

Ore & building
materials extraction

Keywords

- > Silver
- > Zinc
- > Lead
- > Bolivia
- > Cultural Impacts
- > Water
- > Open Pit Mining

Introduction

San Cristobal is located in south-western Bolivia, in the Colcha "K" Municipality of Nor Lipez, Potosi, with altitudes ranging from 3,800 to 4,000 metres (12,467 to 13,123 feet) above sea level. A dry region with decreasing precipitation, it receives an average annual rainfall of 150 to 200 millimetres (6 to 8 inches).

One of the largest zinc, lead and silver deposits in the world was discovered in this area. Plans to exploit the open pit mine included the relocation of a village dating to colonial times. This, in addition to the company's water management practices has generated constant protests by the local community.

Background

The mining operation was originally designed and planned by U.S. company Mineral Reserves Associates (MRA); the San Cristobal mining company, owned by Apex Silver Ltd. took its place in 2007 (its tax domicile is now in the Caiman Islands).

In 2008, the Japanese company Sumitomo took over the project. According to Sumitomo, "From Japan's perspective, the San Cristobal Mine is source of stable imports of silver, zinc and lead, and is making an indirect contribution to a wide range of Japanese industries, notably automobiles, construction, shipbuilding, and consumer electronics" (Sumitomo, 2012a, b).

The governments of Bolivian presidents Hugo Banzer, Jorge Quiroga, and Gonzalo Sanchez de Lozada relinquished the deposits at San Cristobal. Its exploitation was set to begin in 2006, and exportation of its minerals in 2007.

Project

San Cristobal is a silver, zinc and lead open pit mine. According to company data, on 30 June 2011, estimated reserves based on the last perforation were a total of 285,303,000 tons; 1.41 percent zinc, 0.48 percent lead and 53.0 grams/ton of silver (MSC, 2012a). The



*Demonstrations in San Cristóbal, 2010.
Source: El Diario, 2010.*

lifespan of the project is estimated at 17 years.

The two areas in the main deposit are called Jayula and Tesorera, located in the central part of the sedimentary volcanic basin, which is 4 kilometres in diameter. Anima, another field, is located three kilometres away from Tesorera. Sphalerite, galena and argentite are the main minerals found in these fields, which correspond to zinc sulphide, lead and silver, respectively.

The San Cristobal field is characterised by mineralisation in the form of thin veins, veinlets and disseminations. Together these form a very large deposit that does not lend itself to efficient exploitation through conventional underground mining methods. Consequently, the Project has to be run as an open pit mine.

The exploitation work requires a concentrator plant that processes 40,000 tons of ore per day. About 150,000 tons of rocks have to be transported daily to meet demands. The extracted ore is taken to the crushing plant by 200-ton capacity trucks, then transferred to designed storage areas and deposited. The crushed ore is transported to the concentration plant by a 1.6 kilometre-long (1 mile) conveyor belt (MSC, 2012b).

Up to the present, the company has declared a total investment of USD 1.400 million. This is the largest foreign mining investment in Bolivia by far. The infrastructure included 200 kilometres (125 miles) of roads, two bridges, 172 kilometres (106 miles) of 230-kilovolt power lines, and 65 kilometres (40





Landscape of the mining project in San Cristobal

Source: Latino Minería, "San Cristóbal tributó al estado boliviano US\$100 millones en 2010", 27 December 2010. latinomineria.com/2010/12/bolivia-san-cristobal-tributo-al-estado-boliviano-us-100-millones-en-2010/



Location of the San Cristobal Project

Source: minerasancristobal.com/es/donde-estamos



Container in San Cristobal (on the border of Chile) overturned by locals, (16 April 2010)

Source: Los Tiempos, 2010.

miles) of railways. Additionally, phone, Internet and other telecommunication facilities we installed; access to potable water was improved, and a runway was constructed (MSC, 2012c). The company states that these investments not only improve its operations, but also add to the quality of life of the local people. However, local residents claim that only a small part of the population has benefited from them.

Impacts

Exploitation of the mine meant the displacement and relocation of the San Cristobal community—a village of colonial origin—which led to serious social conflicts. A difficult agreement with the company was reached when it offered development projects, financial compensation and jobs to the local people.

Effort was spent to preserve certain architectural elements during the relocation, such as an old seventeenth-century church. However, residents claim their cultural heritage was directly impacted; for instance, three mountains that had previously surrounded them and were believed to be protective deities are now exploited by the company.

