

August 27, 2014

JX Nippon Mining & Metals Corporation

Launch of Commercial Application of Biomining Technology

Technology developed for economical processing of low-grade primary copper sulfide ores

We are pleased to announce that biomining technology developed by BioSigma S.A. (General Manager and CEO: Pilar Parada), a joint venture of JX Nippon Mining & Metals Corporation (president: Shigeru Oi) and Corporación Nacional del Cobre de Chile (National Copper Corporation of Chile: Codelco), has been selected by Codelco for use in its currently active mining operations, marking the start of commercial application as outlined below.

1. Overview of Biomining Technology

Biomining is a hydro-metallurgical method of extracting copper from copper ores in acidic condition, accelerating the extraction by utilizing activity of microorganisms. The BioSigma biomining technology to be applied commercially (“BioSigma Technology”) achieves a higher extraction rate than conventional approaches by selecting microorganisms that are optimal for the type of ore. The effectiveness of the new technology has been demonstrated even with low-grade primary copper sulfide ores (chalcopyrite, etc.) that up to now have had limited resource potential because there has been no economical way to extract copper from them.

2. Development History and Achievements to Date

We established BioSigma as a joint venture with Codelco in 2002 for the purpose of developing an economical method of processing low-grade primary copper sulfide ores. In the course of its research and development, BioSigma has so far acquired 82 biomining-related patents. Among these, major pillars of BioSigma Technology are gene-level monitoring of microorganisms identified as optimal for treating a particular type of ore and a bioreactor developed for selectively cultivating these microorganisms at low cost.

In a year-long industrial test conducted at Codelco’s Radomiro Tomic mine (in Region II or the Antofagasta Region of Chile) starting in December 2012, 50,000 tons of low-grade primary copper sulfide ores were used,

and the application of BioSigma Technology improved the copper extraction rate by 30 to 50 percent.

3. Commercialization Plans

Based on the favorable results of the above industrial test, Codelco recently decided to introduce BioSigma Technology in the Radomiro Tomic mine. In the initial phase the technology will be applied to 3.6 million tons of low-grade primary copper sulfide ores. Now that the mine is becoming exhausted of oxide ores to which conventional hydro-metallurgical process can be applied, the decision to apply the new technology will extend the operating life of the mine.

4. Significance of BioSigma Technology

Global demand for copper is expected to continue to be strong. On the supply end, however, ongoing production at existing mines has exhausted much of the high-grade deposits, leaving behind lower-grade ores from which copper extraction is more costly. To maintain a stable supply of copper, the development of efficient, low-cost processing technology applicable to primary copper sulfide ores, the most abundant in remaining deposits, is essential.

BioSigma Technology matches this need admirably. It has especially great potential as an economical means of processing low-grade primary copper sulfide ores, resources that up to now have not been exploited adequately.

Leveraging our competitive strength backed by this BioSigma Technology and other technologies, including our N-Chlo Process that is being developed independently, we will continue our active involvement in resource development projects to achieve the stable and efficient supply of copper resources, contributing to the sustainable development of society.

For Reference: Overview of BioSigma S.A.

Name	BioSigma S.A.
Location	Santiago, Republic of Chile
Representative	Pilar Parada
Established	2002
Capital	US\$49,299,000 (as of August 2014)
Equity holders	JX Nippon Mining & Metals: 33%; Codelco: 67%
Employees	68 (as of June 2014)