

## Jorge W. Guerrero Soto

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Fecha Nacimiento: 04 Julio 1961

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**Note:** *If you need to read about of my resume, then you must to advance onto the page 7. Also, if you are an English reader then you could be to able for printing the pages of this electronic file only since page 7 up to 15.*

**Nota:** *La versión en idioma español para este currículum, comprende desde la página 1 a la 6.*

## Perfil

Profesional de probada experiencia en la planificación de los recursos económicos, materiales y humanos; la construcción de proyectos mineros, la ingeniería de terreno y la puesta en marcha de operaciones mina y procesos mineros; la administración de operaciones industriales y la dirección técnica de proyectos mineros en conformidad a la normativa legal en seguridad industrial y respeto al medio ambiente.

## Educación

|             |                                                                                                                                                                                                                                                                                                                                            |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1979 – 1983 | Titulado como “ <b>Ingeniero en Minas</b> ”. Enero 3, 1985<br>Universidad de La Serena – Chile                                                                                                                                                                                                                                             |
| 1984        | <u>Proyecto de Tesis para obtener el Grado Profesional</u><br>“Evaluación de Reservas Minerales y la Selección de Métodos de Explotación Minera, aplicando programas computacionales” Nota de aprobación: 6.6 (en la escala de 1 a 7)<br>Profesor Tutor: Ing. Federico Brunner, Master of Rocks Mechanics, Colorado School of Mines – USA. |
| 2008        | Diplomado en “Diseño y Cálculos de Ingeniería para Estructuras Mecánicas, asistido por Software de Ingeniería CAD-CAE” (Programa de 225 horas).<br>Universidad de La Serena – Facultad de Ingeniería – Departamento de Ingeniería Mecánica.                                                                                                |

## Experiencia Profesional y Laboral

### JGS INGENIERÍA DE PROYECTOS MINEROS

- **Ingeniería Sénior en el diseño y evaluación de Proyectos Mineros.**
- Asesoría integral a empresas mineras, tanto nacionales como de origen Chino.
- Estudios de factibilidad económica para proyectos de Oro, Cobre, Hierro y Manganeseo.
- Estudios geológicos preliminares de potenciales prospectos minerales
- Diseño de minas subterráneas y rajo abierto. Diseño de Procesos Minerales.
- Planificación Minera de Mediano y Largo Plazo.
- Ingeniería Básica e Ingeniería de Detalle.
- Evaluación técnico-económica de proyectos. Determinación de costos CAPEX y OPEX.
- Diseños de ingeniería y Elaboración de carpetas técnico-legales para formulación y tramitación de Permisos Sectoriales (Ambientales; Mixtos; Normativos sectoriales).

Período: 1984 a la fecha.

### **INGENIERO ADMINISTRADOR SENIOR – CAP MINERÍA IMOPAC LTDA**

Asignado para la mejora en la administración combinada de operaciones Mina y Planta, los recursos humanos, materiales y económicos. Dirección del staff profesional y sus departamentos asociados: Sistemas Integrados de Gestión (Salud, Seguridad y Medio Ambiente); Planificación y Producción, Mantenimiento Mecánico y Eléctrico de Instalaciones, Equipos y Maquinarias de Gran Volumen.

#### **Administración de Contrato Mina y Planta – Isla Guarello.**

Administración integral de mina, planta y puerto de embarque, para la producción y entrega de mineral de Caliza a la siderúrgica Huachipato.

#### **Administración de Planta de Procesamiento – Minas Algarrobo.**

Administración integral de la planta de procesamiento para concentración magnética de minerales de hierro.

Período: Octubre, 2010 a Octubre, 2011. Término de los servicios profesionales por mutuo acuerdo.

### **GERENTE GENERAL Y GERENTE TECNICO DE PROYECTOS MINEROS.**

Administración general de la empresa: responsabilidad legal; administración y gestión de los recursos técnico-económicos (presupuesto, flujo de caja, programación y control de inversión y gastos); administración del recurso humano (participación en definir perfil y contratación, sueldos e incentivos, capacitación); Revisión y aprobación de los sistemas contables y programación financiera.

Diseño de operaciones mineras mecanizadas, incluyendo la totalidad de la ingeniería de detalle de cada proyecto y la posterior puesta en marcha y planificación de la producción. Ejecución de contratos de ingeniería de minas y mantenimiento electromecánico/electrohidráulico. Obras para filiales CAP Minería-Chile.

Dirección general en explotación de minas O.P y U.G. Abastecimiento de minerales. Contratos DBO (Design, Build and Operate).

Planificación y programación de operaciones unitarias en el desarrollo y explotación de minas; asimismo, de los servicios generales de logística, campamento, energía, abastecimiento, transporte, ventilación.

Construcción de taludes de material agregado, reforzados con pernos anclaje – mallas de refuerzo – hormigón proyectado (shotcrete) y hormigón armado. Exploración, desarrollo y explotación de minas (sondajes, piques, chimeneas, rampas y galerías, cámaras y caserones). Minería en roca incompetente aplicando fortificación con pernos de anclaje, malla reforzada, shotcrete y hormigón.

Compañía: JGS Ingeniería y Construcción.

Períodos desde Enero, 1998 hasta Enero, 2003 y desde Junio, 2004 hasta Octubre, 2009.

### **ADMINISTRADOR DE CONTRATO.**

Excavaciones, fortificaciones de cavernas subterráneas e instalación de anclajes para fundaciones de concreto y montaje de equipos mineros. Áreas subterráneas: Cavernas para Chancado Primario y Concentrador.

