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ENDEAVOUR SILVER CORP.

NI 43-101 TECHNICAL REPORT
AUDIT OF THE
RESOURCE AND RESERVE ESTIMATES
FOR THE
GUANACEVÍ PROJECT
DURANGO STATE
MEXICO

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Report By

William J. Lewis, BSc., P.Geo.
Charley Z. Murahwi, M.Sc., P.Geo, MAusIMM
Robert J Leader, P.Eng.
Dibya Kanti Mukhopadhyay, MAusIMM

SUITE 900 - 390 BAY STREET, TORONTO ONTARIO, CANADA M5H 2Y2
Telephone (1) (416) 362-5135   Fax (1) (416) 362 5763

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1.0 SUMMARY

Endeavour Silver Corp. (Endeavour Silver) has retained Micon International Limited (Micon) to conduct an audit of the updated resource and reserve estimate for its Guanaceví Mines project, located near the town of Guanaceví in the northwest part of the State of Durango in Mexico. This Technical Report constitutes an audit of the December 31, 2009 mineral resource and reserve estimate conducted on the property by Endeavour Silver. The audit was performed to ensure that the mineral resources and reserves comply with the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) standards and definitions referred to in Canadian National Instrument 43-101 (NI 43-101).

The previous December 31, 2008 resource and reserve estimate was the subject of a March 18, 2009, NI 43-101 Technical Report by Micon. The current Micon audit incorporates the exploration and mining data gathered since the publication of the March, 2009, report. The March, 2008, Endeavour Silver Technical Report was posted on the System for Electronic Document Analysis and Retrieval (SEDAR). SEDAR is the filing system developed for the Canadian Securities Administrators (CSA).

1.1 PROPERTY DESCRIPTION

The Guanaceví Mines project is located within the Municipality of Guanaceví in the State of Durango, Mexico, near its northern border with the state of Chihuahua. The property is accessed by travelling from the city of Durango located 320 kilometres (km) southeast. Durango has a modern airport with daily flights to and from Mexico City and portions of the United States. The Guanaceví Mines project is located on the edge of the Sierra Madre, a series of rugged mountains with higher points reaching 3,300 metres (m) above sea level. The Guanaceví Mines project is located at approximately 105°58'20"W longitude and 25°54'47"N latitude.

The Guanaceví mining district covers an area measuring approximately 5 km northeast - southwest by 10 km northwest - southeast and contains more than 50 silver/gold mines. Although only three of the mines are presently operating, there is considerable mining experience available in the area.

1.2 OWNERSHIP

Endeavour Silver holds the Guanaceví Mines project through its 100% owned Mexican subsidiary Endeavour Gold Corporation S.A. de C.V. (Endeavour Gold). Endeavour Gold holds the project through its two 100% owned subsidiaries Minera Plata Adelante S.A. de C.V. (Minera Plata Adelante) and Refinadora Plata Guanaceví S.A. de C.V. (Refinadora Plata Guanaceví). At present, the project is comprised of 38 mineral concessions. The mineral concessions are not all contiguous and vary in size, for a total property area of 1,054 ha. The annual 2010 concession tax for the Guanaceví properties is approximately 205,576 Mexican pesos, which is equal to about US $16,011 at an exchange rate of 12.84 pesos to US $1.00 dollar.

On February 9, 2009, Endeavour Silver entered into a mining exploration agreement with Minerales Monte Blanco S.A. de C.V. (Minerales Monte Blanco), represented by Sergio Enrique Silva Franco, on the El Porvenir Cuatro and La Brisa concessions totaling approximately 55.5518 ha. The El Porvenir Cuatro and La Brisa agreement is an option to earn 100% of these properties over two years for a total consideration of US $700,000.

In February, 2010, Endeavour Silver exercised its option to purchase the El Porvenir Cuatro and La Brisa properties. Endeavour Silver has now acquired a 100% interest in the Porvenir Cuatro and La Brisa properties by paying a total consideration of US $700,000 to the vendors, consisting of US $100,000 cash and 136,054 shares on signing the option agreement and an additional 71,428 common shares and US $160,000 cash on the early exercise of the option to purchase.

In addition to the mineral rights, Endeavour Silver has agreements with various private ranch owners and local Ejidos (El Hacho and San Pedro) that provide access for exploration and exploitation purposes.

1.3 HISTORY

It is not known if the indigenous peoples or the Spanish colonists first began mining in the Guanaceví district but mining extends back to at least 1535 when the mines were first worked by the Spanish. By the start of the 18th century, Guanaceví had become an important mining centre in the Nueva Vizcaya province of Nueva España (New Spain) as reported by Alexander von Humboldt in his travels through Nueva España. However, the Guanaceví mining district is not as well known today.

The Guanaceví mining district and the Guanaceví project area are riddled with mine openings and old workings, in a somewhat haphazard fashion near surface, representing the earliest efforts at extraction, and more systematic at depth, which is indicative of later, better organized and engineered mining. Associated with these openings and workings is a number of ruins, which represent the mine buildings, chapels and residences of the inhabitants and indicate the wealth of the mining district during its past.

The vast bulk of the material which has been extracted from underground operations through the tunnels, shafts and winzes is scattered over the hillsides in waste dumps and beneath the foundations of the ruins and modern buildings. Historically, individual veins or deposits had separate owners and, in the case of some of the larger veins or deposits, had several owners along the strike length which resulted in a surfeit of adits and shafts and very inefficient operations.

During the late sixteenth century silver production accounted for 80% of all exports from Nueva España, although, by the mid-seventeenth century silver production collapsed when mercury, necessary to the refining process, was diverted to the silver mines of Potosí in present day Bolivia. Collapse of the seventeenth century mining led to widespread bankruptcy among the miners and hacienda owners; however, in the latter half of the seventeenth century silver mining began to recover in Nueva España. By the start of the 18th century, Guanaceví had become an important mining centre in the Nueva Vizcaya province.

The peasant uprisings of 1810 to 1821 were disastrous to the Mexican mining industry with both the insurgents' soldiers and royalist troops all but destroying the mining production in Mexico, and the Guanaceví mining district was not spared during this period.

The district has experienced several periods of bonanza-grade production including the operation of a mint in 1844. The Guanaceví mining district, however, reached its greatest period of activity at the start of the 20th century when five processing plants were in operation and more than 15 mines were in production.

J.R. Southworth in his 1905 volume entitled "The Mines of Mexico" mentions that Guanaceví is a very rich district and "that many of the largest capitalists of New York have enormous interests in its mines". Southworth mentions that the Barradán, Hacienda Wilson, El Carmen, Nueva Australia and Hacienda Avila were all good mines and properties within the Guanaceví mining district. However, Southworth also mentioned that "considering the large number of once famous properties in Guanaceví, there are comparatively few now in operation. The cessation of development has been due to various causes, though usually not from lack of ore."

The vast majority of production came prior to the 1910 Mexican Revolution with the Guanaceví mining district being known for its high silver grades. Previous reports noted that the official production records indicate that a total value of 500 million pesos equivalent to approximately 500 million ounces of silver and silver equivalents, with a present day value of about US $3.25 billion, had been extracted from this mining district. This makes the Guanaceví district one of the top five silver mining districts in Mexico on the basis of past production.

The extent of historical exploration on the property is relatively unknown. Prior to management by Endeavour Silver, production was coming from three mines without the benefit of any systematic exploration drilling, geological mapping or mine planning.

1.4 GEOLOGY AND MINERALIZATION

The Guanaceví mineral deposits occur as an epithermal low sulphidation, quartz-carbonate, fracture-filling vein hosted by a structure that trends approximately N45°W and dips 55° southwest. The fault and vein comprise a structural system referred to locally as the Santa Cruz vein structure or Santa Cruz vein fault. The Santa Cruz vein itself has been traced for 5 km along the trend and averages approximately 3.0 m in width. High-grade mineralization in the system is not continuous, but occurs in steeply northwest-raking shoots up to 200 m in strike length. A second vein is located sub-parallel and subjacent (located in the footwall) to the Santa Cruz vein but is less continuous. The footwall vein is economically significant in the Porvenir Dos zone and in the northern portion of deep North Porvenir.

The Santa Cruz vein is a silver-rich structure with lesser amounts of gold, lead and zinc. Based on historic production, mineralization has averaged 500 grams per tonne (g/t) silver and 1 g/t gold over 3 m true width. The minerals encountered are argentite-acanthite with limited gold, galena, sphalerite, pyrite and manganese oxides. Gangue minerals noted are barite, rhodonite, rhodochrosite, calcite, fluorite and quartz. The mineralization down to Level 6 in the Santa Cruz mine is mainly oxidized with a transition zone of oxides to sulphides occurring between Levels 6 to 8, although sulphide ore was mined above Level 6. Mineralization exhibits evidence of episodic hydrothermal events which generated finely banded textures. High-grade mineralization in the district is commonly associated with multiple phases of banding and brecciation. In the Porvenir Dos area and in the deeper portion of North Porvenir, a footwall-hosted vein is associated with the Santa Cruz vein structure. In both areas, this footwall vein is either within Guanaceví Formation footwall rocks or is at the structural contact between the Guanaceví Formation and Lower Volcanic Sequence andesite. It is banded to brecciated quartz plus carbonate and contains local scatterings (< 1%) of sulphides (pyrite>sphalerite >galena>chalcopyrite) and rare pods (< 50 cm) of sulphides.

1.5 EXPLORATION

Exploration data for the Guanaceví Mines project are kept on file at both the project geological/engineering and exploration offices. The data are also on file at Endeavour's exploration administration office, currently located in the city of Durango, Mexico. The data handling system includes a Microsoft Excel database, ACAD drafting software and Maptek's Vulcan deposit modeling software.

In 2009, exploration drilling at Guanaceví focused in two main areas: exploring the Santa Cruz vein structure on the Porvenir Cuatro concession so that any new mineralization could be added to the mine plan for development and production; and discovering new high-grade silver-gold-base metal mineralized zones in the San Pedro area north of the Porvenir mine that have the potential to develop future resources and production.

During 2009, Endeavour Silver completed 13,560 m of drilling in 45 surface diamond drill holes at Porvenir Cuatro and San Pedro. A total of 4,568 samples were collected and submitted for assay.

In the third quarter of 2009, a diamond drilling program was initiated in the North Porvenir mine. The program consisted of one surface rig and one underground rig. By the end of 2009, 5,664 m were drilled in 10 surface drill holes (4,232 m) and 7 underground drill holes (1,432 m).

In 2010, Endeavour Silver plans a follow-up exploration program focused on several of the new discoveries made in the San Pedro sub-district near Endeavour's mining operation at Guanaceví and testing several new prospective targets within the district. The primary long-term goal of this program is to expand reserves and resources and to identify properties for potential acquisition in the Guanaceví district for future growth.

The 2010 exploration program is planned to include 8,000 m of core in 25 surface diamond drill holes to test mantos, stockworks and veins in the San Pedro area in the Guanaceví district. The estimated cost of diamond drilling is US $150/m. A limited program of geological studies is also budgeted for Porvenir Cuatro in 2010.

Drilling proposed for the San Pedro area will test high grade veins as well as moderate grade mantos and one larger stockwork zone of silver-lead-zinc mineralization, all within an area measuring more than 1.5 km in length and 500 m across. Mineralized zones are mainly comprised of narrow veinlets of quartz, carbonate and adularia with sphalerite, galena and pyrite hosted in Tertiary-age volcaniclastic andesite.

Micon has reviewed Endeavour Silver's proposal for further exploration on its Guanaceví Mines property and recommends that Endeavour Silver conducts the exploration program as proposed subject to funding and any other matters which may cause the proposed exploration program to be altered in the normal course of its business activities or alterations which may affect the program as a result of exploration activities themselves.

1.6 RESOURCE AND RESERVE ESTIMATION

The previous resource and reserve estimate was the subject of a March, 2009, Technical Report by Micon. An updated reserve and resource estimation was prepared by Endeavour staff as of December 31, 2009, and this present report incorporates data gathered since the publication of the March, 2009, Technical Report and discusses any changes in the estimation methodologies.

The December 31, 2009 mineral resource estimates used the following parameters:

- Cut-off grade for indicated and inferred resources is 129 g/t for the Alex Breccia, Santa Cruz, Porvenir North and Provenir Dos zones. A silver equivalent cut-off grade was not used for these areas.

- Cut-off grade for indicated and inferred resources is 190 g/t silver equivalent for Porvenir Cuatro.

- Cut-off grade for indicated and inferred resources is 200 g/t silver equivalent or 50 g/t plus 3.5% lead and zinc combined for the Noche Buena and Buena Fe.

- Silver equivalents in the resource tables were estimated using a 65:1 ratio based on prices of US $17/oz silver and US $1,100/oz gold, with no base metal credits.

The December 31, 2009 mineral reserve estimates used the following parameters:

- Cut-off grade for proven and probable reserves is 222 g/t silver equivalent.
- Silver equivalents in the reserve tables were also estimated using a 65:1 ratio based on prices of US $17/oz silver and US $1,100/oz gold, with no base metal credits.

Micon has audited Endeavour Silver's updated resource and reserve estimate for the period ending December 31, 2009. The measured and indicated mineral resource estimate is presented in Table 1.1, while the inferred mineral resources are presented in Table 1.2. The mineral reserve estimate is presented in Table 1.3. The mineral reserve figures reported here are in addition to the reported mineral resources.

Table 1.1
Guanaceví Mines Project Measured and Indicated Mineral Resource Summary as at December 31, 2009

Resource Categories	Tonnes	Silver g/t	Gold g/t	Silver Equivalent g/t	Silver oz	Gold oz	Silver Equivalent oz
Measured	-	-	-	-	-	-	-
Indicated	2,173,000	255	0.53	290	17,830,000	37,100	20,244,100
Total Measured + Indicated	2,173,000	255	0.53	290	17,830,000	37,100	20,244,100

Table 1.2
Guanaceví Mines Project Inferred Mineral Resource Summary as at December 31, 2009

Resource Categories	Tonnes	Silver g/t	Gold g/t	Silver Equivalent g/t	Silver oz	Gold oz	Silver Equivalent oz
Inferred	1,431,000	209	0.36	232	9,607,200	16,400	10,674,800

Table 1.3
Guanaceví Mines Project Mineral Reserve Summary as at December 31, 2008

Reserve Categories	Tonnes	Silver g/t	Gold g/t	Silver Equivalent g/t	Silver oz	Gold oz	Silver Equivalent oz
Proven	229,000	368	0.62	408	2,706,000	4,600	3,001,800
Probable	1,083,000	354	0.51	388	12,329,200	17,900	13,494,200
Total Proven + Probable	1,312,000	356	0.54	391	15,035,200	22,500	16,496,000

The process of mineral resource and reserve estimation includes technical information which requires subsequent calculations or estimates to derive sub-totals, totals and weighted averages. Such calculations or estimations inherently involve a degree of rounding and consequently introduce a margin of error. Where these occur, Micon does not consider them to be material. The final resource and reserve figures in Tables 1.1 through 1.3 have been rounded in most cases to reflect that the numbers are estimates. Mineral resources that are not mineral reserves do not have demonstrated economic viability.

Following its review and audit, Micon is satisfied that the geology/exploration teams at Guanaceví have acquired a good understanding of the geology and mineralization controls which have an important bearing on resource estimates and future exploration efforts. Thus, the resource estimation process (in particular for new reserve/resource blocks like Porvenir Cuatro) is well supported by a good geological/mineralization model. The acquisition of the Ballmark Core Orientation System has enhanced the abilities of Endeavour Silver's exploration division in determining the geometry of the manto type deposits at Buena Fe and other structurally complex targets. Based on its data verification process, Micon is satisfied that the database used in the resource and reserve estimates is credible.

Micon has conducted an audit of the Endeavour Silver resource and reserve estimate for the period ending December 31, 2009, and considers these estimates to have been reasonably prepared and to conform to the current CIM standards and definitions for estimating resources and reserves as required under NI 43-101 regulations. Accordingly, Micon accepts Endeavour Silver's resource and reserve estimate as its basis for the ongoing mining operations at the Guanaceví Mines project. In Micon's opinion there are no significant technical, legal, environmental or political considerations which would affect the extraction and processing of the resources and reserves at the Guanaceví Mines project.

Micon believes that the land controlled by Endeavour Silver continues to be highly prospective both along strike and down dip of the existing mineralization and that further resources could be converted into reserves with additional exploration and development.

Endeavour Silver is in the position of being able to apply modern exploration concepts and technology to one of the major historical mining districts in Mexico which previously had experienced limited exploration. Therefore, Micon believes that the property continues to holds the potential for the discovery of mineralized deposits of similar character and grade as those currently being exploited or mined in the past, either along the trend of the vein or at depth below the presently exploited areas.

1.7 DEVELOPMENT AND OPERATIONS

For the year ending December 31, 2009, silver production was 1,873,833 oz compared to 1,852,969 oz in 2008, an increment of 1%, with gold production of 5,243 oz compared to 3,845 oz in 2008, an increment of 36%. Plant throughput for 2009 was 230,632 tonnes at an average grade of 322 g/t silver and 0.80 g/t gold as compared to 255,656 tonnes at an average grade of 318 g/t silver and 0.58 g/t gold during 2008. In 2009, recoveries averaged 78.4% and 88.8% for silver and gold, respectively. Production from 2005 to 2009 is summarized in Table 1.4.

Table 1.4
Summary of Production for the Guanaceví Property (2005 through 2009)

Year	Tonnes	Silver (g/t)	Gold (g/t)	Oz Silver Recovered	Oz Gold Recovered	Recovery Silver (%)	Recovery Gold (%)
2005	102,617	385	0.88	948,323	2,332	74.7	80.5
2006	117,255	449	0.90	1,352,661	2,493	80.0	73.0
2007	226,295	375	0.70	1,907,795	3,957	69.4	75.7
2008	255,656	318	0.58	1,852,969	3,845	70.9	80.7
2009	230,632	322	0.80	1,873,833	5,243	78.4	88.8
Total	**829,838**			**6,987,258**	**15,538**		

Endeavour Silver is continuing to seek additional improvements and to expand the mineral resources at it operations at the Guanaceví Mines project.

The Guanaceví Mines project produces doré silver bars. However, potentially economic base metals in new deposits currently under development (Alex Breccia and Santa Cruz) may be recovered from Endeavour Silver's re-commissioned flotation circuit.

1.8 CONCLUSIONS AND RECOMMENDATIONS

The Guanaceví Mines project, located in one of the major Mexican silver districts, has been a good acquisition for Endeavour Silver. Micon has reviewed Endeavour Silver's proposal for further exploration and has conducted its third audit of the resource and reserve estimate for the project and has accepted the estimate as correct. Micon makes the following additional recommendations to assist Endeavour Silver in its exploration and resource and reserve estimation processes:

1) Micon recommends that future budgets should include modern-day technology sampling tools to improve the quality of the underground samples used for evaluation.

2) Micon recommends that Endeavour Silver continues to develop an effective reconciliation plan for the Guanaceví Mines project. The ability to be able to reconcile the ore mined and milled on a stope-by-stope basis to the original estimates for the stope will be a critical factor in future resource and reserve estimations. The reconciliations will form the basis of reviewing dilution estimates, mining loss and gain estimates, and will assist in reviewing the classification categories of the resources.

3) Micon recommends that, as further data are generated from mining, more detailed examination of the modeling parameters should be undertaken to develop better estimation protocols.

4) Micon recommends that Endeavour Silver introduces standard procedures for its operating mines and exploration division(s) in so far as resource and reserve parameters are concerned to maintain consistency.

2.0 INTRODUCTION

At the request of Mr. Godfrey Walton, President and Chief Operating Officer of Endeavour Silver Corp. (Endeavour Silver), Micon International Limited (Micon) has been retained to provide an independent audit and review of the resources and reserve estimation for the Guanaceví Mines project in the State of Durango, Mexico. This report is an update of the previous Micon Technical Report entitled "NI 43-101 Technical Report, Audit of the Resource and Reserve Estimates for the Guanaceví Project, Durango State, Mexico" and dated March 18, 2009. The 2009 report was posted by Endeavour Silver on the System for Electronic Document Analysis and Retrieval (SEDAR). SEDAR is the filing system developed for the Canadian Securities Administrators (CSA).

This report constitutes an audit of the December 31, 2009, mineral resource and reserve estimate conducted on the project by Endeavour Silver. The audit was conducted to ensure that these estimates complied with the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) standards and definitions required under Canadian National Instrument 43-101 (NI 43-101) regulations.

The geological setting of the property, mineralization style and occurrences, and exploration history were described in Technical Reports that were prepared by Endeavour Silver (2008), Micon (2007 and 2009), Range Consulting (2006), Watts, Griffis and McOuat Limited (WGM) (2005), and in various government and other publications listed in Section 21 "References". The relevant sections of those reports are reproduced herein.

Endeavour Silver has completed 19,187 m of surface and underground diamond drilling on the Guanaceví Mines project since the most recent Technical Report was issued in March, 2009. The exploration drilling program to December 31, 2009 is discussed in Section 11.

All currency amounts are stated in US dollars or Mexican pesos, as specified, with costs and commodity prices typically expressed in US dollars. Quantities are generally stated in metric (SI) units, the standard Canadian and international practice, including metric tons (tonnes, t) and kilograms (kg) for weight, kilometres (km) or metres (m) for distance, hectares (ha) for area, grams (g) and grams per metric tonne (g/t) for gold and silver grades (g/t Au, g/t Ag). Wherever applicable, any Imperial units of measure encountered have been converted to Système International d'Unités (SI) units for reporting consistency. Precious metal grades may be expressed in parts per million (ppm) or parts per billion (ppb) and their quantities may also be reported in troy ounces (ounces, oz), a common practice in the mining industry. Base metal grades may be expressed as a percentage (%). Table 2.1 provides a list of the various abbreviations used throughout this report. Appendix A contains a glossary of mining terms.

Micon previously visited Endeavour Silver's Guanaceví Mines project from December 15 to 18, 2006, and September 6 to 9, 2008. Micon's latest site visit occurred between November 20 and 22, 2009.

Table 2.1
List of the Abbreviations

Name	Abbreviations	Name	Abbreviations
BSI Inspectorate	BSI	Million ounces	Moz
Canadian Institute of Mining, Metallurgy and Petroleum	CIM	Million years	Ma
Canadian National Instrument 43-101	NI 43-101	Million metric tonnes per year	Mt/y
Carbon in leach	CIL	Milligram(s)	mg
Centimetre(s)	cm	Millimetre(s)	mm
Comisión de Fomento Minero	Fomento Minero	Minera Capela S.A de C.V.	Minera Capela
Day	d	Minera Planta Adelente S.A. de C.V.	Minera Planta Adelente
Degree(s)	^{o}	Minera Santa Cruz y Garibaldi S.A. de C.V.	Minera Santa Cruz
Degrees Celsius	^{o}C	North American Datum	NAD
Digital elevation model	DEM	Net present value	NPV
Dirección General de Minas	DGM	Net smelter return	NSR
Dollar(s), Canadian and US	$, CDN $ and US $	Not available/applicable	n.a.
Endeavour Gold S.A de C.V.	Endeavour Gold	Ounces (troy)	oz
Endeavour Silver Corp	Endeavour Silver	Ounces per year	oz/y
Gram(s)	g	Parts per billion	ppb
Grams per metric tonne	g/t	Parts per million	ppm
Greater than	>	Percent(age)	%
Grupo Peñoles	Peñoles	Quality Assurance/Quality Control	QA/QC
Hectare(s)	ha	Range Consulting Group, LLC	Range Consulting
Internal rate of return	IRR	Second	s
Kilogram(s)	kg	Specific gravity	SG
Kilometre(s)	km	System for Electronic Document Analysis and Retrieval	SEDAR
Less than	<	Système International d'Unités	SI
Litre(s)	L	Tonne (metric)	t
Metalurgica Guanaceví S.A. de C.V.	Metalurgica Guanaceví	Tonnes (metric) per day	t/d
Metre(s)	m	Tonnes (metric) per month	t/m
Mexican Peso	peso	Universal Transverse Mercator	UTM
Micon International Limited	Micon	Year	y
Million tonnes	Mt		

The Qualified Persons responsible for the preparation of this report and the audit of the resource and reserve estimate on the Guanaceví Mines project are Messrs. William J. Lewis, B.Sc., P. Geo. and Charley Z. Murahwi, P. Geo., MAusIMM, both of which are senior geologists with Micon based in Toronto, Dibya Kanti Mukhopadhyay, MAusIMM., a senior mineral resource geologist with Micon based in Norwich (UK) and Robert J. Leader, P.Eng., a senior mining engineer with Micon, based in Vancouver.

Micon was assisted during the visits by a number of employees and consultants working for Endeavour Silver including Barry Devlin, P. Geo., Vice President of Exploration, Ing. Luis R. Castro, Endeavour Silver's Exploration Manager based in Durango and Nick Suter, Chief Mine Geologist, Guanaceví. During the first site visit one grab sample was taken from an underground muck pile to independently verify the mineralization on the property. Further sampling was not undertaken because the independent verification of the mineralization can be conducted by reviewing Endeavour Silver's production records for the project.

Mr. Murahwi visited the Guanajuato property in both 2008 and 2009 where the underground mine workings and surface facilities were inspected, and the initial review of the database and block model for the resource and reserve estimate was performed.

The review of the Guanaceví Mines project was based on published material researched by Micon, as well as data, professional opinions and unpublished material submitted by the professional staff of Endeavour Silver or its consultants. Much of the data came from reports prepared and provided by Endeavour Silver or its Mexican subsidiary, Endeavour Gold. The review of the Quality Assurance/Quality Control protocols and resource and reserve estimation parameters was conducted during the site visits to the Guanaceví Mines project. Further review of the resource and reserve parameters and an audit of the resource and reserve estimates were undertaken in January and February, 2010, upon completion of the estimates by Endeavour Silver. The audit of the resource and reserve estimates was conducted in Micon's Toronto, Vancouver (Canada) and Norwich (UK) offices upon receipt of the block models and polygonal resource information.

Micon is pleased to acknowledge the helpful cooperation of Endeavour Silver's management and personnel, all of whom made any and all data requested available and responded openly and helpfully to all questions, queries and requests for material.

Micon does not have nor has it previously had any material interest in Endeavour Silver or related entities or interests. The relationship with Endeavour Silver is solely a professional association between the client and the independent consultant. This report is prepared in return for fees based upon agreed commercial rates and the payment of these fees is in no way contingent on the results of this report.

This report includes technical information which requires subsequent calculations or estimates to derive sub-totals, totals and weighted averages. Such calculations or estimations inherently involve a degree of rounding and consequently introduce a margin of error. Where these occur, Micon does not consider them to be material.

3.0 RELIANCE ON OTHER EXPERTS

Micon has reviewed and analyzed data provided by Endeavour Silver, its consultants and previous operators of the property, and has drawn its own conclusions therefrom, augmented by its direct field examination. Micon has not carried out any independent exploration work, drilled any holes or carried out any extensive program of sampling and assaying on the property.

Micon audited Endeavour Silver's previous December 31, 2008, resource and reserve estimate and the results were published in a Technical Report dated March 18, 2009. The March, 2009 estimates has been superseded by a new resource and reserve estimate which was completed by Endeavour Silver in early January, 2010 but has an effective date of December 31, 2009. The December 31, 2009, estimates conform to the presently accepted industry standards and definitions for resource and reserves estimates and are compliant with the CIM definitions required by NI 43-101 and, therefore, are reportable as mineral resources and reserves by Endeavour Silver.

While exercising all reasonable diligence in checking, confirming and testing it, Micon has relied upon Endeavour Silver's presentation of the project data in formulating its opinion.

Micon has not reviewed any of the documents or agreements, under which Endeavour Silver holds title to the Guanaceví project or the underlying mineral concessions and Micon offers no opinion as to the validity of the mineral titles claimed. A description of the properties, and ownership thereof, is provided for general information purposes only. The existing environmental conditions, liabilities and remediation have been described where required by NI 43-101 regulations. These statements also are provided for information purposes only and Micon offers no opinion in this regard.

The descriptions of geology, mineralization and exploration are taken from reports prepared by various companies or their contracted consultants. The conclusions of this report rely on data available in published and unpublished reports and information supplied by the various companies which have conducted exploration on the property, and information supplied by Endeavour Silver. The information provided to Endeavour Silver was supplied by reputable companies and Micon has no reason to doubt its validity.

The maps and tables for this report were either produced by Endeavour Silver or reproduced/derived from reports written for Endeavour Silver and the majority of the photographs were taken by two authors of this report during the Micon site visits in December, 2006, September, 2008 and November, 2009. If the illustrations or tables are derived from other sources the source is acknowledged below figure or table.

4.0 PROPERTY DESCRIPTION AND LOCATION

Since January, 2005, the Guanaceví Mines project has been owned and operated by wholly - owned subsidiary companies of Endeavour Silver of Vancouver, Canada.

4.1 PROPERTY DESCRIPTION

The Guanaceví Mines project consists of an industrial complex that includes underground silver - gold mines and a cyanidation ore processing plant in the Guanaceví mining district, Durango State, México. The ore processing facility also comprises a recently commissioned flotation circuit.

The Guanaceví Mines project is located in the Guanaceví mining district which covers an area measuring approximately 5 km northeast - southwest by 10 km northwest - southeast and contains more than 50 silver/gold mines. Although only three of the mines are presently operating, there is considerable mining experience available in the area.

Currently the Guanaceví Mines project operates at 800 t/d. This Technical Report presents current operating conditions and projections as planned by Endeavour Silver. Since acquiring the property, Endeavour Silver has initiated an aggressive program of exploration, mine preparation, cyanidation plant improvement, and equipment replacement. The Endeavour Silver production schedule includes mining and development of oxide and sulphide ore for processing in parallel circuits of cyanidation and flotation, which are anticipated to reach a combined production capacity of more than 1,000 t/d.

For the year ending December 31, 2009, silver production was 1,873,833 oz and gold production was 5,243 oz. Plant throughput for 2009 was 230,632 tonnes at an average grade of 322 g/t silver and 0.80 g/t gold. In 2009, plant recoveries averaged 78.4% for silver and 88.8% for gold.

Endeavour Silver's primary short-term goal at Guanaceví is to invest in mine development and plant improvements in order to steadily increase production. Endeavour's longer term goals are to invest in exploration, find new higher grade orebodies and, if successful, evaluate the potential for further plant expansion.

Endeavour's management recently prepared a 2010 production and exploration forecast, based on a new mine plan and new exploration targets.

4.2 LOCATION

The Guanaceví Mines project is located in the northwest portion of the Mexican state of Durango near its border with the state of Chihuahua. The location of the project is shown in Figure 4.1.

Figure 4.1
Guanaceví Mines Project Location Map

Figure provided by Endeavour Silver Corp.

The project is located 3.6 km from the town of Guanaceví, approximately 260 km northwest of the city of Durango, which is the state capital. The town of Guanaceví also gives its name to the mining district which surrounds it.

The Guanaceví Mines project is located at the approximate UTM coordinates of 401250 east and 2866500 north in zone 14 NAD 27, or 105°58'20"W longitude and 25°54'47"N latitude.

4.3 MINERAL TENURE

Endeavour Silver holds the Guanaceví Mines project through its 100% owned Mexican subsidiary Endeavour Gold Corporation S.A. de C.V. (Endeavour Gold). Endeavour Gold holds the project through its two 100% owned subsidiaries Minera Plata Adelante S.A. de C.V. (Minera Plata Adelante) and Refinadora Plata Guanaceví S.A. de C.V. (Refinadora Plata Guanaceví). At present, the project is comprised of 38 mineral concessions. See Figure 4.2 for a concession map of the Guanaceví Mines project and Table 4.1 for relevant information regarding the individual concessions. The mineral concessions are not all contiguous and vary in size, for a total property area of 1,053.80 ha. The annual 2010 concession tax for the Guanaceví properties is estimated to be approximately 205,576 Mexican pesos (pesos), which is equal to about US $16,011 at an exchange rate of 12.84 pesos to US $1.00 dollar.

In Mexico, exploitation concessions are valid for 50 years and are extendable provided that the application is made within the five-year period prior to the expiry of the concession and the bi-annual fee and work requirements are in good standing. All new concessions must have their boundaries orientated astronomically north-south and east-west and the lengths of the sides must be one hundred metres or multiples thereof, except where these conditions cannot be satisfied because they border on other mineral concessions. The locations of the concessions are determined on the basis of a fixed point on the land, called the starting point, which is either linked to the perimeter of the concession or located thereupon. Prior to granting a concession the company must present a topographic survey to the Dirección General de Minas (DGM) within 60 days of staking. Once this is completed the DGM will usually grant the concession. Most of the exploitation concessions which comprise the Guanaceví Mines project are surveyed but do not have their boundaries orientated astronomically north-south and east-west because the concessions predate the introduction of this legislation.

Endeavour Silver has resurveyed most of its property boundaries. At the writing of this report, the Aguaje group, the La Sultana and San Pedro Uno mineral concessions, and the newly acquired concessions in the Milache, San Pedro and Porvenir Cuatro areas have not been check surveyed.

Prior to December 21, 2005, exploration concessions were granted for a period of 6 years in Mexico and at the end of the 6 years they could be converted to exploitation concessions. However, as of December 21, 2005 (by means of an amendment made on April 28, 2005 to the Mexican mining law) there is only one type of mining concession. Therefore, as of the date of the amendment (April, 2005), there is no distinction between exploration and exploitation concessions on all new titles granted. All concessions are now granted for a 50 year period provided the concessions are kept in good standing. For the concessions to remain in good standing, a bi-annual fee must be paid to the Mexican government and a report must be filed in May of each year which covers the work accomplished on the property between January and December of the preceding year.

4.3.1 Property Agreements

Endeavour Silver has executed a number of agreements regarding the acquisition of the mineral properties, mining rights and processing facility which comprise Guanaceví Mines project. The details of the agreements were extensively reported in the April 16, 2007, Micon Technical Report and the March 31, 2006, Technical Report by Range Consulting.

"Sale and Purchase of Shares with Reservation of Ownership Agreement"

All obligations of this agreement have been completed.

At the writing of this report, Endeavour Silver owns 100% of the Guanaceví Mines project mine and plant through Minera Plata Adelantes' acquisition of Minera Santa Cruz y Garibaldi S.A. de C.V. (Minera Santa Cruz) and Refinadora Plata Guanaceví's acquisition of Metalurgica Guanaceví S.A. de C.V. In 2006, Refinadora Plata Guanaceví had acquired the remaining 49% interest in the Guanaceví plant through the purchase of 100% of the shares of Metalurgica Guanaceví (MG). The purchase price for 100% of the shares of Metalurgica Guanaceví was US $2.2 million.

Endeavour Silver was able to acquire an early buy-out of the remaining shares of Minera Santa Cruz, which owned 49% of the Santa Cruz silver-gold mine. In May, 2007, the Company issued 1,350,000 shares of the Company with a fair market value of US $5.04 per share to acquire the remaining 49% of outstanding shares in Minera Santa Cruz, which included the final option payment originally due in January, 2008, and 49% of the profits for 2006 and 2007.

Endeavour Silver management elected to accelerate the property buy-out in order to streamline the mining operations and facilitate additional capital investments for the mine development program. Specifically, Endeavour Silver is evaluating the development of two new mines, Alex Breccia and Santa Cruz, on the Guanaceví Mines project and the early buy-out gave the Company the required flexibility to make the capital investments in the last half of 2007.

Under the terms of the original agreement, Endeavour Silver had the option to pay to the shareholders of Minera Santa Cruz the amount of US $2,551,430 and spend US $1 million in exploration to acquire up to a 100% interest in Minera Santa Cruz in accordance with the following schedule:

(a) US $852,143 on January 28, 2005, (paid).
(b) US $423,571 on January 28, 2006, (paid).
(c) US $637,858 on January 28, 2007, (paid).
(d) US $637,858 on January 28, 2008, (paid).

"Minera Santa Cruz Shareholders' Agreement"

This agreement between the shareholders of Minera Santa Cruz and Endeavour Silver outlines the participation of the parties in the development, administration and operation of the Santa Cruz property and the mining concessions of Minera Santa Cruz and its assets. The agreement came into effect upon Endeavour Silver earning a 51% option interest in Minera Santa Cruz by the payment of US $852,143 on January 28, 2005.

This agreement was completed in May, 2007, granting Minera Plata Adelante 100% interest in the exploitation and exploration rights.

"Minera Santa Cruz Assignment of Mining Concession Rights Agreement"

This agreement between Minera Santa Cruz and Endeavour Silver involves the transfer of Minera Santa Cruz's rights, interests and title in its mining concessions to Endeavour Silver in consideration for US $448,571. Of this amount, US $428,571 was paid, as required by the agreement, prior to May 17, 2004, and US $5,000 was to be paid annually on January 28, 2005, 2006, 2007 and 2008. Upon payment of US $5,000 on January 28, 2005, Endeavour Silver earned an undivided option interest of 51% in Minera Santa Cruz's mining concessions with Minera Santa Cruz retaining the remaining 49% interest, until January 28, 2006. On January 28, 2006, Endeavour Silver paid US $5,000 in order not to relinquish its 51% interest in the mining concessions. Upon payment of US $5,000 on January 28, 2006, no further payments were required by Endeavour Silver to maintain its 51% interest. Endeavour Silver had the option to increase its interest from 51% to 100% by payments of US $5,000 on January 28, 2007 and another US $5,000 on January 28, 2008."

This agreement was completed in May, 2007, granting Minera Plata Adelante 100% interest in these mining concessions.

"Contract for Transfer of Rights and Obligations and Sale and Purchase of Assets"

In June, 2005, Endeavour Silver signed this agreement with Minera Capela S.A. de C.V., (Minera Capela) for the transfer of rights and obligations on mining concessions which cover 9 properties from Minera Capela to Endeavour Silver. Minera Capela retains a 3% net proceeds royalty. In consideration Endeavour Silver issued 1,000,000 units at a deemed price of CDN $1.60 per unit. Each unit is comprised of one common share and one share purchase warrant with an exercise price of CDN $2.10 until July 22, 2006 and CDN $2.30 thereafter until July 27, 2007.

"Contract for Transfer of Rights"

In July, 2005, Endeavour Silver through its subsidiary Minera Plata Adelante signed an option agreement for the transfer of rights from mining concessions relating to two properties, namely Porvenir Dos and La Sultana. In consideration, Endeavour Silver paid US $137,500 according to the following schedule:

(a) US $25,000 upon signing of agreement, (paid).
(b) US $12,500 on December 30, 2005, (paid).
(c) US $100,000 on December 30, 2006,(paid)

In August, 2005, Endeavour Silver through its subsidiary Minera Plata Adelante signed an option agreement for the exclusive right to investigate and to explore 4 properties known as the La Prieta Group. In consideration, Endeavour Silver paid US $100,000 as follows:

(a) US $15,000 on ratification date, (paid).
(b) US $15,000 by six months of ratification date, (paid).
(c) US $70,000 by twenty-four months of ratification date, (paid).

Both of these agreements were completed in 2007, granting Minera Plata Adelante 100% interest in these mining concession rights.

"Option-to-Purchase Agreements – San Pedro District"

In 2007, Endeavour Silver announced acquisition of two new exploration property positions in the Guanaceví district. The new acquisitions, Milache and San Pedro, are both located in the San Pedro sub-district of the Guanaceví mining district. In addition to the concessions already held (San Pedro Uno and La Sultana), Endeavour now controls approximately 456 hectares in the San Pedro area (Table 4.1). These property acquisitions have excellent exploration potential but do not have an immediate impact on Endeavour Silver's mine operation at Guanaceví.

The Milache properties (74.2 ha) are located along the trend of the Santa Cruz silver vein approximately 2 km northwest of the operating Porvenir mine (Figure 4.2). The properties consist of the El Milache, El Desengaño and Veronica concessions (Table 4.1). They were acquired from Francisco Barraza on November 27, 2007. Endeavour Silver can acquire a 100% interest by paying $50,000 and issuing 30,000 shares upon signing the agreement and paying US $50,000 after 18 months.

The 15 San Pedro properties, totaling 330 ha, are located about 6 km northwest of the Porvenir mine (Table 4.1; Figure 4.2). On December 12, 2007, Endeavour Silver acquired an option to purchase a 100% interest in the San Pedro properties from Ignacio Barraza Duarte by paying 120,000 common shares and issuing 60,000 warrants to purchase 60,000 shares at US $4.69 within a 1 year period upon receipt of regulatory approval and a further 570,776 shares within a 24 month period. Final payment is pending and is expected to be made in 2010. The vendor will retain a 1% net smelter royalty on mineral production. In addition, the Company will provide the vendor with up to US $400/m to advance the Buena Fe adit (Nacho Barraza's tunnel) during the 24 month option period. Any ores produced from this tunnel will be used to repay Endeavour Silver's investment, after which the net profits will be shared equally (50/50) with the vendor. In this way, Endeavour Silver anticipates generating positive cash flow to help pay for the exploration programs on the properties.

"Contract of Assignment of Mining Exploitation Rights"

In October, 2005, an agreement was executed between Minera Tayahua, S.A. de C.V. (Minera Tayahua) and Endeavour Silver through its subsidiary Minera Planta Adelante. The agreement provided for the exclusive right to explore and to mine the El Porvenir property. Under the lease agreement, Endeavour Silver agreed to mine El Porvenir at a rate between 9,000 tonnes and 27,000 tonnes per quarter and to pay a 3% net smelter royalty from production. Endeavour Silver was also committed to incur a minimum of US $100,000 for each quarter in expenditures for exploration, development and mining.

Endeavour Silver held the exclusive right to mine the El Porvenir property for a 5-year period, however the agreement included a clause that either party can terminate the contract in advance, without indicating cause, communicating the termination date at least 2 years before the effective date of the termination. On August 16, 2006, Endeavour Silver received a letter indicating contract termination as of August 31, 2008. Endeavour Silver mined the El Porvenir property until August 30, 2008.

Figure 4.2
Guanaceví Mines Project Mineral Concessions Map

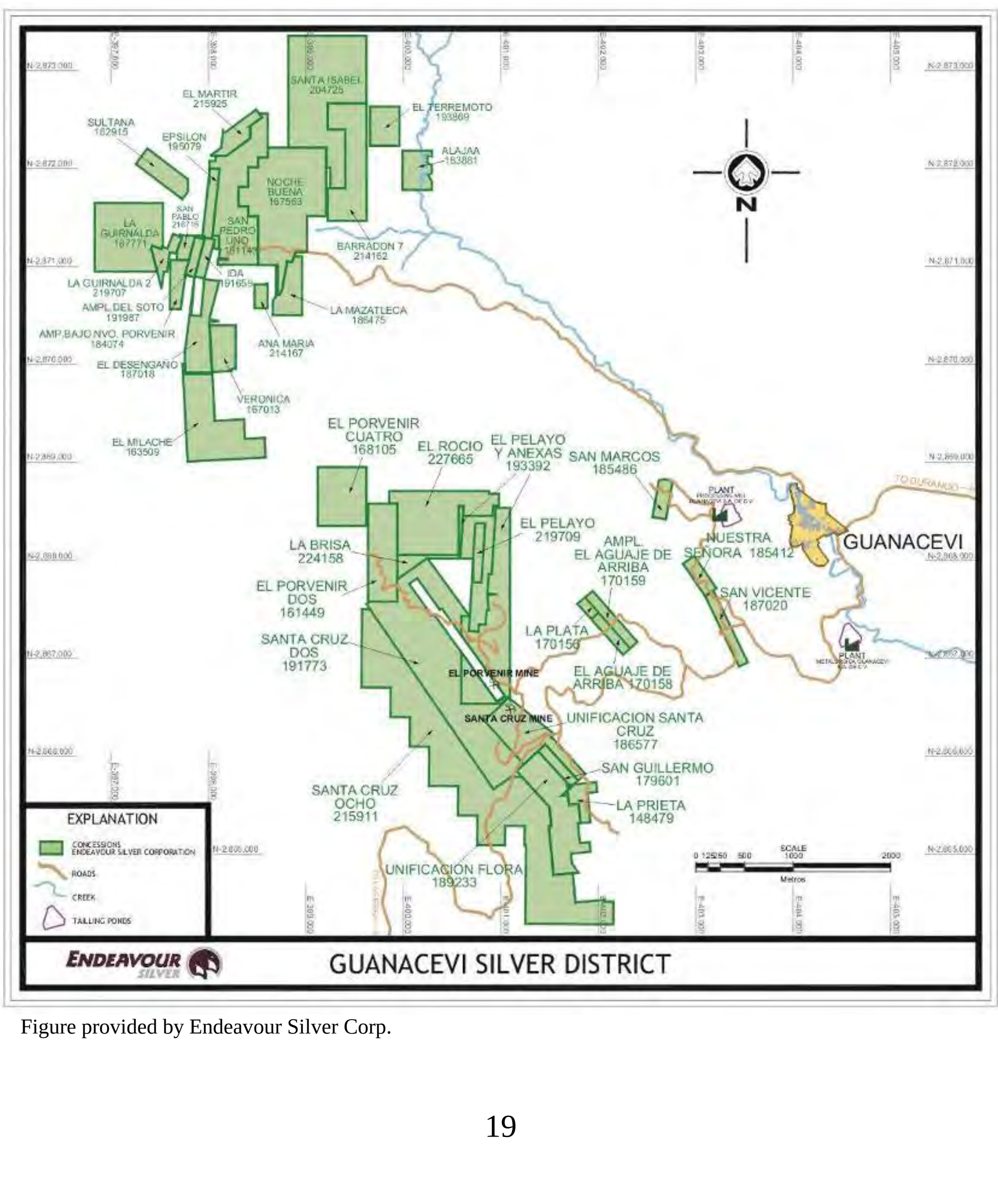


Figure provided by Endeavour Silver Corp.

Table 4.1
Guanaceví Mines Concessions Controlled by EndeavourSilver

Concession Name	Title Number	Term of Mineral Concession		Hectares	2010 Annual Taxes (Pesos)	
		From	To		1st Half	2nd Half
SANTA CRUZ DOS	191773	19/12/91	18/12/41	113.5387	13,265	13,265
EL PELAYO Y ANEXAS	193392	19/12/91	18/12/41	56.2519	6,572	6,572
UNIF. SANTA CRUZ	186577	24/04/90	23/04/40	28.5896	3,340	3,340
SAN GUILLERMO	179601	11/12/86	10/12/36	5.0000	584	584
UNIFICACION FLORA	189233	05/12/90	04/12/40	36.5506	4,270	4,270
SAN MARCOS	185486	14/12/89	13/12/39	5.5469	638	638
SAN VICENTE	187020	29/05/90	28/05/40	8.0000	935	935
NUESTRA SENORA	185412	14/12/89	13/12/39	5.6000	654	654
SAN PEDRO UNO	191143	29/04/91	28/04/41	49.8437	5,823	5,823
SANTA CRUZ OCHO	215911	19/03/02	18/03/52	165.6279	10,995	10,995
EL PELAYO	219709	03/04/03	02/04/53	5.8881	196	196
EL PORVENIR DOS	161449	10/04/75	09/04/25	30.0000	3,505	3,505
LA SULTANA	162915	08/08/78	07/08/28	11.5889	1,354	1,354
EL AGUAJE DE ARRIBA	170158	17/03/82	16/03/32	5.0000	584	584
A. EL AGUAJE DE ARRIBA	170159	17/03/82	16/03/32	7.0000	818	818
LA PLATA	170156	17/03/82	16/03/32	2.0000	234	234
LA PRIETA	148479	29/10/67	28/10/17	7.0000	818	818
EL MILACHE	163509	10/10/78	09/10/28	42.8866	5,011	5,011
VERONICA	167013	11/08/80	10/08/30	11.7648	1,375	1,375
EL DESENGAÑO	187018	29/05/90	28/0540	19.4747	2,275	2,275
EL ROCIO	227665	28/07/06	27/07/56	51.2334	409	409
AMPL. AL BAJO DEL NVO. P.	184074	15/02/89	14/02/39	7.3062	854	854
LA MAZATLECA	186475	02/04/90	01/04/40	14.1797	1,657	1,657
LA GUIRNALDA	187771	17/09/90	16/09/40	46.7611	5,463	5,463
LA GUIRNALDA 2	219707	03/04/03	02/04/53	5.9915	199	199
SAN PABLO	216716	28/05/02	27/05/52	3.3972	226	226
ANA MARIA	214167	10/08/01	09/08/51	3.2320	215	215
EL MARTIR	215925	02/04/02	01/04/52	8.8675	589	589
AMPL. DEL SOTO	191987	19/12/91	18/12/41	3.9998	467	467
IDA	191659	19/12/91	18/12/41	4.9086	573	573
EPSILON	195079	25/08/92	24/08/42	7.0622	825	825
EL TERREMOTO	193869	19/12/91	18/12/41	12.0000	1,402	1,402
ALAJAA	183881	23/11/88	22/11/38	11.2050	1,309	1,309
BARRADON 7	214162	10/08/01	09/08/51	37.1376	2,465	2,465
SANTA ISABEL	204725	25/04/97	24/04/47	84.0000	9,814	9,814
NOCHE BUENA	167563	26/11/80	25/11/30	79.8962	9,335	9,335
EL PORVENIR CUATRO	168105	13/02/81	12/02/31	30.0000	3338	3338
LA BRISA	224158	19/04/05	18/04/55	25.5518	402	402
	TOTALS			**1,053.8023**	**102,788**	**102,788**

Table provided by Endeavour Silver Corp.

"Mining Exploration and Option Agreement"

On February 9, 2009, Endeavour Silver entered into a mining exploration agreement with Minerales Monte Blanco S.A. de C.V. (Minerales Monte Blanco), represented by Sergio Enrique Silva Franco, on the El Porvenir Cuatro and La Brisa concessions totaling approximately 55.5518 ha. The El Porvenir Cuatro and La Brisa agreement is an option to earn 100% of these properties over two years for a total consideration of US $700,000. The first payment is US $100,000 cash on signing and US $200,000 in shares based on the 10 day average price before the signing date of February 9, 2009. The subsequent payments are 12 months from signing with US $240,000 as shares again based on the average price 10 days prior to February 9, 2010; the final payment is due on or before February 9, 2011 and consists of a payment of US $160,000 either as cash or shares.

In February, 2010, Endeavour Silver exercised its option to purchase the El Porvenir Cuatro and La Brisa properties. Endeavour Silver has now acquired a 100% interest in the Porvenir Cuatro and La Brisa properties by paying a total consideration of US $700,000 to the vendors, consisting of US $100,000 cash and 136,054 shares on signing the option agreement and an additional 71,428 common shares and US $160,000 cash on the early exercise of the option to purchase.

"Compensation and/or Indemnification Contract for the Temporary Occupation of Cooperative Land"

In November, 2005, Endeavour Silver entered into an agreement, with the local Ejido for the temporary surface access rights to certain land for the purpose of exploration in areas covered by the mining concessions. In consideration, Endeavour Silver will pay an annual fee of Mexican pesos 10,000 which will increase by the rate of inflation plus 2% for a term of 15 years.

Since the Guanaceví Mines project is composed of a number of exploitation concessions upon which mining has previously been conducted, all of the exploration work continues to be covered by the environmental permitting already in place and no further notice of work is required by any division of the Mexican government.

In order to begin an exploration program on an exploitation concession upon which no substantial mining has been conducted, Endeavour Silver would be required to file a "Notice of Initiation of Exploration Activities" with the local authorities to inform them of the scope and environmental impact of the exploration work. Also, other permits, such as a permit to use the local municipal garbage dump, may be required.

Endeavour Silver reports that it is current in meeting the legal obligations and requirements of Mexican mining and environmental laws and regulations including assessment work, property taxes and operating permits.

4.4 PROPERTY OWNERSHIP

In addition to the mineral rights, Endeavour has agreements with various private ranch owners and a local Ejidos (El Hacho and San Pedro) that provide access for exploration and exploitation purposes.

4.5 ENVIRONMENTAL, PERMITS AND APPROVALS

Endeavour Silver reports that it is in compliance with monitoring environmental aspects and with applicable safety, hygiene and environmental standards to maintain the balance of the ecosystem.

4.5.1 Safety

During 2009, advances continued in safety at Guanaceví with 1,912 hours of training undertaken at the mines. A new safety building was constructed in 2008 and a safety manager was hired as well as promoting a mine rescue trainer. A fully functional mine rescue team is on site with 16 people trained. Mine rescue training is ongoing but included first aid, fire fighting, ventilation, use of Draeger re-breathing equipment, knots, mine exploration, practical mine recovery and smoke scenarios. In 2009, there were 5 lost time accidents as opposed to 13 lost time accidents in 2008.

The safety department undertakes all inductions of new personnel to train them in the basics of mine and plant safety and also monitors housekeeping and sign installation. Safety talks are given at the beginning of each shift to reinforce safety in the workplace. Safety training at the mines includes the Five Point Safety method, first aid, use of PPE (personal protective equipment – helmet, safety glasses, steel toe boots, gloves, hearing protection), explosives handling, barring down and identification of areas requiring support, identification of risks, lock-out/tag-out of equipment, prevention and fighting of fires, fetid gas and practical mine evacuation training (undertaken without notice during a working shift), dust in the workplace. Similarly, the plant safety training includes Five Point Safety, cyanide handling, correct use of tools, working in confined spaces, crushing and milling risk identification, fire fighting and laboratory safety as well as work at elevated heights and welding hazards.

Also during 2009 detailed safety audits began that include management and workers undertaking audits, taking photographs of the issues, and assigning someone to fix each issue within a time limit. These activities are ongoing. In 2009, some new aspects to safety were introduced, including the Safety Monitor system under which 10% of the workforce is trained in additional safety elements with the intent that they become their “brother’s keeper” aiding the safety department by being more active in the workplace. Safety is also an element in the production bonus system. In 2009, management introduced the Chairman’s and President’s Safety Awards (annual and quarterly safety awards) to help incentivize all personnel to work safely.

4.5.2 Environmental

At Guanaceví housekeeping improvements continued to be made in 2009, a plant nursery was completed and a program to plant trees in cooperation with the local schools was implemented. The tree planting program will assist in raising environmental awareness within the community through hands on experience. Tree planting was carried out within the community, tailings area and various sites in and around the mine. Potable water is treated on site and the quality is monitored and certified within the acceptable purity limits necessary for human consumption. In-house and external environmental audits by SERMARNAT and PROFEPA were undertaken, with 100% compliance achieved in 2008. The Guanaceví operation has obtained the Licencia Ambiental Unica (LUA) which identifies that the company is in compliance with all Mexican environmental regulations.

In 2009, Endeavour obtained the authorization for the tailings expansion and for a new road around the tailings expansion which will replace the existing one. Permits and authorization were also obtained for the ventilation raise at Porvenir Dos and the access roads, mine patio and ventilation raise at Porvenir Cuatro.

5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 ACCESSIBILITY

The Guanaceví properties are readily accessible from the city of Durango, capital of the Mexican state of Durango, via paved roads. Access is primarily gained by taking Mexican State Highway 45 north to the town of Canatlan then continuing along the paved highway that connects to Santiago Papasquiaro, then to Tepehuanes, and ending at the town of Guanaceví. The total distance between Durango and the town of Guanaceví is approximately 320 km and requires about four and one half hours drive. The city of Durango is an old colonial city (founded in 1563) which served as the political and ecclesiastical capital of the Nueva Vizcaya province of New Spain until 1823. Minerals are the chief product but the city is also an agricultural, commercial and tourist centre. The city has approximately 427,000 inhabitants (2000) and is the closest major population centre to Guanaceví. Durango has an international airport with numerous regional flights to other major Mexican cities as well as international flights to Los Angeles and to the southeast USA.

The Guanaceví properties lie 3.6 km from the town of Guanaceví which was founded in 1535. From the town of Guanaceví, a well conditioned dirt road leads southwards a few kilometres to the flotation and cyanidation plant and Endeavour offices and then an additional 5 km further to the Santa Cruz and Porvenir mines. Figure 5.1 is a view of part of the town of Guanaceví from the road leading to the Santa Cruz and Porvenir mines. Figure 5.2 is a view of the terrain in the area of mine and mill facilities.

The population of Guanaceví is approximately 2,000, and the town has all modern amenities, including primary schools and a secondary school (high school), various stores, restaurants and a three star hotel. Although the town does not have a bank, it does have a "casa de cambio" (foreign exchange house) and an ATM machine. The town, mine and plant are connected to the national land-base telephone system that provides reliable national and international direct dial telephone communications as well as stable internet connections and satellite television. Guanaceví has a small airport with a 1,000 m long dirt airstrip capable of handling light aircraft.

Although various people are engaged in town services, the town is economically dependent on the mining and milling operations within the district.

5.2 INFRASTRUCTURE

The industrial water for the plant is recycled, with the make-up water (60,000 m^3/year of fresh water) from a nearby underground mine. Electrical power from the Federal Power Authority (34 kV) supplies both the plant and mine.

Figure 5.1
Partial View of the Town of Guanaceví

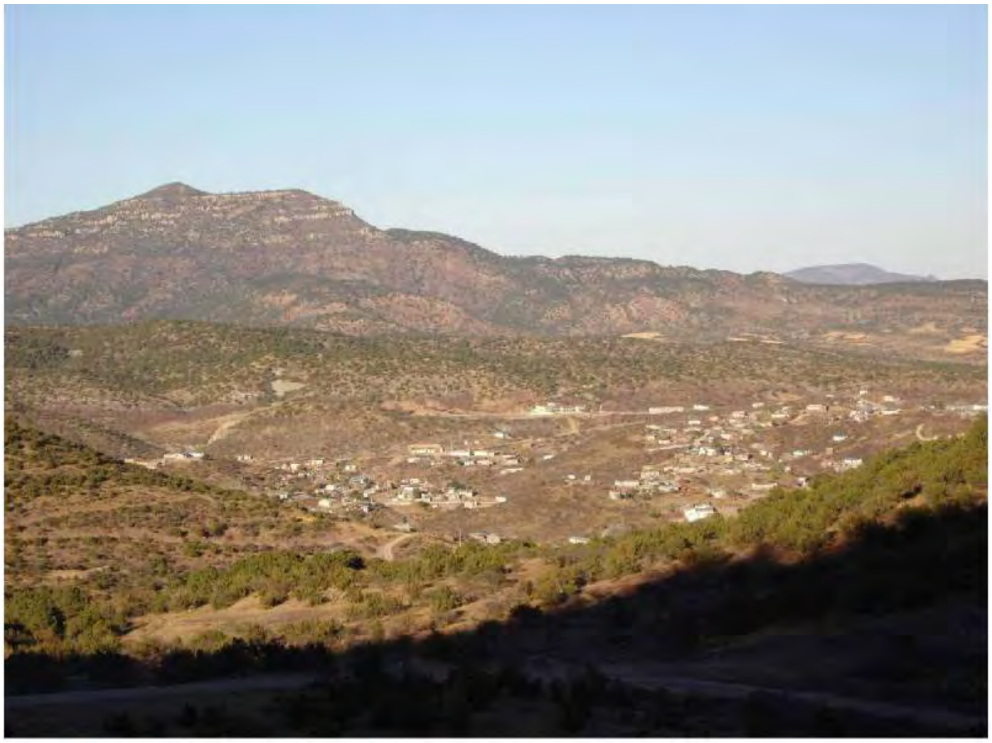


Figure 5.2
View of the Terrain between the Area of Mine and Mill Facilities at Guanaceví

Endeavour Silver is currently assessing its existing tailings area but believes that there is sufficient area for many years of production. Endeavour Silver has also negotiated access and the right to use surface lands sufficient for many years of operation.

5.3 CLIMATE, VEGETATION

The dry season is from October through June with the wet season from July to September. The total average annual rainfall varies from about 65 to 105 mm. Winter temperatures vary from a maximum of 15°C to a minimum of -1.4°C, while summer temperatures range from a minimum of 20°C to a maximum of 30°C. The climate poses no limitations to the length of the operating season. Freezing temperatures can occur overnight but quickly warm to above freezing during daylight hours. Occasional snow does occur in the area but quickly melts on all but the most protected slopes.

The mountains are predominately covered with evergreen forests around Guanaceví. Wildlife in the area consists of deer, badger, foxes, coyotes, squirrels, rabbits and mice.

5.4 PHYSIOGRAPHY, HYDROLOGY

The town of Guanaceví is located on the altiplano at about 2,170 m elevation, east of the Sierra Madre Occidential mountain range within low, rounded mountains showing a relief of about 650 m from the valley bottoms near 2,100 m to the crests at 2,750 m.

5.5 LOCAL RESOURCES

At each of the mine sites, the water required is supplied from the dewatering of the mines. The tailings facility at the plant is set up to recycle all water back into the ore processing plant.

Apart from offices, warehouses and other facilities, Endeavour Silver also provides dormitories and limited housing facilities for employees working on a rotational work schedule. Much of the labour work force lives in Guanaceví and nearby communities. The area has a rich tradition of mining and there is an ample supply of skilled personnel sufficient for both the underground mining operations and the surface facilities.

6.0 HISTORY

6.1 GUANACEVÍ MINING DISTRICT AND THE GUANACEVÍ PROPERTY

Mining has played an important role in Mexico since pre-historic times, but it entered a period of rapid expansion after the Spanish conquest when rich mineral deposits were found. The wealth found in these early mines served as incentives for the early colonizers to locate to remote and barely accessible portions of the county.

It is not known if the indigenous peoples or the Spanish colonists first began mining in the Guanaceví district but mining extends back to at least 1535 when the mines were first worked by the Spanish. By the start of the 18th century, Guanaceví had become an important mining centre in the Nueva Vizcaya province of Nueva España (New Spain) as reported by Alexander von Humboldt in his travels through Nueva España. However, the Guanaceví mining district is not as well known today.

6.2 HISTORICAL EXPLORATION TO DECEMBER, 2008

The extent of historical exploration on the property is relatively unknown. Prior to management by Endeavour Silver, production was coming from three mines without the benefit of any systematic exploration drilling, geological mapping or mine planning.

At the start of the 1960's Engineer P. Sanchez Mejorado of Peñoles recommended more exploration to prove up the resource estimate of 360,000 t grading 500 g/t silver at the time. Engineer P. Sanchez Mejorado mapped and sampled the mine underground and recommended diamond drilling below Level 13. This drilling was completed in 1983, with a reported additional 229,000 t outlined grading 1.20 g/t gold and 525 g/t silver over an average thickness of 4.66 m.

Watts, Griffis and McOuat Limited (WGM) noted in its 2005 Technical Report that "The exploration works conducted by Peñoles consisted of channel sampling across the mineralized zone coupled with short lateral winke diamond drill holes (diameter approximately 1 inch) from the vein structure workings and detailed surveying and geological mapping of the underground workings. The limited exploration by Peñoles was well conducted, and blocked out several areas of potential resources." However, WGM stated further that it believed that more than half of the areas of potential resources except for those below the water table (below Level 13) had been mined out.

Pan American Silver Company (Pan American) conducted an eight-month evaluation program in 2003 that consisted of an extensive, systematic, underground channel sampling and surveying program and the drilling of three diamond drill holes in the North Porvenir area, holes SSC-01, SSC-02 and SSC-03.

Since taking over in 2004 through December 31, 2009, Endeavour Silver has completed 384 diamond drill holes totalling 97,094 m and 22 reverse circulation drill holes totaling 2,977 m on the entire Guanaceví Mines project. More than 25,000 samples have also been collected and submitted for assay.

Of this total, approximately 75,643 m of diamond drilling in 279 holes have been completed on the Santa Cruz vein structure in the Porvenir mine area (Table 6.1). Holes were drilled from both surface and underground drill stations.

Figures 6.1 and 6.2 are a composite drill hole plan map and a long section of the Santa Cruz vein on the Guanaceví property showing the drill hole coverage for the four areas of interest in the mine for further exploration, as well as further extraction of any economic mineralization.

Table 6.1
Drilling Summary for Santa Cruz Vein Structure at Guanaceví Mines Project (through December, 2009)

Project	Diamond Drill Holes	Metres
North Porvenir	150	43,916
Porvenir Dos	24	5,062
La Prieta	31	9,176
Santa Cruz	48	12,412
Alex Breccia	16	3,103
Total	**279**	**75,643**

Table provided by Endeavour Silver Corp.

Figure 6.1
Composite Drill Hole Plan Showing the Drill Hole Coverage of the Santa Cruz Vein for the Guanaceví Mines Project

Figure provided by Endeavour Silver Corp.

Figure 6.2
Long Section Showing Drill Hole Coverage for the Santa Cruz Vein of the Guanaceví Mines Project

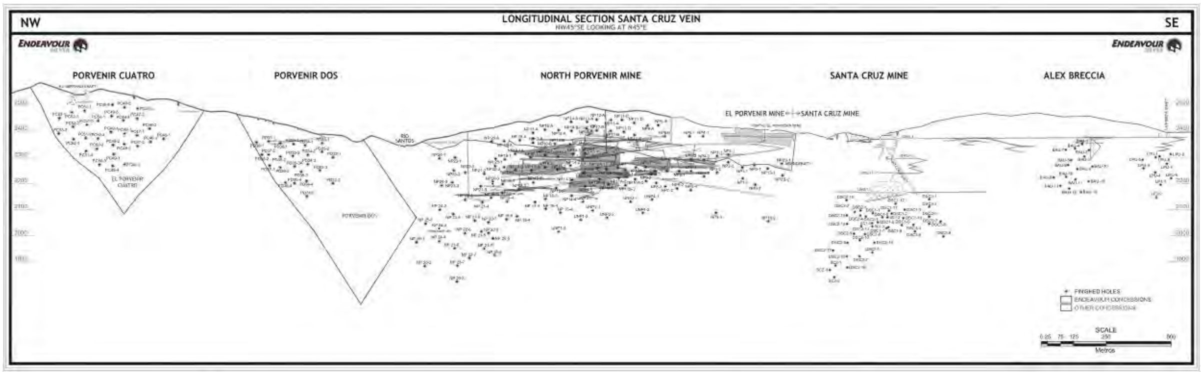


Figure provided by Endeavour Silver Corp.

6.3 HISTORIC MINING

Historic mining was reported in both the April 16, 2007 and March 18, 2009, Micon Technical Reports and is reproduced here for the sake of continuity.

The Guanaceví mining district and the Guanaceví project area are riddled with mine openings and old workings, in a somewhat haphazard fashion near surface, representing the earliest efforts at extraction, and more systematic at depth, which is indicative of later, better organized and engineered mining. Associated with these openings and workings is a number of ruins, which represent the mine buildings, chapels and residences of the inhabitants and indicate the wealth of the mining district during its past. See Figure 6.3 for a photograph of an old mine waste dump located in the trees, alongside the road to the Santa Cruz and Porvenir mines.

The vast bulk of the material which has been extracted from underground operations through the tunnels, shafts and winzes is scattered over the hillsides in waste dumps and beneath the foundations of the ruins and modern buildings. Historically, individual veins or deposits had separate owners and, in the case of some of the larger veins or deposits, had several owners along the strike length which resulted in a surfeit of adits and shafts and very inefficient operations.

The mines within the Guanaceví mining district have been developed primarily by using open stope/shrinkage and cut and fill underground mining methods. Both the ground conditions, which vary from good to poor, and the deposit geometries tend to favour the higher cost, cut and fill mining method with development waste used for backfill.

Figure 6.3
Old Mine Waste Dump Located alongside the Road to the Santa Cruz and Porvenir Mines

6.4 HISTORIC PRODUCTION

Historic production was reported in both the April 16, 2007 March, 18, 2009, Micon Technical Reports and is reproduced here for the sake of continuity.

Mining in the Guanaceví district extends back to at least 1535 when the mines were first worked by the Spanish.

During the late sixteenth century silver production accounted for 80% of all exports from Nueva España (New Spain), although, by the mid-seventeenth century silver production collapsed when mercury, necessary to the refining process, was diverted to the silver mines of Potosí in present day Bolivia. Collapse of the seventeenth century mining led to widespread bankruptcy among the miners and hacienda owners; however, in the latter half of the seventeenth century silver mining began to recover in Nueva España. By the start of the 18th century, Guanaceví had become an important mining centre in the Nueva Vizcaya province.

The peasant uprisings of 1810 to 1821 were disastrous to the Mexican mining industry with both the insurgents' soldiers and royalist troops all but destroying the mining production in Mexico, and the Guanaceví mining district was not spared during this period.

The district has experienced several periods of bonanza-grade production including the operation of a mint in 1844. The Guanaceví mining district, however, reached its greatest period of activity at the start of the 20th century when five processing plants were in operation and more than 15 mines were in production.

J.R. Southworth in his 1905 volume entitled "The Mines of Mexico" mentions that Guanaceví is a very rich district and "that many of the largest capitalists of New York have enormous interests in its mines". Southworth mentions that the Barradán, Hacienda Wilson, El Carmen, Nueva Australia and Hacienda Avila were all good mines and properties within the Guanaceví mining district. However, Southworth also mentioned that "considering the large number of once famous properties in Guanaceví, there are comparatively few now in operation. The cessation of development has been due to various causes, though usually not from lack of ore."

The vast majority of production came prior to the 1910 Mexican Revolution with the Guanaceví mining district being known for its high silver grades. Previous reports noted that the official production records indicate that a total value of 500 million pesos equivalent to approximately 500 million ounces of silver and silver equivalents, with a present day value of about US $3.25 billion, had been extracted from this mining district. This makes the Guanaceví district one of the top five silver mining districts in Mexico on the basis of past production.

Since the 1910 Revolution, production has been sporadic. The Guanaceví Mining Company operated from the 1930s until production ceased in 1942. Daily output was approximately 110 tonnes per day (t/d).

In the 1970s, the Comisión de Fomento Minero (Federal Mining Commission) (Fomento Minero), a Federal government agency charged with the responsibility of assisting the small-scale Mexican mining industry, constructed a 400 t/d flotation plant, now the Metalurgica Guanaceví plant. The plant has been expanded over time to its present capacity of 800 t/d for the cyanide circuit. In the early 1990s, Fomento Minero started construction of a 600 t/d cyanide leach plant but construction ceased when it was only 30% complete due to the lack of funding.

In 1992, Metalurgica Guanaceví, a private company, purchased the Fomento Minero facilities and completed the construction of the leach plant. During 2002, total plant production included 170 t/d to 250 t/d coming from the three mines: Santa Cruz, Barradon and La Prieta mines, with approximately 700 to 800 t/d of additional feed purchased from other small scale operations.

Prior to Endeavour Silver management, production was coming from three mines without the benefit of any systematic exploration drilling, geological mapping or mine planning. During the 1920s, Peñoles Mining Company (Peñoles) purchased several mines including the Santa Cruz mine, where from 1921 to 1924 the 330 m inclined shaft and several kilometres of underground workings on Levels 6, 7, 8, 10, 11 and 13 were developed that partially explored the vein ore shoots. However, the exploration results gave little promise to Peñoles at that time. The mine entered into a passive state and Peñoles rented the mines to various contractors who have, up to 2005, slowly mined the more accessible mineralization.

In 2004, Endeavour Silver completed a final agreement with the Mexican partner that owned the Metalurgica Guanaceví plant and shareholders of Minera Santa Cruz y Garibaldi S.A. de C.V. (Minera Santa Cruz) to take over the Santa Cruz mine. Ramping was initiated in 2004 to intersect the area where Pan American Silver had drilled three holes in North Porvenir – El Porvenir area. In six months, diamond drilling was initiated to outline the area, the ramp was driven and approximately 10,000 t were mined from this new zone. Through 2005, approximately 1,524 m of ramping, 1,122 m of drifting and 466 m of raising were completed and 102,617 t were milled.

While it is evident that historical production has occurred in the Guanaceví mining district since pre-colonial times and early production records from the Spanish colonial period probably exist in the Archive of the Indies (Archivo des Indies), in Seville, Spain, in the records of the Viceroyalty of Mexico or in the records for Vizcaya province of Nueva España, Micon did not have access to any historical records of the actual silver and gold production.

Historical production for the years 1991 to 2003, at the Guanaceví Mines project, prior to Endeavour Silver's involvement, is roughly estimated in Table 6.2.

Table 6.2
Summary of the Production for the Guanaceví Property (1991 to 2003)

Year	Tonnes	Silver (g/t)	Gold (g/t)
1991 (from July)	2,306 (est.)	470 (est.)	1.0 (est.)
1992	10,128	340 (est.)	1.3 (est.)
1993	12,706	320 (est.)	0.8 (est.)
1994	18,256	190 (est.)	0.5 (est.)
1995 (until May)	5,774	280 (est.)	0.5 (est.)
1996	11,952	315	0.74
1997	13,379	409	0.87
1998	11,916	550	0.92
1999	6,466	528	0.84
2000	18,497	538	1.01
2001	13,150	510	1.09
2002	NA	NA	NA
2003	1,531	550	1.00
Total 1991 to 2003	**126,061**	**417**	**0.90**

Table provided by Endeavour Silver Corp.

A summary of the production for the years 2005 through to 2009, after Endeavour Silver became involved is presented in Table 6.3.

Table 6.3
Summary of Production for the Guanaceví Property (2005 through 2009)

Year	Tonnes	Silver (g/t)	Gold (g/t)	Oz Silver Recovered	Oz Gold Recovered	Recovery Silver (%)	Recovery Gold (%)
2005	102,617	385	0.88	948,323	2,332	74.7	80.5
2006	117,255	449	0.90	1,352,661	2,493	80.0	73.0
2007	226,295	375	0.70	1,907,795	3,957	69.4	75.7
2008	255,656	318	0.58	1,852,969	3,845	70.9	80.7
2009	230,632	322	0.80	1,873,833	5,243	78.4	88.8
Total	**829,838**			**6,987,258**	**15,538**		

Table provided by Endeavour Silver Corp.

For the year ending December 31, 2009, silver production was 1,873,833 oz compared to 1,852,969oz in 2008, an increment of 1%, with gold production of 5,243 oz compared to 3,845 oz in 2008, an increment of 36%. Plant throughput for 2009 was 230,632 tonnes at an average grade of 322 g/t silver and 0.80 g/t gold as compared to 255,656 tonnes at an average grade of 318 g/t silver and 0.58 g/t gold during 2008. In 2009, recoveries averaged 78.4% and 88.8% for silver and gold, respectively.

6.5 MINERAL RESOURCES AND MINERAL RESERVES

Historical resources and reserve estimates which were conducted prior to Endeavour Silver‘s involvement with the Guanaceví Mines project will not be discussed in this report as for the most part they are historical estimates which were not conducted according to the CIM Standards for reporting mineral resources and reserves. In addition since Endeavour Silver acquired ownership of the mine the resources and reserves have been revised every year based on both mining and exploration conducted during the year. These reports were posted to the SEDAR website by Endeavour Silver.

The last Technical Report to present a mineral resource and reserve estimate for the Guanaceví Mines project was dated March 18, 2009, but the effective date of the estimate was as of December 31, 2008. The resource and reserve estimate as audited by Micon complied with the current CIM standards and definitions for estimating resources and reserves as required by NI 43-101 regulations.

Since the last resource and reserve estimate was completed, Endeavour Silver has conducted further diamond drilling and underground development and has completed a new resource and reserve estimate for the Guanaceví Mines project. Micon has audited Endeavour Silver’s new resource and reserve estimate and the discussions related to the new estimate are contained in Section 17.0 of this report.

7.0 GEOLOGICAL SETTING

The geological setting of the Guanaceví property is described in detail in the Range (March, 2006) and Micon (April, 2007 and March, 2009) NI 43-101 Technical Reports. The following description of the geological setting has been excerpted from the March, 2009, Micon report.

7.1 REGIONAL GEOLOGY

The rock types of the district can be divided into three principal stratigraphic groups based on stratigraphic studies by the Consejo de Recursos Minerales and Endeavour Silver drill core-based observations during its exploration programs.

7.1.1 Guanaceví Formation

The oldest unit in the district is the Guanaceví Formation, a polymictic basal conglomerate composed of angular to sub-angular fragments of quartz and metamorphic rocks set in a sandy to clayey matrix within sericitic and siliceous cement. It is assigned to the Upper Jurassic or Lower Cretaceous on the basis of biostratigraphic indicator fossils mentioned but not detailed in the Durango State Geological Reference Report (1993). At least 450 m of thickness has been reported in the Guanaceví area for this basal unit, the lower contact of which has not been observed. In most areas, the upper contact is structural on high-angle normal faults but, in the San Pedro area, the upper contact is abrupt from Guanaceví conglomerate rocks to fairly fresh, dark coloured andesitic flows of the Lower Volcanic Sequence that appear conformable to the underlying Guanaceví Formation. The Jurassic assignment of the Guanaceví Formation has been in question, and at least two reports in the 1990’s consider it to be Tertiary (Durning and others, unpublished reports). A Tertiary age for the unit mitigates the idea of a transitional unit persisting through the Cretaceous; alternatively, it is possible that paraconformities in the package may be present but unreported to date.

Regional studies in Mexico demonstrate that Mesozoic rocks basal to the Tertiary section are strongly deformed with the development of sericitic alteration, shearing and microfolding in local shear zones and stronger deformation associated with overthrust nappe folds of Laramide age (late Cretaceous to end of the Paleocene). This type of strong deformation is not visible in the Guanaceví Formation, further raising questions about the validity of a Mesozoic assignment for this unit.

The Guanaceví Formation has been structurally defined as a horst, occupying the central portion of the northwest trending Guanaceví erosional window and flanked by sets of northwest striking normal faults that offset the Upper and Lower Volcanic Sequences down to the southwest and northeast on corresponding sides of the window. Mineralization within the horst is hosted by the conglomerate, both as dilatational high-angle fracture-filled structures and, in the San Pedro area, as manto-like replacement bodies below the upper contact of the conglomerate with overlying andesitic units of the Lower Volcanic Sequence.

7.1.2 Lower Volcanic Sequence

Using an inherited stratigraphic framework for the area, andesitic rocks and associated sedimentary units are placed in a loosely-defined package of flows and volcaniclastic sediments correlated with Eocene volcanism throughout the Sierra Madre of Mexico. No radioisotope age determinations have been made on volcanic units of the Guanaceví district, and lithological correlations to the Lower Volcanic Sequence appear to be reasonable for the andesitic flows and associated volcaniclastic units.

It has been observed in the rocks that host the Porvenir and Santa Cruz mine workings that the andesite occurs as a pale green to nearly black volcanic flow ranging from aphyric to plagioclase-hornblende phyric. Plagioclase is the common phenocryst type with crystals ranging from 1 to 2 mm up to 10 mm. Hornblende phenocrysts are 1 mm to 4 mm in length. In porphyritic andesites, feldspar phenocryst abundance approaches 5%, and hornblende abundance is generally less than 3%.

The sequence of rock types in the Lower Volcanic Sequence, as presently understood, is a coarsening-upward series of volcaniclastic sediments capped by an andesite flow as described above. The sedimentary lithologies are siltstones overlain by sandstone with minor intercalations of conformable conglomerate beds. The siltstone-sandstone sequence becomes transitionally dominated by conglomeratic beds at the top of the volcaniclastic package. Overall thickness of the siltstone-sandstone beds is up to 120 m. Conglomerate beds of the Lower Volcanic Sequence are from a few centimetres to 150 m thick at the top of the package, and differ from the conglomerates of the Guanaceví Formation in that Lower Volcanic Sequence clasts are mainly andesite of varying textural types.

7.1.3 Upper Volcanic Sequence

The Upper Volcanic Sequence consists of rhyolite crystal-lapilli tuff units uncomformably overlying the andesites which are generally structurally disrupted and altered by oxidation and silicification. The rhyolite is strongly argillically-altered with silicification overprinting argillic alteration in the immediate hanging wall of quartz veins and other silicified structures. The rhyolite commonly contains rounded quartz ‘eyes’ up to 4 mm in diameter, and the matrix consists of adularia, kaolinite and quartz. Local concentrations of biotite crystals up to 2 mm are not uncommon. The rhyolite has variable textures from thin-bedded ash flows to coarse lapilli tuffs with lithic clasts of andesite or rhyolite up to 50 cm in diameter. These latter commonly exhibit alteration rims indicating high temperatures and fluids in the volcanic environment. The thickness of the rhyolite tuff assemblage has not been measured at this time, but appears to exceed 300 m.

Geochemically, the lower portion of the rhyolites has been demonstrated by rare earth element (REE) data, from a series of samples taken from East Santa Cruz drilling, to be magmatically linked to the underlying andesites. The similarity between REE patterns of the rhyolite crystal-lapilli tuff and the andesitic rock units in this data set suggests a common source for the two volcanic packages that is difficult to reconcile with the idea of many millions of years of volcanic quiescence (from Lower Volcanic to Upper Volcanic Sequences). This raises the possibility that regional correlations for Guanaceví rhyolite based on radioisotope age determinations may result in assignment of the rhyolite (of the Santa Cruz/Porvenir mine area) to the Lower Volcanic Sequence rather than the Upper. In the San Martin de Bolanos district of Jalisco and also in the Topia district of Durango State, uppermost volcanic lithologies of the Lower Volcanic Sequence are rhyolitic and directly associated with mineralization. This may be true for the Guanaceví mining district as well.

See Figure 7.1 for a map of the regional geology in the area surrounding the Guanaceví mining district. See Table 7.1 for a generalized stratigraphic column in the Guanaceví mining district.

Table 7.1
Generalized Stratigraphic Column in the Guanaceví Mining District

Geological Age		Stratigraphic Units and Lithologies	Thickness (m)
Tertiary	Oligocene	**Upper Volcanic Sequence** Rhyolitic tuffs and ignimbrites	+ 300
	Eocene	**Lower Volcanic Sequence** Andesite porphrytic flow Andesite conglomerate Volcanic sandstone/siltstone	 ≤ 70 ≤ 150 ≤ 120
Jurassic (?)	(Late) ?	Guanaceví Formation	+ 450

Note: Table adapted from the March, 2006 Technical Report by Range Consulting

7.1.4 Structural Setting

Figure 7.1, shows major faults of the Guanaceví mining district on a simplified geologic map of the region. The map pattern constitutes an erosional window caused by crustal uplift apparently centred about 3 km west of Guanaceví. With some exceptions, fracture-filling vein mineralization is localized on the flanks of the uplift centre, suggesting a genetic relationship between uplift and mineralization. The three principal trends of high-angle normal faults that characterize the region are as follows:

- The dominant structural trend in the region is northwest, with significant north-northeast faults in a likely conjugate relationship. This generation of structures hosts most of the mineralization in the district.
- Northeast faults postdate the mineralized structures.
- East-west faults appear last.

This pattern sequence would appear to indicate an early extension in a northeast-southwest direction, followed by a later extension in an east-northeast – west-southwest direction, followed by a northwest-southeast extension and finally ending with the latest extension in a north-south direction. This clockwise evolution of principal stress directions is similar to that of other regions in the American Cordillera, including the Sierra Madre of Mexico.

Figure 7.1
Regional Geology Map for the Guanaceví Mining District

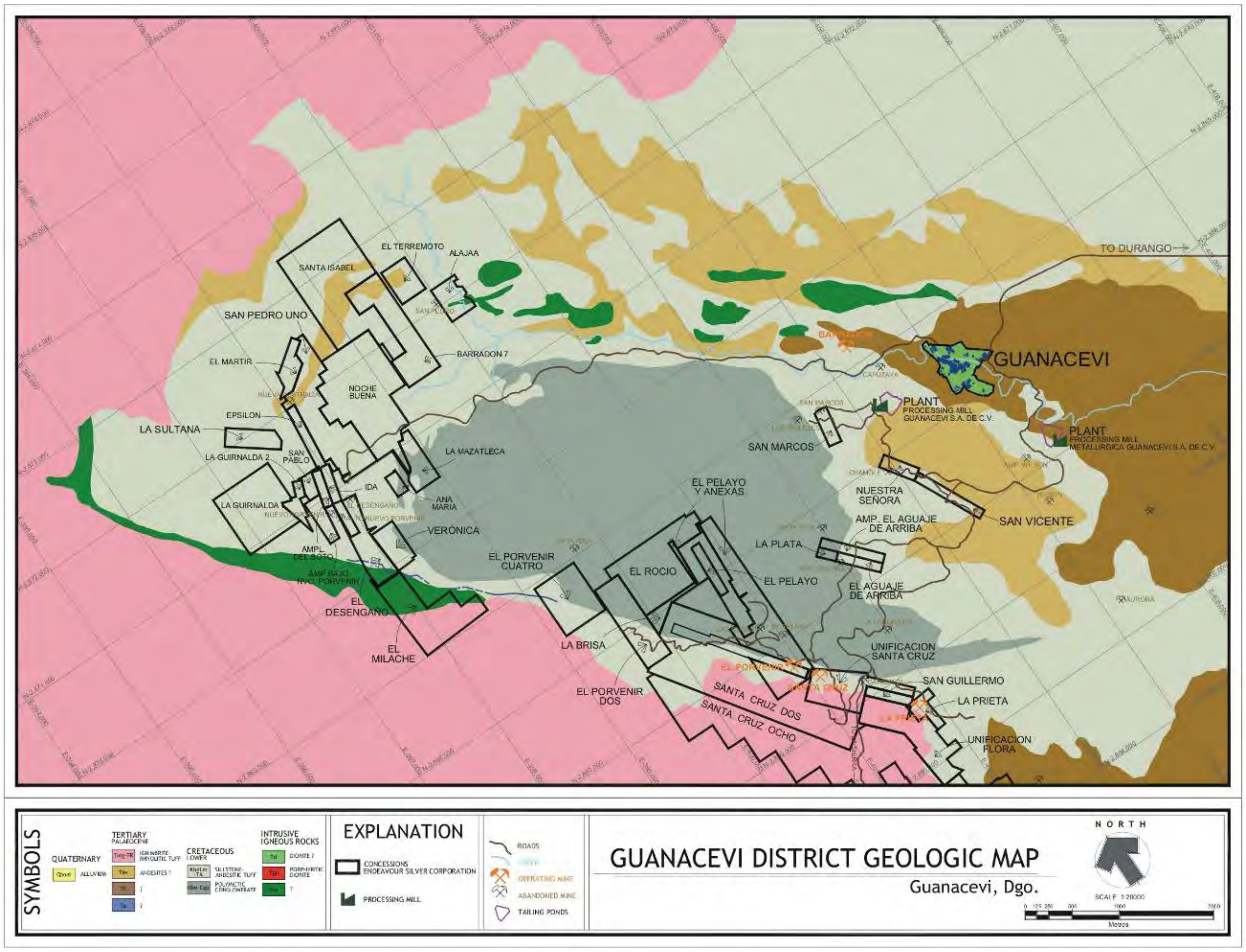


Figure provided by Endeavour Silver Corp.

Timing of uplift of the Guanaceví window is constrained by the following considerations:

- Dilatational fractures flanking the uplift are dominantly northwest trending, with subordinate north and north-northeast components. Northeast and east-west fractures are not significant in controlling the uplift pattern. Thus uplift is early in the structural evolution described above.
- The northeast-southwest extension in Mexico is generally associated with opening of the Gulf of California, and dated as Oligocene to Miocene.
- Uplift therefore may be coeval with the onset of silicic volcanism of the Upper Volcanics, which are considered Oligocene in age.

It is reasonable to conclude that uplift occurred at the onset of Upper Volcanic Sequence eruptions (Oligocene), northeast-southwest extension, and was coeval with mineralization. The cause of uplift, however, is left unexplained by these considerations. Alternative explanations include magmatic upwelling at depth, resurgent doming within a cryptic caldera, or tectonic transpression resulting from large-scale lateral displacement

7.2 PROJECT GEOLOGY

The Santa Cruz mine property, which forms part of the main portion of the Guanaceví Mines project, covers about a 3.0 km strike length of the Santa Cruz fault/vein system. The Santa Cruz vein is similar in many respects to other veins in the Guanaceví district except that it is the only one to lie on the west side of the horst of Guanaceví Formation and associated facies, and it dips west instead of east. See Figure 7.2 for the Guanaceví Mines project geology map.

In the Porvenir Dos area and the Deep Santa Cruz mine workings, a low angle rhyolite crystal-lapilli tuff and andesitic contact occurs high in the hanging wall of the Santa Cruz vein indicating a fault contact with Guanaceví Formation, which obviously cuts the contact.

7.2.1 Local Structure

The Santa Cruz vein, the principal host of silver and gold mineralization, is located on the west side of the horst of the Guanaceví Formation. The mineralized vein is part of a major fault system that trends northwest and principally places the Guanaceví Formation in the footwall against andesite and/or rhyolite in the hanging wall. The vein/fault presents a preferred strike of N45°W with dips from 45° to 70° to the southwest. From La Prieta to Porvenir Dos it extends a distance of 5 km and averages approximately 3.0 m in width.

The broader and higher-grade mineralized ore shoots tend to occur along flexures in the Santa Cruz vein structure, where sigmoidal loops are developed both along strike and down dip. The vein in Deep Santa Cruz for instance splays into two, three or four separate mineralized structures with the intervening wallrocks also often well mineralized, giving mining widths up to 20 m in some places. These sigmoidal loops tend to develop with some regularity along strike and all of the ore shoots at the Santa Cruz mine have about a 60° plunge to the northwest. A shallow northwest plunging striation, raking at 15°- 30°, is noted on a number of fault planes within the Santa Cruz structure; these striations appear to be consistent with an observed sinistral movement seen on minor faults which produce small offsets of the Santa Cruz vein.

Particularly around the peripheral ore zones the vein is observed to develop imbricate structures, either as imbricate lenses shallowly oblique to the principal Santa Cruz trend or as vein segments offset by similarly trending minor faults. The trend of these structural features is generally slightly more westerly than the Santa Cruz vein/fault trend and steeper dipping. Veining is also often affected by north-south structures, which rarely seem to offset the main fault but do cause minor jogs in the vein; often the north-south structures are associated with manganese oxide concentrations and elevated silver grades.

7.2.2 Alteration

The sedimentary and volcanic rocks are hydrothermally altered with propylitization (chlorite) the most widespread, up to 150 m from the veins, with narrower bands of potassic and argillic alteration (kaolinite and adularia) typically up to 25 m thick in the hanging wall and with silicification near the veins. Phyllic alteration, however, is absent in the Guanaceví district.

Figure 7.2
Guanaceví Mines Project Geology Map

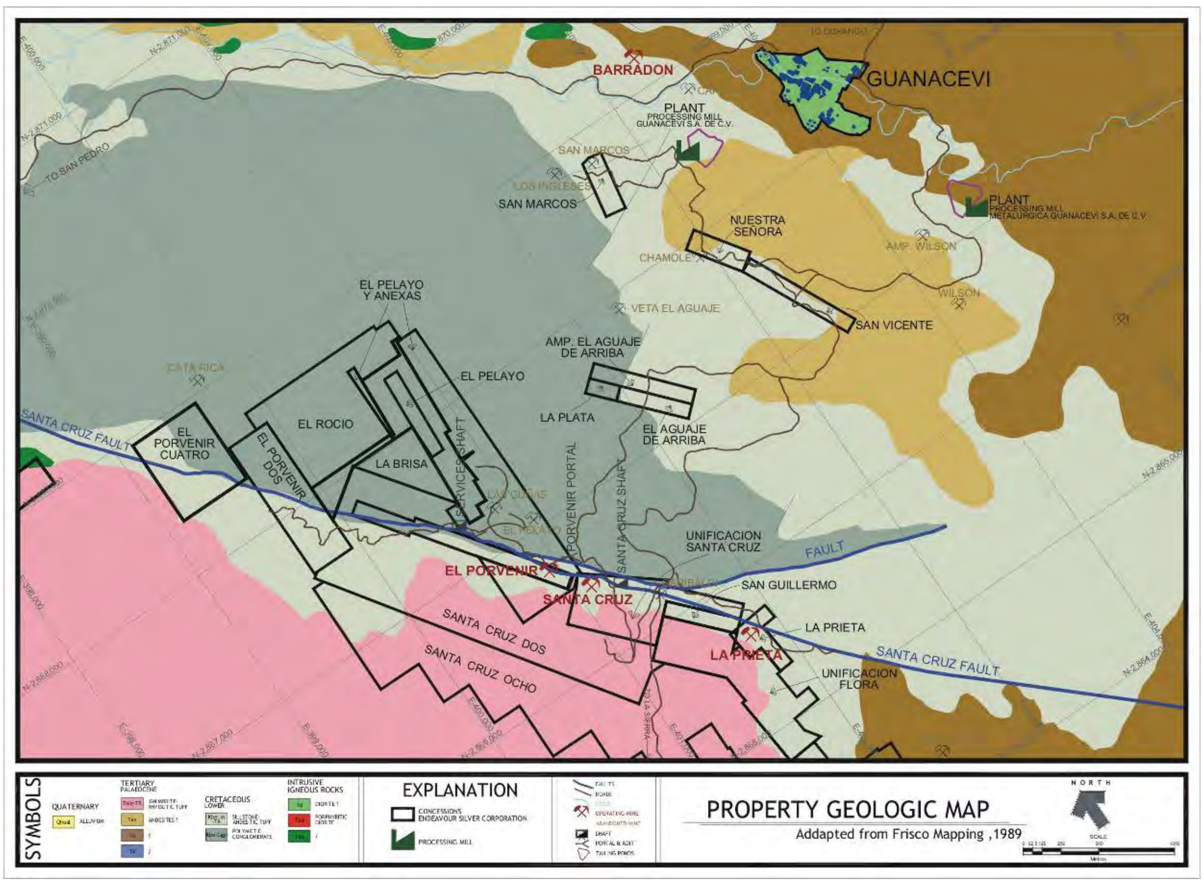


Figure provided by Endeavour Silver Corp.

8.0 DEPOSIT TYPES

The deposit types of the Guanaceví property are described in detail in the Range (March, 2006) and Micon (April, 2007 and March, 2009) NI 43-101 Technical Reports. The following description was excerpted from the March, 2009, Micon report.

The Guanaceví silver-gold district comprises classic, high-grade silver-gold, epithermal vein deposits, characterized by low sulphidation mineralization and adularia-sericite alteration. The Guanaceví veins are typical of most other epithermal silver-gold vein deposits in Mexico in that they are primarily hosted in the Tertiary Lower Volcanic series of andesite flows, pyroclastics and epiclastics overlain by the Upper Volcanic series of rhyolite pyroclastics and ignimbrites. Evidence is accumulating in the Guanaceví mining district that the mineralization is closely associated with a pulse of silicic eruptions that either signaled the end of Lower Volcanic Sequence magmatism or the onset of Upper Volcanic Sequence activity.

