

Turquoise Hill Resources Ltd. (TSX: TRQ, NYSE: TRQ) – Short Term Turbulence with Huge Upside in One of The Biggest Copper/Gold Mines in the World



Investment Highlights

- **Turquoise Hill Resources Ltd.** ("TRQ" or "Company"), TRQ holds 66% interest in their flagship Oyu Tolgoi Project ("Oyu Tolgoi"). The project should be one of the top 5 copper/gold producing mines in the world once the underground development is complete.
- **Big Reserve:** Oyu Tolgoi is one of the largest known copper and gold deposit in the world. The proven and probable reserves at the end of 2020 were 22 billion lbs copper, 12 million Oz of gold and 77 million Oz of silver.
- **Low P/B and EV/Reserve ratio:** The news of overrun CAPEX and delay in underground production has resulted in negative sentiment. The P/B ratio of 0.29 and the ratio of enterprise value to copper equivalent pound of 0.25 vs. a peer average of 0.60, illustrates the current stock price is very attractive.
- **Strong Operating History:** Oyu Tolgoi has been mining since 2012 and producing copper concentrate since 2013 and has a good track record in safe and sustainable operation.
- **Continued Exploration Upside:** The inferred mineral resources as of June 2020, were 48.5 billion lbs copper, 34 million Oz of gold, and 210 million Oz of silver. In general, once the underground development is complete it will be easier and cheaper to drill definition drill holes and convert inferred resources into measured and indicated categories.
- **Political Risk:** Big underground mining is relatively new in Mongolia. The mining jurisdiction is not very mature, and it poses critical risk and may further delay underground production and can cause problems to meet future production targets.
- **Based on our analysis and valuation models, we are initiating coverage with a BUY rating and a fair value per share estimate of C\$31.36 per share.**

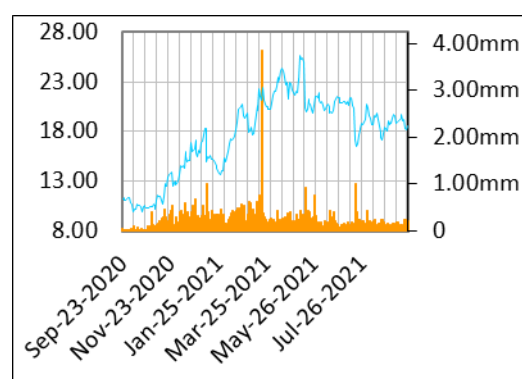
Current Price (C\$):	\$	18.30
Fair Value (C\$):	\$	31.36
Projected Upside:		71.4%
Action Rating:		BUY
Perceived Risk:		HIGH

Shares Outstanding:	201,231,446
Market Cap. (M C\$):	\$ 3,683
P/E	4.83
P/B	0.29
YoY Return	71.49%
YoY TSX Return	26.40%

*Note all \$ amount are C\$ unless otherwise stated.

Cash (M C\$)	857
Debt (M C\$)	5,299
Enterprise Value (M C\$)	6,846
	Period
	Q2 - 2021
Cash from Operations (M C\$)	259.4
Cash from Investing (M C\$)	(270.4)
Cash from Financing (M C\$)	(37.7)

TSX: TRQ Price and Volume History

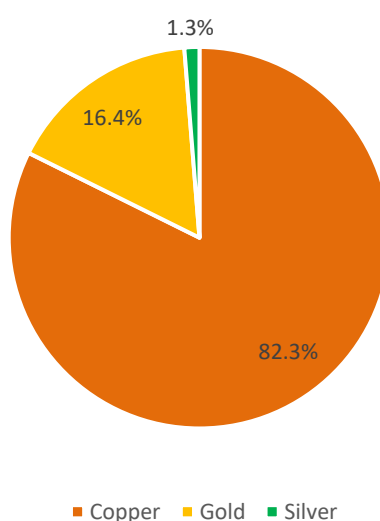


Company Overview and Flagship Project

Turquoise Hill Resources Ltd. is a copper/gold/silver mining company that operates the Oyu Tolgoi Project (“Oyu Tolgoi”) a copper-gold mine located in the south Gobi region of Mongolia, approximately 645 km by road from the capital, Ulaanbaatar. Oyu Tolgoi is one of the largest known copper (Cu) and gold (Au) deposit in the world. The proven and probable reserve in the end of 2020 was 22 billion lbs copper, 12 million Oz of gold and 77 million Oz of silver.

In this valuation report with the assumed copper, gold, and silver prices almost 82% revenue in the complete project life comes from copper and rest comes from the gold and silver. The below figure shows the payable metal by percentage in concentrate for the complete project life used in the income approach (DCF method).

Figure 1 – Revenue by Metal



Source: Couloir Capital

Copper is the most cost-effective conductive material, and it sits at the heart of the energy transition progress and industrial growth. Investing in a copper / gold project provides a long position in the energy transition towards renewable energy including Electric Vehicle (EV) growth and industrial growth with a put option. The strike price of the put option is correlated with the percentage of the revenue that comes from gold.

The company was formerly known as Ivanhoe Mines Ltd. and changed its name to Turquoise Hill Resources Ltd. in August 2012. Rio Tinto with its affiliates holds a majority interest (50.8%) in TRQ. The mineral deposits at Oyu Tolgoi lie in a structural corridor where mineralization has been discovered over a 26 km strike length. Four deposits hosting Mineral Resources have been identified:

- Oyut (considered in reserves)
- Hugo North (considered in reserves)
- Hugo South
- Heruga

Mineral Reserves have been reported at the Oyut and Hugo North Deposits. The Oyut deposit is currently being mined as an open pit and has been producing copper concentrate since 2013. The Hugo North deposit is currently being developed as an underground mine using the block caving mining method. A staged approach is envisaged for developing the Hugo North deposit, involving

mining two block cave lifts (Lift 1 and potentially Lift 2). Mineral Reserves have been estimated for Lift 1, which comprises three panels (Panel 0, Panel 1, and Panel 2). The updated total Oyu Tolgoi mineral reserve and the inferred resources are summarized below in Table – 1. The huge, inferred resources illustrate the potential upside in the mineral reserves and the intrinsic value of the project.

Table 1 – Total Mineral Reserve and Inferred Resources

Classification	Tonnage (Mt)	Cu (%)	Au (g/t)	Ag (g/t)	Contained Metal		
					Cu (Mt)	Au (MOz)	Ag (MOz)
Proven	350	0.49	0.35	1.3	1.7	4.0	14
Probable	920	0.93	0.27	2.1	8.5	7.9	62
Total (Proven + Probable)	1,270	0.81	0.29	1.9	10	12	77
Inferred Resources	3,700	0.29	0.07	1.8	22	34	210

Source: Company

Ownership: Turquoise Hill Resources Ltd. holds a 66% interest in Oyu Tolgoi LLC. The remaining 34% interest is held by the Government of Mongolia through Erdenes Oyu Tolgoi LLC. Oyu Tolgoi is TRQ's principal and only material mineral resource property. Rio Tinto, with other Rio Tinto affiliates, holds a 50.8% majority interest in TRQ, and provide strategic and operational management services and support to Oyu Tolgoi LLC in respect of its operations and activities.

Valuation

The fair value is determined by the average valuation from the income and market approach. The discounted cash flow method (DCF method) is used in the income approach and inputs the production, reserves, and cost numbers from the most recent 43-101 report prepared in August 2020. We incorporated our own assumptions of long-term copper, gold, and silver pricing and increased the discount rate (cost of capital) to incorporate the legal, political, commercial nature of the agreement with Rio Tinto, the sovereign government of Mongolia, and other entities.

The following assumptions are used in the DCF method:

- Sales Price:
 - Cu@ USD3.85/lb
 - Au@ USD1,800/Oz
 - Ag@ USD24/Oz
- Discount rate of 12%
- Block cave operation has a nameplate production rate of 33 Mtpa
- Cost estimates prepared in 2020 real terms
- Mine life of 31 years (from January 01, 2021)
- Exclude all development capital spent up to 31 December 2020, and considered as a sunk cost
- Payback period is calculated from January 01, 2021
- Added 10% for inferred resource

The result of the DCF method shows in the below table.

Table 2 – Summary of Income Approach (DCF method)

Project NPV (US M\$)	11,720
NAV (C M\$) (including resources, debt, cash)	14,189
TRQ's 66% Share in NPV (C M\$)	9,365
NAV per Share (C\$)	46.5
Payback Period (in Years)	3.9

Source: Couloir Capital

The sensitivity table provided below outlines the various NAV per share given changes in the long-term copper price or discount rate:

Table 3 - NAV per share, Sensitivity with Cu sales price in USD and discount rate

	Long term Cu Price Assumption				
	\$2.70	\$3.27	\$3.85	\$4.43	\$5.01
8.0%	\$34.20	\$50.39	\$66.62	\$82.86	\$99.09
10.0%	\$28.32	\$41.90	\$55.52	\$69.11	\$82.73
12.0%	\$23.51	\$35.03	\$46.54	\$58.05	\$69.56
14.0%	\$19.54	\$29.35	\$39.21	\$49.06	\$58.88
16.0%	\$16.23	\$24.71	\$33.20	\$41.65	\$50.14

Source: Couloir Capital

We believe the current EBITDA number of TRQ is not a true representative of its intrinsic value. The EBITDA and net profit margin will improve significantly once the high-grade ore from the underground operation is available. This leads us to avoid enterprise value EV/EBITDA and P/E ratios to determine the fair value of TRQ shares. We used the EV by the proven/probable reserves ratio of comparable publicly listed companies in the market approach to determine the fair share price of the TRQ.

