

**GLENCORE**  
**Resources & Reserves**  
as at 31 December 2021

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# About this report

We report our resources and reserves in accordance with the 2012 edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code), the 2016 edition of the South African Code for Reporting of Mineral Resources and Mineral Reserves (SAMREC), the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Standards on Mineral Resources and Reserves (2014 edition) and the Petroleum Resources Management System (PRMS) for reporting oil and natural gas Reserves and Resources.

The term 'Ore Reserves', as defined in Clause 28 of the JORC Code, has the same meaning as 'Mineral Reserves' as defined in the CIM Definition Standards for Mineral Resources and Mineral Reserves.

## Overview

The resource and reserve data in the following tables are as at 31 December 2021, unless otherwise noted. For comparison purposes, data for 2020 has been included.

Metric units are used throughout.

All data is presented on a 100% asset basis, with the Glencore attributable percentage shown against each asset, with the exception of Oil assets which are shown on a working interest basis.

All tonnage information has been rounded to reflect the relative uncertainty in the estimates; there may therefore be small differences in the totals.

The Measured and Indicated resources are reported inclusive of those resources modified to produce reserves, unless otherwise noted.

Commodity prices and exchange rates used to establish the economic viability of reserves are based on long-term forecasts applied at the time the reserve was estimated.

Where resources and reserves have not been updated, on the basis that the information has not materially changed since it was reported under JORC 2004, this information has not been updated to comply with the JORC code 2012. Reference is given in the report where this is the case.

## Competent/Qualified Persons

Resource and reserve estimates are based on information compiled by Competent Persons (as defined by the JORC, SAMREC Codes), Qualified Persons (as defined by CIM Definition Standards for Mineral Resources and Mineral Reserves) and Adequately Qualified Persons (as defined by PRMS).

Each of the Competent/Qualified Persons has the appropriate professional membership and the relevant experience in relation to the resources and/or reserves being reported by them to qualify as a Competent or Qualified Person as defined in the relevant code or standard. Each has consented to the inclusion of their resource and reserve estimates in the form and context in which it appears in this report.

## Copper

The Copper Mineral Resources and Ore Reserves Statement at 31 December 2021 has been compiled in accordance with the JORC Code.

The Mineral Resources and Ore Reserves statements have been reviewed and the relevant data extracted and compiled by Mark Jamieson, Glencore Copper (AusIMM).

## Zinc

The Zinc Mineral Resource and Ore Reserve Statement at 31 December 2021 has been compiled in accordance with the JORC Code.

The Mineral Resource and Ore Reserve statements have been reviewed and the relevant data extracted and compiled by Jody Todd, Glencore Zinc (AusIMM).

## Nickel

The Canadian and New Caledonian Mineral Resource and Reserve estimates are prepared in accordance with the CIM Definition Standards on Mineral Resources and Mineral Reserves, adopted by CIM Council on 10 May 2014, and the CIM Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines, adopted by CIM Council on 29 November 2019, and have been compiled using geo-statistical and/or classical methods, plus economic and mining parameters appropriate to each project.

The Mineral Resource and Ore Reserve estimates at Murrin in Australia have been prepared in accordance with the JORC Code.

The Mineral Resource and Ore Reserve statements have been reviewed and the relevant data extracted and compiled by Steve Kormos (PGO), Glencore Nickel.

## Ferroalloys

South African chromite, vanadium and manganese Mineral Resources and Ore Reserves in this report were prepared in accordance with the JORC Code.

The Chromite, Vanadium and Manganese Mineral Resource and Ore Reserve Statement at 31 December 2021 is based on the Glencore Ferroalloys "Procedure for the Estimation of Mineral Resources and Ore Reserves". Definitions of all the terms used in this report can be found in the relevant code.

The Mineral Resource and Ore Reserve statements have been reviewed and the relevant data extracted and compiled by Pieter-Jan Gräbe, Glencore Ferroalloys (SACNASP).

## Iron Ore

Iron ore Mineral Resources and Ore Reserves have been compiled in accordance with the JORC Code, unless otherwise stated in the notes for a particular Mineral Resource and Ore Reserve.

Iron Ore Mineral Resources and Ore Reserves have not been re-estimated since 2015.

# About this report

## Coal

Australian, Canadian and Colombian Coal Resources and Reserves have been prepared in accordance with the JORC Code.

South African Coal Resources and Reserves have been prepared in accordance with the 2016 edition of the South African Code for Reporting of Mineral Resources and Mineral Reserves (SAMREC).

The Coal Resource and Reserve Statements as at 31 December 2021 conform to the requirements of these Codes and are consistent with Glencore Coal's internal Coal Resource and Reserve Estimation and Reporting Standard.

Coal resources have been estimated for all coal seams that have reasonable prospects for eventual economic extraction by open cut or underground mining methods within mining leases or exploration licences. In general, Coal Resources are reported within a geoshell limited by the areal and depth extent of the drill holes; i.e. there is very little inclusion of Coal Resources extrapolated beyond the extent of the geological data.

Coal Resources are excluded from those areas where the seam has been extracted or sterilised by mining.

All tonnage information has been rounded to reflect the relative uncertainty in the estimates; there may therefore be small differences in the totals.

Coal Resource and Reserve totals are rounded to appropriate levels of accuracy in accordance with the Glencore Coal rounding procedures. The following table summarises the data rounding assumptions for the 2021 report.

Classification	Tonnage range	Rounding
Measured + Indicated Resources	<10 Mt	1 significant figure
	10Mt - 30Mt	2 significant figures
Proved + Probable Reserves	30Mt - 100Mt	Nearest 5 Mt
	>100Mt	2 significant figures
	>1,000Mt	Nearest 50Mt
Inferred	<100Mt	Nearest 10Mt
	100Mt - 400Mt	Nearest 50Mt
	>400Mt	Nearest 100Mt

Values expressed in the text have not been rounded and therefore do not correlate directly with the tables. These refer to run-of-mine figures unless otherwise stated.

Coal Reserves are rounded to the same assumptions as Measured and Indicated Coal Resources above.

Individual tonnage assessments are added to show Group or Complex tonnages and geographical accumulations. These are not subjected to further rounding.

The Coal Resource and Reserve Competent Person statements have been reviewed and the relevant data extracted and compiled by Matthew White, Glencore Coal.

## Oil

Oil and natural gas Resources and Reserves have been prepared in accordance with the PRMS jointly published by the Society of Petroleum Engineers, the World Petroleum Council, the American Association of Petroleum Geologists and the Society of Petroleum Evaluation Engineers, as amended.

The Oil Reserves statement has been reviewed and the relevant data extracted and compiled by McDaniel & Associates.

The Oil Resources statements for Equatorial Guinea, Chad and Cameroon have been reviewed and the relevant data extracted and compiled by Glencore.

## Portfolio changes

Glencore has sold its interests in the Ernest Henry copper mine (completed in January 2022) and the Aguilar zinc mine (December 2021). The relevant Mineral Resources and Ore Reserves are no longer stated in this report.

In January 2022, Glencore completed the acquisition of the two-thirds of the Cerrejon coal mine it did not already own.

# Definitions

Throughout this report, the following abbreviations and definitions have been used:

## Technical and industry terms:

3PGE	Three Platinum Group Elements (Pt, Pd and Rh)	NSR	Net Smelter Return
CV (kcal/kg)	Calorific Value, kilocalories per kilogramme	OC	Open cast or Open cut
DTC	Davis Tube Concentrate	OR	Ore reserves
EL	Exploration licence	QQ	Quantile quantile plot, a geostatistical method to assess modelled data against actual data
Geoshell	A broad envelope limited by the depth and areal extent of geological data points (primarily drill holes)	ROM	Run of mine
kt	Thousand tonnes	SX/EW	Solvent extraction and electrowinning
LOM	Life of mine	UG	Underground
LOX	Limit of oxidation	UG2	Upper Group No2 chromitite layer
LOZ	Lower oxidised zone	VMS	Volcanogenic Massive Sulphide
Mt	Million tonnes		

## Professional bodies and applicable standards:

AIG	Australian Institute of Geoscientists	ICOG-EurGeol	Ilustre Colegio Oficial de Geólogos – European Geologist
APEGBC	Association of Professional Engineers and Geoscientists of BC	JORC	Joint Ore Reserves Committee
APEGGA	Association of Professional Engineers Geologists and Geophysicists of Alberta	OGQ	Ordre des Géologues du Québec
		OIQ	Ordre des Ingénieurs du Québec
APEGNB	Association of Professional Engineers and Geoscientists of New Brunswick	PEO	Professional Engineers of Ontario
		PGO	Professional Geoscientists Ontario
APGO	Association of Professional Geoscientists of Ontario	PLATO	South African Council for Professional and Technical Surveyors
AusIMM	Australasian Institute of Mining and Metallurgy	PRMS	Petroleum Resources Management System
CIM	Canadian Institute of Mining, Metallurgy and Petroleum	SACNASP	The South African Council for Natural Scientific Professions
ECSA	Engineering Council of South Africa	SAMREC	South African Code for Reporting of Mineral Resources and Mineral Reserves
GSL	Geological Society of London		

Marketable Coal Reserves (CIM/JORC) and Saleable Coal Reserves (SAMREC) are the tonnage and coal quality expected to be available for sale, either in the raw ROM state at specific moisture content or after beneficiation. Definitions of many of the terms used in this report can be found in the relevant codes.

# Copper

## African Copper (Katanga, Mutanda)

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources		Indicated Mineral Resources		Measured and Indicated Resources		Inferred Mineral Resources		Proved Ore Reserves		Probable Ore Reserves		Total Ore Reserves			
				2021	2020	2021	2020	2021	2020	2021	2020	CP	2021	2020	2021	2020	2021	2020	CP
<b>Katanga</b>																			
Kamoto	75%	UG	Ore (Mt)	-	-	76.5	75.5	76.5	75.5	12.1	19.3	JE	-	-	7.6	16.0	7.6	16.0	TR
			Copper (%)	-	-	4.61	4.56	4.61	4.56	1.49	1.13	-	-	3.11	3.31	3.11	3.31	-	-
			Cobalt (%)	-	-	0.55	0.54	0.55	0.54	0.44	0.40	-	-	0.38	0.48	0.38	0.48	-	-
T17	75%	UG/OC	Ore (Mt)	-	-	20.9	20.9	20.9	20.9	-	-	JE	-	-	9.5	10.6	9.5	10.6	TR
			Copper (%)	-	-	5.09	5.08	5.09	5.08	-	-	-	-	4.12	4.13	4.12	4.13	-	-
			Cobalt (%)	-	-	0.77	0.77	0.77	0.77	-	-	-	-	0.67	0.62	0.67	0.62	-	-
Mashamba East	75%	UG/OC	Ore (Mt)	-	-	22.8	28.1	22.8	28.1	21.5	31.4	JE	-	-	15.9	19.6	15.9	19.6	TR
			Copper (%)	-	-	2.69	2.65	2.69	2.65	1.26	1.16	-	-	2.39	2.38	2.39	2.38	-	-
			Cobalt (%)	-	-	0.86	0.81	0.86	0.81	0.56	0.52	-	-	0.79	0.75	0.79	0.75	-	-
KOV	75%	OC	Ore (Mt)	-	-	117.0	134.0	117.0	134.0	24.5	30.0	JE	-	-	76.6	79.1	76.6	79.1	TR
			Copper (%)	-	-	6.00	5.96	6.02	5.96	2.10	2.10	-	-	4.88	4.53	4.88	4.53	-	-
			Cobalt (%)	-	-	0.48	0.48	0.48	0.48	0.33	0.34	-	-	0.48	0.43	0.48	0.43	-	-
Kananga	75%	OC	Ore (Mt)	-	-	4.1	4.1	4.1	4.1	4.0	4.0	JE	-	-	-	-	-	-	n.a.
			Copper (%)	-	-	1.61	1.61	1.61	1.61	2.00	2.00	-	-	-	-	-	-	-	-
			Cobalt (%)	-	-	0.79	0.79	0.79	0.79	0.98	0.98	-	-	-	-	-	-	-	-
Tilwezembe	75%	OC	Ore (Mt)	-	-	9.5	9.5	9.5	9.5	13.8	13.8	JE	-	-	-	-	-	-	n.a.
			Copper (%)	-	-	1.89	1.89	1.89	1.89	1.75	1.75	-	-	-	-	-	-	-	-
			Cobalt (%)	-	-	0.60	0.60	0.60	0.60	0.60	0.60	-	-	-	-	-	-	-	-
KITD	75%	OC	Ore (Mt)	-	-	1.5	2.5	1.5	2.5	-	-	TR	-	-	1.5	2.6	1.5	2.6	TR
			Copper (%)	-	-	1.31	1.37	1.31	1.37	-	-	-	-	1.31	1.36	1.31	1.36	-	-
			Cobalt (%)	-	-	0.14	0.17	0.14	0.17	-	-	-	-	0.14	0.17	0.14	0.17	-	-
Stockpiles	75%	OC	Ore (Mt)	-	-	16.5	15.3	16.5	15.3	-	-	TR	-	-	16.5	15.3	16.5	15.3	TR
			Copper (%)	-	-	0.97	1.21	0.97	1.21	-	-	-	-	0.97	1.21	0.97	1.21	-	-
			Cobalt (%)	-	-	0.40	0.41	0.40	0.41	-	-	-	-	0.40	0.41	0.40	0.41	-	-
<b>Total Katanga</b>	<b>75%</b>		<b>Ore (Mt)</b>	-	-	<b>269</b>	<b>290</b>	<b>269</b>	<b>290</b>	<b>76</b>	<b>99</b>		-	-	<b>128</b>	<b>143</b>	<b>128</b>	<b>143</b>	
			<b>Copper (%)</b>	-	-	<b>4.71</b>	<b>4.73</b>	<b>4.71</b>	<b>4.73</b>	<b>1.70</b>	<b>1.56</b>			<b>3.86</b>	<b>3.66</b>	<b>3.86</b>	<b>3.66</b>		
			<b>Cobalt (%)</b>	-	-	<b>0.56</b>	<b>0.55</b>	<b>0.56</b>	<b>0.55</b>	<b>0.50</b>	<b>0.47</b>			<b>0.51</b>	<b>0.49</b>	<b>0.51</b>	<b>0.49</b>		

### Katanga

The Katanga operations are located at the north western end of the DRC / Zambia copper belt approximately 10km to the east of the town of Kolwezi in the Democratic Republic of Congo.

The Katanga mineralisation is a typical DRC copper belt metasedimentary copper and cobalt. The mineralisation generally occurs as infilling of fissures and open fractures associated with brecciation. The typical copper minerals are mainly chalcopyrite, malachite and pseudomalachite while cobalt is in the form of heterogenite, carrollite and spherocobaltite.

The major changes to the Mineral Resource are due to:

- depletion of 8.8Mt from KOV, Mashamba and Kamoto resources.
- a historically mined portion of the KOV pit ("the KTE fragment") that had been partially mined by a previous owner. Reconstruction of historical mining surfaces is ongoing.
- a net value cut-off grade method has been introduced, versus the copper equivalent cut-off applied historically. The net value method includes updated economic and processing assumptions resulted in a combined 24Mt reduction in Mineral Resources.

The primary changes to the Ore Reserves are due to:

- depletion of 5.7Mt from the open pits and 0.7Mt from Kamoto underground

- the KOV (KTE fragment) surface adjustment plus a change in the block model size to 10x10x5, resulting in a reduction of 18.1Mt in the KOV open pit Ore Reserve.
- Partially offsetting, the Etang South ore fragment (previously reported as part of the KTO UG Mineral Reserve) has been included as part of the KOV open pit Ore Reserve, adding 17.3Mt to the KOV Ore Reserves.
- The T17 Ore Reserves have been converted from underground to open pit (mining methodology change), removing 1.1Mt from the previously reported T17 Ore Reserves.

Remaining life of mine: expected to be in excess of 20 years. Expiry date of relevant permits: 7 May 2022 for the Kananga Extension and 3 April 2024 for all remaining permits (Kamoto and Mashamba East Open Pit, T-17 Open Pit, KOV Open Pit, Tilwezembe Open Pit, Kananga Mine), renewable in accordance with the DRC mining code for a period of 15 years.

Glencore owns 75% of Katanga. La Generale des Carrieres et des Mines ("Gecamines") and La Société Immobilière du Congo, which are state-owned mining companies in the DRC, own the remaining 25%.

The Kananga and Tilwezembe resources are dormant and have been occupied by illegal miners since they were estimated (2009). The amount of resources left is uncertain.

# Copper

## African Copper (Katanga, Mutanda)

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources		Indicated Mineral Resources		Measured and Indicated Resources		Inferred Mineral Resources		CP	Proved Ore Reserves		Probable Ore Reserves		Total Ore Reserves		CP
				2021	2020	2021	2020	2021	2020	2021	2020		2021	2020	2021	2020	2021	2020	
<b>Mutanda</b>																			
Mutanda South	100%	OC	Ore (Mt)	300.3	299.7	78.2	76.8	378.5	376.5	16.7	16.2	PO							
			Copper (%)	1.38	1.38	0.95	0.96	1.30	1.29	0.68	0.68								
			Cobalt (%)	0.57	0.57	0.42	0.42	0.54	0.54	0.54	0.55								
Mutanda South Oxide ore	100%	OC	Ore (Mt)										22.5	20.6	3.9	0.8	26.4	21.3	JP
			Copper (%)										1.85	1.71	1.99	0.80	1.82	1.68	
			Cobalt (%)										0.92	0.91	0.98	0.72	0.90	0.90	
Mutanda South Transitional ore	100%	OC	Ore (Mt)										-	-	-	18.7	-	18.7	JP
			Copper (%)										-	-	-	2.01	-	2.01	
			Cobalt (%)										-	-	-	0.80	-	0.80	
Mutanda South Sulphide ore	100%	OC	Ore (Mt)										-	-	74.8	59.6	74.8	59.6	JP
			Copper (%)										-	-	1.61	1.46	1.56	1.46	
			Cobalt (%)										-	-	0.77	0.74	0.74	0.74	
Stockpiles			Ore (Mt)	32.5	30.4	-	-	32.5	30.4	-	-		29.7	27.8	2.7	2.6	32.5	30.4	JP
			Copper (%)	1.17	1.16	-	-	1.20	1.16	-	-		1.11	1.09	1.84	1.84	1.17	1.16	
			Cobalt (%)	0.45	0.43	-	-	0.50	0.43	-	-		0.43	0.41	0.61	0.63	0.45	0.43	
Mutanda South underground	100%	UG	Ore (Mt)	28.8	28.8	9.1	9.1	37.9	37.9	-	-	PO	-	-	-	-	-	-	n.a
			Copper (%)	1.86	1.86	1.14	1.14	1.69	1.69	-	-		-	-	-	-	-	-	
			Cobalt (%)	0.51	0.51	0.49	0.49	0.51	0.51	-	-		-	-	-	-	-	-	
Mutanda North	100%	OC	Ore (Mt)	9.0	9.0	9.9	9.9	18.9	18.9	0.4	0.4	PO	-	-	-	-	-	-	n.a
			Copper (%)	1.14	1.14	0.88	0.88	1.00	1.00	2.27	2.27		-	-	-	-	-	-	
			Cobalt (%)	0.47	0.47	0.57	0.57	0.52	0.52	0.04	0.04		-	-	-	-	-	-	
<b>Total Mutanda</b>			<b>Ore (Mt)</b>	<b>371</b>	<b>368</b>	<b>97</b>	<b>96</b>	<b>468</b>	<b>464</b>	<b>17</b>	<b>17</b>		<b>52</b>	<b>48</b>	<b>81</b>	<b>82</b>	<b>134</b>	<b>130</b>	
			<b>Copper (%)</b>	<b>1.39</b>	<b>1.39</b>	<b>0.96</b>	<b>0.97</b>	<b>1.31</b>	<b>1.31</b>	<b>0.72</b>	<b>0.72</b>		<b>1.43</b>	<b>1.36</b>	<b>1.64</b>	<b>1.59</b>	<b>1.52</b>	<b>1.51</b>	
			<b>Cobalt (%)</b>	<b>0.55</b>	<b>0.55</b>	<b>0.44</b>	<b>0.44</b>	<b>0.53</b>	<b>0.53</b>	<b>0.53</b>	<b>0.54</b>		<b>0.64</b>	<b>0.62</b>	<b>0.78</b>	<b>0.75</b>	<b>0.70</b>	<b>0.70</b>	

### Mutanda

The Mutanda open pit operations are located at the north western end of the DRC / Zambia copper belt approximately 40km to the east of the town of Kolwezi in the Democratic Republic of Congo.

The Mutanda mineralisation is a typical DRC copper belt metasedimentary copper and cobalt deposit. The mineralisation generally occurs as infilling of fissures and open fractures associated with brecciation. The typical copper minerals are mainly chalcocite, malachite and pseudomalachite while cobalt is in the form of heterogenite, carrollite and spherocobaltite.

The remaining mine life is estimated to be approximately 20 years (assuming approval and investment in sulphide ore processing).

The expiry date of relevant mining permits ("permis d'exploitation") is 26 May 2022 for PE662 and 5 May 2022 for PE643 (The Mutanda South mining operations straddle both mining permits). Both mining permits are renewable in accordance with the DRC mining code for periods of 15 years, and applicable documents requesting the mining permit renewals have been lodged and are under review.

Mutanda was placed into care and maintenance in November 2019 and remained on care and maintenance until September 2021 - when processing of low grade oxide stockpiles recommenced, as a prelude to a planned commencement of mining operations.

Changes to the total Mineral Resources and Ore Reserves estimates are a result of: net stockpile increase due to stockpile survey updates less depletion due to commencement of processing; and an updated survey of the current mine topography.

The stockpiles have been separated out of the general Mutanda South Mineral Resources for 2021, and the 2020 Mineral Resources have been restated with a similar separation of the stockpile tonnage.

The Ore Reserves reporting classification has been simplified to oxides and sulphides. Previously reported "transitional" ore has been reclassified on the basis of which processing circuit (oxide or sulphide) is expected to generate the highest revenue for that ore.

Studies into sulphide mining and processing are in progress.

# Copper

## Collahuasi

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources		Indicated Mineral Resources		Measured and Indicated Resources		Inferred Mineral Resources		CP	Proved Ore Reserves		Probable Ore Reserves		Total Ore Reserves		
				2021	2020	2021	2020	2021	2020	2021	2020		2021	2020	2021	2020	2021	2020	2021
Collahuasi	44%	OC	Sulphide (Mt)	847	840	4,680	4,697	5,526	5,536	4,763	4,848	RO	476.0	491.0	3,691.0	3,685.0	4,167.0	4,176.0	RZ
			Copper (%)	0.80	0.80	0.79	0.80	0.79	0.80	0.73	0.73		1.00	1.01	0.77	0.78	0.80	0.80	
			Molybdenum (%)	0.018	0.018	0.025	0.025	0.024	0.024	0.017	0.017		0.022	0.021	0.022	0.023	0.022	0.022	
			Oxide & Mixed (Mt)	36.0	36.0	33.0	32.0	69.0	69.0	48.0	50.0	RO	-	-	-	-	-	-	RZ
			Copper (%)	0.67	0.66	0.75	0.74	0.71	0.70	0.58	0.58		-	-	-	-	-	-	
<b>Total Collahuasi</b>			<b>(Mt)</b>	<b>883</b>	<b>876</b>	<b>4,713</b>	<b>4,729</b>	<b>5,595</b>	<b>5,605</b>	<b>4,811</b>	<b>4,898</b>		<b>476</b>	<b>491</b>	<b>3,691</b>	<b>3,685</b>	<b>4,167</b>	<b>4,176</b>	
			<b>Copper (%)</b>	<b>0.79</b>	<b>0.79</b>	<b>0.79</b>	<b>0.80</b>	<b>0.79</b>	<b>0.80</b>	<b>0.73</b>	<b>0.73</b>		<b>1.00</b>	<b>1.01</b>	<b>0.77</b>	<b>0.78</b>	<b>0.80</b>	<b>0.80</b>	
			<b>Molybdenum (%)</b>	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>		<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	

### Collahuasi

Collahuasi is located in northern Chile in the Tarapacá Region, about 180km southeast of the port of Iquique, at an altitude of 4,400m.

Collahuasi comprises two large copper-molybdenum porphyry-type deposits (Rosario and Ujina) with several peripheral vein deposits (Rosario Oeste and Rosario Sur). The Rosario deposit is the focus of current open cut mining operations.

The major sulphide copper ore minerals at Rosario and Ujina are chalcopyrite, bornite, and enargite, with minor chalcocite. Rosario Oeste features supergene chalcocite and enargite as the main copper mineral. Rosario Sur is a small oxide-bearing deposit, with chrysocolla being the main mineralisation.

Changes in reported Mineral Resources have primarily been due to new drilling information and updated resource models, with adjustments for depletion by production. Mineral Resources are reported within the constraints of optimized pit shells.

Production of 55.7 Mt of ore for 2021 was depleted from the reported Mineral Resources and Ore Reserves (actual production to September and an estimate for October-December).

All sulphide stockpile are considered Indicated Mineral Resources and are classified as Probable Ore Reserves. Stockpile material from Rosario and Ujina pits have been downgraded to Probable Ore Reserves to reflect the level of uncertainty.

Collahuasi has a life of mine of 86 years from 2022 to 2107, according to the most recent Life of Mine plan that supports the present Ore Reserves reported at a 170 ktpd plant capacity.

The mine is jointly owned by Anglo American plc (44%), Glencore (44%), and Japan Collahuasi Resources B.V. (12%). The operating company is Compañía Minera Doña Inés de Collahuasi.



# Copper

## Antamina

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources		Indicated Mineral Resources		Measured and Indicated Resources		Inferred Mineral Resources		Proved Ore Reserves		Probable Ore Reserves		Total Ore Reserves		CP		
				2021	2020	2021	2020	2021	2020	2021	2020	2021	2020	2021	2020	2021	2020		2021	2020
Antamina	33.75%	OC/UG	Sulphide Cu (Mt)	217	230	401	415	618	645	863	863	LC	133	138	82	95	215	233	FA	
			Copper (%)	0.83	0.82	0.82	0.85	0.83	0.84	0.95	0.96			0.92	0.92	0.98	1.00	0.94	0.95	
			Zinc (%)	0.14	0.12	0.14	0.13	0.14	0.13	0.16	0.16			0.14	0.13	0.17	0.16	0.15	0.15	
			Silver (g/t)	7	7	8	9	8	9	9	9			7	7	8	8	8	7	
			Molybdenum (%)	0.029	0.028	0.026	0.024	0.027	0.025	0.022	0.018			0.036	0.035	0.035	0.034	0.035	0.035	
			Sulphide Cu-Zn (Mt)	89	99	218	227	307	326	397	409	LC	53	68	68	81	121	149	FA	
			Copper (%)	0.84	0.83	0.99	0.95	0.95	0.91	1.10	1.10			0.91	0.87	0.97	0.82	0.94	0.84	
			Zinc (%)	1.75	1.84	1.81	1.80	1.79	1.81	1.46	1.46			1.95	2.07	2.03	2.11	1.99	2.09	
			Silver (g/t)	16	15	17	17	17	16	15	16			13	13	15	13	14	13	
			Molybdenum (%)	0.008	0.007	0.008	0.007	0.008	0.007	0.007	0.006			0.008	0.007	0.008	0.007	0.008	0.007	
<b>Total Antamina</b>			<b>(Mt)</b>	<b>306</b>	<b>329</b>	<b>619</b>	<b>642</b>	<b>925</b>	<b>971</b>	<b>1,260</b>	<b>1,272</b>			<b>186</b>	<b>206</b>	<b>150</b>	<b>176</b>	<b>336</b>	<b>382</b>	
			<b>Copper (%)</b>	<b>0.83</b>	<b>0.82</b>	<b>0.88</b>	<b>0.89</b>	<b>0.87</b>	<b>0.86</b>	<b>1.00</b>	<b>1.01</b>			<b>0.92</b>	<b>0.90</b>	<b>0.98</b>	<b>0.92</b>	<b>0.94</b>	<b>0.91</b>	
			<b>Zinc (%)</b>	<b>0.61</b>	<b>0.64</b>	<b>0.73</b>	<b>0.72</b>	<b>0.69</b>	<b>0.69</b>	<b>0.57</b>	<b>0.58</b>			<b>0.66</b>	<b>0.77</b>	<b>1.01</b>	<b>1.06</b>	<b>0.81</b>	<b>0.91</b>	
			<b>Silver (g/t)</b>	<b>10</b>	<b>9</b>	<b>11</b>	<b>12</b>	<b>11</b>	<b>11</b>	<b>11</b>	<b>11</b>			<b>9</b>	<b>9</b>	<b>11</b>	<b>10</b>	<b>10</b>	<b>9</b>	
			<b>Molybdenum (%)</b>	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	<b>0.01</b>			<b>0.03</b>	<b>0.03</b>	<b>0.02</b>	<b>0.02</b>	<b>0.03</b>	<b>0.02</b>	

### Antamina

Antamina is an open-pit mine located in the Andes mountain range of Peru, 270 km north of Lima, and at an average altitude of 4,200 m above mean sea level.

Antamina is a polymetallic (mainly copper, zinc and molybdenum) skarn deposit resulting from multiple, complex intrusive events. Copper mineralization occurs mainly as chalcopyrite, with minor areas of bornite, representing approximately 5% of the deposit. Zinc mineralization generally occurs as sphalerite. Other significant sulphide minerals include molybdenite and pyrite, while trace amounts of silver and bismuth-bearing minerals and localized galena are also found within the deposit. Copper and Zinc production represent approximately 90% of the total revenue.

Production of 56 Mt of ore for 2021 was depleted from the reported Mineral Resources and Ore Reserves (actual production to September and an estimate for October-December).

The resource block model was updated with additional data from 63 drillholes and 20,132 meters that had no impact on tonnes or grades for Cu.

The Life of Mine plan extends until 2028 and is primarily limited by the tailings-dam capacity. A change on the pit design positively impacted the Cu grade from 0.91% to 0.94%, as the PFS was successfully completed and an authorization was obtained on the relocation of the existing primary crusher that releases a higher grade and less waste strip mining area.

The operating company, Compañía Minera Antamina, is jointly owned by Glencore plc (33.75%), BHP Billiton plc (33.75%), Teck Resources Limited (22.5%) and Mitsubishi Corporation (10%).

