Fortuna Silver Mines Inc.: Caylloma Property, Caylloma District, Peru

Technical Report
Effective Date: May 7, 2012

Prepared by

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Date and Signature Page

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Eric N. Chapman	7th May 2012
[signed and sealed]	Date
Edgard Vilela	7th May 2012
[signed]	Date

Tables

Figures

1 Summary

This Technical Report refers to the Caylloma property, an operating underground mine located in the Caylloma Province, Peru. Since June 2005, the Caylloma property has been 100% owned by Compania Minera Bateas (Minera Bateas), a Peruvian subsidiary of Fortuna Silver Mines Inc. (Fortuna).

The Caylloma property is located in the Caylloma Mining District, 225 kilometers north-northwest of Arequipa, Peru. The property is within the historical mining district of Caylloma, northwest of the Caylloma Caldera complex and southwest of the Chonta Cordero complex. Host rocks at the Caylloma property are volcanic in nature, belonging to the Tacaza Group. Mineralization is in the form of low to intermediate sulfidation epithermal vein systems.

Epithermal veins at the Caylloma property are characterized by minerals such as pyrite, sphalerite, galena, chalcopyrite, marcasite, native gold, stibnite, argentopyrite, and silver-bearing sulfosalts (tetrahedrite, polybasite, pyrargyrite, stephanite, stromeyerite, jalpite, miargyrite and bournonite). These are accompanied by gangue minerals, such as quartz, rhodonite, rhodochrosite, johannsenite (manganese-pyroxene) and calcite.

There are two different types of mineralization at Caylloma; the first is comprised of silver-rich veins with low concentrations of base metals and includes the Bateas, Bateas Techo, La Plata, Cimoide La Plata, San Cristóbal, San Pedro, San Carlos, Paralela, and Ramal Paralela veins. The second type of vein is polymetallic in nature with elevated lead, zinc, copper, silver and gold grades and includes the Animas, Animas NE, Santa Catalina, Soledad, Silvia, Pilar, and Patricia veins.

Underground operations are presently focused on mining the Animas, Silvia, Soledad, Santa Catalina, Bateas, and San Cristóbal veins. Exploration in 2011 focused on the expansion and delineation of the La Plata, Animas, and Bateas veins.

The 2011 Mineral Resource update has relied on channel and drill hole sample information obtained by Minera Bateas since 2005. Mineralized domains identifying potentially economically extractable material were modeled for each vein and used to code drill holes and channel samples for geostatistical analysis, block modeling and grade interpolation by ordinary kriging or inverse distance weighting.

Mineral Resource and Reserve estimates for the Caylloma property reported as of 31 December, 2011 are detailed in Table 1.1 and Table 1.2.

Economic values (NSR) for each mining block take into account the commercial terms of 2011, the average metallurgical recovery, the average grade in concentrate and long term projected metal prices. Mineral Reserves have been reported above a break-even cut-off value calculated for each vein, based on NSR values and operating costs. Mineral Resources have been reported above a US$30/t cut-off value based on NSR values.

Mineral Resources are categorized as Measured, Indicated and Inferred. The criteria used for classification includes, the number of samples, spatial distribution, distance to block centroid, kriging efficiency (KE) and slope of regression (ZZ).

Mineral Reserve estimates have considered only Measured and Indicated Mineral Resources as only these categories have sufficient geological confidence to be considered Mineral Reserves (CIM, 2010). Subject to the application of certain economic and mining-related qualifying factors, Measured Resources may become Proven Reserves and Indicated Resources may become Probable Reserves.

Table 1.1 Mineral Reserves as of December 31, 2011

Vein type	Category	Tonnes (000)	Ag (g/t)	Au (g/t)	Pb (%)	Zn (%)	Cont. Ag (Moz)	Cont. Au (koz)
Silver Veins	Proven	26	687	0.28	0.32	0.32	0.6	0.2
	Probable	755	365	0.42	0.06	0.06	8.9	10.3
	Proven +Probable	781	376	0.42	0.07	0.07	9.4	10.5
Polymetallic Veins	Proven	1,318	87	0.32	1.59	2.39	3.7	13.5
	Probable	2,543	86	0.31	1.58	2.27	7.1	25.5
	Proven +Probable	3,861	86	0.31	1.59	2.31	10.7	39.0
Combined-All Veins	Proven	1,344	98	0.32	1.57	2.35	4.2	13.7
	Probable	3,297	150	0.34	1.23	1.76	15.9	35.8
	Proven +Probable	4,642	135	0.33	1.33	1.93	20.2	49.5

Table 1.2 Mineral Resources as of December 31, 2011

Category	Tonnes (000)	Ag (g/t)	Au (g/t)	Pb (%)	Zn (%)	Cont. Ag (Moz)	Cont. Au (koz)
Measured	574	100	0.31	1.17	1.75	1.8	5.8
Indicated	1,684	131	0.30	0.74	1.11	7.1	16.0
Measured + Indicated	2,258	123	0.30	0.85	1.28	8.9	21.8
Inferred	3,258	112	0.36	0.99	1.50	11.8	37.9

Notes

- Mineral Reserves and Mineral Resources are as defined by CIM Definition Standards on Mineral Resources and Mineral Reserves.
- Mineral Resources are exclusive of Mineral Reserves.
- Mineral Resources which are not Mineral Reserves do not have demonstrated economic viability.
- Mineral Resources and Mineral Reserves are estimated as of June 30, 2011 and reported as of December 31, 2011 taking into account production-related depletion for the period of July 1, 2011 through December 31, 2011.
- Mineral Reserves are reported above a NSR breakeven cut-off grade of US$52.73/t for Animas, Animas NE, Cimoide La Plata, and La Plata; US$151.60/t for Bateas; US$88.42/t for Soledad, and Paralela; US$56.66/t for Santa Catalina, and Silvia; US$80.6/t for San Carlos and San Pedro; US$55.20/t for San Cristóbal.
- Mineral Resources are reported above a NSR cut-off grade of US$30/t.
- Metal prices used in the NSR evaluation are US$26.59/oz for silver, US$1,279.31/oz for gold, US$2,116/t for lead and US$2,028/t for zinc.
- Metallurgical recovery values used in the NSR evaluation are 82% for silver, 45% for gold, 93% for lead, and 88% for zinc.
- Point metal values (taking into account metal price, concentrate recovery, smelter cost, metallurgical recovery) used for NSR evaluation are US$0.64/g for silver, US$17.45/g for gold, US$16.11/% for lead, and US$11.83/% for zinc.
- Mill and administrative costs were estimated based on first half of 2011 actual costs.
- Mineral Reserve tonnes are rounded to the nearest hundred. Measured and Indicated Resource tonnes are rounded to the nearest hundred, and Inferred Resource tonnes are rounded to the nearest thousand.

- The estimate of Mineral Resources may be materially affected by environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues.
- Mineral Resources include oxide material that is not amenable to processing in the existing plant. Measured and Indicated Oxide Resources are estimated at 1,077,000 tonnes averaging 197 g/t Ag, 0.39 g/t Au, 1.00 % Pb, 1.28 % Zn. Inferred Oxide Resources are estimated at 544,000 tonnes averaging 143 g/t Ag, 0.27 g/t Au, 0.55 % Pb, 0.94 % Zn.
- The quantity and grade of the Inferred Resources reported in this estimation are conceptual in nature, and it is uncertain if further exploration will result in upgrading of Inferred Resources to Indicated or Measured Resource categories.
- Totals may not add due to rounding.

Minera Bateas continues to successfully manage the operation, mining 448,866 t of ore from underground to produce 2,008,488 oz of silver, 2,393 oz of gold, 19,677,366 lbs of lead, and 23,424,479 lbs of zinc in 2011 while continuing to improve the mine's infrastructure.

Fortuna believes there is good potential for the significant extension of Mineral Resources at the Caylloma property through the expansion of the Mineral Reserves currently being mined and through the discovery and exploration of new veins. Mapping of the property in 2011 identified multiple exploration targets that are to be investigated in 2012 and subsequent years.

Exploration and development are focused on expanding or discovering new Mineral Resources as well as increasing the confidence of Inferred Resource in 2012 so they can be incorporated into Mineral Reserves and thereby extend the mine life. The company is committed to a strong exploration program, budgeting US$8.5 million in 2012 with the intention of drilling a total of 23,400 m from surface and underground.

Fortuna continues to invest in the property infrastructure with the completion of new offices, core logging and storage facilities, and dining facilities in 2011 with additional upgrades planned for 2012. Construction of the new tailings facility is set for completion in 2012 with numerous additional projects to improve the access and ventilation of the mine scheduled for implementation over the next 12 months.

2 Introduction

This Technical Report has been prepared by Fortuna Silver Mines Inc. (Fortuna) in accordance with the disclosure requirements of Canadian National Instrument 43-101 (NI 43-101) to disclose recent information about the Caylloma property. This information has resulted from additional underground development and sampling, exploration drilling, delineation drilling, and updated Mineral Resource and Reserve estimates.

The Caylloma property is 100% owned by Fortuna (formerly Fortuna Ventures Inc.) and is located approximately 225 km by road from Arequipa in the Caylloma region of southern Peru.

Fortuna is based in Vancouver, British Columbia with management offices in Lima, Peru and is listed on the Toronto (TSX:FVI), Lima (BVL:FVI), and New York (NYSE:FSM) stock exchanges.

The mineral rights of the Caylloma property are held by Minera Bateas S.A.C. (Minera Bateas) and renewed on an annual basis. Minera Bateas is a Peruvian subsidiary 100% owned by Fortuna and is responsible for running the Caylloma operation. Fortuna also owns Compania Minera Cuzcatlan S.A. de C.V. which operates the San Jose silver-gold mine located in the state of Oaxaca, Mexico.

Fortuna acquired the Caylloma property in 2005, and placed it into production in September 2006 with a refurbished mill which included separate circuits for silver-lead, zinc, and later (in 2009) copper. The current operation exploits the Animas vein and other polymetallic (Ag-Pb-Zn) veins, in addition to the silver-gold veins previously exploited by Compania Minera Arcata, a subsidiary of Hochschild Mining plc.

The cut-off date for the channel information used in the Mineral Resource estimate is June 30, 2011. The Mineral Resources and Reserves are reported as of December 31, 2011 with the estimates being depleted to take into account production and updated for significant exploration drilling results obtained between June and the end of 2011.

The December 31, 2011 Mineral Resource and Mineral Reserve estimates supersede the Mineral Resource and Mineral Reserve estimates reported by Fortuna on April 12, 2011, and those reported by Chlumsky, Armbrust & Meyer (CAM) in 2009 that are detailed in the Technical Review (NI 43-101), filed at www.sedar.com on August 27, 2009.

Field data was compiled and validated by Minera Bateas and Fortuna staff. Geological description of the samples, geological interpretations and 3-D wireframes of the veins were completed by Minera Bateas and reviewed by Fortuna personnel. The June 2011 Mineral Resource estimates were undertaken by Fortuna under the technical supervision of the Qualified Person, Mr. Eric Chapman.

The June 2011 Mineral Reserves estimate and December 2011 depletions were undertaken by Fortuna's Mine Planning & Engineering department under the technical supervision of the Qualified Person, Mr. Edgard Vilela.

The authors of this Technical Report are Qualified Persons as defined by NI 43-101. Mr Eric Chapman has been employed as Mineral Resource Manager by Fortuna since May 2011 and has visited the property on numerous occasions, the most recent being December 13, 2011. Mr Edgard Vilela has been employed as Corporate Manager of Technical Services at Fortuna since December 2011 having previously been employed by Minera Bateas as Planning, Engineer and Project Superintendent at the Caylloma operation since December 2010. Mr Vilela has also conducted regular visits to the property in 2011.

Responsibilities for the preparation of the different sections of this Technical Report are shown in Table 2.1.

Table 2.1 Author's responsibilities

Author	Responsible for section/s
Eric Chapman	1. Summary; 2. Introduction; 3. Reliance on Other Experts; 4. Property Description and Location; 5. Accessibility, Climate, Local Resources, Infrastructure and Physiography; 6. History; 7. Geological Setting and Mineralization; 8. Deposit Types; 9. Exploration; 10. Drilling; 11. Sample Preparation, Analyses and Security; 12. Data Verification; 14. Mineral Resource Estimates; 23. Adjacent Properties; 24. Other Relevant Data and Information; 25. Interpretation and Conclusions; 26. Recommendations; 27. References
Edgard Vilela	1. Summary; 13. Mineral Processing and Metallurgical Testing; 15. Mineral Reserve Estimates; 16. Mining Methods; 17. Recovery Methods; 18. Project Infrastructure; 19. Market Studies and Contracts; 20. Environmental Studies, Permitting and Social or Community Impact; 21. Capital and Operating Costs; 22. Economic Analysis; 24. Other Relevant Data and Information; 25. Interpretation and Conclusions; 26. Recommendations; 27. References

Definitions of terms and acronyms used in the report are provided in Table 2.2.

Table 2.2 Acronyms

Acronym	Description	Acronym	Description
Ag	Silver	NI	National Instrument
Au	Gold	NN	Nearest Neighbor
cm	Centimeters	NSR	Net smelter return
COG	Cut-off grade	OK	Ordinary Kriging
Cu	Copper	oz	Troy ounce
g	Grams	oz/t	Troy ounce per tonne
g/t	Grams per tonne	ppm	Parts per million
ha	Hectares	Pb	Lead
kg	Kilograms	QAQC	Quality assurance/Quality control
km	Kilometers	t	Metric tonne
kg/t	Kilogram per tonne	t/m^3	Metric tonnes per cubic meter
lbs	Pounds	tpd	Metric tonnes per day
m	Meters	yr	Year
Ma	Millions of years	Zn	Zinc
masl	Meters above sea level	$US/t	United States dollars per tonne
Moz	Million troy ounces	$US/g	US dollars per gram
Mn	Manganese	$US/%	US dollars per percent
Mt	Million metric tonnes		

3 Reliance on Other Experts

There has been no reliance on other experts who are not qualified persons in the preparation of this report except for information relating to the mineral concessions at the Caylloma property.

Fernando Pickmann, a lawyer and Partner of law firm Gallo Barrios Pickmann reviewed and confirmed by letter dated February 13, 2012 that all mineral concessions and surface rights in the Caylloma district held by Minera Bateas, a subsidiary of Fortuna (as summarized in Section 4) are in good standing and comply will all legal obligations required by Peruvian mining laws and regulations.

4 Property Description and Location

The Caylloma Silver-Lead-Zinc Mine is located in the Caylloma Mining District, 225 road-kilometers north-northwest of Arequipa, Peru. The property is 14 kilometers northwest of the town of Caylloma at the UTM grid location of 192263E, 8321387N, (WGS84, UTM Zone 19S) and covers a total of 11,728.6489 hectares. The location of the mine is shown in Figure 4.1.

Figure 4.1 Map showing the location of the Caylloma property

4.1 Mineral tenure

Fortuna Silver Mines Inc. acquired a 100% interest in the Caylloma property in June of 2005. The property comprises mining concessions (Table 4.1 and Figure 4.2); mining claims (Table 4.2); surface rights (Table 4.3); a permitted 1,500 tonnes per day (tpd) flotation plant; connection to the national electric power grid; permits for camp facilities for 890 men as well as the infrastructure necessary to sustain mining operations.

4.1.1 Mining claims and concessions

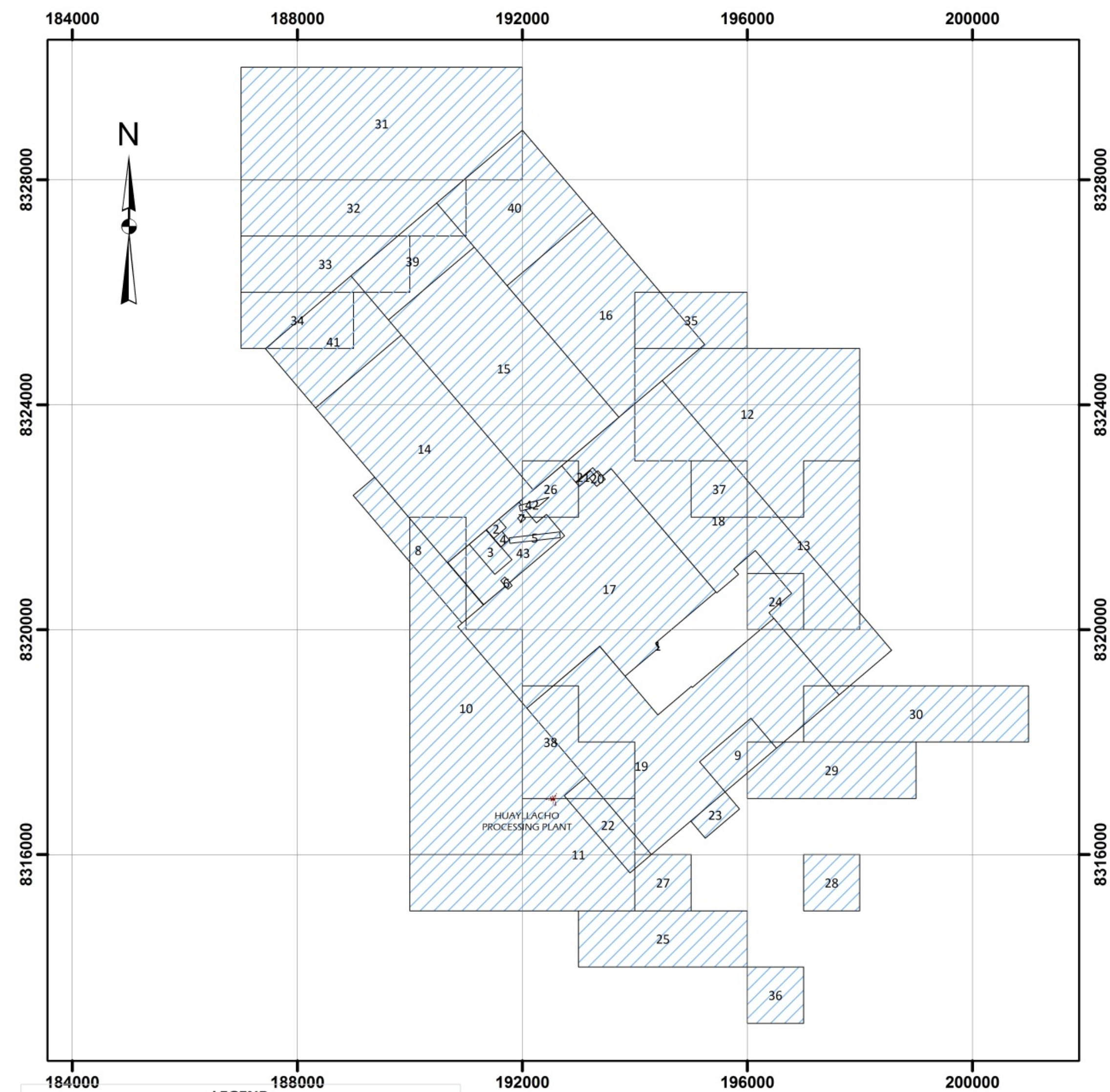
The Caylloma property consists of mineral rights for 43 mining concessions for a total surface area of 11,728.6489 ha. Of these, 21 mining concessions constitute the Economic Management Unit (UEA) of San Cristóbal. A list of the mining concessions showing the names, areas in hectares, and title details are presented in Table 4.1. In addition to these, the Huayllacho mill-site (processing plant) concession is titled, and comprises 2.2174 ha.

In Peru mining concessions do not have expiration dates but an annual fee must be paid to retain the concessions in good standing. Minera Bateas states that all fees are up to date and the concessions listed in Table 4.1 are all in good standing.

