is mature and stable. The estimation workflow was refined on the basis of several

	recommendations from the 2020 audit and subsequent analysis in 2021 and 2022. • The current workflow was internally peer reviewed in December 2022; the review confirmed that the estimation methodology is appropriate for the style of mineralisation and for the evaluation of open pit mining options, and that the estimates reflect the underlying drill hole assay grades. An external audit of the recoverable resource estimation methodology and results was conducted in 2020. The audit found that the estimation methodology was fit for purpose; no fatal flaws were identified.
Discussion of relative accuracy/ confidence	• The precision of Cu grades estimation was determined using the results of a geostatistical simulation of Cu grades within planned annual mining increments inside the proposed starter pit. • The quantified uncertainty of Cu grade estimates is inherent in the classification scheme described above. • Confidence in geological boundaries has not been quantified in the same way. The Competent Person has taken into consideration the maturity of the geological model in determining that the continuity of geological features associated with Cu and Au mineralisation is sufficient to support the classification of the Mineral Resource.

QIT Madagascar Minerals JORC Table 1

The following table provides a summary of important assessment and reporting criteria used 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	• The Petriky deposit was sampled using hand auger (HA) by US Steel in the 1970s and portable vibracore (VIB) by QMM in 1987 to 1988. Samples were collected at 1.5 m intervals with 100% of all samples retrieved for laboratory analyses.
Drilling techniques	• A total of 949 HA holes were drilled to the water table only and therefore never tested the full depth of the deposit. Drill depth averaged 5.6 m. • VIB extended to the full depth of the deposit with an average depth of 19.5 m. • HA and VIB essentially covers the same areas. • In both campaigns samples were collected at 1.5 m intervals.
Drill sample recovery	• Every drill team was led by a geologist who described and recorded sample intervals. The head driller kept a drill log to record drill depth. Information was also recorded on logging sheets. • Sample mass was recorded at drill site and at the sample preparation after the interval was dried. The recorded mass of each dry interval was then compared with an expected theoretical mass, calculated from the dimensions of the drilling tools (volume of the interval) and average density. • No bias has been observed between sample recovery and grade.
Logging	• Samples were logged and described by experienced geologists. • All drill samples were logged at 1.5 m intervals. • Records includes lithology, descriptive features and estimates of grade and clay for comparative purpose with laboratory assays.
Sub-sampling techniques and sample preparation	• All drill samples were collected in calico bags from the drill site. • After logging samples were dried in a laboratory. • Rotary splitter was used to ensure a representative sub-sample for heavy liquid separation. • Sample preparation protocols were validated during subsequent feasibility studies of Mandena. • The Competent Person considers that the sample sizes are appropriate to the material being sampled.
Quality of assay data and laboratory tests	• Assays were conducted in-house following procedures developed jointly by the QIT research department and Carpco, a mineral processing engineering consultant. • Total Heavy Mineral (THM) content was determined by Heavy Liquid Separation (HLS), using Tetrabromoethane (TBE). • THM mass recovery was controlled by float checks, which re-float the light minerals to the HLS, re-measuring the possible sinking mass. • The THM mineralogy for the entire deposit was determined from a composite THM of 37 boreholes using CARPCO electromagnetic separation. • Similar procedures were documented by US Steel in their report. However, as US Steel used a lower density separation liquid, the THM % was adjusted by regression analysis of paired data.
Verification of sampling and assaying	• No formal QAQC programme covered the 1988 programme or prior to that. • As the Mandena and Petriky programs were conducted contemporaneously, the sampling and laboratory methods used in 1988 were validated during the Mandena feasibility study. • Twinned THM assays were used to validate the drilling and showed good correlation with no indication of a bias. • Validations were performed with Sonic drilling over 20 original Vibracore drill sites. Each site was re-drilled with Vibracore and 10 were twinned with both Vibracore and Sonic. • In-house standards were introduced in the sample sequence at the rate of 1 every 25 during the validation process. • Duplicate samples were inserted at 1 duplicate for every 25 routine samples. • Duplicates samples from 10 Vibracore-Sonic drill sites were also analysed at an external laboratory. • Results of standards analysis were consistent and showed acceptable levels of accuracy with no indication of a bias • The average grade difference between routine and duplicate samples showed average variation of 4.3% which is an acceptable level of precision for this style of mineralisation. Similar results were obtained from THM grade in twinned holes. • Statistical analysis concluded that there was no evidence of any significant bias between original

