

### II.2.1.6 Andina Division.

Andina is one of Codelco's newest Divisions. It was developed in the late 60's initially by Cerro Corporation of the United States.

Andina's indicated and inferred reserves are 1.5 billion tons of mineral, but production plans only include 400 million tons, with a cut-off grade of 1.06%. At the current exploitation rate of 35,000 tpd, these reserves are sufficient for seventy years of useful life, but to maintain that rate it will be necessary to expand activities and start operating the Mine's Third Panel, which involves considerable investment. It is intended to raise the exploitation to 60 thousand tpd, thus reaching production capacity of 200,000 tons of fine copper per year compared to the current 120,000 tons. It would involve a semi-autogenous mill with one or two secondary mills and on-line crushers, and the exploitation of 489 million tons of mineral over a 25-year period, with an average grade of 1.02%. In the long-term, operations will be underground once again as the mineral existing in the pits will be depleted.

Andina has several typical characteristics that differentiate it from other Chilean mines. It forms a single mineralized deposit with Los Bronces of Disputada de Las Condes, it has an underground concentrating plant, and it is the only one of Codelco's Divisions that does not have a smelter.

Andina was exclusively an underground mine for many years. But in 1980 a large deposit was discovered in the upper part of the orebody, under a thick layer of ice and snow, 2,500 m. south of the underground mine. Studies recommended it be exploited as an open pit. The application of the open pit exploitation method to the upper part of the deposit has had such positive aspects as low initial investment, the short period of time necessary to implement and execute the project, and a low over burden-mineral ratio during exploitation. Nevertheless, it can only be operated eight to nine months of the year due to adverse weather conditions.

The Sur-Sur mine has been an important factor in the development of Andina. At present this open pit supplies almost half of all Andina's mineral which is 6.5 million tpy, and it is expected that this proportion will be maintained until the beginning of the next millennium. US\$ 54.6 million has been invested in this deposit.

Andina is completing an expansion plan which raised its exploitation rate from 26,000 tpd in 1986 to 35,000 tpd today, and to 40,000 tons in 1992. The latter project has required investment to date of US\$ 13 million.

A second open pit has recently complemented surface mineral production. This is the North Pit which is much smaller than the first one.

In the long term operations will be underground again, because the mineral contained in the pits will be depleted.

Directory XI.2, Equipment Inventory, provides information on the equipment used in Andina.

### II.2.1.7 El Teniente Division.

El Teniente is Codelco-Chile's second Division in terms of production and labor force. It exploits the largest underground mine in the world in the VI Region, east of the city of Rancagua.

El Teniente has been the Division which has had more operative problems in the past years. Successive rock bursts in the main exploitation area have raised a problem that at times has appeared to be insoluble. A recent strike which brought up the subject of the Division's difficult labor relations, ended in an increase in costs. These have risen from 42 cents in 1985 to 68 cents in 1990.

Only last year they rose 10 cents because of the new requirements to strengthen the mine.

This situation has forced postponement of planned expansion which was intended to increase production to 383,000 tpy. Only 278,8 tons were obtained in 1991, and a maximum of 340,000 tons will be reached towards 1997.

The mine's measured reserves are 1.5 (1.504) billion tons with an average grade of 1.19%, equivalent to 17.9 million tons of copper.

### Teniente Production Programs.

The Division planned to increase production levels to 366,000 tons in 1991 and approximately 383,000 tpy in 1993. From that year on, because of the lower grade and increased hardness, a gradual decrease in production would occur.