Table 4.1 Mineral concessions owned by Minera Bateas

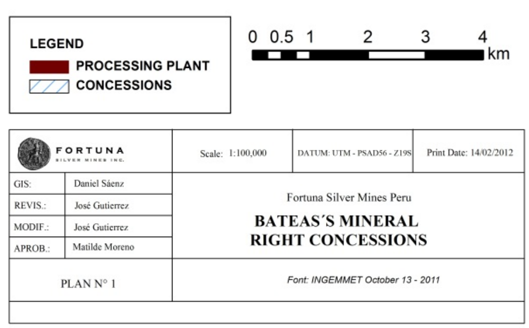
No.	Concession Name	Area (Ha)	Title details	Date
1	S.P.No16	0.1238	R.J.No-0522-2000-RPM	18-02-00
2	Sandra No5	6.00	R.J.No 6917-94-RPM	31-10-94
3	Sandra No4	27.9999	R.J.No 6936-94-RPM	31-10-94
4	Sandra No6	4.0007	R.J.No 6920-94-RPM	31-10-94
5	Sandra No9	9.0001	R.J.No 6919-94-RPM	31-10-94
6	Sandra No7	1.9999	R.J.No 7054-94-RPM	31-10-94
7	Sandra No14	0.9999	R.J.No 6946-94-RPM	31-10-94
8	Sandra No37	149.1438	R.J.No 6918-94-RPM	31-10-94
9	Sandra 106	724.0021	R.J.No 00892-2001-INACC/J	07-07-91
10	Sandra 107	794.0005	R.J.No 00894-2001-INACC/J	27-12-90
11	Sandra 108	613.9990	R.J.No 00891-2001-INACC/J	21-02-91
12	Sandra 120	4.00	R.D. 86-88-EM-DGM-DCM	30-05-88
13	Sandra 121	4.00	R.D.173-88 EMDGM-DCM	20-06-88
14	Sandra 123	89.9994	R.J.No 07169-99-RPM	08-07-99
15	Sandra 124	32.0006	R.J.No 8527-94RPM	30-11-94
16	Sandra 102-A	124.9933	R.J.No 02811-2000-RPM	31-07-00
17	Cailloma 1	5.1778	R.J.No 01544-2002-INACC/J	16-08-99
18	Cailloma 2	108.6728	R.J.No 03987-2000-RPM	13-10-00
19	Cailloma 4	788.7696	R.J.No 001391-2002-INACC/J	12-08-02
20	Cailloma 5	514.1852	R.J.No 001405-2002-INACC/J	12-08-02
21	Cailloma 6	678.8751	R.J.No 001401-2002-INACC/J	12-08-02
22	Cailloma 7	223.0405	R.J.No 001268-2002-INACC/J	23-07-02
23	Cailloma 8	2.2759	R.J.No 02100-2002-INACC/J	11-11-02
24	Cailloma 9	0.0683	R.J.No 02715-03-INACC/J	23-09-03
25	Acumulacion Cailloma No. 1	989.5314	R.J.No00522-2000-RPM	18-02-00
26	Acumulacion Cailloma No. 2	920.412	R.D. 355-90-EM-DGM-DCM	23-05-90
27	Acumulacion Cailloma No. 3	979.277	R.D. 410-90-EM-DGM-DCM	07-06-90
28	Corona de Antimonio N.2	84.0009	R.J.No 8642-96-RPM	23-12-96
29	Eureka 88	4.4562	R.J.No 02782-99-RPM	28-09-99
30	Cristobal R1	300.00	R.P.No 4573-2009-INGEMMET/PCD/PM	20-12-09
31	Cailloma 11	96.3478	R.P.No 2165-2010-INGEMMET/PCD/PM	20-07-10
32	Cailloma 12	100.00	R.P.No 2056-2010-INGEMMET/PCD/PM	12-07-10
33	Cailloma 14	282.2677	R.P.No 2180-2010-INGEMMET/PCD/PM	20-07-10
34	Cailloma 15	371.3139	R.P.No 2436-2010-INGEMMET/PCD/PM	20-08-10
35	Cailloma 16	954.0787	R.P.No 2259-2010-INGEMMET/PCD/PM	27-07-10
36	Cailloma 17	337.2615	R.P.No 3561-2010-INGEMMET/PCD/PM	19-10-10
37	Cailloma 18	219.6491	R.P.No 4711-2010-INGEMMET/PCD/PM	27-12-10
38	Cailloma 19	102.0360	R.P.No 2514-2010-INGEMMET/PCD/PM	24-08-10
39	Cailloma 20	112.6883	R.P.No 2754-2010-INGEMMET/PCD/PM	13-09-10
40	Cailloma 21	100.00	R.P.No 3193-2010-INGEMMET/PCD/PM	27-09-10
41	Sandra 107-A	205.9998	R.P.No 0685-2010-INGEMMET/PCD/PM	11-03-10
42	Sandra 108-A	385.9981	R.P.No 1282-2010-INGEMMET/PCD/PM	17-05-10
43	Sandra 106-A	276.0023	R.P.No 1546-2010-INGEMMET/PCD/PM	02-06-10
Total		11,728.6489		

Figure 4.2 Location of the mining concessions at the Caylloma property



LEGEND

N°	CONCESSION	N°	CONCESSION
1	S.P. N 16	23	SANDRA 124
2	SANDRA N 5	24	CAILLOMA 8
3	SANDRA N 4	25	CRISTOBAL R1
4	SANDRA N 6	26	CAILLOMA 9
5	SANDRA N 9	27	CAILLOMA 11
6	SANDRA N 7	28	CAILLOMA 12
7	SANDRA N 14	29	CAILLOMA 14
8	SANDRA N 37	30	CAILLOMA 15
9	CORONA DE ANTIMONIO N 2	31	CAILLOMA 16
10	CAILLOMA 4	32	CAILLOMA 17
11	CAILLOMA 5	33	CAILLOMA 18
12	CAILLOMA 6	34	CAILLOMA 19
13	CAILLOMA 7	35	CAILLOMA 20
14	SANDRA-106	36	CAILLOMA 21
15	SANDRA 107	37	CAILLOMA 1
16	SANDRA 108	38	CAILLOMA 2
17	ACUMULACION CAILLOMA N 1	39	SANDRA 107-A
18	ACUMULACION CAILLOMA N 2	40	SANDRA 108-A
19	ACUMULACION CAILLOMA N 3	41	SANDRA 106-A
20	SANDRA-120	42	EUREKA 88
21	SANDRA 121	43	SANDRA N 102-A
22	SANDRA 123		



In addition to the 43 mining concessions Minera Bateas also hold 23 mining claims in the Caylloma district. Mining claims are those mining rights that were requested by Minera Bateas and are currently under evaluation by the National Mining Concession Office (INGEMMET). Mining claims are detailed in Table 4.2.

Table 4.2 Mining claims of Minera Bateas

No.	Code	Concession Name	Area (Ha)
1	010357911	Cailloma 22	1,000
2	010357811	Cailloma 23	1,000
3	010357711	Cailloma 24	1,000
4	010388511	Cailloma 24	1,000
5	010388611	Cailloma 25	1,000
6	010357611	Cailloma 25	1,000
7	010357511	Cailloma 26	1,000
8	010357411	Cailloma 27	1,000
9	010357311	Cailloma 28	1,000
10	010357211	Cailloma 29	200
11	010389111	Cailloma 30	1,000
12	010388311	Cailloma 43	200
13	010389211	Cailloma 31	1,000
14	010390011	Cailloma 39	400
15	010390111	Cailloma 40	1,000
16	010390211	Cailloma 41	1,000
17	010390311	Cailloma 42	1,000
18	010388411	Cailloma 44	1,000
19	010388711	Cailloma 47	1,000
20	010388811	Cailloma 48	700
21	010388911	Cailloma 49	1,000
22	010389011	Cailloma 50	1,000
23	010389911	Cailloma 38	1,000
Total			20,500

4.2 Surface rights

Surface rights and easements held by Minera Bateas at Caylloma are detailed in Table 4.3.

Table 4.3 Surface rights held by Minera Bateas at Caylloma

No.	Name	Owner	Area	Type
1	Animas	Minera Bateas	214.41 ha	Surface Right
2	Michihuasi Toldoña Cancha	Saturnino Llacma Cayllahue	192.85 ha	Easement Right
3	Carrtera Veta Animas Plata	Lorenzo Supo Llallacachi	14.74 ha	Easement Right
4	San Francisco I & II	Minera Bateas	62.00 ha	Surface Right
5	Plata	Minera Bateas	255.63 ha	Surface Right
6	Trinidad Tayayaque	Minera Bateas	441 ha	Surface Right
7	Trinidad Tayayaque	Minera Bateas	441 ha	Surface Right
8	Bahia Electrica	Minera Bateas	1,284 m^2	Surface Right
9	Huaraco Vilafro Sahuañaña	Domingo Llallacachi	1,091.85 ha	Easement Right
10	Huayllacho	Minera Bateas	186.73 ha	Surface Right
11	Jururuni Vilafro	Toribio Ynfa Llacho	258.89 ha	Easement Right
12	Cuchuquipa (Tailings)	Lorenzo Supo Llallacachi	17.49 ha	Easement Right
13	Cuchuquipa	Lorenzo Supo Llallacachi	4,025 m^2	Easement Right
14	Palcacucho	Juana Nicolasa Cayllahue Ccalachua	6,125 m^2	Easement Right
15	Anchacca	Hereditary succession Escarza Murguia	4,375 m^2	Easement Right

Regarding the current situation of the surface rights it is important to note the following: -

- Peruvian legislation considers mining concessions as a right separate from the surface land where it is located.
- According to the Mining Law, a mining concessionaire requires a previous authorization from the surface owner or possessor of the land to undertake mining activities in it.
- In the region where Fortuna's concessions are located, the government, through the corresponding local entity (COFOPRI) is involved in a process to identify the properties existing in the area, plot them on a map and establish cadaster where the owners of the different properties will be duly identified. This process has not yet been completed. Once the cadaster process is completed, the recognized possessors can commence with the registration of their surface rights in the Public Registry.

4.3 Royalties

The Caylloma property is not subject to any royalties, back-in rights, payments or encumbrances with the exception of the following:

- The purchase agreement of Minera Bateas, dated 6th May 2005, includes the following royalty contract term "*Minera Bateas S.A.C. grants Minera Arcata S.S. a royalty of 2.0% of the Net Smelter Return which will apply after not less than a total of 21 million ounces of silver have been recovered from the Huayllacho beneficio (mill site) concession right. This contract is a permanent condition and will remain in total validity as long as a valid mining concession exists.*"

  As of 31st December 2011, Minera Bateas has produced a total of 7.1 million ounces of silver; therefore this royalty condition has not yet been met.

- In accordance with the Mining Royalty Act approved by Peruvian Law No. 28258 and its corresponding regulations, federal royalties are determined by applying the monthly rates of 1%, 2% or 3% (scales are provided by the Regulations of the Act) on revenues net of a transport deduction. Importantly, the amount paid in royalties and mining can be deducted as an expense for purposes of calculating income tax. Government royalty payments are set at a base rate of 1% up to US$60 million, 2% on the excess of US$60 million and up to US$120 million, and 3% on the excess of US$120 million. Fortuna is on the scales of 1% and 2% and is current on payment of royalties. The application of the Mining Royalty Act mentioned above is guaranteed by the company's Legal Stability Agreement signed with the Peruvian government.

  Additionally and in accordance with Mining Special Royalty Act approved by Peruvian Law No. 29790 in 2011, royalties are determined by applying quarterly rates ranging from 4% to 12% (scales provided by the Regulations of the Act) on operating income. Any royalties due resulting from the application of this new Act are only paid in excess of royalties already paid under the original Mining Royalty Act.

4.4 Environmental aspects

Minera Bateas is in compliance with Environmental Regulations and Standards set in Peruvian Law and has complied with all laws, regulations, norms and standards at every stage of operation of the mine.

The Caylloma operation (legally referred to as the Economic Management Unit of San Cristóbal) has fulfilled its Program for Environmental Compliance and Management (PAMA) requirements, as approved by the Directorial Resolution No. RD 087-97-EM/DGM dated June 3, 1997 as set out by the Ministry of Mines.

The PAMA identified a number of programs to complete in order for the operation to conform to regulations and standards. The main projects outlined in the PAMA program were: the construction of a retaining wall at the base of the old tailings, vegetation of the old tailings, building a retaining wall at the base of the active tailings and monitoring and treatment of mine water. The budgeted cost of the program was US$365,000.

In 2002 the Ministry of Energy and Mines (MEM) through the Mining Inspection Department conducted an audit of the programs specified in the PAMA document and approved on November 8, 2002 with a formal resolution 309-2002-EM/DGM RD.

The regulations required the approval of the mine closure plan, at a conceptual level, which was approved by WSF Directorial Resolution No. 328-207 MEM / AAM dated 10th December, 2007 by the Ministry of Mines.

The mine closure plan was approved by Executive Resolution No. 365-2009-MEM/AAM dated November 13, 2009.

The Sanitary Authorization for Treatment System Water was approved with Directorial Resolution No. 2307-2009/DIGESA/SA on May 18, 2009.

An Environmental Impact Assessment (EIA) for the "Expansion of Mine and processing plant Huayllacho to 1,500 tpd from 1,030 tpd" was approved with Directorial Resolution 173-2011-MEM/AAM dated June 8, 2011. The "Mine Closure Plan" must be submitted by June 8, 2012 before the EIA can be issued.

Through Resolution No. 351-2010-MEM-DGM/V authorization of the disposal of tailings in Tailings Deposit No. 2 Huayllacho has been confirmed.

4.5 Permits

To the extent known, all permits that are required by Peruvian law for the mining operation have been obtained.

In May 2011, Fortuna submitted to the MEM, in Peru, the application for construction permit of the new tailings facility. Fortuna received notification on April 3, 2012 from the MEM outlining its observations on the construction permit of the new tailings facility and granting thirty days for a response. The principal observations were to surface title documentation for various parcels and minor technical observations. Fortuna has responded to all the observations and does not view them as material at this point. In parallel, a positive engineering study has been concluded to expand the holding capacity of the current tailings facility for an additional five months of operation. The project has a budget of US$0.5 million and will be concluded within three months. This expansion will provide for stand-by holding capacity for any contingency.

5 Accessibility, Climate, Local Resources, Infrastructure and Physiography

5.1 Access

Access to the Caylloma property is by a combination of sealed and gravel road. The property is located 225 road kilometers from Arequipa and requires a trip of approximately 5 hours by vehicle.

5.2 Climate

The climate in the area is characteristic of the puna, with rain and snow between December and March, followed by a dry season from April through September. The climate allows for year round mining and processing, although surface exploration can be disrupted between December and March due to electrical storms, snow or heavy rainfall.

5.3 Topography, elevation and vegetation

The Caylloma property is located in the puna region of Peru at an altitude of between 4,300 masl (meters above sea level) and 5,000 masl. Surface topography is generally steep. The mine facilities are located at approximately 4,300 masl.

5.4 Infrastructure

The mine has been in operation intermittently for over 400 years. In 2011 a number of new buildings have been constructed to replace aging infrastructure. Newly constructed facilities include offices, mess hall, core logging and core storage warehouses.

Experienced underground miners live in the nearby town of Caylloma and other local towns in the district and are transported to the property by bus.

The camp and process facilities are located on the relatively flat valley floor while the entrance to the underground operations is via portals in the steep valley sides. Transport of ore is by a combination of rail and rubber-tired scoops and ore haulage trucks.

Sufficient water for the process plant and mining operations is available from the Santiago River that crosses the property.

The mine facilities are connected to the Electro Sur del Perú electric system, which supplies sufficient power for the operation.

More detailed information regarding the property infrastructure is provided in Section 18.

6 History

6.1 Ownership history

The earliest documented mining activity in the Caylloma district dates back to that of Spanish miners in 1620. English miners carried out activities in the late 1800s and early 1900s. Numerous companies have been involved in mining the district of Caylloma but limited records are available to detail these activities.

The Caylloma property was acquired by Compania Minera Arcata, S.A. (CMA), a wholly owned subsidiary of Hochschild Mining plc in 1981. Fortuna acquired the property from CMA in 2005.

6.2 Exploration history and evaluation

CMA focused exploration on identifying high-grade silver vein structures. Exploration was concentrated in the northern portion of the district and focused on investigating the potential of numerous veins including Bateas, El Toro, Parallel, San Pedro, San Cristóbal, San Carlos, Don Luis, La Plata, Apostles, and Trinidad.

Extensive exploration and development were conducted on the Bateas vein due to its high silver content; however exploration did not extend to the northeast due to the identification of a fault structure that was thought to truncate the mineralized vein.

Animas was one of the primary vein structures identified by CMA, however the mineralization style was identified as polymetallic in nature, rather than the high-grade silver veins CMA were hoping to exploit. Subsequently no further exploration or development was undertaken of this vein until Fortuna took ownership in 2005.

Table 6.1 details the drilling and channel information produced by CMA that was validated by Minera Bateas.

Table 6.1 Exploration by drill hole and channels conducted by CMA

Vein	Drill Holes	Channels
Paralela	-	623
San Pedro	8	2,006
San Cristóbal	20	3,833
San Carlos	-	295
Don Luis	1	-
Don Luis 1	2	-
Elisa	2	-
La Plata	9	-
Ramal San Pedro	1	-
San Miguel	2	-
Ursula	2	-

6.3 Historical resources and reserves

Prior to Fortuna's ownership of the property, Mineral Reserves and Mineral Resources were estimated by CMA on behalf of Hochschild Mining plc. The most recent estimate prior to Fortuna's purchase of the property was conducted in June 2004 (CMA, 2004).

Mineral Reserves and Mineral Resources estimated by CMA in June 2004 were not prepared in accordance with NI 43-101 and should not be relied upon. CMA classified resources using two criteria: the commonly accepted method based on the degree of confidence in the resource (Measured, Indicated, and Inferred); and a method based on economic criteria (NSR). The NSR value used for each metal for reporting Mineral Reserves and Mineral Resources was US$0.13/g for silver, and US$9.2/g for gold.

Mineral Reserves were reported above a breakeven NSR cut-off grade of US$40.26/t (Table 6.2). Measured and Indicated Resources were subdivided into those that had an estimated NSR value between US$28.79/t and US$40.26/t, regarded as "marginal" (Table 6.3) and those that had an estimated NSR value less than US$28.79/t, where Measured and Indicated Resources were combined and regarded as "sub-marginal" (Table 6.4).

Table 6.2 Mineral Reserves reported by CMA in June 2004

Vein Type	Category	Vein	Tonnes	Ag (g/t)	Au (g/t)	Pb (%)	Zn (%)	Contained Ag oz
Silver	**Proven**	San Cristóbal	106,117	505	0.40	0.02	0.02	1,722,929
		San Pedro	48,741	452	1.12	0.00	0.00	708,311
		San Carlos	3,304	1,014	0.34	0.46	1.17	107,713
		La Plata	6,839	597	2.62	0.20	0.09	131,268
		Cimoide (La Plata)	28,037	629	3.73	0.02	0.06	566,987
		Paralela	9,971	665	0.16	0.02	0.03	213,182
		TOTAL	**203,008**	**529**	**1.10**	**0.03**	**0.04**	**3,452,708**
	Probable	San Cristóbal	32,222	566	0.47	0.25	0.31	586,354
		San Pedro	29,604	387	0.98	0.04	0.07	368,343
		San Carlos	6,248	831	0.15	0.33	0.82	166,930
		La Plata	1,448	971	5.49	0.09	0.10	45,204
		Cimoide (La Plata)	4,436	532	3.83	0.06	0.11	75,874
		Paralela	4,013	770	0.00	0.09	0.17	99,346
		TOTAL	**77,971**	**535**	**0.90**	**0.15**	**0.24**	**1,341,152**
Proven + Probable			**280,979**	**531**	**1.04**	**0.06**	**0.10**	**4,796,887**

Table 6.3 Measured & Indicated Resources (Marginal - NSR value between US$28.79/t and US$40.26/t) reported by CMA in June 2004

Vein Type	Category	Vein	Tonnes	Ag (g/t)	Au (g/t)	Pb (%)	Zn (%)	Contained Ag oz
Silver	**Measured**	San Cristóbal	46,320	270	0.00	0.00	0.00	402,090
		San Pedro	5,322	283	0.08	0.02	0.08	48,423
		San Carlos	1,127	247	0.00	0.00	0.00	8,950
		La Plata	0	-	-	-	-	-
		Cimoide (La Plata)	0	-	-	-	-	-
		Paralela	9,307	292	0.00	0.00	0.00	87,374
		Ramal Paralela	0	-	-	-	-	-
		TOTAL	**62,076**	**274**	**0.01**	**0.00**	**0.01**	**546,846**
	Indicated	**TOTAL**	**0**	**-**	**-**	**-**	**-**	**-**

Table 6.4 Measured & Indicated Resources (Sub-marginal - NSR value less than US$28.79/t) reported by CMA in June 2004

Vein Type	Category	Vein	Tonnes	Ag (g/t)	Au (g/t)	Pb (%)	Zn (%)	Contained Ag oz
Silver	**Measured + Indicated**	San Cristóbal	325,317	112	0.04	0.00	0.00	1,171,429
		San Pedro	57,683	124	0.03	0.00	0.00	229,964
		San Carlos	21,185	107	0.00	0.00	0.01	72,879
		La Plata	2,075	110	0.28	0.09	0.26	7,338
		Cimoide (La Plata)	7,493	120	0.14	0.00	0.00	28,909
		Paralela	8,099	213	0.00	0.00	0.00	55,463
		Ramal Paralela	0	-	-	-	-	-
		TOTAL	**421,852**	**115**	**0.04**	**0.00**	**0.00**	**1,559,729**

Additional to the Mineral Resources detailed above, CMA also reported combined Indicated and Inferred Resources above a breakeven NSR cut-off grade of US$40.26/t (Table 6.5).

It should be noted that CMA silver grades were originally reported in troy ounces per tonne but for the purposes of this Technical Report have been converted to grams per tonne for comparison purposes.

Table 6.5 Indicated & Inferred Resources (NSR greater than US$40.26/t) reported by CMA in June 2004

Vein Type	Category	Vein	Tonnes	Ag (g/t)	Au (g/t)	Pb (%)	Zn (%)	Contained Ag oz
Silver	**Measured + Indicated**	San Cristóbal	127,815	439	0.22	0.33	0.42	1,804,004
		San Pedro	132,252	361	0.12	0.51	1.16	1,534,972
		San Carlos	11,956	1,066	0.31	0.64	1.63	409,764
		La Plata	34,910	770	2.88	0.18	0.81	864,235
		Cimoide (La Plata)	5,333	311	2.75	0.06	0.09	53,324
		Paralela	78,863	458	0.01	0.13	0.24	1,161,261
		Ramal Paralela	63,818	511	0.10	0.36	0.98	1,048,468
		TOTAL	**454,948**	**470**	**0.37**	**0.34**	**0.74**	**6,874,651**

Since Minera Bateas took ownership of the property three independent NI 43-101 Technical Reports have been published reporting Mineral Resources and Mineral Reserves (CAM, 2005; CAM, 2006; and CAM 2009).

Mineral Resources and Reserves reported in the CAM 2005 Technical Report are based on the estimates prepared by CMA as of June 30, 2004 and adjusted by Fortuna to account for additional mining dilution and recovery.

Mineral Reserves were reported above a breakeven NSR cut-off grade of US$40.26/t (Table 6.6).

Metal prices used in the evaluation were US$5.87/oz for silver, US$391.99/oz for gold, US$896/t for lead, US$1,010.70/t for zinc, and US$2,685.16/t for copper. The NSR value for each metal used for reporting silver veins was US$0.13/g for silver, US$9.2/g for gold, whereas the NSR values used for reporting the Animas polymetallic vein was US$0.11/g for silver, US$1.22/g for gold, US$5.59/% for lead, and US$5.20/% for zinc.

Table 6.6 Mineral Reserves reported by CAM in April 2005

Vein Type	Category	Vein	Tonnes	Ag (g/t)*	Au (g/t)	Pb (%)	Zn (%)	Contained Ag oz
Silver	**Proven**	San Cristóbal	116,729	455	0.36	0.02	0.02	1,707,581
		San Pedro	53,615	407	1.01	0.00	0.00	701,571
		San Carlos	4,295	710	0.24	0.32	0.82	98,042
		La Plata	8,891	418	1.83	0.14	0.06	119,486
		Cimoide (La Plata)	36,448	440	2.37	0.01	0.04	515,605
		Paralela	10,968	599	0.14	0.02	0.03	211,225
		TOTAL	**230,946**	**452**	**0.87**	**0.02**	**0.04**	**3,355,645**
	Probable	San Cristóbal	35,444	509	0.42	0.23	0.28	580,031
		San Pedro	32,564	348	0.88	0.04	0.06	364,341
		San Carlos	8,122	582	0.11	0.23	0.57	151,977
		La Plata	1,882	680	3.84	0.06	0.07	41,145
		Cimoide (La Plata)	5,766	372	2.37	0.04	0.08	68,962
		Paralela	4,414	693	0.00	0.08	0.15	98,346
		TOTAL	**88,192**	**461**	**0.74**	**0.14**	**0.20**	**1,306,124**
	Proven + Probable		**319,138**	**454**	**0.84**	**0.06**	**0.08**	**4,659,415**
Polymetallic	**Proven**	Animas	316,418	172	0.35	3.01	4.86	1,752,956
	Probable	Animas	140,794	160	0.37	3.18	4.94	726,497
	Proven + Probable		**457,212**	**169**	**0.35**	**3.06**	**4.88**	**2,482,661**
Total Mineable Reserves			**776,350**	**286**	**0.55**	**1.83**	**2.91**	**7,142,420**
*Silver was originally reported in oz/t but has been converted to g/t for comparison purposes.								