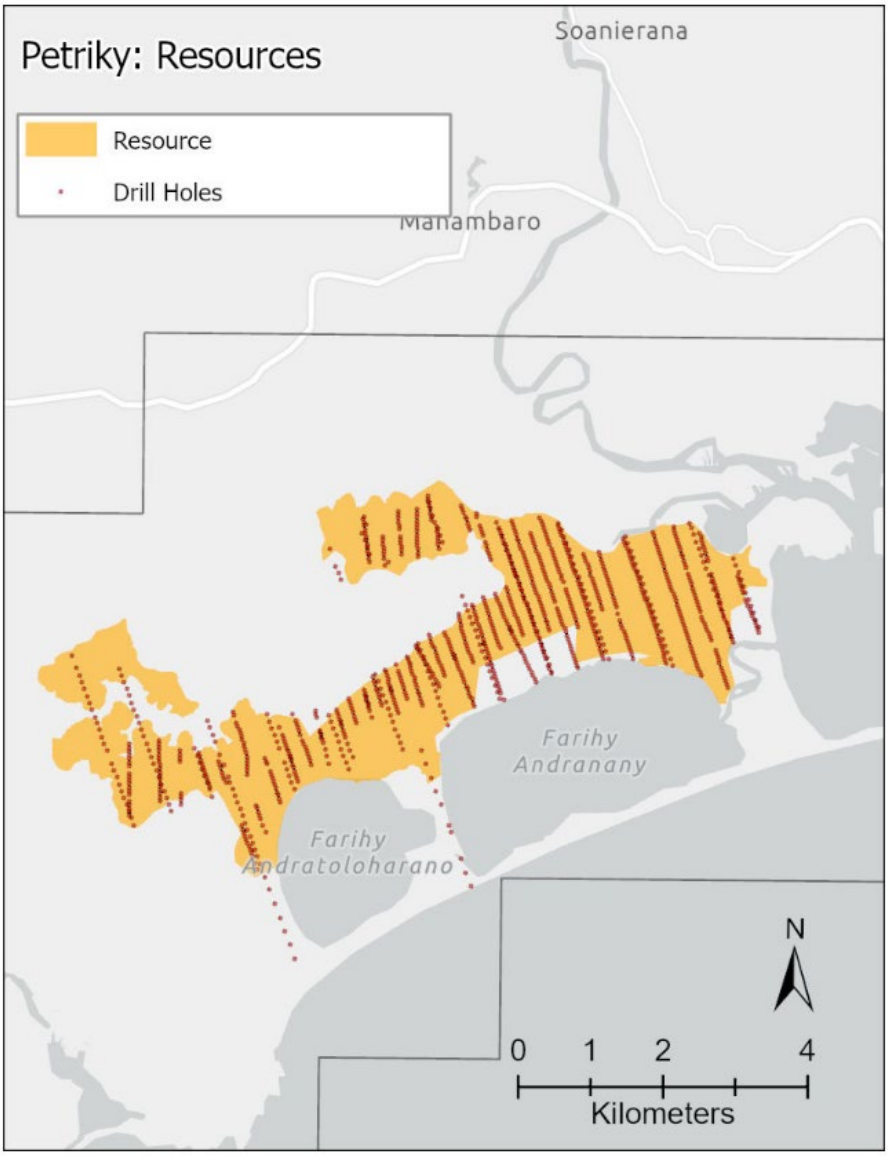
	Vibracore drill results and the Sonic validation drilling. • Data captured in the data base was monitored by Geostat Int and validated on site by the head geologist. • Data was transferred and validated in an acQuire database with built in data validation tools (drilling, sampling and assays) and QA/QC (sampling and assays).
Location of data points	• Collars were surveyed with traditional equipment and techniques (theodolites, levelling rods and total stations). • The collar coordinates were recorded in the original files and reported in the local Laborde coordinate system. In order to convert Laborde data to UTM, a high precision benchmark survey using Real Time Kinematic (RTK) GPS equipment was conducted. • Horizontal survey precision was set to sub-centimetre accuracy and to 1.7 cm vertically. Grid system used is UTM, zone 38 South WGS 84 datum. • As boreholes are shallow, no down hole surveys were conducted.
Data spacing and distribution	• Petriky was drilled to full depth at a drill spacing of 800 m x 100 m using VIB. • Additional data was added using shallow HA drilled on a grid density of 200 m x 50 m. • Mineralogical data is based on composites from only 37 boreholes and not considered to be representative of the resource on local scale. • Data spacing and distribution is sufficient to define an Inferred Resources.
Orientation of data in relation to geological structure	• Drilling orientated along geomorphological features which run parallel to the Laborde's coordinate system. • No orientation based sample bias has been identified.
Sample security	• Samples collected at the drill site were delivered to the laboratory by the responsible geologist. • Sample lists were checked by the laboratory.
Audits or reviews	• An external Resource & Reserve audit was concluded in 2021 for QMM. • Overall audit assessment was rated as "Good". • There were no audits findings related to sampling techniques and data acquisition.

Section 2: Reporting of Exploration Results

Criteria	Commentary
Mineral tenement and land tenure status	• Under decree # 130/2007 dated 4 January 2007 the four Exploration permits (known as 'Permis de Recherche de Fort-Dauphin' as per Article 7 of the Framework Agreement) previously held under the name of the Joint Venture partner "OMNIS" were transferred to QIT Madagascar Minerals SA (QMM) and consolidated into mining permit "type E" # 651 • The Fort-Dauphin mining permits covers 562.5 km^2, the exact 90 cells of the exploration permit. • The permit is valid for 30 years as of 12 December 1996. • Renewal for 10-year periods are granted at QMM`s request.
Exploration done by other parties	• Original exploration data of US Steel's 1972 to 1974 campaigns were acquired in 1986 by QMM. • US Steel drilled a total of 949 hand auger drill holes on a grid density of 200 m x 50 m. • Holes were drilled to the water table only therefore never tested the full depth of the deposit. • Drill depth averaged 5.6 m. • The THM grade data was used to define a thin high grade upper layer accounting for 24 % of the resource estimate.

Geology	• The deposit is a heavy mineral sand placer formed by middle-to late Pleistocene sea transgression/regression cycles 35,000 to 6,000 years ago.
	• The morphology of Petriky is similar to the nearby Mandena deposit.
	• Sands are contained in an embayment that extends inland. A well-developed lagoon system borders the dune systems and is enclosed by a coastal barrier dune.
	• As in Mandena, the same stratigraphic units are recognized in Petriky:
	  ○ The Upper sand has an averages grade of 7.9 % THM and average thickness of 5 m.
	  ○ The lower zone, including the transitional zone are much thicker and lower grade.
	  ○ Total combined thickness of 20 m on average and grade of 3.8 % THM.

Drill hole Information	• The database contains 263 VIB boreholes and 949 HA in the Petriky sector of the Fort-Dauphin deposit.
Data aggregation methods	• Not applicable as no Exploration Results are being reported.
Relationship between mineralisation	• The deposits are mineral sand bodies drilled with vertical drill holes. Width and length measured in drill holes are true intercepts.

widths and intercept lengths	
Diagrams	• Figure 3 in the body of this release shows the property location. • Figure 11 and Figure 12 show the drill hole plan and the stratigraphic column for the deposit.  **Figure 11 Petriky drill hole location map**