Low-sulphidation epithermal veins in Mexico typically have a well defined, subhorizontal ore horizon about 300 m to 500 m in vertical extent where the bonanza grade ore shoots have been deposited due to boiling of the hydrothermal fluids. Neither the top nor the bottom of the Santa Cruz ore horizon has yet been found but, given that high-grade mineralization occurs over a 400 m vertical extent from the top of the Garibaldi shaft (south of the Santa Cruz mine) to below Level 13 in Santa Cruz, it is likely that erosion has not removed a significant extent of the ore horizon.

Low sulphidation deposits are formed by the circulation of hydrothermal solutions that are near neutral in pH, resulting in very little acidic alteration with the host rock units. The characteristic alteration assemblages include illite, sericite and adularia that are typically hosted by either the veins themselves or in the vein wall rocks. The hydrothermal fluid can travel either along discrete fractures where it may create vein deposits or it can travel through permeable lithology such as a poorly welded ignimbrite flow, where it may deposit its load of precious metals in a disseminated deposit. In general terms this style of mineralization is found at some distance from the heat source. Figure 8.1 illustrates the spatial distribution of the alteration and veining found in a hypothetical low-sulphidation hydrothermal system

Figure 8.1
Alteration Mineral Distributions within a Low Suphidation System

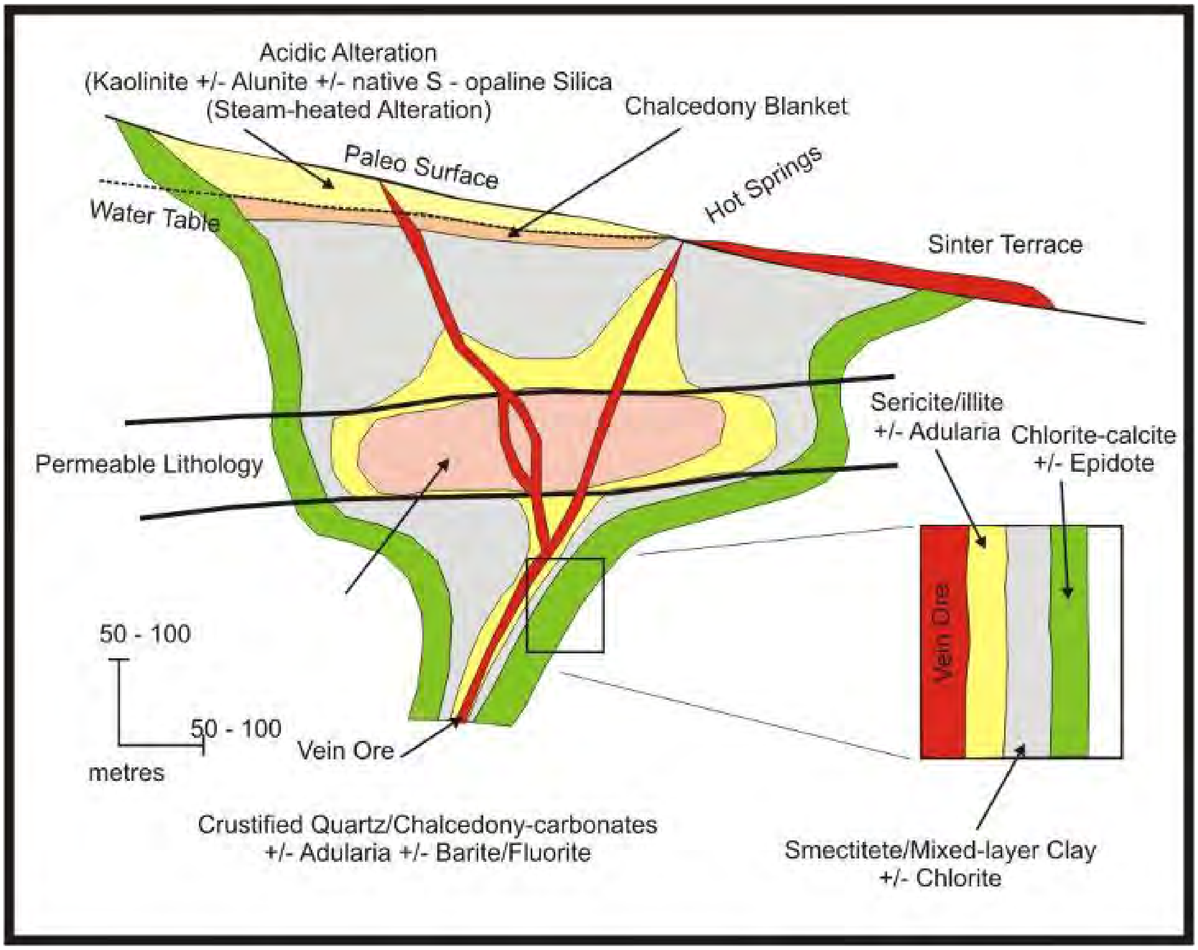


Figure taken from Pressacco, 2005.

9.0 MINERALIZATION

The mineralization of the Guanaceví property is described in detail in the Range (March, 2006) and Micon (April, 2007 and March, 2009) NI 43-101 Technical Reports. The following description of the mineralization has been excerpted from the March, 2009, Micon report.

The principal mineralization within the Santa Cruz-Porvenir mines is an epithermal low-sulphidation, quartz-carbonate, fracture-filling vein hosted by a fault-structure that trends approximately N45°W and dips 55° southwest. The fault and vein comprise a structural system referred to locally as the Santa Cruz vein structure or Santa Cruz vein fault. The Santa Cruz vein structure has been traced for 5 km along the trend and averages about 3.0 m in width. Mineralization in the system is not continuous, but occurs in steeply northwest-raking shoots up to 200 m in strike length. A second vein, sub-parallel to the Santa Cruz vein but less continuous, is economically significant in the Porvenir Dos zone and in the northern portion of deep North Porvenir. It is referred to in both areas as the “Footwall vein”, although in Porvenir Dos, the term “Conglomerate vein” has also been employed.

9.1 SANTA CRUZ VEIN

The Santa Cruz vein is a silver-rich structure with lesser amounts of gold, lead and zinc. Mineralization has averaged 500 g/t silver and 1 g/t gold over 3 m true width. The minerals encountered are argentite-acanthite, limited gold, galena, sphalerite, pyrite and manganese oxides. Gangue minerals noted are barite, rhodonite, rhodochrosite, calcite, fluorite and quartz. The mineralization down to Level 6 in the Santa Cruz mine is mainly oxidized with a transition zone of oxides to sulphides occurring between Levels 6 to 8, although sulphide ore was mined above Level 6.

Mineralization exhibits evidence of episodic hydrothermal events which generated finely banded textures. The higher grade mineralization in the district is commonly associated with multiple phases of banding and brecciation. The first phase, deposition of white quartz, white calcite and pyrite in stockwork structures often exhibits horse-tail structures bifurcating both in the horizontal and vertical sense to form imbricate pods. The second phase deposited semitranslucent quartz with argentite, scarce gold, and oxides of manganese (2%) and rare lead and zinc sulphide (4%), the latter particularly in the lower part of the hydrothermal system. The second phase was accompanied by the deposition of barite, rhodonite, rhodochrosite, fluorite and calcite.

This second phase comprises multiple pulses of mineralization expressed in the vein structures as bands of massive, banded or brecciated quartz. Massive and massive-to-banded quartz are commonly associated with carbonate which is predominantly manganoan calcite and calcitic rhodochrosite. Rhodonite is much less abundant than carbonates but is not uncommon.

According to results obtained through diamond drilling, the lead and zinc mineralization occurs more commonly in the vein below the water table which in the Santa Cruz mine occurs just below the 13 Level.

9.2 FOOTWALL VEINS

In the Porvenir Dos area and in the deeper portion of North Porvenir, a footwall-hosted vein lies in the footwall of the Santa Cruz vein structure. In both areas, this footwall vein is either within Guanaceví Formation footwall rocks or is at the structural contact between Guanaceví Formation and Lower Volcanic Sequence andesite. It is banded to brecciated quartz plus carbonate and contains local scatterings (< 1%) of sulphides (pyrite>sphalerite> galena>chalcopyrite) and rare pods (< 50 cm) of sulphides. It appears likely from drill sections that these footwall vein occurrences are splays of the main Santa Cruz vein structure and are largely sympathetic to it. At the north end of North Porvenir, on Section 19, the footwall vein attains a true width of over 7 m with silver grades of approximately 400 g/t in some areas. In Porvenir Dos, the footwall vein is narrower than the Santa Cruz vein and is overall a lower-grade vein, although one high grade intercept (uncapped) has been recorded in drill hole PD 36-3, at 2,548 g/t silver over 1.25 m.

10.0 EXPLORATION

10.1 2009 GENERAL EXPLORATION AND DRILLING

In 2009, exploration drilling at Guanaceví focused in two main areas: exploring the Santa Cruz vein structure on the Porvenir Cuatro concession so that any new mineralization could be added to the mine plan for development and production; and discovering new high-grade silver-gold-base metal mineralized zones in the San Pedro area north of the Porvenir mine that have the potential to develop future resources and production.

During 2009, Endeavour Silver completed 13,560 m of drilling in 45 surface diamond drill holes at Porvenir Cuatro and San Pedro. A total of 4,568 samples were also collected and submitted for assay.

Endeavour Silver spent US $2,249,451 (including property holding costs) on exploration activities on Porvenir Cuatro and San Pedro, as summarized in Table 10.1.

Table 10.1
Summary of Guanaceví Mines Project Exploration Program in 2009

Mine or Concession/Claim	Area	Description	Pesos	US $
Mine	Santa Cruz	Assays	143,399	10,655
		Geology and engineering personnel	6,767	503
		Subtotal	**150,166**	**11,157**
	Alex Breccia	Assays	5,074	377
		Field	2,171	161
		Geology and engineering personnel	808	60
		Subtotal	**8,052**	**598**
	North Porvenir	Assays	51,175	3,802
		Subtotal	**51,175**	**3,802**
		Mine Total	**209,394**	**15,558**
Concession/Claim	Milache	Contract payments and fees	664,915	49,403
		Subtotal	**664,915**	**49,403**
	Porvenir Cuatro	Assays	724,121	53,802
		Consultants	132,060	9,812
		Diamond drilling	11,980,957	890,185
		Field	199,707	14,838
		Housing	28,620	2,126
		Food	45,480	3,379
		Geology and engineering personnel	1,564,931	116,274
		Management	1,051	78
		Payments and fees	4,194,714	311,667
		Roads and drill pads	641,306	47,649
		Salaries	151,160	11,231
		Travel and lodging	25,701	1,910
		Gasoline	67,883	5,044
		Repair and maintenance	15,742	1,170
		Expenses non deductable	102,371	7,606
		Subtotal	**19,875,806**	**1,476,772**
	San Pedro	Assays	407,646	30,288
		Consultants	397,844	29,560
		Diamond drilling	5,348,048	397,360
		San Pedro field	398,128	29,581
		Housing	57,898	4,302
		San Pedro food	78,414	5,826

Mine or Concession/Claim	Area	Description	Pesos	US $
		Office supplies and equipment	12,393	921
		Geology and engineering personnel	1,729,079	128,471
		Professional development	17,579	1,306
		Reclamation	12,600	936
		Roads and drill pads	366,327	27,218
		Salaries	161,547	12,003
		Travel and lodging	54,562	4,054
		Gasoline	70,267	5,221
		San Pedro repair and maintenance	106,896	7,942
		Expenses non deductable	305,903	22,729
		Subtotal	**9,525,131**	**707,717**
		Concession/Claim Total	**30,065,852**	**2,233,893**
		Guanaceví Exploration Total	**30,275,246**	**2,249,451**

Table provided by Endeavour Silver Corp.

10.2 2009 OTHER EXPLORATION ACTIVITIES

In addition to the exploration drilling, Endeavour Silver also conducted a number of other exploration activities in 2009.

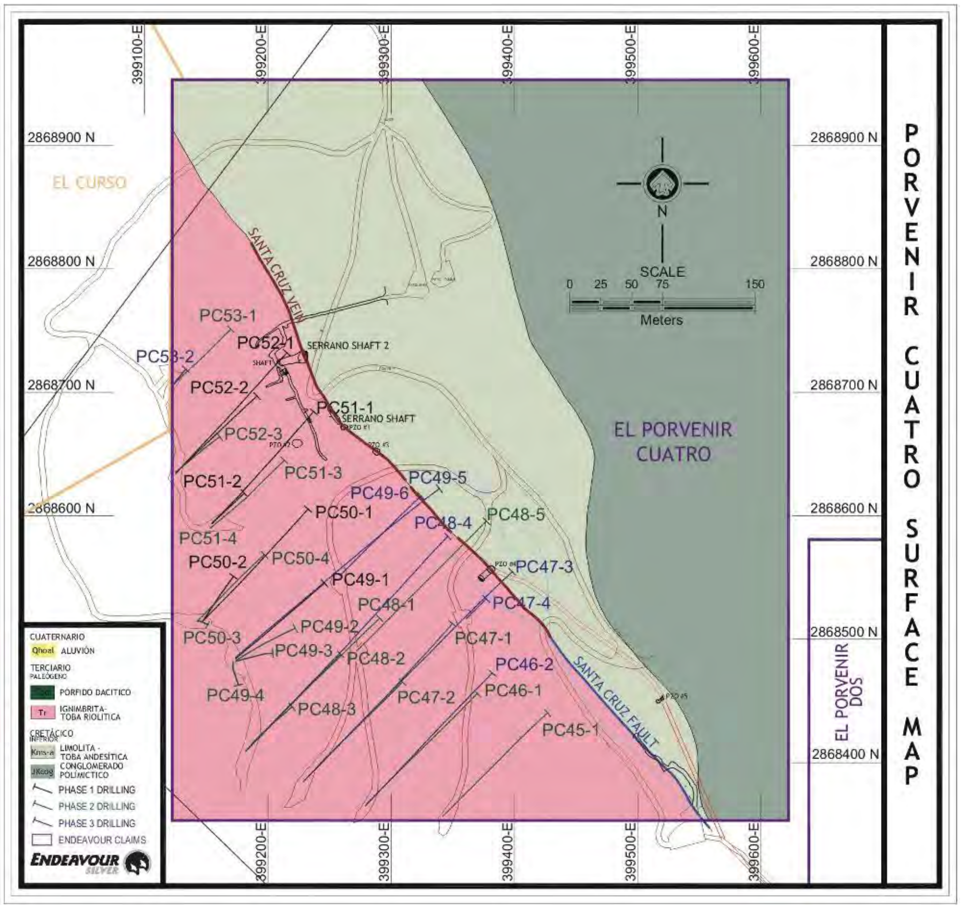
10.2.1 Porvenir Cuatro

In 2009, Endeavour Silver exploration crews conducted surface geological mapping and sampling on the Porvenir Cuatro concession. This work included mapping the surface trace of the northwest-trending Santa Cruz structure as well as north-northeast-trending veins in the hanging wall hosted in conglomerate. Mapping and sampling was also conducted in the small-scale mine workings at the Serrano mine and the cross-cut and drift on the Santa Cruz vein excavated by Cesar Loera at the southeast end of Porvenir Cuatro concession. Endeavour Silver's exploration crew also surveyed cross-section lines in the field every 50 m. Cross-sections were surveyed in the field at regular 50 m spacings starting from the last drill cross-section made in Porvenir Dos.

Surface backhoe trenches were also excavated across the Santa Cruz structure and channel sampled.

Mapping showed that the concession covers about 670 m of strike length along the Santa Cruz vein system (Fig. 10.1). The Santa Cruz vein mapped on Porvenir Cuatro mainly consists of a quartz-calcite +/- barite vein with manganese oxides and fine disseminations of argentite, as observed in the Serrano mine workings and dumps. Abundant manganese oxides are also observed locally. In outcrop, the vein occurs as fine grained quartz to chalcedony in argillized and locally silicified andesite host rock. The structure has two flexural changes. To the southeast, near Porvenir Dos, it strikes N25°W with a dip of 55° SW. About 250 m to the northwest, in the central part of Porvenir Cuatro, it changes to N55°W with a dip of 48° SW. Where this strike change is observed, the Santa Cruz vein is wider, ranging from more than one metre up to 2.5 m. Furthermore, in this flexural zone there are possibly two subparallel, subsidiary structures oblique to the Main Santa Cruz structure. One of these oblique structures marks a sharp contact with the polymictic conglomerate (Conglomerate Guanaceví Kcog) and the other occurs within the conglomerate. The latter is an irregular 1 to 2 m wide structure. Beyond the Serrano mine to the northwest, the Santa Cruz vein varies in strike from N15°-35°W with dip a of 40°-50°.

Figure 10.1
Surface Geology Map showing Traces of the Surface Drill Holes on the Porvenir Cuatro Concession.



* Rectangular area shown in colour denotes the limits of the Porvenir Cuatro concession.
Figure provided by Endeavour Silver Corp.

10.2.1.1 Serrano Mine

Endeavour Silver crews drained water from the portal (Level 36) of the Serrano mine (Figs. 10.2 through 10.4). This portal accesses a cross-cut that was driven to the Santa Cruz structure. Approximately 100 m of development has been done along the vein in the Serrano mine. Previous sampling by CRM (now SGM) was clearly evident in the Serrano mine. Research by Endeavour Silver found that the CRM samples had been collected in 1985 and 1990 and reportedly averaged 270 g/t silver and 2 g/t gold over a width of 1.6 m.

After cleaning Level 36 of the Serrano mine was completed, subsequent mapping and sampling showed the Santa Cruz vein to be located along the contact between the rhyolite and the volcano-sedimentary andesite sequence. Channel samples were then collected every

12 m along the structure. Once all of the assays were received, in-fill sampling was conducted at 2 m spacings in zones of potential economic grade mineralization.

Figure 10.2
Geology and Sampling on Level 36 of the Serrano Mine on the Porvenir Cuatro Concession.

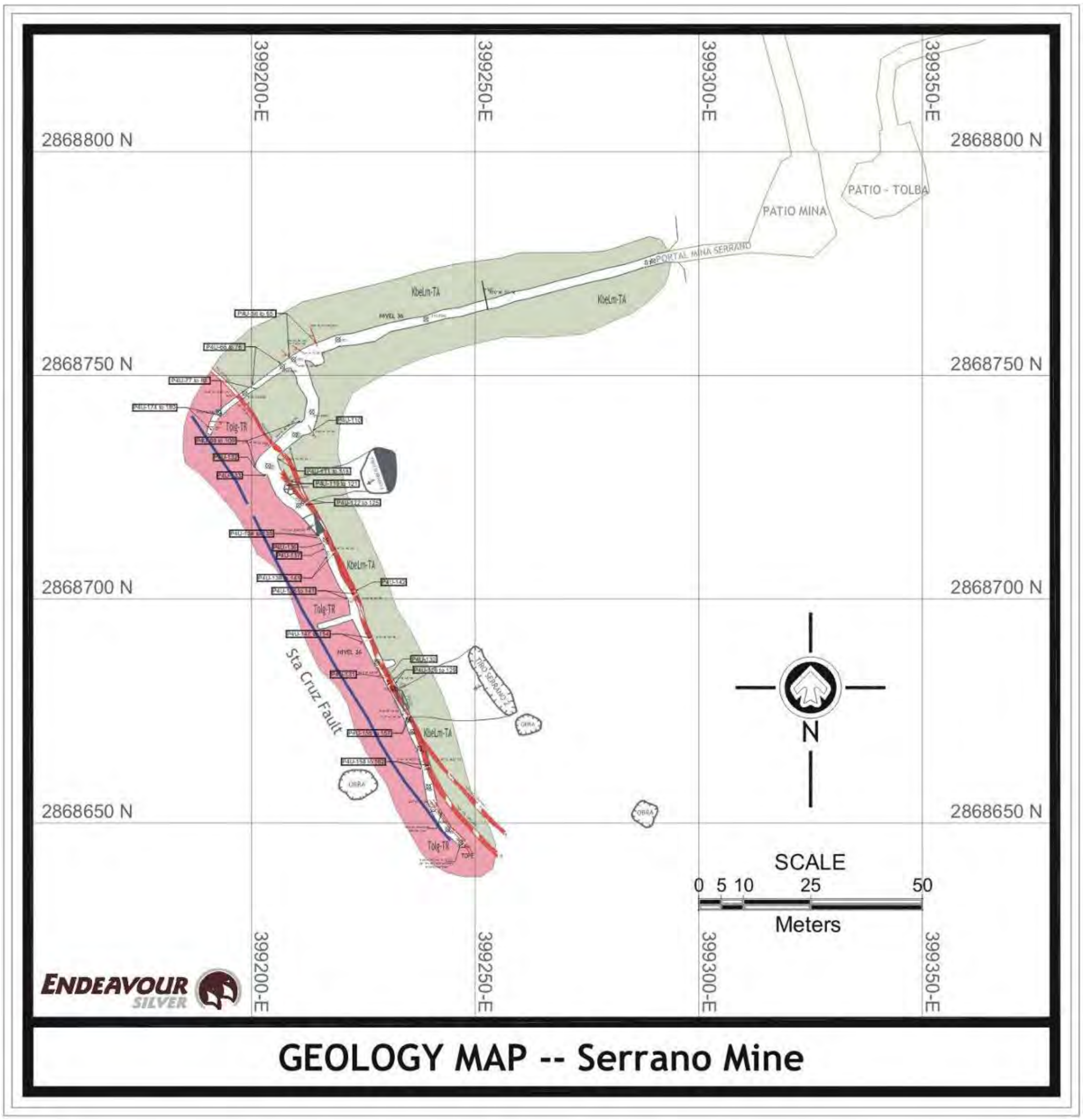


Figure provided by Endeavour Silver Corp.

Figure 10.3
Entrance to Serrano Mine (Cross-Cut) on Porvenir Cuatro Concession

Figure provided by Endeavour Silver Corp.

Figure 10.4
Photo of Santa Cruz vein on Level 36 of the Serrano Mine, Porvenir Cuatro

Figure provided by Endeavour Silver Corp.

Exploration crews subsequently pumped out the lowest level (Level 44) in the Serrano mine and repaired the ladders in the internal shaft to gain access down to Level 44 (Fig. 10.5). Mapping and underground channel sampling was then conducted on the level (Fig. 10.6). A total of 143 samples were collected from Level 44 and submitted to ALS-Chemex for analysis. The averaged assays were around 270 g/t silver and 2 g/t gold, thereby confirming the previous CRM sampling results

Figure 10.5
Photo of the Dewatered and Repaired Internal Shaft to Level 44, Serrano Mine

Figure provided by Endeavour Silver Corp.

Figure 10.6
Map of Level 44 (lowest level) of the Serrano Mine on Porvenir Cuatro

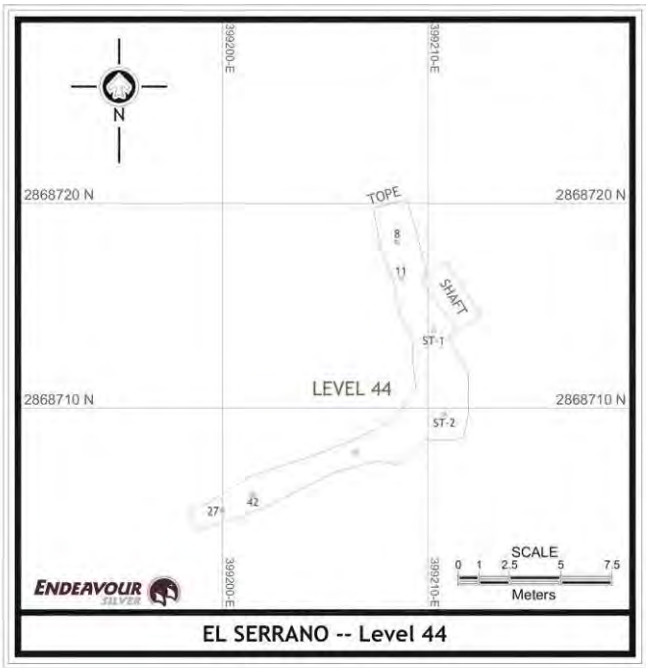


Figure provided by Endeavour Silver Corp.

10.2.1.2 Cesar Loera Tunnel

The investigation of this working on the Porvenir Cuatro concession indicated that 75 m of development had been conducted along the Santa Cruz structure (Figure 10.7). Development had been driven along the footwall of the fault in andesite with a stockwork of calcite-quartz-barite veinlets. Weakly developed zones of quartz breccia were observed in places. Endeavour Silver crews conducted mapping and sampling (50 samples) in the Cesar Loera tunnel. All of sampling returned results which were low-grade.

Figure 10.7
Underground Geology and Sampling Map of the Cesar Loera (P4) Tunnel

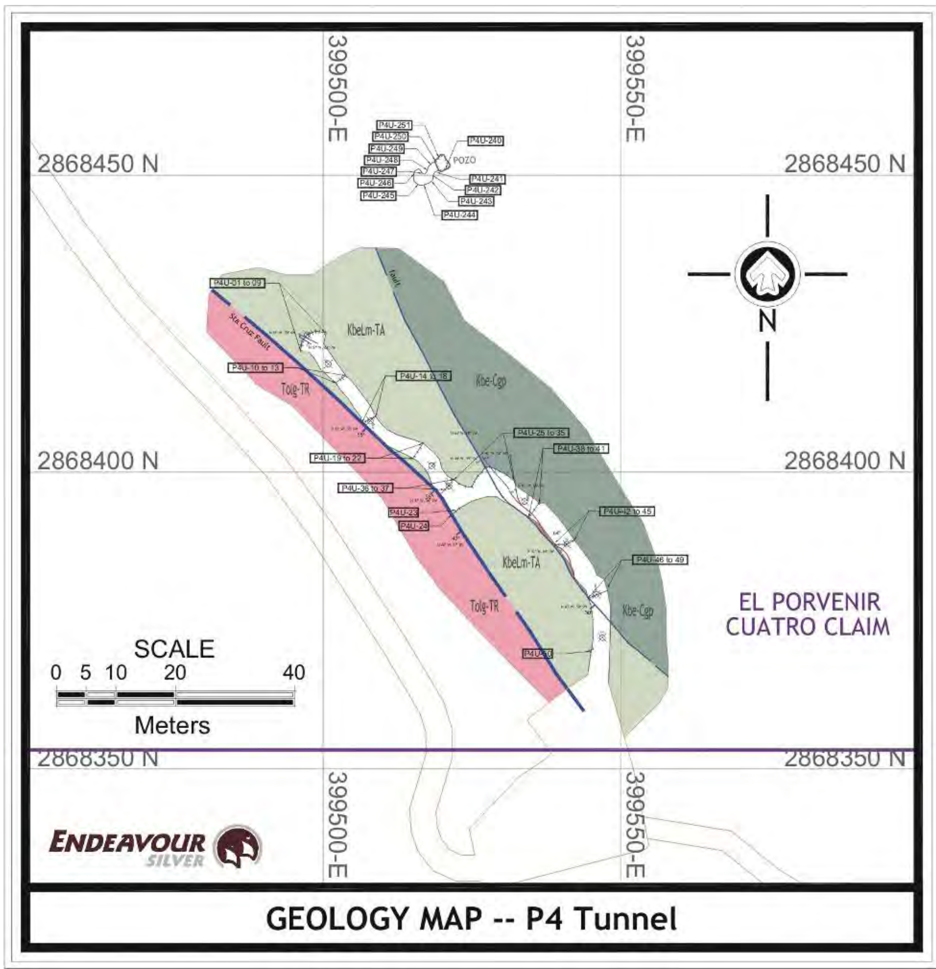


Figure provided by Endeavour Silver Corp.

10.2.2 San Pedro

10.2.2.1 San Pedro – 2008 Geochemical Sampling and 2009 Results

Late in 2008, soil samples were taken from a surveyed grid previously completed for geophysics in the Noche Buena – Buena Fé area in the San Pedro Sub-district. The objective of this soil sampling program was to delineate the extent of the geochemical expression of the target area for possible future trenching and drilling. A soil sampling program was considered the lowest cost and most direct approach to delineating a potentially bulk mineable (open pit) target in the San Pedro sub-district of Guanaceví.

Approximately 500 soil samples (including QA/QC samples) were collected from San Pedro and submitted to ALS-Chemex for multi-element ICP analysis. Sample locations are shown in Figure 10.8.

Figure 10.8
Surface Map Showing Endeavour Silver's Concessions and the Location of the Soil Sample Grid in the Noche Buena - Buena Fé Area

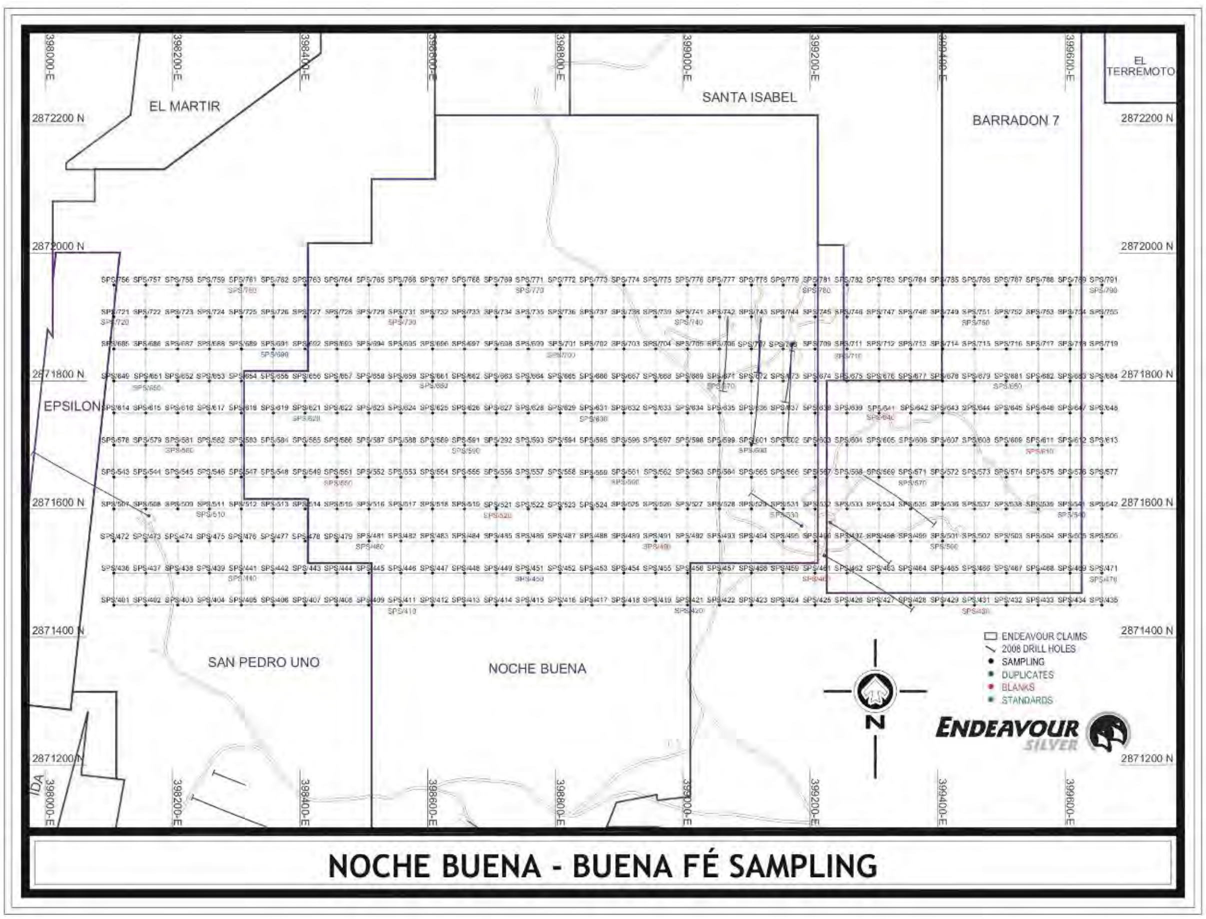


Figure provided by Endeavour Silver Corp.

In early 2009, ICP geochemical analyses were returned from ALS-Chemex for grid soil samples collected from the surveyed grid in the Noche Buena – Buena Fé target area. The contoured data for Ag, Pb and Zn are shown in Figures 10.9 through 10.11. Anomalous geochemical data appear to better define the northeast-trending set of mineralized veinlets mapped in the Noche Buena – Buena Fé target area.

Silver

Geochemical results for silver ranged from <0.2 ppm to 647 ppm, averaging 9 ppm (Figure 10.9).

Three distinct anomalous areas are defined by the silver geochemical data. The strongest anomaly and highest silver values were found in the southwest corner of the grid. The contours show that anomalous values trend north-northeast, parallel to and coincident with the high-grade Epsilon vein, intersected in 2008. Another anomalous area is in the middle of the grid is coincident with the stockwork zone. The anomalous area in the southeast corner of the grid has yet to be thoroughly investigated.

Figure 10.9
Silver Contour Map for Soil and Rock Samples in the Noche Buena – Buena Fé area.

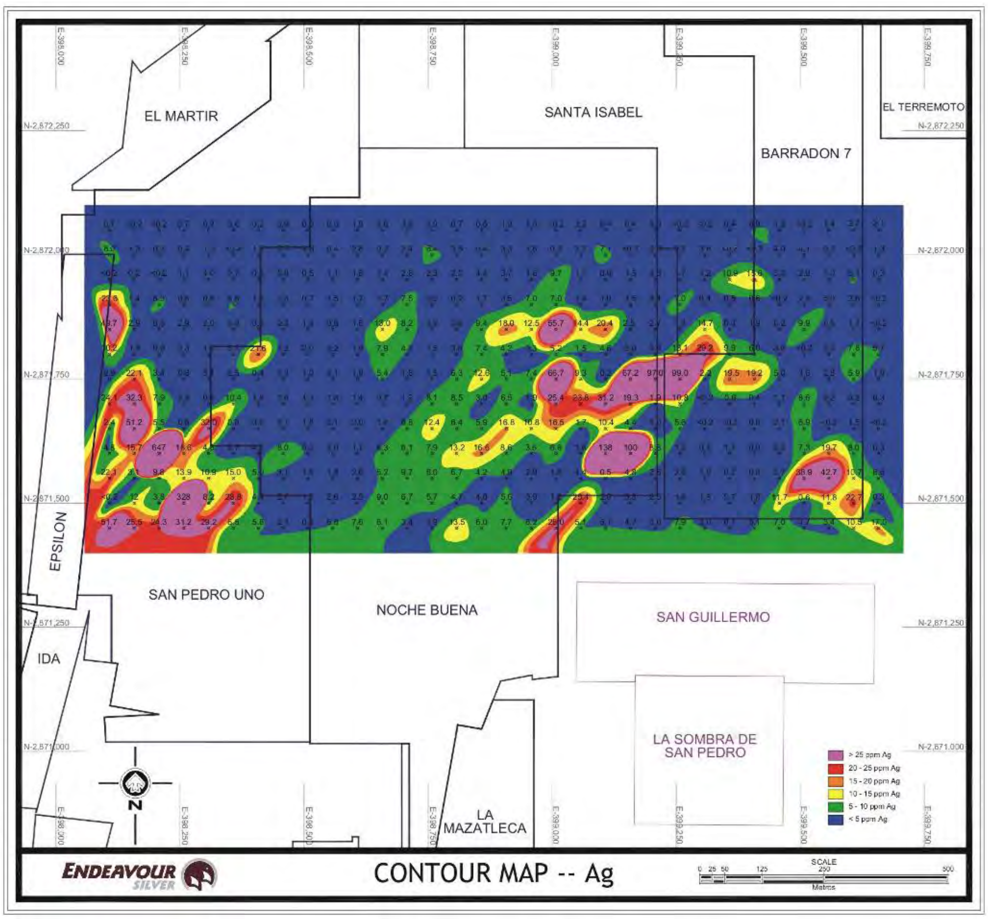


Figure provided by Endeavour Silver Corp.

Lead and Zinc

Geochemical results for lead ranged from <10 to 8,650 ppm, averaging 228 ppm (Figure 10.10). Geochemical results for zinc range from 31 to 9,710 ppm, averaging 320 ppm (Figure 10.11).

The same three anomalous areas present for silver are also shown by the lead and zinc geochemical data. However, the geochemical values in the southwest corner of the grid are not nearly as elevated for lead and zinc, as they are for silver. This is not surprising since mineralized structures in the western part of the San Pedro district contain less lead and zinc mineralization.

Lead and zinc anomalies in the central and southeastern parts of the grid are clearly more widespread and pervasive, and appear to define the areas with the most pronounced stockwork mineralization.

Figure 10.10
Lead Contour Map for Soil and Rock Samples in the Noche Buena – Buena Fé Area.

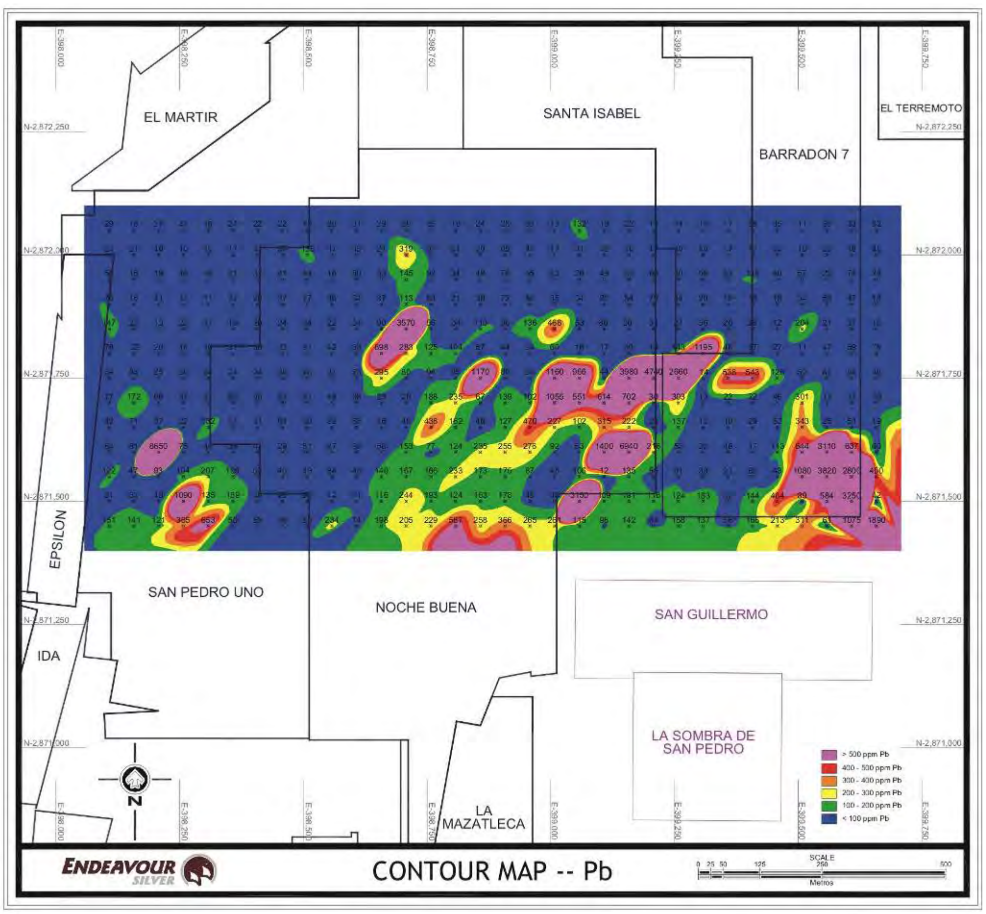


Figure provided by Endeavour Silver Corp.

Figure 10.11
Zinc Contour Map for Soil and Rock Samples in the Noche Buena – Buena Fé Area.

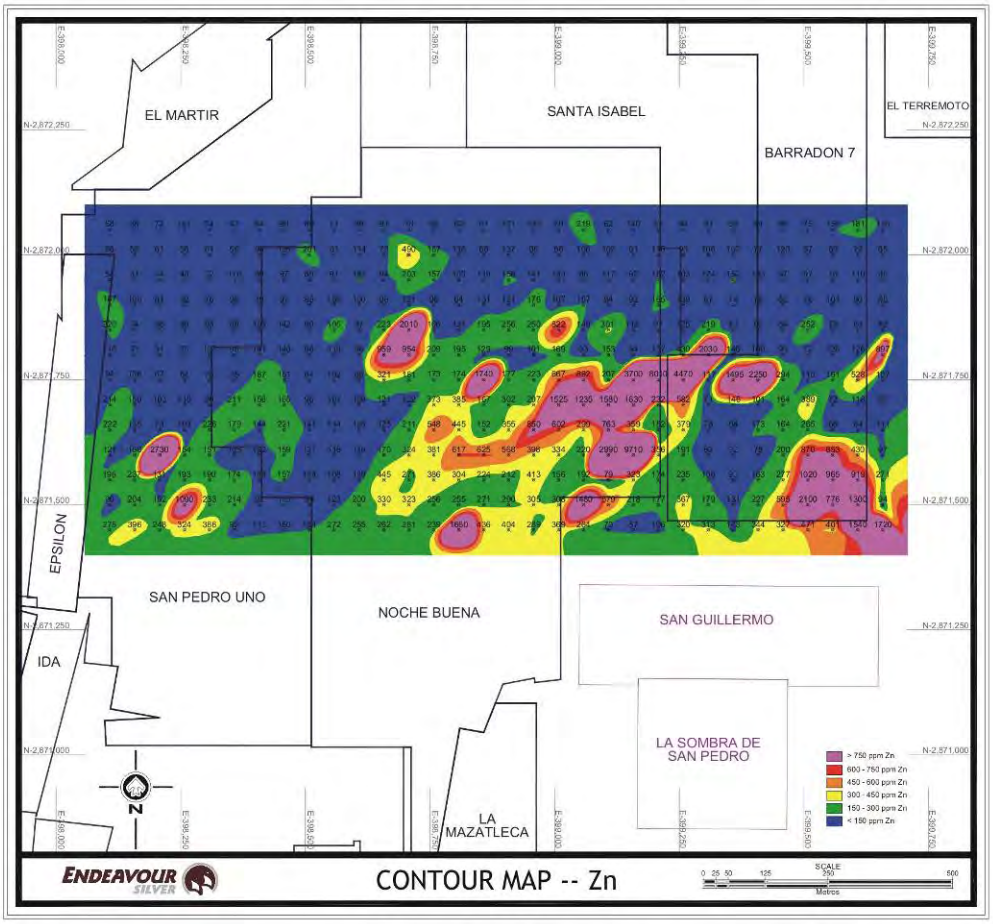


Figure provided by Endeavour Silver Corp.

10.2.2.2 San Pedro – 2009 Geological Mapping and Sampling

During 2009, geological mapping and sampling was conducted in the San Pedro sub-district with emphasis on mapping mineralized structures. These structures were often denoted by argillic alteration. The most pervasive structures in the stockwork system trend N10° to 35°W with another system at N30°E. Stockwork mineralization consists mainly of narrow veinlets with galena-sphalerite in an altered volcano-sedimentary host rock.

Mapping and rock chip sampling has identified approximately 5.25 ha of strong stockwork mineralization in the south and east part of the Noche Buena concession (Figure 10.12). This zone probably extends further northwest but does not outcrop due to pervasive soil cover. However, two areas of outcropping mineralization have been observed further to the northwest, which include workings on Veta Alaska. These two subparallel structures are approximately 200 m apart and appear to represent the margins of the Noche Buena – Buena Fé stockwork vein system. The southwestern margin has an average strike N30W while the northeastern margin averages N50W. Within these margin structures, the most pervasive mineralized structures consist of a conjugate set of stockwork veinlets trending N10W and N40-60E. The margins also appear to be coincident with andesite dikes. A subparallel dike is also present in the centre of the stockwork zone.

Figure 10.12
Air Photo Showing the Zones of Pervasive Stockwork Mineralization (denoted as SW) and Major Vein Structures Mapped and Sampled in the Noche Buena – Buena Fé Target Area

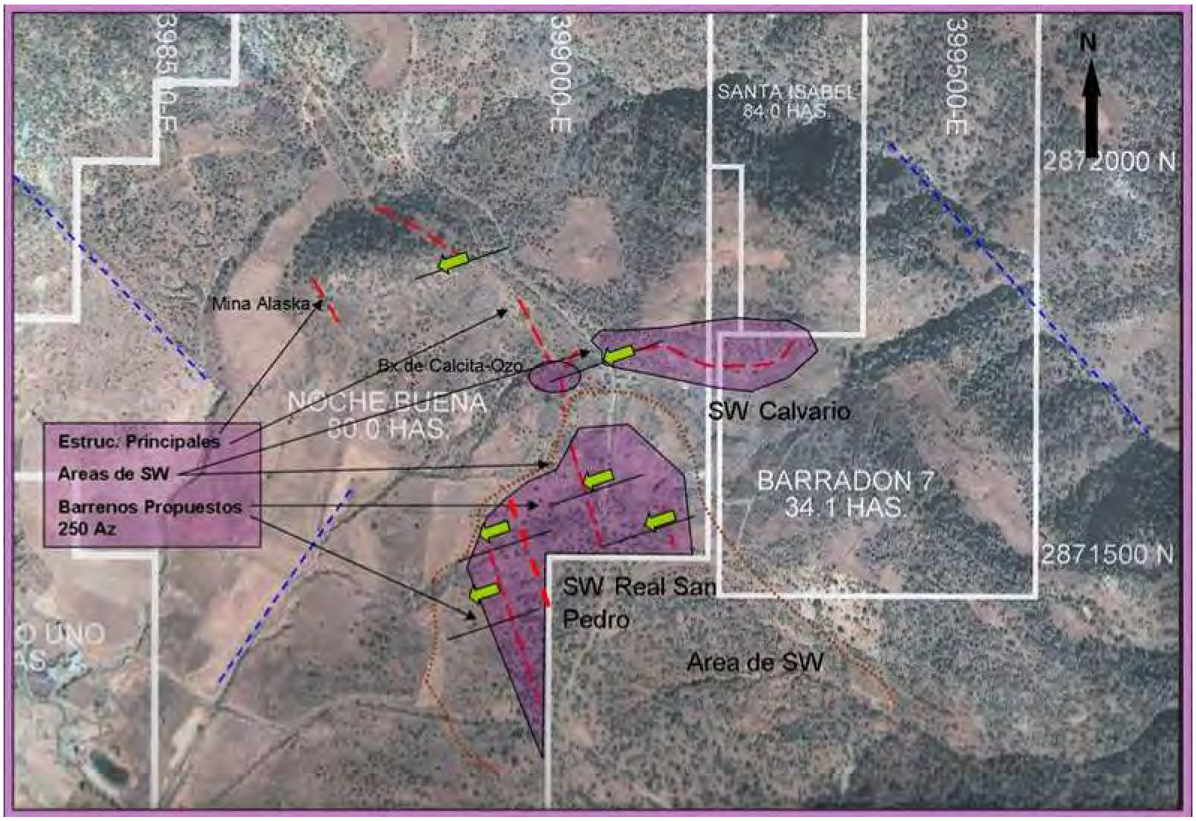


Figure provided by Endeavour Silver Corp.

Stockwork mineralization is hosted in an andesitic volcano-sedimentary sequence. Mineralization consists of small fractures filled with goethite-manganese oxide-hematite with sporadic occurrences of quartz-calcite veinlets. The host rock is argillized with weak silicification-sericitization and hematite-filled boxworks after pyrite. In this system, some areas with major silicification associated with brecciated structures have been identified. The width of the fractures filled with oxides typically is less than 2 cm with some major structures occasionally up to 10 cm.

Samples were collected from separate veinlets and oxidized fractures with different directions, and silicified zones with quartz veinlets, in order to determine which of these contain major mineralization.

Geological mapping and sampling focused in the central zone of stockwork mineralization in the Noche Buena – Buena Fé target area where the highest geochemical values had been reported. A total of 215 regional rock chip samples were collected in early 2009. Significant sampling results include 331 g/t silver, 0.48 g/t gold over 0.6 m and 476 g/t silver and 0.22 g/t gold over 0.2 m. Anomalous values for lead and zinc were also returned from most of the mineralized structures.

In 2009, detailed field mapping and sampling in the Noche Buena – Buena Fé area in the San Pedro sub-district led to the following conclusions:

- The general geology appears simple but the local detailed geology turns out to be rather complicated with a strong influence on mineralization.
- Geological features responsible for ore control mainly include veins, stockwork and "mantos."
- Geologic maps and cross-sections were used to develop a working model with recommendations for further exploration including surface diamond drilling (Figure 10.13).

Figure 10.13
Geologic Cross-Section of Noche Buena – Buena Fé Stockwork Zone.

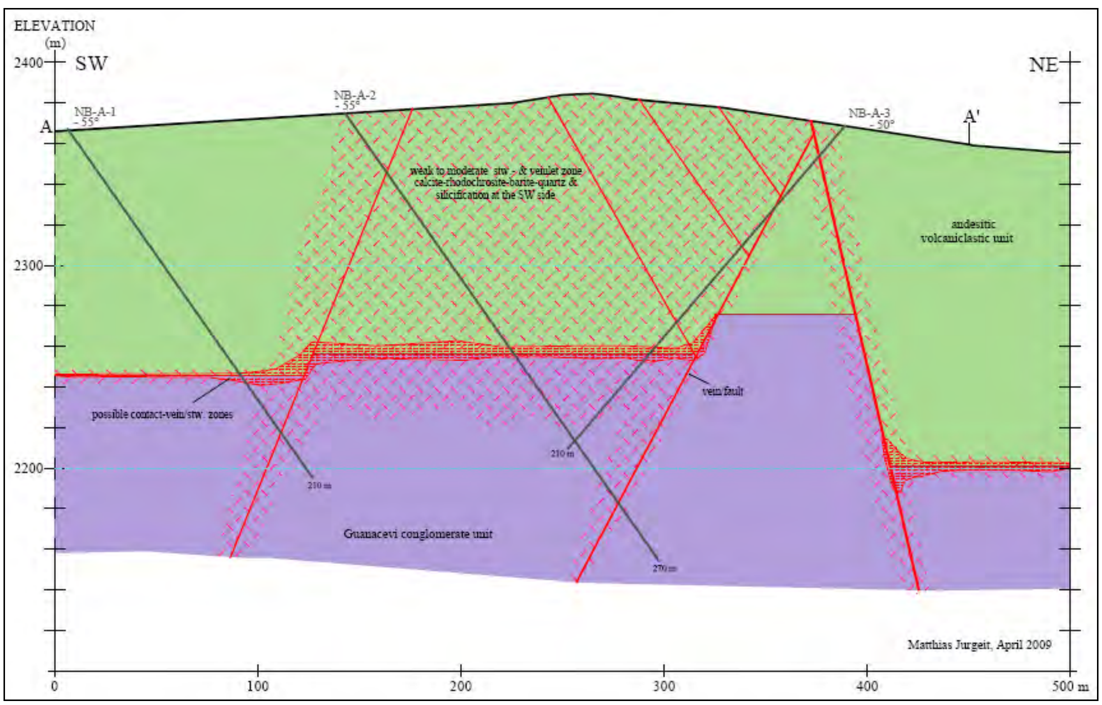


Figure provided by Endeavour Silver Corp.

Detailed geologic mapping also identified three general fault directions in the San Pedro sub-district. Principal (first order) faults trend about northwest-southeast; another second order fault direction trends north-northeast-south-southwest to northeast-southwest and east-west to west southwest-east southeast. Most likely all three systems developed coevally during the main east-west extensional event; however only the first and second structural systems experienced dilation. Mainly strike-slip movement occurred along the east-west structural trend (Figure 10.14). The north-south extensional event followed, causing maximum dilation in the east-west trending faults, although the northwest-southeast and southwest-northeast orientated faults also experienced dilation to some degree (Figure 10.15). Gangue minerals with metallic mineralization were deposited with preference in zones of maximum dilation.

The formation of ore-shoots in veins or mineralized stockwork zones appears to be principally structurally controlled. This includes also the variations in wall-rock competence and changes of competence at lithological contacts. Veins hosted by the massive conglomerate unit tend to be narrow, but stockwork zones could be well developed. Very favourable is the faulted contact between the Guanaceví conglomerate unit and andesitic volcaniclastics, but wide veins are found also within the andesitic-dacitic volcanic rocks and volcaniclastics. The historic El-Tule-Soto mine (just west of the village San Pedro) exploited such a flatly dipping contact vein zone (manto).

Ore shoots in the principal northwest-southeast faults can be expected near inflections to a north-south direction, but also changes toward an east-west strike can produce an ore shoot. The secondary north-south to southwest-northeast faults (with moderate to small vertical displacement) possess a generally favourable direction as they are more or less perpendicular to the east-west extension; however, these veins are generally rather narrow.

It is indicated that east-west to west-northwest-east-southeast trending faults could play an important role for the position of mineralization in the San Pedro sub-district. Several parallel faults transect the San-Pedro-Noche Buena area; a major east-west structural trend (composed itself of numerous parallel east-west faults) appears to pass through the El Tule mine area and can be traced in the satellite image for over one km in length (passes along the creek east of El Tule mine). This fault direction is perpendicular to the north-south extensional event; consequently maximum possible dilation occurred. Usually vertical displacement of the individual faults was rather small (less than 20 m) and resulting vein widths are rather narrow. However, ore shoots and stockwork zones can develop at intersections with other faults.

Figure 10.14
Shown are The Three Most Common Fault Directions (With the Usual Variations)

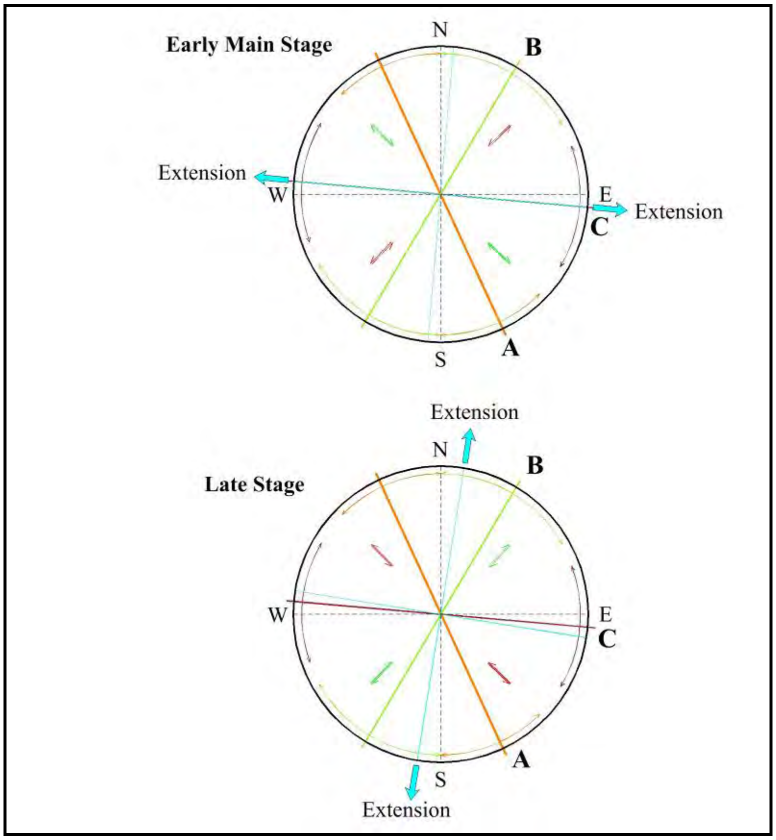
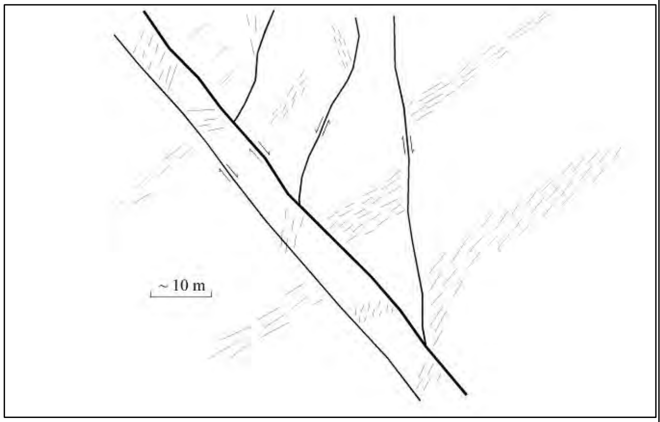
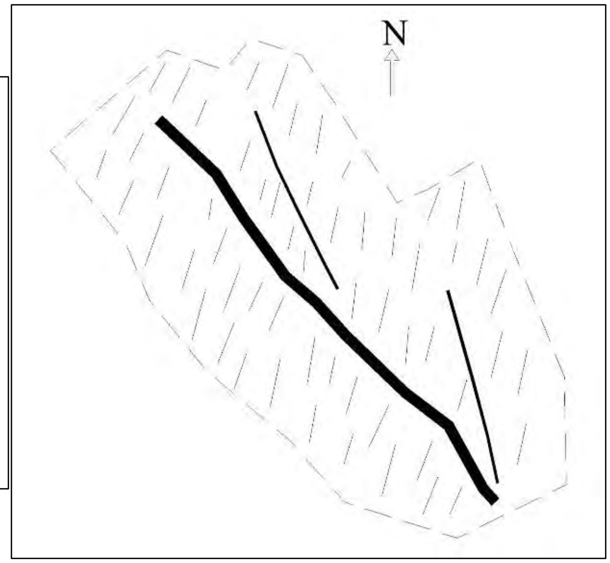


Figure provided by Endeavour Silver Corp.

In Figure 10.14 the major regional structural system is shown with the letter A (eg. Santa Cruz fault); trends B and C can be considered as second order fracture/fault systems. From the upper illustration, relative movements along the faults during the early east-west extensional tectonic event can be be predicted. During this stage, the east-west fault system C did not experience dilation but only strike-slip movements. From the lower illustration, the movements for each fault trend of the Guanaceví system during the late north-south extensional tectonic event can be deduced. Pre-existing east-west faults are thus oriented almost perpendicular to the extensional strain and experience maximum dilation with almost exclusively dip-slip displacement.

Figure 10.15
Observed Relationships between the Principal Veins/Faults and Related Veinlet and Stockwork Zones in San Pedro (left) Plan view (not to scale) showing general relationship between main northwest vein/fault trend & associated stockwork zone with most individual veinlets trending north-northeast.





Figures provided by Endeavour Silver Corp.

10.2.2.3 San Pedro – 2009 Trenching Program

During 2009, a backhoe/hand-trenching and rock chip sampling program was conducted in the Noche Buena - Buena Fé area. Trenching was conducted in areas of anomalous rock chip and soil geochemical samples.

The backhoe trenching program also included 13 trenches in the south portion of the Noche Buena - Buena Fé area (Figure 10.16). The presence and continuity of Buena Fé vein structure was confirmed in the trenches (Figures 10.17; 10.18).

The trenching program completed in the Noche Buena-Buena Fé area included 414 samples and 30 trenches distributed as it follows: 21 on the Buena Fé Vein, 7 on Calvario and 2 looking for the Armagedon structure.

Significant trench sampling results include 748 g/t silver, 0.20 g/t gold, 2.5% lead and 1.8% zinc over 0.25 m and 1,020 g/t silver, <0.05 g/t gold, 2.0% lead and 2.% zinc over 0.15 m.

Figure 10.16
Surface Map Showing the Completed Trenches on the Noche Buena-Buena Fé Area

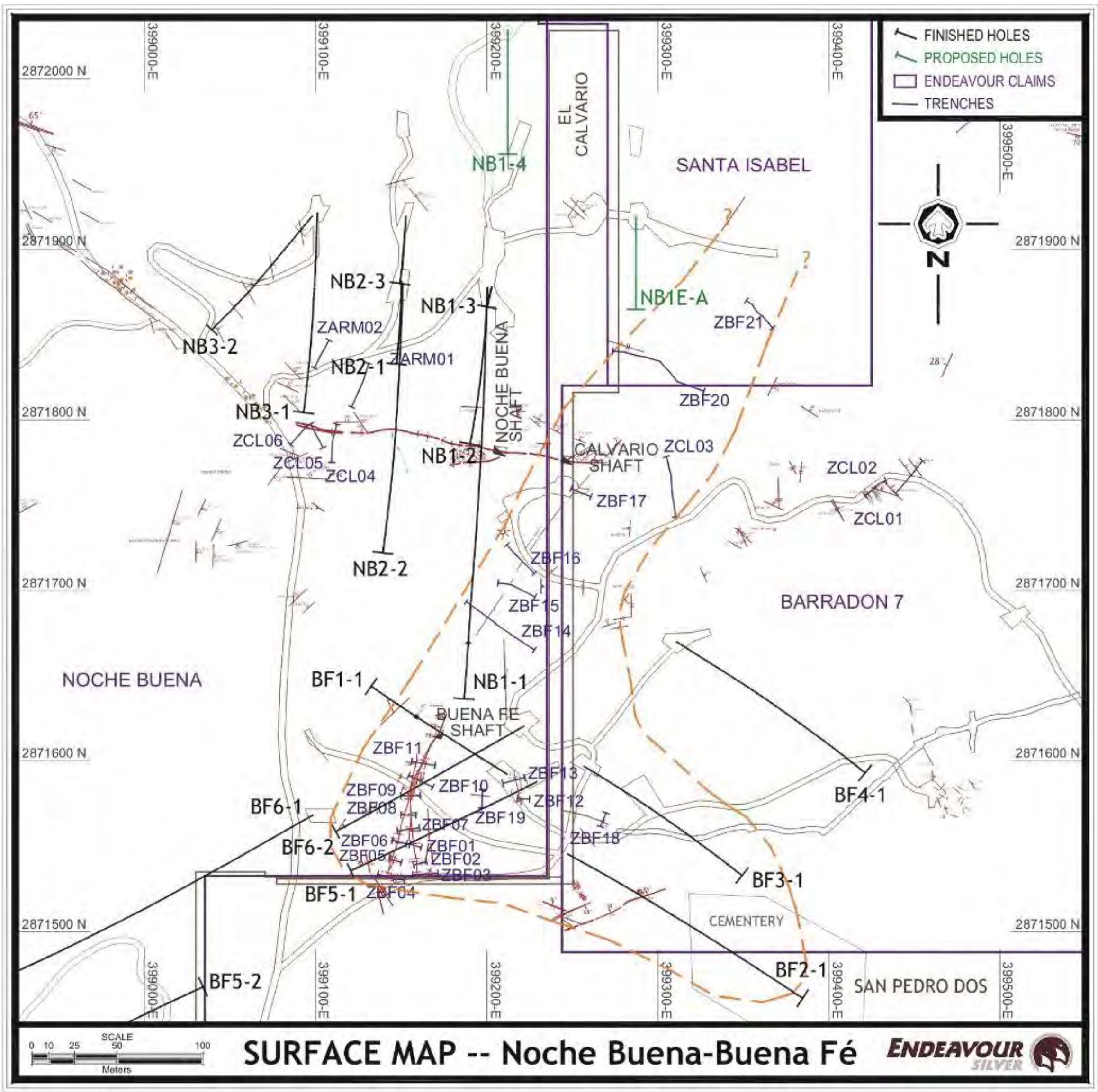


Figure provided by Endeavour Silver Corp.

Figure 10.17
Looking Northeast at Trench ZBF-01 showing the Veins of the Buena Fé Structure

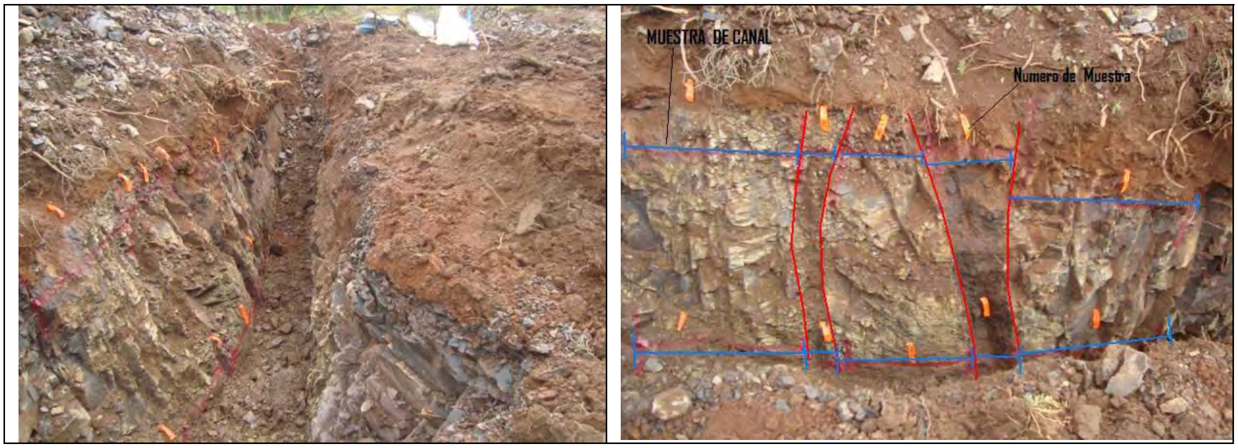


Figure provided by Endeavour Silver Corp.

Figure 10.18
Looking Northeast at Trench ZBF-02 showing Buena Fé vein Structure

Figure provided by Endeavour Silver Corp.

11.0 DRILLING

Endeavour Silver's previous drilling programs on the Guanaceví Mines project have been described in previous Technical Reports. This Section discusses the general drilling and core logging procedures, as well as focusing on the 2009 drilling programs.

11.1 GENERAL DRILLING AND LOGGING PROCEDURES

No changes have occurred to the methods of outlining and surveying the locations of the drill holes since the publication of the previous Micon reports. However, for completeness of this report, the description of Endeavour Silver's drilling procedures from the March, 2009, and April, 2007, reports has been excerpted and is presented below.

11.1.1 Drilling Procedures

After review and approval by management of the planning and budgeting of the drilling programs proposed by Endeavour Silver geologists, the individual drill sites are prepared and surveyed. Drill holes are typically drilled from the hanging wall, perpendicular to and passing through the target structure, into the footwall. No drilling is designed for intercept angles less than about 35° to the target, and most are from 45 to 90°. Drill holes are typically HQ to NQ size in diameter.

On the drill site, the drill set-up is surveyed for azimuth, inclination and collar coordinates with the drilling subject to daily scrutiny and coordination, with the drill crew, by Endeavour Silver geologists. At or near the targeted drill hole depth, the hole is surveyed using a Reflex down-hole survey instrument in multi-shot mode. The instrument is lowered down the drill rod string by wireline (the core barrel has been removed) and extended through the bit, where it hangs unsecured by resting on the bit crown. Survey measurements are thus obtained at a depth of approximately 4 m below the end of the drill string and at 30 m to 50 m intervals from the bottom of the hole to the collar. The survey data obtained from the drill hole are transferred to a handheld PDA, by which it is transferred to the office and thence to the Vulcan mine planning software and AutoCAD databases. True thicknesses are estimated from the measured inclination of the drill hole intercept and the interpreted dip of the vein.

Drill core is collected daily, carried to a secure core storage building where it is laid out, measured, logged for geotechnical and geological data, and marked for sampling.

Depending on the competency of the core, core is either cut in half with a diamond bladed core saw or split with a pneumatic core splitter.

The core storage facilities at Guanaceví are well protected by high level security fences and are under 24 hours surveillance by security personnel. This arrangement assists in ruling out any possibility of tampering with the drill cores.

11.1.2 Ballmark – Core Orientation System

In 2009, Endeavour Silver implemented the Ballmark Oriented Core System for its drilling programs in San Pedro and to some extent in Porvenir Cuatro. The most important benefit of this system is its inherent design for accurate measurement of the orientation of mineralized structures, faults and fractures.

The Ballmark system is designed to accurately orientate drill core as and when the core is broken from the bottom of the hole. It does this by indent marking a soft disc with a non-magnetic free moving ball, which because of gravity lies at the bottom or low side of an angled hole.

Ballmark is unique in that it marks the orientation of the core at the time the core is broken, as against all other systems that return to the bottom of the hole after the event (breaking the core) to try to measure or mark the profile of the hole bottom or the 'stub' left in hole. Because of this basic difference there is no 'downtime' in the drilling cycle and the drill rig continues working at its normal pace, without costly delays to the operation.

The Ballmark system works by utilizing the action of the inner tube back end during core breaking, which transfers load to the outer tube via compression of a spring (Figure 11.1). The system is then able to indent a previously aligned soft disc, using a ceramic ball.

Figure 11.1
The Ballmark Core Orientation System

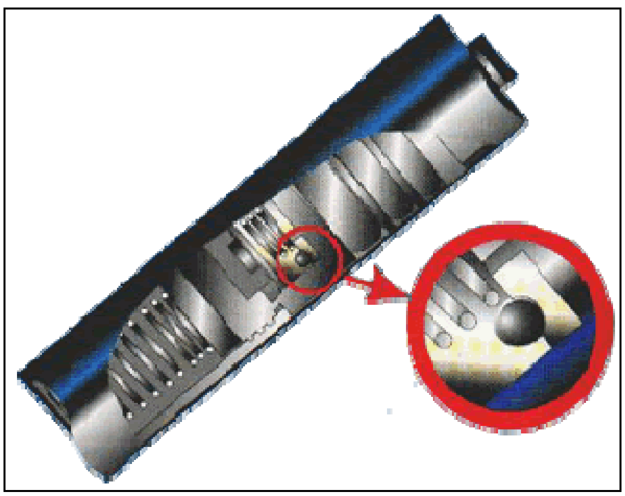


Figure provided by Endeavour Silver Corp.

By breaking core after the drill string has stopped rotating a BALLMARK® is created on the soft disc (Figure 11.2). This mark can then be transposed to the core resulting in consistent, accurate core orientation. This also produces a permanent record (the disc) of the core orientation information.

Figure 11.2
Permanent Core Orientation Information is Created on a Soft Disc of the Ballmark System

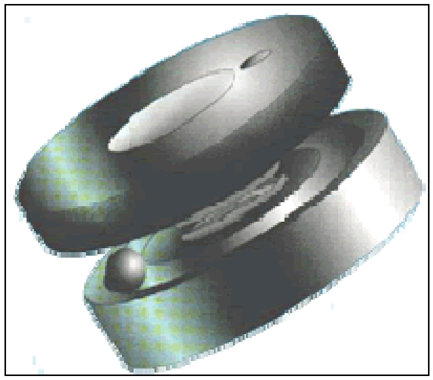


Figure provided by Endeavour Silver Corp.

11.1.3 Core Logging Procedures

In 2009, Endeavour Silver continued using its drill hole data collection and data management system for its exploration projects.

A configuration setup by Century Systems Technologies Inc. was selected for this purpose (Figure 11.3). Century was chosen because it directly interfaces with other software, like Vulcan, MapInfo and ArcGIS. The configuration selected was as follows:

- DHLogger for drill hole data collection, management and reporting which runs on a Windows XP or Vista computer.
- DHLite for drill hole data collection which runs on a handheld Windows mobile computer Fusion Client to move data back and forth between the local computer and the server(s).

In 2008, Endeavour established logging codes and other database organization and implemented the Century data collection and data management system at Guanaceví.

Each project will be captured into a DHLogger stand-alone database. The database comes in two files that can be easily copied to the office for backup and sharing of the data.

Only one person can be adding data to a project's database at a given time in DHLogger but many people can be logging drill holes on DHLite at the same time.

Figure 11.3
Century's Configuration for Drill Hole Data Collection for the Guanaceví Mines Project

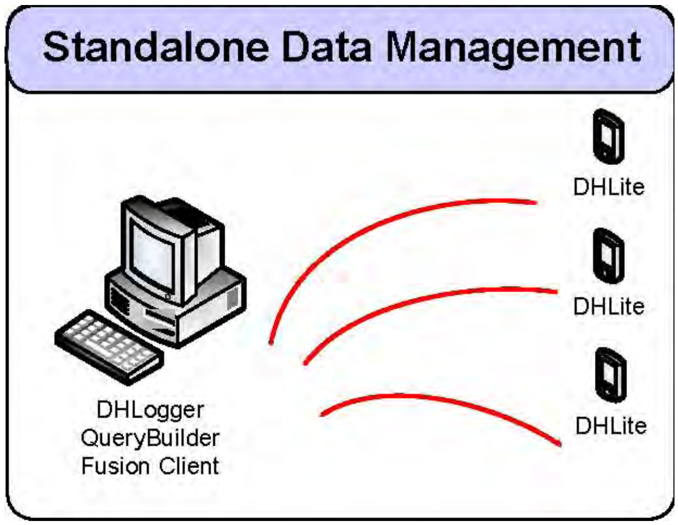


Figure provided by Endeavour Silver Corp.

The data will be captured at the project or in the office and the database files can be posted to a secure area in the office for others to copy to their computer and view.

Directories can be setup in the office similar to the one shown below to store the database files for backup purposes and to view the project data.

11.2 2009 DRILLING PROGRAM AND RESULTS

In 2009, surface exploration drilling at Guanaceví focused in two main areas: exploring the Santa Cruz vein structure on the Porvenir Cuatro concession so that any new mineralization could be added to the mine plan for development and production; and discovering new high-grade silver-gold-base metal mineralized zones in the San Pedro area north of the Porvenir mine that have the potential to develop future resources and production.

During 2009, Endeavour Silver completed 13,560 m of drilling in 45 surface diamond drill holes at Porvenir Cuatro and San Pedro. A total of 4,568 samples were also collected and submitted for assay. Exploration drilling undertaken since January, 2009, is summarized in Table 11.1.

Table 11.1
Guanaceví Mines Project SurfaceExploration Drilling in 2009

Area	June	July	August	September	October	November	December	Total
San Pedro								
No. of Holes	3	2				7	2	**14**
Metres	790	415				2,159	1,021	**4,384**
No. of Samples	241	210				818	669	**1,938**
Porvenir Cuatro								
No. of Holes	4	3	3	4	9	6	2	**31**
Metres	890	883	880	1,307	3,120	1,537	560	**9,176**
No. of Samples	324	295	305	307	787	503	109	**2,630**
Monthly Total								
No. of Holes	**7**	**5**	**3**	**4**	**9**	**13**	**4**	**45**
Metres	**1,680**	**1,297**	**880**	**1,307**	**3,120**	**3,695**	**1,581**	**13,560**
No. of Samples	**565**	**505**	**305**	**307**	**787**	**1,321**	**778**	**4,568**

Table provided by Endeavour Silver Corp.

In addition, in the third quarter of 2009, a diamond drilling program was initiated in the North Porvenir mine which consisted of one surface and one underground drill rig. By the end of 2009 a total of 5,664 m were drilled in 10 surface and 7 underground drill holes

11.2.1 2009 Porvenir Cuatro Surface Diamond Drilling Program

Very little historical exploration work has been conducted on the Porvenir Cuatro concession. There has also only been limited historic production from the Serrano mine, near the northern boundary of Porvenir Cuatro (Figure 10.1). Endeavour Silver believed that surface diamond drilling was warranted to test the vein located on the concession. The initial target concept was to test the vein below the Serrano mine at elevations between 2,000 and 2,200 m, where higher grade values occur in the Porvenir mine. The elevation of the Serrano mine is approximately 2,500 m.

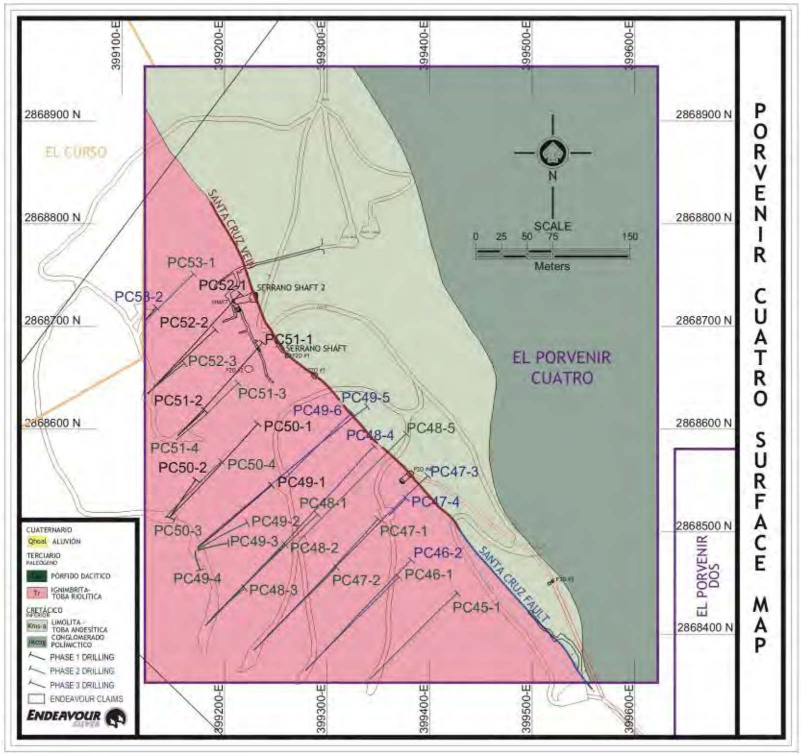
In June, 2009, surface diamond drilling commenced in the Porvenir Cuatro area using one drill rig provided by Layne de Mexico S.A. de CV. (Layne de Mexico). By early December, 2009, Endeavour Silver had completed a total of 9,176 m in thirty-one holes (Table 11.2; Figures. 11.4 and 11.5).

Table 11.2
Summary of the 2009 Surface Diamond Drilling Program for the Porvenir Cuatro Concession

Drill Hole	Drill Hole Coordinates			Azimuth (°)	Dip (°)	Hole Diameter	Length (m)	Start Date	Finish Date
	Northing (Y)	Easting (X)	Elevation (Z)						
PC52-1	2,868,635.39	399,126.07	2,583.59	45	-50	HQ	197.75	14-Jun-09	17-Jun-09
PC52-2	2,868,634.76	399,125.54	2,583.58	45	-70	HQ	240.75	17-Jun-09	21-Jun-09
PC51-1	2,868,595.35	399,156.06	2,587.10	45	-50	HQ	188.65	21-Jun-09	24-Jun-09
PC51-2	2,868,593.95	399,154.81	2,587.31	45	-82	HQ	262.65	24-Jun-09	30-Jun-09
PC50-1	2,868,515.17	399,147.63	2,639.71	45	-60	HQ	258.40	1-Jul-09	7-Jul-09
PC50-2	2,868,514.45	399,147.06	2,639.73	45	-82	HQ	328.65	7-Jul-09	15-Jul-09
PC49-1	2,868,484.26	399,173.67	2,638.98	50	72	HQ	295.65	15-Jul-09	22-Jul-09
PC51-3	2,868,590.63	399,154.09	2,588.02	45	-70	HQ	225.30	16-Aug-09	19-Aug-09
PC51-4	2,868,590.15	399,153.52	2,588.27	45	-90	HQ	319.90	19-Aug-09	24-Aug-09
PC49-2	2,868,482.51	399,173.66	2,639.16	55	-80	HQ	335.15	25-Aug-09	1-Sep-09
PC49-3	2,868,482.00	399,173.79	2,639.15	66	-86	HQ	347.35	1-Sep-09	8-Sep-09
PC53-1	2,868,705.83	399,122.88	2,591.70	45	-71	HQ	210.10	8-Sep-09	12-Sep-09
PC50-3	2,868,514.10	399,142.26	2,640.04	45	-88	HQ	429.20	13-Sep-09	20-Sep-09
PC50-4	2,868,514.52	399,142.65	2,639.99	45	-74	HQ	319.85	26-Sep-09	1-Oct-09
PC52-3	2,868,634.75	399,124.48	2,583.52	45	-80	HQ	253.45	1-Oct-09	5-Oct-09
PC48-1	2,868,409.81	399,182.54	2,635.96	45	-62	HQ	325.85	4-Oct-08	9-Oct-09
PC49-4	2,868,482.05	399,171.70	2,639.26	187	-88	HQ	444.75	5-Oct-09	12-Oct-09
PC48-2	2,868,409.53	399,182.15	2,636.07	45	-71	HQ	335.35	9-Oct-09	14-Oct-09
PC48-3	2,868,409.16	399,181.79	2,636.08	45	-81	HQ	413.40	14-Oct-09	21-Oct-09
PC47-1	2,868,385.05	399,228.97	2,605.02	45	-61	HQ	363.45	13-Oct-09	19-Oct-09
PC47-2	2,868,384.80	399,228.70	2,604.98	45	-72	HQ	353.45	19-Oct-09	24-Oct-09
PC46-1	2,868,364.83	399,278.97	2,582.66	45	-66	HQ	326.00	21-Oct-09	26-Oct-09
PC45-1	2,868,359.23	399,344.78	2,549.57	45	-66	HQ	304.50	27-Oct-09	31-Oct-09
PC53-2	2,868,705.64	399,122.51	2,591.70	45	-86	HQ	234.55	1-Nov-09	4-Nov-09
PC48-4	2,868,410.07	399,182.86	2,636.11	45	-49	HQ	365.35	5-Nov-09	11-Nov-09
PC49-5	2,868,485.19	399,173.76	2,639.03	49	-58	HQ	380.70	12-Nov-09	17-Nov-09
PC48-5	2,868,491.41	399,272.57	2,585.92	45	-49	HQ	255.20	18-Nov-09	21-Nov-09
PC49-6	2,868,551.34	399,258.31	2,576.94	49	-59	HQ	179.40	21-Nov-09	23-Nov-09
PC47-4	2,868,516.23	399,360.50	2,538.41	49	-79	HQ	121.65	24-Nov-09	25-Nov-09
PC47-3	2,868,386.47	399,230.39	2,604.92	45	-45	HQ	319.20	26-Nov-09	1-Dec-09
PC46-2	2,868,366.04	399,279.70	2,582.65	45	-52	HQ	240.40	1-Dec-09	4-Dec-09
Total							**9,176.00**		

Table provided by Endeavour Silver Corp.

Figure 11.4
Surface Geology Map showing Traces of the Surface Holes Drilled to Test the Santa Cruz Vein Targets on the Porvenir Cuatro Concession*



* Rectangular area shown in colour denotes the limits of the Porvenir Cuatro concession.
Figure provided by Endeavour Silver Corp.

Figure 11.5
Porvenir Cuatro Long Section showing Intersection Points on the Santa Cruz Vein

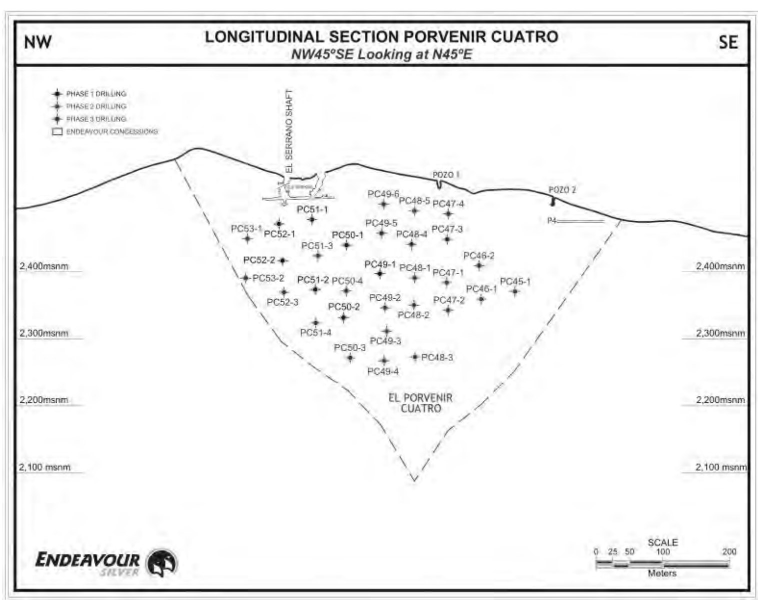


Figure provided by Endeavour Silver Corp.

11.2.2 2009 Porvenir Cuatro Surface Diamond Drilling Results

In 2009, the surface diamond drilling program on the Porvenir Cuatro concession discovered a new zone of high grade, silver-gold mineralization along the Santa Cruz vein system. The potential of this area was first recognized as a result of Endeavour Silver's sampling of the historic, small high grade El Serrano mine. This mine is situated within the same Santa Cruz vein system that contains the Alex Breccia, Santa Cruz, Porvenir mine and Porvenir Dos deposits along strike to the southeast. The Serrano mine was believed to sit near the topographic high on the Porvenir Cuatro property, and the main "bonanza" zone was interpreted to occur lower in elevation. Deeper drill holes eventually proved this interpretation. This newly discovered, high grade silver-gold mineralized zone is outlined by about 14 drill holes over a 250 m long by 250 m deep area within the Santa Cruz vein.

Drilling highlights include 713 g/t silver and 3.85 g/t gold over a 5.67 m true width in hole PC50-2, including 3,250 g/t silver and 39.7 g/t gold over 0.31 m true width; and 727 g/t silver and 1.51 g/t gold over a 3.44 m true width in hole PC50-3, including 1,040 g/t silver and 2.25 g/t gold over 2.21 m true width.

Drilling results are summarized in Table 11.3.

Figure 11.6 represents a typical cross-section and shows Holes PC50-1, 2, 3 and 4 drilled to test the Santa Cruz vein structure on the Porvenir Cuatro concession.

Table 11.3
Summary of the Porvenir Cuatro 2009 Surface Diamond Drilling Results

Drill Hole Number	Vein	Mineral Intersection (m)				Assay Results (g/t)	
		From	To	Core Length	True Width	Silver	Gold
PC45-1	Santa Cruz Vein	191.45	193.80	2.35	2.04	6	<0.05
PC46-1	Santa Cruz Vein	242.50	243.95	1.45	1.26	<5	<0.05
PC46-2	Santa Cruz Vein	217.60	221.00	3.40	3.23	18	0.09
PC47-1	Santa Cruz Vein	249.90	254.55	4.65	3.81	64	0.12
PC47-2	Santa Cruz Vein	276.40	276.70	0.30	0.25	<5	<0.05
PC47-3	Santa Cruz Vein	229.40	232.20	2.80	2.23	50	0.18
PC47-4	Santa Cruz Vein	50.40	52.60	2.20	1.69	48	0.12
PC48-1	Santa Cruz Vein	277.15	280.35	3.20	2.90	83	0.16
PC48-2	Santa Cruz Vein	301.25	303.25	2.00	1.64	73	0.22
PC48-3	Santa Cruz Vein	364.10	367.90	3.80	2.44	70	0.08
PC48-4	Santa Cruz Vein	254.45	259.50	5.05	4.88	121	0.46
PC48-5	Santa Cruz Vein	122.65	124.20	1.55	1.53	21	0.07
PC49-1	Santa Cruz Vein	252.60	255.15	2.55	1.80	297	1.12
	Including	254.00	254.30	0.30	0.21	1,070	5.29
PC49-2	Santa Cruz Vein	292.20	301.30	9.10	5.85	236	0.66
	Including	296.20	296.65	0.45	0.29	610	1.39
PC49-3	Santa Cruz Vein	327.55	334.15	6.60	4.24	494	1.06
	Including	328.70	330.15	1.45	0.93	796	2.26
PC49-4	Santa Cruz Fault Zone	366.50	395.80	29.30	14.65	<5	<0.05
PC49-5	Santa Cruz Fault	211.40	216.10	4.70	4.26	21	0.07
	Santa Cruz Vein	216.10	219.45	3.35	3.04	303	1.18
PC49-6	Santa Cruz Vein	87.75	88.55	0.80	0.75	10	<0.05
PC50-1	Santa Cruz Vein	225.75	228.70	2.95	2.42	13	0.06
PC50-2	Santa Cruz Vein	305.50	312.90	7.40	5.67	713	3.85
	Including	307.65	308.05	0.40	0.31	3,250	39.70

Drill Hole Number	Vein	Mineral Intersection (m)				Assay Results (g/t)	
		From	To	Core Length	True Width	Silver	Gold
	Including	309.20	309.50	0.30	0.23	1,310	2.60
	Including	311.30	311.90	0.60	0.46	1,040	3.79
PC50-3	Santa Cruz Vein	361.00	367.00	6.00	3.44	727	1.51
	Including	361.35	365.20	3.85	2.21	1,040	2.25
PC50-4	Santa Cruz Vein	272.75	276.30	3.55	2.91	427	1.64
	Including	274.60	276.30	1.70	1.39	690	2.66
PC51-1	Santa Cruz Vein	141.05	141.65	0.60	0.56	23	0.07
PC51-2	Santa Cruz Vein	211.50	217.95	6.45	4.94	293	0.88
	Including	211.50	212.00	0.50	0.38	829	3.07
PC51-3	Santa Cruz Vein	173.35	175.70	2.35	1.65	257	1.01
	Including	175.35	175.70	0.35	0.25	534	1.87
PC51-4	Santa Cruz Vein	258.30	272.30	14.00	7.00	332	0.94
	Including	264.95	266.90	1.95	0.85	916	2.33
PC52-1	Santa Cruz Vein	148.00	149.15	1.15	1.08	8	<0.05
PC52-2	Santa Cruz Vein	177.55	180.20	2.65	2.22	389	2.29
	Including	179.30	180.20	0.90	0.75	726	4.79
PC52-3	Santa Cruz Vein	215.40	220.75	5.35	2.68	271	1.04
	Including	218.35	218.95	0.60	0.30	618	3.23
PC53-1	Santa Cruz Fault	127.00	130.25	3.25	2.49	10	0.05
	Santa Cruz Vein	145.50	148.50	3.00	2.30	51	0.16
PC53-2	Santa Cruz Vein	196.10	208.05	11.95	7.68	250	1.11

Table provided by Endeavour Silver Corp.

Figure 11.6
Cross-Section through Holes PC50-1, PC50-2, PC50-3 and PC50-4 Drilled to Test the Santa Cruz Vein

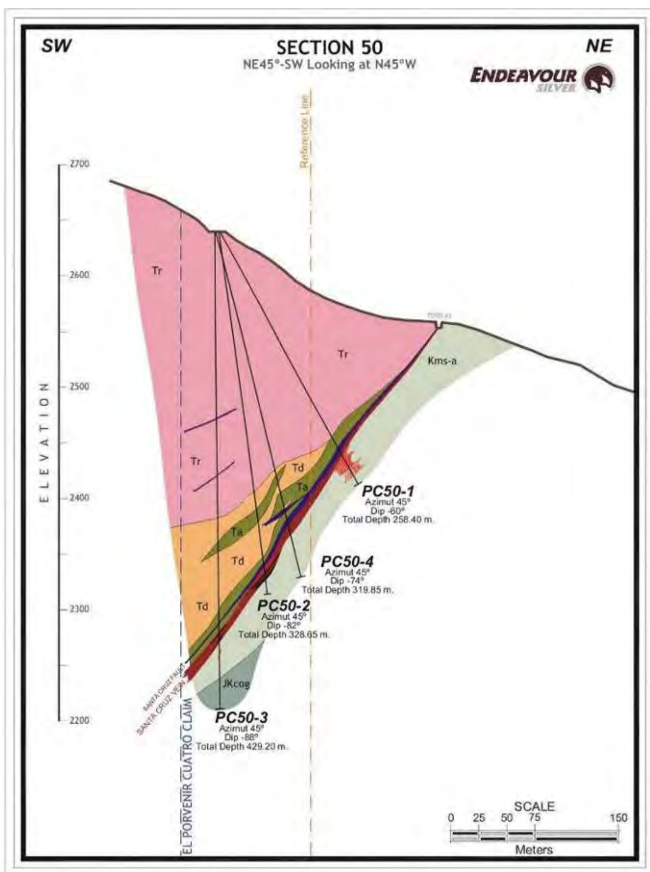


Figure provided by Endeavour Silver Corp.

11.2.3 2009 San Pedro Sub-District Surface Diamond Drilling Program

During 2008 and early 2009, Endeavour Silver's exploration programs in the Noche Buena – Buena Fé area of the San Pedro sub-district identified a potentially widespread zone of silver (gold)-lead-zinc mineralization. This new exploration target consisted of a large mineralized vein/stockwork/ manto system comprised of narrow (1 to 3 cm), discontinuous veinlets. Primary sulphide minerals included sphalerite, galena, minor pyrite and rare chalcopyrite. The gangue consists of quartz, carbonate, adularia and minor fluorite. The Noche Buena – Buena Fé target is hosted mainly in Tertiary volcaniclastic andesite, which overlies the older Guanaceví conglomerates in the area.

The best example of widespread mineralization was intercepted in Hole NB2-1. This hole encountered a zone of vein/stockwork mineralization averaging 89 g/t silver, 0.10 g/t gold, 0.22% lead and 0.43% zinc over 30.2 m (true width).

In mid-2009, surface diamond drilling was initiated to test the highest-grade and best mineralized structures identified as a result of the soil sampling and trenching programs in the Noche Buena – Buena Fé target area

In June, 2009, surface diamond drilling commenced in the Noche Buena – Buena Fé area using one drill rig provided by Layne de Mexico. By the middle of December, 2009, Endeavour Silver had completed a total of 4,384 m in 14 holes (Table 11.4 and Figure 11.7).

Table 11.4
Summary for San Pedro 2009 Surface Diamond Drilling Program

Drill Hole	Azimuth (°)	Dip (°)	Diameter	Total Depth (m)	Start Date	Finish Date
BF5-1	240	-58	HQ	226.70	01/06/2009	04/06/2009
BF5-2	60	-50	HQ	231.55	05/06/2009	08/06/2009
BF6-1	240	-45	HQ	331.65	08/06/2009	13/06/2009
BF6-2	240	-45	HQ	176.75	23/07/2009	26/07/2009
NB3-2	220	-68	HQ	237.85	27/07/2009	31/07/2009
NB1-4	180	-78	HQ	436.10	26/10/2009	02/11/2009
BF7-1	120	-62	HQ	128.05	02/11/2009	04/11/2009
BF8-1	120	-63	HQ	124.90	05/11/2009	07/11/2009
BF9-1	120	-64	HQ	217.65	07/11/2009	10/11/2009
NB1E-1	180	-78	HQ	420.85	10/11/2009	17/11/2009
NB3-3	180	-82	HQ	401.05	17/11/2009	23/11/2009
NB2-4	180	-75	HQ	429.90	24/11/2009	30/11/2009
NB1E-2	180	-81	HQ	548.85	01/12/2009	09/12/2009
NB3-4	180	-70	HQ	472.40	10/12/2009	16/12/2009
				4,384.25		

Table provided by Endeavour Silver Corp.