CAM was unable to confirm the Indicated and Inferred Resources reported by CMA and therefore combined both and reported as Inferred Resources (Table 6.7).

Table 6.7 Inferred Resources reported by CAM in April 2005

Vein Type	Vein	Tonnes	Ag (g/t)*	Au (g/t)	Pb (%)	Zn (%)	Contained Ag oz
Silver	San Cristóbal	127,815	439	0.22	0.33	0.42	1,804,004
	San Pedro	132,252	361	0.12	0.51	1.16	1,534,972
	San Carlos	11,956	1,066	0.31	0.64	1.63	409,764
	La Plata	34,910	770	2.88	0.18	0.81	864,235
	Cimoide (La Plata)	5,333	311	3.00	0.00	0.00	53,324
	Paralela	78,863	458	0.00	0.00	0.00	1,161,261
	Ramal Paralela	63,818	511	0.10	0.36	0.98	1,048,468
	TOTAL	**454,947**	**470**	**0.38**	**0.32**	**0.70**	**6,878,799**
Polymetallic	Animas	**691,652**	**330**	**0.61**	**3.62**	**5.49**	**7,338,428**
Total Inferred Resources		**1,146,599**	**386**	**0.52**	**2.31**	**3.59**	**14,217,828**
*Silver was originally reported in oz/t but has been converted to g/t for comparison purposes.							

Mineral Resources and Reserves reported in the CAM 2006 Technical Report were also based on the estimates prepared by CMA as of June 30, 2004 and adjusted by Fortuna to account for the new Animas vein model, changes in prices and costs, adjustments in mining dilution and recovery.

Mineral Reserves were reported above a breakeven NSR cut-off grade of US$48/t (Table 6.8). Mineral Resources were reported above a NSR cut-off grade of US$36.50/t (Table 6.9).

Metal prices used in the evaluation were US$8/oz for Ag, US$500/oz for gold, US$800/t for lead, and US$1,803/t for zinc. The NSR value for each metal used for reporting purposes was US$0.19/g for silver, US$7.22/g for gold, US$4.81/% for lead, and US$7.10/% for zinc.

Table 6.8 Mineral Reserves reported by CAM in October 2006

Category	Vein	Tonnes	Ag (g/t)	Au (g/t)	Pb (%)	Zn (%)	Contained Ag oz
Proven	San Cristóbal	145,851	422	0.30	0.00	0.00	1,980,562
	San Pedro	52,102	407	1.00	0.00	0.00	682,646
	San Carlos	5,392	622	0.20	0.30	0.70	107,751
	La Plata	8,537	478	2.10	0.20	0.10	131,184
	Cimoide (La Plata)	30,269	575	3.40	0.00	0.10	560,075
	Paralela	11,200	592	0.10	0.00	0.00	213,294
	TOTAL	**253,351**	**451**	**0.90**	**0.00**	**0.00**	**3,675,513**
Probable	San Cristóbal	35,989	507	0.40	0.20	0.30	58,641
	San Pedro	3,365	340	0.90	0.00	0.10	368,157
	San Carlos	7,921	656	0.10	0.30	0.70	16,702
	La Plata	1,954	720	4.10	0.10	0.10	45,213
	Cimoide (La Plata)	5,691	414	3.00	0.00	0.10	75,814
	Paralela	4,491	688	0.00	0.10	0.20	99,339
	TOTAL	**89,695**	**465**	**0.80**	**0.10**	**0.20**	**1,341,953**
Proven + Probable		**343,046**	**454**	**0.80**	**0.10**	**0.10**	**5,017,466**

Table 6.9 Mineral Resources exclusive of Reserves reported by CAM in October 2006

Category	Vein	Tonnes	Ag (g/t)	Au (g/t)	Pb (%)	Zn (%)	Contained Ag oz
Measured	Animas	48,454	152	0.80	2.30	4.20	2,388,782
Indicated	Animas	688,786	137	0.50	2.30	4.20	3,037,544
Measured + Indicated		**1,173,326**	**143**	**0.70**	**2.30**	**4.20**	**5,426,326**
Inferred	San Cristóbal	135,513	407	0.20	0.30	0.40	1,771,635
	San Pedro	92,896	369	0.20	0.70	1.40	1,100,831
	San Carlos	16,626	766	0.20	0.50	1.20	409,654
	La Plata	40,540	663	2.50	0.20	0.70	863,893
	Cimoide (La Plata)	7,326	231	2.00	0.00	0.10	54,330
	Paralela	52,473	563	0.00	0.20	0.30	950,452
	Ramal Paralela	90,094	362	0.10	0.30	0.70	1,049,011
	Animas	980,032	243	0.50	2.70	4.20	7,626,114
Inferred (Total)		**1,415,499**	**305**	**0.40**	**2.00**	**3.10**	**13,825,919**

Mineral Resources and Reserves reported in the CAM 2009 Technical Report are reported as of December 31, 2008 and rely on data gathered by Minera Bateas and CMA. Mineral Reserves were reported above a breakeven NSR cut-off grade of US$47.80/t (Table 6.10). Mineral Resources were reported above a NSR cut-off grade of US$37.15/t (Table 6.11).

Metal prices used in the evaluation were US$13.38/oz for Ag, US$830.05/oz for gold, US$1,698/t for lead, and US$2,161/t for zinc. The NSR value for each metal used for reporting purposes was US$0.27/g for silver, US$9.80/g for gold, US$11.51/% for lead, and US$10.90/% for zinc.

Table 6.10 Mineral Reserves reported by CAM as of December 31, 2008

Category	Vein type	Tonnes	Ag (g/t)	Au (g/t)	Pb (%)	Zn (%)
Proven	Silver Veins	421,320	387	0.83	0.01	0.02
	Polymetallic Veins	3,280,100	103	0.52	2.03	3.09
	TOTAL	**3,701,420**	**136**	**0.55**	**1.8**	**2.74**
Probable	Silver Veins	228,500	369	0.55	0.05	0.09
	Polymetallic Veins	103,000	426	0.44	1.74	2.41
	TOTAL	**331,500**	**387**	**0.51**	**0.58**	**0.81**
Proven + Probable (All Veins)		**4,032,920**	**156**	**0.55**	**1.7**	**2.58**

Table 6.11 Mineral Resources exclusive of Reserves reported by CAM as of December 31, 2008

Category	Tonnes	Ag (g/t)	Au (g/t)	Pb (%)	Zn (%)	Cu (%)	Width (m)
Measured	247,070	63	0.31	1.19	2.23	0.11	1.69
Indicated	20,400	71	0.29	1	1.4	0.15	2.74
Measured + Indicated	**267,470**	**64**	**0.31**	**1.18**	**2.17**	**0.11**	**1.77**
Inferred	**1,279,000**	**187**	**0.29**	**1.92**	**3.25**	**-**	**2.58**

6.4 Production

Historically the Caylloma area has been known as a silver producer. Past production has been from several vein systems that ranged from centimeters, up to 20 m in width. Individual ore shoots can strike for hundreds of meters with vertical depths ranging up to 300 m. Mining has historically taken place between the 4,380 masl and 5,000 masl.

6.4.1 Compania Minera Arcata

Production prior to 2005 came primarily from the San Cristóbal vein, as well as from the Bateas, Santa Catalina and the northern silver veins (including Paralela, San Pedro, and San Carlos) with production focused on silver ores and no payable credits for base metals.

During CMA management production parameters fluctuated during the late 1990's, as reserves were depleted. Owing to low metal prices, funds were not available to develop the Mineral Resources at depth or extend along the strike of the veins. Ultimately this resulted in production being halted in 2002. A summary of the production records at Caylloma under CMA management from 1998 through 2002 are displayed in Table 6.12. Production figures prior to 1998 are unavailable.

Table 6.12 Production figures during CMA management of Caylloma

Production	1998	1999	2000	2001	2002	Total
Ore processed (t)	125,509	129,187	167,037	180,059	164,580	766,372
Head grade Ag (g/t)	308	331	373	405	572	
Head grade Au (g/t)	1.27	0.89	0.67	0.60	0.23	
Recovery Ag (%)	85.1	87.7	87.0	87.2	87.4	
Recovery Au (%)	78.9	72.9	61.6	68.2	55.2	
Concentrate produced (t)	4,623	4,756	6,698	7,725	6,735	
Concentrate grade Ag (g/t)	7,115	7,913	8,097	8,235	12,209	
Concentrate grade Au (g/t)	27.29	17.68	10.31	9.45	3.05	
Production Ag (oz)	1,057,535	1,207,550	1,743,535	2,045,398	2,643,788	8,697,806
Production Au (oz)	4,051	2,697	2,218	2,347	659	11,973

6.4.2 Minera Bateas

Production under Minera Bateas management focused on the development of polymetallic veins producing lead and zinc concentrates with silver and gold credits. A summary of total production figures since the mine reopened in October 2006 are detailed in Table 6.13.

Table 6.13 Production figures during Minera Bateas management of Caylloma

Production	2006	2007	2008	2009	2010	2011	Total
Ore processed (t)	33,460	250,914	331,381	395,561	434,656	448,866	1,894,838
Head grade Ag (g/t)	76	73	95	155	159	171	
Head grade Au (g/t)	0.37	0.66	0.45	0.47	0.40	0.36	
Head grade Pb (%)	1.12	1.70	2.48	3.10	2.44	2.15	
Head grade Zn (%)	2.33	2.93	3.65	3.66	3.10	2.68	
Head grade Cu (%)	-	0.12	0.17	0.25	0.21	0.18	
Production Ag (oz)*	55,529	442,741	805,056	1,685,026	1,906,423	2,008,488	6,903,263
Production Au (oz)*	166	3,328	2,197	2,747	2,556	2,393	13,387
Production Pb (t)	309	3,771	7,485	11,400	9,695	8,926	41,586
Production Zn (t)	603	6,300	10,561	12,900	11,855	10,625	52,844
Production Cu (t)	0	0	0	86	465	16	567
* Recovery of silver and gold from lead and copper concentrate							

Production rates were increased at the operation in 2011 from around 1,000 tpd to approximately 1,300 tpd. The plant has the potential to increase production to 1,500 tpd but is presently restricted by power availability. A study is presently in progress to examine the potential of generating additional power onsite to allow the plant to increase its production to the maximum 1,500 tpd capacity. The results of this study will be available in 2012.

7 Geological Setting and Mineralization

The following description of regional and property geology is summarized from several reports including: Echavarria et al, (2006); CMA (2004); CAM (2006); and CAM (2009).

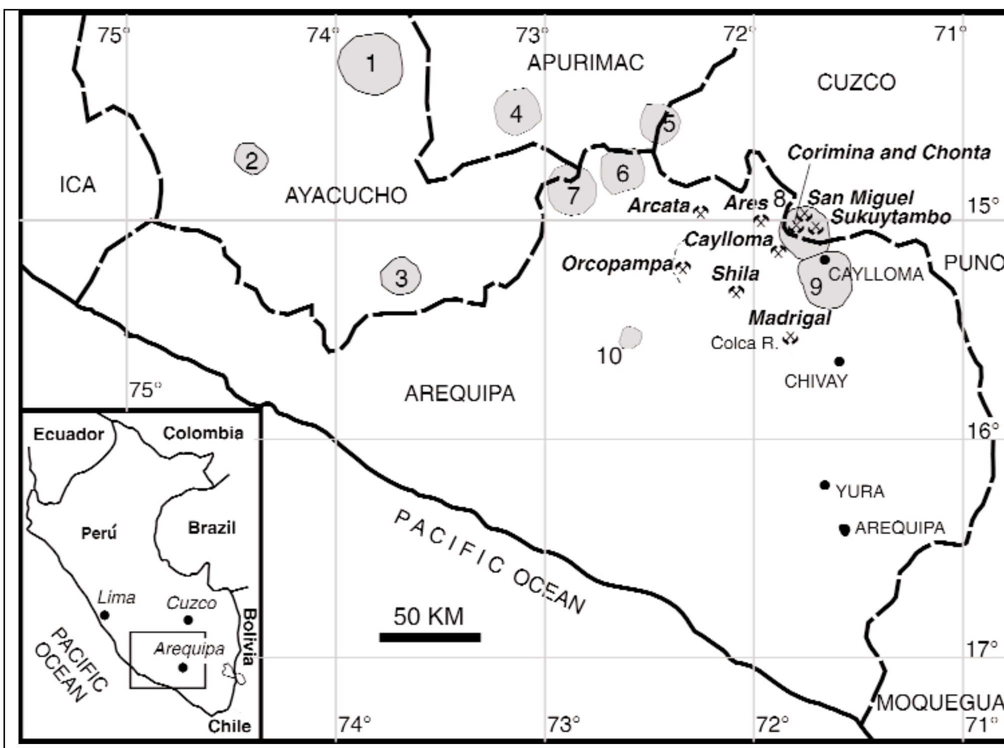
7.1 Regional Geology

The Caylloma district is located in the Neogene volcanic arc that forms part of the Cordillera Occidental. This portion of the volcanic arc developed over a thick continental crust composed of deformed Paleozoic and Mesozoic rocks.

Following the late Eocene early Oligocene Incaic orogeny there was a period of erosion and magmatic inactivity prior to the eruption of the principal host rocks in the Caylloma district. Crustal thickening and uplift occurred between 17 Ma and 22 Ma accompanied by faulting and mineralization in the Caylloma district.

The volcanic belt in the Caylloma district contains large, locally superimposed calderas (Figure 7.1) of early Miocene to Pliocene age comprised of calc-alkaline andesitic to rhyolitic flows, ignimbrites, laharic deposits, and volcanic domes that unconformably overlie a folded marine sequence of quartzite, shale, and limestone of the Jurassic Yura Group.

Figure 7.1 Regional Geology map of Caylloma from Echavarria et al (2006)



Principal Neogene calderas (gray) and epithermal deposits of the region.

Calderas: 1 = Ccarhuarazo, 2 = Pampa Galeras, 3 = Parinacocha, 4 = Tumiri, 5 = Teton, 6 = San Martín, 7 = Esquillay, 8 = Chonta, 9 = Caylloma, and 10 = Coropuna.

Bold dashed line = political (department) boundaries.

7.2 Local Geology

The mining district of Caylloma is located northwest from the Caylloma Caldera Complex (Figure 7.2). The host rock of the mineralized veins is volcanic in nature, belonging to the Tacaza Group. The volcanics of the Tacaza Group lie unconformably over a sedimentary sequence of quartzites and lutites of the Jurassic Yura Group. Portions of the property are covered by variable thicknesses of post-mineral Pliocene-Pleistocene volcanics and recent glacial and alluvial sediments.

7.2.1 Yura Group

The oldest rocks exposed in the Caylloma district belong to the Yura Group of Upper Jurassic to Lower Cretaceous age. The Yura Group is composed of white to gray ortho-quartzites, dark gray siltstones, and blackish greywacke's, intercalated with thin layers of black lutites. The overall thickness of the group is approximately 400 m.

Evidence from outcrops indicates strata are strongly deformed with the presence of recumbent kink folds with straight limbs and narrow hinges. However, strain in the Yura Group is locally weaker at depth where only open folds have been observed in the Caylloma mine (Echavarria et al., 2006).

7.2.2 Tacaza Group

The Tacaza Group consists of a sequence of lavas and tuff breccias intercalated with tuff horizons that lie in angular unconformity and in fault contact with rocks of the Yura Group.

The Tacaza volcanic group is comprised of lavas of intermediate to silicic composition with a porphyritic texture. The dominant color is reddish brown changing to greenish in areas of chloritic alteration. These volcanic rocks locally include a horizon of limestone that grades laterally to siltstone.

Estimated thickness of the Tacaza Group is 900 m, with some sequences showing thinning of volcanic horizons along strike and down dip. The Tacaza Group is of Lower Miocene age.

7.2.3 Tertiary Volcanic Deposits

Overlying the Tacaza Group with unconformable contacts are andesitic lavas, rhyolites, dacites and tuffs belonging to the Barrosso Group. They are generally present in prominent outcrops with sub-horizontal stratification and range from late Miocene to Middle Pleistocene in age.

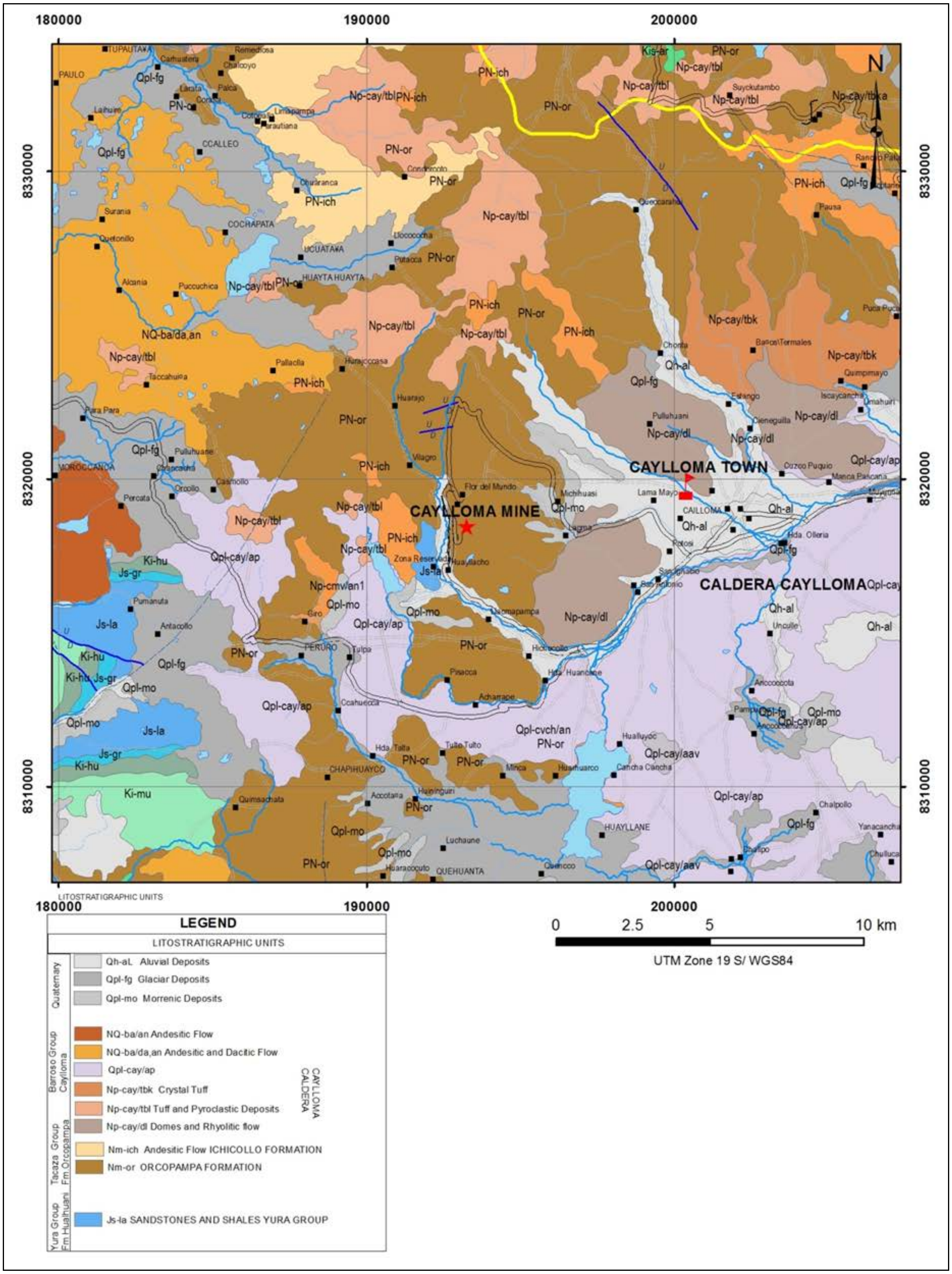
7.2.4 Recent Clastic Deposits

Quaternary clastic deposits locally cover portions of the Caylloma property. The valley floors and lower slopes are covered by alluvial material as well as glacial moraines, colluvium, and fluvio-glacial material.

7.2.5 Intrusive Igneous Rocks

Sedimentary and volcanic rocks have been intruded by post-mineralization, fault-controlled rhyolitic lava domes (Cuchilladas and Trinidad domes) and dikes of the Chonta caldera sequence, characterized by coarse-grained quartz and sanidine phenocrysts, spherulites, and lithophysae, and well-developed laminations (Echavarria et al., 2006). In addition, recent mapping has identified outcrops of a riodacitic dome in the Vilafro area (Vilafro Dome) that are thought to be pre-mineralization.

Figure 7.2 Local Geology map of Caylloma district (sourced from INGEMMET; Sheet 31-S)



7.3 Property Geology

The Caylloma property is characterized by a series of fault and vein structures striking in a northeast-southwest direction (Figure 7.3).

7.3.1 Epithermal mineralization

There are two distinct types of mineralization at the Caylloma property, one with predominately elevated silver values, and the other being polymetallic (elevated silver, lead, zinc, copper, and gold).

A supergene oxide horizon has been identified which contains the following secondary minerals: psilomelane, pyrolusite, goethite, hematite, chalcocite, covelite and realgar (Corona and Antimonio veins). The oxide zone is thin, with no evidence of any secondary silver enrichment.

7.3.2 Hydrothermal Alteration

Three types of hydrothermal alteration have been identified at the Caylloma property: (1) quartz-adularia; (2) quartz-illite; and (3) propylitic. The quartz-adularia (+pyrite+/-illite) alteration is restricted to the margins of the veins, with the thickness of the altered zone being generally proportional to the thickness of the vein. The width varies from a few centimeters to a few meters. Quartz replaces the volcanic matrix in the rocks, and quartz plus adularia occur as small veinlets. Pyrite is disseminated in the veinlets and in iron-manganese minerals in the wall rock. Illite is a product of plagioclase and volcanic matrix alterations. Quartz-adularia is absent in the upper part of the vein system. The alteration assemblage in this upper area consists of a narrow selvage of quartz-illite near the vein. Quartz-illite grades into quartz-adularia at depth. Propylitic alteration is widespread throughout the property and may be regional and perhaps unrelated to mineralizing events. The alteration is a fine aggregate of chlorite, epidote, calcite and pyrite.