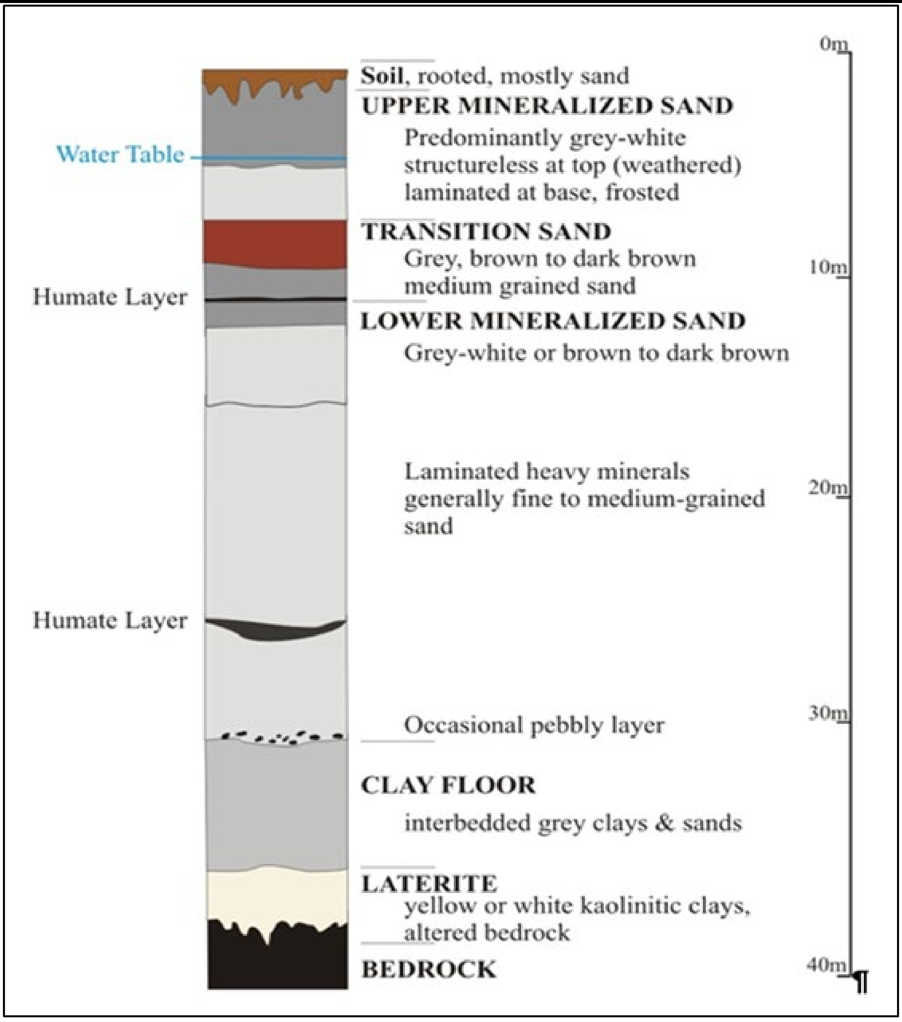


Figure 12 Typical stratigraphic profile of Fort Dauphin mineral sand deposits

Balanced reporting	• Not applicable as no Exploration Results are being reported.
Other substantive exploration data	• Mineralogical variability, metallurgical or bulk testing has not been conducted on the Petriky sands.
Further work	• Future exploration plans have been developed to increase the definition of the Petriky deposit to 400 m x 100 m drill spacing with additional mineralogical characterisation and lab scale metallurgical test.

Section 3: Estimation and Reporting of Mineral Resources

Criteria	Commentary
Database integrity	• Validation is done at the acQuire import stage. • Data validation procedures used searches for empty fields, out of range data, and visual validation on cross sections.
Site visits	• Regular site visits to the Fort Dauphin deposits are undertaken by the Competent Person. • Results of QA/QC and procedures are discussed with geological and laboratory teams, drill programmes and procedures reviewed.
Geological interpretation	• Geological units are defined on cross sections based on lithological and assay results. • Base of mineralisation is defined by lithological observation and where THM is less than 52% and Slimes is more than 10%. • The geological domains comprise 3 mineralised domains: o Lower Sand. o Transitional Sand. o Upper Sand. • As in Mandena, the Upper Sand has a higher THM grade, average 7.9% The Lower Sand and Transitional Sand are much thicker.

	• Total combined average thickness of 20 m and average THM grade of 3.8%.
Dimensions	• The Mineral Resource is contained within continuous mineralised sand extending to natural borders (water bodies, edge of bedrock or minimal mineralised thickness of 3 m). • Mineralised sand overlies a well-defined clay or lateritic bedrock base. • Dimensions for Petriky are 9.5 km x 1.8 km x 20 m.
Estimation and modelling techniques	• The Petriky resource model is a hybrid 2-dimensional grade thickness estimate based on combined HA and VIB borehole composites. • Historic estimates were based only on HA data and lower density heavy liquid (Bromoform, 2.85) as opposed to TBE (2.96) to determine THM content. • A correction derived from the comparison of % THM of the top layer intercepts in paired HA-VIB holes was applied to the older HA data, reducing the average % THM of that layer by 7% in Petriky. • THM, and Slimes were estimated using Ordinary Kriging into 50 m x 50 m parent cells orientated parallel to the Laborde's coordinate system. Estimation was controlled using a hard boundary for the base slimes base. • Search ellipses are based on variogram anisotropy and drill hole grids and range from 600 x 500 m to 4000 x 800 m for HA and VIB composites respectively. • Maximum number of composites used within the search ellipse is 30 and minimum of 1. • Average topographic elevation in each cell was derived from available topographic control points using inverse distance (power of ID is not known) estimation and a 200 m search radius. • No top or bottom cut was employed. • No cut-off grades were applied, however the base was modelled where THM drops below 2% and slimes above 10%. • Estimates were validated statistically and visually.
Moisture	• All tonnages are estimated on a dry basis.
Cut-off parameters	• All estimates are constrained to geological boundaries and hence are at a 0% cut-off grade.
Mining factors or assumptions	• Mining is assumed to be via open pit dredging as with the nearby Mandena deposit.
Metallurgical factors or assumptions	• Metallurgical factors used in Mandena are also applied to Petriky for valuation purpose as mineralogical and grain size characteristics are similar. Metallurgical factors have not yet been confirmed using Petriky samples.
Environmental factors or assumptions	• The “Nouvelle Aire Protegé” (NAP) conservation zone declared at Petriky has been excluded from the Mineral Resource. • No specific Environmental Impact Assessment (EIA) has been completed for mining activities at Petriky, however baseline work has been undertaken during the initial QMM study phase and updated via QMM’s ongoing presence. • An EIA has been prepared and submitted for the next phase of Petriky exploration.
Bulk density	• No bulk density work has been undertaken at Petriky to date. • The tonnages were calculated using the same density formula as originally applied to the nearby Mandena deposit where density = 1.57+0.01*%THM, resulting in an average calculated density of 1.62 g/cm^3.
Classification	• The total Mineral Resource is classified as an Inferred Resource and is estimated at 442 Mt sand containing 22.5 Mt of heavy minerals at a grade of 5.1% THM. • The previously reported Petriky Mineral Resource was classified as Indicated however it was re-classified to Inferred for the 2022 reporting period. • The rationale to down-grade Petriky resources from Indicated to Inferred was a combination of development risk and delays in obtaining sufficient mineralogy and geotechnical data. • Based on experience and results of reconciliation on the current nearby Mandena operation the Competent Person judges the classification as appropriate for the deposit.

Audits or reviews	• An external Resource & Reserve audit was concluded in 2021 for QMM.
	• Overall audit assessment was rated as “Good”.
	• 2 low rated findings were identified for resources:
	  o To have more regular Mineral Resource updates.
	  o Risk associated with access to Petriky for drilling.

