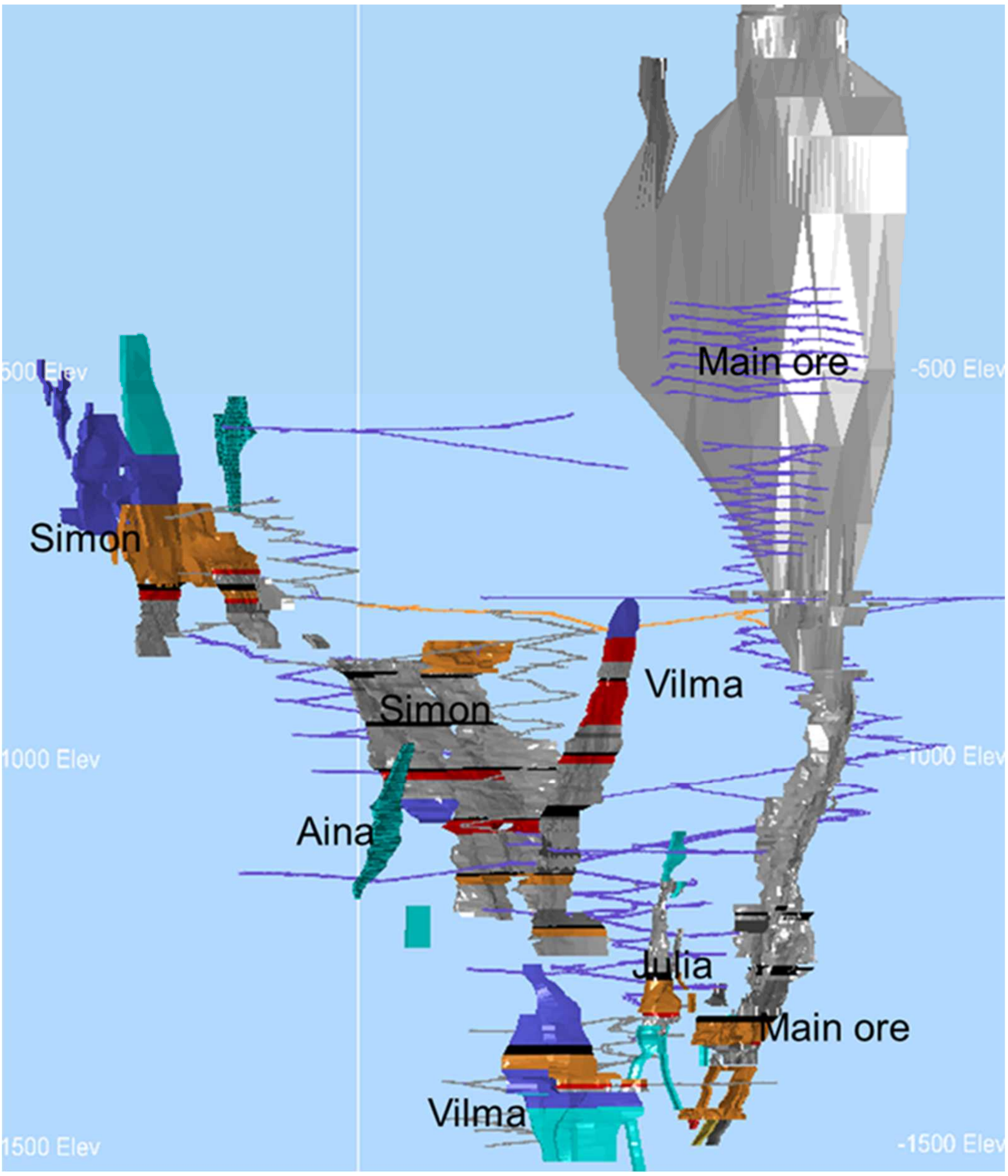
Boliden Summary Report

Mineral Resources and Mineral Reserves | 2020

Renström



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1 SUMMARY

Table 1. Mineral Resources and Mineral Reserves in Renström 2020-12-31

					2020	
	kt	**Au**	**Ag**	**Cu**	**Zn**	**Pb**
Classification		**(g/t)**	**(g/t)**	**(%)**	**(%)**	**(%)**
Mineral Reserves						
Proved	**352**	**2.4**	**141**	**0.5**	**5.6**	**1.0**
Probable	**4 202**	**2.4**	**122**	**0.3**	**6.3**	**1.2**
Total	***4 554***	*2.42*	*124*	*0.35*	*6.22*	*1.19*
Mineral Resources						
Measured	**3**	**0.6**	**39**	**0.0**	**1.7**	**0.3**
Indicated	**1 277**	**1.4**	**81**	**0.6**	**4.1**	**0.8**
Total M&I	***1 280***	*1.35*	***81***	***0.6***	***4.1***	***0.8***
Inferred	**982**	**1.4**	**74**	**0.5**	**4.8**	**0.9**

Notes on Mineral Resource and Mineral Reserve statement.

- *Mineral Resources are reported exclusive of Mineral Reserves.*
- *Mineral Resource and Mineral Reserves is a summary of Resource estimations and studies made over time adjusted to mining situation of December 31.*
- *If Mineral Resource are reported with 15% dilution*
- *Mineral Reserves are equal to 10 years production.*
- *Cut-off depends on mining methods*

1.1 Competence

Table 1. Contributors and responsible competent persons for this report

Description	Contributors	Responsible CP
Compilation of this report	Luc Collin	Johan Bradley
Geology		
Resource estimations	Luc Collin, Lina Åberg	
Mineral processing	Marie Lundberg	
Mining	Lena Andersson	
Environmental and legal permits	Anna Virolainen	

2 GENERAL INTRODUCTION

This report is issued annually to inform the public (shareholders and potential investors) of the mineral assets in the Renström´s mine held by Boliden. The report is a summary of internal Competent Persons' Reports for Renström. Boliden method of reporting Mineral Resources and Mineral Reserves intends to comply with the Pan-European Reserves and Resources Reporting Committee (PERC) "PERC Reporting Standard 2017".

The PERC Reporting Standard is an international reporting standard that has been adopted by the mining associations in Sweden (SveMin), Finland (FinnMin) and Norway (Norsk Bergindustri), to be used for exploration and mining companies within the Nordic countries.

Boliden is reporting Mineral Resources exclusive of Mineral Reserves.

2.1 Pan-European Standard for Reporting of Exploration Results, Mineral Resources and Mineral Reserves – The PERC Reporting Standard

PERC is the organisation responsible for setting standards for public reporting of Exploration Results, Mineral Resources and Mineral Reserves by companies listed on markets in Europe. PERC is a member of CRIRSCO, the Committee for Mineral Reserves International Reporting Standards, and the PERC Reporting Standard is fully aligned with the CRIRSCO Reporting Template.