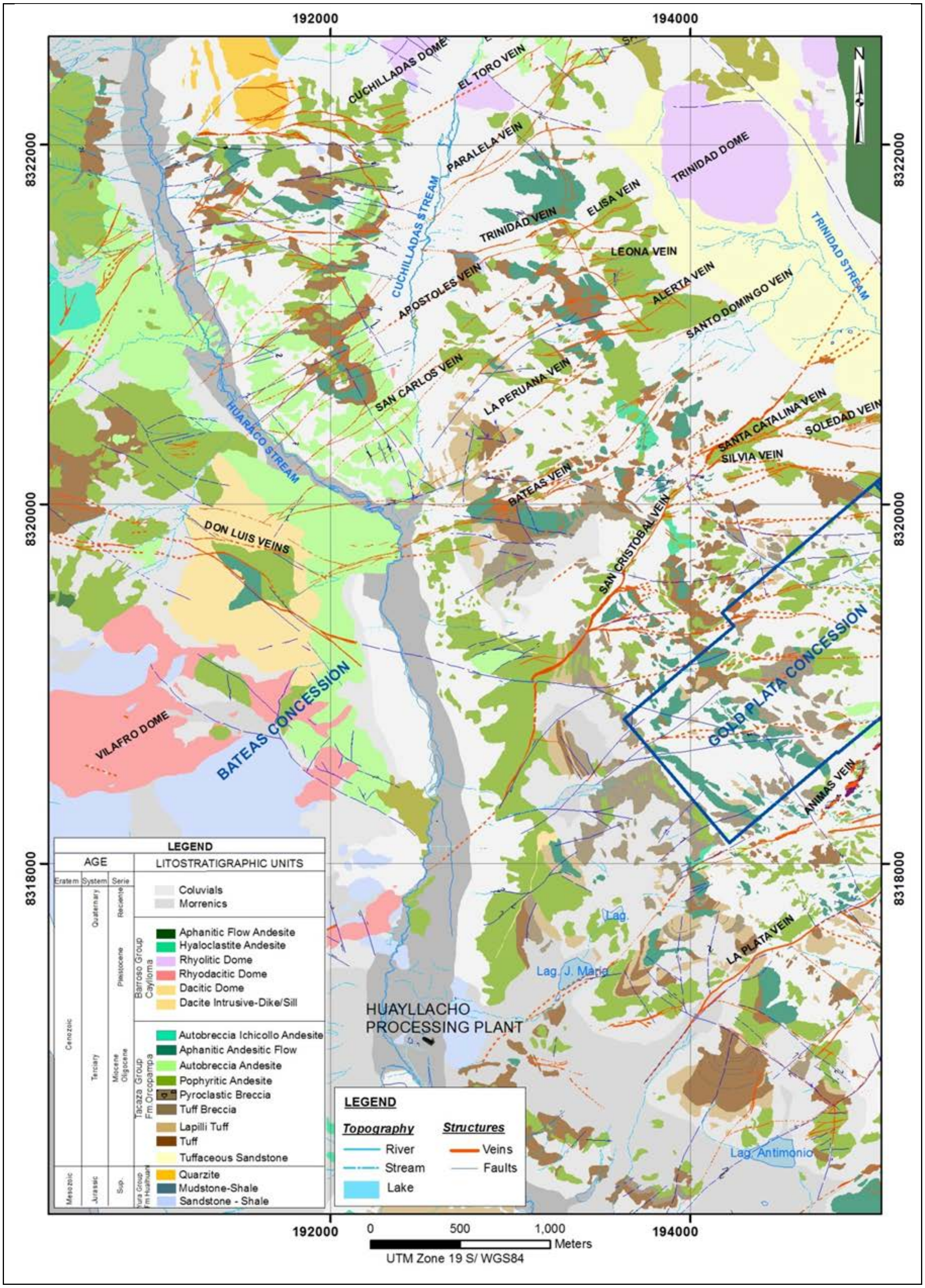
7.4 Description of Mineralized Zones

Veins at the Caylloma property show structural patterns and controls typical of other vein systems hosted by Tertiary volcanic rocks in the western Peruvian mountain range. The Caylloma vein system was developed as a set of dilatational structures as a consequence of tension generated during the main compressional event of the Andes. Veins are very persistent along strike and dip. Locally, veins are displaced by post-mineral faulting along a north-northwest bearing. Horizontal displacement along these faults is minor and ranges from centimeters up to a few meters. No significant vertical displacement is observed on the structures. The vein system is not affected by any folding.

Veins are tabular in nature, with open spaces, filled with episodic deposition. According to Echavarria et al., (2006) most of the minerals, both silver and base metals, are related to the deposition of manganese mineralization occurring in bands, comprised of quartz, rhodonite, rhodochrosite and sulfides.

Vein systems at the Caylloma property all have a general northeast-southwest bearing and predominant southeast dip. Host rocks are breccias, lavas and andesitic volcaniclastics of the Tacaza volcanic group.

Figure 7.3 Geology map of Caylloma property showing vein systems



There are two different types of mineralization at Caylloma; the first is comprised of silver-rich veins with low concentrations of base metals. The second type of vein is polymetallic in nature with elevated silver, lead, zinc, copper, and gold grades.

Mineralization in these vein systems occurs in steeply dipping ore shoots ranging up to several hundred meters long with vertical extents of over 400 m. Veins range in thickness from a few centimeters to 20 meters, averaging approximately 1.5 m for silver veins and 2.5 m for polymetallic veins.

Silver veins

The silver vein systems outcrop in the central and northern portions of the Caylloma property, with the best exposures of mineralization between the Chuchilladas and Trinidad streams. Mineralization is comprised primarily of banded rhodochrosite, rhodonite, and milky quartz, with silver sulfosalts present in certain veins. Vein systems extend to the eastern flank of the Huaraco Stream. Exposures in this area consist of quartz-calcite with low concentrations of manganese oxides. Silver veins can be sub-divided into two groups, 1) those that have sufficient geological information to support Mineral Resource estimates and 2) those that have been identified as exploration targets.

1) Bateas, Bateas Techo, La Plata, Cimoide La Plata, San Cristóbal, San Pedro, San Carlos, Paralela , and Ramal Paralela.
2) Eureka, Copa de Oro, El Toro, La Blanca, Santa Rosa, and Santa Isabel, Trinidad, Elisa, Leona, Apóstoles, Jerusalén, Santo Domingo, La Peruana, Alerta, and Cercana.

A more detailed description of the more important silver veins presently being exploited or explored is presented below.

7.4.1 Bateas & Bateas Techo

The Bateas vein splits into two branches, Bateas Techo is the southern branch, and Bateas is the northern branch. The Bateas Techo vein outcrops on surface for approximately 1,800 m and can be traced from the escarpment of Loma de Vilafro Hill extending to the northeast. At the summit of the hill the vein is covered by recent volcanic ash. Host rock is a volcaniclastic andesite with minor dacite and latite portions. The host rock has a strike of 070º and dip of 82º to the southeast.

Polymetallic mineralization is present in two very well-defined zones. In the northeast, the vein contains chalcedonic and opaline quartz with disseminated silver sulfosalts, pyrite, and calcite. The southwestern end of the vein is characterized by a gangue of quartz, rhodonite and rhodochrosite containing veinlets of sphalerite, galena, chalcopyrite, and disseminated pyrite.

The northern branch of the Bateas vein, also known as the Bateas Piso vein, dips 52º to the northwest and has a strike parallel to the Bateas Techo vein. At its most northeastern extent it opens into a cymoid loop. Mineralization in the vein is characterized by base metal sulfides, sphalerite, galena, and disseminated pyrite in a gangue of quartz, calcite, rhodonite, and rhodochrosite. As of December 2011 the Bateas vein exploration has been focused between 4,505 masl (level 12A) and 4,660 masl (level 10).

7.4.2 La Plata & Cimoide La Plata

The La Plata vein is associated with fracture filling along a regional fault extending for more than 4 km. The most representative part extends over approximately 400 m and consists of quartz, calcite, rhodonite, and abundant manganese oxides in its central portion. The eastern portion of the vein consists of quartz with disseminated pyrite, and ruby silver stained with manganese oxides. The vein has been explored down to level 7 (4,745 masl). A splay of the La Plata has been identified, being referred to as the Cimoide La Plata. It has the same characteristics of the La Plata vein with the vein being composed of gray silica with associated stibnite, pyrite and tetrahedrite. This cymoid has primarily been explored between level 7 and level 8 (4,745 masl and 4,695 masl).

7.4.3 San Cristóbal

The San Cristóbal vein has a recognized strike length of 2.5 km with a 035° to 055° northeast strike, and 50 to 80° dip to the southeast. Its thickness ranges from 5 m to 6 m at the upper levels to 2 m to 2.5 m at the 4,600 masl lower levels (level 11). The primary sulfides in the vein are sphalerite, galena, polybasite, pyrargyrite, chalcopyrite and tetrahedrite distributed in gangue of pyrite, quartz, rhodonite and calcite. This is the most extensively developed structure on the property. The silver values are highly variable along the strike and throughout the thickness of the vein, forming localized enrichments. Silver values have a tendency to decrease gradually at depth, as can be observed at levels 4,600 masl (level 10), 4,540 masl (level 11), and 4,500 masl (level 12).

7.4.4 San Pedro

The San Pedro vein outcrops for 900 m on surface, with a general strike of 045º and dipping at 85º to the southeast. Thickness of the vein varies from 2 m to 3 m and shows banded mineralization consisting of quartz, rhodonite, and manganese and iron oxides, with concentrations of ruby silver and native silver. This vein has been traced and mined down to 4,610 masl (level 10 of the mine), and contains enrichment zones of up to 1,100 g/t Ag. The distribution of silver values in the vein shows a gradual decrease with depth. However, core taken from diamond drill holes drilled by CMA returned values ranging from 271 g/t Ag and 669 g/t Ag below 4,520 masl.

7.4.5 San Carlos

The San Carlos vein outcrops for approximately 300 m on surface, having a strike direction of 045° and dip of 75° to the southeast. Thickness of the vein varies from 0.8 m to 1.05 m. The vein consists of tabular, open-space fillings with episodic periods of deposition. Most of the metals are related to the deposition of manganese minerals that occur in bands of quartz, rhodonite, and sulfides.

7.4.6 Paralela & Ramal Paralela

The Paralela and Ramal Paralela veins outcrop for 400 m on surface with a general strike of 040° and dipping at 72° to the southeast. Thickness of the veins ranges from 1 m to 1.25 m. The veins consist of tabular, open-space fillings with episodic periods of deposition. Most of the metals are related to the deposition of manganese minerals.

Polymetallic veins

A series of polymetallic veins has been identified in the southern and central portions of the Caylloma property. These vein systems tend to be greater in strike length and thickness when compared to the silver vein systems. The main minerals associated with the polymetallic veins are galena, sphalerite, pyrite, chalcopyrite, and in some zones pyrargyrite. The polymetallic veins can also be sub-divided into two groups, 1) those that have sufficient geological information to support Mineral Resource estimates and 2) those that have been identified as exploration targets.

1) Animas, Animas NE, Santa Catalina, Soledad, Silvia, Pilar, and Patricia.
2) Nancy, El Diablo, and Antimonio.

A more detailed description of the more important polymetallic veins that have been estimated is presented below.

7.4.7 Animas & Animas NE

The Animas vein is one of the most prominent and well-defined structures in the southern portion of the property. It is a base-metal-rich polymetallic vein that is divided into two parts based solely on a fault structure that disrupts the vein's continuity. The vein to the southwest of the fault is known as Animas whereas to the northeast of the fault the vein is referred to as Animas NE.

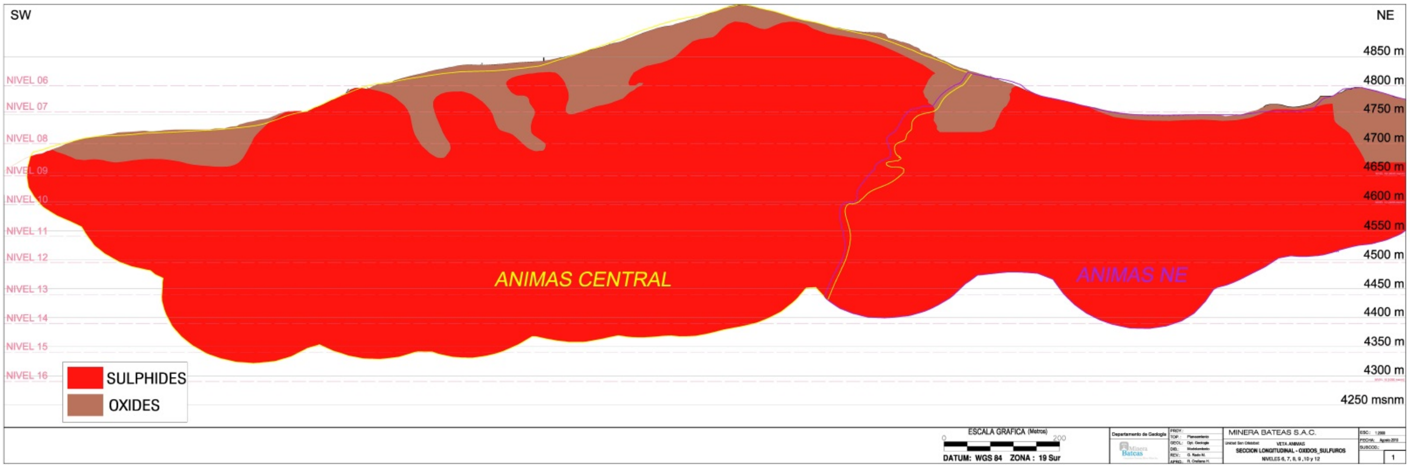
The Animas polymetallic vein is present from level 5 (4,850 masl) to below level 12 (4,495 masl) in the mine. Several wide zones (over 12 m to 14 m thick) are observed in levels 6, 9 and 10 (4,800 masl, 4,645 masl, and 4,595 masl respectively), especially in lateral exploration cross-cuts. The vein outcrops along 1.5 km with silicified exposures stained with manganese oxides and has been identified through diamond drilling over a total length of 3.8 km. Vein thickness can be up to 14 m, but averages approximately 4 m to 5 m. From surface to a depth of 4,800 masl exploration has identified a vein structure with a potential thickness of up to 12 m. Current exploitation has identified widths of up to 16 m in level 9 (4,650 masl) and 10 m in level 12 (4,500 masl) where it forms a sigmoidal loop approximately 300 m in length with widths between 2.5 m to 3 m in the extreme east and west.

Vein mineralogy includes argentiferous galena, sphalerite, marmatite, and chalcopyrite accompanied by minor tetrahedrite and ruby silver. Gangue minerals are pyrite, quartz, calcite, rhodonite, rhodochrosite, and iron-manganese oxides displaying banded, colloform, and brecciated textures.

Oxide Horizon

The mineralization present in all veins is sulfide with the exception of some upper portions of the Animas/Animas NE vein. The Animas vein has been explored close to the surface and a supergene oxide horizon has been identified at a variable depth below the surface based on the presence of iron oxides and lesser amounts of manganese oxides. Figure 7.4 displays the extent of the oxide horizon in the Animas vein.

Figure 7.4 Long section of Animas vein showing oxide and sulfide horizons



7.4.8 Santa Catalina

Surface outcrops of this vein extend over a distance of 700 m along a strike of between 245° to 260º, dipping at 65 º to 80º to the northwest with an average thickness on surface of 1.90 m. The vein contains silver sulfosalts (pyrargyrite and proustite), sphalerite, galena and chalcopyrite in a gangue of quartz, calcite, rhodonite, and rhodochrosite. The host rock is an andesite that exhibits pseudo-stratification banding and massive structures. Tectonic breccias are present in the footwall and hanging wall of the vein. Minera Bateas has mined to 4,720 masl, below level 8, and diamond drilling has intercepted the vein to 4,773 masl (level 9), where polymetallic mineralization is present in well-defined zones controlled by faults. A base-metal-rich region is present between 4,720 masl (level 8) and 4,773 masl (level 9). The average thickness of the vein is 2.46 m.

7.4.9 Soledad

The Soledad vein is exposed at the surface for approximately 250 m, being located to the northeast of the Santa Catalina vein. It has a strike of 248º to 251º and a dip of 76º to the northwest. The average thickness of the vein at the surface is 0.45 m. The vein is presently being exploited between level 6 (4,820 masl) to below level 7 (4,750 masl). Exploration through diamond drilling and underground mine workings have confirmed the vein continues down to at least level 8 (4,720 masl). The vein has an average thickness at depth of 1.09 m. Mineralization is polymetallic in nature, containing silver sulfosalts, sphalerite, galena, chalcopyrite, gray copper (enargite) and disseminated pyrite. The vein is banded with two recognized events: (1) an early phase, rich in base metal sulfides and elevated gold values in banded rhodonite, and (2) a second phase of quartz, rhodochrosite, with disseminated silver minerals and veinlets. The host rock is andesite with pseudo-stratification and intercalated volcanic sediments.

7.4.10 Silvia

The Silvia vein is exposed on surface as a discontinuous series that can be traced for approximately 200 m. It has a variable thickness of between 0.8 m to 1.8 m and a strike of between 250º and 262º. The vein has a variable dip to the northwest between 65º and 82º. Mineralization is polymetallic, with sphalerite, galena, chalcopyrite, and silver sulfosalts (pyrargyrite) present in a gangue of quartz, calcite, rhodonite, and rhodochrosite. The vein has a banded to massive texture with bands of base-metal sulfides of variable thickness.

7.4.11 Pilar

The Pilar vein is considered to be part of the San Cristóbal system. The vein has been identified over a strike length of 85 m in a gallery at level 8 of the San Cristóbal underground workings. It appears to be a tensional feature of the San Cristóbal vein with banded rhodonite and quartz texture with disseminated sulfides of sphalerite, galena, and silver sulfosalts. The average thickness of the vein is 2 m, with a strike direction of 153° and dipping at 48° to the southwest.

7.4.12 Patricia

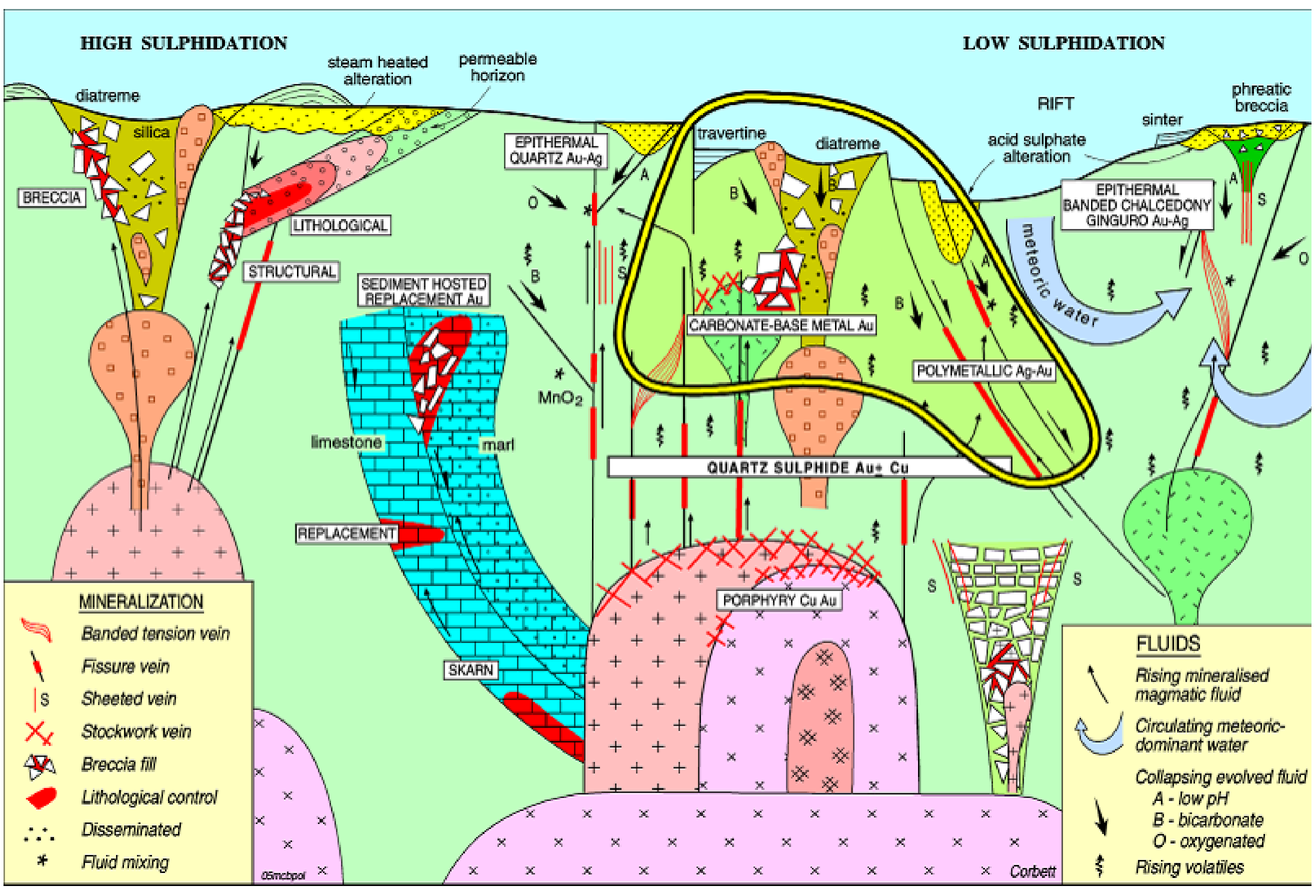
The Patricia vein is a fissure-type structure, composed primarily of banded rhodonite, quartz, and rhodochrosite with mineralization present as veins and lenses in the bands of quartz/rhodonite, as well as being associated with fault zone structures and hydrothermal alteration in the host rock.

8 Deposit types

The Caylloma polymetallic, silver-gold veins are characteristic of a typical low-sulfidation epithermal deposit according to the classification of Corbett (2002), having formed in a relatively low temperature, shallow crustal environment (Figure 8.1). The epithermal veins at the Caylloma property are characterized by minerals such as pyrite, sphalerite, galena, chalcopyrite, marcasite, native gold, stibnite, argentopyrite, and various silver sulfosalts (tetrahedrite, polybasite, pyrargyrite, stephanite, stromeyerite, jalpite, miargyrite and bournonite). These are accompanied by gangue minerals such as quartz, rhodonite, rhodochrosite, johannsenite (Mn-pyroxene) and calcite.

The characteristics described above have resulted in the Caylloma veins being classified as belonging to the epithermal group of precious metals in quartz, adularia veins similar to those at Creede, Colorado; Casapalca, Peru; Pachuca, Mexico and other volcanic districts of the late Tertiary (Cox and Singer, 1992). They are characterized by Ag sulfosalts and base metal sulfides in a banded gangue of colloform quartz, adularia with carbonates, and rhodochrosite (Echavarria et al., 2006). Host rock alteration adjacent to the veins is characterized by illite and widespread propylitic alteration.