Proyecto Expansión Nivel 17 – División Andina – Codelco Chile.

Compañía Contratista: Ing. y Constr. RI.NA.SA. – Subcontrato BDS-Belfi.

Período desde Noviembre 27, 1997 hasta Febrero 28, 1998.

### **INGENIERO DE PLANIFICACIÓN MINA.**

Encargado de la ingeniería de mina en la explotación subterránea de alto tonelaje y mecanización y la implementación de los planes de mejora en la perforación y tronadura de tiros largos de producción. Compañía Minera San Gerónimo. Período desde Marzo a Agosto, 1997.

### **ADMINISTRADOR DE CONTRATO.**

Labores subterráneas para Minas El Indio de Barrick Corp.  
Perforación y fortificación subterránea. Instalación de Pernos Cable, Pernos Resina, Perno-Malla-Shotcrete. Preparación subterránea y explotación de vetas auríferas.  
Compañía Contratista: Antolín Cisternas y Cía. S.A.  
Período, desde Octubre, 1996 hasta Enero 31, 1997.

### **SUPERINTENDENTE GENERAL DE MINAS.**

Administración general y planificación integral para la construcción y puesta en marcha de Proyecto Aurífero en la Alta Montaña. Compañía Minera Pimentón (South American Gold Copper. Group from Canada). Período, desde Septiembre, 1995 a Septiembre 30, 1996.

### **JEFE DE ÁREA.**

Encargado de administrar los recursos materiales-equipos y supervisar a las jefaturas de turno con su dotación para la ejecución de desarrollo subterráneo y fortificación activa. Proyecto 3er Panel, Codelco Chile, División Andina. Compañía Contratista: Ing. y Constr. RI.NA.SA.  
Período, desde Abril hasta Septiembre, 1995.

### **JEFE DE TURNO.**

Proyecto Pascua-Lama, 5200 msnm. - Barrick Corp. Compañía Contratista: Luis Maluenda Sierra.  
Período, Octubre, 1994 a Marzo 30, 1995.

### **INGENIERO CONSULTOR INDEPENDIENTE.**

Diseño y estudios de factibilidad de proyectos y negocios. Área Minería y Área Manufactura.  
Período, desde Agosto, 1992 a Septiembre, 1994.

### **GERENTE DE DIVISION COMERCIAL MINERÍA.**

Dirección y administración técnico – comercial. Importación y comercialización de equipamiento industrial para la mediana y gran minería. Relaciones comerciales con ejecutivos de alto nivel de fábricas internacionales: USA (GETMAN Corp. – Utility trucks), Canadian factories (CME Blasting and mining, MAC LEAN equipment – hydraulic jumbo, NLT Technologies), Switzerland factory (SIG - Drilling equipment's – underground locomotives), Argentina factory (FERRONI crushing, classification, milling Plants).  
Dealer-Company: Pfenniger S.A. Período, desde Julio, 1990 hasta Agosto, 1992.

## **Habilidades y Competencias**

- Idioma Español. Competencia nativa. Buen nivel de redacción y ortografía.
- Idioma Inglés. Hablado y escrito en nivel intermedio.
- Competente como Usuario en computación y programas software:
  - ✓ Microsoft: MS-Windows; MS-Office; MS- Project.
  - ✓ Mining Software: Maptek\_Vulcan; Geovia\_Surpac; Geovia\_Minex; Rocscience\_Slide.
  - ✓ AutoDesk: AutoCAD; Inventor.
  - ✓ PTC: MathCAD; Pro Engineer.
  - ✓ ERP Software: SAP, módulo MM.
- Cursos de Seguridad Industrial:
  - “Prevención de Riesgos Ocupacionales”, Asociación Chilena de Seguridad - Chile.
  - “Seguridad Industrial en la Gran Minería”. Codelco Chile, División Salvador - Chile.