Discussion of relative accuracy/ confidence	• Resource estimates on Petriky provide a reasonable global estimate to support an Inferred Resource. • A more precise local estimate is required as more detailed mineralogical and geological data becomes available.

Richards Bay Minerals JORC Table 1

The following table provides a summary of important assessment and reporting criteria used for the reporting of Mineral Resources and Ore Reserves 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	• Sonic drill core samples are delivered to a dedicated core yard; core is prepared by marking metre intervals measured from the core recovery. Core recovery is measured as a compaction ratio as core sand is transferred form core barrel to plastic sausage bags at the drill site. The core is photographed and sampled in its entirety at 1 m intervals typically weighing 5 to 16 kg. During early exploration in 2005 to 2006 two half metre (0.5 m) intervals per borehole were sampled at times at the ore sand – base clay boundary. • RC samples are collected over 3 m sample lengths from the collar of the drill hole, then 1 m sample lengths are collected within 10 m of the base of the drill hole for better basal definition. • Samples are sent to an in-house laboratory where a set sampling technique is followed, and applicable Standard Operating Procedures (SOPs) are used (refer to sections Sub-sampling techniques and sample preparation; Quality of assay data and laboratory tests).
Drilling techniques	• Sonic drilling is the preferred method of drilling for geological and resource definition. It utilises either a 4" x 6" or 3" x 5" system in which a 4-inch or 3-inch core barrel is used for sampling. The core barrel is overridden by a 6-inch or 5-inch casing to hold the borehole vertically open from the top dune surface to the bottom of the borehole, typically at ±5 m below ore sand – base clay boundary. • Sonic drill samples are analogous to that of diamond drill samples. The difference is that Sonic drilling is used for loose material, where a high frequency wave is transmitted through a drill string in addition to the normal rotary motion to ensure optimum sample recovery. • Relatively undisturbed continuous representative core samples are captured for each run. Each run is measured at the drill site (run transferred to plastic sausage bags) to determine the weight in kilograms by trained drilling crew. • Typical horizontal grid spacing for sampling is 200 m x 100 m Sonic. • RC (also known as Air Core) holes are drilled vertically using AQ (~48 mm outer diameter/ 27 mm inner diameter) rods at an operating pressure of 500 kPa. • Several flaws have been noted with RC drilling in unconsolidated to semi consolidated material, The most pertinent is the underestimation of grade by up to 50%, • In addition, smearing, selective sampling/recovery and winnowing of material occurs, especially below the water table and with increasing depth. • Between 1970 and 1989 40 RC drill holes were completed at Zulti South, followed by successive drilling campaigns until 2005. In total, 3049 RC drill holes were completed at Zulti South. • RC drill holes were used for resource estimation purposes until the 2006 update, which also used sonic data to create a hybrid resource model. • The 2013 resource update, which used sonic data exclusively, superseded the RC / Sonic hybrid model. • All subsequent resource model updates have used sonic data exclusively
Drill sample recovery	• Sonic core recovery is measured by a competent trained geologist as a compaction ratio ((tape measure cm/run length) x 100) represented as a percentage. Weight per metre is correlated to the field measured total run weight. Generally lower recoveries can be expected at the top of the borehole due to the nature of the loose sand material and improve with depth. • One and half metre runs are taken as a precautionary measure for very loose ground where recovery is very poor. • Due to the nature of the orebody no poor recoveries were experienced.
Logging	• All Sonic and RC drill core is logged by a competent trained geologist based on the standardised logging procedures, SOPs. • A small sample is kept for each metre in plastic chip trays as a logging record. • Logging is quantitative, describing attributes relevant for sand characterization following a set of SOPs.
Sub-sampling techniques and sample preparation	• After logging, the complete field samples are delivered to the in-house laboratory for analysis. • At the receiving station the complete field samples are scanned and electronically weighed to confirm the field weight. • A set sampling technique is followed and applicable SOPs are used (refer to Quality of assay data and laboratory tests). This involves: ○ Oven dry the field sample

	o Use a rotary splitter to collect 6 ~700 g representative sub-samples o Attrition the ~700 g sub-sample over -45 µm sieve o +45 µm dried and calculate slimes percentage o A heavy liquid, usually tetrabromoethane (TBE), is used to separate Heavy Minerals (HM) from Quartz o HM is separated with a Carpco magnetic separator to its main components based on magnetic susceptibility o These separate HM components are then separately pulverised, and pellets are moulded for XRF analysis. • At the end of each analysis process two representative ~700 g samples are returned to the drilling store facility for safekeeping and re-analysis, if there are any noticeable deviations or for QA/QC purposes. The other representative 700 g sample is kept at the laboratory store facility. • The sample size and sampling methodology is considered appropriate for the material being sampled.
Quality of assay data and laboratory tests	• The quality of assay data and laboratory tests is based on Standard Analytical Methods (SAMs) and SOPs used at the laboratory. Validation criteria are built into the Laboratory Information Management system (LIMS). • Pairs of duplicate samples from each batch are analysed. These paired duplicate results are analysed and plotted using the Mean Paired Difference per pair. • Re-analysis of quartz float samples after TBE extraction of the HM to ensure complete extraction is done as a check. To pass, remaining THM content needs to be < 0.2% • Carpco control samples of known magnetic susceptibility and mass are passed through the separator before each shift. • TBE density checks are carried out on a regular basis. • For XRF work, controls are run at the beginning of each shift. Charts plot the graphs based on SPC rules. XRF3 model ARL9900 XP for the calibration factors applied. • Standards, blanks, duplicates, and external laboratory checks are used. 1993 QAQC samples of all types were submitted between 2012 and 2015 against a total of 17 700 assay samples used for estimation, thus 11%. • Acceptable levels of accuracy (i.e., lack of bias) and precision have been established. Graphs are used to identify outliers.
Verification of sampling and assaying	• The important intersection at RBM is the Resource Base. This is where there is a sharp increase in slimes and a corresponding drop in grade. This intersection is checked by internal employees from the Resource Modelling and Mine Planning sections. • Borehole twinning has been used for various reasons, but mostly to compare RC Total Heavy Minerals (THM) with Sonic THM, since RC drilling is known to show increasing bias downhole with THM results. • There appears to be a systematic bias between sonic and RC samples, with the degree of bias for heavy minerals increasing with increasing THM grade, and the degree of bias for slimes decreasing with increasing slimes grade. Selected RC holes were chosen for twinning to check the discrepancy in the results when compared with the more accurate Sonic drill method. This process also helps in increasing the level of confidence in the assays for the pre 2013 resource models which incorporated RC drilling with a transformation applied. • Comparison of RC and sonic data using Quantile-quantile (Q-Q) plots informed the process of creating transformation factors for the RC data. • Q-Q plots are created by sorting the respective samples sets in ascending order and computing the grade at each percentile of each distribution. The percentiles are then plotted on a standard scatterplot. • A polynomial function was fitted to each plot to derive a transformation which was applied to the RC data, in order to correct for the grade bias. • The transformation applied to the data varied according to the unit, as well as the attribute and grade thereof. An upgrade factor of 1.06 for ilmenite, rutile and zircon was used in the February 2012 block model. • Since 2013 only Sonic holes were used for resource model updates which precluded the need for transformation factors. • All data is stored in an acQuire database. For each resource update a new database is created. Primary data is not changed, but if there is a need for it to be changed after validations, then this is changed by a Database Manager only and recorded in the system that there is a change in the primary data. Data entry is done in the acQuire database system and the procedures are on the department SharePoint site (electronic). Data verification is done using built in validation checks that are part of the acQuire database system. • Any adjustments in the database are communicated through an office memo for all the users. '-97' values are used to indicate insufficient sample to continue with the XRF analysis and '-99' values are used to indicate samples that have not been analysed.
Location of data points	• Drill hole collars are surveyed using differential GPS. Accuracy is 1 cm horizontal and 2 cm vertical. This is accurate enough for Mineral Resource estimation. • The grid is a modified Clarke 1880 ellipsoid using the Cape Datum.