Figure 11.7
Surface Drill Hole Map of the Noche Buena – Buena Fé area, San Pedro Sub-District, Guanaceví

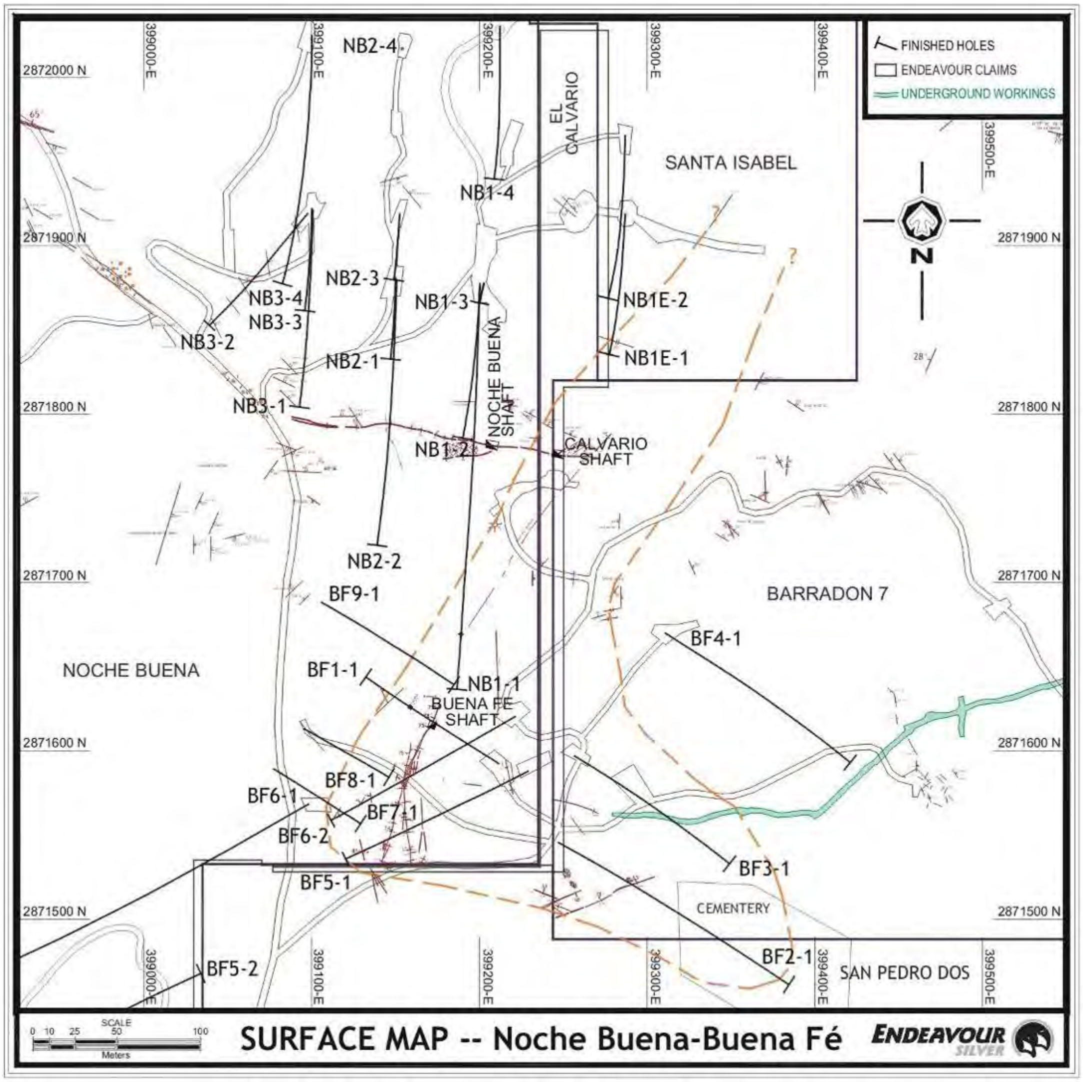


Figure provided by Endeavour Silver Corp.

11.2.4 2009 San Pedro Sub-District Surface Diamond Drilling Results

In 2009, the surface diamond drilling program in the Noche Buena – Buena Fé area of the San Pedro sub-district intercepted several veins and mantos containing high-grade silver-gold-base metal mineralization. Further drilling is planned in 2010 to follow-up on these intercepts.

Drilling highlights included 244 g/t silver, 2.88 g/t gold, 1.1% lead and 2.2% zinc over a 6.97 metre (m) true width for a manto intercept in hole BF6-2, including 3,400 g/t silver, 49.2 g/t gold, 1.5% lead and 2.7% zinc over 0.40 m true width; 1,205 g/t silver and 0.29 g/t gold over a 0.69 m true width in hole BF5-1, including 2,320 g/t silver, 0.52 g/t gold, 6.9% lead and

10.6% zinc over 0.3 m true width; and 1,110 g/t silver, 1.00 g/t gold, 1.1% lead and 1.5% zinc over 0.87 m true width in hole NB3-3.

Drilling results are summarized in Table 11.5.

Figure 11.8 is a cross-section showing holes drilled to test the Buena Fé vein and manto and the Calvario and Armagedon structures in the Noche Buena area. Figure 11.9 is a cross-section showing drill hole BF9-1 which was drilled to test the Buena Fé vein and manto in the Noche Buena area.

Table 11.5
2009 Summary of the San Pedro Sub-District (Noche Buena – Buena Fé) Diamond Drilling Results

Drill Hole	Vein	Drill Hole Intersection (m)				Assay results			
		From	To	Core Length	True Width	Silver (g/t)	Gold (g/t)	Lead (%)	Zinc (%)
BF5-1	Vein	17.20	18.00	0.80	0.69	1,205	0.29	3.53	5.60
	Including	17.20	17.55	0.35	0.30	2,320	0.52	6.90	10.60
	Stockwork	52.45	54.10	1.65	1.55	341	0.12	2.16	4.47
	Including	52.45	52.80	0.35	0.33	1,235	0.38	5.85	11.85
	Vein	74.10	74.55	0.45	0.23	162	<0.05	0.42	0.85
	Vein	81.45	81.70	0.25	0.23	103	<0.05	0.30	0.58
	Stockwork/Manto	108.60	115.85	7.25	5.55	54	0.07	0.76	2.42
	Including	115.30	115.85	0.55	0.42	321	<0.05	6.28	22.30
BF5-2	Stockwork	158.10	159.55	1.45	1.26	72	<0.05	0.06	0.12
	Vein Breccia	224.20	224.60	0.40	0.23	42	0.13	1.44	2.29
BF6-1	Stockwork	212.75	213.05	0.30	0.25	143	0.45	0.02	0.04
	Vein	251.85	253.10	1.25	0.82	71	0.41	0.07	0.12
BF6-2	Vein	13.90	14.10	0.20	0.15	243	0.17	1.20	1.98
	Stockwork	30.35	34.60	4.25	3.48	64	0.08	0.27	0.58
	Including	33.90	34.60	0.70	0.57	251	0.23	0.63	1.33
	Manto	101.95	108.95	7.00	6.97	244	2.88	1.06	2.17
	Including	103.00	103.45	0.45	0.45	351	<0.05	2.06	3.46
	Including	107.95	108.35	0.40	0.40	3,400	49.20	1.45	2.73
BF7-1	No significant intercepts								
BF8-1	Vein	78.30	78.80	0.50	0.29	275	0.20	2.58	6.94
BF9-1	Buena Fe Vein	167.20	175.15	7.95	4.51	206	0.11	0.31	0.66
	Including	171.35	172.40	1.05	0.60	822	0.26	0.82	2.03
	Vein	186.70	187.05	0.35	0.30	299	0.24	1.18	5.15
NB1E-1	Stockwork	26.85	28.15	1.30	1.00	111	<0.05	0.99	2.44
	Armagedon Vein	196.50	200.05	3.55	2.39	88	<0.05	0.61	0.89
	Stockwork	209.05	209.65	0.60	0.54	260	<0.05	0.71	1.61
	Stockwork	224.50	226.55	2.05	0.63	118	0.10	1.35	2.54
	Calvario Vein	300.80	303.25	2.45	1.57	85	0.13	1.07	2.01
	Stockwork	312.50	313.15	0.65	0.42	163	0.13	2.33	4.24
	Stockwork	316.45	316.70	0.25	0.13	114	0.14	2.18	4.99
	Stockwork	390.35	391.40	1.05	0.36	376	0.38	0.30	0.50

Drill Hole	Vein	Drill Hole Intersection (m)				Assay results			
		From	To	Core Length	True Width	Silver (g/t)	Gold (g/t)	Lead (%)	Zinc (%)
NB1E-2	Stockwork	152.40	152.80	0.40	0.14	127	<0.05	0.29	0.30
	Stockwork	184.20	187.80	3.60	2.71	138	<0.05	0.47	0.71
	Including	184.20	184.70	0.50	0.38	504	<0.05	1.35	2.00
	Armagedon Vein	289.10	292.35	3.25	1.94	39	<0.05	0.25	0.51
	Stockwork	330.35	331.30	0.95	0.95	117	<0.05	1.19	1.38
	Stockwork	339.20	341.00	1.80	0.87	104	<0.05	1.08	1.72
	Calvario Vein	379.15	382.30	3.15	1.90	30	<0.05	0.53	4.22
	Stockwork	424.20	424.50	0.30	0.19	335	0.69	0.14	0.23
	Stockwork	440.40	440.70	0.30	0.15	190	0.84	0.20	0.35
NB1-4	Armagedon Vein	293.25	295.25	2.00	1.53	36	0.10	0.04	0.08
	Stockwork	333.95	334.25	0.30	0.19	271	0.27	0.31	0.53
	Stockwork	335.80	336.50	0.70	0.35	288	0.20	0.43	0.55
	Stockwork	343.70	345.40	1.70	0.85	144	0.18	0.14	0.29
	Stockwork	346.90	347.60	0.70	0.35	408	0.30	0.31	0.48
	Calvario Vein	402.50	405.40	2.90	1.66	109	0.26	1.67	3.02
	Stockwork	415.20	416.30	1.10	0.38	289	0.52	0.06	0.09
NB2-4	Stockwork	286.85	287.15	0.30	0.15	106	0.17	0.11	0.20
	Armagedon Vein	299.70	302.70	3.00	1.58	No significant values			
	Stockwork	342.65	343.15	0.50	0.09	130	<0.05	1.12	2.36
	Stockwork	356.25	357.15	0.90	0.31	161	0.18	0.39	0.51
	Calvario Vein	374.25	377.90	3.65	1.71	21	<0.05	0.16	0.25
	Stockwork	401.05	401.90	0.85	0.60	112	<0.05	0.10	0.13
	Stockwork	402.90	403.25	0.35	0.18	149	0.10	0.75	1.31
NB3-2	Stockwork	16.10	16.50	0.40	0.31	143	0.07	0.18	0.13
	Armagedon Vein	105.30	108.60	3.30	1.80	152	0.09	0.23	0.47
	Including	105.50	105.75	0.25	0.16	606	0.36	0.64	1.22
	Including	106.40	106.75	0.35	0.22	309	0.17	0.50	0.27
	Stockwork	139.15	139.55	0.40	0.20	281	0.28	0.50	0.57
	Calvario Vein	142.05	145.80	3.75	2.10	75	0.06	0.43	0.25
	Stockwork	220.30	221.80	1.50	1.41	113	0.07	0.94	0.53
NB3-3	Stockwork	143.90	144.85	0.95	0.61	112	<0.05	0.27	0.58
	Stockwork	166.50	167.30	0.80	0.40	188	<0.05	0.31	0.45
	Armagedon Vein	186.80	189.70	2.90	1.85	130	<0.05	0.12	0.18
	Stockwork	207.35	208.55	1.20	0.51	102	0.26	0.08	0.25
	Stockwork	261.85	262.40	0.55	0.19	511	0.72	2.43	3.18
	Stockwork	289.75	290.75	1.00	0.87	1,110	1.00	1.08	1.45
	Calvario Vein	296.00	305.00	9.00	2.78	252	0.32	0.86	1.29
	Including	300.95	305.00	4.05	1.25	335	0.36	0.95	1.38
	Stockwork	314.45	314.65	0.20	0.13	242	0.51	1.47	4.08

Table provided by Endeavour Silver Corp.

Figure 11.8
Cross-Section Showing the Holes (NB1-1, 1-2, 1-3 and 1-4) Drilled to Test the Buena Fé Vein and Manto and the Calvario and Armagedon Structures in the Noche Buena Area

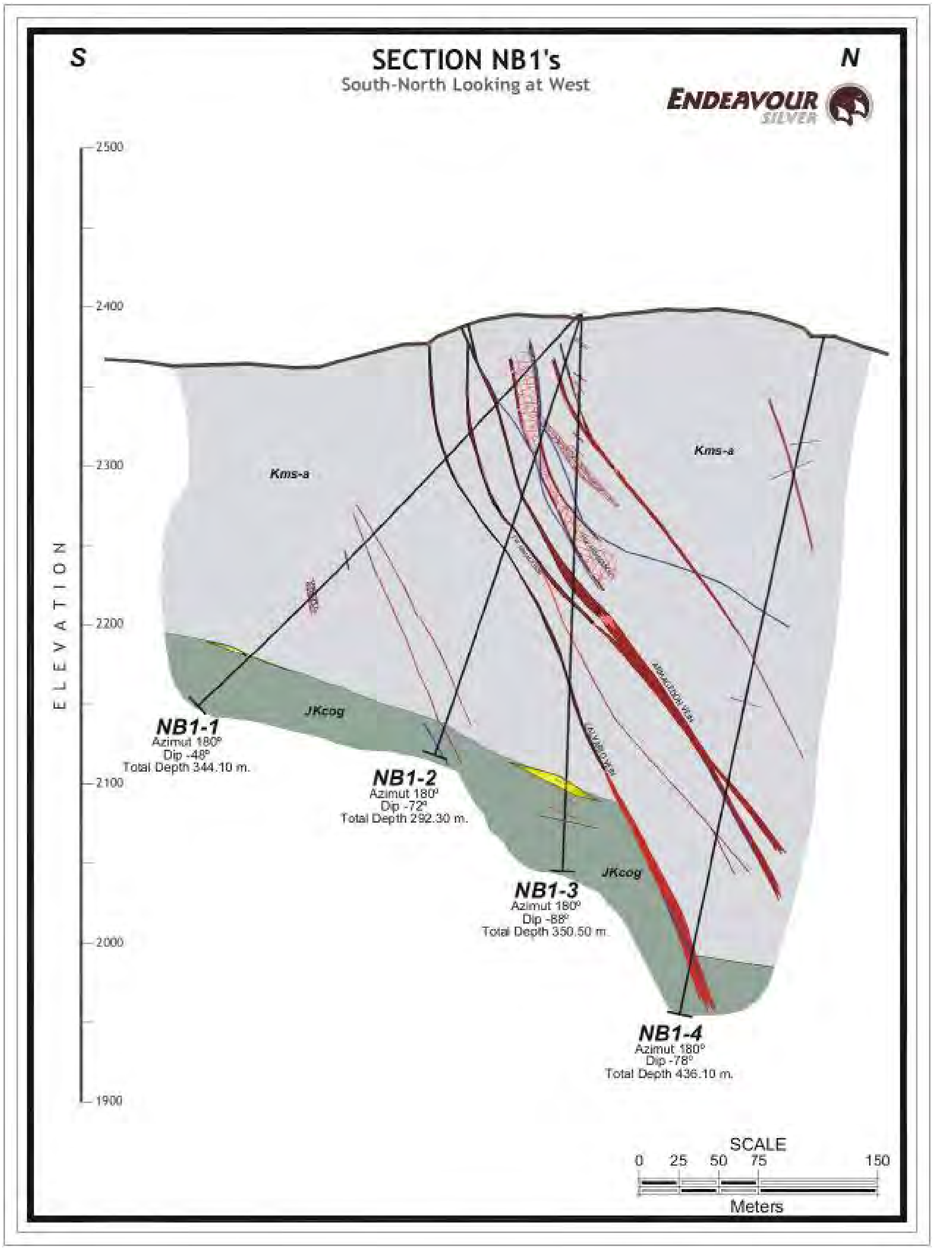


Figure provided by Endeavour Silver Corp.

Figure 11.9
Cross-Section Showing the Hole BF9-1 Drilled to Test the Buena Fé Vein and Manto in the Noche Buena Area

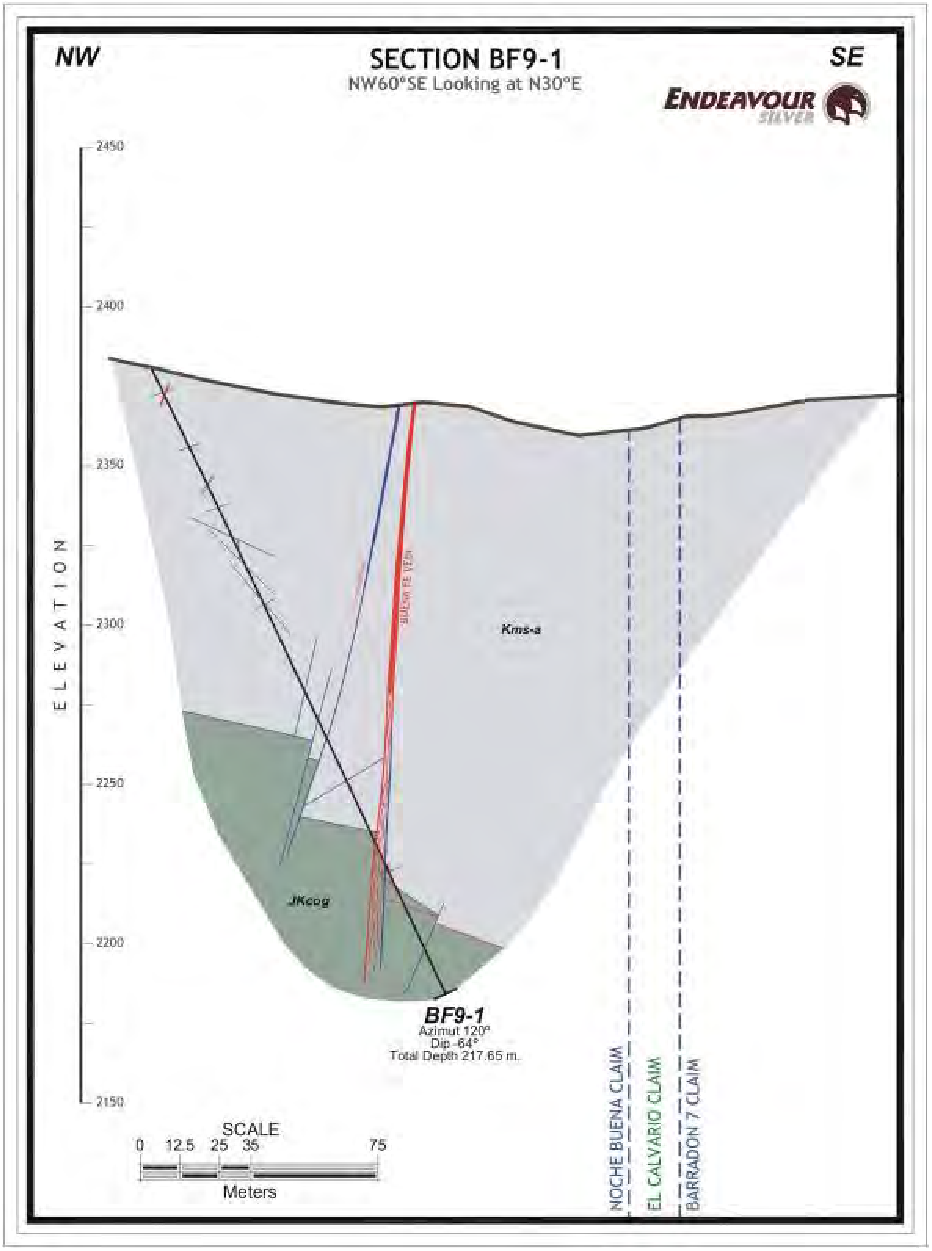


Figure provided by Endeavour Silver Corp.

11.2.5 2009 North Porvenir Mine Surface and Underground Diamond Drilling Program

In the third quarter of 2009, a diamond drilling program was initiated in the North Porvenir mine. The program consisted of one surface rig and one underground rig provided by Corebeil de Mexico S.A. de C.V. (Corebeil). By the end of 2009, 5,664 m were drilled in 10 surface drill holes (4,232 m) and 7 underground drill holes (1,432 m). Table 11.6 summarizes the surface and underground drill holes at the North Porvenir mine.

Figures 11.10 and 11.11 are longitudinal sections showing the underground and surface diamond drill hole pierce points along with the intersection assay results.

11.2.6 2009 North Porvenir Mine Surface and Underground Diamond Drilling Results

In 2009, the drilling programs at the North Porvenir mine extended the northern zone further to the north and the central zone slightly deeper than had been previously recognized. Strong silver mineralization in the Santa Cruz vein was intersected in several drill holes, which has expanded the previously defined resources in this area.

Drilling highlights in the northern zone include 864 g/t silver and 1.13 g/t gold over a 3.48 m true vein width in hole PS-634-01, 410 g/t silver and 0.65 g/t gold over a 3.00 m true vein width in hole PS-638-01, and 408 g/t silver and 0.80 g/t gold over a 3.00 m true vein width in hole PS-634-02.

In the central zone, hole PU-574-01 intersected 455 g/t silver and 0.63 g/t gold over a 2.27 m true vein width.

All North Porvenir mine underground and surface diamond drilling results are summarized in Table 11.7.

Cross-sections of the Santa Cruz vein are shown on Figures 11.12 through 11.16.

Table 11.6
Summary for North Porvenir 2009 Surface and Underground Diamond Drilling

Area	Drill Hole Number	Drilling Date		Drill Hole Collar Coordinates			Azimuth (°)	Dip (°)	Depth (m)	Zone (m)	
		Start	Finish	East	North	Elevation				From	To
Porvenir North Surface Holes	PS-634-01	9/3/2009	9/11/2009	399,823.40	2,867,406.35	2,368.72	44.0	-55.0	363	330.00	343.00
	PS-638-01	9/12/2009	9/19/2009	399,823.13	2,867,407.21	2,368.85	31.0	-58.0	381	358.50	365.00
	PS-630-01	9/21/2009	9/30/2009	399,841.98	2,867,388.19	2,367.53	49.5	-65.0	378	332.00	351.25
	PS-634-02	9/30/2009	10/10/2009	399,829.21	2,867,399.89	2,368.36	45.0	-48.5	360	294.00	308.00
	PS-626-01	10/12/2009	10/22/2009	399,866.60	2,867,326.80	2,365.84	43.5	-64.0	397.6	330.41	370.40
	PS-626-02	10/22/2009	11/1/2009	399,867.30	2,867,326.10	2,365.84	43.5	-70.0	427.5	375.30	404.00
	PS-624-01	11/2/2009	11/11/2009	399,865.30	2,867,325.70	2,365.84	48.0	-73.0	435.5	386.85	412.78
	PS-624-02	11/11/2009	11/19/2009	399,866.20	2,867,207.40	2,365.84	50.0	-81.0	505.5	450.00	465.00
	PS-632-01	11/19/2009	12/1/2009	399,840.99	2,867,388.52	2,367.62	42.0	-70.0	427.5	323.63	390.00
	PS-642-01	12/1/2009	12/11/2009	399,821.00	2,867,405.50	2,368.81	13.0	-63.5	556.5	369.81	372.70
Porvenir North Underground Holes	PU-578-01	9/4/2009	9/14/2009	400,337.30	2,867,107.49	2,236.50	290.0	-79.0	214	124.00	165.95
	PU-580-01	9/15/2009	9/19/2009	400,338.02	2,867,106.51	2,236.56	272.0	-73.5	208	195.00	202.00
	PU-574-01	9/20/2009	9/26/2009	400,339.95	2,867,104.87	2,236.55	164.0	-80.0	195.9	107.16	177.20
	PU-602-01	9/29/2009	10/10/2009	400,159.92	2,867,212.27	2,171.39	336.9	-60.5	226	187.00	197.00
	PU-598-01	10/12/2009	10/17/2009	400,161.00	2,867,212.00	2,171.39	354.8	-73.5	196	150.06	175.77
	PU-594-01	10/19/2009	10/26/2009	400,162.76	2,867,211.40	2,171.29	61.7	-70.0	196	127.00	139.00
	PU-586-01	10/27/2009	11/2/2009	400,163.31	2,867,207.44	2,171.54	121.8	-50.0	196	168.05	177.00

Table provided by Endeavour Silver Corp.

Figure 11.10
Longitudinal Section of the Northern Part of North Porvenir Mine showing Intersection Points of Drill Holes Completed on the Primary Santa Cruz Vein (Zone 1)

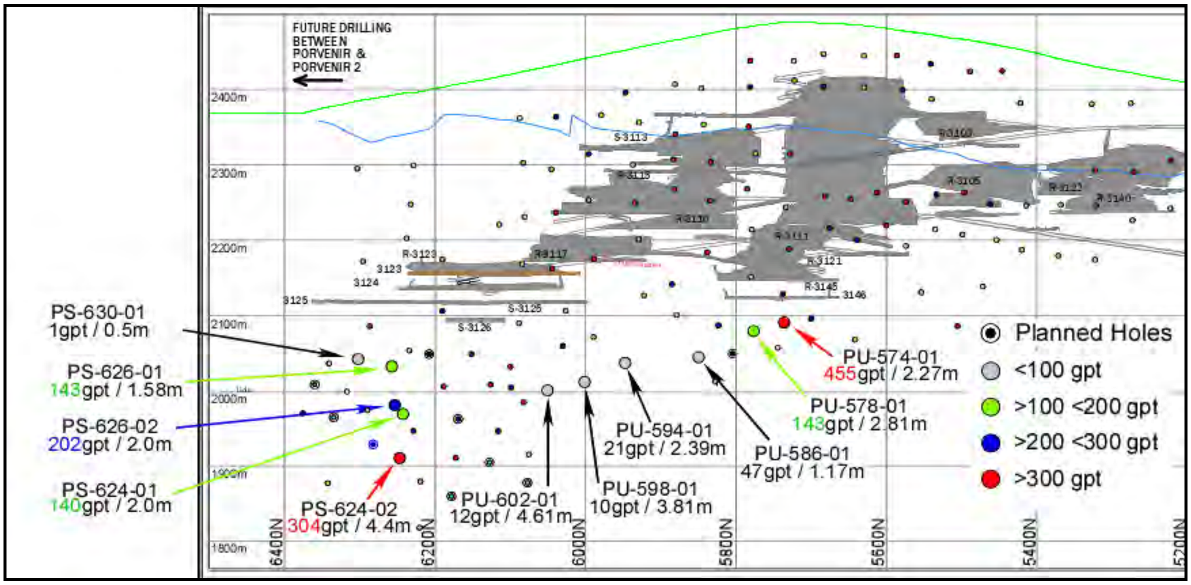


Figure provided by Endeavour Silver Corp.

Figure 11.11
Lonitudinal Section of the Central Part of North Porvenir Mine showing Intersection Points of Drill Holes Completed on the Secondary Santa Cruz Vein (Zone 2)

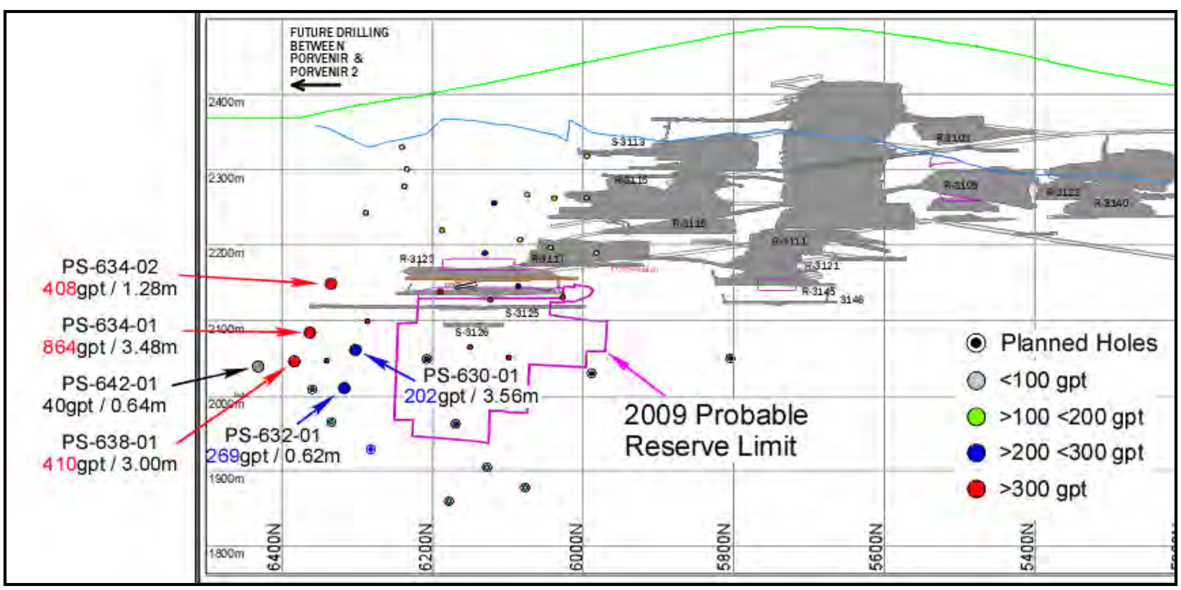


Figure provided by Endeavour Silver Corp.

Table 11.7
North Porvenir Mine 2009 Underground and Surface Diamond Drilling Results

Area	Drill Hole	Santa Cruz Vein (SCV)	Mineralized Intersection (m)				Assays (g/t)	
			From	To	Core Length	True Width	Silver	Gold
Central Zone	PU-574-01	SCV (Zone 1)	147.85	151.50	3.65	2.27	455.2	0.63
	PU-578-01	SCV (Zone 1)	159.90	164.23	4.33	2.81	142.6	0.19
	PU-580-01	SCV (Zone 1)	197.50	201.21	3.71	2.02	19.9	0.02
Northern Zone	PS-624-01	SCV (Zone 1)	408.12	410.70	2.58	2.07	147.8	0.51
	PS-624-02	SCV (Zone 1)	451.00	457.65	6.65	4.51	310.4	0.49
	PS-626-01	SCV (Zone 1)	364.75	366.60	1.85	1.58	143.0	0.01
	PS-626-02	SCV (Zone 1)	397.40	400.00	2.60	2.02	201.8	0.29
	PS-630-01	SCV (Zone 2)	343.00	347.00	4.00	3.56	201.8	0.19
	PS-630-01	SCV (Zone 1)	361.80	362.41	0.61	0.50	1.0	0.01
	PS-632-01	SCV (Zone 2)	378.28	379.04	0.76	0.62	269.0	0.42
	PS-632-01	SCV (Zone 1)	386.30	387.30	1.00	0.80	53.0	0.11
	PS-634-01	SCV (Zone 2)	335.14	338.68	3.54	3.48	864.0	1.13
	PS-634-02	SCV (Zone 2)	295.56	299.00	3.44	3.00	408.0	0.80
	PS-638-01	SCV (Zone 2)	359.42	362.97	3.55	3.00	410.0	0.65
	PU-586-01	SCV (Zone 1)	168.05	170.00	1.95	1.17	47.3	0.01
	PU-598-01	SCV (Zone 1)	155.25	160.87	5.62	3.81	9.7	0.01
	PS-642-01	SCV (Zone 2)	371.95	372.70	0.75	0.64	40.0	0.01
	PU-594-01	SCV (Zone 1)	133.90	136.85	2.95	2.39	20.7	0.01
	PU-602-01	SCV (Zone 1)	188.83	196.35	7.52	4.61	12.3	0.01

Table provided by Endeavour Silver Corp.

Figure 11.12
Cross-Section through Holes PS-634-01 and PS-638-01 Drilled to Test the Santa Cruz Vein in the North Porvenir Mine

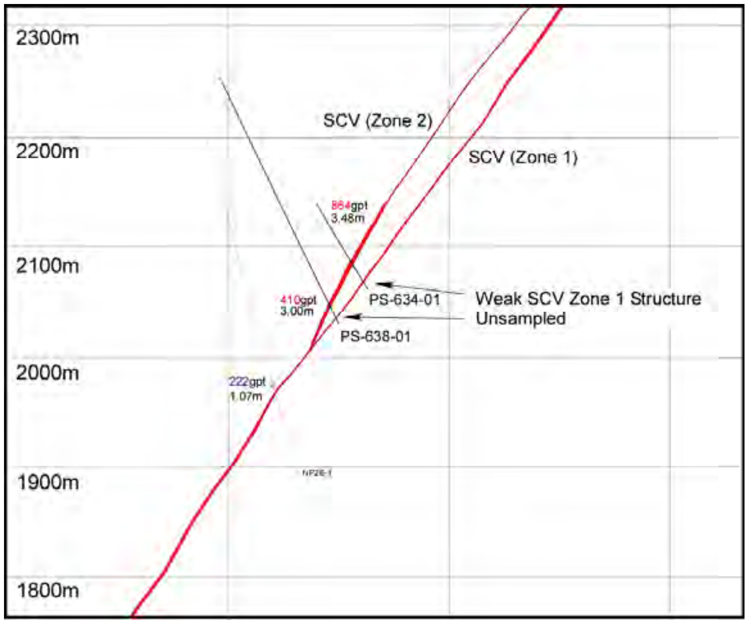


Figure provided by Endeavour Silver Corp.

Figure 11.13
Cross-Section through Holes PS-630-01 and PS-632-01 Drilled to Test the Santa Cruz Vein in the North Porvenir Mine

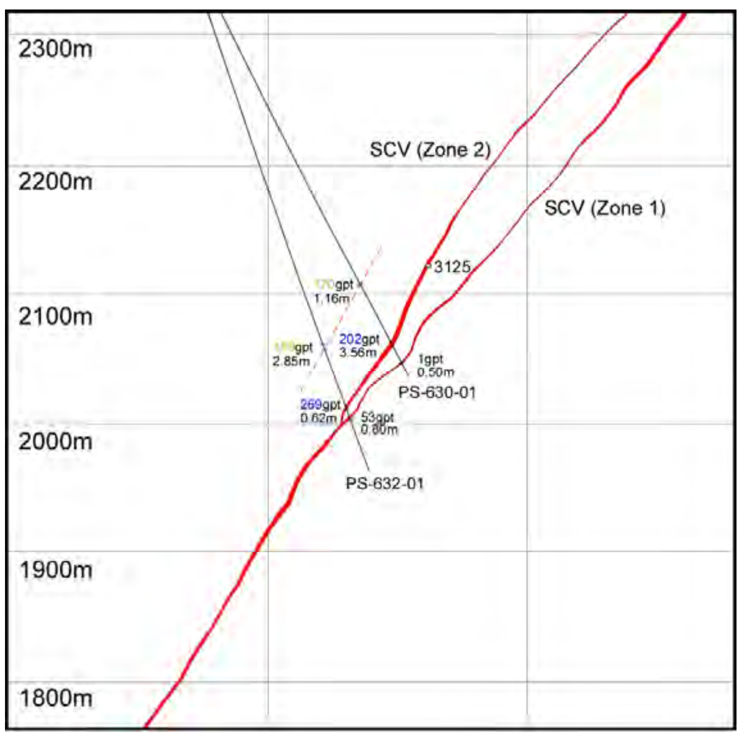


Figure provided by Endeavour Silver Corp.

Figure 11.14
Cross-Section through Hole PS-634-02 Drilled to Test the Santa Cruz Vein in the North Porvenir Mine

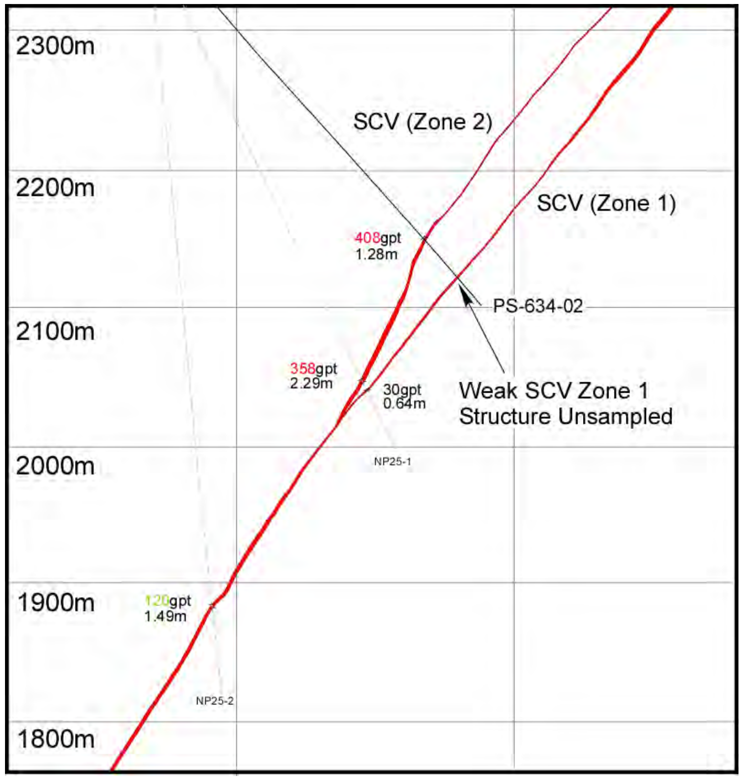


Figure provided by Endeavour Silver Corp.

Figure 11.15
Cross-Section through Hole PU-574-01 Drilled to Test the Central Santa Cruz Vein

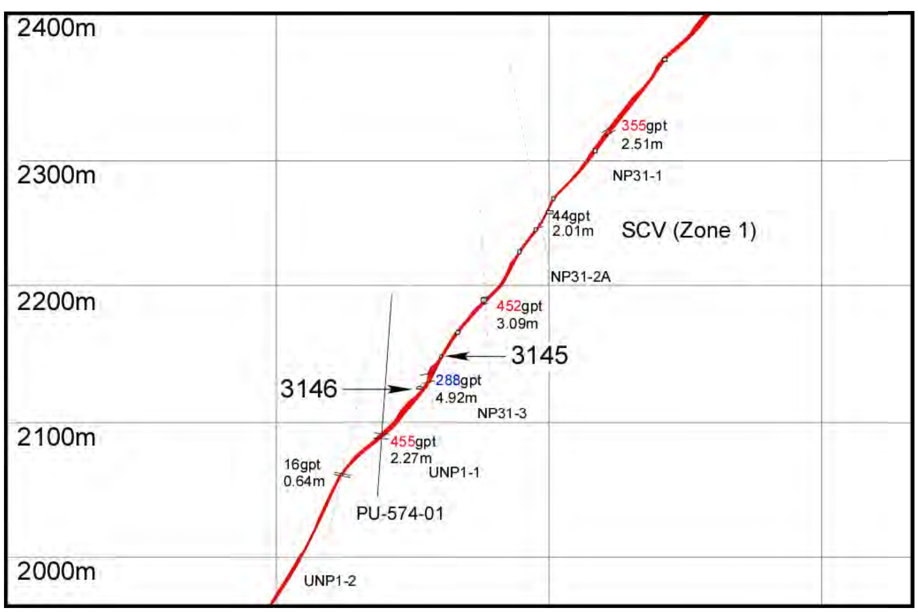


Figure provided by Endeavour Silver Corp.

Figure 11.16
Cross-Section through Hole PU-578-01 Drilled to Test the Santa Cruz Vein

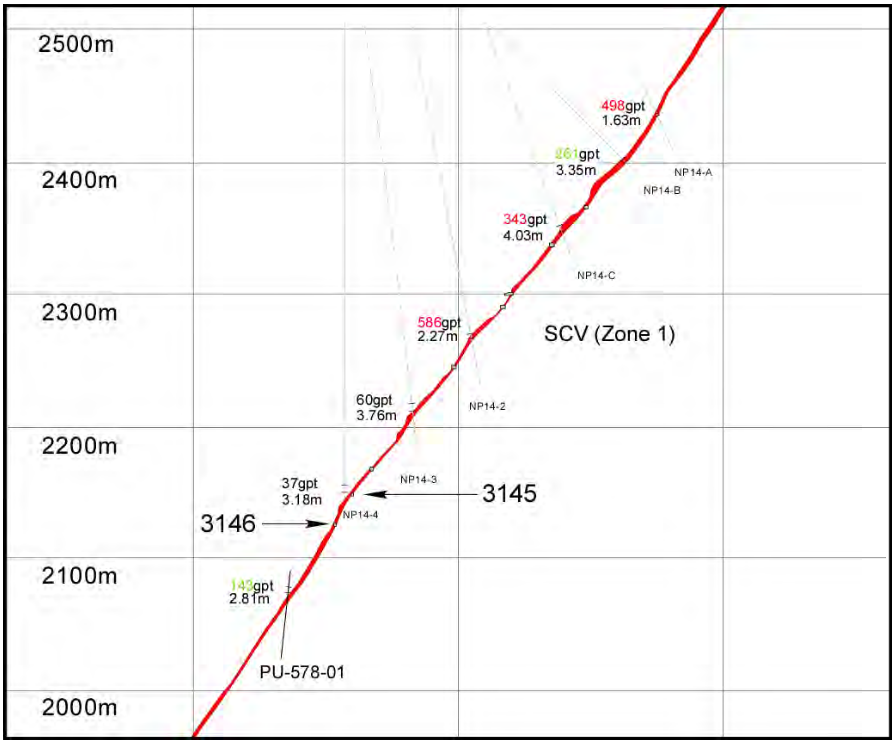


Figure provided by Endeavour Silver Corp.

12.0 SAMPLING METHOD AND APPROACH

A description of Endeavour Silver's sampling method and approach for the Guanaceví Mines project was provided in previous NI 43-101 Technical Reports by Range, (March, 2006) and Micon (April, 2007 and March, 2009). Endeavour Silver personnel have made no material changes to the sampling method and approach since the publication of the March, 2009, Micon report. However, for completeness of this report, the description from the March, 2009, report has been excerpted and is either presented below in its entirety or has been edited where appropriate.

12.1 SAMPLING INTERVALS

Sampling intervals range from about 0.3 m to 2.5 m, with most in the 0.5 m to 1.5 m range. The Endeavour Silver geologist uses geological criteria to select sample intervals. Quartz vein material is separated from hanging wall and footwall horizons, and internal vein samples are broken out by texture type. Three principal types of vein textures are recognized: (a) massive; (b) banded; and (c) brecciated. As much as possible, vein samples are selected to represent mineralization episodes.

12.2 UNDERGROUND SAMPLING METHODOLOGY

Mine samples are collected principally for grade control purposes but are also used to build up a channel sample database for resource estimation purposes. Samples are collected from sills and in stopes. Sill samples are taken from the development face on a blast-by-blast basis. Sill face samples are either taken perpendicular to the structure or are taken horizontally and vertically; preferentially perpendicular samples are collected but with inexperienced samplers the horizontal-vertical method is used. All sampling starts from the footwall and proceeds towards the hanging wall, with sample limits based on geological contacts. In stopes, and in sills if time permits, samples are taken from the back and footwall side-wall. In general footwall waste samples are not taken systematically, although at least one footwall sample is normally taken in a sampling session and if the footwall is veined or sulphide rich. If the vein is present in the footwall side-wall it is sampled, although in early 2008 the length of side-wall samples was not measured. Side-wall channel samples are measured vertically, whilst back samples are measured horizontally. Channel sampling is generally at 2.5 m intervals but can be increased to 5 m intervals in areas where the geology and grade distribution are well known. Samples are taken using a hammer and chisel, or if the back is too high a scaling bar is also used to chip the sample off.

Sample locations underground are measured from a known reference point. The reference points used throughout 2009 are uniquely identified control points installed by Endeavour surveyors. All grade control samples are bagged in heavy duty polyurethane bags with a commercially prepared sample ticket inserted in the bag, and the sample number marked on the bag exterior with marker pen. All sample information is noted in a field notebook and later transferred to daily information sheets in the office. Basic sample information is also noted on sample ticket slips which are stored in the mine geology department office.

12.3 DENSITY DETERMINATIONS

12.3.1 Exploration Samples

No bulk density samples were analyzed from exploration drilling programs in 2009. Density determinations from previous drilling programs were used for converting volumes to tonnes for the 2009 year-end resource estimates for Porvenir Cuatro, Noche Buena and the Santa Cruz mine.

12.3.2 Mine Samples

Bulk density samples were collected from the Porvenir North and Porvenir Dos mines late in 2009. Samples were sent for analysis to the Stewart Group laboratory facility in Zacatecas, Mexico. Preliminary results have been received for 35 samples collected and are summarized in Table 12.1. A program is in place to collect and analyze density samples regularly on a monthly basis for both mineralized and non-mineralized rock types. A specific gravity value of 2.55 based on past production data was used for converting volumes to tonnes for the year-end 2009 reserves. The value is within the acceptable range based on the preliminary results.

Table 12.1
Bulk Density Determinations for Mine Samples from Porvenir North and Porvenir Dos

Statistics	Porvenir North	Porvenir Dos
Number Data	17	18
Mean	2.59	2.60
Median	2.59	2.56
Standard Deviation	0.07	0.11
Sample Variance	0.004	0.013
C.V.	0.03	0.04
IQR	2.54 to 2.63	2.55 to 2.59
Minimum	2.49	2.52
Maximum	2.72	2.94
Range	0.23	0.42

Table provided by Endeavour Silver Corp.

12.4 MICON COMMENTS REGARDING ENDEAVOUR SAMPLING PROCEDURES

Endeavour Silver's sampling protocols for evaluation purposes (underground and surface drill cores) follow the current CIM Exploration Best Practices Guidelines and this provided a degree of confidence regarding the validity and integrity of the database used for the resource and reserve estimates.

For production, channel chip sampling does not attain a perfectly representative sample due to the hardness of the material being sampled, as usually only softer material ends up being sampled. However, the practice of chip sampling is common around the world for underground deposits and the practice of systematically sampling the faces, backs or walls of the development drifts on a close spacing (5 m or less) tends to generate a very large set of samples which, in most cases, is statistically representative of the material being sampled. In summary, Endeavour Silver's underground sampling practice is in line with current industry practices and standards in use and is effectively being used for grade control purposes.

In conclusion, Endeavour Silver's evaluation drilling samples are representative as the HQ and/or NQ core size used yields almost 100% core recovery and provides a large enough sample size. There are no obvious factors that may result in sample biases. Production channel chip samples are yielding the desired result of differentiating ore from waste. The quality of the bulk density samples collected is demonstrated by the results being consistent with previous determinations.

Tables of the significant drilling assay results for the Porvenir Cuatro, San Pedro sub-district (Noche Buena and Buena Fé) and the North Porvenir mine are included in Section 11 as part of the discussion regarding the drilling program results and will not be reproduced here. No table of significant underground sampling assay results is included here as the underground assays are part of the mine grade control program.

13.0 SAMPLE PREPARATION, ANALYSIS AND SECURITY

In March, 2009, Micon reported changes that had been made to Endeavour Silver's sample preparation, analyses and security since the publication of the April, 2007, Micon Technical Report. Further changes have since been made to some areas and these are summarized below.

13.1 SAMPLE PREPARATION

13.1.1 Mine Channel Samples

Mine chip channel samples and mill feed belt samples are prepared and analyzed at the Metalurgica Guanaceví (MG) laboratory, Endeavour's in-house laboratory at the Guanaceví Mines project.

Grade control channel samples, which were used for stope based reserve estimates, are prepared and analyzed at the in-house laboratory. The sample preparation procedure for most of 2009 was the following: Samples are received and checked in by laboratory staff; moist samples are dried for 2 to 4 hours; otherwise samples are crushed to -½ inch in a primary jaw crusher; samples are split using a 1 inch or ½ inch Jones splitter; 100 to 150 g of sample is retained for pulverizing and is put in a metal tray, along with a pulp envelope; remaining coarse rejects are returned to their original bag along with the sample ticket and stored; the 150 g crushed sample is then dried at a temperature of 100° C. The dried sample is then pulverized in a ring pulverizer to -80 mesh; the pulverized sample is stored in a numbered envelope. The procedures for the mine channel sample preparation were the same in 2009 as they were in 2008.

13.1.2 Exploration Core Samples

All exploration drill core is transported to the secure core storage facility at the Santa Cruz mine site. Sampling procedures typically begin with splitting by either a wheel-driven manual splitting device or an electric diamond-bladed core saw. The wheel-driven manual splitting device is generally used only when the core is badly broken-up and cannot be effectively cut by the diamond-bladed core saw. In most cases, the diamond saw is used for splitting the core. One half of the core is replaced in the original core box with depth markers, the other half is bagged with sample tickets and recorded in the sample record. Once samples are bagged, they are transported to an outside laboratory.

In 2009, all drill core samples were sent to ALS-Chemex (Chemex). Chemex maintains a preparation facility in Chihuahua, where 50 g pulps are prepared and shipped to Vancouver, Canada for analysis. Chemex emails assay data results to Endeavour Silver geologists and then returns the pulps to Guanaceví for storage at the core building at the Santa Cruz mine site.

All of Endeavour Silver's drill core samples are bagged and tagged at the Guanaceví Mines project. Upon arrival at Chemex, all samples are logged into the laboratory's tracking system. Then the entire sample is weighed, dried and fine crushed to better than 70% passing 2 mm. A sample split of up to 250 g is then taken and pulverized to 85% passing 75 microns.

Sampling results were also reported to be reasonably representative of the mineralization of the deposits and may be used with acceptable confidence in the estimation of the mineable reserves.

13.2 ANALYSES

13.2.1 Mine/Grade Control Samples

At the MG laboratory, a 10 g sample is removed from the 100 g pulp and subjected to fire assay determination of gold and silver contents. Subsequent splits of the pulp are used for lead, zinc, copper, manganese and iron analyses by atomic adsorption (AA). Pulp and rejects are returned to the geology department within 1 to 3 days. The geology department selects pulps and rejects to be returned to for re-assay. This methodology became fully operational in June, 2009, and since then 954 rejects and 953 pulps have been resubmitted and analyzed.

Endeavour Silver also uses outside laboratory assay facilities for check assaying.

13.2.2 Exploration Samples

At Chemex, the analytical procedure for Au and Ag is also fire assay followed by a gravimetric finish. A 50 gram nominal pulp sample weight is used. Lead, zinc and copper are determined either by AA or atomic emission spectroscopy (AES).

As an economical tool for first pass exploration geochemistry, the pulps are sometimes subjected to aqua regia digestion and inductively coupled plasma (ICP) multi-element analysis. The data reported from an aqua regia leach are considered to represent the leachable portion of the particular analyte. These analytical methods are optimized for low detection limits. The assays for evaluation of high-grade materials are optimized for accuracy and precision at high concentrations (>10,000 ppm). Over-limits for lead, zinc and copper are determined either by atomic adsorption or atomic emission spectroscopy. In 2008, the turn-around time required for analyses was typically been 2 to 4 weeks.

13.3 QUALITY ASSURANCE AND QUALITY CONTROL (QA/QC).

Endeavour Silver imposes and maintains various QA/QC protocols on sampling and assay procedures including duplicates, standards, blanks and check analyses to monitor the integrity of assay results.

13.3.1 Mine Channel Sampling

The QA/QC for production samples involves repeat assays on pulp and reject assays along with in-house prepared blanks and control samples. No commercially available standards were used in 2009 due to import restrictions. Commercial standards should be available in 2010. Roughly 3-5% of production grade control sample are submitted for re-assay.

In August, 2009, the geology department began collecting and sending blanks along with production samples. This practice has continued through December. Currently blanks are inserted at the frequency of 1 to 2 samples per day. Blanks are collected as run-of-mine material from waste headings such as the development ramps. These samples are usually of sufficiently low silver grade to be useful in detecting laboratory errors; however, there is always the possibility of that the samples will contain anomalous values. Blanks are submitted blind, that is, they are inserted into the sample stream using the same sample sequence and identifiers as any other sample collected. Only geology knows the true identity and location of the sample. In the future, attempts will be made to procure certified blanks or blanks with a higher probability of being void of detectable silver. Since August, 182 blank samples have been assayed by the MG laboratory. Results of the blank assays are shown in Figure 13.1. The majority of anomalous values can be traced to suspected sample tag swaps. Sample values less than (<) 100 g/t are considered acceptable.

Figure 13.1
Blank Samples Assayed at the MG Onsite Laboratory

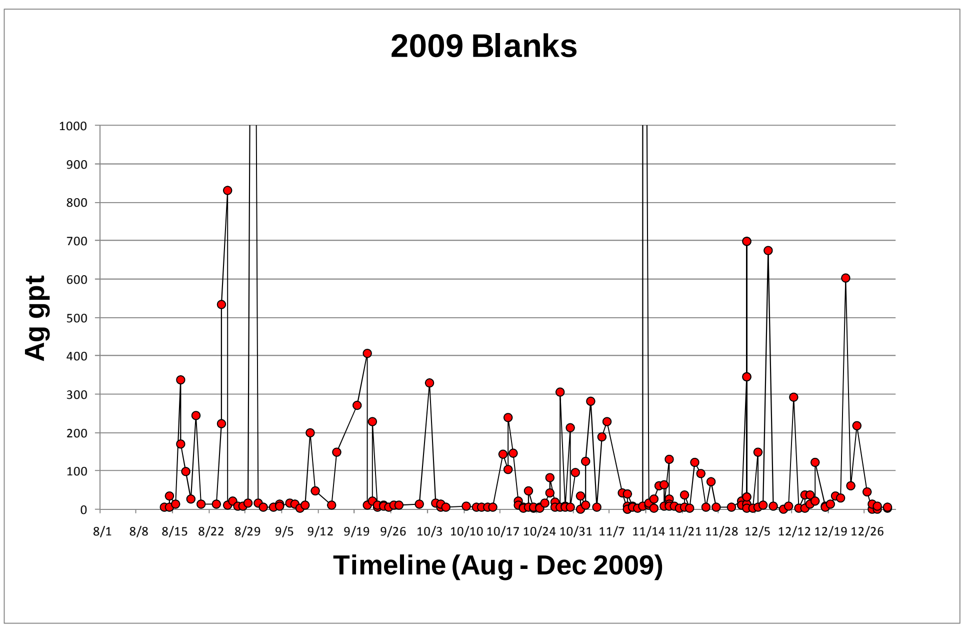


Figure provided by Endeavour Silver Corp.

In October, 2009, the use of two in-house standards (Table 13.1), which were prepared from material collected from active stope headings, were initiated at the MG laboratory on site. The samples were prepared by SGS at its facility in Durango and involved round-robin assaying at three independent external laboratories. In total 80 kg of pulverized material was prepared for each control sample. Control samples submitted to the MG laboratory are selected at random from one of the following choices; 1) GCVI_E, 2) GCVI_F or 3) a regular pulp reject. Controls are inserted at the rate of one in each batch of fire assays. The samples are inserted blind. The random selection and inclusion of normal pulp rejects helps to ensure the anonymity of the samples. A total of 300 control samples were submitted in 2009, 133 GCVI_E, 135GCVI_F and 32 blind pulp samples disguised as control samples.

Table 13.1
Guanaceví Control Samples

Standard Identifier	Reference Number	Gold (g/t)	Silver (g/t)
GCVI_E	N/A	239	0.44
GCVI_F	N/A	235	0.44

Table provided by Endeavour Silver Corp.

Figures 13.2 and 13.3 summarize the silver assay results for the control samples GCVI_E and GCVI_F submitted to the MG laboratory, respectively.

Figure 13.2
Summary of the Silver Assay Results for Control Sample GCVI_E Assayed at the MG Laboratory

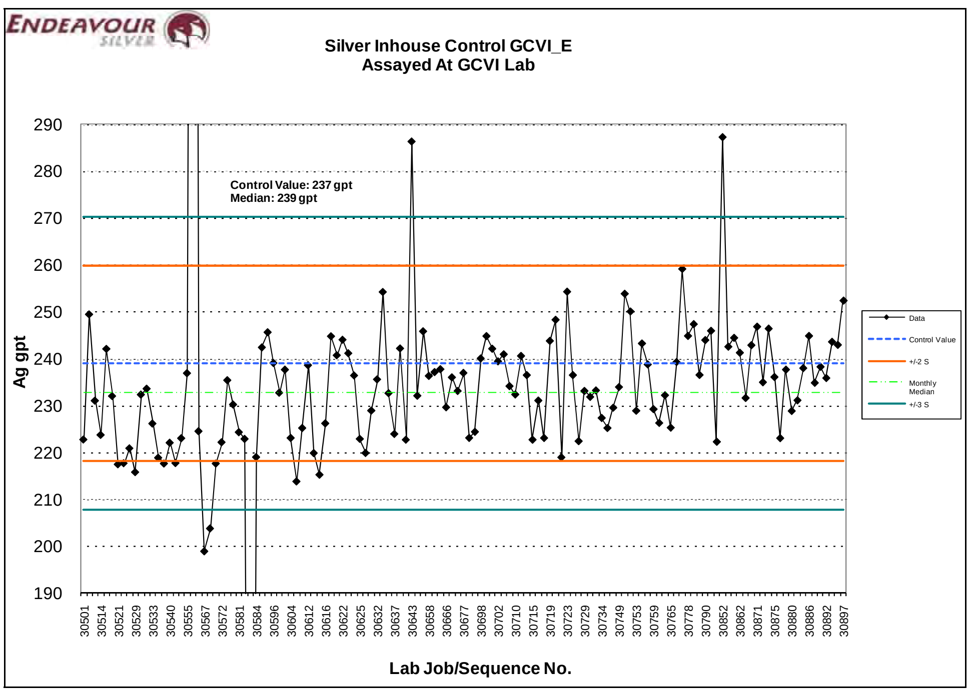


Figure provided by Endeavour Silver Corp.

Figure 13.3
Summary of the Silver Assay Results for Control Sample GCVI_F Assayed at the MG Laboratory

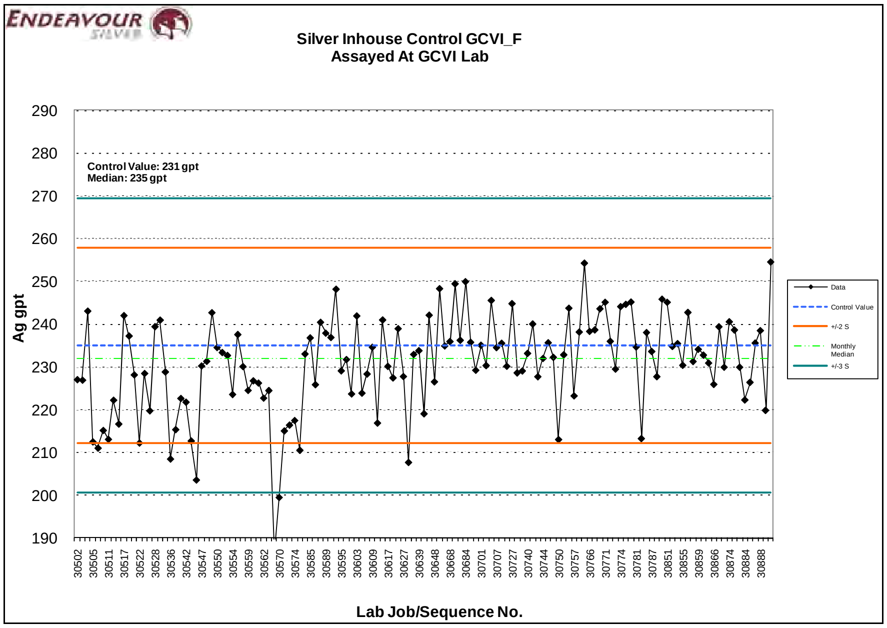


Figure provided by Endeavour Silver Corp.

Figures 13.4 and 13.5 summarize the gold assay results for the control samples GCVI_E and GCVI_F submitted to the MG laboratory, respectively.

Figure 13.4
Summary of the Gold Assay Results for Control Sample GCVI_E Assayed at the MG Laboratory

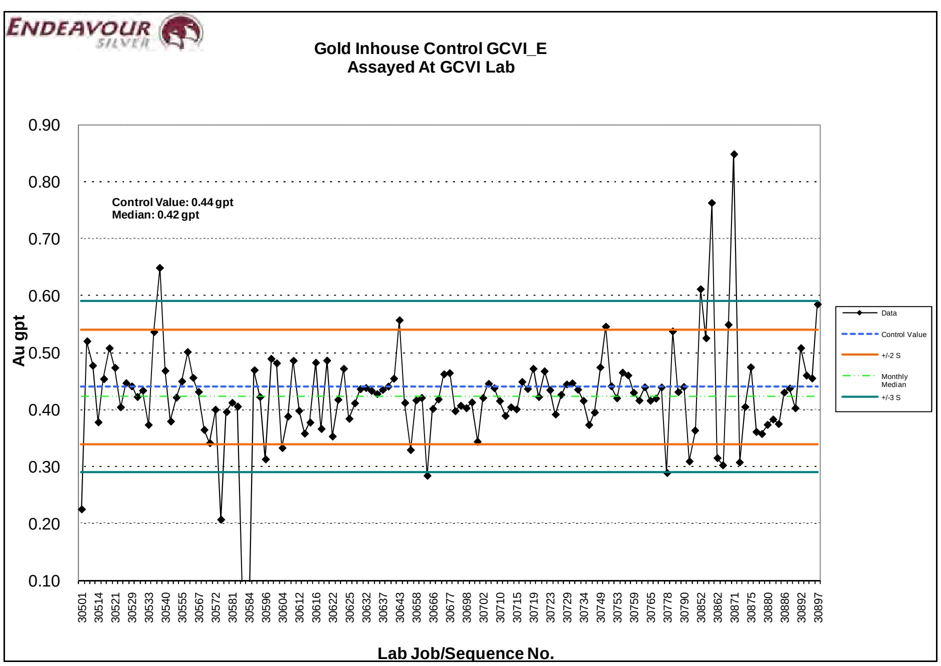


Figure provided by Endeavour Silver Corp.

Figure 13.5
Summary of the Gold Assay Results for Control Sample GCVI_F Assayed at the MG Laboratory

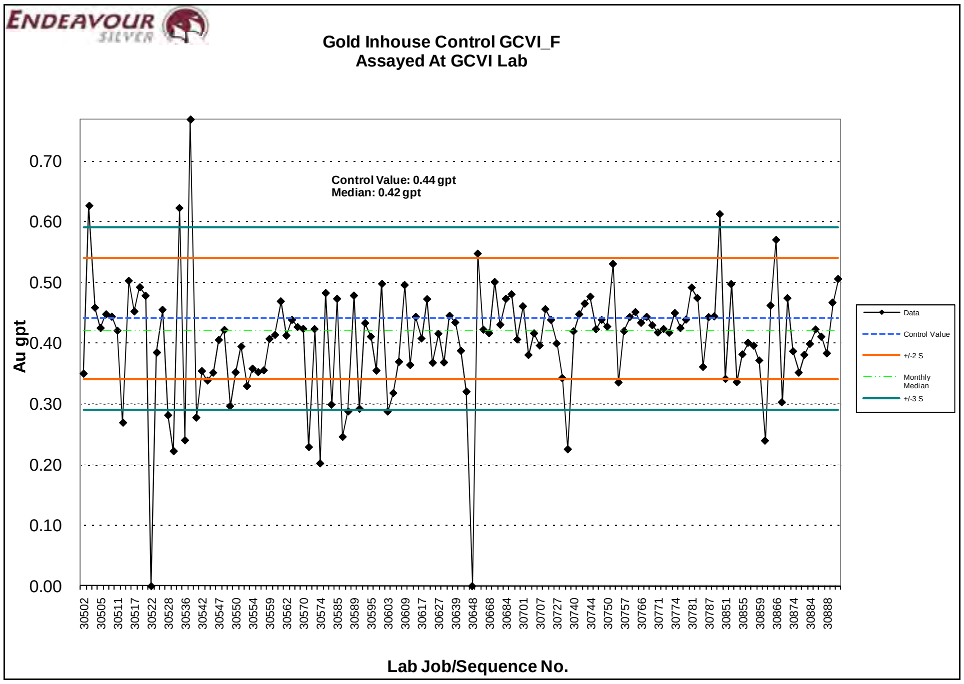


Figure provided by Endeavour Silver Corp.

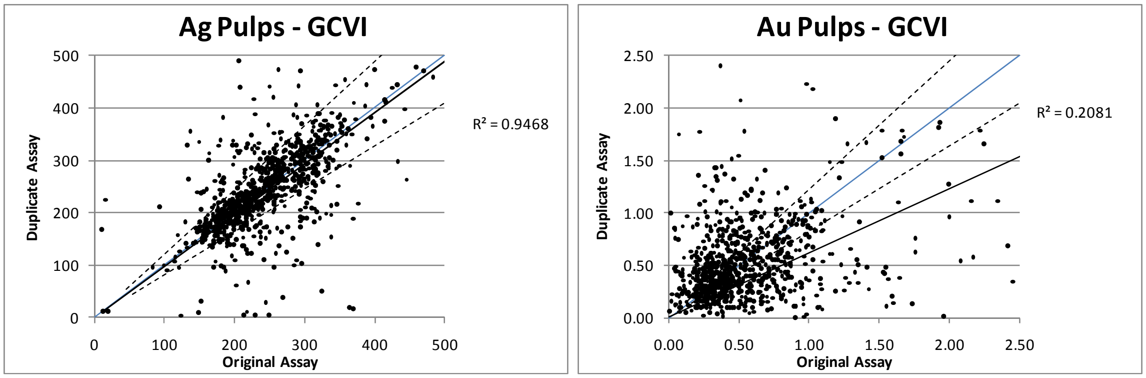
In June, 2009, a regular program of collecting and resubmitting pulp and reject duplicates was implemented on a daily basis. In 2009, a total of 954 coarse rejects and 953 pulp samples from the mine production sampling were collected and resubmitted for analysis. This represents between 5 and 7% of the total production samples collected since the program's inception. In addition to the selection of production pulps and rejects, duplicate field samples were also collected, beginning in January, 2009, in the form of underground chip samples and surface muck pile samples. A total of 1,582 samples were collected since January, 2009, 726 underground duplicates and 856 duplicate muck pile samples.

Discrepancies and inconsistencies in the duplicate sample data are resolved by re-assaying either the pulp or reject or in some cases both.

Scatter diagrams for duplicate samples are shown in Figures 13.6 through 13.9. Figures 13.8 and 13.9 represent all samples collected in 2009.

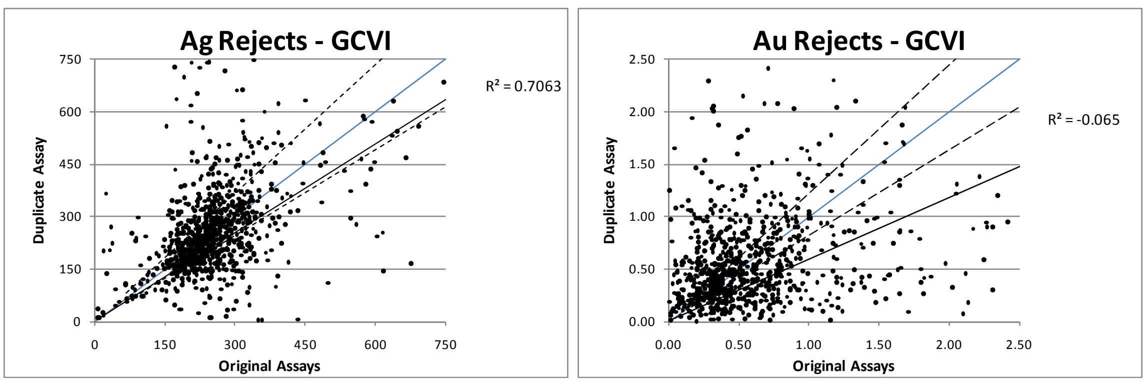
In general, results of the duplicate rea-ssays indicate a good correlation for silver and moderate to poor correlation for gold. The difference in the quality of the results of the pulp assays versus the reject assays suggests that it is possible that the location of sample error is in the sample preparation stage and that improvements in sample preparation may reduce the variability in the reject sample results; an effect that might also carry through and reduce the variability observed in field duplicate samples.

Figure 13.6
Scatterplots of the Pulp Reassays for Silver (left) and Gold (right)



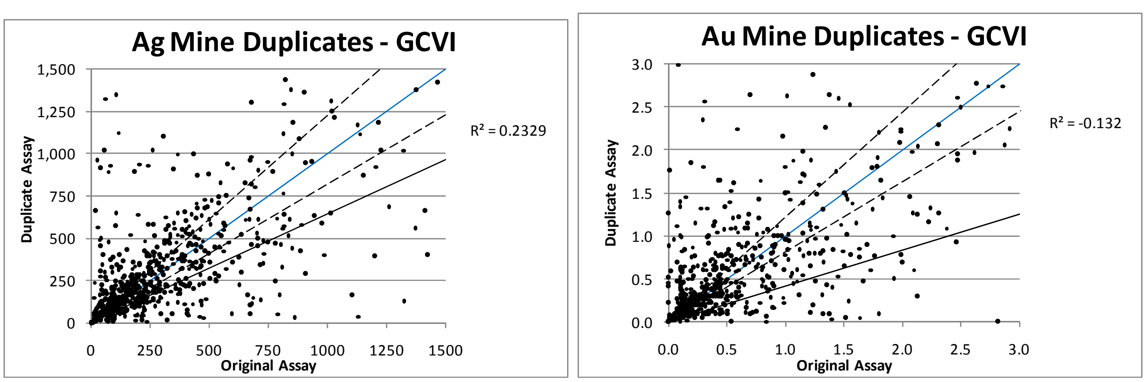
Figures provided by Endeavour Silver Corp.

Figure 13.7
Scatterplots of the Reject Reassays for Silver (left) and Gold (right)



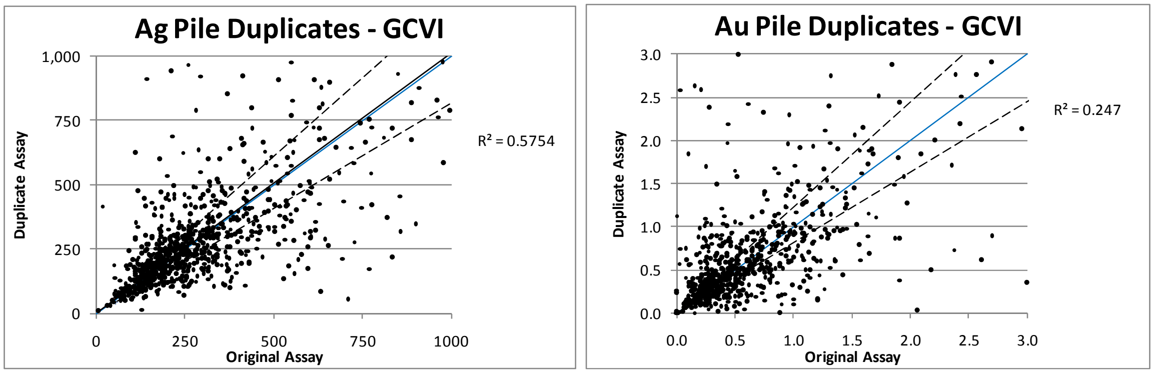
Figures provided by Endeavour Silver Corp.

Figure 13.8
Scatterplots of the Assay Results for the Mine Duplicate Samples for Silver (left) and Gold (right)



Figures provided by Endeavour Silver Corp.

Figure 13.9
Scatterplots of the Assay Results for the Mine Duplicate Samples for Silver (left) and Gold (right)

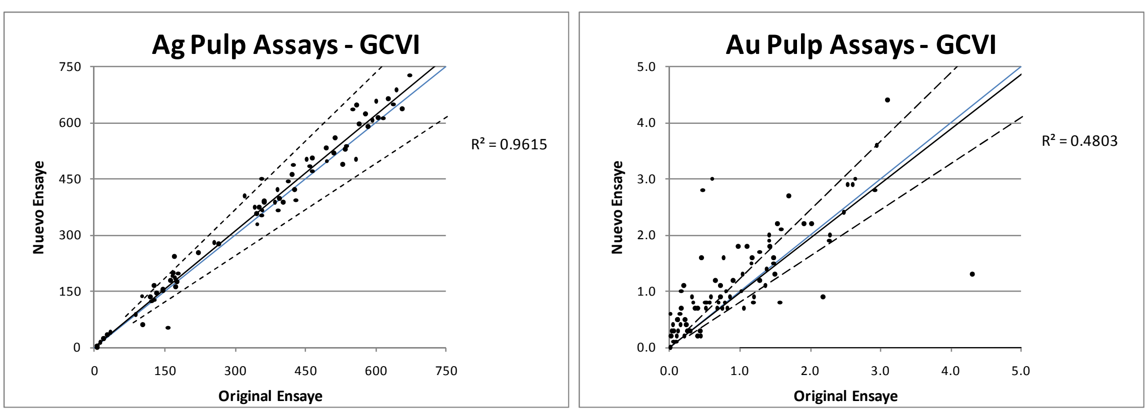


Figures provided by Endeavour Silver Corp.

Check assays are also sent to external laboratories for analysis. Since August, 2009, pulp and reject samples have been collected for submission to three independent laboratories. At year-end, samples were submitted to only one laboratory, the Endeavour Silver laboratory at its Guanajuato Mines project. In January, 2010, samples were also submitted to Stewart Group for analysis and these consisted of a total of 150 pulp and 36 reject samples. At the time of this report, the analytical results are not available. Samples are collected on a regular basis and Endeavour Silver plans start submitting samples to external laboratories on a monthly basis.

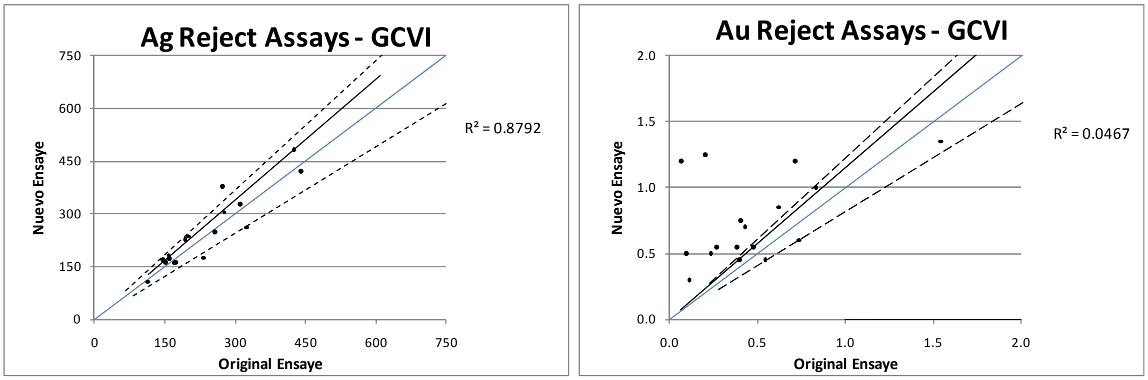
Results from the samples submitted to the Guanajuato laboratory show a very good correlation for silver and a moderate correlation for gold (Figure 13.10 and Figure 13.11).

Figure 13.10
Scatterplots of the Assay Results for the Pulp Duplicates Assayed at the Guanajuato Laboratory Silver (left) and Gold (right)



Figures provided by Endeavour Silver Corp.

Figure 13.11
Scatterplots of the Assay Results for the Reject Duplicates Assayed at the Guanajuato Laboratory
Silver (left) and Gold (right)



Figures provided by Endeavour Silver Corp.

13.3.2 Drilling Programs

Drilling in the Porvenir Cuatro and San Pedro areas included a QA/QC program to monitor the integrity of all assay results. Each batch of 20 samples includes one blank, one duplicate and one standard. Check assaying is also conducted at a frequency of between 5% and 10%.

A total 4,563 samples were collected during Endeavour Silver’s drilling program at Guanaceví in 2009 as shown in Table 13.2.

Table 13.2
Table Showing Quantities of Control Samples Used

Sample Type	No. of Samples	Percentage (%)
Normal	3,898	85%
Blanks	225	5%
Duplicates	219	5%
Standards	221	5%
Total	**4,563**	**100%**
Check assays	207	207

Table provided by Endeavour Silver Corp.

Discrepancies and inconsistencies in the blank and duplicate data are resolved by re-assaying either the pulp or reject or both.

Endeavour Silver’s sampling process, including handling of samples, preparation and analysis, is shown in the quality control flow sheet below (Figure 13.12).

Figure 13.12
Flow Sheet for Core Sampling, Sample Preparation and Analysis

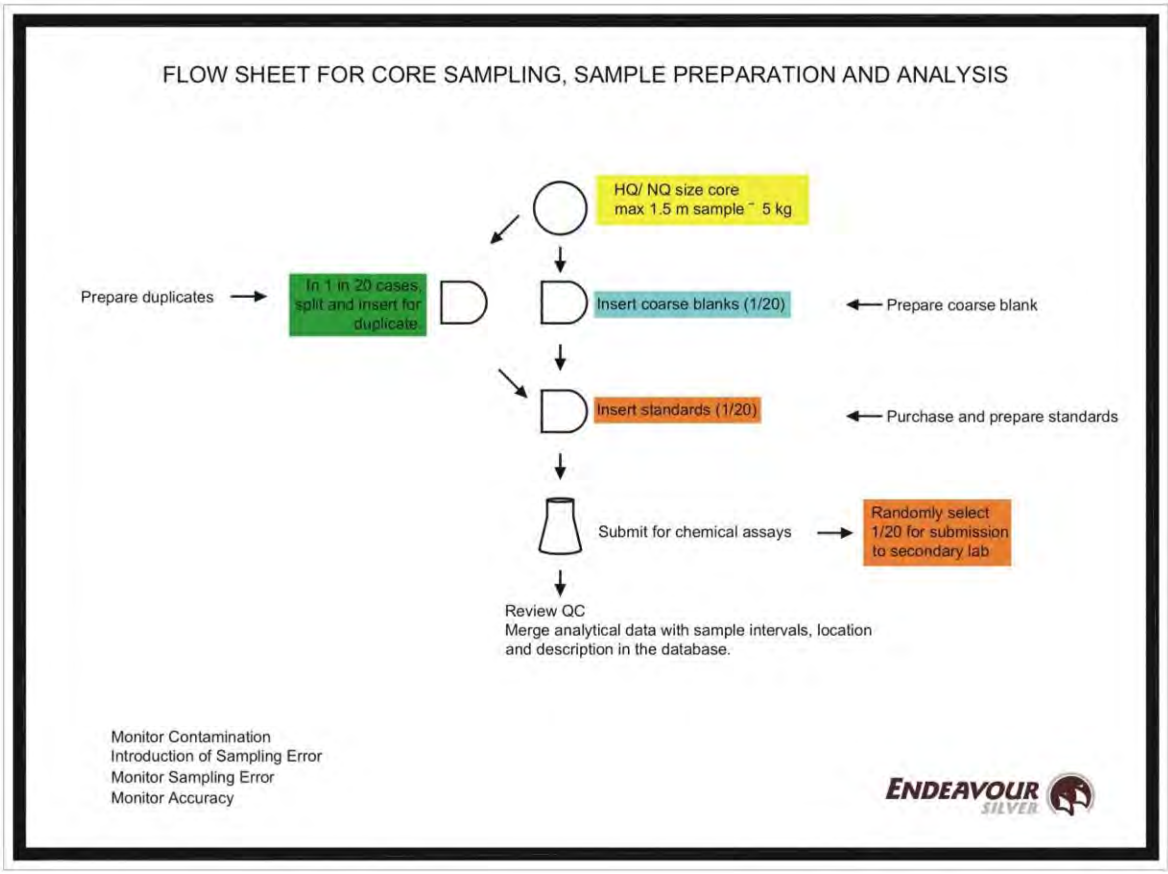


Figure provided by Endeavour Silver Corp.

13.3.3 Blank Samples

Blank samples were inserted to monitor possible contamination during the preparation process and analysis of the samples in the laboratory. The blank material used was usually derived from core samples with no apparent mineralization from the drilling programs in Guanaceví. Occasionally, outcrops of fresh rock are used for blanks. Blank samples are inserted randomly into the sample batch and given unique sample numbers in sequence with the other samples before being shipped to the laboratory.

Every effort is made to overcome the problem of potential low-level background contamination which is possibly inherent in the procedure currently being employed.

Endeavour Silver has purchased some commercially available blanks and has randomly submitted them to Chemex. However, this blank material is a pulp and is not considered an adequate check for any contamination during sample preparation.

Discrepancies and inconsistencies in the blank sample data are generally resolved by re-assaying either the pulp or reject or both.

Results

For gold, all blank samples (100%) out of the 225 total were below the detection limit of 0.05 g/t gold (Figure 13.13).

Figure 13.13
Control Chart for Gold Assays from Blank Samples

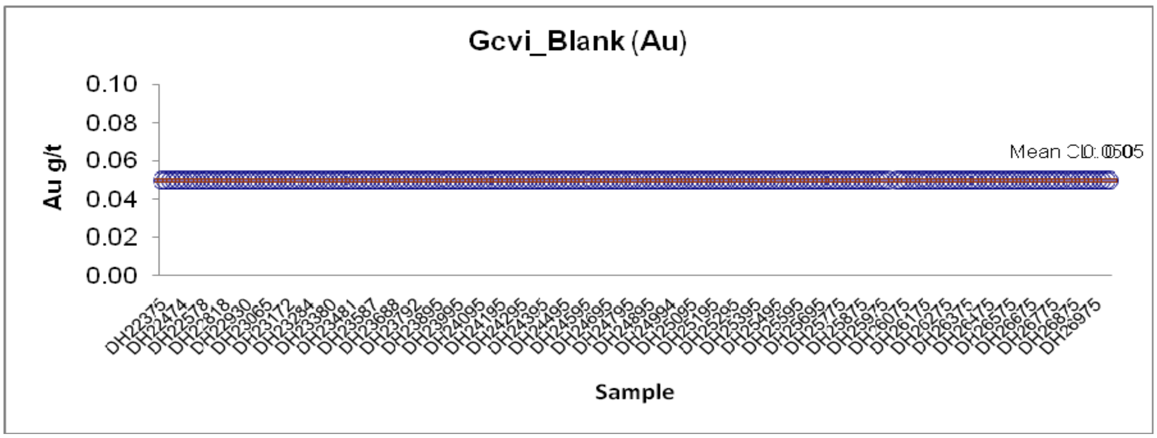


Figure provided by Endeavour Silver Corp.

For silver, only 5 blank samples (2%) out of the 225 total were above the detection limit of 5 g/t silver for the analytical method (Figure 13.14). All five assays were also considered outside the limits of the confidence range of 2 times the standard deviation of the same population.

Figure 13.14
Control Chart for Silver Assays from Blank Samples

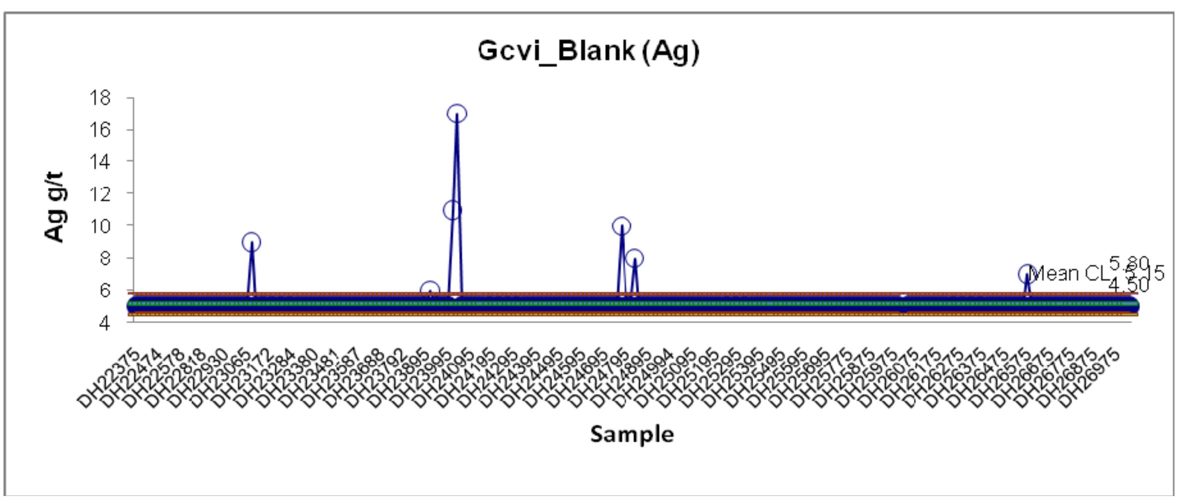


Figure provided by Endeavour Silver Corp.

For lead and zinc, all samples were over the detection limit of the method used (ICP). Only four for lead and seven for zinc were outside the confidence limits (Figures 13.15 and 13.16).

Not all the blank samples were analyzed for base metals, only those from the Noche Buena and Buena Fé zones. This is why some of the graphs presented here show samples without base metal values.

Figure 13.15
Control Chart for Lead Analyses from Blank Samples

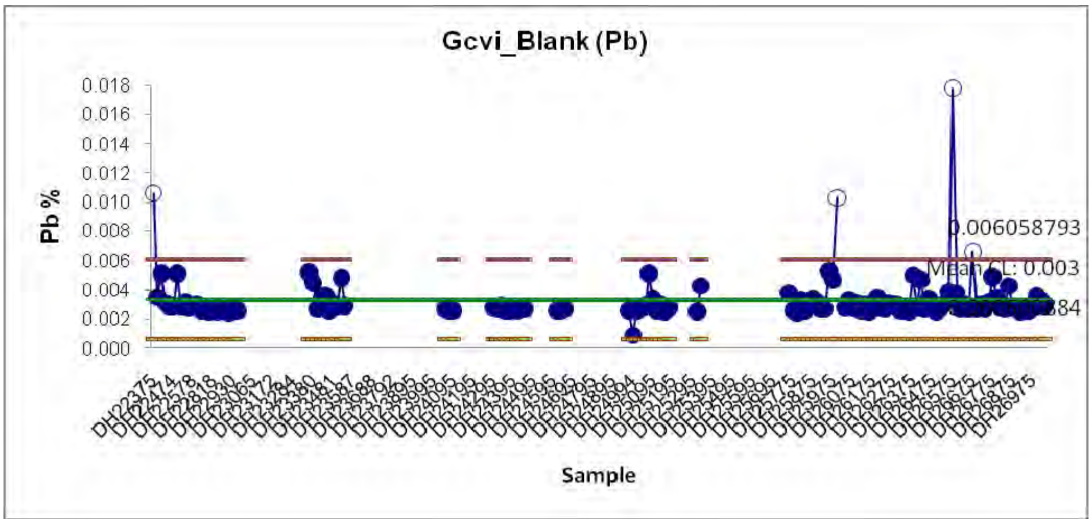


Figure provided by Endeavour Silver Corp.

Figure 13.16
Control Chart for Zinc Analyses from Blank Samples

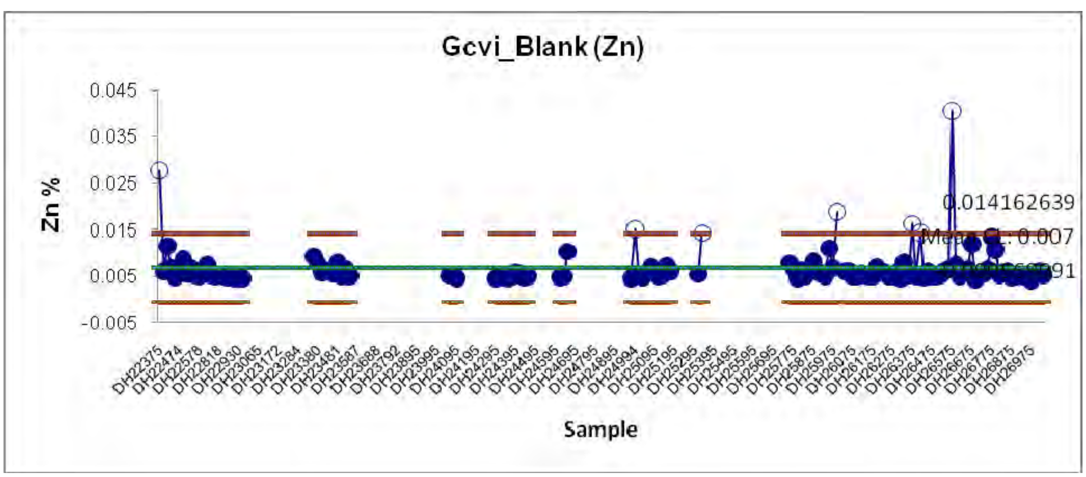


Figure provided by Endeavour Silver Corp.

Upon review of the data, it is reasonable to conclude that, with the exception of a few high assay values for lead and zinc, results for Endeavour Silver's sample preparation and analysis programs are for the most part free of any significant contamination. Any contamination is probably more related to the quality of the original blank material rather than to either contamination in the preparation process or analysis in the laboratory. Some material used for blanks may in fact have had some minor amount of mineralization.

13.3.4 Duplicate Samples

Duplicate samples were used to monitor (a) potential mixing up of samples and (b) variability of the data as products of laboratory error or the lack of homogeneity of the samples.

Duplicate core samples were prepared by Endeavour Silver personnel at the core storage facility at the Guanaceví Mines project. Preparation first involved randomly selecting a sample interval for duplicate sampling purposes. The duplicates were then collected at the time of initial sampling. This required first splitting the core in half and then crushing and dividing the half-split into two portions which were sent to the laboratory separately. The duplicate samples were ticketed with the consecutive number following the original sample. One duplicate sample was collected for each batch of 20 samples.

Discrepancies and inconsistencies in the duplicate sample data are resolved by re-assaying either the pulp or reject or both.

A total of 219 duplicate samples were taken representing 5% of all samples.

Scatter diagrams for duplicate samples are shown in Figures 13.17 through 13.20.

For the duplicate samples, graphical analysis shows good correlation indices for gold, silver, lead and zinc in the majority of the samples.

The correlation indices are all above 0.70. In the case for silver, the correlation index 0.96 which is considered highly satisfactory.

Figure 13.17
Original Versus Duplicate Graph for Gold Assays from Duplicate Samples

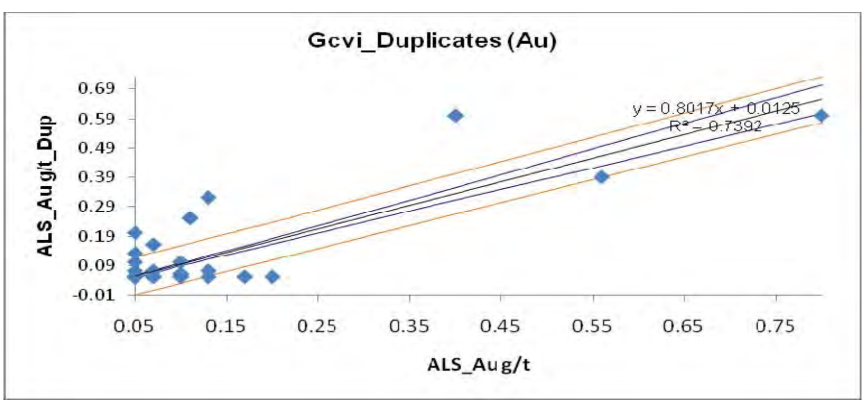


Figure provided by Endeavour Silver Corp.

Figure 13.18
Original Versus Duplicate Graph for Silver Assays from Duplicate Samples

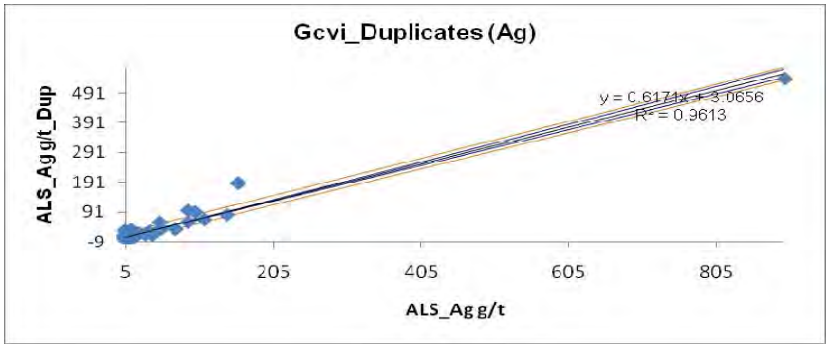


Figure provided by Endeavour Silver Corp.

Figure 13.19
Original Versus Duplicate Graph for Lead Assays from Duplicate Samples

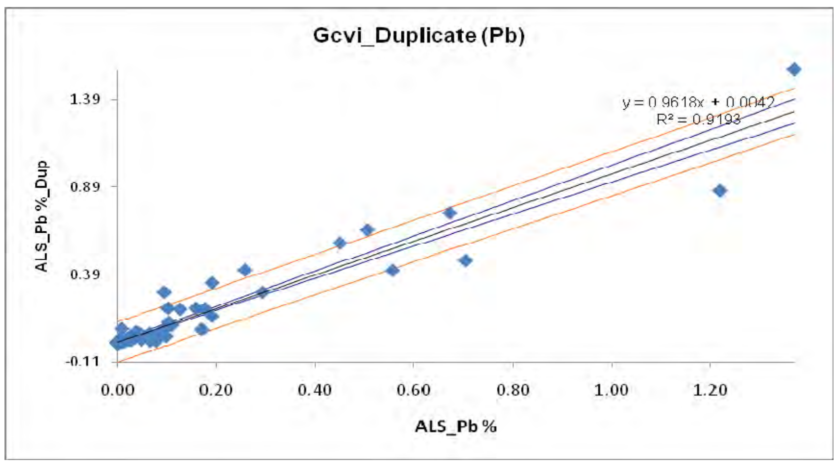


Figure provided by Endeavour Silver Corp.

Figure 13.20
Original Versus Duplicate Graph for Zinc Assays from Duplicate Samples

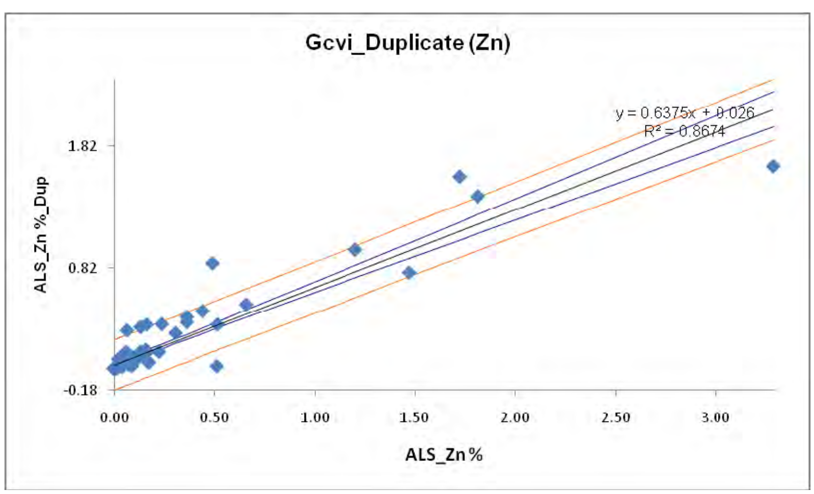


Figure provided by Endeavour Silver Corp.