- Cursos de Administración de Negocios:  
 “Administración y Gestión”. Colegio de Ingenieros de Chile.  
 “Contabilidad de Costos”. Pfenniger S.A.
- Licencia de Conductor Profesional, Clase A2. Experiencia en alta montaña.
- **Competente en la aplicabilidad y cumplimiento a la Legislación Chilena:**
  - ✓ Código del Trabajo – D.F.L. N° 1
  - ✓ Reglamento sobre Condiciones Sanitarias y Ambientales Básicas en los Lugares de Trabajo – Decreto 594/2000
  - ✓ Código de Minería – Ley 18.248
  - ✓ Reglamento de Seguridad Minera – Decreto Supremo 132/2002 – Ministerio de Minería
  - ✓ Reglamento Complementario de la Ley 17.798 sobre Control de Armas y Elementos Similares (explosivos)
  - ✓ Reglamento para la aprobación de proyectos de Diseño, Construcción, Operación y Cierre de los Depósitos de Relaves – Decreto 248/2007
  - ✓ Ley de Accidentes Ocupacionales y Enfermedades Profesionales - Ley 16.744
  - ✓ Reglamento para la aplicación de la Ley 16.744 – Decreto 101/1968
  - ✓ Reglamento sobre Prevención de Riesgos Profesionales – Decreto 40/1969.
  - ✓ Reglamento para la Constitución y funcionamiento de los Comités Paritarios de Higiene y Seguridad – Decreto 54/1969.
  - ✓ Código Sanitario – Decreto Fuerza Ley 725/1967
  - ✓ Reglamento sobre Condiciones Sanitarias y Ambientales en los Lugares de trabajo – Decreto 594/2000.
  - ✓ Reglamento Sanitario sobre Manejo de Residuos Peligrosos – Decreto 148/2004.
  - ✓ Reglamento de Almacenamiento de Sustancias peligrosas – Decreto 78/2010.
  - ✓ Reglamento de Transporte de Cargas peligrosas por Calles y caminos – Decreto 298/1995.
  - ✓ Ley Base del Medio Ambiente – Ley 19.300
  - ✓ Reglamento del Sistema de Evaluación de Impacto Ambiental – Decreto Supremo 40/2012.
  - ✓ Reglamento de Cierre de Faenas e Instalaciones Mineras – Decreto Supremo 41/2012 (Ley 20.551).
  - ✓ Código de Aguas – Decreto Fuerza Ley 1.122
  - ✓ Reglamento de los Servicios de Agua destinado al Consumo humano – Decreto 735/1969
  - ✓ Reglamento de Instalaciones domiciliarias de Agua potable y de Alcantarillado – Decreto 50/2002.
  - ✓ Reglamento General de Alcantarillados particulares, Fosas sépticas, Cámaras de contacto, Cámaras absorbente y Letrinas domiciliarias – Decreto 236/1926 (modificado por el Decreto 75/2004).
  - ✓ Reglamento para el Manejo de Lodos generados en Plantas de tratamiento de aguas servidas – Decreto 4/2009.
  - ✓ Reglamento para Neutralización y depuración de los Residuos líquidos industriales a que se refiere la Ley 3.133.
  - ✓ Ordenanza General de Urbanismo y Construcciones – Decreto Supremo 47/1992 (D.F.L. N°458/1975 – Ley General de Urbanismo y Construcciones).
  - ✓ Decreto 60/2011 – Reglamento que fija los requisitos de Diseño y Cálculo para el Hormigón Armado y Deroga Decreto N°118, de 2010.
  - ✓ Decreto 61/2011 – Reglamento que fija el Diseño Sísmico de Edificios y Deroga Decreto N°117, de 2010.

- ✓ Decreto 138/2005 – Obligación de Declarar emisiones que indica (Emisiones atmosféricas de Grupos Generadores).
  - ✓ Reglamento de Seguridad para las Instalaciones y Operaciones de producción, Refinación, Transporte, Almacenamiento, Distribución y Abastecimiento de Combustibles Líquidos – Decreto 160/2008 (modificado por el Decreto 101/2013).
- **Aplicabilidad de algunas Normas Chilenas:**
- ✓ Decreto Supremo 38/2012 – Norma de Emisión de ruidos molestos generados por Fuentes que indica (Vigente desde 13junio2014; Deroga el Decreto 146/1997 – Norma de Emisión de ruidos molestos generados por Fuentes fijas).
  - ✓ Decreto 12/2011 – Norma primaria de Calidad ambiental para Material particulado fino respirable – MP2.5
  - ✓ Decreto 59/1998 – Norma de Calidad primaria para material particulado respirable – MP10
  - ✓ Norma MINSAL – Circular N°13/2006 – Imparte Instrucciones sobre Aplicación del Decreto Supremo 138/2005.
  - ✓ Norma MINSAL – Resolución 395/2005 – Aprueba Documento de Declaración de Residuos Peligrosos.
  - ✓ Norma MINSAL – Resolución 499/2006 – Aprueba Documento Electrónico de Declaración de Residuos Peligrosos.
  - ✓ Decreto 686//1999 – Norma de Emisión para la regulación de la Contaminación lumínica.
  - ✓ Norma de emisión para la Regulación de Contaminantes asociados a la Descarga de residuos industriales líquidos a Sistemas de alcantarillado – Decreto 609/1998
  - ✓ Norma de Emisión de Residuos Líquidos a Aguas Subterráneas – Decreto 46/2002
  - ✓ Norma Chilena Oficial (INN) – NCh.409/1.Of.2005 – Agua Potable – Requisitos.
  - ✓ Norma Chilena Oficial (INN) – NCh.382.Of.1998 – Sustancias Peligrosas – Terminología y Clasificación General.
  - ✓ Norma Chilena Oficial (INN) – NCh.1377.Of.1990 – Gases Comprimidos – Cilindros de gas para uso Industrial – Marcas para Identificación del Contenido y de los Riesgos Inherentes.
  - ✓ Norma Chilena Oficial (INN) – NCh.1411/4 – Señales de Seguridad para la Identificación de Riesgos de Materiales.
  - ✓ Norma Chilena Oficial (INN) – NCh.2120/1.Of.2004 – Sustancias Peligrosas – Clase 1 – Explosivos.
  - ✓ Norma Chilena Oficial (INN) – NCh.2120/2.Of.2004 – Sustancias Peligrosas – Clase 2 – Gases.
  - ✓ Norma Chilena Oficial (INN) – NCh.2120/3.Of.2004 – Sustancias Peligrosas – Clase 3 – Líquidos inflamables.
  - ✓ Norma Chilena Oficial (INN) – NCh.2120/4.Of.2004 – Sustancias Peligrosas – Clase 4 – Sólidos inflamables.
  - ✓ Norma Chilena Oficial (INN) – NCh.2120/5.Of.2004 – Sustancias Peligrosas – Clase 5 – Sustancias comburentes y Peróxidos orgánicos.
  - ✓ Norma Chilena Oficial (INN) – NCh.2120/6.Of.2004 – Sustancias Peligrosas – Clase 6 – Sustancias tóxicas y Sustancias infecciosas.
  - ✓ Norma Chilena Oficial (INN) – NCh.2120/7.Of.2004 – Sustancias Peligrosas – Clase 7 – Sustancias radioactivas.
  - ✓ Norma Chilena Oficial (INN) – NCh.2120/8.Of.2004 – Sustancias Peligrosas – Clase 8 – Sustancias corrosivas.
  - ✓ Norma Chilena Oficial (INN) – NCh.2120/9.Of.2004 – Sustancias Peligrosas – Clase 9 – Sustancias y Objetos peligrosos varios.