# Copper

## Other South America (Lomas Bayas, Antapaccay)

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources		Indicated Mineral Resources		Measured and Indicated Resources		Inferred Mineral Resources		Proved Ore Reserves		Probable Ore Reserves		Total Ore Reserves		CP	
				2021	2020	2021	2020	2021	2020	2021	2020	2021	2020	2021	2020	2021	2020		2021
<b>Lomas Bayas</b>	100%																		
Lomas Bayas I		OC	Oxides (Mt)	101	95	401	505	503	600	69	107	MS	69	68	77	99	145	167	EC
			Copper (%)	0.32	0.31	0.24	0.24	0.26	0.25	0.22	0.22		0.34	0.32	0.26	0.25	0.3	0.28	
			Soluble Copper (%)	0.19	0.19	0.13	0.14	0.14	0.15	0.08	0.11		0.2	0.20	0.15	0.15	0.18	0.17	
		OC	Sulphides (Mt)	70	61	653	507	722	568	749	422	MS	-	-	-	-	-	-	
			Copper (%)	0.45	0.49	0.31	0.35	0.33	0.37	0.27	0.31		-	-	-	-	-	-	
			Soluble Copper (%)	0.11	0.12	0.03	0.04	0.04	0.05	0.01	0.01		-	-	-	-	-	-	
Lomas Bayas II		OC	Oxides (Mt)	119	100	168	226	287	326	16	17	MS	94	83	91	142	186	225	EC
			Copper (%)	0.33	0.32	0.27	0.26	0.30	0.28	0.14	0.13		0.33	0.33	0.27	0.27	0.30	0.29	
			Soluble Copper (%)	0.23	0.22	0.17	0.17	0.20	0.19	0.09	0.08		0.24	0.23	0.19	0.18	0.21	0.20	
<b>Antapaccay</b>	100%																		
Antapaccay		OC	Ore (Mt)	194	183	438	403	632	586	177	96	HB	189	177	286	269	475	446	HB
			Copper (%)	0.44	0.48	0.37	0.40	0.39	0.42	0.28	0.30		0.45	0.48	0.4	0.41	0.42	0.44	
			Gold (g/t)	0.08	0.09	0.08	0.08	0.08	0.08	0.05	0.06		0.08	0.09	0.08	0.08	0.08	0.08	
			Silver (g/t)	1.19	1.28	1.06	1.11	1.10	1.17	0.66	0.69		1.19	1.28	1.13	1.15	1.15	1.21	
Coroccohuayco		OC	Ore (Mt)	72	69	571	490	643	559	61	12	HB	-	-	-	-	-	-	n.a.
			Copper (%)	0.64	0.67	0.59	0.63	0.60	0.68	0.36	0.28		-	-	-	-	-	-	
			Gold (g/t)	0.08	0.08	0.08	0.09	0.08	0.09	0.05	0.04		-	-	-	-	-	-	
			Silver (g/t)	2.60	2.65	2.3	2.37	2.33	2.49	1.23	0.89		-	-	-	-	-	-	
<b>Total Other South America</b>			<b>Ore (Mt)</b>	<b>556</b>	<b>509</b>	<b>2,231</b>	<b>2,131</b>	<b>2,787</b>	<b>2,639</b>	<b>1,072</b>	<b>654</b>		<b>352</b>	<b>328</b>	<b>454</b>	<b>510</b>	<b>806</b>	<b>838</b>	
			<b>Copper (%)</b>	<b>0.42</b>	<b>0.44</b>	<b>0.38</b>	<b>0.39</b>	<b>0.39</b>	<b>0.41</b>	<b>0.27</b>	<b>0.29</b>		<b>0.40</b>	<b>0.41</b>	<b>0.35</b>	<b>0.34</b>	<b>0.37</b>	<b>0.37</b>	
			<b>Gold (g/t)</b>	<b>0.04</b>	<b>0.04</b>	<b>0.04</b>	<b>0.04</b>	<b>0.04</b>	<b>0.04</b>	<b>0.01</b>	<b>0.01</b>		<b>0.04</b>	<b>0.05</b>	<b>0.05</b>	<b>0.04</b>	<b>0.05</b>	<b>0.04</b>	
			<b>Silver (g/t)</b>	<b>0.8</b>	<b>0.8</b>	<b>0.8</b>	<b>0.8</b>	<b>0.8</b>	<b>0.8</b>	<b>0.2</b>	<b>0.1</b>		<b>0.6</b>	<b>0.7</b>	<b>0.7</b>	<b>0.6</b>	<b>0.7</b>	<b>0.6</b>	

# Copper

## **Lomas Bayas (I)-Lomas Bayas (III)**

The Lomas Bayas open cut operations are located in the centre of the Atacama Desert copper belt approximately 115 km to the northeast of the town of Antofagasta in Chile.

Lomas Bayas is a low grade copper-molybdenum deposit resulting from the intrusion of several porphyry and breccia systems that were later exposed to leaching and subsequent supergene enrichment and in situ oxidation. Green copper oxides, copper sulphates in various forms and less partially mixed ores are the main source of ore for the existing SX/EW operation.

For the 2021 Resource Reporting Lomas I Resources include the Lomas III Sulphide Resources that were reported separately in 2020.

Lomas I resource estimate update includes the following changes in 2021:

- Updated resource model based on new geological information gathered in the 2020 drilling campaign (27,236m of infill drilling), as well as updated modelling and estimation parameters.
- An updated resource cutoff grade for Lomas I and Lomas II pits has been applied due to reduction in the cost inputs for the pit optimisation process. The cutoff grade used for sulphides are the same as in the prefeasibility study.
- Incorporation of updated copper price assumptions which have resulted in an updated final pit shell.

The Lomas III Mineral Resources have been reported within the Lomas I sulphide Resource. This change has been made as the Lomas III mineralisation was the at depth extension of the Lomas I and will therefore be reported as a single resource going forward.

Changes to the Ore Reserves in 2021 are mainly a result of mining depletion, an updated operational pit life-of-mine developed in 2021, and a decrease in the cut-off grade to 0.12% CuT.

## **Lomas Bayas (II)**

This low grade copper deposit is located 2km south of Lomas Bayas (I) pit, in the same district and geological environment as Lomas Bayas deposit. The main difference is a larger presence of water soluble copper oxides and lower geotechnical rock quality. The Lomas Bayas (II) block model includes historic drill holes totalling 129Km and sampled at 2m intervals.

The Mineral Resources are estimated using Ordinary Kriging. The 2020 infill drilling program in Lomas Bayas (II) with 5,518 m of drilling focused on converting resources from Inferred to Indicated, and increasing orebody knowledge.

Changes to the Ore Reserves in 2021 are mainly a result of mining depletion and revised cut-off grades (0.07% CuT).

The Lomas Bayas SX/EW plant is fed by both Lomas Bayas (I) and (II) and has a current life of mine plan that extends to 2029; permits for the operation are valid to the end of the life of the mine.

## **Antapaccay**

Antapaccay is a copper-gold porphyry deposit with zones of gold-silver skarn mineralisation. The primary minerals are bornite and chalcopyrite.

The Mineral Resource estimate is based on a block model interpolation using Ordinary Kriging. Mineral Resources and Ore Reserves were estimated using a variable cut-off grade with a marginal cut-off grade of 0.10% Cu content considered as the minimum recoverable grade.

The geological model of the deposit and the Mineral Resources estimate were updated in 2021 using a drilling database that now includes 385,030 meters (1,117 holes) total drilling data. The last geological drilling campaign was carried out in 2021 with 12,422.8 meters (50 drill holes).

Life of mine based on ore reserves is 12 years ending in 2033. Ore is processed through both the Tintaya and Antapaccay plants. The operating permits are valid until the end of the mine's useful life.

## **Coroccohuayco**

Coroccohuayco, along with Tintaya and Antapaccay is part of the mineralized Tintaya district. The Coroccohuayco project is 9 km to the south east of Tintaya. Coroccohuayco is a copper-gold skarn deposit with the main copper ore-bearing minerals being bornite, chalcopyrite and chalcocite.

The Mineral Resource estimates were updated in 2019 using 255,611 metres of drilling. No further drilling took place in 2020-21.

The Mineral Resources are based on an economic pit shell and are reported with a 0.10% Cu cut-off as minimum recoverable grade on the plant.

The difference in resources compared to 2020 is due to the increase in the prices of Cu, Au and Ag metals, as well as decreased mining costs in the long-term. The Coroccohuayco project is in the pre-feasibility stage of development, and ore reserves are not reported.

# Copper

## Australia (Cobar)

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources		Indicated Mineral Resources		Measured and Indicated Resources		Inferred Mineral Resources		CP	Proved Ore Reserves		Probable Ore Reserves		Total Ore Reserves		
				2021	2020	2021	2020	2021	2020	2021	2020		2021	2020	2021	2020	2021	2019	CP
Cobar	100%	UG	Ore (Mt)	3.9	4.5	3.5	3.4	7.4	7.9	4.0	3.8	EA	4.2	4.9	2.6	2.8	6.8	7.7	JC
			Copper (%)	5.74	5.77	4.92	5.14	5.36	5.50	5.41	5.66	4.00	3.95	3.60	3.65	3.80	3.84		
			Silver (g/t)	24	25	20	21	22.0	23.0	20	22	16.4	16.3	14.1	15.0	15.6	15.8		

### Cobar

The mine is located approximately 10km north from the town of Cobar, in the north west of New South Wales, Australia. Economic mineralisation of copper and silver at Cobar occurs mostly as narrow lenses with short strike lengths that are extensive at depth. Lenses consist of vein or semi-massive to massive chalcopyrite hosted by sub-vertical quartz-chlorite shear zones within a siltstone unit. The Cobar Mineral Resources and Ore Reserves are reported within five 'systems': Western, Eastern, QTS North, QTS South and QTS Central.

The 2021 results shown a reduction of the Mineral Resource compared with previous year. The change is due to mining activity (-0.9Mt) not being fully offset by resource growth (0.2Mt of new material as the result of resource growth in QTS North and Western, as defined by drilling; and 0.4Mt resource growth in QTS Central, QTS North and Western, resulting from reinterpretation).

The expected remaining life of mine is approximately 6 years based on Ore Reserves and approximately 10 years based on Mineral Resources. Cobar has previously, over the past 50 years, been able to extend its expected life of mine through exploratory drilling. The expiry date of relevant mining/concession licences is 24 June 2028.

# Copper

## Other projects

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources		Indicated Mineral Resources		Measured and Indicated Resources		Inferred Mineral Resources		CP	Proved Ore Reserves		Probable Ore Reserves		Total Ore Reserves		
				2021	2020	2021	2020	2021	2020	2021	2020		2021	2020	2021	2020	2021	2020	2021
Polymet	72%	OC	Ore (Mt)	319	319	403	403	722	722	415	415	ZB	157	157	106	106	264	264	HW
			Copper (%)	0.24	0.24	0.23	0.23	0.23	0.23	0.24	0.24	0.29	0.29	0.29	0.29	0.29	0.29	0.29	
			Nickel (%)	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.08	0.08	0.08	
			Palladium (g/t)	0.22	0.22	0.21	0.21	0.21	0.21	0.23	0.23	0.27	0.27	0.26	0.26	0.26	0.26	0.26	
			Platinum (g/t)	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.08	0.08	0.08	0.08	0.08	0.08	0.08	
			Gold (g/t)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	
			Silver (g/t)	0.88	0.88	0.87	0.87	0.87	0.87	0.87	0.87	1.05	1.05	1.08	1.08	1.06	1.06	1.06	
			Cobalt (ppm)	71	71	68	68	39	39	56	56	74.21	74.21	73.56	73.56	73.95	73.95		
El Pachón	100%	OC	Ore (Mt)	533	534	1,045	1,055	1,578	1,588	1,693	1,536	FM	-	-	-	-	-	-	n.a.
			Copper (%)	0.67	0.67	0.49	0.49	0.55	0.55	0.40	0.41	-	-	-	-	-	-	-	
			Silver (g/t)	2.4	2.4	2.0	2.0	2.1	2.2	1.8	1.8	-	-	-	-	-	-	-	
			Molybdenum (%)	0.013	0.013	0.011	0.011	0.012	0.012	0.009	0.009	-	-	-	-	-	-	-	
West Wall Copper Project	50%		Ore (Mt)	-	-	861	861	861	861	1,072	1,072	RT	-	-	-	-	-	-	n.a.
			Copper (%)	-	-	0.51	0.51	0.51	0.51	0.42	0.42	-	-	-	-	-	-	-	
			Gold (g/t)	-	-	0.05	0.05	0.05	0.05	0.05	0.05	-	-	-	-	-	-	-	
			Molybdenum (%)	-	-	0.008	0.008	0.008	0.008	0.006	0.006	-	-	-	-	-	-	-	
Total Other projects			Ore (Mt)	852	853	2,309	2,319	3,161	3,171	3,180	3,023		157	157	106	106	264	264	
			Copper (%)	0.51	0.51	0.45	0.45	0.47	0.47	0.39	0.39		0.29	0.29	0.29	0.29	0.29	0.29	

### PolyMet

PolyMet and the deposit NorthMet is located approximately 92Km north of the town of Duluth, to the west of Lake Superior in Minnesota, United States of America. Northmet is a polymetallic deposit hosting copper-nickel-platinum located at the northern margin of the Duluth Complex.

The Duluth Complex is a large, composite, layered, mafic intrusion that was emplaced into comagmatic flood basalts along a portion of the Mesoproterozoic Midcontinent Rift System. The ore-bearing units are primarily found in the basal unit of the Duluth Complex, which contains disseminated sulphides and minor massive sulphides hosted in troctolitic rocks.

The metals of interest are copper, nickel, cobalt, platinum, palladium, silver and gold. The majority of the metals are found in the sulphide minerals: chalcopyrite, cubanite, pentlandite, and pyrrhotite. Platinum, palladium and gold are found in bismuthides, tellurides, and alloys.

There are no changes to the Mineral Resource and Ore Reserve estimates for PolyMet in 2021.

Both the mineral resource and mineral reserve estimates take into consideration metallurgical recoveries, concentrate grades, transportation costs, smelter treatment charges and royalties in determining NSR values.

Ore Reserves exceed the currently approved EIS LOM ore milled limit of 204 million tonnes over a mine life of 20 years.

### El Pachón

Located in the southwest of San Juan Province of Argentina, the El Pachón orebody is a porphyry copper-molybdenum deposit in which two major stages of sulphide mineralisation contributed to the formation of the orebody. The bulk of the ore takes the form of disseminated Chalcopyrite-Molybdenite primary sulphides on top of which an immature, relatively small copper enrichment blanket has been developed. In this upper part of the deposit Chalcocite and minor Covellite are partially replacing the primary Chalcopyrite ore.

The mineral resource estimate changes are a result of updated cost and commodity price assumptions for 2021.

Mineral Resources stated herein are based on assay and geology information from 135Km of mainly diamond drill holes. Mineral Resources have been classified using a combination of criteria including geological continuity and Kriging parameters. Mineral Resources are constrained by the use of an economic pit shell.

### West Wall

The West Wall Copper Project is located in the central Chilean Andes, approximately 100km NNE of Santiago.

West Wall is a copper-molybdenum porphyry, with two distinct mineralized zones; Lagunillas to the south of the prospect, and West Wall Norte (WWN) 2km to the north of Lagunillas. The mineralization zones are part of an extensive NNE striking hydrothermal alteration zone of approximately 9km by 4km.

The sulphide Mineral Resource is reported within an economic pit shell at a copper cut-off and remains unchanged from 2019.

Glencore and Anglo American each have a 50% interest in the mining company West Wall SCM which holds the project. The project is jointly owned by Glencore plc (50%) and Anglo American (50%).

# Zinc

## Kazzinc

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources		Indicated Mineral Resources		Measured and Indicated Resources		Inferred Mineral Resources		CP	Proved Ore Reserves		Probable Ore Reserves		Total Ore Reserves		
				2021	2020	2021	2020	2021	2020	2021	2020		2021	2020	2021	2020	2021	2020	CP
<b>Maleevsky</b>	69.7%	UG	Ore (Mt)	1.9	1.2	2.3	2.4	4.2	3.6	1.9	2.0	APC	1.3	1.6	2.1	2.3	3.4	3.9	AAA
			Zinc (%)	5.1	6.6	5.2	5.3	5.1	5.7	6	6		3.3	4.7	3.6	3.4	3.4	4.0	
			Lead (%)	0.9	1.0	1.0	1.0	1.0	1.0	2	1		0.5	0.8	0.7	0.6	0.6	0.7	
			Copper (%)	1.7	2.2	1.3	1.8	1.5	1.9	1	1		0.9	1.3	0.8	1.2	0.8	1.2	
			Silver (g/t)	58	71	48	63	53	66	43	40		33	45	32	34	33	39	
			Gold (g/t)	0.4	0.5	0.4	0.4	0.4	0.4	0.3	0.3		0.2	0.3	0.2	0.2	0.2	0.3	
<b>Ridder-Sokolny</b>	69.7%	UG	Ore (Mt)	39.9	51.0	26.7	34.8	66.6	85.8	12.2	17	APC	16.2	15.5	9.3	10.6	25.4	26.1	AAA
			Zinc (%)	0.7	0.9	0.6	0.8	0.7	0.9	0.5	0.7		0.4	0.6	0.4	0.5	0.4	0.6	
			Lead (%)	0.3	0.4	0.3	0.4	0.3	0.4	0.2	0.3		0.2	0.3	0.2	0.2	0.2	0.3	
			Copper (%)	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.5		0.4	0.5	0.5	0.5	0.4	0.5	
			Silver (g/t)	14	13	16	14	15	13	15	13		8	8	9	9	8	8	
			Gold (g/t)	2.3	1.9	1.8	1.6	2.1	1.8	1.7	2.0		2.3	1.8	1.9	1.7	2.2	1.8	
<b>Tishinsky</b>	69.7%	UG	Ore (Mt)	3.6	5.0	2.1	1.4	5.7	6.4	0.7	0.8	APC	0.9	1.1	0.3	0.5	1.2	1.6	AAA
			Zinc (%)	4.9	5.5	5.1	4.0	5.0	5.2	4	4		6.7	6.9	5.1	6.0	6.3	6.6	
			Lead (%)	0.8	1.0	1.1	0.5	0.9	0.9	0.7	0.6		1.5	1.3	0.8	1.5	1.3	1.4	
			Copper (%)	0.7	0.6	0.4	0.4	0.6	0.6	0.4	0.4		0.7	0.7	0.4	0.4	0.6	0.6	
			Silver (g/t)	10	10	7	6	9	9	6	5		12	14	6	8	10	12	
			Gold (g/t)	0.8	0.7	0.3	0.4	0.6	0.6	0.3	0.3		0.8	1.2	0.4	0.4	0.7	0.9	
<b>Staroye Tailings Dam</b>	69.7%		Ore (Mt)	-	-	2.4	2.4	2.4	2.4	1.4	1.4	AL	-	-	-	-	-	-	n.a.
			Silver (g/t)	-	-	11	11	11	11	10	10		-	-	-	-	-	-	
			Gold (g/t)	-	-	1.0	1.0	1.0	1.0	0.8	0.8		-	-	-	-	-	-	
<b>Chashinskoye Tailings Dam</b>	69.7%	OC	Ore (Mt)	-	-	58	58	58	58	30.0	30	MM	-	-	-	-	-	-	n.a.
			Silver (g/t)	-	-	5	5	5	5	5	5		-	-	-	-	-	-	
			Gold (g/t)	-	-	0.7	0.7	0.7	0.7	0.5	0.5		-	-	-	-	-	-	
<b>Shaimerden Stockpiles</b>	69.7%	OC	Ore (Mt)	-	-	1.1	1.2	1.1	1.2	-	-	AL	-	-	1.1	1.2	1.1	1.2	AAA
			Zinc (%)	-	-	24.4	24	24.4	24	-	-		-	-	24.4	24.4	24.4	24.4	
<b>Dolinnoe</b>	69.7%	UG	Ore (Mt)	6.5	6.2	1.2	1.6	7.8	7.7	7.4	7.5	APC	3.9	4.4	0.3	0.6	4.2	5.0	AAA
			Zinc (%)	1.1	1.2	0.9	0.9	1.1	1.1	0.8	0.8		1.0	1.1	0.9	0.8	1.0	1.1	
			Lead (%)	0.6	0.6	0.5	0.4	0.6	0.6	0.4	0.4		0.6	0.6	0.4	0.4	0.5	0.6	
			Copper (%)	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1		0.1	0.1	0.1	0.1	0.1	0.1	
			Silver (g/t)	39	42	35	37	38	41	11	11		43	41	31	32	42	40	
			Gold (g/t)	2.7	3.0	2.0	2.0	2.6	2.8	1.8	1.8		2.7	2.8	2.4	2.2	2.7	2.7	

# Zinc

## Kazzinc (continued)

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources		Indicated Mineral Resources		Measured and Indicated Resources		Inferred Mineral Resources		CP	Proved Ore Reserves		Probable Ore Reserves		Total Ore Reserves			
				2021	2020	2021	2020	2021	2020	2021	2020		2021	2020	2021	2020	2021	2020	2021	2020
<b>Obruchevsky</b>	69.7%	UG	Ore (Mt)	-	-	1.7	1.7	1.7	1.7	4.9	4.9	APC	-	-	-	-	-	-	-	n.a.
			Zinc (%)	-	-	7.5	7.5	7.5	7.5	5	5	-	-	-	-	-	-	-	-	-
			Lead (%)	-	-	3.6	3.6	3.6	3.6	2	2	-	-	-	-	-	-	-	-	-
			Copper (%)	-	-	0.7	0.7	0.7	0.7	0.6	0.6	-	-	-	-	-	-	-	-	-
			Silver (g/t)	-	-	18	18	18	18	30	30	-	-	-	-	-	-	-	-	-
			Gold (g/t)	-	-	0.4	0.4	0.4	0.4	0.5	0.5	-	-	-	-	-	-	-	-	-
<b>Zhairem Zapadny</b>	69.7%	OC	Ore (Mt)	5.9	8.3	5.0	6.7	11.0	15.1	0.01	0.70	APC	8.3	8.0	2.0	5.7	10.3	13.7	AAA	
			Zinc (%)	4.7	4.9	4.2	4.2	4.5	4.6	2	1	-	4.6	4.8	3.3	4.2	4.3	4.6	-	
			Lead (%)	1.6	1.6	1.3	1.2	1.5	1.4	0.5	0.5	-	1.6	1.6	0.8	1.2	1.4	1.4	-	
			Silver (g/t)	30	31	26	23	28	27	12	10	-	29	30	21	23	27	27	-	
<b>Zhairem Dalnezapadny</b>	69.7%	OC	Ore (Mt)	36.0	38.4	3.1	3.3	39.1	41.7	0.03	0.1	APC	39.2	37.4	0.04	2.9	39.3	40.2	AAA	
			Zinc (%)	4.7	4.6	5.2	5.1	4.7	4.6	3	3	-	4.5	4.5	2.0	5.0	4.5	4.5	-	
			Lead (%)	1.3	1.3	1.5	1.4	1.3	1.3	2	1	-	1.2	1.2	1.0	1.3	1.2	1.2	-	
			Silver (g/t)	16	16	14	14	16	16	22	19	-	15	16	22	14	15	16	-	
<b>Zhairemsky Ushkatyn</b>	69.7%	OC	Ore (Mt)	0.6	0.6	1.3	1.3	1.9	1.9	0.1	0.1	AL	-	-	-	-	-	-	n.a.	
			Zinc (%)	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	-	-	-	-	-	-	-	-	
			Lead (%)	5.3	5.3	3.7	3.7	4.2	4.2	3	3	-	-	-	-	-	-	-	-	
			Silver (g/t)	35	35	27	27	30	30	18	18	-	-	-	-	-	-	-	-	
<b>Ushkatyn I</b>	69.7%	OC	Ore (Mt)	-	-	-	-	-	-	5.9	5.9	AL	-	-	-	-	-	-	n.a.	
			Zinc (%)	-	-	-	-	-	-	2	2	-	-	-	-	-	-	-		
			Lead (%)	-	-	-	-	-	-	5	5	-	-	-	-	-	-	-		
<b>Uzhynzhal</b>	100.0%	OC	Ore (Mt)	-	-	-	-	-	-	21.2	21.2	AL	-	-	-	-	-	-	n.a.	
			Zinc (%)	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-		
			Lead (%)	-	-	-	-	-	-	3	3	-	-	-	-	-	-	-		
			Silver (g/t)	-	-	-	-	-	-	48	48	-	-	-	-	-	-	-		
<b>Novo-Leninogorsky</b>	69.7%	UG	Ore (Mt)	-	-	8.0	8.0	8.0	8.0	22.2	22.2	APC	-	-	-	-	-	-	n.a.	
			Zinc (%)	-	-	4.3	4.3	4.3	4.3	5	5	-	-	-	-	-	-	-		
			Lead (%)	-	-	1.7	1.7	1.7	1.7	2	2	-	-	-	-	-	-	-		
			Copper (%)	-	-	0.2	0.2	0.2	0.2	0.2	0.2	-	-	-	-	-	-	-		
			Silver (g/t)	-	-	38	38	38	38	48	48	-	-	-	-	-	-	-		
			Gold (g/t)	-	-	2.0	2.0	2.0	2.0	1.8	2.0	-	-	-	-	-	-	-		
<b>Chekmar</b>	69.7%	OC	Ore (Mt)	-	-	-	-	-	-	57.8	57.8	APC	-	-	-	-	-	-	n.a.	
			Zinc (%)	-	-	-	-	-	-	2.6	3.0	-	-	-	-	-	-			
			Lead (%)	-	-	-	-	-	-	0.9	0.9	-	-	-	-	-	-			
			Copper (%)	-	-	-	-	-	-	0.5	0.5	-	-	-	-	-	-			
			Silver (g/t)	-	-	-	-	-	-	13	13	-	-	-	-	-	-			
			Gold (g/t)	-	-	-	-	-	-	0.4	0.4	-	-	-	-	-	-			
<b>Total Polymetallic Kazzinc</b>			Ore (Mt)	94	111	113	123	208	234	166	172		70	68	15.1	23.8	85	92		
			Zinc (%)	2.7	2.8	1.3	1.4	2.0	2.0	2.0	2.0	2.2		3.4	3.5	3.1	3.5	3.3	3.5	
			Lead (%)	0.9	0.9	0.4	0.4	0.6	0.6	1.2	1.2	1.2		1.0	1.0	0.3	0.6	0.9	0.9	
			Copper (%)	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3		0.1	0.2	0.4	0.3	0.2	0.2	
			Silver (g/t)	18	18	13	13	15	15	21	21	21		17	18	14	15	16	17	
			Gold (g/t)	1.2	1.1	1.0	1.0	1.1	1.0	0.7	0.8	0.8		0.7	0.6	1.3	0.8	0.8	0.7	
Vasilkovsky (Gold)	69.7%	OC	Ore (Mt)	63	71.8	26.5	26.5	89	98.4	0.6	0.6	APC	35.4	43.0	36.0	36.0	71	79	AAA	
			Gold (g/t)	1.9	1.9	1.9	1.9	1.9	1.9	1	0.9	-	2.0	2.0	1.8	1.8	1.9	1.9		
		UG	Ore (Mt)	1.4	1	26.5	27	27.9	27.9	1.4	1.4	APC	-	-	-	-	-	-		
			Gold (g/t)	2.1	2.1	2.3	2.3	2.3	2.3	2	2.2	-	-	-	-	-	-	-		
<b>Kazzinc Gold (Vasilkovskoye)</b>			Ore (Mt)	64	73	53	53	117	126	2.0	2.0		35	43	36	36	71	79		
			Gold (g/t)	1.9	1.9	2.1	2.1	2.0	2.0	1.7	1.8		2.0	2.0	1.8	1.8	1.9	1.9		

# Zinc

## Maleevsky

Maleevsky is a typical syngenetic VMS deposit hosting ores of sulphide-polymetallic formation with associated gold and silver. The geological model and resource estimate were updated in 2021 with adjustments to wireframing and classification to reflect drilling performed in 2021. Infill drilling in various parts of the deposit enabled resource conversion to Indicated and Measured resources, particularly near the active mining fronts.

The mined material from Maleevsky during 2021 was 1.6 Mt at 3.9% Zn, 0.7% Pb, 1.3% Cu, 44 g/t Ag and 0.3 g/t Au.

The expected mine life for Maleevsky is 4 years based on Ore Reserves and up to an estimated 5 years based on the life of mine schedule which is inclusive of all available Mineral Resources categories.

## Ridder-Sokolny

The Ridder-Sokolny deposit is a unique deposit that has characteristics of several deposit styles. The total footprint of the mineralisation exceeds 20 km<sup>2</sup>. The upper ore zone of the deposit consists of a cluster of sub-horizontal VMS-style lens-shaped bodies associated with a carbonaceous unit adjacent to a vertical fault structure. The lenticular VMS-style mineralisation is underlain by a steeply dipping to sub-vertical polymetallic Cu-rich stringer-stockwork ore zone. Structurally controlled gold-bearing quartz veins overprint the entire system. Individual or small cluster of veins with high gold grades have been selectively mined. Ridder-Sokolny mineral resources decreased, mainly due to sterilization of resource in pillars around historically mined areas and due to changes in the marketing assumptions.

The mined material from Ridder-Sokolny during 2021 was 1.7 Mt at 0.3% Zn, 0.1% Pb, 0.3% Cu, 4.3 g/t Ag and 2.0 g/t Au.

The expected mine life for Ridder-Sokolny is 12 years based on Ore Reserves and up to an estimated 15 years based on the life of mine schedule which is inclusive of all available Mineral Resources categories.

## Tishinsky

Tishinsky is a syngenetic VMS deposit of Au- and Ag-bearing sulfide polymetallic ores. Changes to the zinc and lead grades in Measured resource are due to mining of higher grade material and to the downgrade of the Far West Zone to Indicated resources, pending modern data acquisition.

The mined material from Tishinsky during 2021 was 539 Kt at 6.1% Zn, 1.0% Pb, 0.5% Cu, 13 g/t Ag and 0.9 g/t Au.

The expected mine life for Tishinsky is 2.5 years based on Ore Reserves and up to an estimated 10 years based on the life of mine schedule which is inclusive of all available Mineral Resources categories.

## Staroye tailings

The Staroye tailings are composed of the waste by-products of the processing of gold and polymetallic ores (primarily silver, copper, lead and zinc) from the Ridder Mining and Concentrating Complex (RMCC) and their composition reflect the major constituents of the ore. No material has been processed from the tailings in the last 5 years.

## Chasinskoye tailings

The Chashinskoye tailings are composed of the waste by-products of the processing of gold and polymetallic ores from RMCC. Four test holes were drilled in 2021 and the mineral resource is in the process of being updated. No material has been processed from the tailings in the last 5 years.

## Shaimerden

The Shaimerden stockpile is composed of high-grade, crushed zinc oxide ore which is not amenable to the concentration process; it is directly sent to the Ridder Complex Zinc refinery. Total material processed during 2021 was 180 Kt at 20.7% Zn.

## Dolinnoe

The Dolinnoe deposit is situated in the south-eastern portion of the Ridder mining district in the Rudny-Altay geotectonic block. Gold is the main mineral of economic interest and structural interpretation, modelling and classification of the mineral resource was completed on the basis of an underground infill drilling campaign. Changes to the mineral resources (and ore reserves) are due to the addition of data from infill drilling and to sterilisation of unrecoverable ore near the mined out stopes that consist of higher grade material.

The mined material from Dolinnoe in 2021 was 564 Kt at 1.1% Zn, 0.5% Pb, 0.2% Cu, 40 g/t Ag and 2.2 g/t Au.

The expected mine life for Dolinnoe is 9 years based on Ore Reserves and up to an estimated 10 years based on the life of mine schedule which is inclusive of all available economic Mineral Resources categories.

## Obruchevsky

The Obruchevsky deposit is situated 1,000 m below surface in the south-eastern portion of the Ridder mining district. Mineralisation consists of banded to massive sulphides of Zn-Pb-Cu in one principal, subhorizontal lens 1,000 m long by 300 m wide with thickness from 3 to >40 m. It was discovered in 1987 and delineated with 147,000 m of drilling in 130 drillholes by the end of 1996. Confirmation and infill drilling was ongoing in 2019, 2020, and 2021. Late arrival of analytical results and a substantially modified geological model delayed a resource update for year-end 2021.

## Zhairem

The various iron, manganese, barite and polymetallic deposits of the Zhairem area, central Kazakhstan, were discovered by geological and geophysical prospecting between the 1930s and 1960s. Between 1978 and 1995, 22 million tonnes of low-grade zinc-lead ore including barite-dominated mineralisation were mined. As of 1996, focus was set on manganese and iron ore production. The Zhairem deposits were acquired by Kazzinc in 2014, based on their polymetallic value. All deposits have since been remodelled with focus on zinc production. Zapadny resource changes are related to drilling performed in 2021 and changes to the economic assumptions for the resource pit optimization.