	• A LiDAR survey was done for topographic control. The average accuracy in the Z direction is 0.11 m (2013 Survey check against 75 drill holes).
Data spacing and distribution	• Typically, RC drill holes were drilled on a 200 m N x 50 m E grid. • Samples were taken every 3 m down hole. • Typically, Sonic drill holes are drilled on a 200 m N x 100 m E grid. • Samples are taken every metre down hole. • The data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied. This is verified by using reconciliations at the Zulti North operations. • For estimation purposes the samples are composited into 2 m sample lengths.
Orientation of data in relation to geological structure	• All drilling is vertical and orientated along the long axis of the deposit and the general direction of mining. It is therefore deemed representative. • Mineralised structures broadly follow the long axis of the deposit. Directional variogram analysis confirms this trend although some domains can be at an angle to the deposit but do not seem to vary by more than 30 degrees to the deposit orientation. No significant sampling bias is expected.
Sample security	• Samples are tracked from the drill site to the core shed to the laboratory by tracking sheets and signed off by the relevant field geologist. • Retained samples are stored in a core shed and a record is kept of available samples.
Audits or reviews	• There was an Internal Rio Tinto Resource and Reserve Audit completed in October 2014. RBM achieved a Satisfactory Rating, with four low rated findings. • The most recent Rio Tinto Resource and Reserve Audit was conducted in June 2022, using Golder & Associates as external reviewers. The report was rated Satisfactory with two low level findings; actions are in place to address these.

Section 2: Reporting of Exploration Results

Criteria	Commentary
Mineral tenement and land tenure status	• Zulti South leases were held by Zululand Titanium (Pty) Ltd in terms of the Mineral Lease No K154/90 and Protocol No. 496/93. On 9 May 2012 RBM executed new order mining rights at the Department of Mineral Resources, which is valid for 28 years. This conversion extends for the current Zulti North deposit as well as the Zulti South Deposit, subject to fulfilling the Social and Labour plan. • RBM is situated approximately 200 km north of Durban and 20 km northeast of Richards Bay on the east coast of South Africa. The two main ore bodies are known as the Zulti North and Zulti South leases as well as the depleted Tisand lease, which is the repository for the Minerals Separation Plant's stockpiled tailings resource. • The Zulti South ore body comprises three leases, known as On Reserve 10, Kraal Hill 1 and Kraal Hill 2, and is located south of Richards Bay and to the north of the town of Mtunzini • Richards Bay Minerals (RBM) is the trading name for Richards Bay Mining (Pty) Limited and Richards Bay Titanium (Pty) Limited. • Ownership of RBM is summarized as Rio Tinto (74%), Blue Horison (24%) - a consortium of investors and our Host Communities Mbonambi, Sokhulu, Mkhwanazi and Dube and 2% RBM employees. • Current discussions and negotiations with the Ingonyama Trust are in process regarding surface rights in the Zulti South area. The potential impact of a failure to obtain agreement is a delay in the start of the project.
Exploration done by other parties	• Not applicable, all work has been carried out by RBM.
Geology	• The Zulti South heavy mineral sands deposit represents an unconsolidated beach placer deposit found within a belt of undulating aeolian dunes aligned roughly parallel to the coast, of Pliocene – Pleistocene and Holocene age. At present only the Holocene dunes are mined by RBM. Material mined by RBM is from the Sibayi (<10 ka) and KwaMbonambi (57 to 6 ka) Formations, which are the youngest units of the Maputaland Group, a thin veneer set on the Zululand Coastal Plain, formed in response to sea-level changes and uplift during the Neogene (25-2 Ma) and Quaternary (2 Ma to present) periods.
Drill hole Information	• Table of drill holes <table><tr><td>RC Collars</td><td>Sonic Collars</td></tr><tr><td>3049</td><td>777</td></tr></table>
Data aggregation methods	• Not applicable as no Exploration Results are being reported.

Relationship between mineralisation, widths and intercept lengths	• Nearly all the lease areas are mineralised between the topographic surface and the slimes base. • There is no dip in the overall geometry of the mineralisation. All drill holes dip by 90 degrees which is fitting for the style of mineralisation. • The mineralisation width can vary from 1 m to >150 m.
Diagrams	• Figure 4 in the body of this release shows the property location. • Figure 13 and Figure 14 show the drill hole plan and a typical cross section through the deposit.