Figure 8.1 Idealized section displaying the classification of epithermal and base metal deposits sourced from Corbett (2002)



9 Exploration

Mining activity in the Caylloma district dates back to workings by Spanish miners in the 1620s. English miners carried out activities in the late 1800s and early 1900s. The property was acquired by Compania Minera Arcata in 1981 who implemented a series of exploration programs to complement their mining activities prior to the closure of the operation in 2002.

Fortuna acquired the property in 2005, and placed it into production in September 2006 with a refurbished mill. Fortuna has continued to conduct extensive exploration of the property since the acquisition.

9.1 Exploration conducted by Compania Minera Arcata

There is no information available to detail the exploration conducted by CMA at the Caylloma property.

9.2 Exploration conducted by Minera Bateas

Since 2005 exploration activities have been directed by Fortuna.

9.2.1 Geophysics

In 2007, induced polarization (IP) and resistivity studies were conducted by Arce Geophysics over the Nancy and Animas NE veins covering an area of seven square kilometers. The survey was performed using an IRIS ELREC Pro receptor with a symmetrical configuration poly pole array with spacing of 50 meters between electrodes.

Results of the geophysical studies identified three coincident zones of low IP potential associated with high chargeability and resistivity. The three geophysical anomalies were investigated through a targeted drilling campaign.

9.2.2 Surface channel sampling

Extensive surface channel samples have been taken along all principal mineralized structures identified by Minera Bateas.

The sampling process consists of making a channel perpendicular to the structure at approximately 3 m intervals along the strike. Sampling is conducted according to lithological or mineralogical characteristics with samples being between 0.2 m and 1.0 m in length. Care is taken to ensure samples are representative, homogeneous and free of contamination.

Channel widths vary between 0.2 m and 0.3 m. Channels are cleaned beforehand by removing a layer of approximately 0.02 m of surface material, which tends to be highly weathered and unrepresentative of the structure. Once the surface material is removed the sample is extracted using a hammer and chisel with the removal of an additional 0.02 m of material, with the average sample weight being 3 kg.

The sample is bagged and a label inserted recording the following information; channel azimuth and inclination, structural, lithological and mineralogical descriptions. The UTM coordinate of the first sample is recorded using a hand held GPS. The coordinates of subsequent samples in the channel are estimated from the first according to the azimuth and inclination of the channel and the length of each sample.

Exploration has focused on the delineation of major vein structures such as Animas, Bateas, Santa Catalina, Soledad and Silvia. However additional exploration has also been conducted to define the mineral potential of other veins on the property (Figure 9.1).

Surface channel samples are not used for Mineral Resource estimation but as a guide for exploration drilling and to identify the vein structure on surface.

9.2.3 Mapping

Animas

During 2006 and early 2007, a surface mapping campaign of the Animas vein structure was conducted in the northeastern portion of the property. The mapping identified discontinuous outcrops of quartz and occasional brecciated zones (quartz and rhodonite) covered by a manganese oxide cap. Surface mapping was complemented by a drilling campaign (described in Section 10) that confirmed the continuity of the structure at depth.

Exploration activities of the Animas vein resumed in 2010, during underground development of level 6 (4,800 masl), brecciated mineralization was discovered with fragments of rhodochrosite and rhodonite in quartz and silica matrix, with disseminations and veinlets of galena and silver sulfosalts.

Antimonio

This vein was first recognized in the 1980s with the mapping of approximately 300 m of outcropping vein, with an average surface thickness of 2.0 m and consisting of massive milky quartz with traces of stibnite. In 2006 the mapping was reviewed and a limited drill program executed. In 2011 as part of the Southern Sector Exploration Program of the Caylloma property, geological mapping and geochemical analysis identified the presence of the vein over a total distance of 1 km striking in a northeast to southwest direction. Geochemical sampling of the vein returned values of up to 3.13 g/t Au, 401 g/t Ag and concentrations greater than 10,000 ppm Sb, as well as elevated arsenic and base metal grades. The presence of stibnite in this vein suggests a later stage of mineralization.

Bateas

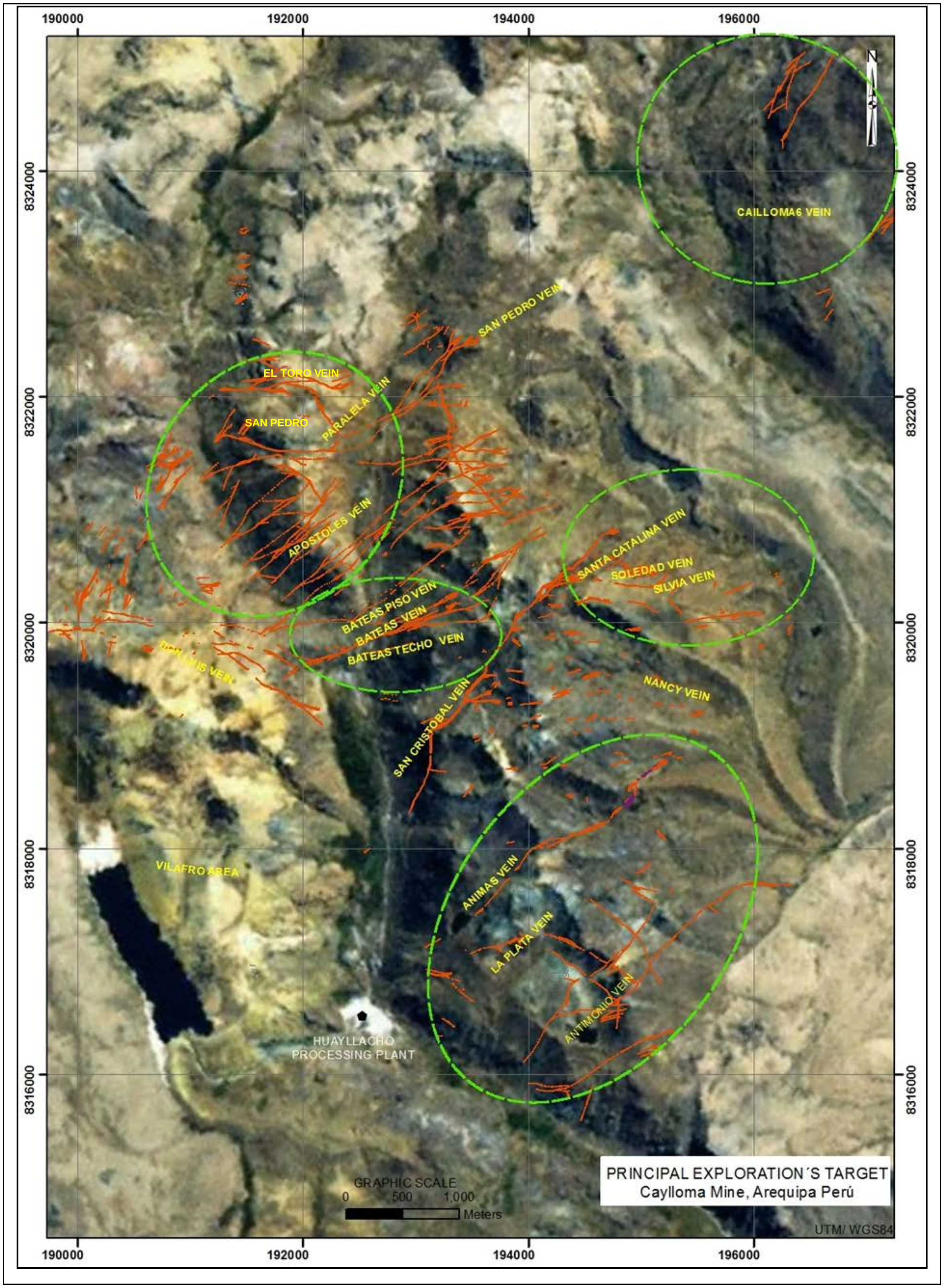
Exploration by Fortuna of the Bateas vein has been ongoing since 2007. Initial work involved surface mapping and the sampling of outcrops that returned anomalous silver grades. Based on the initial results a diamond drill program from surface was conducted in late 2007 and early 2008, being described in Section 10. Exploration has been conducted from the surface as well as from underground workings of the mine.

Silvia

The Silvia vein outcrops on surface discontinuously over a distance of approximately 200 m, varying in thickness from 0.80 m to 1.80 m with a variable strike direction of between 250° to 262° and dipping at 65° to 82° to the northwest. The vein is composed of rhodonite, rhodochrosite, quartz and calcite associated with sulfides such as sphalerite, galena, chalcopyrite and sulfosalts of silver (pyrargyrite). It has a banded to massive texture with varying band widths of basic sulphides. The host rock is an andesitic volcanic rock with propylitic-chloritic alteration.

Exploration continues to be conducted from underground developments and galleries to better understand the behavior of the polymetallic mineralization.

Figure 9.1 Plan showing principal exploration targets



Soledad

The Soledad vein has been mapped on surface over a length of 250 m running parallel with the Santa Catalina vein, and displaying a similar strike (248º to 251º) and dip (76 ° to the northwest). The vein is approximately 0.45 m in thickness, having a banded texture consisting of sphalerite, galena, chalcopyrite, gray copper, silver sulfosalts and disseminated pyrite. Two well-defined mineralization events have been identified in the vein; the first event corresponds to banded rhodonite with the presence of anomalous gold sulfides, and a second event, which disrupts the first, consisting of rhodochrosite with disseminated silver and quartz veinlets.

The structure of the Soledad vein continues to be explored from underground (via the Santa Catalina workings). A structural control to the mineralization has been observed with faults of both pre- and post-mineralization origin being identified.

Patricia

In 2010, exploration of the Patricia vein commenced and was undertaken from underground with the drilling of seven drill holes (described in Section 10) designed to investigate the vein structure around 4,725 masl.

San Cristóbal

There has been limited new exploration by Minera Bateas of the San Cristóbal vein as significant information regarding the structure was available from historical underground workings. San Cristóbal is one of the most prominent veins of the property and is known to have enriched silver concentrations compared to other veins at the property. From 2006 to 2008 exploration drilling (described in Section 10) was conducted in order to explore the mineralization potential at depth. In 2011 exploration was conducted through 578.70 m of new mine workings in level 11, comprising 282.70 m of galleries with the remaining development comprising bypass, cross-cuts, and chimneys. Underground observations identified a banded structure averaging 2.36 m in width and 128 g/t Ag, consisting of quartz veinlets, calcite, and rhodonite with veins and disseminated silver sulfosalts.

Santa Catalina

Santa Catalina is a vein that has been historically exploited. Exploration by Minera Bateas commenced in 2006 with a series of drilling programs as described in Section 10.

Nancy

From 2006 to 2008 reconnaissance work and geological mapping was conducted on portions of the Nancy vein not covered by glacial moraine. Surface samples returned anomalous values of up to 461 g/t Ag and 5.63 g/t Au. In 2007, resistivity and induced polarization geophysical surveys were conducted in the area, with high chargeability anomalies providing evidence of potential mineralization. Exploration drilling, as described in Section 10, has confirmed the presence of an important structure at the property. The structure is open laterally and at depth.

Don Luis II

Exploration of the Don Luis II vein, located to the west of the property, commenced in 2009. The area was divided into three zones, mapped and outcrops sampled. Assay results indicate a structure averaging 1.4 m in thickness and extending over 600 m in length.

Vilafro

In December 2005 samples were collected from the Vilafro area (887 ha) in relation to silica-alunite anomalies identified in ASTER images. In mid-2006, a review of the Vilafro surface geology was performed and in 2007 the area was divided into three zones (South, North, and North B) for systematic mapping and sampling.

The North zone is an area of intense silica alteration due to rhyodacitic subvolcanic intrusives intruding clastic sequences of the Jurassic Yura Group. Mineralization identified in this area is associated with veinlets of silica with hyaline oxides, in most cases with galena and stibnite and anomalous silver and gold.

The North B zone has a similar geology to the North zone, with a rhyodacitic dome intruding a sequence of quartzites. Mineralization is associated with veins and veinlets of silica with iron oxides. No hydrothermal alteration events have been detected related to the dome. The subvolcanic rhyodacitic contains only gold and silver anomalies, restricted to silica veins containing iron oxides.

The South zone is also characterized by subvolcanic, rhyodacitic silicified alteration corresponding with a high-sulfidation epithermal system along with hydrothermal breccias and argillic alteration.

La Plata

The La Plata vein is associated with infilling of a fault oriented northeast to southwest and dipping 60 ° to the southeast. The vein has been mapped over a length of 1,400m, having an average width of 2.5 m.

Mineralogy consists of quartz, calcite, banded rhodonite, johansenita (silicate of calcium and manganese) in the presence of silver sulfosalts, tetrahedrite and manganese oxides. In the first half of 2011 exploration of the vein was resumed with geological mapping and geochemical surface sampling. This involved a reinterpretation of the structure and excavation of exploratory trenches in the far northeast of the vein, and the taking of 160 channel samples that returned values of up to 0.36 g/t Au, 302 g/t Ag and values greater than 10,000 ppm Sb.

Other veins

In 2010 remapping of the Trinidad, Cross Lode, Apostles, Leona, and Elisa areas was conducted in order to improve structural interpretations and evaluate the potential for significant epithermal mineralization.

9.2.4 Recent exploration activities

Exploration conducted between July 2010 and December 2011 has been carried out in order to increase silver resources within the limits of the Minera Bateas concessions.

In conjunction with an extensive drilling program, a comprehensive geological mapping program has been completed throughout the area in order to better understand the structural characteristics of the district and define potential exploration targets. Regional exploration work included: -

- Geological fieldwork (mapping, outcrop sampling).
- Geological and structural mapping of the property (75% completed as of December 2011).

- Identification of 36.4 km of additional vein structures on surface (new veins and extensions).
- Surface sampling (channels and chips).
- Re-logging of drill holes to support the cross-sectional interpretation of the property, as well as the lithostratigraphic column.
- Confirmation of continuity towards the northeast of the San Cristóbal vein (into the Cailloma 6 concession).

10 Drilling

Exploration and definition drilling has been conducted at the Caylloma property by both CMA and Minera Bateas. Diamond drilling has been the preferred methodology with other drilling techniques being unsuitable due to the terrain and the required depths of exploration.

10.1 Drilling conducted by Compania Minera Arcata

Minera Bateas were able to recover and validate information on 43 diamond drill holes totaling 7,159.32 m drilled by CMA between 1981 and 2003 on the Caylloma property. It is unlikely these are the only holes drilled over this period but data on additional drill holes could not be recovered and validated. Table 10.1 details the CMA exploration drilling information retrieved by Minera Bateas.

Table 10.1 Exploration drilling conducted by CMA

Vein	Surface Drill holes		Underground Drill holes	
	Number	Meters	Number	Meters
San Pedro	-	-	8	1,252.85
San Cristóbal	2	882.65	18	1,903.20
Don Luis	-	-	1	130.87
Don Luis I	-	-	2	252.90
Elisa	-	-	2	239.10
La Plata	9	2,228.95	-	-
Ramal San Pedro	1	268.80	-	-
TOTAL	**12**	**3,380.40**	**31**	**3,778.92**

10.2 Drilling conducted by Minera Bateas

As of the end of 2011 Minera Bateas had drilled 481 drill holes on the Caylloma property totaling 65,350.60 m of drilling completed since the company took ownership in 2005. All holes are diamond drill holes and include 203 from the surface totaling 47,246.10 m, and 278 from underground totaling 18,104.50 m. Table 10.2 provides a summary of the drilling used in the 2011 Mineral Resource update.

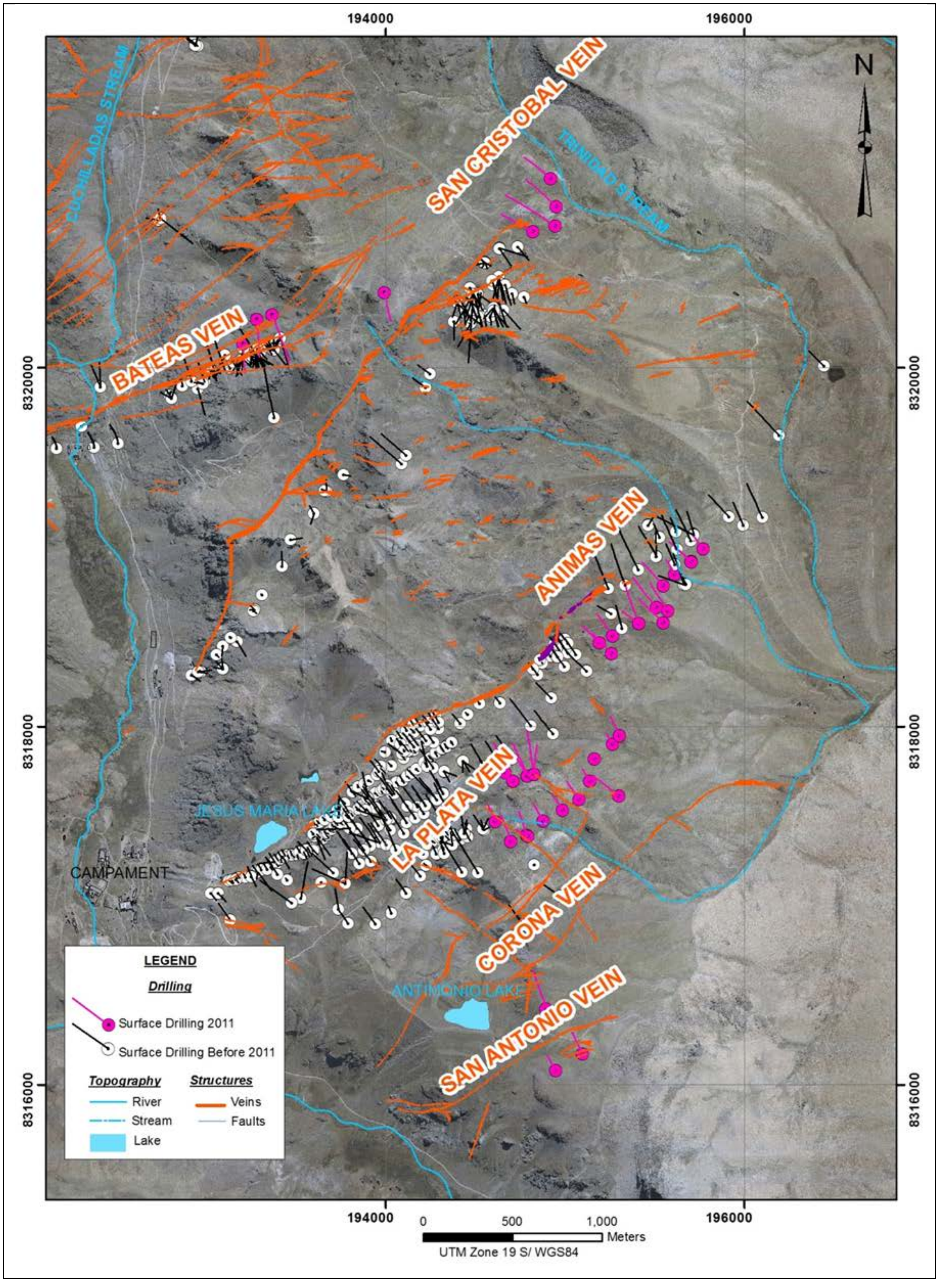
The collar locations of surface drill holes drilled by Minera Bateas at the Caylloma property are displayed in Figure 10.1.

Table 10.2 Exploration drilling conducted by Minera Bateas

Vein	Year	Surface drilling		Underground drilling	
		Number	Meters	Number	Meters
Animas & Animas NE	2005	0	0	94	2,028.00
	2006	37	7,638.75	2	110.65
	2007	32	8,770.35	0	0
	2008	10	3,666.10	0	0
	2009	0	0	0	0
	2010	21	2,300.45	9*	805.40
	2011	12	3,411.10	10*	1,745.75
Antimonio & Corona Antimonio	2006	5	1117.50	0	0
	2011	1	344.60	0	0
Bateas	2007	7	2,786.10	0	0
	2008	4	1,594.20	0	0
	2009	0	0	10*	829.50
	2010	0	0	9*	510.20
	2011	2	640.55	38*	2,714.10
Silvia & Soledad	2008	0	0	6	816.70
	2009	0	0	13	1,577.20
	2010	7	923.80	15	1,010.30
	2011	0	0	7*	591.30
Patricia	2010	0	0	7	682.80
	2011	0	0	12	981.80
Pilar	2011	0	0	2	143.50
San Antonio	2011	2	391.50	0	0
San Cristóbal & Santa Catalina	2006	3	551.00	10	480.55
	2007	0	0	8	850.60
	2008	0	0	4	700.10
	2009	0	0	0	0
	2010	0	0	0	0
	2011	4	1,396.15	4	527.80
Nancy	2006	1	86.60	0	0
	2007	6	1205.50	0	0
	2008	12	3,094.00	0	0
Don Luis II	2010	12	2,265.40	0	0
Vilafro	2010	2	304.30	0	0
La Plata & Cimoide La Plata	2005	0	0.00	7	289.05
	2006	11	2,262.30	11	709.20
	2007	0	0.00	0	0
	2008	0	0.00	0	0
	2009	0	0.00	0	0
	2010	0	0.00	0	0
	2011	11	2,495.85	0	0
Total	**2005-11**	**203**	**47,246.10**	**278**	**18,104.50**

*Definition drilling for quality control purposes

Figure 10.1 Map showing collar locations of surface drill holes at Caylloma



Animas and Animas NE

In 2005, 94 drill holes were drilled from underground, to identify the potential of the Animas structure at depth.

During 2006, 37 drill holes totaling 7,638.75 meters were drilled from surface and two from underground in order to determine the continuity of the Animas vein to a maximum depth of approximately 4,450 masl. Exploration of the Animas NE vein was directed towards 4,800 masl and included nine drill holes, although only two holes intercepted any significant mineralization. Exploration drilling of the Animas central zone was focused between 4,700 masl (level 8) and 4,450 masl (level 13) and resulted in several significant intercepts. Drilling in the southwest of the Animas vein included four drill holes in order to identify potential mineralization.

In 2007, 32 drill holes were drilled totaling 8,770.35 meters. The objective was to verify the structural continuity and mineral content both horizontally and vertically from 4,600 masl to 4,500 masl in Animas central.

In 2008 the structure was further explored through drilling of ten diamond drill holes including three drill holes to level 10 (4,595 masl) and one to level 12 (4,500 masl), where the structure was identified due to the presence of quartz breccia and rhodonite, with a width of 4.7 m and averaging 83 g/t Ag.

In 2010, a diamond drill program was designed to investigate the upper levels of the Animas vein proximal to level 5 (4,850 masl) and resulted in the drilling of ten diamond drill holes, which extended the mineralization to higher elevations close to the topographic surface.