The mined material from Zapadny Open-Pit during 2021 was 2.8 Mt at 4.8% Zn, 1.3% Pb, and 32 g/t Ag.

The expected mine life for Zapadny pit is 3 years based on Ore Reserves and Resources, constrained by the same economic pit shell.

The 2021 drilling campaign for Dalnezapadny is still ongoing and changes in the resources are due to an update of the economic assumptions for the resource pit optimization. There has been no drilling in 2021 in Ushkatyn I and no update to the resource model.

## Uzynzhal

The Uzynzhal sedimentary exhalative deposit is located in central Kazakhstan, in the same belt as the Zhairem deposits. Pb-Zn ores shows close spatial correlations with barite and manganese ores. The deposit is made up of an oxide cap, containing mainly Pb-oxide ores, while the sulphide portion of the deposit contains both Zn and Pb sulphides. The drilling campaign that commenced in 2021 is ongoing. Upon completion a mineral resource update will take place. No mining took place in 2021.

## Novo-Leninogorskoye

The Novo-Leninogorsky deposit is part of the Ridder-Sokolny group of polymetallic VMS deposits in Eastern Kazakhstan. Novo-Leninogorsky was discovered in 1981 and was explored between 1981 and 1985. Two styles of mineralisation can be found at Novo-Leninogorsky: barite-polymetallic and polymetallic (massive and stringers), with the mineralisation hosted by siltstones and quartzites. The historical mineral resource was confirmed in 2019-2020 with a 15,000 m diamond drilling program. There has been no drilling in 2021 and no update to the resource model.

## Chekmar

The Chekmar deposit comprises two main polymetallic mineralised zones: Chekmar and Gusliakov, which are separated by a distance of approximately 1.5 km. The deposits are typical syngenetic VMS deposits, with distinct metal zonation and near-surface weathering profiles. The deposits were initially explored in the 1970s. Studies are underway to confirm the Mineral Resource and to perform metallurgical testing of the mineralization. Due to the historical nature of the previous drilling, all Mineral Resources are currently classified as Inferred.

## Vasilkovsky

Vasilkovsky is a gold deposit of epigenetic stockwork type and beresite subtype of deposits hosting ores of gold-quartz formation. The Vasilkovsky mineral resources are divided into open pit and underground portions. The open pit resources are limited by an optimised pit shell from engineering studies. The total open pit mineral resources decreased as a result of mining depletion. The reserves are only within the open pit. The drilling campaign that commenced in 2021 is ongoing and there has been no update to the resource model.

The mined material from Vasilkovsky Open-Pit during 2021 was 8.0 Mt at 2.1 g/t Au.

The expected mine life for Vasilkovsky is 10 years based on Ore Reserves and Resources; both are constrained by the same economic pit shell.



# Zinc

## Australia (Mount Isa, McArthur River)

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources		Indicated Mineral Resources		Measured and Indicated Resources		Inferred Mineral Resources		CP	Proved Ore Reserves		Probable Ore Reserves		Total Ore Reserves			
				2021	2020	2021	2020	2021	2020	2021	2020		2021	2020	2021	2020	2021	2020	2021	2020
<b>Mount Isa</b>	100%																			
Mount Isa Open Pit - Zn		OC	Ore (Mt)	-	-	125.0	125.0	125.0	125.0	178.0	178.0	DC	-	-	-	-	-	-	-	n.a.
			Zinc (%)	-	-	3.9	3.9	3.9	3.9	4	4		-	-	-	-	-	-	-	
			Lead (%)	-	-	3.0	3.0	3.0	3.0	2	2		-	-	-	-	-	-	-	
			Silver (g/t)	-	-	66	66	66	66	35	35		-	-	-	-	-	-	-	
Rio Grande		UG	Ore (Mt)	-	-	2.3	2.3	2.3	2.3	13.1	13.1	DC	-	-	-	-	-	-	-	n.a.
			Zinc (%)	-	-	6.0	6.0	6.0	6.0	6	6		-	-	-	-	-	-	-	
			Lead (%)	-	-	2.4	2.4	2.4	2.4	2	2		-	-	-	-	-	-	-	
			Silver (g/t)	-	-	58	58.0	58	58.0	54	54.0		-	-	-	-	-	-	-	
Pb Underground		UG	Ore (Mt)	-	-	32.0	32.0	32.0	32.0	15.4	15.4	DC	-	-	-	-	-	-	-	n.a.
			Zinc (%)	-	-	4.8	4.8	4.8	4.8	4	4		-	-	-	-	-	-	-	
			Lead (%)	-	-	4.3	4.3	4.3	4.3	5	5		-	-	-	-	-	-	-	
			Silver (g/t)	-	-	108	108	108	108	108	108.0		-	-	-	-	-	-	-	
<b>George Fisher</b>	100%																			
South (P49) Orebodies		UG	Ore (Mt)	27.7	28.6	24.2	24.4	52	53	20.4	20.1	DC	3.8	6.1	8.4	8.3	12.2	14.4	CF	
			Zinc (%)	8.4	8.4	8.1	8.2	8.2	8.3	8	8		6.5	6.7	6.3	6.1	6.4	6.4		
			Lead (%)	5.3	5.3	4.8	4.7	5.1	5.0	5	5		4.7	4.6	4.6	4.6	4.6	4.6		
			Silver (g/t)	116	115	101	98	109	107	94	91		101	100	103	103	102	102		
North (L72) Orebodies		UG	Ore (Mt)	48.1	49.2	121	120	169	169	57	61	DC	14.3	15.4	37.0	37	51	52	CF	
			Zinc (%)	9.4	9.2	8.8	8.8	9.0	8.9	9	9		7.6	7.2	7.2	7.0	7.4	7.1		
			Lead (%)	3.4	3.4	3.3	3.3	3.3	3.4	3	3		3.4	3.5	3.3	3.3	3.4	3.4		
			Silver (g/t)	57	58	52	52	53	54	53	54		58	61	54	56	55	57		
Handlebar Hill Open Cut (primary)		OC	Ore (Mt)	1.6	1.6	3.6	3.6	5.2	5.2	0.8	0.8	DC	-	-	-	-	-	-	n.a.	
			Zinc (%)	7.8	7.8	6.1	6.1	6.6	6.6	5	5		-	-	-	-	-	-		
			Lead (%)	2.6	2.6	2.0	2.0	2.2	2.2	2	2		-	-	-	-	-	-		
			Silver (g/t)	41	41	35	35	37	37	30	30		-	-	-	-	-	-		
Handlebar Hill Open Cut (oxide)		OC	Ore (Mt)	0.5	0.5	0.1	0.1	0.6	0.6	-	-	DC	-	0.5	-	-	-	0.5	n.a.	
			Zinc (%)	0.4	0.4	0.4	0.4	0.4	0.4	-	-		-	0.4	-	-	-	0.4		
			Lead (%)	8.5	8.5	4.1	4.1	7.8	7.8	-	-		-	8.5	-	-	-	8.5		
			Silver (g/t)	89	89	65	65	85	85	-	-		-	89	-	-	-	89		
<b>Lady Loretta</b>	100%	UG	Ore (Mt)	4.7	5.5	2.4	2.5	7.1	8.1	1.1	1.2	DC	3.6	4.3	1.3	0.9	4.9	5.3	CF	
			Zinc (%)	12.2	13.7	11.3	11.9	11.9	13.1	8	8		10.9	11.8	9.6	11.5	10.6	11.7		
			Lead (%)	3.3	4.3	2.1	2.4	2.9	3.7	3	1		3.3	4.1	1.8	2.2	2.9	3.8		
			Silver (g/t)	63	76	45	49	57	68	33	33		62	71	35	45	55	66		
<b>Total Mount Isa - Zinc bearing</b>			<b>Ore (Mt)</b>	<b>83</b>	<b>85</b>	<b>310</b>	<b>310</b>	<b>393</b>	<b>395</b>	<b>286</b>	<b>290</b>		<b>22</b>	<b>26</b>	<b>47</b>	<b>46</b>	<b>68</b>	<b>72</b>		
			<b>Zinc (%)</b>	<b>9.1</b>	<b>9.2</b>	<b>6.3</b>	<b>6.3</b>	<b>6.9</b>	<b>6.9</b>	<b>5</b>	<b>5</b>		<b>8.0</b>	<b>7.8</b>	<b>7.1</b>	<b>6.9</b>	<b>7.5</b>	<b>7.3</b>		
			<b>Lead (%)</b>	<b>4.0</b>	<b>4.1</b>	<b>3.4</b>	<b>3.4</b>	<b>3.5</b>	<b>3.6</b>	<b>2</b>	<b>3</b>		<b>3.6</b>	<b>3.9</b>	<b>3.5</b>	<b>3.5</b>	<b>3.6</b>	<b>3.7</b>		
			<b>Silver (g/t)</b>	<b>77</b>	<b>78</b>	<b>67</b>	<b>67</b>	<b>69</b>	<b>69</b>	<b>48</b>	<b>48</b>		<b>66</b>	<b>72</b>	<b>62</b>	<b>64</b>	<b>63</b>	<b>67</b>		
<b>MICO</b>	100%																			
Mount Isa Open Pit		OC	Ore (Mt)	12.9	12.9	80.2	80.2	93.1	93.1	9.5	9.5	DC/	-	-	-	-	-	-	n.a.	
			Copper (%)	1.8	1.8	1.4	1.4	1.5	1.5	1	1	AM	-	-	-	-	-	-		
X41 Mine 500, 650, 1100 & 1900 Orebodies		UG	Ore (Mt)	26.2	24.9	25.5	26.1	51.7	50.9	1.9	2.3	DC/	1.9	2.7	12.7	13.1	14.6	15.9	SJ	
			Copper (%)	1.9	1.9	1.8	1.8	1.9	1.8	2	2	AM	1.8	1.8	1.7	1.7	1.7	1.7		
Enterprise Mine 3000 & 3500 Orebodies		UG	Ore (Mt)	16.6	19.6	2.2	2.7	18.8	22.3	0.1	0.2	DC/	4.0	6.8	3.4	2.9	7.4	9.6	SJ	
			Copper (%)	2.5	2.5	2.3	2.3	2.5	2.4	2	2	AM	2.5	2.5	2.2	1.9	2.4	2.3		
Black Rock Cave		UG	Ore (Mt)	-	-	1.9	2.4	1.9	2.4	0.4	0.4	DC/	-	-	1.1	1.4	1.1	1.4	SJ	
			Copper (%)	-	-	5.5	5.5	5.5	5.5	4	4	AM	-	-	4.8	4.4	4.8	4.4		
<b>Total Mount Isa - Copper bearing</b>			<b>Ore (Mt)</b>	<b>55.7</b>	<b>57.4</b>	<b>109.8</b>	<b>111.4</b>	<b>165.5</b>	<b>168.7</b>	<b>11.9</b>	<b>12.4</b>		<b>5.9</b>	<b>9.5</b>	<b>17.2</b>	<b>17.4</b>	<b>23.1</b>	<b>26.9</b>		
			<b>Copper (%)</b>	<b>2.1</b>	<b>2.1</b>	<b>1.6</b>	<b>1.6</b>	<b>1.8</b>	<b>1.8</b>	<b>1.5</b>	<b>1.5</b>		<b>2.3</b>	<b>2.3</b>	<b>2.0</b>	<b>1.9</b>	<b>2.0</b>	<b>2.1</b>		

# Zinc

## Australia (Mount Isa, McArthur River) (continued)

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources		Indicated Mineral Resources		Measured and Indicated Resources		Inferred Mineral Resources			Proved Ore Reserves		Probable Ore Reserves		Total Ore Reserves		
				2021	2020	2021	2020	2021	2020	2020	2019	CP	2021	2020	2021	2020	2021	2020	CP
<b>McArthur River</b>	100%																		
Open Cut		OC	Ore (Mt)	103	106	40.8	48.6	144	154	-	-	CH	71	74	20.0	12.7	91	87	DH
			Zinc (%)	9.7	9.5	9.7	9.5	9.7	9.5	-	-		9.1	9.4	7.8	7.8	8.8	9.2	
			Lead (%)	4.2	4.1	4.9	4.7	4.4	4.3	-	-		4.1	4.3	4.0	3.8	4.1	4.2	
			Silver (g/t)	42	40	52	51	45	44	-	-		41	43	42	39	41	42	
Woyzbun South Zone		UG	Ore (Mt)	-	-	8.3	8.3	8.3	8.3	-	-	CH	-	-	-	-	-	-	n.a.
			Zinc (%)	-	-	14.2	14.2	14.2	14.2	-	-		-	-	-	-	-	-	
			Lead (%)	-	-	5.6	5.6	5.6	5.6	-	-		-	-	-	-	-	-	
			Silver (g/t)	-	-	58	58	58	58	-	-		-	-	-	-	-	-	
<b>Total McArthur River</b>			<b>Ore (Mt)</b>	<b>103</b>	<b>106</b>	<b>49</b>	<b>57</b>	<b>152</b>	<b>162</b>	<b>-</b>	<b>-</b>		<b>71</b>	<b>74</b>	<b>20.0</b>	<b>12.7</b>	<b>91</b>	<b>87</b>	
			<b>Zinc (%)</b>	<b>9.7</b>	<b>9.5</b>	<b>10.5</b>	<b>10.2</b>	<b>9.9</b>	<b>9.7</b>	<b>-</b>	<b>-</b>		<b>9.1</b>	<b>9.4</b>	<b>7.8</b>	<b>7.8</b>	<b>8.8</b>	<b>9.2</b>	
			<b>Lead (%)</b>	<b>4.2</b>	<b>4.1</b>	<b>5.0</b>	<b>4.8</b>	<b>4.5</b>	<b>4.4</b>	<b>-</b>	<b>-</b>		<b>4.1</b>	<b>4.3</b>	<b>4.0</b>	<b>3.8</b>	<b>4.1</b>	<b>4.2</b>	
			<b>Silver (g/t)</b>	<b>42</b>	<b>40</b>	<b>53</b>	<b>52</b>	<b>46</b>	<b>45</b>	<b>-</b>	<b>-</b>		<b>41</b>	<b>43</b>	<b>42</b>	<b>39</b>	<b>41</b>	<b>42</b>	
<b>Total Zinc Australia</b>			<b>Ore (Mt)</b>	<b>186</b>	<b>191</b>	<b>359</b>	<b>367</b>	<b>545</b>	<b>558</b>	<b>286</b>	<b>290</b>		<b>93</b>	<b>100</b>	<b>67</b>	<b>59</b>	<b>159</b>	<b>159</b>	
			<b>Zinc (%)</b>	<b>9.4</b>	<b>9.3</b>	<b>6.9</b>	<b>6.9</b>	<b>7.8</b>	<b>7.7</b>	<b>5</b>	<b>5</b>		<b>8.8</b>	<b>9.0</b>	<b>7.3</b>	<b>7.1</b>	<b>8.2</b>	<b>8.3</b>	
			<b>Lead (%)</b>	<b>4.1</b>	<b>4.1</b>	<b>3.6</b>	<b>3.6</b>	<b>3.8</b>	<b>3.8</b>	<b>2</b>	<b>3</b>		<b>4.0</b>	<b>4.2</b>	<b>3.6</b>	<b>3.6</b>	<b>3.9</b>	<b>4.0</b>	
			<b>Silver (g/t)</b>	<b>58</b>	<b>57</b>	<b>65</b>	<b>65</b>	<b>62</b>	<b>62</b>	<b>48</b>	<b>48</b>		<b>47</b>	<b>51</b>	<b>56</b>	<b>59</b>	<b>51</b>	<b>53</b>	
<b>Mount Margaret</b>	100%																		
E1		OC	Ore (Mt)	4.6	4.6	5.5	5.5	10.1	10.1	0.4	0.4	JS	-	-	-	-	-	-	n.a.
			Copper (%)	0.7	0.7	0.8	0.8	0.7	0.7	1	1		-	-	-	-	-	-	
			Gold (g/t)	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3		-	-	-	-	-	-	
Monakoff		OC	Ore (Mt)	-	-	2.4	2.4	2.4	2.4	0.1	0.1	JS	-	-	-	-	-	-	n.a.
			Copper (%)	-	-	1.0	1.0	1.0	1.0	0.8	0.8		-	-	-	-	-	-	
			Gold (g/t)	-	-	0.3	0.3	0.3	0.3	0.2	0.2		-	-	-	-	-	-	
<b>Total Mount Margaret</b>			<b>Ore (Mt)</b>	<b>5</b>	<b>5</b>	<b>8</b>	<b>8</b>	<b>13</b>	<b>13</b>	<b>0.5</b>	<b>0.5</b>		<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	
			<b>Copper (%)</b>	<b>0.6</b>	<b>0.6</b>	<b>0.8</b>	<b>0.8</b>	<b>0.7</b>	<b>0.7</b>	<b>0.9</b>	<b>0.9</b>		<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	
			<b>Gold (g/t)</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.3</b>	<b>0.3</b>		<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	

### Mount Isa Open Pit ("MIOP")

Lead-zinc-silver mineralisation occurs in galena and sphalerite-rich bedding parallel horizons in dolomitic and variably carbonaceous pyritic shales and siltstones.

Approximately 85% of the lead-zinc-silver Mineral Resource is primary sulphide; the remainder being considered as transitional mineralisation (mixed sulphide and secondary oxide/carbonate). The copper resource in MIOP has not been included here; it is reported separately as part of MICO, and is constrained by the same pit shell.

The region's previously reported Black Star Open Cut (BSOC) resources are now included here. MIOP, PBUG and the RG are all located on Mining Lease ML8058 which expires on 30 November 2036.

### Pb Underground ("PBUG")

PBUG is the continuation of the same lead-zinc-silver mineralisation in Black Star Open Cut, which occurs in galena and sphalerite-rich bedding parallel horizons in dolomitic and variably carbonaceous pyritic shales and siltstones.

### Rio Grande ("RG")

RG is a southern continuation of PBUG where lead-zinc-silver mineralisation occurs in galena and sphalerite-rich bedding parallel horizons in dolomitic and variably carbonaceous pyritic shales and siltstones. This mineralization occurs close to Cu mine operations around 4800N.

### Mount Isa Copper ("MICO")

#### Mount Isa Copper Open Pit

The mineralisation occurs generally as breccia-hosted massive to disseminated copper minerals in "silica-dolomite" altered pyritic dolomitic siltstone. The Mineral Resources consist primarily of chalcopyrite, the remainder being oxidised or partially oxidised.

Ore Reserves were depleted by a combined 3.4 Mt from X41 and Enterprise Mines and 0.4 Mt from the Black Rock Cave in 2021. The underground life of mine estimate for the X41 mine is 2026, with Enterprise and the Black Rock Cave closing in early 2025. The tenements are due to expire on 30 November 2036. The life of mine of MICO is under review pending the outcome of several engineering studies.

#### X41 & Enterprise

Mineralisation occurs generally as breccia-hosted massive to disseminated chalcopyrite in "silica-dolomite" altered pyritic dolomitic siltstone.

#### Black Rock Cave

Copper mineralisation occurs generally within a Chalcocite Zone that lies above the Leached Primary material. The zone is interpreted to lie outside of the silica-dolomite alteration.

# Zinc

## **George Fisher Mine**

### **North (L72) & South (P49) Orebodies**

Orebodies: Lead-zinc-silver mineralisation occurs in galena and sphalerite-rich bedding parallel horizons in dolomitic and variably carbonaceous pyritic shales and siltstones. Orebody and structural interpretation, modelling and classification of the mineral resource was completed on the basis of additional geological information and improved systems. The current extraction method at George Fisher is sublevel open stoping. Mine production for 2021 totalled 2.9 Mt at 6.8% Zn, 3.9% Pb and 70 g/t Ag. The mine is located on Mining Lease ML8058 and the lease expires on 30 November 2036.

The expected mine life for George Fisher Mine is approximately 18 years based on Ore Reserves and up to an estimated 23 years based on the life of mine schedule which is inclusive of all available Mineral Resources categories.

### **Handlebar Hill Open Cut**

Lead-zinc-silver mineralisation occurs in galena and sphalerite-rich bedding parallel horizons in dolomitic and variably carbonaceous pyritic shales and siltstones. The Handlebar Hill Open Cut resource is up dip of and additional to the George Fisher South Mineral Resource. Material from the oxidised portion of the mineralisation is reported as a Mineral Resource.

No depletion has occurred through mining during 2021.

The Handlebar Hill Open Cut is located on Mining Lease ML8058 which expires on 30 November 2036. The mine was placed in care and maintenance in July 2014.

### **Lady Loretta**

Lead-zinc-silver mineralisation occurs in a galena and sphalerite rich massive sulphide lens located in carbonaceous pyritic shales and siltstones. The deposit occurs in a tight syncline dislocated by a number major faults. The deeper and high-grade portion of the deposit reaches 500 m below the surface.

Resources changes are mainly associated with mining activity, drilling and improvements in overall modelling and estimation techniques.

Mine production at Lady Loretta in 2021 totalled 1.7 Mt at grades of 12.2% Zn, 5.1% Pb and 77 g/t Ag. The Mining Lease, ML5568, is current until January 31st, 2026. The expected mine life for Lady Loretta Mine is approximately 2.5 years based on Ore Reserves and up to an estimated 3 years based on the life of mine schedule which is inclusive of all available Mineral Resources categories.

## **McArthur River Mine**

Zinc-lead-silver mineralisation occurs predominantly as ultrafine bedded parallel sphalerite and galena rich bands hosted by dolomitic and carbonaceous pyritic siltstones, graded beds and chaotic debris flow breccias. Changes in the mineral resource are as a result of new drill data and resulting updated interpretation, as well as economic factors.

The Ore Reserves have been depleted during 2021 by a total of 3.9 Mt at 9.2% Zn and 4.0% Pb. The expected mine life for McArthur River Mine is approximately 19 years based on Ore Reserves and up to an estimated 29 years based on the life of mine schedule which is inclusive of all available Mineral Resources categories. Mineral Resources and Ore Reserves are located within leases valid to 2043.

### **Mount Margaret**

Economic mineralisation at E1 occurs as breccia-hosted mineralisation within the footwall volcanics at E1 North, and as strata-bound, replacement style mineralisation within the mineralised sedimentary units at E1 North, Central, South, and East. Mine lease tenements expire in December 2032.

Economic mineralisation at Monakoff and Monakoff East occurs in very fine to medium grained steeply dipping metasediment units. Mine lease tenements expire in October 2032.

# Zinc

## North America (Kidd Creek, Matagami, PD1, Errington, Vermilion, Hackett River, Bell, Granisle)

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources		Indicated Mineral Resources		Measured and Indicated Resources		Inferred Mineral Resources			Proved Ore Reserves		Probable Ore Reserves		Total Ore Reserves		
				2021	2020	2021	2020	2021	2020	2021	2020	CP	2021	2020	2021	2020	2021	2020	CP
<b>Kidd Creek</b>	100%	UG	Ore (Mt)	5.2	7.9	0.7	1.7	6.0	9.7	0.1	10.5	BD	1.9	3.3	1.2	1.7	3.1	5.0	KS
			Zinc (%)	3.8	4.0	4.2	5.2	3.8	4.2	4	5		2.8	3.4	5.0	4.0	3.6	3.6	
			Copper (%)	1.8	1.8	1.9	1.4	1.8	1.7	1	2		1.9	1.9	1.8	1.6	1.9	1.8	
			Silver (g/t)	46.0	50.0	49.0	48.0	46	50	57	41		45	47	44	38	45	44	
<b>Mine 5</b>	100%	UG	Ore (Mt)	4.9	-	8.4	-	13	-	6	-	MM	-	-	0.3	-	0.3	-	KS
			Zinc (%)	3.9	-	3.8	-	4	-	4	-		-	-	2.5	-	2.5	-	
			Copper (%)	1.6	-	1.6	-	2	-	2	-		-	-	1.2	-	1.2	-	
			Silver (g/t)	44.0	-	33.0	-	37	-	29	-		-	-	40	-	40	-	
<b>Matagami Bracemac-McLeod</b>	100%	UG	Ore (Mt)	0.4	2.0	-	-	0.4	2.0	-	-	MM	0.4	1.2	-	-	0.4	1.2	JD
			Zinc (%)	5.3	5.8	-	-	5.3	5.8	-	-		4.7	5.8	-	-	4.7	5.8	
			Copper (%)	1.0	1.0	-	-	1.0	1.0	-	-		0.9	1.0	-	-	0.9	1.0	
			Silver (g/t)	25	26	-	-	25	26	-	-		22	26	-	-	22	26	
			Gold (g/t)	0.6	0.6	-	-	0.6	0.6	-	-		0.5	0.7	-	-	0.5	0.7	
<b>Caber</b>	100%	UG	Ore (Mt)	0.8	0.8	0.7	0.7	1.5	1.5	-	-	AL	-	-	-	-	-	-	n.a.
			Zinc (%)	6.1	6.1	5.4	5.4	5.8	5.8	-	-		-	-	-	-	-	-	
			Copper (%)	1.1	1.1	1.1	1.1	1.1	1.1	-	-		-	-	-	-	-	-	
			Silver (g/t)	10	10	9	9	10	10	-	-		-	-	-	-	-	-	
			Gold (g/t)	0.3	0.3	0.3	0.3	0.3	0.3	-	-		-	-	-	-	-	-	
<b>Caber Nord</b>	100%	UG	Ore (Mt)	-	-	-	-	-	-	6.0	6.0	AL	-	-	-	-	-	-	n.a.
			Zinc (%)	-	-	-	-	-	-	3	3		-	-	-	-	-	-	
			Copper (%)	-	-	-	-	-	-	1	1		-	-	-	-	-	-	
			Silver (g/t)	-	-	-	-	-	-	11	11		-	-	-	-	-	-	
			Gold (g/t)	-	-	-	-	-	-	0.1	0.1		-	-	-	-	-	-	
<b>PD-1</b>	100%	OC/UG	Ore (Mt)	0.6	0.6	1.0	1.0	1.6	1.6	-	-	GR	-	-	-	-	-	-	n.a.
			Zinc (%)	4.2	4.2	5.0	5.0	4.7	4.7	-	-		-	-	-	-	-	-	
			Copper (%)	0.8	0.8	1.4	1.3	1.2	1.1	-	-		-	-	-	-	-	-	
			Silver (g/t)	20	20	20	20	20	20	-	-		-	-	-	-	-	-	
<b>Errington</b>	100%	UG	Ore (Mt)	6.6	6.7	2.3	2.3	8.9	9.0	-	-	GR	-	-	-	-	-	-	n.a.
			Zinc (%)	3.9	3.9	4.4	4.3	4	4	-	-		-	-	-	-	-	-	
			Lead (%)	1.1	1.1	1.2	1.3	1.1	1.2	-	-		-	-	-	-	-	-	
			Copper (%)	1.1	1.2	1.1	1.1	1.1	1.2	-	-		-	-	-	-	-	-	
			Silver (g/t)	52	52	52	55	52	53	-	-		-	-	-	-	-	-	
<b>Vermilion</b>	100%	UG	Ore (Mt)	2.8	2.8	0.4	0.4	3.2	3.2	-	-	GR	-	-	-	-	-	-	n.a.
			Zinc (%)	4.2	4.2	5.3	5.3	4.3	4.3	-	-		-	-	-	-	-	-	
			Lead (%)	1.2	1.2	1.3	1.3	1.2	1.2	-	-		-	-	-	-	-	-	
			Copper (%)	1.3	1.3	1.1	1.1	1.3	1.3	-	-		-	-	-	-	-	-	
			Silver (g/t)	53	53	56	56	53	53	-	-		-	-	-	-	-	-	
<b>Hackett River</b>	100%	OC/UG	Ore (Mt)	-	-	27.0	27.1	27.0	27.1	61	60	GR	-	-	-	-	-	-	n.a.
			Zinc (%)	-	-	4.5	4.5	4.5	4.5	4	4		-	-	-	-	-	-	
			Lead (%)	-	-	0.6	0.6	0.6	0.6	1	1		-	-	-	-	-	-	
			Copper (%)	-	-	0.5	0.5	0.5	0.5	0.4	0.4		-	-	-	-	-	-	
			Silver (g/t)	-	-	132	130	132	130	119	150		-	-	-	-	-	-	
<b>Total Zinc North America</b>			<b>(Mt)</b>	<b>21</b>	<b>21</b>	<b>41</b>	<b>33</b>	<b>62</b>	<b>54</b>	<b>73</b>	<b>77</b>		<b>2.3</b>	<b>4.5</b>	<b>1.5</b>	<b>1.7</b>	<b>4</b>	<b>6</b>	
			<b>Zinc (%)</b>	<b>4.0</b>	<b>4.3</b>	<b>4.4</b>	<b>4.6</b>	<b>4.2</b>	<b>4.4</b>	<b>3.5</b>	<b>4.1</b>		<b>3.13</b>	<b>4.04</b>	<b>4.5</b>	<b>4.0</b>	<b>3.6</b>	<b>4.0</b>	
			<b>Lead (%)</b>	<b>0.5</b>	<b>0.5</b>	<b>0.5</b>	<b>0.6</b>	<b>0.5</b>	<b>0.6</b>	<b>0.4</b>	<b>0.8</b>		-	-	-	-	-	-	
			<b>Copper (%)</b>	<b>1.4</b>	<b>1.4</b>	<b>0.8</b>	<b>0.6</b>	<b>1.0</b>	<b>0.9</b>	<b>0.6</b>	<b>0.7</b>		<b>1.74</b>	<b>1.67</b>	<b>1.7</b>	<b>1.6</b>	<b>1.7</b>	<b>1.6</b>	
			<b>Silver (g/t)</b>	<b>46</b>	<b>46</b>	<b>100</b>	<b>114</b>	<b>81</b>	<b>88</b>	<b>102</b>	<b>124</b>		<b>41</b>	<b>41</b>	<b>43</b>	<b>38</b>	<b>42</b>	<b>40</b>	
			<b>Gold (g/t)</b>	<b>0.4</b>	<b>0.4</b>	<b>0.3</b>	<b>0.3</b>	<b>0.3</b>	<b>0.4</b>	<b>0.2</b>	<b>0.2</b>		<b>0.09</b>	<b>0.20</b>	-	-	<b>0.1</b>	<b>0.1</b>	

# Zinc

## North America (Kidd Creek, Matagami, PD1, Errington, Vermilion, Hackett River, Bell, Granisle) (continued)

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources		Indicated Mineral Resources		Measured and Indicated Resources		Inferred Mineral Resources		CP	Proved Ore Reserves		Probable Ore Reserves		Total Ore Reserves			
				2021	2020	2021	2020	2021	2019	2021	2019		2021	2019	2020	2019	2020	2019	CP	
<b>Bell</b>	100%	OC	Ore (Mt)	57	57	200	200	257	257	100	100	BD	-	-	-	-	-	-	-	n.a.
			Copper (%)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	-	-	-	-	-	-	-	-
			Gold (g/t)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	-	-	-	-	-	-	-	-
<b>Granisle</b>	100%	OC	Ore (Mt)	18.0	18	55.0	55	73.0	73	20	20	BD	-	-	-	-	-	-	-	n.a.
			Copper (%)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	-	-	-	-	-	-	-	-
			Gold (g/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-	-	-	-	-	-	-	-
<b>Total Copper North America</b>			<b>Ore (Mt)</b>	<b>75</b>	<b>75</b>	<b>255</b>	<b>255</b>	<b>330</b>	<b>330</b>	<b>120</b>	<b>120</b>		-	-	-	-	-	-	-	
			<b>Copper (%)</b>	<b>0.4</b>	<b>0.4</b>	<b>0.4</b>	<b>0.4</b>	<b>0.4</b>	<b>0.4</b>	<b>0.4</b>	<b>0.4</b>	<b>0.4</b>		-	-	-	-	-	-	-
			<b>Gold (g/t)</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>		-	-	-	-	-	-	-

### Kidd Creek

#### Kidd

Kidd Mine is a VMS Cu-Zn-Ag deposit. Mineralisation occurs within a rhyolitic volcanic/volcaniclastic sequence as massive sulphide lenses of dominantly pyrite-pyrrhotite-sphalerite-galena-rich ores that are underlain by copper in chalcopyrite stringer zones. Ore Reserves are based on the approved mining plan to 2,940 m (9,600 ft) depth.