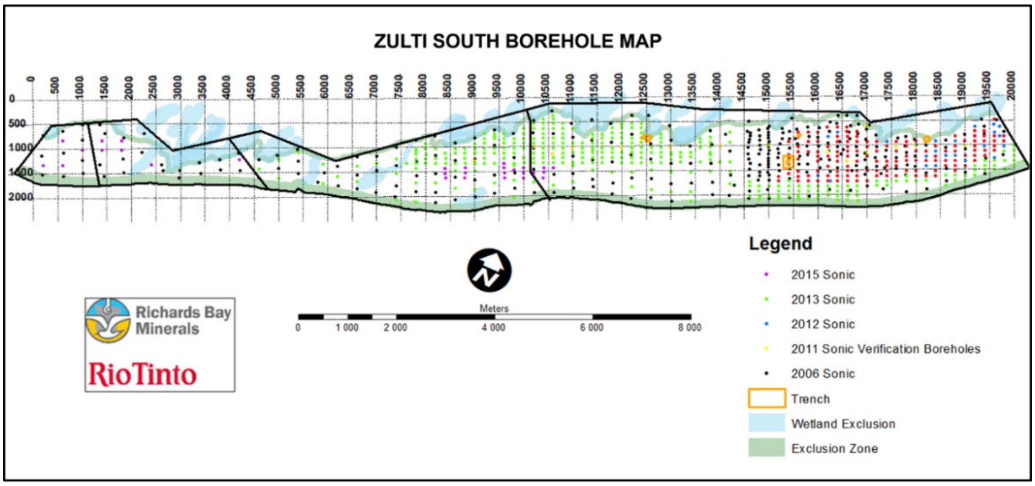


Figure 13 Zulti South drill hole location map

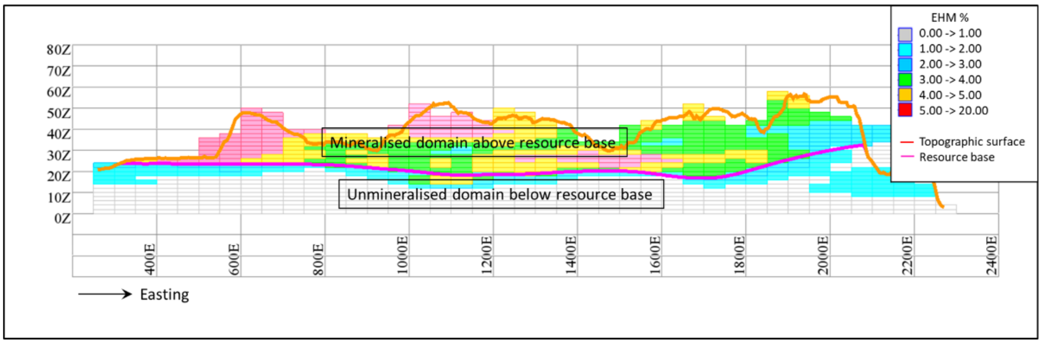


Figure 14 Typical cross section through Zulti South block model showing mineralisation boundaries and EHM grade

Balanced reporting	• Not applicable as no Exploration Results are being reported.
Other substantive exploration data	• Other exploration data is collected including: o grain size o hardness o colour o lithology o estimated THM percentage o estimated slimes content o water table intersection o bulk sample data o geotechnical data o groundwater data. • This information is captured in acQuire where appropriate.
Further work	• Infill resource drilling is required once mining commences.

Section 3: Estimation and Reporting of Mineral Resources

Criteria	Commentary
Database integrity	• For each resource update a new database is created. Any adjustments in the database will be communicated through an office memo for all the users. '-97' values are used to indicate insufficient sample to continue with the XRF analysis and '-99' values are used to indicate samples that have not been analysed. • Where there are '-97' values indicating below detection limit, half detection limit values (0.05%) for all attributes are assigned to these samples for estimation purposes. '-99' values indicating missing samples are retained in the database and are treated as absent for estimation. • Where slimes content was too great to allow analysis, a value of 35% was assigned in the database This allowed these samples to be flagged, while being close to the maximum expected value found within the acQuire database validation rules.
Site visits	• The Competent Person for Mineral Resources is based on site.
Geological interpretation	• The geology of the deposit is well understood, and the geological interpretation is sound. Academic studies were completed by several people to understand the deposit. • Data used for geological interpretations includes geological logging descriptions and assay data. • The main geological domaining control used is the resource base. • This is based on modelling a surface defined by a high slimes (greater than 12%) / low THM (less than 2%) contact. • Using the following assay (slimes, THM and EHM) and geology (slimes & hardness) attributes, intersection points were chosen according to the criteria above, and snapped to the drill hole traces. Cross-sections were then drawn along the drill lines using these points. The cross-sections were then wire-framed to create a resource base surface. • Grade is affected by the depositional history and resulting stratigraphy, but grade and geology generally show good continuity. Variability is greatest down hole where most changes happen within the first 5 m. Horizontal continuity is better with most change happening in a distance from 100 to 200 m.
Dimensions	• The Zulti South deposit is approx. 20 km in extent along the strike and varies in width from 0.5 to 3 km. Vertical extent varies from 1 to 80 m plus.
Estimation and modelling techniques	• The data are composited into 2 m lengths from the top of the drill hole. Fractional lengths are included if the fraction at the bottom of the drill hole represents more than 1 m (50% of composite length) • The following attributes are estimated during resource updates: ○ Ilm_Mag_Other – weakly magnetic ilmenite (unrecoverable) ○ Ilm_Mags – economic ilmenite ○ Mag_Other – 'Junk' material ○ Magn – Magnetite ○ Mags – Highly magnetic material ○ Non_Mags – Non Magnetic fraction ○ Non_Mags_TIO2_NM - Rutile ○ Non_Mags_Zircon_NM - Zircon ○ Slimes – fines smaller than 45 µm ○ Total Heavy Mineral content (THM). • The estimation technique used is Ordinary Kriging with anisotropy based on variograms. Ordinary Kriging is an appropriate method of estimation for this type of deposit. The appropriateness of kriging was confirmed during peer reviews and audits. • Search neighbourhood criteria are based on variography and are as follows: ○ Maximum number of samples per hole: 4 ○ Maximum number of informing samples: 25 ○ Max search distance: 5000 m horizontal and 100 m vertical. • The modelling software package used was Surpac, which has a built-in geostatistics capability. • No assumptions were made regarding recovery of by-products. • Estimations of deleterious elements or other non-grade variables of economic significance were included. These are: ○ Ilmenite Mag Other ○ Mag Other ○ Magnetite ○ Mags ○ Non Mags ○ Slimes • The block size generally represents half the drill spacing horizontally and twice the sample spacing vertically (100 m x 50 m x 2 m). Lower confidence areas however exist where the horizontal block size represents a quarter of the drill spacing.

