Report to:

SILVER STANDARD RESOURCES INC.

Technical Report on the Diablillos Property – Salta and Catamarca Provinces, Argentina

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TECHNICAL REPORT ON THE DIABLILLOS PROPERTY – SALTA AND CATAMARCA PROVINCES, ARGENTINA

JULY 2009

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1.0 SUMMARY

The Diablillos property is situated approximately 160 km southwest of the city of Salta in northwestern Argentina. It is comprised of eight mineral leases that are owned and operated by Pacific Rim Mining Corporation Argentina S.A. (Pacific Rim), a wholly-owned subsidiary of Silver Standard Resources Inc. (Silver Standard).

Silver Standard retained Mr. J. D. Blanchflower (P.Geo.) in November 2007 to conduct a property examination and review the results of their exploration. Upon completion of their 2008 drilling program and receipt of all the assay results in May 2009, Silver Standard retained Wardrop Engineering Inc. (Wardrop), A Tetra Tech Company, of Vancouver, British Columbia (BC) to estimate the National Instrument 43-101 (NI 43-101) compliant mineral resources for the Oculto zone within the property, and to co-author an independent NI 43-101 technical report with recommendations for further evaluation of the property.

The Diablillos property is readily accessible from the city of Salta northwesterly to the town of San Antonio de los Cobres via National Highway 51. There is a secondary all-weather gravel road that leads southwardly to the pueblo of Santa Rosa de los Pastos Grandes and then to the property. It is approximately 320 km from Salta to the property, which is a driving time of 6 to 7 hours. The property is also accessible by fixed-wing aircraft.

The property is situated within the ‘Puna’ physiographic region, an Andean uplands consisting of broad valleys separating ranges of mountains exceeding 3500 m, extending southward from the altiplano of southern Peru, Bolivia, and northern Chile. Elevations within the property range from 4100 to 4650 masl.

The Diablillos property is situated near the intersection of the north-south trending Diablillos-Cerro Galán fault zone with the northwesterly trending Cerro Ratones lineament. The Diablillos-Cerro Galán fault zone is one of several major north-south brittle to ductile shear zones in the Puna that were formed during Neoproterozoic and lower Paleozoic tectonism, and then reactivated during the Mesozoic and Cenozoic time. These fault and shear zones are reportedly hundreds of kilometres long and several kilometres wide.

In the vicinity of the Diablillos property, the Diablillos-Cerro Galán fault zone is approximately 10 km wide. Magmatism and hydrothermal activity often occur regionally at the intersection of the Diablillos-Cerro Galán fault zone with northwesterly trending shear structures, such as the Cerro Ratones lineament.

Tertiary andesitic flows and flow breccias crop out with more felsic and intermediate tuffs and subvolcanic porphyritic rocks occurring at higher elevations (Goad, 1994).

Precambrian granitic and granodioritic rocks with gneissic textures unconformably underlie most of the volcanic pile at the Oculto zone. Recent drilling by Silver Standard indicates that the unconformity is probably a paleo-erosional surface reflected by a poorly sorted conglomerate unit, and that the unit was also brecciated by subsequent low-angle faulting. The highly permeable unconformity appears to have controlled the lateral movement of later hydrothermal fluids. Phyllitic metasedimentary rocks of probably Ordovician age are in contact with the basement intrusive rocks on the eastern side of the mineralized zone.

The hydrothermal alteration of the country rocks at Diablillos is consistent with the style and mineralogy of a high sulphidation epithermal precious metal mineralizing system. Steeply-dipping northeasterly and east–west trending fault and shear structures have apparently controlled much of the mineralization at the Oculto zone, as did the sub-horizontal basement unconformity and sub-horizontal fracturing. Hydrothermal alteration is confined to the graben structure bounded by the Pedernales and Jasperoid faults, part of the north-south trending Cerro Galán fault zone. A silica-clay-alunite-jarosite alteration assemblage, indicative of a strong acid leaching environment, is common at the Oculto zone with a strong correlation between gold and silica.

Exploration activity began on the property in the mid-1960s by the Argintinian military and, in the mid-1980s, Abra de Mina S.A. (Abra de Mina) acquired the ground. Shell, Billiton, and Ophir Partnership conducted drilling programs; however, the Oculto deposit wasn't discovered by drilling until December 1990 by Billiton. Billiton conducted geological mapping, trenching, collected rock chip samples, and drilled 6,833 m of reverse circulation (RC) drill holes.

Pacific Rim optioned the property from Abra de Mina in 1992 and undertook a comprehensive exploration program including geological mapping, ground geophysical surveying, auger and rock sampling, trenching, and 2,014 m of diamond drilling.

Between 1996 and 1999, Barrick Exploraciones Argentina S.A. collected rock samples, soils samples, completed 40,850 m of RC drilling and 5,600 m of diamond drilling, excavated trenches, and conducted geophysical surveying.

In August 2001, Mine Development Associates Inc. estimated a NI 43-101 compliant mineral resource on the Oculto deposit within the Diablillos property.

In December 2001, Silver Standard acquired all assets of Pacific Rim. Pacific Rim continued to explore the property on behalf of Silver Standard, completing drilling programs in 2003 totalling 3,050 m, 1,770 m in 2005, 10,325 m in 2007, and 7,910 m in 2008.

A total of 8,315 drill core samples, not including quality assurance and quality control (QA/QC) samples, were shipped during the 2007 and 2008 drilling programs to the accredited analytical facilities of ALS Chemex Laboratories in Mendoza, Argentina for sample preparation and analyses. All of the samples were initially analyzed for 48 elements using conventional mass spectroscopy – inductively coupled plasma (MS-ICP) analysis. If any MS-ICP analytical result exceeded 200 ppm silver, a 30 g sample charge was re-analyzed using a fire assay fusion and gravimetric analysis finish procedure. Gold assays were a combination of fire assay fusion with atomic absorption (AA) spectroscopy analysis.

In 2007 and 2008, Pacific Rim inserted quality control samples (alternating between standard, blank or duplicate samples) and sent check assay samples to a secondary laboratory at a minimum rate of 1 sample per 20 samples. QA/QC sampling at a rate of about 10% was conducted on the pre-2007 database. The primary samples within the Diablillos database have passed a detailed QA/QC review conducted by Ms Caroline Vallat (G.I.T.).

In 2008, Silver Standard commissioned metallurgical testing on drill core samples collected from the Oculto mineralized zone. The gold recovery for two column cyanide tests on the high and low grade columns was 65 and 56%, respectively. Silver showed a wider range, with 63% recovery in the high grade column, and 37% in the low grade column. For resource estimation purposes, an average recovery of 65% was used for gold and 40% for silver.

Mineral resources at the Diablillos project were estimated by Wardrop at a cut-off of US$10 recoverable metal value (RMV) to contain capped indicated resources of 21.6 Mt averaging 111 g/t Ag and 0.922 g/t Au. Wardrop estimated that the Diablillos deposit contains additional capped inferred resources of 7.2 Mt averaging 27 g/t Ag and 0.807 g/t Au. RMV was based on metal values of US$11/oz Ag and US$700/oz Au, and applied recoveries of 65% for gold and 40% for silver. Blocks within the modelled grade shells were classified as indicated and interpolated blocks outside of the modelled grade shells were classified as inferred.

Wardrop recommends a $1,275,000 exploration program for the Diablillos property. In-fill drilling is recommended as is a continuation of the metallurgical program with additional bottle roll and column test work to confirm the amenability of the mineralization for heap leaching. Wardrop also recommends surveying the remaining holes that were drilled in the 2007/2008 exploration program and any future holes using differential GPS equipment. Finally, Wardrop also recommends completion of an in-house desktop economic evaluation to determine the viability of the project using some combination of heap leaching and conventional milling.

2.0 INTRODUCTION AND TERMS OF REFERENCE

The Diablillos property is situated approximately 160 km southwest of the city of Salta in northwestern Argentina. It is comprised of eight mineral leases that are owned and operated by Pacific Rim, a wholly-owned subsidiary of Silver Standard.

Silver Standard retained Mr. J.D. Blanchflower (P.Geo.) in November 2007 to conduct a property examination and review the results of their exploration. Upon completion of their 2008 drilling program and receipt of all the assay results in May 2009, Silver Standard retained Wardrop of Vancouver, BC, to estimate the NI 43-101 compliant mineral resources for the Oculto zone within the property, and to co-author an independent NI 43-101 technical report with recommendations for further evaluation of the property.

2.1 TERMS OF REFERENCE

This report has been prepared in accordance with the formatting requirements of National Policy 43-101F1 to be a comprehensive review of recent exploration activities on the property providing documentation for written disclosures, and is intended to be read in its entirety. The resource estimates were undertaken in accordance with the 'Guidelines for Mineral Resource Estimation', adopted by the Canadian Institute of Mining, Metallurgy, and Petroleum Resources (CIM), and reported in compliance with the Canadian Securities Administrators' NI 43-101.

2.2 SOURCE OF INFORMATION

Mr. Blanchflower, an independent qualified person (QP) according to NI 43-101, visited the Diablillos property on November 17 and 18, 2007. During this site visit, Mr. Blanchflower performed the following:

- examined the surface mineralization of the Oculto, Fantasma, and Los Corderos zones
- collected seven verification samples from various surface showings and drill core intercepts
- reviewed drilling results, sampling and shipping procedures, geological and geotechnical logging techniques, surveying records and documentation procedures with the on-site geological personnel.

Mr. Blanchflower relies on over 37 years of field experience with precious metal deposits similar to that within the Diablillos property.

This report and the mineral resource estimates contained herein are based upon exploration information and drilling and assay data collected, compiled, validated, and documented by Pacific Rim and Silver Standard. The co-authors consider the current drilling database of adequate quality for the current mineral resource study.

Mineral lease data was provided by Silver Standard, including a March 31, 2009 title opinion prepared for Silver Standard by Dr. Ignacio Frezze Durand of Estudio Perez Alsina, an independent Argentine legal counsel firm.

Most of the information contained within Sections 4.0 through 13.0 of this report was derived from the following:

- recent exploration reports, documents, and maps provided by Silver Standard
- a NI 43-101-compliant technical report on the Diablillos property by Messrs. Steve Ristorcelli (P.Geo.) and Peter Ronning (P.Eng.) dated August 3, 2001
- various exploration reports and presentations by Barrick Gold Corporation
- various geological reports including the 2001 M.Sc. thesis on the Diablillos property by David Matthew Stein.

The authors have re-organized the various data to comply with the NI 43-101 format, and made minor revisions and additional comments.

Ms Caroline Vallat (G.I.T.) of GeoSpark Consulting (GeoSpark) compiled and analyzed the assay and QA/QC data provided by Silver Standard, and prepared the "Quality Assurance and Quality Control Report for the Silver Standard Diablillos Project". This report comprises an analysis of available pre-2007 and recent QA/QC data, including the assay data utilized for the geomodelling and mineral resource estimate contained herein. The conclusions from the QA/QC report are quoted in this report. The co-authors have no reason to believe that any of the information is inaccurate.

All sources of information are listed in Section 21.0 (References) of this report and are also acknowledged where referenced in the report text. Information received in discussions with other persons is acknowledged where it appears in the report. Information not specifically attributed to another source is based upon the author's own observations or general knowledge acquired during his property visit and professional experience.

Metric units are used throughout in this report and costs are shown in Canadian Dollars (Cdn$) unless otherwise stated. Abbreviations used in this report are provided in Table 2.1.

Table 2.1 List of Abbreviations

Term	Abbreviation
Abra de Mina S.A.	**Abra de Mina**
acre	**ac**
atomic absorption	**AA**
BHP-Utah	**BHP**
British Columbia	**BC**
Canadian Institute of Mining, Metallurgy, and Petroleum Resources	**CIM**
centimetre	**cm**
controlled source audio magneto telluric	**CSMAT**
degrees (Celcius)	**°C**
degrees (Fahrenheit)	**°F**
Dollar (Canadian)	**Cdn$**
Dollar (United States)	**US$**
Gemcom Software International Inc.	**Gemcom**
GEMS Version 6.2	**GEMS**
GeoSpark Consulting	**Geospark**
gram	**g**
grams per tonne	**g/t**
hectare	**ha**
hour	**h**
inductively coupled plasma	**ICP**
kilometre	**km**
Knight Piésold Ltd.	**Knight Piésold**
mass spectroscopy – inductively coupled plasma	**MS-ICP**
metre	**m**
metres above sea level	**masl**
millimetres	**mm**
million tonnes	**Mt**
million years	**Ma**
Moreno Surveying & Geographics	**Moreno**
National Instrument 43-101	**NI 43-101**
ounce	**oz**
Pacific Rim Mining Corporation Argentina S.A.	**Pacific Rim**
parts per million	**ppm**
point load tests	**PLT**
Process Research Associates Ltd.	**PRA**
qualified person	**QP**
quality assurance/quality control	**QA/QC**
recoverable metal value	**RMV**
reverse circulation	**RC**
rock quality designation	**RQD**
seconds (time)	**s**

table continues…

Term	Abbreviation
Silver Standard Resources Inc.	**Silver Standard**
specific gravity	**SG**
Standard Penetration Tests	**SPT**
tailings storage facility	**TSF**
tonne	**t**
tonnes per cubic metre	**t/m^3**
unconfined compressive strength	**UCS**
Wardrop Engineering Inc.	**Wardrop**

2.3 ACKNOWLEDGEMENTS

The author wishes to thank the Silver Standard administrative staff based in Vancouver for their kind and generous help with this study. Messrs. Ken McNaughton (Silver Standard Vice President of Exploration) and Mr. Ron Burk (Silver Standard Chief Geologist) generously helped with property examination arrangements, project and exploration overviews, and database acquisition.

3.0 RELIANCE ON OTHER EXPERTS

The co-authors have relied on the following individuals to provide necessary information during the mineral resource estimation work and preparation of this report.

- Mr. Ken McNaughton (Silver Standard Vice President Exploration) provided corporate information and data for the historical and recent exploration work and their results.
- Mr. Ron Burk (Silver Standard Chief Geologist) provided updated descriptions of the regional and property geological setting of the Diablillos property and the Oculto mineralized zone.
- Mr. Zoran Lukic (Silver Standard Database Manager) provided drilling and assay data for the collation and compilation of the drilling database utilized for the mineral resource estimates.

The 2001 M.Sc. thesis titled "The Diablillos Ag-Au Deposit, Salta, Argentina: Deeply Oxidized High-Sulphidation Epithermal Mineralization in the Southern Puna Province" by David Matthew Stein was referenced for the geological setting, lithologic descriptions, and metallogenic relationships of the Diablillos mineralization.

The co-authors have relied upon the results and observations documented in the QA/QC report by Ms. Caroline Vallat of GeoSpark, and from the recent metallurgical studies reported by Messrs. Frank Wright (P.Eng.) and Peter Tse of Process Research Associates Ltd. (PRA).

This report is not intended to be a guarantee of mineral title, nor is it intended to be a thorough description of past, existing, or future option, sale, or title agreements, nor is it intended to include a thorough description of possible liabilities, environmental or otherwise, of assessment, access, land claims, and exploration requirements and programs completed, planned, or contemplated.

The co-authors were not involved in any exploration work on the Diablillos property; therefore, this report has made extensive reference to the work and reports undertaken by other qualified geologists, metallurgists, and field personnel. Their work has been referenced whenever possible.

4.0 PROPERTY DESCRIPTION AND LOCATION

4.1 PROPERTY LOCATION

The Diablillos property is located approximately 160 km southwest of the city of Salta, along the border between the Provinces of Salta and Catamarca, Argentina. It covers an area of 4,500 ha (11,120 ac) in the high puna and altiplano region of northwestern Argentina. The geographic coordinates at the centre of the property are 25°18' South latitude by 66°50' West longitude (Figure 4.1).

4.2 PROPERTY DESCRIPTION

Pacific Rim owns and operates eight mining leases or ‘minas’ that comprise the Diablillos property. Verification of the land titles and mining rights owned by Pacific Rim was documented in a March 31, 2009, title opinion by Dr. Ignacio Frezze Durand of Estudio Perez Alsina, an independent Argentine legal counsel firm. The location and configuration of the subject mining leases or minas are shown in Figure 4.2. Table 4.1 documents their pertinent information.

Table 4.1 Summary of Mining Lease Information (after Silver Standard, 2009)

Mineral Lease Name	File No.	Registration Date	Size (ha)	Province	Owner/ Operator
Alpaca I	16031	Aug. 11, 1998	300	Salta	Pacific Rim
Fantasma	15840	Feb. 19, 1997	600	Salta	Pacific Rim
Los Corderos	11749	Jul. 6, 1983	600	Salta	Pacific Rim
Pedemales	11750	Jul. 6, 1983	600	Salta	Pacific Rim
Relincho I	11964	Apr. 24, 1984	600	Salta	Pacific Rim
Relincho II	11965	Apr. 24, 1984	600	Salta	Pacific Rim
Relincho III	11966	Apr. 24, 1984	600	Salta	Pacific Rim
Renacuajo	11751	Jul. 6, 1983	600	Salta	Pacific Rim
Total Area			**4,500**		

Figure 4.1 Location Map

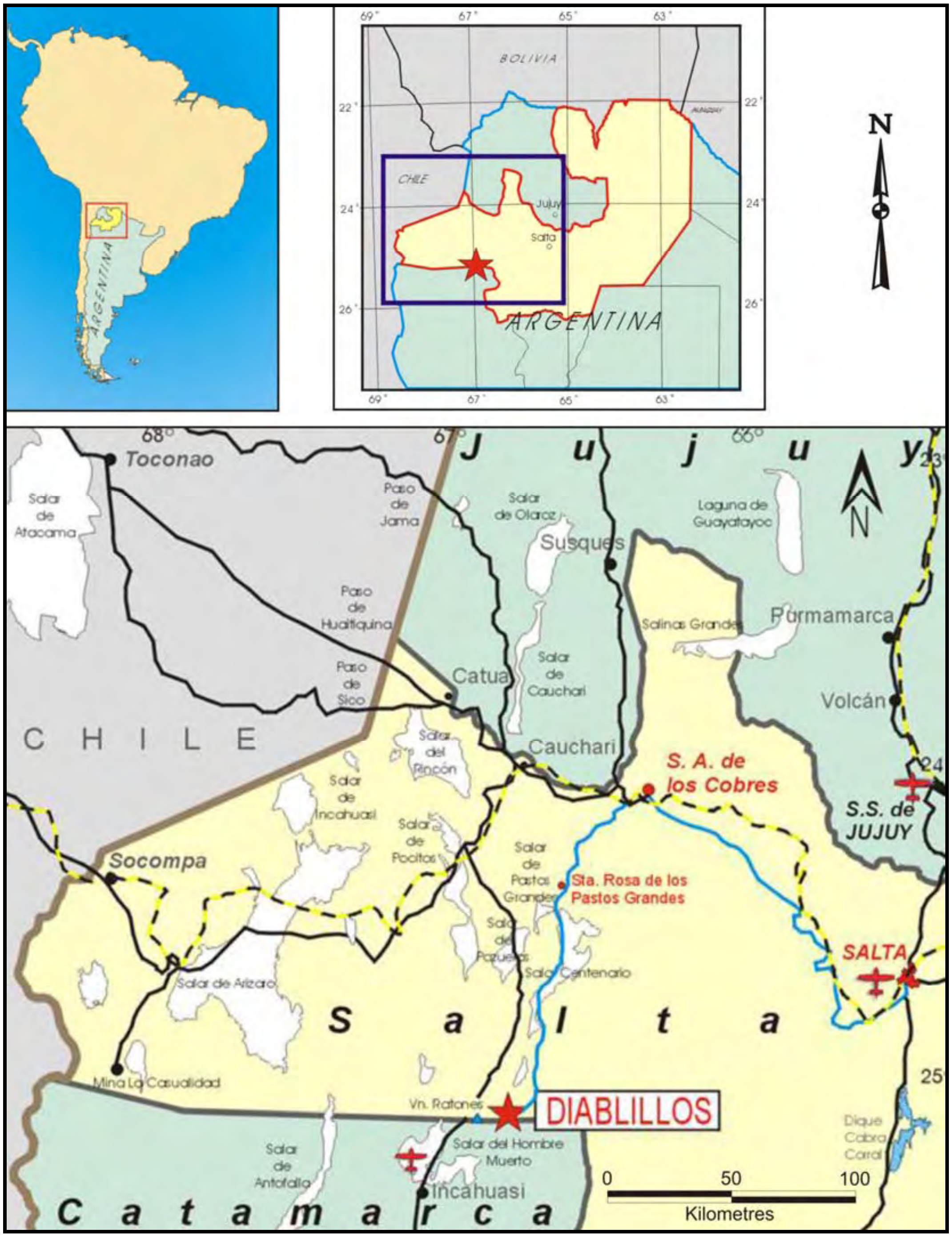
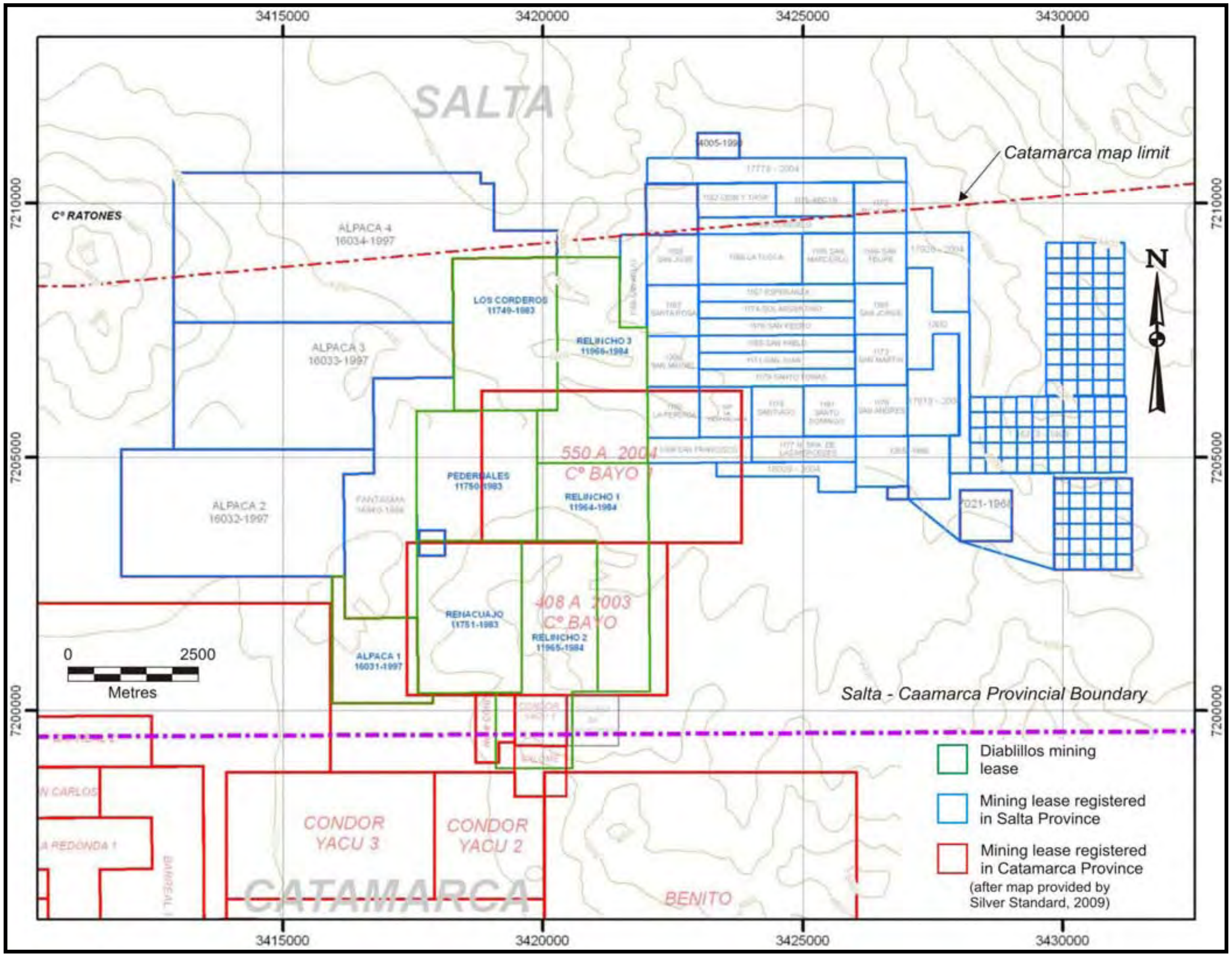


Figure 4.2 Mineral Lease Map



There are two basic levels of mineral rights in Argentina, 'cateos' and 'minas'. According to Ronning (1995):

> *"Cateos are exploration permits that confer a right to explore but not exploit, and provide temporary protection from competitors. No cateos are included in the Diablillos property.*
>
> *Minas, analogous to mining leases, have an unlimited life subject to fees and investment requirements, and confer the right to exploit as well as explore for minerals. Their permissible size varies depending on the style of mineralization they are intended to cover. In the case of Diablillos, which is considered to contain "disseminated" mineralization, minas may consist of up to 35 pertenencias, each of which covers 100 hectares. Thus the maximum size of a mina would be 3,500 hectares. Once application is made for a mina there is a process of establishing it that culminates in a legal survey. The applicant must file a schedule of planned investment meeting minimum requirements. After a mina has existed for three years the owner must commence to pay canones, or fees. These amount to US$400 per 100 hectares, payable twice yearly, on June 30 and December 31 of each year."*

According to Pacific Rim (2008), the annual provincial taxes for property maintenance, made payable to the Province of Salta, are US$10,000.

