

Mansfield Minera S.A.



EPCM Service to Lindero Gold Mine Project – Updated News



SAXUM is managing the largest mining project currently under development in Argentina. Lindero is a gold mine project owned by Mansfield Minera S.A., the Argentinean Company of Fortuna Silver Mines Inc., which is located in the Puna region of the province of Salta. SAXUM started with the EPCM service for this project back in July 2017 through the update of the basic engineering and CapEx. In November 2017 SAXUM started the first purchasing activities, and in January 2018 the Construction Management regarding the temporary camps and the soils movement started. The construction of the PAD started in April this year and the pouring of the concrete for the crushing areas started recently in November 2018. SAXUM is managing all areas of engineering, procurement and construction management by means of a permanent project team of around 80 (eighty) professionals distributed in our Tucuman and Buenos Aires offices and on-site. SAXUM's team is composed by highly qualified and experienced engineers, managers, comptrollers, supervisors and designers from different background. Our on-site team also includes QA/QC and Health, Safety and Envi-

ronmental supervisors, to follow-up and comply the SAXUM/Mansfield policies, provincial and national laws, and international standards.

By November 2018, SAXUM already completed up to 80% of the detailed engineering for the project. Civil and structural engineering must be 100% completed by end November 2018, according to the Master Schedule. Other engineering areas such as Piping, Instrumentation and Mechanical engineering will be completed by middle of February 2019. The engineering by SAXUM includes the support, assistance and review of the design works done by the equipment suppliers. SAXUM has developed and implemented an efficient Document Control System in order to manage, receive and deliver documents and to facilitate the communication with its client: Mansfield Minera S.A. (Fortuna Silver Mines Inc.).

In addition, through its qualified project control team, SAXUM has also developed a very efficient Project Control System and a highly detailed Master Schedule. This is accompanied by an effective early warning procedure to keep a tight and

close follow-up of the project schedule.

SAXUM's Procurement Team have ensured the purchasing of about 80% of materials/equipment for the proper completion of the Project. In addition to that, all major contracts have been finalized as SAXUM had established proven procedures (in conjunction with Mansfield's policies) to select the most suitable providers to optimize costs, quality standards and delivery time according to the CapEx and the Master Schedule. SAXUM is working with well known providers in Argentina and overseas in different areas such as: EDVSA, SIC Comunicaciones, Schneider Electric, Panedile, Ruhr Pumpen, WEIR Vulco, Westpro, Siemens, Proyectos Metalúrgicos, Ecosan, Weg, Cinter and many others.

Regarding Construction Management, SAXUM is currently working on the site permanent camps infrastructure and progressing the heap leach pad and grinding areas. On-site, there are currently about 700 workers employed by different contractors. SAXUM is supervising and managing their activities to achieve the committed delivery date for the Project. ■

GCC USA



Civil/Structural Engineering and Site Supervision for the Upgrade of GCC Cement Plant in Rapid City, South Dakota, USA.

Grupo Cementos de Chihuahua (GCC) owns the cement plant located in Rapid City, South Dakota, US. In 2016 GCC started the development of the modernization of its plant which included, on one hand, the upgrade of the pyro-process and grinding areas to enlarge the clinker production capacity and, on the other hand, the upgrade of the existing homogenization silos. The upgrade of the pyro-process and grinding areas of GCC plant in South Dakota was carried out by FLSmidth (FLS), while GCC directly awarded SAXUM the evaluation of the structural safety condition and design of the required reinforcements in the existing homogenization silos. FLS also awarded SAXUM the civil and structural engineering related to its project for the upgrade of the pyro-process and grinding areas of the plant. This project involved many old and large structures which were subjected to relevant and complex upgrades; particularly complex were the structural designs to upgrade the existing Preheater Tower due to the involved large loads and to the limited number of additional columns that were able to be placed in this area.

The entire engineering project needed to be performed by SAXUM in very limited



time frame and the last phase of the engineering designs were developed in fast-track mode as the construction phase had already started. SAXUM's scope of work for FLS for this project included the on-site supervision during 12 months to attend and follow up the Request For Information of the construction company.

SAXUM assigned for these projects related to the upgrade of GCC's cement

plant in Rapid City a highly experienced team of engineers, designers and Project Manager, with deep knowledge of the structural designs features for all different buildings of cement plants.

To accomplish the project's objectives, SAXUM's project manager and lead engineers needed to coordinate and work with all involved companies in this project and, particularly, with the steel structures manufacturing workshop.

SINOMA



Soil/Bedrock Investigations and Topographic/Utilities Surveys for L'Amali Line Project of Loma Negra.

SINOMA is a global engineering company supplying one source plants, systems and services to the cement and minerals industries.