During 2011 twelve diamond drill holes totaling 3,411.1 m were drilled from surface to investigate the Animas NE vein between 4,650 masl and 4,500 masl. Results were positive with the identification of a new ore shoot.

Underground drilling conducted in 2010 and 2011 was used for definition purposes.

Antimonio & Corona Antimonio

In 2006, mapping was reviewed and a limited drill program executed with the drilling of five diamond drill holes from surface, but with little success.

A single drill hole was drilled in 2011 to investigate the Antimonio/Corona Antimonio veins at depth. The hole failed to intersect any significant mineralization.

Bateas

A diamond drill program involving eleven drill holes from surface was conducted to explore the Bateas vein in late 2007 and early 2008. The drilling confirmed the existence of a vein structure oriented to the northeast, characterized by the presence of manganese minerals such as rhodonite, rhodochrosite, and alabandite.

In 2011, two diamond drillholes totaling 640.55 m were drilled from surface that successfully identified the continuity of the Bateas vein to the northeast with the most significant intercept being 1.6 m of mineralization with grades of 220 g/t Ag and 0.33 g/t Au.

Definition drilling accounts for the underground drill holes drilled since 2009.

Silvia

In late 2007 and early 2008 a drilling program designed to investigate the Santa Catalina vein intersected the Silvia vein. Drill hole STCM000507 intercepted 0.60 m of mineralization associated with the Silvia vein returning elevated grades of lead (5.61%), zinc (4.94 %), copper (1.05%), and silver (152 g/t). Since 2008, underground development of level 7 (4,750 masl) of the vein has increased the understanding of the style of mineralization. At the end of 2008 diamond drill holes started from level 8 of the Santa Catalina vein have been used to explore the Silvia vein. The Silvia vein has four levels, with exploration currently focused on level 9 (4,650 masl).

During 2010, 15 drill holes totaling 1,010.3 m were drilled from underground to investigate the ore shoot between 4,800 masl to 4,670 masl. Results proved the continuity of the ore shoot with the best result intercepting 2.07 meters of mineralization averaging 319 g/t Ag and 0.66 g/t Au.

Definition drilling accounts for the underground drill holes drilled since 2011.

Soledad

In 2007 drilling designed to investigate the Santa Catalina vein also intersected the Soledad vein with one drill hole intercepting 1.30 m of mineralization and returning elevated grades of silver (534 g/t), and gold (1.81 g/t). In late 2008, a drill hole campaign was conducted from underground to confirm the continuity of the structure to level 9 (4,650 masl) of the vein.

In 2010, seven diamond drill holes totaling 923.8 m were drilled from surface to explore the Soledad vein to a depth of approximately 4,800 masl. The drilling intersected the mineralized structure with most significant intercept being over a 1.3 m length averaging 135 g/t Ag and 0.62 g/t Au.

Patricia

In 2010, exploration of the Patricia vein commenced from underground with the drilling of seven drill holes designed to investigate the vein structure at the 4,725 masl.

In 2011, an additional twelve drill holes were drilled from underground to further trace the continuity of the vein and allow a preliminary estimate of the Inferred Resource.

Pilar

In 2011 two exploration drill holes were drilled from the underground workings of San Cristóbal to investigate the continuity of the Pilar vein. Both holes intersected the Pilar structure, being approximately 1 m in thickness and comprised of banded rhodochrosite, rhodonite, and quartz with veinlets of sphalerite, galena, chalcopyrite, and pyrite.

San Antonio

Drilling of the San Antonio vein commenced in 2011 with the drilling of two drill holes from surface to investigate the mineralization potential at depth. The vein thickness varies from 0.70 m to 6 m with mineralization consisting of massive quartz, brecciated quartz, and boxwork quartz with infillings of limonite, quartz geodes displaying crustiform textures, pyrite and barite.

San Cristóbal

From 2006 to 2008 drilling was performed from surface and underground in order to explore the mineralization potential at depth from level 11(4,540 masl) to level 12 (4,500 masl). The drilling did not intersect any significant mineralization.

In 2011 a drilling campaign was conducted to demonstrate the continuity of the San Cristóbal vein to the northeast. Four drill holes totaling 1,396.15 m were drilled from surface with three of the holes intersecting the vein structure but displaying limited mineralization. The fourth hole failed to intersect the vein. Field reconnaissance conducted post-drilling traced the projection of the San Cristóbal vein to the northeast and identified the structure on surface in the Cailloma 6 concession (Figure 9.1).

Santa Catalina

Exploration of the Santa Catalina vein by Minera Bateas commenced in 2006 with a drilling program from surface focused on investigating level 8 (4,720 masl). In 2007 exploration continued through underground drilling to investigate between level 8 (4,720 masl) and level 9 (4,773 masl) and resulted in the intersection of a very narrow structure less than 5 m wide composed of banded rhodonite-rhodochrosite with calcite and disseminated silver sulfosalts. Exploration drilling of the Santa Catalina vein also resulted in the discovery of additional polymetallic veins, such as Soledad, Silvia, Patricia, and Pilar.

Nancy

Exploration drilling from 2006 to 2007 included the drilling of seven diamond drill holes from surface totaling 1,292.1 m were used to identify a structure consisting of a gray silica matrix and fragments of quartz with sulfides. In 2008, twelve drill holes were drilled from surface totaling 3,094 m and resulted in some significant mineralized intercepts. In 2011, three drill holes designed to investigate the Animas NE vein, also intercepted the Nancy vein providing further information on the vein continuity and grade.

Don Luis II

In mid-2010 seven diamond drill holes were drilled from surface to explore the Don Luis II vein at depth. Due to positive results the program was expanded to include five additional holes that were drilled by the end of 2010. Additional drilling is planned for 2012 in an attempt to increase the understanding of this vein.

Vilafro

In 2010 two drill holes were drilled in order to intersect fault structures associated with quartz veinlets and disseminated mineralization. Due to the limited success of the drill program the exploration of this area was suspended.

La Plata and Cimoide La Plata

In 2005 seven drill holes were drilled from underground between 4,695 masl (level 8) and 4,745 masl (level 7) to investigate the behavior of the La Plata vein at this depth.

During 2006 eleven drill holes were drilled from surface to confirm the continuity at the extreme west of the La Plata vein, between 4,550 masl and 4,700 masl. Results confirmed the continuity of the vein with grades between 20 g/t Ag and 100 g/t Ag and widths of 0.6 m to 1.2 m. Eleven diamond drill holes were also drilled from underground targeting the La Plata vein at a depth of 4,695 masl (level 8), to investigate the continuity of the ore shoot at depth.

In 2011, the drill program included twelve drill holes oriented between 4,600 masl and 4,700 masl, with the most significant intercept returning grades of 260 g/t Ag and 5.74 g/t Au and an average vein width of 1.90 m.

10.3 Diamond drilling methods

Minera Bateas has used a variety of different drilling contractors to perform exploration drilling since it took ownership of the property in 2005. Between 2010 and 2011 drilling was conducted by three different drilling contractors including Geodrill, Teamrock, and Geotecnia. Multiple drill rigs were used during the campaign, including three LY-44's, a DIAMEC-262, and a DIAMEC-282. Both HQ (63.5 mm) and NQ (47.6 mm) diameter core was obtained, depending on the depth of the hole.

Proposed surface drill hole collar coordinates (Datum WGS84, UTM Zone 19S), azimuths and inclinations were designed based on the veins known orientation and the planned depth of vein intersection using geological plan maps and sections as a guide.

The drilling platform, together with its access road and slurry sedimentation pit, were prepared using a D7 tracked tractor. The dimensions of the drilling platform are clearly marked with flags indicating the limits for earth movement in order to minimize soil disturbance and comply with government directive D.S. N° 020-2008-EM regarding Environmental Regulations for Exploration Activities.

Drill core is stored in waterproof cardboard boxes with each box storing up to 3.0 m of core. Prior to transportation, core boxes are verified to ensure correct, consecutive labeling, as well as clear and legible drill hole codes. The inside of the box is checked for a direction arrow indicating the start and end of the core sequence. The lid of the core box must clearly show the accrued length and each side of the lid must detail the previous accrued length ("From"), and current accrued length ("To").

Drill core boxes will only be handled and transported by personnel appointed to this task. Boxes are checked and secured prior to transportation to minimize the risk of shifting or mixing of core samples during transportation. Care is taken to ensure that core boxes arrive at the logging facilities with minimal disturbance to the core or the depth markers.

In the logging facilities, geologists and geotechnical technicians carry out geotechnical measurements, logging and sampling of mineralized core.

Core is first examined to capture geological information. Initially, quick logging is performed to prepare a brief description of the mineralization intersects. The logging sheet allows the recording of essential information in the form of both graphics and written descriptions. A photographic record of the core is taken using a digital camera.

10.4 Drill core recovery

Sample recovery is recorded by geotechnical technicians. Drill core recovery is generally good, on average greater than 90%. Recoveries can be lower near surface or when fault structures are encountered due to the more fragmented nature of the core. However, recovery is generally excellent through the mineralized vein structures. The core recovery values are used when considering the reliability of the sample. The presence of bias due to core loss is detected by performing a correlation analysis on recovery and grade.

10.5 Extent of drilling

Drill holes are typically drilled on sections spaced 40 m to 60 m apart along the strike of the vein with surface drilling focusing on exploring the extents of the Animas, Bateas and Nancy veins and underground drilling used for a mix of exploration and resource definition. The extent of drilling varies for each vein with those having the greatest coverage having drill holes extending over 4,000 m of the veins strike length (Animas), to the least having only a couple of drill holes extending over 50 m (Antimonio).

10.6 Drill hole collar surveys

The coordinate for the proposed drill hole collar location is determined through assessing the azimuth and inclination of the hole to achieve the desired depth of intercept in cross sections. Once the coordinates have been determined the location of the collar is located in the field using differential GPS. The drilling pad is then prepared at this marked location. Upon completion of the drill hole a survey of the collar is performed using Total Station equipment, with results reported in the collar coordinates using Reference Datum WGS84, UTM Zone 19S.

10.7 Downhole surveys

The geologist in charge of drilling is responsible for measuring the azimuth and inclination of the hole at the collar using a compass clinometer. Downhole surveys were completed by the drilling contractor using survey equipment such as a Flexit or Reflex tool at approximately 50 m intervals for all surface Minera Bateas drill holes and underground drillholes greater than 100 m in length. Minera Bateas assess the downhole survey readings as a component of the data validation. If the underground drillhole is less than 100 m in length the azimuth and inclination is recorded at the collar and used to project the hole to its full depth.

Drill holes recovered from CMA do not include downhole survey information and drill hole azimuths and inclinations recorded at the collar have been used to project the hole to its full depth.

11 Sample preparation, analyses, and security

The sampling methodology at the Caylloma operation has adhered to strict procedures with minor adjustments and improvements made to the protocols over the years to continually improve the processes. All samples are collected by geological staff of Minera Bateas with sample preparation and analysis being conducted either at the onsite Bateas laboratory (channel samples and underground development drill core) or the ALS Chemex laboratory in Lima (exploration drill core). The Bateas on-site laboratory is not a certified laboratory. Therefore, pulp splits and preparation duplicates, along with reference standards and blanks are routinely sent to the ISO certified ALS Chemex laboratory in Lima to monitor the performance of the Bateas laboratory.

11.1 Sample preparation prior to dispatch of samples

11.1.1 Channel Sampling

Channel samples are collected from the backs of underground workings. The entire process is carried out under the geology department's supervision.

Since February 2011 the location of each channel has been surveyed using Total Station equipment. Surveyors use an underground survey reference point to locate the starting coordinates of each channel. Prior to February 2011, this process was performed by compass and tape measure.

Sampling is carried out at 2 m intervals within the drifts of all veins and 3 m intervals in stopes (except for Bateas and Soledad, where sampling is carried out every 2 m in stopes). The channel's length and orientation are identified using paint in the underground working and by painting the channel number on the footwall. The channel is between 20 cm to 30 cm wide and approximately 2 cm deep, with each individual sample being no longer than 1.5 m.

The area to be sampled is washed down to provide a clean view of the vein. The channel is sampled by taking a succession of chips in sequence from the hanging wall to the footwall perpendicular to the vein based on the geology and mineralization.

Samples, comprised of fragments, chips and mineral dust, are extracted using a pick and hammer, along the channel's length on a proportional basis. Proper marking of the channel is critical to ensuring that the proportions taken are representative.

For veins with narrow or reduced thickness (<0.20 m), the channel width is expanded to 0.40 m, thus allowing to obtain the necessary sample amount.

Sample collection is normally performed by two samplers, one using the hammer and pick, and the other holds the receptacle (cradle), to collect rock and ore fragments. Usually the cradle consists of a sack, with the mouth kept open by a wire ring. The collected sample is placed on a plastic sheet for preparation.

Firstly, coarse fragments are reduced in size with the aid of a maul hammer, a small anvil and a plastic sheet (1 m wide by 1.2 m long), which is used to collect the fragments. The rock fragments for each sample are reduced in size until a granulometry under 2 cm is obtained. Once the required diameter is obtained, the entire sample is homogenized, and split.

The sample is prepared prior to being bagged using a cone and quarter methodology. The process involves homogenizing the sample by overturning the sample numerous times within the plastic sampling sheet, with care taken not to lose any material. Once the sample has been homogenized it is divided into four equal quarters and a representative sample collected from opposite quarters, diagonally (the other two quarters are discarded). Splitting maybe performed more than once to ensure a sample no heavier than 2.5 kg to 3 kg is collected, corresponding to a full sampling bag. The obtained sample is deposited in a plastic sample bag with a sampling card and the assigned sample ID.

11.1.2 Core Sampling

A geologist is responsible for determining and marking the intervals to be sampled, selecting them based on geological and structural logging. The sample length must not exceed 1 m or be less than 10 cm.

Splitting of the core is performed by diamond saw. The geologist carefully determines the line of cutting, in such a way that both halves of the core are representative. The core cutting process is performed in a separate building adjacent to the core logging facilities. Water used to cool the saw is not re-circulated but stored in drums to allow any fines to settle before final disposal.

Once the core has been split, half the sample is placed in a sample bag. A sampling card with the appropriate information is inserted with the core.

11.1.3 Bulk Density determination

Samples for density analysis are collected underground using a hammer and chisel to obtain a single large sample of approximately six kilograms. The sample is always taken of mineralized material in the same locality as a channel sample. The coordinates of the closest channel sample is assigned to the density sample. The sample is brought to the surface and delivered to the core cutting shed where each side of the sample is cut using a diamond saw to produce a smooth sided cube. The sample is labeled and bagged prior to being stored in the storage facilities to await transportation with other samples to the ALS Chemex laboratory in Arequipa.

Density tests are performed at the ALS Chemex laboratory in Lima using the OA-GRA09A methodology. This test consists of firstly cutting, weighing (maximum of 6 kg) and coating the sample in paraffin wax. Samples are then slowly placed into bulk density apparatus which is filled with water. The displaced water is collected into a graduated cylinder and measured. The bulk density calculations are corrected for air temperature and the density of the wax coating.

11.2 Dispatch of samples, sample preparation, assaying and analytical procedures

11.2.1 Sample dispatch

Once samples have been collected they are assigned a batch number and either submitted to the Minera Bateas onsite laboratory, or sent to the mine warehouse to await transportation (three times a week) to the ALS Chemex facility in Arequipa , and then on to the ALS Chemex laboratory in Lima for analysis.

The primary laboratory (Bateas) uses the same sample preparation, assaying and analytical procedures as are performed at the umpire laboratory (ALS Chemex).

11.2.2 Sample preparation

Upon receipt of a sample batch the laboratory staff immediately verifies that sample bags are sealed and undamaged. Sample numbers and ID's are checked to ensure they match that as detailed in the submittal form provided by the geology department. If any damaged, missing, or extra samples are detected the sample batch is rejected and the geology department is contacted to investigate the discrepancy. If the sample batch is accepted the samples are sequentially coded and registered as received.

Accepted samples are then transferred to individual stainless steel trays with their corresponding sample ID's for drying. The trays are placed in the oven for 2 to 4 hours at a temperature of 110°C.

Once samples have been dried they are transferred to a separate ventilated room for crushing using a two stage process. Firstly the sample is fed into a terminator crusher to reduce the original particle size so that approximately 90% passes ½ inch mesh sieve size. The entire sample is then fed to the secondary Rhino crusher so that the particle size is reduced to approximately 85% passing a 10 mesh sieve size. The percent passing is monitored daily to ensure these specifications are maintained. The crushing equipment is cleaned using compressed air and a barren quartz flush after each sample.

Once the sampling has been crushed it is reduced in size to 150 g ± 20 g using a single tier Jones riffle splitter. The reduced sample is returned to the sampling tray for pulverizing whereas the coarse reject material is returned to a labeled sample bag and temporarily placed in a separate storage room for transferal to the long term storage facilities located adjacent to the core logging facilities.

Crushed samples are pulverized using a Rocklab standard ring mill so that 90% of particles pass a 200 mesh sieve size. The pulp sample is carefully placed in an envelope along with the sample ID label. Envelopes are taken to the balance room where they are checked to ensure the samples registered as having being received and processed match those provided in the envelopes.

The Minera Bateas laboratory's preparation facilities have been inspected by Mr. Eric Chapman on various occasions and found to be clean and well organized. All weighing equipment is calibrated on a daily basis using in-house weights and externally calibrated once a year.

11.2.3 Assaying of silver, lead, copper and zinc

Upon receipt of samples in the analytical laboratory, all pulps are re-checked to ensure they match the list in the submittal form. Once completed, 0.5 g of the pulp is weighed and transferred into a 250 ml Teflon container. Added to this is 5 ml of HNO^3, 5 ml of HCl, 1 ml HF, and 1 ml of perchloric acid and the solution is placed in a small oven at 150°C to 200°C until the mixture becomes pasty in consistency. The paste is cooled before 25 % HCl is added to the container. This mixture is then boiled until it changes color. The solution is then transferred to a new vial, cooled and diluted with distilled water before being analyzed.

The elements of silver, copper, lead and zinc are assayed using atomic absorption techniques. An initial and duplicate reading is taken and an internal standard is inserted every ten samples to monitor and calibrate the equipment.

11.2.4 Assaying of gold

After checking that the pulps match the submittal form, 30 g of the pulp is weighed and added to a crucible, along with 120 g of flux, and 1 g to 5 g of KNO_3 if it is a sulfide sample or 1.5 g to 2.0 g of flour if it as an oxide sample. The material is carefully homogenized before being covered by a thin layer of borax.

The mixture is placed in an oven for approximately one to two hours and heated to 1,150°C ± 50°C. Once the crucibles have cooled the slag material is separated and discarded with the remaining material being transferred to a ceramic cup and placed in an oven for 45 to 60 minutes at a temperature of between 950°C to 1,050°C in order to evaporate any lead and leave behind a clean doré (Ag/Au).

The doré is careful transferred to a test tube and 1 ml of 15% nitric acid is added before it is transferred to an oven and heated to 200°C ± 20°C and monitored until digestion is complete. The sample tubes are removed from the oven, cooled for five minutes before 2.5 ml of hydrochloric acid is added. The solution is heated once again until a pale yellow solution is observed marking the end of the reaction and cooled once more for five minutes before 1 ml of 2% aluminum nitrate. Distilled water is then added to the test tube to ensure the volume of solution is 5 ml, before it is covered and agitated. The test tubes are left to stand to allow sedimentation prior to analysis by atomic absorption.

11.3 Sample security and chain of custody

Sample collection and transportation of both drill hole and channel samples is the responsibility of the geology department.

Core boxes are sealed and carefully transported to the core logging facilities where there is sufficient room to layout and examine several holes at a time. The core logging facility is located at the mine site and is locked when not in use.

Once logging and sampling have been performed, the remaining core is transferred to the core storage facilities located adjacent to the logging facilities. The storage facilities consist of a secure warehouse constructed in 2011 to replace the older facilities that were located a kilometer to the north of the mine camp. The warehouse is dry and well illuminated, with metal shelving with sufficient capacity to store all historical drill core and plenty of space for the coming years.

The core is stored chronologically and location plans of the warehouse provide easy access to all core collected by Minera Bateas. The storage facility is managed by the Brownfields Exploration Manager and the Superintendent of Geology and any removal of material must receive their approval.

Coarse reject material for drill core, channel and exploration samples are collected from the Minera Bateas laboratory every ten days and stored in a storage facility adjacent to the core storage facility. Storage of the core and exploration coarse rejects is the responsibility of the Brownfields Exploration Manager. Storage of the channel sample rejects is the responsibility of the resource modeling department. All drill core rejects are presently retained indefinitely. Channel reject material is stored between three and twelve months depending on the sample location.

Pulps for drill core, channel and exploration samples are returned to the originator for storage in a separate building adjacent to the Bateas laboratory. It is the responsibility of the originator to ensure these samples are stored in an organized and secure fashion. Samples are retained in accordance with the Fortuna corporate sample retention policy.

All surface drill core and exploration pulps are stored for the life of mine. Disposal of exploration coarse reject samples is performed after 90 days and is controlled by the exploration department. All underground drill core and pulps obtained during underground sampling are retained for the life of mine. Disposal of underground coarse reject samples is performed after 90 days and is the responsibility of the Geology Superintendent.

11.4 Quality control measures

The routine insertion of certified reference material, blanks, and duplicates with sample submissions as part of a sample assay quality assurance/quality control (QAQC) program is current industry best practice. Analysis of QAQC data is made to assess the reliability of sample assay data and the confidence in the data used for the estimation.

Minera Bateas routinely inserts certified standards, blanks, and field duplicates to the Minera Bateas laboratory and regularly sends preparation (coarse reject), and pulp duplicates along with standards and blanks to the umpire ALS Chemex laboratory.

Previous technical reports (CAM, 2006 and CAM, 2009) have assessed the QAQC results of CMA and Minera Bateas and reported them as acceptable. These historical results were reviewed in 2011 by Fortuna and are regarded as acceptable according to industry best practices. A more detailed analysis has focused on the performance of the laboratory over the twelve months prior to the 2011 Mineral Resource update.

11.4.1 Standard Reference Material

Certified reference material (SRM) are samples that are used to measure the accuracy of analytical processes and are composed of material that has been thoroughly analyzed to accurately determine its grade within known error limits. SRMs are inserted by the geologist into the sample stream, and the expected value is concealed from the laboratory, even though the laboratory will inevitably know that the sample is a SRM of some sort. By comparing the results of a laboratory's analysis of a SRM to its certified value, the accuracy of the result is monitored.

SRMs, or standards, whose true values are determined by a laboratory, have been placed into the sample stream by Minera Bateas geologists to ensure sample accuracy throughout the sampling process.