As an administrative convenience the subject minas are all registered in the Mining Court in the Province of Salta, although some lie partly within the province of Catamarca. According to a private report prepared in April 2000 by Geographe International MFS Inc. for Barrick Gold Corporation:

> *"A dispute has historically existed between the two authorities as to which province has jurisdiction. The province of Salta was the first to deal with the Diablillos claims and also the main Oculto deposit lies within Salta province. Thus, Salta province has jurisdiction based on a resolution completed with the provinces in mid-1999. The claims, as listed above, do not accurately reflect the size of the property subsequent to this provincial resolution which has resulted in a reduction in size to the claims partially located in Catamarca province."*

4.3 PROPERTY OWNERSHIP

Pacific Rim is an Argentinean mining corporation with an authorized capital of 35,000 shares of issued and outstanding common stock. According to Durand (2009), Silver Standard Argentina (BVI) Inc., a British Virgin Islands corporation, owns 34,999 common shares of Pacific Rim. Silver Standard Resources Inc., a BC corporation, owns one common share of Pacific Rim. Silver Standard Argentina (BVI) Inc. is a wholly-owned subsidiary of Silver Standard Resources Inc. (McNaughton, 2009).

According to Durand (2009), as of March 31, 2009 Pacific Rim has unrestricted and exclusive property rights, and good and marketable title to all the assets of the Diablillos property, free and clear of all liens, charges, encumbrances or restrictions. Furthermore, Pacific Rim is in good standing with all filings pertaining to the Diablillos property.

The authors are neither legal experts nor well versed on the system of mineral tenure in Argentina. The preceding information has relied upon the title opinion of Durand (2009).

4.4 Environmental, Reclamation, and Permitting Issues

The authors are not aware of any outstanding environmental, reclamation, or permitting issues that would impact future exploration work. Future exploration work will require the usual permitting requirements and reclamation commitments appropriate with work in this area.

5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 ACCESSIBILITY

The Diablillos property is readily accessible from the city of Salta northwesterly to the town of San Antonio de los Cobres via National Highway 51. There is a secondary all-weather gravel road that leads southwardly to the pueblo of Santa Rosa de los Pastos Grandes and then to the property. It is approximately 320 km from Salta to the property, which is a driving time of 6 to 7 hours. An alternate road route is via the town of Pocitos on Provincial Route 17, which is the main road to Antofagasta, Chile and the primary road access to the RTZ Minas Tincalayu borax mine located a few kilometres southwest of the Diablillos property on the northeastern shore of the Salar Hombre Muerto (Figure 7.2).

Most of the local roads are gravel, requiring two-wheel drive vehicles with high clearances; however, during the rainy periods, sections of the road access are susceptible to flooding or small landslides. Four-wheel drive vehicles are required for access within the property.

The property is also accessible by fixed-wing aircraft. According to Geographe International MFS Inc. (2000), there are good quality airstrips located on the Salar Hombre Muerto, about 10 km southwest of the property, and at the FMC Hombre del Muerto lithium mine situated about 40 km west of the Diablillos property.

5.2 PHYSIOGRAPHY, CLIMATE, AND VEGETATION

The property is situated within the ‘Puna’ physiographic region, an Andean uplands consisting of broad valleys separating ranges of mountains exceeding 3500 m, extending southward from the altiplano of southern Peru, Bolivia, and northern Chile. Elevations within the property range from 4100 to 4650 masl.

Weather conditions are typical of a high, arid region with little or no precipitation throughout most of the year. During the winter season (i.e. July and August) temperatures can range from 8°C to 10°C during the daytime to -5°C to -8°C at night. In the summer (i.e. December to February), daytime temperatures may average 25°C to 30°C but near freezing temperatures at night.

Annual precipitation may range from 80 to 100 mm, mainly during February and March but, in some years, there is no recorded precipitation (Servicio Meteorologica Nacional, 2008). Strong northwesterly and westerly winds in excess of 45 km/h are common in the area, especially during the winter and spring seasons.

Local vegetation is sparse, typically with varieties of upland grasses and stunted shrubs.

5.3 LOCAL RESOURCES AND INFRASTRUCTURE

The narrow-gauge General Belgrano Railway line connects the city of Salta with the seaport of Antogasta, Chile. The town of Pocitos situated approximately 100 km north of the property is nearest rail access point.

Both an electrical transmission line and a natural gas pipeline cross the Puna between Salta and Chile. According to Silver Standard (2008), Pocitos is the closest access point to this power transmission line while the gas pipeline is approximately 140 km from the Diablillos property.

The closest permanent communities are Santa Rosa de los Pastos Grandes and San Antonio de los Cobres with estimated populations of 100 and 1,500 respectively. Limited basic supplies and some fuel may be purchased in San Antonio de los Cobres but the city of Salta is the main regional commercial centre where supplies, fuel, and equipment may be purchased and trucked to the property year-round. Salta is also serviced by regular daily commercial flights from Buenos Aires and other major South American cities.

6.0 HISTORY

The following discussion of the historic exploration work on the Diablillos property is derived largely from reports by Ristorcelli and Ronning (2001), Rojas et al (2003), and Puigdomenech (2006). A summary of the exploration history is as follows.

6.1 1960S

In the early to mid 1960s, the Dirección General de Fabricaciones Militares (a branch of the Argentine military) evaluated the Argentine Puna for porphyry-style deposits of copper and/or molybdenum.

6.2 1970S

On December 31, 1971, the area was included in a federal government mineral reservation. The Secretaría de Minería de la Nación undertook geological and geochemical reconnaissance work in the area at a scale of 1:50,000. It included the collection and analysis of 1,409 rock chip samples from outcrops and slope debris (Gonzalez, 1985).

6.3 1984

The reserve area expired and Abra de Mina, private Argentine prospecting company, acquired the ground that now constitutes the Diablillos property.

6.4 1984 TO 1987

In 1985, a joint venture between Shell and Billiton optioned the Diablillos property from Abra de Mina. The joint venture partners explored the Jasperoide area with rock geochemical surveying and they drilled three shallow drill holes. Despite recognizing the high-sulphidation epithermal nature of the alteration system, the joint venture partners terminated their option (Geographe International, 2000).

In early 1987, an American mining and prospecting syndicate called the Ophir Partnership, optioned the Diablillos property and drilled 31 RC drill holes to an average depth of 30 m within the Corderos, Pedernales, Laderas, and Jasperoid areas (Figure 7.3 and Figure 7.4). Although several of the holes reportedly intersected anomalous to significant gold and silver values (Mustard, 1994), the

Ophir Partnership contacted and later optioned the property to Minera Utah, a subsidiary of BHP-Utah (BHP) in 1988.

6.5 1988 TO 1991

In 1988, BHP carried out reconnaissance exploration of the area identifying several silicified hot spring targets. Their 1989 reconnaissance work identified four areas of interest: the North, Central, South (including Oculto), and East zones.

In late 1989, BHP acquired control of the property by signed agreements with Ophir and Abra de Mina, and they proceeded to drill 21 RC holes (2,000 m) on the North, Central, and South zones. Initial positive drilling results were followed up with a second 2,386 m RC drilling campaign during late 1990 on the North and Central zones. A third campaign of 2,000 m of RC drilling during December 1990 concentrated on the Oculto-Laderos areas within their 'South' zone. This drilling included the discovery hole for the Oculto deposit (i.e. DAR-45 – 105 m grading 2.91 g/t gold and 250 g/t silver) (Geographe International, 2000). By mid-1991, BHP had spent an estimated US$1.4 M on exploration work, which included:

- geological mapping at scales ranging from 1:1,000 to 1:7,500
- collection and analysis of 380 rock chip samples
- 1,200 m of bulldozer trenching
- drilling 55 air RC drill holes ranging from 50 to 250 m long, totalling 6,833 m
- an in-house estimation of a mineral inventory.

According to Mustard (1994), BHP estimated the geological resources of the Oculto zone at 4.1 Mt grading 2.4 g/t gold and 141 g/t silver at a cut-off grade of 0.5 g/t gold and average density of 2.5 g/cc. This resource estimate is not NI 43-101 compliant and should not be relied upon. It is documented for its historical perspective only. BHP attempted to solicit a joint venture partner to continue exploration but none were forthcoming, and their option agreement with Abra de Mina was terminated in September 1991.

6.6 1992 TO 1993

Pacific Rim optioned the Diablillos property from Abra de Mina in 1992 and in 1993 they drilled 5 HQ-size diamond drill holes in the Oculto zone, totalling 1,001.8 m (Mustard, 1994).

6.7 1994

Pacific Rim undertook a comprehensive exploration program on the Diablillos property (Mustard, 1994), including:

- 149 line-km of chain and compass grid lines
- geological mapping at various scales
- 122 line-km of ground magnetic surveying and 34 line-km of induced polarization surveying
- hand auger sampling at 213 sites and collection of more than 250 rock samples
- 2.5 km of trenching
- 12 HQ/NQ-size diamond drill holes, totalling 2,013.9 m, within the Oculto zone.

According to Mustard (1994), poor drilling conditions were encountered and several holes failed to reach their target depths.

6.8 1995 TO 1996

Barrick Exploraciones Argentina S.A. (Barrick), a wholly-owned subsidiary of Barrick Gold Corporation, began negotiating an agreement with Pacific Rim in early 1995 and signed an agreement in July 1996 that allowed Barrick to acquire an option on the shares of the Pacific Rim Argentinean subsidiary.

6.9 1996 TO 1999

Barrick carried out a thorough mapping and surface sampling program over the main target zones from February to July of 1996. Their first drilling campaign in August 1996 tested the continuity of the Oculto deposit with 31 RC drill holes totalling 8,449 m. The drilling results established the flat-lying, tabular geometry for the mineralization (Geographe International, 2000).

Between January and May 1997, Barrick drilled 5 diamond and 40 RC drill holes, totalling 13,311 m, to increase the drill density, confirm the continuity of the mineralization, and extend the known size with step-out drilling. Geophysical surveys (controlled source audio magneto telluric [CSMAT] and magnetics) were completed over the Oculto zone, in addition to preliminary environmental impact and metallurgical studies (Geographe International, 2000).

According to Geographe International (2000) and Ristorcelli and Ronning (2003), exploration work by Barrick between January 1996 and the end of 1999 included:

- collecting 2,165 rock chip samples that were analyzed for gold and 34 other elements using the inductively coupled plasma (ICP) methods
- collecting 648 soil samples that were analyzed for gold and 34 other elements using the ICP methods
- collecting more than 40,000 RC drill samples that were analyzed for gold and silver by fire assay, plus 9,000 samples were analyzed for 34 other elements using the ICP techniques
- geological mapping at scales of 1:1,000, 1:2,000, 1:5,000, and 1:10,000
- detailed geological mapping along specific grid lines at scales of 1:50, 1:100, and 1:250
- construction of 160 drill platforms and the necessary access roads
- drilling 150 RC boreholes totalling 40,846 m
- drilling 24 diamond boreholes totalling 5,608 m
- excavating 592 m of trenches with rock chip sampling
- topographic surveying
- geophysical surveying including resistivity, CSMAT, and magnetics
- conventional and mobile metal ion soil geochemical surveying
- studies of alteration minerals in surface and underground samples utilizing a PIMA instrument
- drilling 4 core holes to test the continuity of the high grade silver zone and the reproducibility of high grade silver assays identified with RC drilling
- sponsoring an M.Sc. thesis at Queens University on the mineralogy and genesis of the Oculto deposit, and other mineralogical and metallurgical studies.

6.10 2001

In April 2001, David Matthew Stein submitted an M.Sc. thesis to the Department of Geological Sciences and Geological Engineering of Queen's University titled “The Diablillos Ag-Au Deposit, Salta, Argentina: Deeply Oxidized High-Sulphidation Epithermal Mineralization in the Southern Puna Province”. This work contains a detailed study of mineralization, alteration, geochronology, and geochemistry of Diablillos.

In August 2001, Mine Development Associates Inc. (Ristorcelli and Ronning, 2001) compiled exploration and drilling data on behalf of Pacific Rim, and estimated a

NI 43-101 compliant mineral resource on the Oculto zone within the Diablillos property.

According to Ristorcelli and Ronning (2001), drill hole samples were composited to 6 m lengths honouring geological coding. Kriging was used to interpolate grades for the silver and low-grade gold zones while inverse distance cubed was used to interpolate the high-grade gold zone. All resources were defined as 'Inferred' because of the limited scope of the study. In December 2001, Silver Standard acquired all assets of Pacific Rim in consideration of staged payments totalling US$3.4 M, paid in a combination of cash and shares.

6.11 2003

Pacific Rim, on behalf of Silver Standard, drilled 20 holes totalling 3,046 m from September 29 to November 18, 2003. This work tested probable extensions of the Oculto zone below the sedimentary-volcanic cover immediately west of the main mineralization. Six holes drilled to test chargeability anomalies west of the Oculto zone intersected only weakly altered andesite hosting fracture controlled pyrite veinlets and disseminations without any significant precious metal mineralization. Two drill holes were collared to test for Oculto mineralization southward beneath the talus cover on the Renacuajo concession. Only weak silver values were intersected. Three drill holes tested other geological targets within the Pedernales, Relincho I and III concessions with encouraging results, and three other holes continued testing the Oculto deposit (Puigdomenech, 2006).

In December 2003, Maximus Ventures Ltd. completed an exploration program on the neighbouring Condor Yacu property and on two Los Corderos and Relincho II mineral concessions held through a joint venture agreement with Silver Standard. The program consisted of detailed geologic mapping and rock sampling, plus 397.3 m of diamond drilling in 6 holes within the Los Corderos concession, and reconnaissance mapping and sampling of the Relincho II concession (Puigdomenech, 2006). According to Puigdomenech (2006):

> *"In the Los Corderos Area, four zones of epithermal and/or fault related mineralization were recognized from mapping and previously reported exploration activities: Corderos, Pedernales Norte, Vicuña, and Guanaco. All were drill tested except the Guanaco zone.*
>
> *In the Condor Yacu Area, ten trenches totalling 552 meters were excavated, and sampled, followed by 7 diamond drill holes totalling 621.7 meters. The program focused on exploring for gold-silver mineralized epithermal related hydrothermal breccia bodies, similar to the previously delineated South Outcrop body."*

6.12 2005

A program of 10 drill holes was carried out and finished by June 15. A total of 1,772 m of drilling was sampled resulting in 1,850 samples. Half of the holes were located on the Renacuajo lease and the other half tested the Alpaca lease within Diablillos property.

6.13 2006

A short field program in late May was carried out to check the property geology, collect rock geochemical samples, and verify drill hole collar information.

6.14 2007

Pacific Rim, on behalf of Silver Standard, set up a 40-person field camp and drilled 54 HQ-size diamond drill holes totalling 10,323.4 m. There were 5 drill holes (227.20 m) that tested the Corderos mineralized zone, 3 drill holes (292.80 m) that tested the Pedernales mineralized zone, 1 drill hole (203.1 m) that tested the Laderos zone, and the balance of the drilling (9,600.3 m) was directed at evaluating the Oculto zone. The cores from four HQ-size diamond drill holes in the Oculto zone were bulk sampled for metallurgical test work.

6.15 2008

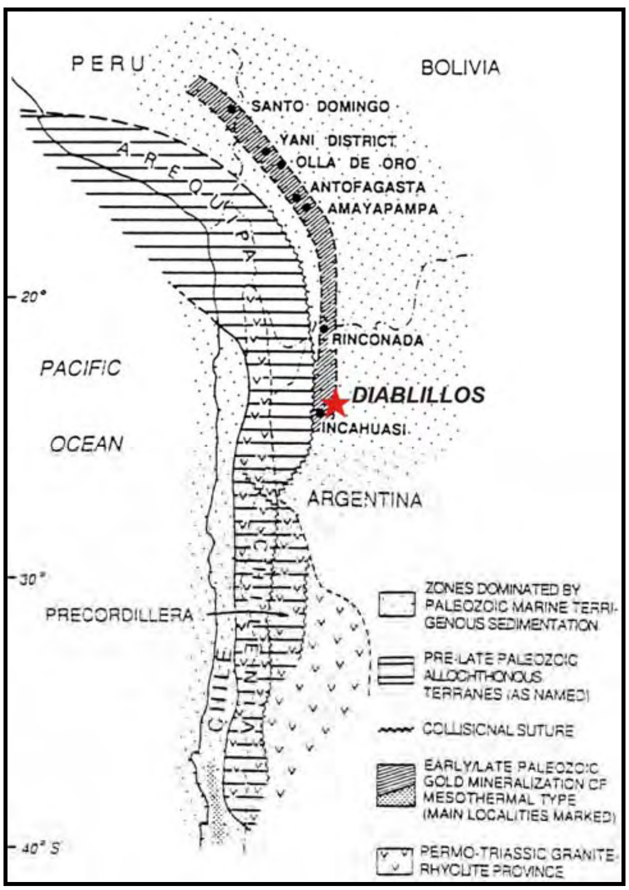
Pacific Rim, on behalf of Silver Standard, drilled 52 HQ-size diamond drill holes, totalling 7,909.45 m. There were 49 drill holes collared to continue the evaluation of the Oculto zone and 3 drill holes, totalling 385.65 m, were completed for geotechnical studies. In addition, two stages of metallurgical testing were conducted in preparation for an economic evaluation.

7.0 GEOLOGICAL SETTING

7.1 INTRODUCTION

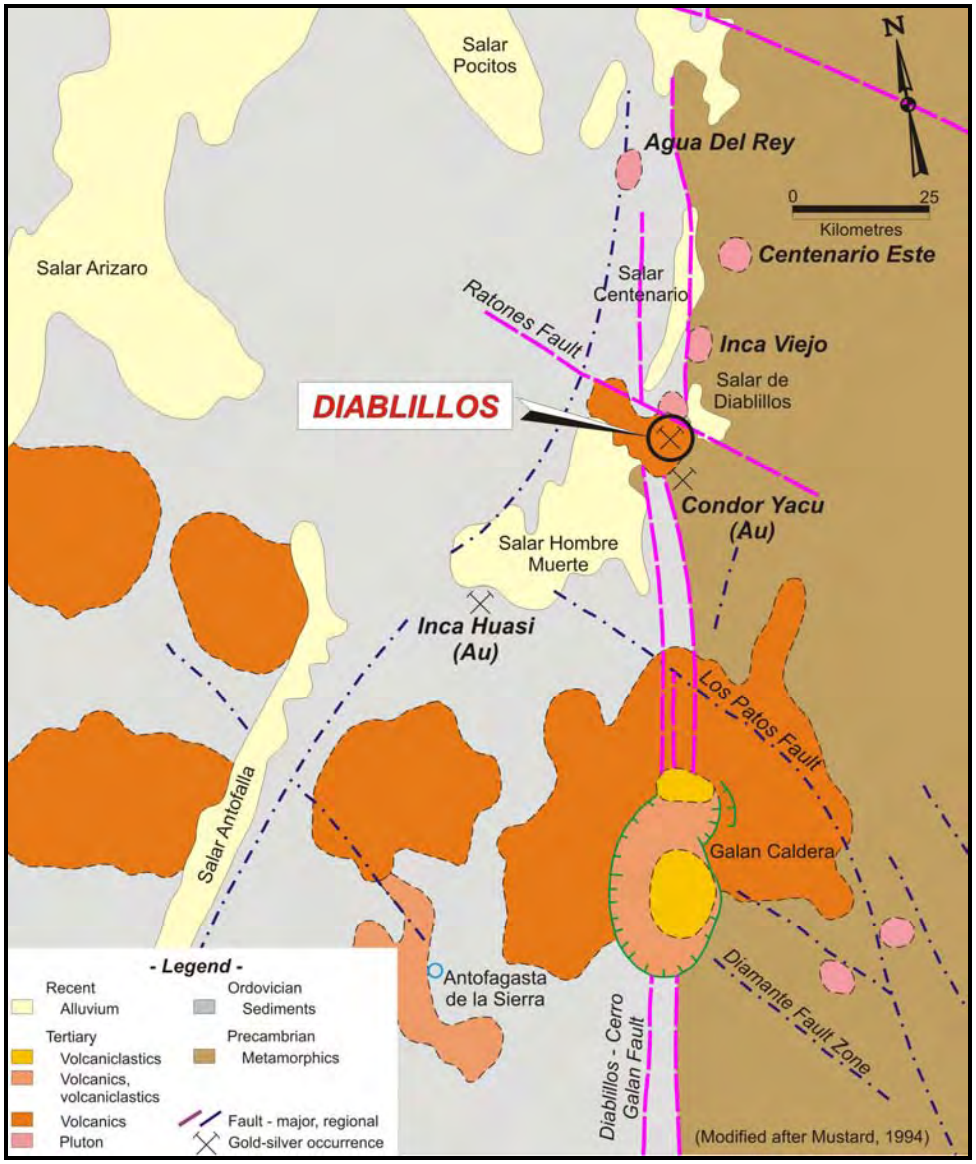
The Argentine Puna is the southern extension of the Altiplano of southern Peru, Bolivia, and northern Chile. It is east of a modern volcanic arc and above a moderately dipping segment of the eastwardly subducting Nazca Plate. During the mid-Miocene Quechuan Orogeny, the subduction zone beneath the Puna gradually steepened as the South American plate overrode the Nazca plate (Coira et al., 1993). Extensive late Miocene to Pliocene volcanic activity occurred along the western margin of the Puna Plateau and along northwest-southeast conjugate structures (Coira et al., 1993). Diablillos lies near the eastern margin of the Puna (Figure 7.1).

