

Mineral resources and reserves



Our mining base is the great strength that underpins the company's future, with mega-deposits that have an expected life of over 80 years.

In reporting its mining asset inventory, Codelco differentiates between mineral resources and reserves in accordance with current regulation. In addition, in reporting geological resources, it indicates the current potential of deposits identified.

Geological resources - which are classified as measured, indicated or inferred - are the result of exploration and are estimated using geoscientific models. When these resources are economically interesting and have a reasonable likelihood of being mineable, they are known as mineral resources.

Mineral reserves, which are classified as proven or probable, are the subset of measured and indicated mineral resources that can be extracted according to a technically and economically sustainable mine plan included in a production scenario.

The process of transforming mineral resources into reserves, which is carried out by a competent person, includes the projection of current operations and projects at the pre-feasibility and feasibility engineering level of each divisional production scenario.

Our mining assets are classified according the common definitions for all the company's Divisions, with a comprehensive and auditable classification process and quality control of the geological modelling and estimation process.

Inventory of in situ geological resources

Division	Measured resources			Indicated resources			Inferred resources			Geological resources		
	Mineral Mt	CuT grade %	Fine Cu Mt	Mineral Mt	CuT grade %	Fine Cu Mt	Mineral Mt	CuT grade %	Fine Cu Mt	Mineral Mt	CuT grade %	Fine Cu Mt
Radomiro Tomic	1,448	0.49	7.2	1,713	0.43	7.4	4,438	0.37	16.4	7,599	0.41	31.0
Chuquicamata	2,731	0.65	17.8	1,767	0.51	9.0	9,538	0.37	35.7	14,036	0.45	62.5
Ministro Hales	219	1.05	2.3	369	0.86	3.2	1,249	0.68	8.5	1,837	0.76	14.0
Gabriela Mistral	387	0.35	1.4	75	0.29	0.2	508	0.33	1.7	970	0.34	3.3
Salvador	704	0.48	2.4	671	0.39	2.2	1,904	0.43	10.4	3,279	0.43	15.1
Andina	2,856	0.74	21.0	2,493	0.67	16.7	16,974	0.58	98.1	22,323	0.61	135.8
El Teniente	2,956	0.83	24.4	2,701	0.56	15.1	9,585	0.48	46.2	15,242	0.56	85.8
Exploration/ businesses and subsidiaries	161	0.26	0.4	138	0.27	0.4	2,701	0.35	9.5	3,000	0.34	10.2
Total	11,463	0.68	77.5	9,928	0.55	54.2	46,897	0.48	224.3	68,287	0.52	356.8

Mt: Millions of tonnes. **CuT%:** Total copper percentage.

In our 2016 inventory, geological resources showed a minimal drop of 0.1% of fine copper over the 2015 inventory. This was explained by the update of geological models and new estimates of resources in the light of reconnaissance campaigns.

On the other hand, resources in artificial deposits showed a 2% increase in fine copper, due to an update of the estimate of stock and broken material.

Inventory of resources in artificial deposits

Division	Mineral Mt	CuT grade %	Fine Cu
Chuquicamata	1,406	0.24	3.3
Salvador	1,390	0.24	3.3
El Teniente	2,415	0.53	12.8
Total	5,210	0.37	19.4

Resources in artificial deposits

Broken material: Resources not extracted, remnants of extraction of sectors exploited using underground mining.

Stock: Extracted resources that are stockpiled in duly identified areas. Stock is the result of open-pit mining and depends on the mine plan's cut-off grades (short and long-term). Tailings and gravel are also reported as artificial deposits.

Mineral Resources

Each year, Codelco prepares a Business and Development Plan that contains a projection of the business in the short, medium and long term.

The strategic long-term plan is drawn up on the basis of mineral resources with potential economic value, taking into account geological, metallurgical, geo-mechanical, economic, financial, environmental and community factors and other factors of a technical-economic nature with their corresponding degree of reliability.

In order to update and refine the classification of mineral resources, we carry out drilling campaigns that provide additional information. This allows us to implement the different profile, pre-feasibility and feasibility

engineering stages in a robust manner. This process involves a series of specific activities that are set out in the company's strategic agenda and are scheduled, programmed and budgeted over time. The Division with the lowest level of resources has an expected exploitation horizon of ten years while, in the case, of some of the company's mega-deposits, it is in excess of 80 years.

In our corporate inventory of mineral resources, information from all the company's Divisions is consolidated, based on measurement of the pit shell in the case of open-pit mines and, in the case of underground mines, the volumes of mineral, using variable cut-off grades calculated from a mine plan.