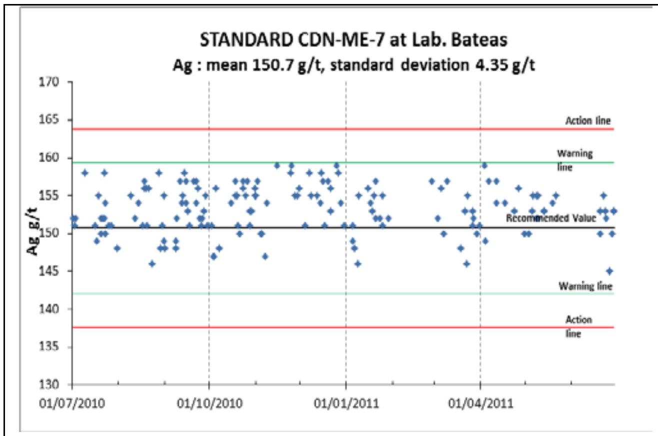
This analysis focuses on the submission of 1,045 standards between July 2010 and June 2011 to the Bateas laboratory. The grade characteristics of the eight different SRMs used for analysis are provided in Table 11.1.

Table 11.1 Accepted values for standards inserted at Bateas laboratory

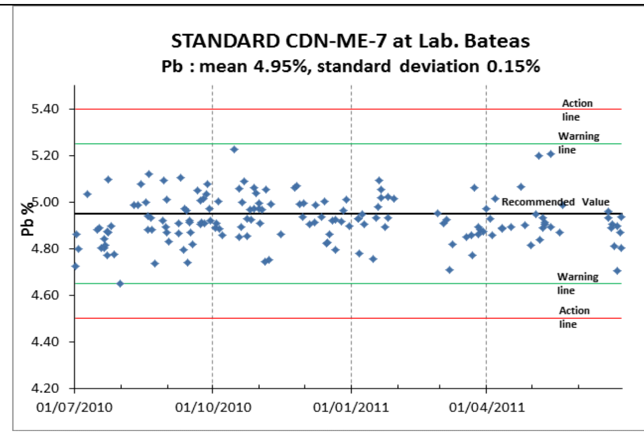
Standard	Silver (g/t)		Lead (%)		Zinc (%)		Gold (g/t)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
CDN-HZ-3	27.3	1.60	0.707	0.018	3.16	0.08	0.055	0.005
CDN-ME-2	14.0	0.65	-	-	1.35	0.05	2.1	0.055
CDN-ME-3	276	8.55	2.82	0.06	0.88	0.03	9.97	0.29
CDN-ME-4	414	8.5	4.25	0.12	1.10	0.03	2.61	0.15
CDN-ME-5	206.1	6.55	2.13	0.06	0.579	0.01	1.07	0.07
CDN-ME-6	101	3.55	1.02	0.04	0.517	0.02	0.27	0.014
CDN-ME-7	150.7	4.35	4.95	0.15	4.84	0.085	0.219	0.012
CDN-ME-8	61.7	2.35	1.94	0.04	1.92	0.04	0.093	0.009

Submitted certified standards indicate the Bateas laboratory has acceptable levels of accuracy for silver, lead, zinc, and gold. The assay results for most standards demonstrate little or no bias with the exception of CDN-ME-7 which shows that reported silver assays tend to be consistently marginally elevated, although all results are within acceptable tolerance levels (Figure 11.1). The results for this standard should be closely monitored and if required the standard replaced if the reason for the bias cannot be ascertained.

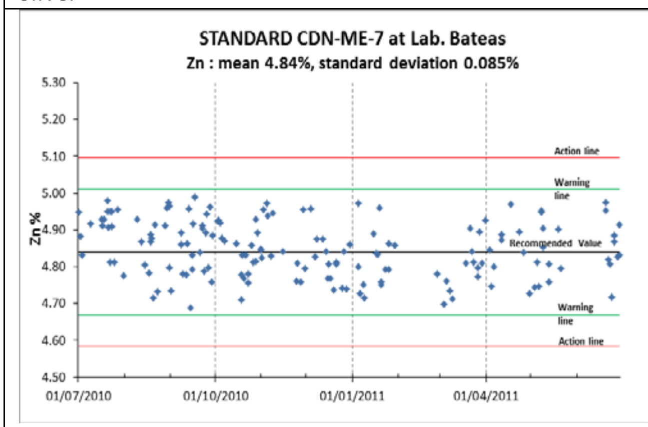
Figure 11.1 Analysis of standard CDN-ME-7 submitted to the Bateas laboratory



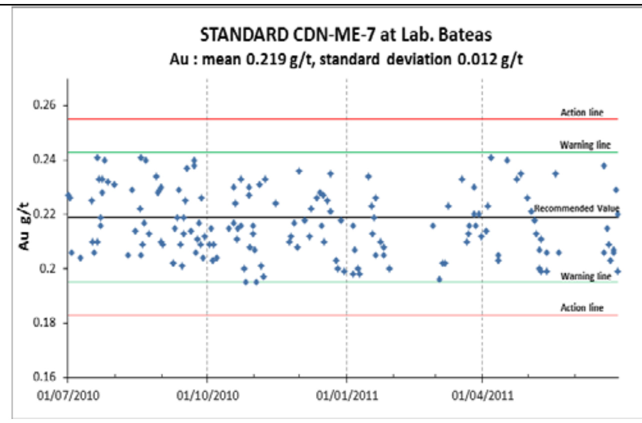
Silver



Lead



Zinc



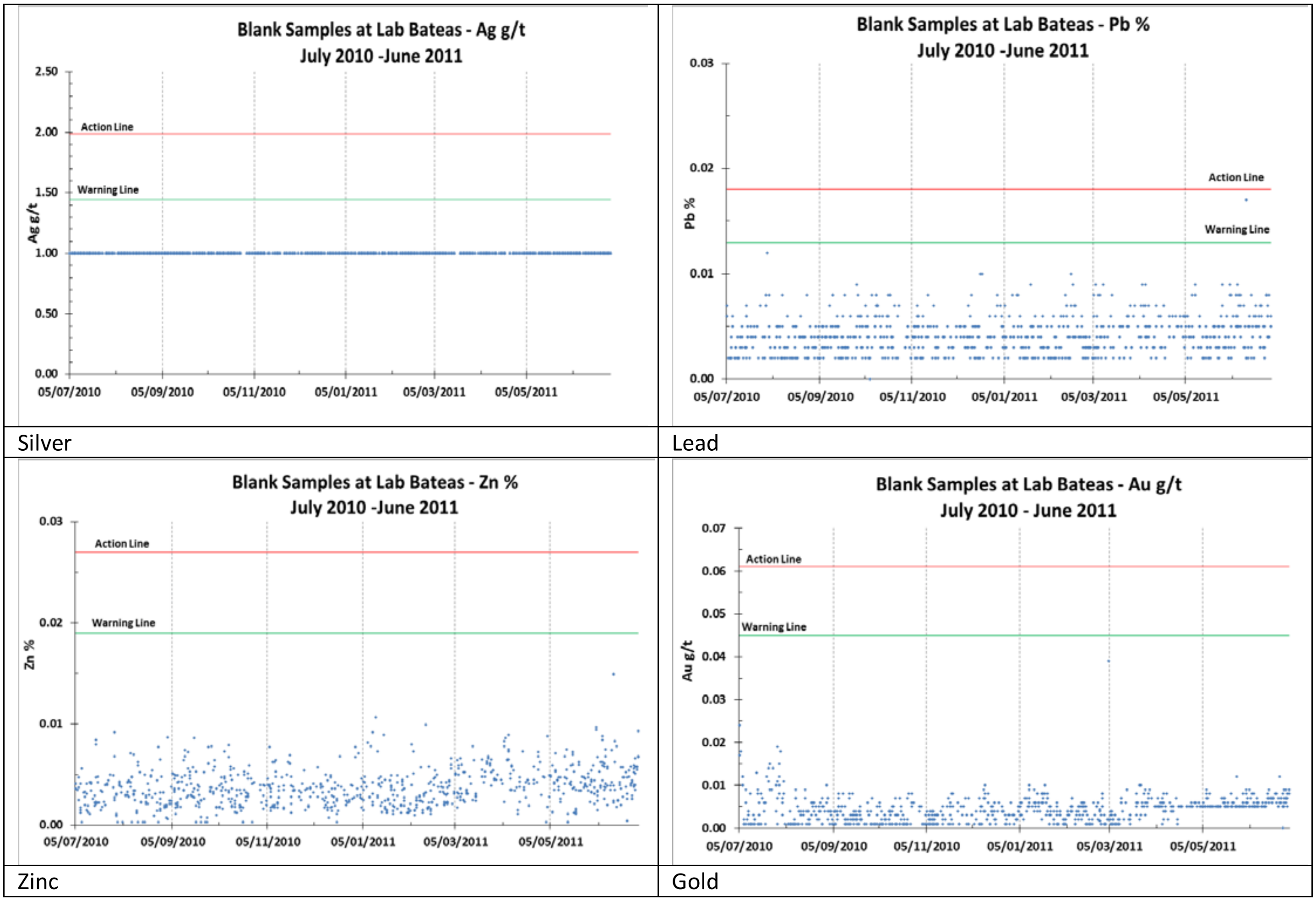
Gold

11.4.2 Blanks

Field blank samples are composed of material that is known to contain grades that are less than the detection limit of the analytical method in use (or in the case of Pb and Zn are known to be very low) and are inserted by the geologist in the field. Blank sample analysis is a method of determining sample switching and cross-contamination of samples during the sample preparation or analysis processes. Minera Bateas uses coarse quartz sourced from outside the area and provided by an external supplier as their blank sample material. The blank is tested to ensure the material does not contain elevated values for the elements of interest.

The analysis focuses on the submission of 865 blanks between July 2010 and June 2011. The results of the analysis for each element are displayed in Figure 11.2.

Figure 11.2 Analysis of blanks submitted to the Bateas laboratory



The results of the blanks submitted indicate that cross contamination and mislabeling are not material issues at the Bateas laboratory. Of the 865 blank samples submitted only one exceeded the warning line indicating an excellent result.

11.4.3 Duplicates

The precision of sampling and analytical results can be measured by re-analyzing the same sample using the same methodology. The variance between the measured results is a measure of their precision. Precision is affected by mineralogical factors such as grain size and distribution and inconsistencies in the sample preparation and analysis processes. There are a number of different duplicate sample types which can be used to determine the precision for the entire sampling process (field duplicate), sample preparation (preparation duplicate), and analysis process (pulp duplicate).

Minera Bateas inserts field, preparation, and pulp duplicates as part of a comprehensive QAQC program. Field duplicates are prepared and assayed in the Bateas laboratory whereas preparation and pulp duplicates are sent to the certified laboratory of ALS Chemex to provide an external monitor to the precision of the Bateas laboratory.

Standards and blanks are also submitted with the duplicates to ensure the accuracy of the ALS results.

Numerous plots and graphs can be used to quantify precision and bias for analytical methods. A brief description of the plots employed in the analysis of Bateas duplicate data, as presented in this report, are briefly described below:

- Scatter plot: assesses the degree of scatter of the duplicate result plotted against the original value, which allows for bias characterization and regression calculations.
- Precision plot: half absolute difference (HAD) of the sample pairs against their mean. The reference lines indicate different levels of precision.
- Relative difference plot: relative difference of the paired values divided by their average.
- Ranked half absolute relative difference (HARD) of samples plotted against their rank % value. For preparation (coarse reject) duplicate samples, the sample threshold is accepted to be approximately 20% or below at the 90th percentile, depending on the nature of mineralization.

Minera Bateas has inserted field, preparation, and laboratory duplicates since sampling commenced at the operation in 2005. Previous technical reports (CAM, 2006 and CAM, 2009) have assessed the results and reported them as acceptable. The results obtained in previous years have been reviewed and are regarded as demonstrating acceptable levels of precision. A more detailed analysis has focused on the performance of the laboratory over the twelve months prior to the Mineral Resource update.

Field duplicates

Since Minera Bateas commenced sampling a total of 1,634 field duplicates have been submitted at an approximate 1 in 30 submission rate. Levels of precision prior to July 2010 are regarded as acceptable. A total of 681 field duplicates have been submitted to the Bateas laboratory between July 2010 and June 2011, representing approximately a 1in 20 submission rate. All field duplicates are of channel samples with a second sample taken in the same location and using the same methodology as the first.

Silver

Of the 681 duplicate samples submitted between July 2010 and June 2011 all had grades above the detection limit and were regarded as suitable for analysis. Duplicate silver grades display reasonable levels of precision with 264 samples being within 5% of the original grade and 589 samples being within 20%. The half absolute relative difference is 24.1% at the 90th percentile which is regarded as acceptable for field duplicates of silver grades in a heterogeneous polymetallic style deposit.

Gold

Of the 681 duplicate samples submitted 680 had grades above the detection limit and were regarded as suitable for analysis. Duplicate gold grades display acceptable levels of precision with 225 samples being within 5% of the original grade and 559 samples being within 20%. The half absolute relative difference is 29.3% at the 90th percentile. The result is close to the accepted threshold of 30% for field duplicates but Fortuna is aware that gold mineralization in this deposit can be highly variable over short distances therefore a lower level of precision is expected for gold.

Lead

Of the 681 duplicate samples submitted all have grades above the detection limit and were regarded as suitable for analysis. Duplicate lead grades display acceptable levels of precision with 267 samples being within 5% and 562 samples being within 20% of the original grade and the HARD being 28.6% at the 90th percentile. The precision is lower than would have been expected for lead but is still within acceptable tolerances. However the sampling methodology should be investigated to ensure a bias is not occurring during sampling.

Zinc

Of the 681 field duplicate samples submitted all have grades above the detection limit and were regarded as suitable for analysis. Duplicate zinc grades also display acceptable levels of precision with 274 samples being within 5% of the original grade and 577 samples being within 20%. The half absolute difference is 26.7% at the 90th percentile which is regarded as acceptable for field duplicates.

Preparation duplicates

Since 2008 a total of 2,333 preparation duplicates have been submitted at an approximate 1 in 25 submission rate. Results prior to July 2010 are regarded as acceptable. This analysis focuses on the submission of 593 samples between July 2010 and June 2011 to the ALS Chemex laboratory. Of the 593 samples 15 were certified standards and 18 were blanks to assess the accuracy and contamination of the umpire laboratory. The submission of 560 preparation duplicates equates to approximately a 1 in 25 submission rate.

Silver (Figure 11.3)

Of the 593 preparation duplicate samples submitted 571 samples have grades above the detection limit and are regarded as suitable for analysis. Duplicate silver grades display good levels of precision with 383 samples being within 5% of the original grade and 527 samples being within 20%. The half absolute relative difference is 16.8% at the 90th percentile which is regarded as acceptable for preparation duplicates of silver grades in epithermal style deposits.

Lead

Of the 593 preparation duplicate samples submitted 589 samples have grades above the detection limit and are regarded as suitable for analysis. Duplicate lead grades display excellent levels of precision with 407 samples being within 5% of the original grade and 555 samples being within 20%. The half absolute relative difference is 11.6% at the 90th percentile which is regarded as very good for preparation duplicates.

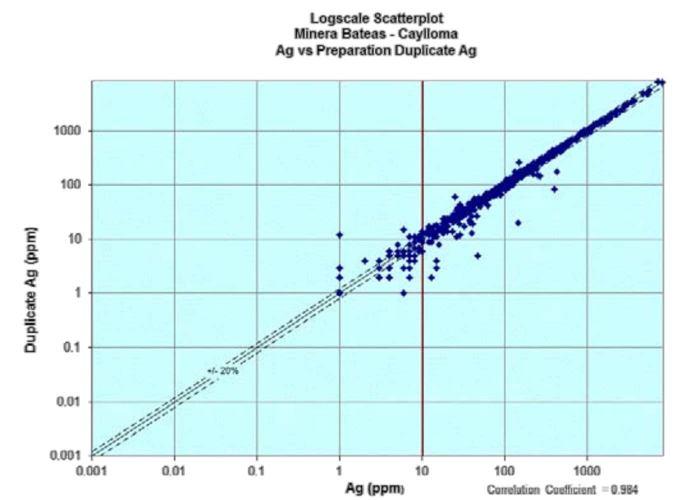
Zinc

Of the 593 preparation duplicate samples submitted 591 samples have grades above the detection limit and are regarded as suitable for analysis. Duplicate zinc grades also display excellent levels of precision with 439 samples being within 5% of the original grade and 558 samples being within 20%. The half absolute difference is 10.7% at the 90th percentile which is regarded as good for preparation duplicates.

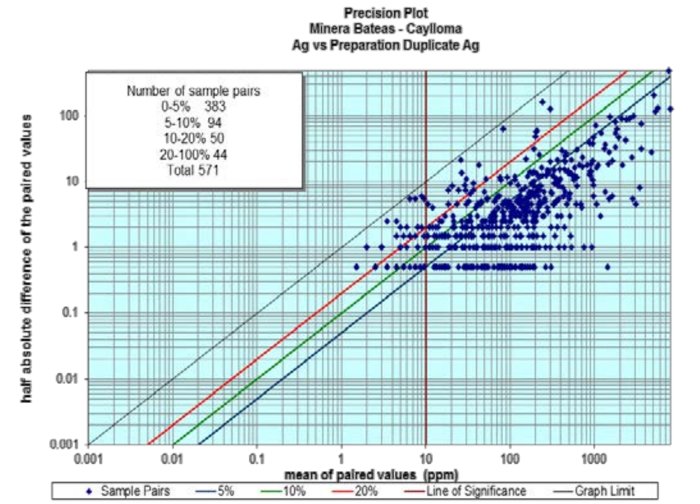
Gold

Of the 593 preparation duplicate samples submitted 575 samples have grades above the detection limit and are regarded as suitable for analysis. Duplicate gold grades display acceptable levels of precision with 254 samples being within 5% of the original grade and 499 samples being within 20% of the original grade. The half absolute relative difference is 24.7% at the 90th percentile which is high for preparation duplicates. However it is noted that the larger precision discrepancies tend to be related to samples with gold grades below the 0.05 g/t Au (x10 the detection limit) and when these are filtered the HARD fall to 20% at the 90th percentile. The level of precision for gold is regarded as acceptable but should be monitored in an attempt to improve the results.

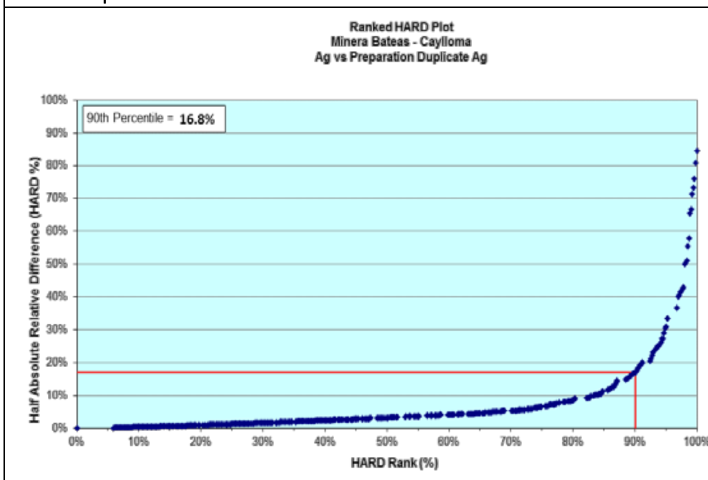
Figure 11.3 Analysis of preparation duplicates for silver grades



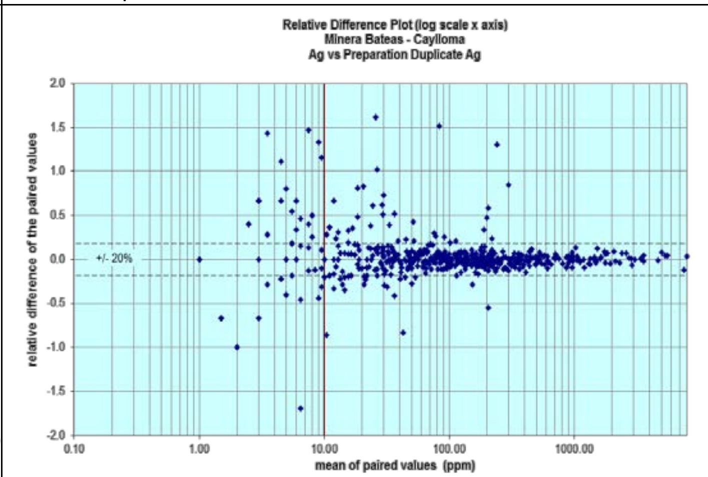
Scatter plot



Precision plot



Ranked HARD plot



Relative difference plot

Blanks submitted with preparation duplicates

The results of the blanks demonstrate contamination at the umpire laboratory is not a significant problem. However no blanks were reported to have been submitted between July 2010 and September 2010 and there were two separate fails, one sample that displayed an elevated lead grade and the other an elevated zinc grade. These batches should be investigated as a matter of routine and the batch re-submitted if deemed appropriate.

Standards submitted with preparation duplicates

Submitted certified standards indicate the umpire laboratory has acceptable levels of accuracy for silver, lead, zinc and gold. There was a single failure with the laboratory reporting an elevated gold grade for standard CDN ME-2 and this should be investigated during routine analysis of the results and the batch re-submitted if deemed appropriate. There are two few standards to draw meaningful conclusions to possible biases.

The lower levels of precision are expected for the more variable gold and silver elements but are still within acceptable levels of precision for preparation duplicates in an epithermal style deposit. Gold grade duplicate results should be carefully monitored throughout the year to ensure acceptable levels of precision are maintained with the half absolute difference at the 90th percentile approximate to 20%. Levels of precision for lead and zinc grades are good. Analysis of standards and blanks for the umpire laboratory indicate acceptable levels of accuracy and little indication of contamination.

Laboratory duplicates

Since 2008 a total of 2,573 laboratory or pulp duplicates have been submitted at an approximate 1 in 25 submission rate. Precision levels prior to July 2010 are regarded as acceptable. The analysis focuses on the submission of 603 samples between July 2010 and June 2011 to the ALS laboratory. Of the 603 samples 22 were certified standards and 19 were blanks to assess the accuracy and contamination of the duplicate analytical process of the umpire laboratory. The submission of 562 laboratory duplicates equates to approximately a 1 in 25 submission rate.

Silver (Figure 11.4)

Of the 603 duplicate samples submitted 590 samples have grades above the detection limit and are regarded as suitable for analysis. Duplicate silver grades display good levels of precision with 453 samples being within 5% of the original grade and 523 samples being within 10% of the original grade. The half absolute relative difference is 13.0% at the 90^{th} percentile which is regarded as acceptable for pulp duplicates of silver grades in epithermal style deposits.