Table 4 – Key Ratios of TRQ and comparable companies

Company	Enterprise Value (B C\$)	Proven + Probable Cu (B lbs)	Proven + Probable Au (M Oz)	Proven + Probable Cu Eq (B)	P/B	P/E	EV/ EBITDA	EV/Reserve (\$/lbs)
Turquoise Hill Resources Ltd	\$6.8	22.0	12.0	27.7	0.29	4.69	6.63	\$0.25
First Quantum Minerals Ltd	\$28.6	63.7	15.4	77.8	1.49	41.53	7.63	\$0.37
Ivanhoe Mines Ltd	\$11.0	23.2	-	25.2	3.78	NA	NA	\$0.44
Freeport-McMoRan	\$81.2	81.8	15.5	98.1	4.34	18.52	8.18	\$0.83
Southern Copper Corporation	\$66.2	147.5	-	148.7	6.15	17.13	8.76	\$0.45
Antofagasta	\$27.1	27.0	5.5	30.1	2.52	19.22	5.46	\$0.90

Source: Couloir Capital

The average ratio of EV/copper equivalent reserves of the comparable companies is 0.60 compared to the TRQ's ratio of EV/copper equivalent reserves of 0.25, which translates to a fair value C\$39.46 after existing debt and cash is accounted for.

We also considered that underground production will not start until 2024 and at that point average grade will improve significantly afterward. Thus, we have reduced the NAV by 50% in our price 12-month price target. The fair value of TRQ is determined by the average of income approach (C\$23.27) and market approach (C\$39.46). This results in the price target of TRQ of **C\$31.36**, which shows a 12-month potential upside of 71.4% from the current share price.

Oyu Tolgoi Project

Location: The Oyu Tolgoi Property is approximately 645 km by road south of the capital of Mongolia, Ulaanbaatar.

Figure 2 – Oyu Tolgoi Project Location Map



Source: Company

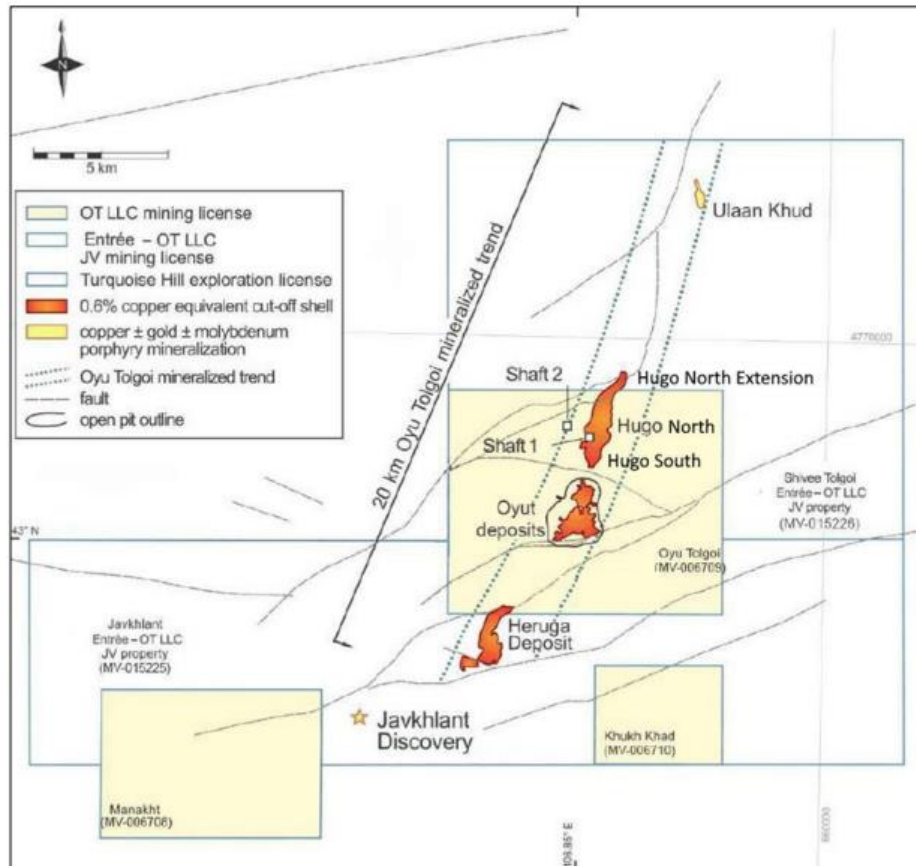
Mineral License: The Oyu Tolgoi Property comprises five mining licences held by Oyu Tolgoi LLC and Entrée LLC, a subsidiary of Entrée Resources Ltd. The mining licences provide rights to the holders to explore, develop mining infrastructure, and conduct mining operations at Oyu Tolgoi. The below table summarizes the mining license in the Oyu Tolgoi Project.

Table 5 – Mining Licenses comprising the Oyu Tolgoi Property

License Number	Area (ha)	Legal Owner	Oyu Tolgoi Interest	Mining Area
MV-006708	4,533	Oyu Tolgoi LLC	100%	
MV-006709	8,490	Oyu Tolgoi LLC	100%	Oyut, Hugo North, Hugo South, Heruga (partially)
MV-006710	1,763	Oyu Tolgoi LLC	100%	
MV-015225 (Javkhant)	20,327 (under agreement)	Entrée LLC	70% from the surface to 560 m below the surface; and 80% from below 560m	Heruga (mostly)
MV-015226 (Shivee Tolgoi)	42,592.58 (under agreement)	Entrée LLC	70% from the surface to 560 m below the surface; and 80% from below 560m	Hugo North Extension

Source: Company

Figure 3: Location of the Oyu Tolgoi Mining Licenses



Source: Company

Agreements: The following agreements relating to the Project have been entered into by TRQ, the Government of Mongolia, and other entities and have an impact on TRQ's interest in, and obligations relating to the Oyu Tolgoi Property:

- Investment Agreement dated 6 October 2009, between the Government of Mongolia, Oyu Tolgoi LLC, TRQ, and Rio Tinto in respect of Oyu Tolgoi (Investment Agreement).
- Amended and Restated Shareholders Agreement dated 8 June 2011 among Oyu Tolgoi LLC, THR Oyu Tolgoi Ltd. (formerly Ivanhoe Oyu Tolgoi (BVI) Ltd.), Oyu Tolgoi Netherlands B.V. and Erdenes MGL LLC (ARSHA). Erdenes MGL LLC since transferred its shares in Oyu Tolgoi LLC and its rights and obligations under the ARSHA to its subsidiary, Erdenes Oyu Tolgoi LLC.
- Underground Mine Development and Financing Plan (Underground Development Plan) dated 18 May 2015, between TRQ, the Government of Mongolia, Erdenes Oyu Tolgoi LLC, THR Oyu Tolgoi Ltd., Oyu Tolgoi Netherlands B.V., Rio Tinto and Oyu Tolgoi LLC.
- PSFA dated 31 December 2018, between the Government of Mongolia and Oyu Tolgoi LLC, including the amendment to the PSFA dated 26 June 2020.

Copies of each agreement have been filed with the Canadian Securities Authorities on SEDAR at www.sedar.com. In December 2019, a Resolution of the Parliament of Mongolia was published that included resolutions to take comprehensive measures to improve the implementation of the Investment Agreement and the ARSHA, to improve the Underground Development Plan, and to explore and resolve options to have a product sharing arrangement or swap Mongolia's equity holding of 34% for a special royalty.

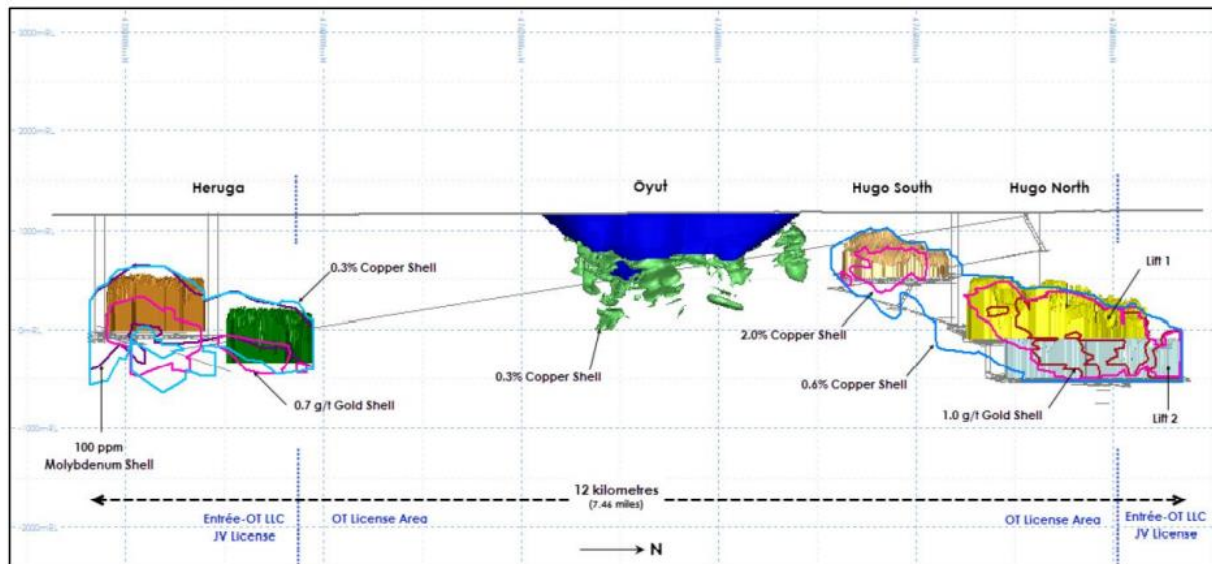
The agreements are further in detail discussed in Appendix I.