The PERC standard sets out minimum standards, recommendations and guidelines for Public Reporting of Exploration Results, Mineral Resources and Mineral Reserves in Europe.

2.2 Definitions

Public Reports on Exploration Results, Mineral Resources and/or Mineral Reserves must only use terms set out in the PERC standard.

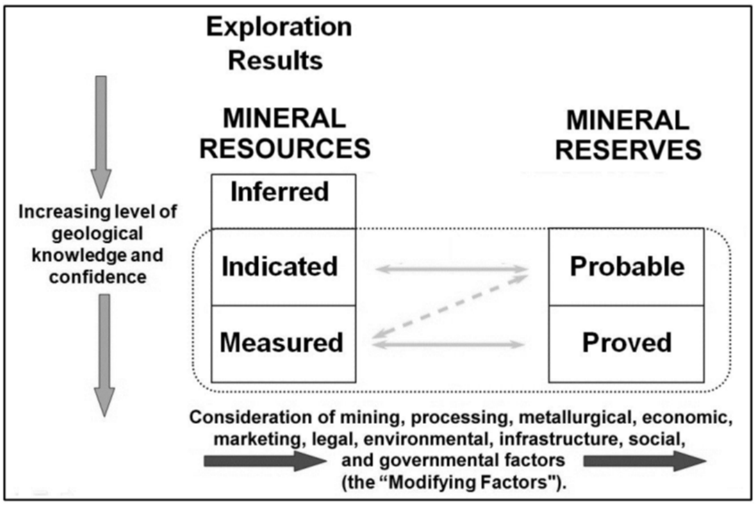


Figure 1. General relationship between Exploration Results, Mineral Resources and Mineral Reserves (PERC 2017)

2.2.1 Mineral Resource

A Mineral Resource is a concentration or occurrence of solid material of economic interest in or on the Earth's crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction.
The location, quantity, grade or quality, continuity and other geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling.

2.2.2 Mineral Reserve

A Mineral Reserve is the economically mineable part of a Measured and/or Indicated Mineral Resource.

It includes diluting materials and allowances for losses, which may occur when the material is mined or extracted and is defined by studies at Pre-Feasibility or Feasibility level as appropriate that include application of Modifying Factors. Such studies demonstrate that, at the time of reporting, extraction could reasonably be justified.

3 RENSTRÖM

3.1 Project Outline

The Renström mine is located 17 km north-west of the Boliden Area Process Plant in Boliden and produces from polymetallic mineralisations of Volcanogenic Hosted Massive Sulphide type. The production in 2020 was 479 kton[1] at 2,1 ppm gold, 121 ppm silver, 0,6% copper, 4,7% zinc and 0,9% lead. The mine has been in production since 1948 and the mining today is done underground between 600 and 1500 m depth. Valuable metals and their relative importance are showed below:

Table 2: metal value relative importance

Au	31%
Ag	20%
Cu	8%
Zn	36%
Pb	4%

3.2 Major changes

3.2.1 Technical studies

Figure 2. Technical studies of new positions

	Tonnages lifted from resources
Extension of V884/858/840/821	40 kton
New position S572/538G	173 kton
New position S609/575 H	227 kton
New position J1418/1378	160 kton

3.2.2 Beneficiation test

No test done in 2020.

[1] Mill throughput

3.3 Location

Figure 3: Location

3.4 History

In 1926, Renström East was found in drill holes and two subsequent principal ores. A mining test and a shaft down to a 469 m level were achieved during the period 1944-48. In 1953, Renström was in full production. The shaft was deepened in 1959 down to the 910 m level. Simon was discovered in 1998 and was in production in 2000. Two sulphide lenses were encountered in 2005 in the deep ore zone (Vilma and Julia) and ore production in Vilma started in 2006. Large scale mining method starts in Simon.

Up to 2020, 14 493 kton of ore have been concentrated at 2.7 g/t Au, 143 g/t Ag, 0.7 % Cu, 6.0 % Zn and 1.3 % Pb.

3.5 Ownership and Royalties

Boliden owns the land immediately adjacent to the mine and covering the surface footprint of the majority of Mineral Reserves. There are several private landowners within the outlying land designation areas related to surface infrastructure, however royalties are applicable only to those permits where active production takes place. Table 3 provides an overview of these by permit.

Table 3: Landowner & Royalties

Permit name	Description of royalty payments
Renström K nr 1	Permit granted prior to 2005. Boliden owned land. No royalties are payable to the State.
Renström K nr 2	Permit granted after 2005. The total royalty comprises 0.2% of the value of the minerals recovered, of which 0.15% is payable to the landowner and 0.05% to the State. Only a very small part of the forecast LOMP production lies within this concession.

3.6 Permits

Boliden owns the deposits and also the tenement

Table 5. Mining lease and impact survey

Mining lease	Valid to
Renström K no. 1	31/12/2024
Renström K no. 2	12/08/2038

3.6.1 Exploration Permits & Exploitation Concessions

The Renström mine is cover by one exploration permit and two exploitation concession, as presented in Table 66 below. In addition, the Petiknäs concessions cover surface infrastructure at the historic Petiknäs mine, from which Renström is accessed via a ramp system. Current and forecast mine production is exclusively from the Renström K nr 1 and K nr 2 permits, which entitle the extraction of gold, silver, zinc, copper and lead.

Table 6: Exploration Permit and Exploitation Concession Summary

Type	**Exploration Permit**	**Exploitation Concession**				
Name	Renström nr 1005	Renström K nr 1	Renström K nr 2	Petiknäs K nr 1	Petiknäs K nr 2	Petiknäs K nr 3
Owner	Boliden Mineral AB (100.00%)					
Licence id	2016:45	N/A				
Area (ha)	3 387,5	143,0	1,3	3,7	17,7	7,6
Valid from	2016-05-09	2000-01-01	2014-08-12	2001-10-22	2001-10-22	2005-03-04
Valid to	2022-05-09	2025-01-01	2039-08-12	2026-10-22	2026-10-22	2030-03-04
Diary nr	2016000184	1998000695:R:R:R	2014000396	2000000506:R	2000000505	2004000937:R:R:R:R

Municipality	Norsjö	Skellefteå	Norsjö

It is notable that Renström K nr 1 is due to expire in 2025, some 5 years prior to the end of forecast production, according to the current life of mine plan (LOMP). Boliden intend to apply for a ten year extension to this license in good time and in accordance with standard operating procedure. Whilst the detailed terms of any extension are uncertain at this stage, Boliden is not aware of any current or impending material impediments that would negatively influence a decision from the relevant permitting authorities and would reasonably expect an application for extension to be granted.