	• No assumptions regarding modelling of selective mining units were used. • The resource base was the main geological domaining control. Two domains were thus identified: Above and Below resource base. • Outlier grades were identified by built in acQuire database validation checks. • One sample was removed as the extremely high THM grade pointed to the assay result being an analytical error. This was verified by checking the adjacent samples. • Swath plots were used to compare the estimated kriged attributes to the composites used for the update, as well as comparisons between the current and previous resource model updates. • Variation between the composites and the estimated kriged attributes, as well as variation between the previous and current resource model updates, was within acceptable limits.
Moisture	• Tonnages are estimated on a dry basis.
Cut-off parameters	• No cut-off parameters were used; the Mineral Resource is reported within the geological unit.
Mining factors or assumptions	• Zulti South consists of several ore zones of varying geometrical properties. Grade variations within the Zulti South orebody are apparent with grade in general declining from South to North as well as from the inland side of the deposit to the seaward side. • Margin ranking plots of the orebody revealed that the highest value ore grade is located in the central inland portion of the orebody. • A phased approach to mining was adopted to allow the most appropriate and beneficial exploitation of the Zulti South orebody. The approach allows the most appropriate mining method to be used for the various ore geometries that are present at Zulti South. • Dry mining was selected as the mining method due to the high grade and thinness of the ore body. Inland ore close to the selected permanent land-based concentrator position will be mined first. Mining will progress away from the concentrator, initially mining the high grade inland ore.
Metallurgical factors or assumptions	• Mined sand is pumped through to the concentrating plant which consists of two units, a surge bin and concentrator. The concentrating plant utilises gravity separation with spirals to recover the valuable heavy minerals. Magnetite is magnetically separated from the heavy mineral concentrate (HMC) and is discarded with the tails before the HMC is pumped to stockpile. • Further product separation is completed at the Mineral Separation Plant
Environmental factors or assumptions	• RBM is dedicated to achieving a high standard of environmental management throughout its business and operations. This includes the mining and beneficiation of heavy minerals and the marketing of its products. The company is committed to preventing pollution and minimising any adverse impacts its activities may have on the environment. • The company strives to achieve this by: o Maintaining a comprehensive environmental management system with sub-systems and procedures that effectively identify, monitor, and control its potential risks. o Evaluating the environmental impacts associated with its activities, products, and services - and taking effective action to minimise significant risks. o Seeking continuous improvement through setting and reviewing objectives and targets, assessing and reporting environmental performance and ensuring best practice is applied to the local situation. o Communicating openly with interested and affected parties about environmental issues and contributing to the development of better environmental practices o Establishing programmes to conserve natural resources, minimise waste, protect and rehabilitate the environment, and promote and support local development initiatives. o Ensuring that parties conducting work on or behalf of RBM are themselves committed to the protection of the environment with sound systems and practices. o Conducting regular environmental audits and maintaining ISO 14001 certification. • The environmental efforts at RBM are focussed on achieving compliance with legal requirements stipulated in the EMPR (Environmental Management Programme Report), shareholder standards and / or identified best practices. The company is subject to routine internal and external environmental management systems audits, conducted by ISO certification bodies and Rio Tinto representatives.
Bulk density	• The bulk density was determined by initially measuring specific gravity (SG) using mini-bulk samples from auger drill holes. The excavated sand was stored in bags. Sampling started 2 m below the surface down to a maximum depth of 33 m. Three holes were drilled. The moisture was determined, and the bags were weighed. Sand replacement calculations were done for 1 m increments. • Additional work directed towards determining the bulk density for Zulti North and Zulti South included density analysis of 63 split spoon samples from Zulti South, 16 trench samples from Zulti South, sand replacement samples, laboratory test work at QMM using Zulti North samples., and 8 sand replacement samples from Zulti North. • A PhD thesis, The Mineability of Richards Bay Minerals Dune Sands, by Dr WP Ansell, used 57 undisturbed sonic samples from Zulti North, analysing the dry density of the RBM sand. This study was key to developing the relationship between porosity, burial depth, and density. • Dry density is used for estimation. The main attribute that affects dry density is the total heavy

	mineral (THM) content. Porosity, burial depth, and slimes content also influence the density • A formula is used to calculate bulk density from the SG measurements. The formula is: SG = (0.0265 x (100 – THM) + 0.04082 x THM) x (0.578 x depth x 0.0165) x (1 + (slimes x 0.0054)) This formula takes THM content, porosity, burial depth, and slimes content into account.

Classification	• Mineral Resources are classified as Measured and Indicated only. Both the drill spacing and volume of resource per metre drilled are used as the basis for classification of the Mineral Resources into varying confidence categories. The categories are as follows:
	  ○ Measured: ≤100 m x 200 m: ≥50 holes/km^2 or <20 000 m^3/metre drilled.
	  ○ Indicated: 100 m x 200 m to 200 m x 400 m: 12.5 holes/ km^2 - 50 holes/ km^2 or 20 000 m^3 – 80 000 m^3/metre drilled.
	  ○ Inferred: > 200 m x 400 m; <12.5 holes/ km^2 or >80 000 m^3/metre drilled.
	• The result appropriately reflects the Competent Person's view of the deposit.

Audits or reviews	• There was an Internal Rio Tinto Resource and Reserve Audit completed in October 2014. RBM achieved a Satisfactory Rating, with four low rated findings. • The most recent Rio Tinto Resource and Reserve Audit was conducted in June 2022, using Golder & Associates as external reviewers. The report was rated Satisfactory with 2 low level findings; actions are in place to address these.
Discussion of relative accuracy/ confidence	• The methodology of combining drill spacing, as well as consideration of the sample to volume ratios, has proven to be effective for this style of mineralisation, considering the luxury of 36 years of mining in which reconciliation can be compared to for the nearby Zulti North deposit. The optimum ratio is based on areas that reconcile to a factor of 1.0 to the overlying Sonic drilling model at Zulti North mining operations.