Geology and Mineral Resources: The Oyu Tolgoi Cu-Au porphyry deposits are distributed along a 12 km NNE striking corridor. These deposits lie within the Gurvansayhan island-arc terrane, a fault bounded segment of the broader Silurian to Carboniferous Kazakh-Mongol arc, located towards the southern margin of the Central Asian Orogenic Belt. The Oyu Tolgoi copper-gold deposits comprise, from north to south

- Hugo North
- Hugo South
- Oyut
- Heruga

These deposits are shown in plain view in above Figure 3, and the below Figure 4 shows the long section showing spatial distribution of the Oyu Tolgoi deposits.

Figure 4 – Long Section View of the deposits



Source: Company

At the Oyut and Hugo North deposits, the molybdenum head grades are considered too low to justify the capital required to add a molybdenum recovery circuit to the Oyu Tolgoi concentrator. Consequently, no significant test work has focused on molybdenum recovery. No payment or penalty is applied for molybdenum in a copper concentrate. A common rule-of-thumb is that a molybdenum head grade of 150 ppm is required for economic molybdenum recovery, whereas Hugo North grades are in the order of 27 ppm. The Heruga deposit has grades of around 140 ppm molybdenum, which may be high enough for economic production of a molybdenum flotation concentrate in the future.

Mineral Resources: The total updated Oyu Tolgoi deposits in total contain estimated Measured and Indicated Mineral Resources of 8.5 Mt (18.7 billion pounds) of contained copper, 9.4 Moz of contained gold, and estimated Inferred Mineral Resource of 22 Mt (48 billion pounds) of contained copper and 34 Moz of contained gold. The cut-off grade of 0.24% CuEq (copper equivalent) has been used for mineral resources for open pit and 0.41% CuEq for underground mining. The 2019 Mineral Resources have been prepared in accordance with the CIM Definition Standards for Mineral Resources and Mineral Reserves (the CIM Definition Standards (2014) and in accordance with the requirements of NI 43-101.

The Mineral Resources for the Hugo North deposit reported in the 2020 Technical Report have been updated from the Mineral Resources reported for the deposit in the Company's Annual Information

Form (AIF) for the year ended 31 December 2019 (2019 AIF). The update reflects changes to the Hugo North Lift 1 Mineral Reserve resulting from the redesign of the panels in Lift 1 including leaving two pillars separating panels.

There has been no update to the Mineral Resource estimates for the Oyut, Hugo South, or Heruga deposits. In the Mineral Resource tabulations, the term Entrée LLC refers to ownership by the proposed joint venture arrangement between Oyu Tolgoi LLC and Entrée LLC.

The total Mineral Resources for Oyu Tolgoi is shown in the table below.

Table 6 – Total Mineral Resources for Oyu Tolgoi Deposit, as of 31 Dec 2019 (updated 30 June 2020)

Classification	Tonnage (Mt)	Cu (%)	Au (g/t)	Ag (g/t)	Contained Metal		
					Cu (Mt)	Au (M Oz)	Ag (M Oz)
Measured	87	1.4	0.53	3.2	1.2	1.5	9.0
Indicated	640	1.2	0.39	2.8	7.3	8.0	58
Measured + Indicated	720	1.2	0.41	2.9	8.5	9.4	67
Inferred	720	0.84	0.07	1.9	6.1	1.7	44

Source: Company

The mineral resources by individual deposits are shown in Appendix II.

Mineral Reserves: The mineral reserves mentioned in the latest 43-101 report dated on August 2020 used the following assumptions:

- Sales Price of Cu@ 3.08 USD/lb; Au@ 1,292 USD/Oz; Ag@ 19 USD/Oz
- Hugo North estimated mining, processing, G&A costs range from 17.27 - 17.90 USD/t
- Oyut open pit processing, G&A cost ranges from 7.18 – 10.14 USD/t

The mineral reserves are limited to Oyut and Hugo North deposits only, Hugo South and Heruga deposits are limited to resources only and have not been included in the valuation or reserves. The total Mineral Reserves for Oyu Tolgoi by deposit and stockpiles are shown in the below the table.

Table -7 Oyut open pit Mineral Reserves as of 31 December 2019

Classification	Ownership	Tonnage (Mt)	Cu (%)	Au (g/t)	Ag (g/t)	Contained Metal		
						Cu (Mt)	Au (M Oz)	Ag (M Oz)
Proven	Oyu Tolgoi LLC	310	0.52	0.39	1.3	1.6	3.8	13
Probable	Oyu Tolgoi LLC	480	0.39	0.23	1.1	1.9	3.5	17
Total	Oyu Tolgoi LLC	780	0.44	0.29	1.2	3.5	7.2	30

Source: Company

Table - 8 Hugo North Underground Mineral Reserves as of 31 December 2019 (updated 30 June 2020)

Classification	Ownership	Tonnage (Mt)	Cu (%)	Au (g/t)	Ag (g/t)	Contained Metal		
						Cu (Mt)	Au (M Oz)	Ag (M Oz)
Probable	Oyu Tolgoi LLC	400	1.5	0.29	3.1	6.0	3.8	40
Probable	Entrée LLC	40	1.5	0.53	3.6	0.6	0.7	4.6
Total		440	1.5	0.32	3.2	6.7	4.5	45

Source: Company

Table - 9 Oyut Surface Stockpiles Mineral Reserves as of 31 December 2019

Classification	Ownership	Tonnage (Mt)	Cu (%)	Au (g/t)	Ag (g/t)	Contained Metal		
						Cu (Mt)	Au (M Oz)	Ag (M Oz)
Proven	Oyu Tolgoi LLC	48	0.33	0.12	0.93	0.16	0.19	1.4

Source: Company

Table - 10 Total Oyu Tolgoi Mineral Reserves as of 31 December 2019 (updated 30 June 2020)

Classification	Tonnage (Mt)	Cu (%)	Au (g/t)	Ag (g/t)	Contained Metal		
					Cu (Mt)	Au (M Oz)	Ag (M Oz)
Proven	350	0.49	0.35	1.3	1.7	4.0	14
Probable	920	0.93	0.27	2.1	8.5	7.9	62
Total	1,270	0.81	0.29	1.9	10	12	77

Source: Company

Recovery of Metal to Concentrate: Copper recovery for the Oyut open pit varies based on copper grade and ore type. Ore type defines the expected copper speciation and the relationship between copper grade and copper recovery is different for each ore type. Gold and silver recovery are predicted based on observed performance in the concentrator, supported by metallurgical test work. Copper recovery for Hugo North varies based on the copper grade and ore types. Both gold and silver recovery vary with copper recovery and ore type. It is noted that silver only makes a small contribution to the value of the mineral reserve. After processing, the estimated recovery of metal to copper concentrate from the Oyu Tolgoi Mineral Reserves are shown in Table 15.

Table 11 – Estimate of Metal Contained in Concentrate from Each Ore Source

Classification	Ownership	Recovery			Contained Metal		
		Cu (%)	Au (%)	Ag (%)	Cu (Mt)	Au (M Oz)	Ag (M Oz)
Oyut Open Pit	Oyu Tolgoi LLC	78	67	52	2.7	4.8	16
Stockpiles	Oyu Tolgoi LLC	73	44	47	0.1	0.1	1
Hugo North	Oyu Tolgoi LLC	93	79	80	5.6	3.0	32
Hugo North	Entrée LLC	92	81	83	0.6	0.5	4
Total Hugo North	Oyu Tolgoi LLC + Entrée LLC	93	79	80	6.2	3.5	36
Total Project	Oyu Tolgoi LLC + Entrée LLC	87	71	69	9.0	8.5	52

Source: Company (Total may not match due to rounding)

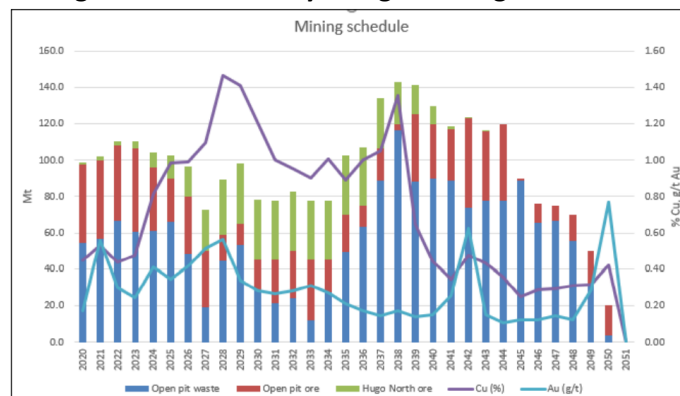
Mining Introduction: Open-pit (surface) mining of the Oyut deposit was started in 2012 and the mine currently has an ore production rate of about 40 Mtpa. The initial investment decision to develop Phase 1, included continued investment into the development of the Hugo North underground mine as a block caving operation (Phase 2 of the Project). Development of Phase 2 commenced in July 2016. The Hugo North mine is being developed in two stages, Lift 1, and Lift 2. Development of Lift 1 is at an advanced stage with the first draw-bell estimated to be blasted in mid-2022, subject to any delays arising from the COVID-19 pandemic and subject to further study and assessment. Concept studies have been carried out on developing Hugo North Lift 2, Hugo South, and Heruga deposits. The studies

envisage that the Hugo South and Heruga deposits will be mined by underground caving methods like Hugo North.

Mine Production: The current production rate from the Oyut open pit continues until 2023, after which it will be progressively reduced as production builds up from underground. Open pit mining will continue in parallel with Hugo North Lift 1 to keep the Oyu Tolgoi concentrator operating at its design capacity. Following depletion of Lift 1, production from the Oyut open pit will be increased to meet mill capacity.