- ✓ Norma Chilena Oficial (INN) – NCh.2190.Of.2003 – Transporte de Sustancias Peligrosas – Distintivos para Identificación de Riesgos.
  - ✓ Norma Chilena Oficial (INN) – NCh.2245.Of.2003 – Sustancias Químicas – Hojas de datos de Seguridad – Requisitos.
  - ✓ Norma Chilena Oficial (INN) – NCh.2095/1.Of.2000 – Protección contra incendios – Sistemas de rociadores – Terminología, características y clasificación.
  - ✓ Norma Chilena Oficial (INN) – NCh.2095/2.Of.2000 – Protección contra incendios – Sistemas de rociadores – Equipos y componentes.
  - ✓ Norma Chilena Oficial (INN) – NCh.2095/3.Of.2001 – Protección contra incendios – Sistemas de rociadores – Requisitos de los sistemas y de instalación.
  - ✓ Norma Chilena Oficial (INN) – NCh.2095/4.Of.2001 – Protección contra incendios – Sistemas de rociadores – Diseño, planos y cálculos.
  - ✓ Norma Chilena Oficial (INN) – NCh.2095/5.Of.2001 – Protección contra incendios – Sistemas de rociadores – Suministro de agua.
  - ✓ Norma Chilena Oficial (INN) – NCh.2095/6.Of.2001 – Protección contra incendios – Sistemas de rociadores – Recepción del sistema y mantención.
  - ✓ Norma Chilena Oficial (INN) – NCh.170.Of.1985 – Hormigón – Requisitos generales.
  - ✓ Norma Chilena Oficial (INN) – NCh.430.Of.2008 – Hormigón Armado – Requisitos de Diseño y Cálculo.
  - ✓ Norma Chilena Oficial (INN) – NCh.431.Of.2010 – Diseño Estructural – Cargas de Nieve.
  - ✓ Norma Chilena Oficial (INN) – NCh.432.Of.2010 – Diseño Estructural – Cargas de Viento.
  - ✓ Norma Chilena Oficial (INN) – NCh.433.Of.1996 modificada 2009 – Diseño Sísmico de Edificios.
  - ✓ Norma Chilena Oficial (INN) – NCh.1537.Of.2009 – Diseño Estructural – Cargas permanentes y Cargas de uso.
  - ✓ Norma Chilena Oficial (INN) – NCh.2369.Of.2003 – Diseño Sísmico de Estructuras e Instalaciones Industriales.
  - ✓ Norma Chilena Oficial (INN) – NCh.2745.Of.2013 – Análisis y diseño de edificios con aislación sísmica.
  - ✓ Norma Chilena Oficial (INN) – NCh.3171.Of.2010 – Diseño Estructural – Disposiciones generales y combinaciones de carga.
  - ✓ Norma SEC – N°5/55 - Norma de Instalaciones eléctricas de Corrientes fuertes.
  - ✓ Norma SEC – N°4/2003 – Condiciones mínimas de seguridad que deben cumplir las Instalaciones eléctricas de consumo en Baja Tensión.
  - ✓ Norma SEC – NCh\_2/84 – Disposiciones técnicas que deben cumplirse en la elaboración y presentación de proyectos relacionados con Instalaciones eléctricas.
  - ✓ Norma SEC – NCh\_10.84 – Procedimiento a seguir para la puesta en servicio de una Instalación interior.
- **Aplicabilidad de algunos estándares internacionales:**
- ✓ ISO 9001:2008 – Requisitos para un Sistema de Gestión de Calidad
  - ✓ ISO 14001:2004 – Requisitos para un Sistema de Gestión Ambiental
  - ✓ OHSAS 18001:2007 – Especificaciones para un Sistema de Gestión de Seguridad y Salud Ocupacional
  - ✓ AP 42, Fifth Edition – Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources (US-EPA – Agencia de Protección Ambiental de los Estados Unidos de América).

**Jorge W. Guerrero Soto**  
Ingeniero en Minas

## **Jorge W. Guerrero**

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### **Profile**

Senior Mining Engineer with 30 years of experience on industry and mining, with strong knowledge of engineering, from design to industrial applications, with proven expertise in industrial and economic planning, project construction, start up, managing of industrial operations and management of mining projects according to safety and environmental compliance.

Experience in built engineering team with strong abilities of leadership to design and built the mining projects. Installation and start up of mine operations and ore-processing plants. Proficient as Senior Consulting in Mining Industry.

Self-interest on matters extracurricular to my university career. Science and Technology, Electronics and Robotics, mathematics and Algorithms, Structural Analysis, Analysis of physical systems, Operations Research. For years I have combined both my field experience and the academic teaching with myself studies in engineering science and its applications, to development and technological evolution towards the service of human welfare and industrial development.