13.3.5 Reference Standards

Endeavour Silver uses commercial reference standards to monitor the accuracy of the laboratories. Standard reference material has been purchased from various internationally-recognized companies (eg. WCM Minerals, Geostats Pty. Ltd. and Rock Labs.). Each reference standard was prepared by the vendor at its own laboratories and shipped directly to Endeavour Silver along with a certificate of analysis for each standard purchased.

In 2009, a total of 221 reference control samples were submitted at an average frequency of 1 for each batch of 20 samples. Reference standards were ticketed with pre-assigned numbers in order to avoid inadvertently using numbers that were being used during logging.

Six different standards were submitted and analyzed for gold, silver, copper, lead and zinc. Reference standards used during Endeavour Silver's drilling programs are in Table 13.3.

Table 13.3
Reference Standards used for Endeavour Silver's Drilling Programs

Reference Standard	Reference Number	Reference Source	Reference Standard Assays				
			Gold (g/t)	Silver (g/t)	Copper (%)	Lead (%)	Zinc (%)
edr-1	GBM904-11	Geostats			0.88	9.47	23.63
edr-11	PM1118	WCM Minerals	1.8	38			
edr-12	PB130	WCM Minerals		82	0.25	0.73	1.44
edr-13	PM1125	WCM Minerals		1,776			
edr-14	PM1124	WCM Minerals		228			
edr-17	SH41	Rock Labs	1.3				

Table provided by Endeavour Silver Corp.

For graphical analysis, results for the standards were scrutinized relative to the mean or control limit (CL), and a lower control limit (LC) and an upper control limit (UL), as shown in Table 13.4.

Table 13.4
Table showing Basis for Interpreting Standard Samples

Limit	Value
UL	Plus 2 standard deviations of standard reference material
CL	Recommended value (mean) of standard reference material)
LL	Minus 2 standard deviations of standard reference material

Table provided by Endeavour Silver Corp.

Endeavour Silver's general rules for a batch failure are as follows:

- A reported value for a standard greater than 3 standard deviations from the mean is a failure.
- Two consecutive values of a standard greater than 2 standard deviations is a failure.

- A blank value over the acceptable limit is a failure.

- Results are reported to Endeavour Silver's Qualified Person every month.

Analysis of the data showed that out of the 394 analyses, only 15 (3.8%) were outside the established control limit.

Results of each standard are presented separately below.

Edr-1 (a base metal standard)

The average values for standard Edr-1 were consistently below the accepted value as shown in Table 13.5 and the control charts (Figures 13.21, 13.22 and 13.23). In almost all cases, the reported values are within 2 standard deviations of the accepted value.

Only two analyses for lead (sample numbers DH25026 and DH25765) were below the accepted range. These samples, however, are not submitted at the same time, so the error does not appear to be related to the laboratory but, is possibly related to the quality of the standard.

Table 13.5
Laboratory Performance on Standard Sample Edr-1

Element	Average Grade of Samples Submitted	Accepted Value of Standard
Cu (%)	0.82	0.88
Pb (%)	8.88	9.47
Zn (%)	22.42	23.63

Table provided by Endeavour Silver Corp.

Figure 13.21
Control Chart for Copper Assays from the Standard Reference Sample Edr-1

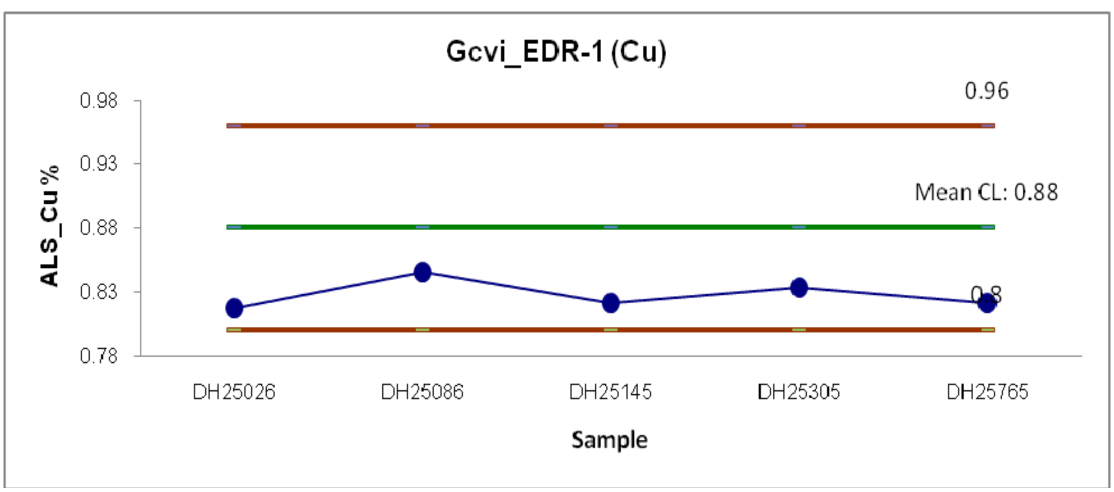


Figure provided by Endeavour Silver Corp.

Figure 13.22
Control Chart for Lead Assays from the Standard Reference Sample Edr-1

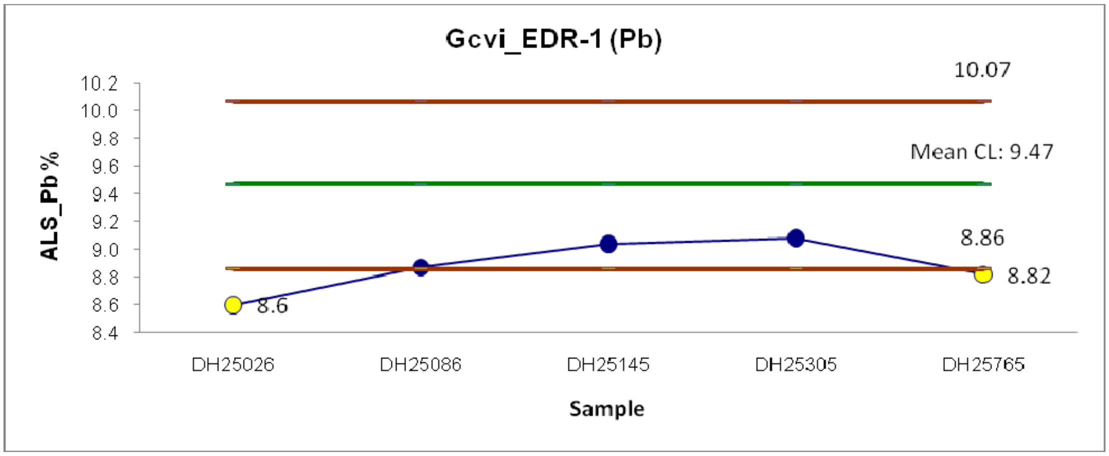


Figure provided by Endeavour Silver Corp.

Figure 13.23
Endeavour Silver's Control Chart for Zinc Assays from the Standard Reference Sample Edr-1

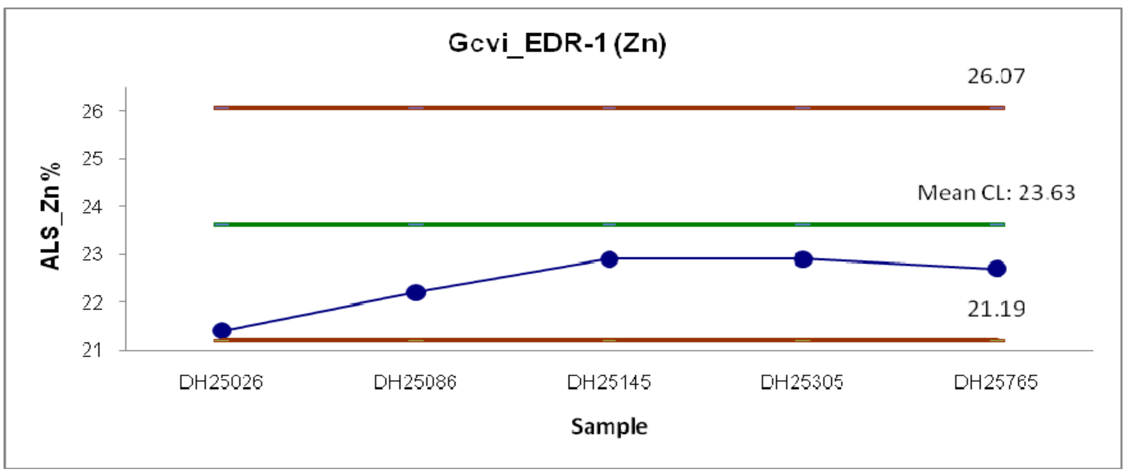


Figure provided by Endeavour Silver Corp.

Edr-11 (a gold-silver-copper standard)

Eleven samples of reference standard Edr-11 were submitted. The average values of the standard and the control charts are shown in Table 13.6 and Figures 13.24, 13.25 and 13.26.

The average was observed to be very close to the accepted values for silver and copper. In the case for gold, the average value was slightly above the accepted value.

Only one sample (DH23920) was significantly more than the control limit for gold, approximately 15% above the accepted value. This sample was more than 3 times the standard deviation for the standard.

For silver, three samples (DH22381, DH23177 and DH24586) were above the control limits, ranging between 7% and 14% above the accepted value for the standard. These samples were more than 3 times the standard deviation for the standard.

Only one sample (DH22286) was significantly below the control limit for copper. This sample was more than 3 times the standard deviation for the standard.

Table 13.6
Laboratory Performance on Standard Edr-11

Element	Average Grade of Samples Submitted	Accepted Value of Standard
Au (g/t)	1.89	1.82
Ag (g/t)	38	38
Cu (%)	0.95	0.96

Table provided by Endeavour Silver Corp.

Figure 13.24
Control Chart for Gold Assays from the Standard Reference Sample Edr-11

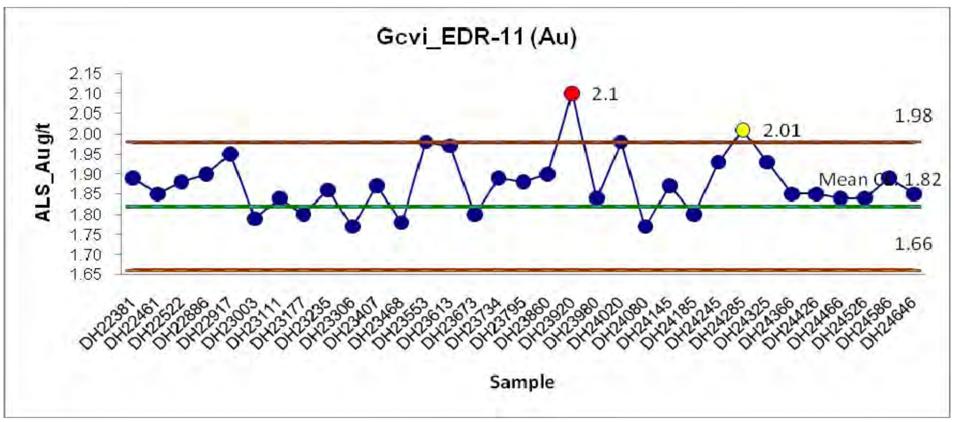


Figure provided by Endeavour Silver Corp.

Figure 13.25
Control Chart for Silver Assays from the Standard Reference Sample Edr-11

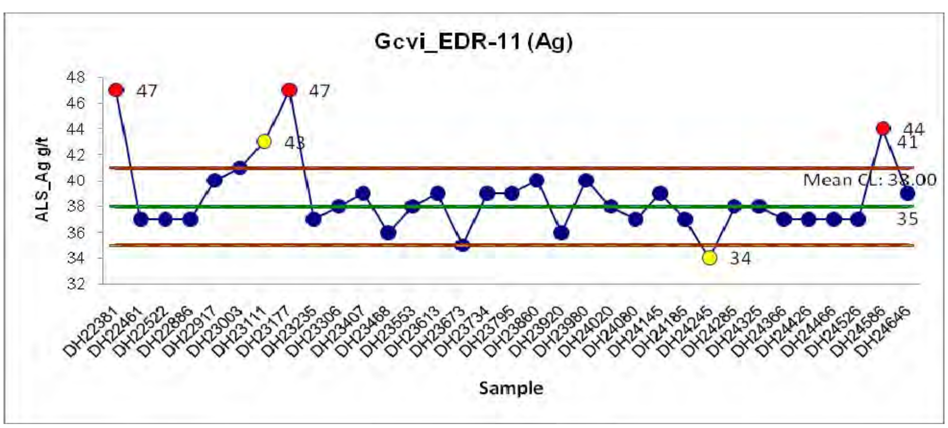


Figure provided by Endeavour Silver Corp.

Figure 13.26
Control Chart for Copper Assays from the Standard Reference Sample Edr-11

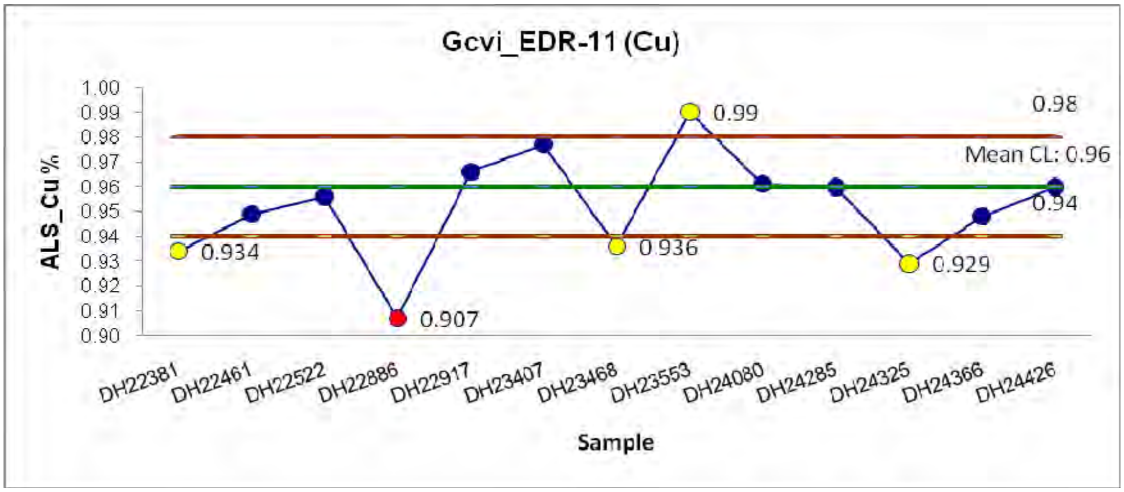


Figure provided by Endeavour Silver Corp.

Edr-12 (a silver-base metal standard)

Twelve samples of reference standard Edr-12 were submitted.

The average values of the standard and the control charts are shown in Table 13.7 and Figures 13.27 through 13.30.

Most of the values for silver, copper and zinc were slightly below accepted values for the standard. In the case for lead, many were below the lower control limit. Previous assaying of this standard showed similar low values for lead and probably reflects more the quality of the standard than the performance of the laboratory.

The following samples failed the accepted protocol because they were beyond 3 times the standard deviation for the standard:

- For silver, four samples (DH25985, DH25945, DH26025 and DH27025), ranged from 9% to 27% below the accepted value for the standard.

- For copper, only one sample (DH26205) was significantly above (+10%) the accepted value for the standard.

- For lead, nine samples (DH25325, DH25865, DH25945, DH26125, DH26245, DH26325, DH26505, DH26545 and DH26625) ranged from 9% to 15% below the accepted value for the standard.

- For zinc, only one sample (DH26165) was significantly above (+10%) the accepted value for the standard.

Table 13.7
Laboratory Performance on Standard Edr-12

Element	Average Grade of Samples Submitted	Accepted Value of Standard
Ag (g/t)	80	82
Cu (%)	0.25	0.25
Pb (%)	0.66	0.73
Zn (%)	1.41	1.44

Table provided by Endeavour Silver Corp.

Figure 13.27
Control Chart for Silver Assays from the Standard Reference Sample Edr-12

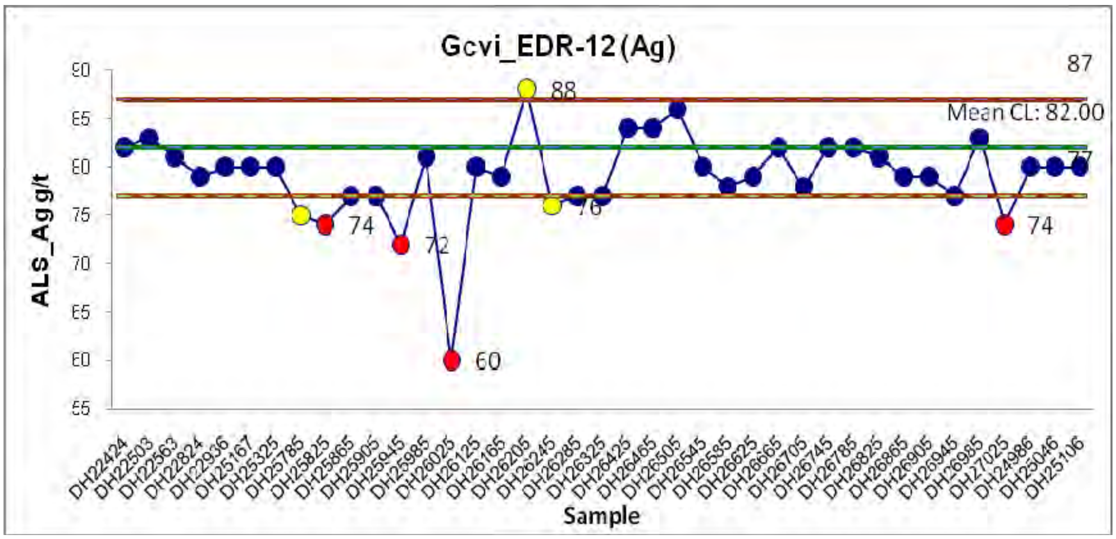


Figure provided by Endeavour Silver Corp.

Figure 13.28
Control Chart for Copper Assays from the Standard Reference Sample Edr-12

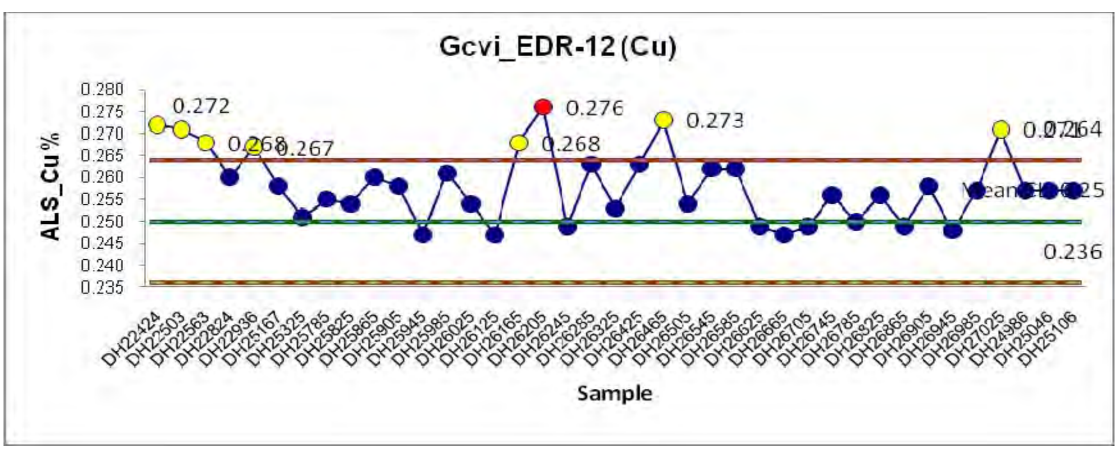


Figure provided by Endeavour Silver Corp.

Figure 13.29
Control Chart for Lead Assays from the Standard Reference Sample Edr-12

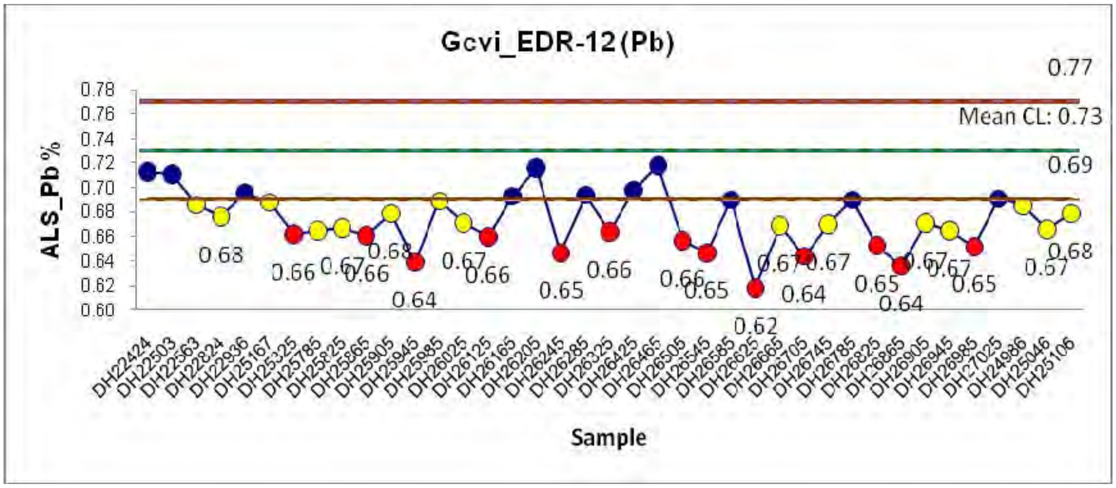


Figure provided by Endeavour Silver Corp.

Figure 13.30
Control Chart for Zinc Assays from the Standard Reference Sample Edr-12

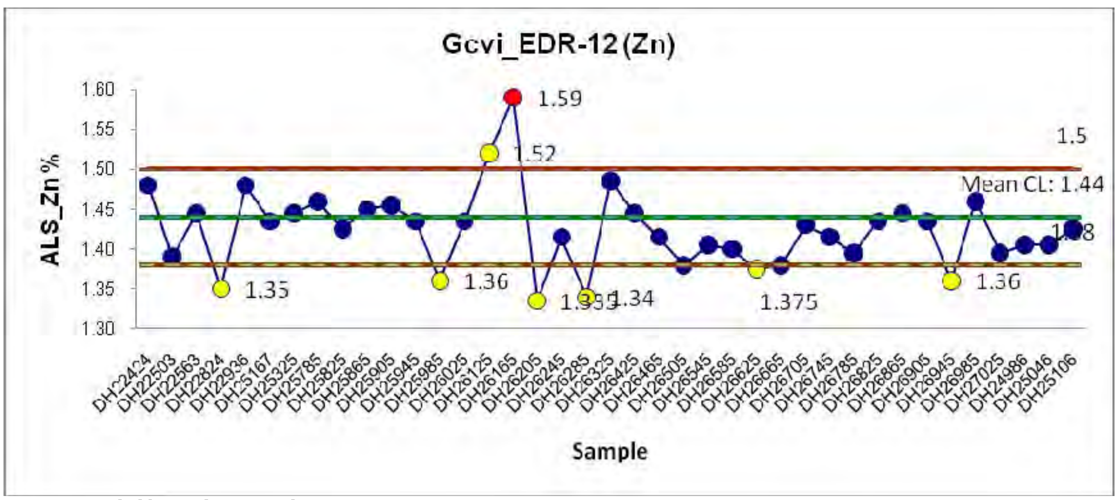


Figure provided by Endeavour Silver Corp.

Edr-13 (a silver standard)

Forty samples of reference standard Edr-13 were submitted. The average value of the standard and the control chart are shown in Table 13.8 and Figure 13.31.

Most of the values were slightly below the accepted value for the standard but most were within the control limits. Only three samples were slightly below the lower control limit for the standard, and less than 95% of the accepted value for the standard. These three samples were not part of the same assay batch and thus are not attributed to poor laboratory performance.

Table 13.8
Laboratory Performance on Standard Edr-13

Element	Average Grade of Samples Submitted	Accepted Value of Standard
Ag (g/t)	1,696	1,776

Table provided by Endeavour Silver Corp.

Figure 13.31
Control Chart for Silver Assays from the Standard Reference Sample Edr-13

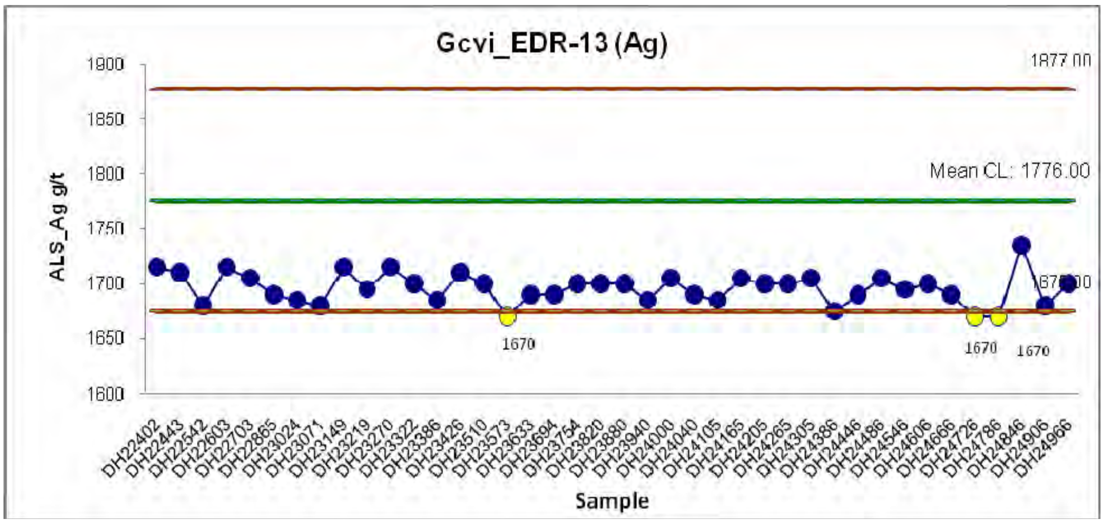


Figure provided by Endeavour Silver Corp.

Edr-14 (a silver standard)

Fourteen samples of reference standard Edr-14 were submitted. The average value of the standard and the control chart are shown in Table 13.9 and Figure 13.32.

Most values except one were slightly below but within the control limits for the standard.

Four samples (DH23343, DH26965, DH23093 and DH26805) were significantly below the control limit with two of them (DH23093 and DH26805) failing the accepted protocol because they were beyond 3 times the standard deviation for the standard.

Table 13.9
Laboratory Performance on Standard Edr-14

Element	Average Grade of Samples Submitted	Accepted Value of Standard
Ag (g/t)	223	228

Table provided by Endeavour Silver Corp.

Figure 13.32
Control Chart for Silver Assays from the Standard Reference Sample Edr-14

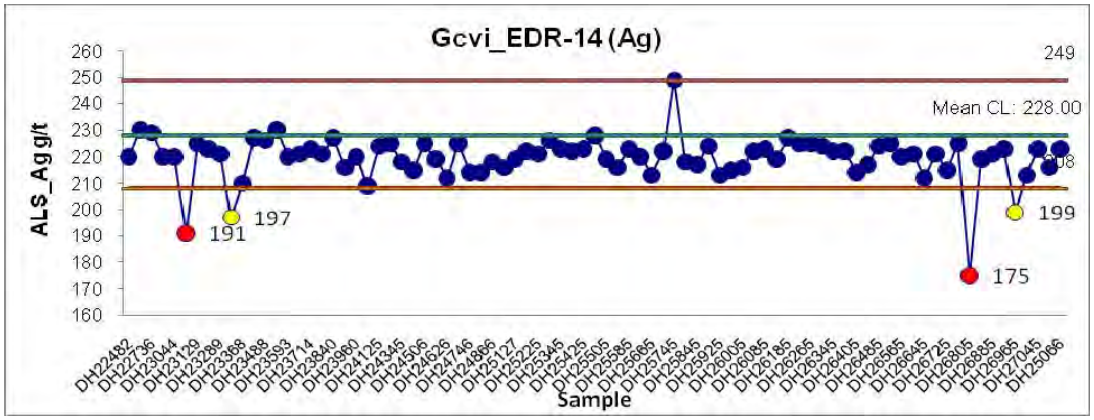


Figure provided by Endeavour Silver Corp.

Edr-17 (a gold standard)

Twenty-one samples of reference standard Edr-17 were submitted. The average value of the standard and the control chart are shown in Table 13.10 and Figure 13.33.

Most values were found to be within the control limits. Only four samples (DH24826, DH24886, DH25365 and DH25725) were slightly out of the range of +/- 2 times the standard deviation of the standard.

Table 13.10
Laboratory Performance on Standard Edr-17

Element	Average Grade of Samples Submitted	Accepted Value of Standard
Ag (g/t)	1.36	1.34

Table provided by Endeavour Silver Corp.

Figure 13.33
Control Chart for Gold Assays from the Standard Reference Sample Edr-17

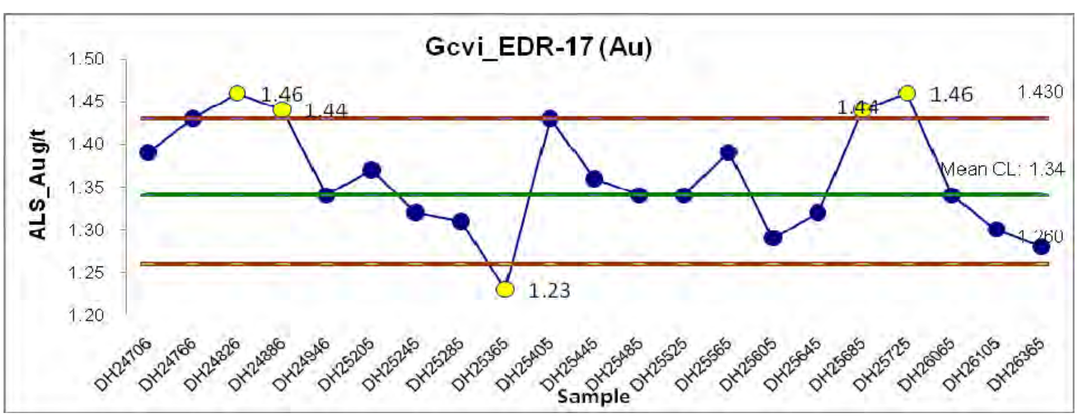


Figure provided by Endeavour Silver Corp.

Summary of Control Sample Results

Several different standards have been used during the Guanaceví drilling program. To view the overall results of this QA/QC program, it was necessary to prepare a single control chart to show the variability of results over time. The summary control charts are shown in Figures 13.34 through 13.38.

The control chart for gold shows most of the results clustering close to the expected values for the standards, dropping slightly below the expected value near the end of the drilling program.

For gold, it can be observed that most results are within 10% deviation of the average expected result with only one major low peak and one major high peak for the duration of the project. In general, the range varies from 92% to 115% of the value for gold, averaging 103%.

Figure 13.34
Control Chart of Gold Assays over Time for Standards Submitted as Part of Guanaceví Drilling Program

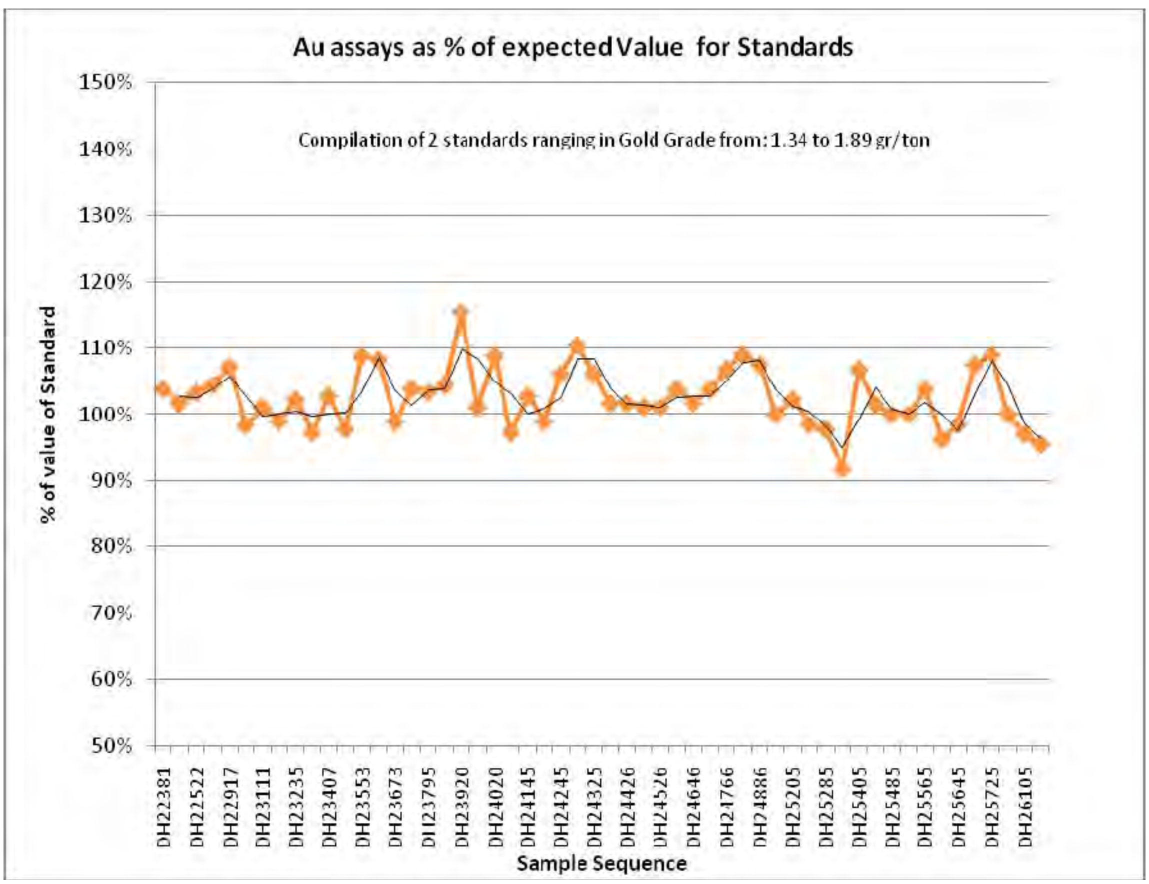


Figure provided by Endeavour Silver Corp.

In the case of silver, a higher degree of variability can be observed over time with most of the assays being within 5% below the expected values. In general, the range varies from 74% to 124% of the value for silver, averaging 97%.

Figure 13.35
Control Chart of Silver Assays over Time for Standards Submitted as Part of Guanaceví Drilling Program

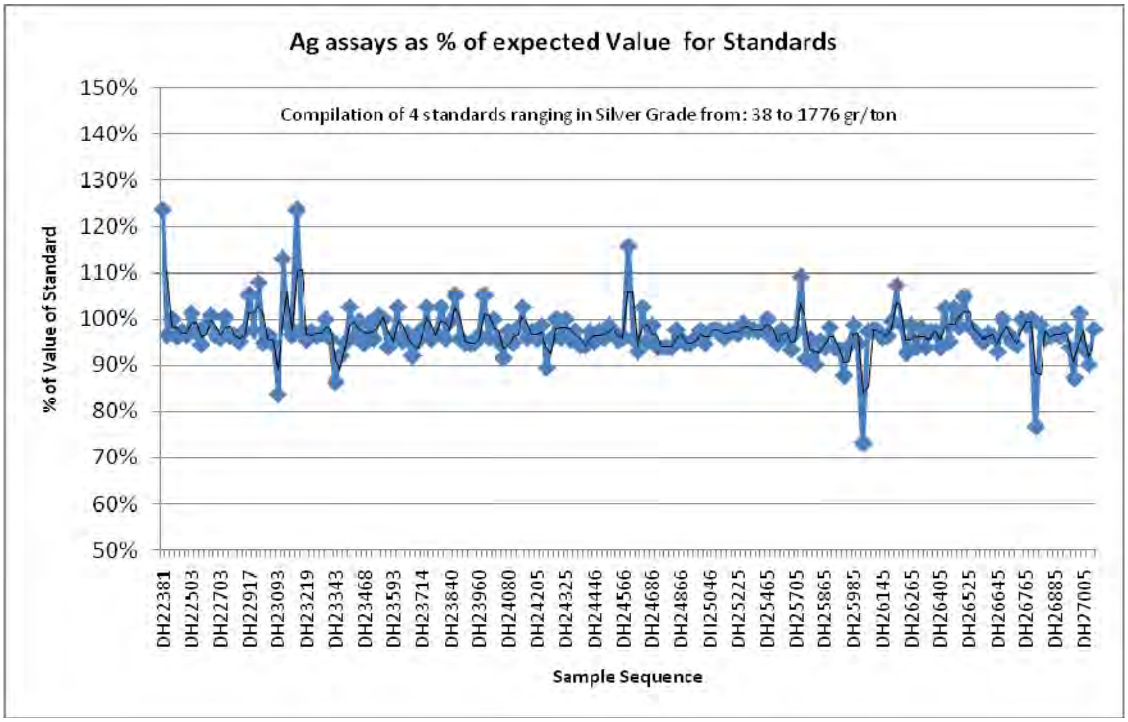


Figure provided by Endeavour Silver Corp.

For copper, lead and zinc, results cluster around the expected values with much less variability than gold and silver. Average values are 102, 92, 98% of the expected values for copper, lead and zinc, respectively.

For copper, values range from 93% to 110%, averaging 102% of the expected value for the standard reference material.

For lead, values were consistently lower than the expected value, ranging from 85% to 98% and averaging 92%.

For zinc, it can be observed that most results are within 10% deviation of the average expected result. The values range from 91% to 110% with an average of 98%.

Figure 13.36
Control Chart of Copper Assays over Time for Standards Submitted as Part of Guanaceví Drilling Program

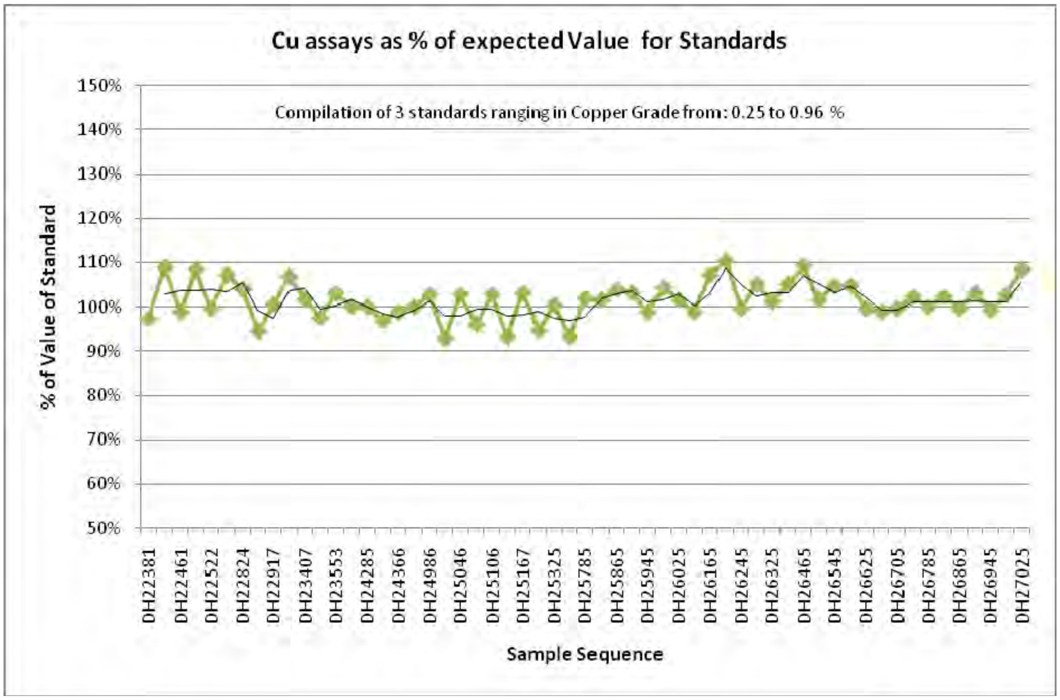


Figure provided by Endeavour Silver Corp.

Figure 13.37
Control Chart of Lead Assays over Time for Standards Submitted as Part of Guanaceví Drilling Program

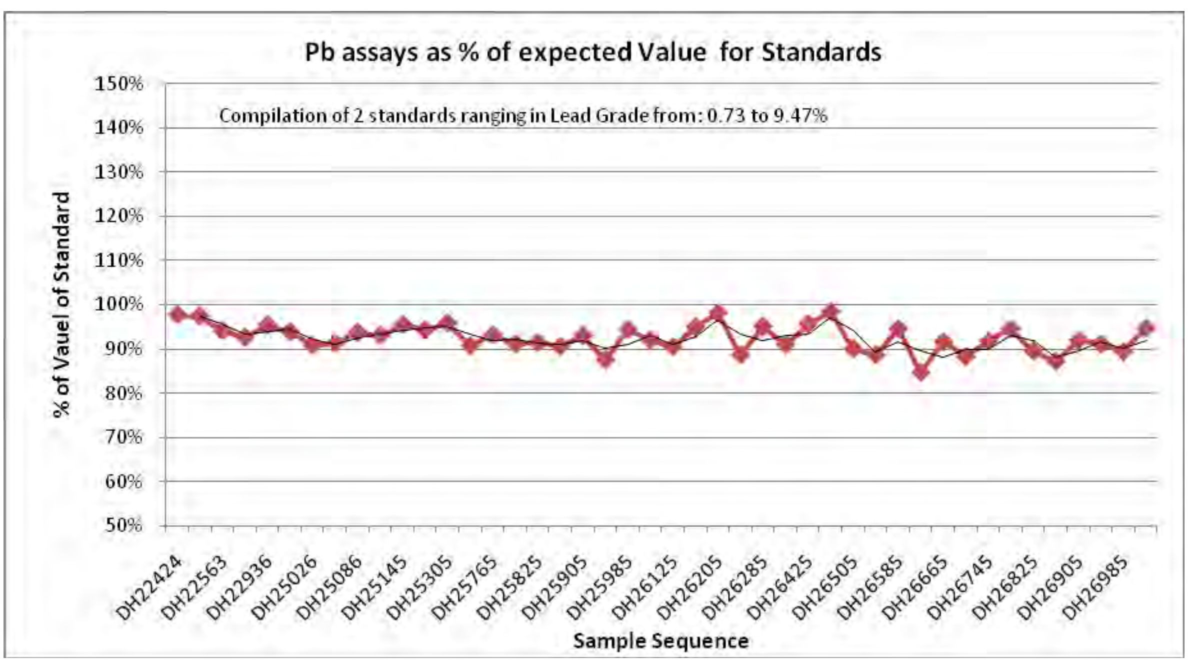


Figure provided by Endeavour Silver Corp.

Figure 13.38
Control Chart of Zinc Assays over Time for Standards Submitted as Part of Guanaceví Drilling Program

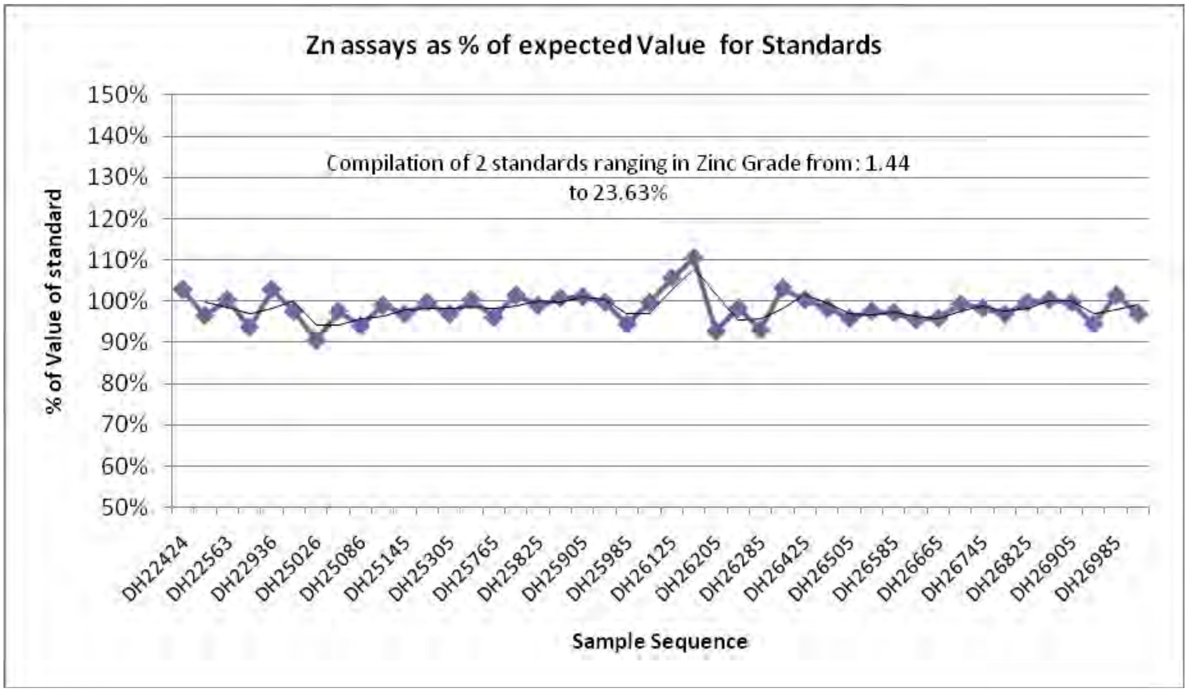


Figure provided by Endeavour Silver Corp.

13.3.6 Check Assaying

To evaluate sample quality control, Endeavour Silver periodically conducts check analyses.

Random pulps were selected from original core samples and sent to a second laboratory to verify the original assay and monitor any possible deviation due to sample handling and laboratory procedures.

A total of 207 pulps from different mineralized zones intercepted in the 2009 Porvenir Cuatro, Noche Buena and Buena Fé drill holes were sent to a third party laboratory (BSI-Inspectorate) for check analysis. All pulps were analyzed for gold and silver. A total of 140 out of the 207 pulps were also analyzed by BSI-Inspectorate for copper, lead and zinc. For the majority of these samples, there was close correlation between the original assay and the check assay.

For gold and silver, correlation indices were 0.95 and 0.96, respectively. For both gold and silver, a very tight clustering of assays is observed (Figures 13.39 and 13.40).

In the case of copper, lead and zinc, correlation coefficients were very high, calculated to be 0.98 for copper, 0.99 for lead and 0.99 for zinc. These correlation coefficients indicate that the check assays are nearly identical to the original assays.

Standards and blanks were also submitted along with the pulps sent for check assay. The standards returned assays very close to the expected values for gold, silver, copper, lead and zinc. Only standard EDR12 showed any problems. This standard typically varies from the expected value and is believed to be more related to the quality of the standard and not the performance of the laboratory.

The blanks submitted along with the check assays all returned values less than the detection limit for gold and silver. In the case of copper, lead and zinc, the values for the standards were very low with very little deviation.

Figure 13.39
Scatter Diagram of the Gold Check Samples

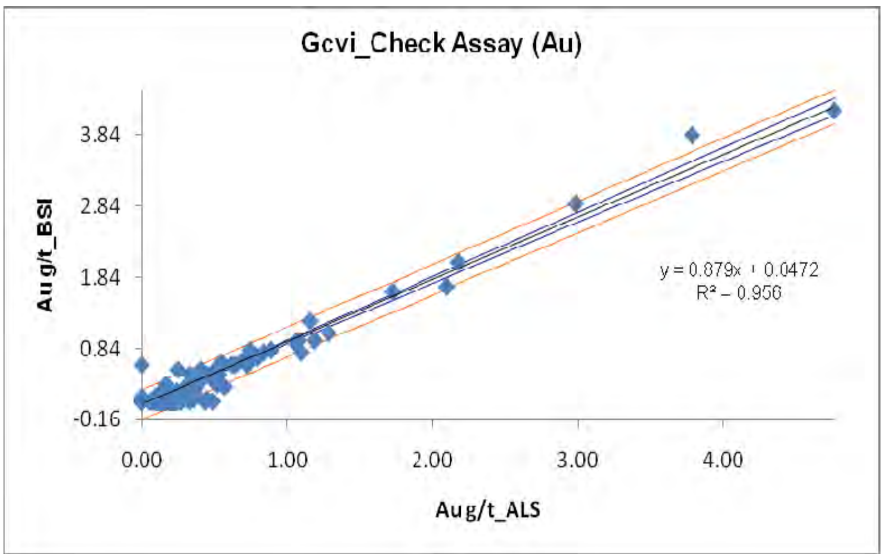


Figure provided by Endeavour Silver Corp.

Figure 13.40
Scatter Diagram of the Silver Check Samples

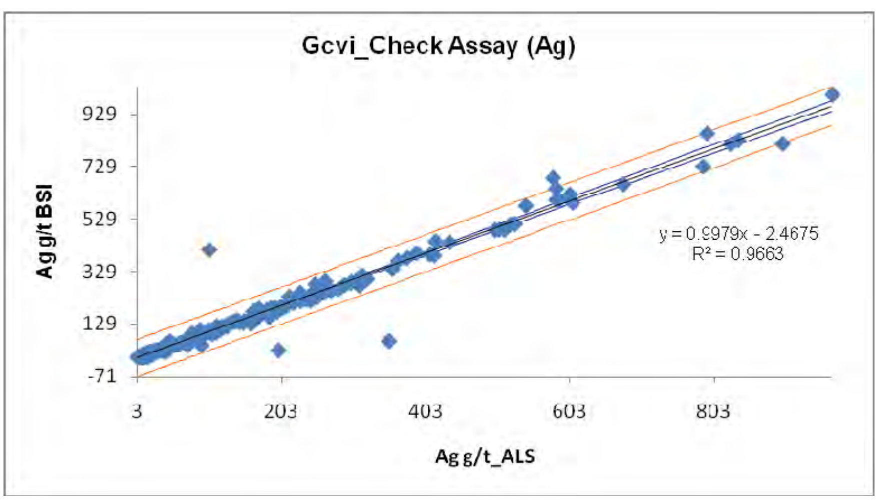


Figure provided by Endeavour Silver Corp.

A total of 140 samples were analyzed for copper, lead and zinc. Correlation indices are high (>0.98) for all three metals, showing a very good correlation between the original ALS-Chemex assay and the BSI-Inspectorate check assay, as shown in Figures 13.41, 13.42 and 13.43.

Figure 13.41
Scatter Diagram of the Copper Check Samples

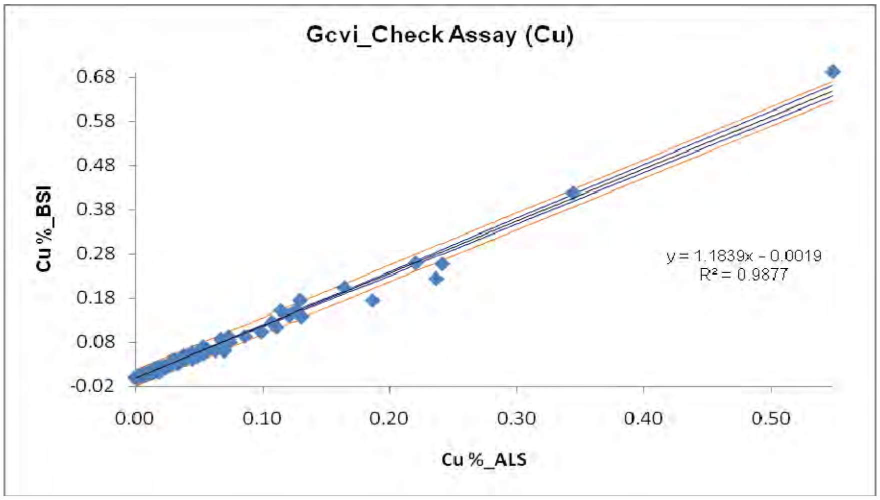


Figure provided by Endeavour Silver Corp.

Figure 13.42
Scatter Diagram of the Lead Check Samples

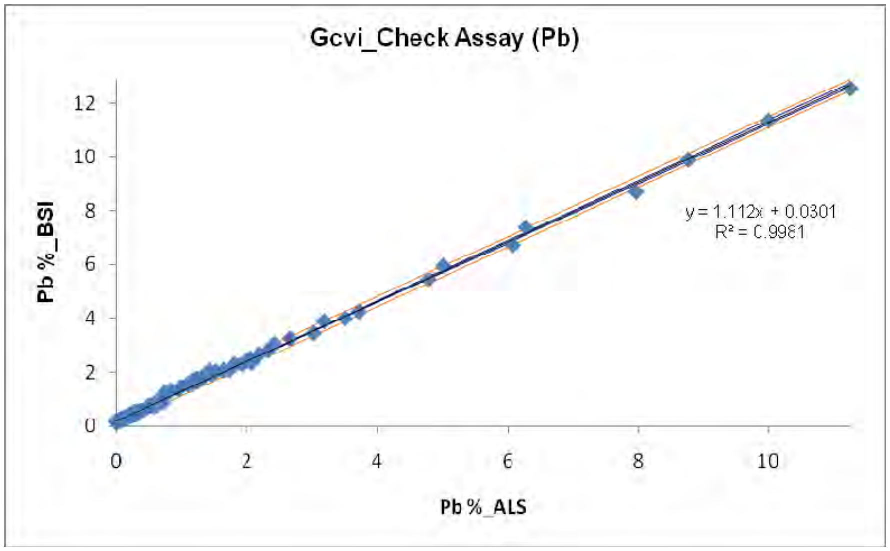


Figure provided by Endeavour Silver Corp.

Figure 13.43
Scatter Diagram of the Zinc Check Samples

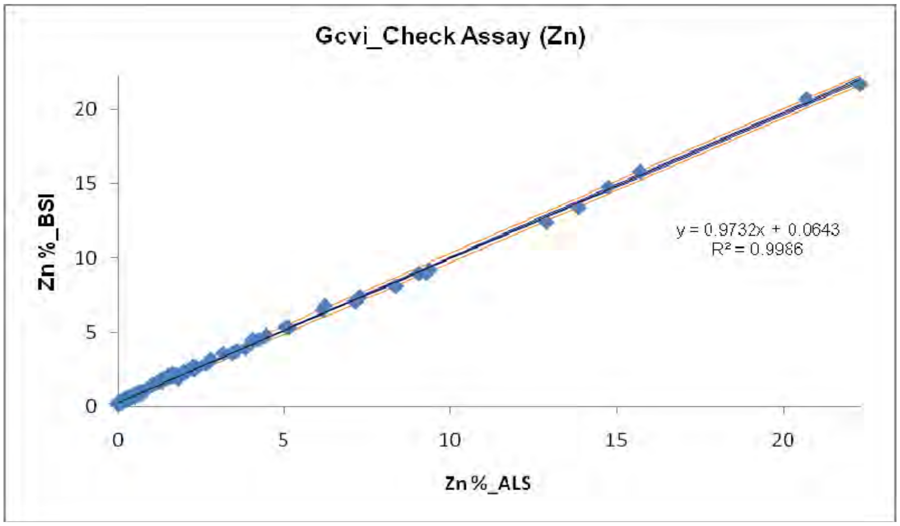


Figure provided by Endeavour Silver Corp.

13.4 SECURITY

Diamond drill core and pulps are being stored in a core storage facility constructed on the Santa Cruz mine site. The core storage building was completed in 2007. It is a covered, open-sided structure with 1.5-metre knee walls on the foundations, and chain-link fencing material above the knee walls. Access to the stored core is through a locked steel-mesh, iron-framed double gate in front, and a locked steel door in the back. Pulps are stored in boxes within the core building. Access to the core building is restricted.

13.5 MG LABORATORY IMPROVEMENTS AND QA/QC

During 2008, a new analytical facility was built at the MG laboratory and put into operation in October. The MG laboratory performs analyses for the geology, exploration, ecology, metallurgy and plant departments with a comprehensive range of services. The new facilities have improved sample turnaround time and are a key to improving quality control and laboratory performance. The improvements include separated and environmentally controlled:

- Balance area with 3 analytical balances and 2 microbalances.
- Wet area.
- Fire assay area with 3 electric furnaces.
- Atomic absorption area.
- Storage area.
- Scrubber area.

In January, 2009, the MG laboratory implemented a round-robin program for check assays with other Mexican mines and commercial laboratories. This among other measures, will help to ensure the accuracy and reliability of Endeavour Silver's in-house analytical data.

Samples were sent to SGS, and Pan American Silver's Colorada laboratory. Samples included the Guanaceví mine and process samples along with Bolañitos concentrate samples. However, the concentrate samples were tested only at the SGS laboratory. Table 13.11 summarizes the round-robin samples sent out for secondary testing. Figures 13.44 to 13.49 are scatter diagrams for the various round robin samples.

Table 13.11
Round-Robin Samples

Laboratory	Number of GCV Samples	Number of GTO Concentrate Samples
SGS	301	132
Pan American Colorada	571	---

Table provided by Endeavour Silver Corp.

Figure 13.44
Scatter Diagram of the 301 Silver Check Samples Tested at SGS

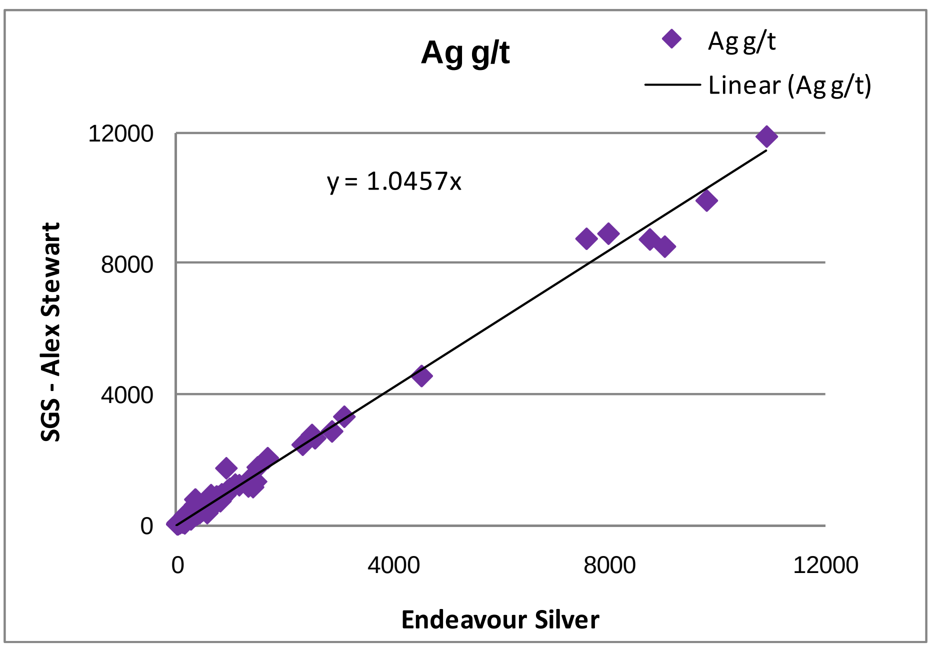


Figure provided by Endeavour Silver Corp.

Figure 13.45
Scatter Diagram of the 301 Gold Check Samples Tested at SGS

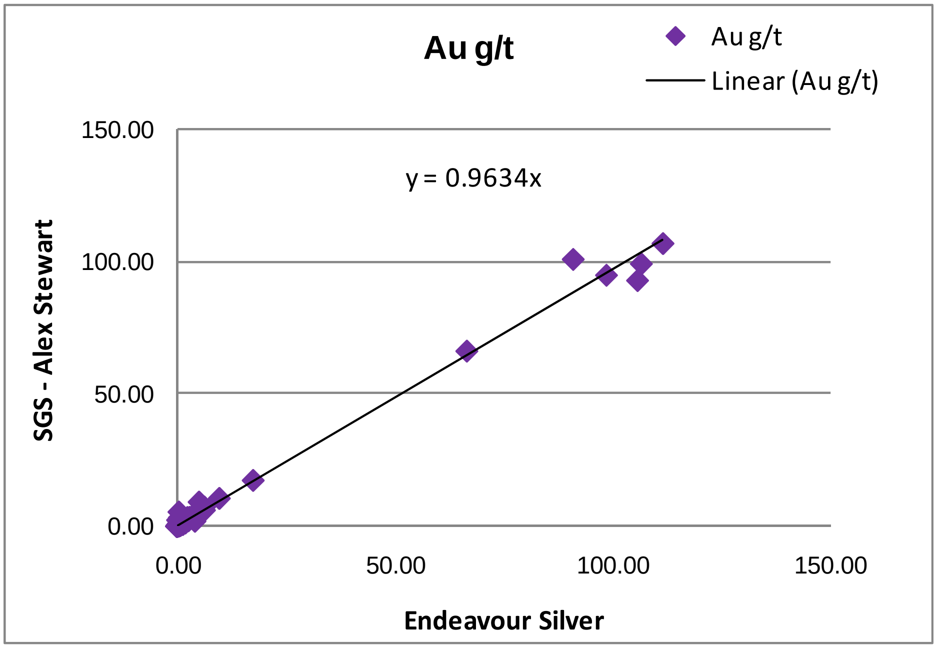


Figure provided by Endeavour Silver Corp.

Figure 13.46
Scatter Diagram of the 571 Silver Check Samples Tested at Pan American Silver

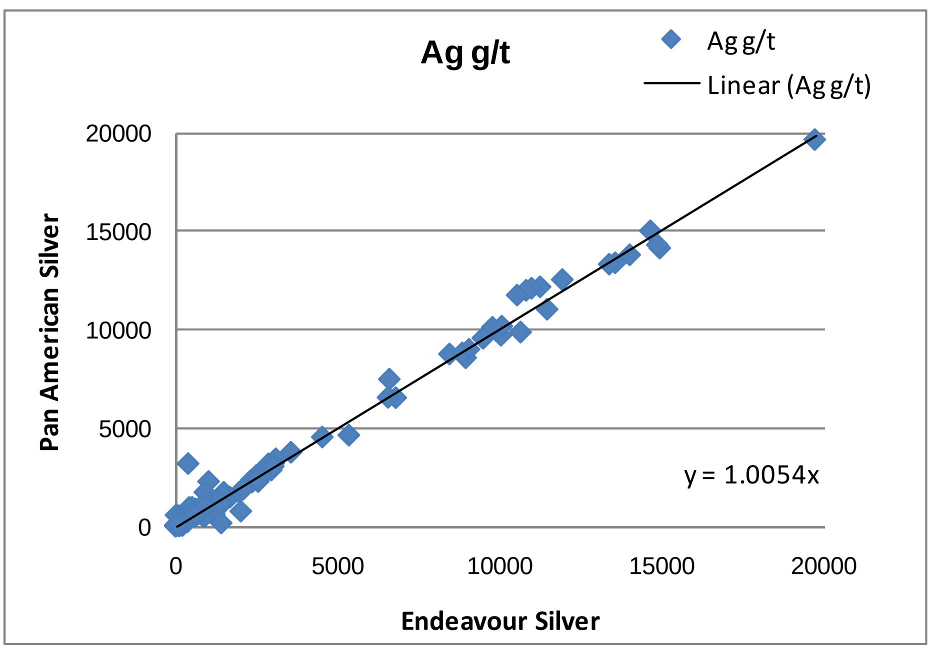


Figure provided by Endeavour Silver Corp.

Figure 13.47
Scatter Diagram of the 571 Gold Check Samples Tested at Pan American Silver

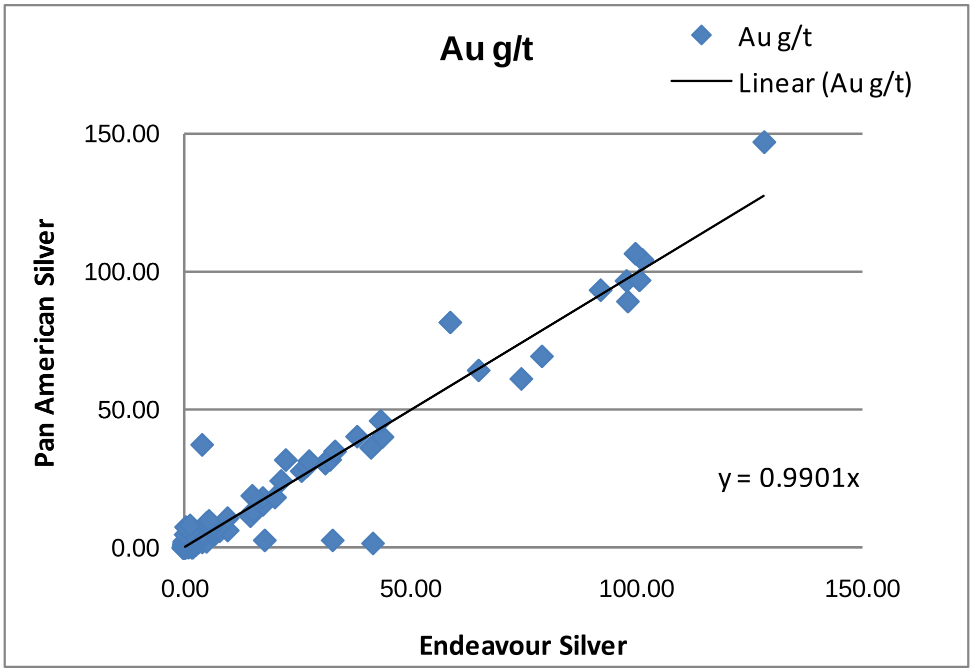


Figure provided by Endeavour Silver Corp.

Figure 13.48
Scatter Diagram of the 132 Silver Concentrate Check Samples Tested at SGS

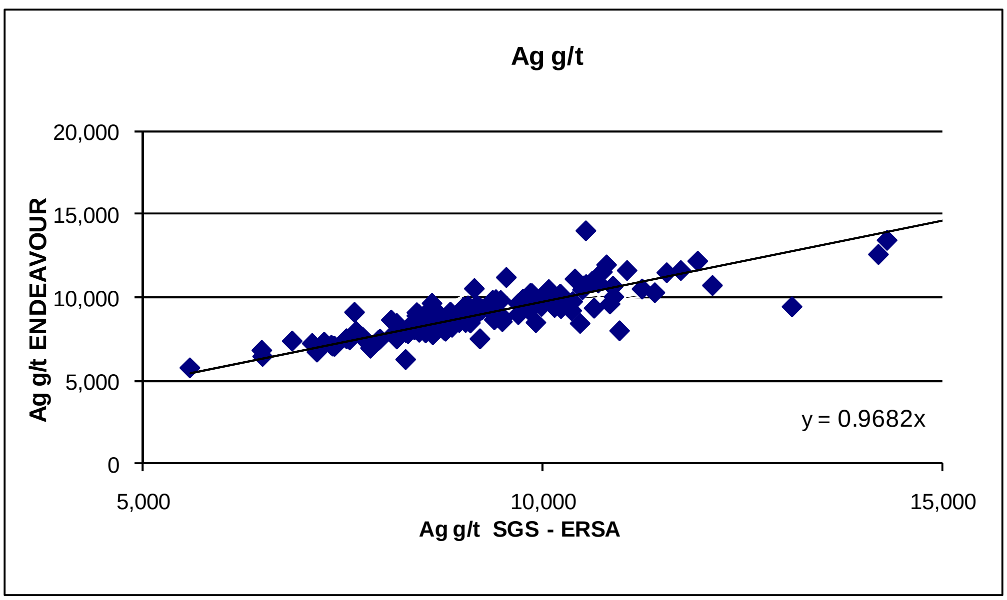


Figure provided by Endeavour Silver Corp.

Figure 13.49
Scatter Diagram of the 132 Gold Concentrate Check Samples Tested at SGS

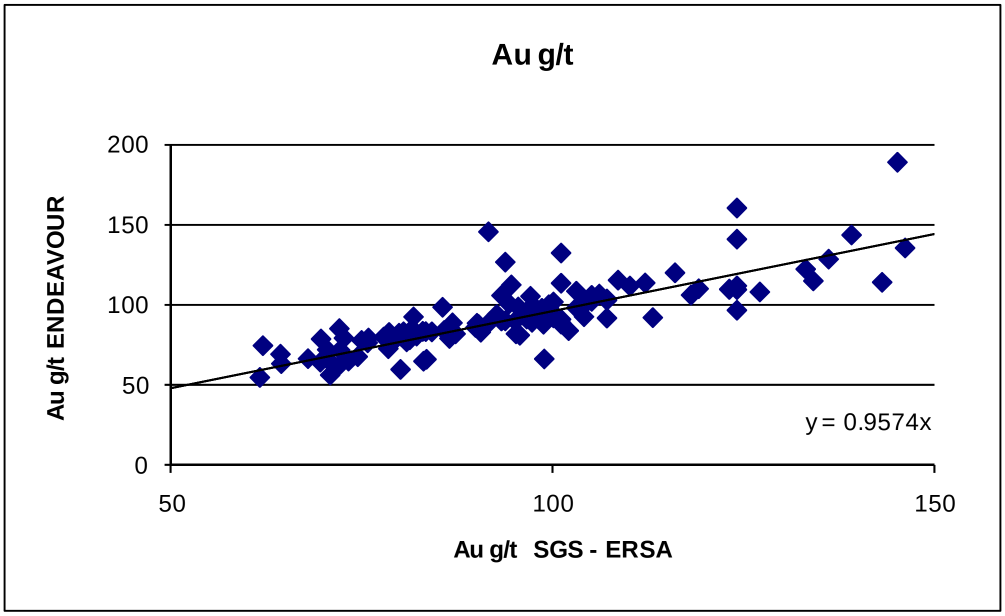


Figure provided by Endeavour Silver Corp.

13.6 CONCLUSIONS

The quality control measures employed and check analyses/testing procedures utilized, including the results and corrective actions taken, are in line with the CIM's Best Practices Guidelines currently in use. Thus, following its review, Micon believes that the QA/QC procedures and protocols employed at the Guanaceví Mines project are rigorous enough to ensure that the sample data are appropriate for use in mineral resource and reserve estimations. The core storage building provides adequate security for the samples and drill cores against tampering.

14.0 DATA VERIFICATION

14.1 INTRODUCTION

The data verification completed by Micon at Guanaceví was carried out during three separate site visits during the periods December 16 to 18, 2006, September 6 to 9, 2008 and November 20 to 22, 2009. Micon was represented by William Lewis during the first visit and by Charley Murahwi during the second and third visits. In every case, no independent sampling was conducted by Micon since other Qualified Persons have previously sampled the mineralization, as discussed in earlier published Technical Reports. Furthermore, Micon considers production records as the most reliable data of mineralization contained in the deposits under development at the mine.

Endeavour Silver took effective control of the mining operation of the Guanaceví Mines project during 2004. The project is comprised of an operating mine which is producing silver doré bars on a regular basis. The sales of doré are a clear representation of Endeavour Silver's production.

Endeavour Silver maintains an active program of assay checks for the production of doré at the project's plant, in addition to a sampling and assaying program by a sales representative in the city of Torreón, Coahuila, to check the assays reported by the Met-Mex Peñoles smelter. An adequate amount of checking has been conducted and the results are representative of the doré produced at the Guanaceví Mines project and shipped to the smelter.

The Micon data verification comprised three separate but interrelated phases as follows: (a) general review of in-house data verification procedures, (b) validation of the in-house data protocols and (c) physical inspection of the blocks/areas drilled and/or sampled for reserve and resource definition.

14.2 REVIEW OF THE IN-HOUSE DATA VERIFICATION PROCEDURES

Endeavour Silver conducts a validation process on the underground sampling and surface exploration data generated from its Guanaceví Mines project. The data verification procedures generally involve:

- Visually checking the data for the following:
    - Any non-conforming assay information such as duplicate samples and missing sample numbers.
    - Verifying collar elevations against survey information for each drill hole.
    - Verifying collar coordinates against survey information for each drill hole.

    - Verifying the dip and azimuth against survey information for each hole.
    - Comparing the database interval against the original assay certificate for drill hole/channel samples.
    - Verifying survey information for location of underground channel samples used in reserve estimation.
- Using Vulcan software to check for data errors and vein continuity.

The assay information comes directly from the laboratory in an electronic format and is merged into the database using sample numbers. Once the laboratory has finalized assays they are put into a dedicated database directory.

The data are in a format that is directly importable to the company's Vulcan modeling software. The export format is an Excel spreadsheet so all data are also readily importable for use in spreadsheets or a different database.

Senior project personnel have portable versions of the drill hole database on their laptop computers. This allows them access to the data at all times. The portable databases are only up-to-date to the point that the master database is copied onto the laptop. Through day-to-day use of the database staff personnel are constantly verifying and rechecking data.

Channel sample assay data are entered into an Excel spreadsheet used for day-to-day grade control purposes; in addition assay data on sample orientation and location are also entered; all location data are relative to a local surveyed reference point. Channel samples are plotted onto plans prepared on the basis of most up-to-date survey information. If survey data for a particular stope cut are not available the sample location is estimated on the basis of the most recent survey pick-up (and if available subsequent survey pick-ups). Coordinates are recorded manually and then entered into an Excel spreadsheet. The process of plotting data onto plans ensures that most field recording errors are identified and corrected.

The channel survey and assay data are then merged on the basis of sample numbers to produce the final database for resource estimation. For data collected in late 2007 and early 2008 the merging of data was done using assay plans prepared in AutoCAD, as field data were not routinely plotted up and coordinates recorded at the time. The merging of data encountered numerous problems of data duplication. Problems of channel data duplication were filtered using Excel spreadsheets and also Vulcan software. Problems of errors with sample location were identified using Vulcan 3-D software. Duplicated channel data are generally removed with the oldest data being accepted as the original information. In some cases (evaluated on a case-by-case basis) duplicated data were accepted or rejected on the basis of sample number sequences. Given the large number of channels that were originally available for use in the channel sample database the general approach was to exclude any channels/samples with data issues. Much of this process of data elimination is manual and extremely time consuming; due to the quantity of data some errors will exist in the channel sample database but the relatively small number means they will have an insignificant effect on the overall resource estimates. A final channel database for resource estimation in an Excel spreadsheet is in a format compatible for import into a Vulcan database.

Assay data and information generated by both operations and exploration are currently transmitted manually and the entire paper trail is accessible and available for inspection.

QA/QC procedures for (a) drilling, (b) sampling and (c) analyses and security are detailed in Sections 11, 12 and 13, respectively.

Micon considers the in-house protocols to be adequate to ensure the integrity of the database for resource and reserve estimates.

14.3 MICON VALIDATION OF DATA AND IN-HOUSE PROTOCOLS

During the three site visits, Micon completed the following validation tasks:

- Review of the property geology and the state of geological/mineralization knowledge.
- Review of the evaluation/exploration practices, specifically drilling, underground channel sampling, drill core handling and sampling procedures and sample security arrangements.
- Review of on-site laboratory facilities.
- General review of QA/QC procedures.
- Review of database integrity/back-up and storage procedures.

14.3.1 State of Geological /Mineralization Knowledge

Endeavour Silver site geologists base their geological model on a clear understanding of the geology of the deposit. That understanding comes from the intelligent interpretation of accurate observations of surface, underground and drilling exposures. Testing of the geological model is achieved through a thorough review of the geological mapping of the surface and underground openings as well as auditing the logging and recording of geological observations from drill holes. Endeavour Silver conducts underground development and continuous level back mapping to guide development sampling crews and to facilitate the interpretation of the sampling results.

The surface exploration team efforts have been recently enhanced by the use of drill core orientation techniques (Ballmark Oriented Core System) which provide vital information on geological structure and mineralization continuity influencing the geological model used in the resource estimation. The core orientation angles are measured using an improvised goniometer as depicted in Figure 14.1.

Figure 14.1
Site Geologist Measuring Core Orientation Angles

Comments:

Following its review, Micon is satisfied that the geology teams at Guanaceví have acquired a good understanding of the geology and mineralization controls which have an important bearing on resource estimates and future exploration efforts. Thus, the resource estimation process is well supported by a good geological/mineralization model.

14.3.2 Review of Exploration Practices

The drilling procedures as observed by Micon are in accordance with the current CIM Exploration Best Practices Guidelines. On the drill site, surveys are conducted to obtain collar coordinates, elevation of the site and its surroundings, inclination and azimuth of the drill hole. This is important for accuracy in the production of maps, sections and plans. As drilling progresses, the inclination and azimuth of the drill hole are monitored by conducting down-hole surveys. As the targeted drill hole depth is approached, the hole is surveyed using a Reflex down-hole survey instrument in multi-shot mode.

Endeavour Silver aims for HQ and NQ core sizes for surface and underground drilling, respectively. The bigger the sample, the more representative it is. The slightly smaller underground core is due to the lower capacity of the rigs as compared to surface rigs. Core logging is by bar-coding systems with a minimum of descriptive content. This is good practice and is to be commended as it provides a check list, minimizes data transcription errors and assists in maintaining consistency in logging.

In summary, Endeavour Silver's diamond drilling QA/QC are assured by good survey control, NQ and HQ core sizes which yield representative samples, good core recoveries which yield whole intercepts in targeted potential ore zones, and target intersection angles as near to perpendicular as possible. The core storage facilities at Guanaceví are well protected by a high level security fence and are located in an area under 24-hour surveillance by security personnel. The core shed facilities at Guanaceví are depicted in Figure 14.2

Figure 14.2
Exploration Staff at the Guanaceví Core Shed Facilities

14.3.3 On-site Laboratory Inspection

Micon carried out inspections of the new laboratory facilities commissioned at Guanaceví in the earlier half of 2009 and noted that the deficiencies previously described during similar inspections in 2007 and 2008 have been corrected. The sample preparation room has been enlarged and measures are now in place to minimize contamination between samples. The laboratory's capabilities have also been enhanced by the addition of new AA and ICP machines plus two electric furnaces (Figure 14.3). Although the laboratory is not yet ISO certified it is actively participating in round-robin exercises with other Mexican laboratories including SGS and Pan American Silver's Colorada laboratory. The laboratory in-house QA/QC protocols are in accordance with the CIM best practices guidelines. Currently the laboratory takes care of all production samples for the mine and half of the trench samples from the exploration team. However, Micon noted that Endeavour Silver still utilizes external ISO certified laboratories for most of its analytical work involving exploration projects. This assists in the assurance that there is credibility in the assay database of new prospective production additions to the mine.

Figure 14.3
Inside the New Laboratory Complex at Guanaceví

14.3.4 QA/QC on Assay Data

In addition to using accredited laboratories off the mine sites, Endeavour Silver's exploration division has imposed and maintains various quality controls on sampling and assaying procedures including:

- Duplicate samples.
- Blanks.
- Reference standards.
- Check assaying of selected pulps at different laboratories.

Micon's evaluation of the QA/QC data generated from the above practices does not reveal any major deficiencies that are likely to have a material impact on the assay results used in the reserve/resource database.

14.3.5 Review of the Database

Endeavour Silver's data are stored in digital format but, for both internal and external audit purposes, hard copy output of raw and interpreted data in the form of tables, plans and sections is readily available.

Micon conducted an audit of the database at Endeavour Silver's exploration office in Durango City on September 5, 2008 and November 19, 2009. The audit comprised a review of its construction, and the categories of information contained in it, to ensure that all the data necessary for the proper estimation of the resources have been assembled, and that data relating to all key geological and physical features can be accessed individually or in groupings.

As a means of verification, Micon inspected various prints and plots from the database to ensure that the output is sensible. Micon noted that Endeavour Silver ensures and maintains a clean database by imposing restricted access to the database files and established that in all respects the database is in good order.

In line with Micon's previous recommendation Endeavour Silver has reviewed its security measures for the ultimate protection of the database against destruction by fire, theft or electronic failure and has acquired a safe. Good housekeeping practice generally requires regular backups of electronic data with at least one up-to-date copy being maintained off site and Endeavour Silver has put this into practice.

14.4 MICON VALIDATION OF DATA AND IN-HOUSE PROTOCOLS

During the November, 2009 site visit, Micon's representative was able to inspect all the resource and reserve blocks that contribute to the estimates discussed herein. Of particular importance to Micon were the adequacy of the sampling/drilling density of the resource and reserve blocks and the accessibility of the proven or probable reserve blocks. On the basis of this exercise, Micon was able to better understand and audit Endeavour's classification of the resources and the reserves. Figure 14.4 shows an old working in the Noche Buena area were Endeavour's exploration efforts have yielded substantial indicated resources as detailed in Section 17.

Figure 14.4
Old Adit on the Armagedon Vein in the Noche Buena Area

14.5 RESOURCE/RESERVE AUDITS

Micon's review and audit of the Endeavour Silver resource and reserve estimate is summarized as follows:

1) A site visit was conducted to the Guanaceví Mines project in Mexico where the data input procedures, geological model, block model parameters and resource classification details were reviewed in detail over a period of two days. The site visit included an underground tour to examine the various vein systems for continuity and mineralization; geological mark-up procedures and mining methods were observed and discussed. A tour of the mill was also arranged.

2) The review of the resource block model included review of the cut-off grade, wire-framing, capping of high grade assays and block model protocols.

A review of the spreadsheets of tabulated reserves and resources for each zone and by polygon block was undertaken to verify that:

- Appropriate methodology and parameters had been used to estimate quantities of dilution and recovery of mineral within the stoping areas.

- Calculations had been made correctly.

- Blocks had been correctly categorized as proven or probable reserves.

Summary tables had correctly listed total tonnages, grades and contained metal within reserve categories.

A review of the block model showed that

- The capping was adequately conservative.

- Endeavour Silver's variogram ranges and search ellipses are similar to Micon's parallel calculations.

- Overall the block model correlates well with the sample data and geological model.

15.0 ADJACENT PROPERTIES

15.1 INTRODUCTION

Endeavour Silver's property exists within the Guanaceví mining district which has hosted several past producers. A number of these past producers are located on the property and the majority of the past producers in the district are located on quartz veins that are similar or related to those found on the Guanaceví property. However, there are no immediately adjacent properties which directly affect the interpretation, evaluation of the mineralization, or anomalies found on the Guanaceví property. The geology, nature of the mineralization, historical production over the last two centuries and the limited use of modern exploration concepts and technology on the property to identify new areas of mineralization along both the strike and dip directions of the veins, as well as parallel to the Santa Cruz vein to identify "hidden" or "blind" parallel veins which do not necessarily outcrop on surface, positively affect the prospectivity of the ground contained within the property.

15.2 OTHER SILVER-GOLD PRODUCTION ACTIVITY IN THE GUANACEVÍ MINING DISTRICT

Micon previously reported that, during 2006, the MG plant did custom milling and processing for several small mines in the Guanaceví district. These mines include the Barradon mine owned by Cesar Loera, the San Rafael mine owned by a group of local individuals, the San Marcos mine, leased by Ignacio Barraza, and a small operation in the San Pedro area also owned by Ignacio Barraza. The cumulative tonnage from these operations runs between 100 and 500 tonnes per month, and the material from each mine is run through the plant separately in batch mode. Each mine exploits quartz-carbonate veins similar in character to the Santa Cruz mineralization, but with varying amounts of base metals.

In 2008 there were two other plants in the district. One is owned by Cesar Loera who owns the Barradon concession and is treating about 100 tonnes per day. The other is located at the San Rafael property and processes about 50 tonnes per day. Endeavour Silver does still process other ore that it purchases. This allows the Company to credit its account with the silver production.

See Figure 15.1 for the locations of some of the other mineral properties and mines in the region and within the Guanaceví mining district.

Figure 15.1
Adjacent Mineral Properties/Mines in the Guanaceví Mining District

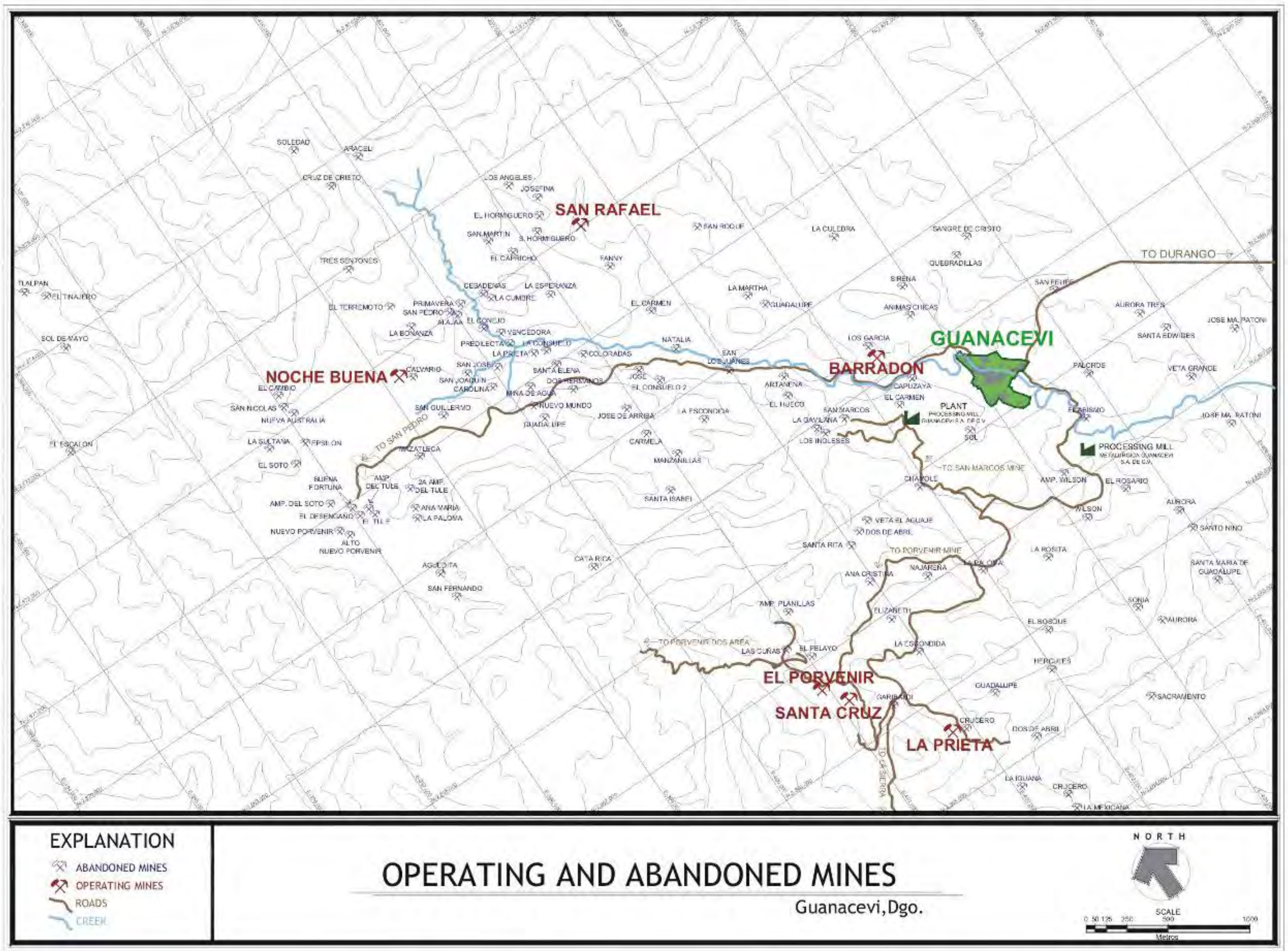


Figure provided by Endeavour Silver Corp.

16.0 MINERAL PROCESSING AND METALLURGICAL TESTING

16.1 INTRODUCTION

The mill was originally built in 1970 by the Mexican government and designed to custom mill ores from various mines in the district.

The crusher plant consists of a coarse ore circuit with 4 ore bins; three bins are dedicated to run-of-mine ore and one dedicated to purchased ore. Coarse ore is crushed in two stages and screened to minus 5/8" with a 24"x36" jaw crusher and two cone crushers (4-foot and 3-foot cone crushers), then conveyed to five fine ore bins, where it is fed to the grinding circuit, which has four operating ball mills: A 10.5'x12' Hardinge mill, a 7'x 7.5' Denver mill and a 5'x 6' Fimsa ball mill. One additional Denver ball mill operates as a regrind mill after the Hardinge ball mill, and the ground ore is sent to a cyanidation circuit. Figure 16.1 is a partial view of the mill.

Figure 16.1
View of Leach Tanks and CCD circuits

Leaching is carried out in twelve 20'x 20' and four 30'x30' agitation tanks. Leach residues are washed in five 50' thickeners and discharged to a lined tailings pond. Reclaim water is pumped back to the mill process. The pregnant solution is treated in a Merrill-Crowe circuit and gold and silver precipitate is smelted into doré bars and shipped for refining.

The flotation circuit consists of lead and zinc flotation. The flotation cells are designed for a throughput of 400 t/d but are currently limited to the 80 t/d capacity of the Fimsa ball mill. At this time there is no material being processed through the flotation circuit. All material is processed through the cyanide leach circuit. The second Denver mill was rehabilitated in 2009 and the material from the Fimsa mill is processed in the leach circuit, allowing up to 900 t/d to be processed.

By the end of 2008, silver recovery had improved from 68 to 70% to 78% due to higher cyanide concentration in the leach process. Oxygen injection was scaled down from August, 2008, and completely stopped in November, 2008, with no detrimental effect on metal recovery. Figure 16.2 is a view of the Merrill-Crowe precious metal recovery circuit.

Figure 16.2
Merrill-Crowe Circuit

In 2009, hydrated lime was switched to quicklime to reduce the consumption and reduce flocculent and diatomaceous earth consumptions in the pregnant solution clarification stages. There was not much improvement and flocculent and diatomaceous earth consumption did not decrease significantly.

16.2 PORVENIR CUATRO – PRELIMINARY METALLURGICAL TESTING

In September, 2009, Endeavour Silver commissioned SGS de Mexico to conduct cyanide bottle roll testing on two core samples from Porvenir Cuatro. The two samples selected for bottle roll testing were P4C-1 & P4C-3 (Tables 16.1 and 16.2; Figures 16.3, 16.4, and 16.5).

Table 16.1
Assays for Santa Cruz Vein Intercept in Hole PC51-2 Selected for CN Bottle Roll Test Sample P4C-1

Sample	Interval (m)		Rejects Weight	ALS-Chemex		Composite		
	From	To		Gold (g/t)	Silver (g/t)	Weight	Gold (g/t)	Silver (g/t)
DH23033	213.35	213.75	1.32	0.91	306	2.61	0.77	261
DH23036	214.20	214.65	1.29	0.62	214			

Table provided by Endeavour Silver Corp.

Figure 16.3
Santa Cruz Vein Intercept in Hole PC51-2 (Sample No. DH23033) Selected for CN Bottle Roll Test Sample P4C-1

Figure provided by Endeavour Silver Corp.

Figure 16.4
Santa Cruz Vein Intercept in Hole PC51-2 (Sample No. DH23036) Selected for CN Bottle Roll Test Sample P4C-1

Figure provided by Endeavour Silver Corp.

Table 16.2
Assays for Santa Cruz Vein Intercept in Hole PC50-2 Selected for CN Bottle Roll Test Sample P4C-3

Sample	Interval		Reject Weight	ALS-Chemex		Composite		
	From	To		Gold (g/t)	Silver (g/t)	Weight	Gold (g/t)	Silver (g/t)
DH23223	307.45	307.65	0.67	0.77	236	2.84	1.74	467
DH23225	308.05	308.70	2.17	2.04	539			

Table provided by Endeavour Silver Corp.

Figure 16.5
Porvenir Cuatro Intercept in Hole PC50-2 (DH23223 & DH23225) Selected for Cyanide Bottle Roll Test Sample P4C-3

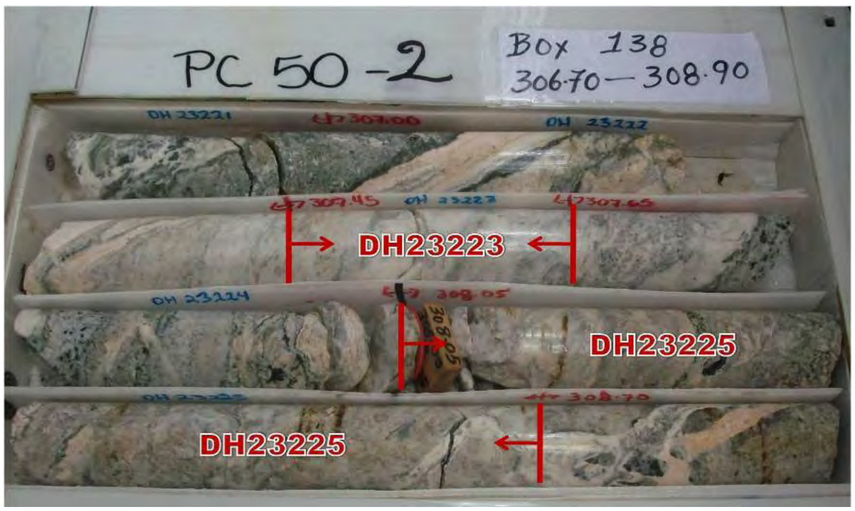


Figure provided by Endeavour Silver Corp.

16.2.1 Metallurgical Test Results

Cyanide bottle roll tests on Porvenir Cuatro diamond drill core showed good recoveries for silver of 77 to 87% and 71 to 88% for gold (Table 16.3).

Table 16.3
Final Results from SGS for Cyanide Bottle Roll Tests on Porvenir Cuatro Core

Final Results											
Sample	NaCN	Head Assay		Head Calculation		Extraction		Residue		Reagent Consumption	
	ppm	Au g/t	Ag g/t	Au g/t	Ag g/t	Au %	Ag %	Au g/t	Ag g/t	NaCN Kg./t	CaO Kg./t
P4C-1 (1)	5,000	0.75	256	0.7	268	70.6	77.6	0.20	60	3.1	3.0
P4C-1 (2)				0.7	272	70.6	77.3	0.20	62	3.2	2.9
P4C-3 (1)		1.54	435	1.6	471	87.8	86.1	0.20	66	10.3	1.5
P4C-3 (2)				1.6	468	87.8	86.6	0.20	63	10.7	1.5

Table provided by Endeavour Silver Corp.