Mineral Resources and Ore Reserves changes are primarily the result of mining drawdown, with some adjustments due to updated mine design, cost reductions, and commodity pricing changes. The Mine 5 resource previously reported under Kidd in 2020 is now being reported separately. The current extraction method at Kidd Mine is sublevel open stoping.

2021 production totalled 1.44 Mt at 3.81% Zn, 1.71% Cu and 45 g/t Ag. The mine life is anticipated to be 2 years. All land tenures covering the existing Mineral Resources and Ore Reserves are patented and never expire.

#### Mine 5

Mine 5 is the down dip extension of the Kidd Mine deposit which is a VMS Cu-Zn-Ag deposit. Ore Reserves are based on the portion of the approved mining plan from 2,940 m to 3,020 m (Level 9800 and Level 9900) that lies within the remaining 2 years of the current Kidd Mine life. Mineral Resources are reported from 2,940 m to 3,430 m (9800 ft to 11,200 ft) depth. Additional mineralisation continuity is identified to 3,840 m (12,600 ft) depth.

Potential mine life is under review at the PFS/FS levels. All land tenures covering the existing Mineral Resources and Ore Reserves are patented and never expire. Mine 5 resources were reported under Kidd in 2020.

### Matagami

#### Bracemac-McLeod

The Bracemac-McLeod deposits comprise a cluster of polymetallic VMS lenses. All shallower deposits are now mined-out and only the McLeod Deep lens remains. The end of mine life is estimated as the end of June 2022, resulting in the sterilisation of 0.78 Mt of Resources.

Mine production for 2021 was 0.9 Mt grading 5.6% Zn, 0.9% Cu, 25g/t Ag and 0.7g/ Au.

#### PD-1

The PD-1 deposit is a polymetallic VMS of the same age and derived from the same ore forming hydrothermal system as the rest of the Matagami camp deposits. The deposit is located on a mining claim owned by Glencore.

#### Caber / Caber Nord

The Caber deposit is polymetallic VMS of the same age and derived from the same ore forming hydrothermal system as the rest of the Matagami camp deposits.

### Errington

The Errington deposit is a polymetallic massive sulphide located in the Sudbury Basin, Ontario. The 5 lenses that make up this deposit are hosted by sedimentary rocks of the Vermilion Formation at the contact of the Onaping and Onwatin formations.

The historical Mineral Resource was confirmed in 2013 with a 50,000 m drill program and has been reported in compliance with the JORC Code 2012.

### Vermilion

The Vermilion deposit is a polymetallic massive sulphide body located in the Sudbury Basin, Ontario. The 17 lenses that make up the deposit are hosted by sedimentary rocks of the Vermilion Formation at the contact of the Onaping and Onwatin Formations. The Mineral Resource was confirmed in 2013 with a 10,000 m drill program. Mineral Resources were interpolated by ID2.

#### Hackett River Project

The Hackett River project is located in Nunavut, Canada, approximately 480 km northeast of Yellowknife and 105 km south-southwest of the community of Bathurst Inlet, which is located on the Arctic Ocean.

The Hackett River deposits are situated within the Slave Structural Province, a predominantly Archaean granite greenstone-sedimentary terrane that lies between Great Slave Lake and Coronation Gulf.

Four principal sulphide deposits were defined as economically viable Mineral Resources, following boundaries of open cut vs underground mining, through a Preliminary Economic Assessment prior to Glencore's acquisition in 2010. Following the exploration drilling campaign of 2013, which added 114 drillholes totalling 39,000 m, reinterpretation was carried out outlining an in situ resource using Zn equivalent grades. The Mineral Resource grades are interpolated using ID<sup>2</sup> estimation.

#### Bell/Granisle

Bell and Granisle are porphyry copper-gold deposits located at Babine Lake. The Babine deposits are associated with calc-alkaline magmatic rocks. They were formed in the roots of Eocene volcanoes built upon continental crust.

The latest Mineral Resource estimate does not include the additional 25 holes (12,260 m) drilled in 2012. A resource update will be completed in 2022.

There are no known land tenure issues and the mining leases are renewed yearly.

# Zinc

## Volcan

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources		Indicated Mineral Resources		Measured and Indicated Resources		Inferred Mineral Resources			Proved Ore Reserves		Probable Ore Reserves		Total Ore Reserves		
				2021	2020	2021	2020	2021	2020	2021	2020	CP	2021	2020	2021	2020	2021	2020	CP
<b>Yauli</b>	23.3%	UG	Ore (Mt)	2.9	1.8	5.3	5.9	8.3	7.7	4.7	4.5	AA	1.4	0.8	3.0	3.9	4.4	4.7	BF
Andaychagua	Zinc (%)		8.6	5.7	5.4	7.0	6.6	6.7	4.5	5.5	8.9	5.3	5.6	6.8	6.6	6.5			
	Lead (%)		1.6	1.3	1.0	1.3	1.2	1.3	0.8	0.8	1.4	1.3	0.9	1.2	1.1	1.2			
	Silver (g/t)		91	109	105	125	100	121	107	137	63	95	83	97	77	97			
Zoraida		UG	Ore (Mt)	-	-	2.8	3.0	2.8	3.0	1.6	1.0	AA	-	-	-	-	-	-	n.a.
	Zinc (%)		-	-	4.6	4.8	4.6	4.8	4.0	4.8	-	-	-	-	-	-	-	-	
	Lead (%)		-	-	3.1	3.3	3.1	3.3	2.8	3.7	-	-	-	-	-	-	-	-	
	Silver (g/t)		-	-	136	143	136	143	113	149	-	-	-	-	-	-	-	-	
Carahuacra		UG	Ore (Mt)	2.6	2.5	3.8	4.5	6.4	7.0	4.4	4.5	AA	0.3	0.4	1.0	1.6	1.3	2.0	BF
	Zinc (%)		5.3	5.5	6.2	6.4	5.8	6.1	6.2	7.1	5.9	4.9	4.9	4.8	5.2	4.8			
	Lead (%)		0.6	0.6	1.1	1.1	0.9	0.9	1.1	1.2	0.9	0.7	1.2	1.0	1.1	0.9			
	Silver (g/t)		74	71	101	122	90	104	112	136	108	88	100	111	102	106			
San Cristobal		UG	Ore (Mt)	7.1	6.3	12.7	13.7	19.8	20.0	14.8	16.8	AA	2.9	2.2	7.2	7.0	10.1	9.3	BF
	Zinc (%)		7.0	6.7	6.1	6.3	6.5	6.4	5.3	5.3	5.8	5.0	4.5	5.1	4.9	5.1			
	Lead (%)		1.0	0.9	1.1	1.2	1.1	1.1	0.9	1.0	0.9	0.7	0.8	1.0	0.8	0.9			
	Silver (g/t)		133	128	124	132	127	131	102	105	103	96	91	107	94	104			
Ticlio		UG	Ore (Mt)	2.1	1.9	3.3	3.2	5.4	5.1	5.8	4.7	AA	0.4	0.3	0.4	0.4	0.8	0.7	BF
	Zinc (%)		5.7	5.3	3.9	4.1	4.6	4.5	3.6	3.4	5.4	6.3	5.0	5.4	5.2	5.7			
	Lead (%)		1.3	1.3	0.9	0.9	1.0	1.0	1.2	1.0	0.9	1.2	0.8	0.8	0.8	0.9			
	Silver (g/t)		68	61	46	51	55	55	72	64	58	66	64	85	61	78			
<b>Chungar</b>	23.3%	UG	Ore (Mt)	1.0	1.2	1.8	2.1	2.8	3.2	3.3	4.0		0.1	0.1	0.3	0.4	0.4	0.5	
Islay	Zinc (%)		1.8	1.6	1.8	2.1	1.8	1.9	1.7	1.8	AA	2.5	2.3	3.2	3.3	3.0	3.1	BF	
	Lead (%)		0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.9	1.2	1.1	1.1	1.2	1.1	1.2			
	Silver (g/t)		172	174	139	139	151	152	146	135	164	181	91	156	114	161			
Animon		UG	Ore (Mt)	1.9	3.4	7.9	10.6	9.7	14.0	13.2	14.4	AA	0.7	1.4	2.5	4.0	3.2	5.4	BF
	Zinc (%)		9.5	9.2	7.2	6.7	7.7	7.3	5.5	5.4	4.8	5.6	4.5	4.5	4.5	4.8			
	Lead (%)		2.7	2.6	2.3	2.0	2.4	2.1	1.8	1.8	1.7	1.7	1.6	1.6	1.6	1.6			
	Silver (g/t)		94	87	86	75	88	78	78	69	47	62	60	62	57	62			
<b>Alpamarca</b>	23.3%	OC	Ore (Mt)	1.4	3.1	0.6	0.6	2.0	3.7	0.44	0.0	AA	0.4	1.5	0.2	0.1	0.6	1.6	BF
	Zinc (%)		1.0	1.2	1.1	1.4	1.0	1.2	1.0	1.5	0.9	1.2	1.2	1.1	1.0	1.1			
	Lead (%)		0.8	0.9	0.9	1.0	0.8	0.9	1.0	0.9	0.8	0.9	0.9	0.8	0.8	0.9			
	Silver (g/t)		50	62	52	75	51	64	51	70	39	59	43	47	40	59			
<b>Palma</b>	23.3%	UG	Ore (Mt)	-	-	12.5	12.5	12.5	12.5	10.2	10.2	AA	-	-	-	-	-	-	n.a.
	Zinc (%)		-	-	4.5	4.5	4.5	4.5	4.2	4.2	-	-	-	-	-	-	-	-	
	Lead (%)		-	-	0.9	0.9	0.9	0.9	0.8	0.8	-	-	-	-	-	-	-	-	
	Silver (g/t)		-	-	27	27	27	27	17	17	-	-	-	-	-	-	-	-	
<b>Romina II</b>	23.3%	UG	Ore (Mt)	5.8	5.8	4.7	4.7	10.5	10.5	3.9	3.9		-	-	-	-	-	-	
Puagjanca	Zinc (%)		4.3	4.3	5.3	5.3	4.7	4.7	4.2	4.2	AA	-	-	-	-	-	-	n.a.	
	Lead (%)		2.3	2.3	3.0	3.0	2.6	2.6	2.5	2.5	-	-	-	-	-	-	-	-	
	Silver (g/t)		35	35	43	43	39	39	35	35	-	-	-	-	-	-	-	-	
Andrea	23.3%	UG	Ore (Mt)	-	-	-	-	-	-	5.4	5.4	AA	-	-	-	-	-	-	n.a.
	Zinc (%)		-	-	-	-	-	-	-	-	4.0	4.0	-	-	-	-	-	-	
<b>La Tapada</b>	23.3%	UG	Ore (Mt)	-	-	3.6	3.6	3.6	3.6	6.5	6.5	AA	-	-	-	-	-	-	n.a.
	Zinc (%)		-	-	3.6	3.6	3.6	3.6	3.4	3.4	-	-	-	-	-	-	-	-	
	Lead (%)		-	-	1.5	1.5	1.5	1.5	1.3	1.3	-	-	-	-	-	-	-	-	
	Silver (g/t)		-	-	46	46	46	46	40	40	-	-	-	-	-	-	-	-	

# Zinc

## Volcan (continued)

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources		Indicated Mineral Resources		Measured and Indicated Resources		Inferred Mineral Resources			Proved Ore Reserves		Probable Ore Reserves		Total Ore Reserves		
				2021	2020	2021	2020	2021	2020	2021	2020	CP	2021	2020	2021	2020	2021	2020	CP
<b>Cerro de Pasco</b>	23.3%																		
Raul Rojas block - Oxides		OC	Ore (Mt)	-	-	2.8	3.6	2.8	3.6	0.2	0.4	AA	-	-	0.4	0.6	0.4	0.6	BF
			Zinc (%)	-	-	0.0	0.1	0.0	0.1	0.1	0.1		-	-	-	-	-	-	
			Lead (%)	-	-	0.1	0.1	0.1	0.1	0.2	0.2		-	-	-	-	-	-	
			Silver (g/t)	-	-	142	118	142	118	158	116		-	-	189	195	189	195	
			Gold (g/t)	-	-	1.9	1.5	1.9	1.5	2	1		-	-	1.2	1.3	1.2	1.3	
Raul Rojas pit - sulphides		UG	Ore (Mt)	-	-	-	-	-	-	15.4	18.1	AA	-	-	-	-	-	-	n.a.
			Zinc (%)	-	-	-	-	-	-	0.3	0.3		-	-	-	-	-	-	
			Lead (%)	-	-	-	-	-	-	0.3	0.4		-	-	-	-	-	-	
			Copper (%)	-	-	-	-	-	-	0.4	0.4		-	-	-	-	-	-	
			Silver (g/t)	-	-	-	-	-	-	106	106		-	-	-	-	-	-	
			Gold (g/t)	-	-	-	-	-	-	0.5	0.6		-	-	-	-	-	-	
Raul Rojas pit - polymetallic		UG	Ore (Mt)	-	-	-	-	-	-	45.0	69.5	AA	-	-	-	-	-	-	n.a.
			Zinc (%)	-	-	-	-	-	-	6.5	6.9		-	-	-	-	-	-	
			Lead (%)	-	-	-	-	-	-	2.4	2.6		-	-	-	-	-	-	
			Copper (%)	-	-	-	-	-	-	0.2	0.2		-	-	-	-	-	-	
			Silver (g/t)	-	-	-	-	-	-	104	113		-	-	-	-	-	-	
			Gold (g/t)	-	-	-	-	-	-	0.1	0.1		-	-	-	-	-	-	
Stockpiles - oxides		OC	Ore (Mt)	-	-	-	-	-	-	0.2	-	AA	-	-	-	-	-	-	n.a.
			Zinc (%)	-	-	-	-	-	-	0.5	-		-	-	-	-	-	-	
			Lead (%)	-	-	-	-	-	-	2.3	-		-	-	-	-	-	-	
			Silver (g/t)	-	-	-	-	-	-	219.0	-		-	-	-	-	-	-	
			Gold (g/t)	-	-	-	-	-	-	0.1	-		-	-	-	-	-	-	
Stockpiles - sulphides		OC	Ore (Mt)	-	-	4.4	8.4	4.4	8.4	2.3	1.9	AA	-	-	-	-	-	-	n.a.
			Silver (g/t)	-	-	207	189	207	189	188	175		-	-	-	-	-	-	
			Gold (g/t)	-	-	0.2	0	0	0	0.2	0.3		-	-	-	-	-	-	
Stockpiles - Polymetallic		OC	Ore (Mt)	-	-	8.4	38.4	8.4	38.4	9.1	49.2	AA	-	-	2.4	2.8	2.4	2.8	BF
			Zinc (%)	-	-	1.8	1.6	1.8	1.6	2	2		-	-	1.5	1.8	1.5	1.8	
			Lead (%)	-	-	0.7	0.7	0.7	0.7	1	1		-	-	0.6	0.7	0.6	0.7	
			Silver (g/t)	-	-	52	48	52	48	43	44		-	-	47	40	47	40	
<b>Total Cerro de Pasco Cu</b>			<b>Ore (Mt)</b>	-	-	-	-	-	-	<b>60</b>	<b>88</b>		-	-	-	-	-	-	
			<b>Copper (%)</b>	-	-	-	-	-	-	<b>0.2</b>	<b>0.2</b>		-	-	-	-	-	-	
<b>Total Cerro de Pasco Au</b>			<b>Ore (Mt)</b>	-	-	<b>7</b>	<b>12</b>	<b>7</b>	<b>12</b>	<b>63</b>	<b>90</b>		-	-	<b>0.4</b>	<b>1</b>	<b>0.4</b>	<b>1</b>	
			<b>Gold (g/t)</b>	-	-	<b>0.8</b>	<b>0.7</b>	<b>0.8</b>	<b>0.7</b>	<b>0.2</b>	<b>0.2</b>		-	-	<b>1.2</b>	<b>1.3</b>	<b>1.2</b>	<b>1.3</b>	
<b>Total Pb-Zn-Ag Zinc</b>			<b>Ore (Mt)</b>	<b>25</b>	<b>26</b>	<b>75</b>	<b>115</b>	<b>99</b>	<b>141</b>	<b>146</b>	<b>215</b>		<b>6</b>	<b>7</b>	<b>17</b>	<b>21</b>	<b>24</b>	<b>28</b>	
			<b>Zinc (%)</b>	<b>5.9</b>	<b>5.3</b>	<b>4.4</b>	<b>3.6</b>	<b>4.8</b>	<b>3.9</b>	<b>4.5</b>	<b>4.4</b>		<b>6.0</b>	<b>4.3</b>	<b>4.1</b>	<b>4.6</b>	<b>4.6</b>	<b>4.6</b>	
			<b>Lead (%)</b>	<b>1.5</b>	<b>1.5</b>	<b>1.2</b>	<b>1.1</b>	<b>1.3</b>	<b>1.1</b>	<b>1.4</b>	<b>1.5</b>		<b>1.1</b>	<b>1.1</b>	<b>0.9</b>	<b>1.1</b>	<b>1.0</b>	<b>1.1</b>	
			<b>Silver (g/t)</b>	<b>87</b>	<b>84</b>	<b>87</b>	<b>82</b>	<b>87</b>	<b>82</b>	<b>85</b>	<b>83</b>		<b>82</b>	<b>80</b>	<b>81</b>	<b>91</b>	<b>81</b>	<b>88</b>	

# Zinc

## Volcan (continued)

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources		Indicated Mineral Resources		Measured and Indicated Resources		Inferred Mineral Resources		C/P	Proved Ore Reserves		Probable Ore Reserves		Total Ore Reserves		CP		
				2021	2020	2021	2020	2021	2020	2021	2020		2021	2020	2021	2020	2021	2020			
<b>Santa Barbara</b>	23.3%	OC	Ore (Mt)	-	-	-	-	-	-	140	140	GR	-	-	-	-	-	-	n.a.		
			Cu (%)	-	-	-	-	-	-	-	0.4	0.4		-	-	-	-	-	-		
			Gold (g/t)	-	-	-	-	-	-	-	0.2	0.2		-	-	-	-	-	-	-	
<b>Rondoni</b>	23.3%	OC	Ore (Mt)	18.4	18.4	34.3	34.3	53	53	7.8	7.8	GR	-	-	-	-	-	-	n.a.		
			Cu (%)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		-	-	-	-	-	-	-	
			<b>Ore (Mt)</b>	<b>18.4</b>	<b>18.4</b>	<b>34.3</b>	<b>34.3</b>	<b>53</b>	<b>53</b>	<b>148</b>	<b>148</b>										
<b>Total Cu</b>			<b>Gold (g/t)</b>	-	-	-	-	-	-	<b>0.2</b>	<b>0.2</b>		-	-	-	-	-	-	-		
			<b>Cu (%)</b>	<b>0.5</b>	<b>0.5</b>	<b>0.5</b>	<b>0.5</b>	<b>0.5</b>	<b>0.5</b>	<b>0.4</b>	<b>0.4</b>		-	-	-	-	-	-	-	-	

Glencore holds 55.0% of the total class A common shares (63.0% of the class A common shares excluding treasury shares) and has an economic interest in Volcan of 23.3% (including the class B common shares and excluding treasury shares)

### Yauli

The Yauli dome is located 100 km east of Lima, Peru. The southern portion of the dome is where Andaychagua, Carahuacra, San Cristobal and Ticlio are located, and is made up of mantos and vein-type deposits. Changes to the 2021 resources are as a result of mineralisation interpretation updates from new drill data. The main mining methods used are Sub-level Stopping and Over Cut and Fill, while the Under Cut and Fill and SARC methods are also applied in some areas. In 2021, Yauli complex production was split between the four operations:

- Andaychagua production was 890 kt grading 5.8% Zn, 1.3% Pb, and 76 g/t Ag.
- Carahuacra production was 457 kt grading 3.7 % Zn, 0.9% Pb and 119 g/t Ag.
- Ticlio production was 345 kt grading 4.6% Zn, 0.8% Pb and 72 g/t Ag.
- San Cristobal production was 1,195 kt grading 5.4% Zn, 0.7% Pb and 104 g/t Ag.

The expected mine lives of the Yauli complex operations are:

- Andaychagua: 6 years based on Ore Reserves and 6 years based on the life of mine schedule which is inclusive of all available economic Mineral Resources categories;
- Carahuacra: 3 years based on Ore Reserves and 10 years based on the life of mine schedule which is inclusive of all available economic Mineral Resources categories;
- Ticlio: 2 years based on Ore Reserves and 3 years based on the life of mine schedule which is inclusive of all available economic Mineral Resources categories;
- San Cristobal: 7-8 years based on Ore Reserves and 10 years based on the life of mine schedule which is inclusive of all available economic Mineral Resources categories.

### Zoraida

The Zoraida deposit is located in the Yauli district, 15 km from the Andaychagua concentrator. The deposit is comprised of three stratiform manto bodies, and smaller volumes of vein and replacement bodies. Changes to the resource in 2021 are a result of new drillhole data and resulting update to the interpretation of the mineralized zones.

### Chungar

Located in the Huaron mining district, Chungar encompasses the Islay and Animon mines. The mineralisation at Islay mainly consists of silver-rich, subordinated lead and zinc, breccia-type fissure fill. The Animon deposit, is a hydrothermal polymetallic deposit. The main mining method at Animon is cut and fill; sub-level stoping production is subordinate. The mining method at Islay is sub-level stoping in vein-hosted mineralisation, and room and pillar for sub-horizontal mineralized bodies.

Resource models were revised for Animon and Islay following integration of new drillhole data and update to the interpretation of the mineralisation wireframes. Notable changes are observed in refining the mineralisation extents at Animon, resulting in a decrease in tonnage with an increase in grade.

Production during 2021 was as follows:

- Animon production was 1.064 Mt at 4.7% Zn, 1.7% Pb and 59 g/t Ag.
- Islay production was 142 kt at 2.4% Zn, 1.0% Pb and 142 g/t Ag.

The expected life of mine is:

- Animon: 2-3 years based on Ore Reserves and 6 years based on the life of mine schedule which is inclusive of all economic Mineral Resources categories.
- Islay: 2 years based on Ore Reserves and 4 years based on the life of mine schedule which is inclusive of all economic Mineral Resources categories.

### Alpamarca

The Alpamarca deposit is a structurally-controlled vein-type deposit located in the Pacaros district of the province of Huari. Resources are reported within an optimized pit shell.

Alpamarca is mined by open cut and in 2021, the mine produced 998kt at 1.1% Zn, 0.8% Pb and 56 g/t Ag. The expected mine life of Alpamarca is less than one year based on Ore Reserves.

### Palma

Palma is a sub-seafloor replacement VMS deposit in the Casma greenstone belt of coastal Peru, which also hosts the Perubar, Cerro Lindo and Colquisiri deposits. Zinc, lead and silver mineralization at Palma is found in a series of semi conformable lenses crosscut by a system of North-South trending dykes. The project is located in the Huarochiri province of Lima.

### Romina II

The Puagjanca and Andrea deposits make up an advanced exploration project, which hosts polymetallic mineralisation that includes zinc, lead, and silver. The deposits outcrop in the form of replacement bodies and sills rich in lead and zinc. It is located 15 km west of the Alpamarca mine in the Pacaros district of the province of Huaral in the region of Lima. The Puagjanca deposit is currently undergoing a Feasibility Study.

### La Tapada

The La Tapada project is in the early exploration stage. It is close to Volcan's Yauli operating unit within the geological formation known as the Yauli Dome. The hosting formation consists of folded structures that are aligned over an intrusive stock, enriched in zinc, lead and silver.

### Cerro de Pasco

The Cerro de Pasco mine hosts polymetallic deposits associated with dacitic pyroclastic volcanism, structural deformation and carbonate replacement. Work continued in 2021 to validate historical drill data and mining voids, resulting in a reduction in the Mineral Resource. The insitu material, hosted in the Raul Rojas block, is segregated by mineralisation type and to reflect different metallurgical/processing methods. The Cerro de Pasco stockpile models were drilled, analysed, and reclassified which led to the loss of previously categorised Inferred resources. An oxide stockpile was added to resource inventory in 2021.

Mineral Resources are reported for polymetallic Pb-Zn, sulphides, and in situ oxides of the Raul Rojas block, as well as stockpiles having demonstrated reasonable prospects for eventual economic extraction. Ore Reserves are declared for areas within existing permit boundaries and expiries; these will potentially be extended depending on a regulatory procedure.

Production in 2021 was 2.6 Mt of stockpile material, grading 1.9% Zn, 0.6% Pb and 32 g/t Ag from sulphide stockpiles, and 0.5 Mt grading 245 g/t Ag and 1.0 g/t Au from the Cerro de Pasco Oxides.

### Santa Bárbara and Rondoni

The geological setting of the Santa Barbara and Rondoni projects are characteristic of Andean Cu-porphyry deposits, with mineralisation dominantly occurring in chalcopyrite-bearing veinlets with intermediate argillic and potassic alteration.



# Zinc

## Other Zinc Mineral Resources (Los Quenuales, Illapa, Sinchi Wayra, Pallas Green)

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources		Indicated Mineral Resources		Measured and Indicated Resources		Inferred Mineral Resources		CP	Proved Ore Reserves		Probable Ore Reserves		Total Ore Reserves			
				2021	2020	2021	2020	2021	2020	2021	2020		2021	2020	2021	2020	2021	2020	2021	2020
<b>Los Quenuales</b>	97.6%																			
Iscaycruz pit		OC	Ore (Mt)	0.4	0.4	0.3	0.2	0.7	0.6	0.03	0.2	AA	-	-	-	-	-	-	-	n.a.
			Zinc (%)	6.4	7.2	7.8	9.2	7.0	8.0	5.3	8.7		-	-	-	-	-	-	-	
			Lead (%)	0.6	0.6	0.7	0.8	0.6	0.7	0.4	0.8		-	-	-	-	-	-	-	
			Copper (%)	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.1		-	-	-	-	-	-	-	
			Silver (g/t)	43	40	39	41	41	40	37	43		-	-	-	-	-	-	-	
Iscaycruz		UG	Ore (Mt)	0.2	0.3	0.2	0.5	0.4	0.7	1.4	0.8	AA	0.1	0.1	0.01	-	0.1	0.1	BF	
			Zinc (%)	16.2	12.6	11.1	7.6	13.4	9.6	8.9	6.5		15.4	13.5	11.2	8.9	14.9	12.6		
			Copper (%)	0.3	0.4	0.5	0.8	0.4	0.6	0.5	0.7		0.2	0.4	0.3	0.3	0.3	0.4		
			Silver (g/t)	16	15	23	27	20	22	13	15		11	11	8	10	11	11		
Yauliyacu		UG	Ore (Mt)	6.2	6.8	11.0	12.0	17.1	18.9	12.9	13.4	AA	1.1	1.4	7.0	6.8	8.1	8.2	BF	
			Zinc (%)	3.0	2.9	3.0	2.9	3.0	2.9	2.9	2.8		1.9	1.9	1.5	1.6	1.6	1.6		
			Lead (%)	1.1	1.0	1.2	1.2	1.2	1.1	1.6	1.5		0.5	0.7	0.5	0.7	0.5	0.7		
			Copper (%)	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3		0.2	0.2	0.2	0.2	0.2	0.2		
			Silver (g/t)	121	107	151	151	140	135	260	247		67	79	87	101	84	97		
Contonga		UG	Ore (Mt)	2.5	2.5	5.0	5.0	7.5	7.5	4.4	4.4	AA	0.3	0.3	0.8	0.8	1.2	1.2	BF	
			Zinc (%)	3.3	3.3	2.9	2.9	3.0	3.0	2.4	2.4		3.3	3.3	3.4	3.4	3.4	3.4		
			Lead (%)	0.5	0.5	0.8	0.8	0.7	0.7	0.8	0.8		0.8	0.8	1.2	1.2	1.1	1.1		
			Copper (%)	0.8	0.8	0.5	0.5	0.6	0.6	0.5	0.5		0.8	0.8	0.5	0.5	0.6	0.6		
			Silver (g/t)	50	50	52	52	51	51	49	49		55	55	63	63	61	61		
<b>Illapa</b>	45%																			
Bolivar		UG	Ore (Mt)	1.1	1.4	1.0	1.0	2.1	2.4	5.5	5.4	AA	0.8	0.8	0.8	0.7	1.5	1.6	BF	
			Zinc (%)	12.9	12.7	12.4	12.2	12.7	12.5	9.5	9.0		9.5	9.4	8.7	8.6	9.1	9		
			Lead (%)	1.4	1.4	1.3	1.3	1.3	1.4	0.9	0.9		1.0	1.1	0.9	0.9	0.9	1.0		
			Silver (g/t)	324	308	293	283	309	297	352	350		248	251	214	215	231	234		
Porco		UG	Ore (Mt)	0.8	0.7	0.4	0.4	1.2	1.1	2.0	2.2	AA	0.2	0.1	0.2	0.1	0.3	0.3	BF	
			Zinc (%)	11.6	10.7	12.6	10.9	12.0	10.8	11.2	11.8		9.6	8.9	10.2	7.8	9.9	8.4		
			Lead (%)	0.7	0.6	1.0	0.8	0.8	0.7	0.8	0.8		0.5	0.4	0.6	0.5	0.5	0.4		
			Silver (g/t)	116	83	154	114	129	93	97	98		102	67	152	104	126	85		
<b>Sinchi Wayra</b>	100%	UG	Ore (Mt)	0.8	0.9	0.6	0.6	1.4	1.6	2.2	2.3	AA	0.9	0.9	0.7	0.6	1.6	1.6	BF	
Caballo Blanco			Zinc (%)	13.6	13.7	13.9	13.1	13.7	13.5	12.3	12.2		7.2	7.3	7.5	7.6	7.3	7.4		
			Lead (%)	3.2	3.7	3.0	3.2	3.1	3.5	2.2	2.4		1.8	2.3	1.6	1.8	1.7	2.1		
			Silver (g/t)	294	364	310	318	301	346	203	241		170	234	175	194	172	217		
<b>Pallas Green</b>	100%																			
Tobermalug Zone			Ore (Mt)	-	-	-	-	-	-	45.4	45.4	AH	-	-	-	-	-	-	n.a.	
			Zinc (%)	-	-	-	-	-	-	7	7		-	-	-	-	-	-		
			Lead (%)	-	-	-	-	-	-	1	1		-	-	-	-	-	-		
			<b>(Mt)</b>	<b>12.0</b>	<b>13.0</b>	<b>19</b>	<b>21</b>	<b>30</b>	<b>35</b>	<b>74</b>	<b>75</b>		<b>3.4</b>	<b>3.6</b>	<b>9.5</b>	<b>9.0</b>	<b>12.8</b>	<b>13.0</b>		
			<b>Zinc (%)</b>	<b>5.6</b>	<b>5.5</b>	<b>4.2</b>	<b>3.8</b>	<b>4.7</b>	<b>4.3</b>	<b>6.6</b>	<b>6.3</b>		<b>6.0</b>	<b>5.6</b>	<b>2.9</b>	<b>2.8</b>	<b>3.6</b>	<b>3.5</b>		
			<b>Lead (%)</b>	<b>1.1</b>	<b>1.6</b>	<b>1.1</b>	<b>1.6</b>	<b>1.1</b>	<b>1.5</b>	<b>1.2</b>	<b>1.2</b>		<b>1.0</b>	<b>1.4</b>	<b>0.7</b>	<b>1.0</b>	<b>0.8</b>	<b>1.1</b>		
			<b>Copper (%)</b>	<b>0.3</b>	<b>0.3</b>	<b>0.3</b>	<b>0.3</b>	<b>0.3</b>	<b>0.3</b>	<b>0.1</b>	<b>0.1</b>		<b>0.1</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>		
			<b>Silver (g/t)</b>	<b>132</b>	<b>129</b>	<b>134</b>	<b>125</b>	<b>133</b>	<b>124</b>	<b>84</b>	<b>83</b>		<b>136</b>	<b>151</b>	<b>104</b>	<b>113</b>	<b>110</b>	<b>122</b>		

# Zinc

## **Iscaycruz**

Zinc, lead and copper mineralisation are exposed as subvertical massive sulphide orebodies. Hydrothermal mineralisation assemblages are mainly composed of sphalerite, galena, pyrite and chalcopyrite distributed in several zones named Limpe Centro, Limpe Sur, Chupa, Tinyag II, Tinyag I and Santa Este, from north to south. Resources are reported only for the Santa Este and Limpe Sur bodies.