The planned production schedule does not reflect the impacts of the COVID-19 pandemic which are ongoing and continues to be assessed. Several work fronts at Hugo North underground mine are directly impacted by the COVID-19 pandemic due to the lack of availability of critical resources and restrictions on site workforce numbers. The below Figure and Table show the yearly production by site and the average grade for the mine life.

Figure 5 – Planned Oyu Tolgoi Mining Production



Source: Company

Table 12 - Planned Oyu Tolgoi Mining Production

Year	Oyut open pit				Hugo North ore mined			Total ore mined		
	Waste (Mt)	Ore (Mt)	Cu (%)	Au (g/t)	Ore (Mt)	Cu (%)	Au (g/t)	Ore (Mt)	Cu (%)	Au (g/t)
2020	54	43	0.44	0.16	1	1.0	0.27	44	0.45	0.16
2021	57	43	0.52	0.56	2	0.8	0.19	45	0.53	0.54
2022	66	41	0.41	0.28	2	1.1	0.30	44	0.44	0.28
2023	61	46	0.39	0.21	4	1.5	0.43	50	0.48	0.23
2024	61	35	0.57	0.38	8	1.8	0.49	43	0.81	0.40
2025	66	24	0.35	0.23	12	2.2	0.56	36	0.98	0.34
2026	48	32	0.31	0.26	16	2.3	0.56	48	0.99	0.37
2027	19	31	0.33	0.40	23	2.2	0.52	53	1.11	0.45
2028	45	14	0.49	0.76	31	1.9	0.47	45	1.47	0.56
2029	54	11	0.43	0.09	33	1.8	0.42	45	1.42	0.33
2030	29	16	0.50	0.15	33	1.6	0.35	50	1.22	0.28
2031	21	24	0.49	0.15	33	1.4	0.32	57	1.02	0.25
2032	24	26	0.57	0.17	33	1.3	0.34	59	1.00	0.26
2033	12	33	0.66	0.22	33	1.3	0.33	66	0.98	0.28
2034	27	18	0.66	0.24	33	1.2	0.27	50	1.04	0.26
2035	49	21	0.45	0.14	33	1.2	0.21	53	0.90	0.18
2036	63	12	0.40	0.16	32	1.3	0.17	44	1.02	0.16
2037	89	18	0.40	0.06	28	1.5	0.16	46	1.06	0.12
2038	116	4	0.38	0.11	23	1.5	0.15	26	1.36	0.14
2039	88	37	0.38	0.12	16	1.3	0.12	53	0.65	0.12
2040	90	30	0.34	0.18	10	0.8	0.07	40	0.44	0.15
2041	89	28	0.34	0.39	1	0.6	0.03	29	0.35	0.37
2042	74	49	0.51	0.62	0	0.6	0.02	49	0.51	0.62
2043	78	38	0.45	0.16	0	0.3	0.01	38	0.45	0.16
2044	78	42	0.42	0.10	-	-	-	42	0.42	0.10
2045	89	1	0.22	0.26	-	-	-	1	0.22	0.26
2046	66	10	0.31	0.19	-	-	-	10	0.31	0.19
2047	67	8	0.32	0.31	-	-	-	8	0.32	0.31
2048	56	14	0.42	0.13	-	-	-	14	0.42	0.13
2049	31	19	0.35	0.47	-	-	-	19	0.35	0.47
2050	4	16	0.50	1.24	-	-	-	16	0.50	1.24
2051	-	-	-	-	-	-	-	-	-	-
Total	1,771	783	0.44	0.29	440	1.51	0.32	1,223	0.83	0.30

Source: TRQ

Permits and Authorizations: All work at Oyu Tolgoi must be carried out in accordance with the laws of Mongolia. This requires obtaining numerous permits and authorizations from Mongolian regulatory authorities. As of the date of the 2020 Technical Report, all material permits and authorizations necessary to develop and operate the Project have been obtained. Subject to the risks discussed below, it is reasonable to expect that future permits and authorizations required to continue the development and operation of the Project as currently planned, will be granted.

Road Access: Road access to the Oyu Tolgoi Property from Ulaanbaatar is currently by an unpaved road, via Mandalgovi (Figure 1). The Chinese Government has upgraded 226 km of road from Ganqimaodao to Wuyuan, providing a direct road link between the Mongolian border crossing at Gashuun Sukhait, 80 km south of Oyu Tolgoi, and the Trans-China railway system. A 105 km sealed road is currently being constructed from Oyu Tolgoi to the Mongolian Chinese border crossing at Gashuun Sukhait. Approximately 23 km of the road are pending final construction to a fully paved standard.

Air Access: A permanent domestic airport designed to accommodate commercial aircraft up to the Boeing 737-800 series has been constructed 11 km north of the Oyu Tolgoi camp area. The flight time from Ulaanbaatar is just over one hour. The airport also serves as the regional airport for the town of Khanbogd.

Rail Access: The Trans-Mongolian Railway crosses the Mongolia-China border approximately 420 km east of Oyu Tolgoi, traversing the country from south-east to north-west through Ulaanbaatar to the border with Russia. There is currently no access from the Project site to the Mongolian railway network except along a 330 km desert trail north-east to Sainshand. At the Mongolian Chinese border, the rail gauge changes from the Russian standard to the Chinese standard. The Government of Mongolia may construct or facilitate construction and management of a railway in the vicinity of the Project. Oyu Tolgoi LLC will be consulted regarding the railway route. If constructed, the Government of Mongolia is obliged to make the railway available for use by Oyu Tolgoi on commercial and non-discriminatory terms. A single-track heavy-haul railway from the Erdenes Tavan Tolgoi coal mine (approximately 150 km to the north-west of Oyu Tolgoi) to Gashuun Sukhait, ultimately to be interconnected with the Chinese rail network at Ganqimaodao. Once constructed, the rail line will pass within 12 km of Oyu Tolgoi and therefore represents an opportunity for the eventual connection of Oyu Tolgoi to the rail network.

Port Access: Oyu Tolgoi makes use of the Chinese Port of Tianjin, the largest port in northern China, some 150 km south-east of Beijing, to import freight from overseas. The port is open year-round and has no ice restrictions during winter. Road delivery from Tianjin is via Chinese highways connecting Tianjin to Wuyuan, about 1,050 km, from there along a state highway to Hailiutu, about 60 km, and then on to the China-Mongolia border crossing at Ganqimaodao-Gashuun Sukhait. This is the primary border crossing for both cargo and Chinese personnel immigration for the Project. Baotou, just east of Wuyuan, is the consolidation point for freight originating from China.

CAPEX and OPEX: This section's focus is on the remaining capital required to complete the project and to mine and process the mineral reserves. The forecast costs exclude the potential impacts arising from the COVID-19 pandemic, as the duration of the pandemic and the impact on costs is currently unknown. Oyu Tolgoi is being developed in two phases (Phase 1 and Phase 2). Phase 1 involved development of the Oyut open pit, and construction of the Oyu Tolgoi concentrator and associated infrastructure. The capital expenditure on Phase 1 (the Phase 1 capital) is complete except for \$24 million planned to be spent to complete outstanding road works. Phase 2, which is ongoing, involves development of the Hugo North underground mine, modifying the concentrator, and expanding the site infrastructure.

Table 13 – Summary of Planned CAPEX by Year

Year	Phase 2 (\$ billion)
Spent to from 1 January 2015 to 31 December 2019	3.4
2020	1.2
2021	1.0
2022	0.6
2023	0.4
2024	0.2
2025	0.0
Total	6.8

Source: Company

Table 14 – Phase 2 Development Capital by Area

Description	Spent from 1 January 2015 to 31 December 2019 (\$ billion)	Forecast to complete from 1 January 2020 (\$ billion)	Total Phase 2 (\$ billion)
Underground mine (Hugo North Lift 1)	1.4	1.3	2.7
Site development	0.0	0.0	0.0
Concentrator Modifications	0.0	0.2	0.2
Utilities and ancillaries	0.1	0.0	0.1
Offsite facilities	0.1	0.1	0.2
Subtotal direct costs	1.6	1.6	3.2
Indirect costs	0.8	0.7	1.4
Owner's costs, escalation, growth, forex, contingency	1.0	1.2	2.2
Subtotal – indirect costs	1.8	1.8	3.6
Total	3.4	3.4	6.8

Source: Company

Anticipated Funding Shortfall: The agreement (Heads of Agreement) was made on and as of April 09, 2021, between TRQ and Rio Tinto International Holdings Limited (RTIHL).

The below list summarizes the key points of the agreement.

- i. The anticipated funding shortfall to complete the underground development is about US\$ 2.3 billion.
- ii. Approximately US\$ 1.4 billion from the re-profiling of the existing Oyu Tolgoi's project financing.
- iii. Rio Tinto Manager would engage with the IFI Lenders to negotiate up to US\$500 million of additional A loans.
- iv. up to US\$750 million from a co-lending by a member of the Rio Tinto Group to OT LLC under the OT Project Financing to address any deficiencies in the aggregate of (ii) or (iii) above.
- v. up to US\$500 million from an equity offering by TRQ.

Sustaining CAPEX: The sustaining CAPEX for the project life by the area of operation is shown in the below table. All the numbers are in 2020 US\$.