Figure 7.1 Tectonic and Metallogenic Features of the Central Andes



Note: after Sillitoe, 1992.

Figure 7.2 Simplified Regional Geology Map



The following sections are summarized from descriptions of the regional and local geology by Ronning (1997), Stein (2001), and Ristorcelli and Ronning (2001).

7.2 Regional Geology

The Diablillos property is situated near the intersection of the north-south trending Diablillos-Cerro Galán fault zone with the northwesterly trending Cerro Ratones lineament (Coira et al., 1993). According to Ronning (1997), the Diablillos-Cerro Galán fault structure is one of several major north-south brittle to ductile shear zones in the Puna that were formed during Neoproterozoic and lower Paleozoic tectonism, and then reactivated during the Mesozoic and Cenozoic time. These fault and shear zones are reportedly hundreds of kilometres long and several kilometres wide, within which there are anastomosing shears and sometimes bounding lenses of undeformed country rocks (Figure 7.2).

According to Ronning (1995), the following regional lithologic units occur in the vicinity of the property:

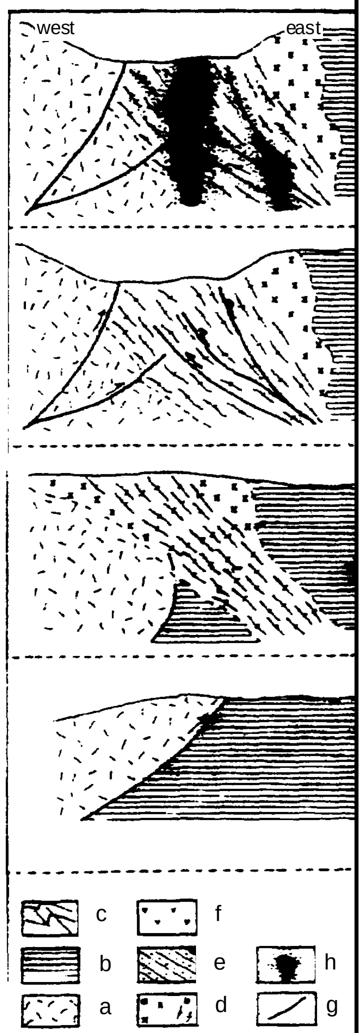
- Stocks and Extrusive Domes:
  - Puna stocks and domes are 12 to 15 Ma-old sub-volcanic intrusives and extrusives, frequently associated with tephra deposits from low volume, plinian to phreatomagmatic eruptions. They are generally K_2O rich dacitic rocks with biotite and occasional amphibole mafic phenocrysts, and accessory apatite, ilmenite, allanite and tourmaline.
- Cerro Ratones Volcanics:
  - Cerro Ratones volcanic rocks are reportedly of Oligocene age (30 ± 3 Ma) (Coira et al., 1993), but a recent 40Ar/39Ar age of about 7 Ma for biotite from a flank unit at Cerro Ratones indicates a possible wider age range.
- *Faja Eruptiva* Granitoids:
  - Magmatic rocks of broadly Ordovician age are widespread in northwestern Argentina, including a magmatic belt known as the *Faja Eruptiva de la Puna Oriental,* or simply the *Faja Eruptiva* (Lork and Bahlburg, 1991). This belt extends from about 27° South latitude in Argentina to nearly 22° South latitude in southernmost Bolivia (Bahlburg, 1990). In the Diablillos area, the *Faja Eruptiva* is spatially coincident with the Diablillos–Cerro Galán fault zone.
  - Rocks of the *Faja Eruptiva* form large and elongate bodies of porphyritic and equigranular, partly hypabyssal granitoids rich in sedimentary xenoliths. In the vicinity of Diablillos, rocks assigned to the *Faja Eruptiva* contain feldspar phenocrysts up to 4 cm long. They follow a calc-alkaline differentiation trend and are peraluminous. Based on five U-Pb ages, Lork and Bahlburg (1991) consider the igneous rocks of the *Faja Eruptiva* to be middle Ordovician.
- Ordovician Sediments:
  - The *Faja Eruptiva* intrudes and is folded with a sequence of Ordovian metasediments. In the vicinity of Diablillos, they are phyllites, meta-siltstones, and quartzites. Farther north, the Ordovician metasedimentary rocks contain late Ordovician fossils, in contradiction to the middle Ordovician radiometric ages for the *Faja Eruptiva*.
- Precambrian Units:
  - Viramonte et al. (1991) termed the pre-Ordovician basement of the eastern Puna the 'Pachamama Igneous-Metamorphic Complex'. It is comprised of 3 subparallel north-south belts 200 km long. The Diablillos

property is situated near the western margin of the eastern belt, which is comprised of metamorphosed pelitic, psammitic, and granitic rocks that have been intruded by younger granitoids of the *Faja Eruptiva*.

Figure 7.3, from the technical report by Ronning (1997), clearly illustrates the evolution of the regional geology in the vicinity of the Diablillos property.

Figure 7.3 Evolution of the Diablillos Regional Geology

4. Magmatism with associated hydrothermal alteration and mineralization.
3. Andean Orogeny. Compressional tectonics re-activate older structures and generate new ones. Complex fault pattern.
2. Oclóyica (Ordovician-Silurian) deformation. Paleozoic granitoids (Faja Eruptiva?) intrude the low grade metamorphics. Deformation of granitoids ranges from nil to strong ductile.
1. Precambrian deformation. Schist, gneiss and migmatite thrust eastward over low grade metamorphic rocks.



Symbols

- a Precambrian schist, gneiss, migmatite
- b Precambrian low grade metamorphics
- c Ordovician sediments and volcanics
- d Ordovician granitoids; undeformed; mylonitized
- e-f not applicable
- g faults
- h cenozoic magmatic bodies with associated hydrothermal alteration and mineralization

Note: after Ronning (1997) and Hongn (1995).

In the vicinity of the Diablillos property, the Diablillos-Cerro Galán fault zone is approximately 10 km wide, and has been repetitively active since its formation in Precambrian time. Magmatism and hydrothermal activity often occur regionally at the intersection of the Diablillos-Cerro Galán fault zone with northwesterly trending shear structures, such as the Cerro Ratones lineament (Hongn, 1995).

Disseminated and vein occurrences of the northern and central Puna are dominated by base metal, gold, silver, tin, and antimony mineralization commonly associated with the small, potassic-rich, Tertiary stocks and extrusive domes that have been dated at 15 ± 2 Ma (Sillitoe, 1977, in Coira et al., 1993). Elsewhere, the salars in the vicinity of Diablillos contain many borate occurrences.

7.3 Property Geology

The Diablillos property hosts several zones of high-sulphidation epithermal alteration and mineralization with strong supergene overprinting. The main zone of mineralization, called the 'Oculto', is hosted by a subaerial volcanic sequence, ranging in composition from pyroxene-homblende to biotite-hornblende andesite. These volcanic rocks have been age dated by Stein (2001) and assigned to the Middle Miocene Tebequincho Formation. The deeper mineralization is hosted by Ordovician-age alkali-feldspar, porphyritic granite of the Complejo Eruptivo Oire and Neoproterozoic-to Cambrian-age metasedimentary rocks of the Complejo Metamorfico Rio Blanco. Small, well altered dacitic bodies have also intruded the basement and andesitic sequence (Stein, 2001).

7.3.1 *Lithology*

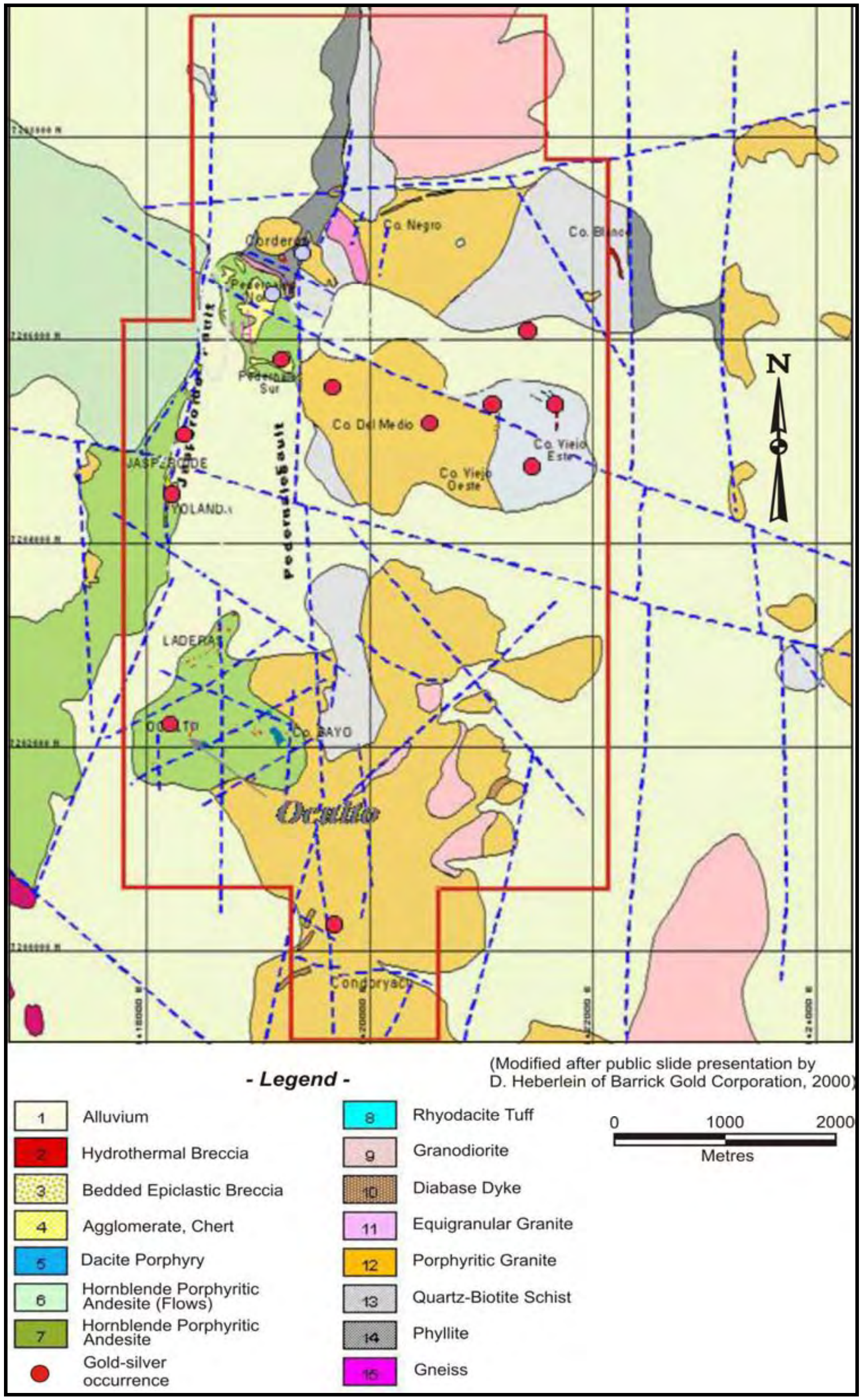
Table 7.1, showing property-wide lithologic units, was adapted and modified by Ristorcelli and Ronning (2001) after a legend on a 1:7,500 scale geological map by Barrick (1997), dated March 1997. All the local lithologies are variants of the regional stratigraphy.

Table 7.1 Lithologic Units on Diablillos Property

Probable Age	Supracrustal Rocks	Intrusive Rocks	Hydrothermal Rocks
Tertiary (5.8 to 7 Ma)	Andesite		
	Amphibolitic Andesite		
	Andesite Tuff		
	Dacite Tuff	Dacite Porphyry	Hot Spring Sinter
	Volcanic Breccia		Hydrothermal Breccia
	Pyroclastic Breccia		
	Tuffaceous Breccia		
Ordovician	Phyllite	Granite (Faja Eruptiva)	
	Quartzite		
	Micaceous Schist		
Precambrian	Granite		
	Gneissic Granite		

Note: after Ristorcelli and Ronning, 2001.

Figure 7.4 Property Geology Map



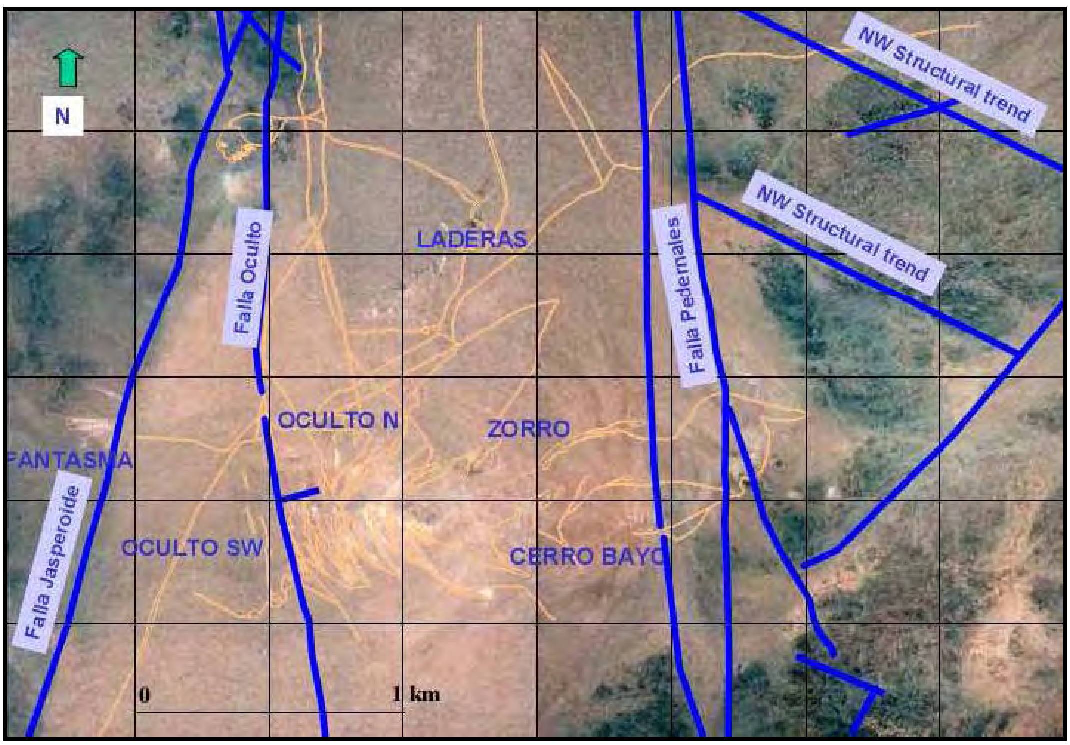
Note: after Ristorcelli and Ronning, 2001.

7.3.2 STRUCTURE

The property is cut by two major north-south trending faults, called the 'Pedernales' and 'Jasperoid', part of the major regional Diablillos-Cerro Galán fault zone. The Pedernales fault transects the centre of the property with the Jasperoid fault to its west. A graben has formed between these faults within which most of the altered volcanic rocks occur. The graben varies from 2.7 km wide at the Oculto zone to 800 m wide at the Pedernales zone, about 4.5 km to the north.

There are conjugate and extensional east-west and southeast-northwest fault structures intersecting the main Diablillos-Cerro Galán fault zone that may have been repetitively reactivated during the tectonic history of the region, and these structures appear to have channelled and controlled the local magmatic and hydrothermal activity (Figure 7.5). The southeast–northwest structural trend appears to be related to regional movement on the nearby Cerro Ratones lineament (Figure 7.2).

Figure 7.5 Major Fault Structures



Note: after Puigdomenech, 2006.

The Tertiary stratigraphy is generally flat to gently dipping while the older Ordovician and Precambrian rocks that were folded and metamorphosed during the lower Paleozoic Oclóyic Orogeny have varying attitudes (Ronning, 1997).

7.3.3 ALTERATION

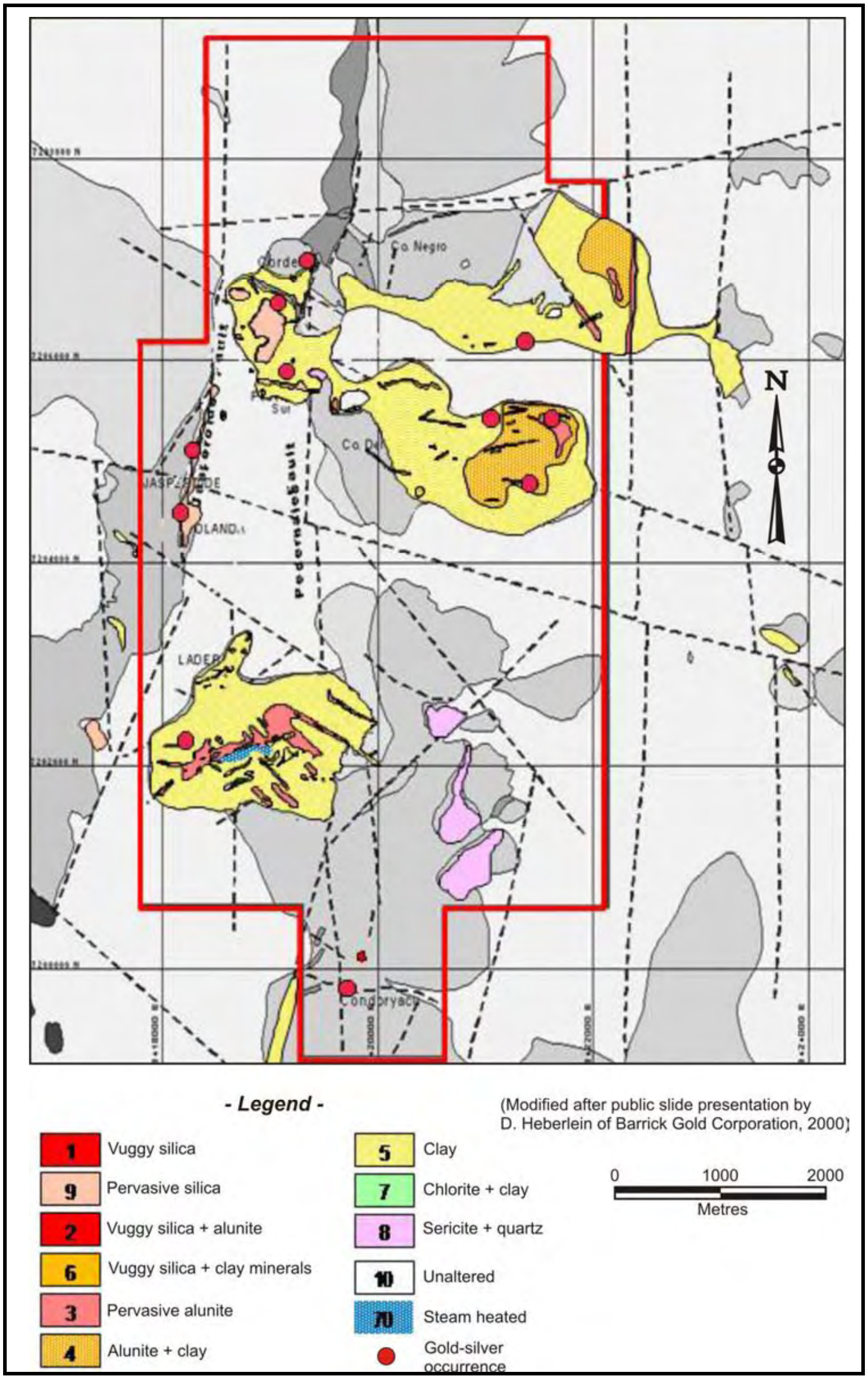
The hydrothermal alteration of the country rocks at Diablillos is consistent with the style and mineralogy of a high sulphidation epithermal precious metal mineralizing system. According to Ristorcelli and Ronning (2001), in the central and eastern portions of the property, up to an elevation of about 4350 masl, the upper Tertiary rocks exhibit evidence of a late, shallow steam-heated alteration, overprinting the earlier hypogene alteration. Late-stage altered rocks have a light grey colour and porous texture with abundant kaolinite and white, finely crystalline alunite, minor opal and occasional native sulphur.

The hypogene alteration of the volcanic rocks differs slightly from that of the intrusive rocks at Diablillos. This difference appears to be due largely to differing mineralogies. According to Ristorcelli and Ronning (2001), the alteration facies of volcanic and intrusive rocks are as follows:

- Alteration Facies in Upper Volcanic Rocks
  - Propylitic: Mainly characterized by chlorite, usually with significant development of clay minerals. Propylitic alteration has been observed on the surface at the Pedernales Sur zone and subsurface at Laderas and Oculto zones.
  - Intermediate Argillic: More abundant than propylitic alteration with clay minerals being dominant.
  - Advanced Argillic: Argillic alteration occurs in most mineralized zones. Comprised of usually clay minerals but at Oculto and Pedernales zones some alunite is present.
  - Quartz-Alunite: Alunite is typically the dominant or only alteration mineral, sometimes completely replaces the protolith. Associated minerals identified in PIMA studies are dickite, pyrophyllite and diaspore.
  - Vuggy Silica: The central core of the Oculto deposit consists of strongly developed vuggy silica, probably temporally related to late-stage boiling epithermal fluids and steam alteration. Vugs may be lined or partly filled by pyrophyllite, dickite and diaspore, or by alunite.
- Alteration Facies in Intrusive Rocks
  - Silicification: Silicification is most pronounced adjacent to main hydrothermal fluid channel ways. Tabular bodies of silica have the appearance of quartz veins or veinlets, but are really silicified granitoid rocks.
  - Alunitization: Alunite occurs as fine grained or microcrystalline masses replacing feldspars and mafic minerals in the granitic rocks. Alunite also occurs with quartz as veinlets and sometimes with jarosite.
  - Argillization: Occurs away from loci of hydrothermal activity as clay alteration of feldspars and biotitization of mafic minerals.

Figure 7.6 shows the property-wide distribution of alteration facies.

Figure 7.6 Property Alteration Map



Note: after Ristorcelli and Ronning, 2001.

8.0 DEPOSIT TYPE

The hydrothermal alteration and mineralization at Diablillos is consistent with the geological characteristics of a high-sulphidation epithermal mineralizing system. The following description of high sulphidation epithermal systems is derived from the ‘Epithermal Au-Ag-Cu: High Sulphidation’ mineral deposit profile by Pantelyev (1996).

High-sulphidation epithermal deposits are commonly referred to as ‘acid sulphate’ types after the chemistry of the hydrothermal fluids, ‘quartz-alunite’ or ‘kaolinite-alunite’ types after their alteration mineralogy, or ‘high-sulphidation’ types in reference to the oxidation state of the acid fluids responsible for alteration and mineralization. Gold, silver, and copper are common ore products often with associated arsenic and antimony by-products. The Goldfield and Paradise Peak (USA), Nansatsu (Japan), and El Indio (Chile) are typical examples of high-sulphidation epithermal mineral deposits (Panteleyev, 1996).