3.6.2 Environmental Permits

In accordance with Environmental Law, a main permit as a partial decision: 2014-05-27, case nr. M354-13 was issued in May 2014 and updated in 2019 with final conditions for discharges as: 2019-03-27, case nr. M 354-13. A decision on 2019-11-20 (nr. M1832-19) permitted increased annual maximum production to a rate of 520 ktpa. These permits cover matters including:

- Maximum production rate 520 ktpa;
- Maximum total concentrations of elements in discharged water (there is no limitation on quantity);
- Maximum noise levels;
- Dust;
- Vibrations;
- Requirement to run operations as stated in the technical description;
- Acquisition and importation of additional waste rock and/or tailings sand, also temporary storage, for use as fill underground;
- Environmental monitoring;
- Explosives – spillage etc.;
- Remediation plans, to be submitted before closure; and
- As of 2019-02-19 a new financial bank guarantee of 20 MSEK was approved by the Environmental Court in case nr M354-13. The guarantee shall cover all environmental liabilities in case of bankruptcy.

3.7 Geology

3.7.1 Regional

The rocks in the Skellefte district were formed approximately 1.9 Ga during a period of active volcanism. The felsic magmas intruded as shallow (subvolcanic) intrusions (dykes and sills) at and close to the surface, where they mixed and mingled with wet sediments and mass-flows derived from volcanic slopes resulting in hyaloclastic brecciation and peperites. The active volcanic region also initiated a convection of solutions within the deposited package which enabled the dissolution and transportation of metals and minerals. These solutions also altered the rocks both physically, through (hydro-) brecciation and fragmentation, and chemically resulting in the heavily altered rocks present today.

After the main volcanic period, regional deformation took place within the Skellefte district. The brittle deformation accommodated for fractures and fissures, which would be filled by mafic magmas forming andesitic and basaltic dykes.

3.7.2 Local

The Renström area is located 15km west of Boliden, in the eastern part of the Skellefteå district. The Renström area has a volcanically complex and multiply deformed rock sequence. Rock types include a large range of basaltic andesite to rhyolite volcanic facies. Juvenile basaltic andesite, dacite and rhyolite volcanoclastic facies are particularly abundant and these have been intruded by numerous basaltic, andesitic dacitic and rhylitic sills and doms. The area has two main generations of folding with a complex interference pattern, and several generations of faults and intrusions.

The Renström area is one of the most intensely mineralized parts of the Skellefte district and the Renström deposit is one of the most important deposits due to its size (>10 million tonnes), grade (high Zn, Au, Ag values) and metallurgical characteristics (medium grained; low arsenic and antimony contents). The ores in the Renström deposit are associated with strong chlorite, dolomite, sericite and silica alteration.

3.7.3 Mineralization

The Renström mineralization consists of several smaller lenses, which are all characterized by massive to semimassive pyrite-sphalerite dominated ores with subordinate massive to semimassive pyrite-chalocopyrite ore and local stringer-type pyrite-chalocopyrite±pyrrhotite mineralization. The main ore minerals are pyrite, sphalerite, galena, chalcopyrite, pyrrotite and arsenopyrite with minor tetrahedrite-tennantite, other sulphosalts, electrum and amalgam (Helfrich, 1971; Kläre, 2001). Ores in the Renström area have higher zinc, gold, silver and lead contents and lower sulphur and arsenic content than most volcanic-hosted massive sulfide ores in the Skellefte district.

3.8 Drilling procedures and data

3.8.1 Drilling techniques

Diamond drilling is the main technique of drilling used for Renström exploration. However, due to the high amount of chloritisation around most of the Renström ore lenses alternative drilling methods have also been used, mainly to penetrate the chlorite layers and prevent the drill rods from getting stuck. Drilling was performed by Drillcon. The drill rod sizes used by Drillcon for the exploration diamond drilling are in general BQ (36.5mm core diameter), WL56 (39mm or NQ (47.6mm)

Infill drilling of mineral reserves is conducted ahead of mining on a pattern from 20*15 to 15*15m2 depending of the geometry of the lodes. The method is the same as for exploration, except the core´s diameter is always 39 mm (WL56). Core´s lengths range from 100 to 200m. 12 202 meters of infillcore have been produced in 2020. Drilling company is Protek.

3.8.2 Downhole surveying

Downhole surveying are done by either EM-measurements or then by Gyro Is-measurements. Most of the EM-surveys done by exploration are for longer exploration holes and stand for approximately 10% of the measurements while the majority of holes are surveyed by gyro. The EM-surveys are done by the Boliden geophysics department while the Gyro-measurements are done by the Drill Con team.

All infill drillholes are surveyed by the drilling company using a reflex gyro ®tool.

3.8.3 Sampling

The exploration drill cores are logged by Boliden geologists and sampled by Boliden technical personnel. A couple of drill holes have been analysed for lithogeochemical purposes; 20-30cm sample of the core is taken every 20-30m meters. In the case of metal analysis of mineralization of core samples; the sampling is started up to 10m before the actual mineralized zone to assure that there is no gold associated with any base metals that might be present even before the actual ore. Samples with the length of 1.5–2m are taken for the extent of the mineralization and extended roughly 10m past the visible zone of mineralization. For both lithological and metal analysis, the core samples are then halved either by the Boliden core shed technical personnel or by a separate preparation laboratory before further assaying. The metal samples are analysed for the base metals Zink (Zn), Lead (Pb) and Copper (Cu), Sulphur (S), Silver (Ag) and Gold (Au), and for processing the negatively affecting elements Arsenic (As) and Antimony (Sb).
Infill samples are labeled during core logging, entered (BHID, FROM, TO) in the database acQuire® and shipped to the external lab ALS Chemex. Samples are made of whole cores. Assays are entered and matched by the central geodataservice in acQuire.

3.8.4 Logging

Geological logs are entered in WellCad®, stored in a central database.

3.8.5 Density

Density is calculated out the grades Cu, Zn; Pb; As, and S in a polynomial formula of first grade. Density of barren rock is 2,7.

3.8.6 Analysis and QAQC

The sample preparations were done by ALS Minerals, ACT Lab or MS Analytical. Metal sample assaying is done by the previously mentioned laboratories while BVM (Bureau Veritas Minerals) is used for lithological samples. In most cases, ALS Minerals performs the pulp duplicate check assays alternatively the pulp duplicate assays are done by MS Analytical. In-house standards BSBM2 and BSBM3 were utilized as standards for control. For the year 2020 a total of 843 metal samples and 170 litho samples were taken for analysis of which the number of standards sent for QAQC were; 39 + 7 QAQC standards (4.0% + 3.8% of total metal and lithological samples), 57 + 7 blank samples (5.9% + 3.8% of total). Additionally 31 + 2 check assays (3.2% + 1.1% of total) were submitted to ALS and MSA.
The results of the QAQC in 2020 have in general been good with only a few minor deviations outside of the error limits but none that would have forced the laboratories to take corrective measures or any deviations that would have showed systematic errors in analysis methods. There have also been a few incidents where the measured values of a standard and a sample have been mixed up by the assay laboratories but these have been noticed when reviewing the results. The laboratories have been notified of any errors and asked to correct them before the results have been accepted.
As mineral reserves are infill drilled and start to be mined, the QAQC consists of reconciliation between grade model and mill input. Discrepancies have grown these past 2 years to the point a general review of the blockmodell has been undertaken at the end of 2020.