### **Education**

|             |                                                                                                                                                                                                                                                                                  |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1979 – 1983 | Graduated as “ <b>Mining Engineer</b> ”. Titled: January 3, 1985<br>University of La Serena – Chile                                                                                                                                                                              |
| 1984        | Thesis Project to obtain the Professional Degree<br>“Evaluation of Ore Reserves and Choosing of Underground Mining Methods”.<br>Approval Score: 6.6 (on scale from 1 to 7)<br>Tutor Teacher: Mr. Federico Brunner, Master of Rocks Mechanics, Colorado<br>School of Mines – USA. |
| 2008        | “Design and Engineering Compute of Mechanical Structures, aided by<br>Software of Engineering CAD – CAE” (Diploma Program – 225 Hours).<br>University of La Serena – Faculty of Engineering – Departament of<br>Mechanical Engineering - Chile                                   |

### **Skills**

- English language. Spoken and written at intermediate level. Technical reading at advanced level.
- Spanish language. Native speaker. Good command of both spelling and redaction for Spanish language.
- Proficient in Computer and Software:  
Microsoft: MS-Windows; MS-Office; MS- Project. Mining Software: Maptek\_Vulcan;  
Geovia\_Surpac; Geovia\_Minex; Rocscience\_Slide. AutoDesk: AutoCAD; Inventor. PTC:  
MathCAD; Pro Engineer. ERP Software: SAP.
- Courses of Industrial Safety:  
“Prevention of Occupational Risks”, Asociación Chilena de Seguridad - Chile.  
“Industrial Safety in the Great Mining”. Codelco Chile, Salvador Division- Chile.

- Management courses:  
 “Administration and Management of Business”. Colegio de Ingenieros de Chile.  
 “Technical and Commercial Management”. Pfenniger S.A.  
 “Accountancy of Cost”. Pfenniger S.A.
- Proficient in the applicability and compliance under Chilean legislation:  
 Labor Code – D.F.L. N° 1  
 Mining Safety Regulations of Chile – D.S. 132  
 Act on Occupational Accidents and Occupational Diseases - Law 16744  
 General Law on Environmental – Law 19300  
 Reclamation and Closure Plan of Mining Facilities – Law 20551
- Applicability of some International Standards:  
 ISO 9001; ISO 14001 and OHSAS 18001  
 AP 42, Fifth Edition – Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources (USA-Environmental Protection Agency).
- Driver’s Card as Professional Class. Experience as mountain road driver.

## **Related Experience**

### **JGS-MINING PROJECT ENGINEERING**

*Note: If you need to check and read the Mining Consulting about of these engineering services, then you must to advance onto the page 11.*

Working as Senior Consulting Engineer and also leading his associated engineer’s team, this small firm has been able to design and evaluate large mining projects.

Geological studies of orebodies; Design of both underground and open pit mines; Design for ore processing. Feasibility Study and other industrial – mining engineering jobs. Exploration and evaluation of mining prospects for mineral projects of gold, copper, iron and manganese. Design and development of engineering folders, all this for purposes to get the Chilean government permits.

Period: 1984 until date.

### **EXECUTIVE SENIOR ENGINEER FOR SUBSIDIARIES OF CAP MINERIA (Group CAP – Chile)**

Commissioned for improvement in the combined management of mine and plant operations, human resources, materials and financial resources. Managing of staff professional and their associated departments: Health, Safety and Environmental; Planning and Production, Mechanical and Electrical Maintenance.

Period: October’ 2010 until October 31’ 2011. End of professional services by mutual agreement.

Site Manager of mine and plant – Guarello Island – CAP Minería Imopac Ltda

Comprehensive management of mine – plant and the shipping port for the open pit production and delivery of 90,000 tpm crushed limestone mineral.

Site Manager of processing plant – Algarrobo Mines – Cap Minería Imopac Ltda

Comprehensive management of the processing plant for Iron ore. Crushing and screening of 180.000 to 200.000 tpm of low grade ores.

### **MINING MANAGER OF PROJECTS AND ENGINEERING.**

Legal representative of company and mining manager in own business, offering both engineering and mining construction services (DBO Agreement). Exploration, development and mining of manganese orebodies. Mining in weak waste rock, by means anchor bolt, reinforced mesh, shotcrete and concrete. Technical economic evaluation of both underground and open pit mining projects. Periods since January, 1998 until January, 2003 and June, 2004 until October, 2009.

**CONTRACT MANAGER.**

Excavations, underground support and anchor bolts for concrete foundations and equipment mounting's. Underground areas, such as, Primary crushing and Ore concentrate. Expansion Project – Division Andina – Codelco Chile. Contract Company: Ing y Constr. RI.NA.SA. – Subcontract BDS-Belfi. Period since November 27, 1997 until February 28, 1998.

**MINE PLANNING ENGINEER.**

Engineer with the responsibilities on the mine engineering and the improvement plans of underground mining by means Blast Long Holes (Drill fan) and specific activities of prepare-development in copper ore-deposit with wide thickness. Compañía Minera San Gerónimo. Period since March 26 until August 31, 1997.

**CONTRACT MANAGER.**

Underground labours for El Indio Mines of Barrick Corp. Drilling and Underground support. Installation with Cable bolts, Resin bolts, bolt-mesh-shotcrete. Contractor Company: Antolin Cisternas y Cia S.A. Period, since October 02, 1996 until January 31, 1997. (This date, Barrick announce close of mine)

**GENERAL MINE SUPERINTENDENT.**

General management and integral planning for start up of Gold Project. Design of mine exploitation and expand plan. Mining methods are Sub level stoping and Cut and fill. Installation of Ore processing Plant and start up. Metallic gold produced by means CN leaching and Merrill Crowe. Compañía Minera Pimenton (South American Gold Copper. Group from Canada). Period, since September 26, 1995 until September 30, 1996.