Recent studies have shown that high-sulphidation epithermal mineral deposits form in subaerial volcanic complexes or composite island arc volcanoes above degassing magma chambers. These deposits are usually multi-staged related to periodic extensional and transtensional tectonism with associated high-level intrusive activity and magmatic hydrothermal fluid generation (Panteleyev, 1996).

Volcanic pyroclastic and flow rocks, commonly subaerial andesitic to dacitic and rhyodacitic composition, and their subvolcanic intrusive equivalents usually host high-sulphidation epithermal deposits as veins, stockworks, vuggy breccias, and sulphide replacements ranging from pods to massive lenses. The mineralization is characteristically associated with high level hydrothermal systems with acid leaching, and advanced argillic and siliceous alteration. Most of the high-sulphidation epithermal mineral deposits are of Tertiary to Quaternary age, and less commonly associated with Mesozoic and rarely Paleozoic volcanic belts (Panteleyev, 1996).

According to Panteleyev (1996), principal ore minerals of high-sulphidation epithermal systems include pyrite, enargite/luzonite, chalcocite, covellite, bornite, gold, and electrum. Chalcopyrite, sphalerite, tetrahedrite/tennantite, galena, marcasite, arsenopyrite, silver sulphosalts, and tellurides are common subordinate ore minerals. Massive enargite-pyrite and/or quartz-alunite-gold are the most common economic ore types. Pyrite and quartz are the dominant gangue minerals with minor barite. These deposits have a wide range of tonnages and grades depending upon whether they are bulk-minable, low-grade, or selectively mined high grade deposits.

Widespread and prominent advanced argillic alteration is characteristic of high-sulphidation epithermal systems. Quartz occurs commonly as vuggy, residual silica in acid-leached rocks and as fine-grained replacements with other alteration minerals including kaolinite/dickite, alunite, barite, hematite, sericite/illite, amorphous clays and silica, pyrophyllite, andalusite, diaspore, corundum, and/or tourmaline. Abundant limonite (jarosite-goethite-hematite) often occurs in a groundmass of kaolinite and quartz within weathered rocks. Fine-grained supergene alunite veins and nodules are common (Panteleyev, 1996).

9.0 MINERALIZATION

There are a number of mesothermal and epithermal precious and base metal occurrences situated along the trend of the Diablillos-Cerro Galán fault zone within the northern and central Puna, including Diablillos, Incahuasi, Cóndor Yacu, Inca Viejo, and Centenario (Figure 7.1 and Figure 7.2). Many of the mineral occurrences are spatially, and probably genetically, related to a group of small Tertiary stocks and extrusive domes that are usually hydrothermally altered and host lead, zinc, silver and gold (± Sn, Sb, Cu, Mo) disseminated and vein mineralization (Coira et al., 1993).

There are seven known mineralized zones on the Diablillos property, with the Oculto zone being the most important and best explored. These mineralized zones are:

- Oculto including the Zorro and Cerro Bayo subzones
- Fantasma
- Laderas
- Pedernales including the Pedernales Sur subzone (including Truchas and Saddle showings) and Pedernales Norte subzone (including Vicuna, Corderos Suri, and Guanaco showings)
- Cerro del Medio
- Cerro Viejo
- Cerro Viejo Este.

At the Oculto zone, there is a broad zone of intense acid leaching that is controlled by various structures, lithologic permeability, and the basement unconformity. The mineralization appears to be widely distributed but subsurface since higher gold grades are not associated the intensely altered and leached outcrops. At the other zones, the mineralization appears confined to tabular veins controlled by discrete structures and higher surface gold values are common. The veins contain silica-rich hydrothermal breccias with alunite, jarosite, and clay alteration assemblages with near-surface textural features. Some of the structures are overlain by siliceous hot spring sinters and terrace breccias.

According to Ristorcelli and Ronning (2001), near-surface sinter deposits yield low metal values with most of the vein breccia-hosted mineralization occupying steeply dipping, cross-cutting structures that may narrow from 15 m wide at surface to 1 or 2 m wide at depths of 100 m or more. These structures also pinch out along strike usually with lengths of 100 m.

9.1 OCULTO ZONE

The Oculto zone is situated on an east-west trending ridge on the western flank of Cerro Bayo (Figure 7.5). It was discovered in 1990 by BHP and has been the focus of most of the exploration work on the property.

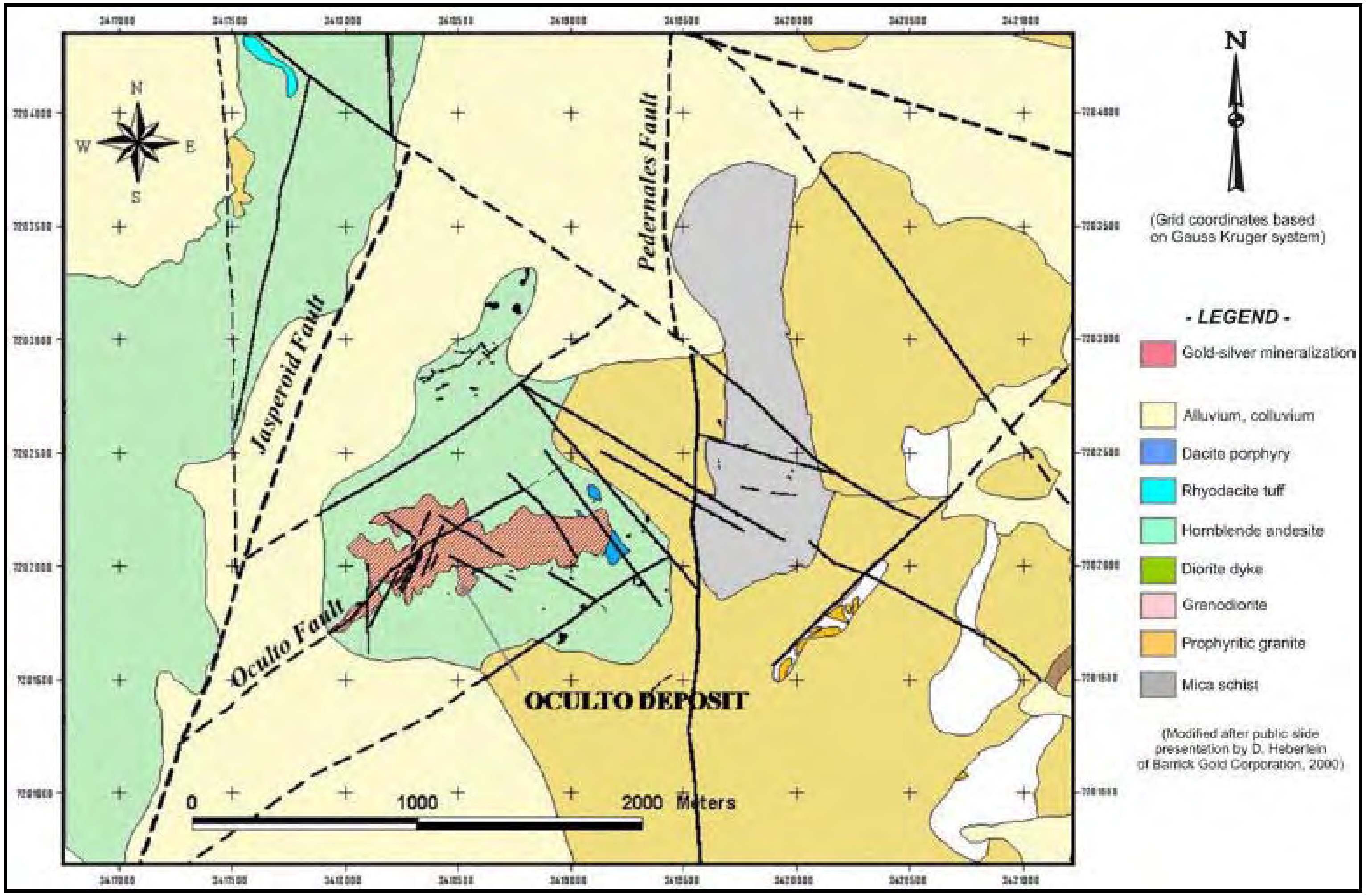
Tertiary andesitic flows and flow breccias crop out with more felsic and intermediate tuffs and subvolcanic porphyritic rocks occurring at higher elevations (Goad, 1994). Precambrian granitic and granodioritic rocks with gneissic textures unconformably underlie most of the volcanic pile at the Oculto zone. Recent drilling by Silver Standard indicates that the unconformity is probably a paleo-erosional surface reflected by a poorly sorted conglomerate unit, and that the unit was also brecciated by subsequent low-angle faulting. The highly permeable unconformity appears to have controlled the lateral movement of later hydrothermal fluids (Burk, 2009). Phyllitic metasedimentary rocks of probably Ordovician age are in contact with the basement intrusive rocks on the eastern side of the mineralized zone (Mustard, 1994).

Detailed drilling at the Oculto zone has shown that the Tertiary volcanic pile is very heterogeneous. Andesitic to dacitic, fine- to coarse-grained ash tuffs and tuffaceous breccias are the most common pyroclastic rocks with lesser extrusive andesitic flows and flow breccias. Intrusive rocks include subvolcanic, dacitic porphyry, and a varied suite of igneous and tectonic breccias. These breccias include a monomictic breccia of andesitic breccia fragments and groundmass that is variably altered and mineralized, and two types of tectonic breccias – one type with sub-rounded volcanic and basement fragments and clasts of vuggy silica, and another with clasts of silica and jarosite.

Steeply-dipping northeasterly and east–west trending fault and shear structures have apparently controlled much of the mineralization at the Oculto zone, as did the sub-horizontal basement unconformity and sub-horizontal fracturing. Hydrothermal alteration is confined to the graben structure bounded by the Pedernales and Jasperoid faults, part of the north-south trending Cerro Galán fault zone (Figure 9.1 and Figure 9.2). A silica-clay-alunite-jarosite alteration assemblage, indicative of a strong acid leaching environment, is common at the Oculto zone with a strong correlation between gold and silica (Ristorcelli and Ronning, 2001). There are alteration assemblages elsewhere on the property but not as widespread and intense as at the Oculto zone.

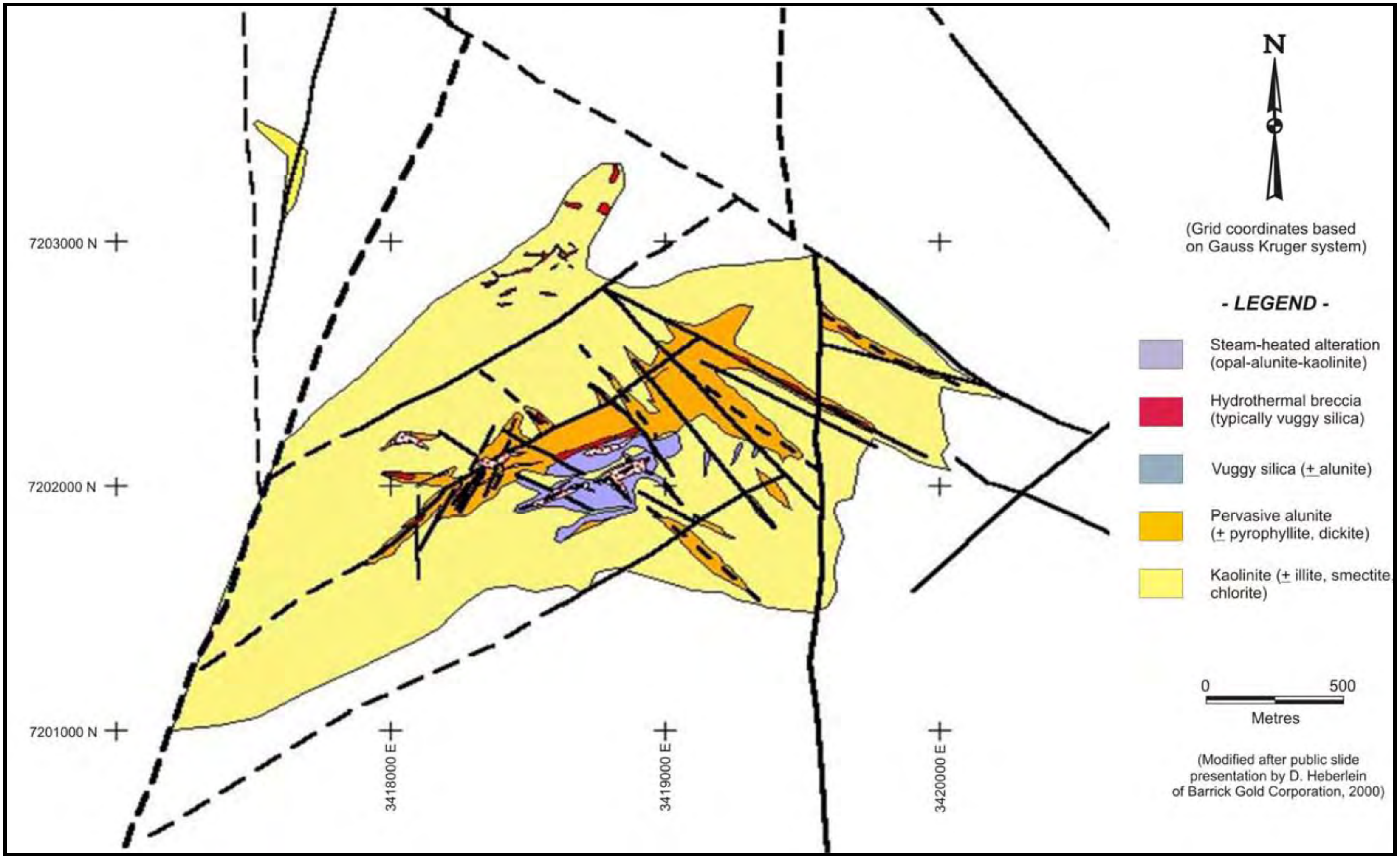
The Oculto mineralization occurs within a vertical range of 3965 to 4300 masl with the most of the mineralization situated between 4050 and 4250 masl (Figure 9.3). Northeast-southwest and easterly trending, steeply dipping structures, plus the sub-horizontal fracturing and bedding structures, have controlled the emplacement of the hydrothermal fluids and deposition of the associated mineralization. Tabular-shaped bodies of mineralization occur centrally within the deposit and along the basement unconformity. Above and below this central zone, higher grade mineralization has been dominantly controlled by steeply dipping shear, breccia, and fault structures.

Figure 9.1 Geological Plan of the Oculto Zone



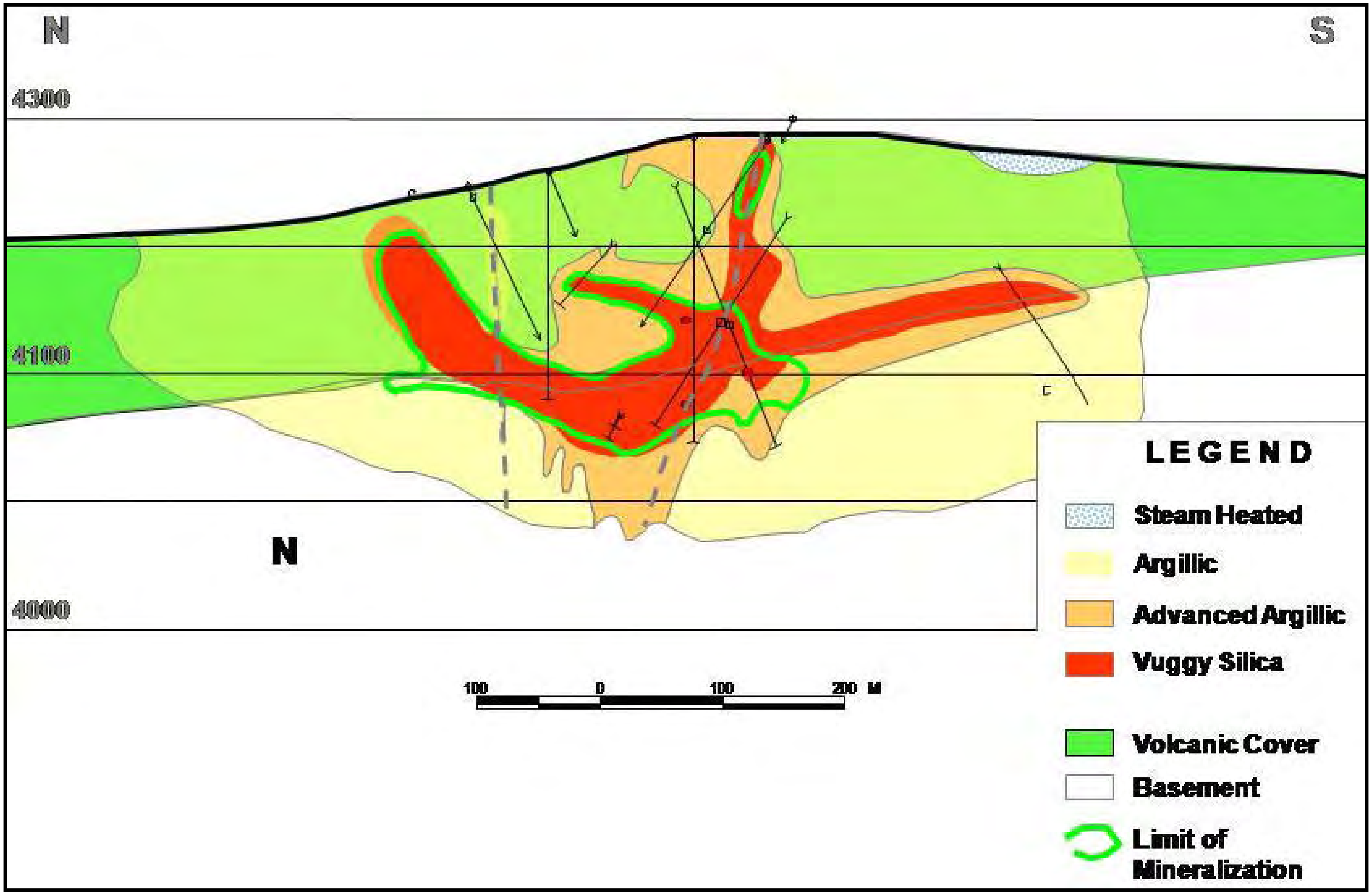
Note: after Ristorcelli and Ronning, 2001.

Figure 9.2 Alteration Plan of the Oculto Zone



Note: after Ristorcelli and Ronning, 2001.

Figure 9.3 Cross Section of Oculto Zone Mineralization



Note: after Heberlein, 1999.

According to Stein (2001):

"Early pyrite veinlets (0.2 to 2 mm) are common but generally do not yield significant gold or silver assays. The precious metals are associated with pyrite-alunite-base metal sulphide + argentiferous tennantite + barite veins and breccia-fillings. Hypogene sulphides and sulphosalts include, in order of decreasing abundance, pyrite, galena, enargite, chalcopyrite, sphalerite and matildite ($AgBiS_2$). Incipient supergene sulphide enrichment is observed locally in the hypogene assemblages: e.g., covellite replaces chalcopyrite and polybasite replaces Ag-tennantite. Mineralization at the southwest extremity of the deposit is comprised of native gold, native silver, acanthite and minor jalpaite (Ag_3CuS_2), associated with quartz, iron oxides and sulphates. It is unclear whether this zone represents a distinct hypogene assemblage or an uplifted zone of supergene sulphide enrichment mineralization. The oxidized zone is located in the upper levels of the NE part of the deposit, and constitutes much of the mineralization. Open-space filling and replacement of hypogene vein and breccia mineralization are the dominant styles. The most abundant ore minerals in the oxide zone are chlorargyrite (AgCl) and native gold, but iodargyrite (AgI) occurs locally at the base of this zone, and bismoclite ($BiOC_1$) is commonly associated with the highest silver grades."

10.0 EXPLORATION

The pre-Silver Standard exploration history of the Diablillos property is described in Section 6.0. Since 2007, the following exploration work has been focused on evaluating the Oculto gold-silver deposit. The various drilling campaigns will be described in detail in Section 11.0.

10.1 2007 EXPLORATION PROGRAM

In 2007, Silver Standard established a 40-person exploration camp about 700 m west of the Laderas zone on the property. In addition, Silver Standard completed 54 NQ- and HQ-size diamond drill holes, totalling 10,323.4 m, primarily directed at evaluating the mineralization of the Oculto zone. The drilling contractor Major Drilling Argentina Ltd. was utilized for the program. Smaller diameter NQ-size drilling was utilized when completing deeper holes. The core from four of the HQ-size drill holes were bulk sampled for metallurgical test work.

10.2 2008 EXPLORATION PROGRAM

10.2.1 DIAMOND DRILLING

Between mid-August and mid-November 2008, Silver Standard completed 49 NQ- and/or HQ-size diamond drill holes, totalling 7,523.8 m, directed at defining the gold-silver mineralization of the Oculto deposit. The drilling contractor Major Drilling Argentina Ltd. was utilized for the program. Drill holes ranged in length from 50 to 320 m. Most of the drilling recovered HQ-size drill cores, though smaller diameter NQ-size drilling was commonly required for completing deeper holes. For geotechnical purposes, 3 boreholes totalling 385.5 m were drilled (Burk, 2009).

10.2.2 GEOTECHNICAL STUDIES

Knight Piésold Ltd. (Knight Piésold), a well-respected geotechnical consulting firm based in Vancouver, BC, was retained by Silver Standard to carry out geotechnical studies on possible open pit, tailings, and mill facility sites in preparation for a pre-feasibility study of the project.

According to Burk (2009), between September 15 and October 5, 2008, Knight Piésold engineers and technicians supervised and/or conducted the following work:

- 3 inclined boreholes totalling 385.5 m of HQ-size diamond drilling were completed to pass through the final walls of a proposed open pit at the Oculto deposit
- geomechanical logging of drill cores for rock quality designation (RQD), lithology, structural discontinuities, etc.
- orienting of drill cores using a Reflex ACT orientation system for the measurement of structural discontinuities and identification of faults
- installation of 1″ diameter PVC standpipe and piezometer in one drill hole (KP-08-01) for groundwater testing
- collection of core samples for laboratory-based rock strength testing, including unconfined compressive strength (UCS) and point load tests (PLT)
- excavation of 52 test pits (1 to 3-m deep) in areas of proposed mine site infrastructure
- laboratory test work done on materials collected from the 52 test pits.

The following text is taken directly from the 'Conclusions and Recommendations' section of the technical report by Knight Piésold dated March 12, 2009.

The 2008 geotechnical site investigation at the Diablillos project site consisted of an oriented drill hole and test pit program. The program collected additional geotechnical information for the pre-feasibility level pit slope and mine facility design.

The geomechanical data collected in the Oculto deposit area provided further insight for pit slope refinement. The 2008 geotechnical data indicates that rock structural data is generally consistent with the existing interpretation but the overall rock mass quality is slightly lower than originally thought. It is confirmed that the preliminary recommended pit slope angles are reasonable; however, additional bench ravelling is anticipated. Therefore, low damage controlled blasting must be implemented for the final wall development along with careful scaling and monitoring. Additional work to complete a feasibility-level pit slope design is recommended below:

- Additional geomechanical data collection – additional oriented drill holes and a surface mapping program are recommended to collect more rock mass quality and structural data for detailed stability analyses.
- Geological model refinement – it will be necessary to refine the lithology and structural model for the Oculto Zone with the current exploration data. A 3D digital model will be required for the feasibility pit slope study.
- Update of slope stability analyses – additional rock mass characterization should be performed using the additional geomechanical data. The slope

stability analyses and recommended slope geometries will be updated accordingly.