In this project and particularly for the new Line #2 at L'Amali Plant of Loma Negra CIASA (Loma Negra), in Olavarría, Argentina, SINOMA required specialized technical assistance to develop underground soils and rock investigations with the purpose of furnishing geotechnical parameters, both static and dynamic, for the proper foundation designs of the new facilities, for accurate estimation of the expected slopes, and eventual soil treatments, and finally, for the proper operation of the relevant dynamic

equipment that will be placed in the new Line #2, avoiding resonance effects. For this purpose and based on the deep knowledge of its professionals and recognized experience, SINOMA awarded SAXUM the project.

The soil investigations by SAXUM in the L'Amali plant of Loma Negra for the purpose of the new Line#2 were developed between October 2017 and January 2018. They have involved an extensive area and included both standard and non-standard soil investigations, and also vibration analysis during the operation of the existing vertical mills in Line #1 of the L'Amali plant. The soils investigations by SAXUM were oriented to identify and

determine the stratum conformation, the physical/mechanical features of each stratum, the condition of underground water, the quality of the bedrock, the admissible soil capacity at different levels below the ground, and the mathematical model for evaluating the settlements in each facility of Line #2.

In addition, the soil/rock investigations by SAXUM included the investigations of the dynamic features of the different layers of underground soils/rocks in the areas below the vertical mills (cement, coal and raw mills). Finally, the assistance included on-site surveys for topography and existing water and air utilities in the areas involved in the project.

GOLDCORP Inc.



Engineering and Project Control Service for Cerro Negro project in Santa Cruz, Argentina.



Oroplata S.A. (Argentine subsidiary of Goldcorp Inc.) is developing different expansion and upgrade projects for its Cerro Negro goldmine in the Province of Santa Cruz, approximately 60 km from the City of Perito Moreno in the Patagonia. For the purpose of these projects Oroplata S.A. has signed a framework agreement

with SAXUM to develop the engineering designs and the project control during the construction phase of these projects.

In this agreement, SAXUM has assigned a team of qualified and experienced professionals to conduct on-site surveys with the purpose to analyze current situation

and engineering needs in different areas of Cerro Negro. As a result, projects have been identified which will involve new constructions and/or upgrades to existing facilities in the mining plant. Once the different projects and corresponding scopes of the work are defined, SAXUM will perform the designs (from conceptual to detailed solutions) in all different disciplines, including Mechanical, Civil, Structural, Electrical and Instrumentation engineering. In parallel, SAXUM is developing/defining all needed data sheets and specifications for purchasing the required equipment and construction/erection works.

SAXUM assistance service to Oroplata includes the provision of an on-site Project Control Team to develop projects cost control and scheduling. Main purpose is the planning and follow-up/audit of all project construction works. ■

THE COMPANY



SAXUM Civil/Structural Engineering Manager N.A. Val Tarbet PE.

Val is based in Saxum's North American office in Irving, Texas and brings over 40 years of Civil/Structural engineering experience in the cement, oil & gas and power industries. Val earned his B.S. Construction Engineering Technology degree from Texas Tech University and his Master's degree in Civil Engineering from The University of Texas at Arlington. He is a licensed professional engineer in eleven states in the United States and has been a licensed engineer for 36 years.

Val worked as structural engineer for Texas Industries, an integrated cement company, in Dallas Texas; during his time there, he was a lead structural engineer for the installation of the fourth Kiln at the Midlothian plant and the lead structural engineer for a new cement plant built in Hunter, Texas. He was also the lead structural engineer over design projects for sand and gravel mining plants, Ready Mix

concrete plants, a stone mining plant, a concrete pipe plant, a lightweight aggregate plant and a precast concrete plant. Val designed belt conveyors, belt conveyors, chutes, shaker screen supports, rock and stone crusher foundations and feed and discharge chutes, equipment foundations and rigid frame metal buildings. Val continued his career working for several engineering companies as the lead structural engineer working on projects such as tank foundations, processing tower foundations, pipe-rack and pipe-rack foundations and electrical building foundations in several US states. Val's career includes extensive knowledge of steel fabrication and site work processes as he spent 6 years working for two different steel fabricators and has been on site for weeks at several project sites including Mexico and Canada, supervising civil/structural work processes and gathering field information. This field work has provided him



with an excellent insight to create designs allowing for efficient and economic installation of civil/structural work.

Val is a highly respected team manager and is fully supported by the SAXUM civil/structural department. He is already involved as Civil/Structural PE and Lead Engineer in different projects of SAXUM under development in the USA and North America for the cement industry. Val is strongly oriented to quality and schedule and, without question, has strongly enriched SAXUM's professional team. ■

CONNECTION is a newsletter published by SAXUM Engineered Solutions for its clients

BRAZIL	USA	ARGENTINA
+55 3133094578	+1 972 7173331 +1 972 7173332	+54 11 43721815 +54 381 4226151