16.3 SAN PEDRO – MINERALOGIC STUDIES

During 2009, Endeavour Silver continued to support a Master's Degree in geology for Darcy Garcia at the Sonora University in Hermosillo, Sonora, Mexico. Fifty samples of San Pedro diamond drill core are being studied from the Veronica, Epsilon, Noche Buena and Buena Fé areas. The studies include geochemical analyses, petrographic and mineralogic studies and measurement and study of stable isotopes and fluid inclusions.

Results of these studies are expected to be published in 2010.

16.4 SANTA CRUZ VEIN – METALLURGICAL TESTING AND MINERALOGIC STUDIES

During 2009, samples of diamond drill core were collected from different areas along the Santa Cruz vein (Santa Cruz mine, North Porvenir, Porvenir Dos and Porvenir Cuatro). Megascopic descriptions of the mineral content, mainly the manganese-bearing oxide, silicate and carbonate minerals, have been completed. Samples were also submitted to a commercial petrographic service for further petrographic and mineralogic work. SGS is also conducting cyanide bottle roll testing on these samples.

In 2010, results of these studies will be analyzed and used for "metallurgical mapping" of the remaining mineralization on the Santa Cruz vein for future process optimization and other development and mine planning consideration.

17.0 MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES

17.1 INTRODUCTION

The most recent resource and reserve estimate for the Guanaceví Mines project was reported in a Technical Report by Micon dated March 18, 2009, and posted on SEDAR.

Since the effective date of the last resource and reserve estimate of December 31, 2008, Endeavour Silver has conducted further diamond drilling and underground development and has completed a new resource and reserve estimate for the Guanaceví Mines project as of December 31, 2009.

Reserves and resources have been updated for all of Endeavour Silver's mines and deposits in the Guanaceví Mines project. All mines and deposits are considered as separate entities and as such have been were modeled separately. These include the Porvenir mine, Porvenir Dos, Porvenir Cuatro, Santa Cruz, Alex Breccia, Noche Buena, Buena Fé and several small deposits located in the San Pedro district.

17.2 RESERVE ESTIMATION METHODOLOGIES

For the December 31, 2009 reserve and resource estimate, three different methodologies have been employed for the Guanaceví Mines project.

The three methodologies used, and the mineralized areas to which they have been applied:

- Polygonal interpretation on longitudinal section: Noche Buena, Buena Fé, smaller San Pedro deposits.
- Block modeling: Porvenir Cuatro, Santa Cruz.
- The methodology used for Porvenir North, Porvenir Dos and Alex Breccia is described below.

For the Porvenir North, Porvenir Dos and Alex Breccia mines, the resource and reserve estimates were completed in a 2-D horizontal plane. The model was then rotated back to 3-D. Drill holes and composites were converted into point data with a single 3-D UTM coordinate. These data were rotated twice: first a clockwise rotation was applied to align to the local grid and, second, the data were rotated to horizontal (Table 17.1). These point data, particularly accumulation and thickness, were used for estimation. Compositing of the drill holes was done in an Excel spreadsheet to vein width. The composite grades and thicknesses were used in the modeling process. The footwall surface was then modeled to coincide with the footwall composite boundary. The modeled thickness was added to the footwall grid on a cell-by-cell basis to create the hanging wall surface. These two modeled surfaces were joined together to create a wireframe of the mineralized zone. Un-estimated blocks were given a vein thickness based on the average thickness of nearby cells.

Table 17.1
Rotation Angles used for Coordinate Transformation

Mine	Rotation (Clockwise)	Dip (Clockwise)
Porvenir North	+40.0°	+55.0°
Porvenir Dos	+45.0°	+55.0°
Alex Breccia – SCV (Zone 1)	+43.0°	+48.0°
Alex Breccia – HW-SCV (Zone 2)	+43.0°	+48.0°
Alex Breccia – FW-SCV (Zone 3)	+43.0°	+48.0°

All resources for Porvenir Cuatro and Santa Cruz were estimated by block model methods using Vulcan computer software.

For smaller deposits in the San Pedro district including Noche Buena and Buena Fé, Endeavour Silver employed traditional manual polygonal methods to estimate resources.

The reported reserves are only for the Porvenir and Porvenir Dos mines, and represent that portion of the Guanaceví Mines project for which Endeavour Silver has a mine plan in place.

17.3 GEOLOGICAL INTERPRETATION

As first reported by Micon in April, 2007;

> *"The Guanaceví silver-gold district comprises classic, high grade silver-gold, epithermal vein deposits, characterized by low sulphidation mineralization and adularia-sericite alteration. The principal mineralization in the Santa Cruz-Porvenir mines is an epithermal, fracture filling quartz-carbonate vein of low sulphidation geochemistry closely associated with a major fault that extends over 10 km in a northwest strike direction with a generally moderate southwest dip. The Santa Cruz vein is a silver-rich structure with lesser amounts of gold, lead and zinc. Mineralization has averaged 500 g/t silver and 1 g/t gold over a 3 m true width. The minerals encountered are argentite-acanthite, limited gold, galena, sphalerite, pyrite and manganese oxides. Gangue minerals noted are barite, rhodonite, rhodochrosite, calcite, flourite and quartz. The Santa Cruz mine property covers about a 3.0 km strike length of the Santa Cruz fault/vein system. The broader and higher grade mineralized ore shoots tend to occur along flexures in the Santa Cruz vein structure, where sigmoidal loops are developed both along strike and down dip. The vein in the Santa Cruz workings, for instance, splays into two, three or four separate mineralized structures and the intervening wallrocks are also often well mineralized, giving mining widths ranging up to 10, and even 20 m in some places. These sigmoidal loops tend to develop with some regularity along the strike and ore shoots at the Santa Cruz mine have approximately a 60° to 80° plunge to the northwest. Mineralization associated with the Santa Cruz vein is restricted to quartz veins, even*

though locally strong silicification extends tens of metres into the hanging wall. This helps in identification of the mineralized envelopes".

There are currently six identified zones on the property: the Porvenir, Porvenir Dos, Porvenir Cuatro, Santa Cruz, Alex Breccia and San Pedro.

17.4 2-D - 3-D MODELING (PORVENIR MINE)

17.4.1 Top-Cutting High Assays (Capping)

Capping of data are necessary in the presence of extreme outlier data or when sampling issues or biases exist. There are several methods used in the industry for the capping of high grade data. A common approach is to cap the data at a specified percentile determined from examination of the cumulative probability plots. It should be noted that due to the somewhat arbitrary nature of selecting cut-off thresholds, the use of capping can a significant impact on resource estimation. Capping is common and widely used in the industry.

Capping was done on the channel silver and gold accumulation based on the 95th percentile of the cumulative probability plot before compositing was performed. Accumulation (grade times thickness) was chosen as the capping variable for chip sample data. Capping accumulation is sensitive to sample length and is a robust capping method used to limit the spread of metal throughout the model. The accumulation capping method was chosen for chip data for several reasons, (1) chip data are of relatively poor quality (high sampling bias), (2) chip data are usually of greater sample lengths and therefore have a much higher metal content, and (3) the actual true widths are not correct since the orientation of each chip sample is approximated.

No capping of width was done on the channel data. Capping of drill hole assays was done using silver and gold grade and based on the 97.5th percentile of the cumulative probability plot before compositing.

For the December 31, 2009, resource estimate, the capping threshold selected for the Porvenir North drill hole assays was 560 g/t silver and 1.10 g/t gold, respectively, and 843 m.g/t silver and 1.30 m.g/t gold, respectively, for the channel assay data (Table 17.2).

Table 17.2
Capping Thresholds Used for Gold and Silver at the Porvenir Mine

Capping Threshold Porvenir North		
	Silver	**Gold**
Drill Holes (Assays at 97.5 percentile)	560 g/t	1.10 g/t
Channels (Accumulation at 95 percentile)	843 m.g/t	1.30 m.g/t

The capping threshold selected for the Porvenir Dos drill hole assays was 431 g/t silver and 0.94 g/t gold, respectively, and 1,004 m.g/t silver and 2.19 m.g/t gold, respectively for the channel assay data (Table 17.3).

Table 17.3
Capping Thresholds Used for Gold and Silver at the Porvenir Dos Mine

Capping Threshold Porvenir Dos		
	Silver	Gold
Drill Holes (Assays at 95 percentile)	431 g/t	0.94 g/t
Channels (Accumulation at 95 percentile)	1,004 m.g/t	2.19 m.g/t

17.4.2 Sample Composites

For the 2009 resource estimation, assays were composited into true width intervals. There are in excess of 7,000 channel samples in the database for the Porvenir mine, too many to be composited by hand. The Vulcan mining software in use at the Porvenir mine lacks a robust compositing routine that will composite to the desired specifications. Thus, compositing was done 'ad hoc' in a multi-step process to produce composites that meet the criteria specified by the engineering and geology departments. Composites were calculated over the geological vein width. The true width was calculated for individual assays where the orientation of each assay considered was one of three possibilities, 1) vertical, 2) horizontal or 3) perpendicular. The azimuth considered for each assay within a channel sample was the same. The main objective of the compositing process was to determine the composite width followed by the composite grade. The compositing process was designed to take into consideration any internal low-grade or waste zones. Final composite widths were calculated using uncapped assays based on the geological vein width as interpreted by the geology department.

The compositing was completed in 2 passes:

1. Calculate the full vein width composite (zero cut-off).

2. Modification for multiple vein composites in a single channel if needed.

Some channels may contain two or more composites and include 1) a primary zone composite, and 2) one or more secondary zone composites. The composites are separated by internal zones of low grade and/or waste and are included in the single composite if the internal dilution is less than 2 m true width and is carried by the secondary composites.

The drill hole data were composited on a hole-by-hole basis over the vein width, using an Excel spreadsheet. Many of the wider drill hole intercepts (8-10 m) used in the 2009 resource estimation have been reduced in width due to reinterpretation of the geology in the deep Porvenir. The splay structure located in the deep Porvenir will be the main source of economic mineralization in the near future. Through geologic mapping and development on the 3123, 3124 and 3415 levels, the interpretation of the geology including the dip of the structure has changed. The structure in this area is steeper than in other parts of the mine. Recalculation of the true width based on this interpretation leads to a reduction in the estimated true width of drill hole intercepts in the area.

Composites were 'desurveyed' into x, y and z coordinates of the midpoint of the composite. The composites were compiled in Excel and exported to GSLIB for statistical analysis, variography and modeling. A robust compositing routine is available to calculate the optimum channel composite and will be implemented for future estimates.

17.4.3 Statistics

The data used for the reserves and resources for the Porvenir North mine are comprised of both underground channel data and diamond drill hole data. The data consist of 7,446 composited channel samples and 167 composited drill hole intervals spanning the main Porvenir structure and adjoining deep Porvenir splay structure. The univariate statistics for the channel data and the drill hole composites are shown in Tables 17.4 through 17.9. The tables are for composite data only. Additional tables for assay data can be found in Appendix B. Histograms and probability plots for the thickness and accumulation are also contained in Appendix B with volume variance and variograms in Appendix C. All spatial analyses were completed on 2-D data. Transforming the data to 2-D generally improves the variography by removing the third dimension. This is particularly true when dealing with narrow vein type deposits.

Table 17.4
Zone 1 Univariate Statistics for Uncapped Channel Composite Data

Porvenir North Zone 1 Chip Composite Data					
Statistic	**TW**	**Gold g/t**	**Silver g/t**	**Gold.t**	**Silver.t**
Number Data	4,338	4,338	4,338	4,338	4,338
Mean	2.09	0.63	412.09	1.29	854.68
Median	2.05	0.38	280.865	0.79125	576.49215
Standard Deviation	0.77	1.07	479.38	2.20	988.26
Sample Variance	0.60	1.14	229806.23	4.85	976,664.38
C.V.	0.37	1.69	1.16	1.70	1.16
IQR	1.60 - 2.53	0.21 - 0.73	148.5 - 506.4	0.40 - 1.55	274.3 – 1,079.4
Minimum	0.15	0	0	0	0
Maximum	8.11	37.65	9,311.00	73.794	17,732.16
Range	7.96	37.65	9,311.00	73.794	17,732.16

TW = true width, Au.t = Au g/t.true thickness, Ag.t = Ag g/t.true thickness.

Table 17.5
Zone 1 Univariate Statistics for Uncapped Drill Hole Composite Data

Porvenir North Zone 1 Drill Hole Composite Data					
Statistic	**TW**	**Gold g/t**	**Silver g/t**	**Gold.t**	**Silver.t**
Number Data	140	140	140	140	140
Mean	2.94	0.41	209.19	1.25	652.51
Median	2.48	0.295	164.33	0.7636	399.0123
Standard Deviation	2.25	0.46	184.69	1.52	738.97
Sample Variance	5.07	0.21	34110.74	2.31	546,079.70
C.V.	0.76	1.11	0.88	1.22	1.13
IQR	1.40 - 3.77	0.12 - 0.47	63.3 - 302.4	0.22 - 1.74	116.8 - 882.5
Minimum	0.1	0.01	1	0.001	0.5
Maximum	11.3	2.86	1,050.10	9.2364	4,008.49
Range	11.2	2.85	1,049.10	9.2354	4,007.99

TW = true width, Au.t = Au g/t.true thickness, Ag.t = Ag g/t.true thickness.

For Zone 1, uncapped channel sample data have a maximum true width of 8.11 m and the average is 2.09 m. Silver values range from 0 g/t to a maximum of 9,311 g/t. The mean silver grade is 412 g/t and the interquartile range (IQR) indicates that the vast majority of composite values are <500 g/t. Gold data have a range of 0 to 37.6 g/t with the majority of composites having gold values <0.73 g/t (Table 17.4).

For Zone 2, uncapped channel sample data have a maximum true width of 8.12 m and the average is 3.28 m. Silver values range from 0 g/t to a maximum of 5,701 g/t. The mean silver grade is 347 g/t and the interquartile range (IQR) indicates that the vast majority of composite values are <400 g/t. Gold data have a range of 0 to 6.7 g/t with the majority of composites having gold values <0.79 g/t (Table 17.6).

Zone 1 uncapped drill hole data have a maximum true width ofs 11.3 m and the average is 2.94 m. Silver values range from 1 g/t to a maximum of 1,050 g/t. The mean silver grade is 209 g/t and the interquartile range (IQR) indicates that the vast majority of composite values are <302 g/t. Gold data haves a range of 0.01 to 2.86 g/t with the majority of composites having gold values <0.47 g/t (Table 17.5).

Zone 2 uncapped drill hole data have a maximum true width of 7.62 m and the average is 3.02 m. Silver values range from 5.2 g/t to a maximum of 952 g/t. The mean silver grade is 295 g/t and the interquartile range (IQR) indicates that the vast majority of composite values are <413 g/t. Gold data have a range of 0.01 to 1.73 g/t with the majority of composites having gold values <0.83 g/t (Table 17.7).

Table 17.6
Zone 2 Univariate Statistics for Uncapped Channel Composite Data

Porvenir North Zone 2 Chip Composite Data					
Statistic	**TW**	**Gold g/t**	**Silver g/t**	**Gold.t**	**Silver.t**
Number Data	810	810	810	810	810
Mean	3.28	0.64	347.24	2.15	1,131.53
Median	3.415	0.45	266.16	1.4425	873.28775
Standard Deviation	1.36	0.69	366.16	2.58	1155.77
Sample Variance	1.85	0.48	134069.67	6.63	1,335,797.03
C.V.	0.41	1.09	1.05	1.20	1.02
IQR	2.42 - 4.12	0.24 - 0.79	174.4 - 400.7	0.62 - 2.73	495.0 – 1,460.1
Minimum	0.25	0	0	0	0
Maximum	8.12	6.67	5,701.26	24.3321	15,099.55
Range	7.87	6.67	5,701.26	24.3321	15,099.55

TW = true width, Au.t = Au g/t.true thickness, Ag.t = Ag g/t.true thickness.

Table 17.7
Zone 2 Univariate Statistics for Uncapped Drill Hole Composite Data

Porvenir North Zone 2 Drill Hole Composite Data					
Statistic	**TW**	**Gold g/t**	**Silver g/t**	**Gold.t**	**Silver.t**
Number Data	27	27	27	27	27
Mean	3.02	0.57	294.90	2.10	1102.39
Median	3.48	0.43	201.8	1.036	718.23
Standard Deviation	2.07	0.56	249.19	2.55	1,268.44
Sample Variance	4.28	0.32	62,094.26	6.52	1,608,935.01
C.V.	0.68	0.98	0.85	1.22	1.15
IQR	1.09 - 4.53	0.09 - 0.83	113.9 - 413.4	0.13 - 2.88	137.5 – 1,323.3
Minimum	0.1	0.01	5.2	0.001	0.52
Maximum	7.72	1.73	952.14	8.349	4,740.70
Range	7.62	1.72	946.94	8.348	4,740.18

TW = true width, Au.t = Au g/t.true thickness, Ag.t = Ag g/t.true thickness.

Table 17.8
Porvenir Dos Univariate Statistics for Uncapped Channel Composite Data

Porvenir Dos Chip Composite Data					
Statistic	**TW**	**Gold g/t**	**Silver g/t**	**Gold.t**	**Silver.t**
Number Data	166	166	166	166	166
Mean	2.39	0.83	415.09	1.92	962.17
Median	2.4	0.68	337.105	1.62435	802.0095
Standard Deviation	1.11	0.71	346.35	1.66	799.70
Sample Variance	1.24	0.50	119,960.38	2.75	639,513.18
C.V.	0.47	0.85	0.83	0.86	0.83
IQR	1.47 - 3.19	0.33 - 1.15	170.8 - 576.6	0.62 - 2.65	376.8 – 1,401.9
Minimum	0.02	0	3.89	0	1.104
Maximum	6.64	3.41	2,731.16	8.4288	5,899.77
Range	6.62	3.41	2,727.27	8.4288	5,898.66

TW = true width, Au.t = Au g/t.true thickness, Ag.t = Ag g/t.true thickness.

Table 17.9
Porvenir Dos Univariate Statistics for Un-Capped Drill Hole Composite Data

Porvenir Dos Drill Hole Composite Data					
Statistic	**TW**	**Gold g/t**	**Silver g/t**	**Gold.t**	**Silver.t**
Number Data	23	23	23	23	23
Mean	2.65	0.43	165.99	1.35	580.19
Median	3.41	0.43	102.98	0.962	156.5296
Standard Deviation	1.46	0.33	174.83	1.44	717.91
Sample Variance	2.14	0.11	305,63.96	2.07	515,390.78
C.V.	0.55	0.77	1.05	1.07	1.24
IQR	1.35 - 3.85	0.13 - 0.65	29.1 - 254.2	0.15 - 2.23	17.8 - 828.7
Minimum	0.23	0.02	3.89	0.0153	3.22
Maximum	4.29	1.15	516.32	4.554	2,028.21
Range	4.06	1.13	512.43	4.5387	2,024.99

TW = true width, Au.t = Au g/t.true thickness, Ag.t = Ag g/t.true thickness.

Porvenir Dos uncapped channel data have a maximum true width of 6.64 m and the average is 2.39 m. Silver values range from 3.89 g/t to a maximum of 2,731 g/t. The mean silver grade is 415 g/t and the interquartile range (IQR) indicates that the vast majority of composite values are <577 g/t. Gold data hve a range of 0 to 3.41 g/t with the majority of composites having gold values <1.15 g/t (Table 17.8).

Porvenir Dos uncapped drill hole data hve a maximum true width of 4.29 m and the average is 2.65 m. Silver values range from 3.89 g/t to a maximum of 516 g/t. The mean silver grade is 166 g/t and the interquartile range (IQR) indicates that the vast majority of composite values are <254 g/t. Gold data have a range of 0.02 to 1.15 g/t with the majority of composites having gold values <0.65 g/t (Table 17.9).

The variogram volume plots in Appendix C show the spatial correlation of data in the plane of the Porvenir structure. The general trend of correlation in the plane of the vein occurs at a rotated azimuth of approximately 106° for both silver and gold. These directions correspond to the northwest-southeast direction in UTM coordinates or the strike direction of the structure.

Multi-directional variograms for grade and thickness are also shown in Appendix C. Fitted variogram models for silver and gold accumulation as well as thickness are shown in Figures C-8 through C-31 of Appendix C. The variograms can be adequately modeled in most cases by three structures, two nested spherical schemes and one exponential scheme, and a nugget variance. The channel samples naturally reveal a shorter range component of the variogram than the drill hole composites and have also been used in determining the variography employed for the kriging calculations. For the closely spaced channel data, the general short range anisotropy identified from the variography is on the order of 3-4:1 with the long axis in the strike direction and perpendicular. This identified anisotropy is likely a function of the channel configuration since most channels trend in the strike direction and the true anisotropy is most likely less than a 2:1 ratio. The drill hole variography also exhibits anisotropy on the order of 4-5:1 and is also likely related to the long strike direction versus the shorter vertical component. The final search ellipses employed in kriging to select data used an anisotropy ratio of about 1.2:1 for the channel data and 2:1 for the drilling data and should not be confused with the anisotropic weighting applied through the variogram model specified at the time of kriging.

17.4.4 Mineral Resource and Reserve Modeling

For the December 31, 2009 resource and reserve estimate, Endeavour Silver generated its own block model in a methodology that used GSLIB software to model the structures in 2-D followed by post-processing using Vulcan computer software to generate a 3-D block model. The final Vulcan 3-D models were used to generate the resource and reserve figures.

Coordinate Transformation

To facilitate modeling in 2-D it was necessary to transform the 3-D coordinates. The transformation involved a double rotation: first in the horizontal plane and, second, in the vertical plane. The rotation point of the horizontal rotation is the origin of the local grid located at local coordinates 5000N, 5000E. The rotation point of the vertical rotation was arbitrarily picked from a vertical cross-section in the plane of the vein so that the rotation would result in the points falling close to the rotation point elevation of 1,950 m. The horizontal rotation is a 45° clockwise rotation about the z axis, followed by a 55° rotation about the y axis. The rotation points and rotation angles are shown in Table 17.10 and graphically illustrated in Figures 17.1, 17.2 and 17.3. All data were transformed to horizontal 2-D coordinates before any statistics and modeling was completed.

Table 17.10
Coordinate Transformation

Coordinate Transformations		
Grid Rotation (Plan view)		
	North	**East**
Local Grid Origin	5,000	5,000
Local Grid Origin on UTM Grid	400,802.958	2,866,500.000
Local Grid Rotation	45°	Clockwise
Grid Rotation (Inclined to Horizontal, Cross-sectional view)		
	East	**Elev**
Local Grid Rotation Point	5,000	-3,303.76
Local Grid Rotation	55°	Clockwise

17.4.5 Block Model Description

There were two block models used in the 2-D modeling process. A 5 m by 5 m model was used for estimating resources in the vicinity of the mine workings and a 25 m by 25 m model for areas surrounding the 5 m model. The 5 m model was interpolated using both channel and drill hole data. The 25 m model was interpolated using drill hole data only which have an average spacing of about 50 m. A block size of 25 m is the minimum reasonable block size and is equal to half the drill hole intercept spacing.

As a final step, the 25 m model was rescaled to 5 m and combined with the 5 m model to create a 5 m model encompassing the whole area of interest. The block sizes chosen were considered appropriate given the relative spacing of the channel and drill hole data.

Figure 17.1
Rotation in Horizontal Plane, 45° Clockwise

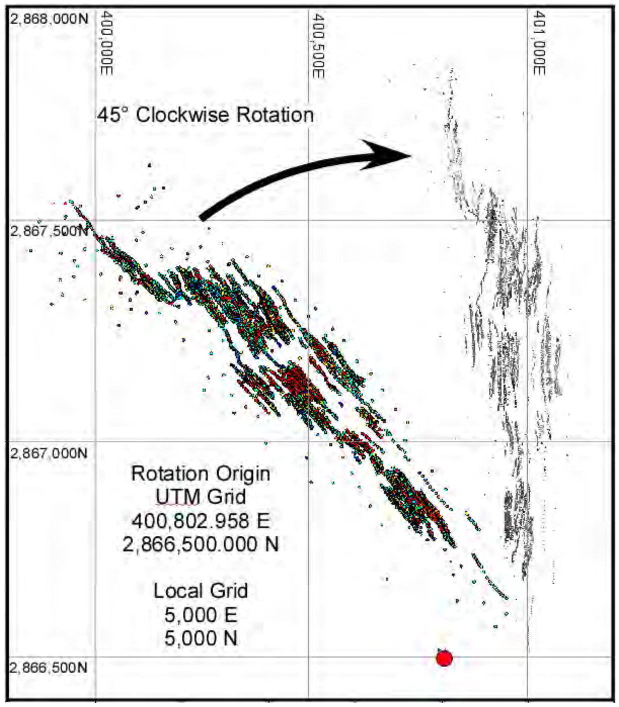


Figure 17.2
Rotation in Vertical Plane, 55° Clockwise

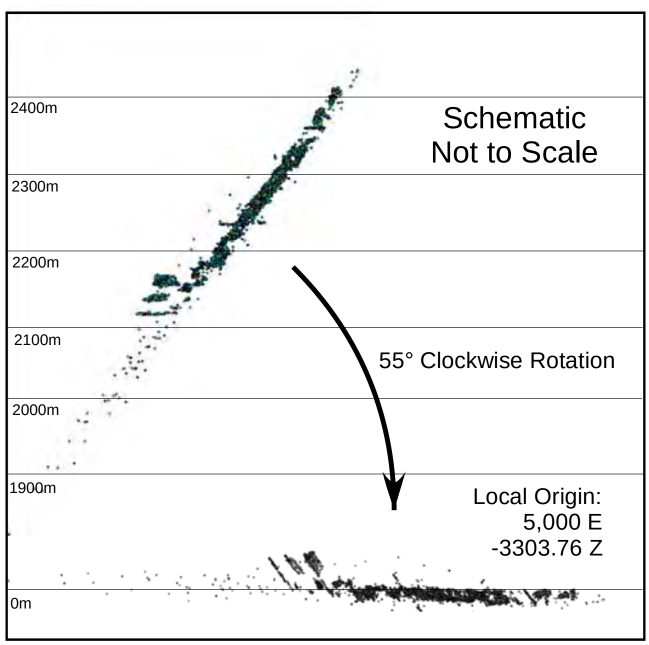


Figure 17.3
Rotation in Vertical Plane, with Translation to Zero Elevation

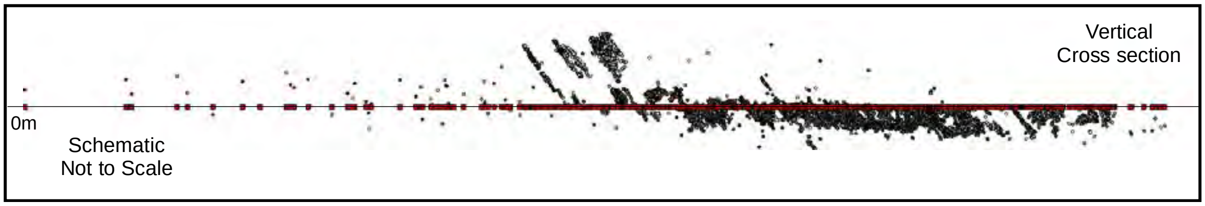


Table 17.11 provides the specifications of the 2-D block model.

Table 17.11
2-D Block Model Specification

5m x 5m Model Centred on Mine Workings				
	N	**Size**	**Min**	**Max**
X	100	5	5,125	5,625
Y	230	5	5,100	6,250
25m x 25m Model				
	N	**Size**	**Min**	**Max**
X	36	25	4,775	5,675
Y	68	25	4,900	6,600
Combined 5m x5m and 25m x 25m Model				
	N	**Size**	**Min**	**Max**
X	180	25	4,775	5,675
Y	340	25	4,900	6,600

The updated 3-D resource block model for the Porvenir mineralized zone was generated using a parent block size of 20 m (northing) by 20 m (easting) by the width of the vein or mineralized boundary (vertical or "z"). This block size was deemed appropriate relative to the geometry of the zones, the distance between channel samples and mine planning. Table 17.12 provides the specifications of this 3-D block model.

Table 17.12
3-D Block Model Specification

Description	X	Y	Z
Origin	399,545.24	2,867,592.37	1,577.50
Number	360	225	Variable
Size (m)	5	5	0.25-1.50
Minimum	5	5	0.25
Bearing	139	-	-
Rotation	0	-55	-
Rotation Axis	Y	X	-

The Vulcan 3-D blocks were rotated to fit the general dip (-55°) and strike (139°) of the Santa Cruz structure in the Porvenir mineralized zone. In the rotated model, X and Y directions are in the plane of the vein whilst Z is perpendicular to vein direction. In the final Porvenir 3-D block model all blocks have a uniform 5 m x 5 m size in the X and Y dimension whilst the Z dimension is variable with a minimum dimension of 0.25 m and a maximum dimension of 1.50 m; the Z dimension can vary in increments of 0.25 m. The Vulcan variable block dimension option means that for an individual vein model the Z direction of the model contains 3 blocks – footwall, vein and hanging wall block, each of variable thickness. The thickness of the 3-D blocks is determined from vein wireframes used during the model construction process.

At the Porvenir North mine, two vein structures were modeled for the year-end 2009 reserves and resources. The main Santa Cruz structure (Zone 1), which includes virtually all the development above the 3123 level, and the splay structure called Zone 2 in the reserves which includes most of the development from the 3123 and below. Each vein was modeled individually in 2-D before being imported into its own individual 3-D block model. Both structures include three block models; 1) vein only undiluted model, 2) 1.8 m minimum width model, 3) fully diluted model. The models were not created using a grade or cut-off constraint.

17.4.6 Interpolation Methods

The interpolation method used was ordinary kriging on a 2-D grid. The program used was `kt3d.exe` which is part of the GSLIB suite of programs. Drill hole and channel assay data were composited by thickness weighted averaging to true width intercepts with a minimum true width of l.80 m. Assay values were capped using the method described previously. Ordinary kriging, using all accepted data without any further modification, was performed on silver and gold accumulation in three separate passes:

1. Channel and drill hole data using a search ellipse of 21 m in the principal direction and 17 m in the perpendicular direction.

2. Channel and drill hole data using a search ellipse of 42 m in the principal direction and 34 m in the perpendicular direction.

3. Channel and drill hole data using a search ellipse of 180 m in the principal direction and 90 m in the perpendicular direction.

The search ellipse directions used in the ordinary kriging runs are summarized in Table 17.13.

Table 17.13
Search Ellipse Directions

Search Ellipse Directions	Azimuth
Principal Direction (Silver)	165°
Perpendicular Direction (Silver)	255°
Principal Direction (Gold)	0°
Perpendicular Direction (Gold)	90°

Kriging was done on 5 m by 5 m blocks in the plane of the structure estimating thickness and accumulation for passes 1 and 2 in the upper, developed part of the mine, followed by kriging on 25 m by 25 m blocks in the plane of the structure estimating thickness and accumulation for pass 3 in the lower mine below developed areas where data are sparse. The 5 m by 5 m block size is not justified for the lower parts of the deposit on the basis of the data spacing. The block model in the lower region of the mine was rescaled to 5 m by 5 m and combined with the upper model to make a single deposit-wide model. The results were imported from the GSLIB *kt3d* output files into a custom Excel spreadsheet (*Merge_Models _***.xlsx*) that merges the models and creates a final output model. Two additional spreadsheets (*TW_Model_***.xlsx* and *Model_Dilution_***.xlsx*) were used for model manipulation. The excel spreadsheet *TW_Model_***.xlsx* calculates the hanging wall, mid-point and footwall coordinates for each cell in the model. Coordinates are calculated in both UTM and local grid space. The last spreadsheet, *Model_Dilution_***.xlsx*, calculates the appropriate footwall and hanging wall surfaces of the diluted models. The surfaces can be used to construct dilution solids in any general mining software package. Un-estimated blocks due to insufficient data are identified by "-999".

Two splay structures were identified and treated separately from the main Porvenir structure. The structures have limited information. Splay 2 sits on the footwall side of the main structure and consists of 11 drill hole intercepts. Splay 3 contains both channel data and drill hole data. The data set used for estimation contains 206 channels and 7 drill hole intercepts. The channel data are highly clustered in relation to the area of interest which would make meaningful variography difficult. Despite the fact there are over 200 channel samples in the area of Splay 3, there are insufficient spatial data to give a good measure of spatial variability. Although one could justify using the variography from the main structure, it was decided to use the IDW interpolator for these areas given their relatively small size.

In a Similar manner to the main structure, the splay data were transformed to local 2-D space where the interpolation was done. The IDW interpolator used an exponent of 3 with a minimum of 3 samples and maximum of 10 need to estimate a cell. The models used a cell size of 5 m by 5 m. The splays were estimated in one pass using the same search ellipse as performed on the Santa Cruz vein drill hole data (180 m @ 165° / 90 m @ 255°).

For import into the Vulcan 3-D model the local 3-D block centroid coordinates (XYZ local) are transformed mathematically into 3-D UTM coordinates. Prior to import into Vulcan, data manipulation was performed in Excel to generate such model variables as dilution factors, diluted tonnes and diluted grades, and tonnage factors to be used in place of density to estimate reserve tonnes from the undiluted vein model.

Table 17.14 summarizes the kriging parameters used for modeling.

The block model variables were imported into Vulcan as a point database, which can be used for rapid data review. All the point data are located at the centre of the modeled vein for any given location.

As both the 2-D and 3-D block models are based on 5 m by 5 m blocks in the X and Y dimensions, each data point falls within only one 5 x 5 m block. Block values are assigned from the point data using a nearest neighbour technique based on a 5 x 5 m rectangular search (not elliptical). The search dimension in the block model Z axis was set at 10 m to ensure that any sub-blocks within the vein limits were also filled (they would have the same values as the parent 5 m x 5 m blocks and the only difference would thus be the block volume). Only blocks with the 3-D centroids lying within the vein solid triangulation were modeled. Hence, a number of different block models were built to model different veins and different models of the same vein structure.

Bulk density was assigned to each individual block using a factor of 2.55 t/m^3. Late in 2008, 36 samples were collected from stopes to be used for density analysis. The results were received in December, 2008, and a majority of these, particularly from vein samples, gave very low values compared to previous in-house bulk density tests. External bulk density results from the same laboratory (SGS Durango) for other Guanaceví deposits (Alex Breccia, Santa Cruz and Porvenir Dos) gave similar results to previous in-house estimations. The laboratory indicated that the samples had significant open space which raised concerns that the samples may have been too fractured for meaningful analysis. Therefore, it was decided to use the previous density estimate until a new set of samples could be collected, analyzed and a review of the results performed.

Table 17.14
Summary of Kriging Parameters Used for Modeling

Channel Data			
Item	**True Width**	**Silver Accumulation**	**Gold Accumulation**
Minimum # of Comps	2	2	2
Maximum # of Comps	12	12	12
Major Axis Search (Pass 1 /2)	21 / 42	21 / 42	21 / 42
Minor Axis Search (Pass 1 /2)	17 / 34	17 / 34	17 / 34
Axis Ratio	1.2	1.2	1.2
Azimuth Principal Ellipse Direction	165°	165°	0°
Number of Structures	2	3	3
Nugget Variance	0.025	0.452	0.500
Structure 1 Type	Spherical	Exponential	Exponential
Structure 1 Variance Component	0.643	0.283	0.192
Structure 1 a_max, a_min (metres)	2.0 , 3.0	8.9 , 1.8	18.0 , 2.0
Structure 2 Type	Exponential	Spherical	Spherical
Structure 2 Variance Component	0.107	0.101	0.690
Structure 2 a_max, a_min (metres)	30.0 , 16.0	30.8 , 68.2	25.4 , 75.2
Structure 3 Type		Spherical	Spherical
Structure 3 Variance Component		0.165	0.239
Structure 3 a_max, a_min (metres)		86.4, 68.2	98.5, 75.2
Drill Hole Data			
Item	**True Width**	**Silver Accumulation**	**Gold Accumulation**
Minimum # of Comps	2	2	2
Maximum # of Comps	12	12	12
Major Axis Search	180	180	180
Minor Axis Search	90	90	90
Axis Ratio	2.0	2.0	2.0
Azimuth Principal Ellipse Direction	165°	165°	0°
Number of Structures	2	3	2
Nugget Variance	0.250	0.300	0.150
Structure 1 Variance Component	Spherical	Spherical	Spherical
Structure 1 a_max, a_min	0.483	0.317	0.287
Structure 2 Variance Component	78.5, 58.7	99.1, 14.8	89.5 , 81.3
Structure 2 a_max, a_min	Exponential	Spherical	Spherical
Structure 3 Variance Component	0.267	0.101	0.400
Structure 3 a_max, a_min	296.0 , 105.2	197.5 , 164.1	93.6 , 82.8
Structure 3 Type			Spherical
Structure 3 Variance Component			0.163
Structure 3 a_max, a_min (metres)			360.4, 97.3

17.4.7 Mineral Resource Classification

The drill spacing, in general, remains 30 m in both strike and dip of the Guanaceví deposits. Mineral resources were classified on the basis of the location of blocks relative to the data used to interpolate the block grade. The protocols for assignment of mineral resources for the Guanaceví deposits adhere to the Australasian Code for Reporting of Mineral Resources and Ore Reserves (JORC Code) and to the CIM “Standards on Mineral Resources and Reserves”. The Porvenir mine Mineral Resources were categorized as follows:

- No Measured Mineral Resources were defined, as the tonnages involved were minor.

- Indicated Mineral Resource: Blocks which lie within an envelope with a 35 m radius from the last drill hole or channel sample in the periphery of the mineralized zone; the envelope maintains geological continuity based on geological interpretation.

- Inferred Mineral Resource: Blocks which lie within an envelope outside the 35 m periphery but within 75 m from the last drill hole or channel sample in any direction within the defined mineralization.

The resource (and drill hole based reserve) limits were all defined using the 25 m x 25 m 2-D block model with the basic criterion for inclusion being that the block centre (especially at the periphery of the zones) was within 35 m or 75 m of the nearest sample point in the plane (55° plane) of the vein.

The influence of this classification system for the Porvenir Mineral Resources is shown in Figures 17.4, 17.5 and 17.6.

The final Mineral Resource model was cut by the surface topography and depleted to account for previously mined volumes, and pillar zones around these mined areas. For much of the Porvenir mine, the upper limit to resources and reserves was defined by the contact between the El Porvenir concession (Minera Tayahua S.A.) and Endeavour Silver's Santa Cruz Dos concession (Porvenir North): Endeavour Silver had a contract to mine the El Porvenir material which terminated in August, 2008. Resources were also depleted by the material which is considered by Endeavour Silver to be reserves as of December 31, 2009. The resulting Mineral Resource statement is effective December 31, 2009. The Mineral Resources are exclusive of the Mineral Reserves, discussed subsequently.

Figure 17.4
Classification of Mineral Resources and Reserves for the Guanaceví Mines Project - Porvenir North Mine (Zone 1)

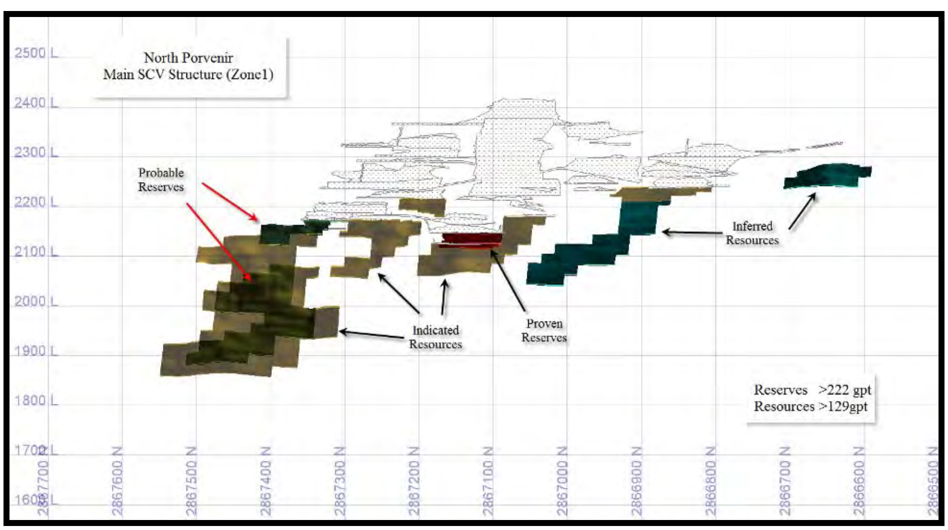


Figure 17.5
Classification of Mineral Resources and Reserves for the Guanaceví Mines Project - Porvenir North Mine (Zone 2)

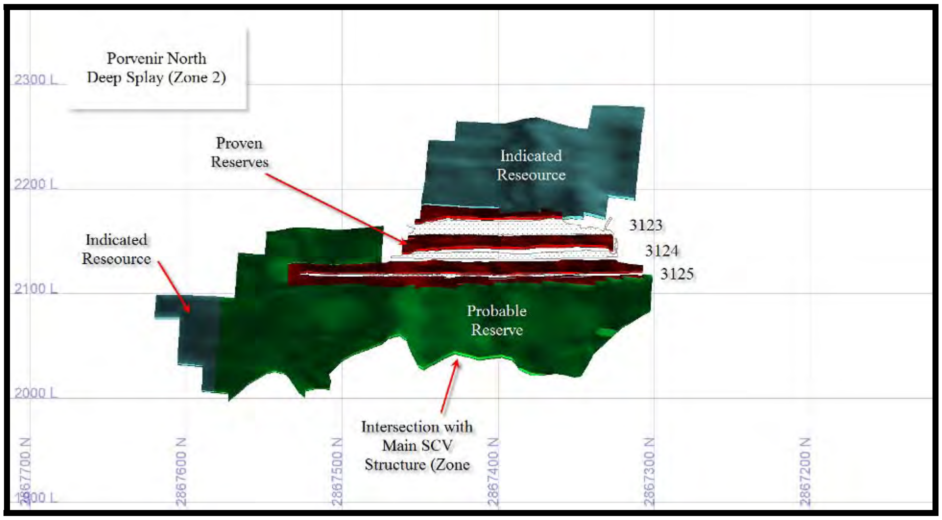
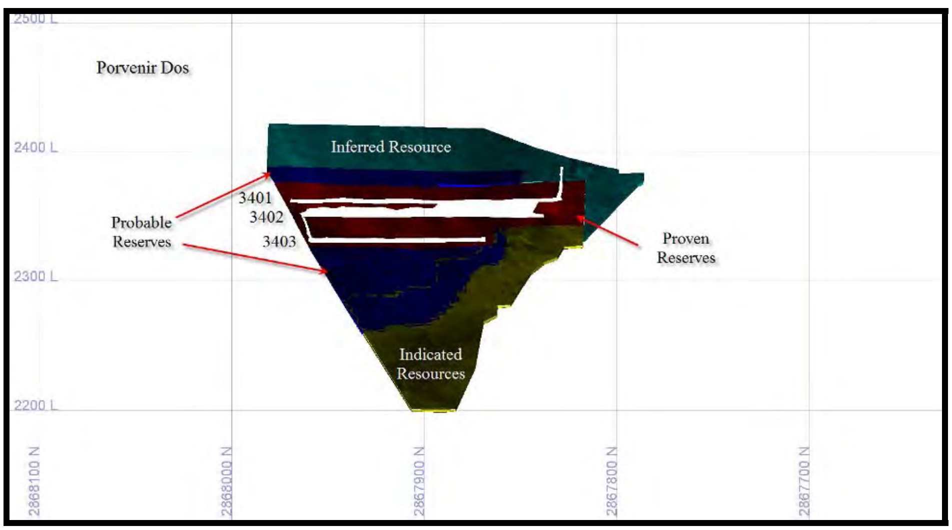


Figure 17.6
Classification of Mineral Resources and Reserves for the Guanaceví Mines Project - Porvenir Dos Mine



17.4.8 Porvenir Deposit Resource Cut-off Grade

For the Porvenir mine resource estimates as of December 31, 2009 the geological cut-off grade used was 129 g/t silver. The resource cut-off used at Porvenir was based on the reserve calculation. The resource cut-off includes processing and indirect costs but excludes the mining cost per tonne of ore. Future plans to lower mine operating costs, raise mill throughput and improve mill recoveries at Guanaceví also justify using the 129 g/t silver geological cut-off for resources, which may reasonably be converted to reserves in the short to medium term.

17.5 3-D WIREFRAME MODELING (PORVENIR CUATRO AND SANTA CRUZ)

For the December 31, 2009 resource estimates of the Porvenir Cuatro and Santa Cruz deposits, wireframe modeling was carried out by geologists and technicians working for Endeavour Silver's exploration department. Wireframe modeling was conducted in a similar manner as was described in the April, 2007, Micon Technical Report. In 2009, however, drilling information for the Noche Buena and Buena Fé deposits, was considered insufficient for adequate 3-D wireframe modeling. Therefore, for the Noche Buena and Buena Fé resource estimates, traditional polygon methods were employed.

Vein structures modeled in 3-D for each deposit include:

Porvenir Cuatro	SCV – Santa Cruz vein
Santa Cruz	SCV – Santa Cruz vein in cross-cuts 1 and 3 (XC1-3) SCV2 – Santa Cruz vein in cross-cut 2 (XC-2)

In 2009, 3-D wireframe modeling was changed to honour the geological boundaries (ie. vein contacts) in a manner to best represent the mining method currently being employed at the Guanaceví Mines project. , Grade control geologists are currently marking for exploitation, the entire portion of the vein at a minimum mining width. To honour this practice, wireframes were also constructed at a minimum mining width.

For wireframe construction, the entire vein, regardless of grade, having a minimum true vein width of 1.5 m was selected. This was done only for drill core. When only an uneconomic composite is present, a mineralized boundary is still selected to ensure that the wireframe model maintains a 1.5 m minimum true vein width throughout its entirety.

With this methodology, the wireframe does not always snap to an exact sample intersection. As previously reported by Micon in the April, 2007, and March, 2009, Technical Reports, this should not have any adverse effect on the resource estimation, especially since best practices were used during the wireframe modeling.

17.5.1 3-D Statistical Analysis

For the December 31, 2009 resource estimates, no 3-D statistical analyses were conducted for the mineralized zones in the Guanaceví Mines project.

17.5.2 Top-Cutting High Assays (Capping)

Endeavour Silver has developed basic statistical parameters for raw silver and gold assays. This showed that the data are positively skewed and that it was necessary to limit the influence of outliers by top-cutting high assays and making equal length composites within each zone. To determine appropriate capping for each zone, lognormal probability plots were examined and the capping used for each zone is shown in Table 17.15.

Table 17.15
Grade Capping for Alex Breccia, Santa Cruz, Porvenir Dos and Noche Buena

Zone	Ag (g/t)	Au (g/t)	Pb (%)	Zn (%)
Santa Cruz	1,025	2.00	5.79	7.10
Porvenir Cuatro	761	2.60	n.a.	n.a.

17.5.3 Sample Composites

For the 2009 resource estimate, Endeavour Silver decided to discontinue using 1 m as the composite length for resources for the Santa Cruz and Porvenir Cuatro deposits. Instead for the December 31, 2009 resource estimate, no compositing was done and only sample length was used for weighting of assays.

17.5.4 Spatial Analysis

As first reported in Micon's April, 2007, and later in the March, 2009, Technical Reports, only the Porvenir mine has sufficient samples upon which to construct a variogram for the area of mineralization. All other zones lacked sufficient data upon which to conduct meaningful variography.

Endeavour Silver carried out several studies of the variography for both silver and gold in the general direction of the strike and dip of Santa Cruz vein in the Porvenir mine. The variography clearly defined both small scale and large scale variability in the deposit.

For resource estimates, Endeavour Silver decided to use the search directions for each deposit as shown in the Table 17.16. These directions essentially represent the strike and dip of each mineralized zone, and have been deemed adequate for resource estimates.

Table 17.16
Search Ellipse Directions

Area	Bearing	Plunge	Dip
Porvenir Cuatro	135	0	-55
Santa Cruz Xc1-3	145	0	-42
Santa Cruz Xc-2	135	0	-58

17.5.5 Mineral Resource Modeling

For the December 31, 2009, resource estimate, Endeavour Silver generated its own 3-D block model using Vulcan computer software for Santa Cruz and Porvenir Cuatro.

17.5.6 Block Model Description

The resource block models for Santa Cruz and Porvenir Cuatro were generated using a block size of 5 m (northing) by 5 m (easting) by the width of the vein (z). The block size chosen was deemed appropriate relative to the geometry of the zones, the distance between channel samples and mine planning.

The blocks were rotated to fit the general dip and strike of the structures modeled in each area, as shown in Table 17.17.
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Table 17.17
Summary of Blocks and Search Ellipses

Area	Model	Bearing	Dip
Porvenir Cuatro	PD-1	135	-55
Santa Cruz	XC1-3	145	-42
	XC-2	135	-58

17.5.7 Grade Interpolation

The 3-D wireframes for the Santa Cruz and Porvenir Cuatro mineralized zones (including any ancillary structures) were filled with blocks. Parent blocks were sub-blocked to fill the wireframe completely and to remove any volume discrepancy arising out of the difference between the wireframe volume and the block model volume.

Bulk density was assigned to these individual blocks before grade interpolation. Endeavour Silver uses specific gravity (SG) factors for calculating the tonnes for the resource blocks. Specific gravity (bulk density) determinations are reported in Section 12.2 above.

The method used by Endeavour Silver for silver and gold grade interpolation was inverse distance with a power of 3. The minimum number of samples used in the grade estimation of each block was 2 for Porvenir Cuatro and 1 for Santa Cruz and maximum 24 for both deposits.

To assign grades to the blocks, two different search ellipsoids were used. The first pass was used basically to assign grades to the Indicated resource blocks and the second pass for the Inferred resources in areas that were not interpolated during the first pass, as shown in the Table 17.18 and 17.19.

Table 17.18
Summary of Search Ellipses used in the Porvenir Cuatro Estimation

Pass	Major Axis	Semi-Major Axis	Minor Axis	Min. No. of Samples	Max. No. of Samples
1	40	40	15	2	24
2	100	100	30	2	24

Table 17.19
Summary of Search Ellipses used in the Santa Cruz Estimation

Pass	Major Axis	Semi-Major Axis	Minor Axis	Min. No. of Samples	Max. No. of Samples
1	30	30	20	1	24
2	150	150	50	1	24

17.5.8 Specific Gravity (SG)

The specific gravity used for each mineralized zone was as follows:

Porvenir Cuatro	2.55
Santa Cruz	2.70

17.5.9 Mineral Resource Classification

Mineral resources were classified on the basis of the location of blocks relative to the data used to interpolate the block grade. The protocol for assignment of mineral resources to the appropriate category is the same as in previous Technical Reports. The protocol continues to adhere to the CIM "Standards on Mineral Resources and Reserves". The mineral resources were categorized as follows:

- Indicated Mineral Resource: Blocks which lie within a 30 m radius from the last drill hole in the periphery of the mineralized zone.

- Inferred Mineral Resource: Blocks outside the 30 m periphery but within 100 m from the last drill hole in any direction within the defined mineralization.

The final mineral resource model was depleted to account for previously mined volumes, and was cut by the surface topography.

17.5.10 Cut-off Grades

The following cut-off grades were used for reporting indicated and inferred resources for the Santa Cruz and Porvenir Cuatro and Noche Buena mineralized zones:

Santa Cruz (All Zones): ≥ 129 g/t silver cut-off.

Plus:

Santa Cruz XC-2 deep zone: ≥ 50 but < 129 g/t silver and combined lead and zinc ≥ 3.50%.

Porvenir Cuatro: ≥ 190 g/t silver equivalent cut-off (a silver/gold ratio of 65:1 was used for the calculation of silver equivalencies.

Noche Buena: ≥ 100 g/t silver or ≥ 50 but < 100 g/t silver and combined lead and zinc ≥ 3.50%.

17.6 NOCHE BUENA – BUENA FÉ 2-D POLYGONAL RESOURCE ESTIMATES

The 2-D polygonal method is based on the use of a longitudinal section to estimate the mineral resources for the Noche Buena and Buena Fé deposits. Drill indicated mineral resource blocks are defined by drawing a polygon around each drill intercept on a longitudinal section. Before a polygon is drawn the intercept must be above the established cut-off grade and meet the 1.5 m minimum width criteria. A 25 m projection from the centroid of the drill intercept was then made for indicated resource blocks. When the continuity of mineralization is determined, an additional 25 m projection was made for inferred resources. Block volumes are estimated by drawing each block area on a longitudinal section and measuring this area using AutoCAD. The area of the block is then multiplied by the average horizontal width of the composited drill intercept to estimate the volume.

17.7 PROVEN AND PROBABLE MINERAL RESERVES

Proven and Probable Mineral Reserves for the Guanaceví Mines project were estimated by block model methods using Vulcan computer software, in conjunction with GSLIB open source software for 2-D block estimation steps and statistical and geostatistical analysis. The procedures used are those described in Sections 17.2 through 17.8

Endeavour Silver first estimated undiluted resources based on a 129 g/t silver cut-off grade for silver and a minimum undiluted true vein width of 1.8 m. The methodology for estimation of undiluted resources is discussed in the previous sections. Undiluted resource blocks were manipulated mathematically to produce diluted tonnes and grades for each estimated block; these diluted block estimates form the basis of the reserve classification and estimation. Ore loss and recovery were applied at the mine planning stage to the reported in-situ reserves.

Data used for the reserve estimation were as of October 31, 2009. For an effective date of December 31, 2009, polygon and triangulation limits for the Mineral Reserves excluded areas mined in November and December, 2009, as defined by the Porvenir mine survey pick up for December 31, 2009. Reserves reported here are in addition to the resources reported earlier in this section.

17.7.1 Reserve Cut-off Grade

A breakeven cut-off grade was used which considers metal prices, total mining, milling and administration costs, freight costs, mill recoveries and smelter charges. Cut-off grades do not include either exploration or capital costs.

For recoverable reserves, a cut-off grade of 222 g/t silver was used for the December 31, 2009 estimate. The cut-off grade used in the calculation is based on actual accumulated costs from January through September, 2009, and has been adjusted for an inflation rate of 5%. Cost data were derived from company consolidated cost reports issued by Dan Dickson (CFO) in October, 2009; the inflation rate was that used for 2010 budgetary planning in October, 2009. Total calculated costs were $81.22 per tonne of ore mined and processed at the Guanaceví operations.

Plant recovery for 2010 was fixed at 78% based on historical plant recoveries in 2009. A medium-to-long term silver price provided by Endeavour Silvers corporate office was set at US $14.74 per ounce.

17.7.2 Dilution

For each undiluted ore block, dilution was applied by adding additional width on the footwall and hanging wall sides of the undiluted structure. Dilution factors were based on field observations by Endeavour Silver staff. The parameters applied to the reserves reflect these observations and the expectations of improved mining performance as a result of plans to increase the emphasis on monitoring dilution.

Dilution is applied in a two step process. In the first step, undiluted vein-only thicknesses are diluted to a minimum width of 1.8 m. Cells with a thickness greater than 1.8 m are unmodified. The result is a model diluted to a minimum width of 1.8 m. Dilution was applied using 90 g/t silver and 0.1 g/t gold.

In the second step, a constant wall rock dilution factor of 5% of the width was added to the hangingwall side of the model diluted to minimum mining width in all zones.

On the footwall side of the structure, dilution was applied differently depending on cell thickness. For cells with a thickness of <4 m, dilution was applied using a factor of 25% of the width. Cells where the thickness was >4 m, dilution was added using a factor of 15% of the cell width.

The application of these dilution parameters results in a minimum in-situ mining width of 2.25 m for all blocks. This conforms to the minimum mining widths required for mine equipment.

Dilution was applied using a silver grade of 90 g/t and a gold grade of 0.1 g/t.

Dilution is added to the model on a cell-by-cell basis. Dilution is based on the preferred additive method where dilution is calculated as:

$$\text{Dilution } \% = \left(\frac{\text{Total Tonnes}}{\text{Resource Tonnes}} - 1 \right) \times 100$$

Dilution measurements taken during 2009 suggest that dilution ranges between 20% and 50% and averages 30%. Most of these measurements are from narrow zones where dilution is greater. Reserves are reported fully diluted using 25% dilution of 90 g/t silver and 0.1 g/t gold for cells with a true width less than 4 m and 15% at the same grades for cells with a true width greater than 4 m. The lower dilution rates reflect plans of Endeavour Silver to reduce dilution and increase mining efficiency in 2010.

The removal of pillars based on the mine plan and the addition of fill dilution has not been considered and will be added accordingly to the new mine plan.

17.7.3 Extraction

Extraction in cut and fill operations is typically high because of the minimum number and size of pillars required between stopes and the mining of crown pillars typical by open stoping methods. Vein thickness is probably the most overriding factor affecting extraction at Guanaceví. With a minimum true mining width of 2.25 m used for modeling the reserves, any material left in place could have a significant impact on extraction ratio. Review of the stope geometry and mining practices at the Porvenir mine shows that for an average stope, the extraction ratio should be approximately 97%. Ore losses, which are largely a result of incomplete mucking and localized sterilization of ore due to hanging wall failure, were estimated at 5%. For the reserve estimation the block model was queried for diluted block tonnes and grade. Recovery and ore losses were applied during the mine planning stage.

17.7.4 Mineral Reserve Classification

Mineral resources were converted to mineral reserves first by diluting the vein-only model to a minimum mining width model followed by the application of dilution to the minimum mining width model. As with the resource classification, the principal criteria for determining reserve categories was block grade followed by the location of the block. Two basic data sets were used for resource-reserve estimation: The first is the closely spaced channel sample database (from grade control data in sills and stopes); and the second is the more widely spaced drill hole sample database. Only cells that met or exceeded the reserve cut-off criterion (222 g/t silver) were considered for inclusion in the reserves category.

In areas of the deposit where channel data were available, blocks were estimated using both channel and drill hole data. In these areas similar selection criteria to those used historically at the mine were employed. For each reserve category of Proven and Probable, only blocks equal to or greater than the reserve cut-off (222 g/t Ag) were tabulated. Blocks below cut-off are not used in the tabulation of reserves, although they are included in mine planning regardless of grade. Proven stope blocks are defined by use of longitudinal sections to loosely define a 10 m vertical limit above and below workings with channel sample data. Within this 10 m limit Proven stope blocks are defined on the basis of the majority of the diluted blocks being above the economic cut-off grade. Probable Reserves use a similar method based on areas that are greater than 10 m vertically but less than 35 m vertically from mine workings.

In a number of areas, principally the deeper parts of the deposit, channel data are not available and Probable Reserves were defined on the basis of the drill hole data. In these areas the drilling data and geological data give enough confidence to define additional reserves, but the wider spaced nature of the data means that there is an additional element of uncertainty associated with the model estimates and more chance of the model not being as reliable spatially. For this reason more conservative criteria were adopted. As with the resource classification a strict distance criterion was not used, rather an envelope based on a maximum distance of 35 m, in the plane of the vein was defined. All diluted material within the envelope was categorized as Probable Mineral Reserves and includes only cells that are greater than or equal to the 222 g/t cut-off grade. Sub-cut-off grade blocks at the peripheries of the zone were not included in the reserve limits. Once reserve limits in the Porvenir zone were defined the mine engineering department developed a mine plan to ensure that the defined limits were economically viable.

The influence of this classification system on the Proven and Probable Reserve areas is displayed in Figures 17.4 through 17.6.

17.8 MINERAL RESOURCE AND RESERVE TABULATIONS

Following the methodologies outlined above, the resulting Mineral Resource and Mineral Reserve figures are summarized in Tables 17.20, 17.21 and 17.22, respectively. All reported Resources exclude material reported as Reserves.

In 2009, the reserves were more than doubled from 2008 with more development and drilling that allowed more confidence in the estimation in 2009. The vast majority of this difference is attributable to changes in the modeling methodology, which are summarized below:

- Undiluted minimum mining width decreased from 2.10 m to 1.80 m.
- Maximum mineable undiluted vein width of 6 m applied to December 31, 2008 reserves, no capping of vein width in December 31, 2009 reserves.
- Reduced reserve limits in the Porvenir Deep zone to better reflect confidence associated with drill data, based on initial mining experience in upper part of zone.
- Grade and thickness estimated using ordinary kriging in place of the inverse distance weighting method and with different search parameters.
- Additional information from drilling and development sampling.

The process of mineral resource and reserve estimation includes technical information which requires subsequent calculations or estimates to derive sub-totals, totals and weighted averages. Such calculations or estimations inherently involve a degree of rounding and consequently introduce a margin of error. Where these occur, Micon does not consider them to be material. The final resource and reserve figures in Tables 17.20 through 17.22 have been rounded to provide a mineral resource and reserve statement which implies an appropriate level of accuracy in order to reflect that the numbers are estimates.

Table 17.20
Guanaceví Mines Project Measured and Indicated Mineral Resource Summary as at December 31, 2009

Resource Categories/Location		Tonnes	Silver g/t	Gold g/t	Silver Equivalent g/t	Silver oz	Gold oz	Silver Equivalent oz	Lead %	Zinc %
Measured	North Porvenir - Zone 1	-	-	-	-	-	-	-	-	-
	North Porvenir - Zone 2	-	-	-	-	-	-	-	-	-
	Porvenir Dos	-	-	-	-	-	-	-	-	-
	Alex Breccia	-	-	-	-	-	-	-	-	-
Total Measured		-	-	-	-	-	-	-	-	-
Indicated	North Porvenir - Zone 1	628,000	204	0.41	231	4,126,700	8,300	4,664,000		
	North Porvenir - Zone 2	233,000	221	0.48	252	1,658,200	3,600	1,891,500		
	Porvenir Dos	76,000	195	0.48	227	480,100	1,200	557,300		
	Santa Cruz Mine XC1-3	203,000	310	0.54	345	2,025,300	3,500	2,254,400		
	Santa Cruz Mine XC-2	173,000	393	0.70	438	2,181,800	3,900	2,434,400		
	Santa Cruz Mine XC-2 (Ag-Pb-Zn)	112,000	233	0.66	276	835,600	2,400	990,200	2.14	3.12
	Porvenir Cuatro	399,000	308	0.93	369	3,957,600	11,900	4,733,100		
	Milache-Veronica-La Blanca	20,000	259	0.45	288	164,700	300	183,300		
	Noche Buena	329,000	227	0.20	240	2,400,000	2,100	2,535,900	0.79	1.50
Total Indicated		**2,173,000**	**255**	**0.53**	**290**	**17,830,000**	**37,100**	**20,244,100**	-	-
Total Measured + Indicated		**2,173,000**	**255**	**0.53**	**290**	**17,830,000**	**37,100**	**20,244,100**	-	-

Table 17.21
Guanaceví Mines Project Inferred Mineral Resource Summary as at December 31, 2009

Resource Categories/Location		Tonnes	Silver g/t	Gold g/t	Silver Equivalent g/t	Silver oz	Gold oz	Silver Equivalent oz	Lead %	Zinc %
Inferred	North Porvenir - Zone 1	195,000	173	0.38	198	1,085,300	2,400	1,240,500		
	Porvenir Dos	71,000	408	0.78	459	933,200	1,800	1,049,400		
	Alex Breccia	381,000	257	0.35	280	3,155,400	4,300	3,437,000	1.18	1.76
	Santa Cruz Mine XC1-3	70,000	187	0.35	210	418,100	800	469,000		
	Santa Cruz Mine XC-2	45,000	530	0.97	593	762,200	1,400	852,900		
	Santa Cruz Mine XC-2 (Ag-Pb-Zn)	149,000	184	0.61	224	880,600	2,900	1,071,200	1.32	1.93
	Porvenir Cuatro	2,000	183	0.44	211	11,800	-	13,700		
	Milache-Veronica-La Blanca	75,000	251	0.41	278	604,500	1,000	668,700		
	Noche Buena	136,000	181	0.17	192	792,100	800	841,400	0.61	1.07
	Buena Fe (Ag-Pb-Zn)	307,000	98	0.10	104	964,000	1,000	1,030,900	1.73	3.32
Total Inferred		**1,431,000**	**209**	**0.36**	**232**	**9,607,200**	**16,400**	**10,674,800**		

Table 17.22
Guanaceví Mines Project Mineral Reserve Summary as at 31 December, 2008

Reserve Categories/Location		Tonnes	Silver g/t	Gold g/t	Silver Equivalent g/t	Silver oz	Gold oz	Silver Equivalent oz
Proven	North Porvenir - Zone 1	30,000	411	0.57	448	401,500	600	437,400
	North Porvenir - Zone 2	145,000	347	0.58	385	1,613,500	2,700	1,787,500
	Porvenir Dos	54,000	399	0.76	448	691,000	1,300	776,900
Total Proven		**229,000**	**368**	**0.62**	**408**	**2,706,000**	**4,600**	**3,001,800**
Probable	North Porvenir - Zone 1	553,000	287	0.45	316	5,104,500	8,000	5,625,200
	North Porvenir - Zone 2	425,000	447	0.55	483	6,115,700	7,500	6,600,500
	Porvenir Dos	105,000	330	0.73	377	1,109,000	2,500	1,268,600
Total Probable		**1,083,000**	**354**	**0.51**	**388**	**12,329,200**	**17,900**	**13,494,200**
Total Proven + Probable		**1,312,000**	**356**	**0.54**	**391**	**15,035,200**	**22,600**	**16,496,100**

Micon has conducted an audit of the Endeavour Silver resource and reserve estimate for the period ending December 31, 2009, and considers these estimates to have been reasonably prepared and to conform to the current CIM standards and definitions for estimating resources and reserves as required under NI 43-101 regulations. Accordingly, Micon accepts Endeavour Silver's resource and reserve estimate as its basis for the ongoing mining operations at the Guanaceví Mines project. In Micon's opinion there are no significant technical, legal, environmental or political considerations which would affect the extraction and processing of the resources and reserves at the Guanaceví Mines project.

17.9 MICON VALIDATION

17.9.1 Block Model Validation

Mining Areas

1. Porvenir North.
2. Porvenir Dos.

Porvenir North

Micon was provided with the resource model for Porvenir both for the active mining area and the near mine exploration area. The details of methodology adopted by the team of geologists at the Porvenir mine are explained above. Micon was retained to audit the process of resource evaluation.

Micon carried of several checks to validate the resource starting from application of appropriate capping through to estimation. The resource was estimated using 148 drill holes and 7600 underground channel samples. The validation carried out included:

1. Outlier study of gold and silver.
2. Correlation between gold and silver.
3. De-cluster analysis.

Outlier Study of Silver and Gold

Micon prepared cumulative normal distribution plots to analyze outliers. The samples were extracted using the wireframes provided by Endeavour Silver. The channel samples represent the underground grade control samples while the drill hole samples represent near mine exploration samples. The analyses of outliers for channel samples and drill hole samples were carried out separately. Cumulative normal distribution plots were made using the rank method. The outliers were identified as the infliction points from the straight line. The plots for both silver and gold with the capping value used by Endeavour Silver are provided in Figures 17.7, 17.8, 17.9 and 17.10. While the capping used for drill hole samples seems appropriate, the channel samples have been capped at a much lower grade than that dictated by the probability plot. The reasons provided by Endeavour Silver in using lower capping for channel samples are:

1. Sampling bias - Working on improved sampling practice but as mineralized zones are often more fractured, the zone gets sampled preferentially.

2. Possible laboratory error as indicated by QA/QC data.

3. Mining dilution is also a factor, although capping was principally used to take into account the first two uncertainties.

Micon concurs with the above and agrees with use of conservative capping for channel samples. It is suggested that detailed analysis be made of the first two factors towards minimizing error due to reasons of sampling.

Figure 17.7
Cumulative Normal Distribution Plot for Silver (g/t) for Porvenir Mine (Channel Samples)

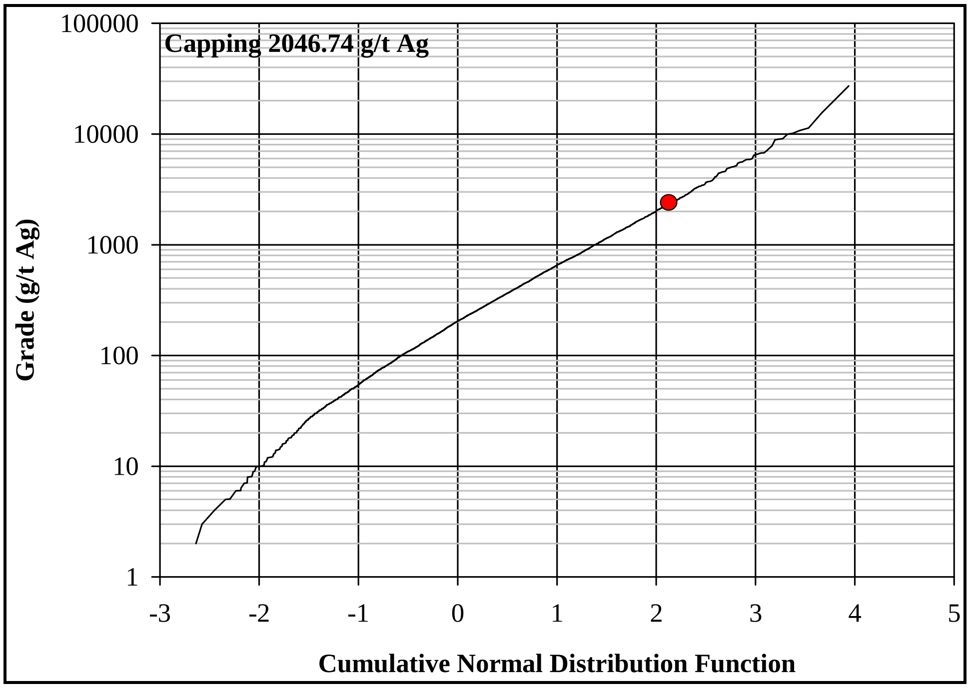


Figure 17.8
Cumulative Normal Distribution Plot for Gold (g/t) for Porvenir Mine (Channel Samples)

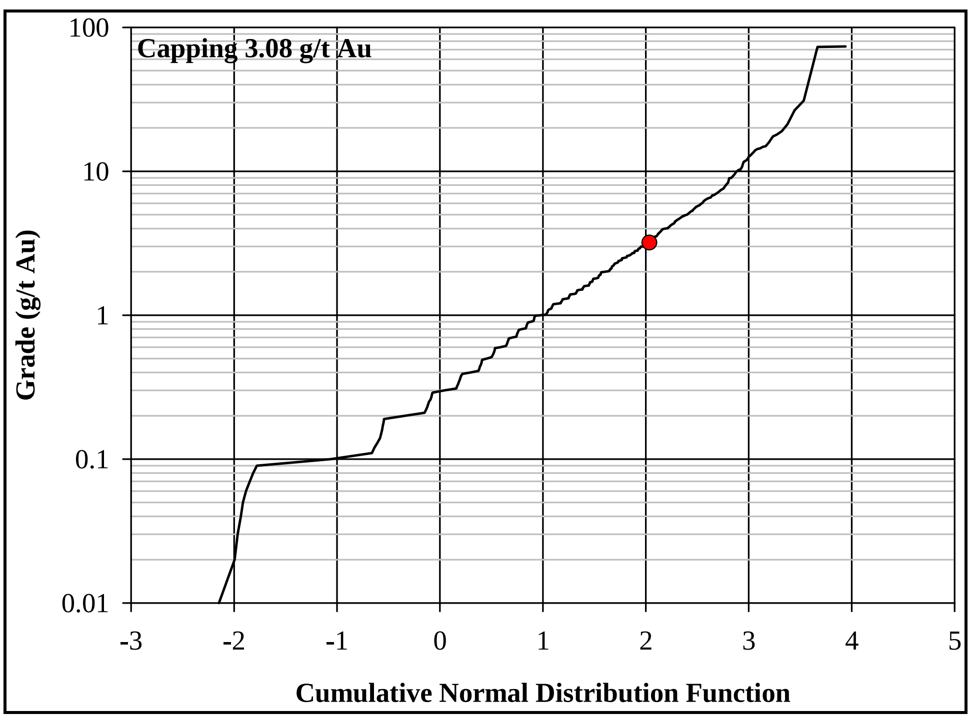


Figure 17.9
Cumulative Normal Distribution Plot for Silver (g/t) for Porvenir Near Mine Area (Drill Hole Samples)

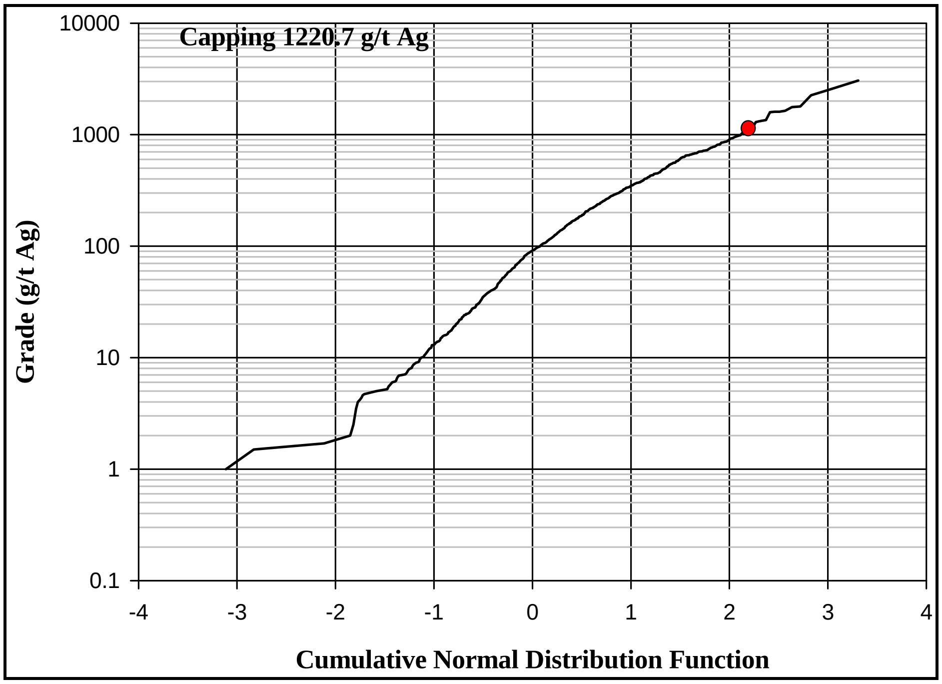
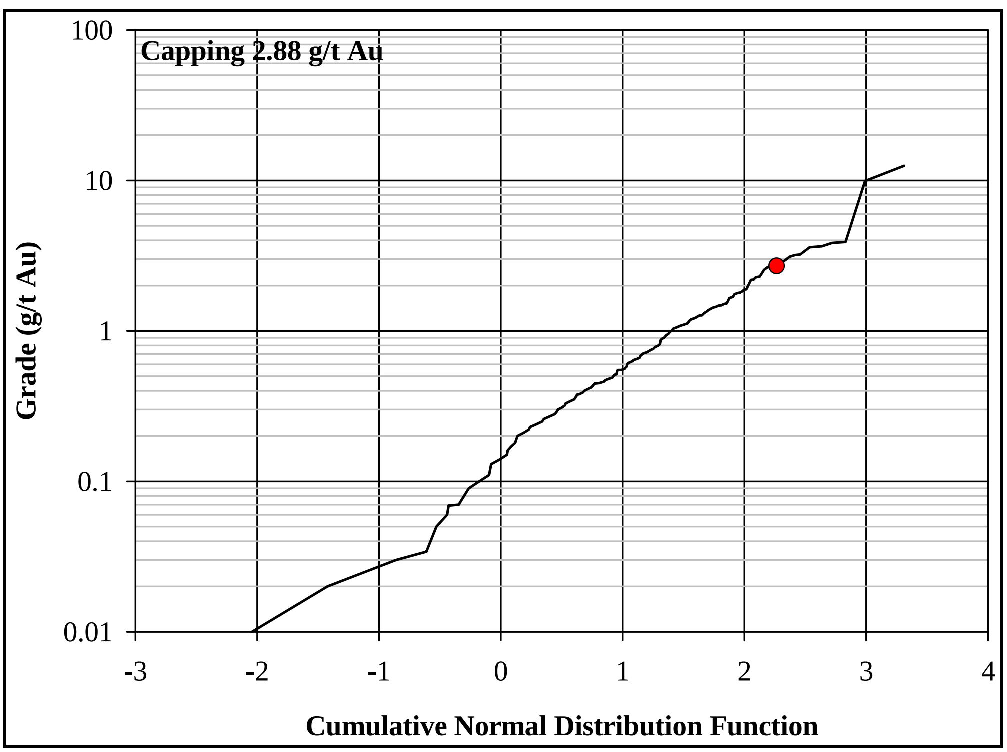


Figure 17.10
Cumulative Normal Distribution Plot for Gold (g/t) for Porvenir Near Mine Area (Drill Hole Samples)



Correlation between Gold and Silver

Micon prepared scatter plot to understand the relation between gold and silver (Figure 17.11). The correlation coefficient derived is 0.84 and considered to be relatively good. Endeavour Silver has carried out a similar study and arrived at a similar result. A co-kriging approach may be built in future and compared for better confidence in the resource.

De-cluster Analysis

Micon carried out de-clustering analysis for two window sizes, 50 m x 50 m and 5 m x 5 m. The first size represents the approximate drill hole spacing and the second one represents the block size. A 50 m x 50 m window was used for Micon's internal verification and has not been given in this report.

The samples were de-clustered to a block size of 5 m x 5m along the strike and dip direction of the vein. Micon re-blocked the complete block model to 5 m x 5 m and compared the results for both and silver and gold with the de-clustered drill hole samples using scatter plot. The exercise was carried out separately for the Zone 1 and Zone 2 veins. The results are shown in Figures 17.12, 17.13, 17.14 and 17.15. The correlation of grades between samples and blocks in Zone 1 is better than Zone 2 which is represented by the compact nature of the scatter plots for Zone 1 compared to Zone 2.

Figure 17.11
Correlation Between Gold and Silver for the Porvenir North Mine

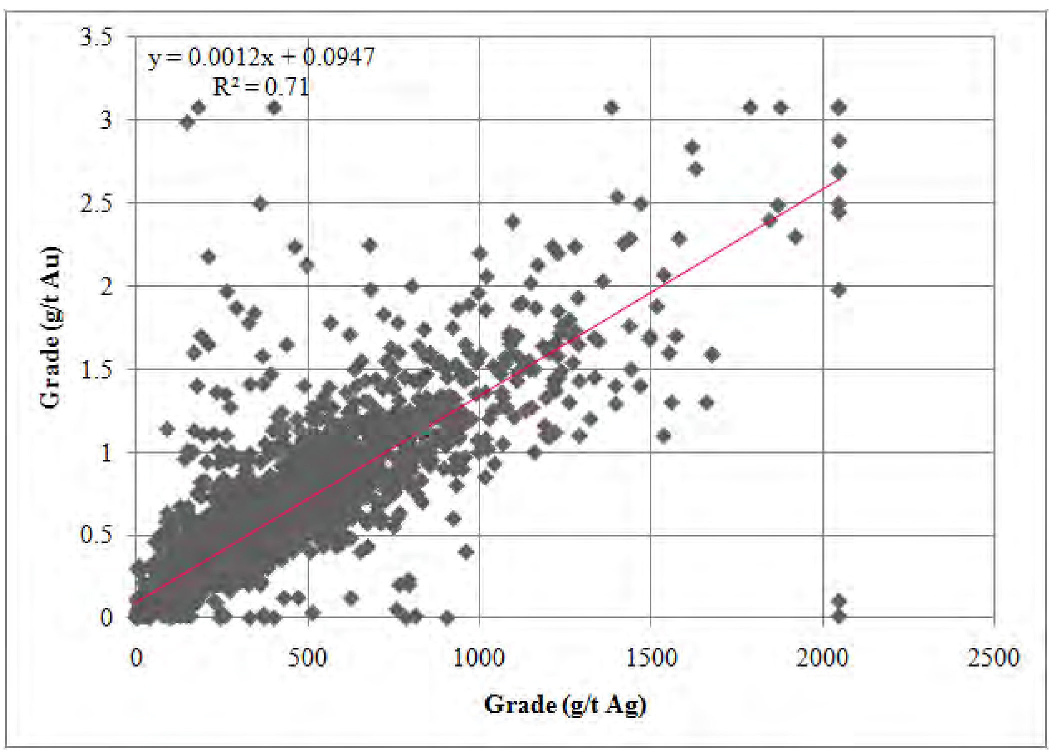


Figure 17.12
Scatter Plot between De-clustered Drill Hole Data and Estimated Block Model Data for Silver (g/t) for Zone 1

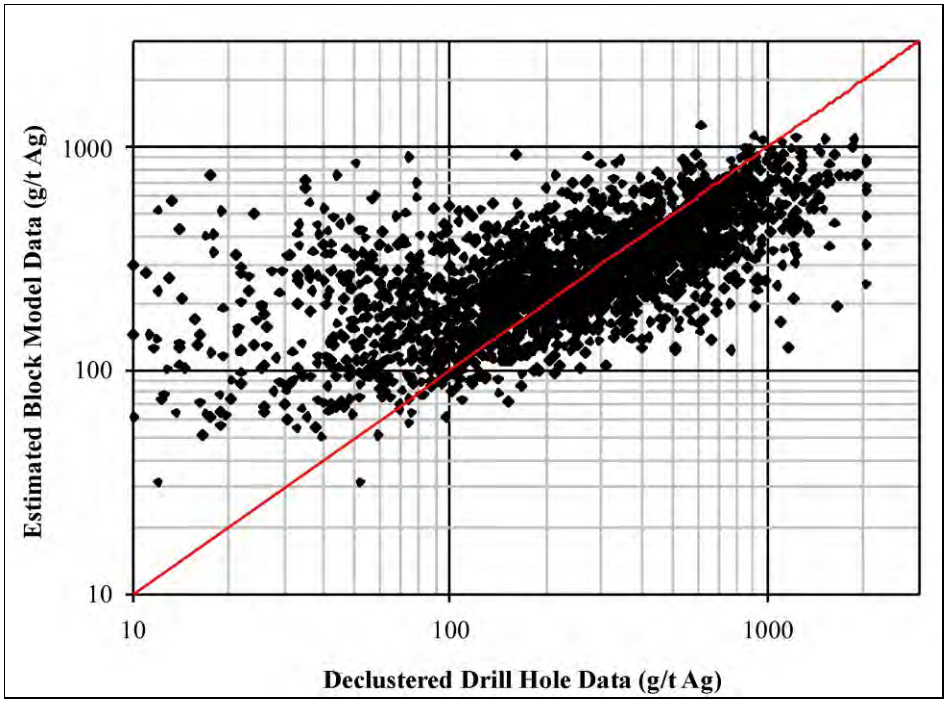


Figure 17.13
Scatter Plot between De-clustered Drill Hole Data and Estimated Block Model Data for Gold (g/t) for Zone 1

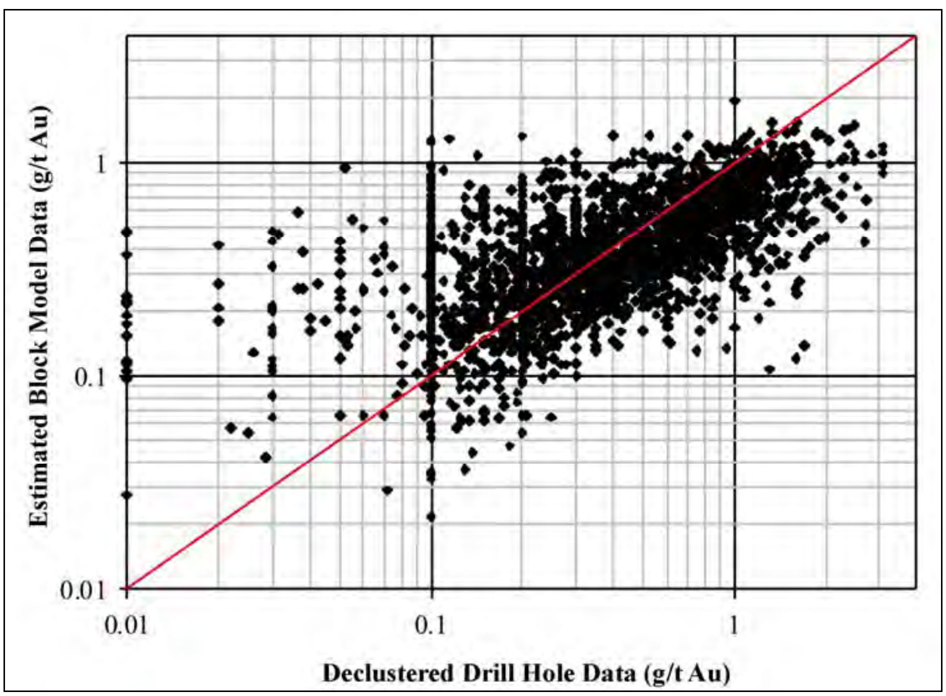


Figure 17.14
Scatter Plot between De-clustered Drill Hole Data and Estimated Block Model Data for Silver (g/t) for Zone 2

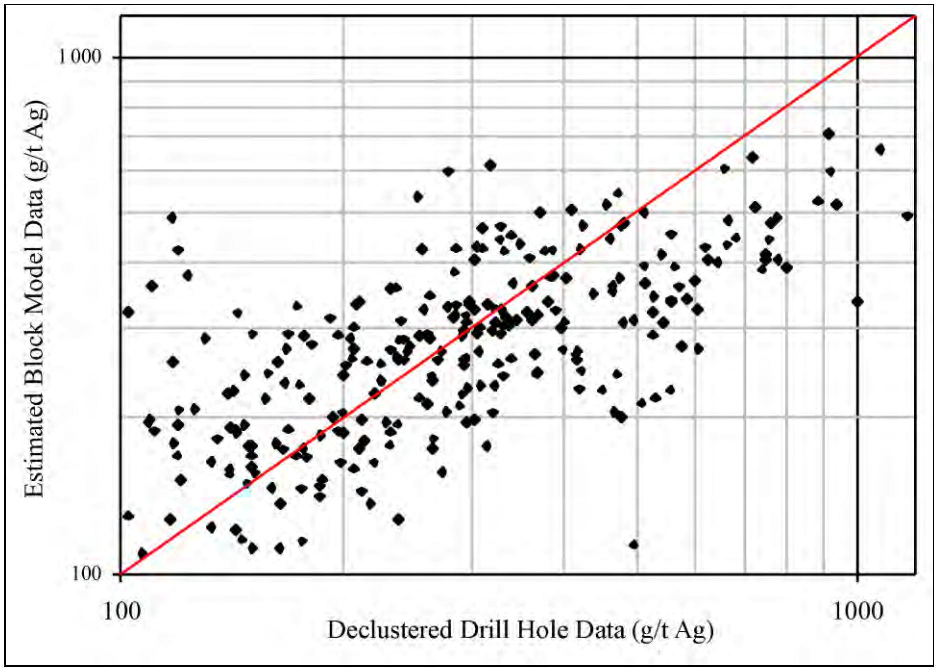
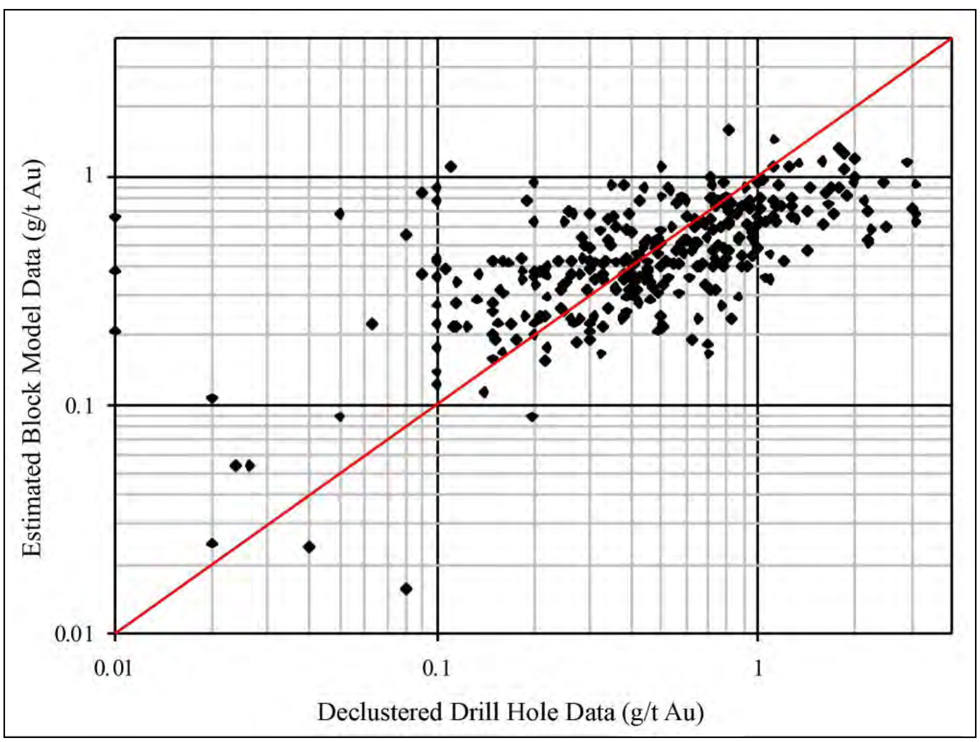


Figure 17.15
Scatter Plot between De-clustered Drill Hole Data and Estimated Block Model Data for Gold (g/t) for Zone 2



Micon used the samples, generated using de-clustering, to compare the distribution of grade for silver between drill hole samples and the block model, as shown in Figures 17.16 and 17.17. Averages were calculated for de-clustered samples and the block model including co-relation co-efficient, and are given in Tables 17.23 and 17.24. The distribution in Figures 17.16 and 17.17 is a result of ordinary kriging where the lower grades are over-estimated and higher grades are under-estimated, with the mode of the sample distribution matching the mode of the block model.

Table 17.23
Average Grade of the Elements for Porvenir North along with Correlation Co-efficient for Zone 1

Elements	De-clustered Sample Mean	Estimated Block Model Mean	Correlation Coefficient
Silver (g/t)	337.56	315.15	0.66
Gold (g/t)	0.50	0.44	0.61

Table 17.24
Average Grade of the Elements for Porvenir North along with Correlation Co-efficient for Zone 2

Elements	De-clustered Sample Mean	Estimated Block Model Mean	Correlation Coefficient
Silver (g/t)	321.46	285.87	0.67
Gold (g/t)	0.62	0.50	0.56

Figure 17.16
Frequency Distribution of Silver Grades for Zone 1, Porvenir North

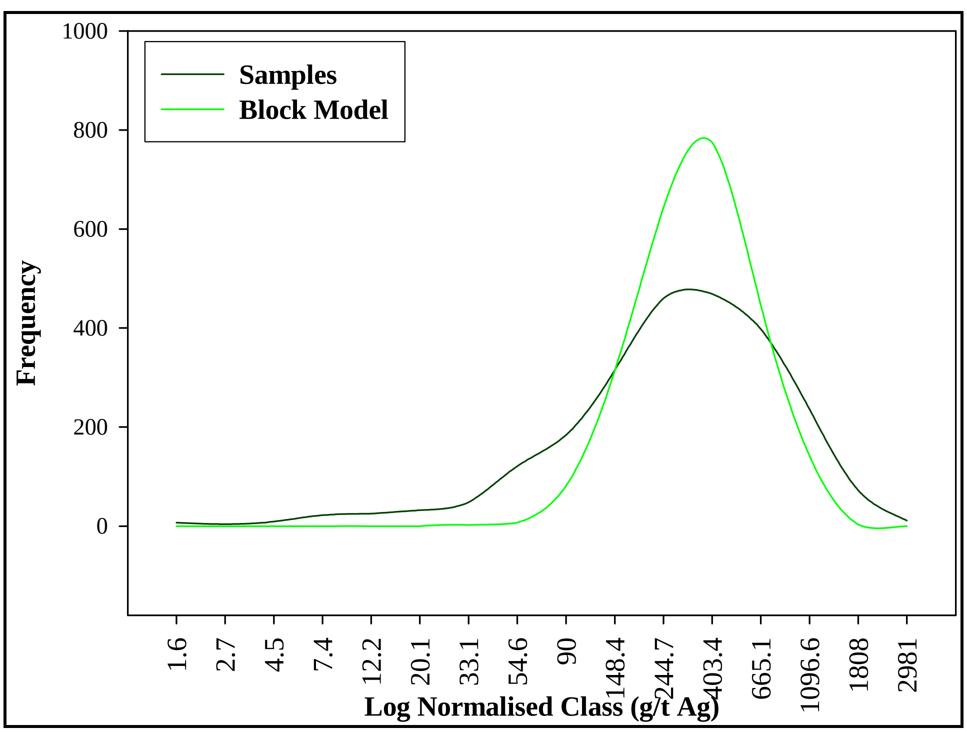
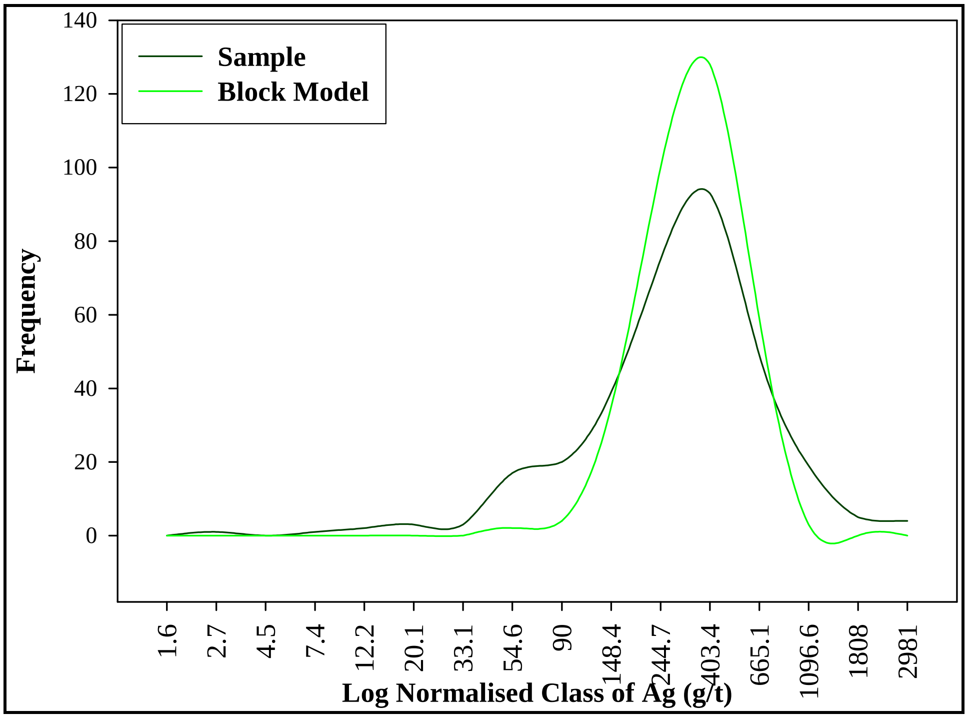


Figure 17.17
Frequency Distribution of Ag grades for Zone 2, Porvenir North



From the above analysis, Micon concurs with the methods adopted in resource estimation of Porvenir North and the results derived therefrom.