The geotechnical data collected from the proposed mine infrastructure sites indicate that the surficial geology of the Diablillos site is primarily eolian materials that are comprised of sand, gravel, cobbles, silt, and minor clay. Colluvium deposits were found close to the steep slopes of the Oculto deposit. Bedrock depth is largely unknown in the valley of the proposed tailings storage facility (TSF) site, proposed mill site, waste dump, and potential heap leach sites but appears to be near surface at the raw water pond. The overburden materials are typically loose to medium dense with less than 30% fines content. Soft deposit layers were not identified during the 2008 field program. Suitable construction borrow materials are likely available on the site. Groundwater levels are generally low but appear to be higher in the valley of the proposed TSF site. The overburden materials are permeable and the permeability value is in the order of 1×10^{-3} cm/s.

Additional site investigation work to complete the feasibility-level waste management and foundation design is recommended as follows:

- Geotechnical drilling and in situ testing – additional geotechnical drill holes are recommended for the proposed TSF, waste dump, and plant sites. Standard Penetration Tests (SPT) should be conducted to examine the strength properties of the overburden materials.
- Hydrogeology study – additional piezometers and/or groundwater monitoring wells should be installed at the mine site to establish a preliminary hydrogeology model for the feasibility study.
- Laboratory testing – additional laboratory soil index, strength, and permeability testing should be conducted to increase the confidence of the existing database. Durability tests are recommended for assessing potential construction materials.

10.2.3 *METALLURGICAL STUDIES*

In late 2007, Silver Standard provided PRA of Richmond, BC, with five mineral samples of the Oculto zone mineralization. These samples were used for a preliminary evaluation of the mineral processing response to recover gold and silver. Other laboratory and engineering studies were undertaken including a review of historical work by other operators. Laboratory test work was primarily performed by PRA with related chemical analyses performed by IPL Laboratory of Richmond, BC.

Based on historical test work and the reported mineralogy, laboratory studies were directed at whole ore cyanidation procedures on ground material. The sample composites were also subjected to alternate cyanide testing procedures, as well as gravity and flotation scoping studies.

According to Wright (2008), metallurgical test work showed that the Oculto zone composite samples responded well to direct cyanidation of ground ore, and further optimization and variability studies were recommended. In addition, it was recommended that the use of site water be evaluated as part of future process development, and additional procedures were recommended for investigating gravity pre-treatment to reduce the required cyanide leach retention time and use of column leach studies to evaluate heap leach potential.

In 2008, Silver Standard contracted PRA to carry out variability testing for the recovery of gold and silver by cyanide bottle roll leaching. Drill hole assay sample rejects were blended into 53 metallurgical composites and tested for precious metal dissolution in cyanide within 48 hours.

Two other test procedures were performed on the 2007 composite samples consisting of a cyanidation bottle roll in locked cycle with zinc precipitation, using groundwater provided from the Diablillos property. The second procedure included two column leaching tests using low and high grade feed material.

A detailed description of recent metallurgical studies and their results are contained in Section 16.0.

11.0 DRILLING

Pacific Rim, on behalf of Silver Standard, focused most of their 2007 and 2008 drilling programs on delineating and evaluating the Oculto zone. Pre-2007 drilling has been summarized in Section 6.0 and has been described in detail by Ristorcelli and Ronning (2001).

11.1 2007 DRILLING PROGRAM

Pacific Rim contracted Major Drilling Argentina Ltd. to provide the drilling equipment and personnel for the 2007 drilling program. The drilling commenced after the 40-person field camp was established on site.

The Corderos and Pedernales zones were tested with 8 drill holes totalling 520 m. Then drilling was directed at delineating the lateral and vertical extent of the Oculto zone. There were 45 HQ-size boreholes totalling 9,600.3 m drilled within the Oculto zone at a variety of azimuths and inclinations. The last drill hole (203.1 m) of the program was collared in the Laderos zone, north of the Oculto zone, to evaluate a large exposure of siliceous volcanics and jasper.

The cores from four diamond drill holes collared within the Oculto zone were bulk sampled for metallurgical studies conducted by PRA based in Richmond, BC (see Section 16.0).

Drill hole collar locations were surveyed using differential GPS equipment. Downhole survey measurements were recorded usually at 50-m intervals within each hole.

11.2 2008 DRILLING PROGRAM

Major Drilling Argentina Ltd. was again contracted by Pacific Rim to provide the drilling equipment and personnel for the 2008 drilling program. During the period of August to November 2008, Pacific Rim drilled 52 HQ-size diamond drill holes, totalling 7,909.45 m. There were 49 drill holes collared to in-fill drilled coverage within the Oculto zone and 3 drill holes, totalling 385.65 m, completed for geotechnical studies. All of this drilling was focused on evaluating the Oculto zone in preparation for pre-feasibility studies planned in 2009.

Drill hole collar locations up to hole DDH-08-071 were surveyed using differential GPS equipment. The remaining drill holes (DDH-08-072 to DDH-08-108) were surveyed by chain and compass from nearby surveyed drill holes. Chain and compass surveyed holes were seldom less than 25 m from the nearest surveyed drill hole. Downhole survey measurements were recorded usually at 50-m intervals within each hole.

Figure 11.1 shows the locations of the 2007 and 2008 diamond drill holes. Table 11.1 summarizes the locations, lengths, azimuths, and inclinations of the 2007 and 2008 drill holes.

11.3 Results of the 2007 and 2008 Drilling Programs

The results of the 94 boreholes drilled within the Oculto zone during 2007 and 2008 drilling programs have greatly aided in the interpretation and estimation of the precious metal-bearing mineralization. The current property-wide Diablillos exploration database contains drilling data from 411 boreholes. A total of 4,286 downhole measurements are recorded and 65,163 drill samples have been collected and analyzed from these boreholes, not including those field duplicate samples for quality assurance testing.

There is now sufficient drilling data to create several 3D geological and grade domain models of the Oculto zone, and estimate its mineral resources (see Section 17.0).

Table 11.1 Summary of Recent Drill Hole Data

Drill Hole No.	UTM Easting (m)	UTM Northing (m)	Elevation (m)	Length (m)	Azimuth (°)	Dip (°)	Drill Type	Zone
LC-07-005	3,419,327.500	7,206,740.501	4,206.134	37.90	0.0	-90.0	DD	Corderos
LC-07-003	3,419,177.689	7,206,770.028	4,182.428	46.20	0.0	-90.0	DD	Corderos
LC-07-004	3,419,269.531	7,206,770.181	4,198.583	43.40	0.0	-90.0	DD	Corderos
LC-07-002	3,419,199.940	7,206,742.700	4,188.562	56.30	40.0	-60.0	DD	Corderos
LC-07-001	3,419,236.608	7,206,789.062	4,196.885	43.40	0.0	-90.0	DD	Corderos
PN-07-001	3,419,060.005	7,206,693.137	4,195.436	101.00	0.0	-90.0	DD	Pedernales
PN-07-002	3,418,764.761	7,206,626.752	4,194.854	102.00	0.0	-90.0	DD	Pedernales
PN-07-003	3,419,028.121	7,206,529.974	4,245.458	89.80	0.0	-90.0	DD	Pedernales
DDH-07-022	3,418,325.258	7,202,019.205	4,315.753	290.50	360.0	-65.0	DD	Oculto
DDH-07-023	3,418,325.039	7,202,219.937	4,277.053	230.50	180.0	-80.0	DD	Oculto
DDH-07-024	3,418,299.970	7,202,200.046	4,276.819	299.30	180.0	-55.0	DD	Oculto
DDH-07-025	3,418,274.950	7,202,181.406	4,275.528	239.40	180.0	-60.0	DD	Oculto
DDH-07-026	3,418,274.577	7,202,200.423	4,271.717	210.15	0.0	-90.0	DD	Oculto
DDH-07-027	3,418,199.836	7,202,149.998	4,265.720	162.00	0.0	-90.0	DD	Oculto
DDH-07-028	3,418,227.717	7,202,196.360	4,266.534	176.90	0.0	-90.0	DD	Oculto
DDH-07-029	3,418,200.929	7,202,080.295	4,268.734	258.00	180.0	-60.0	DD	Oculto
DDH-07-030	3,418,271.414	7,202,075.062	4,288.770	286.40	180.0	-60.0	DD	Oculto
DDH-07-031	3,418,204.148	7,202,010.149	4,272.215	80.45	180.0	-63.0	DD	Oculto
DDH-07-031A	3,418,203.919	7,202,015.232	4,272.031	30.60	180.0	-63.0	DD	Oculto
DDH-07-032	3,418,295.827	7,202,075.243	4,296.261	254.20	180.0	-60.0	DD	Oculto
DDH-07-033	3,418,199.236	7,201,939.834	4,268.591	211.70	180.0	-60.0	DD	Oculto
DDH-07-034	3,418,174.914	7,202,244.663	4,252.158	135.50	0.0	-90.0	DD	Oculto
DDH-07-035	3,418,149.869	7,202,065.548	4,257.011	174.50	360.0	-50.0	DD	Oculto
DDH-07-036	3,418,174.970	7,202,004.698	4,263.236	187.20	0.0	-90.0	DD	Oculto
DDH-07-037	3,418,101.025	7,202,069.684	4,245.906	220.00	180.0	-50.0	DD	Oculto

table continues…

Drill Hole No.	UTM Easting (m)	UTM Northing (m)	Elevation (m)	Length (m)	Azimuth (°)	Dip (°)	Drill Type	Zone
DDH-07-038	3,418,249.847	7,201,878.683	4,275.554	189.10	360.0	-53.0	DD	Oculto
DDH-07-038A	3,418,249.652	7,201,883.446	4,275.822	250.00	360.0	-53.0	DD	Oculto
DDH-07-039	3,418,098.674	7,202,149.280	4,246.088	222.90	180.0	-50.0	DD	Oculto
DDH-07-040	3,418,097.587	7,201,955.115	4,241.209	220.40	180.0	-50.0	DD	Oculto
DDH-07-041	3,418,156.631	7,201,950.225	4,257.313	230.00	360.0	-50.0	DD	Oculto
DDH-07-042	3,418,070.135	7,201,977.689	4,236.423	259.20	360.0	-45.0	DD	Oculto
DDH-07-043	3,418,076.892	7,202,050.516	4,240.414	250.50	360.0	-45.0	DD	Oculto
DDH-07-044	3,418,148.134	7,201,815.815	4,242.019	218.35	360.0	-52.0	DD	Oculto
DDH-07-045	3,418,073.057	7,201,755.118	4,223.238	197.00	360.0	-47.0	DD	Oculto
DDH-07-046	3,418,125.459	7,201,774.686	4,233.025	190.20	360.0	-80.0	DD	Oculto
DDH-07-047	3,418,049.785	7,201,720.622	4,216.782	205.75	360.0	-45.0	DD	Oculto
DDH-07-048	3,417,999.259	7,201,874.309	4,217.461	118.00	180.0	-50.0	DD	Oculto
DDH-07-048A	3,417,999.381	7,201,870.277	4,217.461	221.00	180.0	-50.0	DD	Oculto
DDH-07-049	3,418,049.860	7,201,660.333	4,211.566	214.35	360.0	-45.0	DD	Oculto
DDH-07-050	3,418,024.817	7,201,640.299	4,208.939	200.80	360.0	-45.0	DD	Oculto
DDH-07-051	3,418,024.878	7,201,690.195	4,210.323	211.80	360.0	-45.0	DD	Oculto
DDH-07-052	3,417,949.720	7,201,649.883	4,200.828	161.00	360.0	-55.0	DD	Oculto
DDH-07-053	3,417,999.754	7,201,819.692	4,215.131	181.00	180.0	-50.0	DD	Oculto
DDH-07-054	3,417,951.969	7,201,690.019	4,202.249	131.50	360.0	-55.0	DD	Oculto
DDH-07-055	3,417,973.055	7,201,778.274	4,209.379	122.50	180.0	-55.0	DD	Oculto
DDH-07-055A	3,417,973.292	7,201,783.028	4,209.483	170.50	180.0	-55.0	DD	Oculto
DDH-07-056	3,418,399.971	7,202,049.920	4,339.634	296.45	360.0	-80.0	DD	Oculto
DDH-07-057	3,418,424.573	7,202,104.521	4,330.225	296.50	180.0	-58.0	DD	Oculto
DDH-07-058	3,418,475.118	7,202,091.631	4,343.165	365.00	360.0	-65.0	DD	Oculto
DDH-07-059	3,418,397.765	7,202,032.164	4,339.691	320.95	0.0	-90.0	DD	Oculto
DDH-07-060	3,418,475.187	7,202,089.964	4,343.134	137.50	360.0	-87.0	DD	Oculto
DDH-07-060A	3,418,475.094	7,202,090.888	4,343.286	301.75	360.0	-87.0	DD	Oculto

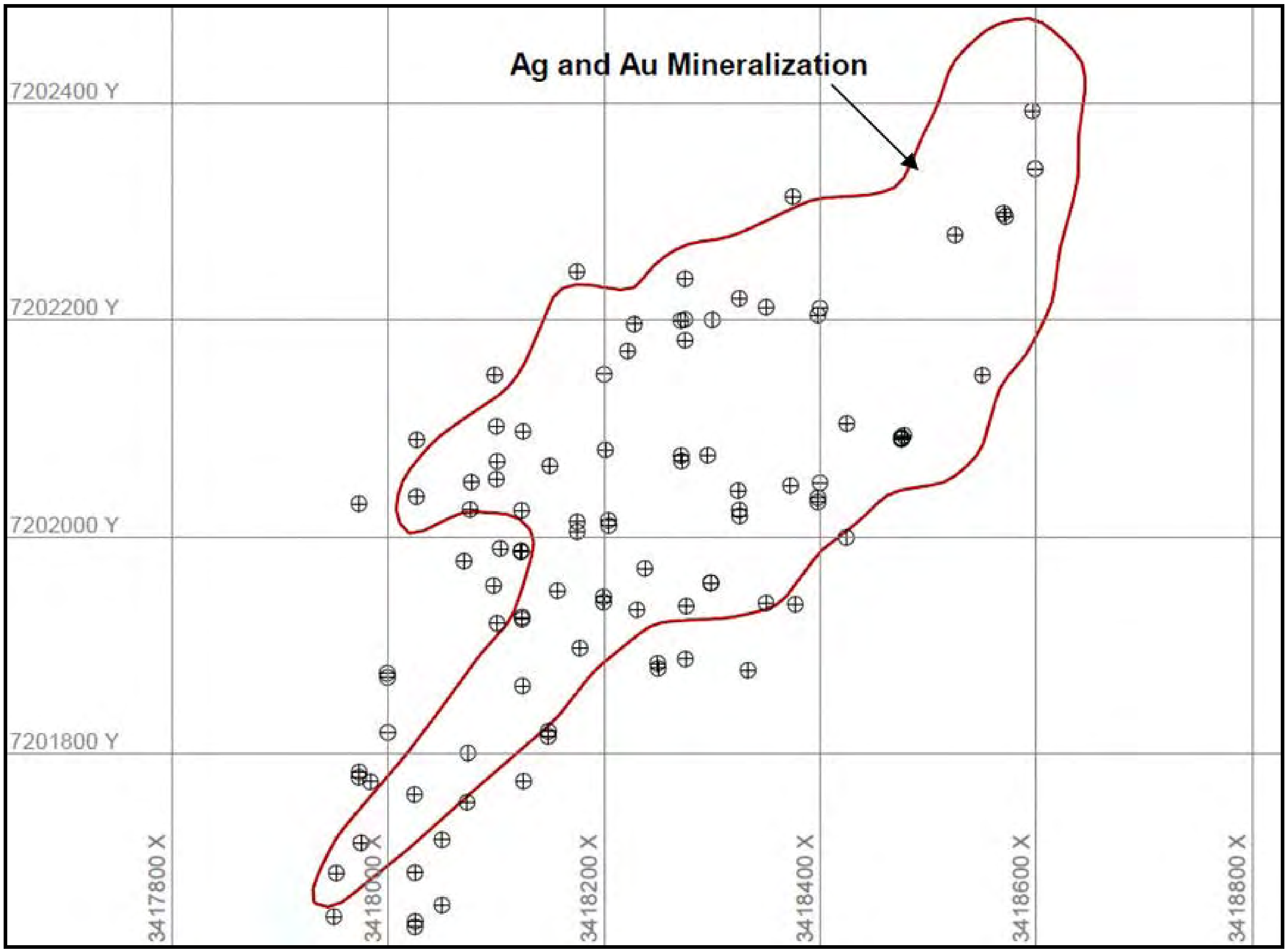
table continues…

Drill Hole No.	UTM Easting (m)	UTM Northing (m)	Elevation (m)	Length (m)	Azimuth (°)	Dip (°)	Drill Type	Zone
DDH-07-061	3,418,333.216	7,201,877.030	4,299.583	269.00	360.0	-57.0	DD	Oculto
DDH-07-062	3,418,595.789	7,202,940.579	4,261.386	203.10	0.0	-90.0	DD	Laderas
DDH-08-063	3,418,349.880	7,202,211.757	4,284.016	332.20	180.0	-60.0	DD	Oculto
DDH-08-064	3,418,399.715	7,202,211.132	4,292.960	171.20	360.0	-87.0	DD	Oculto
DDH-08-065	3,418,199.403	7,201,944.870	4,268.574	210.00	0.0	-90.0	DD	Oculto
DDH-08-066	3,418,177.740	7,201,897.287	4,259.106	239.00	360.0	-63.0	DD	Oculto
DDH-08-067	3,418,569.567	7,202,298.569	4,301.221	132.30	335.0	-65.0	DD	Oculto
DDH-08-067A	3,418,571.603	7,202,295.558	4,301.510	355.00	335.0	-65.0	DD	Oculto
DDH-08-068	3,418,271.518	7,202,069.990	4,288.903	320.30	180.0	-60.0	DD	Oculto
DDH-08-069	3,418,024.984	7,201,645.286	4,208.912	200.00	360.0	-45.0	DD	Oculto
DDH-08-070	3,418,148.417	7,201,820.584	4,241.982	200.00	360.0	-52.0	DD	Oculto
DDH-08-071	3,418,397.971	7,202,036.210	4,339.672	236.50	360.0	-90.0	DD	Oculto
DDH-08-072	3,418,123.500	7,202,024.500	4,249.800	187.25	360.0	-55.0	DD	Oculto
DDH-08-073	3,418,125.000	7,202,097.200	4,251.000	116.00	360.0	-57.0	DD	Oculto
DDH-08-074	3,418,100.000	7,202,101.900	4,245.600	127.70	180.0	-51.0	DD	Oculto
DDH-08-075	3,418,123.200	7,201,987.000	4,249.000	86.40	360.0	-61.0	DD	Oculto
DDH-08-075A	3,418,122.900	7,201,986.300	4,249.000	166.70	360.0	-61.0	DD	Oculto
DDH-08-076	3,418,100.000	7,202,053.300	4,246.200	62.05	180.0	-51.0	DD	Oculto
DDH-08-077	3,418,075.900	7,202,025.300	4,239.000	123.75	360.0	-50.0	DD	Oculto
DDH-08-078	3,418,103.600	7,201,989.500	4,243.900	212.10	180.0	-52.0	DD	Oculto
DDH-08-079	3,418,100.900	7,201,920.100	4,241.000	192.60	180.0	-52.0	DD	Oculto
DDH-08-080	3,418,124.300	7,201,862.500	4,242.800	163.35	0.0	-90.0	DD	Oculto
DDH-08-081	3,418,124.000	7,201,924.000	4,247.300	83.00	0.0	-90.0	DD	Oculto
DDH-08-081A	3,418,124.000	7,201,926.000	4,247.500	165.00	0.0	-90.0	DD	Oculto
DDH-08-082	3,418,026.500	7,202,089.500	4,225.800	154.00	0.0	-90.0	DD	Oculto
DDH-08-083	3,418,026.300	7,202,037.000	4,224.600	152.35	0.0	-90.0	DD	Oculto
DDH-08-084	3,417,973.000	7,202,030.500	4,218.000	141.00	0.0	-90.0	DD	Oculto

table continues…

Drill Hole No.	UTM Easting (m)	UTM Northing (m)	Elevation (m)	Length (m)	Azimuth (°)	Dip (°)	Drill Type	Zone
DDH-08-085	3,418,024.500	7,201,762.500	4,215.000	120.00	360.0	-47.0	DD	Oculto
DDH-08-086	3,418,377.100	7,201,937.800	4,323.000	60.00	360.0	-90.0	DD	Oculto
DDH-08-087	3,417,974.800	7,201,717.800	4,207.000	103.90	360.0	-70.0	DD	Oculto
DDH-08-088	3,418,175.000	7,202,013.900	4,263.500	77.10	360.0	-60.0	DD	Oculto
DDH-08-089	3,418,237.500	7,201,971.000	4,282.000	139.20	180.0	-86.0	DD	Oculto
DDH-08-090	3,418,074.000	7,201,800.500	4,229.000	135.10	360.0	-58.0	DD	Oculto
DDH-08-091	3,418,275.200	7,201,887.300	4,284.200	60.00	360.0	-88.0	DD	Oculto
DDH-08-092	3,418,276.000	7,201,936.000	4,289.900	60.00	360.0	-85.0	DD	Oculto
DDH-08-093	3,418,230.200	7,201,932.700	4,277.000	70.00	360.0	-82.0	DD	Oculto
DDH-08-094	3,418,298.600	7,201,957.700	4,300.000	40.00	360.0	-55.0	DD	Oculto
DDH-08-095	3,418,298.500	7,201,957.500	4,300.000	51.85	180.0	-60.0	DD	Oculto
DDH-08-096	3,418,350.000	7,201,938.800	4,314.000	55.00	0.0	-90.0	DD	Oculto
DDH-08-097	3,418,325.000	7,202,024.900	4,314.500	63.50	360.0	-87.0	DD	Oculto
DDH-08-098	3,418,221.700	7,202,171.500	4,267.500	158.60	0.0	-90.0	DD	Oculto
DDH-08-099	3,418,271.000	7,202,199.700	4,271.500	198.00	180.0	-77.0	DD	Oculto
DDH-08-100	3,418,275.000	7,202,238.000	4,266.100	122.30	0.0	-90.0	DD	Oculto
DDH-08-101	3,418,374.800	7,202,314.000	4,269.500	239.00	180.0	-65.0	DD	Oculto
DDH-08-102	3,418,477.300	7,202,093.700	4,343.500	140.80	180.0	-72.0	DD	Oculto
DDH-08-103	3,418,524.800	7,202,278.500	4,297.000	228.00	360.0	-82.0	DD	Oculto
DDH-08-104	3,418,550.000	7,202,149.000	4,333.000	200.00	180.0	-60.0	DD	Oculto
DDH-08-105	3,418,598.800	7,202,339.500	4,302.500	217.50	180.0	-60.0	DD	Oculto
DDH-08-106	3,418,596.500	7,202,393.100	4,298.500	234.20	180.0	-79.0	DD	Oculto
DDH-08-107	3,418,372.500	7,202,047.500	4,328.100	140.00	360.0	-60.0	DD	Oculto
DDH-08-108	3,418,324.000	7,202,042.500	4,309.800	80.00	360.0	-65.0	DD	Oculto
KP-08-001	3,418,397.900	7,202,204.500	4,294.500	200.15	45.0	-65.0	DD	Oculto
KP-08-002	3,418,424.000	7,201,999.500	4,348.300	66.00	120.0	-65.0	DD	Oculto
KP-08-003	3,417,983.500	7,201,774.000	4,210.000	119.50	225.0	-65.0	DD	Oculto

Figure 11.1 Drill Hole Plan of the Oculto Zone – 2007 and 2008



12.0 SAMPLING METHOD AND APPROACH

12.1 DRILL CORE HANDLING, SAMPLING, LOGGING, AND STORAGE

The diamond drill core handling, logging, and sampling were carried out according to company protocols. The recovered drill core was transported by truck to the core handling, logging, and storage facility on site where it was gently washed to remove any drilling fluids and mud. Prior to any geotechnical and geological logging, the entire drill core was photographed in detail. Digital colour photographs were taken using natural light, and the digital images were uploaded daily to the on-site computer. The best images for each interval of core were later filed with the digital geological logs.