Table 7. Overview of ALS's designation of analytical methods. Over-range method applies to samples where assay result reached upper detection limit of primary method

	Method	Over-range method
Preparation	CR-21; SPL-21; PUL-21	
Assay Au	AU-ICP-21	Au-GRA21
Assay Ag; Cu; Zn;Pb;As	Ag-, Cu-, Zn-, Pb-, As-AA46	Zn: ME-ICPORE

3.9 Exploration activities and infill drilling

Exploration focused on Vilma and Julia orebodies downwards.
Infill focused on the continuity of Simon upwards for accessing the possibility of expanding the large scale mining method in that direction.

3.10 Mining methods, mineral processing and infrastructure

3.10.1 Mining methods

4 mining methods are used in the mine:

Table 8. Proportion of different mining methods used in Renström 2020

Methods	Proportions
Cut & fill	77%
Open stoping	18,6%
Retreat mining	4%
Bench	0.4%

Backfilling reuses barren rock from the developments and tailings from the mill. A test with process sand from a neighbor mine has been conducted.

3.10.2 Mineral processing

Ore is delivered by truck to the industrial area where each truck is weighed on a truck scale in order to determine the tonnage arriving to the industrial area. The ore arriving at the industrial area is either taken into the processing plant or stored in a stockpile. Separate stock piles are kept for each of the individual mines in the Boliden area. Ore from the different mines is processed in campaigns where fresh ore from the mine is combined with ore from stockpiles. The feed tonnage to the processing plant is determined using a weighing system with a stationary belt scale. Feed tonnage and weights from the trucks scale are used to determine current tonnage on the stockpiles.

In the processing plant the ore is ground in two stages. The primary mill is a fully autogenous mill and the secondary mill is a pebble mill fed with pebbles extracted from the primary mill. The ground ore is classified using screens and hydrocyclones. A gravimetric concentrate containing coarse grained gold bearing minerals is produced in the grinding circuit and a flash flotation cell is used to extract mainly copper minerals with high flotability. The gravimetric concentrate is packed in big bags and delivered by truck to the Rönnskär smelter.

Flotation is done in a three-stage process: copper-lead bulk flotation, copper-lead separation and zinc flotation producing three concentrate qualities, copper, lead and zinc.

Cyanide leaching is performed on flotation tailings when the leaching plant is available. Gold and silver is leached and recovered to doré bullions that can be delivered to the smelter.

The mineral concentrates are dewatered using thickeners and vertical plate pressure filters. The concentrates are transported by truck to the Rönnskär smelter and shipping port. Lead and zinc are transported by boat to Boliden smelters in Norway and Finland or to external buyers.

Metallurgical accounting where a sum of products calculated using assays from daily composite samples of main process streams and assays and tonnage for delivered products together with feed tonnage is used to determine the head grade of the ore.

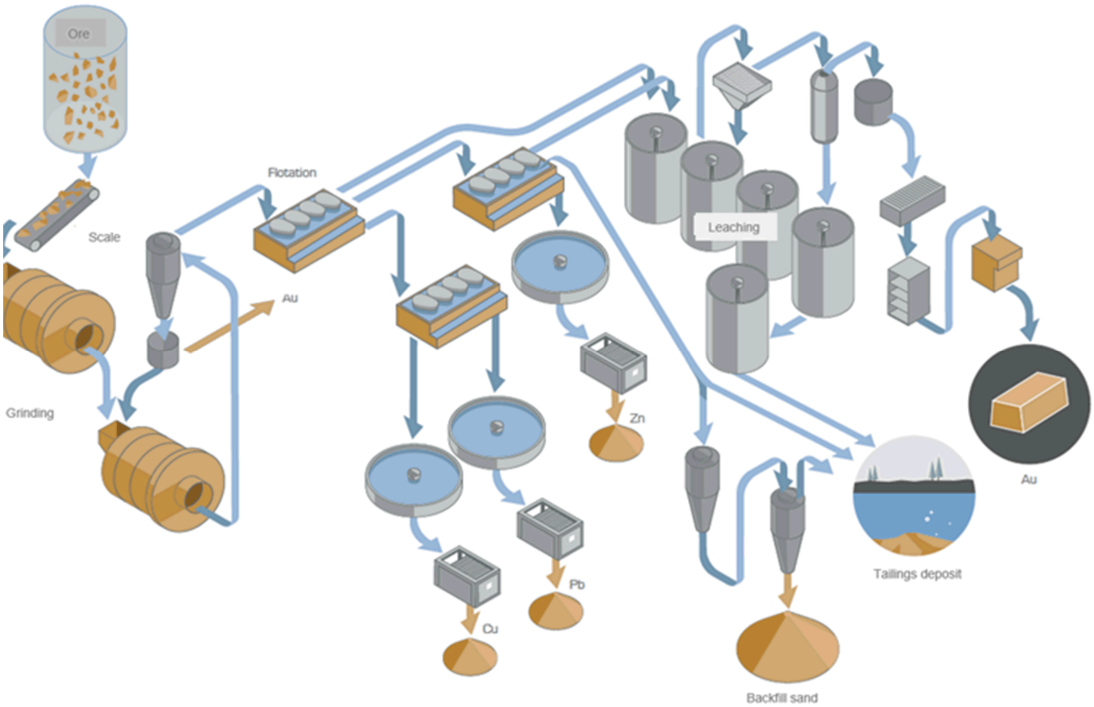


Figure 4: Flowsheet

3.10.3 Infrastructure

Beside dewatering and power supply, a ramp system goes from any level to the main shaft at the level 900m. There a crusher prepares ore for skipping to surface. Lorries carry the ore to the plant. A decline joins Renström to surface via Petiknäs' mine.

3.11 Prices, terms and costs

Table 8. Example table. Long term planning prices currently used in the Renström Mine. Including exchange rates.