Inventory of mineral resources (I)

Division	Measured resources			Indicated resources			Inferred resources			Mineral resources		
	Mineral Mt	CuT grade %	Fine Cu Mt	Mineral Mt	CuT grade %	Fine Cu Mt	Mineral Mt	CuT grade %	Fine Cu Mt	Mineral Mt	CuT grade %	Fine Cu Mt
Radomiro Tomic	1,300	0.50	6.5	1,288	0.46	5.9	1,195	0.43	5.2	3,784	0.46	17.5
Chuquicamata	650	0.87	5.7	641	0.70	4.5	645	0.51	3.3	1,936	0.69	13.4
Ministro Hales	136	1.22	1.7	59	1.02	0.6	726	0.90	6.5	922	0.95	8.8
Gabriela Mistral	355	0.36	1.3	69	0.30	0.2	6	0.25	0.0	431	0.35	1.5
Salvador	208	0.67	1.4	123	0.52	0.6	310	0.25	0.8	641	0.44	2.8
Andina	1,585	0.85	13.5	1,073	0.80	8.6	1,937	0.80	15.4	4,595	0.82	37.6
El Teniente	1,405	0.98	13.8	685	0.80	5.5	1,679	0.74	12.5	3,770	0.84	31.8
Total	5,640	0.78	43.7	3,939	0.66	25.9	6,499	0.67	43.7	16,078	0.71	113.4

Note: At variable copper grade according to mine plan.

Mt: millions of tonnes. **CuT%:** Total copper percentage.

Inventory of artificial material (II)

Division	Artificial material		
	Mineral Mt	CuT grade %	Fine Cu Mt
Radomiro Tomic	31	0.34	0.1
Chuquicamata	130	0.35	0.4
Ministro Hales	76	0.38	0.3
Salvador	236	0.60	1.4
Andina	221	0.72	1.6
El Teniente	482	0.54	2.6
Total	1,176	0.55	6.4

Note: At variable copper grade according to mine plan.

Inventory of mineral resources by division (I+II)

Division	Total 2017 Business and Development Plan		
	Mineral Mt	CuT grade %	Fine Cu Mt
Radomiro Tomic	3,815	0.46	17.6
Chuquicamata	2,066	0.67	13.9
Ministro Hales	997	0.91	9.1
Gabriela Mistral	431	0.35	1.5
Salvador	877	0.48	4.2
Andina	4,817	0.81	39.2
El Teniente	4,252	0.81	34.3
Total	17,254	0.69	119.8

Contribution of mineral resources by subsidiaries

Participation in subsidiary	Subsidiaries' mineral resources		
	Mineral Mt	CuT grade %	Fine Cu Mt
Anglo American Sur (20%)	1,629	0.64	10.4
Inca de Oro (33,84%)	156	0.41	0.6
El Abra (49%)	1,089	0.44	4.8
Subtotal subsidiaries	2,875	0.55	15.8
Total Codelco	20,129	0.67	135.6

Note: Codelco's stakes in other companies include the Los Bronces, El Soldado, El Abra and Inca de Oro mines. Mineral reserves are included in mineral resources.

Sources: Anglo American Sur, Freeport McMoran and Panaust (Annual Report 2014).

Mt: Millions of tonnes. CuT%: Total copper percentage.

In our 2017 Business and Development Plan, mineral resources show a drop of 2.4 million tonnes of fine copper as compared to the previous Plan. This reduction is explained by annual consumption and an update of the inventory of mineral resources in mine plans. One example of the latter is the reformulation of the El Teniente Division's Recursos Norte project where, as a result of a review of future projects to expand processing capacity and optimization of the global plan, a plan was achieved that requires less mineable resources.

The inventory adds 15.8 million tonnes of fine copper to the company's resources, taking into account stakes in the Anglo American Sur mines, Inca de Oro and El Abra, and brings the total up to 136 million tonnes of fine copper.

Mineral reserves

Our mineral reserves were determined in accordance with the norms issued by Chile's Mining Resources and Reserves Competency Appraisal

Commission created under Law N° 20.235. They are the result of long-term mine planning and include only the measured and indicated mineral resources of projects for which a pre-feasibility or feasibility study has been completed. Inferred resources within the life of the mine plan of open-pit and underground mines are treated as waste rock for the purposes of economic evaluation.

Details of the calculation of the company's mineral reserves as of 2016 can be found in each Division's Resources and Reserves Public Report.

