

CURRICULUM VITAE

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SUMMARY OF PROFESSIONAL ACTIVITIES

I have worked as a geologist in the minerals industry for over 22 years. My work experience includes 10 years as an exploration geologist for gold and base metal deposits, 10 years as a mine geologist in open pit mining and more than 2 years as a consulting geologist working in base metals and precious metals.

Geologist with solid geological experience and extensive knowledge in:

- Integration of the mining process at different stages: from greenfield-brownfield exploration, pre-feasibility studies, feasibility to mine production.
- The basics of recoverable resources model: sampling (database – QA/QC) and geological model.
- Geological Modeling epithermal deposits and porphyry Cu-Au-Mo, using field observations and drill core.
- Design, management, and execution of drilling programs.
- Training, leadership, management and supervision of work teams.
- Preparation and cost analysis, planning and implementation of budgets and estimated. Design, administration and execution of drilling programs.

Strong commitment demonstrated in environment, communities and safety of the daily work with contractors.

Leadership and management of geological studies in phases of pre-feasibility and feasibility according to international standards (JORC, NI 43-101), including geotechnical studies, metallurgical and hydrogeological for the development of the project.

EDUCATION

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|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2006 – 2009 | Magíster (Master in Business Administration Collage of Economy and Business Administration (ESEADE), Argentina. Accreditation by CONEAU, Resolution N° 522/04. Argentina. |
| 1986 – 1993 | Geologist. National University of Córdoba (Argentina). |

PROFESSIONAL

- Competent Person as JORC and NI 43-101.
- Canadian Institute of Mining, Metallurgy and Petroleum. MEMBER CIM # 152176.
- Australasian Institute of Mining and Metallurgy. MAusIMM # 992246 CP (Geo) (Member Chartered Professional Geology).

LANGUAGES

Native language: Spanish.

Other languages: Level Intermediate in English (translation, speaking and writing).

TEACHING EXPERIENCE

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|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2016 | Argentine Mining Geological Service (SEGEMAR).
Training courses "The Fundamentals of the Recoverable Resources Model". Theory 16 Hs and Practical 16 h (32 h.) |
| 2015 to date | National University of Córdoba. F.C.E.F. y N. Geology – Department of Applied Geology.
Subject: Geology and Mining Operations (100 h). Assistant Professor by public contest. 2015 to date. |
| 2012 to date | National University of Buenos Aires. |

	F.C.E.F. and N. Post- graduate of specialization in Mining Geology. Module 2: Prospecting and Exploration (40 h).
2009	National University of San Luis. F.C.E. and N.
	Geology and geotechnical applied to open pit mine. Department of mining (20 h)
2004 to 2013	Minera Alumbrera Ltd. – Xstrata Copper. Leadership Development Program.
	Senior Facilitator. 2006 -2013
	Facilitator. 2004 - 2006
2002 to date	National University of Córdoba. F.C.E.F. y N. Geology – Department of Applied Geology.
	Subject: Well Drilling and Sludge Injection (100 h) Assistant Professor for public contest.

WORK EXPERIENCE

Nov. 2013 to date	CONSULTANG GEOLOGIST.
10/2016	“Antamina Mine”. Compañía Minera Antamina S.A. Perú. Audit Geological Model of Antamina. Final report.
05/2016	“Zafranal Project”. Compañía Minera Zafranal SAC, Perú. (AQM Copper). Conduct and responsibility as QP in the points 10, 11 and 12 of the Technical Report NI 43-101. Firm consents for AQM Copper (Zafranal Project, Peru Technical Report on the Pre-Feasibility Study).
10/2015	“Las Bambas Project”. Compañía Minera Las Bambas, Perú. (MMG). Ferrobamba, Chalcobamba and Sulfobamba deposits. Technical Review of QA/QC and Geological Model. Final reports.
08/2014-03/2015	“Zafranal Project”. Compañía Minera Zafranal SAC, Perú. (AQM Copper). Geological support for re-logging program and infill drilling. Pre-feasibility study. Final report: Data base, QA/QC program, Density and Geological model.
02/2015	“Spence Mine”. BHP Billiton. Chile. Audit QA/QC and Geological Model of Spence. Final report.
09/2014	“Antamina Mine”. Compañía Minera Antamina S.A. Perú. Audit Geological Model of Antamina. Final report.
08/2014	“El Peñón Mine”. Minera Meridian LTD (Yamana). Chile. Technical visit to the plant of the “El Peñón Mine”. Final report on sampling processing plant.
02/2014 to 03/2014	“Bajo de la Alumbrera Mine”. Minera Alumbrera Ltd. Argentina. (Glencore). Updated and calculation of reserves for BLA, 2014. Firm consents to NI-43101 for Yamana Gold.
11/2013 to 12/2013	“Zafranal Project”. Compañía Minera Zafranal SAC, Perú. (AQM Copper). Reports: “QA/QC data analysis, density, proposed infill DDH program, criteria and procedures used to interpret and obtain the solids models for the updated mineralization zones model.
April 2013 to Oct. 2013	MINERA PANAMA S.A. – FIRST QUANTUM MINERALS LTD. Proyecto “Cobre Panamá” (Panamá). SUPERINTENDENT GENERAL OF GEOLOGY. Report: Analysis and recommendations in the geological models”. Report: “Interpret, define and build geological wireframe models. Realization of the exploratory data analysis (EDA). Interpretation and definition the Geological Units”. Work with the FQM Mineral Resource group in Perth (West Australia) to review and re-build the entire Cobre Panamá resource.
Nov. 1998 to March 2013	MINERA ALUMBRERA LTD. – XSTRATA COPPER. “Bajo de La Alumbrera” Mine and “Agua Rica” Project. Province of Catamarca (Argentina). SUPERINTENDENT OF GEOLOGY & EXPLORATION (Greenfield – Brownfield areas). Disseminated areas and Agua Rica Project (Feasibility Study). November 2008 to date. SUPERINTENDENT OF GEOLOGY (Department of Geology, Geotechnics & Dewatering). Nov. 2007 / Nov. 2008. Responsible of the annual statement of reserves and resources, by code JORC and NI 43-10. SUPERINTENDENT OF GEOLOGY (Department of Geology & Geotechnics). June