**FIELD CHIEF.**

Underground development and Active support. III Panel Project, Codelco Chile, Division Andina. Contractor Company: Ing. y Constr. RI.NA.SA. Period, since April 02 until September 25, 1995 (End of contract service).

**FIELD CHIEF.**

Building of mining roads and boring stations, using wheel loader, dozers and DTH rock drill. Pascua-Lama Project, 5200 amsl. - Barrick Corp. Contractor company: Luis Maluenda Sierra. Period, October 17, 1994 until March 30, 1995 (summer season).

**INDEPENDANT CONSULTANT ENGINEER.**

Design and feasibility studies of projects and business. Mining Area: Mine Operation and Ore Processing. Manufacture Areas: Industrial Production, Business, Management, Accountancy and Finance. Period, since August, 1992 until September, 1994.

**MINING MANAGER OF MACHINERY SALES.**

Import and business management of industrial equipment's for median and great mining. Relations with executives of high level from USA factory (GETMAN Corp. – Utility trucks), Canadian factories (CME Blasting and mining, MAC LEAN equipment – hydraulic jumbo, NLT Technologies), Switzerland factory ( SIG - Drilling equipment's – underground locomotives), Argentina factory (FERRONI crushing, classification, milling Plants). Dealer-Company: Pfenniger S.A. Period, since July, 1990 until August, 1992.

**SEVERAL COMPANIES. Since October'1984 until June'1990**

- Minmetal Ingeniería y Construcción S.A. Technical inspector of mining contractors. El Teniente Mine – Codelco Chile.
- Minera Lac Chile S.A. Assistant mining department chief. Los Andes Mountain chains 5000-5100 amsl. Apolinario Project.
- Compañía Minera San José Ltda. Mine Boss for the development of exploration tunnels. Los Andes Mountain Chain, 4200 amsl. El Indio Mine. Tambo Project.
- Codelco Chile – División Salvador. Shift Boss in the development of opening for preparing of Block Caving Method in the great mining. Quebrada Granito Project.
- ENAP – Empresa Nacional del Petróleo – Chile. Assistant of Head of Development for petroliferous holes drilling.

**Jorge W. Guerrero**  
**Mine Engineer**

## **CONSULTING AND CONSTRUCTION OF MINING PROJECTS.**

Made by: Mr. Jorge W. Guerrero – Senior Mining Engineer.

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- 1. GEOLOGY, EXPLORATION AND PROSPECTING**
- 2. OPEN PIT AND UNDERGROUND MINING**
- 3. ORE PROCESSING**

### **1. GEOLOGY, EXPLORATION AND PROSPECTING**

#### **GEOLOGICAL MODEL AND RESERVE BLOCK MODELLING FOR “OSO NEGRO” IRON PROJECT.**

Taking in count the drilling logs, it was done a detailed drilling database plus a site accuracy topography, next to enter the data to a 3D mining software to rebuilt a geological model and compute the resources. Besides to review the previous designs of final pit, waste dump and distance of the material transport. Finally, it was to get a reserve block model for scheduling of the earthmoving and dispatch the iron ore to processing plant.

Mining project for "Minera San Fierro Chile Ltda". (Chilean subsidiary of Hebei Wenfeng Industrial Group from People's Republic of China) – 2014 to 2015.

#### **MANAGEMENT TO BEGIN A NEW DRILLING CAMPAIGN FOR THE IRON ORE PROSPECTING – HERMOTITA PROJECT.**

The job was to prepare the capital budget and the scheduling of the drilling campaign. Besides, the coordination, meeting and relationship with several of mining service contractors, such as SRK consulting, topographic service, drilling company, assay laboratories, geophysical log company, service and supplies. The goal was define mineral resources and next to reach a first scoping study to present in the Hong Kong stock exchange. The project was postponed and suspended until new date.

Technical management for such companies as “Chile Cheerbond Mining S.A.” and “Minera Rixin Chile Ltda”. (Both Chilean companies are subsidiary of “Rixin Shunde Development LTD”, an investment company from People's Republic of China) – 2013.

#### **REVIEW OF MINING PROPERTY AND PRELIMINARY STUDY TO CONSIDER THE PROSPECTION OF “IOCG OREBODIES” (Iron ore, copper and gold).**

Field geological jobs. Topography and sampling. Drawing of preliminary map. Choosing of the prospection targets and to suggest the core drill program. Study for CAP Minería – Manganesos Atacama S.A. – Chile – 2010.

**PRELIMINARY EVALUATION OF “SAN JUAN 1-20” – A COPPER AND SILVER MINING PROSPECT.**

Recognition of the study area, topography, sampling of rock faces. Interpretation of the surface geological and underground findings. Compute of identified geological resources. Proposal of mining plan to development. Study for CAP Minería – Manganesos Atacama S.A. – Chile – 2009.

**PRELIMINARY EVALUATION OF “LOS AMIGOS” MINING PROSPECT.**

**PRELIMINARY EVALUATION OF “FLOR DEL BOSQUE” MINING PROSPECT – MINE “LOMA BLANCA”.**

Recognition of the study area, topography, sampling of rock faces. Interpretation of the geological findings. Compute of identified geological resources. Mining plan to development. Study for CAP Minería – Manganesos Atacama S.A. – Chile – 2003.