METAL PRICES		Budget 2021	LTP 2022->
Copper	USD/tonne	6 630	6 600
	Usc/lb	301	299
	SEK/tonne	57 018	52 800
Zinc	USD/tonne	2 522	2 400

	Usc/lb	114	109
	SEK/tonne	21 689	19 200
Lead	USD/tonne	1 982	2 100
	Usc/lb	90	95
	SEK/tonne	17 045	16 800
Gold	USD/tr oz	1 963	1 300
	SEK/kg	542 762	334 368
Silver	USD/tr oz	27.5	17.0
	SEK/kg	7 604	4 373

Mining method	Cut-off
Cut and fill, retreat minig, bench	550 kr/ton
Openstope	390 kr/ton
Mineral resources	480 kr/ton

Table 9. cut-off

3.12 Mineral Resources

Boliden method of reporting Mineral Resources and Mineral Reserves intends to comply with the Pan-European Standard for reporting of Exploration results, Mineral Resources and Mineral Reserves (The PERC Reporting standard 2017). It is an international reporting standard that has been adopted by the mining associations in Sweden (SveMin), Finland (FinnMin) and Norway (Norsk Bergindustri), to be used for exploration and mining companies within the Nordic counties.

After the completion of exploration drilling the geological modelling is done using CAD software Microstation, Leapfrog or Datamine. Typically, for Boliden VMS deposits a drill spacing grid of 100 x 100 m is used as a guide for inferred mineral resource, 50 x 50 m for indicated mineral resource and 25 x 25 m for measured mineral resource. These drill hole spacing guidelines are based upon Boliden´s history of mining massive sulphides in the Skellefte district.

The mineral resource is obtained from a wireframe based on geology, mining assumptions and NSR (Net Smelter Return) value. The NSR value is based on Boliden's long term estimation on metal prices for zink, silver, lead, copper and gold and on results from the mineral process for Renström ore.

The geology controls the interpretation of the ore and a cut-off value is used as a guide. The cut-off of 480 SEK/ton is given by the mine to reflect the actual mining costs in Boliden Renström mine. A cut-off value of 550kr/ton is used when deciding on what sections of the mineralization to include in the estimation from each drill hole. This corresponds to the cut-off defined by Renström mine at 480kt/ton with an added 15 % waste rock dilution. Ore interpretations are then created as horizontal shapes every 5e meters though the area of interest.

All block models in Renström have parent block size of 6 x 5 x 5m (x, y and z respectively).

Today there are two alternative softwares packages which are being used for the resource estimations. Propack, which is an add-on to CAD program Microstation has historically been used by Boliden, but in recent years Datamine Studio RM is being used increasingly.

Ordinary kriging and inverse distance weighing methods are used for estimating mineral resources.

Composite Length Analysis normally sets the most suitable composite length. For many of the estimations in G1R a composite length of 2m is used which represents the dominating section length of the analyses or a multiple of it.

Statistics (histograms) are studied for outliers in order to decide the used of grade capping. For many of the resource estimates a straight grade cap of 10g/t Au and 1000g/t Ag is used.

The classification of the resources is based on geological understanding and continuity, quality and quantity of informing drill hole data and confidence in the block estimates.

Mineral Recourses in Renström are normally reported with 15% waste dilution.

3.13 Mineral Reserves

Before actual mining, positions in the mineral reserves are infill drilled. See 3.7. Out of the geological logs a geological interpretation is set up. Based on it and on the assays wireframes are made for each lode in Studio ®. Grades are interpolated in the wireframes most generally using inverse square distance for calculation and dynamic anisotropy for the search volume. The wireframes are then extended to the minimal mining unit and restricted to the economical ore. That builds the mineable volume. After each slice (for cut&fill positions) the model is updated to take in account the face and roof mappings. Further modifying factors may shrink that first mineable volume such as overall profitability, rock mechanic (pillars) down to the mineral reserves.

Table 9. Mineral Resources and Mineral Reserves Renström 2020-12-31 divided by ore lenses