2005 – Nov. 2007.

SENIOR GEOLOGIST (Department of Geology). February 2004 - June 2005

ORE CONTROL GEOLOGIST. March 2003 – January 2004

EXPLORATION GEOLOGIST. November 1998 – October 1999; April 2000 – February 2003.

- Generation of value through the Bajo El Durazno project, extending the useful life of Bajo de la Alumbrera mine. Exploration, drilling, geological interpretation and quantification of resources & reserves, according to NI 43-101 and JORC code.
- Five consecutive years of increases mineral reserves of Bajo de la Alumbrera mine. 218 MTn additional ore reserves in the period 2003 to 2008, expansion of mine life in six years. Increase from changes in the geological model, pit design, metal prices and optimizing inter-ramp angles. Diamond drilling program: infill geological and geotechnical.

Nov. 1999 to March 2000 **IAMGOLD ARGENTINA S.A.**
Project: “Mesa”. Province of Santa Cruz (Argentina).
EXPLORATION GEOLOGIST. (PROJECT CHIEF).

August to October 1998 **ARGENTINA MINERAL DEVELOPMENT s.a.**
Project: “La Cabeza”. Province of Mendoza (Argentina).
EXPLORATION GEOLOGIST.

January to June 1998 **WESTERN MINING CORPORATION**
Project: “Río Frío”, “Regalito”, “Guanaco Zonzo” and “Fabiana”. Valle del Cura.
Province of San Juan (Argentina).
EXPLORATION GEOLOGIST.

August 1996 to Sept. 1997 **MINERA ELDORADO S.A.**
Project: “Peña Negra” and “Laguna Verde”. Province of La Rioja and Catamarca
(Argentina). EXPLORATION GEOLOGIST. (PROJECT CHIEF).

February 1995 – July 1996 **HIGH AMERICAN GOLD S.A.**
PROSPECTING AND EXPLORATION GEOLOGIST.

TECHNICAL TRAINING

“Community Relations Management and Conflict Environmental Social in the Mining Sector”. (Intercede. Consultancy & Training). 200 h. April 2012 to April 2013.

“International Regulations for the certification of resources and mineral reserves”. UNSL. By M. Rossi. 24 h. April 2011. “Balanced Score Card Applied to the Mining Industry”. (Intercede. Consultancy & Training). 40 h. February 2011.

“Management of Mining Projects”. (Intercede. Consultancy & Training). 40 h. September 2010.

“Public report and Code JORC”. Workshop Xstrata Copper (AUSIMM – A. Clark). 16 h. Junio 2010.

“Geostatistics Applied to Resources and Reserves Calculation”. Nivel I y II. UNSL. By M. Rossi. 60 h. March – Nov. 2008.

“Basic Statistics course and Sampling for Deposit Evaluation”. Mine Engineering. University of Chile. 30 h. December 2006.

“Geotechnics Applied to Open Pit Mine”. (E-Mining Technology. Chile). 30 h. October 2006.

“Advanced Course on Acquire”. (Metech Chile). 40 h. March 2005.

“Geostatistic and Modelling of Minesigh”. (Mintec Chile). 40 h. March 2004.

“Basic Minesight”. (Mintec Chile). 40 h. May 2003.

“Basic Autocad 2000”. (Center Kandinsky). Córdoba. Argentina. 40 h. November 2002.