Production for 2021 was 76 kt grading 7.6% Zn and 47 g/t Ag. Open pit production from Santa Este in 2021 was 68 kt grading 7.0% Zn, 0.2% Cu and 52 g/t Ag. Underground production for 2021 was 8 Kt grading 12.64% Zn, 0.1% Pb, 0.3% Cu and 13 g/t Ag. Changes in Santa Este Mineral Resources are due to economic factors. For Limpe Sur, changes are due to new drilling information. No reserve is reported for Santa Este as the open pit was depleted in early 2021. Technical and economic assessments are ongoing for Santa Este pit. Processing of mine stockpiles continued until August 2021.

Relevant mining/concession licenses are permanent.

## **Yauliyacu**

Main mineralisation occurs as sphalerite, galena, tetrahedrite and chalcopyrite in 60-80 degrees northwest dipping narrow veins, stockwork and minor replacement massive orebodies.

Changes to the Mineral Resource are due to adjustments on the sterilization of historical production zones, and updated geological interpretation.

The current extraction method at Yauliyacu is sublevel open stoping. Production for year 2021 was 1.2 Mt grading 1.9% Zn, 0.9% Pb and 84 g/t Ag.

The expected life of Yauliyacu is 6 years based on Ore Reserves and 10-11 years based on the life of mine schedule which is inclusive of all economic Mineral Resources categories. Expiry date of relevant mining/concession licenses: permanent.

## **Contonga**

Contonga is a polymetallic deposit of Zinc, and Lead-Silver, and lesser Copper, skarns. There was no production in 2021 as Contonga was placed on care and maintenance in 2019. The expected life of Contonga mine is 3-4 years based on Ore Reserves and 5-6 years based on the life of mine schedule which is inclusive of all economic Mineral Resources categories. Agreement has been reached to sell Contonga to a third party, with closing expected in 2022.

## **Illapa and Sinchi Wayra**

The majority of the deposits within the Illapa and Sinchi Wayra portfolio are epigenetic-hydrothermal base metal type vein and fault-filled mineralisation hosted within a variety of lithologies from volcanic tuffs to sedimentary packages.

The Caballo Blanco operational unit consists of three mines: Colquechaquita, Reserva and Tres Amigos, which supply the central plant, Don Diego, situated close to Potosi. The mines use a combination of narrow vein open stoping, cut and fill mining and shrinkage as the extraction methods.

Production for 2021 for each operation was:

- Bolivar: 267kt grading 8.4% Zn, 0.7% Pb and 205 g/t Ag;
- Porco: 107kt grading 8.1% Zn, 0.6% Pb and 153 g/t Ag;
- Caballo Blanco: 253kt grading 7.0% Zn, 2.1% Pb and 232 g/t Ag.

The expected life of the mines, considering current production capacities, is an average of 7 years based on Ore Reserves and 13 to 15 years based on the life of mine schedule which is inclusive of all available economic Mineral Resource categories.

Expiry date of the relevant mining concessions / authorisations or contracts is different for each mine. Porco and Bolivar - July 2028 (joint venture agreement entered into in 2013) and permanent in respect of Caballo Blanco. Agreement has been reached to sell the Bolivian mines to a third party, with closing expected in 2022.

## **Pallas Green**

The Pallas Green project is situated near Limerick in Southwestern Ireland. The Tobermalug zone consists of multiple, subhorizontal, stratiform lenses of Irishtype, breccia-hosted, sphalerite-galena-pyrite within a Carboniferous limestone. The lenses occur over an area 4,000 m by 4,000 m, and from 300 m to 1,300 m below surface.

The Inferred Mineral Resource is based on 413,600 m of diamond drilling in 806 drill holes completed between 2002 and the end of 2018. Drill spacing is nominally 100 m, but 178 infill drill holes at 50 m spacing have been completed. Mineralisation wireframes were built, taking into account a cut-off of 4% Zn+Pb and a minimum 3.0 m true thickness. There were no changes to the Resource in 2021. The Pallas Green deposit is held under Prospecting Licenses 636 and 2529, which remain valid and in good standing with bi-annual expenditures and reporting.

# Nickel

## Integrated Nickel Operations (INO) (Raglan, Sudbury)

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources		Indicated Mineral Resources		Measured and Indicated Resources		Inferred Mineral Resources		CP	Proved Ore Reserves		Probable Ore Reserves		Total Ore Reserves		
				2021	2020	2021	2020	2021	2020	2021	2020		2021	2020	2021	2020	2021	2020	CP
<b>Raglan</b>	100%	UG	Ore (Mt)	5.22	5.86	18.87	14.08	24.1	19.9	10	15	PSA	4.38	4.17	4.94	6.13	9.32	10.30	RC
			Nickel (%)	3.14	3.15	3.08	3.17	3.09	3.16	3.3	3.2		2.56	2.52	2.76	2.80	2.66	2.69	
			Copper (%)	0.85	0.81	0.91	0.96	0.90	0.91	0.9	0.9		0.72	0.65	0.76	0.81	0.74	0.75	
			Cobalt (%)	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07		0.06	0.05	0.06	0.06	0.06	0.06	
			Platinum (g/t)	0.93	0.86	0.91	0.93	0.91	0.91	0.9	0.9		0.77	0.71	0.81	0.88	0.79	0.81	
			Palladium (g/t)	2.25	2.09	2.28	2.34	2.27	2.27	2.3	2.4		1.87	1.72	1.95	2.14	1.91	1.97	
<b>Sudbury</b>	100%	UG	Ore (Mt)	3.94	3.72	23.88	22.62	27.8	26.3	37	34	JO	3.22	4.10	16.30	13.84	19.52	17.94	JO
			Nickel (%)	1.49	1.70	2.05	2.16	1.97	2.09	0.9	0.9		1.27	1.31	1.86	2.12	1.77	1.93	
			Copper (%)	0.76	0.92	2.48	2.56	2.23	2.33	2.2	2.2		0.64	0.71	0.94	1.01	0.89	0.94	
			Cobalt (%)	0.04	0.04	0.04	0.05	0.04	0.05	0.02	0.02		0.04	0.03	0.04	0.05	0.04	0.05	
			Platinum (g/t)	0.45	0.52	0.95	0.91	0.88	0.85	0.8	0.8		0.40	0.42	0.38	0.38	0.39	0.39	
			Palladium (g/t)	0.40	0.48	1.08	1.13	0.99	1.04	1.0	1.0		0.35	0.37	0.43	0.43	0.41	0.42	
<b>Total INO</b>			<b>Ore (Mt)</b>	<b>9.1</b>	<b>9.6</b>	<b>42.8</b>	<b>36.7</b>	<b>51.9</b>	<b>46.2</b>	<b>47</b>	<b>49</b>		<b>7.60</b>	<b>8.30</b>	<b>21.20</b>	<b>19.90</b>	<b>28.8</b>	<b>28.2</b>	
			<b>Nickel (%)</b>	<b>2.43</b>	<b>2.59</b>	<b>2.50</b>	<b>2.55</b>	<b>2.49</b>	<b>2.55</b>	<b>1.4</b>	<b>1.6</b>		<b>2.01</b>	<b>1.93</b>	<b>2.07</b>	<b>2.33</b>	<b>2.06</b>	<b>2.21</b>	
			<b>Copper (%)</b>	<b>0.81</b>	<b>0.85</b>	<b>1.79</b>	<b>1.95</b>	<b>1.61</b>	<b>1.72</b>	<b>1.9</b>	<b>1.8</b>		<b>0.68</b>	<b>0.67</b>	<b>0.90</b>	<b>0.95</b>	<b>0.84</b>	<b>0.87</b>	
			<b>Cobalt (%)</b>	<b>0.05</b>	<b>0.06</b>	<b>0.05</b>	<b>0.06</b>	<b>0.05</b>	<b>0.06</b>	<b>0.03</b>	<b>0.03</b>		<b>0.05</b>	<b>0.04</b>	<b>0.04</b>	<b>0.06</b>	<b>0.05</b>	<b>0.05</b>	
			<b>Platinum (g/t)</b>	<b>0.73</b>	<b>0.73</b>	<b>0.93</b>	<b>0.92</b>	<b>0.89</b>	<b>0.88</b>	<b>0.8</b>	<b>0.8</b>		<b>0.62</b>	<b>0.57</b>	<b>0.48</b>	<b>0.53</b>	<b>0.52</b>	<b>0.54</b>	
			<b>Palladium (g/t)</b>	<b>1.46</b>	<b>1.47</b>	<b>1.61</b>	<b>1.59</b>	<b>1.58</b>	<b>1.57</b>	<b>1.3</b>	<b>1.4</b>		<b>1.22</b>	<b>1.05</b>	<b>0.78</b>	<b>0.95</b>	<b>0.90</b>	<b>0.99</b>	

For the purposes of this statement, the term 'Ore Reserves' as defined by the JORC Code 2012 has the same meaning as 'Mineral Reserves' as defined in the CIM Standards 2014. The resource totals have been restated in compliance with the JORC Code.

There are no known environmental, permitting, legal, taxation, political or other relevant issues that would materially affect the estimates of the Mineral Reserves.

Depending on when production is scheduled, Mineral Reserves and Resources are calculated using a blend of short, medium, or long term metal price assumptions and exchange rates.

### Raglan

Ni-Cu-Co-PGE mineralisation is located at or near the base of subvolcanic mafic-ultramafic intrusive complexes referred to as the "Raglan Formation". Resources are generally determined at a 1.5% Ni cut-off and are composed of disseminated, net-textured, and massive pyrrhotite-pentlandite-chalcocopyrite rich sulphides contained within 110 individual sulphide lenses, extending from surface to more than 900m vertical depth. The size of these high-grade sulphide lenses varies significantly from 0.01Mt to 6.1Mt, averaging 0.2Mt. Mineral Reserves are sufficient to support a 6 year mine life. Significant undeveloped Mineral Resources provide an opportunity to extend mine life by more than 12 years.

Expiry date of relevant mining leases and exploration licenses: depending on the mine/project, range from 2 May 2024 to 25 June 2038.

### Sudbury

Sulphide deposits sit on broadly defined trends of mineralisation along basal brecciated rocks of the Sudbury Igneous Complex as pentlandite-pyrrhotite-chalcocopyrite rich concentrations as well as within the underlying footwall in fractured pathways as chalcocopyrite dominated polymetallic (Cu, Ni, Au, Ag, Pt, Pd) vein-style sulphides. The Ore Reserve tonnage increased and the grade decreased from 2020 due to the Onaping Depth definition drilling results and associated updates to the resource models, mine design and change to the cut-off grade. Inferred Resources increased due to the recent discovery of the Moose Lake Zone. Cut-off grades are calculated for each individual mine site or resource based on a metal equivalent or net smelter return value taking into account all recoverable metals. The expected reserve-based mine life is 17 years.

All land holdings in Sudbury covering existing Ore Reserves are patented and 100% owned by Glencore, with the exception of one site where a portion of reserves are covered by two licences of occupation which are held in perpetuity. Mineral Resources are also patented with the exception of areas covered by several mining leases which expire in 2033 and 2036 and one License of Occupation which is held in perpetuity.

# Nickel

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources		Indicated Mineral Resources		Measured and Indicated Resources		Inferred Mineral Resources			Proved Ore Reserves		Probable Ore Reserves		Total Ore Reserves		
				2021	2020	2021	2020	2021	2020	2021	2020	CP	2021	2020	2021	2020	2021	2020	CP
<b>Murrin Murrin</b>	100%	OC	Ore (Mt)	139.7	144.1	52.2	74.6	192.0	218.8	9	17	SK	59.5	103.0	9.0	33.9	68.5	136.8	MR/
			Nickel (%)	1.02	1.00	0.98	1.00	1.01	1.00	1.0	0.9		1.09	1.02	1.07	1.04	1.09	1.03	CW
			Cobalt (%)	0.088	0.074	0.070	0.084	0.083	0.077	0.06	0.07		0.113	0.081	0.091	0.109	0.110	0.088	
<b>Koniambo</b>	49%	OC	Ore (Mt)	11.0	11.5	43.8	44.0	54.8	55.5	84	84	RM	11.0	11.0	26.0	26.0	37.0	37.2	RM
			Nickel (%)	2.47	2.47	2.41	2.41	2.42	2.42	2.5	2.5		2.22	2.23	2.19	2.17	2.20	2.20	

## Murrin Murrin

Nickel and cobalt mineralisation at Murrin is hosted within a laterite formed from the weathering of ultramafic rocks. The resources are hosted in multiple deposits over three main project areas (North, South and East). Mineral Resource and Ore Reserve figures as at 31 December 2021 are generated by depletion of the resource models by using end-of-period surface surveys as at 30 September 2021, with adjustments applied for October to December forecast production. Resources are determined at a 0.8% Ni cut-off.

The Murrin 2021 Ore Reserve estimate is based on the optimised Base Case pit shells for Measured and Indicated Mineral Resources, and includes scats and stockpiles. Updates to process modelling, 4-yearly shutdown costs and operating costs have been included. The Ore Reserve tonnage has decreased materially from 2020, due to a combination of mining depletion, increased operating cost assumptions, changes in pillar width assumptions for In-Pit Tailings Storage Facilities and a decrease in the tonnage of low-grade stockpile material included in the Ore Reserve.

Ore Reserve grades have been subject to the application of grade modifying factors. These have been derived from analysis of the latest applicable two years mine-to-mill grade performance and result in grade modifying factors of 96.5% and 93.9% for nickel and cobalt respectively.

Remaining mine life: the most recent Life of Mine schedule indicates the remaining mine life is 22 years or until 2043. Expiry dates for relevant tenements differ for each tenement and range from 2022 to 2043.

## Koniambo

Nickel rich laterite deposits are developed on variably serpentinized ultramafic rocks. Mineral Resources and Ore Reserves include inventories as of 3 November 2021 with adjustments applied for November to December forecast production.

Mineral Resources are calculated through Conditional Simulations within the LOM area. In areas outside the LOM footprint, Mineral Resources were estimated by the plan polygonal method. Mineral Resources and Ore Reserves are reported at a cut-off grade of 2.0% Ni. The differences this year are due to depletion and new drilling.

In converting Mineral Resources to Ore Reserves, a mining recovery of 90% and a mining dilution of 15% (0.5% Ni) were assumed. The mining dilution factors are based on historical data, production reconciliation and equipment selectivity.

Designed yearly production rate is 2.5 Mtpa and expected mine life is 16 years. The expiry date of relevant mining property licences is 31 December 2048. Ore Reserves stated include a stockpile estimated at 257kt at 2.14% Ni between the mine and process plant.

# Ferroalloys

## Chrome

### Bushveld Complex – Western Limb

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources		Indicated Mineral Resources		Measured and Indicated Resources		Inferred Mineral Resources			Proved Ore Reserves		Probable Ore Reserves		Total Ore Reserves		
				2021	2020	2021	2020	2021	2020	2021	2020	CP	2021	2020	2021	2020	2020	2020	CP
<b>Western Chrome Mines – LG6 Chromitite Package and MG1 Chromitite Layer</b>																			
<b>Waterval Mine</b>	79.5%	UG	Ore (Mt)	16.231	16.231	1.03	1.03	17.26	17.26	0.7	0.7	MM/DR	-	-	-	-	-	-	MM/DR
			Cr <sub>2</sub> O <sub>3</sub> (%)	41.31	41.31	42.6	42.6	41.4	41.4	43	43		-	-	-	-	-	-	DR
<b>Marikana West</b>	79.5%	UG	Ore (Mt)	2.974	2.974	1.69	1.69	4.66	4.66	-	-	MM/DR	-	-	-	-	-	-	MM/DR
			Cr <sub>2</sub> O <sub>3</sub> (%)	42.43	42.43	42.6	42.6	42.5	42.5	-	-		-	-	-	-	-	-	DR
<b>Kroondal Mine</b>	79.5%	UG/OC	Ore (Mt)	9.308	9.433	0.61	0.61	9.92	10.04	-	-	MM/DR	2.251	2.476	0.53	0.54	2.78	3.02	MM/DR
			Cr <sub>2</sub> O <sub>3</sub> (%)	42.79	42.76	41.5	41.5	42.7	42.7	-	-		29.11	28.96	28.19	28.14	28.95	28.78	DR
<b>Kroondal Gemini</b>	79.5%	UG/OC	Ore (Mt)	13.793	12.972	0.85	2.21	14.64	15.18	-	-	MM/DR	7.972	7.635	0.69	1.93	8.66	9.57	MM/DR
			Cr <sub>2</sub> O <sub>3</sub> (%)	42.30	42.31	41.3	41.3	42.3	42.2	-	-		30.78	30.73	30.31	30.13	30.75	30.59	DR
<b>Marikana East</b>	79.5%	UG	Ore (Mt)	4.459	4.459	0.52	0.52	4.98	4.98	-	-	MM/DR	-	-	-	-	-	-	MM/DR
			Cr <sub>2</sub> O <sub>3</sub> (%)	42.23	42.23	41.9	41.9	42.2	42.2	-	-		-	-	-	-	-	-	DR
<b>Klipfontein/Waterval</b>	79.5%	UG	Ore (Mt)	13.235	12.278	29.69	22.46	42.93	34.74	92.6	100.7	MM/DR	0.026	0.307	0.17	0.08	0.20	0.39	MM/DR
			Cr <sub>2</sub> O <sub>3</sub> (%)	42.01	42.06	42.0	42.0	42.0	42.0	42	42		28.49	27.99	28.37	28.29	27.82	27.84	DR
<b>Boshoek</b>	79.5%	UG/OC	Ore (Mt)	-	-	17.09	17.09	17.09	17.09	-	-	MM/DR	-	-	0.58	0.58	0.58	0.58	MM/DR
			Cr <sub>2</sub> O <sub>3</sub> (%)	-	-	40.5	40.5	40.5	40.5	-	-		-	-	26.14	26.1	26.14	26.1	DR
<b>Townlands Extension 9</b>	79.5%	UG	Ore (Mt)	-	-	12.94	12.94	12.94	12.94	-	-	MM/DR	-	-	-	-	-	-	MM/DR
			Cr <sub>2</sub> O <sub>3</sub> (%)	-	-	41.4	41.4	41.4	41.4	-	-		-	-	-	-	-	-	
<b>Total LG6 and MG1</b>			<b>Ore (Mt)</b>	<b>60.000</b>	<b>58.347</b>	<b>64.42</b>	<b>58.55</b>	<b>124.42</b>	<b>116.89</b>	<b>93.3</b>	<b>101.4</b>		<b>10.249</b>	<b>10.418</b>	<b>1.97</b>	<b>3.13</b>	<b>12.22</b>	<b>13.56</b>	
			<b>Cr<sub>2</sub>O<sub>3</sub> (%)</b>	<b>42.05</b>	<b>42.05</b>	<b>41.5</b>	<b>41.4</b>	<b>41.8</b>	<b>41.7</b>	<b>42</b>	<b>42</b>		<b>30.41</b>	<b>30.23</b>	<b>28.3</b>	<b>29.0</b>	<b>30.1</b>	<b>29.9</b>	
<b>Western Chrome Mines – Tailings</b>																			
<b>Tailings</b>	79.5%		Ore (Mt)	-	-	-	-	-	-	3.1	2.9	MM/DR	-	-	-	-	-	-	
			Cr <sub>2</sub> O <sub>3</sub> (%)	-	-	-	-	-	-	18	17		-	-	-	-	-	-	

Tonnages are quoted as dry million metric tonnes. Grades are quoted as %Cr<sub>2</sub>O<sub>3</sub>. The Measured and Indicated Mineral Resources are inclusive of those Mineral Resources modified to produce Ore Reserves.

The chromitite assets include those owned by Glencore and Merafe in different ownership percentages, the attributable interest in such assets remain as reflected.

All Glencore Ferroalloys' chrome operations mine the chromitite deposits developed within the world renowned Bushveld Complex of South Africa. The 2060 Ma year-old Bushveld Complex is the largest known deposit of chrome, vanadium and platinum group elements (PGEs) in the world. The Bushveld Complex stretches 350km east-west and 450km north-south. The chrome ore is mined from shallow dipping (8° – 14°) tabular orebodies.

Although there are numerous chromitite layers developed in the Bushveld Complex, the chromitite layers targeted for economic exploitation are the LG6/LG6A Chromitite Layer package, the MG1 and the MG2 Chromitite Layers. Alternative layers are being investigated on a continuous basis.

No cut-off grades are applied to the chromitite layers being mined. The chromitite layers are mined from upper to lower contact and no selective mining cuts are applied. The chromitite layer grades show exceptional regional grade consistency and continuity. The chromitite layers are currently all mined underground using trackless mechanised mining methods on a bord-and-pillar mine layout.

The Mineral Resources are estimated as chromitite tonnages and grades to reflect the grades of the various individual chromitite layers and have been presented by separate layers for clarity in this report. To this end the Mineral Resources for the Eastern Limb properties have been split between the MG1 and MG2 Chromitite Layers. Both the LG6 and MG1 Chromitite Layers which Glencore currently mine are discrete solid chromitite layers with sharp contacts.

Changes in the year on year Mineral Resource tonnage and grade estimates are mainly due to mining depletion, changes due to additional geological information gained through exploration and mining and prospecting right boundary changes. These changes reflect in the tonnage and grade reports from the grade block models.

The tonnages and grades for all the tailings facilities that can be economically exploited have been estimated and declared.

The tonnage and grade estimations for the chromitite layers are initiated by the geostatistical analysis of the exploration drill hole data. The outcomes of this analysis are used in the construction of block models for each and every mine and project area. The geostatistical analysis of the chromitite data indicates a high degree of continuity both in grade and thickness of the chromitite layers. The block model estimates are verified using geostatistical parameters such as Kriging Efficiency to test the stability of the variograms used and the suitability of the selected cell sizes and Kriging parameters. Post-estimate validations are done using swath plots and quantile-quantile plots. Tonnages and grades are reported from these block models for each mine and project. There is a high degree of confidence in the tonnage and grade estimations derived from the block models. This is confirmed by the monthly and yearly reconciliations between the block model estimates, the monthly survey measurements and the actual mine production for each operating mine. The tailings facility estimates are based on current and historical daily production sampling and dam volumes, surveyed by a certified surveyor.

The LOM for the operating chrome mines varies between 2.5 and 5 years based on the declared Ore Reserves. The LOM periods for the various operating mines, based on all the Mineral Resources converted to Ore Reserves vary between 13 and 43 years. The Mining Right expiry dates vary from 2037 to 2039 for the operating chrome mines. All the chrome mining rights were granted for an initial period of 30 years.

The production rates for the various chrome mines vary from 110kt ROM per month to 147kt ROM per month.

#### Western Chrome Mines

The Western Chrome Mines mining complex consist of the operating mine of Kroondal and the resource areas of Waterval, Klipfontein/Waterval and Boshoek. The Mineral Resources had a net decrease of 0.156 Mt after mining depletion. The Ore Reserves had a net increase of 0.023Mt after mining depletion.

No material changes were recorded compared with the 2020 resource and reserve estimation.

# Ferroalloys

## Bushveld Complex – Eastern Limb

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources		Indicated Mineral Resources		Measured and Indicated Resources		Inferred Mineral Resources		CP	Proved Ore Reserves		Probable Ore Reserves		Total Ore Reserves		
				2021	2020	2021	2020	2021	2020	2021	2020		2021	2020	2021	2020	2021	2020	CP
<b>Eastern Chrome Mines –MG1 Chromitite Layer</b>																			
<b>Thornccliffe</b>	79.5%	UG/OC	Ore (Mt)	44.028	45.095	3.47	3.60	47.50	48.70	-	-	SV/	20.224	22.959	2.51	2.62	22.73	25.58	SV/
			Cr <sub>2</sub> O <sub>3</sub> (%)	40.03	42.21	40.8	40.9	40.1	42.1	-	-	DR	34.78	34.31	32.9	33.0	34.6	34.2	DR
<b>Helena</b>	79.5%	UG/OC	Ore (Mt)	21.473	23.396	13.29	13.02	34.76	36.42	9.6	10.4	SV/	1.667	4.271	-	-	1.67	4.27	SV/
			Cr <sub>2</sub> O <sub>3</sub> (%)	39.81	39.80	38.5	38.5	39.3	39.3	38	38	DR	29.43	29.15	-	-	29.4	29.2	DR
<b>De Grooteboom</b>	79.5%	UG/OC	Ore (Mt)	1.037	1.037	0.50	0.50	1.54	1.54	-	-	SV/	-	-	-	-	-	-	SV/
			Cr <sub>2</sub> O <sub>3</sub> (%)	40.22	40.22	40.3	40.3	40.2	40.2	-	-	DR	-	-	-	-	-	-	-
<b>Richmond</b>	79.5%	UG	Ore (Mt)	1.559	1.774	22.27	23.22	23.83	24.99	25.9	24.6	SV/	1.256	0.471	2.57	1.81	3.82	2.28	SV/
			Cr <sub>2</sub> O <sub>3</sub> (%)	41.10	41.23	41.0	41.1	41.0	41.1	41	41	DR	34.69	36.36	32.6	34.9	33.3	35.2	DR
<b>St George</b>	79.5%	UG	Ore (Mt)	0.716	0.715	4.45	4.39	5.17	5.11	18.6	18.5	SV/	-	-	-	-	-	-	SV/
			Cr <sub>2</sub> O <sub>3</sub> (%)	40.41	40.41	39.4	39.7	39.5	39.8	39	40	DR	-	-	-	-	-	-	-
<b>Total MG1</b>			<b>Ore (Mt)</b>	<b>68.813</b>	<b>72.017</b>	<b>43.98</b>	<b>44.73</b>	<b>112.80</b>	<b>116.76</b>	<b>54.1</b>	<b>53.5</b>		<b>23.147</b>	<b>27.701</b>	<b>5.08</b>	<b>4.43</b>	<b>28.22</b>	<b>32.13</b>	
			<b>Cr<sub>2</sub>O<sub>3</sub> (%)</b>	<b>39.99</b>	<b>41.36</b>	<b>40.1</b>	<b>40.2</b>	<b>40.0</b>	<b>40.9</b>	<b>40</b>	<b>40</b>		<b>34.39</b>	<b>33.55</b>	<b>32.7</b>	<b>33.8</b>	<b>34.1</b>	<b>33.6</b>	
<b>Eastern Chrome Mines – MG2 Chromitite Layer</b>																			
<b>Thornccliffe Mine</b>	79.5%	UG/OC	Ore (Mt)	-	-	-	-	-	-	41.8	41.8	SV/	-	-	-	-	-	-	SV/
			Cr <sub>2</sub> O <sub>3</sub> (%)	-	-	-	-	-	-	-	38	38	DR	-	-	-	-	-	-
<b>Helena Mine</b>	79.5%	UG/OC	Ore (Mt)	-	-	-	-	-	-	85.4	85.4	SV/	-	-	-	-	-	-	SV/
			Cr <sub>2</sub> O <sub>3</sub> (%)	-	-	-	-	-	-	-	38	38	DR	-	-	-	-	-	-
<b>Total MG2</b>			<b>Ore (Mt)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>127.2</b>	<b>127.2</b>		<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	
			<b>Cr<sub>2</sub>O<sub>3</sub> (%)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>38</b>	<b>38</b>		<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	
<b>Total MG1 and MG2</b>			<b>Ore (Mt)</b>	<b>68.813</b>	<b>72.017</b>	<b>43.98</b>	<b>44.73</b>	<b>112.80</b>	<b>116.76</b>	<b>181.3</b>	<b>180.7</b>		<b>23.147</b>	<b>27.701</b>	<b>5.08</b>	<b>4.43</b>	<b>28.22</b>	<b>32.13</b>	
			<b>Cr<sub>2</sub>O<sub>3</sub> (%)</b>	<b>39.99</b>	<b>41.36</b>	<b>40.1</b>	<b>40.2</b>	<b>40.0</b>	<b>40.9</b>	<b>39</b>	<b>39</b>		<b>34.39</b>	<b>33.55</b>	<b>32.7</b>	<b>33.8</b>	<b>34.1</b>	<b>33.6</b>	
<b>Eastern Chrome Mines – Tailings</b>																			
<b>Tailings</b>	79.5%		Ore (Mt)	-	-	-	-	-	-	4.9	4.9	SV	-	-	-	-	-	-	SV
			Cr <sub>2</sub> O <sub>3</sub> (%)	-	-	-	-	-	-	-	20	20		-	-	-	-	-	-

### Eastern Chrome Mines

The Eastern Mines Complex had a net increase in Mineral Resources of 2.363Mt after mining depletion. The increase was mainly due to the addition of pillars. The Ore Reserves of the Eastern Mines had a net decrease of 0.225 Mt after mining depletion.

# Ferroalloys

## Vanadium

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources		Indicated Mineral Resources		Measured and Indicated Resources		Inferred Mineral Resources		CP	Proved Ore Reserves		Probable Ore Reserves		Total Ore Reserves		
				2021	2020	2021	2020	2021	2020	2021	2020		2021	2020	2021	2020	2021	2020	CP
<b>Rhovan</b>	74.0%	OC	Ore (Mt)	51.662	49.754	33.49	35.56	85.15	85.31	91	93	SM/DR	19.993	22.223	8.18	9.45	28.17	31.67	SM/
			V <sub>2</sub> O <sub>5</sub> (%)	0.47	0.47	0.5	0.5	0.5	0.5	0.5	0.5		0.46	0.47	0.43	0.43	0.5	0.5	DR

Tonnages are quoted as dry million metric tonnes. Grades are quoted as %V2O5.

The Measured and Indicated Mineral Resources are inclusive of those Mineral Resources modified to produce Ore Reserves.

The vanadium mining operations mine the vanadiferous magnetite deposits developed within the Bushveld Complex, South Africa. The 2060 Ma year-old Bushveld Complex is the largest known deposit of chrome, vanadium and platinum group elements (PGE's) in the world.