Porvenir Dos

Porvenir Dos contains only silver and gold mineralization. The area has similar mineralization to the Porvenir mine. The evaluation of the deposit was carried out using 24 drill hole samples and 106 underground channel samples. The validation carried out was:

1. Outlier study of gold and silver.
2. Correlation between gold and silver.
3. De-cluster analysis.

Outlier Study of Silver and Gold

The outlier study was carried out using cumulative normal distribution function plots for silver and gold. The analysis was done for channel samples and drill hole samples separately. The plots are given in Figures 17.18, 17.19, 17.20 and 17.21. The capping used for silver and gold looks slightly higher than expected based on the plots in the area of mining.

Figure 17.18
Cumulative Normal Distribution Plot for Silver (g/t) for Porvenir Dos Mine Area

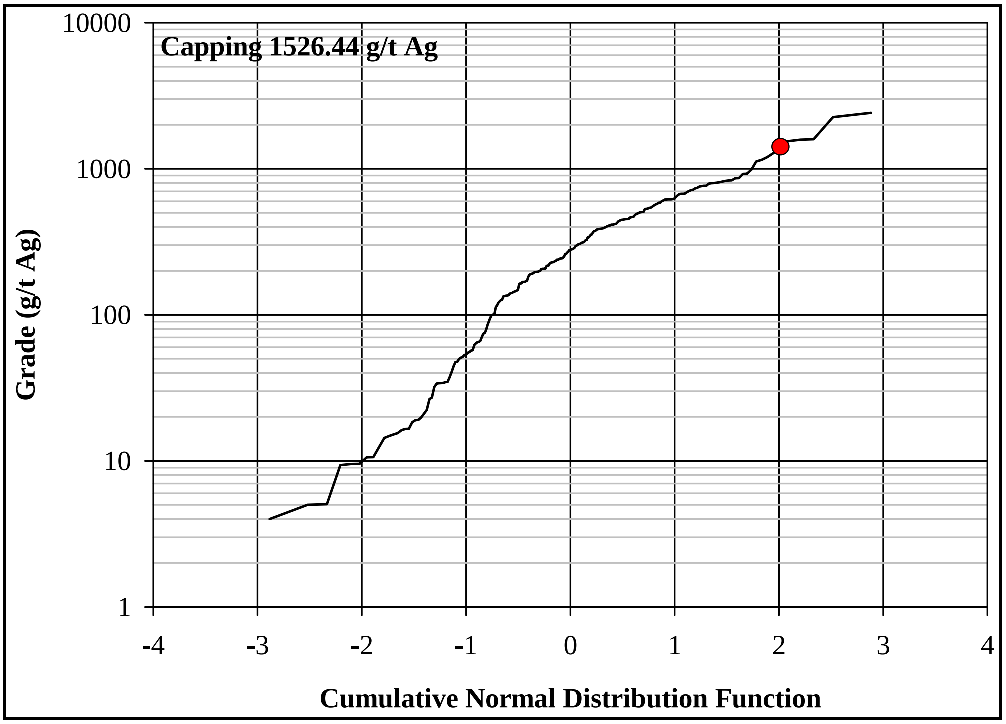


Figure 17.19
Cumulative Normal Distribution Plot for Gold (g/t) for Porvenir Dos Mine Area

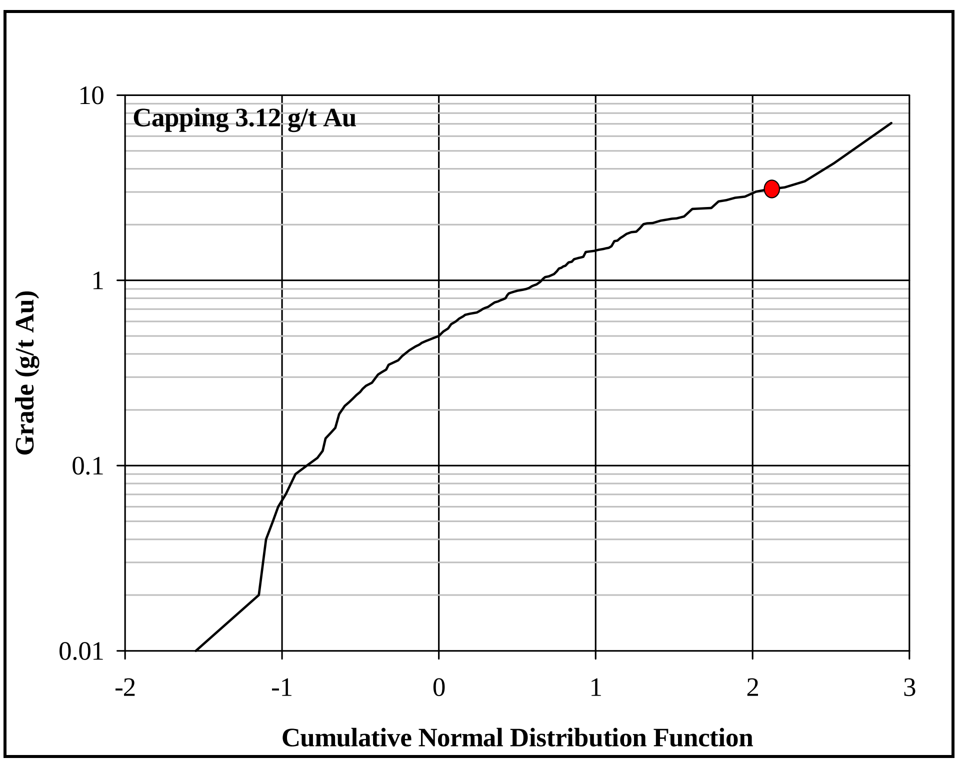


Figure 17.20
Cumulative Normal Distribution Plot for Silver (g/t) for Porvenir Dos Exploration Area

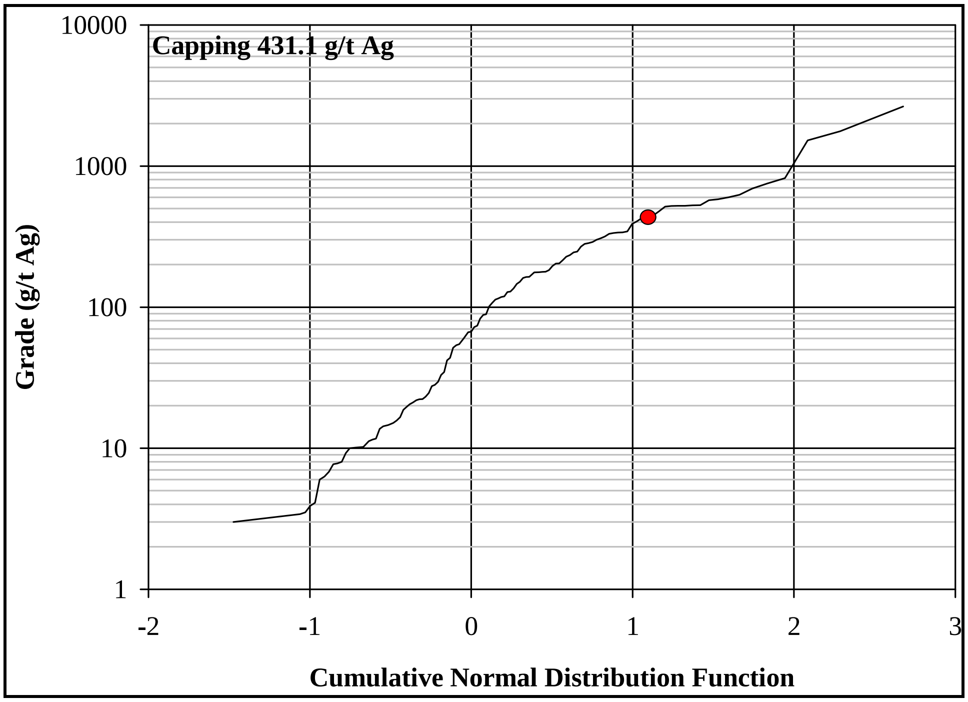
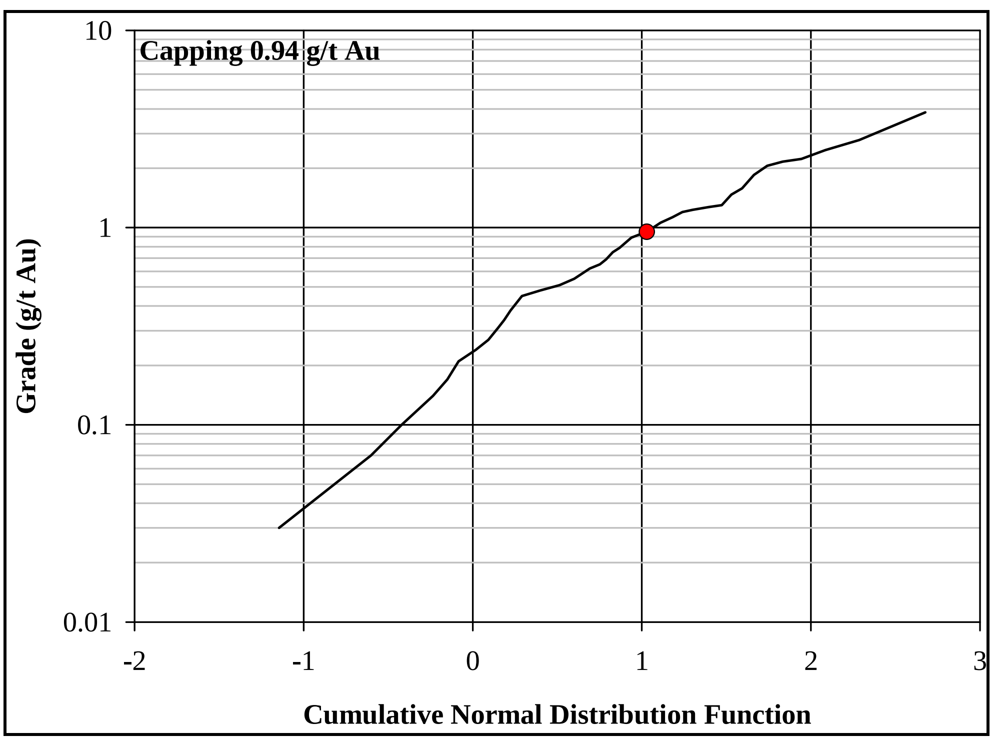


Figure 17.21
Cumulative Normal Distribution Plot for Gold (g/t) for Porvenir Dos Exploration Area



Correlation between Gold and Silver

Micon prepared a scatter plot to understand the relation between gold and silver (Figure 17.22). The correlation coefficient derived is 0.82 and considered to be relatively good.

De-cluster Analysis

Micon carried out a similar exercise as detailed for Porvenir North in case of Porvenir Dos. The results are given in Figures 17.23 and 17.24. The scatter plot for both silver and gold are close to a 1:1 regression line barring a few outliers. The scatter does not show any apparent bias. Micon used the samples, generated using de-clustering, to compare the distribution of grade for silver between drill hole samples and the block model, as showen in Figure 17.25. Averages were calculated for de-clustered samples and the block model including co-relation co-efficients and are given in Table 17.25. A reasonably high correlation co-efficient indicates that the drill hole grades have been well represented within individual blocks which indicates a reasonable local estimate within the mining area.

Table 17.25
Average Grade of the Elements for Porvenir Dos along with Correlation Co-efficient

Elements	De-clustered Sample Mean	Estimated Block Model Mean	Correlation Coefficient
Silver (g/t)	277.85	297.36	0.81
Gold (g/t)	0.63	0.55	0.72

Figure 17.22
Correlation Between Gold and Silver for Porvenir Dos

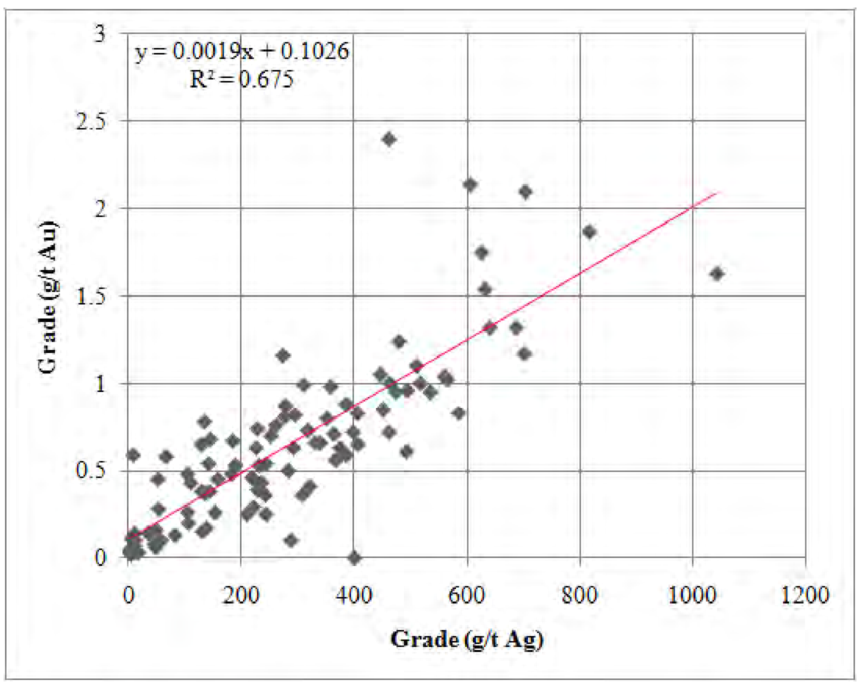


Figure 17.23
Scatter Plot between De-clustered Drill Hole Data and Estimated Block Model Data for Silver (g/t) for Porvenir Dos

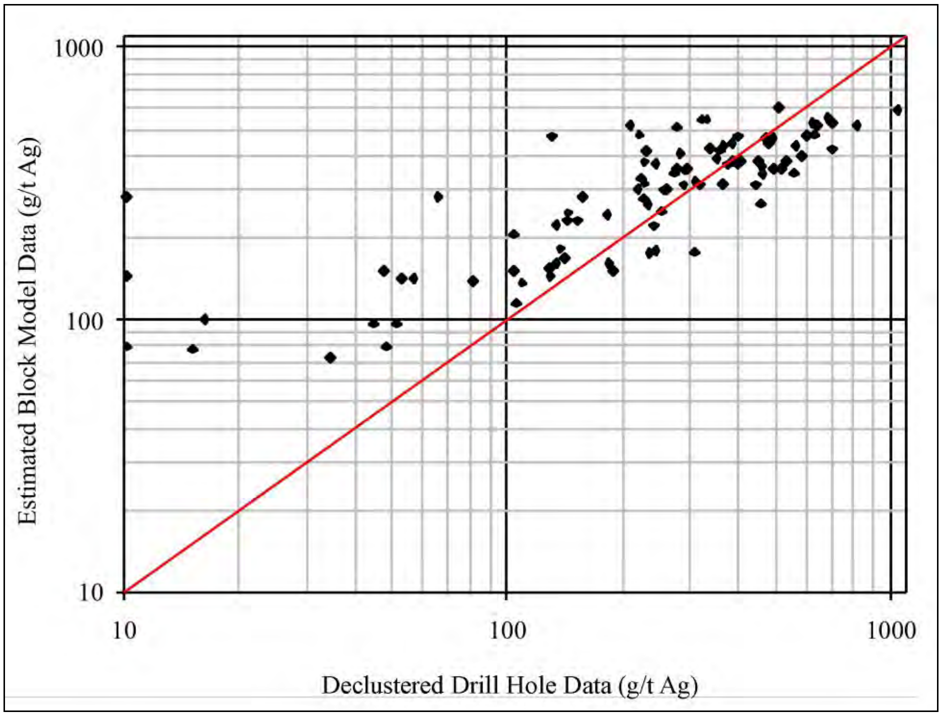


Figure 17.24
Scatter Plot between De-clustered Drill Hole Data and Estimated Block Model Data for Gold (g/t) for Porvenir Dos

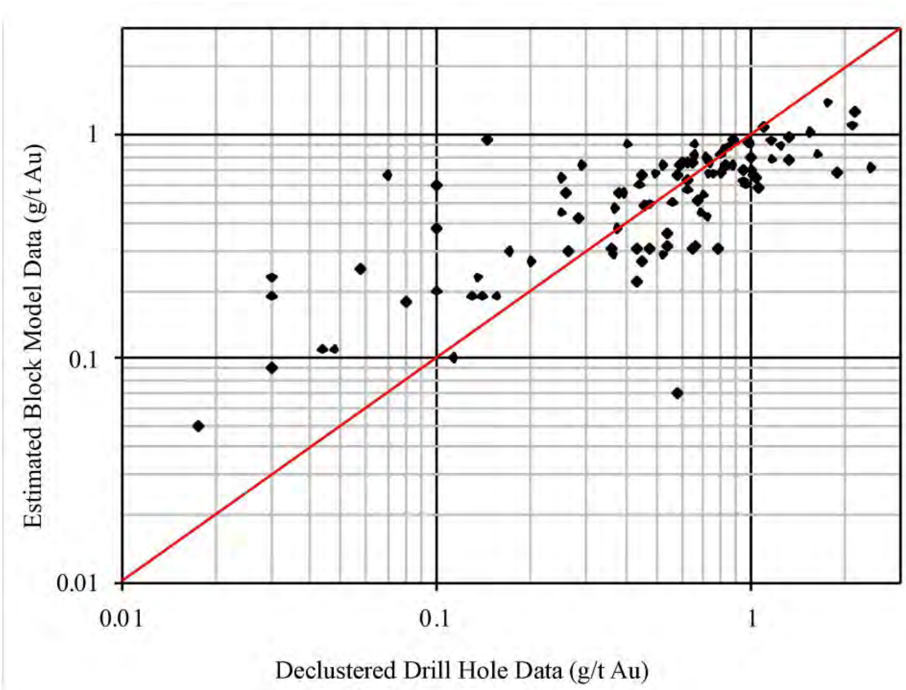
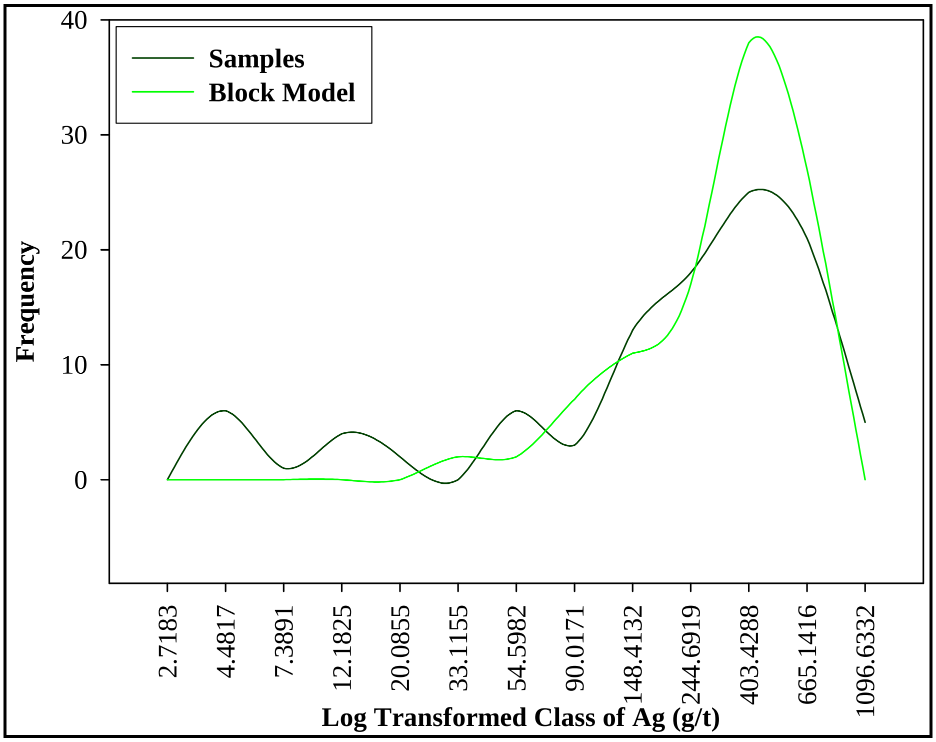


Figure 17.25
Frequency Distribution of Silver Grades for Porvenir Dos.



Exploration Areas within/close to Existing Underground Infrastructure

The exploration areas within and/or close to existing underground infrastructure are as given below:

1. Alex Breccia.
2. Santa Cruz.
3. Porvenir Cuarto.

The exploration areas have been drilled to various drill densities. More than one mineralized vein occurs in each of the areas. The drill spacing ranges from 50 m x 50 m and in places it is more than 100 m along the section. The approaches that have been used to carry out interpolation in these areas are given in Table 17.26, along with some other information.

Table 17.26
Summary of Resource Evaluation Parameters

Parameter	Alex Breccia	Santa Cruz	Porvenir Cuarto
Number of drill holes	16	44	31
Minimum vein width	1.5 m	1.5 m	1.5 m
Capping	95th Percentile	95th Percentile	95th Percentile
Compositing	1 m	1 m	1 m
Block Size	5 m x 5 m and Variable along the width of the vein	5 m x 5 m and Variable along the width of the vein	5 m x 5 m and Variable along the width of the vein
Interpolation Method	Inverse Distance with a power of 3	Inverse Distance with a power of 3	Inverse Distance with a power of 3
Ranges Used (major, Semi-major, minor)	1st- 30 m x 30 m x 20 m 2nd-150 m x 150 m x 50 m	1st- 30 m x 30 m x 20 m 2nd-150 m x 150 m x 50 m	1st- 40 m x 40 m x 15 m 2nd-100 m x 100 m x 30 m
Minimum number of samples	3	3 (2-2nd Pass)	2
Maximum number of samples	24	24	24
Categorization	Indicated and Inferred	Indicated and Inferred	Indicated and Inferred

Micon carried out the following basic checks for each area.

1. Check of outliers: Micon developed cumulative normal distribution plots using the rank method to identify the outliers. An inflection from the straight line would indicate the appropriate capping value.

2. Checking of average grade of samples de-clustered to 50 m x 50 m and comparing the average grade with the block model re-blocked to 50 m x 50 m. This would provides the comparison of the global estimated grade between the block model and the samples.

3. Scatter plot between de-clustered drill hole sample grades and estimated block model grades: The drill hole samples were de-clustered with a window of 50 m x 50 m. The block model was also re-blocked to the same size. The data from both were then used to calculate the average grade and the correlation co-efficient. Micon reviewed all the scatter plots and found them to have good correlation. They are not reproduced in this report as there are very few points in each of the plots. The correlation co-efficients have been tabulated for easier understanding.

The general comments which Micon considers important as a result of the validation study are:

1. Review of mineralization considered: The understanding of the geology and continuity of mineralization is good. A detailed understanding of economic parameter needs to be considered in future. The amount of material included below cut-off in most of the veins needs to be reviewed as it appears to be higher than normal.

2. Review of outliers: The capping considered for all the areas is reasonable.

3. Review of compositing: It was considered appropriate to composite the samples to 1 m. Considering the length of samples analyzed, this is considered reasonable.

4. Review of block size: Considering drill spacing, the blocks size is too small and results in the estimation of unrealistic local grades.

5. Classification of resources: Some of the areas located close to the existing underground workings have been classified as indicated resource based on a limited number of drill holes. This was based on the experience Endeavour Silver gained while mining other nearby areas. Micon considers this treatment somewhat optimistic but agrees that experience factors are also important in decision making.

Alex Breccia

Alex Breccia has two zones, one having only silver and gold and the other having lead and zinc in addition to silver and gold. The plots in Figures 17.26, 17.27, 17.28, 17.29 and 17.30 show the cumulative normal distribution plots with the outlier values as derived by Endeavour Silver. The identified outliers and capping used is considered reasonable for all five elements.

The mean grades for all the elements are very close between de-clustered drill hole samples and estimated block model grades (Table 17.27). The difference is well within the error of estimation. The correlation co-efficient is relatively low and is a direct result of block size. As mentioned previously, the average drill spacing does not support the small block size (5 m x 5 m) selected by Endeavour. The scatter plots (Figures 17.31, 17.32 and 17.33) using the de-clustering technique are reasonable and Micon concurs that, on a global basis, the resource estimate is appropriate.

Table 17.27
Average Grade of the Elements for Alex Breccia along with Correlation Co-efficient

Elements	De-clustered Sample Mean	Estimated Block Model Mean	Correlation Coefficient
Silver (g/t)	172.98	190.50	0.36
Gold (g/t)	0.26	0.27	0.48
Copper (%)	0.03	0.04	0.39
Lead (%)	0.74	0.88	0.58
Zinc (%)	1.42	1.50	0.68

Figure 17.26
Cumulative Normal Distribution Plot for Silver (g/t) for Alex Breccia

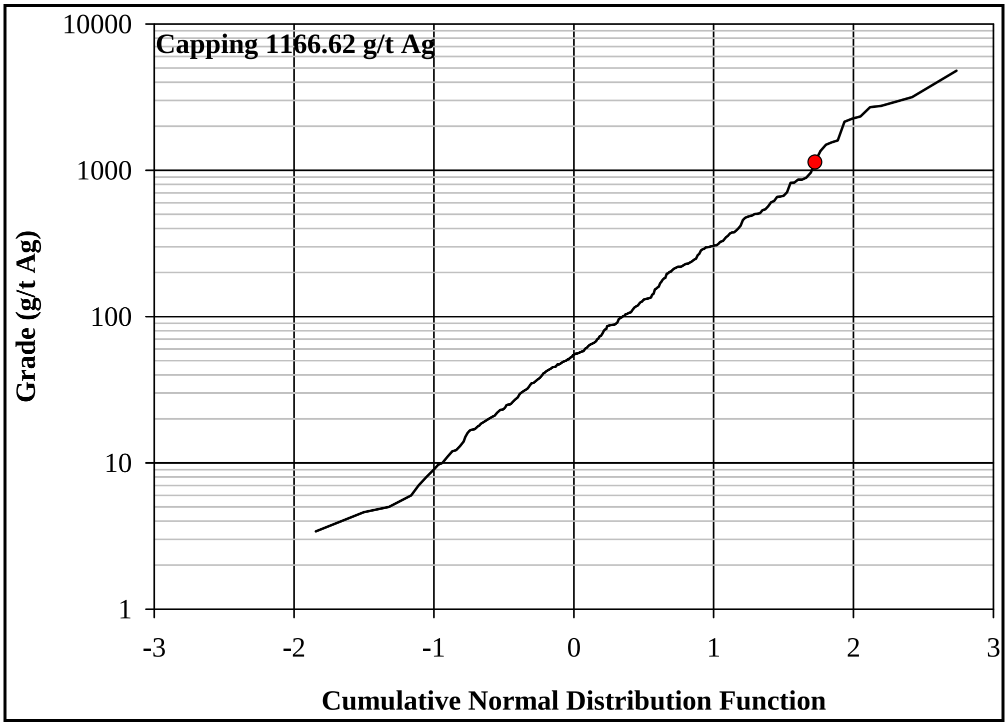


Figure 17.27
Cumulative Normal Distribution Plot for Gold (g/t) for Alex Breccia

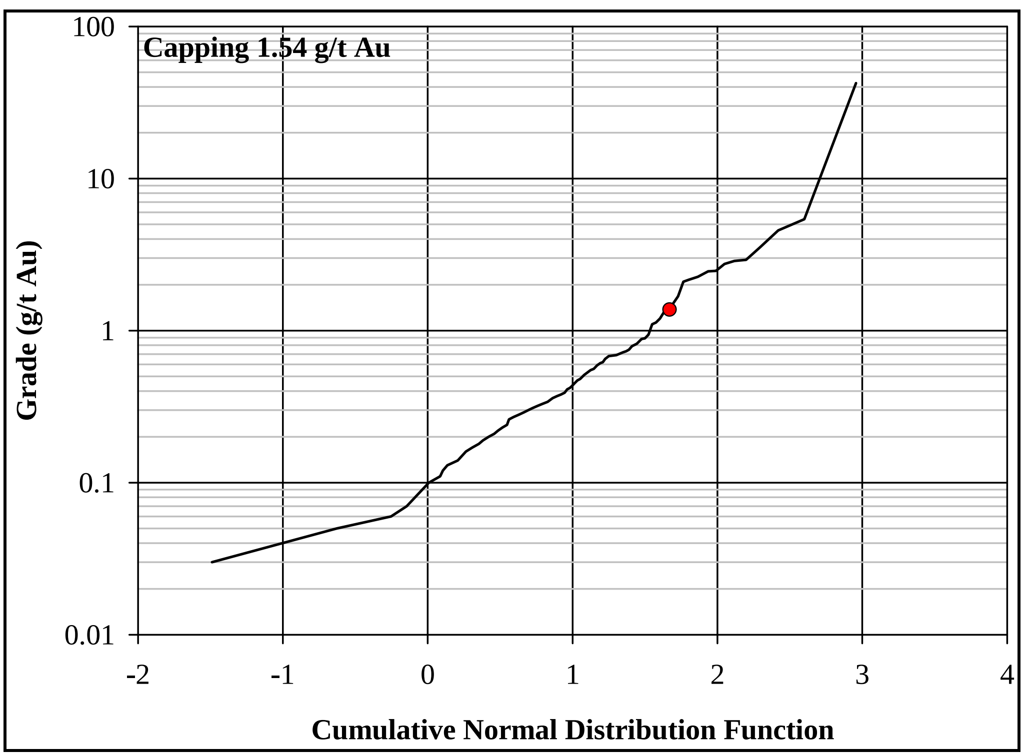


Figure 17.28
Cumulative Normal Distribution Plot for Lead (%) for Alex Breccia

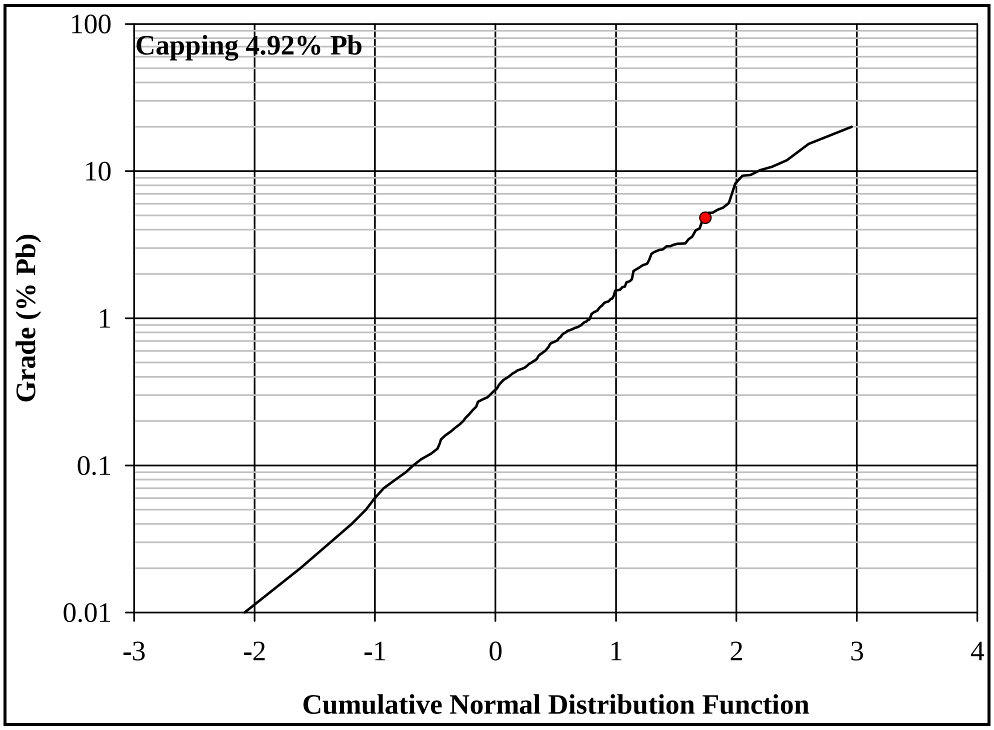


Figure 17.29
Cumulative Normal Distribution Plot for Zinc (%) for Alex Breccia

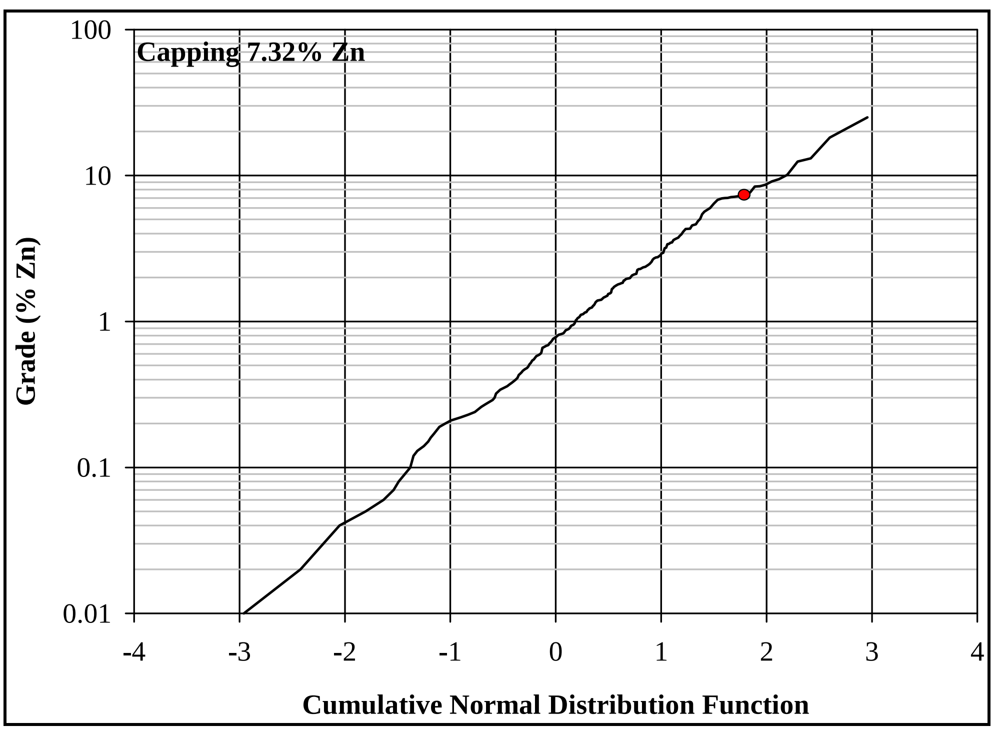


Figure 17.30
Cumulative Normal Distribution Plot for Copper (%) for Alex Breccia

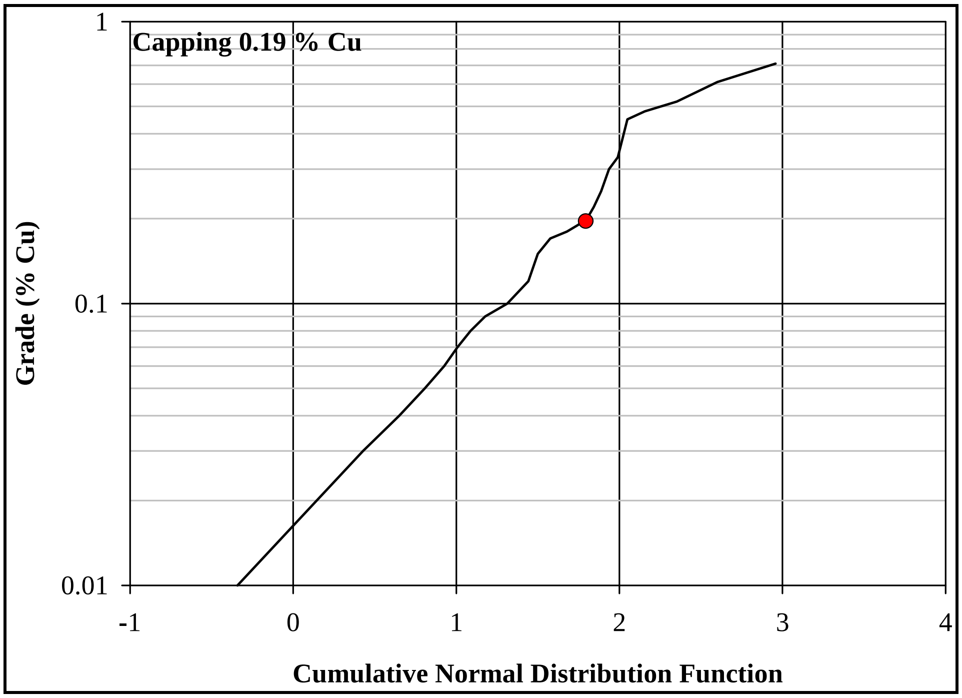


Figure 17.31
Scatter Plot between De-clustered Drill Hole Data and Estimated Block Model Data for Silver (g/t) for Alex Breccia

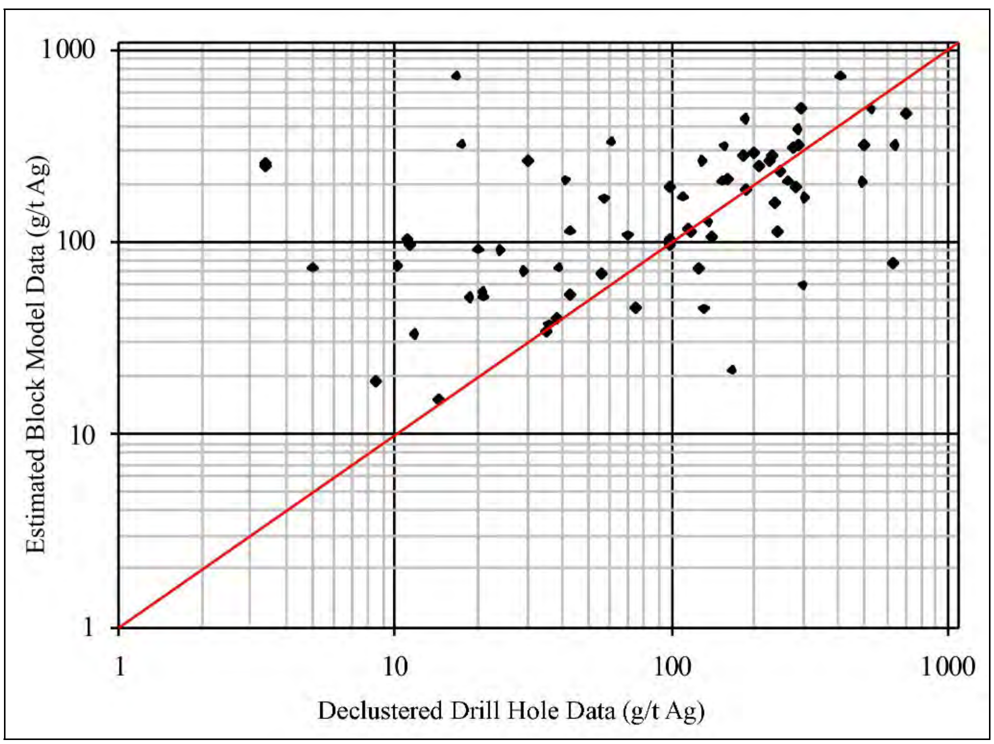


Figure 17.32
Scatter Plot between De-clustered Drill Hole Data and Estimated Block Model Data for Gold (g/t) for Alex Breccia

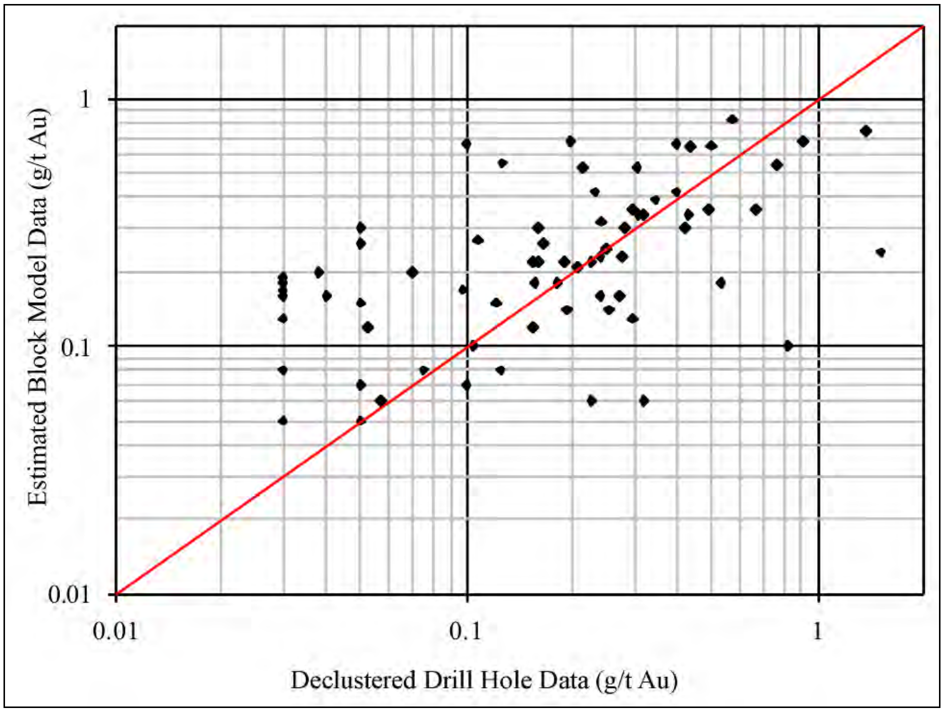
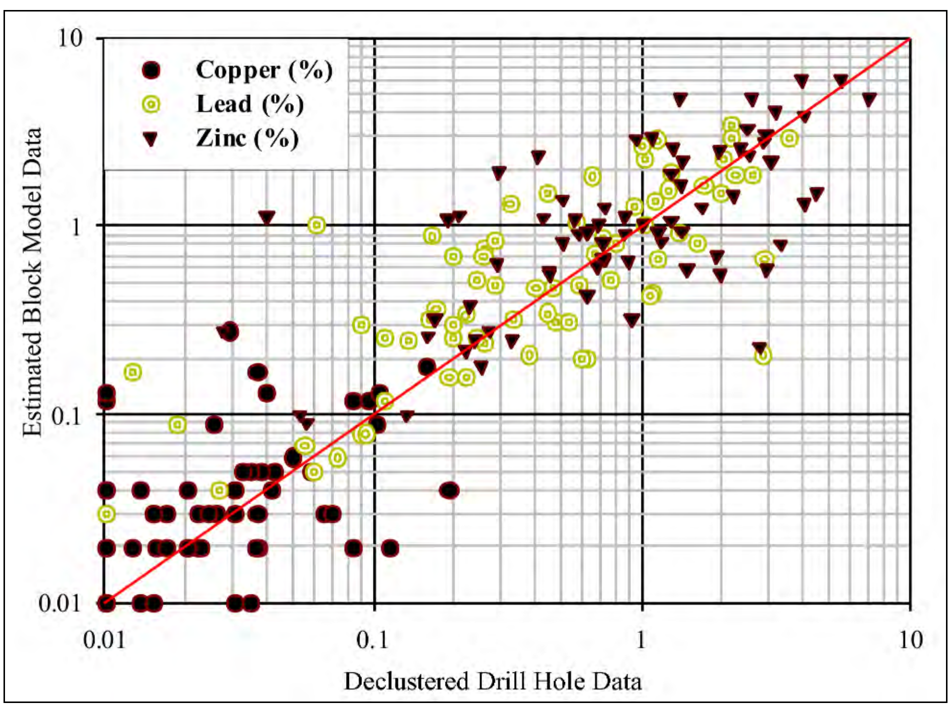


Figure 17.33
Scatter Plot between De-clustered Drill Hole Data and Estimated Block Model Data for Copper (%), Lead (%) and Zinc (%) for Alex Breccia



Santa Cruz

Santa Cruz has zones of copper, lead and zinc mineralization in addition to silver and gold, similar to Alex Breccia. The capping used for four elements (silver, gold, lead and zinc) is shown in Figures 17.34, 17.35, 17.36 and 17.37. While the silver, gold and zinc capping values are considered appropriate, the value used may be marginally high in case of lead. The mean grades for all five elements between drill hole samples and the block model grades are comparable, with high correlation co-efficients (Table 17.28).

The scatter plots (Figures 17.38, 17.39 and 17.40) generated using de-clustering techniques corroborates the high correlation co-efficients shown in Table 17.28. Micon concurs that, on a global basis, the resource estimate is appropriate.

Table 17.28
Average Grade of the Elements for Santa Cruz along with Correlation Co-efficient

Elements	De-clustered Sample Mean	Estimated Block Model Mean	Correlation Coefficient
Silver (g/t)	228.44	220.02	0.83
Gold (g/t)	0.46	0.44	0.75
Copper (%)	0.05	0.05	0.62
Lead (%)	1.62	1.41	0.73
Zinc (%)	2.57	2.26	0.69

Figure 17.34
Cumulative Normal Distribution Plot for Silver (g/t) for Santa Cruz

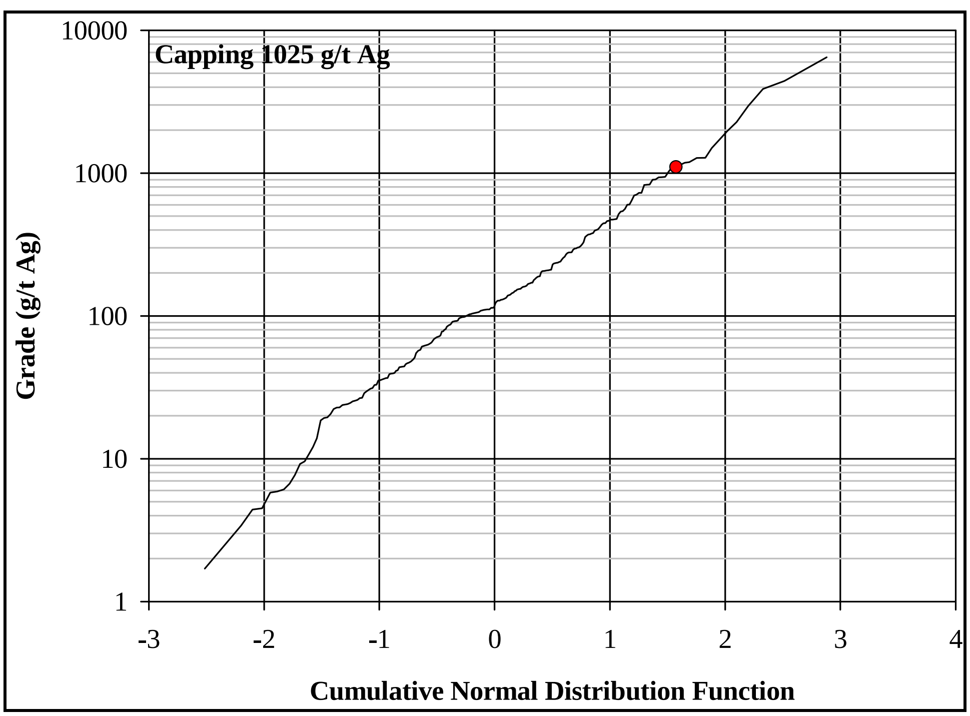


Figure 17.35
Cumulative Normal Distribution Plot for Gold (g/t) for Santa Cruz

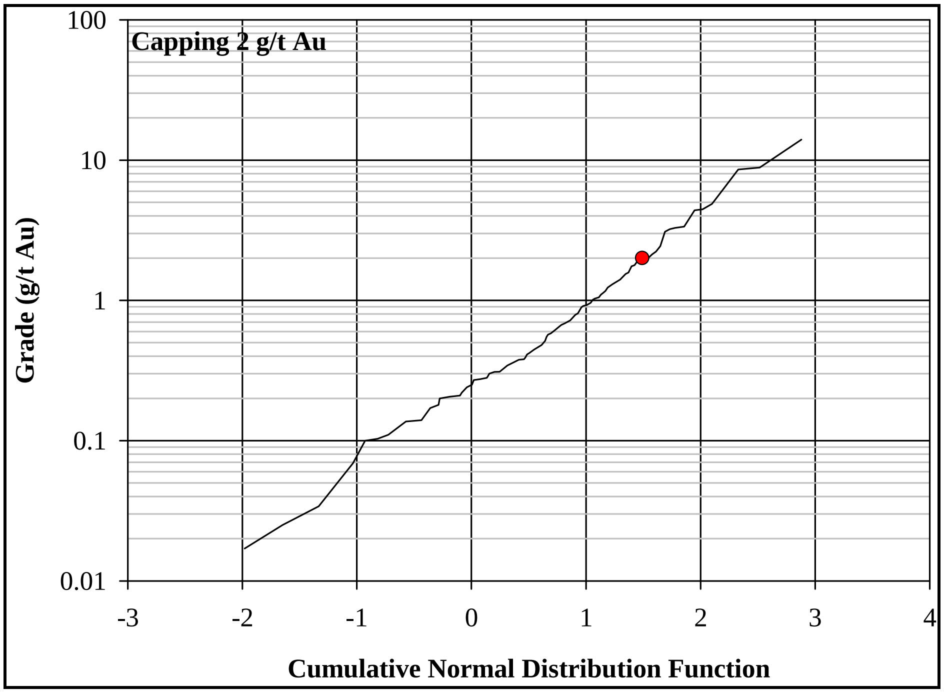


Figure 17.36
Cumulative Normal Distribution Plot for Lead (%) for Santa Cruz

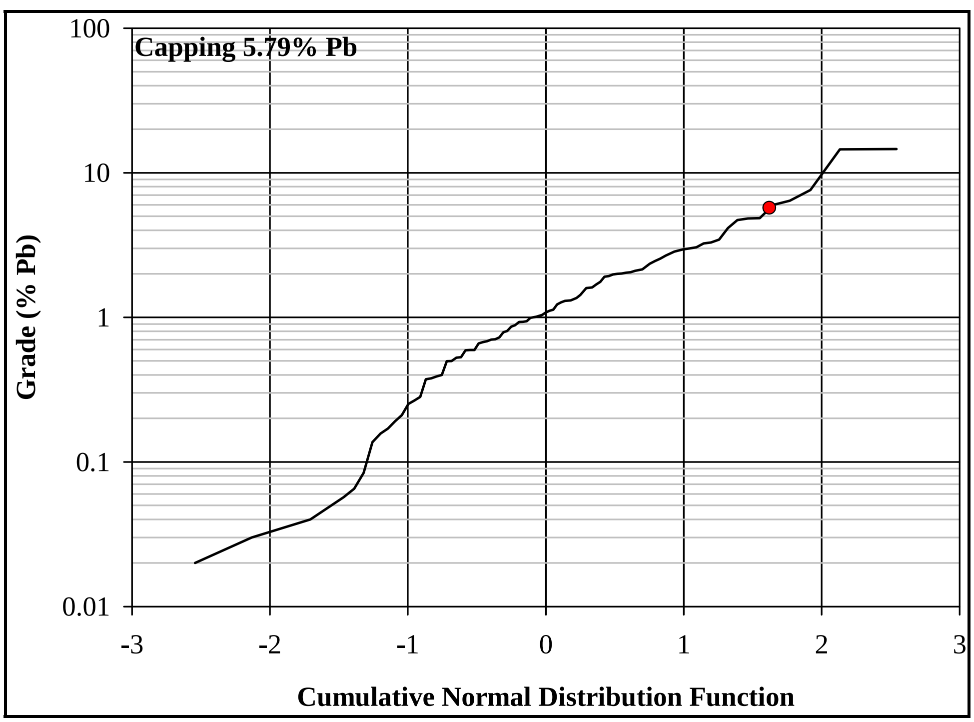


Figure 17.37
Cumulative Normal Distribution Plot for Zinc (%) for Santa Cruz

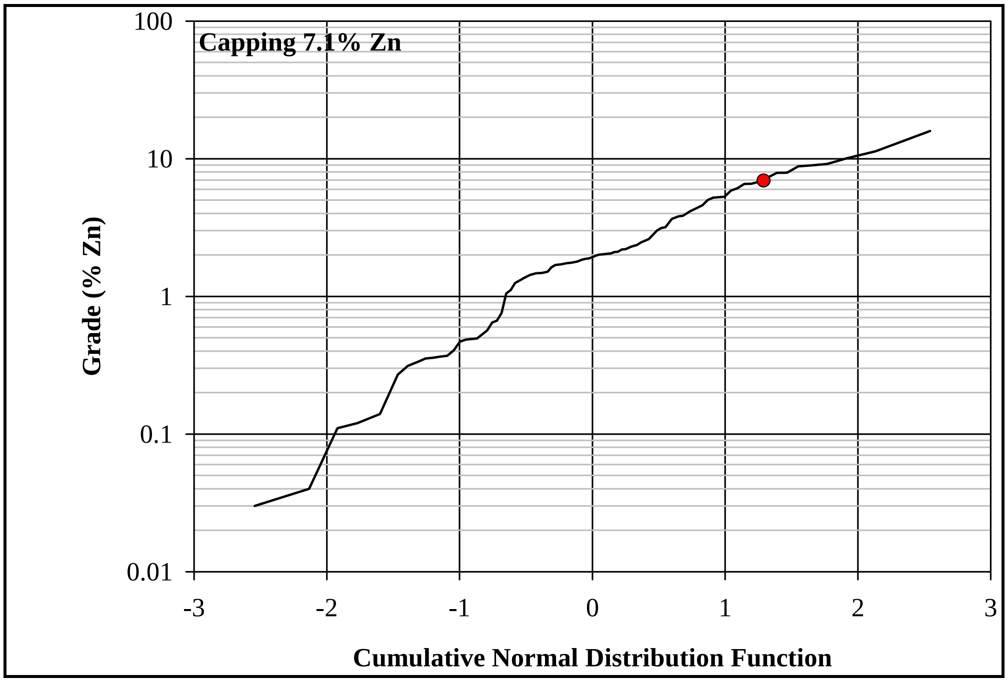


Figure 17.38
Scatter Plot between De-clustered Drill Hole Data and Estimated Block Model Data for Silver (g/t) for Santa Cruz

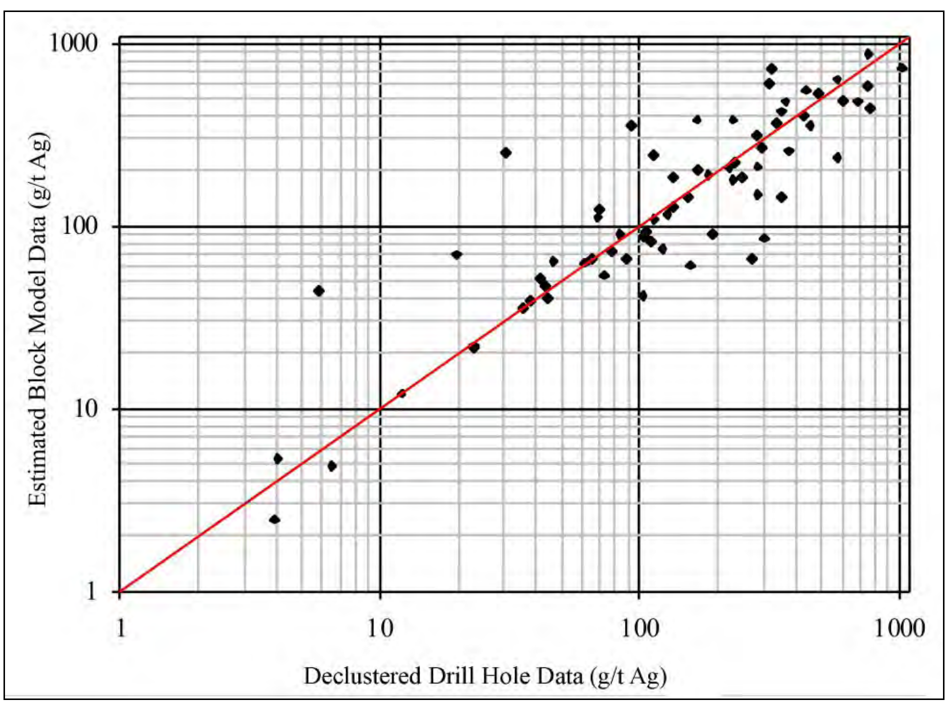


Figure 17.39
Scatter Plot between De-clustered Drill Hole Data and Estimated Block Model Data for Gold (g/t) for Santa Cruz

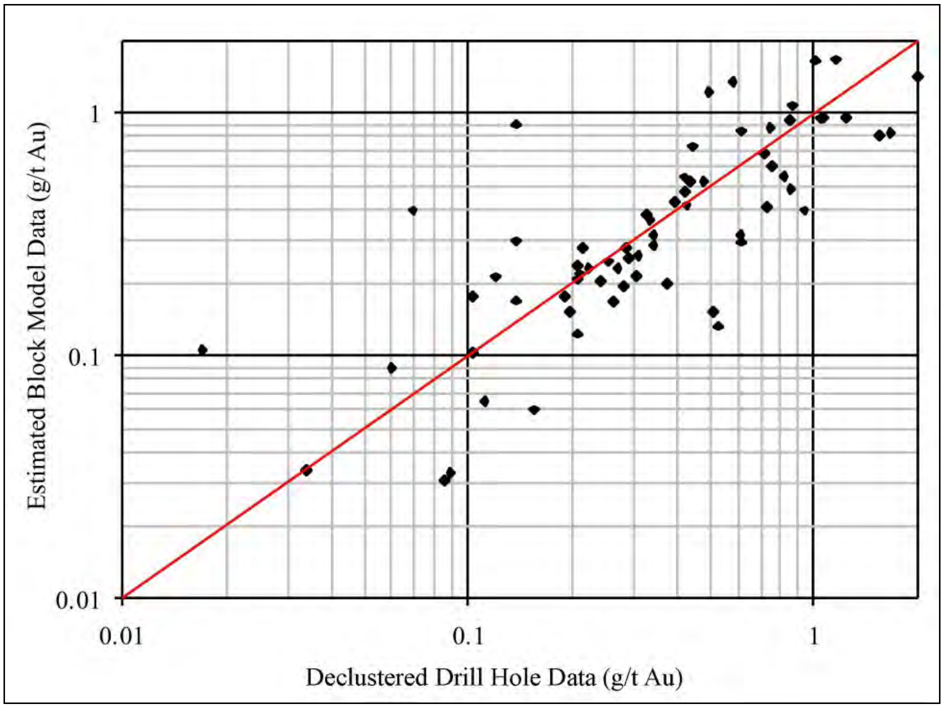
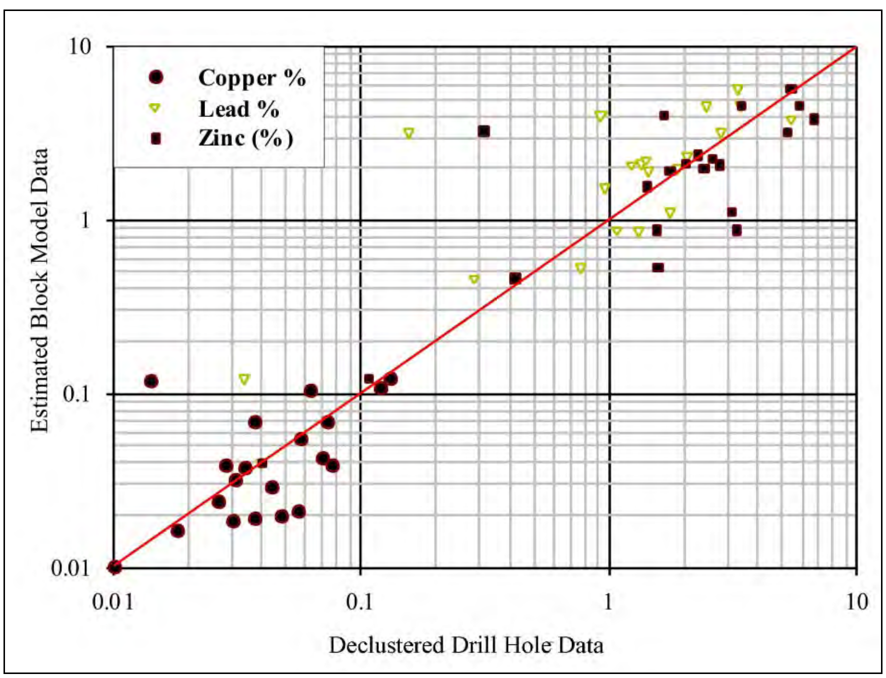


Figure 17.40
Scatter Plot between De-clustered Drill Hole Data and Estimated Block Model Data for Copper (%), Lead (%) and Zinc (%) for Santa Cruz



Porvenir Cuatro

Porvenir Cuatro has similar style of mineralization to Porvenir and Porvenir Dos. The plots in Figures 17.41 and 17.42 show the cumulative normal distribution plot with the outlier value as derived by Endeavour Silver. The capping value is considered conservative for both silver and gold.

The scatter plots (Figures 17.43 and 17.44) using the de-clustering technique are reasonable and Micon concurs, that on a global basis, the resource estimate is appropriate.

Figure 17.41
Cumulative Normal Distribution Plot for Silver (g/t) for Porvenir Cuatro

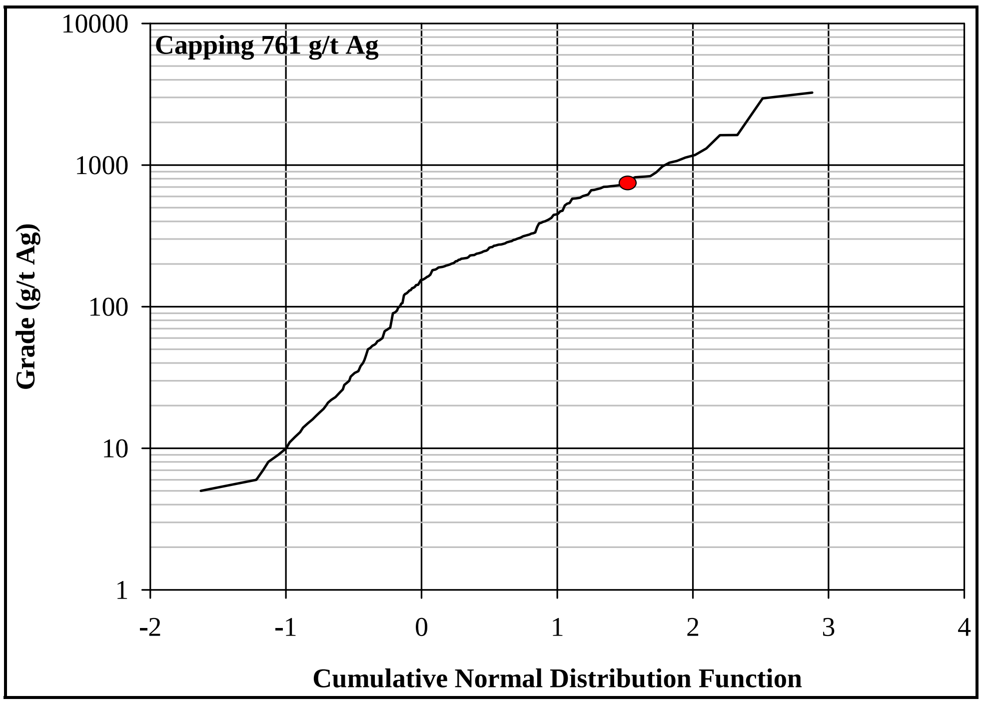


Figure 17.42
Cumulative Normal Distribution Plot for Gold (g/t) for Porvenir Cuatro

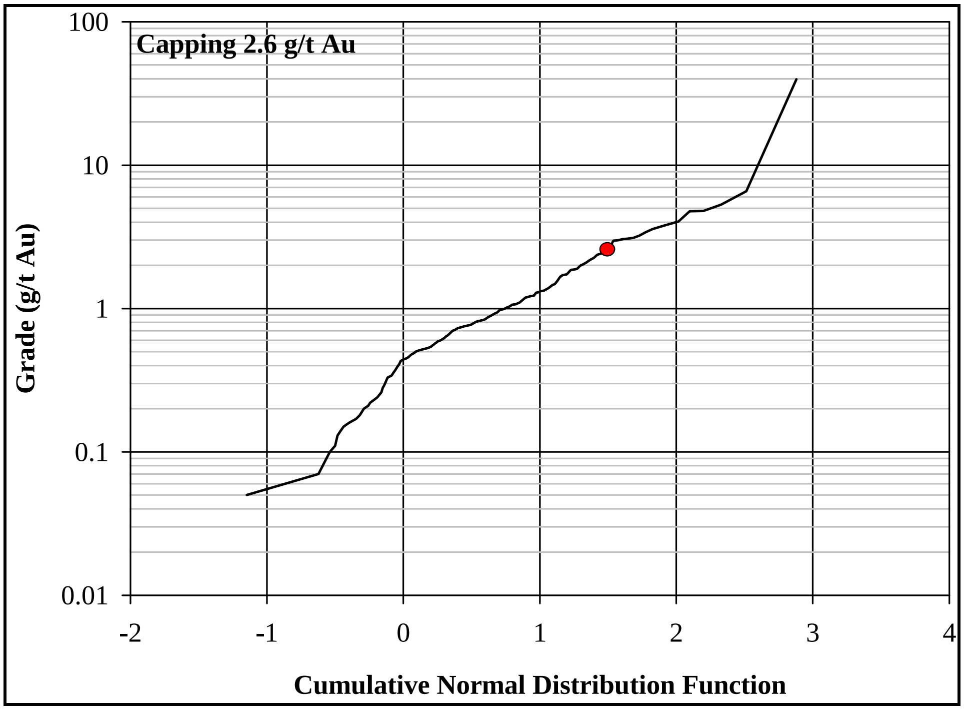


Figure 17.43
Scatter Plot between De-clustered Drill Hole Data and Estimated Block Model Data for Silver (g/t) for Porvenir Cuatro

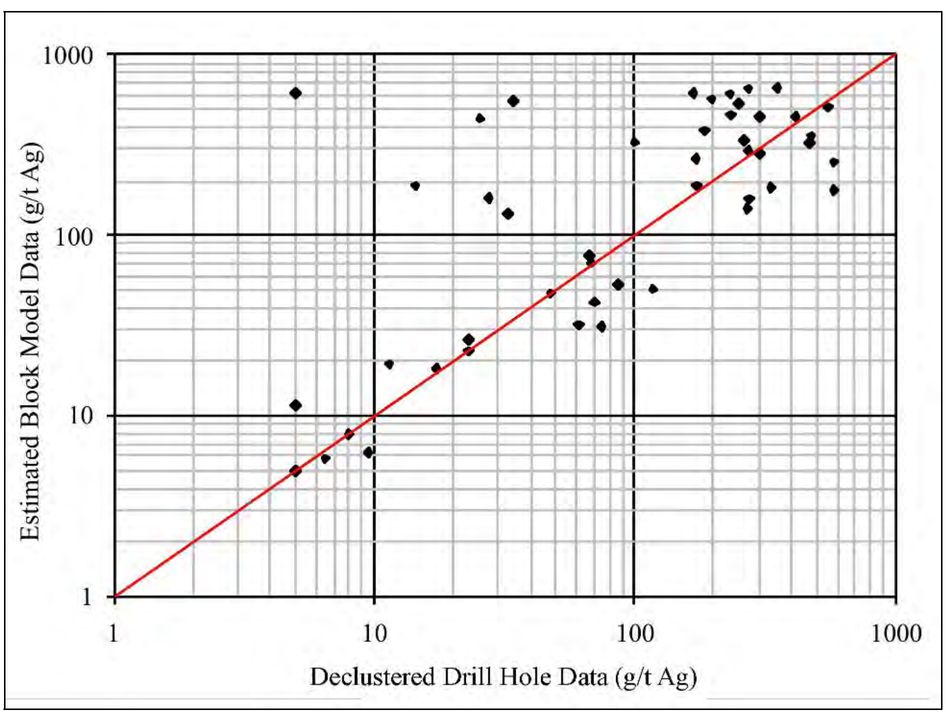
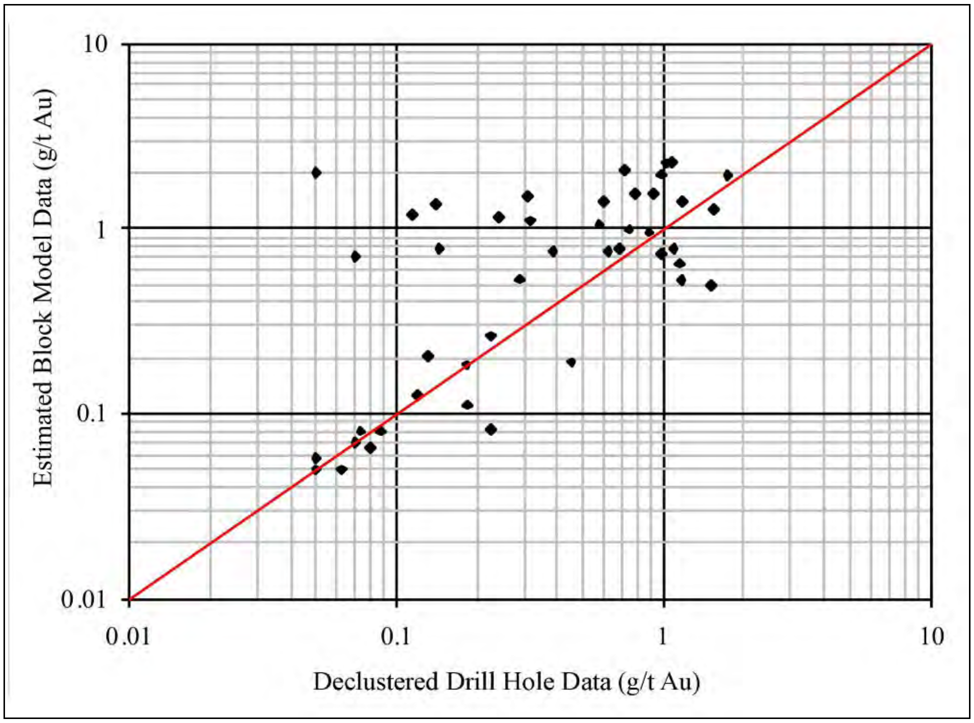


Figure 17.44
Scatter Plot between De-clustered Drill Hole Data and Estimated Block Model Data for Gold (g/t) for Porvenir Cuatro



Other Exploration Areas (San Pedro Project)

The other exploration areas within the Guanacevi concessions which are at advanced stages of exploration are the Noche Buena and the Milache-Veronica-La Blanca areas. Endeavour Silver has used the traditional manual polygonal method to estimate Indicated and Inferred resources. Micon considers this approach sensible in view of the limited number of drill holes. In both areas, Endeavour Silver capped the drill hole samples statistically, based on the cumulative probability of approximately 95%. The cut-off grades applied to the resources are as follows:

- Noche Buena: 100 g/t silver equivalent or 50 g/t silver plus >3.5% combined lead and zinc. This cut-off is consistent with Micon's previous recommedation.

- Milache-Veronica-La Blanca: 200 g/t silver equivalent.

The various veins have different characteristics and where geological continuity is well demonstrated the cut-off may be lowered in order to maintain a coherent resource block; this is the case applicable to Noche Buena. In both areas the geological and mineralization continuity is reasonably demonstrated despite the limited number of holes. Accordingly, Micon has accepted Endeavour Silver's categorization of resources into Indicated and Inferred.

18.0 OTHER RELEVANT DATA AND INFORMATION

At the writing of this report, all relevant data and information regarding Endeavour Silver's Guanaceví Mines project are included in other sections of this report. This section will focus on covering the items contained in Item 25 of the Form 43-101-F1 Technical Report "Additional Requirements for Technical Reports on Development Properties and Production Properties"

18.1 MINING OPERATIONS

Since January 1, 2007, Endeavour Silver has been in control of the day-to-day mining operations at the Guanaceví Mines project. Endeavour Silver assumed control of the mining operations from a local mining contractor in order to allow for more flexibility in operations and to continue optimizing the costs.

On December 31, 2009, the Guanaceví Mines project had a roster of 398 employees. The mine operates on two 10-hour shifts, 7 days a week, whereas the mill operates on a 24/7 schedule. The miners are skilled and experienced in vein mining and are currently not unionized. There is an incentive system in place rewarding personnel for good attendance, safety and production. Technical services and overall supervision is provided by Endeavour Silver staff. The mine employs geology, planning and surveying personnel and has detailed production plans and schedules. All the mining activities are being conducted under the direct supervision and guidance of the mine manager.

An organization chart for the Guanaceví Mines project is shown in Figure 18.1.

18.2 GROUND CONDITIONS

The Porvenir mine is a classic, high grade silver-gold, epithermal vein deposit, characterized by low sulphidation geochemistry and adularia-sericite alteration. The Santa Cruz vein is the host of the silver and gold mineralization. It is oriented northwest and occurs principally within the Guanaceví Formation, with a preferred strike of N45°W and dips of between 50° and 55° to the southwest.

The footwall is an unaltered andesite that has rock quality determination (RQD) ranging from 80 to 100. This is competent ground that only occasionally requires additional support such as 6-foot spilt-set bolts or shotcrete.

The vein is a classic quartz vein that varies from 1 to 5 m wide with an average width of approximately 3.0 m. The footwall contact is defined by a clear change of rock type from vein material to unaltered andesite. The hanging wall contact is typically defined by a clear structural boundary between the vein and the hanging wall rocks, with the contact usually defined as the Santa Cruz fault, a normal fault characterized by striations and fault gouge. The gouge material is typically white clay that can range from 5 mm up to 1 m or 2 m in thickness. The vein is generally self-supporting over the entire width and requires no mechanical supports. When vein widths increase beyond 5 m some local support in the form of split-set bolts and welded wire mesh may be required. In some areas post-mineral movement of the fault has caused some fracturing along the vein.

Figure 18.1
Organization chart for the Guanaceví Mines Project as of February, 2009

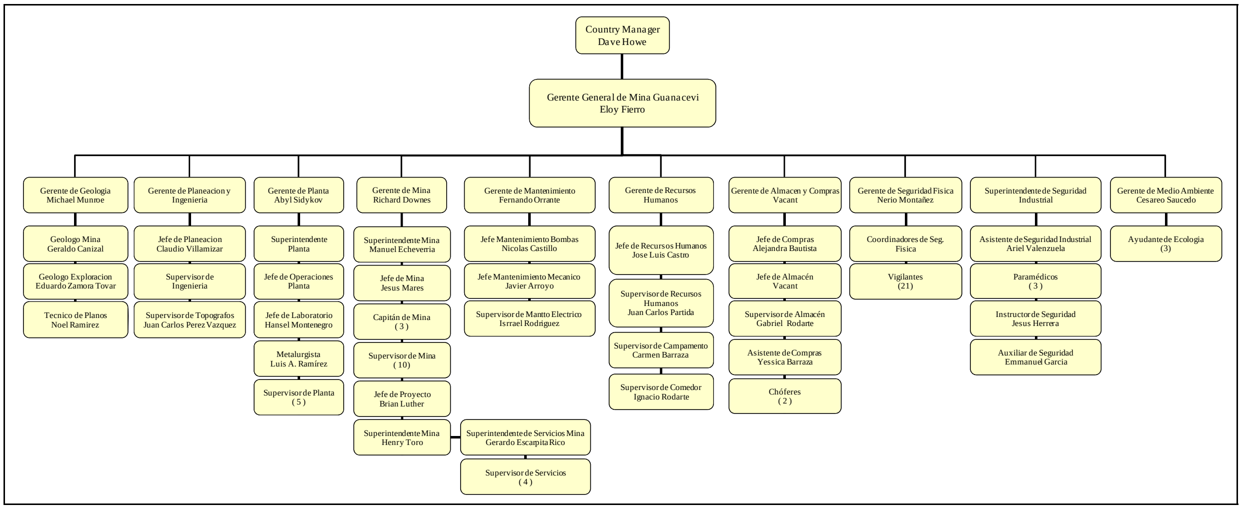


Figure provided by Endeavour Silver Corp.

In the Porvenir Deep zone, mineralization is hosted both in the vein and in altered and weakly to moderately oxidized wall rocks. The vein and argillic altered andesitic hosts to mineralization are moderately fractured with RQDs ranging from <20% locally to typically 50-80%. Mine workings in the upper level have openings up to 5 m in width without experiencing serious ground problems but requiring some ground support. Typically the wider mineralized zones are not close to the hanging wall fault and are less prone to hanging wall instability issues seen in some other parts of the mine.

The footwall to the Porvenir Deep zone in its central part consists of oxidized and argillic altered andesite with a number of faults, the latter generally requiring support in the form of split sets. The immediate footwall zone is moderately competent but, from about 10 m to 40 m from the vein, systematic ground support is required, consisting of both split sets and wire mesh. One major fault zone requires more extensive support in the form of timber or steel sets due to water lubrication of the clay-filled fault plane.

The hanging wall is an andesite with adularia-sericite alteration which varies locally from very weak to very strong, depending on the amount of argillic phases. In the zones of intense argillic hanging wall alteration, ground support such as 3.6 m Swellex bolts and welded mesh support straps are required on a 1.5 m by 1.5 m spacing to maintain stability. In these areas there is always a risk of greater dilution and the mine accounts for these areas when estimating the reserves. Occasionally, a thin cap of vein material is left on the hanging wall to prevent weathering of the clay and assist with stability.

18.3 MINING METHOD

A conventional cut and fill mining method is employed with the stopes generally 150 m long and 20 m high. Access to the stoping areas is provided by a series of primary and secondary ramps located in the footwall. The ramps have grades from minus 15% to plus 12%, with plus or minus 12% as standard. The cross-sections are 4 metres by 4 metres for the primary ramps and 3.5 metres by 3.5 metres for the secondary ramps.

In the upper parts of the mine stope access is by short (10 metres to 40 metres) cross-cuts from the ramp to the vein/stope. These cross-cuts are generally 3.5 metres by 3.5 metres in cross-section and are usually driven down at minus 18% to intersect the stope. As the stope advances up-dip on the vein, the back is taken down in these cross-cuts to maintain access until the cross-cut reaches a maximum inclination of 22%.

In the lower parts of the mine (below the water table) stope access is by 60 m long cross-cuts to the vein/stope. The cross-cuts are generally 3.0 m by 3.5 m in cross-section and are driven at plus 1% to intersect the stope (for water drainage). As the stope advances up-dip on the vein, the back is taken down in these cross-cuts to maintain access until the cross-cut reaches a maximum inclination of plus 22.5%.

Mining in the stopes is done with jackleg drills. Back cuts are taken 2 m to 2.5 m high via vertical up-hole drilling or by breasting. The broken material is mucked out using scooptrams (2 yard or 3.5 yard depending on vein width). Waste fill from mine development is placed in the stope by the same scooptrams to within 2 metres to 2.5 metres of the back. When the vein is less than minimum mining width the footwall is slashed to provide adequate width. This slashing is done during the fill cycle and the slashed material remains in the stope as fill.

Mining dilution has been estimated by Endeavour Silver as variable with a minimum of 0.4 metres of overbreak wallrock dilution and a minimum operational vein width of 2.2 metres; additional dilution is derived from the footwall especially in sill development, from occasional hanging wall failure and from re-mucking of floor fill. In general dilution is estimated at being between 15% and 32%, whilst lost ore is estimated at approximately 5%. The dilution material in almost all cases is mineralized and, therefore, it is difficult to estimate its impact on the final grades of the mined ore, particularly as reliable reconciliation is very difficult to achieve; mining dilution is assumed to have an average grade of 90 g/t Ag and 0.18 g/t Au.

Stopes that have high-grade ore in the sill when started are filled with one metre of cemented rock fill to allow recovery of the sill pillar. The cemented rock fill consists of development waste mixed with 5% by weight ordinary Portland cement and is placed over a five millimetre steel welded mesh on the stope sill. The cemented rock fill is mixed in a muck bay adjacent to the stope by the same scooptrams that will place it in the stope. Three to six sacks of cement (depending on bucket capacity) are simply dumped on top of a bucket of waste, a little water is added and this is mixed a few times by the scooptram and then carried into the stope and dumped on the sill. The cemented rock fill is placed starting at the entrance going into the sill so that the scooptram is driving on top of the fresh fill to provide compaction. This is a common method in Mexico which works well where it is used. Ore and waste transportation is by scooptram and truck haulage.

Ore and waste haulage is performed using two TORO EJC 522 15 tonne underground trucks which are complemented with four nine tonne capacity diesel highway trucks rented from local contractors. For stope and development mucking, Endeavour currently has five 2-yard scooptrams and five 3.5-yard scooptrams. Two single boom Jumbo drills and jacklegs are used for development headings and stope drilling is by jackleg drilling only. A scissor lift truck for services is now on site to improve operational efficiency. Complete maintenance and service facilities for the underground mobile equipment are located near the mine portal.

At shallower depths in the Porvenir mine, drainage and pumping was minimal as very little ground water was encountered. Water was also brought in from the surface for drilling and dust control. As mining has proceeded deeper, a second pump station has been built at the bottom of the second ventilation borehole to handle water produced from below the water table; the mine is currently pumping to surface from 2,000 to 3,000 gallons per minute, and utilizes two pump stations to handle water from the deep Porvenir. A third pump station is in construction now to handle water from the Santa Cruz side of the mine.

Principal mine ventilation is provided by two 100 horsepower, 54 inch conventional exhaust fans in parallel. These fans are located on surface at the head of a 220 m long by 2.1 m diameter borehole. Fresh air is drawn down the ramp, through the workings and exhausted out to the surface through the borehole. This circuit is moving approximately 80,000 cubic feet per minute of air. A second ventilation borehole, 292 m long and 2.4 m diameter located close to the northeastern limit of the deposit, was completed in early 2009. The second borehole, which connects the main Porvenir Deep ramp spiral to surface, will use a 400 HP exhaust fan to move a minimum of 220,000 cubic feet per minute through the circuit. Secondary ventilation is by conventional axial-vane mine fans that are from 24 to 36 inches in diameter and 25 HP to 50 HP. These fans blow ventilating air into the working headings through ventilation ducting that is 24 or 36 inches in diameter.

The electrical power for the mine is distributed by a series of substations connected to the public power grid. Electric power arrives at the mine site via 34.5 KV overhead transmission lines which is reduced by a 2,000 KVA transformer to 13.5 KV and distributed to the Santa Cruz mine and the Porvenir mine transformers. The power is taken underground at the Porvenir mine at 13.5 KV via the ventilation borehole to the principal underground transformer where it is reduced by a 750 KVA transformer to 4,160 volts and distributed out to five portable underground mine transformers where it is reduced further, to 480 V. From the portable transformers electricity is distributed out to the secondary ventilation fans, the jumbo drill and other points of consumption by armored cables sized for the load. The underground electrical system is equipped with an automatic ground-fault-interrupter system. Additional underground transformers will be added as required. The Porvenir mine also has a 350 HP diesel generator capable of supplying power for pumping, secondary ventilation and a compressor in case of any power outage. A new 33 KV electrical line from the previous substation (Santa Cruz) to the new ventilation borehole area (Robbins 2) and Porvenir Dos has been built to assure supplying energy to new projects and new mines. The installation of the new 5,000 KVA transformer in the Robbins 2 ventilation borehole area will support the additional 2,000 KVA contracted to maintain the pumping requirements of the mine; this transformer will reduce 33 KV to 4.16 KV. Power is taken underground at 4.16 KV via the ventilation borehole to the Robbins underground substation where it is reduced using two 1,000 KVA transformers to 480 volts and to the Santa Cruz underground substation where it is reduced by two 750 KVA transformers to 480 volts.

Compressed air is provided by four 650 CFM electric compressors installed on the surface. Compressed air is brought into the mine by a six-inch diameter pipe that passes down the principal ventilation borehole and then branches up and down the ramps in four inch diameter principal airlines and then to two inch airlines that enter the individual working places.

18.4 GRADE CONTROL

The sill faces are mapped on a daily basis by a geologist and tied into the last survey station. The geologist or a sampler spray paints the sample locations and lengths perpendicular to the structures (with less experienced samplers horizontal and vertical samples are also used – until they have the confidence to mark perpendicular samples). The geologist will also spray paint the maximum width that he wants the next round to be within. Typically there are 3-4 samples taken per face: (a) a sample directly above the main mineralized vein; (b) one or two samples in the vein; and (c) a sample directly in the footwall of vein. A sampler then takes chip samples over the marked sample lengths. The samples are placed in individual sample bags with a numbered tag. The second half of the tag remains in the sample book and all pertinent information about the sample is recorded. This is repeated until all the samples are taken for each face. The samples are collected and then delivered to the MG laboratory for sample preparation and assaying. Field duplicates and blanks are submitted on a daily basis. A similar procedure is followed when taking stope samples: In stopes, back and some footwall channel samples are taken every 2.5 m; typically 3-4 channels are taken in each round, but more or less samples are possible depending on the width of the structure; typical sample length is approximately 1 metre but varies from 0.5 metres to 2.0 metres; stope sample lengths are measured horizontally and vertically.

Sampling is done by the mine geology staff to identify potential stopes and make forecasts regarding production from working and planned stopes. The best grade control is the direct interaction between the geologist and the miner in the stope on a daily basis. This includes discussions on selective mining, leaving the hanging wall intact and not gouging into the footwall. The geology and engineering staff meet with mining supervision on a weekly basis to discuss the previous week's production, grade control, and grade control issues, including planned individual stope widths for the coming week. Grade control takes the ongoing involvement of everyone in the mine.

18.5 PRODUCTION

For the year ending December 31, 2009, silver production was 1,873,833 oz and gold production was 5,243 oz. Plant throughput for 2009 was 230,632 tonnes at an average grade of 322 g/t silver and 0.80 g/t gold. In 2009, mill recoveries averaged 78.4% for silver and 88.8% for gold.

Endeavour Silver mine management is currently working on projects to access the deeper portions of already developed ore zones, as well as opening up new mineralized zones.

Two ramps are currently being driven from the Porvenir mine, one into the deep part of the North Porvenir ore zone, where production has already begun, and the other into the deeper portion of the Santa Cruz mine ore zone.

Endeavour Silver has also driven a ramp in to the Porvenir Dos zone via a new portal. Porvenir Dos has become a stand-alone facility with a minimal amount of development. The Porvenir Dos zone is located on the northwest extension of the Santa Cruz vein.

18.6 MINERAL PROCESSING

In 2008 the Guanaceví mill processed ore from the Porvenir mine (North Porvenir and El Porvenir), purchased ore and Bolañitos (Guanajuato) flotation concentrate. In 2008, grinding had a capacity of 698 t/d average.

The flotation circuit has a capacity of approximately 420 t/d, while the cyanide leach circuit can process up to 800 t/d. The re-commissioned flotation section started processing ore in October, 2008, but is currently shutdown due to insufficient of feed.

The plant consists of the following circuits:

- Crushing: ore bins, conventional crushing with a primary 24”x36” jaw crusher, a 4-foot secondary cone and 3-foot tertiary cone crushers, a 5’x10’ vibrating screen (-½” to -5/8”).
- Grinding: with 4 ball mills: a 10.5’x12’ Hardinge, two 7’x7.5’ Denver and a 5’x 6’ Fimsa ball mill.
- Cyanidation and CCD circuit: 16 leach tanks in two series (12 tanks of 20’x20’ and 4 tanks of 30’x30’).
- Merrill-Crowe circuit with 2 leaf clarifiers and one de-aeration tower.
- Refinery: two gas fired furnaces.
- Flotation.

Oxidized ore is ground and pumped to a 50-foot diameter thickener and is thickened to 50% solids. The thickened slurry is transferred to 2 series of agitated leach tanks (12 units of 20’x20’ and 4 units of 30’x30’) that are arranged for gravity flow from tank to tank. NaCN is added to the slurry at a ratio of 2.7 kg per tonne of solids. The solution from the leaching tanks is processed in a counter-current decantation circuit through five thickeners. The pregnant solution goes to the Merrill-Crowe plant for clarification and precipitation of the silver and gold. The retention time in the leaching plant is about 72 hours.

A gas furnace smelts the precipitate to produce doré which typically averages 98% silver and is shipped and processed at the Peñoles Met-Mex facility in Torreón for final refining. The refined gold and silver is sold through Auramet in London, England.

The assay laboratory utilizes wet assaying, fire assaying and atomic absorption methods. The laboratory does all the assaying required for mill processing as well as assaying mine and exploration samples. Duplicates and blanks are run on a regular basis, as well as check assays at outside laboratories.

18.7 TAILINGS DAM

The mill lies adjacent to historic tailings dams which are not utilized in current operations, and a new tailings pond (Figure 18.2). Endeavour Silver has sampled the old tailings and it is believed that re-treatment of the tailings could possibly add to the economics of the Guanaceví Mines project in the future. Any potential resources in the historic tailings are beyond the scope of this report.

The new tailings pond expansion phase 2 was completed in June, 2008 which will allow the plant to operate until mid-2009. A temporary tailings dam was constructed on the top of the old tailings pond to use in the period of the new tailings facility expansion. Endeavour Silver was contracted AMEC to design and build a temporary dam, which will allow operating for approximately 5 months.

The new tailings dam was constructed using the centreline method and is completely lined (Figure 18.3). The process water is recycled back to the mill. Further expansion of the tailings facility requires construction of a new access road. A new road permit application is in process and is expected in March, 2009.

Figure 18.2
Aerial View of the Plant and Tailings Facilities of the Guanaceví Mines Project

Figure provided by Endeavour Silver Corp.

Figure 18.3
Photograph of Tailings Dam Being Constructed With Historical Tailings and Plant in the Background

Figure provided by Endeavour Silver Corp.

18.8 CONTRACTS

Endeavour Silver has no contracts for mining, smelting, refining, transportation, handling, sales, contracts or agreements that are outside of normal or generally accepted practices within the mining industry. Endeavour Silver has a policy on not hedging or forward selling any of its products.

18.9 ENVIRONMENTAL CONSIDERATIONS AND SAFETY

The Guanaceví Mines project monitors all the effluents and air quality at the site. Regular monitoring and laboratory testing are conducted either by Endeavour Silver staff or out-sourced to qualified contractors. Regular meetings are held with the local Ejido and President of the Municipality of Guanaceví to discuss areas of mutual concern.

The mill and mine recycle batteries, oils, greases, steel and aluminum.

The mine and mill have induction meetings and tours with all new employees and hold daily safety meetings with all employees.

Endeavour Silver has completed approximately 65% to 70% of an environmental action plan established by the Mexican government environmental authority (SEMARNAT) for the Guanaceví Mines project. These improvements are necessary due to negligence in the areas of ecology and the environment by previous operators of the project. Endeavour Silver is confident that it can meet the standards set by the environmental authorities within the established time period.

Endeavour Silver has an environmental contingency plan in place to take immediate control of any incident, correcting the main cause of the incident, and implementing the actions needed to prevent it from happening again.

Environmental projects currently being worked on at the Guanaceví Mines project include:

- Environment impact studies for the extension of the tailings dam and moving of the main access road and a new haul from the Porvenir Dos mine to the MG plant.
- General cleaning and painting activities at the MG plant, office and staff living quarters at the "Colonia" and at the mine.

Endeavour Silver acknowledges the importance of the safety and health of its employees, while at the same time, improving the quality of their lives. To ensure this, Endeavour Silver has implemented safety programs to prevent accidents and work-related illnesses, and raise awareness of the value of these programs and to promote improvement of the conditions and work environment in every area of the Guanaceví Mines project. Specific objectives include:

- To protect all personnel from possible work risks that could cause health damage.

- To provide the employees with the necessary training and emphasize the precautions required to prevent accidents.

- To establish safety regulations for all work areas and activities.

- To provide the employees with rules, guidelines and basic procedures about safety and health in order to prevent risks in every area of the workplace.

Endeavour Silver has designed a personnel training program to prevent workplace accidents, which is registered at the Ministry of Labour and Social Prevention.

Endeavour Silver has established mine rescue training at the Guanaceví Mines project. The objective is to have on site a team of mine rescue personnel that can take control of any accident in the mine, including the most serious risk, a mine-related fire. A total of 15 employees are currently enrolled in the mine rescue program. Ongoing training is being conducted by a qualified mine rescue trainer who previously worked seven years for Peñoles at the Cienega mine in Durango.

18.10 TAXES

Taxation in Canada and Mexico is often complex and varies from one jurisdiction to the other. There are numerous calculations and allowances, all of which are outside the scope of this report. However, taxes are all levied in the normal course of business. Endeavour Silver is subject to the taxing jurisdictions of Durango, Mexico and Canada. Endeavour Silver represents that all taxes assessed have been paid or will be paid when due, aside from any protests or other tax relief available under law.

18.11 CAPITAL COST ESTIMATES

In 2009, the plant expansion and upgrade program continued at the Guanaceví Mines project. During the year emphasis was on expanding plant capacity.

Capital projects completed in 2009 included:

- Mine development 4,040 m.
- Lime feeder at plant.
- Concentrate handling facility.
- Tailings pond expansion.
- Pumps stations.
- Electrical power substations.
- Robbins for North Porvenir.
- Porvenir Dos Ramp and access road.

In 2010, Endeavour Silver has US $22,643,249 million budgeted for capital projects at the Guanaceví Mines project (Table 18.1). This budget for capital expenditure on the mine and plant and is in addition to the exploration budget presented in Section 20.0 below.

Table 18.1
2010 Capital Cost Estimates for the Guanaceví Mines Project

Description	Cost (US $)
Mine equipment	3,312,978
Mine various	824,000
Assay laboratory	166,630
Plant, general	316,500
Tailings	930,000
Environmental	81,705
Mine exploration	1,626,500
Development	9,445,806
Plant	5,734,130
Buildings	95,000
Vehicles	110,000
Total	**22,643,249**

Table provided by Endeavour Silver Corp.