“Workshop Field” of 10 days of duration. Directed by E. Llambías. “Massif North Patagonic and “El Deseado”. (Argentina). December 1999.

“Handling and interpretation of sampling data (macroscopic and drilling), with PIMA II” (Portable Infrared Spectrometer). By Spectral International, Inc. 30 h. December 1997.

“Introduction to linear Geostatistics Applied to Evaluation of Mineral Resources”. Superior Professional Council of Geology. Bs. As. Argentina. 30 h. September 1995.

CAPACITACION MANAGEMENT

LEADERSHIP DEVELOPMENT PROGRAM (LDP). Facilitator and trainer of facilitators from other divisions. December 2004 -2103. Minera Alumbrera Ltd. – Xstrata Copper.

Participation in the design and realization of STRATEGIC PDL WORKSHOP OF MINERA ALUMBRERA LTD. June 2009

Course: “TRAINING THE TRAINER”. Level I y II (IGH Group, Tucumán. Argentina). 60 h. August 2008

Course: “PROFESSIONAL SUPERVISOR”. University de Queens, Canadá. (Tucumán, Argentina). 30 h. August 2003.

CONFERENCES AND PUBLICATIONS

XIX ARGENTINIAN CONGRESS GEOLOGY (CORDOBA, ARGENTINA)

“The Risks in the Fundamentals of the Recoverable Resources Model”.

Authors: Bruna Novillo J., Bassan J., Rossi. Speaker: J. Bruna Novillo. June 2014.

ARGENTINIAN CONGRESS ON ECONOMIC GEOLOGY (SAN JUAN, ARGENTINA)

“Episodes of the mineralization of Mo in Bajo de la Alumbrera mine, Catamarca, Argentina”.

Authors: D. Mutti, M. Marzano, A. Carrazana y J. Bruna Novillo. September 2013.

SPANISH SOCIETY MAGAZINE MINERALOGÍA. MACLA N° 15 (BARCELONA, ESPAÑA)

“Mineralogy of Bajo Agua Tapada Project, Catamarca, Argentina”.

Authors: D.G. Torrente, A. Carrazana, J. Bruna Novillo and J.L. Fernández Turiel. September 2011.

REGIONAL CONFERENCE MINESIGHT (SANTIAGO, CHILE)

“Using the Minesight Software 3D, in the Fundaments of the Model of Recoverable Resources”.

Authors: J. Bassan and J. Bruna Novillo. November 2010.

CONFERENCE MINING 2010 (SAN JUAN, ARGENTINA)

“The Board of Control like Management Tool in the Model of Recoverable Resources”.

Authors: J. Bruna Novillo, J. Bassan and M. Rossi. Speaker: J. Bruna Novillo. August 2010.

CONFERENCE MINING 2010 (SAN JUAN, ARGENTINA)

“The System of Veins Intermediate-sulfidation, in Bajo de La Alumbrera Mine, Catamarca, Argentina”.

Authors: N. Montenegro, A. Carrazana and J. Bruna Novillo. August 2010.

XVI MINE ENGINEERING SIMPOSIUM. SIMIN 2009 (SANTIAGO, CHILE)

“Fundamentals of the Recoverable Resources Model”.

Authors: J. Bruna Novillo, J. Bassan and M. Rossi. August 2009.

CONFERENCE MINING DAY 2009 (CATAMARCA, ARGENTINA)

“Process and Stages of an Exploration Program for Copper Porphyry Deposits”.

Authors: J. Bruna Novillo. Speaker: J. Bruna Novillo. May 2009.

INTERNATIONAL CONFERENCE ON MINING INNOVATION - MININ 2008 (SANTIAGO, CHILE)

“Ore Control System in Bajo de La Alumbrera, Catamarca, Argentina”.

Authors: I. Zapata, J. A. Bassan and J. Bruna. Speaker: J. Bruna Novillo. August 2008.

INTERNATIONAL CONFERENCE ON MINING INNOVATION – MININ 2006 (SANTIAGO, CHILE)

“Geotechnical Characterization and Modeling of its Variables in Bajo de La Alumbrera Mine, Catamarca, Argentina”.

Authors: C. Giraud, J. A. Bassan and J. Bruna. May 2006

ACQUIRE REGIONAL CONFERENCE (SANTIAGO, CHILE)

“Use to Acquire in the Processes of Minera Alumbrera”.

Authors: J. A. Bassan and J. Bruna Novillo. March 2005.

38° BRASILIAN CONGRESS OF GEOLOGY (CAMBORIU, BRASIL)

“Methodological extensions of the Matheron corrector in the petro-structural analysis of para-granite massif, Copina area (“Sierras Chica” and “Grande” in Cordoba) – Argentina.”

Authors: Bruna Novillo J. and Lucero Michaut H. October 1994.