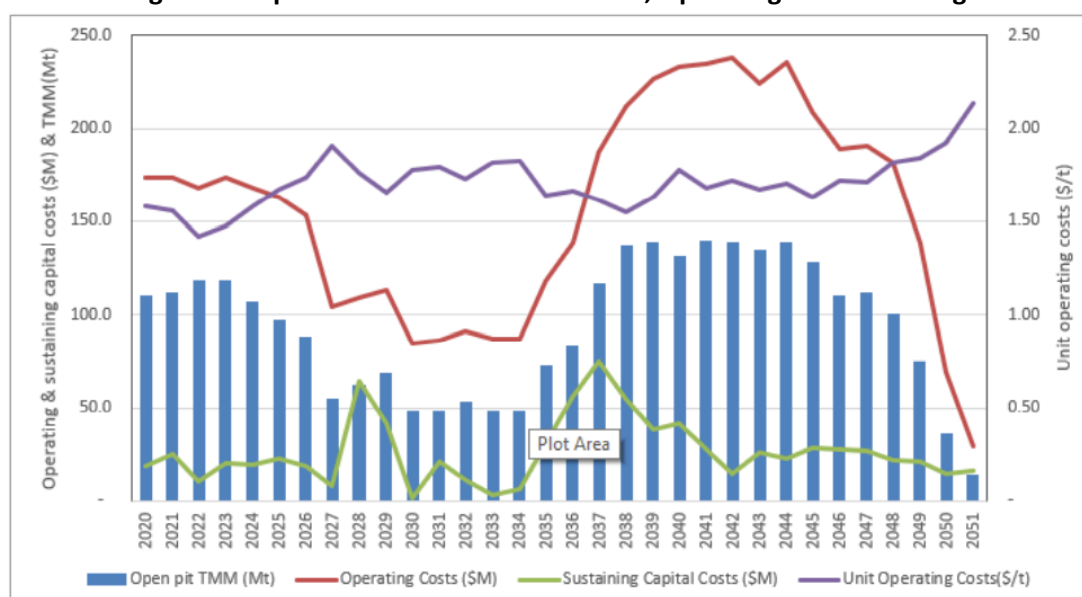
Table 15 – Total Sustaining CAPEX

Description	Total (\$ billion)
Open Pit	0.8
Hugo North Lift 1	2.7
Concentrator	0.1
Tailings	0.8
Infrastructure	0.3
Other	0.2
Sub-total	5.0
VAT & Duties	0.5
Total	5.5

Source: Company

Open Pit OPEX: The figure below shows the planned annual total material movement for the open pit, together with the estimated unit operating cost, OPEX and sustaining capital costs.

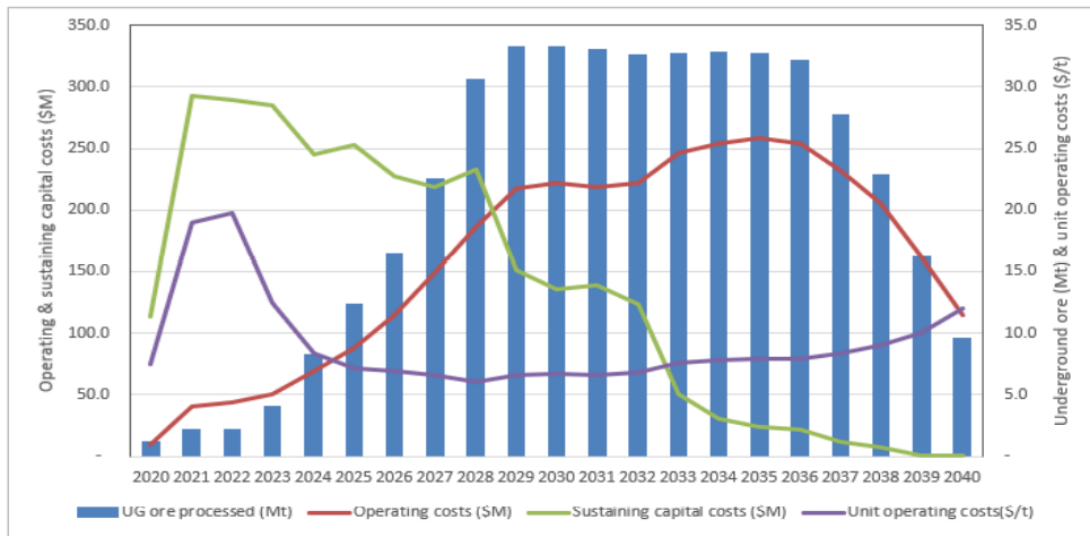
Figure 6 – Open Pit Annual Ore Production, Operating and Sustaining Cost



Source: Company

Hugo North Underground OPEX: The figure below shows the planned annual ore processed from the underground mine, together with the estimated unit operating cost, OPEX and sustaining capital costs.

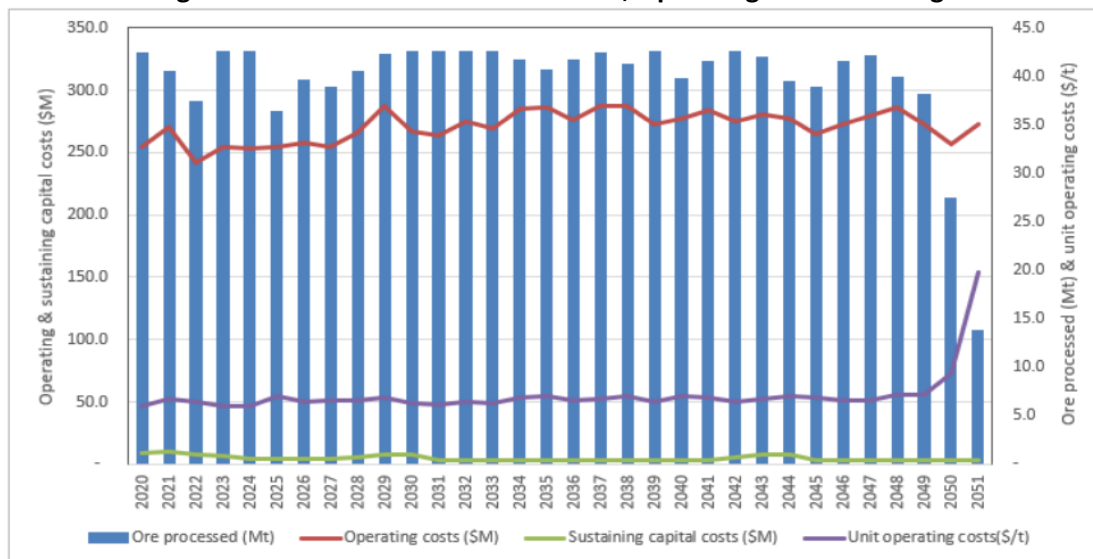
Figure 7 – Underground Ore Production, Operating and Sustaining Cost



Source: Company

Concentrator Operating Cost: The figure below shows the planned annual ore processed in the concentrator, together with the estimated unit operating cost, OPEX and sustaining capital costs.

Figure 8 – Concentrator Ore Processed, Operating and Sustaining Cost



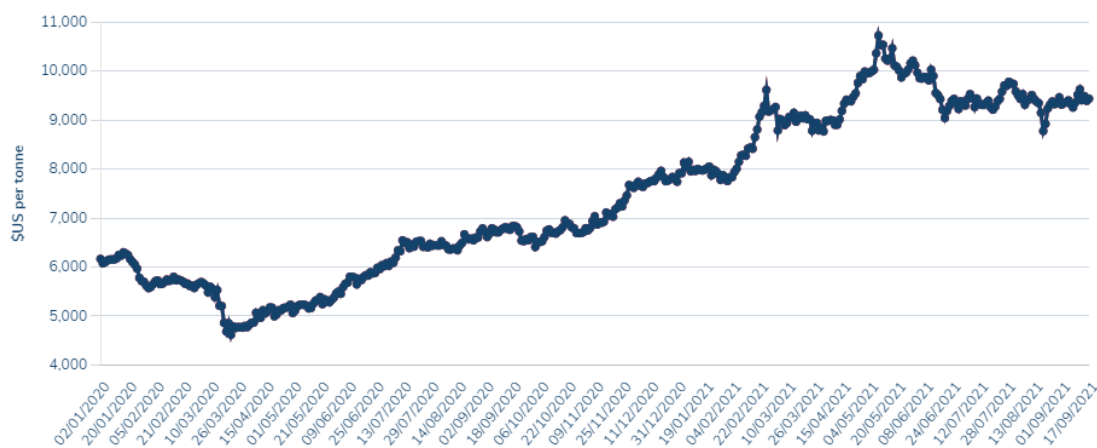
Source: Company

Copper Outlook

Copper, one of the most broadly consumed industrial metals globally, has seen a marked increase in interest as measured by its market pricing, with recent LME copper pricing at US\$9,435 per tonne or around US\$4.3 per pound. This marks a major uplift relative to a low of around US\$2.1 per pound in

late March 2020, with the bearish sentiment at the onset of the coronavirus pandemic having been replaced with widespread optimism around copper's future demand. Major short-term drivers of bullish copper pricing movement include a weak dollar as well as recovering global demand, led primarily by China, which has outperformed most other global economies in its pandemic recovery.