Additionally, mineral extraction requires huge amounts of surface and groundwater. An estimated 50,000 cubic

metres of water are drawn per day from company wells. Aquifer recharge by rainfall or snow is almost non-existent in the region. Surface waters connect to groundwater through filtration (Moran, 2009). The community states that if the water continues to be pumped, the surface waters, used for agricultural purposes, could dry out.

Village residents claim that water sources have disappeared due to extensive use by the mining company. In addition, the megaproject in the region generates a huge amount of dust, which not only affects the health of people in San Cristobal and neighbouring communities, but also the camelid livestock, due to loss of grazing pastures and water sources (Ribera Arismendi, 2010).

Finally, according to the local population, the Jaukiwa River has been contaminated by the disposal of general waste that was not treated.



1970s	The San Cristobal Mining Company initiated activities. Communities began to protest.
1995-1998	Negotiations began with the company. Some agreements were reached, including the relocation of a Catholic church and cemetery; identification of the cadastral boundaries; identification of land property; et cetera. The San Cristobal Foundation, a private initiative supported by the mining company was established.
2000	The EIA was submitted, and approved despite certain reservations on the water issue. It was updated twice, in 2004 and 2007. Communities complained about the lack of information and consultation on the study.
2008	July, The mining company in San Cristobal was bought by the Japanese company Sumitomo Corporation (buying 65 percent of Apex Silver's shares). Communities continued to protest.
2008	December, First exportation of minerals (close to 52,000 tons of lead and zinc).
2009	The Water Ministry asked for a comprehensive study that includes a model for water depletion.
2010	April, Community protests continued. Company property was destroyed.
2010	August, Local population continued protests. Law enforcers were sent to re-establish order.
2011	March and April, Local residents continued to demonstrate against company activities.

Conflict and consequences

The social conflict and mobilisation by the affected local communities and the mine workers have been constant in San Cristobal. Two of the main organisations working on this issue in the area are the *Federacion Regional Unica de Trabajadores y Campesinos del Altiplano Sur* FRUTCAS (Regional Federation of Workers and Farmers of the Southern Altiplano) and the *Federación Sindical de Trabajadores Mineros de Bolivia* (Federal Union of Mine Workers of Bolivia).

Mine employees affirm that the working and security conditions are inadequate, and claim that their health is now given due attention; they feel mistreated by the subcontracted staff. In 2009, 2010 and 2011, workers and locals protested and paralysed the activities of the company. They blocked the roads and border posts and burned the company's installations (El Diario, 2010, Los Tiempos, 7 April 2010).

The *Observatorio Bolivariano de Conflictos Mineros* (Bolivian Observatory of Mining Conflicts) has asserted that as a result of these acts, the company began to employ intimidation tactics toward people who participated in the protests (OSBOM, 2009), and even turned to the criminal justice system against the demonstrators.

Meanwhile, the local population has reported that water sources in the area are being used indiscriminately. The company declares that the water it consumes is not suitable for human consumption, agriculture or livestock (La Prensa, 2012). However, the communities state that the availability of surface waters suitable for human consumption and farming activities has been affected.

It is important to note that people in San Cristobal and other nearby communities are divided between those who have benefited from the mining company, and those who oppose it. This division is clear in times of protest. People claim that the company has promoted this schism by providing jobs and transportation to communities that have been less critical of their activities. The system of job rotation in the area creates rivalries among the people who apply to for them. The communities posit that the social fabric has been ruptured, and foreign values are being introduced.

A major issue that drives the protests is the economic benefits acquired by exploiting non-renewable resources. Local people are aware of the huge financial gains to be had from mineral exploitation, and thus demand more investments in their communities. They want the company to adhere to the Mining Code and pay for consuming natural water sources as stated in the law.

More on this case

- Elizabeth López Canelas, [La industria minera: Una industria sedienta. Estudio caso: Mancomunidad López: caso Minera San Cristóbal.](#) p. 30.

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Carbonell, M. H., 2014. Zinc, lead and silver mega-deposits in San Cristobal (Bolivia), EJOLT Factsheet No. 17, 4 p.

Additionally, the Supreme Court of Bolivia stated in 2006 that the Mining Code of 1997 was unconstitutional and that natural resources belong to Bolivians, despite concessions made to foreign corporations. Coinciding with the protests in April 2010, the Ministry of Mining and Metallurgy, referring to the San Cristobal's case, declared "Mining concessions must change their contracts, acknowledge State participation in revenues and a regional right to exploit natural resources (must be put in place)" (La Razón, 2010).

Although the Supreme Court decision came into force in 2008, demands to nationalise natural resources have not been yet been met.

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