The magnetite ore is mined from shallow dipping (6° – 25°) stratified magnetite orebodies developed in the Upper Zone of the Bushveld Complex. Various ore zones with varying grades can be identified within the orebody. The ore zones are defined based on their magnetite and vanadium content.

The magnetite ore is mined using open cast mining methods.

### Rhovan

There was a net increase of 0.426 Mt in the Mineral Resource estimate after mining depletions have been discounted. The change is mainly due to re-interpretation and re-estimation of the Mineral Resources.

The Ore Reserves had a net decrease of 1.101 Mt after mining depletions have been discounted. The change is mainly due to re-interpretation and re-estimation of the Mineral Resources before the conversion to Ore Reserves. Obsidian Consulting Services updated the estimate of the Mineral Resources for all production areas including, Leeuven, Pit 1, Pit 2, Pit 3 as well as Pit6W and Pit7. This update made use of data from 53 new exploration holes and 1,360 blastholes providing some 8,825 new assay results.

The tonnage and grade estimations were done using ordinary kriging utilising spherical semi-variograms models derived from the exploration drill hole and blast hole data. The block model estimates were assessed using geostatistical parameters such as Kriging Efficiency and Slope of Regression to test the stability of the variogram models used and the suitability of the selected cell sizes. A final geospatial validation was done by visual inspections and the compilation of swath and QQ plots. Other validations included a comparison of distributions of the source data versus estimated results. Tonnages and grades are reported from the block models for each pit. For the estimation, cut-off grades of 15% Magnetics and 1.8% V<sub>2</sub>O<sub>5</sub> were applied for Pits 1, 2, 3 and Leeuven while 15% Magnetics and 1.85 % V<sub>2</sub>O<sub>5</sub> was used for the Pit 4, 6, 6 West and 7 areas. The degree of confidence in the tonnage and grade estimations derived from the block models is reflected in the classified Mineral Resource classes.

The Rhovan LOM based on the declared Ore Reserves is 10 years. The LOM based on all the Mineral Resources converted to Ore Reserves is over 30 years. Rhovan is mining from various open cast pits at an actual mining rate averaging 233kt of ROM per month (2021). The stripping ratio averaged 1.54 (t:t) for the same period.

The Mining Right expires in 2027.

# Ferroalloys

## Manganese

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources		Indicated Mineral Resources		Measured and Indicated Resources		Inferred Mineral Resources		CP	Proved Ore Reserves		Probable Ore Reserves		Total Ore Reserves		
				2021	2020	2021	2020	2021	2020	2021	2020		2021	2020	2021	2020	2021	2020	CP
<b>Mokala</b>	49.0%	OC	Ore (Mt)	26.229	27.186	19.55	19.55	45.78	46.74	3	3	JC/DR	20.490	21.650	5.66	4.10	26.15	25.75	JC/
			Mn (%)	37.56	37.24	36.4	36.5	37.1	36.9	36	36		36.27	36.34	35.9	35.9	36.2	36.3	PJG

Tonnages are quoted as dry million metric tonnes. Grades are quoted as %Mn.

The Measured and Indicated Mineral Resources are inclusive of those Mineral Resources modified to produce Ore Reserves.

The manganese mining operation mine the manganese deposits developed within the Kalahari Manganese Field, South Africa. The Kalahari Manganese Field is the largest known deposit of manganese in the world.

The manganese ores in the Kalahari Manganese Field are mined from both underground and opencast operations. The manganese orebodies, occur as three stratiform beds, the Upper, Middle and Lower Ore Bodies, developed within the Hotazel Formation. The Hotazel Iron Formation consists of banded iron formations with interbedded manganese ores. In the Mokala area, the Hotazel Formation sub-crop below the Kalahari Formation, the Mooidraai Dolomites and the Dwyka Tillite.

### Mokala

There was a net increase of 0.055 Mt in the Mineral Resource estimate after mining depletions have been discounted. The change is mainly due to re-interpretation and re-estimation of the Mineral Resources.

The Ore Reserves had a net increase of 1.454 Mt after mining depletions have been discounted. The change is mainly due to re-interpretation and re-estimation of the Mineral Resources before the conversion to Ore Reserves. Mokala is situated on the farm Gloria 4 km's west of the town of Hotazel, Northern Cape, South Africa. Stripping of waste commenced in May 2020 and Ore production began in March 2021.

The target mineralization is the Lower Manganese ore-body which vary in thickness from a few meters to >20m. The ore-body is shallow dipping towards the west at 5°- 12°.

The mining cut has been defined by a minimum composite cut-off grade of 36% Mn, and a minimum sample cut-off grade of 28% Mn.

Obsidian Consulting Services has been contracted to estimate the Mineral Resources for the Mokala pit during November 2021.

The tonnage and grade estimations were done using geo-statistical analysis of the exploration drill holes. From this analysis, the most appropriate parameters for the construction of a block model for the pit was derived. The block model estimates are verified using geostatistical parameters such as Kriging Efficiency and Slope of Regression to test the stability of the variograms used and the suitability of the selected cell sizes. A final geospatial validation is done by means of swath and QQ plots. Other validations included a comparison of distributions of the source data versus estimated results. Tonnages and grades are reported from the block model for an optimised pit. For the estimation, a composite cut-off grade of 36% Mn was used and a sample cut-off grade of 28% Mn. The degree of confidence in the tonnage and grade estimations derived from the block model is reflected in the classified Mineral Resource classes. Known non-mineralised and restricted areas are excluded from the Mineral Resources.

The Mokala Ore Reserves is based on a pit optimisation exercise conducted during November 2019. The main input parameters for the optimisation were the forward looking Mn prices at the time of the exercise, US\$ 4.20 per dtmu for lump and US\$ 3.70 per dtmu for fines, minimum 36% Mn.

The Mineral Resources to Ore Reserves conversion was based on a mining extraction rate of 98% and skin dilution along the upper and lower contacts of the mining cut.

The Mokala LOM of the declared Ore Reserves is 16 years, based on a mining rate of 130kt per month. The average stripping ratio for the LOM is 4.9 (m3:t).

The Mining Right expires in 2037



# Aluminium/Alumina

## Aurukun Mineral Resources

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources		Indicated Mineral Resources		Measured and Indicated Resources		Inferred Mineral Resources		CP	Proved Ore Reserves		Probable Ore Reserves		Total Ore Reserves			
				2021	2020	2021	2020	2021	2020	2021	2020		2021	2020	2021	2020	2021	2020	CP	
Aurukun	70%	OC	Ore (Mt)	96	96	331	352	427	448	3	4	JB	-	-	-	-	-	-	-	n.a.
			Al <sub>2</sub> O <sub>3</sub> (%)	53.5	53.3	49.9	49.7	50.7	50.5	49.4	48.8	-	-	-	-	-	-	-	-	-

### Aurukun

The Aurukun Bauxite deposits are located on the western side of the Cape York Peninsula in far north Queensland, Australia. Glencore currently holds tenure to the deposits via a mineral development licence or "MDL" granted in late 2017, which allows feasibility studies to be performed. Currently there is no production from the MDL. In 2004 and 2005, the Queensland State government funded the Aurukun Geoscientific Investigation Programme. The programme involved drilling approximately 8,500 drill holes and produced approximately 200,000 samples at 0.25m intervals. Most samples were assayed. All samples sent to the lab were beneficiated at 1.2 mm screen size and the +1.2 mm fraction analysed.

The samples from the 2004/05 programme were used to produce the November 2018 bauxite resource model. The tonnes and grade estimates for this 2021 Mineral Resource statement are based on the November 2018 resource model.

Measured and indicated Mineral Resources decreased by 21 million tonnes (5%) from 2020 to 2021 due to changes in the economic assumptions, resulting from an increase in mining and processing costs and an increase in the exchange rate.

# Iron ore

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources		Indicated Mineral Resources		Measured and Indicated Resources		Inferred Mineral Resources		CP	Proved Ore Reserves		Probable Ore Reserves		Total Ore Reserves		
				2021	2020	2021	2020	2021	2020	2021	2020		2021	2020	2021	2020	2021	2020	2021
<b>El Aouj Mining Company S.A.</b>																			
Guelb el Aouj East	50%	OC	Ore (Mt)	400	400	1,170	1,170	1,570	1,570	300	300	AM / SvdM	380	380	551	551	931	931	NS
			Iron (%)	36	36	36	36	36	36	36	36		35	35	35	35	35	35	
			DTC wt (%)	45	45	45	45	45	45	45	45		44	44	43	43	44	44	
			DTC iron (%)	69.8	69.8	69.2	69.2	69.3	69.3	69.5	69.5		69.6	69.6	69.0	69.0	69.2	69.2	
			Oxidised (Mt)	70	70	80	80	150	150	30	30		-	-	-	-	-	-	
			Iron (%)	34	34	35	35	35	35	35	35		-	-	-	-	-	-	
Guelb el Aouj Centre	50%	OC	Ore (Mt)	-	-	185	185	185	185	615	615	AM / SvdM	-	-	-	-	-	-	n.a.
			Iron (%)	-	-	34	34	34	34	35	35		-	-	-	-	-	-	
			DTC wt (%)	-	-	43	43	43	43	44	44		-	-	-	-	-	-	
			DTC iron (%)	-	-	69.6	69.6	69.6	69.6	69.8	69.8		-	-	-	-	-	-	
			Oxidised (Mt)	-	-	-	-	-	-	45	45		-	-	-	-	-	-	
			Iron (%)	-	-	-	-	-	-	33	33		-	-	-	-	-	-	
Bou Derga	50%	OC	Ore (Mt)	-	-	-	-	-	-	510	510	AM / SvdM	-	-	-	-	-	-	n.a.
			Iron (%)	-	-	-	-	-	-	36	36		-	-	-	-	-	-	
			DTC wt (%)	-	-	-	-	-	-	43	43		-	-	-	-	-	-	
			DTC iron (%)	-	-	-	-	-	-	69.7	69.7		-	-	-	-	-	-	
			Oxidised (Mt)	-	-	-	-	-	-	130	130		-	-	-	-	-	-	
			Iron (%)	-	-	-	-	-	-	35	35		-	-	-	-	-	-	
Tintekrate	50%	OC	Ore (Mt)	-	-	-	-	-	-	710	710	AM / SvdM	-	-	-	-	-	-	n.a.
			Iron (%)	-	-	-	-	-	-	36	36		-	-	-	-	-	-	
			DTC wt (%)	-	-	-	-	-	-	44	44		-	-	-	-	-	-	
			DTC iron (%)	-	-	-	-	-	-	69.4	69.4		-	-	-	-	-	-	
			Oxidised (Mt)	-	-	-	-	-	-	180	180		-	-	-	-	-	-	
			Iron (%)	-	-	-	-	-	-	34	34		-	-	-	-	-	-	
<b>Total El Aouj Mining Company S.A.</b>			<b>Ore (Mt)</b>	<b>470</b>	<b>470</b>	<b>1,435</b>	<b>1,435</b>	<b>1,905</b>	<b>1,905</b>	<b>2,520</b>	<b>2,520</b>		<b>380</b>	<b>380</b>	<b>551</b>	<b>551</b>	<b>931</b>	<b>931</b>	
			<b>Iron (%)</b>	<b>36</b>	<b>36</b>	<b>36</b>	<b>36</b>	<b>36</b>	<b>36</b>	<b>35</b>	<b>35</b>		<b>35</b>	<b>35</b>	<b>35</b>	<b>35</b>	<b>35</b>	<b>35</b>	
<b>Sphere Mauritania S.A.</b>																			
Askaf North	90%	OC	Ore (Mt)	200	200	160	160	360	360	45	45	AM / SvdM	-	-	-	-	-	-	n.a.
			Iron (%)	36	36	35	35	36	36	36	36		-	-	-	-	-	-	
			DTC wt (%)	47	47	45	45	46	46	45	45		-	-	-	-	-	-	
			DTC iron (%)	69.8	69.8	69.4	69.4	69.6	69.6	69.2	69.2		-	-	-	-	-	-	
			Oxidised (Mt)	15	15	30	30	45	45	15	15		-	-	-	-	-	-	
			Iron (%)	35	35	35	35	35	35	35	35		-	-	-	-	-	-	
Askaf Centre	90%	OC	Ore (Mt)	-	-	-	-	-	-	95	95	AM / SvdM	-	-	-	-	-	-	n.a.
			Iron (%)	-	-	-	-	-	-	36	36		-	-	-	-	-	-	
			DTC wt (%)	-	-	-	-	-	-	42	42		-	-	-	-	-	-	
			DTC iron (%)	-	-	-	-	-	-	69.9	69.9		-	-	-	-	-	-	
			Oxidised (Mt)	-	-	-	-	-	-	13	13		-	-	-	-	-	-	
			Iron (%)	-	-	-	-	-	-	37	37		-	-	-	-	-	-	
Askaf East	90%	OC	Ore (Mt)	-	-	-	-	-	-	70	70	AM / SvdM	-	-	-	-	-	-	n.a.
			Iron (%)	-	-	-	-	-	-	35	35		-	-	-	-	-	-	
			DTC wt (%)	-	-	-	-	-	-	42	42		-	-	-	-	-	-	
			DTC iron (%)	-	-	-	-	-	-	70.3	70.3		-	-	-	-	-	-	
			Oxidised (Mt)	-	-	-	-	-	-	13	13		-	-	-	-	-	-	
			Iron (%)	-	-	-	-	-	-	31	31		-	-	-	-	-	-	
<b>Total Sphere Mauritania S.A.</b>			<b>Ore (Mt)</b>	<b>215</b>	<b>215</b>	<b>190</b>	<b>190</b>	<b>405</b>	<b>405</b>	<b>251</b>	<b>251</b>		<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	
			<b>Iron (%)</b>	<b>36</b>	<b>36</b>	<b>35</b>	<b>35</b>	<b>36</b>	<b>36</b>	<b>35</b>	<b>35</b>		<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	

# Iron ore

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources		Indicated Mineral Resources		Measured and Indicated Resources		Inferred Mineral Resources		CP	Proved Ore Reserves		Probable Ore Reserves		Total Ore Reserves		CP
				2021	2020	2021	2020	2021	2020	2021	2020		2021	2020	2021	2020	2021	2020	
<b>Sphere Lebtheinia S.A.</b>																			
Lebtheinia Centre	100%		Ore (Mt)	-	-	2,180	2,180	2,180	2,180	350	350	AM / SvdM	-	-	-	-	-	-	n.a.
			Iron (%)	-	-	32	32	32	32	32	32		-	-	-	-	-	-	
			DTC wt (%)	-	-	27	27	27	27	27	27		-	-	-	-	-	-	
			DTC iron (%)	-	-	68.6	68.6	68.6	68.6	68.1	68.1		-	-	-	-	-	-	
			Oxidised (Mt)	-	-	-	-	-	-	210	210		-	-	-	-	-	-	
			Iron (%)	-	-	-	-	-	-	31	31		-	-	-	-	-	-	
<b>Junelle Limited</b>																			
Zanaga	50%	OC	Ore (Mt)	2,300	2,300	2,500	2,500	4,800	4,800	2,100	2,100	MT	770	770	1,290	1,290	2,070	2,070	GB
			Iron (%)	34	34	30	30	32	32	31	31		37	37	32	32	34	34	

All Mineral Resources are considered suitable for open cut extraction.

DTC wt (%) – Davis Tube Concentrate mass recovery.

DTC Iron (%) – Davis Tube Concentrate assay %Fe.

Davis Tube test work has been conducted at a grind size of 95% passing 80 micron.

The rounding used for the values in this report reflects the confidence in the different levels of Mineral Resource and Ore Reserve classifications.

No exploration activities were carried out in the reporting period.

**El Aouj Mining Company:** Glencore holds a 50% interest in the El Aouj Mining Company through a Joint Venture arrangement with SNIM.

**Guelb el Aouj East:** The “Guelb” deposits are hosted in Banded Iron Formations (BIF) within the Dorsale Reguibat, an uplifted part of the Archaean West African Craton, which dominates the northern third of Mauritania’s surface geology. Recrystallisation and aggregation of the magnetite grains in BIF has resulted in the partial to total destruction of the original banded (bedding) texture to produce the Guelb el Aouj magnetite-quartzite deposits.

The geological sequence is overprinted by a reasonably uniform, approximately 80m thick weathered zone in which much of the magnetite has oxidised to hematite.

In 2018, the FEED phase of the development programme was completed. The project is based on the production of 11.3Mtpa of sinter feed product derived from fresh magnetite ore, beneficiated to product 66.5% iron content concentrate. The FEED phase has provided a firm and costed project implementation plan, and options to further enhance the project's viability.

Mineral Resources and Ore Reserves are unchanged compared to previous reporting periods. The long term IODEX65 pricing for Ore Reserves modelling is \$90/dmt CFR North China.

This resource uses a cut-off grade of 20% DTC wt% for fresh (unoxidised) mineralisation and a cut-off grade of 20% head Fe for oxidised mineralisation. All reported concentrate grades were weighted by DTC wt%.

**Guelb el Aouj Centre:** The El Aouj Centre magnetite-quartzite (MQ) deposit is a highly metamorphosed banded iron formation (meta-BIF) unit that ranges in true thickness from 50m to over 200m. The geometry of the deposit is defined by a tight synformal structure with a sub-vertical axial plane. The synform outcrops over a strike length of about 2.4km. The thickest accumulation of magnetite-quartzite is found along the western limb of the synform, pinching out towards the east. A series of stacked recumbent isoclinal folds probably controlled the overall geometry of the deposit. The original bedding has been partially to completely obliterated by recrystallisation, resulting in a coarse-grained texture with aggregated magnetite grains. The weathered zone, though variable, has an average vertical thickness of approximately 40m. In this zone partial to complete oxidation of magnetite to hematite has occurred.

This resource uses a cut-off grade of 20% DTC wt% for fresh (unoxidised) mineralisation and a cut-off grade of 20% head Fe for oxidised mineralisation. All reported concentrate grades were weighted by DTC wt%.

**Bou Derga:** The Bou Derga deposit forms part of a larger scale synformal structure defined by an Archaean magnetite-quartzite (MQ) unit that ranges in true thickness from approximately 20m to 200m. The thicker parts of the deposit are considered to be a result of isoclinal folding. Drilling was restricted to the western fold closure. The deposit dips towards the northeast at about 60°. The deposit contains a number of internal waste bands (typically 5m to 50m thick) which have been modelled separately and excluded from the Mineral Resource estimation. A northwest-southeast trending fault displaces the mineralisation in the south-eastern part of the deposit.

This resource uses a cut-off grade of 20% DTC wt% for fresh (unoxidised) mineralisation and a cut-off grade of 20% head Fe for oxidised mineralisation. All reported concentrate grades were weighted by DTC wt%.

The Bou Derga Mineral Resource Statement has been prepared in accordance with the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the JORC Code, 2004 Edition).

**Tintekrate:** The Tintekrate deposit is hosted within the Dorsale Reguibat, an uplifted part of the Archaean West African Craton, which dominates the northern third of Mauritania’s surface geology. Recrystallisation and aggregation of the magnetite grains in the meta-banded iron formation (BIF) units has resulted in partial to total destruction of the original banded (bedding) texture to produce the Tintekrate and other similar magnetite-quartzite deposits. The Tintekrate deposit is a circular structure defined by a steep dipping MQ unit with dips of 50° to 80° (locally overturned) with true mineralised thicknesses of 100m to 150m on the western side of the structure to 50m to 100m on the eastern side. The weathered zone averages 70m to 75m vertical depth below natural surface and its base tends to mirror the natural surface profile. In this zone, magnetite has been partially to completely oxidised to hematite.

This resource uses a cut-off grade of 20% DTC wt% for fresh (unoxidised) mineralisation and a cut-off grade of 20% head Fe for oxidised mineralisation. All reported concentrate grades were weighted by DTC wt%.

**Tintekrate:** The Tintekrate deposit is hosted within the Dorsale Reguibat, an uplifted part of the Archaean West African Craton, which dominates the northern third of Mauritania’s surface geology. Recrystallisation and aggregation of the magnetite grains in the meta-banded iron formation (BIF) units has resulted in partial to total destruction of the original banded (bedding) texture to produce the Tintekrate and other similar magnetite-quartzite deposits. The Tintekrate deposit is a circular structure defined by a steep dipping MQ unit with dips of 50° to 80° (locally overturned) with true mineralised thicknesses of 100m to 150m on the western side of the structure to 50m to 100m on the eastern side. The weathered zone averages 70m to 75m vertical depth below natural surface and its base tends to mirror the natural surface profile. In this zone, magnetite has been partially to completely oxidised to hematite.

This resource uses a cut-off grade of 20% DTC wt% for fresh (unoxidised) mineralisation and a cut-off grade of 20% head Fe for oxidised mineralisation. All reported concentrate grades were weighted by DTC wt%.

# Iron ore

**Askaf North:** Askaf North Deposit is an east-west striking synformal structure defined by a magnetite-quartzite (MQ) unit that ranges in true thickness from approximately 140m in the western hinge zone to approximately 30m along the eastern part of the southern limb. The synformal axis plunges at between 20° to 30° towards the east in the western part of the synform, and at about 35° to 45° towards the west at the eastern fold closure, producing a double plunging synform. A dolerite dyke has been emplaced along an east-west fault zone that displaces the northern part of the deposit in a dextral shear sense. The disruption and emplacement of the dolerite along the northern limb of the synform has not affected the quality of the mineralisation. The MQ unit represents a metamorphosed banded iron-formation (BIF). The precursor BIF was subjected to high-grade metamorphic conditions during the Archaean, which resulted in complete recrystallisation of the original fine-grained BIF. In most cases the primary textures have been destroyed by the recrystallisation. Coarse-grained (>1mm) MQ is produced as a result, with good Davis Tube liberation characteristics and concentrate grades at a liberation grind size of 95% passing 80 micron.

The Askaf North Mineral Resource Statement uses a cut-off grade of 20% DTC wt% for fresh (unoxidised) mineralisation and a cut-off grade of 20% head Fe for oxidised mineralisation. All reported concentrate grades were weighted by DTC wt%.

**Askaf Centre:** The Askaf Centre deposit comprises a northern body that is exposed over a strike length of 3.5km and a southern body that is exposed over a strike length of 1.7km. Both bodies form part of a regional scale antiformal structure and each body is also duplicated within itself by outcrop-scale tight isoclinal folding. The northern and southern bodies are separated and displaced in a dextral shear sense by a regional scale fault/fracture system. The northern body is generally sub-vertical striking roughly northwest-southeast. The magnetite-quartzite unit ranges in thickness from approximately 50m in the west to approximately 70m in the east, with the magnetite-quartzite mineralisation being thinnest in the steep dipping middle portion (±10 m). The multiple layers reported is the result of tight isoclinal folding. The southern body comprises an open synformal structure with an undulating sub-horizontal fold axis that plunges at approximately 25° towards the southwest at the southern part of the deposit. At this locality the mineralisation is still open-ended at depth. The two limbs of the synform are exposed over a strike length of approximately 1km. The northern part of the synform is tighter than is the case in the south, with the eastern limb almost being overturned in some places. Magnetite-quartzite ranges in thickness from approximately 30m to 35m in the limbs to approximately 45m to 55m in the synformal keel as a result of structural thickening with thicknesses of up to 90m reported. The magnetite-quartzite unit is embedded within an Archaean granitic/gneiss sequence. The weathered zone which, though variable, has an average vertical thickness of approximately 40m and in this zone partial to complete oxidation of magnetite to hematite has occurred. Oxidation significantly reduces the Davis Tube mass recovery (wt%) in mineralised drill samples.

This resource uses a cut-off grade of 20% DTC wt% for fresh (unoxidised) mineralisation and a cut-off grade of 20% head Fe for oxidised mineralisation. All reported concentrate grades were weighted by DTC wt%.

**Askaf East:** The Askaf East deposit occupies the southern limb of an apparent east-west striking synformal structure defined by an Archaean magnetite-quartzite unit that ranges in true thickness from approximately 20m at the western end of the limb to approximately 140m in the central part of the limb. The hinge zone is at the eastern end of the deposit. The synformal axis plunges about 40° towards the west in the eastern part of the synform. The thickening of the sequence in the eastern part of the deposit is probably as a result of isoclinal folding within the sequence. The MQ unit is embedded within an Archaean granitic/gneiss sequence. The weathered zone, though variable, has an average vertical thickness of approximately 40m. Partial to complete oxidation of magnetite to hematite has occurred in this zone and this significantly reduces the Davis Tube mass recovery (wt%) in mineralised drill samples.

This resource uses a cut-off grade of 20% DTC wt% for fresh (unoxidised) mineralisation and a cut-off grade of 20% head Fe for oxidised mineralisation. All reported concentrate grades were weighted by DTC wt%.

**Lebtheinia:** The magnetite-rich Banded Iron Formations (BIF) at Lebtheinia form part of the Archaean Lebzena Group. The BIF units in EL264 are exposed over a total strike length of approximately 24km, of which Lebtheinia Centre has a strike length of 11.5km. Parts of the main BIF units at Lebtheinia Centre deposit are covered by laterite and colluvium consisting of BIF fragments.

The magnetite-BIF at Lebtheinia Centre averages about 240m thick. The BIF is characterised by a well-defined banding pattern, with individual bands ("mesobands") averaging 5-10mm thick. Drilling shows that mineralisation extends to at least 400m vertically below natural surface and is open at depth. The deposit is intruded by a series of sub-vertical dolerite dykes, striking NE-SW to NNE-SSW. Lebtheinia Centre has a hanging wall of (variously) quartzite, amphibolite, rhyolite, clay/saprolite (altered amphibolite) and a footwall of quartzite or amphibolite.

The depth of weathering (oxidation) of the BIF averages around 50m. In the lower two thirds of the oxidised zone (the Lower Oxidised Zone, "LOZ") the degree of oxidation is less than in the more oxidised upper third.

The Lebtheinia Centre Mineral Resource Statement for fresh mineralisation uses 20% DTC wt% cut-off. For the LOZ unit the cut-off is 14 SI x 10<sup>-3</sup> units of magnetic susceptibility.

The Lebtheinia Mineral Resource Statement has been prepared in accordance with the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the JORC Code, 2004 Edition).

**Zanaga Project:** The Zanaga ELs are located within a north-south oriented greenstone belt which extends for over 47km in length, and vary between 0.5km and 3km in width. The mineralisation is hosted by metamorphosed volcano-sedimentary itabirites, and is interbedded with amphibolites and mafic schists. The contact with the crystalline basement is typically faulted and sheared. The principal ore lithologies consist of itabirites, interbedded with basic lavas, which are later altered to amphibolites. Typically, the itabirites consist of layers of iron-rich and quartz rich meta-sediments, on a millimetre to centimetre scale. The orebody lithologies are crosscut by late intrusions and dolerite dykes, oriented northeast-southwest. The deposit comprises a sequence of weathering domains, which overlay an un-weathered protore comprising itabirite. The weathered sequence observed at Zanaga is typical of iron ore deposits, where the surficial material demonstrates enrichment in iron above the protore due to a mass reduction and associated leaching of the silicate layers.

The Mineral Resource is reported at a 0% Fe cut-off.

The Zanaga Mineral Resource Statement has been prepared in accordance with the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the JORC Code, 2012 Edition).

The Zanaga Project Ore Reserve Statement was prepared by SRK Consulting (UK) Limited as part of a Feasibility Study.

The full release of this Mineral Resource and Ore Reserve update is available on the Zanaga Iron website ([www.zanagairon.com](http://www.zanagairon.com)).

# Coal

## New South Wales

Name of operation	Attributable interest	Mining method	Commodity	Measured Coal Resources		Indicated Coal Resources		Inferred Coal Resources		CP	Coal Reserves		Marketable Coal Reserves		Total Marketable Coal Reserves		CP	
				2021	2020	2021	2020	2021	2020		Proved	Probable	Proved	Probable	2021	2020		
				2021	2020	2021	2020	2021	2020		2021	2021	2021	2021	2021	2020		
<b>Oakbridge Group</b>			Thermal Coal (Mt)	<b>979</b>	<b>999</b>	<b>640</b>	<b>620</b>	<b>1,450</b>	<b>1,450</b>			<b>140</b>	<b>60</b>	<b>95</b>	<b>42</b>	<b>140</b>	<b>140</b>	
Bulga Complex	85.9%	OC/UG	Thermal Coal (Mt)	960	980	580	560	1,300	1,300	HXJ								
			CV (kcal/kg)	6,000	5,900	5,850	5,600	5,900	5,700									
Bulga OC	85.9%	OC	Thermal Coal (Mt)								140	20	95	12	110	70	JGR	
			CV (kcal/kg)										6,250	6,300	6,250	6,300		
Bulga UG	85.9%	UG	Thermal Coal (Mt)								-	40	-	30	30	70	POG	
			CV (kcal/kg)										-	-	-	6,150		
Running Stream	85.9%	OC	Thermal Coal (Mt)	19	19	60	60	150	150	MJL	-	-	-	-	-	-	-	n.a.
			CV (kcal/kg)	5,050	5,050	5,050	5,050	5,150	5,150									
<b>Liddell</b>	67.5%	OC	Thermal Coal (Mt)	<b>210</b>	<b>210</b>	<b>240</b>	<b>240</b>	<b>400</b>	<b>400</b>	JET/	<b>6</b>	<b>1</b>	<b>4</b>	<b>-</b>	<b>4</b>	<b>7</b>	APC	
			CV (kcal/kg)	6,250	6,250	6,200	6,200	6,150	6,150	LRG			6,700	6,700	6,700	6,750		
<b>Mount Owen Complex</b>			Thermal Coal (Mt)	<b>290</b>	<b>305</b>	<b>265</b>	<b>266</b>	<b>441</b>	<b>441</b>		<b>83</b>	<b>9</b>	<b>45</b>	<b>5</b>	<b>50</b>	<b>52</b>		
Mount Owen	100%	OC	Thermal Coal (Mt)	180	190	190	190	350	350	LRG	75	9	40	5	45	45	STH	
			CV (kcal/kg)	6,050	6,050	6,100	6,150	6,100	6,100				6,100	6,200	6,100	6,250		
Ravensworth East		OC	Thermal Coal (Mt)	60	60	25	26	1	1	LRG	5	-	3	-	3	3	BOB	
			CV (kcal/kg)	5,700	5,700	5,650	5,700	5,750	5,750				5,900	-	5,900	5,950		
Glendell		OC	Thermal Coal (Mt)	50	55	50	50	90	90	LRG	3	-	2	-	2	4	BOB	
			CV (kcal/kg)	5,900	5,900	5,850	5,850	5,800	5,800				6,600	-	6,600	6,650		
<b>Integra</b>	100%	UG	Thermal/Coking Coal (Mt)	<b>17</b>	<b>18</b>	<b>55</b>	<b>55</b>	<b>30</b>	<b>30</b>	MAS	<b>4</b>	<b>-</b>	<b>3</b>	<b>-</b>	<b>3</b>	<b>5</b>	AWF	
			CV (kcal/kg)	5,950	6,000	5,900	5,900	5,800	5,800									
			Ash (%)	-	-	-	-	-	-				8	8	8	8		
<b>United - Wambo</b>	47.5%	OC/UG	Thermal Coal (Mt)	<b>290</b>	<b>300</b>	<b>340</b>	<b>340</b>	<b>500</b>	<b>500</b>	JET	<b>70</b>	<b>6</b>	<b>50</b>	<b>4</b>	<b>55</b>	<b>60</b>	PTP	
			CV (kcal/kg)	5,950	5,950	5,700	5,700	5,600	5,600				6,550	6,500	6,550	6,550		
<b>Ulan Complex</b>	100%		Thermal Coal (Mt)	<b>215</b>	<b>225</b>	<b>253</b>	<b>263</b>	<b>420</b>	<b>520</b>		<b>131</b>	<b>1</b>	<b>119</b>	<b>1</b>	<b>119</b>	<b>134</b>		
Ulan OC			Thermal Coal (Mt)	45	45	13	13	20	20	MJL	6	0.4	4	0.2	4	4	LRO	
			CV (kcal/kg)	4,950	4,950	5,200	5,200	4,900	4,900				5,000	5,000	5,000	5,000		
Ulan UG			Thermal Coal (Mt)	170	180	240	250	400	500	MJL								
			CV (kcal/kg)	6,350	6,400	4,750	4,750	5,000	5,000									
Ulan #3 UG			Thermal Coal (Mt)								50	-	45	-	45	50	EAM	
			CV (kcal/kg)										6,150	-	6,150	6,150		
Ulan West UG			Thermal Coal (Mt)								75	0.6	70	0.6	70	80	RDA	
			CV (kcal/kg)										6,100	6,100	6,100	6,100		
<b>Ravensworth Group</b>			Thermal Coal (Mt)	<b>374</b>	<b>394</b>	<b>240</b>	<b>240</b>	<b>100</b>	<b>100</b>		<b>160</b>	<b>12</b>	<b>110</b>	<b>8</b>	<b>120</b>	<b>130</b>		
Narama	100%	OC	Thermal Coal (Mt)	24	24	-	-	-	-	MAS	-	-	-	-	-	-	n.a.	
			CV (kcal/kg)	5,600	5,600	-	-	-	-									
Ravensworth North	90%	OC	Thermal Coal (Mt)	350	370	240	240	100	100	MAS	160	12	110	8	120	130	DJC	
			CV (kcal/kg)	6,000	6,050	6,050	6,050	5,650	5,650				6,300	6,400	6,300	6,250		
<b>Mangoola</b>	100%	OC/UG	Thermal Coal (Mt)	<b>95</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>1,500</b>	<b>1,500</b>	MAS	<b>45</b>	<b>30</b>	<b>40</b>	<b>24</b>	<b>65</b>	<b>70</b>	MRW	
			CV (kcal/kg)	5,250	5,250	4,750	4,750	4,250	4,250				5,450	5,400	5,450	5,400		
<b>Ravensworth UG</b>	100%	UG	Thermal Coal (Mt)	<b>320</b>	<b>320</b>	<b>220</b>	<b>220</b>	<b>250</b>	<b>250</b>	MJL	<b>40</b>	<b>-</b>	<b>28</b>	<b>-</b>	<b>28</b>	<b>28</b>	KJB	
			CV (kcal/kg)	5,800	5,800	5,400	5,400	5,350	5,350				6,950	-	6,950	6,950		
<b>Hunter Valley Operations</b>	49%	OC	Thermal Coal (Mt)	<b>780</b>	<b>800</b>	<b>1,300</b>	<b>1,300</b>	<b>2,400</b>	<b>2,400</b>	LMP	<b>400</b>	<b>460</b>	<b>290</b>	<b>330</b>	<b>630</b>	<b>640</b>	PJO	
			CV (kcal/kg)	6,500	6,500	6,450	6,450	6,200	6,200				6,350	6,350	6,350	6,350		
<b>Total New South Wales</b>			<b>Coking/Thermal Coal (Mt)</b>	<b>3,570</b>	<b>3,671</b>	<b>3,653</b>	<b>3,644</b>	<b>7,491</b>	<b>7,591</b>		<b>1,079</b>	<b>579</b>	<b>784</b>	<b>414</b>	<b>1,214</b>	<b>1,266</b>		

# Coal

## New South Wales

The New South Wales Coal Resources and Reserves are contained within the Sydney Basin.