Figure 9 – Copper LME Cash Price Trend

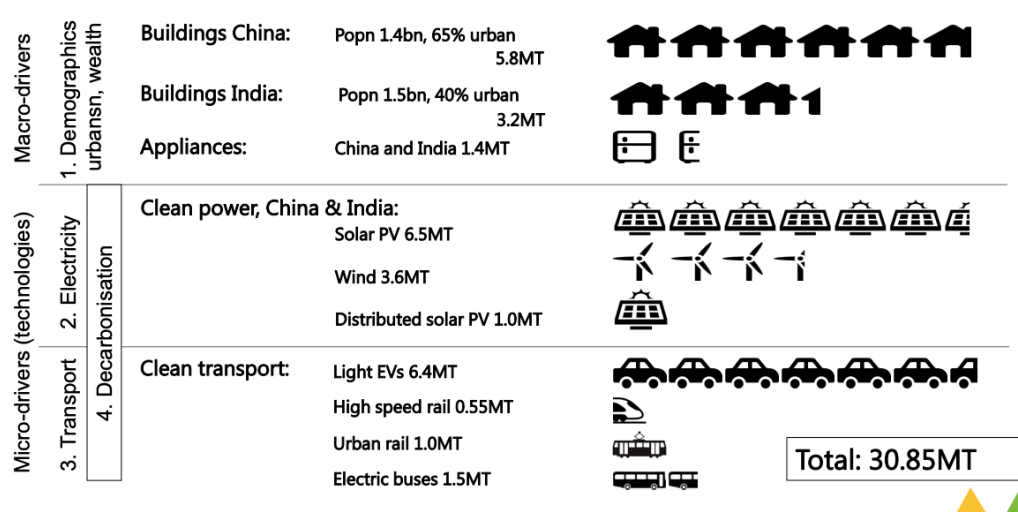


Source: LME

Copper is the most cost-effective conductive material, copper sits at the heart of the energy transition progress. Achieving a net zero emissions will result in shift of demand from fossil fuels (Oil, Coal) to green metals in which copper would be a big one and the critical one. Longer-term, demand for copper is expected to grow considerably, as a number of factors together combine to contribute to what Roskill estimates will be 38 million tonnes of copper demand in 2030, a 28% increase compared to 2020's consumption of just under 30 million tonnes. Asia alone is expected to drive an estimated incremental 30.85 million tonnes of copper consumption demand by 2030, according to the Warren Centre. The major projected drivers of copper demand include:

- Electrification and the move to renewables.
- Demographic changes and population growth, especially in Asia.
- Passenger transportation growth and vehicle electrification.
- Broader decarbonization and move to clean economies.

Figure 10 – Drivers of Incremental Copper Demand in Asia through 2030



Source: The Warren Centre

Despite the strong demand picture for copper over the long-term, supply has remained tight, with global copper production having only grown at a CAGR of 2.19%. In 2020, the US Geological Survey (“USGS”) estimated world copper production at approximately 20 million tonnes, with mine production coming short of global copper demand by almost 10 million tonnes. This of course does not reflect the actual supply gap as copper can be recycled and even substituted in some applications for metals like aluminium if copper prices become prohibitively high. However, the supply gap is nonetheless expected to grow, with estimates by CRU group putting the annual supply gap at 4.7 million tonnes by 2030. The gap may further grow to 10 million tonnes by that year if no new mines are built, according to Trafigura Group. Despite there being clear incentive to bring forward production and invest in new copper mines with prices at over US\$4 per pound, miners face clear challenges in bringing new capacity online. Apart from increasing technical difficulties in developing viable ore bodies, approvals have become increasingly onerous to the point that Bloomberg Intelligence estimates lead times on new mines have increased from 4 years (in previous commodities cycles) to 14 years at current.

The below figure shows the global mined copper production by year since 2010.

Figure 11 – Global Mined Copper Production (‘000 of Metric Tonne)

	2010	2011	2012	2013	2014	2015
Chile	5420	5,260	5,430	5,780	5,750	5,760
Peru	1250	1,240	1,300	1,380	1,380	1,700
China	1190	1,310	1,630	1,600	1,760	1,710
Congo	343	520	600	970	1,030	1,020
US	1110	1,110	1,170	1,250	1,360	1,380
Australia	870	958	958	990	970	971
Russia	703	713	883	833	742	732
Zambia	690	668	690	760	708	712
Mexico	260	443	440	480	515	594
Canada	525	566	579	632	696	697
Total	15900	16,100	16,900	18,300	18,500	19,100
	2016	2017	2018	2019	2020	CAGR
Chile	5,550	5,500	5,830	5,790	5,700	0.81%
Peru	2,350	2,450	2,440	2,460	2,200	5.90%
China	1,900	1,710	1,590	1,680	1,700	2.64%
Congo	846	1,090	1,230	1,290	1,300	9.60%
US	1,430	1,260	1,220	1,260	1,200	0.78%
Australia	948	860	920	934	870	-0.96%
Russia		705	751	801	850	1.77%
Zambia	763	794	854	797	830	2.20%
Mexico	752	742	751	715	690	4.53%
Canada	708			573	570	0.07%
Total	20,100	20,000	20,400	20,400	20,000	2.19%

Source: USGS, Couloir Capital

The increased demand for copper and limited projects in the pipeline would result in a significant increase in copper prices. A report published by Goldman Sachs in April 2021 projected the copper price to average \$9,675/t in 2021, \$11,875/t in 2022, \$12,000/t in 2023 before a material step-up to \$14,000/t in 2024 and \$15,000/t in 2025.

Investors / ESG

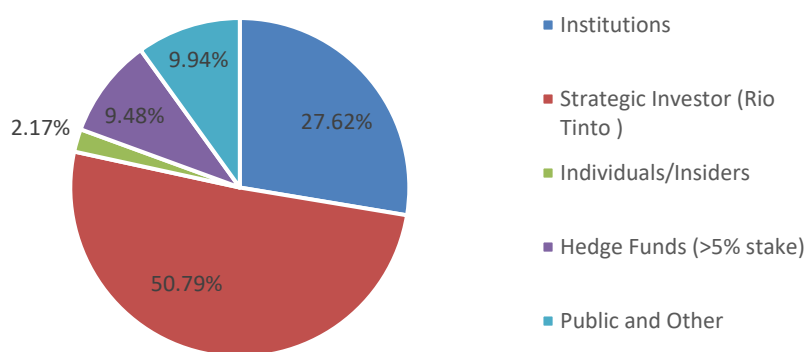
Strategic investors, Institutions, Insiders/individuals, and hedge fund managers own more than 90% of the total outstanding shares. The below table and figure show the top shareholders and type.

Table 16 – Top Holders

Major Investors	Shares	% of Total
Rio Tinto Group	102,196,643	50.79%
Pentwater Capital Management	19,070,056	9.48%
Kopernik Global Investors LLC	10,054,956	5.00%
SailingStone Capital Partners LLC	4,891,088	2.43%
Credit Suisse	4,805,819	2.39%
	-	70.08%

Source: Couloir Capital

Figure 12 – Ownership by Type



Source: Couloir Capital

In addition to our review of the company's management and directorship, the below table outlines our ESG rating parameters for TRQ. Note that this is a largely qualitative rating measure based on publicly available information – it may not fully reflect the company's true governance strength. Particularly strong governance ratings can positively impact our corporate valuations, whilst weak ratings call for a discount in our framework.

Figure 13 – ESG Rating

	ESG Rating Strength				
	Very Poor	Poor	Moderate	Good	Very Good
Management Track Record				Good	
Corporate Structure				Good	
Insider Ownership	Very Poor				
Institutional and HNW Presence					Very Good
Board Independence				Good	
Financial Reporting Quality			Moderate		
Shareholder Dilution Track Record			Moderate		
Local Socioeconomic Impact				Good	
Minimal Environmental Disturbance				Good	
Permitting Track Record				Good	
Overall				Good	

Source: Couloir Capital

Financial Overview

As of September 23, 2021, the following table summarizes the company's key financial data.

Table 17 – Key Financial Data

Shares (Outstanding)	201,231,446	
Share Price (C\$)	18.30	
Market Cap (M C\$)	3,683	
Cash (M C\$)	857	
Debt (M C\$)	5,299	
Enterprise Value (M C\$)	6,846	
	Period	
	Q2 - 2021	2020
Cash from Operations (M C\$)	259.4	52.2
Cash from Investing (M C\$)	(270.4)	(691.2)
Cash from Financing (M C\$)	(37.7)	(35.2)

Source: Couloir Capital

The above table shows that TRQ's operational cash flow is positive, and it also results in a positive net profit. The negative cash flow of financing is due to the payment related to the outstanding debt and no recent capital raised by diluting the equity. The development capital needed to complete Phase 2 is discussed above. It includes raising US\$ 500 million by an additional equity offering. It is not significant in terms of the book value, and it has been a while since the last public offering was in 2014. We assumed the impact of this equity offering on the share price would be minimal.

Table 18 – Production and Financial Evaluation Summary

Description	Units	Value (life of Project)
Material Processed	Bt (Billion Tonne)	1.2
Payable Cu	Mt (Billion lb)	8.5 (18.8)
Payable Au	M Oz	8.0
Payable Ag	M Oz	46.5
Mine life	Years	31
Development Capital (nominal)	US\$ billions	2.3
Development Capital (real)	US\$ billions	2.2
Payback Period	Years	3.4
IRR (unlevered, after tax)	%	46%
NPV (after tax)	US\$ billion	12.14
TRQ's Share in NPV (66%)	US\$ billion	8.01

Source: Couloir Capital

Conclusion

After accounting for our valuation methodologies, we have arrived at fair value per share estimate of \$31.36 per share. We are initiating coverage on TRQ with a BUY rating, and expect the following catalysts to materially impact our valuation estimate:

- Relationship with the local partner, Government of Mongolia
- Starting the production from the UG mine and able to maintain the mine production plan
- Future copper and gold price
- Mine safety
- Environmental Impact and a sustainable operation
- Process recoveries

Risks

- The political risk is big as Mongolia is not in an established mining jurisdiction and exposes the Project to factors and risks that may affect the production, life and net cash flow.
- In the recent past Government of Mongolia has sent notice or invoice for the federal income tax in Q1 2021. It was for US \$321.3 million and resulted in a negative net profit in that quarter. TRQ would adjudicate those charges, but their short-term impact is unavoidable.
- The mining jurisdiction is not very mature in Mongolia and a similar incident would impact access, title, and or the right to develop and operate the Project as envisaged in the 2020 Feasibility Study.
- Many of the risks are of a legal, political, or commercial nature associated with the agreements with Rio Tinto, the sovereign government of Mongolia and other entities. These risks are set out in detail in the 2019 AIF available on SEDAR at www.sedar.com
- COVID 2019, we understand that Mongolia may be seeing a recent surge in cases which has the potential to affect mining operations

Appendix I

Rio Tinto Agreements

Since 2006, Rio Tinto has entered into several agreements to increase its indirect ownership interest in Oyu Tolgoi LLC and to secure funding and management control of the Project development and operation. A summary of significant agreements is included in Table 4.