Ore/Lens	Classification	Quantity	Au	Ag	Cu	Zn	Pb	As	S	Dilution	Ore	NSR
Position		2020-12-31	g / t	g / t	%	%	%	%	%	%	Recovey	SEK/ton
		Kton									%	
Main ore												
H1362 1388	Proven Reserve	23	1.08	39.2	0.61	1.96	0.47	0.02	7.18	9%	57%	840
H1362 1388	Probable Reserve	40	1.13	37	0.65	2.36	0.50	0	9	12%	55%	910
H1362 1388	Inferred Resource	26	3.40	64	0.37	8.79	3.31	0	13	15%	100%	2406
H1450 1425	Proven Reserve	14	3.34	118	0.63	8.05	1.39	0	23	0%	100%	2395
H1450 1425	Probable Reserve	231	2.17	221	0.32	8.55	2.24	0	15	15%	100%	2422
H1530	Indicated Resource	97	3.50	160	0.50	7.77	1.92	0	13	12%	100%	2513
H1500 1600	Inferred Resource	261	1.30	38	0.78	4.31	0.68	0	9	15%	100%	1244
Pillar 1	Indicated Resource	0	0.00	0	0.00	0.00	0.00	0	0	0%	100%	0
Pillar2	Measured Resource	0	0.00	0	0.00	0.00	0.00	0	0	0%	100%	0
Pillar2	Measured Resource	0	0.00	0	0.00	0.00	0.00	0	0	0%	100%	0
Total main ore		668	2.03	121	0.55	6.41	1.50	0	12	14%	97%	1883
Simon												
Simon J	Inferred Resource	128	1.31	65	0.06	4.97	0.76	0	11	15%	100%	1163
Simon I	Indicated Resource	146	1.00	183	0.10	4.00	1.00	0	14	15%	100%	1329
S609 575 H	Probable Reserve	227	3.11	168	0.13	7.37	1.58	0	8	4%	100%	2243
S690 658-H	Probable Reserve	180	2.06	45	0.31	4.17	0.45	0	6	4%	100%	1250
Simon H	Indicated Resource	170	0.47	11	0.15	1.75	0.16	0	3	4%	100%	413
S510G	Indicated Resource	166	1.98	162	0.08	9.99	1.71	0	12	15%	100%	2266
S572/538G	Probable Reserve	163	3.29	252	0.16	15.67	2.49	0	18	8%	98%	3592
S653/628/613G	Probable Reserve	569	3.09	172	0.16	9.18	1.63	0	10	8%	98%	2480
S752/727/702/677	Probable Reserve	1 613	2.45	78	0.19	4.58	0.83	0	7	5%	90%	1470
S768-G	Proven Reserve	0										0
S855-G/830-G/805-G	Proven Reserve	85	2.49	60	1.11	6.84	0.75	0	12	12%	87%	2006
S768-F/746-F/722-F	Proven Reserve	17	2.38	294	0.14	6.79	1.68	0	18	9%	100%	2359
S768-F/746-F/722-F	Probable Reserve	59	2.79	295	0.24	7.90	1.51	0	25	9%	100%	2614
S855-F/830-F/805-F	Proven Reserve	124	1.61	155	0.30	4.55	0.84	0	20	20%	88%	1518
S1036/1070/1084	Proven Reserve	0										0
S1036/1070/1084	Indicated Resource	42	1.77	27	1.70	2.59	0.19	0	22	15%	100%	1392
S1140/S1113	Probable Reserve	57	1.77	112	0.72	4.50	0.85	0	13	15%	69%	1574
S1206/1180	Probable Reserve	34	3.24	197	0.50	9.94	1.77	0	21	20%	100%	2802
S1245	Inferred Resource	72	2.40	218	0.29	7.36	1.90	0	10	15%	100%	2291
Total Simon		3 851	2.37	117	0.23	6.16	1.09	0	10	8%	94%	1779
Vilma												
V834	Measured Resource	3	0.62	39	0.04	1.70	0.26	0	2	17%	100%	491
V884/858/840/821	Proven Reserve	34	1.99	135	0.08	3.90	0.77	0	5	17%	98%	1395
V978/953/927	Proven Reserve	24	6.26	254	0.22	9.35	1.80	11	0	16%	100%	3507
V1047/1022	Proven Reserve	18	1.67	132	0.22	3.53	0.82	0.14	7	16%	100%	1318
V1206/1180	Probable Reserve	16	2.26	96	0.38	4.57	0.90	0.09	8	17%	100%	1543
V1240	Probable Reserve	22	0.68	76	0.10	2.59	0.71	0.14	6	21%	100%	769
V1355/1324	Indicated Resource	129	0.48	50	0.78	1.93	0.60	0	7	15%	100%	792
V1415/1399	Indicated Resource	52	0.36	8	0.90	0.42	0.10	0	7	7%	100%	469
V1415/1399	Probable Reserve	110	2.07	202	0.49	5.08	1.36	0	10	7%	100%	1923
V1415/1399	Proven Reserve	14	5.83	360	0.43	10.34	2.87	0	16	7%	100%	3969
V1500/1460	Probable Reserve	449	1.83	154	0.45	7.89	1.65	0	13	15%	100%	2077
V1500/1460	Indicated Resource	261	0.45	32	1.09	1.78	0.38	0	7	15%	100%	805
V1500/1460	Inferred Resource	38	1.31	29	3.48	0.69	0.11	0	12	15%	100%	1660
Pos5	Inferred Resource	0	0.00	0	0.00	0.00	0.00	0	0	0%	100%	0
Total Vilma		1 170	1.43	110	0.72	4.75	1.05	0	10	14%	100%	1536
Fingal												
F920	Probable Reserve	225	1.18	16	1.60	0.41	0.06	0	6	3%	100%	919
F920	Indicated Resource	20	1.15	18	1.86	0.47	0.03	0	7	6%	100%	1009
Total Fingal		244	1.18	16	1.62	0.41	0.06	0	6	3%	100%	927
Julia												
J 1130	Inferred Resource	33	1.77	39	0.17	5.35	1.24	0	8	15%	100%	1317
J1362/1334	Proven Reserve	0	2.80	150	0.30	8.40	1.80	0	13	2%	100%	2318
J1362/1334	Probable Reserve	47	2.04	117	0.31	5.99	1.15	0	11	6%	91%	1713
J1418/1378	Probable Reserve	160	2.87	104	0.61	6.36	1.40	0	11	15%	90%	2037
J1550	Indicated Resource	62	1.97	32	0.71	3.81	0.51	0	9	15%	100%	1289
J 1550	Inferred Resource	220	1.96	106	0.29	5.81	1.15	0	8	15%	100%	1636
Total Julia		522	2.24	93	0.43	5.73	1.16	0	9	14%	96%	1705
Aina												
	Inferred Resource	230	0.85	57	0.18	4.10	0.69	0	11	15%	100%	962
Total Aina		230	0.85	57	0.18	4.10	0.69	0	11	15%	100%	962
Dagbrott												
	Indicated Resource	107	3.10	118	0.60	6.14	1.10		17	18%	100%	2079
Total Dagbrott		107	3.10	118	0.60	6.14	1.10	0	17	18%	100%	2079

Table 10. Mineral Resources and Mineral Reserves Renström 2020-12-31 by position

	2020	2019

Classification	kt	Au (g/t)	Ag (g/t)	Cu (%)	Zn (%)	Pb (%)	kt	Au (g/t)	Ag (g/t)	Cu (%)	Zn (%)	Pb (%)
Mineral Reserves												
Proved	352	2.4	141	0.5	5.6	1.0	302	2.5	116	0.5	6.2	1.0
Probable	4 202	2.4	122	0.3	6.3	1.2	3 687	2.0	111	0.4	5.7	1.1
Total	*4 554*	*2.42*	*124*	*0.35*	*6.22*	*1.19*	*3 989*	*2.1*	*111*	*0.40*	*5.74*	*1.09*
Mineral Resourcess												
Measured	3	0.6	39	0.0	1.7	0.3	0					
Indicated	1 277	1.4	81	0.6	4.1	0.8	1 161	2.1	111	0.4	4.8	1.0
Total M&I	*1 280*	*1.35*	*81*	*0.6*	*4.1*	*0.8*	*1 161*	*2.1*	*111*	*0.43*	*4.79*	*1.01*
Inferred	982	1.4	74	0.5	4.8	0.9	1 512	2.2	133	1.0	9.3	1.6

Table 11. Mineral Resources and Mineral Reserves Renström and comparison year to year