**PROJECT OF EXPLORATION – PREPARATION AND UNDERGROUND MINING – MINE “LA ALTA” – CHILE.**

Planning of diamond drilling campaign to limit and define geological reserves of the manganese ore-beds such as lower, intermediate and upper beds, placed between the old mine “La Liga” and the new mine “La Alta”. Preliminary design of the main tunnel, raises, galleries, slot and production rooms for starting a mechanized exploitation of manganese beds. Project submitted for Venture Capital Fund, Enami-Chile/2000.

**FIELD STUDIES FOR THE GOLD ORE MINING.**

Define the Mine plan to ores extraction, recognition and also to prepare a base on future exploitation of the veins, stockworks and alluvial deposits. Approximation of mining costs.

Overseeing and managing the technical team for working of field at Minas del Prado’s Project – Chile, 1987.

## **2. OPEN PIT AND UNDERGROUND MINING**

**OPEN PIT MINING PROJECT FOR “OSO NEGRO” IRON MINE.**

Mining Project with an earth and rock movement of 15 million tonnes per year. Design and submit to Chilean government office the Comprehensive Feasibility Study for the phases of construction, operation and mine closure. The consultancy was the basic engineering plus a few of detail engineering. Inventory of the Iron Ore Reserves; Design of the open pit mine. Geotechnical assessment for the slope stability of benches. Planning of the mining extraction. Design of the blasting of precut and production. Compute and programming of the mine equipments (drilling, loading, transport, services). Design of the rock waste dump. Plan of Earth-moving and the internal roads. Support on the technical standard, mining safety and environmental permits to compliance of the Chilean regulatory legislation.

Mining project for “Minera San Fierro Chile Ltda”. (Chilean subsidiary of Hebei Wenfeng Industrial Group from People’s Republic of China) – 2012 to 2014.

### **MANGANESE PROJECT - MINE DESIGN AND FEASIBILITY STUDY.**

Underground mining design of San Carlos mine and Feasibility study of both "San Carlos" underground project and "Placilla" open pit – underground project. Basic engineering. Study for CAP Minería – Manganesos Atacama S.A. – Chile – 2011.

### **MINING CONTRACTS – DBO (DESIGN – BUILD – OPERATE).**

Design of mechanized mining operations, including all the detail engineering of each project and subsequent commissioning and production planning. Technical and general management on both mining for open pit mines and underground mines.

Contracts DBO (Design, Build and Operate).

Planning and scheduling of unitary operations in the development and mining (blasting, fortifications, electrification of the mine, compressed air lines and water, ventilation circuits, transport of minerals); Also, the design of general logistics services, site camp, energy, supply, transportation.

Construction of embankments with aggregate material reinforced with anchor bolts - reinforcing mesh - sprayed concrete (shotcrete) and reinforced concrete. Exploration, development and mining operations (drilling, shafts, raises, ramps (decline) and galleries, rooms and stopes). Mining for incompetent rock mined using rock support by means of rock bolts, reinforced mesh, shotcrete and concrete.

Mining Works for CAP Minería – Manganesos Atacama S.A. – Chile – 1998 until 2009.

### **PROJECT OF OPEN PIT MINING – MINE "PLACILLA".**

Basic engineering study on design of pits to compute a budget of pre-stripping and earth movement, its operational sequence and the different waste/ore ratios. Study for CAP Minería – Manganesos Atacama S.A. – Chile – 2007.

### **PROJECT OF UNDERGROUND MINING – MINE "LA ALTA".**

Evaluation of geological reserves – Modeling of orebody – Design of mining operations and LOM – Scheduling and the compute of mining activities, operational performance schedule – Definition of requirements of mine infrastructure and equipments – Estimation of operational requirement and its annual budget – Determination of CAPEX and OPEX. Feasibility study for CAP Minería – Manganesos Atacama S.A. – Chile. 2003 –2004.

### **DESIGN OF UNDERGROUND MINE FOR A GOLD VEINS SYSTEM, NARROW VEINS AND HIGH GRADE ORES – LOS ANDES MOUNTAIN – CHILE.**

Design of mechanized operation, in High Mountain. There, are designed and implemented the galleries of mine development to use as LHD levels, haulage levels and vents service levels. Also are built internal shafts for ore and waste transfer and the raises for ventilation circuits. The mine includes different gold veins, changing its rock properties, thickness of vein and angle of vein dip. The production stopes are mined by Shrinkage Stopping, Sub Level Stopping and Cut and Fill Stopping. Also there were introduced some Slusher Systems. Besides, it was formed the department of mine planning to plan the preparation, development and start up of different production stopes. Also were introduced several index of development and production, considering blending of different ores types to feed the processing plant with gold ores on 0.48 ounces per tonne.

Engineering design, overseeing and managing on site for "Pimenton Project" of "Compañía Minera Pimenton", subsidiary of Canadian Investment Group - South American Gold and Copper. Chile, 1995 – 1996

### **RECOVERY PROJECT OF ROCK PILLARS BETWEEN TWO MINES PROPERTIES WITH A GOLD VEIN THAT CROSS BOTH.**

The orebody is a high grade gold vein with 20 feet in wide and a strong dip, along its strike between both mines Patria Nueva and Monica. The mining project was the recovery of both the pillars around property line and also the main rock slab. The method included to introduce timber raise, concrete slab to replace the ore slab rock and to backfill with waste rock materials for supporting of rock hanging walls.