Copies of the significant agreements have been filed on SEDAR and can be accessed at www.sedar.com

Table I-1 – Key Rio Tinto Agreements

Date	Agreement Description	Terms, Provisions and Outcomes
18-Oct-2006	Private Placement Agreement	<ul style="list-style-type: none"> • Acquisition of 19.7% stake in TRQ by way of two tranches, the first of which closed in October 2006 and the second of which closed in October 2009. • Granting of certain pre-emptive rights to RTIH entitling it to participate, subject to certain exceptions, in future issuances of common shares of TRQ, which pre-emptive rights remain in effect. • Formation of a joint “Technical Committee” to oversee and approve the Project development
08-Dec-2010	Heads of Agreement	<ul style="list-style-type: none"> • Provided for series of funding measures, including \$1.8 billion interim funding facility from Rio Tinto. • Establishment of a joint “Operating Committee”. • Granting of the right to Rio Tinto to appoint an affiliate to manage Oyu Tolgoi pursuant terms of a management agreement.
17-Apr-2012	Memorandum of Agreement (MoA)	<ul style="list-style-type: none"> • Rio Tinto to provide \$1.5 billion of bridge financing and standby commitment to \$1.8 billion rights funding by TRQ • Rio Tinto to support Project funding, including granting of a completion support guarantee by a Rio Tinto affiliate

		<ul style="list-style-type: none"> • Reduction of TRQ Board of Directors to 13 members, from the initial 14 members.
28-Jun-2013	Short-Term Bridge Funding Agreement	<ul style="list-style-type: none"> • Rio Tinto to make available to TRQ a convertible non-revolving term credit facility of up to \$225 million.
7-Aug-2013 23 Aug 2013	New Bridge Funding Agreement and 2013 MoA	<ul style="list-style-type: none"> • Rio Tinto and TRQ to amend the short-term bridge funding agreement to extend the Maturity Date to 28 August 2013 • Rio Tinto to provide TRQ a new secured bridge funding facility in the amount of \$600 million. • If required, TRQ agreed to conduct a further rights offering prior to 30 December 2013 to cover interim funding and bridge facility amounts with a Rio Tinto standby commitment. • TRQ agreed to enter into a general security agreement with Rio Tinto and reimburse Rio Tinto associated costs.
15-Dec-2015	Project Finance Facility and Financing Support Agreements	<ul style="list-style-type: none"> • Syndicated \$4.4 billion project finance facility intended for the development of the underground mine of the Project with Rio Tinto completion support. • TRQ entered into a number of agreements in connection with the project financing, including: a financing support agreement with Rio Tinto, a financing support agreement with Oyu Tolgoi LLC and Rio Tinto, a cash management services agreement with affiliates of Rio Tinto, and a sponsor debt service undertaking agreement pursuant to which, among other things, TRQ and Rio Tinto guaranteed to the finance parties payment of principal, interest and fees owed by Oyu Tolgoi to the senior lenders under the project financing payable prior to completion.

Investment Agreement

The Investment Agreement provides for, among other things, a framework for undertaking mining activities in compliance with all laws in Mongolia.

The Investment Agreement became effective on 31 March 2010 and has an initial term of 30 years (until 31 March 2040). Oyu Tolgoi LLC has the right, by giving notice not less than 12 months prior to the expiry of the initial term and subject to the fulfillment of certain conditions, to extend the initial term of the Investment Agreement for an additional term of 20 years.

To exercise its right to extend the initial term, Oyu Tolgoi LLC must have performed certain following obligations in the first 30 years, including among other:

- Having demonstrated that Oyu Tolgoi has been operated to industry best practice in terms of national and community benefits, environmental health and safety practices.
- Having made capital expenditures in respect of Oyu Tolgoi of at least \$9 billion.
- Having complied in all material respects with its obligations to pay taxes under the laws of Mongolia, as stabilized under the terms of the Investment Agreement.
- If, as part of the development of Oyu Tolgoi, Oyu Tolgoi LLC has constructed a copper smelter, Oyu Tolgoi LLC must have constructed or be constructing such smelter in Mongolia.
- If the development and operation of Oyu Tolgoi has caused any unanticipated and irreversible ecological damage to natural resources in Mongolia, then Oyu Tolgoi LLC must have paid compensation based on the value of any such permanently damaged natural resources in accordance with the applicable laws of Mongolia.

- Having secured the total power requirements for Oyu Tolgoi from sources within the territory of Mongolia within four years of commencement of production. This obligation has been subsequently amended and restated through the Power Sector Cooperation Agreement, which was in turn superseded by the PSFA, amended in 2020. Please see Power discussion below.

Sale of mineral products

The Investment Agreement confirms Oyu Tolgoi LLC's rights to market sell and export mineral products from Oyu Tolgoi at international market prices and to freely expend and repatriate its sale proceeds in Mongolian Togrogs and foreign currencies. It also conveys legal protection on capital, property and assets of Oyu Tolgoi LLC and its affiliates, and the requirement that any expropriation action must be in accordance with due process of law on a non-discriminatory basis and with the condition of full compensation by the Government of Mongolia to the affected party.

Taxes royalties and fees

Throughout the term of the Investment Agreement, if any, all taxes as set out in Section 2.1 of the Investment Agreement payable by Oyu Tolgoi LLC will remain stabilized including the corporate income tax rate, customs duties, value-added tax, excise tax (except on gasoline and diesel fuel purchases), royalties, mineral exploration and mining licence payments, and immovable property tax and/or real estate tax. Non-stabilized taxes will apply to Oyu Tolgoi LLC on a non-discriminatory basis. Examples of non-stabilized taxes are social security obligations, work placement fees, royalties on the use of sand and gravel and water levies, some of which are paid locally.

Infrastructure, roads, and water

The Investment Agreement permits Oyu Tolgoi LLC to construct a road between the Oyu Tolgoi site and the Gashuun Sukhait border crossing with China. Oyu Tolgoi LLC may deduct the road construction expenses from its annual taxable income. 19 km of the road remains to be constructed. Oyu Tolgoi LLC has the right to access and use self-discovered water resources for any purpose connected with Oyu Tolgoi during the life of the Project. Oyu Tolgoi LLC is required to pay fees for its water use, but such fees must be no less favourable than those payable from time to time by other domestic and international users, must take into account the quantity and quality of the water removed and consumed, and are treated as a deductible expense from Oyu Tolgoi LLC's taxable income.

Power Source Framework Agreement Amendment

Oyu Tolgoi LLC currently sources power for the Oyu Tolgoi mine from China's Inner Mongolian Western Grid, via overhead power line, pursuant to back-to-back power purchase arrangements with Mongolia's National Power Transmission Grid JSC, (NPTG) the relevant Mongolian power authority, and Inner Mongolia Power International Cooperation Co., Ltd (IMPIC), the Chinese power generation company.

Oyu Tolgoi LLC is obliged under the 2009 Oyu Tolgoi Investment Agreement to secure a longterm domestic source of power for the Oyu Tolgoi mine. The Power Source Framework Agreement entered into between Oyu Tolgoi LLC and the Government of Mongolia on 31 December 2018 provides a binding framework and pathway for long-term power supply to the Oyu Tolgoi mine. The Power Source Framework Agreement originally contemplated the construction of a coal-fired power plant at Tavan Tolgoi (TTPP), which would be majority-owned by Oyu Tolgoi LLC and situated close to the Tavan Tolgoi coal mining district located approximately 150 kilometres from the Oyu Tolgoi mine. In April 2020, the Government of Mongolia advised that it was unwilling to support Oyu Tolgoi LLC's proposal to develop the TTPP and announced its intention to fund and construct a state-owned power plant at Tavan Tolgoi.

On 26 June 2020, Oyu Tolgoi LLC and the Government of Mongolia amended the Power Source Framework Agreement (the Power Source Framework Agreement Amendment) to reflect their agreement to jointly prioritise and progress the state-owned power plant, in accordance with and subject to agreed milestones, as the domestic source of power for the Oyu Tolgoi mine. The milestones include: signing a Electricity Purchase and Sale Agreement(Power Purchase Agreement) for the supply of power to the Oyu Tolgoi mine by March 31, 2021, commencing construction of a state owned power plant by no later than 1 July 1 2021, commissioning the state-owned power plant within four years thereafter, and reaching agreement with IMPIC on an extension to the existing power import arrangements by 1 March 2021 in order to ensure there is no disruption to the power supply required to safeguard the Oyu Tolgoi mine’s ongoing operations and development pending start of the supply from the state-owned power plant.

The Power Source Framework Agreement Amendment provides that if certain agreed milestones are not met in a timely manner (subject to extension for defined delay events) then Oyu Tolgoi LLC will be entitled to select from, and implement, the alternative power solutions specified in the Power Source Framework Agreement (as amended), including an Oyu Tolgoi LLC led coalfired power plant and a primary renewables solution, and the Government of Mongolia would be obliged to support such decision.

Local Communities and Employment

The Investment Agreement requires that at least 90% of the employees at Oyu Tolgoi and at least 50% of Oyu Tolgoi LLC engineers at Oyu Tolgoi are Mongolian nationals. Oyu Tolgoi LLC currently meets these requirements. Oyu Tolgoi LLC must also use its best endeavours to ensure that at least 70% of its engineers are Mongolian nationals after September 2023. Oyu Tolgoi LLC must also use its best efforts to ensure that not less than 60% of its contractors’ employees are Mongolian nationals for construction work and 75% of its contractors’ employees are Mongolian nationals for mining and mining related work.