18.12 2009 OPERATING COSTS

The cash operating cost of silver produced at the Guanaceví Mines project in fiscal year 2009 was $7.99 per oz compared to $8.60 in 2008 (Table 18.2). Cash operating cost per oz of silver is calculated net of gold credits and royalties. On a per tonne of ore processed basis, the cash operating costs in 2009 averaged US $86.24/t compared to 2008 US $75.28/t.

The decrease in cash costs per ounce over 2009 is attributed to a combination of increased gold credit from new ore zones, appreciation of gold prices and improved production efficiencies.

The development of deep North Porvenir and Porvernir Dos contributed to the significantly reduced cash costs towards year end.

18.13 2010 PRODUCTION FORECAST

For 2010, Endeavour Silver is forecasting to produce 2.345 million ounces of silver and 5,085 ounces of gold from the Guanaceví Mines project. Plant throughput for 2010 is forecast at 319,592 t at an estimated average grade of 309 g/t silver and 0.60 g/t gold. Recoveries are forecast to average 74% and 82% for silver and gold, respectively. Plant throughput is based on production from the Porvenir North mine, Porvenir Dos mine and third party ore bought from local miners. The production plan for the Porvenir mine reserves is presented in the following section.

Table 18.2
2008 and 2009 Operating Costs for the Guanaceví Mines Project

(In US $000s except oz produced / payable and cash cost/oz)	Year Ended Dec 31, 2009	Three Months Ended Dec 31, 2009	Three Months Ended Sep 30, 2009	Three Months Ended June 30, 2009	Three Months Ended Mar 31, 2009
Cost of Sales	$20,255	$8,142	$4,908	$3,782	$3,423
Add/(Subtract):					
Royalties	($820)	$27	($296)	($334)	($271)
Change in Inventories	$455	($1,790)	$68	$1,442	$735
Change in By-Product Inventories	($661)	$188	($24)	($676)	($149)
By-Product gold sales	($4,427)	($2,495)	($885)	($423)	($624)
Cash Operating Costs	**$14,802**	**$4,072**	**$3,771**	**$3,791**	**$3,168**
Oz Produced	1,870,337	587,477	457,609	415,775	409,476
Oz Payable	1,851,634	581,603	453,033	411,617	405,381
Cash Operating Cost Per Oz US $*	**$7.99**	**$7.00**	**$8.32**	**$9.21**	**$7.81**
(In US $000s except oz produced / payable and cash cost/oz)	**Year Ended Dec 31, 2008**	**Three Months Ended Dec 31, 2008**	**Three Months Ended Sep 30, 2008**	**Three Months Ended June 30, 2008**	**Three Months Ended Mar 31, 2008**
Cost of Sales	$19,950	$4,983	$5,376	$4,467	$5,124
Add/(Subtract):					
Royalties	($807)	($264)	($77)	($198)	($268)
Change in Inventories	$13	($191)	($22)	196	$30
By-Product gold sales	($3,336)	($796)	($824)	($764)	($979)
Cash Operating Costs	$15,820	$3,759	$4,453	$3,701	$3,907
Oz Produced	1,858,937	515,407	465,661	419,245	458,624
Oz Payable	1,840,348	510,253	461,004	$415,053	454,038
Cash Operating Cost Per Oz US $*	**$8.60**	**$7.37**	**$9.66**	**$8.92**	**$8.61**

*Based on payable silver production attributable to cost of sales
Table provided by Endeavour Silver Corp.

The property has a substantial undeveloped resource potential. Beyond 2010, Endeavour Silver believes that continued exploration and development will lead to the discovery of new resources, and Endeavour Silver actively continues acquiring rights to new properties in the Guanaceví district.

18.14 PORVENIR – PORVENIR DOS MINE RESERVES PRODUCTION PLAN 2010 - 2011

The life-of-mine plan for the Porvenir mine and Porvenir Dos forecasts production of 1,094,807, tonnes at an average recoverable grade of 303 g/t silver and 0.42 g/t gold to produce 10,647,693 ounces of silver and 14,877 ounces of gold during the next 3 years. Plant recoveries are forecast to average 74% for silver and 82% for gold.

The mine plan also includes development advance and ore production from the Santa Cruz and Porvenir Cuatro resources. The development of these projects has been considered in the capital investments for 2010. Ore production from these resources will be stockpiled near the process plant. The mine plan was prepared by the Guanaceví Mines project engineering department.

For 2010 the mine plan forecasts production of 2.345 million ounces of silver and 5,085 oz of gold from the Porvenir North and Porvenir Dos mines as well as third party material. Plant throughput is forecast at 319,592 t at an average grade of 309 g/t silver and 0.60 g/t gold.

The production plan forecasts that mining of the reserves will be completed in December, 2013. The average monthly production rate is 20,229 t from the Porvenir North mine and 8,254 t from the Porvenir Dos mine. To achieve the planned production the mine plan forecasts a total of 9,714 m of development, with an average monthly advance of 236 m in Porvenir mine and 191 m of development in Porvenir Dos mine. For an average combined monthly advance of 214 m.

The mine plan tonnages and grades for North Porvenir and Porvenir are based on the fully diluted models; tonnages and grades for Santa Cruz and Porvenir Cuatro are taken from the vein models; all models were created at the 2009 year-end. Different variables were applied to the block models estimations based on mine considerations. An ore loss of 3% was considered for all mines. A mine recovery of 97% was taken in Porvenir Dos based on poor stability in the north side of the stopes and 90% recovery was considered in Porvenir Cuatro; this is a safety factor used because the uncertainty of the resource. Recovery of 60% was the safety factor of the Santa Cruz deposit; this factor is higher because there is a higher grade of uncertainty. The dilution factor for Porvenir Cuatro was 15% since the widths of the vein were higher than 4 m. For Santa Cruz 25% dilution was taken, with grades of 40 g/t silver and 0.05g/t gold used for dilution.

The mine plan is based on the mining methodology and equipment described in Section 18.3. The mine plan assumes 6 jackleg production crews for ore production. Development will be performed by 2 jackleg crews and 2 jumbo crews. Each crew works a 10 hour shift with two shifts being operated 365 days in the year. Production crews produce 60 t per shift; drilling 35 blast holes. Development jacklegs crews blast an average of one round per shift with an average advance of 1.5 m. The average jackleg advance per shift from the 2 crews is 3 m. The jumbo crews blast on average 1.5 rounds per shift with an average round advance of 2.8 m, giving an effective shift advance of 4.2 m.

Endeavour Silver’s mine and development plan through December, 2010 is shown in Figure 18.4 (Porvenir North) and Figure 18.5 (Porvenir Dos).

Figure 18.4
Longitudinal Section of the Porvenir North Mine (looking northeast) showing Mine and Development Plan through December, 2010

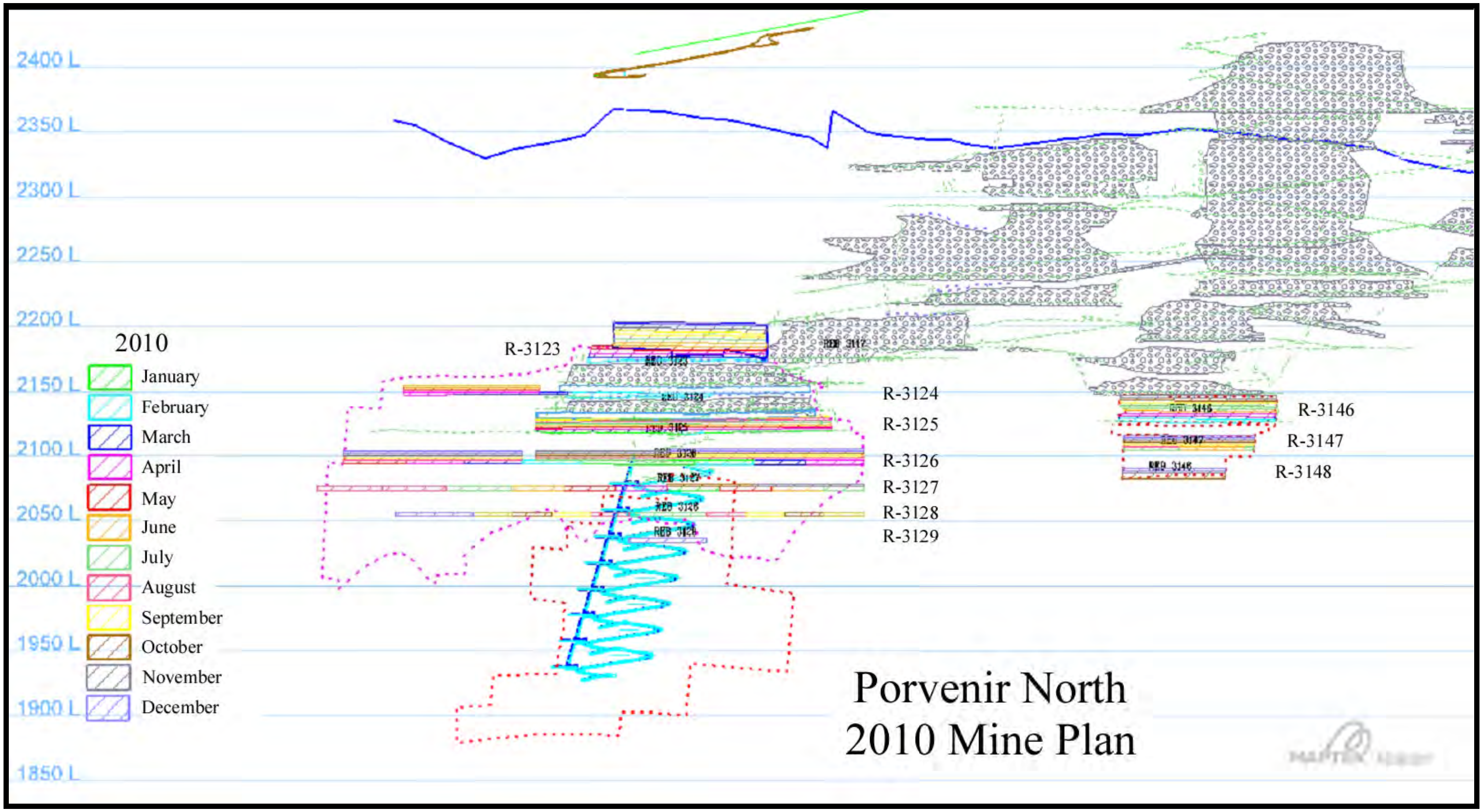


Figure provided by Endeavour Silver Corp.

Figure 18.5
Longitudinal Section of the Porvenir Dos Mine (looking northeast) showing Mine and Development Plan through December, 2010

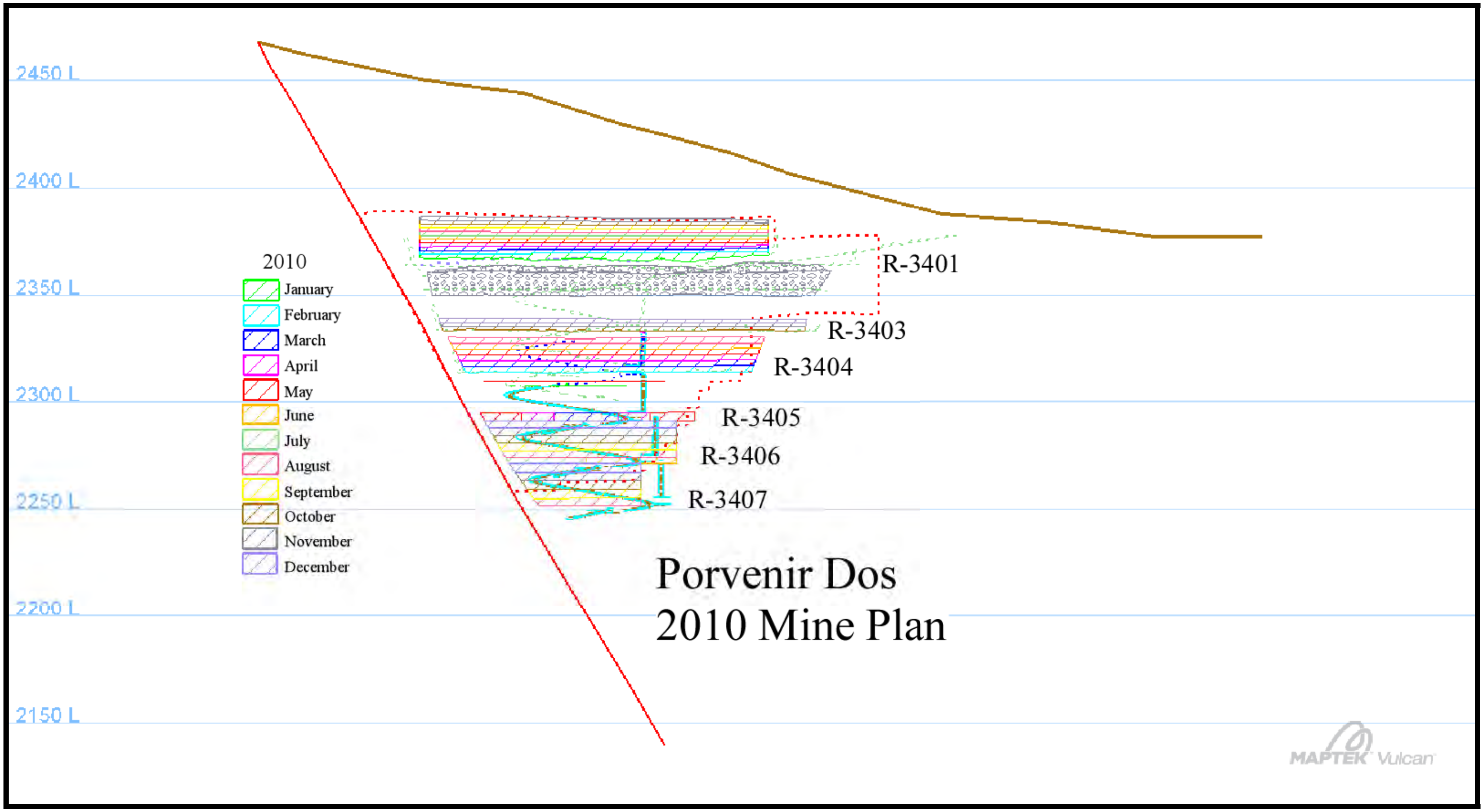


Figure provided by Endeavour Silver Corp.

19.0 INTERPRETATION AND CONCLUSIONS

19.1 DISCUSSION AND INTERPRETATION

Endeavour Silver's Guanaceví Mines project has an extensive mining history and well known silver and gold bearing vein systems. The ongoing exploration programs have continued to demonstrate the potential for the discovery of additional resources and reserves as development and exploration at the mine continues.

In addition, since taking over the day-to-day operation of the mine, Endeavour Silver has continued to implement measures in a number of areas which have culminated in increased productivity and efficiency leading to cost savings. Further improvements in implementing low cost mining techniques should allow mining to be expanded beyond the boundaries of previously mined areas and extend into new areas.

Following its review, Micon is satisfied that the geology/exploration teams at Guanaceví have acquired a good understanding of the geology and mineralization controls which have an important bearing on resource estimates and future exploration efforts. Thus, the resource estimation process (in particular for new reserve/resource blocks like Porvenir Cuatro) is well supported by a good geological/mineralization model. The acquisition of the Ballmark Core Orientation System has enhanced the abilities of Endeavour's Silver's exploration division in determining the geometry of the manto type deposits at Buena Fe and other structurally complex targets. Also based on its data verification as detailed under Section 14, Micon is satisfied that the database used in the reserve/resource estimate is credible.

Micon has audited Endeavour Silver's updated resource and reserve estimate for the period ending December 31, 2009. The results of the measured and indicated mineral resource estimate are presented in Table 19.1, while the inferred mineral resource is presented in Table 19.2. The results of the mineral reserve estimate are presented in Table 19.3. The mineral reserve figures reported here are in addition to the reported mineral resources.

Table 19.1
Guanaceví Mines Project Measured and Indicated Mineral Resource Summary as at December 31, 2009

Resource Categories	Tonnes	Silver g/t	Gold g/t	Silver Equivalent g/t	Silver oz	Gold oz	Silver Equivalent oz
Measured	-	-	-	-	-	-	-
Indicated	**2,173,000**	**255**	**0.53**	**290**	**17,830,000**	**37,100**	**20,244,100**
Total Measured + Indicated	**2,173,000**	**255**	**0.53**	**290**	**17,830,000**	**37,100**	**20,244,100**

Table 19.2
Guanaceví Mines Project Inferred Mineral Resource Summary as at December 31, 2009

Resource Categories	Tonnes	Silver g/t	Gold g/t	Silver Equivalent g/t	Silver oz	Gold oz	Silver Equivalent oz
Inferred	**1,431,000**	**209**	**0.36**	**232**	**9,607,200**	**16,400**	**10,674,800**

Table 19.3
Guanaceví Mines Project Mineral Reserve Summary as at 31 December, 2008

Reserve Categories	Tonnes	Silver g/t	Gold g/t	Silver Equivalent g/t	Silver oz	Gold oz	Silver Equivalent oz
Proven	229,000	368	0.62	408	2,706,000	4,600	3,001,800
Probable	1,083,000	354	0.51	388	12,329,200	17,900	13,494,200
Total Proven + Probable	1,312,000	356	0.54	391	15,035,200	22,500	16,496,000

The process of mineral resource and reserve estimation includes technical information which requires subsequent calculations or estimates to derive sub-totals, totals and weighted averages. Such calculations or estimations inherently involve a degree of rounding and consequently introduce a margin of error. Where these occur, Micon does not consider them to be material. The final resource and reserve figures in Tables 19.1 through 19.3 have been rounded in most cases to reflect that the numbers are estimates. Mineral resources that are not mineral reserves do not have demonstrated economic viability.

Micon has conducted an audit of the Endeavour Silver resource and reserve estimate for the period ending December 31, 2009, and considers these estimates to have been reasonably prepared and to conform to the current CIM standards and definitions for estimating resources and reserves as required under NI 43-101 regulations. Accordingly, Micon accepts Endeavour Silver's resource and reserve estimate as its basis for the ongoing mining operations at the Guanaceví Mines project. In Micon's opinion there are no significant technical, legal, environmental or political considerations which would affect the extraction and processing of the resources and reserves at the Guanaceví Mines project.

Micon believes that the land controlled by Endeavour Silver continues to be highly prospective both along strike and down dip of the existing mineralization and that further resources could be converted into reserves with additional exploration and development.

Endeavour Silver is in the position of being able to apply modern exploration concepts and technology to one of the major historical mining districts in Mexico which previously had experienced limited exploration. Therefore, Micon believes that the property continues to holds the potential for the discovery of mineralized deposits of similar character and grade as those currently being exploited or mined in the past either along the trend of the vein or at depth below the presently exploited areas.

19.2 CONCLUSIONS

In the case of the Guanaceví Mines project, although a number of mineralized areas have been exploited during the past, improvements in mining techniques have allowed mining to be expanded within the boundaries of previously mined areas and extended the mining into new areas.

The resources and reserves reported herein by Endeavour Silver for the Guanaceví Mines project have been audited and accepted by Micon as constituting the basis for Endeavour Silver's operations in Mexico.

Micon is satisfied that Endeavour Silver's exploration and development objectives for the year ended December 31, 2009 have been met, as evidenced by the discovery of the Porvenir Cuatro deposit and a significant increase in resources/reserves in other areas as summarized in Section 17. Therefore, in summary, Micon believes that the program for further exploration on the Guanaceví Mines project proposed by Endeavour Silver is both warranted and justified as the potential for the continuing discovery of additional resources is good.

20.0 RECOMMENDATIONS

20.1 2010 EXPLORATION PROGRAMS

Endeavour Silver's exploration efforts are ongoing and exploration efficiencies appear to be improving progressively as new resources are being discovered.

In 2010, Endeavour Silver plans a follow-up exploration program focused on several of the new discoveries made in the San Pedro sub-district near Endeavour's mining operation at Guanaceví and testing several new prospective targets within the district. The primary long-term goal of this program is to expand reserves and resources and to identify properties for potential acquisition in the Guanaceví district for future growth.

The 2010 exploration program is planned to include 8,000 m of core in 25 surface diamond drill holes to test mantos, stockworks and veins in the San Pedro area in the Guanaceví district. The estimated cost of diamond drilling is US $150/m. A limited program of geological studies is also budgeted for Porvenir Cuatro in 2010.

Drilling proposed for the San Pedro area will test high grade veins as well as moderate grade mantos and one larger stockwork zone of silver-lead-zinc mineralization, all within an area measuring more than 1.5 km in length and 500 m across. Mineralized zones are mainly comprised of narrow veinlets of quartz, carbonate and adularia with sphalerite, galena and pyrite hosted in Tertiary-age volcaniclastic andesite.

In so far as mine exploration is concerned, given that (1) the known mineralization on the Santa Cruz vein extends some 4,500 m along strike, that (2) the mineralized zones in the Deep Santa Cruz, Porvenir, Porvenir Dos and Alex Breccia areas are open at depth, and that (3) the down-dip potential of the Deep Santa Cruz, Porvenir, Porvenir Dos and Alex Breccia areas does not appear to be constrained by the increase in base-metal to silver and gold ratios, Endeavour Silver could reasonably expect that further exploration may yield additional mineralized areas which could have a considerable positive impact on the resources and possibly on the reserves as exploration and development continue at the Guanaceví Mines project. Therefore, Micon believes that the program for further exploration on the Guanaceví Mines project proposed by Endeavour Silver is both warranted and justified as the potential for the continuing discovery of additional resources is good.

The proposed exploration program will focus on expanding the highest priority discovery areas in order to prepare them for an updated reserve/resource report at year-end 2010.

Table 20.1 summarizes the planned 2010 exploration budget for the Guanaceví Mines project.

Table 20.1
Guanaceví Exploration Priority Targets – 2010

Project Area	2009 Program			Budget US $
	Holes	Metres	Samples	
Priority Target Areas				
San Pedro Surface	25	8,000	7,050	1,466,700
Porvenir Cuatro Surface				17,000
Porvenir Mine Surface & Underground	15	5,000	1,500	791,000
Totals	**25**	**7,700**	**3,950**	**1,296,000**

Table provided by Endeavour Silver Corp.

Exploration Target Areas

Priority targets include San Pedro surface, Porvenir Cuatro surface and Porvenir mine surface and underground. For each of these targets, the programs are:

1. San Pedro – surface mapping/sampling/trenching; surface diamond drilling (8,000 m).
2. Porvenir Cuatro – geological studies.
3. Porvenir mine surface and underground – exploration development; underground diamond drilling (5,000 m).

The detailed budget for the priority exploration targets is summarized in Table 20.2.

Table 20.2
Guanaceví Exploration Budget – 2010

Area	Activity (units)	Units	Unit Cost (US $)	Total Cost (US $)
San Pedro - Epsilon	Assays - Rock and soil (sample)	400	30.00	12,000
	Assays - Core (sample)	1,300	40.00	52,000
	Consultants (days)	20	1,200.00	24,000
	Diamond drilling (m)	4,000	125.00	500,000
	Field and office supplies (weeks)	15	500.00	7,500
	Housing and food (weeks)	15	300.00	4,500
	Geology and engineering personnel (weeks)	15	3,500.00	52,500
	Salaries - labour (weeks)	15	1,600.00	24,000
	Trenches, roads, drill pads and reclamation (weeks)	15	2,000.00	30,000
	Trenches – sampling only (days)	10	500.00	5,000
	Travel and lodging (weeks)	15	100.00	1,500
	Vehicle inc. gasoline, repair and maintenance (weeks)	15	200.00	3,000
	Surface use agreements (months)	3	5,000.00	15,000
	Expenses non deductable (weeks)	15	100.00	1,500
	Epsilon Subtotal			**732,500**
San Pedro – Noche Buena – Buena Fé	Assays (sample)	1,250	40.00	50,000
	Diamond drilling (m)	3,500	125.00	437,500
	Field and office supplies (weeks)	12	500.00	6,000
	Housing and food (weeks)	12	300.00	3,600
	Geology and engineering personnel (weeks)	12	3,500.00	42,000
	Salaries - labour (weeks)	12	1,000.00	12,000
	Trenches, roads, drill pads and reclamation (weeks)	12	2,000.00	24,000
	Travel and lodging (weeks)	12	100.00	1,200
	Vehicle inc. gasoline, repair and maintenance (weeks)	12	200.00	2,400

	Surface use agreements (months)	2	5,000.00	10,000
	Expenses non deductable (weeks)	12	100.00	1,200
	Noche Buena - Buena Fe Subtotal			**589,900**
San Pedro – Veronica – La Blanca	ASSAYS - Rock and soil (sample)	400	30.00	12,000
	ASSAYS - Core (sample)	200	40.00	8,000
	Diamond drilling (m)	500	125.00	62,500
	Field and office supplies (weeks)	8	500.00	4,000
	Housing and food (weeks)	8	300.00	2,400
	Geology and engineering personnel (weeks)	8	2,500.00	20,000
	Salaries - labour (weeks)	8	1,400.00	11,200
	Trenches, roads, drill pads and reclamation (weeks)	8	2,000.00	16,000
	Trenches – sampling only (days)	10	500.00	5,000
	Travel and lodging (weeks)	8	100.00	800
	Vehicle inc. gasoline, repair and maintenance (weeks)	8	200.00	1,600
	Surface use agreements (months)		5,000.00	
	Expenses non deductable (weeks)	8	100.00	800
	Veronica - La Blanca Subtotal			**144,300**
Porvenir Cuatro	Assays (sample)		40.00	
	Consultants (days)	10	1,200.00	12,000
	Diamond drilling (m)		125.00	
	Field and office supplies (weeks)		500.00	
	Housing and food (weeks)		300.00	
	Geology and engineering personnel (weeks)		2,500.00	
	Salaries - labour (weeks)		1,000.00	
	Trenches, roads, drill pads and reclamation (weeks)	5	1,000.00	5,000
	Travel and lodging (weeks)		100.00	
	Vehicle inc. gasoline, repair and maintenance (weeks)		200.00	
	Surface use agreements (months)		5,000.00	
	Expenses non deductable (weeks)		100.00	
	Porvenir Cuatro Subtotal			**17,000**
	Guanaceví MineProject Exploration Total			**1,483,700**

Table provided by Endeavour Silver Corp.

20.2 RECOMMENDATIONS

Micon has reviewed Endeavour Silver’s proposal for further exploration on its Guanaceví Mines property and recommends that Endeavour Silver conducts the exploration program as proposed subject to funding and any other matters which may cause the proposed exploration program to be altered in the normal course of its business activities or alterations which may affect the program as a result of exploration activities themselves.

The Guanaceví Mines project, located in one of the major Mexican silver districts, has been a good acquisition for Endeavour Silver. Micon has reviewed Endeavour Silver’s proposal for further exploration and has conducted its third audit of the resource and reserve estimate for the project and has accepted the estimate as correct. Micon makes the following additional recommendations to assist Endeavour Silver in its exploration and resource and reserve estimation processes:

1) Micon recommends that future budgets should include modern-day technology sampling tools to improve the quality of the underground samples used for evaluation.

2) Micon recommends that Endeavour Silver continues to develop an effective reconciliation plan for the Guanaceví Mines project. The ability to be able to reconcile the ore mined and milled on a stope-by-stope basis to the original estimates

for the stope will be a critical factor in future resource and reserve estimations. The reconciliations will form the basis of reviewing dilution estimates, mining loss and gain estimates, and will assist in reviewing the classification categories of the resources.

3) Micon recommends that, as further data are generated from mining, more detailed examination of the modeling parameters should be undertaken to develop better estimation protocols.

4) Micon recommends that Endeavour Silver introduces standard procedures for its operating mines and exploration division(s) in so far as resource and reserve parameters are concerned to maintain consistency.

MICON INTERNATIONAL LIMITED

"William J. Lewis"

William J. Lewis, B.Sc., P.Geo.
Senior Geologist March 15, 2010

"Charley Z. Murahwi"

Charley Z. Murahwi, M.Sc., P.Geo, MAusIMM
Senior Geologist March 15, 2010

"Robert J. Leader"

Robert J. Leader, P.Eng
Senior Mining Engineer March 15, 2010

"Dibya Kanti Mukhopadhyay"

Dibya Kanti Mukhopadhyay, M.Sc, MAusIMM
Senior Mineral Resource Geologist March 15, 2010

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CERTIFICATE OF AUTHOR
WILLIAM J. LEWIS

As the co-author of this report on the Guanaceví Mines project of Endeavour Silver Corp., in Durango State, Mexico, I, William J. Lewis do hereby certify that:

1) I am employed by, and carried out this assignment for, Micon International Limited, Suite 900, 390 Bay Street, Toronto, Ontario M5H 2Y2, tel. (416) 362-5135, fax (416) 362-5763, e-mail wlewis@micon-international.com;

2) I hold the following academic qualifications:

   B.Sc. (Geology) University of British Columbia 1985

3) I am a registered Professional Geoscientist with the Association of Professional Geoscientists of Manitoba (membership # 20480); as well, I am a member in good standing of several other technical associations and societies, including:

   - Association of Professional Engineers and Geoscientists of British Columbia (Membership # 20333)
   - Association of Professional Engineers, Geologists and Geophysicists of the Northwest Territories (Membership # 1450)
   - Association of Professional Geoscientists of Ontario (Membership # 1522)
   - The Geological Association of Canada (Associate Member # A5975)
   - The Canadian Institute of Mining, Metallurgy and Petroleum (Member # 94758)

4) I have worked as a geologist in the minerals industry for 25 years;

5) I am familiar with NI 43-101 and, by reason of education, experience and professional registration; I fulfill the requirements of a Qualified Person as defined in NI 43-101. My work experience includes 4 years as an exploration geologist looking for gold and base metal deposits, more than 11 years as a mine geologist in underground mines and 5 years as a surficial geologist and consulting geologist on precious and base metals and industrial minerals;

6) I visited the property in December, 2006 and have not conducted further site visits to the property;

7) I have co-authored the previous Micon Technical reports for the mineral properties in question;

8) As of the date of this certificate to the best of my knowledge, information and belief, the technical report contains all scientific and technical information that is required to be disclosed to make this report not misleading;

9) I am independent of the parties involved in the transaction for which this report is required, other than providing consulting services;

10) I am responsible for the preparation of sections 1, through 11, 15 16, 18, 19, 21 and jointly wrote sections 12, 13, and 20 of the Technical Report dated March 15, 2010 entitled “NI 43-101 Technical Report Audit of the Resource and Reserve Estimate for the Guanaceví Mines Project, Durango State Mexico.”

Dated this 15 day of March, 2010

“William J. Lewis”

William J. Lewis, B.Sc., P.Geo.
Senior Geologist,
Micon International Limited

CERTIFICATE OF AUTHOR
CHARLEY Z. MURAHWI

As a co-author of this report on the Guanaceví Mines project of Endeavour Silver Corp., I, Charley Z. Murahwi do hereby certify that:

1) I am employed as an Senior Geologist by, and carried out this assignment for, Micon International Limited, Suite 900, 390 Bay Street, Toronto, Ontario M5H 2Y2, telephone 416 362 5135, fax 416 362 5763, e-mail cmurahwi@micon-international.com.

2) I hold the following academic qualifications:

   B.Sc. (Geology) University of Rhodesia, Zimbabwe, 1979;

   Diplome d´Ingénieur Expert en Techniques Minières, Nancy, France, 1987;

   M.Sc. (Economic Geology), Rhodes University, South Africa, 1996.

3) I am a registered Professional Geoscientist of Ontario (membership number 1618), a member of the Australasian Institute of Mining & Metallurgy (AusIMM) (membership number 300395) and am also a registered Professional Natural Scientist with the South African Council for Natural and Scientific Professions (membership # 400133/09).

4) I have worked as a mining and exploration geologist in the minerals industry for over 28 years;

5) I do, by reason of education, experience and professional registration, fulfill the requirements of a Qualified Person as defined in NI 43-101. My work experience includes 14 years on gold, silver, copper, tin and tantalite projects (on and off- mine), and 12 years on Cr-Ni-Cu-PGE deposits in layered intrusions/komatiitic environments.

6) I visited the Guanaceví Mines project in Mexico from 6 to 9 September, 2008 and from 20 to 22 November, 2009. I also visited the Endeavour Silver exploration office in Durango (Mexico) on 5 September, 2008 and on 19 November, 2009.

7) I have co-authored the previous Micon Technical reports for the mineral properties in question;

8) As of the date of this certificate to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make this report not misleading;

9) I am independent of the parties involved in the Guanaceví property, other than providing consulting services;

10) I have read the NI 43-101 and the portions of this Technical Report for which I am responsible have been prepared in compliance with this Instrument.

11) I am responsible for the preparation of section 14 and co-authored sections 10, 12, 13, 17, 19 and 20 of this Technical Report dated March 15, 2010 and entitled "NI 43-101 Technical Report Audit of the Resource and Reserve Estimate for the Guanaceví Mines Project, Durango State, Mexico."

Dated this 15th day of March, 2010

"Charley Z. Murahwi"

Charley Z. Murahwi, M.Sc., P. Geo. MAusIMM

CERTIFICATE OF AUTHOR
ROBERT JAMES LEADER

As the co-author of this report on the Guanaceví project of Endeavour Silver Corp., in Durango State, Mexico, I, Robert James Leader do hereby certify that:

1) I am employed by, and carried out this assignment for, Micon International Limited, Suite 205, 700 West Pender Street, Vancouver, BC, V6C 1G8, tel. (604) 647-6463, fax (604) 647-6455, e-mail jleader@micon-international.com;

2) I hold the following academic qualifications:

ACSM (First Class)	Camborne School of Mines - 1974
M.Sc. (Engineering)	Queens University, Kingston, Ontario - 1981

3) I am a registered Professional Engineer with the Association of Professional Engineers and Geoscientists of British Columbia (Membership #13896), I am a member in good standing of other technical associations and societies, including:
   - The Canadian Institute of Mining, Metallurgy and Petroleum
   - The Institute of Materials, Minerals and Mining (IOM3), UK

4) I have worked as a mining engineer in the minerals industry for 32 years;

5) I am familiar with NI 43-101 and, by reason of education, experience and professional registration; I fulfill the requirements of a Qualified Person as defined in NI 43-101. My work experience includes 3 years working as a mining engineer on a base metal underground mine, and over 15 years as a senior mining engineer and consultant carrying out reserves estimates and mine planning and design for diverse mining projects both underground and open pit;

6) I have not visited the Guanaceví Mines Project in Mexico;

7) I have co-authored the previous Micon Technical reports for the mineral properties in question;

8) As of the date of this certificate to the best of my knowledge, information and belief, the technical report contains all scientific and technical information that is required to be disclosed to make this report not misleading;

9) I am independent of the parties involved in the transaction for which this report is required, other than providing consulting services;

10) In this report, I am responsible for the preparation of parts of Sections 1, 2, 17.7, and 17.8, and parts of Sections 19 and 20 of the technical report dated March 15, 2010 entitled "NI 43-101 Technical Report Audit of the Resource and Reserve Estimate on the Guanaceví Project, Durango State, Mexico."

Dated this 15th day of March 2010

"Robert J. Leader"

Robert J. Leader, M.Sc., P.Eng.
Senior Mining Engineer
Micon International Limited

CERTIFICATE OF AUTHOR
DIBYA KANTI MUKHOPADHYAY

As the co-author of this report on the Guanaceví project of Endeavour Silver Corp., in Durango State, Mexico, I, DIBYA KANTI MUKHOPADHYAY do hereby certify that:

1) I am employed by, and carried out this assignment for, Micon International Co. Limited, Suite 10, Keswick Hall, Norwick, United Kingdom of Great Britain and Northern Ireland, tel. 0044(1603) 501 501, fax 0044(1603) 507 007, e-mail dk@micon-international.co.uk;

2) I hold the following academic qualifications:

   M.Sc. (Applied Geology) Jadavpur University, Kolkata, India 1993

3) I am a member of the Australasian Institute of Mining and Metallurgy (Member # 225557); as well, I am a member in good standing with The Canadian Institute of Mining, Metallurgy and Petroleum (Member # 140645)

4) I have worked as a geologist in the minerals industry for almost 14 years;

5) I am familiar with NI 43-101 and, by reason of education, experience and professional registration; I fulfill the requirements of a Qualified Person as defined in NI 43-101. My work experience includes 3 years as an exploration geologist looking for gold and base metal deposits, more than 3 years as a mine geologist in open pit and underground mines and 8 years as a surficial geologist and consulting geologist on precious and base metals and industrial minerals;

6) I have not visited the Guanaceví Mines Project in Mexico;

7) I have co-authored the previous Micon Technical reports for the mineral properties in question;

8) As of the date of this certificate to the best of my knowledge, information and belief, the technical report contains all scientific and technical information that is required to be disclosed to make this report not misleading;

9) I am independent of the parties involved in the transaction for which this report is required, other than providing consulting services;

10) I am responsible for the Micon audited resource estimate and related portions of Sections 1, 14, 17, 17.9, 19 and 20, except for those portions of the report discussing the reserves of the technical report dated March 15, 2010 entitled "NI 43-101 Technical Report Audit of the Resource and Reserve Estimate on the Guanaceví Project, Durango State Mexico."

Dated this 15th day of March 2010

"Dibya Kanti Mukhopadhyay"

Dibya Kanti Mukhopadhyay, M.Sc, MAusIMM
Senior Mineral Resource Geologist,
Micon International Limited

APPENDIX A

GLOSSARY OF MINING TERMS

GLOSSARY AND DEFINED TERMS

The following is a glossary of certain mining terms that may be used in this Technical Report.

A

Adit	A horizontal passage from the surface into the mine providing access to a mineral deposit.
Ag	Silver.
Assay	A chemical test performed on a sample of ores or minerals to determine the amount of valuable metals contained.
Au	Gold.

B

Backfill	Waste material used to fill the void created by mining an orebody.
Ball mill	A steel cylinder filled with steel balls into which crushed ore is fed. The ball mill is rotated, causing the balls to cascade and grind the ore.
Base metal	Any non-precious metal (eg. copper, lead, zinc, nickel, etc.).
Blasthole	A drill hole in a mine that is filled with explosives in order to blast loose a quantity of rock.
Block caving	An inexpensive method of mining in which large blocks of ore are undercut, causing the ore to break or cave under its own weight.
Bulk mining	Any large-scale, mechanized method of mining involving many thousands of tonnes of ore being brought to surface per day.
Bulk sample	A large sample of mineralized rock, frequently hundreds of tonnes, selected in such a manner as to be representative of the potential orebody being sampled. Used to determine metallurgical characteristics.
Bullion	Metal formed into bars or ingots.
Byproduct	A secondary metal or mineral product recovered in the milling process.

C

Calcine	Name given to concentrate that is ready for smelting (i.e. the sulphur has been driven off by oxidation).
Chalcopyrite	A sulphide mineral of copper and iron; the most important ore mineral of copper.

Channel sample	A sample composed of pieces of vein or mineral deposit that have been cut out of a small trench or channel, usually about 10 cm wide and 2 cm deep.
Chip sample	A method of sampling a rock exposure whereby a regular series of small chips of rock is broken off along a line across the face.
Chute	An opening, usually constructed of timber and equipped with a gate, through which ore is drawn from a stope into mine cars.
CIM Standards	The CIM Definition Standards on Mineral Resources and Mineral Reserves adopted by CIM Council from time to time.
CIM	The Canadian Institute of Mining, Metallurgy and Petroleum.
Concentrate	A fine, powdery product of the milling process containing a high percentage of valuable metal.
Contact	A geological term used to describe the line or plane along which two different rock formations meet.
Core	The long cylindrical piece of rock, about an inch in diameter, brought to surface by diamond drilling.
Core sample	One or several pieces of whole or split parts of core selected as a sample for analysis or assay.
Cross-cut	A horizontal opening driven from a shaft and (or near) right angles to the strike of a vein or other orebody. Also used to signify that a drill hole is crossing the mineralization at or near right angles to it.
Cu	Copper.
Custom smelter	A smelter which processes concentrates from independent mines. Concentrates may be purchased or the smelter may be contracted to do the processing for the independent company.
Cut-off grade	The lowest grade of mineralized rock that qualifies as ore grade in a given deposit, and is also used as the lowest grade below which the mineralized rock currently cannot be profitably exploited. Cut-off grades vary between deposits depending upon the amenability of ore to gold extraction and upon costs of production.
Cyanidation	A method of extracting exposed gold or silver grains from crushed or ground ore by dissolving it in a weak cyanide solution. May be carried out in tanks inside a mill or in heaps of ore out of doors.
Cyanide	A chemical species containing carbon and nitrogen used to dissolve gold and silver from ore.

D

Dacite	The extrusive (volcanic) equivalent of quartz diorite.

Decline	A sloping underground opening for machine access from level to level or from surface; also called a ramp.
Deposit	An informal term for an accumulation of mineralization or other valuable earth material of any origin.
Development	Underground work carried out for the purpose of opening up a mineral deposit. Includes shaft sinking, cross-cutting, drifting and raising.
Development drilling	Drilling to establish accurate estimates of mineral resources or reserves.
Dilution	Rock that is, by necessity, removed along with the ore in the mining process, subsequently lowering the grade of the ore.
Diorite	An intrusive igneous rock composed chiefly of sodic plagioclase, hornblende, biotite or pyroxene.
Dip	The angle at which a vein, structure or rock bed is inclined from the horizontal as measured at right angles to the strike.
Drift	A horizontal or nearly horizontal underground opening driven along a vein to gain access to the deposit.

E

Ejido	A local community of people who own the surface rights to an area of land
Endeavour Silver	Endeavour Silver Corp., including, unless the context otherwise requires, the Company's subsidiaries.
Epithermal	Hydrothermal mineral deposit formed within one kilometer of the earth’s surface, in the temperature range of 50–200°C.
Epithermal deposit	A mineral deposit consisting of veins and replacement bodies, usually in volcanic or sedimentary rocks, containing precious metals or, more rarely, base metals.
Exploration	Prospecting, sampling, mapping, diamond drilling and other work involved in searching for ore.

F

Face	The end of a drift, cross-cut or stope in which work is taking place.
Fault	A break in the Earth's crust caused by tectonic forces which have moved the rock on one side with respect to the other.

Flotation	A milling process in which valuable mineral particles are induced to become attached to bubbles and float as others sink.
Fold	Any bending or wrinkling of rock strata.
Footwall	The rock on the underside of a vein or ore structure.
Fracture	A break in the rock, the opening of which allows mineral-bearing solutions to enter. A "cross-fracture" is a minor break extending at more-or-less right angles to the direction of the principal fractures.

G

g/t	Grams per metric tonne.
Galena	Lead sulphide, the most common ore mineral of lead.
g/t	Grams per metric tonne.
Grade	Term used to indicate the concentration of an economically desirable mineral or element in its host rock as a function of its relative mass. With gold, this term may be expressed as grams per tonne (g/t) or ounces per tonne (opt).
Gram	0.0321507 troy ounces.

H

Hanging wall	The rock on the upper side of a vein or ore deposit.
High grade	Rich ore. As a verb, it refers to selective mining of the best ore in a deposit.
Host rock	The rock surrounding an ore deposit.
Hydrothermal	Processes associated with heated or superheated water, especially mineralization or alteration.

I

Indicated Mineral Resource

An Indicated Mineral Resource is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics, can be estimated with a level of confidence sufficient to allow the appropriate application of technical and economic parameters, to support mine planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough for geological and grade continuity to be reasonably assumed.

Inferred Mineral Resource

An Inferred Mineral Resource is that part of a Mineral Resource for which quantity and grade or quality can be estimated on the basis of geological evidence and limited sampling and reasonably assumed, but not verified, geological and grade continuity. The estimate is based on limited information and sampling gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes.

Intrusive — A body of igneous rock formed by the consolidation of magma intruded into other

K

km — Kilometre(s). Equal to 0.62 miles.

L

Leaching — The separation, selective removal or dissolving-out of soluble constituents from a rock or ore body by the natural actions of percolating solutions.

Level — The horizontal openings on a working horizon in a mine; it is customary to work mines from a shaft, establishing levels at regular intervals, generally about 50 m or more apart.

Limestone — A bedded, sedimentary deposit consisting chiefly of calcium carbonate.

M

m — Metre(s). Equal to 3.28 feet.

Marble — A metamorphic rock derived from the recrystallization of limestone under intense heat and pressure.

Measured Mineral Resource

A Measured Mineral Resource is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, physical characteristics are so well established that they can be estimated with confidence sufficient to allow the appropriate application of technical and economic parameters, to support production planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough to confirm both geological and grade continuity.

Metallurgy — The science and art of separating metals and metallic minerals from their ores by mechanical and chemical processes.

Metamorphic	Affected by physical, chemical, and structural processes imposed by depth in the earth's crust.
Mill	A plant in which ore is treated and metals are recovered or prepared for smelting; also a revolving drum used for the grinding of ores in preparation for treatment.
Mine	An excavation beneath the surface of the ground from which mineral matter of value is extracted.
Mineral	A naturally occurring homogeneous substance having definite physical properties and chemical composition and, if formed under favorable conditions, a definite crystal form.
Mineral Claim	That portion of public mineral lands which a party has staked or marked out in accordance with federal or state mining laws to acquire the right to explore for and exploit the minerals under the surface.
Mineralization	The process or processes by which mineral or minerals are introduced into a rock, resulting in a valuable or potentially valuable deposit.
Mineral Resource	A concentration or occurrence of natural, solid, inorganic or fossilized organic material in or on the earth's crust in such form and quantity and of such grade or quality that it has reasonable prospects for economic extraction. The location, quantity, grade, geological characteristics and continuity of a mineral resource are known, estimated or interpreted from specific geological evidence and knowledge. The term mineral resource covers mineralization and natural material of intrinsic economic interest which has been identified and estimated through exploration and sampling and within which mineral reserves may subsequently be defined by the consideration and application of technical, economic, legal, environmental, socio-economic and governmental factors. The phrase reasonable prospects for economic extraction implies a judgment by the Qualified Person in respect of the technical and economic factors likely to influence the prospect of economic extraction. A mineral resource is an inventory of mineralization that under realistically assumed and justifiable technical and economic conditions, might become economically extractable. The term mineral resource used in this AIF is a Canadian mining term as defined in accordance with NI 43-101 – Standards of Disclosure for Mineral Projects under the guidelines set out in the Canadian Institute of Mining, Metallurgy and Petroleum (the CIM), Standards on Mineral Resource and Mineral Reserves Definitions and guidelines adopted by the CIM Council on August 20, 2000 (the CIM Standards).

N

Net Smelter Return	
	A payment made by a producer of metals based on the value of the gross metal production from the property, less deduction of certain limited costs including smelting, refining, transportation and insurance costs.

O

Open Cut	A term sometimes used to differentiate mining workings which are excavated beneath the surface of the ground but remain exposed to the surface.
Ounce	A measure of weight in gold and other precious metals, correctly troy ounces, which weigh 31.2 grams as distinct from an imperial ounce which weigh 28.4 grams.
Outcrop	An exposure of rock or mineral deposit that can be seen on surface, that is, not covered by soil or water.
Oxidation	A chemical reaction caused by exposure to oxygen that results in a change in the chemical composition of a mineral.
oz	Ounce
oz/t or opt	Ounces per metric tonne

P

Pb	Lead
Plant	A building or group of buildings in which a process or function is carried out; at a mine site it will include warehouses, hoisting equipment, compressors, maintenance shops, offices and the mill or concentrator.
Pyrite	A common, pale-bronze or brass-yellow, mineral. Pyrite has a brilliant metallic luster and has been mistaken for gold. Pyrite is the most wide-spread and abundant of the sulphide minerals and occurs in all kinds of rocks.

Q

Qualified Person	Conforms to that definition under NI 43-101 for an individual: (a) to be an engineer or geoscientist with at least five years' experience in mineral exploration, mine development or operation or mineral project assessment, or any combination of these; (b) to have experience relevant to the subject matter of the mineral project and the technical report; and (c) to be a member in good standing of a professional association that, among other things, is self-regulatory, has been given authority by statute, admits members based on their qualifications and experience, requires compliance

	with professional standards of competence and ethics and has disciplinary powers to suspend or expel a member.

R

Raise	A vertical hole between mine levels used to move ore or waste rock or to provide ventilation.
Ramp	An inclined underground tunnel which provides access for exploration or a connection between levels of a mine.
Reclamation	The restoration of a site after mining or exploration activity is completed.
Recovery Rate	A term used in process metallurgy to indicate the proportion of valuable material obtained in the processing of an ore. It is generally stated as a percentage of the material recovered compared to the total material present.
Refining	The final stage of metal production in which impurities are removed from the molten metal.
Refractory ore	Ore that resists the action of chemical reagents in the normal treatment processes and which may require pressure leaching or other means to effect the full recovery of the valuable minerals.

S

Shaft	A vertical passageway to an underground mine for moving personnel, equipment, supplies and material including ore and waste rock.
Shoot	A concentration of mineral values; that part of a vein or zone carrying values of ore grade.
Skarn	Name for the metamorphic rocks surrounding an igneous intrusive where it comes in contact with a limestone or dolostone formation.
Sphalerite	A zinc sulphide mineral; the most common ore mineral of zinc.
Stockpile	Broken ore heaped on surface, pending treatment or shipment.
Stope	An area in an underground mine where ore is mined.
Strike	The direction, or bearing from true north, of a vein or rock formation measureon a horizontal surface.
Stringer	A narrow vein or irregular filament of a mineral or minerals traversing a rock mass.
Sulphides	A group of minerals which contains sulfur and other metallic element such as copper and zinc. Gold is usually associated with sulphide enrichment in mineral deposits.

T

Tailings	Material rejected from a mill after most of the recoverable valuable minerals have been extracted.
Tailings pond	A low-lying depression used to confine tailings, the prime function of which is to allow enough time for heavy metals to settle out or for cyanide to be destroyed before water is discharged into the local watershed.
Tonne	A metric ton of 1,000 kilograms (2,205 pounds).
Tunnel	A horizontal underground opening, open to the atmosphere at both ends.

V

Vein	A fissure, fault or crack in a rock filled by minerals that have travelled upwards from some deep source.

W

Wall rocks	Rock units on either side of an orebody. The hanging wall and footwall rocks of an orebody.
Waste	Unmineralized, or sometimes mineralized, rock that is not minable at a profit.

Z

Zn	Zinc
Zone	An area of distinct mineralization.

APPENDIX B

EXPLORATORY STATISTICS

DRILL HOLE AND CHANNEL DATA

Exploratory Statistics – Porvenir North

Zone 1 Chip data histograms of Thickness, Uncapped and Capped Au and Ag Accumulation

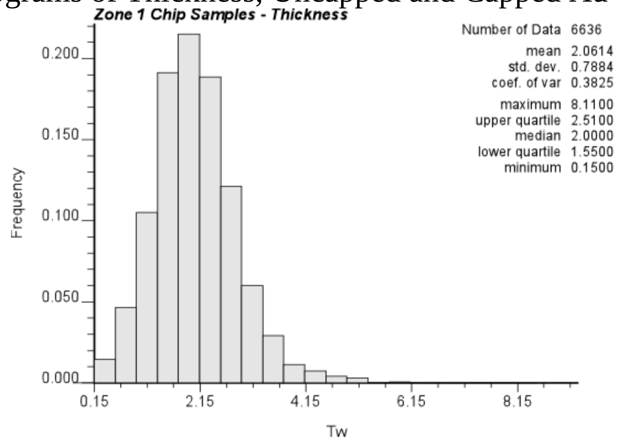
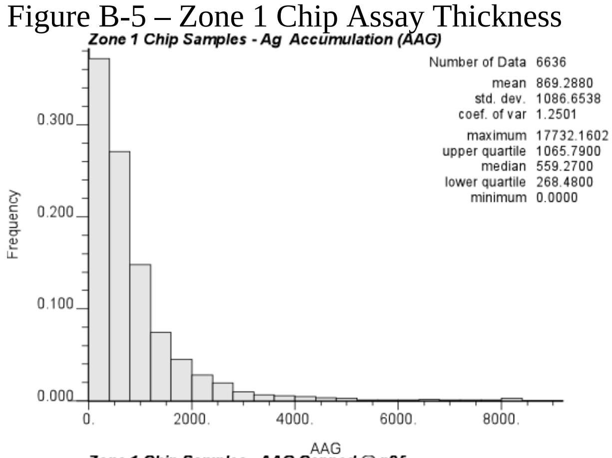


Figure B-5 – Zone 1 Chip Assay Thickness



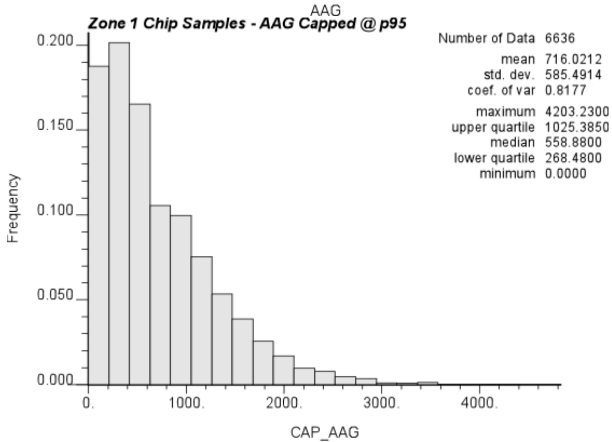


Figure B-6 - Zone 1 Channel Ag Accumulation; Left: Uncapped, Right: Capped at 95th percentile.

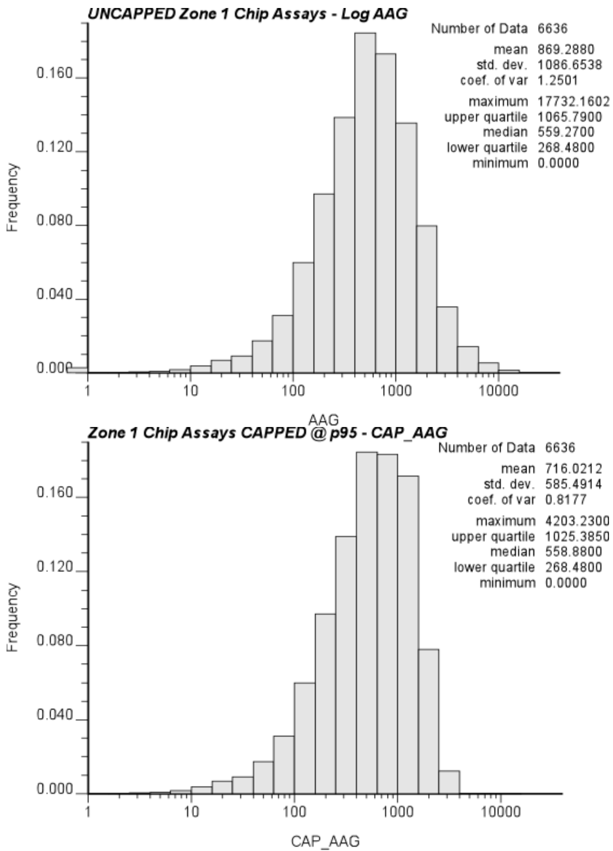


Figure B-7 - Zone 1 Channel Log Ag Accumulation; Left: Uncapped, Right: Capped at 95th percentile.

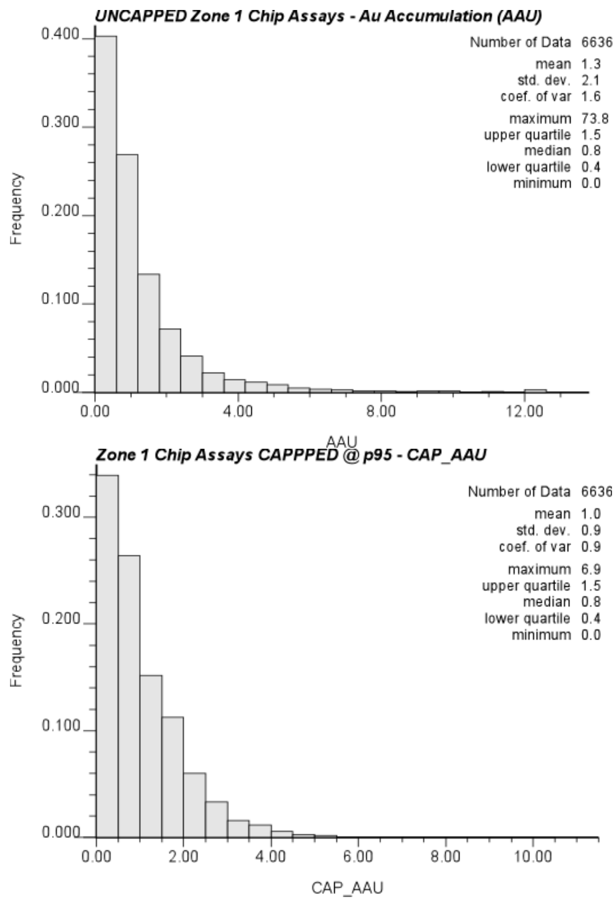


Figure B-8 - Zone 1 Channel Au Accumulation; Left: Uncapped, Right: Capped at 95th percentile.

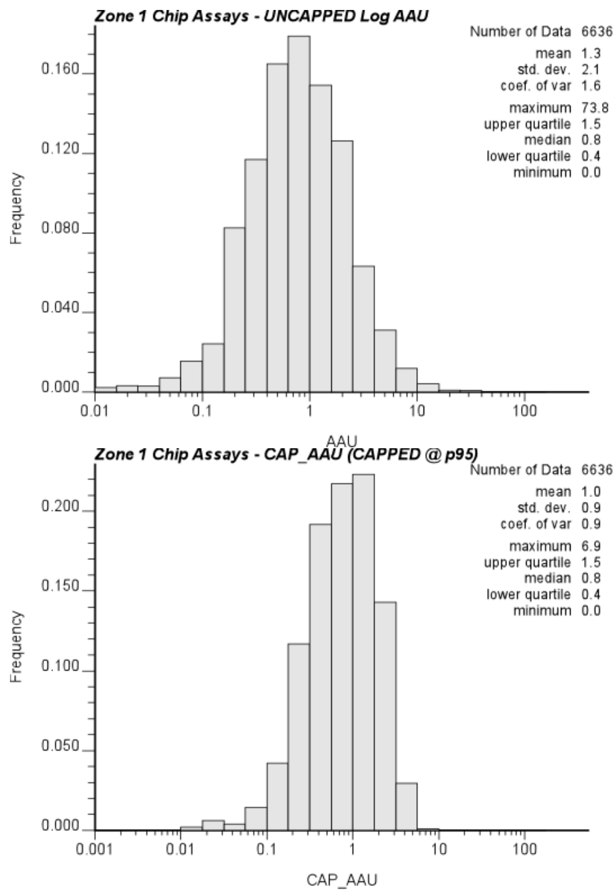


Figure B-9 - Zone 1 Channel Log Au Accumulation; Left: Uncapped, Right: Capped at 95th percentile.

Zone 2 Chip data histograms of Thickness, Uncapped and Capped Au and Ag Accumulation

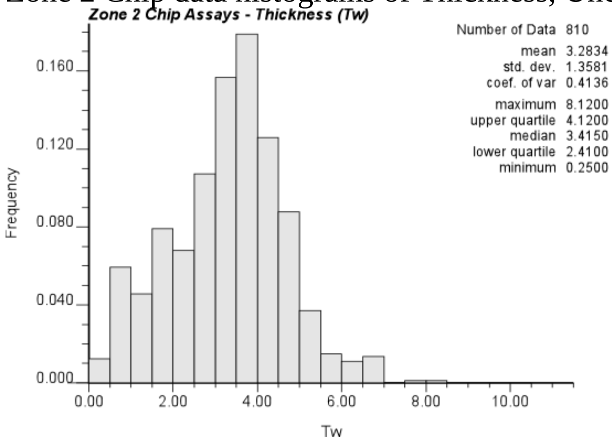
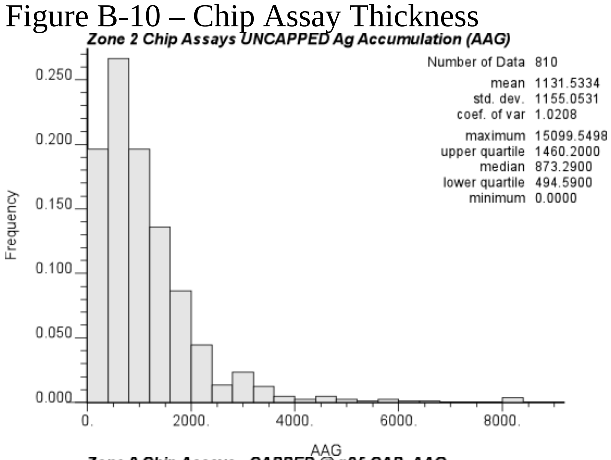


Figure B-10 – Chip Assay Thickness



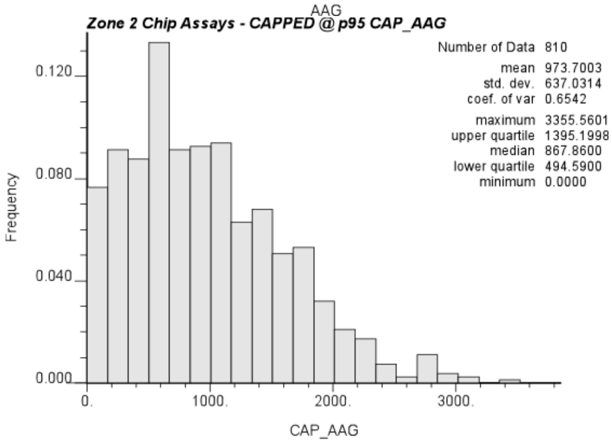


Figure B-11 - Zone 2 Channel Ag Accumulation; Left: Uncapped, Right: Capped at 95th percentile.

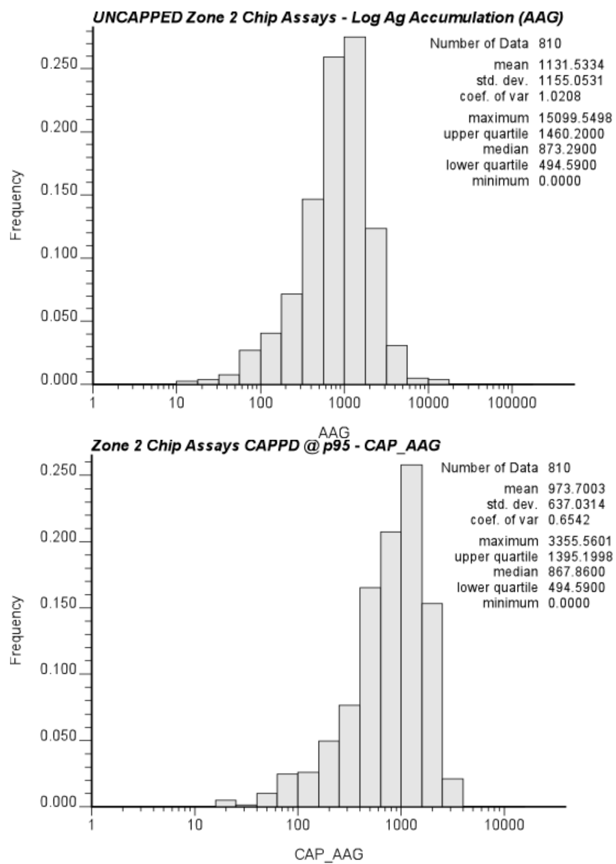


Figure B-12 - Zone 2 Channel Log Ag Accumulation; Left: Uncapped, Right: Capped at 95th percentile.

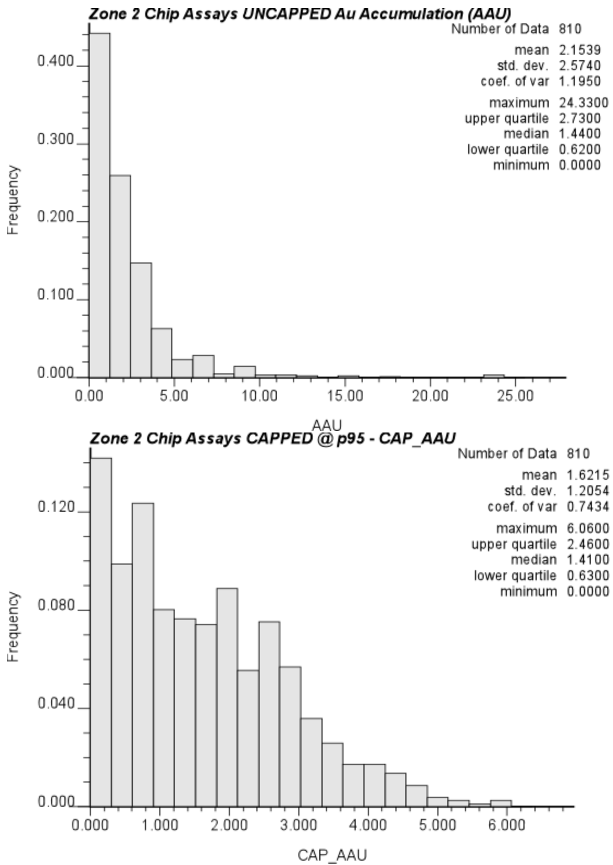


Figure B-13 - Zone 2 Channel Au Accumulation; Left: Uncapped, Right: Capped at 95th percentile.

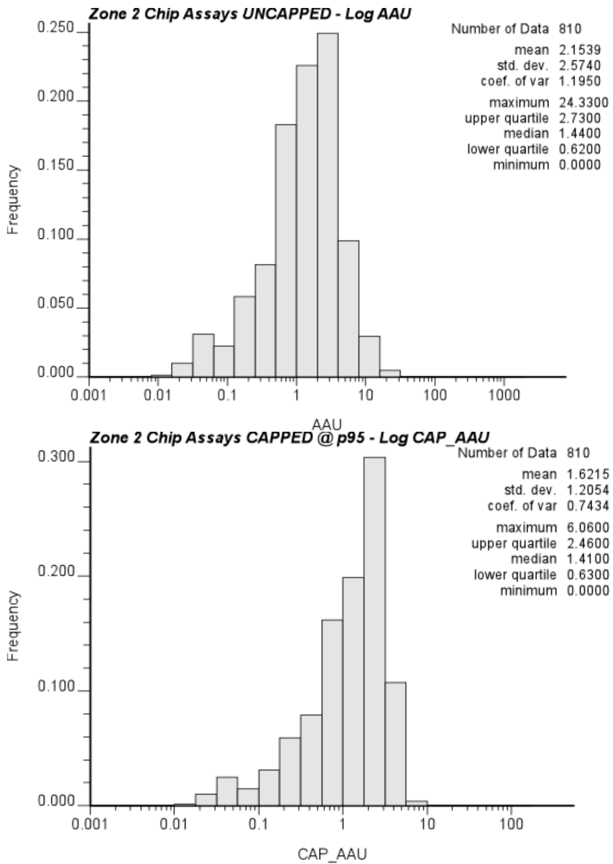


Figure B-14 – Zone 2 Channel Log Au Accumulation; Left: Uncapped, Right: Capped at 95th percentile.

Combined Drill Hole histograms of Thickness, Uncapped and Capped Au and Ag Accumulation

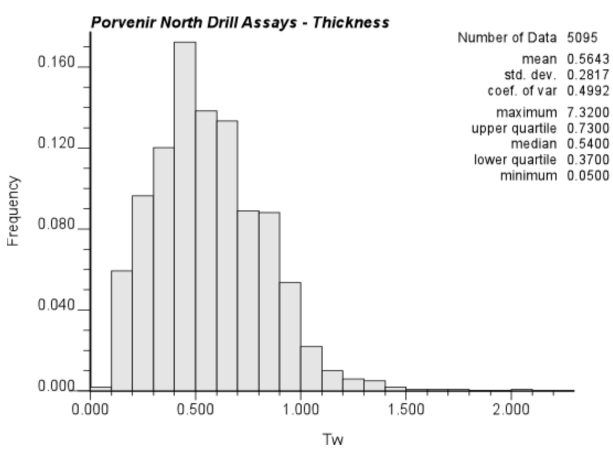


Figure B-15 – Drill Hole Assay Thickness

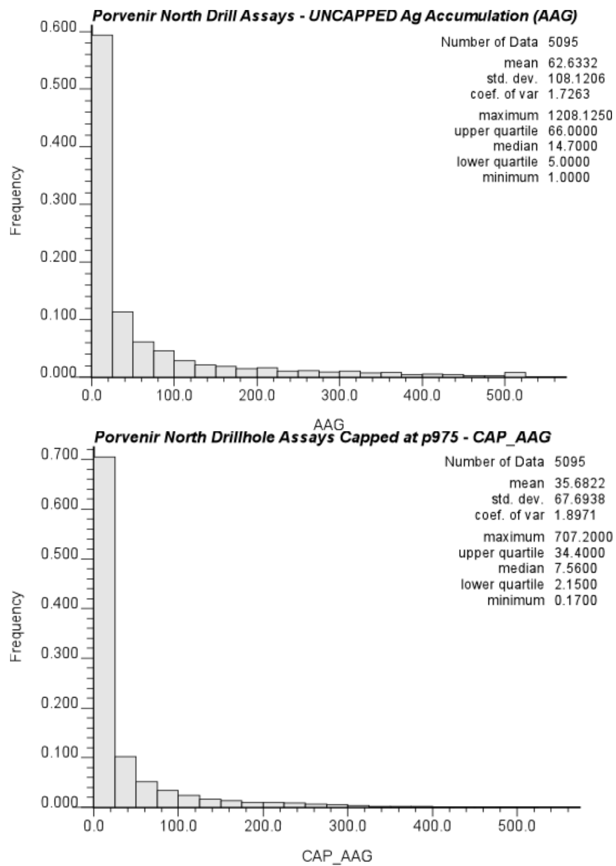


Figure B-16 – Drill Hole Ag Accumulation; Left: Uncapped, Right: Capped at 97.5th percentile.

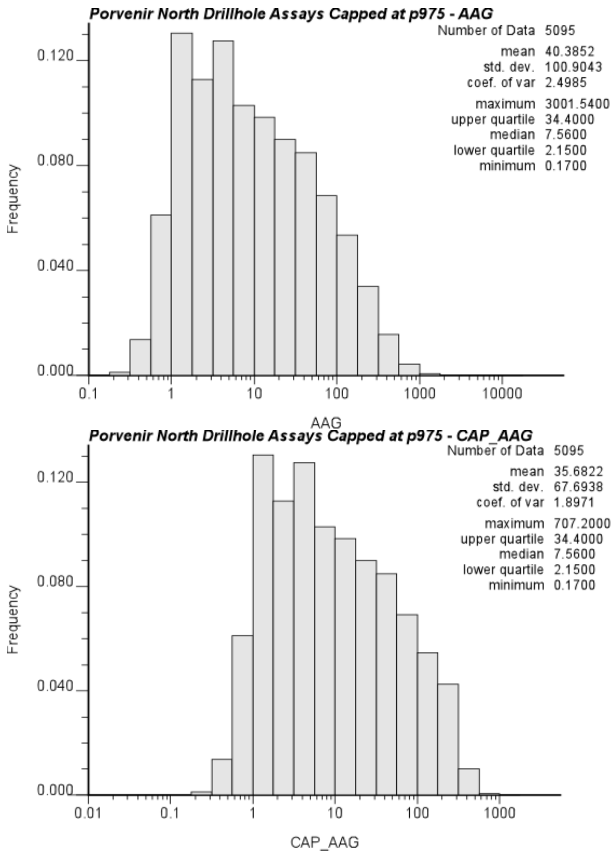


Figure B-17 – Drill Hole Log Ag Accumulation; Left: Uncapped, Right: Capped at 97.5th percentile.

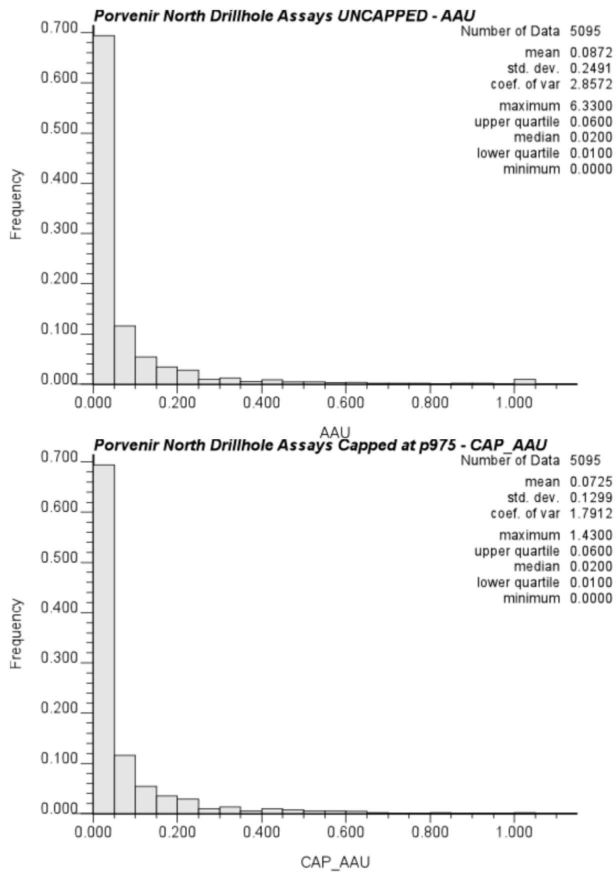


Figure B-18 – Drill Hole Au Accumulation; Left: Uncapped, Right: Capped at 97.5th percentile.

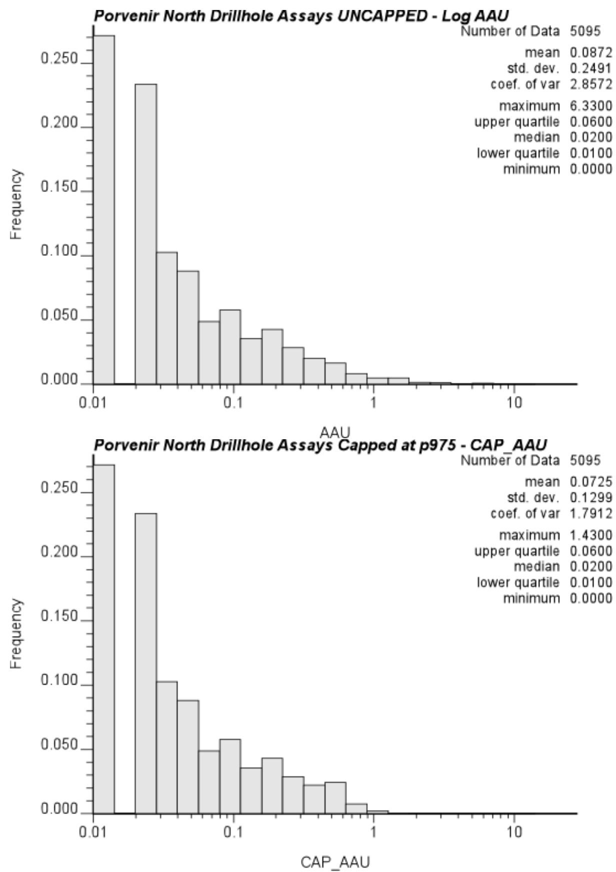


Figure B-19 – Drill Hole Au Accumulation; Left: Uncapped, Right: Capped at 95th percentile.

Zone 1 Chip Assay Probability Plots

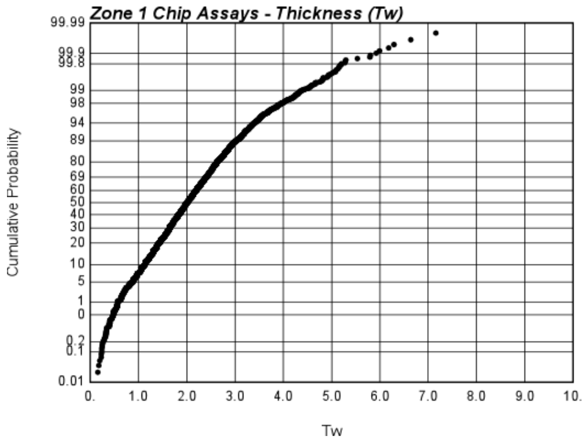
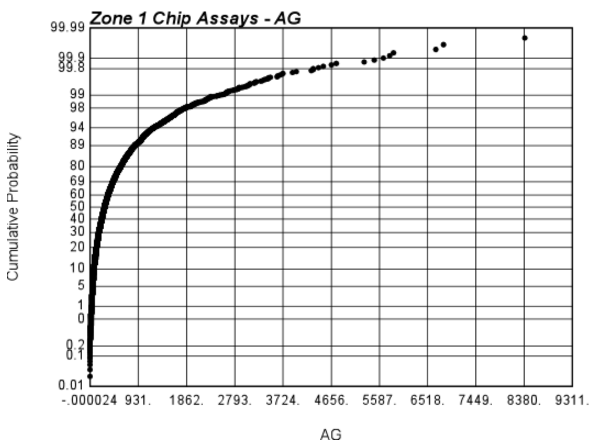


Figure B-20 - Zone 1 Chip Assays Thickness



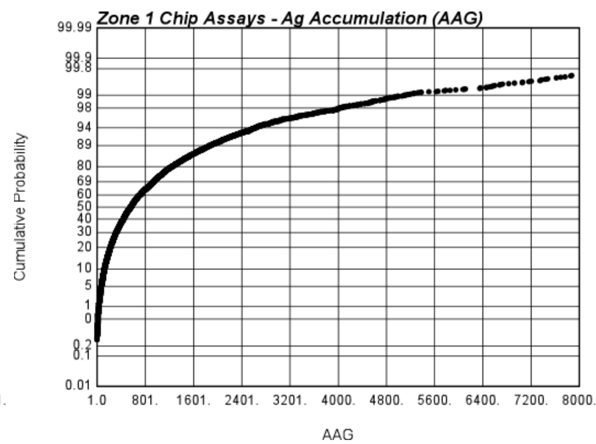
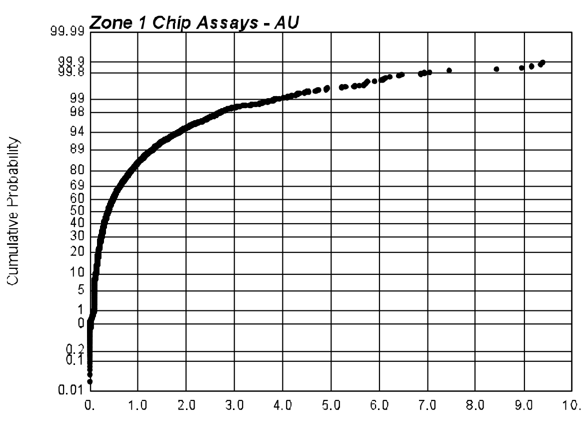


Figure B-21 – Zone 1 Chip Assays (Left) Ag, (Right) Ag Accumulation



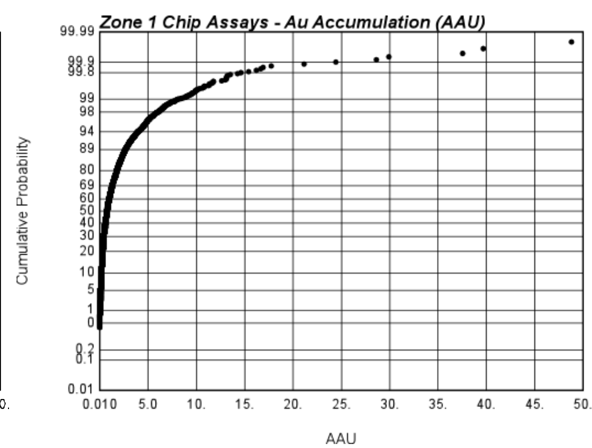


Figure B-22 – Zone 1 Chip Assays (Left) Au. (Right) Au Accumulation

Zone 2 Chip Assay Probability Plots

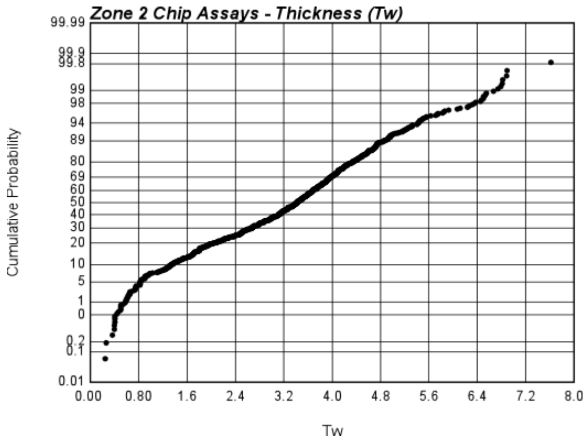
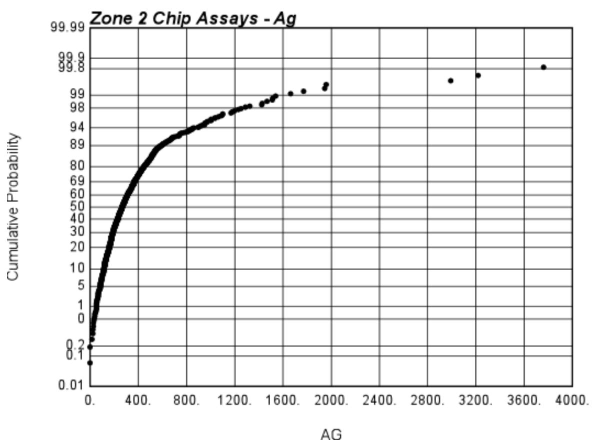


Figure B-23 - Zone 2 Chip Assays Thickness



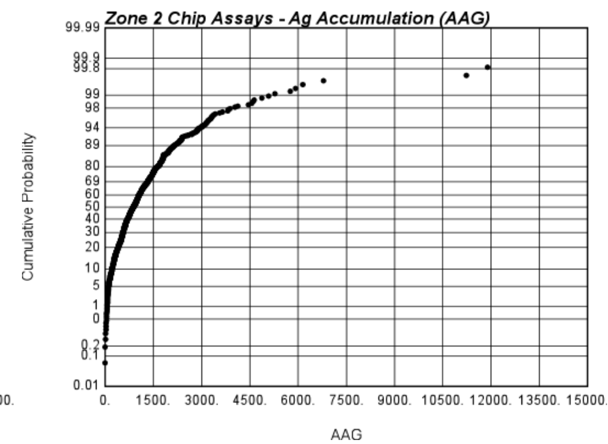
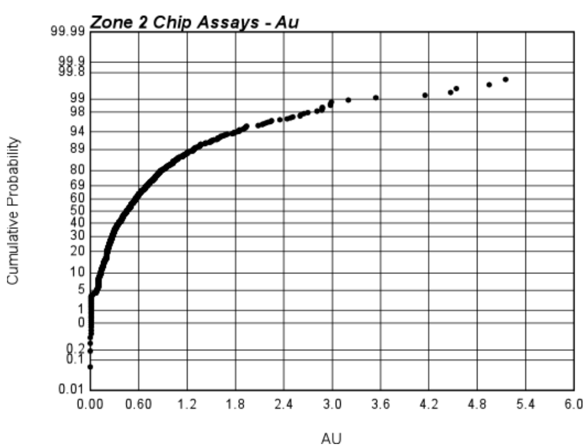


Figure B-24 – Zone 2 Chip Assays (Left) Ag, (Right) Ag Accumulation



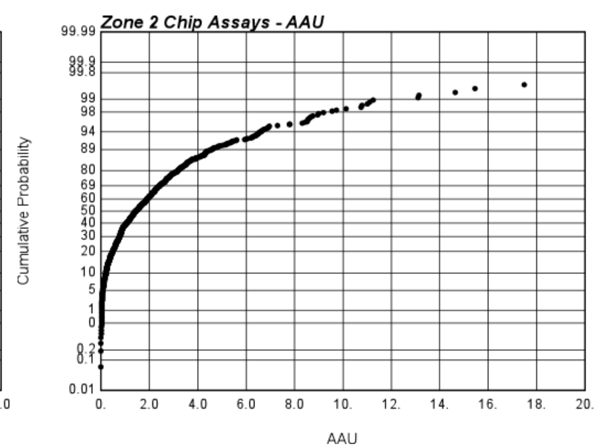


Figure B-25 – Zone 2 Chip Assays (Left) Au. (Right) Au Accumulation

Porvenir North Drill Hole Probability Plots

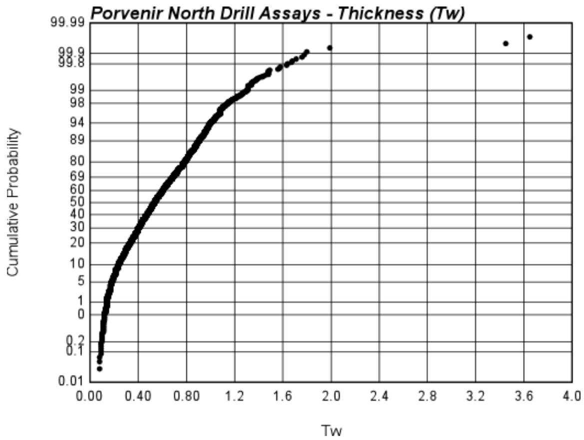
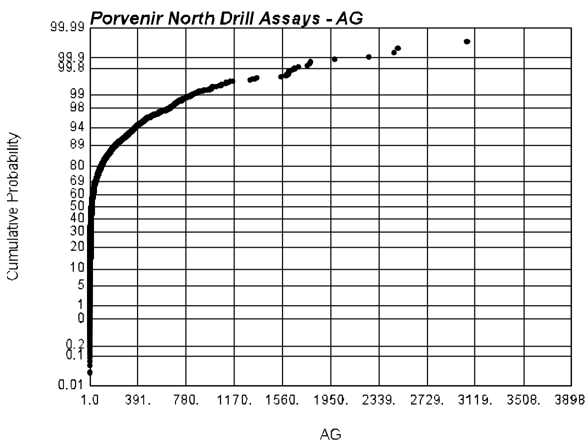


Figure B-26 – Drill Hole TW Probability Plot



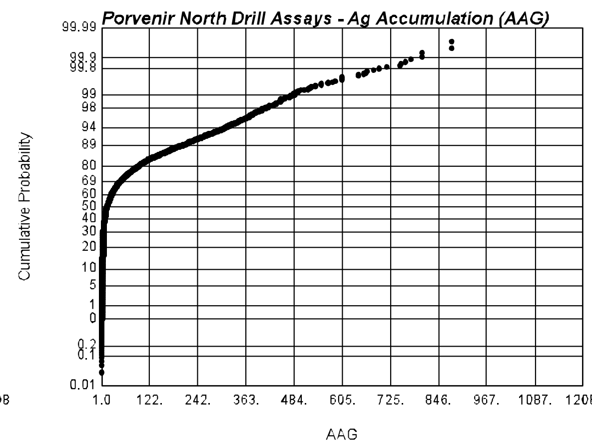
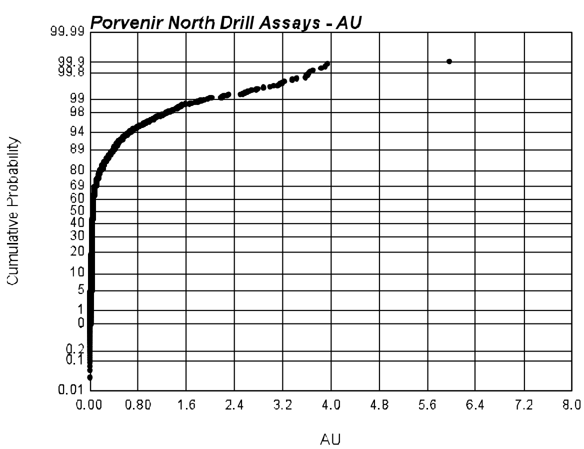


Figure B-27 – Drill Hole Assays (Left) Ag. (Right) Ag Accumulation



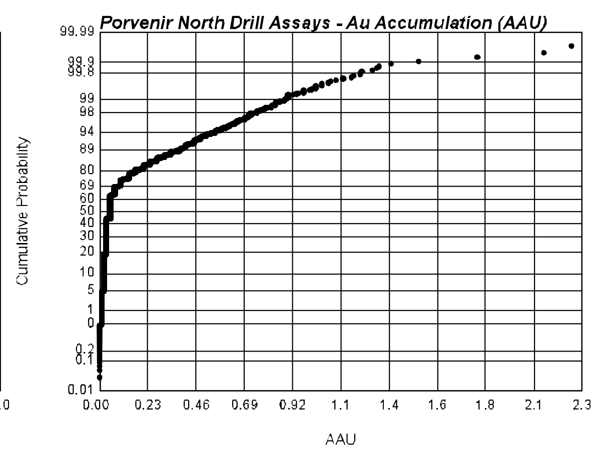


Figure B-28 – Drill Hole Assays (Left) Au. (Right) Au Accumulation

Exploratory Statistics – Porvenir Dos

Chip assay histograms of Thickness, Uncapped Gold, Silver, Gold Accumulation and Silver Accumulation

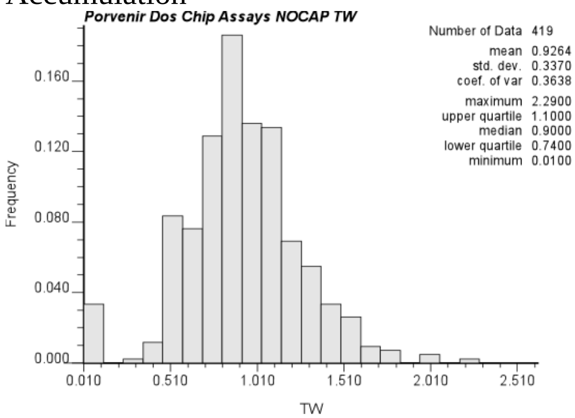
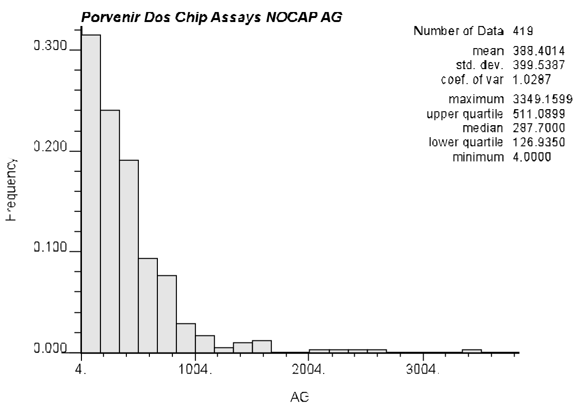


Figure B-29 – Chip Assay Thickness



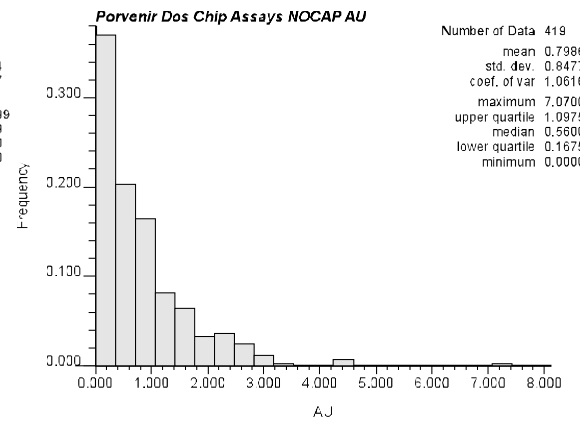
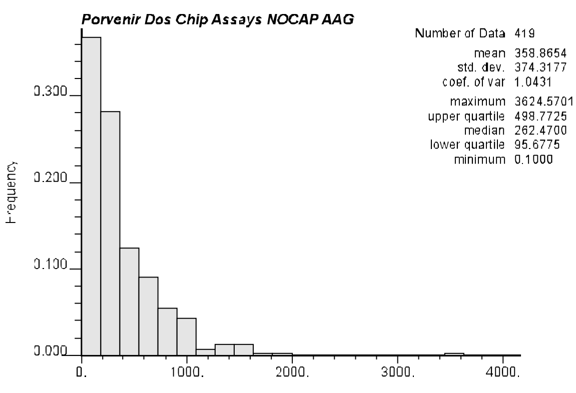


Figure B-30 - UNCAPPED Chip Assays (Left) AG. (Right) AU



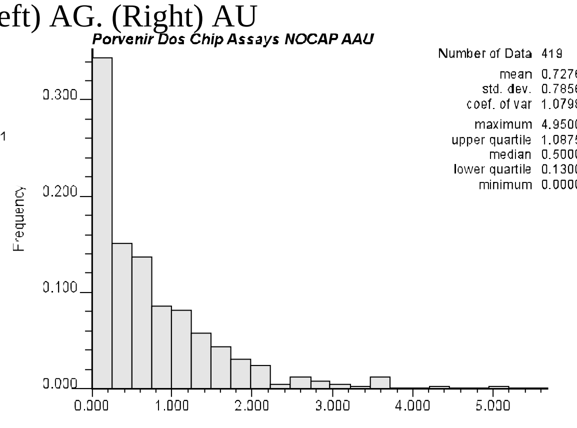


Figure B-31 – UNCAPPED Chip Assays (Left) AAG. (Right) AAU

Drill Hole assay histograms of Thickness, Uncapped Au, Ag, Au and Ag Accumulation

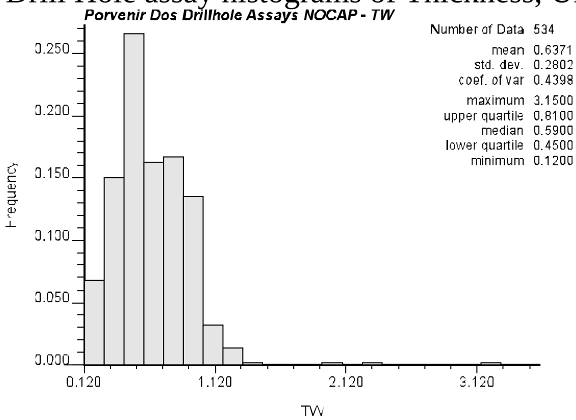
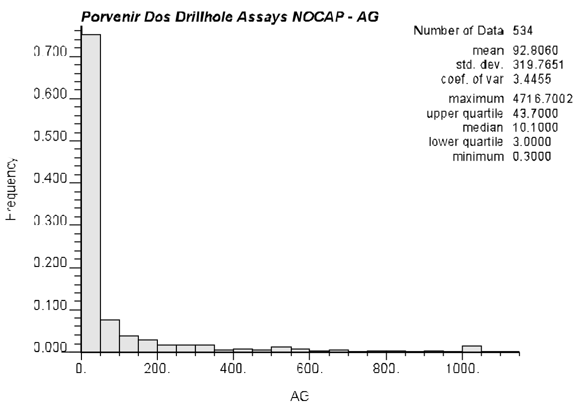


Figure B-32 – Drill Hole Assay Thickness



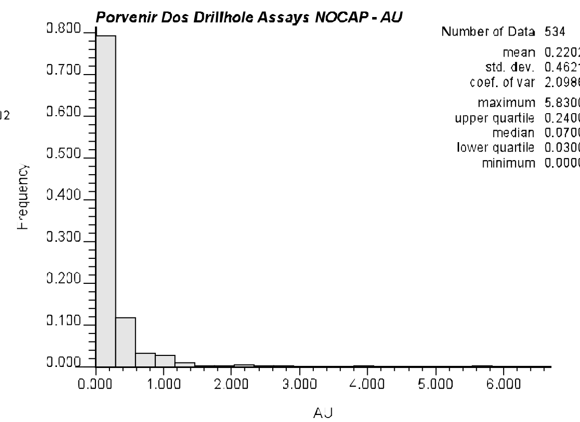
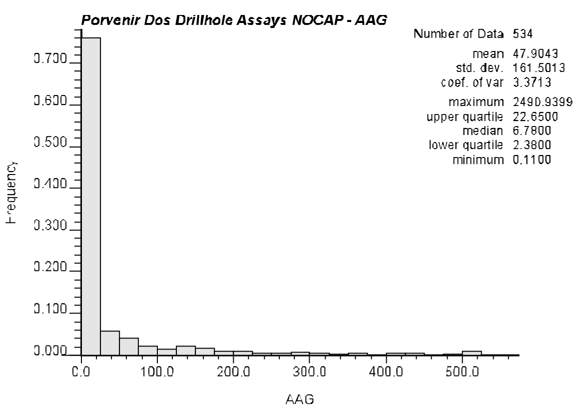


Figure B-33 - UNCAPPED Drill Hole Assays (Left) AG. (Right) AU



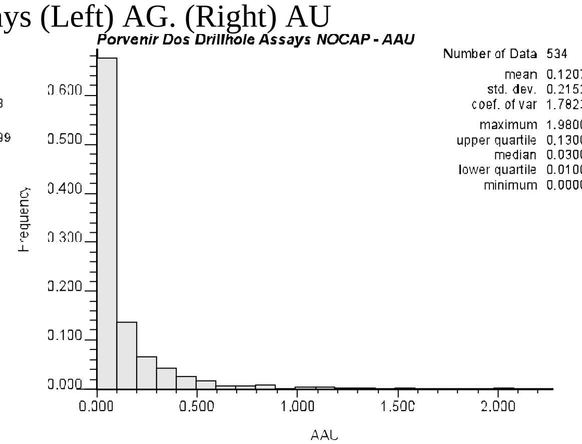


Figure B-34 – UNCAPPED Drill Hole Assays (Left) AAG. (Right) AAU

Probability Plots Chip Uncapped Assay Data

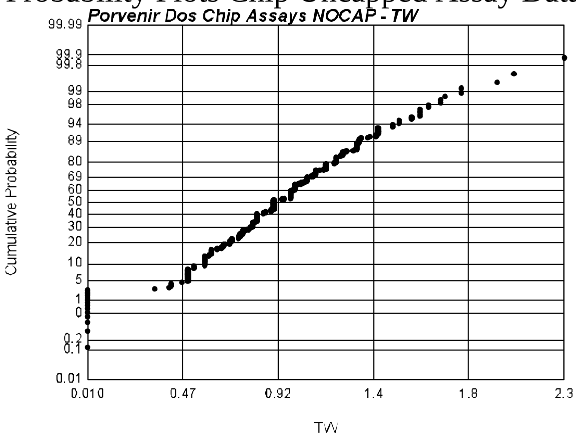
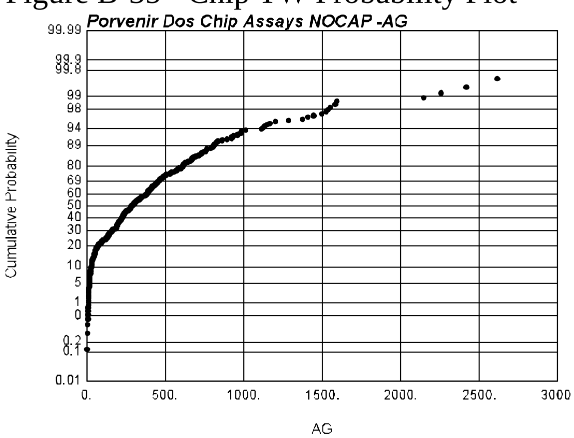


Figure B-35 - Chip TW Probability Plot



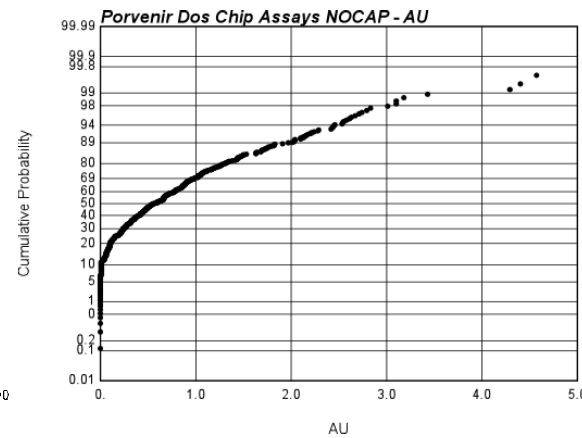
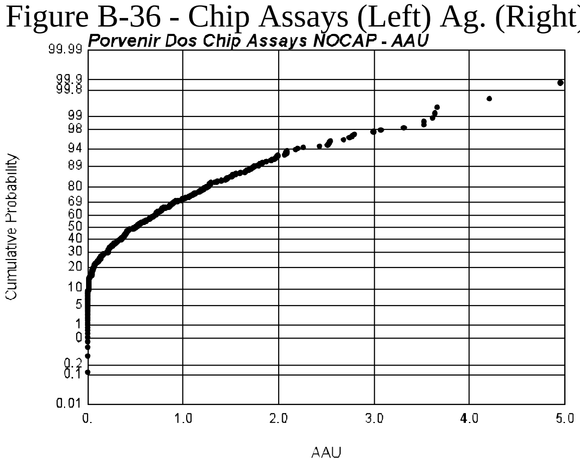


Figure B-36 - Chip Assays (Left) Ag. (Right) Au.