In 2016, mineral reserves showed a drop of 2.7 million tonnes of fine copper, due principally to consumption during the year which explained 2 million tonnes. The rest of the difference corresponds to the reduction in the reserves of El Teniente's Recursos Norte project.

The inventory of mineral reserves includes 2.7 million tonnes of fine copper which correspond to Codelco's stake in SCM El Abra and Anglo American Sur, taking the total of mineral reserves to 48.2 million tonnes of fine copper.

Inventory of sulfide and oxide reserves

Division	Proven			Probable			Reserves		
	Mineral Mt	CuT grade %	Fine Cu Mt	Mineral Mt	CuT grade %	Fine Cu Mt	Mineral Mt	CuT grade %	Fine Cu Mt
Radomiro Tomic	887	0.51	4.6	1,238	0.49	6.0	2,125	0.50	10.6
Chuquicamata	638	0.88	5.6	695	0.59	4.1	1,333	0.73	9.8
Ministro Hales	169	1.07	1.8	56	0.91	0.5	225	1.03	2.3
Gabriela Mistral	320	0.36	1.2	73	0.30	0.2	393	0.35	1.4
Salvador	30	0.54	0.2	12	0.55	0.1	42	0.55	0.2
Andina	728	0.78	5.7	237	0.64	1.5	965	0.75	7.2
El Teniente	763	1.07	8.1	820	0.72	5.9	1,583	0.89	14.1
Total Codelco	3,536	0.77	27.2	3,131	0.59	18.4	6,667	0.68	45.5

Note: Codelco's stakes in other companies include the Los Bronces, El Soldado and El Abra mines. **Source:** 2015 Annual Reports of Anglo American Sur and Freeport McMoran.
Mt: Millions of tonnes. **CuT%:** Total copper percentage.

Subsidiaries' contribution to reserves

Participation in subsidiary	Reserves		
	Mineral Mt	CuT grade %	Fine Cu Mt
Anglo American Sur (20%)	337	0.54	1.8
El Abra (49%)	196	0.44	0.9
Subtotal subsidiaries	533	0.50	2.7
Total Codelco	7,200	0.67	48.2

Mt: Millions of tonnes. **CuT%:** Total copper percentage.

The budget restrictions of recent years prompted a review of the development of projects and the company's strategy for consumption of reserves, which may imply some variation in estimates of mineral resources and reserves in the next planning exercise.

(Instrument 43-101), South Africa (SAMREC), the United States (Society of Mining Engineers), Europe (Pan-European Code) and Russia (NAEN) which adhere to common international regulation on the reporting and disclosure of exploration prospects and mineral resources and reserves.

Competent persons

Codelco's public reports on resources and reserves are signed by the following competent persons from the company, depending on their divisional or corporate level of responsibility, and are the information on the basis of which the company's inventory of resources and reserves is prepared. These competent persons are registered with the Mining Resources and Reserves Competency Appraisal Commission.

In line with best practices, the geo-mining metallurgical information on which the inventories of the company's different Divisions (2015) are based was audited and reviewed, depending on the case, by independent auditors from within the company as well as from Tetrattech-Metálica, NCL Ingeniería y Construcción S.A. and EMI-S.A.

Chilean Law N° 20.235 regulates matters relating to competent persons and created the Mining Resources and Reserves Competency Appraisal Commission. This Commission is a member of the Committee for Mineral Reserves International Reporting Standards (CRIRSCO), which brings together organizations from Australia (JORC), Canada

Register N°	Competent person	Organization
0093	Manuel Mansilla Orellana	Mining Resources Area
0099	Patricio Zúñiga Rojas	
0084	Felipe Celhay Schoelermann	El Teniente Division
0198	Daniel Bustamante Valdés	
0254	Michel Galeb Nicolas	Andina Division
0239	Víctor Sandoval Zepeda	
0318	Rodrigo Molina Paredes	Salvador Division
0017	Hugo Adrián Flores	
0203	Claudio Nicolás Vargas	Gabriela Mistral Division
0098	Rafael Valenzuela Briceño	
0200	Alejandro Dagnino Espinoza	Ministro Hales Division
0197	Víctorino Moyano Escobar	
0192	Raúl Cancino González	Radomiro Tomic Division
0206	Sebastián de la Fuente Alfaro	
0257	Renato Valdés Romo	Chuquicamata Division
0252	Juan Carlos Peña Pérez	

Note: These competent persons were certified in February and March 2017.