Oyu Tolgoi LLC will conduct, implement, and update, from time to time, socio-economic impact assessments, socio-economic risk analyses, multi-year community plans, community relations management systems, policies, procedures and guidelines, and mine closure plans, all of which shall be produced with community participation and input and be consistent with international best practices. Oyu Tolgoi LLC will also conduct community development and education programs.

Oyu Tolgoi LLC will prioritize the training, recruiting and employment of citizens from local communities for Oyu Tolgoi, giving specific preference to the citizens of Umnugobi Aimag.

ARSHA

The ARSHA forms the basis upon which the Government of Mongolia, through Erdenes Oyu Toigoi LLC, acquired an initial 34% equity interest in Oyu Tolgoi through a shareholding in Oyu Tolgoi LLC. It also provides for the respective rights and obligations of the parties as shareholders of Oyu Tolgoi LLC.

Under the terms of the ARSHA, if Oyu Tolgoi LLC exercises its right to extend the initial term of the Investment Agreement for an additional term of 20 years, Erdenes Oyu Tolgoi LLC has the option to acquire additional Oyu Tolgoi shares on terms to be agreed upon between Erdenes and the Oyu Tolgoi Shareholder Holdcos, (being THR Oyu Tolgoi Ltd. and Oyu Tolgoi Netherlands B.V., the two indirect, wholly-owned subsidiaries through which TRQ holds its interest in Oyu Tolgoi LLC), to increase its shareholding in Oyu Tolgoi LLC to 50%.

The ARSHA requires that the Oyu Tolgoi LLC’s board of directors appoint a management team for Oyu Tolgoi as nominated by the Oyu Tolgoi Shareholder Holdcos to provide management services to Oyu Tolgoi LLC for the Project.

Underground Development Plan

The Underground Development Plan addressed several matters, including that Oyu Tolgoi LLC pay a 5% sales royalty to the Government of Mongolia calculated on gross revenues by not allowing deductions for the costs of processing, freight differentials, penalties, or payables.

The Underground Development Plan also revised the management services payment rates, established by the ARSHA, to the management team. In calculating the management services payment, the rate applied to capital costs of the underground development was reduced from 6% to 3%. The management services payment rate on operating costs and capital related to current operations remains at 6%.

Environmental Liabilities

The Oyu Tolgoi is required to comply with the environmental requirements set out in the Investment Agreement and in other permits and agreements. These include remediation of the environment, mine decommissioning and reclamation, the safe management of toxic substances, tailings and waste storage, and other matters.

Appendix II

The individual Mineral Resources for Oyu Tolgoi by deposit are shown below in Table I-1 through I-5.

Table I -1 – Oyu Open Pit Mineral Resources Summary, as of 31 December 2019

Classification	Ownership	Tonnage (Mt)	Cu (%)	Au (g/t)	Ag (g/t)	Contained Metal		
						Cu (Mt)	Au (MOz)	Ag (MOz)
Measured	Oyu Tolgoi LLC	16	0.39	0.41	1.2	0.1	0.2	0.6
Indicated	Oyu Tolgoi LLC	80	0.34	0.29	1.2	0.3	0.8	3.0
Total Mea. + Ind.	Oyu Tolgoi LLC	95	0.35	0.31	1.2	0.3	1.0	3.6
Inferred	Oyu Tolgoi LLC	320	0.29	0.17	1.0	0.9	1.8	10

Table I-2 – Oyu Underground Mineral Resources Summary, as of 31 December 2019

Classification	Ownership	Tonnage (Mt)	Cu (%)	Au (g/t)	Ag (g/t)	Contained Metal		
						Cu (Mt)	Au (MOz)	Ag (MOz)
Measured	Oyu Tolgoi LLC	14	0.47	0.88	1.3	0.1	0.4	0.6
Indicated	Oyu Tolgoi LLC	69	0.38	0.59	1.1	0.3	1.3	2.5
Total Mea. + Ind.	Oyu Tolgoi LLC	83	0.39	0.64	1.1	0.3	1.7	3.0
Inferred	Oyu Tolgoi LLC	180	0.39	0.40	1.2	0.7	2.2	6.8

Table I-3 – Hugo North Underground Mineral Resources Summary, as of 31 December 2019 (updated 30 June 2020)

Classification	Ownership	Tonnage (Mt)	Cu (%)	Au (g/t)	Ag (g/t)	Contained Metal		
						Cu (Mt)	Au (MOz)	Ag (MOz)
Measured	Oyu Tolgoi LLC	58	1.9	0.48	4.2	1.1	0.9	7.8
	Entrée LLC	-	-	-	-	-	-	-
	All Hugo North	58	1.9	0.48	4.2	1.1	0.9	7.8

Indicated	Oyu Tolgoi LLC	401	1.3	0.34	3.1	5.4	4.4	41
	Entrée LLC	87	1.6	0.54	4.1	1.4	1.5	12
	All Hugo North	488	1.4	0.38	3.3	6.8	5.9	52
Measured + Indicated	Oyu Tolgoi LLC	459	1.4	0.36	3.3	6.5	5.3	48
	Entrée LLC	87	1.6	0.54	4.1	1.4	1.5	12
	All Hugo North	546	1.4	0.39	3.4	7.8	6.8	60
Inferred	Oyu Tolgoi LLC	765	0.8	0.28	2.4	6.1	6.9	59
	Entrée LLC	167	1.0	0.36	2.8	1.7	1.9	15
	All Hugo North	932	0.8	0.29	2.5	7.8	8.8	74

Table I-4 – Hugo South Underground Mineral Resources Summary, as of 31 Dec 2019

Classification	Ownership	Tonnage (Mt)	Cu (%)	Au (g/t)	Ag (g/t)	Contained Metal		
						Cu (Mt)	Au (MOz)	Ag (MOz)
Inferred	Oyu Tolgoi LLC	720	0.84	0.07	1.9	6.1	1.7	44

Table I-5 – Heruga Underground Mineral Resources Summary, as of 31 Dec 2019

Classification	Ownership	Tonnage (Mt)	Cu (%)	Au (g/t)	Ag (g/t)	Mo (ppm)	Contained Metal			
							Cu (Mt)	Au (MOz)	Ag (MOz)	Mo (Mlbs)
Inferred	Oyu Tolgoi LLC	110	0.42	0.30	1.6	110	0.4	1.0	5.3	26
Inferred	Entrée LLC	1,400	0.41	0.40	1.5	120	6.0	19	68	390
Inferred	Total Heruga	1,600	0.42	0.39	1.5	120	6.5	20	73	410

Appendix III

MANAGEMENT

The biographies of key management individuals are outlined below.

Steve Thibeault – Interim CEO

He serves as Interim Chief Executive Officer at Turquoise Hill Resources Limited since March 3, 2021 and has been its Non-Independent Director since March 3, 2021. Mr. Thibeault served as the Chief Financial Officer at Turquoise Hill Resources Ltd. since June 1, 2014 until May 23, 2017. Mr. Thibeault served as the Chief Financial Officer of Energy Resources of Australia Ltd. from July 27, 2009 to May 30, 2014 and Company Secretary from September 24, 2009 to May 30, 2014. He has extensive financial and corporate experience. Mr. Thibeault joined Alcan Inc. in 1981 and held various positions in

Finance, working his way from the Operations group to Corporate. Mr. Thibeault was the Chief Financial Officer of the CSL Group (Canada Steamship Lines) from 2017 to 2020. Mr. He graduated in Finance from the Université du Québec à Chicoutimi (1981), and in Accounting from the École des Haute Études Commerciales de Montréal (1990).

Luke Colton – CFO

He has been CFO at Turquoise Hill Resources Ltd. since October 09, 2017 and served as its Interim Chief Executive Officer since July 01, 2018 until 2018. As Chief Financial Officer of the Corporation, Mr. Colton is responsible for the overall oversight of treasury, financial, tax and accounting matters. Mr. Colton served as Chief Financial Officer at Richards Bay since 2013 until 2017 and was directly responsible for financial and managerial accounting, business planning, treasury, tax, warehousing and compliance functions as well as a member of the senior leadership team. He served as Manager, Financial Capital Accounting and Compliance, Pilbara Iron Company from 2010 to 2013. He has been with Rio Tinto since 2004 and has worked in various business units, including minerals, iron ore and energy. He served as Principal of Valuations and Analysis in Rio Tinto Controllers and Manager of Statutory Reporting and Control with Rio Tinto Energy America. Prior to joining Rio Tinto, Mr. Colton served as Senior Accountant with Ernst & Young.

Jo-Anne Dudley – COO

She has been Chief Operating Officer at Turquoise Hill Resources Ltd. since June 3, 2019. For the past nine years she has been a key member of the Oyu Tolgoi technical team that manages the development of the world-scale Oyu Tolgoi copper-gold mine in Mongolia in consultation with Turquoise Hill. Most recently she led Oyu Tolgoi's 30-person Strategic Mine and Resources Planning unit. She has extensive experience in underground mine development, at Oyu Tolgoi and elsewhere. Prior to commencing her work on Oyu Tolgoi, Ms. Dudley spent five years working with Rio Tinto's technical group on mines in South Africa and the USA. Before that she worked in underground mines across Australia as an Underground contractor and spent nearly ten years in Operations and Studies roles at the Northparkes copper and gold mine in central New South Wales, Australia. During her time at Northparkes, it developed from an open pit operation to an underground mine using block caving, similar to the development path at Oyu Tolgoi. Ms. Dudley graduated from the University of New South Wales as a mining engineer in 1994.

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