Changes and issues material to the estimation of Coal Resources and Reserves are noted below for specific projects. Reference to production changes between 31 December 2020 and 31 December 2021 are detailed for each producing mine site.

Unless otherwise stated, tenement expiries will be eligible for a standard renewal as per the relevant Government policy.

Tonnages are quoted as million metric tonnes. Values expressed in the text have not been rounded and therefore do not correlate directly with the tables.

### Oakbridge Group

**Bulga open cut:** Coal Resource and Reserve depletion due to mining (-10.7Mt).

Inclusion of additional drilling associated with the Bulga Extension Project (BEP) resulted in an increase of 14.8Mt Measured and Indicated and 21.8Mt Inferred resources. Resource CV has increased, due to the disaggregation of the coal quality model and the subsequent removal of partings, resulting in lower Ash% and higher CV values.

The BEP pit shell has been incorporated with an associated uplift of 42.3Mt in Marketable Proved and Probable Reserves

Coal Reserves for Bulga Open Cut operations are sufficient to support a mine life of approximately 18 years.

**Bulga underground:** The adoption of the BEP pit shell has brought about a revision to the prospects for underground mining at Bulga. The previous plans for mining the Piercefield B seam are no longer compatible and hence the underground Marketable Reserve has been written down by 37.7Mt

Tenements for the Bulga Complex expire between September 2022 and June 2040. Some tenements are undergoing a routine renewal process with the NSW Government.

**Running Stream** is an undeveloped thermal coal project. Coal Resources were not re-estimated in 2021.

Potential mining methods are open cut for the shallow Coal Resources (less than 60m depth of cover) and underground mining for Coal Resources in excess of 60m depth of cover.

Assessment Lease expired in May 2020, and a renewal has been lodged.

### Liddell Open Cut

Coal Resources include both the current Liddell Open Cut Operations and the project area known as Liddell South. Each area has been assessed by a different Competent Person; Liddell Open Cut by John Terrill and Liddell South by Leigh Gibson.

Coal Resource and Reserve depletion due to mining at Liddell Open Cut (-4.7Mt).

Tenements for Liddell Operations expire between October 2023 and November 2028. Coal Reserves for Liddell Operations are sufficient to support the planned mine life of 2 years.

Tenements for Liddell South Project expire between December 2023 and July 2025.

### Mt Owen Complex

**Mount Owen:** Coal Resource and Reserve depletion due to mining (-7.5Mt).

Marketable Reserve CV has decreased due to refinement of the geological model to better reflect expected coal recovery, the addition of a flotation plant to the Mt Owen CHPP resulting in higher yields, and lower CV values due to an increase in product moisture of the fine coal fraction.

Tenements for Mt Owen expire between January 2026 and March 2041. Some tenements are undergoing a routine renewal process with the NSW Government.

Coal Reserves for Mt Owen Operations are sufficient to support the planned mine life of 15 years.

**Ravensworth East:** Tenements for Ravensworth East expire between August 2022 and October 2034. Coal Reserves for Ravensworth East operations are sufficient to support the planned mine life of 2 years.

**Glendell:** Coal Resource and Reserve depletion due to mining (-3.1Mt).

Tenements for Glendell expire between November 2021 (renewal lodged) and November 2033. Some tenements are undergoing a routine renewal process with the NSW Government. Coal Reserves for Glendell operations are sufficient to support the planned mine life of 1 year.

## Integra

Coal Resource and Reserve depletion due to mining (-2.2Mt).

Tenements for the area expire between November 2023 and October 2034. Some tenements are undergoing a routine renewal process with the NSW Government. Coal Reserves for Integra operations are sufficient to support the planned mine life of 2 years.

### United - Wambo

Coal Resource Depletion due to Mining (-8.0Mt).

Tenements for the JV area expire between August 2022 and March 2023. Some tenements are undergoing a routine renewal process with the NSW government. Coal reserves of the United-Wambo JV are sufficient to support a planned mine life of 13 years.

### Ulan Complex

Coal Resource Measured and Indicated decrease due to sterilisation (-15.3Mt) of the upper part of the mining section as mining occurs in the lower part. The mining section was depleted (-11.8Mt) as a direct result of mining. Reduction of Inferred resources (-8.0Mt) owing to sterilisation of upper seams (above mined out longwall workings) based on "no reasonable prospect of mining" (Clause 20, JORC2012).

Tenements for Ulan expire between April 2022 and May 2042. Some tenements are undergoing a routine renewal process with the NSW Government.

**Ulan Open Cut:** No mining during reporting period therefore no change to Coal Reserves estimations since 31 December 2020.

**Ulan West Underground:** Coal Reserve depletion due to mining (-6.6Mt).

Coal Reserves for Ulan West underground operations are sufficient to support the planned mine life of 11 years.

**Ulan #3 Underground:** Coal Reserve depletion due to mining (-5.3Mt).

Coal Reserves for Ulan #3 underground operations are sufficient to support the planned mine life of 9 years.

### Ravensworth Group

**Narama:** No change to Coal Resources since 31 December 2020. Mining Operations in Narama ceased at the end of 2014 upon completion of the Narama mine plan.

Tenements for Narama expire between December 2023 and August 2036.

**Ravensworth North:** Coal Resource and Reserve depletion due to mining (-11.7Mt).

Tenements for Ravensworth North expire between June 2022 and September 2035. Some tenements are undergoing a routine renewal process with the NSW Government. Coal Reserves for Ravensworth North operations are sufficient to support the planned mine life of 14 years.

### Ravensworth Underground

No change in Coal Resource or Reserve estimations since 31 December 2020.

Production was suspended in September 2014 with the mine currently on care and maintenance.

Tenements for Ravensworth Underground expire between October 2022 and April 2029. Some tenements are undergoing a routine renewal process with the NSW Government.

### Mangoola

Coal Resource and Reserve depletion due to mining (-7.3Mt).

Tenements for Mangoola expire in November 2029. Some tenements are undergoing a routine renewal process with the NSW Government. Coal Reserves for Mangoola operations are sufficient to support the planned mine life of 9 years.

### Hunter Valley Operations

Coal Resource and Reserve depletion due to mining at Hunter Valley Operations (-13.5Mt).

Tenements for Hunter Valley Operations expire between December 2022 and November 2041. Some tenements are undergoing a routine renewal process with the NSW Government. Coal Reserves at Hunter Valley Operation are sufficient to support the planned mine life of approximately 30 years.

# Coal

## Queensland

Name of operation	Attributable interest	Mining method	Commodity	Measured Coal Resources		Indicated Coal Resources		Inferred Coal Resources		CP	Coal Reserves		Marketable Coal Reserves		Total Marketable Coal Reserves			
				2021	2020	2021	2020	2021	2020		Proved	Probable	Proved	Probable	2021	2020	CP	
<b>Oaky Creek</b>	55%		Coking/Thermal Coal (Mt)	<b>230</b>	<b>240</b>	<b>355</b>	<b>355</b>	<b>80</b>	<b>80</b>			<b>26</b>	<b>15</b>	<b>18</b>	<b>10</b>	<b>28</b>	<b>30</b>	
Oaky North		UG	Coking Coal (Mt)	230	240	310	310	60	60	RJH		26	15	18	10	28	30	POG
			Ash (%)												9			
Fairhill Oaky Creek		OC	Thermal Coal (Mt)	-	-	45	45	20	20	RJH		-	-	-	-	-	-	n.a.
			CV (kcal/kg)															
<b>Red Rock</b>	75%	OC/UG	Coking/Thermal Coal (Mt)	<b>1</b>	<b>1</b>	<b>300</b>	<b>300</b>	<b>200</b>	<b>200</b>	RJH		-	-	-	-	-	-	n.a.
			CV (kcal/kg)	6,900	6,900	5,100	5,100	5,450	5,450			-	-	-	-	-	-	
<b>NCA</b>	100%		Coking/Thermal Coal (Mt)	<b>460</b>	<b>466</b>	<b>569</b>	<b>569</b>	<b>1,020</b>	<b>1,010</b>			<b>10</b>	<b>35</b>	<b>10</b>	<b>22</b>	<b>31</b>	<b>85</b>	
Newlands, Suttor		OC/UG	Thermal Coal (Mt)	310	310	140	140	400	400	JET								n.a.
Eastern (RCM)			CV (kcal/kg)	5,750	5,750	5,200	5,200	5,050	5,050									
Wollombi (MCM)		OC/UG	Coking Coal (Mt)	14	15	75	75	100	100	JET		-	-	-	-	-	-	n.a.
			Thermal Coal (Mt)	6	6	26	26	60	60			-	-	-	-	-	-	
			CV (kcal/kg)	5,500	5,550	5,250	5,250	5,150	5,150									
Newlands OC		OC	Coking Coal (Mt)									1	1	0.7	0.8	2	3	LEN
			Ash (%)											8	8	8	9	
		OC	Thermal Coal (Mt)									2	0.8	2	0.7	2	17	LEN
			CV (kcal/kg)											6,100	6,100	6,100	6,400	
Sarum		OC/UG	Coking Coal (Mt)	30	30	8	8	60	60	JET		-	-	-	-	-	-	n.a.
			Thermal Coal (Mt)	-	-	70	70	250	250			-	-	-	-	-	-	
			CV (kcal/kg)	-	-	5,450	5,450	4,650	4,650									
Collinsville		OC/UG	Coking Coal (Mt)	65	40	200	80	100	40	MAS								n.a.
			Thermal Coal (Mt)	35	65	50	170	50	100									
			CV (kcal/kg)	4,800	5,350	5,000	6,000	4,900	5,550									
Collinsville OC		OC	Coking Coal (Mt)							n.a.		-	24	-	12	12	-	LEN
			Thermal Coal (Mt)									7	9	7	8	15	65	
			CV (kcal/kg)											5,750	5,750	5,750	5,950	
<b>Cook</b>	95%	OC/UG	Coking/Thermal Coal (Mt)			<b>180</b>	<b>180</b>	<b>700</b>	<b>700</b>	JET		-	-	-	-	-	-	n.a.
			CV (kcal/kg)	-	-	6,650	6,650	6,500	6,500									
<b>Rolleston</b>	100%		Thermal Coal (Mt)	<b>220</b>	<b>230</b>	<b>340</b>	<b>190</b>	<b>500</b>	<b>430</b>			<b>130</b>	<b>45</b>	<b>130</b>	<b>45</b>	<b>180</b>	<b>190</b>	
Rolleston ML		OC	Thermal Coal (Mt)	220	230	190	190	350	350	NMP		130	45	130	45	180	190	EMI
			CV (kcal/kg)	5,700	5,700	5,550	5,550	5,500	5,500					5,600	5,450	5,550	5,550	
Rolleston MDL & EPCs		OC	Thermal Coal (Mt)	-	-	150	-	150	80	MAW		-	-	-	-	-	-	n.a.
			CV (kcal/kg)	-	-	5,450	-	5,550	5,650									
<b>Togara North</b>	70%	OC/UG	Thermal Coal (Mt)	<b>360</b>	<b>370</b>	<b>220</b>	<b>250</b>	<b>800</b>	<b>700</b>	MAS		-	<b>28</b>	-	<b>28</b>	<b>28</b>	<b>28</b>	PJO
			CV (kcal/kg)	6,200	6,350	6,000	6,000	5,900	6,000					-	6,300	6,300	6,300	
<b>Wandoan</b>	75%		Thermal Coal (Mt)	<b>1,650</b>	<b>1,650</b>	<b>2,250</b>	<b>2,250</b>	<b>4,600</b>	<b>4,600</b>	MPL		-	-	-	-	-	-	PJO
			CV (kcal/kg)	5,300	5,300	5,400	5,400	5,400	5,400									
<b>Milray</b>	75%	OC/UG	Thermal Coal (Mt)	-	-	<b>170</b>	<b>170</b>	<b>600</b>	<b>600</b>	RJH		-	-	-	-	-	-	n.a.
			CV (kcal/kg)	-	-	6,050	6,050	4,950	4,950									
<b>Pentland</b>	75%	OC/UG	Thermal Coal (Mt)	<b>100</b>	<b>100</b>	<b>40</b>	<b>40</b>	<b>10</b>	<b>10</b>	RJH		-	-	-	-	-	-	n.a.
			CV (kcal/kg)	4,400	4,400	4,050	4,050	4,100	4,100									
<b>Clermont</b>	37%	OC/UG	Thermal Coal (Mt)	<b>65</b>	<b>75</b>	<b>8</b>	<b>9</b>	-	-	JET		<b>60</b>	<b>6</b>	<b>60</b>	<b>6</b>	<b>65</b>	<b>75</b>	WTE
			CV (kcal/kg)	6,150	6,150	6,100	6,100	-	-					5,900	6,000	5,900	5,900	
<b>Hail Creek</b>	84.67%		Coking/Thermal Coal (Mt)	<b>680</b>	<b>720</b>	<b>440</b>	<b>480</b>	<b>370</b>	<b>420</b>			<b>100</b>	<b>55</b>	<b>80</b>	<b>40</b>	<b>120</b>	<b>120</b>	
Hail Creek		OC/UG	Coking/Thermal Coal (Mt)	680	720	320	360	300	350	RJH		100	55	80	40	120	120	APC
Lake Elphinstone		OC/UG	Coking/Thermal Coal (Mt)	-	-	120	120	40	40	JET		-	-	-	-	-	-	
Mount Robert		OC/UG	Coking/Thermal Coal (Mt)	-	-	-	-	30	30	LMP		-	-	-	-	-	-	
<b>Valeria</b>	71%	OC	Thermal Coal (Mt)	<b>220</b>	-	<b>320</b>	<b>410</b>	<b>250</b>	<b>250</b>	MPL		-	-	-	-	-	-	n.a.
<b>Valeria South</b>	100%	OC	Thermal Coal (Mt)	-	-	<b>55</b>	-	<b>90</b>	-	MPL		-	-	-	-	-	-	
<b>Total Queensland</b>			<b>Coking/Thermal Coal (Mt)</b>	<b>3,986</b>	<b>3,852</b>	<b>5,247</b>	<b>5,203</b>	<b>9,220</b>	<b>9,000</b>			<b>326</b>	<b>184</b>	<b>298</b>	<b>151</b>	<b>452</b>	<b>528</b>	

# Coal

## Queensland

The Queensland Coal Resources and Reserves are contained within the Bowen Basin, the Surat Basin and the Galilee Basin.

Changes and issues material to the estimation of Coal Resources and Reserves are noted below for specific projects. Reference to production changes between 31 December 2020 and 31 December 2021 are detailed for each producing mine site.

Unless otherwise stated, tenement expiries will be eligible for a standard renewal as per the relevant Government policy.

Tonnages are quoted as million metric tonnes (Mt). Values expressed in the text have not been rounded and therefore do not correlate directly with the tables.

### Oaky Creek

Coal Resource depletion due to mining (-6.5Mt). Resources increased (2.4Mt) due to the inclusion of operations drilling and strip sampling data.

Coal Reserves are sufficient to support the planned mine life for 7 years. Tenements for the Oaky Creek Complex expire between March 2021 and June 2041. Some tenements are undergoing a routine renewal process with the QLD Government.

### Red Rock

Red Rock Resources remain unchanged.

Tenements for Red Rock expire between September 2023 and September 2025.

### NCA

**Newlands Open Cut:** Coal Reserve depletion due to mining (-5.1Mt).

Mine plan changes associated with the completion of mining activities (closure) and rehabilitation of Newlands Open Cut have resulted in a write down of (-19.0Mt) ROM and (-12.4Mt) Marketable Reserves.

Coal Reserves for Newlands Open Cut are sufficient to support the planned mine life of 1 year.

**Newlands, Suttor, Eastern (RCM – Rangal Coal Measure):** Newlands Coal Resource depletion due to mining (-0.8Mt).

Eastern Creek Coal Resource depletion due to mining (-1.4Mt).

Suttor Creek Coal Resource no material change since 31 December 2019.

Tenements for Newlands Complex expire between March 2022 and February 2042. Some tenements are undergoing a routine renewal process with the QLD Government.

**Wollombi (MCM – Moranbah Coal Measures):** Coal Resource depletion due to mining (-3.2Mt).

**Sarum:** No change in the Coal Resource estimation since 31 December 2012.

The Sarum Project is inclusive of the Sarum and Gattonvale deposits. Tenements at the Project expire between November 2025 and April 2026.

**Collinsville:** Coal Resource and Reserve depletion due to mining (-2.1Mt).

A significantly revised mining strategy that has changed from producing a low volatile matter thermal product and which now focusses on mining and marketing a metallurgical coal product along with a secondary thermal product has resulted in a write down of (-36.3Mt) ROM and (-34.5Mt) Marketable Reserves at Collinsville Open Cut. Combined with the re-correlation completed on the resource model, the revised strategy has had a corresponding increase in Resources allocated to coking product and a similar decrease in Resources assigned as thermal product.

Coal Reserves for Collinsville are sufficient to support the planned mine life for 14 years.

Tenements for Collinsville expire between September 2024 and September 2035.

### Cook (Blackrock)

No Change in the Coal Resource estimation at Cook since 31 December 2020.

The tenement for Cook expires in April 2042.

### Rolleston

Coal Resource and Reserve depletion due to mining (-13.5Mt).

The inclusion of a maiden resource for the southern section of EPC737 has resulted in an additional (145.4Mt) Measured and Indicated, and (58.0Mt) Inferred resources at Rolleston.

Tenements for Rolleston expire between January 2022 and May 2043. Some tenements are undergoing a routine renewal process with the QLD Government.

Coal Reserves for Rolleston are sufficient to support the planned mine life of 19 years.

### Togara North

The addition of new drilling information and the associated modifications to the JORC resource classification polygons and the re-correlation of the structural geology has resulted in the reclassification adjustment in all categories; -38.4Mt Measured and Indicated, and +59.0Mt Inferred resources. There is also an associated decrease in Measured and Inferred CV.

Tenements for Togara North expire between September 2023 and December 2046.

### Wandoan

No change in the Coal Resource estimation since 31 December 2020.

Tenements for Wandoan expire between August 2022 and December 2043. Some tenements are undergoing a routine renewal process with the QLD Government.

### Milray

No change in the Coal Resource estimation since 31 December 2020.

Tenements for Milray expire between November 2024 to January 2026.

### Pentland

No change in the Coal Resource estimation since 31 December 2020.

Tenements for Pentland expire in September 2026.

### Clermont

Clermont Coal Resources estimated for the extraction of thermal coal via open cut methods.

Coal Resource depletion due to mining (-9.4Mt).

Tenements for Clermont expire between March 2025 and July 2031. Coal Reserves at Clermont are sufficient to support the planned mine life for 6 years.

### Hail Creek Operations

Hail Creek Coal Resources estimated for the extraction of thermal and coking coal via open cut methods

Coal Resource depletion due to mining (-10.2Mt).

A significant disaggregation and remodelling process has resulted in adjustments to reported resource quantities, the major components are:

Removal of Yarabee Tuff stone band previously incorporated into Hynds full sequence (-47.3Mt) Measured and Indicated, and (-45.7Mt) Inferred resources.

Removal of Fort Cooper 4 stone partings (-46.6Mt) Measured and Indicated, and (-28.5Mt) Inferred resources; and.

Re-correlation (Hynds Upper and Middle) (22.1Mt) Measured and Indicated, and (-1.0Mt) Inferred resources.

Tenements for Hail Creek expire in December 2040. Coal Reserves at Hail Creek are sufficient to support the planned mine life for 20 years.

### Lake Elphinstone

Resources estimated for the extraction of thermal coal via open cut methods. No exploration or analysis work completed since acquisition so previous resource model re-applied for 2021 reporting period. The previous estimate did not include a quality estimation.

Tenements for Lake Elphinstone expire in December 2040.

### Mt Robert

Mt Robert Coal Resources estimated for the extraction of thermal coal via open cut methods.

No exploration or analysis work completed since acquisition so previous resource model re-applied for 2021 reporting period. The previous estimate did not include a quality estimation.

Tenements for Mt Robert expire between November 2022 and August 2025. Project planning has not yet commenced at Mt Robert.

### Valeria

Valeria Coal Resources estimated for the extraction of thermal and semi soft coking coal via open cut methods. The inclusion of additional drill and quality data, has resulted in (134.7Mt) Measured and Indicated, and (22.4Mt) Inferred resources. Tenements for Valeria expire in September 2026.

### Valeria South

This is the maiden resource statement for Valeria South and includes (53.8Mt) Measured and Indicated, and (86.3Mt) Inferred resources.

Tenements for Valeria South expire in June 2024.



# Coal

## South Africa

Name of operation	Attributable interest	Mining method	Commodity	Measured Coal Resources		Indicated Coal Resources		Inferred Coal Resources			Extractable Coal Reserves		Saleable Coal Reserves		Total Saleable Coal Reserves			
				2021	2020	2021	2020	2021	2020	CP	Proved	Probable	Proved	Probable	2021	2020	CP	
				2021	2020	2021	2020	2021	2020	CP	2021	2021	2021	2021	2021	2020	CP	
<b>Tweefontein</b>	79.8%		Thermal Coal (Mt)	<b>840</b>	<b>850</b>	<b>60</b>	<b>60</b>	<b>38</b>	<b>38</b>			<b>152</b>	<b>5</b>	<b>93</b>	<b>3</b>	<b>96</b>	<b>112</b>	
Tweefontein North		OC/UG	Thermal Coal (Mt)	640	650	-	-	8	8	MS		143	5	86	3	89	105	TH
			CV (kcal/kg)	5,250	5,250	-	-	5,500	5,500			-	-	5,600	5,600	5,600	5,600	
Tweefontein South		OC/UG	Thermal Coal (Mt)	200	200	60	60	30	30	MS		9	-	7	-	7	7	
			CV (kcal/kg)	5,350	5,350	4,350	4,350	4,600	4,600			-	-	5,900	-	5,900	5,900	
<b>Goedgevonden</b>	73.99%		Thermal Coal (Mt)	<b>460</b>	<b>480</b>	<b>10</b>	<b>7</b>	-	<b>1</b>	MS		<b>260</b>	-	<b>168</b>	-	<b>168</b>	<b>167</b>	CT
			CV (kcal/kg)	4,800	4,800	5,000	5,000	-	3,540			-	-	5,400	-	5,400	5,400	
<b>iMpunzi</b>	79.8%		Thermal Coal (Mt)	<b>340</b>	<b>350</b>	<b>13</b>	<b>13</b>	<b>2</b>	<b>2</b>			<b>78</b>	<b>6</b>	<b>49</b>	<b>2</b>	<b>51</b>	<b>68</b>	
iMpunzi North		OC	Thermal Coal (Mt)	220	230	4	4	2	2	MS		14	3	8	1	9	12	TH
			CV (kcal/kg)	5,250	5,250	5,500	5,500	5,600	5,600			-	-	5,600	5,600	5,600	5,600	
iMpunzi East		OC	Thermal Coal (Mt)	120	120	9	9	-	-	MS		64	3	41	1	42	56	TH
			CV (kcal/kg)	5,400	5,400	5,250	5,250	-	-			-	-	5,600	5,600	5,600	5,600	
<b>Zonnebloem</b>	100%	OC	Thermal Coal (Mt)	<b>180</b>	<b>190</b>	<b>35</b>	<b>35</b>	-	-	MS		-	<b>160</b>	-	<b>76</b>	<b>76</b>	<b>74</b>	TH
			CV (kcal/kg)	5,150	5,150	4,850	4,850	-	-			-	-	-	5,500	5,500	5,500	
<b>Oogiesfontein</b>	100%	UG	Thermal Coal (Mt)	<b>45</b>	<b>44</b>	<b>18</b>	<b>18</b>	-	-	MS		-	<b>7</b>	-	<b>4</b>	<b>4</b>	<b>4</b>	TH
			CV (kcal/kg)	4,950	4,950	4,950	4,950	-	-			-	-	-	5,700	5,700	5,700	
<b>Nooitgedacht</b>	100%	UG	Thermal Coal (Mt)	<b>21</b>	<b>21</b>	<b>40</b>	<b>40</b>	<b>5</b>	<b>5</b>	MS		-	<b>33</b>	-	<b>22</b>	<b>22</b>	<b>22</b>	TH
			CV (kcal/kg)	4,850	4,850	4,850	4,850	4,850	4,850			-	-	-	5,500	5,500	5,500	
<b>Undeveloped Resources</b>	100%	OC/UG	Thermal Coal (Mt)	-	-	<b>12</b>	<b>12</b>	<b>100</b>	<b>100</b>			-	-	-	-	-	-	n.a.
			CV (kcal/kg)	-	-	4,750	4,750	5,400	5,400			-	-	-	-	-	-	
<b>Paardekop</b>	100%	UG	Thermal Coal (Mt)	<b>120</b>	<b>120</b>	<b>570</b>	<b>575</b>	<b>80</b>	<b>80</b>	MS		-	-	-	-	-	-	n.a.
			CV (kcal/kg)	5,350	5,350	5,400	5,400	5,350	5,350			-	-	-	-	-	-	
<b>Izimbiwa</b>	48.73%		Thermal Coal (Mt)	<b>102</b>	<b>106</b>	<b>35</b>	<b>35</b>	<b>32</b>	<b>32</b>			<b>7</b>	<b>25</b>	<b>5</b>	<b>22</b>	<b>27</b>	<b>34</b>	
MBO		OC	Thermal Coal (Mt)	24	26	-	-	2	2	MS		7	-	5	-	5	10	HG
			CV (kcal/kg)	5,200	5,200	-	-	5,600	5,600			-	-	5,300	-	5,300	5,300	
Argent		OC	Thermal Coal (Mt)	28	28	-	-	-	-	MS		-	25	-	22	24	24	HG
			CV (kcal/kg)	5,100	5,100	-	-	-	-			-	-	-	4,500	4,500	4,500	
Springboklaagte		UG	Thermal Coal (Mt)	50	52	35	35	30	30	MS		-	-	-	-	-	-	n.a.
			CV (kcal/kg)	5,100	5,100	5,050	5,050	4,950	4,950			-	-	-	-	-	-	
<b>Umcebo</b>	48.67%		Thermal Coal (Mt)	<b>148</b>	<b>153</b>	<b>44</b>	<b>44</b>	<b>86</b>	<b>86</b>			<b>25</b>	-	<b>19</b>	-	<b>19</b>	<b>27</b>	
Wonderfontein		OC	Thermal Coal (Mt)	60	65	5	5	1	1	MS		25	-	19	-	19	27	HG
			CV (kcal/kg)	5,350	5,350	5,200	5,200	-	4,900			-	-	4,700	-	4,700	4,700	
Norwesco		OC	Thermal Coal (Mt)	1	1	-	-	-	-	GC		-	-	-	-	-	-	n.a.
			CV (kcal/kg)	5,000	5,000	-	-	-	-			-	-	-	-	-	-	
Klippan		UG	Thermal Coal (Mt)	3	3	1	1	-	-	KvD		-	-	-	-	-	-	n.a.
			CV (kcal/kg)	5,800	5,800	5,800	5,800	-	-			-	-	-	-	-	-	
Hendrina		UG	Thermal Coal (Mt)	24	24	20	20	80	80	MS		-	-	-	-	-	-	n.a.
			CV (kcal/kg)	4,400	4,400	4,400	4,400	4,700	4,700			-	-	-	-	-	-	
Belfast		UG	Thermal Coal (Mt)	60	60	18	18	5	5	MS		-	-	-	-	-	-	n.a.
			CV (kcal/kg)	5,200	5,200	5,050	5,050	5,150	5,150			-	-	-	-	-	-	
<b>Total South Africa</b>			<b>Thermal Coal (Mt)</b>	<b>2,256</b>	<b>2,314</b>	<b>837</b>	<b>839</b>	<b>343</b>	<b>344</b>			<b>522</b>	<b>236</b>	<b>334</b>	<b>129</b>	<b>463</b>	<b>508</b>	

# Coal

## South Africa

The South African Coal Resources and Coal Reserve estimates have been prepared in accordance with the 2016 edition of the South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves (the SAMREC Code) and the South African Guide to the Systematic Evaluation of Coal Resources and Coal Reserves (SANS 10320:2004).