3.14 Comparison with previous year/estimation

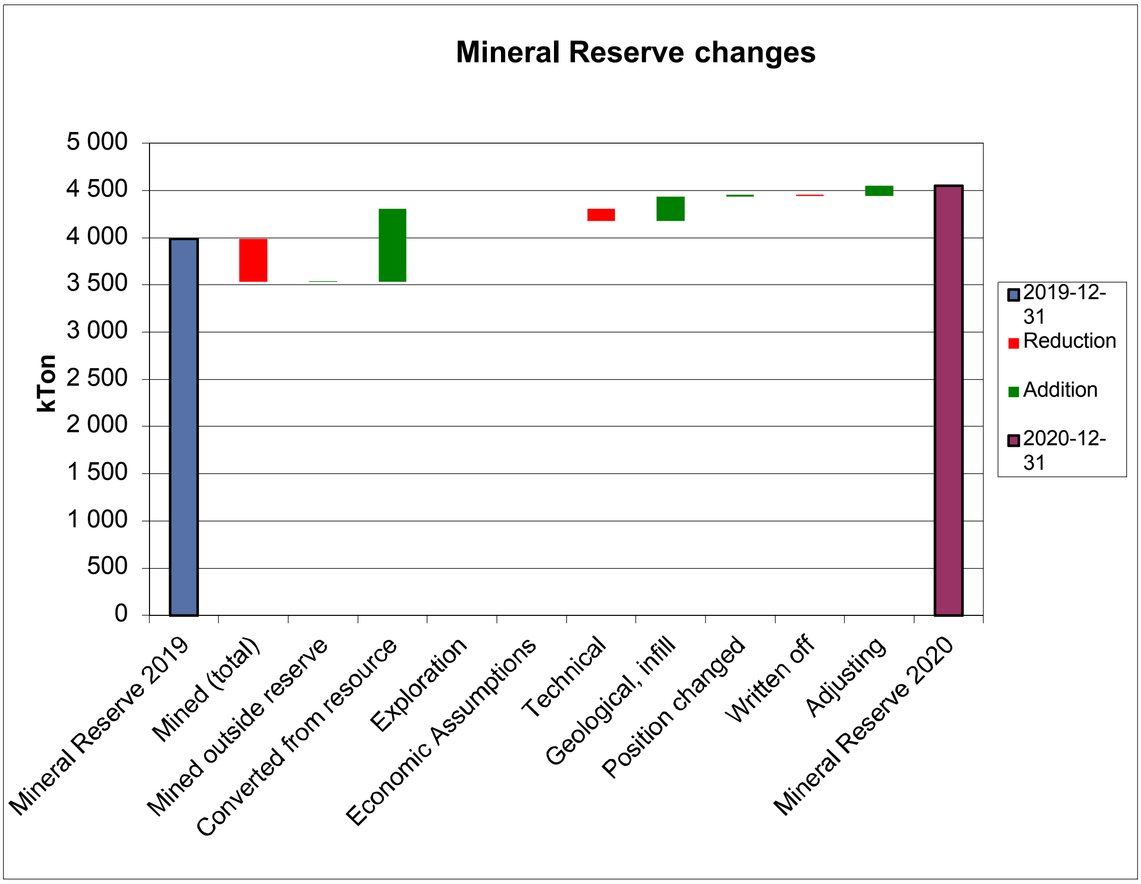
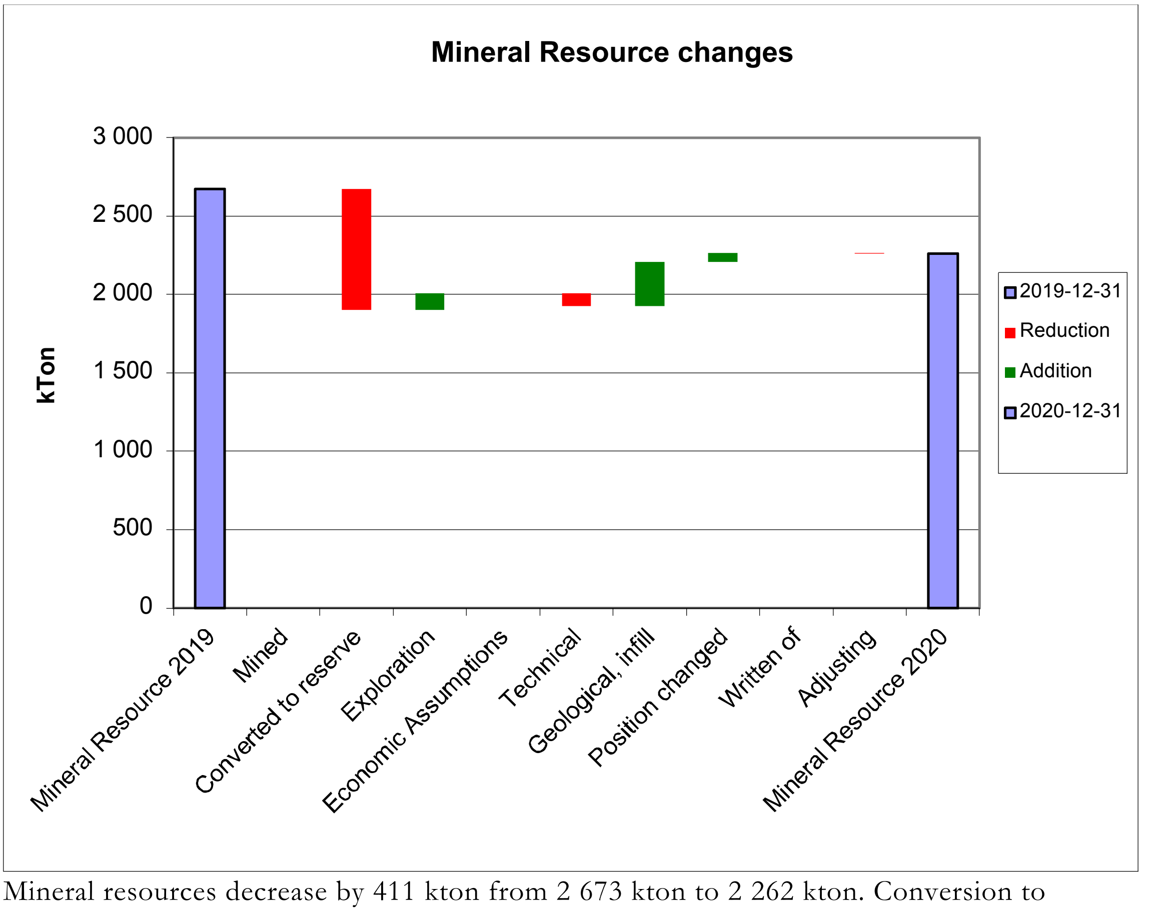


Figure 1.Changes to mineral reserve

Gains in mineral reserves amply offset the 457 kton of production as a net balance of +565 kton.
Conversion from resources stands for +773 kton.
2 sillpillars stand for most of the losts.



Mineral resources decrease by 411 kton from 2 673 kton to 2 262 kton. Conversion to mineral reserves stand for 773 kton. Exploration brings 108 kton in.

Figure 2 Changes to mineral resource

3.15 Reconciliation

Reconciliation blockmodel versus mill shows very high negative discrepancies for Zn and Pb, high negative ones for Au and Ag and moderate negative one for Cu. The author did an overall review of the grade calculation for 4 out of 5 lodes.