12.1.1 GEOTECHNICAL LOGGING

After initial processing the drill core boxes were placed on the logging tables in chronologic order and a trained geotechnician recorded the core recovery and rock quality data for each measured drill run. Drilling-induced breaks and breaks from loading core boxes were not included. Veined sections of core were lightly hammer-tapped. Those pieces that remained intact were included as the solid fraction of core for the RQD determinations.

12.1.2 GEOLOGICAL LOGGING

All lithological, structural, alteration, and mineralogical features of the drill core were observed and recorded during the geological logging procedure. This information was later transcribed into a drill hole-specific spreadsheet-style file that could be readily entered into the Gemcom Software International Inc. (Gemcom) mineral exploration software program.

The geologist responsible for the geological logging assigned drill core sample intervals with the criteria that the intervals did not cross geologic contacts and the maximum sample length was 2 m. Within any geologic unit, sample intervals 1.5 m long could be extended or reduced to coincide with any geologic contact. Sample lengths were rarely greater than 2 m or less than 0.5 m, averaging 1.5 m long.

Once the geological logging was complete, the drill core from each assigned sample interval was individually removed and split in half lengthwise. One-half of the drill core was placed in a sample bag and the other half was returned to its original position in the core box. The individual drill core sample bags were securely tied with non-slip plastic straps properly labelled and stored in the core storage facility under the supervision of the project geologist until they were shipped to the assay laboratory.

It is Doug Blanchflower's opinion that the core logging procedures employed on this project are thorough and provide sufficient geotechnical and geological information. There are no apparent drilling or recovery factors that would materially impact the accuracy and reliability of the drilling results.

12.1.3 Drill Core Storage

After the logging and sampling operations, the core boxes were transported directly to the on-site outside drill core storage area and stacked chronologically for any later re-examination.

13.0 SAMPLE PREPARATION, ANALYSES, AND SECURITY

A total of 8,315 drill core samples, not including QA/QC samples, were shipped during the 2007 and 2008 drilling programs to the accredited analytical facilities of ALS Chemex in Mendoza, Argentina, for sample preparation and analyses. ALS Chemex is an internationally recognized minerals testing laboratory operating in 16 countries and has an ISO 9001:2000 certification.

Appendix A of this report contains ALS Chemex technical summaries of the various analytical and assay procedures employed on the drill core samples and their sample preparation method. Appendix B contains the analytical results of the verification samples collected by Doug Blanchflower.

13.1 SAMPLE PREPARATION

Upon arrival at the ALS Chemex laboratory the drill core samples were logged into their system. Each sample was placed into a stainless steel tray and dried for approximately 4 to 8 hours, depending upon its moisture content. Then each sample was progressively crushed by primary and secondary crushers until more than 70% of the crushed sample passed through a 2 mm (Tyler 10 mesh) screen. Standard crushing practice also included repeatedly cleaning the crusher prior to, during, and after each sample batch using coarse quartz material, and air cleaning the crushers after each sample. The sample material was then riffle split to obtain approximately 250 to 500 g, and the remaining coarse reject material was returned to Pacific Rim for storage and possible future use.

The 250 to 500 g sample, size dependent upon requested analyses, was pulverized using a disk pulverizer until 85% of the pulverized material passed through a 75 µm (Tyler 200 mesh) screen. Then 250 g of finely pulverized material was transferred to a paper envelope for later analytical work. This same preparation procedure was used for 2007 and 2008 drill core samples.

13.2 SAMPLE ANALYSES AND ASSAYS

All of the samples were initially analyzed for 48 elements using conventional MS-ICP analysis. This analytical procedure uses a mixture of nitric, perchloric, and hydrofluoric acids to digest the sample pulp. Elements are determined by mass spectrometer and inductively coupled plasma methods. A summary of the lower and upper detection limits for each of these elements accompanies the ALS Chemex procedures document in Appendix A of this report.

Gold assays were a combination of fire assay fusion with AA spectroscopy analysis (ALS Chemex Procedures Au-AA23). The Au-AA23 fire assay/AA procedure utilizes a 30 g weight of the sample pulp for analysis with 0.005 and 10 ppm as the lower and upper detection limits. The procedure involves the fusion of a metal bead that is then digested in acids, cooled, diluted, and analyzed by AA spectroscopy versus matrix-matched standards. When the analytical result exceeded 10 ppm gold, a re-analysis was requested using a second method (Au-GRA21), which is a fire assay of a 30 g charge with a gravimetric finish.

If any MS-ICP analytical result exceeded 200 ppm silver, a 30 g sample charge was re-analyzed using a fire assay fusion and gravimetric analysis finish procedure (Ag-GRA21), which has lower and upper detection limits of 5 and 10,000 ppm respectively.

13.3 Sample Security

After each drill core sample was split and bagged, the sample bags were tied shut with non-slip plastic ties. The sample bags were then moved to a locked storage area in the core logging and storage facility controlled by the company geologists. Prior to shipping, several sample bags were placed into large woven nylon 'rice' bags, their contents were marked on each bag, and each bag was securely sealed.

All of the drill core and quality control samples were shipped in closed and secured trucks directly to the ALS Chemex in Mendoza, Argentina. This same procedure was followed by Doug Blanchflower after collection of his verification samples.

14.0 DATA VERIFICATION

14.1 QUALITY ASSURANCE AND QUALITY CONTROL PROGRAM

Pacific Rim, on behalf of Silver Standard, has an established quality assurance (QA) program utilizing quality control (QC) samples to monitor accuracy (i.e. sample standards), contamination (i.e. sample blanks), precision (i.e. duplicates), and other possible sampling errors (i.e. sample mislabelling). Sample results are monitored by Pacific Rim and Silver Standard personnel for any QC failures or problems. Should any occur, they are reported to the assay laboratory and check analyses are performed to rectify the failure.

The QA/QC protocol utilized on the project required the insertion of QC samples at a minimum rate of 5% or one sample per 20 samples submitted to the assay laboratory. Check assaying at a secondary laboratory was also to be carried out at a minimum rate of 5%. Thus, a quality control sample was inserted randomly within every 20 consecutive samples, alternating between standard, blank, or duplicate samples. The standard and blank samples were inserted into the sample sequence as the sample shipment was being readied while any duplicate samples were inserted into the sample sequence at the time of collection. The quality control samples were numbered in the same way as the primary samples and were not identified in any other manner.

According to Vallat (2009), the project exploration database is comprised of drilling data from 411 boreholes – 305 holes were from pre-2007 drilling and 106 holes were drilled during the 2007 and 2008 drilling programs. The assay database is comprised of 65,163 primary samples with analytical results (i.e. 56,862 samples are from pre-2007 drilling and 8,301 samples are from the 2007 and 2008 drilling).

The pre-2007 assay results were transcribed into the database from original assay certificates by Silver Standard personnel. Data validation was carried out by cross-checking approximately 10% of the assay certificates that were randomly selected. This validation work found the data to be quite accurate, with the exception of some portions of original certificate data that did not appear in the database and rare typographical errors. The data was also verified by Silver Standard during the database compilation process. According to Vallat (2009), the pre-2007 assay database appears to be accurately transcribed from the original hard-copy data.

The 2007 and 2008 assay results were transcribed directly from original digital assay certificates provided by ALS Chemex (Vallat, 2009).

It was not the company policy to insert duplicate samples into the sample sequence to monitor homogeneity or laboratory error since field duplicate sample results often are considerably more variable than multiple analyses of the primary sample pulp. More commonly, one or two samples per assay batch were re-analyzed by the assay laboratory to check for precision of analysis. When field duplicate samples were sent for analysis, they were not marked as duplicates and their sample numbers were different than the primary sample number.

There are 6,561 duplicate or repeat assay samples in the Diablillos database from pre-2007 drilling, representing 11.54% of the total number of pre-2007 primary samples in the database. During the 2007 and 2008 drilling, 600 samples were duplicated or repeated, representing 7.23% of the total 2007/2008 drill samples.

Standard and blank samples, not crushed or pulped, are usually inserted into the sample sequence at the rate of 1 blank per 25 drill core samples to detect contamination during the laboratory sample preparation process. During the 2007 and 2008 drilling campaigns, 952 standards and blanks were inserted into the project sample shipments, representing 11.47% of the total number of primary samples.

Check samples were also submitted to the accredited assay laboratories of Assayers Canada in Vancouver, BC, to detect if there were any assay or analytical biases affecting the primary assay results from ALS Chemex.

The following text is quoted directly from the QA/QC report prepared by Vallat (2009):

> *"The pre-2007/2008 repeat sample analyses have been reviewed in detail. Overall strong precision has been inferred for the primary sample gold concentrations. Overall moderate to strong precision has been inferred for the primary sample silver concentrations in the Diablillos database.*
>
> *The pre-2007/2008 standard analyses reviewed have inferred an overall very strong accuracy for both the primary sample gold concentrations and the primary sample silver concentrations in the Diablillos database.*
>
> *With inferred strong precision and inferred very strong accuracy, the pre-2007/2008 gold concentrations in the Diablillos database can be considered of high quality and appropriate to represent the Diablillos project.*
>
> *With inferred moderate to strong precision and inferred very strong accuracy, the pre-2007/2008 silver concentrations within the Diablillos database can be considered to be of sufficient quality to represent the Diablillos project.*

The 2007/2008 exploration programs at Diablillos have included sufficient quality assurance and quality control measures to represent the precision and accuracy for the primary sample analytical results in the Diablillos database.

The 2007/2008 field duplicate and repeat samples have been reviewed and have inferred moderate to strong precision for the primary sample gold concentrations reported by ALS Chemex. The re-run samples submitted to ALS Chemex have shown very strong precision in the primary sample gold concentrations.

The 2007/2008 primary sample silver concentrations reported by ALS Chemex have been inferred to have strong precision by the comparison of the field duplicate and repeat sample analyses. The re-run samples have been compared to the primary samples to infer very strong precision for the primary sample silver results returned by ALS Chemex.

The 2007/2008 primary sample gold concentrations reported by ALS Chemex have been inferred to have very strong accuracy. This inference was determined through detailed review of the field standards submitted to ALS Chemex.

The 2007/2008 primary sample silver concentrations reported by ALS Chemex are inferred to have strong accuracy as determined through the detailed review of the field standards submitted to ALS Chemex.

With moderate to strong precision inferred from the repeat analyses on the 2007/2008 gold concentrations, very strong precision inferred by the re-run sample pair comparisons, and very strong accuracy inferred through the field standard analyses for gold, the 2007/2008 primary sample gold results within the Diablillos database are inferred to be of sufficient quality to represent the Diablillos project.

With strong precision inferred through the comparison of field duplicate and repeat pairs to primary samples, very strong precision inferred by the review of the re-run samples, and strong accuracy inferred through the field standards, the primary sample silver concentrations within the Diablillos database can be inferred to be of high quality and sufficient to represent the Diablillos project.

Check samples submitted to Assayers Canada have been compared to primary sample analytical results from ALS Chemex. The review has inferred that there is no apparent bias in the primary sample results obtained from ALS Chemex.

The detailed review of repeat pairs and standard analyses for the pre-2007/2008 Diablillos analytical results has inferred that the primary *sample results are sufficiently precise and accurate to represent the Diablillos project.*

The detailed review of the field repeat pairs and field standards submitted to ALS Chemex for the 2007/2008 Diablillos exploration programs has inferred that the primary sample results are adequately precise and accurate to represent the Diablillos project.

Check samples have been compared to the 2007/2008 primary samples originating from ALS Chemex resulting in an inference that there is no apparent bias in the primary sample results obtained.

The primary samples within the Diablillos database have passed this quality assurance and quality control review."

14.2 INDEPENDENT VERIFICATION SAMPLING

14.2.1 *VERIFICATION SAMPLING AND ANALYTICAL PROCEDURES*

Doug Blanchflower collected seven verification samples during his property examination work on November 16, 2007. Their locations and descriptions are shown in Table 14.1.

Table 14.1 Description of Verification Samples

Sample No.	Length (m)	Sample Type	UTM East (m)	UTM North (m)	Description
E901325	1.0	Chip	3418527.4	7202003.9	Located 10 m east of RC 97-066 collar at 4,383 m. Silicified and jarositic vuggy tuff with widespread hematite-jarosite alteration and voids filled with clear quartz.
E901326	1.0	Chip	3418128.0	7201965.0	Located 5 m east of DDH 07-036 collar. Intensely fractured and advanced argillic altered tuff brecciated by 1-m wide, NE-trending fault.
E901327	25.0	Grab	3418061.7	7202202.8	Grab sample along 30-m wide, silicified ridge of tuffaceous and lithic tuff. Tuff is advanced argillic altered and coated with jarosite-hematite on surface.

table continues…

Sample No.	Length (m)	Sample Type	UTM East (m)	UTM North (m)	Description
E901328	2.0	Chip	3417246.7	7202333.9	Fantasma showing - chip sample along west side of trench approximately 3 m below the upper volcanic flow contact. Light to medium brown, well silicified, fine-grained tuff with quartz-calcite fracture fillings and jarosite-hematite coatings.
E901329	2.5	Chip	3419235.5	7206788.3	Los Corderos showing - very silicified, advanced argillic heterolithic tuffaceous breccia on hanging wall of hematite-rich fault zone with kaolinite-clay zone on footwall.
E901330	1.5	Core	3417999.8	7201819.7	Quarter-core duplicate of Sample 20249, DDH 07-053, 129.0-130.5 m. Limonitic, brown, advanced argillic altered tuff.
E901331	1.5	Core	3418097.6	7201955.1	Quarter-core duplicate of Sample 8794, DDH 07-040, 121.5-123.0 m. Jarositic, silicified, advanced argillic tuff breccia.

The seven samples were shipped by Doug Blanchflower to the ALS Chemex assay laboratory in Mendoza, Argentina, on November 20, 2007, and confirmed by the laboratory to be received in good order on November 23, 2007. Doug Blanchflower requested that the samples be analyzed using conventional MS-ICP analytical procedures (ALS Chemex Procedure ME-ICP61). The gold values were determined using a 30-g charge with fire assay and gravimetric finish procedures (i.e. Au-AA23). Any over-limit precious metal values were to be re-analyzed using fire assay and gravimetric finish procedures.

14.2.2 VERIFICATION SAMPLING RESULTS

The results of the verification sampling undertaken by Doug Blanchflower have been summarized in Table 14.2.

Table 14.2 Summary of Verification Sample Analytical Results

Sample No.	Gold (ppm)	Silver (ppm)	Copper (ppm)	Lead (ppm)	Lead (%)	Zinc (ppm)	Arsenic (ppm)	Antimony (ppm)
E901325	<0.005	0.17	5.4	152		13	20.0	1.5
E901326	<0.005	2.85	26.5	52.3		5	95.0	13.3
E901327	0.007	4.66	2.4	281		8	43.0	30.2
E901328	0.005	0.26	129.5	3170		47	188.5	1.8
E901329	0.881	19.20	11.9	48		5	157.0	11.2
E901330	0.007	31.70	25.5	>10000	1.86	71	4150.0	189.0
E901331	1.060	74.00	41.6	4090		18	178.0	46.6

It is Doug Blanchflower's opinion that the tenor of mineralization observed during the site visit is consistent with the reported analytical results. Appendix B of this report contains the complete analytical results by ALS Chemex.

14.3 DATABASE VERIFICATION

Diablillos drill core samples assay data verification was initially undertaken by Silver Standard and then independently verified by GeoSpark.

All drill core assays were compiled at the end of 2008 drilling campaign by Silver Standard personnel into Microsoft Excel and Access data files. This updated database was then compared with the pre-existing assay database to identify potential errors. A total of 1,674 assay discrepancies were found and then corrected in the current database by referring to original assay certificates for the assay values. The majority of incorrect assay values were of a typographical nature with a few the result of rounding.

The assay database was then loaded into Gemcom where drill hole verification was undertaken to identify and correct any discrepancies for lithology codes, borehole lengths, downhole orientation data, and assay values.

GeoSpark was then contracted to independently verify the drill hole database and to conduct a full QA/QC evaluation of the data. GeoSpark's analysis involved the comparison of assay values in the digital database with 64 randomly selected assay certificates comprising 12.5% of the database.

For the 64 sample batches examined, GeoSpark reported that the examination of assay values showed only rare discrepancies between laboratory assay values and values recorded for those samples in the working database. In most of these cases, the discrepancies appear to be typographical in nature. For example, in certificate 39672860.1 from Bondar-Clegg, sample 22500 yielded a gold assay value of 0.025 ppm Au, whereas the value recorded in the database was 0.028 ppm. In few cases, the assay values for duplicate samples were entered into the database instead of the original sample result.

GeoSpark concluded that the review of 64 pre-2007/2008 analytical certificates showed that overall the drill hole assay database is very consistent with the data recorded in the original assay certificates. GeoSpark concluded that the pre-2007/2008 primary assay results were properly transcribed from the original laboratory certificates.

In 2006, Moreno Surveying & Geographics (Moreno) surveyed all historical drill hole collars and numerous access roads using differential GPS equipment. Moreno also surveyed drill hole collar locations for 2007/2008 drilling up to hole DDH-08-071. The remaining drill holes (DDH-08-072 to DDH-08-108) were surveyed by chain and compass from nearby surveyed drill holes. Chain and compass surveyed holes were seldom less than 25 m from the nearest surveyed drill hole.

15.0 ADJACENT PROPERTIES

Two prospects in the vicinity of Diablillos are the Inca Viejo and Centenario occurrences. Both occurrences are situated along the trend of the Diablillos–Cerro Galán fault zone, north of Diablillos (Figure 7.2). These occurrences were described by Ronning (1997) as follows.

15.1 CENTENARIO

In a news release dated March 7, 1997, Aranlee Resources Ltd., the current operator of the Centenario project, described 6 drill holes which:

> *"…tested a small part of a strongly altered porphyry to approximately 100 m below surface...4 of the 6 holes contain significant anomalous gold mineralization with intercepts including 48 m at 0.20 g/t (including one 2-m interval at 0.85 g/t gold) in drill hole CE-3, 48 m at 0.12 g/t gold in drill hole CE-2, and 48 m at 0.11 g/t in drill hole CE-4, the latter bottoming in anomalous gold mineralization (14 m at 0.10 g/t gold)."*

Surface work in the same area had yielded "up to 0.41 g/t gold in rock panel samples" from "altered, brecciated, and stockworked intrusive".

15.2 INCA VIEJO

Inca Viejo has been known at least as long as Diablillos. Unlike Diablillos, it appears on the 1973 mineral deposits map (Ricci, 1973) as a copper deposit. Quin (1994) described Inca Viejo as:

> *"... a large copper/gold target associated with a dacitic porphyry stock with an 800 m by 1,000 m hydrothermal alteration zone. The potential is for the discovery of a large tonnage secondary enrichment blanket (of copper – P.R.) with possible associated gold values."*

Northern Orion Explorations Ltd., controlled by Miramar Mining Corp., is the current operator of the Inca Viejo project.

16.0 MINERAL PROCESSING AND METALLURGICAL TESTING

16.1 MINERAL PROCESSING

Doug Blanchflower is not aware of any mineral processing of any mineralized material from the Diablillos property.

16.2 METALLURGICAL TESTING

In 2008, Silver Standard commissioned two phases of metallurgical testing on drill core samples collected from the Oculto mineralized zone. These studies were supervised and reported on by F. Wright Consulting Inc. with the required analytical work being conducted by PRA and the IPL Division of Inspectorate America, both based in Richmond, BC.

The first phase of metallurgical test work involved cyanidation processing of potential gold-silver ores. Five composite samples were also investigated for the viability of ore pre-treatment using gravity recovery and flotation methods prior to cyanidation. The results of this test work (Wright, 2008) are as follows:

- Sulphide contents ranged from 0.2 to 2.7%, which was considerably lower than the total sulphur, probably due to natural oxidation.
- A preliminary study indicated that the composites were relatively insensitive to grind in relation to recovery of the gold and silver by cyanide leaching. Baseline results were conducted at a target grind deemed near the maximum particle size (80% passing 200 µm) suitable for cyanide tank leaching.
- Cyanide leaching results ranged from approximately 69 to 91% for gold, and 73 to 94% for silver. Optimum silver recovery was achieved in less than 24 h, while gold dissolution continued up to 48 h of leach retention time.
- Alternate test procedures (including finer grinding, the use of activated carbon, and extending the leach retention time) were each shown not to significantly reduce the metal losses during cyanidation. Cyanide bottle roll testing using coarser particle sizes showed encouraging results.
- Two pre-treatment procedures prior to cyanidation – namely, flotation and gravity – were separately tested. Both pre-treatment procedures reduced

final residue (tailing) losses to marginally improve the overall recovery and appeared to decrease the required leach retention time, particularly for gold.

- Standalone flotation had precious metal losses significantly higher than cyanidation. Cyaniding the flotation tailing resulted in the lowest metal losses but the improvement would not likely justify incorporation of both circuits.
- Gold tailing losses by whole ore cyanidation ranged from 0.03 to 0.39 g/t for gold, and 5 to 88 g/t for silver.

The initial metallurgical test work showed the Oculto mineralization responded well to direct cyanidation of ground ore. Further testing was recommended, including gravity pre-treatment to reduce the required cyanide leach retention time, and the use of column leach studies to evaluate heap leach potential, in addition to the use of site water as part of future process development.

Acting upon the recommendations from the first phase of test work, Silver Standard commissioned a second phase of metallurgical testing. According to Wright (2009), this phase of testing included:

- a variability study to evaluate the response of 53 drill core composite samples to cyanide tank leaching by performing 48-h kinetic bottle roll tests
- a locked-cycle bottle roll test using a water sample collected from site and conducted using similar conditions as the variability study
- a preliminary heap-leach evaluation consisting of two column leach tests on minus ¾" composite samples – one conducted on a low-grade composite sample and another on a relatively high-grade sample.