The SAMREC Code and SANS 10320:2004 require that Coal Resources be reported on a Mineable Tonnes In Situ (MTIS) basis. The reported MTIS Coal Resource estimates take into account theoretically mineable seam thicknesses, coal quality cut-off parameters, geological loss factors, depth and/or strip ratio cut-offs and, where applicable, are discounted by coal tonnages which have previously been extracted. Coal Resources are reported inclusive of Coal Reserves.

Coal Resources have been re-estimated in 2021 for inclusion in this summary table except where otherwise stated. Revision of the totals includes changes to classifications of Coal Resource status due to exploration, geological reinterpretation and remodelling, and changes to lease holdings.

The reported Run-of-Mine (ROM) Coal Reserve estimates take into account planned practical mining thicknesses, mine layout losses, mining extraction factors, mining recovery efficiency factors, dilution, and contamination.

Saleable Coal Reserves are derived from the ROM Coal Reserves that are discounted by applying practical product yield factors which, where applicable, reflect historical processing plant efficiencies.

Changes and notes relevant to the estimation of Coal Resources and Coal Reserves are listed below for specific projects. Unless otherwise specified, changes reported are exclusive of production from 31 December 2020 to 31 December 2021. Depletion due to mining is based on the actual depletion from January to September, and a forecast for October to December. This forecast is reconciled each year to the actual production and an adjustment is made accordingly.

Coal Resource and Coal Reserve totals are rounded to appropriate levels of accuracy in accordance with the 2016 SAMREC Code and Glencore's standard procedures. In summary, Measured and Indicated Coal Resources are rounded to one significant figure if less than 10Mt and two significant figures if greater than 10Mt; calorific values are rounded to the nearest 50kcal/kg.

Values expressed in the text have not been rounded and therefore do not correlate directly with the tables.

### Tweefontein Complex

**Tweefontein North:** Coal Resource depletion due to mining (-10.0Mt), with a further reduction due to mining losses, including low wall losses, scalping and floor coal left behind (1.0Mt).

The Tweefontein North development includes all five seams present in the Vryheid Formation, however, only the No.1, No. 2, No. 4 and No. 5 seams form part of the mineable and economic Coal Resources. The Coal Resources have the potential to be extracted via both opencast truck and shovel or dragline, and underground bord and pillar mining methods.

Coal Reserve depletion due to mining (-9.4Mt) as well as the exclusion of uneconomic reserves from Makoupan North from the mine plan (-13.5Mt) partially offset by the mining of unplanned reserves from outside mine plan at TUGO 2 Seam during 2021 (1.0Mt)

The Mining right for Tweefontein North expired on 27 March 2020, and an application for a renewal was lodged in March 2020. Coal Reserves for Tweefontein North are sufficient to support a mine life of 13 years (2034).

**Tweefontein South:** Tweefontein South Complex is contained in the iMpunzi new order mining right and in the Klippoortjie old order mining authorisation. A section 102 consent was obtained to incorporate the Klippoortjie MR into iMpunzi. Execution of the deed of amendment to give effect to the consent is pending. The mining area development includes all five seams, however only the No.1, No. 2, No. 4 and No. 5 seams form part of the Coal Resources.

No mining was conducted in 2021 and the No. 5 Seam Addcar Coal Reserves remain available for future extraction.

Mining rights for Tweefontein South expire on 28 March 2029. Coal Reserves for Tweefontein South are sufficient to support a mine life of 10 years.

**Goedgevonden:** Coal Resource depletion due to mining (-9.1Mt). Changes related to a revision of the geological interpretation and the resource block limits which caused a reclassification from Measured resources to Indicated resources resulting in an overall resource reduction (4.8Mt).

Opencast dragline mining operations in the area are extracting the No. 2, No. 4 and No. 5 seams. The No. 3 seam is too thin for practical extraction and the No.1 seam is not considered economic.

Coal Reserve depletion due to mining (-9.2Mt). Changes in the resource model based on infill drilling resulted in an increase in no. 2 and 5 Seam reserves (1.3Mt) and a yield increase based on an adjustment to assumptions (6.1Mt).

The consolidated Goedgevonden mining right (including Zaaewater West) will expire on 21 January 2037. Coal Reserves for Goedgevonden are sufficient to support a mine life of 22 years (2043).

### iMpunzi

The iMpunzi mining right incorporates the iMpunzi East area, consisting of the East pit, and the iMpunzi North area, comprising the North, Phoenix and Office pits. The mining right for iMpunzi expires on 28 March 2040. Coal Reserves for iMpunzi North and East are sufficient to support a mine life of 10 years (2031).

**iMpunzi North:** Coal Resource depletion due to mining (-3.6Mt).

iMpunzi North consists of the iMpunzi North Opencast (opencast dragline and truck and shovel operations in North and South pit) and iMpunzi Mini-pits (truck and shovel operations in the Phoenix, and Office pits). The Opencast Coal Resources include the No.1, No. 2 and No. 4 seams, whilst the Mini-pit involves only the No. 4 seam.

Coal Reserve depletion due to mining (-3.8Mt), as well as the exclusion of uneconomic reserves from the mine plan (-1.9Mt). Partially offsetting is the mining of unplanned reserves from outside mine plan during 2021 (0.7Mt).

**iMpunzi East:** Coal Resource depletion due to mining (-4.1Mt).

iMpunzi East consists of the iMpunzi East Opencast (opencast dragline and truck and shovel operations in the East pit). A large proportion of No. 2 seam and a small area of No. 4 seam have been previously mined by underground bord and pillar methods. The full seam is extracted through opencast mining methods – the lower zone of each seam was previously partially extracted by underground mining and the upper zone remains intact.

Coal Reserve depletion due to mining (-4.2Mt), as well as the exclusion of uneconomic reserves situated in VDD South from the mine plan (-18.4Mt).

### Zonnebloem

Coal Resource depletion due to mining (-0.9Mt), with a further reduction as a result of weathered coal left in the pit, and mining losses, including low wall losses, scalping and floor coal left behind (-2.7Mt). Resource decreased further after re-modelling and revision of the geological interpretation (-0.5Mt).

The No. 1 and No. 2 seams are developed and are amenable to extraction by opencast dragline and truck and shovel operations.

Phase 1 of Zonnebloem is continuing using truck and shovel mining.

Coal Reserve depletion due to mining (-0.6Mt). A re-design of the West Pit pit-shell resulted in an increase in Coal Reserves (8.1Mt) offset by the exclusion of uneconomic reserves from the Central Pit mine plan (-1.4Mt). The Zonnebloem mining right expires on 28 March 2039. Coal Reserves are sufficient to support a mine life of 10 and 19 years for Phase 1 and Phase 2 respectively.

### Oogiesfontein

The Oogiesfontein mining right expired on 19 April 2018. Consent was obtained before expiry to consolidate the right under the Goedgevonden 169 mining right which expires on 21 January 2037. The deed of amendment to give effect to the consent was executed on 6 September 2018. The Environmental Management Programme and Water Use Licence have been approved.

There are no changes in Coal Resources or Coal Reserves for the current reporting period. A review of the rounding rules resulted in an amendment to the reported resource figure.

# Coal

## South Africa

### Paardekop

A new order mining right was granted in 2017 for 30 years and will expire on 19 August 2047. This right has not been executed due to an on-going dispute with Department of Mineral Resources and Energy. Approval of environmental licensing and permitting is awaited.

The Paardekop project area contains the Main seam which represents nearly 95% of the extractable coal. The seam has a mean thickness of 2.5m and is amenable to underground mining. The upper zone of the seam exhibits a relatively low CV whilst the lower zone has an average raw CV >5,300kcal/kg.

There are no changes in Coal Resources or Coal Reserves for the current reporting period. A review of the rounding rules resulted in an amendment to the reported resource figure.

### Nooitgedacht

The No. 2 Seam and No. 4 Seam reserves represent a potential future underground extension to Tweefontein South.

There are no changes in Coal Resources or Coal Reserves for the current reporting period.

### Undeveloped Coal Resources

Applications for mining rights have been submitted for all the undeveloped Coal Resources. The mining right for Amersfoort was granted and will expire on 30 May 2037, while the Boschmanspoort mining right is still pending.

The Amersfoort project is located in the southern sector of the Ermelo Coalfield in Mpumalanga province, southwest of Breyten. The Coal Resource estimate is based on the C seam which averages 2.5m in thickness and occurs at a depth of approximately 200m. The coal quality of the Amersfoort resource was re-evaluated and adjusted accordingly.

The Boschmanspoort project is located in the Witbank Coalfield in Mpumalanga province, southeast of Middelburg.

The Coal Resource estimate is based on the No. 2 seam that dips towards the east, therefore allowing some potential for opencast resources in the west.

### Izimpiwi Coal

Izimpiwi Coal consists of a number of mines with a life of 4 years that have been grouped into the Middelburg Complex, and two greenfield projects, Argent and Springboklaagte.

The expiry date of the relevant mining rights are as follows: Graspan renewed and valid until 16 May 2029 and Graspan extension was valid until 22 March 2021. A renewal application was lodged on 28 February 2021 and remains pending. The Townlands and Steelcoal mining rights expired in July 2020, and the renewal applications were lodged in April 2020. The mining rights for Argent and Springboklaagte were granted in May 2016 for 15 years (expiring on 30 May 2031), and 20 years (expiring on 30 May 2036) respectively.

Springboklaagte is held as a Joint Venture between Izimpiwi Coal and Umcebo. 100% of the Springboklaagte Coal Reserves and Coal Resources are included in the table above. Springboklaagte is the subject of a sale agreement and pending Section 11 Application to cede the right to the buyer.

**Middelburg Complex (MBO):** Graspan, Townlands, Steelcoal and Corobrik, have been grouped into Middelburg Complex (MBO).

Coal Resource depletion due to mining (-2.1Mt). Coal Resource reduction as a result of mining losses, including low wall losses, scalping and floor coal left behind as well as coal left in the pit for geotechnical considerations (-2.4Mt). Gain in resources due to modifications applied to the resource model aligned to exploration results within the reporting period (1.8Mt).

Coal Reserve depletion due to mining (-2.4Mt). Updated Business Plan assumptions have resulted in the exclusion of uneconomical reserves in the Plant Reserve, MTC Block B and Steelcoal (-8.1Mt).

Graspan, Graspan Extension (Corobrik), Middelburg Townlands and Middelburg Townlands Extension (Steelcoal) are subject to a sale agreement and a pending Section 11 application to cede these rights to the buyer. The target date for completion of the transfer is H1 2022.

**Argent:** The Argent Coal Resource will be exploited through opencast truck and shovel and is awaiting finalisation of the environmental licensing and permitting before mining can commence.

Reserve loss due to a re-design of the pit-shell in order to accommodate a more optimised mining layout (-1.5Mt). All saleable reserves allocated to domestic Eskom market as per the latest LOM.

**Springboklaagte:** The mining right for Springboklaagte has been granted and awaits environmental licensing and permitting.

### Umcebo

The remaining mine life of the individual operations range up to 8 years while brownfield extensions and greenfield projects can extend the life to beyond 2036. Expiry date of relevant mining/concession licenses are different for each mine, ranging from October 2020 to March 2037. Renewals have been granted for Klippan (renewal granted until 25 September 2022) and Norwesco (renewal granted until 3 October 2020). A second renewal application was submitted in September 2020 and is pending. Norwesco is the subject of a sale agreement and a Section 11 Application to cede the right to the buyer is pending.

The Wonderfontein mining right, held by Umsimbithi, expires on 2 June 2037.

**Klippan:** The mine is currently closed but represents a potential future underground extension to the Wonderfontein Coal Resources. Klippan is the subject of a sale agreement in respect of which the Section 11 Application documents are in preparation and are expected to be submitted to the DMRE by Q1 2022.

**Wonderfontein:** Coal Resource depletion due to mining (-2.8Mt).

Wonderfontein is an opencast truck and shovel operation. The opencast Coal Resources include the No.1, No. 2, No. 3 and No. 4 seams. The Coal Reserves for Wonderfontein are sufficient to support a mine life of 9 years.

Coal Reserve depletion due to mining (-3.0Mt) as well as exclusion of the uneconomic reserves in Pit D (-10.3Mt). An increase in the footprint of Pit A due to a re-design of the pit-shell has resulted in a reserve increase (1.4Mt).

**Hendrina:** The project area is located south of the town of Hendrina in the province of Mpumalanga. The mining right application covers three discrete blocks of ground named Mcoivley East, Mcoivley West and Bosmanskrans. The area is traversed by the national road N11 which connects Hendrina and Ermelo. The Hendrina Project is envisaged as an underground mine to supply an Eskom-type product. A mining right application was accepted by the Department of Mineral Resources in June 2016. The application remains pending.

**Belfast:** The prospecting right encompasses a number of blocks extending approximately 45km from east of Belfast to west of Wonderfontein. The N4 highway, the Gauteng-Maputo railway and Eskom power lines traverse the area.

The renewed prospecting right expired in October 2017. A mining right application, covering parts of the prospecting right area, was lodged in September 2017 and accepted on 11 October 2017. The mining right application outcome is pending.

**Norwesco:** There are no changes in Coal Resources or Coal Reserves for the current reporting period.

# Coal

## Americas

Name of operation	Attributable interest	Mining method	Commodity	Measured Coal Resources		Indicated Coal Resources		Inferred Coal Resources			Extractable Coal Reserves		Saleable Coal Reserves		Total Saleable Coal Reserves		
				2021	2020	2021	2020	2021	2020	CP	Proved	Probable	Proved	Probable	2021	2020	CP
<b>Colombia</b>																	
Calenturitas	100%		Thermal Coal (Mt)	-	140	-	130	-	60	KJW	-	-	-	-	-	-	n.a
			CV (kcal/kg)	-	6,300	-	6,250	-	6,300		-	-	-	-	-	-	
La Jagua	100%		Thermal Coal (Mt)	-	50	-	25	-	-	KJW	-	-	-	-	-	-	n.a
			CV (kcal/kg)	-	7,100	-	7,100	-	-		-	-	-	-	-	-	
<b>Prodeco</b>			<b>Thermal Coal (Mt)</b>	-	<b>190</b>	-	<b>155</b>	-	<b>60</b>		-	-	-	-	-	-	
<b>Carrejón</b>	33.3%		<b>Thermal Coal (Mt)</b>	<b>3,250</b>	<b>3,300</b>	<b>1,250</b>	<b>1,250</b>	<b>600</b>	<b>600</b>	GH	<b>200</b>	<b>130</b>	<b>190</b>	<b>120</b>	<b>320</b>	<b>350</b>	SC
			CV	6,550	6,550	6,550	6,550	6,350	6,350		6,100	6,100	6,200	6,200	6,200	6,200	
<b>Canada</b>																	
Suska	100%		Coking/Thermal Coal (Mt)	-	-	13	13	90	90	KJW	-	-	-	-	-	-	n.a
			CV (kcal/kg)	-	-	6,100	6,100	6,100	6,100		-	-	-	-	-	-	
Sukunka	100%		Coking Coal (Mt)	45	45	100	100	40	40	KJW	-	-	-	-	-	-	n.a
<b>Total Canada</b>			<b>Coking/Thermal Coal (Mt)</b>	<b>45</b>	<b>45</b>	<b>113</b>	<b>113</b>	<b>130</b>	<b>130</b>		-	-	-	-	-	-	

### Colombia

Coal Resources are reported on an in situ moisture basis. Coal Reserves take into account geological losses, mining losses, contamination and as mined moisture adjustments. Reserves are reported on a ROM moisture basis.

Saleable Reserves: As sold basis are Coal Reserves adjusted for yield losses in the preparation plant (if applicable) and converted to a saleable moisture basis. The Coal Resource and Coal Reserve estimates tabulated above are stated on a total mine basis as at 31 December 2021.

Coal Resource qualities are reported on an in situ moisture basis and Coal Reserve qualities are reported on a gross as received basis. Coal Resources are reported inclusive of those Coal Resources modified to produce Coal Reserves. Coal tonnages are quoted as million metric tonnes

Changes and issues material to the estimation of Coal Resources and Reserves are noted below for specific projects. Reference to production changes between 31 December 2020 and 31 December 2021 are detailed for each producing mine site.

Coal Resource and Coal Reserve totals are rounded to appropriate levels of accuracy in accordance with the 2012 JORC Code and the Glencore Coal Assets rounding procedures.

Values expressed in the text have not been rounded and therefore do not correlate directly with the tables

### Prodeco

**Calenturitas:** CI Prodeco S.A. was titleholder to the Calenturitas Mine through Mining Contract No. 044/89 (the Mining Contract), which had been entered into with the Colombian Mining Authority, the National Mining Agency (ANM).

On 4 February 2021, Prodeco submitted to ANM its relinquishment in connection with the Mining Contract, a decision that was accepted on 6 September 2021.

As a result of ANM's acceptance of Prodeco's relinquishment, the Mining Contract was effectively terminated as of 6 September 2021 and the parties are currently undergoing the liquidation phase.

Prodeco no longer has title to the Calenturitas mine and no coal resources and reserves have been reported.

**La Jagua:** Carbones de La Jagua S.A., titleholder to Mining Contracts Nos. 285/95, HKT-08031 and DKP-141, Consorcio Minero Unido S.A., titleholder to Contract 109/90 and Carbones El Tesoro S.A., titleholder to Contract 132/97, exploited the La Jagua Mine through an integrated operation.

On 4 February 2021, Carbones de La Jagua S.A. and Consorcio Minero Unido S.A. submitted to ANM their relinquishment to their mining contracts.

On 6 September 2021 ANM accepted the relinquishment of Carbones de La Jagua S.A. in connection with Contract 285/95, as well as the relinquishment of Consorcio Minero Unido S.A. in respect of Contract 109/90.

As a result of ANM's acceptance, both mining contracts were effectively terminated as of 6 September 2021 and the parties are currently undergoing the liquidation phase. Mining Contract 132/97 had already been declared terminated since 17 September 2020 as a result of the depletion of its reserves, as reported last year.

Carbones de La Jagua S.A., Consorcio Minero Unido S.A. and Carbones El Tesoro S.A. no longer have any title to the Mining Contracts 285/95, 109/90 and 132/97 through which they exploited the La Jagua Mine and no coal resources and reserves have been reported.

The relinquishment of contract HKT-08031 and DKP-141, which are covered by a different legal regime, has not yet been accepted by ANM pending fulfilment of certain environmental obligations. There are no reasonable expectations that resources within these areas could be exploitable in the future, given that they were part of the full integrated operation of the La Jagua deposit. As a result no coal resources and reserves have been reported in relation to these contracts.

### Carrejón:

In 2021, Coal Resources at Carrejón totalling approximately 5,100Mt were reported as gross tonnes in situ (GTIS) within a 'geoshell' constrained by the horizontal and vertical distribution of data within the drill hole (data limits) envelope. Approximately 350Mt of the total coal resources are within the current LOM plan. The Coal Resources include that coal for which the continuity, quality and mineability are established but occur outside the LOM plan. Total resources exclude approximately 230Mt of coal within 1 km of major towns. Coal Resources comply with current and foreseen mining and marketing criteria and are considered to have reasonable prospects of eventual economic extraction.

Coal Reserves have decreased due to mining depletion (24Mt) and mine design changes (-5Mt) that included a re-classification from Proved Reserves to Probable Reserves in relation to Tabaco Dome.

The current mining rights expire in 2033.

Glencore increased its interest in Carrejón to 100% in January 2022.

### Canada Coal Resources

Glencore's Canadian coal resources (Sukunka, Suska) occur in the Peace River area of the Province of British Columbia. Additional tenements adjacent to these Peace River projects are targeted for exploration. These include tenement areas identified as Central South, South Cirque and other tenements that extend south of the Pine River.

Coal Resource tonnage and quality are reported at an in situ moisture basis. Coal Resources are reported in accordance with the JORC Code 2012 edition.

**Suska:** Coal Resources have not been re-estimated since 2013.

**Sukunka:** Coal Resources have not been re-estimated since 2015.

# Oil

## Net Reserves (Proven and Probable)<sup>1</sup>

	Working Interest Basis								
	Equatorial Guinea		Chad		Cameroon		Total		Combined mmboe
	Oil mmbbl	Gas bcf	Oil mmbbl	Gas bcf	Oil mmbbl	Gas bcf	Oil mmbbl	Gas bcf	
31 December 2020	11	152	97	-	4	-	112	152	138
Revisions	1	32	-	-	-	-	1	32	7
Production	(2)	(20)	-	-	(1)	-	(3)	(20)	(6)
31 December 2021	<b>10</b>	<b>164</b>	<b>97</b>	-	<b>3</b>	-	<b>110</b>	<b>164</b>	<b>139</b>

## Net Contingent Resources (2C)<sup>1</sup>

	Working Interest Basis								
	Equatorial Guinea		Chad		Cameroon		Total		Combined mmboe
	Oil mmbbl	Gas bcf	Oil mmbbl	Gas bcf	Oil mmbbl	Gas bcf	Oil mmbbl	Gas bcf	
31 December 2020	26	434	61	-	2	-	89	434	164
Revisions	1	(124)	-	-	(2)	-	(1)	(124)	(23)
Licence relinquishment	-	-	(61)	-	-	-	(61)	-	(61)
31 December 2021	<b>27</b>	<b>310</b>	-	-	-	-	<b>27</b>	<b>310</b>	<b>80</b>

<sup>1</sup> "Net" Reserves or Resources are equivalent to Glencore's working interest in the asset/property.

### Equatorial Guinea

Equatorial Guinea reserves and contingent resources consist of Block O (Glencore 25% working interest ("WI")) and Block I (Glencore 23.75% WI) reserves and resources.

The Aseng field (Block I, 23.75% WI) came on stream in November 2011. The field is produced from subsea wells tied back to a Floating Production, Storage and Offloading facility ("FPSO"). Average 2021 gross production was ~17,800 barrels per day.

The Alen field (95% Block O, 25% WI and 5% Block I, 23.75% WI) came on stream in May 2013. The field is produced from subsea wells tied back to a production platform where condensate is stripped from the gas stream and transported to the Aseng FPSO via a subsea pipeline. The gas has been commercialised since Q1 2021. Average 2021 gross condensate production was ~5,700 b/d and average 2021 gross gas production was ~220 mmscf/d.

The Aseng and Alen fields have a 25 year exploitation term from approval of a plan of development.

Reserves for Equatorial Guinea were independently assessed by McDaniel & Associates (McDaniel), have been prepared in accordance with the Petroleum Resources Management System (PRMS) and have been extracted without material adjustment from the McDaniel report dated 31 December 2021. Contingent resources are based on Glencore estimates and have been prepared in accordance with PRMS.

### Chad

Glencore holds an 85% WI in the Badila and Mangara oil field Exclusive Exploitation Authorisations (EXAs) and a 75% WI in the Krim EXA.

The Badila field is an onshore development, which came on stream in September 2013. Oil is transported through an export pipeline to the Chad/Cameroon export pipeline (Totco/Cotco pipeline) with off-take at the Marine Terminal in Cameroon. As a result of the COVID-19 pandemic, including the resulting disruptions to international mobility, transportation and supply chains, in April 2020, Glencore's wholly owned subsidiary, PetroChad (Mangara) Limited ("PCM") was forced to declare force majeure and cease production operations at the Badila and Mangara oil fields located in the Republic of Chad and the facilities were placed onto care and maintenance since that date. There was no production in 2021.

The Mangara field is an onshore development that came on stream in late December 2014. Oil is transported through an export pipeline to the Totco/Cotco pipeline with off-take at the Marine Terminal in Cameroon. The field remains in care and maintenance as described above with no production in 2021. The EXA's have a 25 year exploitation term after the authorisation of the EXA.

Glencore has reached an agreement with Perenco for Perenco to acquire Glencore's Chad upstream oil business. Subject to certain conditions precedent, including the approval of the Chad Government, the transaction is expected to close in 2022. Glencore is also in the process of relinquishing some legacy acreage that is not part of the transaction perimeter.

Reserves for Chad were independently assessed by McDaniel, have been prepared in accordance with PRMS and have been extracted without material adjustment from the McDaniel report dated 31 December 2021.

### Cameroon

The first phase of development of the Oak field (Bolongo license, 37.5% WI) came on stream on 7 August 2019. The field is currently produced from two platform wells tied back to third party infrastructure. Average 2021 gross production was ~7,800 barrels per day.

Reserves for Cameroon were independently assessed by McDaniel, have been prepared in accordance with PRMS and have been extracted without material adjustment from the McDaniel report dated 31 December 2021.

# Competent Persons

## Copper

### Africa

JE	Jacobus Engelbrecht	MAusIMM	Glencore
JP	Julian Poniewierski	AusIMM	Glencore
PO	Paula Ogilvie	SANASP	Glencore
TR	Timothy Rijsdijk	MAusIMM	Glencore

### Collahuasi

RO	Ronald Reycardo Ordezo Lozano	MAusIMM(CP)	Compañía Minera Doña Inés de Collahuasi
RZ	Rodrigo Eduardo Zuñiga Ramírez	MAusIMM(CP)	Compañía Minera Doña Inés de Collahuasi

### Antamina

LC	Lucio Canchis	AusIMM	Compañía Minera Antamina
FA	Fernando Angeles	EGBC	Compañía Minera Antamina

### Other South America

EC	Edwin Cortes	AusIMM	Glencore
HB	Heller Bernabé	AusIMM	Glencore
JA	Javier Aymachoque	AusIMM	Independent consultant
MS	Mario Saez	CCCRRM (Chile)	Glencore

### Australia

EA	Eliseo Apaza	AusIMM	Glencore
JC	Jan Coetzee	AusIMM	Glencore
JS	Jessica Shiels	AusIMM	Glencore

### Other projects

HW	Herbert Welhener	SME Registered Member	Independent Mining Consultants Inc.
MM	Manuel Octavio Machuca Valderrama	AusIMM	Glencore
RS	Richard A. Schwering	SME Registered Member	Hard Rock Consulting LLC
RT	Raul Tarnovski	CCCRRM (Chile)	Anglo American
ZB	Zachary Black	SME Registered Member	Hard Rock Consulting LLC

## Zinc

AA	Arthur Almgren	AusIMM	Glencore
AAA	Angel Angelov	SAIMM	Glencore
AH	Allan Huard	PGO	Glencore
AL	Amanda Landriault	OGQ	Glencore
APC	Ana Paula Chiquini	AusIMM	Glencore
AM	Aaron Meakin	AusIMM	Glencore
BD	Benoit Drolet	PGO	Glencore
BF	Bastien Fresia	OGQ	Glencore
CF	Callum Fannin	AusIMM	Glencore
CH	Chris Hy	AIG	Glencore
DC	Dhaniel Carvalho	AusIMM	Glencore
DH	Drew Herbert	AusIMM	Glencore
GR	Gilles Roy	OGQ	Glencore
JD	Julie Drapeau	OGQ	Glencore
JS	Jessica Shiels	AusIMM	Glencore
KS	Keiran Swanton	PEO	Glencore
MM	Maxime Menard	OGQ	Glencore
SJ	Simon Jackson	AusIMM	Glencore
SP	Sam Patterson	AusIMM	Glencore
JT	Jody Todd	AusIMM	Glencore

## Nickel

PSA	Pierre St Antoine	OGQ	Glencore
RC	Richard Caumartin	OIQ	Glencore
JO	Jorge Oliveira	PGO	Glencore
RM	Roberto Menin	AusIMM	Koniambo Nickel SAS
MR	Mitch Rohr	AusIMM	MMO Pty Ltd.
CW	Clifford Webster	AusIMM	MMO Pty Ltd.
SK	Stephen King	AusIMM	MMO Pty Ltd.

## Ferroalloys

PJG	Pieter-Jan Gräbe	SACNASP	Glencore
SV	Solly Vaid	PLATO	Glencore
DR	Dean Richards	SACNASP	Obsidian Consulting Services
MM	Mogomotsi Maputle	SACNASP	Glencore
SM	Sydney Maseti	SACNASP	Glencore
JC	Jan Coetzer	SACNASP	Mokala Manganese

## Aluminium

JB	John Bower	AusIMM	OBK Consulting (Pty) Ltd
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# Competent Persons

## Iron ore

AM	Alan Miller	MAusIMM (CP)	Independent consultant
GB	Gabor Bacsfalusi	MAusIMM (CP)	SRK Consulting (UK) Ltd
MT	Malcolm Tittley	MAusIMM (CP)	CSA Global (UK) Ltd
NS	Nicolas Szwedska	OIQ	BBA Inc
Svdm	Schalk van der Merwe	SACNASP	Independent consultant

## Coal

### New South Wales

APC	Andrew Connell	AusIMM	Glencore
AWF	Alison Freeman	AusIMM	Glencore
BOB	Brendan O'Brien	AusIMM	Glendell Open Cut
DJC	David Cahill	AusIMM	Ravensworth Open Cut
EAM	Ed McGonigle	AusIMM	Ulan Underground
HXJ	Hugh Jennings	AusIMM	Glencore
JET	John Terrill	AIG	Glencore
JGR	Joel Grant	AusIMM	Glencore
KJB	Konrad Bawelkiewicz	AusIMM	Glencore
LMP	Lyndon Pass	AusIMM	Encompass Mining
LRG	Leigh Gibson	AusIMM	Mount Owen Complex
LRO	Livia Rodriguez Gonzalas	AusIMM	Glencore
MJL	Mark Laycock	AusIMM	Glencore
MAS	Michael Stadler	AusIMM	Glencore
MRW	Mark Williams	AusIMM	Mangoola Open Cut
PJO	Paul Jones	AusIMM	Glencore
POG	Paul O'Grady	AusIMM	Glencore
PTP	Phuc Pham	AusIMM	United Colliery
RDA	Ryan Davidson	AusIMM	Ulan West
STH	Shane Holmes	AusIMM	Glencore

## Coal (cont.)

### Queensland

APC	Andrew Connell	AusIMM	Glencore
EMI	Ewen Mills	AusIMM	Rolleston Coal
JET	John Terrill	AIG	Glencore
LEN	Larry Nielsen	AusIMM	Glencore
LMP	Lyndon Pass	AusIMM	Encompass Mining
MAS	Michael Stadler	AusIMM	Glencore
MAW	Mark Winsley	AusIMM	Rolleston Coal
MPL	Murray Little	AusIMM	Glencore
NMP	Nicole Phillips	AusIMM	Rolleston Coal
POG	Paul O'Grady	AusIMM	Glencore
PJO	Paul Jones	AusIMM	Glencore
RJH	Richard Hingst	AusIMM	Oaky Creek Coal
WTE	Whiteboy Tembo	AusIMM	Glencore

### South Africa

CT	Chris Theart	SAIMM (706513)	Glencore
GC	Gerrit Cronjé	Pr Sc Nat 400128/86	Glencore
HG	Hugo Groebler	SAIMM	Glencore
KvD	Karin van Deventer	Pr Sc Nat 400705/15	Suger Bush Consultancy
MS	Marius Smith	Pr Sc Nat 400075/03	Glencore
TH	Trevor Howard	SAIMM (701062)	Glencore

### Americas

KJW	Kerry Whitby	AusIMM	McElroy Bryan Geological Services (Pty) Ltd
GH	German Hernandez	GSSA	Carbones del Cerrejón
SC	Shah Chaudari	AusIMM	Carbones del Cerrejón