Engineering Design for "Punta de Talca's Mining Complex" – Chile, 1988.

### **COMPREHENSIVE IMPROVEMENT OF MINING PLANNING AT GOLD VEINS MINES.**

Rational exploitation of underground gold mines low water table at 500 and 900 feet in depth. Project of mines electrification. Design and implementation of pumping stations. Planning and introduce methods of opening development for deepening the mining operations. Design and implementation of a joint operation by mining methods such as, Shrinkage Stopping and Sub Level Stopping. Define new alternatives of rock support. Optimization on efficiency in the ores extraction by means the production Shaft. Evaluation, compute of efficiency rates and replacement of mining equipments. To restructure the mines staffing, increasing their productivity.

Planning Engineering for "Punta de Talca's Mining Complex" at the mines: "Patria Nueva", "Miles" and "Cabra" – Chile, 1987.

### **DESIGN OF ROOM & PILLAR MINING SYSTEM.**

The underground mining design is related to an orebody with several isolated copper beds with an average height (ore thickness) in 85 feet. The reserves modeling of the orebody was configured through of a drills grid of both Diamond drills and down the hole drills. Next, the mining design was choose for considering both the geomechanical properties of rocks and the expected productivity rates. The stopes and pillars in size were both 25 ft. x 25 ft. and 15 ft. x 15 ft, respectively. The distance between the haulage levels were 15 feet.

Engineering Service for "Minera San Cristobal". "The Rubio's Mines" - Chile. 1984.

## **3. ORE PROCESSING**

### **ORE MAGNETIC PROCESSING MINING PROJECT FOR “OSO NEGRO” IRON MINE.**

For its project of iron ore processing with an annual rate of 1.65 million tonnes per year and so to recovery 1.2 million tonnes per year of magnetic iron concentrate with size below 3mm. The consultancy was the basic engineering plus a few of detail engineering. The technical job was to integrate the engineering and the collaboration on the design of ore processing plant for recovering the magnetic iron dry concentrates. Collaboration on the design of the complementary and ancillary installations of project operation. Design of the dump for fines tailing. Design of the fugitive dust control system. Support on the technical standard, mining safety and environmental permits to compliance of the Chilean regulatory legislation. Technical Assistant for the Chinese General Manager on engineering and mining management about of legal matters, Chilean procedures and relationships with Chilean officers.

Mining project for "Minera San Fierro Chile Ltda". (Chilean subsidiary of Hebei Wenfeng Industrial Group from People's Republic of China) – 2012 to 2013.

### **MANGANESE PROJECT – PROCESSING PLANT DESIGN AND FEASIBILITY STUDY.**

Manganese ore processing plant design, by means of processing operations such as crushing, screening and Jig wet concentration; all these to get dry manganese products. A first commercial product will be the manganese lumps of size between 3/8" to 2" with 38%Mn grade; the second commercial product will be manganese concentrate below 1/8" with 38%Mn grade. The first product is recovered by means of only crushing and screening operations to reduce and classify the 25%Mn grade head ore, while its dry tailing below 3/8" in size will be feed to a Jig process, previous a size reduction below 1/8". The project design, include processing rates, compute of requirements of energy and water. Basic engineering. Processing design study of manganese ore was included to evaluate integrally the feasibility study of the mines "San Carlos" and "Placilla", all as an integral project with a useful life of 8 years. Study for CAP Minería – Manganesos Atacama S.A. – Chile – 2011.

#### **DESIGN, BUILT AND START UP OF A GOLD PROCESSING PLANT IN LOS ANDES MOUNTAIN.**

Considering the blending of different gold ores types to feed the processing plant with ore grade over 0.48 ounces per tonne, besides the expected recovery; the processing facilities were integrally designed with each process workshop, such as: ROM stockpile, crushing, conveyors, ore bins, screening, wet milling, wet classification, gravimetric concentration, flotation, CN leaching, Merrill Crowe process, filtering, pumping, foundry, tailing site leakproof on the basal soil. All facilities linked to get the Dore product and the fines tailings previously neutralized cyanide content. The processing plant was built and put on start up. "Pimenton Project" of "Compañía Minera Pimenton", subsidiary of Canadian Investment Group - South American Gold and Copper. Chile, 1995 – 1996.

#### **PRELIMINARY STUDIES ON THE RECOVERY PROCESS FOR GOLD ORES.**

With gold ores mined in the stockworks and alluvial deposits, previously selected, these were processed in several processing tests. Batch testing and Pilot processing of low grade gold ores: Only amalgamation; amalgamation plus flotation; flotation and cyanidation of gold concentrates plus electrowinning. The finest gold particles are 300# Tyler. Approximation of mining and processing costs.

Overseeing and managing the technical team for working of field at "Minas del Prado's Project" – Chile, 1988.

#### **STUDY OF PRE-FEASIBILITY TO BEGIN A MINING OPERATION WITH THIN LAYER LEACHING USING MIXED ORES OF SULPHIDE COPPER AND OXIDE COOPER.**

The study considered aspects such as concept of metallurgical process, preliminary conditions of ores, size of crushing and screening equipments and their products, liquid flows and its copper concentrations. Also, this study considered both capital cost and operation cost. Besides, environmental aspects.

Engineering Service for "Minera San Cristobal". "The Rubio's Mines" - Chile. 1985.