Section 4: Estimation and Reporting of Ore Reserves

Criteria	Commentary
Mineral Resource estimate for conversion to Ore Reserves	• The Mineral Resource underpinning the Ore Reserve constitutes a block model with a block size of 100 m x 50 m x 2 m. • The conversion from Mineral Resource to Ore Reserve is done on consideration of operational and economic constraints, which includes hydrological parameters, geotechnical parameters, mining methods, mining limits, metallurgical properties, environmental factors and above all economic feasibility of mining the resource. • Mineral Resources are classified as Measured and Indicated and have all been converted to Probable Reserves.
Site visits	• The Competent Person for Ore Reserves is based on site.
Study status	• The latest feasibility study was completed in February 2019.
Cut-off parameters	• The concept of cut-off grade is not necessarily relevant to RBM mineralised sand ore bodies. The marginal economic cut-off grade for Zulti South was calculated to guide the generation of Ore Reserves to HMC from in-situ sand as input in metallurgical design parameters. • 100% of the Mineral Resource is above this cut-off grade, thus effectively no cut-off grade was applied.
Mining factors or assumptions	• Ore will be mined by free digging using front end loaders. • Various methods including dredge mining were considered and found to be inappropriate or not cost effective. • No pre-stripping is required as there is no overburden on the deposit. Bush clearing and topsoil reclamation will be done and is allowed for in costs. • Pit slopes are established by allowing the sand to fail to its natural angle of repose of 33 degrees as it is removed by digging. • Grade control will be achieved by in pit monitoring of the mining base. No target plant feed grade is established or required, and grade control will be to avoid over and under digging. • Based on the mining method, digging blocks of 200 m x 100 m are used. • Mining direction and capacity was optimised using the 2016 Zulti South resource model and the RBM financial model. There is not expected to be a material impact due to resource model update. • Mining losses are 3%, oversize losses 5% and mining losses below the water table 10%. • To allow in pit disposal of tailings a minimum first pass mining width of 600 m is required. • No Inferred Mineral Resources are included in the mine plan. • The mining method requires the following infrastructure: access roads, raw water supply, electrical supply, on lease electrical distribution, ore and HMC slurry pumping facilities, sand tailings disposal infrastructure, surface water management, dry mining unit, concentrator, thickeners, and water reticulation dams.

Metallurgical factors or assumptions	• Metallurgical process is based on the existing process at Zulti North (RBM) mine plant, Mineral Separation Plant (MSP); extensive test work has been conducted to verify the appropriateness of metallurgical process on the Zulti South mineralisation. • The metallurgical process utilises well tested technology within the RBM process (gravity separation/spirals, magnetic separation, and electrostatic separation). • Design improvements have been made within the mine plant where a vertical double spiral is utilised. • Test work was conducted both at the RBM Pilot Plant and at the spirals supplier test facility in Australia. The onsite (RBM) test work included HMC generation that was used for MSP simulation that produced Roaster Feed Stock, Rutile and Zircon. • Allowances were made such that the amount of Calcium bearing Almandine and magnetite are limited in the HMC produced; these minerals have negative impact on the performance of the entire processing and smelting value chain. • Bulk samples were taken in three different areas within the orebody. These samples were run on the pilot plant to generate HMC which was then used for the MSP process, i.e., Feed Preparation to generate Roaster Feed Stock and Feed Preparation Concentrate, the Feed Preparation Concentrates were used to simulate Dry Mills where Rutile and Zircon are produced. The samples are deemed to be representative of the orebody (start-up site area).

Environmental	• Environmental studies have been completed and the requisite permits applied for granted. These permits are under continuous review by the legal and environmental teams to ensure their validity and continuous renewal where applicable:
	  ○ EMP update
	  ○ Environmental authorisation for mining infrastructure and clearing of indigenous dune forest
	  ○ Surface rights lease
	  ○ Water use license
	  ○ Landowner agreements
	  ○ Provincial planning development application.

Infrastructure	• Infrastructure will mostly be developed on lease where land is available. • Water and electricity will be supplied via a services corridor from the uMhlathuze weir and the RBM main site respectively. The required offtake agreements for water and electricity exists with the required authorities • Local labour is available in the area and skills to operate will be a mixture of new locally trained employees balanced with skilled employees from the existing operations. • Significant local road infrastructure exists up to the town of eSikhaleni. The area road network leading to the lease construction areas are to be upgraded where required and maintained in good order during the construction phase and operations thereafter.
Costs	• Capital costs on the feasibility study were estimated on the bases of engineering studies conducted. • Development and sustaining capital costs are sourced from the RBM operations financial model in accordance with the 5-year plan. These estimated costs utilise historical plant data available and incorporate major expansion projects brought in per project planning through the life of mine • Operating costs are based on the Zulti North existing operating plants' costs of comparative capacity. • Closure costs are discounted at the prescribed closure cost discount rate, following internal guidance. • Allowances have been made for royalties in terms of the 2008 Royalty Act of South Africa.
Revenue factors	• The derivation of assumptions made of metal or commodity price(s), for the principal minerals and co- products are derived from Rio Tinto Iron and Titanium (RTIT) market studies, existing contracts, and customer mix, in accordance with the latest internal Rio Tinto internal pricing guidelines. The detail of this process and of the price points selected are commercially sensitive and are not disclosed.
Market assessment	• The demand, supply is based on RTIT market studies and supplemented by a specialized consultant. • Sale volume and prices are adjusted according to market demand and production adjusted to maintain low stock volumes. • RTIT has a long-established customer base and maintains technical support to customers to meet product specification.
Economic	• Economic inputs such as carbon pricing, inflation, exchange rate, discount rate and escalation are generated internally by Rio Tinto. The detail of this process and its outputs are commercially sensitive and are not disclosed. • Economic evaluation using Rio Tinto long-term prices demonstrates a positive net present value for the Zulti South Ore Reserves under a range of price, cost, and productivity scenarios.
Social	• RBM operates within the constraints of an approved Social and Labour Plan. • Four communities in which RBM operates collectively have a 24% shareholding.

Other	• A detailed risk register, specifically pertaining to Mineral Resource and Ore Reserve risks, is maintained, and updated periodically for all RBM Mineral Resources and Ore Reserves. • The last risk review was conducted on 11 August 2022. • Action plans are in place to mitigate the effect of the identified risks.
Classification	• Ore Reserves have historically been classified according to the resource classification where all Measured Resources were converted to Proven Reserves, and all Indicated Resources converted to Probable Reserves • RBM Ore Reserve tonnes for 2022 include a change in classification for the Zulti South Proven Reserves to Probable Reserves. The change results from increased uncertainty in the modifying factors as a result of schedule delays, due to community and social complexity. The original project timelines have been affected, and a new schedule is being developed. The restart will be commenced through internal approvals at which time the classification for the Zulti South Ore Reserves will be reviewed.
Audits or reviews	• The most recent Rio Tinto Resource and Reserve Audit was conducted in June 2022, using Golder & Associates as external reviewers. The report was rated Satisfactory with 2 low level findings.
Discussion of relative accuracy/ confidence	• Confidence in the Ore Reserve estimation is measured by quarterly reconciliations with production data and is within acceptable limits as defined by JORC for Zulti North. No production data is available for Zulti South; however, the same methodologies, as for Zulti North, are applied.