Table 12. 2020 reconciliation mine versus mill

Position m. Linsnr	Ton	Au g/t	Ag g/t	Cu %	Zn %	Pb %	S %	dilution
Mine output	**457 494**	**2.4**	**139.0**	**0.64**	**5.7**	**1.2**	**10.8**	**7%**
Anm.								
Stockpiles	**464 602**	**2.5**	**143**	**0.6**	**5.8**	**1.2**	**11.0**	
Mill throughput	*479 117*	*2.1*	*121*	*0.58*	*4.7*	*0.9*	*11*	
deviation versus mill	**14 515**	**-0.4**	**-21.9**	**0.0**	**-1.1**	**-0.3**	**-0.1**	
deviation versus mill %	**3.1**	**-14.9**	**-15.3**	**-7.9**	**-18.8**	**-25.4**	**-1.1**	

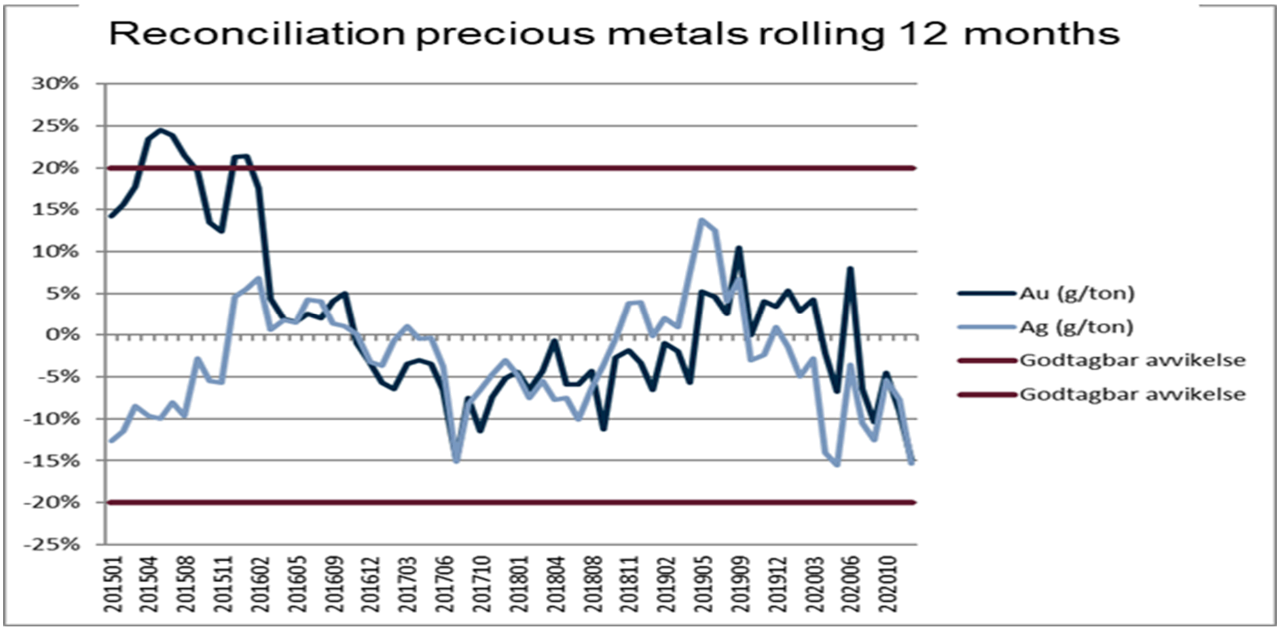


Figure 5. Rolling 12 month reconciliation for precious metals since 2015

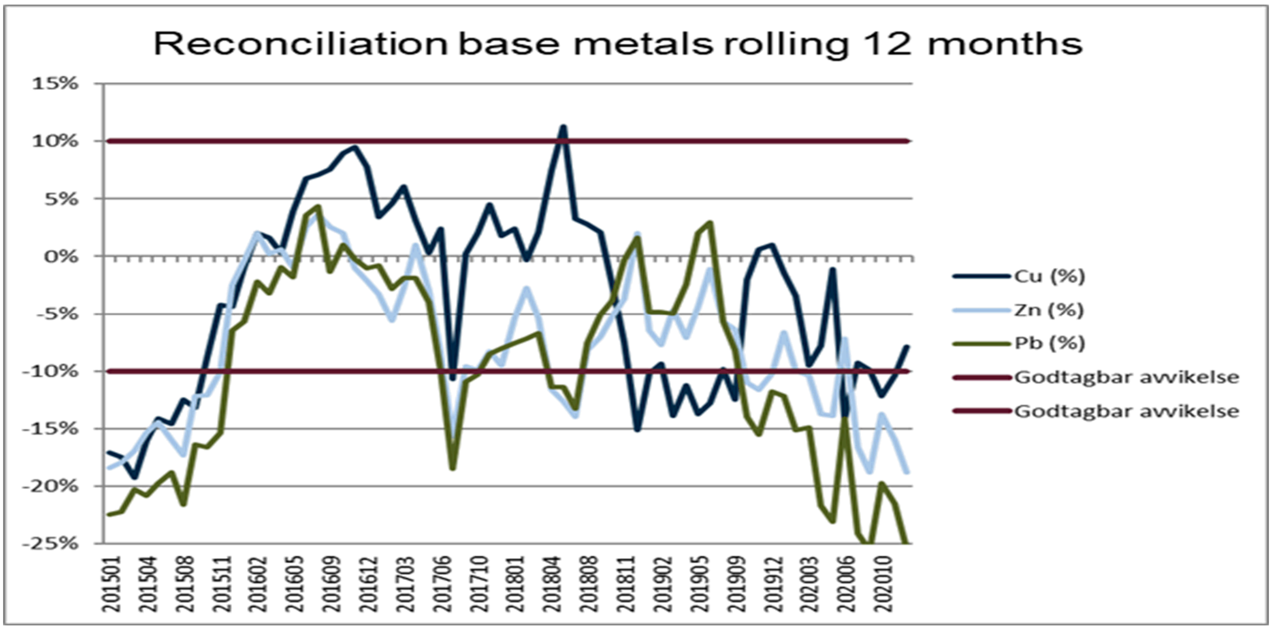


Figure 6. Rolling 12 month reconciliation for base metals since 2015

4 REFERENCES

Pan-European Standard for reporting of Exploration results, Mineral Resources and Mineral Reserves (The PERC Reporting standard 2017.) www.percstandard.eu

History (Example)

1921	Prospecting started in Renström and the ore blocks were discovered.
1926	Renström Östra was encountered in drill holes.
1928	Huvudmalmen was encountered in drill holes.
1944-1948	mining test, a shaft sunk to level of 469 m.
1953	Full ore production.
1959	The shaft deepened down to 910 m.
1996	A 2.5 km long gallery between Renström and Petiknäs completed. Huvudmalmen and the deep ore were encountered in drill holes at a depth of 1550 m.
1998	Simon was discovered.
2005	In the deep zone's extension, two sulphide lenses were discovered, Julia and Vilma.
2007	Vilma´s ore production starts.
2007	A new sulphide lens discovered to the east of Simon and Vilma. The lens is named Aina.
2008	A large increase in Simon upwards and eastwards. The copper ore from Main ore 1195 and 1255 mined separately with regard to a large scale beneficiation test at the mill.
2009	Beneficiation test of copper ore shows no income difference between separating copper ore and mixing it with the zinc ore.
2010	Further discoveries linked to the Simon ore body up to 515m level. Development of the so called Fingal copper mineralisation. The mine now extends from -890m to -1333m.
2011	Deepening of Vilma ore down to -1520m.
2015	Exploration of Simon from gallery 650
2017	Simon I entered in inferred resources