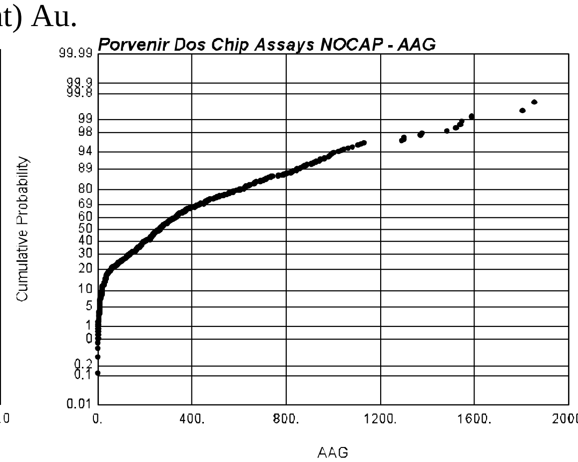


Figure B-37 - Chip Assays (Left) Au Accumulation. (Right) Ag Accumulation

Probability Plots Drill Hole Uncapped Assay Data

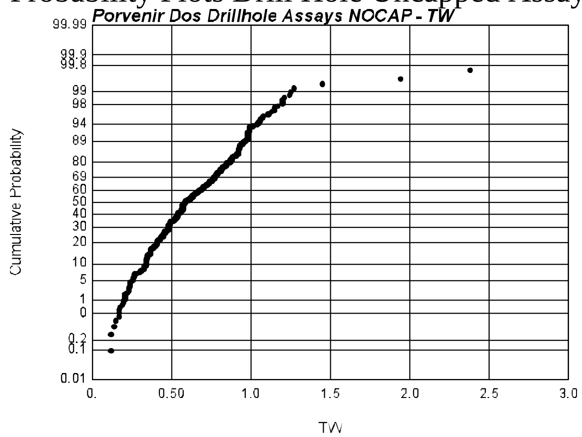


Figure B-38 – Drill Hole TW Probability Plot

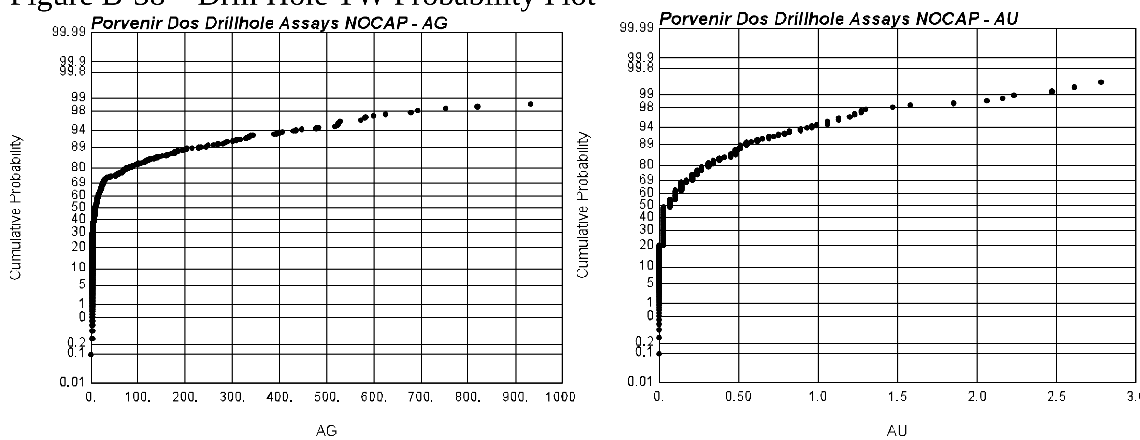


Figure B-39 – Drill Hole Assays (Left) Ag. (Right) Au.

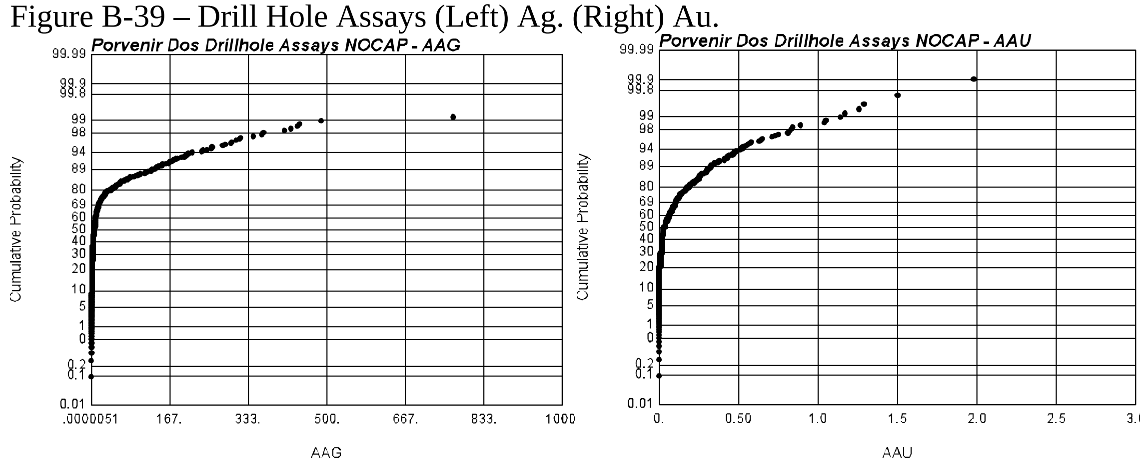


Figure B-40 – Drill Hole Assays (Left) Au Accumulation. (Right) Ag Accumulation

Exploratory Statistics – Alex Breccia

Drill Hole assay histograms of Thickness, Au, Ag, Cu, Pb, and Zn

Main SCV Vein (Zone 1)

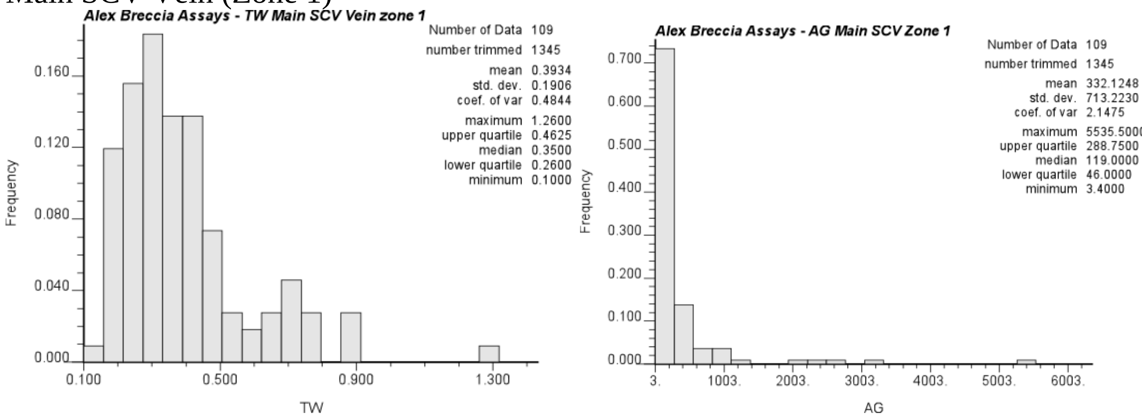


Figure B-41 - Zone 1Drill Hole Assays (Left) Thickness. (Right) Ag.

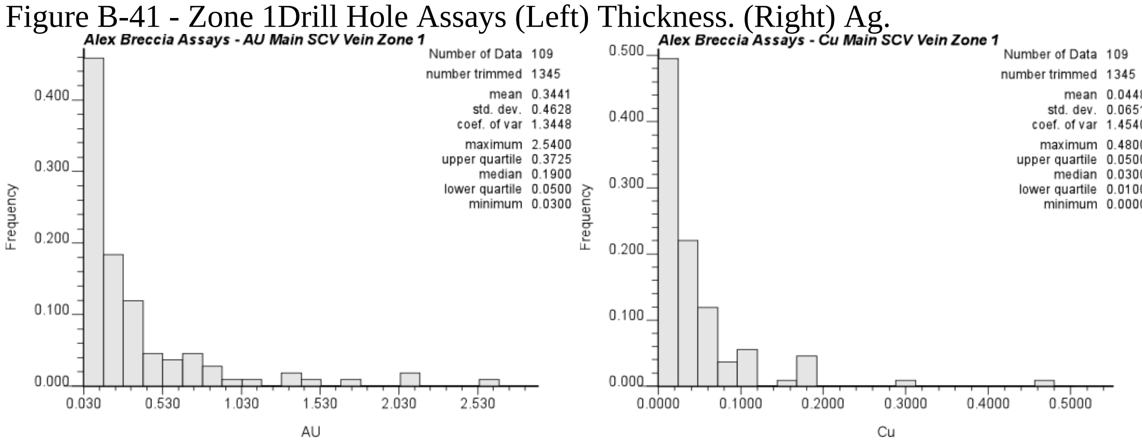


Figure B-42 - Zone 1 Drill Hole Assays (Left) Au. (Right) Cu.

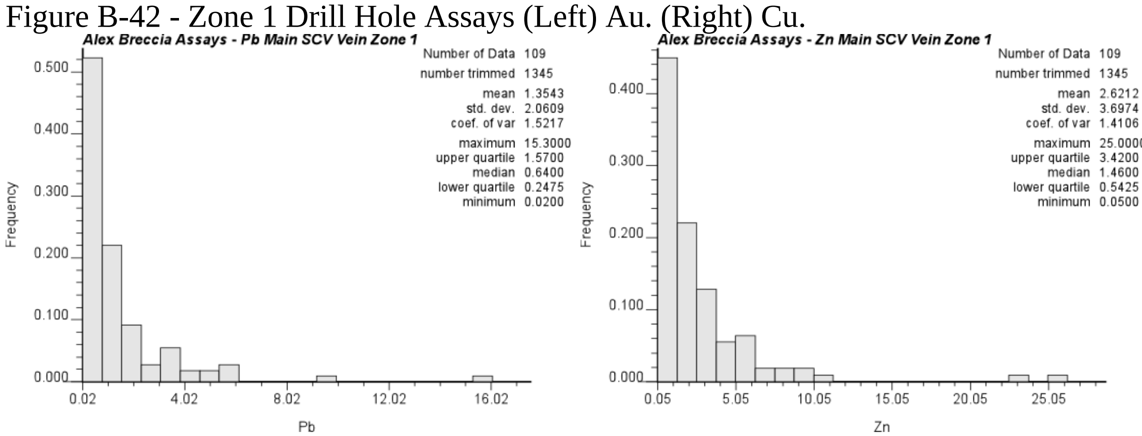
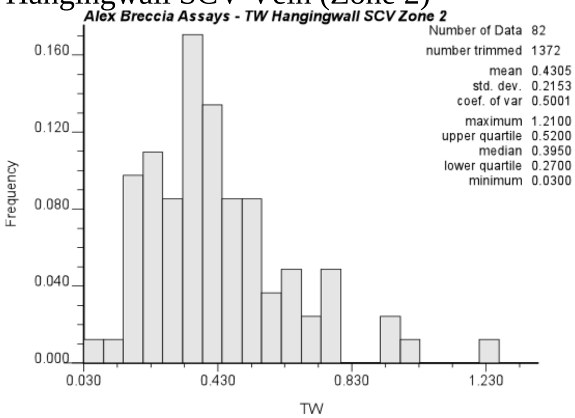


Figure B-43 - Zone 1 Drill Hole Assays (Left) Pb. (Right) Zn.

Hangingwall SCV Vein (Zone 2)



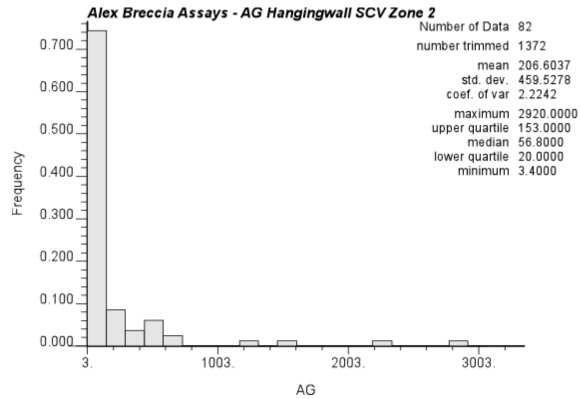
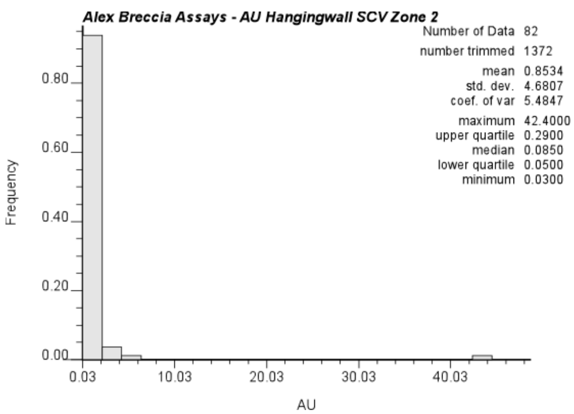


Figure B-44 – Zone 2 Drill Hole Assays (Left) Thickness. (Right) Ag.



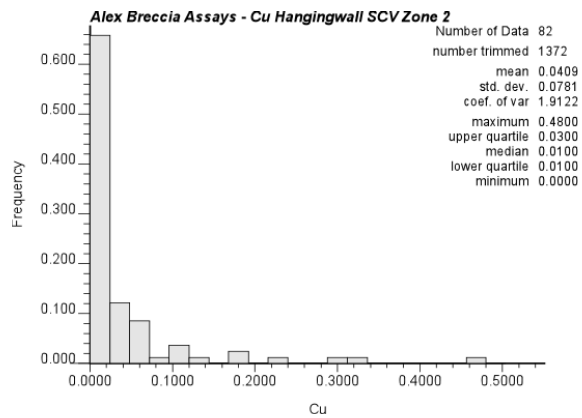
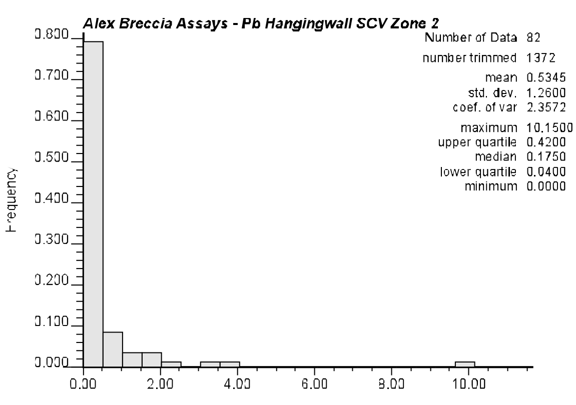


Figure B-45 - Zone 2 Drill Hole Assays (Left) Au. (Right) Cu.



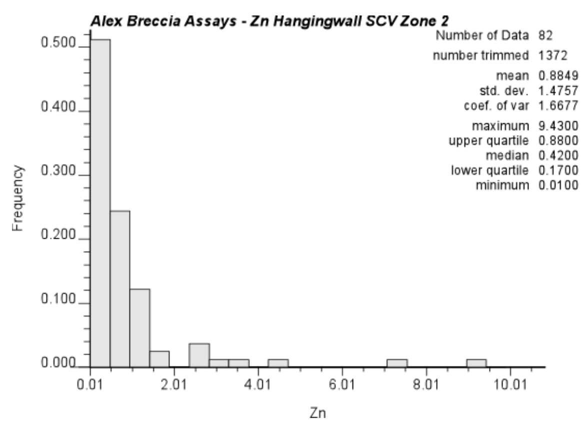
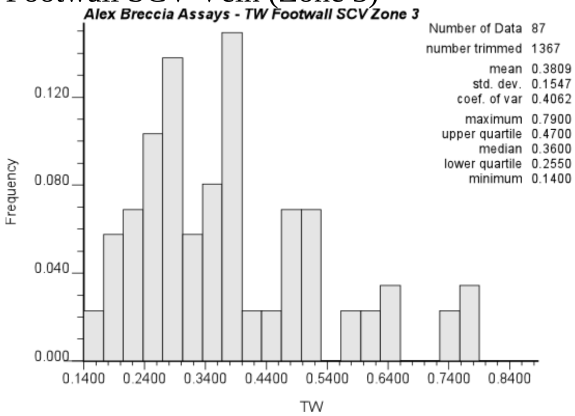


Figure B-46 - Zone 2 Drill Hole Assays (Left) Pb. (Right) Zn.

Footwall SCV Vein (Zone 3)



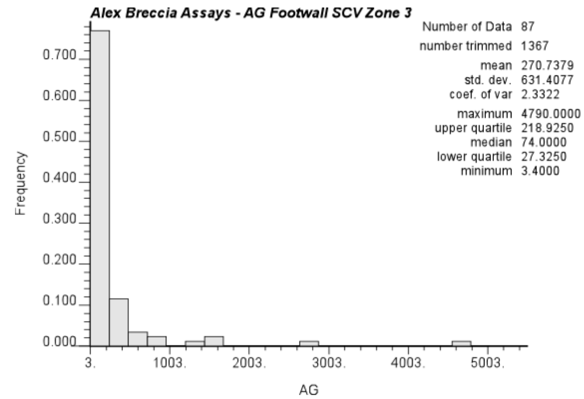
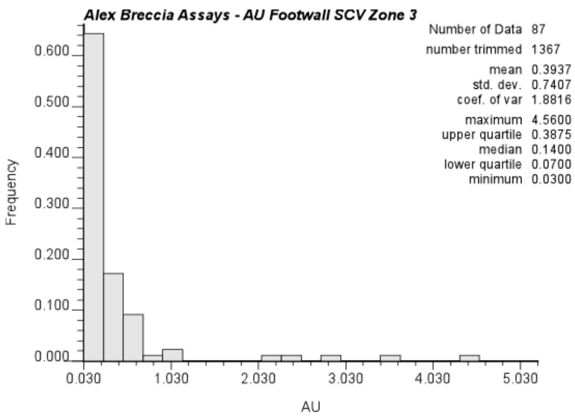


Figure B-47 – Zone 3 Drill Hole Assays (Left) Thickness. (Right) Ag.



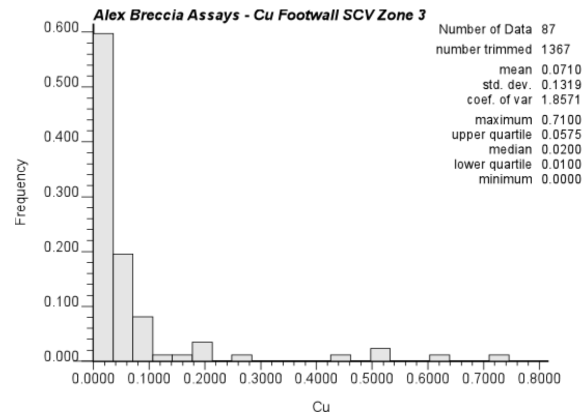
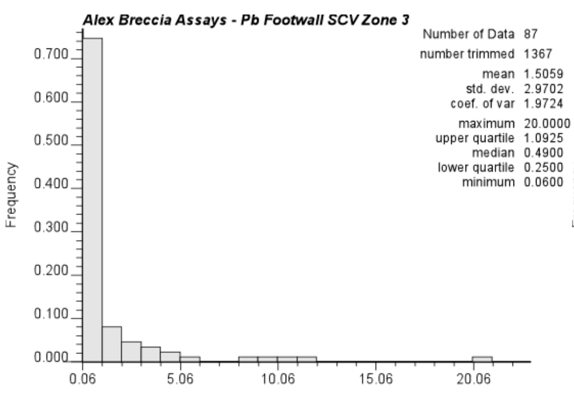


Figure B-48 - Zone 3 Drill Hole Assays (Left) Au. (Right) Cu.



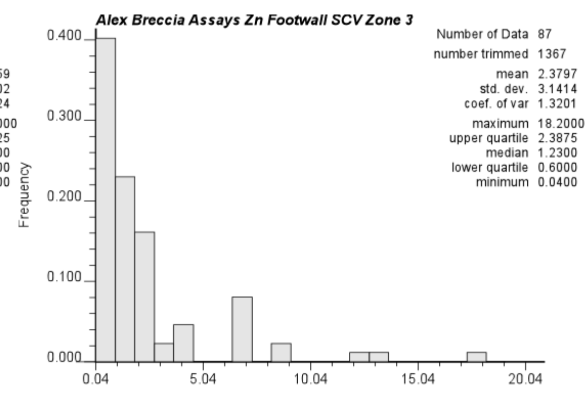
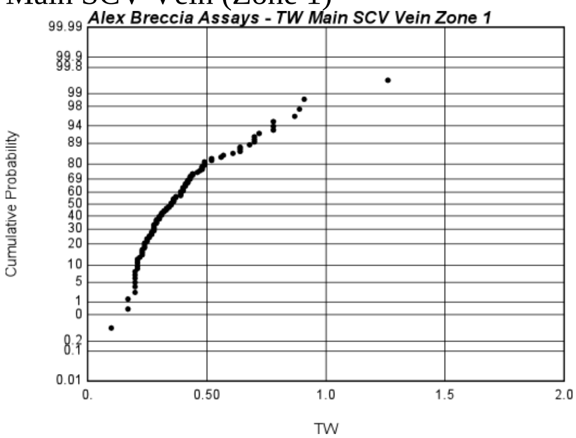


Figure B-49 - Zone 3 Drill Hole Assays (Left) Pb. (Right) Zn.

Drill Hole Assay Probability Plots of Thickness, Au, Ag, Cu, Pb, and Zn
Main SCV Vein (Zone 1)



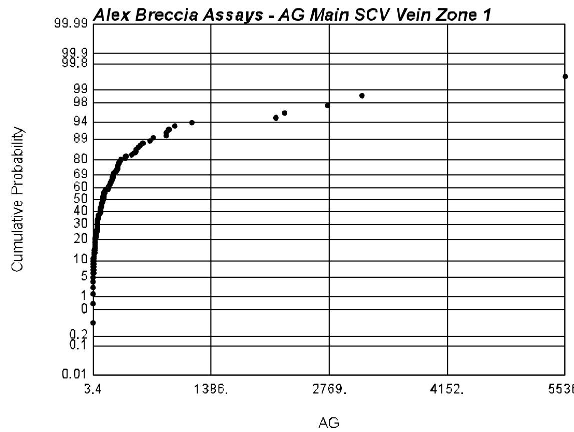
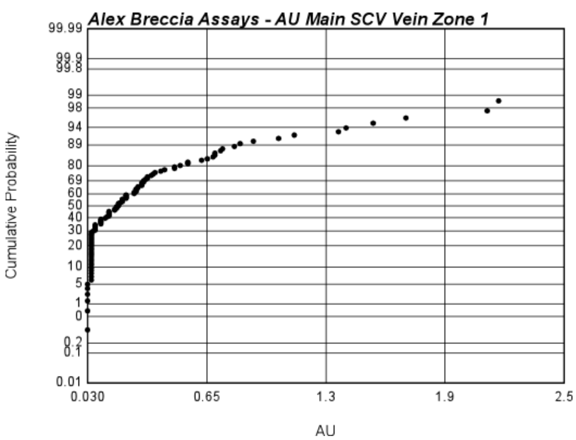


Figure B-50 – Zone 1 Drill Hole Assays (Left) Thickness. (Right) Ag.



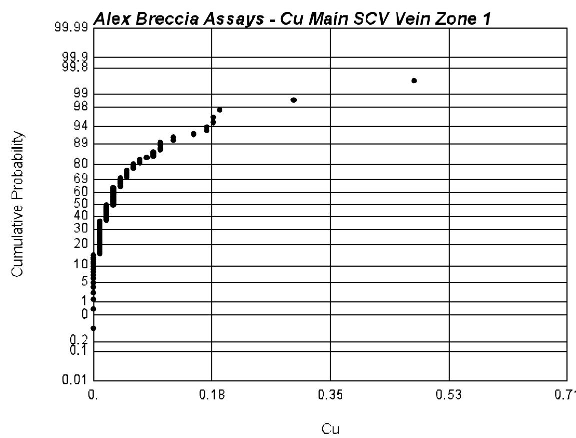
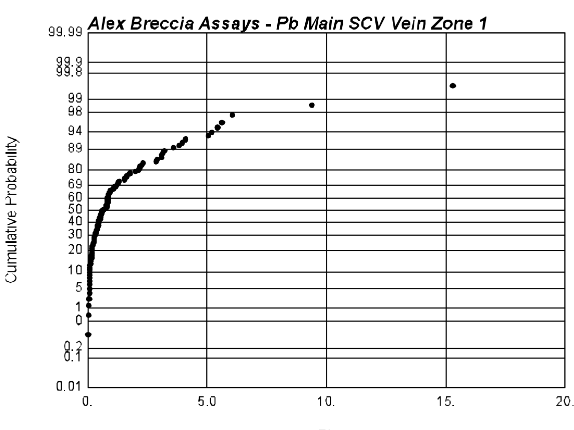


Figure B-51 - Zone 1 Drill Hole Assays (Left) Au. (Right) Cu.



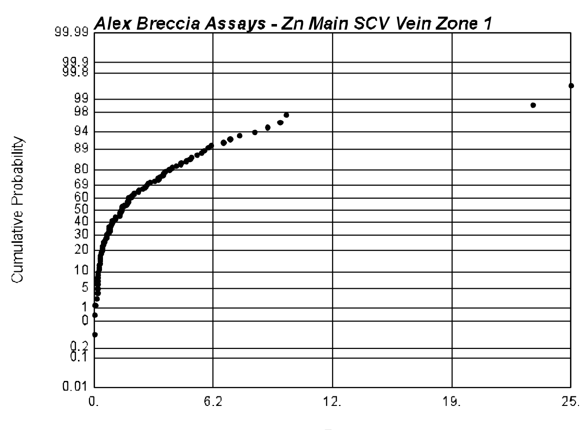
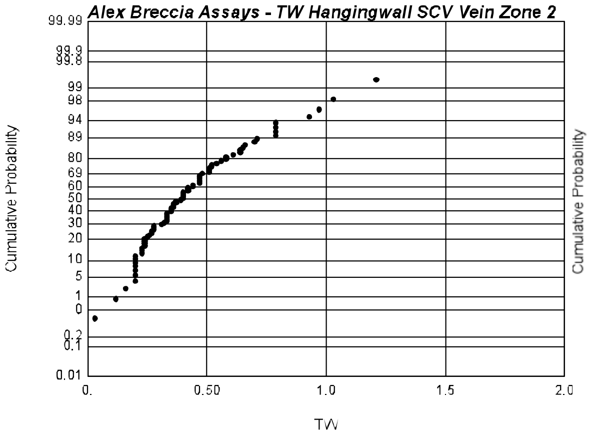


Figure B-52 - Zone 1 Drill Hole Assays (Left) Pb. (Right) Zn.

Hangingwall SCV Vein (Zone 2)



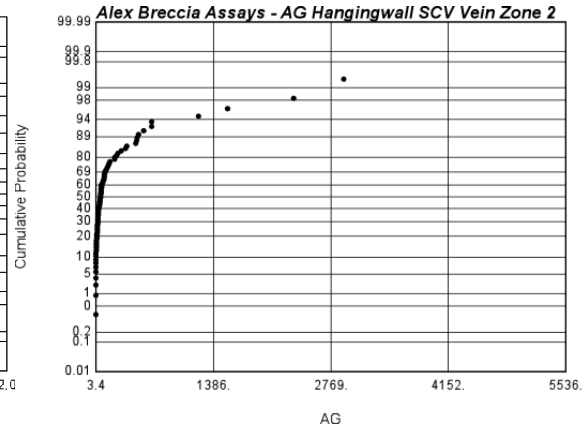
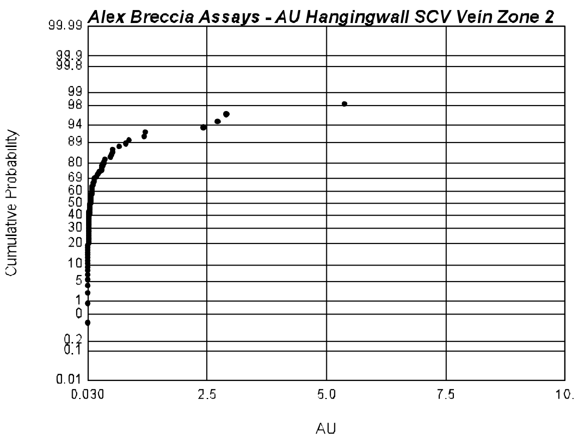


Figure B-53 – Zone 2 Drill Hole Assays (Left) Thickness. (Right) Ag.



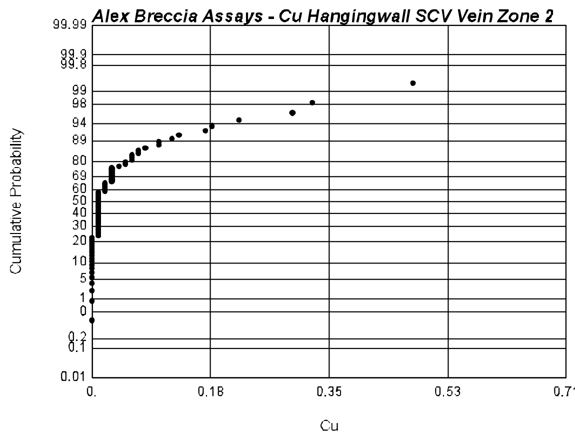
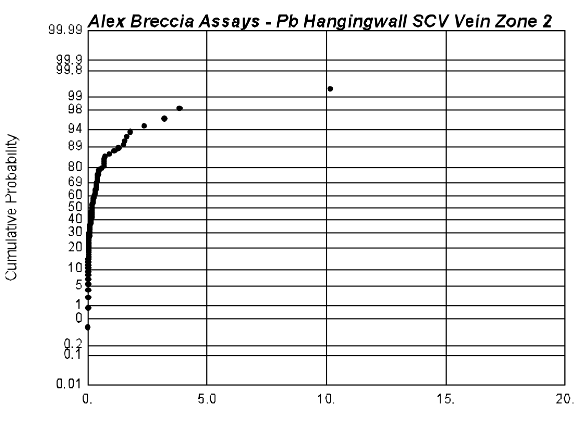


Figure B-54 - Zone 2 Drill Hole Assays (Left) Au. (Right) Cu.



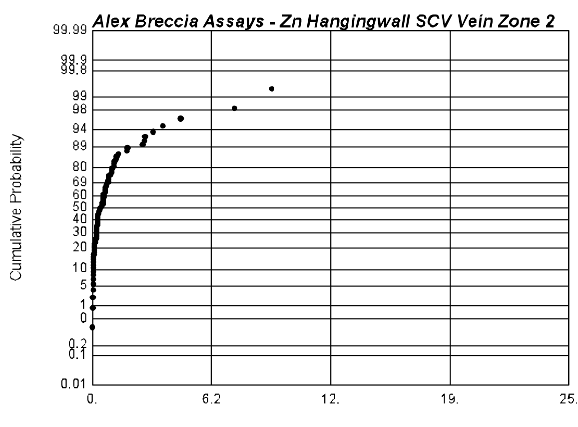


Figure B-55 - Zone 2 Drill Hole Assays (Left) Pb. (Right) Zn.

Footwall SCV Vein (Zone 3)

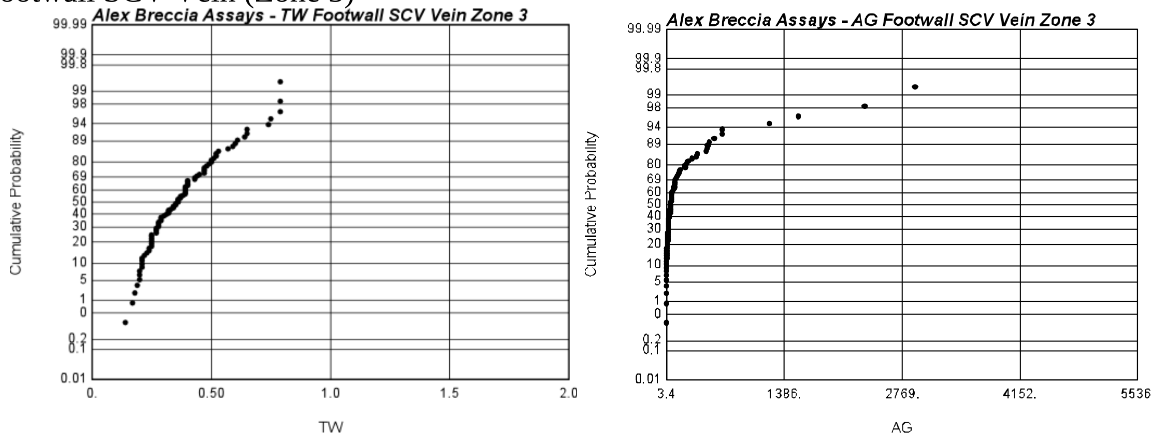


Figure B-56 – Zone 3 Drill Hole Assays (Left) Thickness. (Right) Ag.

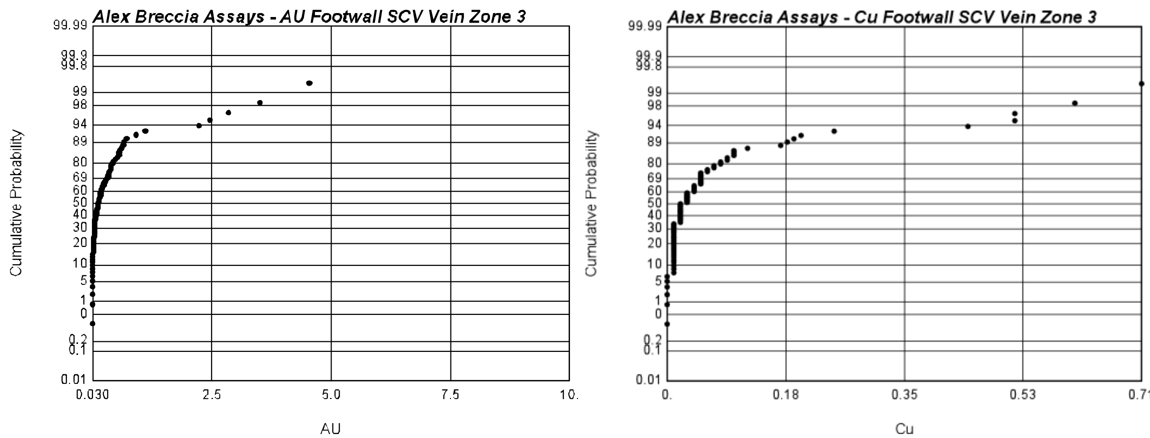


Figure B-57 - Zone 3 Drill Hole Assays (Left) Au. (Right) Cu.

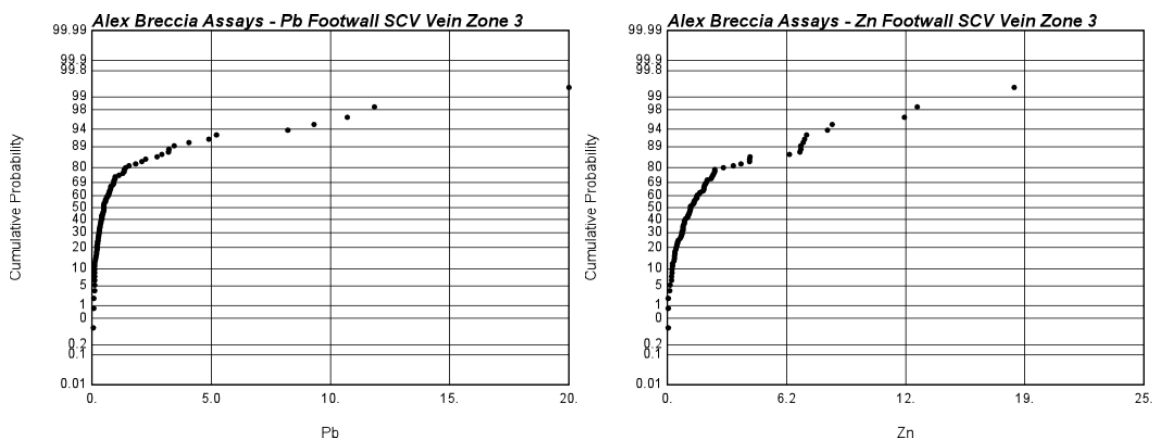


Figure B-58 - Zone 3 Drill Hole Assays (Left) Pb. (Right) Zn.

APPENDIX C

VARIOGRAPHY

micon INTERNATIONAL LIMITED | mineral industry consultants

Variogram Models – Porvenir North
Zone1 (SCV Main) – True Width (TW) Channel Data

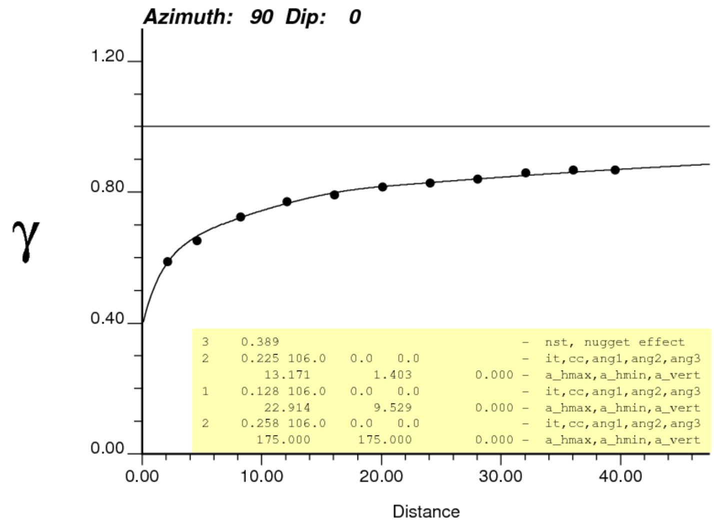


Figure C- 1: Zone 1 Chip Data – True Width Omni Directional Variogram

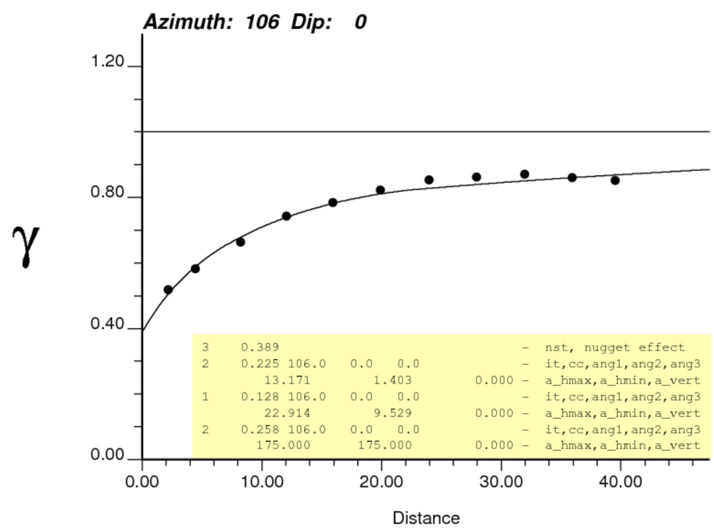


Figure C- 2: Zone 1 Chip Data – True Width Principal Directional Variogram

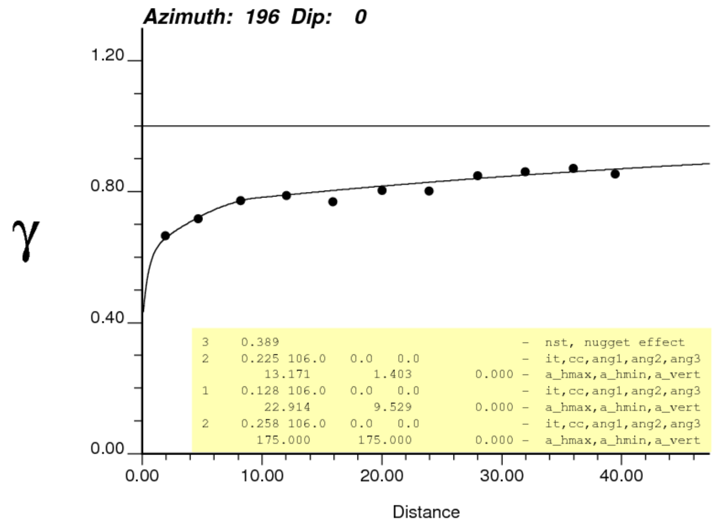


Figure C- 3: Zone 1 Chip Data – True Width Perpendicular Directional Variogram

$$\gamma(\mathbf{h}) = 0.389 + 0.225 \cdot Exp_{\left(\frac{1.4}{13.2}\right)} + 0.128 \cdot Sph_{\left(\frac{9.5}{22.9}\right)} + 0.258 \cdot Exp_{\left(\frac{175.0}{175.0}\right)}$$

Figure C- 4: Chip Data – True Width Variogram Model

Zone 1 (SCV Main) - True Width (TW) Drill Data

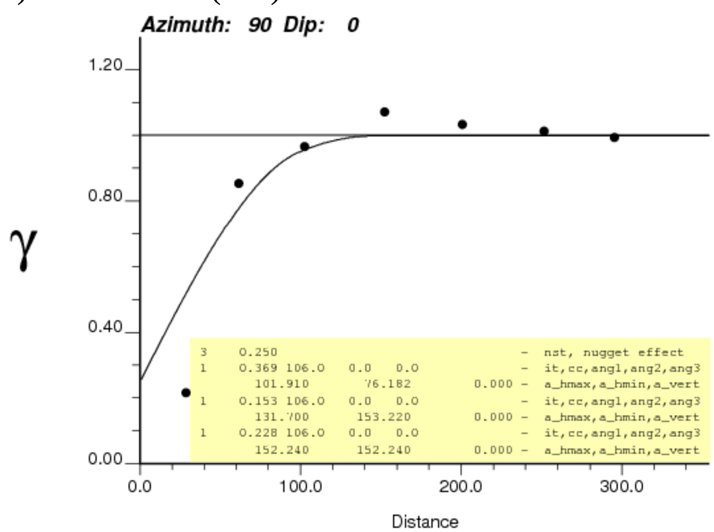


Figure C- 5: Zone 1 Drill Hole Data – True Width Omni Directional Variogram

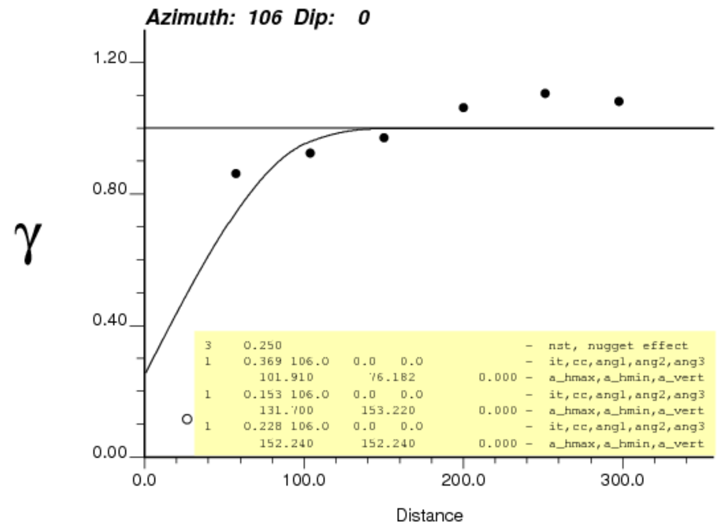


Figure C- 6: Zone 1 Drill Hole Data – True Width Principal Directional Variogram

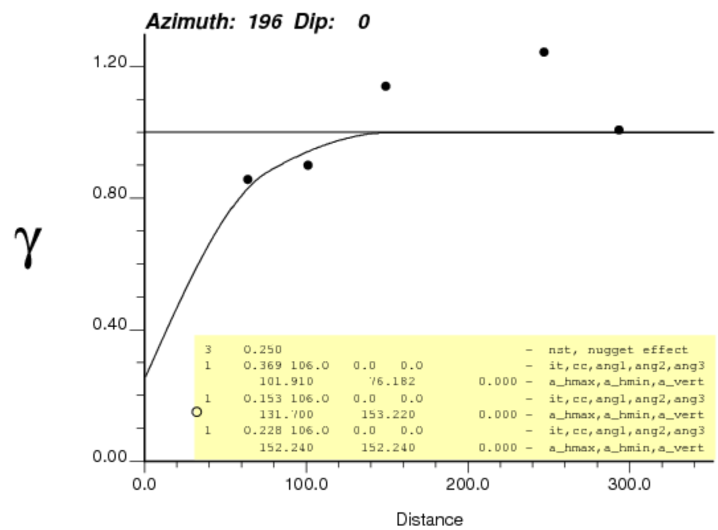


Figure C- 7: Zone 1 Drill Hole Data – True Width Perpendicular Directional Variogram

$$\gamma(\mathbf{h}) = 0.25 + 0.369 \cdot Sph_{\left(\frac{76.2}{101.9}\right)} + 0.153 \cdot Sph_{\left(\frac{153.2}{131.7}\right)} + 0.228 \cdot Sph_{\left(\frac{152.2}{152.2}\right)}$$

Figure C- 8: Drill Data – True Width Variogram Model

Zone 1 (SCV Main) – Capped Ag Accumulation (CAP_AAG) Channel Data

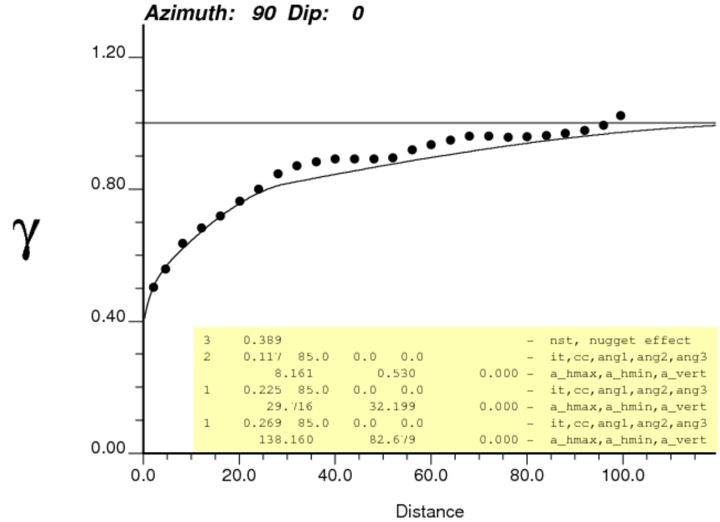


Figure C- 9: Zone 1 Channel Data – CAP_AAG Omni Directional Variogram

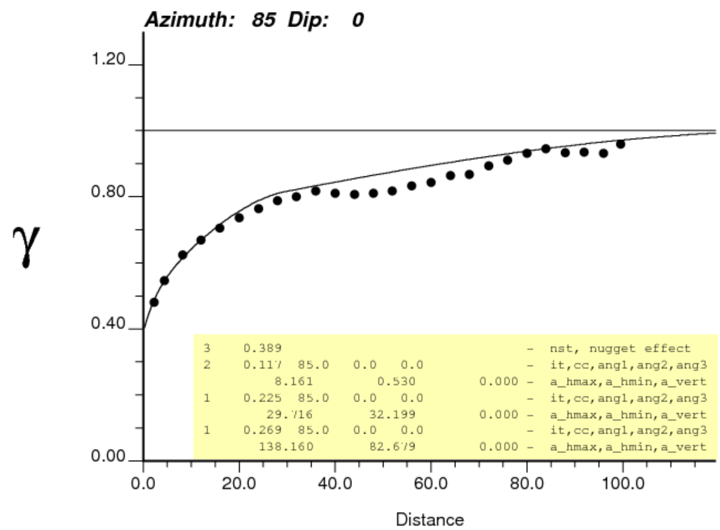


Figure C- 10: Zone 1 Channel Data – CAP_AAG Principal Directional Variogram

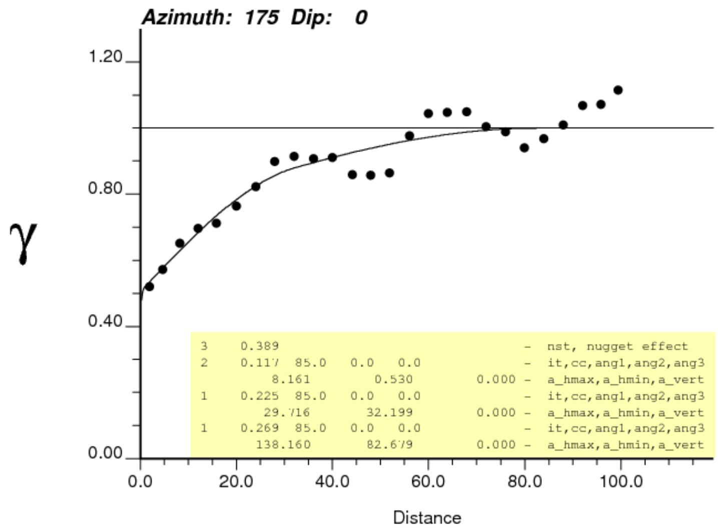


Figure C- 11: Zone 1 Channel Data – CAP_AAG Perpendicular Directional Variogram

$$\gamma(\mathbf{h}) = 0.389 + 0.117 \cdot Exp_{\left(\frac{0.5}{8.2}\right)} + 0.225 \cdot Sph_{\left(\frac{32.2}{29.7}\right)} + 0.269 \cdot Sph_{\left(\frac{82.7}{138.2}\right)}$$

Figure C- 12: Zone 1 Channel Data – CAP_AAG Variogram Model

Zone 1 (SCV Main) – Capped Ag Accumulation (CAP_AAG) Drill Hole Data

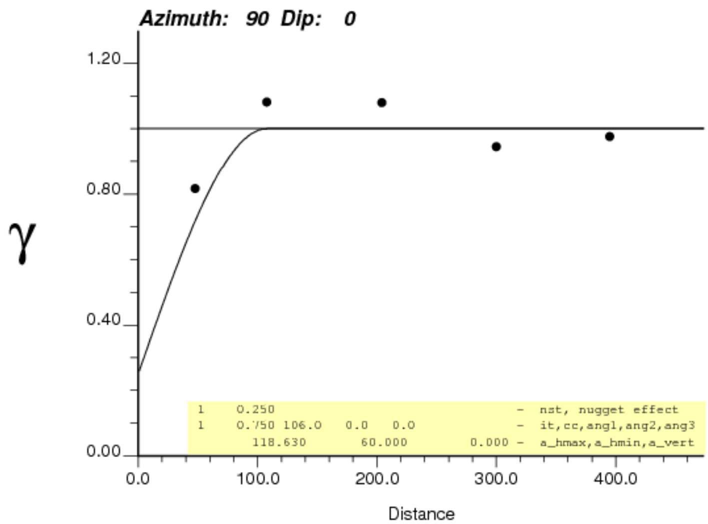


Figure C- 13: Zone 1 Drill Hole Data – CAP_AAG Omni Directional Variogram

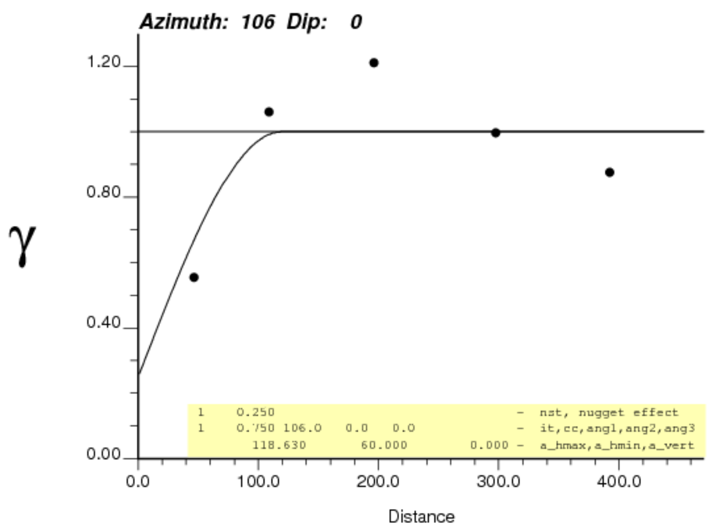


Figure C- 14: Zone 1 Drill Hole Data – CAP_AAG Principal Directional Variogram

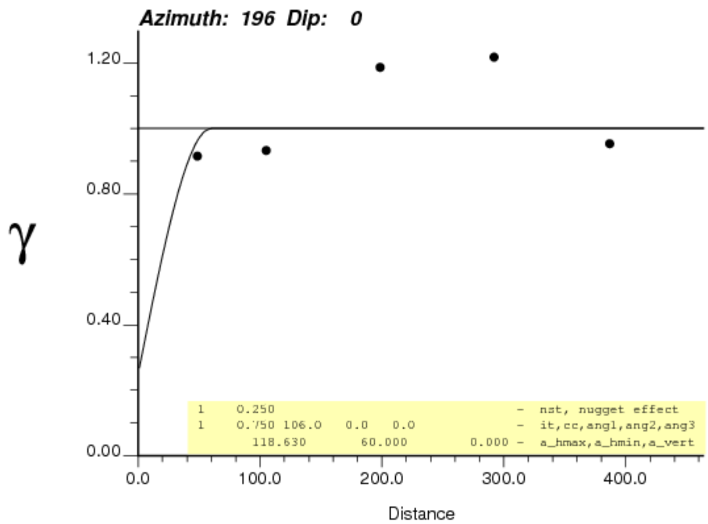


Figure C- 15: Zone 1 Drill Hole Data – CAP_AAG Perpendicular Directional Variogram

$$\gamma(\mathbf{h}) = 0.250 + 0.750 \cdot Sph_{\left(\frac{60.0}{118.6}\right)}$$

Figure 32: Zone 1 Drill Hole Data – CAP_AAG Variogram Model

Zone 1 (SCV Main) – Capped Au Accumulation (CAP_AAU) Channel Data

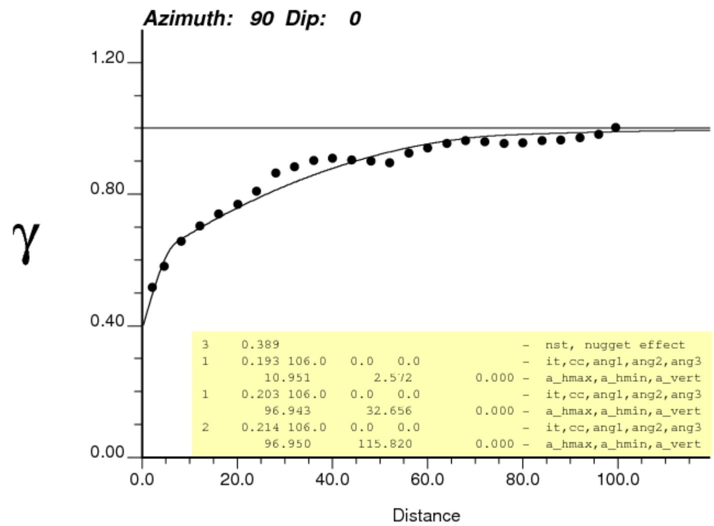


Figure C- 16: Zone 1 Channel Data – CAP_AAU Omni Directional Variogram

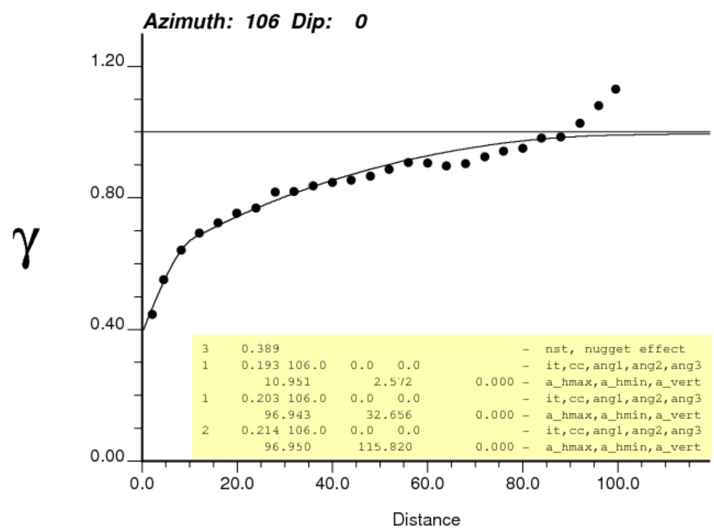


Figure C- 17: Zone 1 Channel Data – CAP_ AAU Principal Directional Variogram

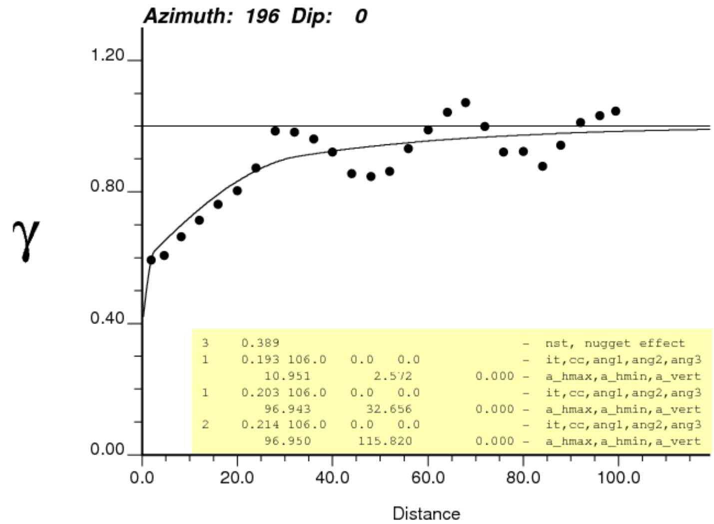


Figure C- 18: Zone 1 Channel Data – CAP_ AAU Perpendicular Directional Variogram

$$\gamma(\mathbf{h}) = 0.389 + 0.193 \cdot Sph_{\left(\frac{2.6}{11.0}\right)} + 0.203 \cdot Sph_{\left(\frac{32.7}{96.9}\right)} + 0.214 \cdot Exp_{\left(\frac{115.8}{97.0}\right)}$$

Figure C- 19: Zone 1 Channel Data – CAP_ AAU Variogram Model

Zone 1 (SCV Main) – Capped Au Accumulation (CAP_AAU) Drill Hole Data

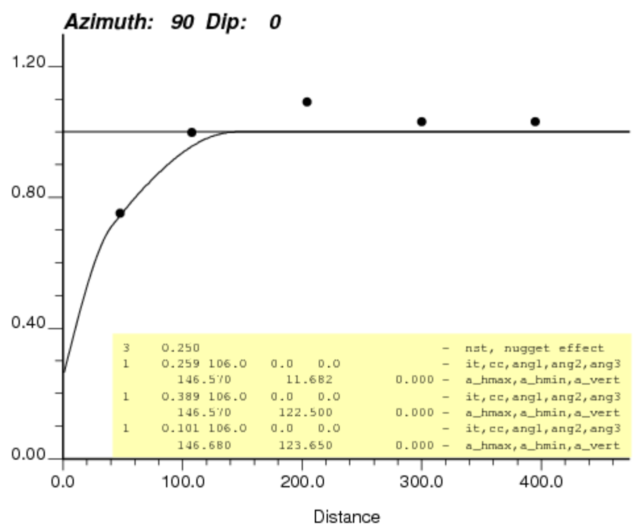


Figure C- 20: Zone 1 Drill Hole Data – CAP_AAU Omni Directional Variogram

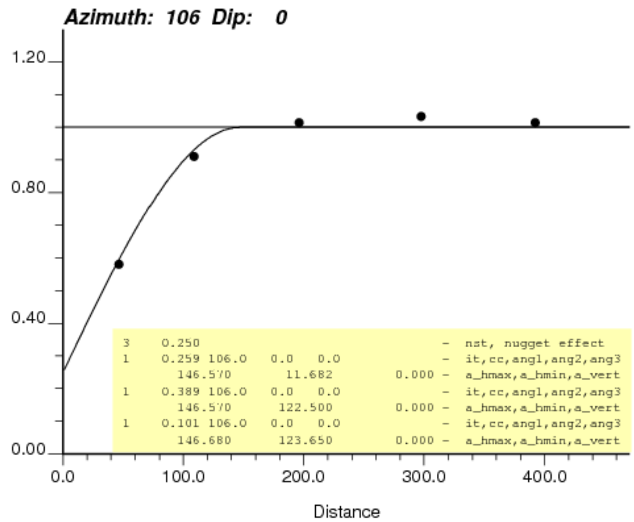


Figure C- 21: Zone 1 Drill Hole Data – CAP_ AAU Principal Directional Variogram

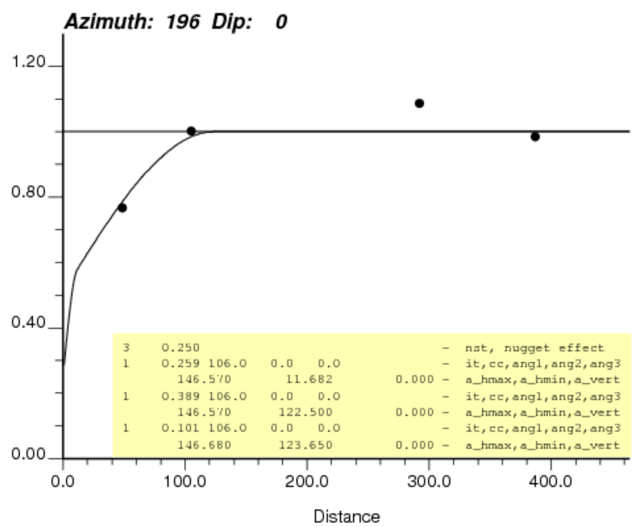


Figure C- 22: Zone 1 Drill Hole Data – CAP_ AAU Perpendicular Directional Variogram

$$\gamma(\mathbf{h}) = 0.250 + 0.259 \cdot Sph_{\left(\frac{11.7}{146.6}\right)} + 0.389 \cdot Sph_{\left(\frac{122.5}{146.6}\right)} + 0.101 \cdot Sph_{\left(\frac{123.6}{146.7}\right)}$$

Figure C- 23: Zone 1 Drill Hole Data – CAP_ AAU Variogram Model

Zone 2 (SCV Splay) – True Width (TW) Channel Data

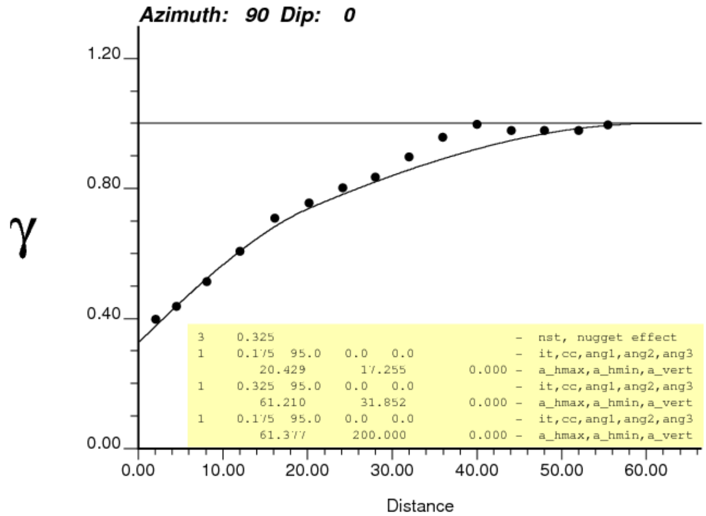


Figure C- 24: Zone 2 Chip Data – True Width Omni Directional Variogram

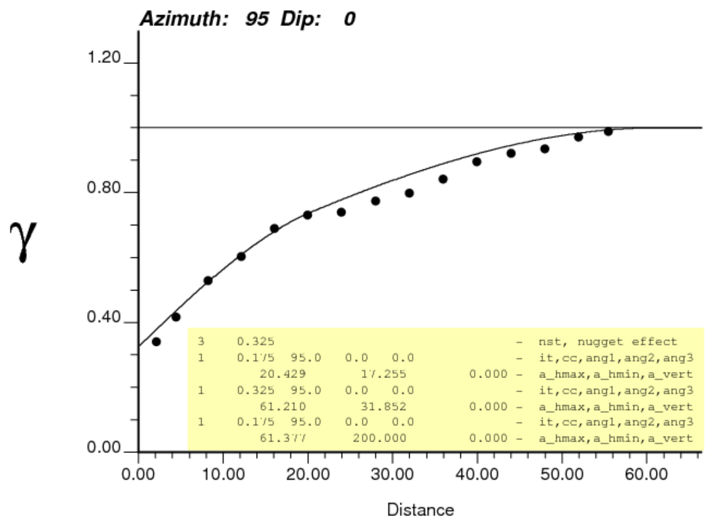


Figure C- 25: Zone 2 Chip Data – True Width Principal Directional Variogram

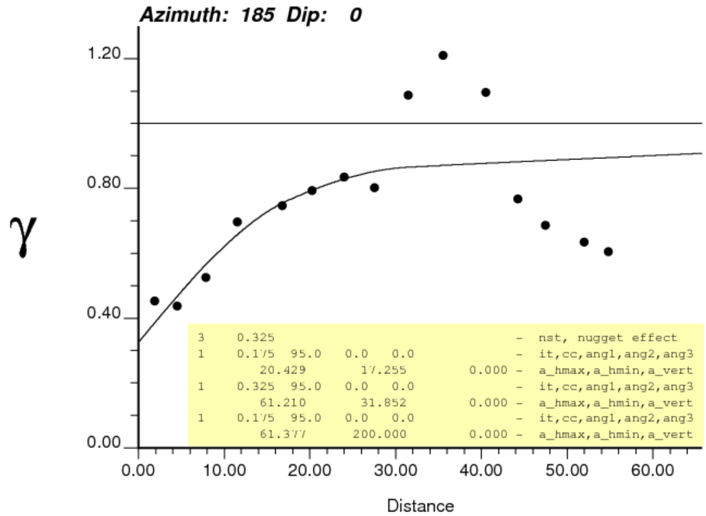


Figure C- 26: Zone 2 Chip Data – True Width Perpendicular Directional Variogram

$$\gamma(\mathbf{h}) = 0.325 + 0.175 \cdot Sph_{\left(\frac{17.2}{20.4}\right)} + 0.325 \cdot Sph_{\left(\frac{31.9}{61.2}\right)} + 0.175 \cdot Sph_{\left(\frac{200.0}{61.4}\right)}$$

Figure 33: Zone 2 Chip Data – True Width Variogram Model

Zone 2 (SCV Splay) - True Width (TW) Drill Data

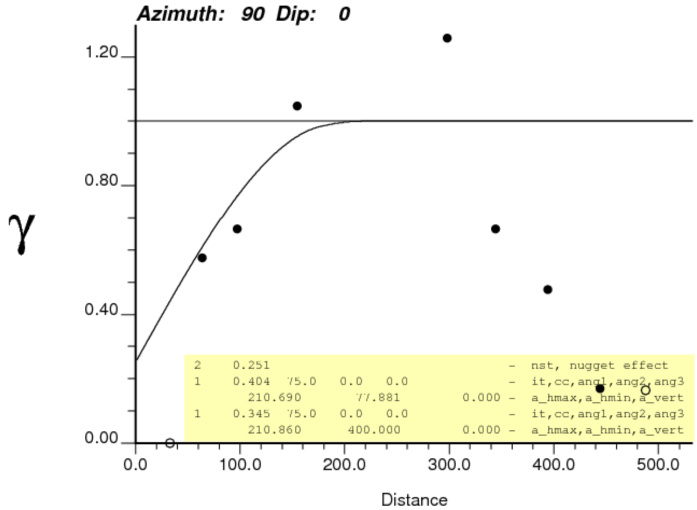


Figure C- 27: Zone 2 Drill Hole Data – True Width Omni Directional Variogram

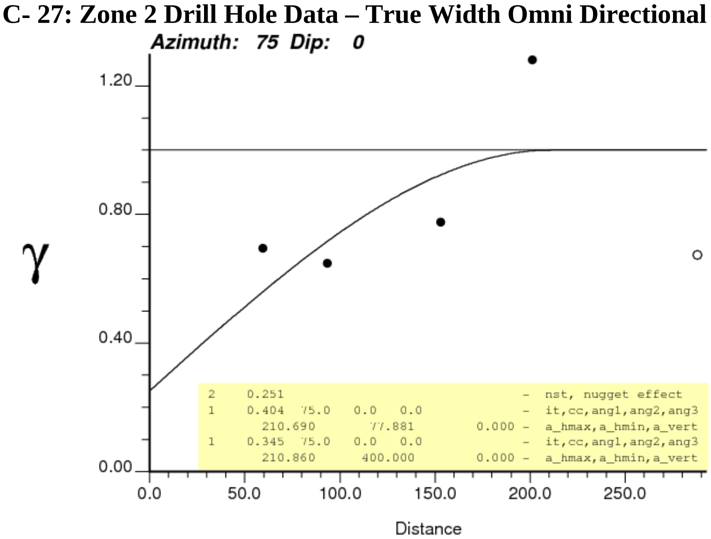


Figure C- 28: Zone 2 Drill Hole Data – True Width Principal Directional Variogram

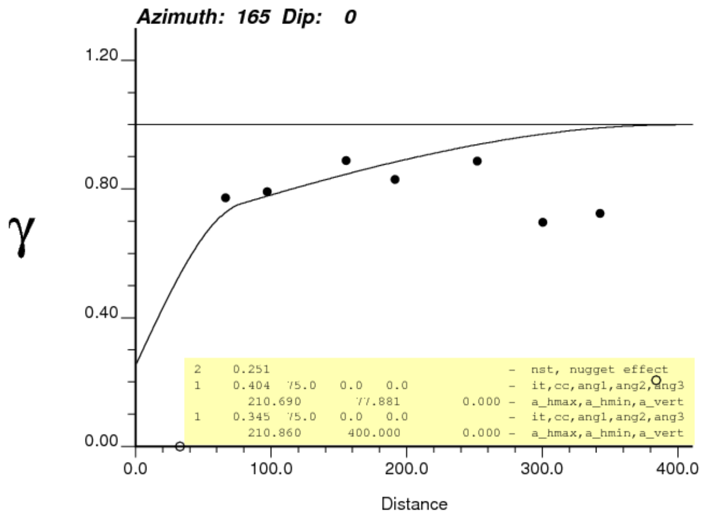


Figure C- 29: Zone 2 Drill Hole Data – True Width Perpendicular Directional Variogram

$$\gamma(\mathbf{h}) = 0.251 + 0.404 \cdot Sph_{\left(\frac{77.9}{210.7}\right)} + 0.345 \cdot Sph_{\left(\frac{400.0}{210.9}\right)}$$

Figure 34: Drill Data – True Width Variogram Model

Zone 2 (SCV Splay) – Capped Ag Accumulation (CAP_AAG) Channel Data

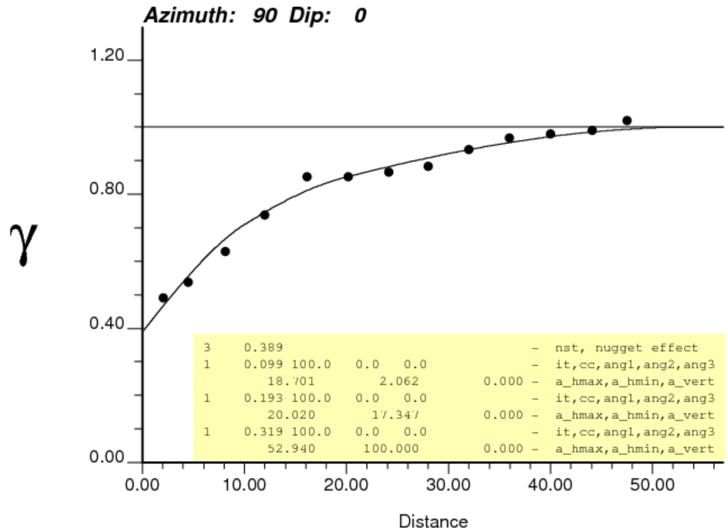


Figure C- 30: Zone 2 Channel Data – CAP_AAG Omni Directional Variogram

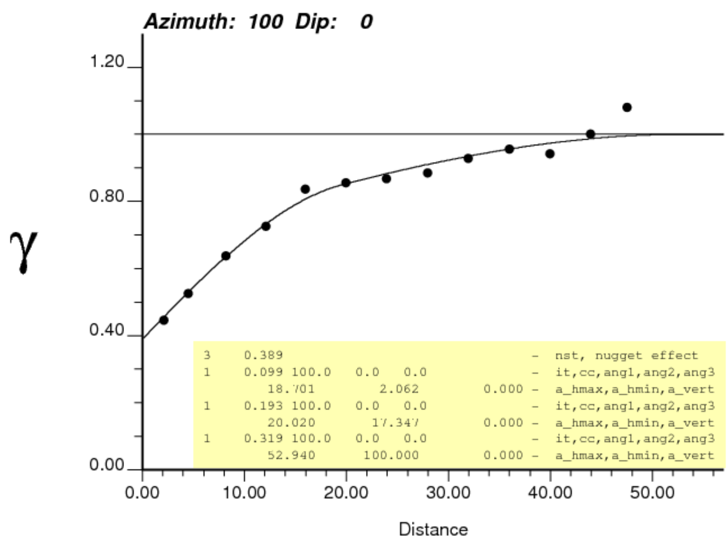


Figure C- 31: Zone 2 Channel Data – CAP_AAG Principal Directional Variogram

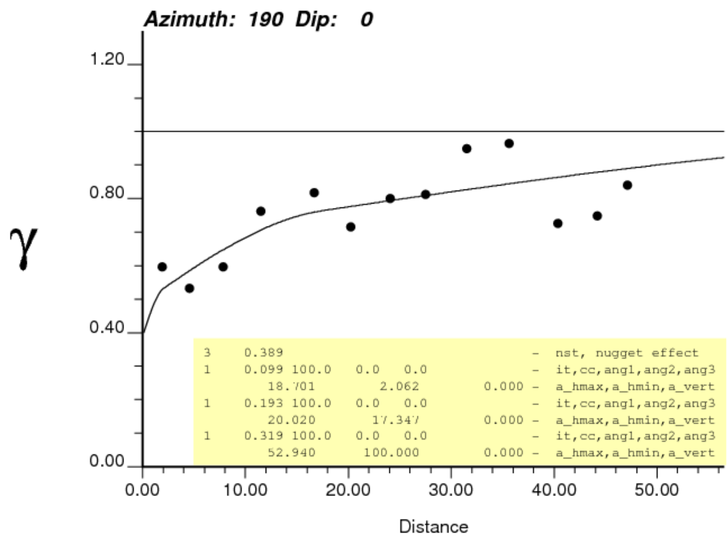


Figure C- 32: Zone 2 Channel Data – CAP_AAG Perpendicular Directional Variogram

$$\gamma(\mathbf{h}) = 0.389 + 0.099 \cdot Sph_{\left(\frac{2.0}{18.7}\right)} + 0.193 \cdot Sph_{\left(\frac{17.3}{20.0}\right)} + 0.319 \cdot Sph_{\left(\frac{100.0}{52.9}\right)}$$

Figure 35: Zone 2 Channel Data – CAP_AAG Variogram Model

Zone 2 (SCV Splay) – Capped Ag Accumulation (CAP_AAG) Drill Hole Data

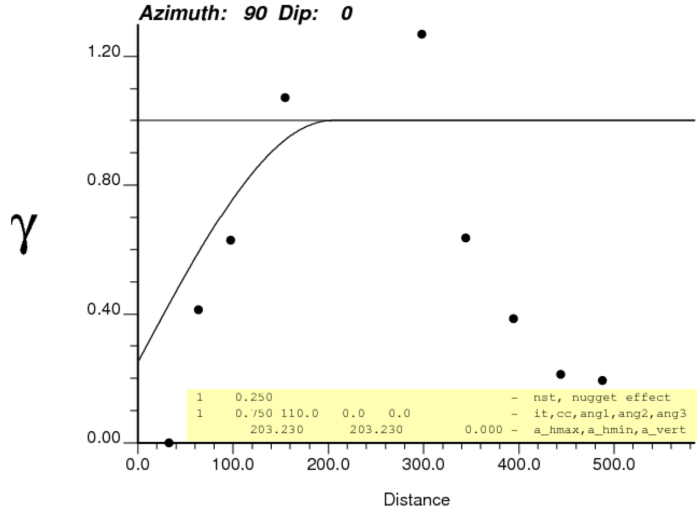


Figure C- 33: Zone 2 Drill Hole Data – CAP_AAG Omni Directional Variogram

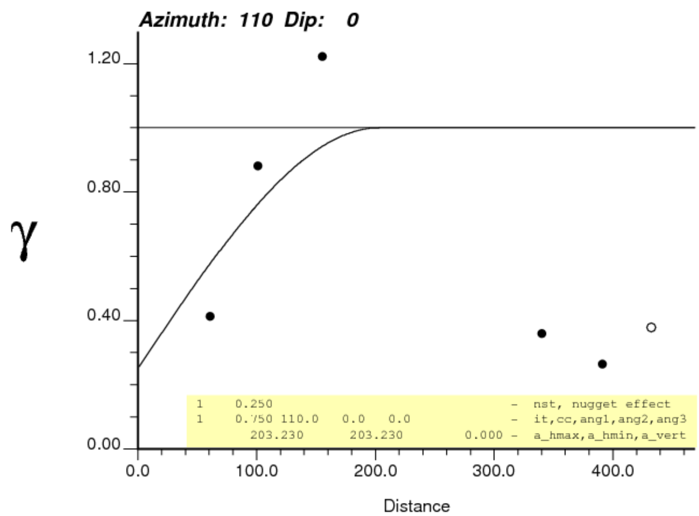


Figure C- 34: Zone 2 Drill Hole Data – CAP_AAG Principal Directional Variogram

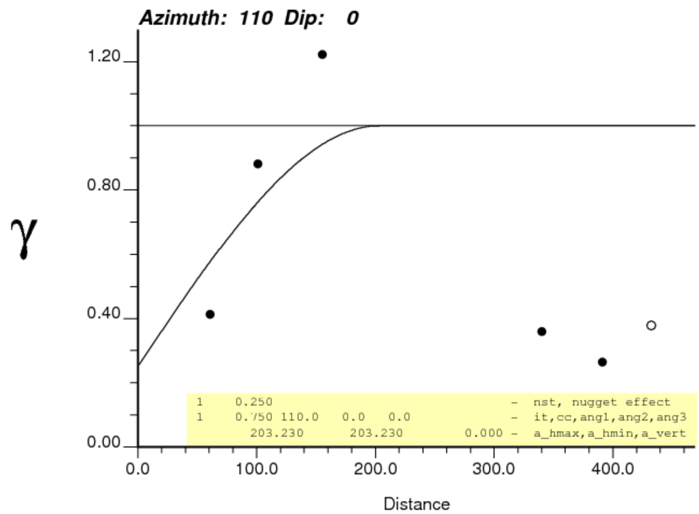


Figure C- 35: Zone 2 Drill Hole Data – CAP_AAG Perpendicular Directional Variogram

$$\gamma(\mathbf{h}) = 0.250 + 0.750 \cdot Sph_{\left(\frac{203.2}{203.2}\right)}$$

Figure 36: Zone 2 Drill Hole Data – CAP_AAG Variogram Model

Zone 2 (SCV Splay) – Capped Au Accumulation (CAP_AAU) Channel Data

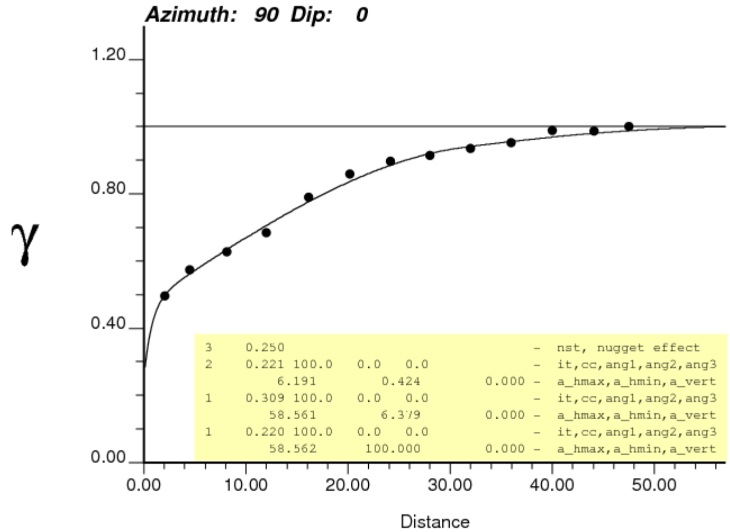


Figure C- 36: Zone 2 Channel Data – CAP_AAU Omni Directional Variogram

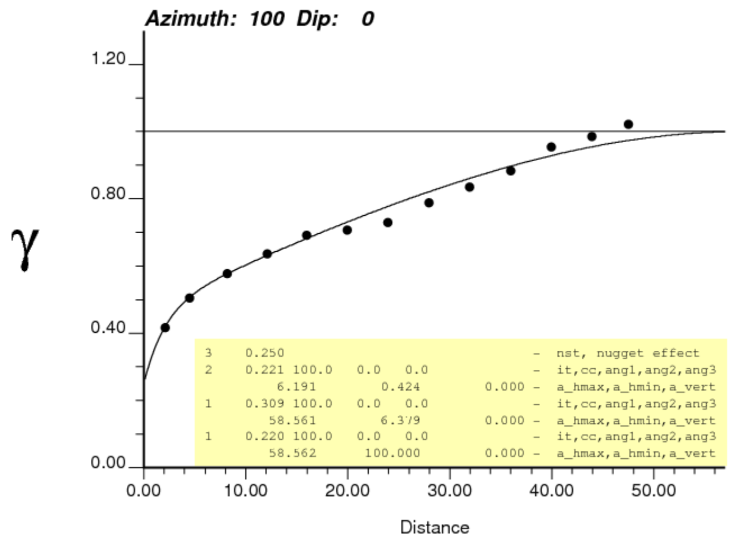


Figure C- 37: Zone 2 Channel Data – CAP_ AAU Principal Directional Variogram

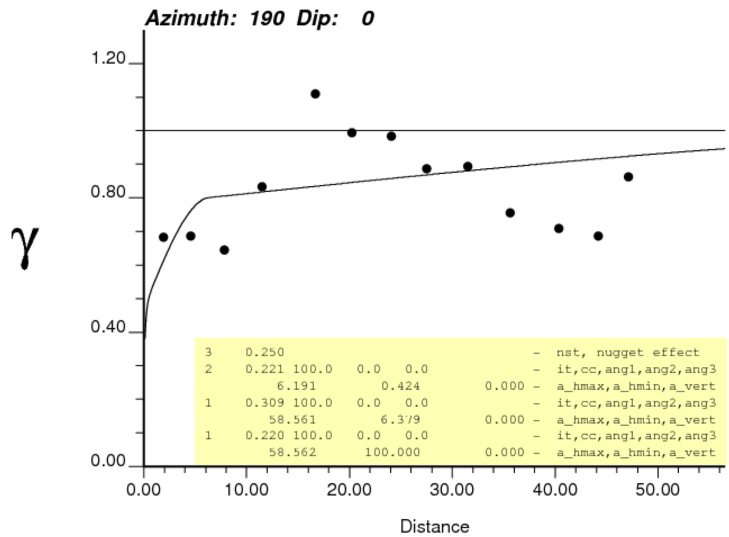


Figure C- 38: Zone 2 Channel Data – CAP_ AAU Perpendicular Directional Variogram

$$\gamma(\mathbf{h}) = 0.250 + 0.221 \cdot Exp_{\left(\frac{0.4}{6.2}\right)} + 0.309 \cdot Sph_{\left(\frac{6.4}{58.6}\right)} + 0.220 \cdot Sph_{\left(\frac{100.0}{58.6}\right)}$$

Figure C- 39: Zone 2 Channel Data – CAP_ AAU Variogram Model

Zone 2 (SCV Splay) – Capped Au Accumulation (CAP_AAU) Drill Hole Data

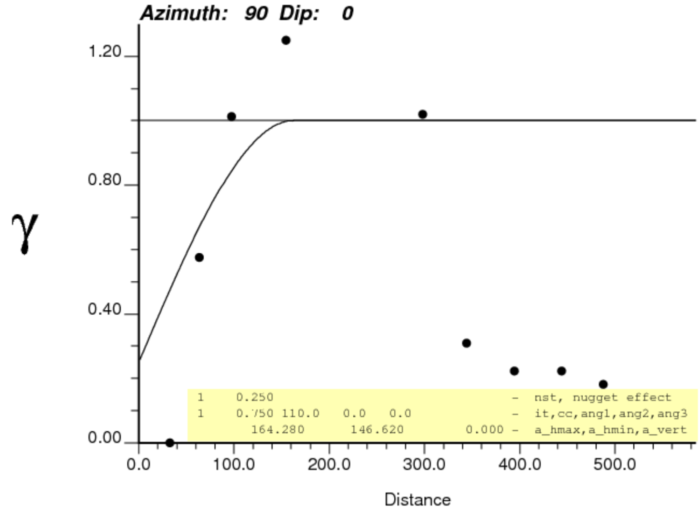


Figure C- 40: Zone 2 Drill Hole Data – CAP_AAU Omni Directional Variogram

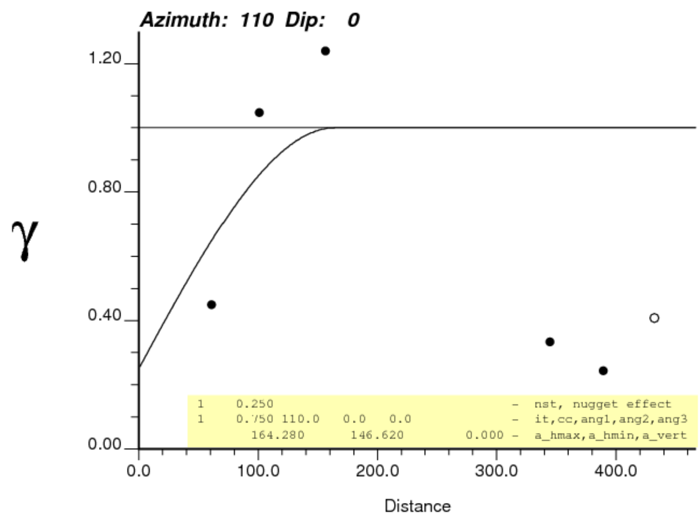


Figure C- 41: Zone 2 Drill Hole Data – CAP_ AAU Principal Directional Variogram

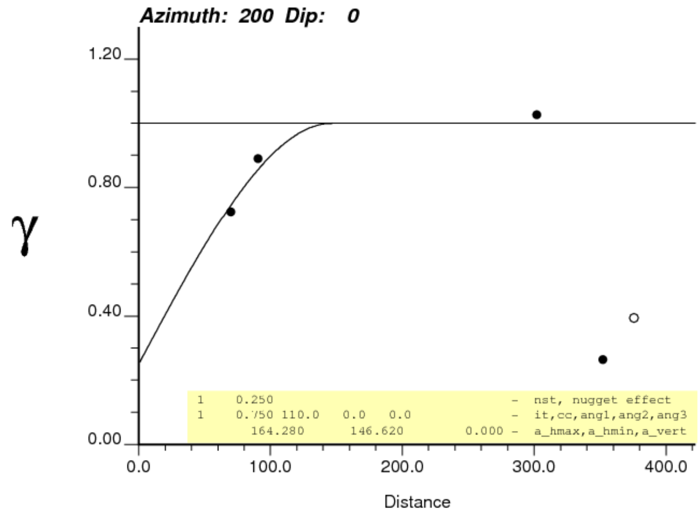


Figure C- 42: Zone 2 Drill Hole Data – CAP_ AAU Perpendicular Directional Variogram

$$\gamma(\mathbf{h}) = 0.250 + 0.750 \cdot Sph_{\left(\frac{146.6}{164.3}\right)}$$

Figure C- 43: Zone 2 Drill Hole Data – CAP_ AAU Variogram Model