According to Wright (2009), the results of the second phase of metallurgical testing were:

- The gold recovery results from the 53 bottle roll tests ranged from 60 to 96%, averaging 88%, with an average residue grade of 0.10 g/t gold. The silver recoveries ranged from 30 to 96%, averaging 75%, with an average residue grade of 26 g/t silver.
- Silver dissolution kinetics were more rapid than that for gold with the maximum recovery in 24 h or less. The gold extraction from many of the composites continued to increase after 24 h of leaching, especially for the higher grade samples.
- The results did not show a trend correlating the recovery to the degree of sample oxidation or to the base metal content of the sample.
- The locked cycle cyanide bottle roll test using zinc precipitation did not indicate any detrimental effects with precious metal dissolution and precipitation resulting in 86 and 87% for gold and silver recoveries, respectively.

- The two column cyanide tests provided rapid leach kinetics of both gold and silver in the first 30 days but with decreased dissolution following up to when the leach was terminated at 71 days.
- The gold recovery for the high and low grade columns at the termination of the test period (71 days) was 65 and 56%, respectively. Silver showed a wider range with 63% recovery in the high grade column and 37% in the low grade column.
- A comparison of the cyanidation results from the column leaching study versus the bottle roll data indicates that tank leaching offers a significantly improved recovery over heap leaching.

The complete descriptions of both phases of metallurgical test work are contained in the reports by F. Wright Consulting Inc., dated August 28, 2008, and March 28, 2009.

17.0 MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES

Mineral resources at the Diablillos project were estimated by Wardrop with the use of 3D geological modelling software, GEMS Version 6.2 (GEMS), provided by Gemcom. Resources were estimated by Mr. Michael Waldegger of Wardrop, and then verified and validated by Dr. Gilles Arseneau (P.Geo.), Manager of Geology at Wardrop.

17.1 Exploration Data Analysis

17.1.1 Assays

A total of 66,321 assay results from 429 holes were received by Wardrop from the client in a Microsoft Access database. For the purpose of geological modelling and resource estimation, Wardrop used 54,954 assays results from 301 holes in the direct vicinity of the Oculto zone.

Descriptive statistics of the assays are presented in Table 17.1.

Table 17.1 Descriptive Statistics on Silver and Gold in Raw Samples

	Ag (g/t)	Au (g/t)	Length (m)	Easting	Northing	Elevation
Count	54,954	54,954	54,954	54,954	54,954	54,954
Mean	28.49	0.252	1.10			
Standard Error	0.85	0.005	0.00			
Sample Variance	39,884.42	1.573	0.07			
Standard Deviation	199.71	1.254	0.26			
Variation Coefficient	7.011	4.971	0.24			
rel. V. Coefficient (%)	6.048	46.157	7.894			
Skewness	31.20	32.195	4.46			
Kurtosis	1,391.41	2,080.557	55.56			
Minimum	0	0	0.05	3417811.45	7201562.01	3907.63
Maximum	13,437	116	9.00	3419033.90	7202919.81	4430.60
1st Percentile	0.05	0.002	0.73			
5th Percentile	0.25	0.003	1			
10th Percentile	0.4	0.003	1			
25th Percentile	0.9	0.007	1			

table continues…

	Ag (g/t)	Au (g/t)	Length (m)	Easting	Northing	Elevation
Median	2.8	0.021	1			
75th Percentile	12	0.116	1			
90th Percentile	43.9	0.479	1.5			
95th Percentile	96.63	1.078	1.5			
99th Percentile	420.28	3.960	2			

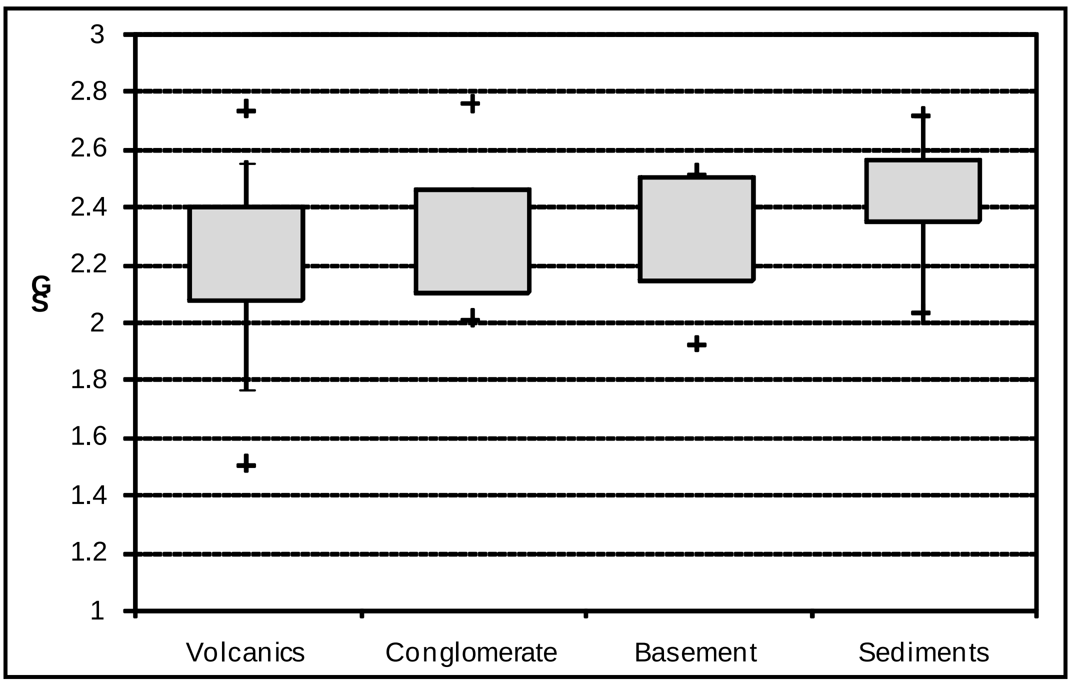
17.1.2 BULK DENSITY

There were 160 bulk specific gravity (SG) tests performed on drill core samples. The SG was averaged per rock type in the geological model (Table 17.2) and presented as a box and whisker plot in Figure 17.1.

Table 17.2 Average SG by Rock Type

Rock Type	Average SG
Volcanics	2.22
Conglomerate	2.3
Sediments	2.44
Basement	2.3

Figure 17.1 Box and Whisker Plot of SG per Rock Type



17.2 Geological Interpretation

Wireframes representing rock types were constructed using surfaces. The wireframes honour logged intersections in drill holes of four main rock types: volcanic rocks, a conglomerate, sedimentary rocks, and basement rocks.

Silver and gold mineralization does not appear to be restricted to specific rock types; however, the lateral extent closely resembles the extent of the conglomerate. Silver and gold mineralization is concentrated along a northeast trending corridor but not necessarily coincident with one another. For these reasons, grade shells for silver and gold were constructed independently. Using a cut-off of 40 g/t silver and 0.5 g/t gold, lines were digitized on vertical section, snapping to the drill hole's assay limits.

17.3 Composites

Assays were composited starting from the collar of the drill hole downwards to a fixed length of 1.5 m, interrupted at wireframe contacts, and composites less than 0.75 m in length were deleted. A total of 5,942 composites were generated within the silver grade shell and 35,632 composites were generated outside of the silver grade shell. A total of 3,532 composites were generated within the gold grade shell and 38,042 composites were generated outside of the gold grade shell.

Grade capping of the composited assays was considered by examining histograms and metal contribution by deciles and percentiles. Wardrop capped 51 silver composites to 2,000 g/t and 67 gold composites to 10 g/t.

Composited grades were used for the grade interpolation in the block model. Descriptive statistics on composited data within the grade shells are presented in Table 17.3 and Table 17.4.

Table 17.3 Descriptive Statistics of Silver Composites

	Inside Ag Grade Shell			**Outside Ag Grade Shell**		
	Length (m)	**Ag (g/t)**	**Ag Capped (g/t)**	**Length (m)**	**Ag (g/t)**	**Ag Capped (g/t)**
Valid Cases	5942	5942	5942	35632	35632	35632
Mean	1.50	159.3	142.0	1.50	7.1	7.1
Standard Error of Mean	0.00	5.9	3.5	0.00	0.1	0.1
Variance	0.00	209369.9	72107.5	0.00	382.7	382.7
Standard Deviation	0.05	457.6	268.5	0.03	19.6	19.6
Variation Coefficient	0.03	2.9	1.9	0.02	2.8	2.8
rel. V. Coefficient (%)	0.04	3.7	2.5	0.01	1.5	1.5
Skew	-12.03	11.3	4.6	-16.96	16.1	16.1
Kurtosis	149.90	175.8	25.1	305.06	449.0	449.0

table continues…

	Inside Ag Grade Shell			Outside Ag Grade Shell		
	Length (m)	Ag (g/t)	Ag Capped (g/t)	Length (m)	Ag (g/t)	Ag Capped (g/t)
Minimum	0.75	0.0	0.0	0.75	0.0	0.0
Maximum	1.50	10933.0	2000.0	1.50	826.1	826.1
1st Percentile	1.49	0.2	0.2	1.50	0.0	0.0
5th Percentile	1.50	4.5	4.5	1.50	0.0	0.0
10th Percentile	1.50	10.1	10.1	1.50	0.2	0.2
25th Percentile	1.50	27.3	27.3	1.50	0.7	0.7
Median	1.50	60.3	60.3	1.50	2.0	2.0
75th Percentile	1.50	135.0	135.0	1.50	7.0	7.0
90th Percentile	1.50	305.3	305.3	1.50	17.6	17.6
95th Percentile	1.50	531.2	531.2	1.50	27.4	27.4
99th Percentile	1.50	1727.3	1727.3	1.50	66.6	66.6

Table 17.4 Descriptive Statistics of Gold Composites

	Inside Au Grade Shell			Outside Au Grade Shell		
	Length (m)	Au (g/t)	AuCap (g/t)	Length (m)	Au (g/t)	AuCap (g/t)
Valid Cases	3,532	3,532	3,532	38,042	38,042	38,042
Mean	1.49	1.701	1.580	1.50	0.109	0.106
Standard Error of Mean	0.00	0.047	0.033	0.00	0.003	0.002
Variance	0.00	7.877	3.795	0.00	0.389	0.131
Standard Deviation	0.06	2.807	1.948	0.03	0.624	0.362
Variation Coefficient	0.04	1.650	1.233	0.02	5.698	3.432
rel. V. Coefficient (%)	0.06	2.776	2.075	0.01	2.921	1.759
Skew	-9.97	6.700	2.442	-18.10	79.481	13.032
Kurtosis	102.60	79.139	6.597	345.94	9,974.953	254.551
Minimum	0.75	0.000	0.000	0.75	0.000	0.000
Maximum	1.50	58.331	10.000	1.50	86.375	10.000
1st Percentile	1.20	0.005	0.005	1.50	0.000	0.000
5th Percentile	1.50	0.034	0.034	1.50	0.000	0.000
10th Percentile	1.50	0.094	0.094	1.50	0.003	0.003
25th Percentile	1.50	0.381	0.381	1.50	0.005	0.005
Median	1.50	0.924	0.924	1.50	0.016	0.016
75th Percentile	1.50	1.967	1.967	1.50	0.079	0.079
90th Percentile	1.50	3.751	3.751	1.50	0.239	0.239
95th Percentile	1.50	5.689	5.689	1.50	0.433	0.433
99th Percentile	1.50	12.601	10.000	1.50	1.339	1.339

17.4 SPATIAL ANALYSIS

Geostatisticians use a variety of tools to describe the pattern of spatial continuity, or strength of the spatial similarity of a variable with separation distance and direction. The correlogram measures the correlation between data values as a function of their separation distance and direction. The distance at which the correlogram reaches the maximum variance is called the "range of correlation" or simply the range. The range of the correlogram corresponds roughly to the more qualitative notion of the "range of influence" of a sample; it is the distance over which sample values show some persistence or covariance.

Using Sage 2001 software, variography was completed for each silver and gold within each grade shell at the Oculto zone. Directional sample correlograms were calculated along horizontal azimuths of 0, 30, 60, 90, 120, 150, 180, 210, 240, 270, 300, and 330 degrees. For each azimuth, sample correlograms were also calculated at dips of 30 and 60 degrees in addition to horizontally. Lastly, a correlogram was calculated in the vertical direction. Using the 37 correlograms, an algorithm determined the best-fit model. This model is described by the nugget ($C_{0)}$, two nested structure variance contributions (C_1, C_2), ranges for the variance contributions, and the model type (spherical or exponential). After fitting the variance parameters, the algorithm then fits an ellipsoid to the 37 ranges from the directional models for each structure. The final models of anisotropy are given by the lengths and orientations of the axes of the ellipsoids (Table 17.5).

Table 17.5 Correlogram Data

Element	Model	Z Rotation	Y Rotation	Z Rotation	X Range	Y Range	Z Range
Ag	C_0=0.229						
	C_1=0.755	-11	-79	-65	17.2	28.8	144.8
	C_2=0.016	73	-20	67	120.2	339.2	535.5
Au	C_0=0.09						
	C_1=0.771	-39	-69	14	15.5	15.1	20
	C_2=0.139	58	-88	-69	42.9	647.1	956.2

Note: Rotation angles were set to correspond to the Gemcom's rotational convention, which follows the right hand rule with rotation about Z-axis being positive when X moves towards the Y-axis; rotation about the Y-axis is positive when Z moves towards the X-axis.

17.5 RESOURCE BLOCK MODEL

A block model was prepared with parameters presented in Table 17.6.

Table 17.6 Block Model Parameters

Model	Origin	No. of Blocks	Size of Blocks
Easting	3417680	10 m	150 columns
Northing	7201500	10 m	150 rows
Elevation	4500	5 m	120 levels

The block model was set up to allow the interpolation of silver and gold grades to be restricted by different grade shells and to be subsequently combined into one grade model and reported by rock type.

17.5.1 *Rock Type Model*

The rock type model was coded from the modelled wireframes representing the local geology, as described in Section 17.2, with integers presented in Table 17.7. The selection of blocks for coding from the wireframes was based on the block being at least 50% by volume within a wireframe using a needling accuracy of 3 needles per block oriented vertically.

Table 17.7 Block Model Rock Codes and SG

Rock Type	Block Model Code	Density
Air	0	0
Volcanics	104	2.22
Conglomerate	103	2.3
Sediments	102	2.44
Basement	101	2.3

17.5.2 *Density Model*

The density model was coded based on rock type as presented in Table 17.7.

17.5.3 *Grade Model*

Silver and gold grades were interpolated into blocks using ordinary kriging.

Silver grades were interpolated into blocks within the silver grade shell using only composites found within the silver grade shell, and into blocks outside the silver grade shell with only those composites found outside the silver grade shell. Similarly, gold grades were interpolated into blocks within the gold grade shell using only composites found within the gold grade shell, and into blocks outside the gold grade shell with only those composites found outside the gold grade shell.

Interpolation was carried out in two passes using a different search ellipse for each pass, as outlined in Table 17.8. For the first pass, grades were interpolated only if a minimum of 7 samples from at least 3 holes were found within the search ellipse, and no more than 3 samples per hole or 12 samples in total were used to interpolate grade within a block. For the second pass, grades were interpolated if at least 4 samples from at least 2 holes were found within a larger search ellipse, and no more than 3 samples per hole or 12 samples in total were used to interpolate grade within a block. The second pass only interpolated grades into blocks that had not been interpolated during the first interpolation pass.

A calculation of RMV for blocks, was based on metal values of US$11/oz Ag and US$700/oz Au, and applied recoveries of 65% for gold and 40% for silver.

Table 17.8 Search Ellipse Parameters

Ellipse	Ranges (m)	Maximum Samples per Hole	Minimum Samples	Maximum Samples
Pass 1	X = 100	3	7	12
	Y = 50			
	Z = 20			
Pass 2	X = 200	3	4	12
	Y = 100			
	Z = 40			

17.6 Mineral Resource Classification

Mineral resources were classified in accordance with definitions provided by the CIM as stipulated in NI 43-101. The mineral resources at Diablillos are classified by Wardrop as indicated and inferred.

Blocks within the modelled grade shells were classified as indicated. These blocks were interpolated in 2 passes (as described above) with an average distance of samples used below 50 m. Minor discontinuous zones of blocks where the average distance of samples used to interpolate the blocks were greater than 50 m were included for continuity.

Blocks outside of the modelled grade shells that were interpolated were classified as inferred. Blocks that were not interpolated were unclassified.

17.7 Mineral Resource Tabulation

Wardrop estimated that the Diablillos deposit, at a cut-off of US$10 RMV, contains capped indicated resources of 21.6 Mt averaging 111 g/t Ag and 0.922 g/t Au.

Wardrop estimated that the Diablillos deposit contains additional capped inferred resources of 7.2 Mt averaging 27 g/t Ag and 0.807 g/t Au as outlined in Table 17.9.

Table 17.9 Diablillos Capped Mineral Resources at US$10 RMV Cut-off

Classification	Density (t/m^3)	Tonnage (Mt)	Au (g/t)	Ag (g/t)
Indicated	2.29	21.6	0.92	111
Inferred	2.321	7.2	0.81	27

Wardrop also estimated uncapped resources as outlined in Table 17.10.

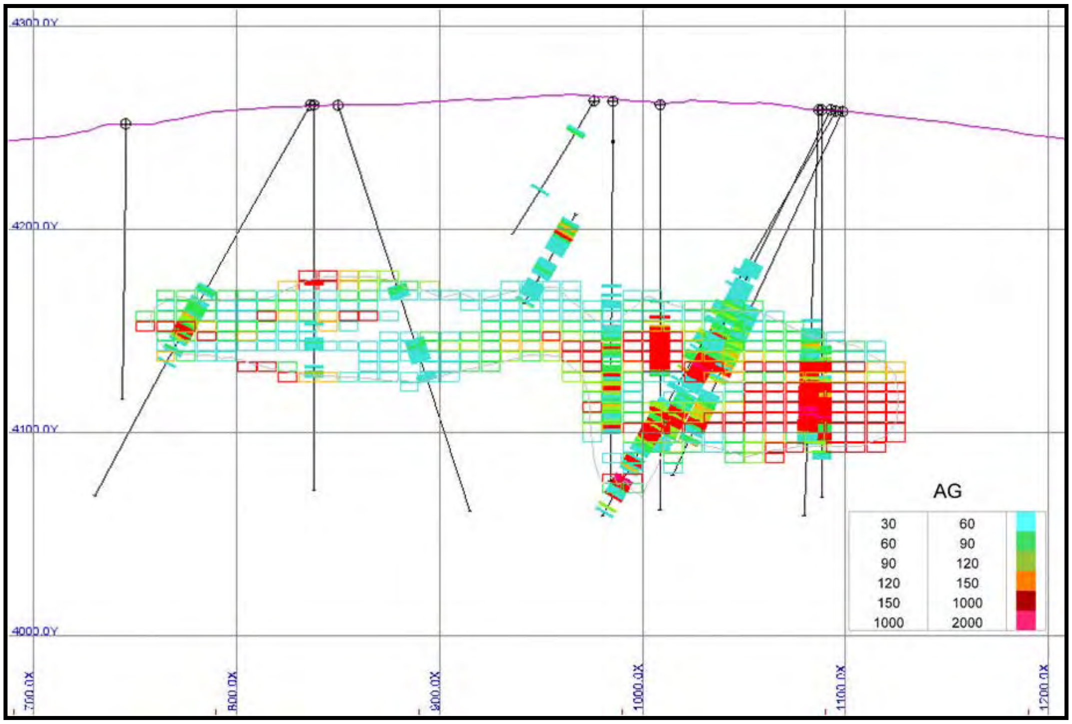
Table 17.10 Diablillos Uncapped Mineral Resources at US$10 RMV Cut-off

Classification	Density (t/m^3)	Tonnage (Mt)	Au (g/t)	Ag (g/t)
Indicated	2.29	21.6	0.98	118
Inferred	2.321	7.2	1.06	27

17.8 BLOCK MODEL VALIDATION

Wardrop completed a detailed visual validation of the Diablillos block model. The model was checked for proper coding of drill hole intervals and block model cells, in both section and plan. Coding was found to be correct. Grade interpolation was examined relative to drill hole composite values by inspecting sections and plans. The checks showed good agreement between drill hole composite values and block model cell values. An example of block values compared to drill hole composites is presented in Figure 17.2.

Figure 17.2 Section 3418175 E Displaying Silver Grades in Blocks and Drill Holes



18.0 OTHER RELEVANT DATA AND INFORMATION

There are no known environmental, permitting, legal, title, taxation, access rights, water rights, land-use rights, socio-economic or political issues, unless otherwise stated in this report, that may adversely affect any exploration on the Diablillos property.

The authors are not aware of any additional relevant data or information on the Oculto zone.

19.0 INTERPRETATION AND CONCLUSIONS

Mineral resources at the Diablillos project were estimated by Wardrop at a cut-off of US$10 RMV to contain capped indicated resources of 21.6 Mt averaging 111 g/t Ag and 0.92 g/t Au. Wardrop estimated that the Diablillos deposit contains additional capped inferred resources of 7.2 Mt averaging 27 g/t Ag and 0.81 g/t Au.

20.0 RECOMMENDATIONS

Wardrop recommends a $1,275,000 exploration program for the Diablillos property. In-fill drilling is recommended to increase the density of drilling in the northeastern portion of the deposit and around the perimeter of the modelled wireframes. Increasing the density of drilling may have a positive impact on the tonnage, as there are currently isolated holes with positive results not included in the current wireframe model.

Wardrop recommends continuation of the metallurgical program with additional bottle roll and column test work to confirm the amenability of the mineralization for heap leaching. Wardrop also recommends the continued collection of samples for specific gravity test work from any future holes drilled.

Wardrop recommends surveying the remaining holes that were drilled in the 2007/2008 exploration program and any future holes using differential GPS equipment.

Finally, Wardrop recommends the completion of an in-house desktop economic evaluation to determine the viability of the project using some combination of heap leaching and conventional milling.

A detailed budget is presented in Table 20.1

Table 20.1 Recommended Budget

Item	Total ($)
Drilling 5,000 m at $225/m	$1,125,000
Metallurgical Test Work	$100,000
Desktop Economic Evaluation	$50,000
Total	**$1,275,000**

21.0 REFERENCES

Bahlberg, Heinrich, 1990: The "Faja Eruptiva de la Puna Oriental" in the Northern Argentinian Puna Revisited: Granitoid Emplacement in a Late-Ocloyic (? Silurian) Sinistral Strike-Slip Zone. *XI Congreso Geológico Argentino*, San Juan, 1990, Actas II, pp. 297-300.

Burk, R., 2009: Personal communications regarding the geology of the Diablillos property and recent exploration work.

Coira, B., Mahlburg Kay, S. and Viramonte, J., 1993: Upper Cenozoic Magmatic Evolution of the Argentine Puna—A Model for Changing Subduction Geometry. International Geology Review, v. 35, no. 8, pp 677-720.

Durand, Dr. Ignacio Frezze: Legal Title Opinion for Pacific Rim Mining Corporation Argentina S.A. and the Diablillos Mining Concessions; private paper prepared for Silver Standard Resources Inc., March 31, 2009, pp. 6.

F. Wright Consulting, 2008: Diablillos Gold Silver Project, Preliminary Metallurgical Study, Draft for Comment – Revision 1; August 28, 2008, pp 31.

F. Wright Consulting, 2009: Diablillos Gold Silver Project, Phase 2 – Cyanidation Study (Draft); March 28, 2009, pp 195 including appendices.

Geographe International MFS Inc., 2000: Information Memorandum, Diablillos Silver and Gold Project, Salta Province, Argentina; private report prepared for Pacific Rim Mining Corporation, 23 p.

Goad, Bruce, 1994: 1993 Drilling Report, Diablillos Project. Unpublished consultant report for Pacific Rim Mining Corporation.

Gonzalez, Osvaldo Edgar, 1985: *Estudio del Area de Investigación Geológico Minera N^{o} 1, "Diablillos"*. Unpublished internal report for the *Secretaría de Minería, Dirección nacional de Minería y Geología, Centro de Exploracion NOA.*

Heberlein, D., 1999: Slide presentation of the Diablillos Project to the Vancouver Mineral Exploration Group Meeting, November 1999.

Hongn, Fernando, 1995: *Control de Zonas de Cizalla Precambrico-Paleozoicas Sobre el Emplazamiento de Sistemas Volcanico-Subvolcanicos Cenozoicos de Interes Económico, Puna de Salta y Catamarca. V Congreso Económico Geologico* (pre-print copy).

Knight Piesold Consulting, 2009: Silver Standard Resources Inc. Diablillos Project, 2008 Geotechnical Site Investigation (Ref. No. VA201-292/1-1); March 12, 2009, pp 218 including plans and appendices.

Lork, Anette, and Bahlburg, Heinrich, 1991: Precise U-Pb Ages of Monazites from the Faja Eruptiva de la Puna Oriental and the Cordillera Oriental, NW Argentina. *XII Congreso Geológico Argentino y II Congreso de Exploración de Hidrocarburos, Actas T^{o} IV (1-6).*

McNaughton, K., 2009: Personal communications.

McNaughton, K., 2008: Personal communications.

Melbye, Charles E., 1988: Geological and Drilling Report, Diablillos and Condor Yaku Properties, Salta Province, Argentina. Consultants report for the Ophir Partnership Limited.

Mustard, J. W., 1994: Diablillos Project Report. Unpublished consultant report for Pacific Rim Mining Corp. 55 pp plus figures and appendices.

Panteleyev, A., 1996: Epithermal Au-Ag-Cu: High Sulphidation, in Selected British Columbia Mineral Deposit Profiles, Volume 2 – Metallic Deposits, Lefebure, D. V. and Hoy, T., Editors, British Columbia Ministry of Employment and Investment, Open File 1996-13, pages 37 – 39.

Puigdomenech, H., 2006: An Update of Exploration Information, Diablillos Project, Salta, Argentina; private report prepared for Pacific Rim Mining Corporation Argentina S.A., 18 p.

Ricci, Susana M., 1973: *Provincias de Salta y Jujuy, Mapa Minero* (Mineral Deposit Map). *Subsecretaría de Minería.*

Ristorcelli, S. and Ronning, Peter A., 2001: Diablillos Silver and Gold Resources, Salta Province, Argentina; 43-101 compliant technical report prepared Mine Development Associates for Pacific Rim Mining Corporation, August 3, 2001, 58 p. plus maps and appendices.

Ristorcelli, Steve J., 1998: Executive Summary Report on the Gold and Silver Resource Estimate - An Update on the Oculto Area, Diablillos Project, Salta Province, Argentina; Unpublished consultant report on behalf of Pacific Rim Mining Corporation.

Ristorcelli, Steve J. 1997: Gold and Silver Resources Oculto Area, Diablillos Project, Salta Province, Argentina; Unpublished consultant report on behalf of Pacific Rim Mining Corporation.

Rojas, N., Rojas, W. and Fava, L., 2003: Report on Exploration Completed In Silver Standard (Pacific Rim Mining Corporation) Properties in 2003, Diablillos Project, Salta Province, Northwestern Argentina; private report prepared for by Pacific Rim Mining Corporation Argentina S.A., 28 p.

Rojas, Nivaldo, 1990: Comments and conceptual ideas about Diablillos. In-house memorandum, Minera Utah de las Américas Inc.

Ronning, Peter A., 1997: Review of the Diablillos Project, Argentina: private report prepared for Pacific Rim Mining Corporation, pp 55.

Scott, Alan, 1994: Geophysical Report, Induced Polarization/Resistivity Survey, Diablillos Property, Salta, Argentina. Unpublished consultant report on behalf of Pacific Rim Mining Corporation.

Silitoe, R. H., 1992: Gold and Copper Metallogeny in the Central Andes – Past, Present and Future Exploration Objectives; *Economic Geology* Vol. XX, pp 2205 – 2216.

Vallat, C., 2009: Quality Assurance and Quality Control Report for the Silver Standard Diablillos Project, Diablillos, Salta Province, Argentina; private technical report prepared for Silver Standard Resources Inc., pp. 91.

22.0 CERTIFICATE OF QUALIFIED PERSON

22.1 J. DOUGLAS BLANCHFLOWER

I, J. Douglas Blanchflower of Aldergrove, BC, do hereby certify that as a co-author of this **TECHNICAL REPORT ON THE DIABLILLOS PROPERTY – SALTA AND CATAMARCA PROVINCES, ARGENTINA**, dated July 27, 2009, I hereby make the following statements:

- I am a Consulting Geologist with a business office at 25856 – 28th Avenue, Aldergrove, British Columbia, V4W 2Z8, and President of Minorex Consulting Ltd.
- I am a graduate of Economic Geology with a Bachelor of Science, Honours Geology degree from the University of British Columbia in 1971.
- I have practiced my profession as a Professional Geologist since graduation.
- I am a Registered Professional Geoscientist in good standing with the Association of Professional Engineers and Geoscientists of British Columbia (No. 19086), and a Registered Professional Geologist in good standing with the Association of Professional Engineers, Geologists and Geophysicists of Alberta (No. M69488).
- I have read the definition of “qualified person” set out in NI 43-101 and certify that, by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a “qualified person” for the purpose of NI 43-101.
- I conducted a field examination of the Diablillos Property on November 17 and 18, 2007, during which time I examined the mineral showings, sampled several trenches and drill hole intercepts, and reviewed the results of recent mineral exploration work.
- I am responsible for Sections 1.0 to 16.0 and 18.0 of this report titled “Technical Report on the Diablillos Property – Salta and Catamarca Provinces, Argentina” dated July 27, 2009.
- I am not aware of any material fact or material change with respect to the subject matter of this technical report which is not reflected in the technical report.
- I am independent of the Issuer as defined by Section 1.4 of the Instrument.

- I was retained by Silver Standard Resources Inc. to conduct a field examination of the property and co-author this report with Wardrop. I am familiar with epithermal precious metal deposit models, and have experience conducting property evaluations, and writing technical reports.
- I have read National Instrument 43-101 and the Technical Report has been prepared in compliance with National Instrument 43-101 and Form 43-101F1.

Signed and dated this 27th day of July, 2009 at Aldergrove, BC

"Original Document, Revision 01 signed and sealed by J. Douglas Blanchflower, P.Geo."

J. Douglas Blanchflower, P.Geo.
Consulting Geologist
Minorex Consulting Ltd.

22.2 GILLES ARSENEAU

I, Dr. Gilles Arseneau, of North Vancouver, BC, do hereby certify that as a co-author of this **TECHNICAL REPORT ON THE DIABLILLOS PROPERTY – SALTA AND CATAMARCA PROVINCES, ARGENTINA**, dated July 27, 2009, I hereby make the following statements:

- I am a Manager of Geology with Wardrop Engineering Inc. with a business address at #800 – 555 West Hastings St., Vancouver, BC, V6B 1M1.
- I have a B.Sc. in Geology from the University of New Brunswick (1979), a M.Sc. in Geology from the University of Western Ontario (1984), and a Ph.D. in Geology from the Colorado School of Mines (1995).
- I am a member in good standing of the Association of Professional Engineers and Geoscientists of British Columbia (License #25474).
- I have practiced my profession in mineral exploration continuously since graduation. I have over 20 years of experience in mineral exploration and 8 years experience preparing mineral resource estimates using block-modelling software.
- I have read the definition of “qualified person” set out in National Instrument 43-101 (NI 43-101) and certify that, by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a “qualified person” for the purpose of NI 43-101.
- I am responsible for the preparation of Sections 17.0, 19.0, and 20.0 of this technical report titled “Technical Report on the Diablillos Property – Salta and Catamarca Provinces, Argentina“, dated July 27, 2009.
- I have no prior involvement with the Property that is the subject of the Technical Report.
- As of the date of this Certificate, to my knowledge, information, and belief, this Technical Report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.
- I am independent of the Issuer as defined by Section 1.4 of the Instrument.
- I have read National Instrument 43-101 and the Technical Report has been prepared in compliance with National Instrument 43-101 and Form 43-101F1.

Signed and dated this 27th day of July, 2009 at Vancouver, British Columbia.

“Original Document, Revision 01 signed and sealed by Dr. Gilles Arseneau, P.Geo.”

Dr. Gilles Arseneau, P.Geo.
Manager of Geology
Wardrop Engineering Inc.

APPENDIX A

SAMPLE ASSAY AND ANALYTICAL PROCEDURES – ALS CHEMEX

ALS Chemex

<u>Geochemical Procedure</u> – ME-MS61
Ultra-Trace Level Method Using ICP-MS and ICP-AES

Sample Decomposition: $HF-HNO_3-HClO_4$ acid digestion, HCl leach (GEO-4A01)

Analytical Methods: Inductively Coupled Plasma - Atomic Emission Spectroscopy (ICP - AES) Inductively Coupled Plasma - Mass Spectrometry (ICP-MS)

A prepared sample (0.25 g) is digested with perchloric, nitric, hydrofluoric and hydrochloric acids. The residue is topped up with dilute hydrochloric acid and analyzed by inductively coupled plasma-atomic emission spectrometry. Following this analysis, the results are reviewed for high concentrations of bismuth, mercury, molybdenum, silver and tungsten and diluted accordingly. Samples meeting this criterion are then analyzed by inductively coupled plasma-mass spectrometry. Results are corrected for spectral interelement interferences.

NOTE: Four acid digestions are able to dissolve most minerals; however, although the term "*near-total*" is used, depending on the sample matrix, not all elements are quantitatively extracted.

Element	Symbol	Units	Lower Limit	Upper Limit
Silver	Ag	ppm	0.01	100
Aluminum	Al	%	0.01	50
Arsenic	As	ppm	0.2	10 000
Barium	Ba	ppm	10	10 000
Beryllium	Be	ppm	0.05	1 000
Bismuth	Bi	ppm	0.01	10 000
Calcium	Ca	%	0.01	50

Element	Symbol	Units	Lower Limit	Upper Limit
Cadmium	Cd	ppm	0.02	1 000
Cerium	Ce	ppm	0.01	500
Cobalt	Co	ppm	0.1	10 000
Chromium	Cr	ppm	1	10 000
Cesium	Cs	ppm	0.05	500
Copper	Cu	ppm	0.2	10 000
Iron	Fe	%	0.01	50
Gallium	Ga	ppm	0.05	10 000
Germanium	Ge	ppm	0.05	500
Hafnium	Hf	ppm	0.1	500
Indium	In	ppm	0.005	500
Potassium	K	%	0.01	10
Lanthanum	La	ppm	0.5	10 000
Lithium	Li	ppm	0.2	10 000
Magnesium	Mg	%	0.01	50
Manganese	Mn	ppm	5	100 000
Molybdenum	Mo	ppm	0.05	10 000
Sodium	Na	%	0.01	10
Niobium	Nb	ppm	0.1	500
Nickel	Ni	ppm	0.2	10 000
Phosphorous	P	ppm	10	10 000
Lead	Pb	ppm	0.5	10 000
Rubidium	Rb	ppm	0.1	10 000
Rhenium	Re	ppm	0.002	50
Sulphur	S	%	0.01	10
Antimony	Sb	ppm	0.05	10 000

Element	Symbol	Units	Lower Limit	Upper Limit
Scandium	Sc	ppm	0.1	10 000
Selenium	Se	ppm	1	1 000
Tin	Sn	ppm	0.2	500
Strontium	Sr	ppm	0.2	10 000
Tantalum	Ta	ppm	0.05	100
Tellurium	Te	ppm	0.05	500
Thorium	Th	ppm	0.2	10 000
Titanium	Ti	%	0.005	10
Thallium	Tl	ppm	0.02	10 000
Uranium	U	ppm	0.1	10 000
Vanadium	V	ppm	1	10 000
Tungsten	W	ppm	0.1	10 000
Yttrium	Y	ppm	0.1	500
Zinc	Zn	ppm	2	10 000
Zirconium	Zr	ppm	0.5	500

ALS Chemex

Assay Procedure – ME-OG62

Ore Grade Elements by Four Acid Digestion Using Conventional ICP-AES Analysis

Sample Decomposition: HNO_3-$HClO_4$-HF-HCl Digestion (ASY-4A01)
Analytical Method: Inductively Coupled Plasma - Atomic Emission Spectroscopy (ICP - AES)*

Assays for the evaluation of ores and high-grade materials are optimized for accuracy and precision at high concentrations. Ultra high concentration samples (> 15 -20%) may require the use of methods such as titrimetric and gravimetric analysis, in order to achieve maximum accuracy.

A prepared sample is digested with nitric, perchloric, hydrofluoric, and hydrochloric acids, and then evaporated to incipient dryness. Hydrochloric acid and de-ionized water is added for further digestion, and the sample is heated for an additional allotted time. The sample is cooled to room temperature and transferred to a volumetric flask (100 mL). The resulting solution is diluted to volume with de-ionized water, homogenized and the solution is analyzed by inductively coupled plasma - atomic emission spectroscopy or by atomic absorption spectrometry.

***NOTE**: ICP-AES is the default finish technique for ME-OG62. However, under some conditions and at the discretion of the laboratory an AA finish may be substituted. The certificate will clearly reflect which instrument finish was used.

Element	Symbol	Units	Lower Limit	Upper Limit
Silver	Ag	ppm	1	1500
Arsenic	As	%	0.01	30
Bismuth	Bi	%	0.01	30
Cadmium	Cd	%	0.0001	10
Cobalt	Co	%	0.001	20

Element	Symbol	Units	Lower Limit	Upper Limit
Chromium	Cr	%	0.002	30
Copper	Cu	%	0.001	40
Iron	Fe	%	0.01	100
Manganese	Mn	%	0.01	50
Molybdenum	Mo	%	0.001	10
Nickel	Ni	%	0.001	30
Lead	Pb	%	0.001	20
Zinc	Zn	%	0.001	30

ALS Chemex

Fire Assay Procedure – Au-AA23 & Au-AA24
Fire Assay Fusion, AAS Finish

Sample Decomposition: Fire Assay Fusion (FA-FUS01 & FA-FUS02)
Analytical Method: Atomic Absorption Spectroscopy (AAS)

A prepared sample is fused with a mixture of lead oxide, sodium carbonate, borax, silica and other reagents as required, inquarted with 6 mg of gold-free silver and then cupelled to yield a precious metal bead.

The bead is digested in 0.5 mL dilute nitric acid in the microwave oven, 0.5 mL concentrated hydrochloric acid is then added and the bead is further digested in the microwave at a lower power setting. The digested solution is cooled, diluted to a total volume of 4 mL with de-mineralized water, and analyzed by atomic absorption spectroscopy against matrix-matched standards.

Method Code	Element	Symbol	Units	Sample Weight (g)	Lower Limit	Upper Limit	Default Overlimit Method
Au-AA23	Gold	Au	ppm	30	0.005	10.0	Au-GRA21
Au-AA24	Gold	Au	ppm	50	0.005	10.0	Au-GRA22

APPENDIX B

VERIFICATION SAMPLE ANALYTICAL RESULTS

ALS Chemex
EXCELLENCE IN ANALYTICAL CHEMISTRY
ALS Argentina
Altos Hornos Zapla 1605
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To: **SUNSHINE ARGENTINA INC SUCURSAL ARG**
PIEDRAS 975 PISO 4 DPTO. A
CAPITAL FEDERAL CF 1070

Finalized Date: 11-DEC-2007
Account: SUNSHINE

CERTIFICATE ME07138311

Project: PIRQUITAS
P.O. No.:
This report is for 7 Rock samples submitted to our lab in Mendoza, MD, Argentina on 23-NOV-2007.

The following have access to data associated with this certificate:

DOUG BLANCHFLOWER	JIM MACCREA	

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-22	Sample login - Rcd w/o BarCode
CRU-QC	Crushing QC Test
PUL-QC	Pulverizing QC Test
CRU-31	Fine crushing - 70% <2mm
SPL-21	Split sample - riffle splitter
PUL-31c	Pulv. Lg split to >85% -75um

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	
ME-MS61	48 element four acid ICP-MS	
ME-OG62	Ore Grade Elements - Four Acid	ICP-AES
Pb-OG62	Ore Grade Pb - Four Acid	VARIABLE
Au-AA23	Au 30g FA-AA finish	AAS

To: **SUNSHINE ARGENTINA INC SUCURSAL ARG**
ATTN: DOUG BLANCHFLOWER
PIEDRAS 975 PISO 4 DPTO. A
CAPITAL FEDERAL CF 1070

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

Signature: Mascaraqui

Milder Mascaraqui, Laboratory Manager, Peru

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To: **SUNSHINE ARGENTINA INC SUCURSAL ARG**
PIEDRAS 975 PISO 4 DPTO. A
CAPITAL FEDERAL CF 1070

Finalized Date: 11-DEC-2007
Account: SUNSHINE

Project: PIRQUITAS

CERTIFICATE OF ANALYSIS ME07138311

Sample Description	Method Analyte Units LOR	WEI-21 Recvd Wt. kg 0.02	Au-AA23 Au ppm 0.005	ME-MS61 Ag ppm 0.01	ME-MS61 Al % 0.01	ME-MS61 As ppm 0.2	ME-MS61 Ba ppm 10	ME-MS61 Be ppm 0.05	ME-MS61 Bi ppm 0.01	ME-MS61 Ca % 0.01	ME-MS61 Cd ppm 0.02	ME-MS61 Ce ppm 0.01	ME-MS61 Co ppm 0.1	ME-MS61 Cr ppm 1	ME-MS61 Cs ppm 0.05	ME-MS61 Cu ppm 0.2
E901325		1.82	<0.005	0.17	6.43	20	390	0.33	2.44	0.11	0.04	58.7	0.7	64	0.42	5.4
E901326		2.60	<0.005	2.85	5.99	95	230	0.36	10.25	0.12	0.02	56.7	0.3	45	0.6	26.5
E901327		2.96	0.007	4.66	5.76	43	390	0.58	37.8	0.34	0.5	76.7	0.8	76	0.88	2.4
E901328		2.32	0.005	0.26	0.6	188.5	400	0.72	0.43	0.28	0.17	55.3	1	17	5.33	129.5
E901329		3.42	0.881	19.2	0.24	157	60	0.41	12.05	0.04	0.04	18.3	0.4	35	0.44	11.9
E901330		2.92	0.007	31.7	3.75	4150	740	0.25	73.2	0.01	0.03	8	0.7	59	1.85	25.5
E901331		2.54	1.060	74	1.36	178	740	0.39	8.22	0.14	<0.02	4.73	0.7	36	2.11	41.6

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Sample Description	Method Analyte Units LOR	ME-MS61 Fe % 0.01	ME-MS61 Ga ppm 0.05	ME-MS61 Ge ppm 0.05	ME-MS61 Hf ppm 0.1	ME-MS61 In ppm 0.005	ME-MS61 K % 0.01	ME-MS61 La ppm 0.5	ME-MS61 Li ppm 0.2	ME-MS61 Mg % 0.01	ME-MS61 Mn ppm 5	ME-MS61 Mo ppm 0.05	ME-MS61 Na % 0.01	ME-MS61 Nb ppm 0.1	ME-MS61 Ni ppm 0.2	ME-MS61 P ppm 10
E901325		2.45	18.9	0.1	1	0.034	2.66	39.4	1	0.02	70	1.49	0.06	17.5	4.5	610
E901326		4.76	11.55	0.13	2.9	0.064	2.57	40.5	8	0.01	42	1.76	0.1	20.4	0.8	1760
E901327		2.21	54.6	0.07	4.3	0.027	2.37	67	4	0.03	127	1.17	0.06	19.1	1.1	1560
E901328		2.78	2.54	0.14	2.7	0.193	0.09	25.6	3.2	0.03	58	1.47	0.09	21.3	3.2	1430
E901329		1.78	3.46	0.06	0.2	0.04	0.11	9.8	2.3	0.01	67	1.15	0.02	3.9	1.5	220
E901330		16.25	21.8	0.2	3	6.69	2.96	3.6	10.1	<0.01	51	3.28	0.05	21.7	0.7	1750
E901331		7.57	7.6	0.11	4.1	1.46	1.1	2.5	8.4	0.01	94	0.87	0.02	21	1.4	600

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Sample Description	Method / Analyte / Units / LOR	ME-MS61 Pb ppm 0.5	ME-MS61 Rb ppm 0.1	ME-MS61 Re ppm 0.002	ME-MS61 S % 0.01	ME-MS61 Sb ppm 0.05	ME-MS61 Sc ppm 0.1	ME-MS61 Se ppm 1	ME-MS61 Sn ppm 0.2	ME-MS61 Sr ppm 0.2	ME-MS61 Ta ppm 0.05	ME-MS61 Te ppm 0.05	ME-MS61 Th ppm 0.2	ME-MS61 Ti % 0.005	ME-MS61 Tl ppm 0.02	ME-MS61 U ppm 0.1
E901325		152	8.6	<0.002	5.52	1.54	2.7	2	4.8	491	1.11	0.87	7.8	0.469	0.24	1.5
E901326		52.3	16.9	<0.002	5.37	13.3	9	6	4.5	934	1.14	3.29	7.4	0.575	1.42	1.7
E901327		281	4.7	<0.002	5.1	30.2	9.8	2	16.7	893	1	0.83	14.7	0.523	1.83	5
E901328		3170	4.4	<0.002	0.3	1.77	5.7	12	4.4	1000	0.78	0.33	8.5	0.797	1.59	13.2
E901329		48	3.4	<0.002	0.25	11.2	0.9	3	3.9	88.5	0.19	6.49	2.3	0.157	0.21	0.4
E901330		>10000	8	<0.002	6.38	189	8.7	3	15.6	162.5	1.18	7.17	3.8	0.515	1.7	2.3
E901331		4090	6.6	<0.002	2.59	46.6	4.1	9	4.1	60.6	0.97	4.05	1.2	0.53	3.56	0.8

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Sample Description	Method Analyte Units LOR	ME-MS61 V ppm 1	ME-MS61 W ppm 0.1	ME-MS61 Y ppm 0.1	ME-MS61 Zn ppm 2	ME-MS61 Zr ppm 0.5	Pb-OG62 Pb % 0.01
E901325		133	2.7	4.3	13	25.2	
E901326		129	1.4	7.4	5	92.3	
E901327		142	3.6	10.9	8	151	
E901328		157	2.4	12.6	47	104.5	
E901329		12	1.6	3.9	5	8	
E901330		133	53.4	2.3	71	100.5	1.86
E901331		60	22.7	3.7	18	125	

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Method	CERTIFICATE COMMENTS
ME-MS61	REE's may not be totally soluble in this method.