Lead

Of the 603 duplicate samples submitted 601 samples have grades above the detection limit and are regarded as suitable for analysis. Duplicate lead grades display reasonable levels of precision with 453 samples being within 5% of the original grade and 545 samples being within 10% of the original grade. The half absolute difference is 9.1% at the 90th percentile which is regarded as acceptable for pulp duplicates.

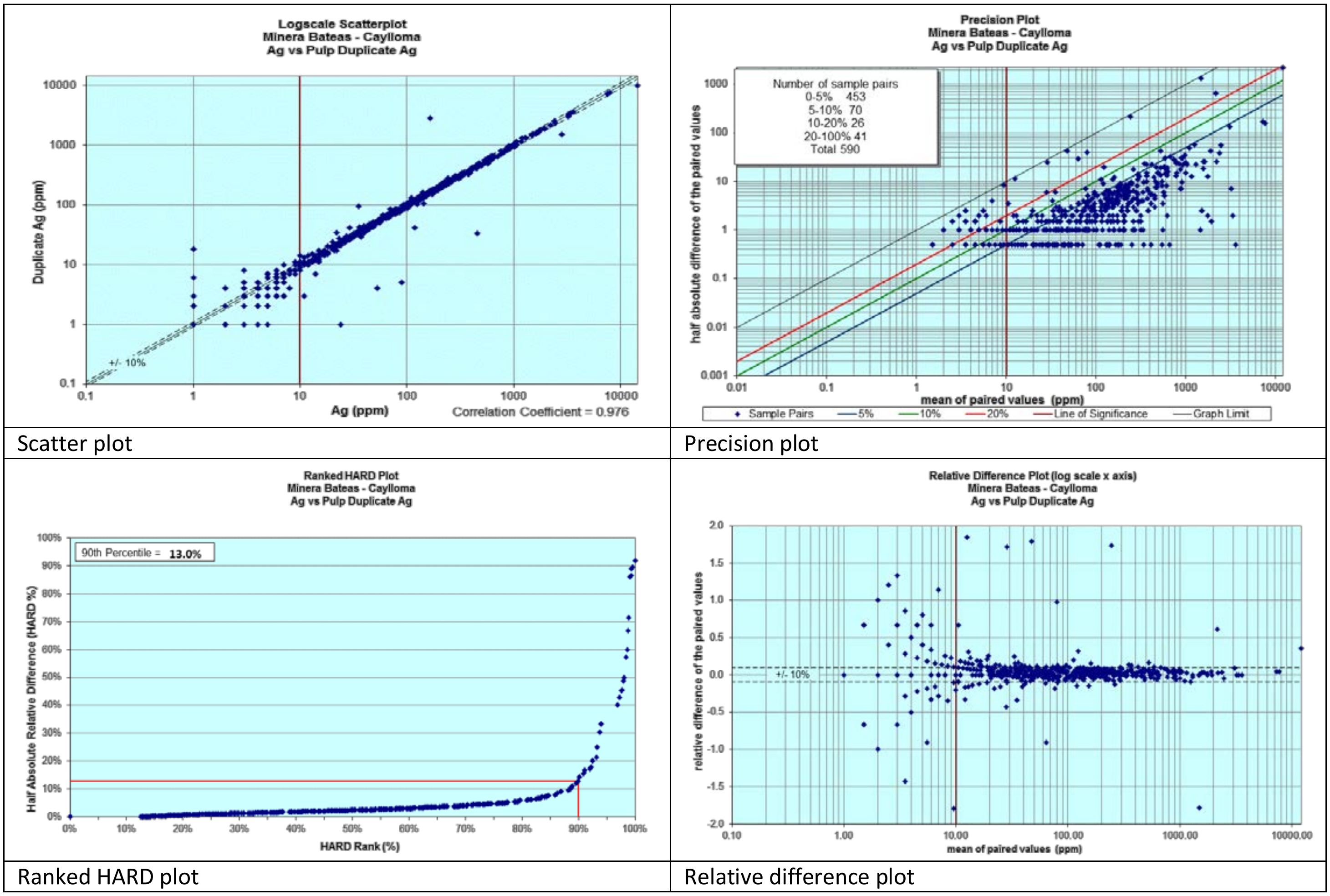
Zinc

Of the 603 duplicate samples submitted 602 samples have grades above the detection limit and are regarded as suitable for analysis. Duplicate zinc grades also display excellent levels of precision with 527 samples being within 5% of the original grade and 573 samples being within 10% of the original grade. The half absolute difference is 6.0% at the 90th percentile which is regarded as good for pulp duplicates.

Gold

Of the 603 duplicate samples submitted 580 samples have grades above the detection limit and are regarded as suitable for analysis. Duplicate gold grades display acceptable levels of precision with 257 samples being within 5% of the original grade and 408 samples being within 10% of the original grade. The half absolute relative difference is 22.1% at the 90th percentile which is regarded as acceptable for pulp duplicates of gold grades in epithermal style deposits.

Figure 11.4 Analysis of laboratory duplicates for silver grades



Blanks submitted with laboratory duplicates

The results of the blanks submitted with the laboratory duplicates indicate that occasional contamination maybe occurring at the umpire laboratory. Seven of the twelve blanks submitted returned slightly elevated silver grades with three samples being significantly elevated. One of these blanks also returned significantly elevated lead and zinc grades and is likely to have been mislabeled. These failures should be investigated and the batch re-analyzed if required.

Standards submitted with laboratory duplicates

Submitted certified standards submitted with the laboratory duplicates indicate the umpire laboratory has acceptable levels of accuracy for silver, lead, and zinc. However, there were failures with the laboratory reporting elevated gold grades for standard CDN-ME-2, CDN-ME-5, CDN-ME-6, and these should be investigated during routine analysis of the results. There are two few standards to draw meaningful conclusions to possible biases.

The lower precision levels are expected for the more variable gold and silver elements but are still within acceptable levels of precision for pulp duplicates in an epithermal style deposit. Gold grade duplicate results need to be carefully monitored throughout the year to ensure acceptable levels of precision are maintained with the half absolute relative difference at the 90th percentile preferentially not exceeding 20%. Levels of precision for lead and zinc grades are good. Analysis of standards and blanks for the umpire laboratory indicate acceptable levels of accuracy for silver, lead and zinc grades but some issues with the accuracy of gold grades. The results of the blanks submitted indicate that some silver contamination may be occurring at the umpire laboratory and this should be investigated.

11.4.4 Quality control measures employed by Compania Minera Arcata

It is understood from the technical reports submitted by CAM (CAM, 2005, CAM, 2006 and CAM, 2009) that CMA employed a comprehensive QAQC program that was reviewed and validated by the authors of these reports. Fortuna has not been able to review this information but believes the findings of this independent report are reliable.

The 2011 Mineral Resource estimation of Animas, Animas NE, Bateas, Bateas Techo, Silivia, Soledad, Santa Catalina, Patricia, and Pilar do not rely on any CMA information. However estimates of La Plata, Cimoide La Plata, Paralela, San Carlos, San Cristóbal, and San Pedro use drill hole and channel samples obtained by both CMA and Minera Bateas. Fortuna has been able to access the underground workings from where some of these samples were obtained to establish the reliability of the original results. Subsequently CMA drill hole and channel samples have been used in the estimation of these veins with the results from the 2010 estimate reported in this Technical Report for completeness.

11.4.5 Conclusions regarding quality control results

Analysis of standards and blanks for the Bateas laboratory indicate acceptable levels of accuracy for silver, lead, zinc, and gold grades. The results of the blanks submitted indicate that contamination or mislabeling of samples is not a material issue at the Bateas laboratory. Field, preparation and laboratory duplicates indicate acceptable levels of precision in the Bateas laboratory for silver, lead, zinc, and gold grades.

The high levels of accuracy and lack of contamination indicate that grades reported from the Bateas laboratory are suitable for Mineral Resource estimation.

Although Fortuna was unable to verify the accuracy and precision of the CMA channel data there is sufficient supporting information from underground workings to indicate the reported grades are reasonably reliable.

11.5 Opinion on adequacy of sample preparation, security, and analytical procedures

It is the opinion of Fortuna's Mineral Resource Manager Mr. Eric Chapman (P. Geo.) that the sample preparation, security, and analytical procedures have been conducted in accordance with acceptable industry standards and that assay results generated following these procedures are suitable for use in Mineral Resource and Mineral Reserve estimation.

12 Data verification

Minera Bateas mine site staff adhere to a stringent set of procedures for data storage and validation, performing verification of its data on a monthly basis. The operation employs a Database Manager who is responsible for data entry, verification and maintenance.

Data used for Mineral Resource estimation are stored in three databases. Minera Bateas information is stored in two of these databases, one stores data relating to the mine (including channel samples) and the other for storage of drilling results. Both databases are in a SQL Server format. A separate Microsoft Access database is used for the storage of recovered CMA information.

Data relating to drill hole and channel samples taken by CMA were collated in 2008 and 2009 through a careful data recovery process from historical documents and assay certificates. The database was fully validated by Fortuna in 2009 and 2010 during Mineral Resource estimation exercises. The database storing CMA information was not validated in 2011 based on the fact that no new information has been acquired since the previous validation in 2010.

A preliminary validation of the Minera Bateas databases was performed by Fortuna's Database Management team at the end of May 2011. The onsite databases have a series of automated import, export, and validation tools to minimize potential errors; however the preliminary validation identified and corrected the following discrepancies.

- Lack of standardization with capital and lower case letters.
- Density data with no corresponding lithology and occasionally no coordinates.
- Some channel and drill hole sample overlapping.
- Missing summary descriptions of drill hole (i.e. region).

After correcting all inconsistencies, the databases were accepted as validated on June 4, 2011.

Both databases were then reviewed and validated by Mr. Eric Chapman, P. Geo. The data verification procedure involved the following

- Inspection of selected drill core to assess the nature of the mineralization and to confirm geological descriptions.
- Inspection of geology and mineralization in underground workings of the Animas and Bateas veins.
- Verification that collar coordinates coincide with underground workings or the topographic surface.
- Verification that downhole survey bearing and inclination values display consistency.
- Evaluation of minimum and maximum grade values.
- Investigation of minimum and maximum sample lengths.

- Randomly selecting assay data from the databases and comparing the stored grades to the original assay certificates.
- Assessing for inconsistences in spelling or coding (typographic and case sensitivity errors).
- Ensuring full data entry and that a specific data type (collar, survey, lithology, and assay) is not missing.
- Assessing for sample gaps or overlaps.

A small number of inconsistences were noted generally relating to coding (i.e. geological codes entered in both upper and lower case) and were subsequently corrected.

Based on the data verification detailed above, Fortuna's Mineral Resource Manager Mr. Eric Chapman, P. Geo. considers the Minera Bateas and CMA data to be suitable for the estimation of classified Mineral Resources and Mineral Reserve.

13 Mineral processing and metallurgical testing

The Caylloma concentrator plant was purchased from CMA as part of the overall purchase of the Caylloma property. Major modifications have been made to the plant following the purchase of the property by Fortuna.

Numerous metallurgical tests have been conducted in the concentrator plant since Minera Bateas took o in order to optimize silver recovery.

The most important testwork performed by the Metallurgical Laboratory during the last two years is as follows:

1) Processing Plant evaluation.

   - Evaluation of rougher flotation banks bulk A and B to compare the work of X-chile impellers against picsa impellers (used to facilitate mixing between the ore and reagents). A total of four evaluations were conducted with the best recoveries obtained using X-chile drivers.
   - Testing and evaluation of double tailings classification circuit with hydrocyclones D15 and D4 in front of the dual circuit with hydrocyclone classification D15 and D10 showing balances of solids and water.
   - Performance of flash flotation.
   - Evaluating circuit grinding/classification of lead and zinc flotation.

2) Grading analysis of plant products (head grade, lead concentrate, zinc concentrate, and tailings).

1. Flotation metallurgical testing with ore plant and intermediate products.
2. Flotation reagent evaluation.
3. Flotation metallurgical testing with ore samples taken by geology department.

Based on the above testwork, metallurgical recoveries for silver, lead and zinc were 85.67%, 91.28% and 87.99% respectively for 2010 and 81.43%, 92.68% and 88.46% respectively for 2011.

14 Mineral Resource estimates

14.1 Introduction

The following chapter describes in detail the Mineral Resource estimation methodology of the veins warranting updating as of June 2011. These include the Animas, Animas NE, Bateas, Bateas Techo, Soledad, Silvia, Santa Catalina, La Plata, Cimoide La Plata, Patricia, and Pilar veins.

If no new information was obtained since the previous resource statement (Fortuna, 2011) the previous result was retained. Veins that did not require updating included San Carlos, Paralela, Ramal Paralela, San Cristóbal, and San Pedro. A summary of the estimation methodology used to estimate these veins has been included for completeness.

14.2 Disclosure

Mineral Resources were prepared by Fortuna under the technical supervision of Eric Chapman, M.Sc., P.Geo., C.Geol. (FGS), a Qualified Person as defined in National Instrument 43-101. Mr. Chapman is an employee of Fortuna.

Mineral Resources are reported as of December 31, 2011. A preliminary Mineral Resource update was conducted using all drilling and channel data available as of June 30, 2011. The Mineral Resource estimate was revised as of December 31, 2011 to deplete the estimate of ore extracted between July and December of 2011 and to adjust the geological model to take into account of any significant exploration drilling intercepts obtained over the same period.

Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

14.2.1 Known issues that materially affect Mineral Resources

Fortuna does not know of any issues that materially affect the Mineral Resource estimates. These conclusions are based on the following:

Environmental

Minera Bateas is in compliance with Environmental Regulations and Standards set in Peruvian Law and has complied with all laws, regulations, norms and standards at every stage of operation of the mine.

Permitting

Minera Bateas has represented that permits are in good standing.

Legal

Minera Bateas has represented that there are no outstanding legal issues; no legal action, and injunctions are pending against the Project.

Title

Minera Bateas has represented that the mineral and surface rights have secure title.

Taxation

No known issues.

Socio-economic

Minera Bateas has represented that the Project has strong local community support.

Marketing

No known issues.

Political

Minera Bateas believes that the current government is supportive of the Project.

Other relevant issues

No known issues.

Mining

Minera Bateas has been successfully operating a mining facility at Caylloma since 2006, which has included extraction from the Animas, Animas NE, Bateas, Soledad, Silvia, Santa Catalina veins. Underground mining has also been successfully performed (prior to the collapse in silver metal prices in the late 1990's and early 2000's) by Compania Minera Arcata including extraction of mineralized material from the San Cristóbal, Bateas, Santa Catalina, San Pedro, Paralela, and San Carlos veins.

Metallurgical

Minera Bateas presently successfully treats ore extracted from the Caylloma mine in the onsite processing plant to produce lead and zinc concentrates with gold and silver credits (Section 13).

Infrastructure

In May 2011, Fortuna submitted to the MEM, in Peru, the application for construction permit of the new tailings facility. Fortuna received notification on April 3, 2012 from the MEM outlining its observations on the construction permit of the new tailings facility and granting thirty days for a response. The principal observations were to surface title documentation for various parcels and minor technical observations. Fortuna has responded to all the observations and does not view them as material at this point. In parallel, a positive engineering study has been concluded to expand the holding capacity of the current tailings facility for an additional five months of operation. The project has a budget of US$0.5 million and will be concluded within three months. This expansion will provide for stand-by holding capacity for any contingency.

14.3 Assumptions, methods and parameters

The 2011 Mineral Resource estimates for veins requiring updating (Animas, Animas NE, Bateas, Soledad, Silvia, La Plata, Cimoide La Plata, and Santa Catalina) were prepared in the following steps:

- Data validation as performed by Fortuna
- Data preparation including importation to various software packages.
- Geological interpretation and modeling of mineralization domains
- Coding of drill hole and channel data within mineralized domains.
- Sample length compositing of both drill holes and channel samples.

- Analysis of extreme data values and application of top cuts.
- Exploratory data analysis of the key constituents – Ag, Au, Pb, Zn, and Density.
- Analysis of boundary conditions.
- Variogram analysis and modeling.
- Derivation of kriging plan.
- Kriging neighborhood analysis and creation of block models.
- Grade interpolation of Ag, Au, Pb, Zn, and sample length, assignment of density values.
- Validation of grade estimates against input sample data.
- Classification of estimates with respect to CIM guidelines.
- Assignment of a net smelter return (NSR) based on long term metal prices, metallurgical recoveries, smelting costs, commercial contracts, and average concentrate grades.
- Mineral Resource tabulation and reporting.

If no new information for a vein was available since the previous Mineral Resource estimation the grade values were not re-estimated. However the methodology and results were reviewed and updated metal prices and costs were applied to provide a current NSR value. This was the case for the San Carlos, Paralela, Ramal Paralela (a splay of the Paralela vein), San Cristóbal, and San Pedro veins.

14.4 Supplied data, data transformations and data validation

Minera Bateas information used in the 2011 estimation is sourced from two databases, one stores data relating to the mine (including channel samples) and the other for storage of drilling results. Both databases are in a SQL Server format. A separate Microsoft Access database is used for the storage of recovered CMA information.

The two databases storing the Minera Bateas channel and drill hole data have been used for the estimation of the Animas, Animas NE, Bateas, Bateas Techo, Silvia, Soledad, Santa Catalina, Patricia, and Pilar veins.

The database storing the historical CMA data has also been used for estimating the La Plata, and Cimoide La Plata veins. Additionally, veins that are reported but were not updated in the 2011 Mineral Resource estimate (Paralela, Ramal Paralela, San Carlos, San Cristóbal, and San Pedro) use CMA drill hole and channel data stored in this database.

Supplied data included all information available as of June 30, 2011 and was provided by Minera Bateas.

14.4.1 Data transformations

Data transformations of the supplied drill hole and channel information were not required.

14.4.2 Software

Mineral Resource estimates have relied on several software packages for undertaking modeling, statistical, geostatistical and grade interpolation activities. Wireframe modeling of the mineralized envelopes was performed in Leapfrog version 2.4. Data preparation, block modeling and grade interpolations were performed in Datamine Studio version 3.18.2751. Statistical and variographic analysis was performed in Supervisor version 7.

14.4.3 Data preparation

Collar, survey, lithology, and assay data exported from the drill hole database, mine (channels) database, and CMA database provided by Minera Bateas were imported into Datamine and used to build 3D representations of the drill holes and channels. Assay values at or below the detection limit were corrected to half the detection limit. The number of surface drill holes, underground drill holes and channels used in the Caylloma 2011 Mineral Resource estimate is shown in Table 14.1.

Table 14.1 Drill holes and channels used in the 2011 Mineral Resource estimate

Vein	Surface Drill holes		Underground Drill holes		Channels	
	Number	Meters	Number	Meters	Number	Meters
Animas	73	19,072	108	3,098	1,830	42,424
Animas NE					6,509	16,830
Silvia			28	2,644	1,017	1,627
Soledad	7	924	10	1,008	4,973	4,470
Santa Catalina	3	551	11	1,500	1,740	3,584
Bateas	12	4,712	32	2,036	3,604	2,455
Bateas Techo	10		3	838	190	117
Patricia	1	148	29	3,063	36	32
Pilar			16	1,755	21	25
La Plata*#	17	3,547	18	998	371	290
Cimoide La Plata*#					311	376
Paralela & Ramal Paralela*					623	936
San Carlos*					295	145
San Cristóbal*	2	883	17	1,676	3,833	7,818
San Pedro*			6	1,046	2,006	2,646
Total	**125**	**29,837**	**278**	**19,662**	**27,359**	**83,775**

* Includes CMA channel samples.

Drill holes intersect both La Plata and Cimoide La Plata veins.

14.4.4 Data Validation

An extensive data validation process was conducted by the Database Management and Mineral Resource groups of Fortuna prior to Mineral Resource estimation with a more detailed description of this process provided in Section 12.

Validation checks were also performed upon importation into Datamine mining software and included searches for overlaps or gaps in sample and geology intervals, inconsistent drill hole identifiers, and missing data. No significant discrepancies were identified.

14.5 Geological interpretation and Domaining

Caylloma is a low sulfidation epithermal style deposit, primarily consisting of sulfosalts and silver sulfides and base metal sulfides. Mineralization is associated with distinct veins characterized by Ag sulfosalts and base metal sulfides in a banded gangue of quartz, rhodonite and calcite. Host rocks adjacent to the veins are characterized by local illite, and widespread propylitic alteration.

Major vein systems recognized at the Caylloma property, all have a general northeast to southwest strike orientation and dipping predominantly to the southeast. Wall rocks are andesitic lavas, pyroclastics and volcaniclastics of the Tacaza volcanic group.

There are two different types of mineralization at Caylloma; the first is comprised of silver-rich veins with low concentrations of base metals. The second type of vein is polymetallic in nature with elevated silver, lead, zinc, copper, and gold grades.

Silver veins

- Bateas, Bateas Techo, La Plata, Cimoide La Plata, San Cristóbal, San Pedro, San Carlos, Paralela , and Ramal Paralela veins.

Polymetallic veins

- Animas, Animas NE, Santa Catalina, Soledad, Silvia, Pilar, and Patricia veins.

For the estimation of Animas, Animas NE, Bateas, Bateas Techo, Santa Catalina, Silvia, Soledad, La Plata, Cimoide La Plata, Patricia, and Pilar the mineralized envelopes were constructed by the Minera Bateas geological department based on the interpretation of the deposit geology and refined using the drill hole, channel and underground mapping information. The mineralized wireframes were modeled in Leapfrog based on channel and drill hole intersections that have an average combined (Ag, Au, Pb, and Zn) NSR value greater than US$30 (regarded as being potentially economically extractable). Prices used for determining the metal value were based on long term metal prices as reported by CAM (2011) and summarized in Table 14.2.

Table 14.2 Metal prices used to define mineralized envelopes

Metal	Price
Ag	26.59 US$/oz
Au	1279.31 US$/oz
Pb	0.96 US$/lb
Zn	0.92 US$/lb

Veins estimated in 2010 (Paralela, Ramal Paralela, San Carlos, San Pedro, and San Cristóbal) were not modeled using wireframes as those in 2011. Instead AutoCAD was used to generate 2D polygons representing the mineralized envelope into which were estimated grade and thickness characteristics as obtained from CMA channel and drill hole data.

14.6 Exploratory data analysis

14.6.1 Compositing of assay intervals

Compositing of sample lengths was undertaken so that the samples used in statistical analyses and estimations have similar support (i.e., length). Minera Bateas sample drill holes and channels at varying interval lengths depending on the length of intersected geological features and the true thickness of the vein structure. Sample lengths were examined for each vein and composited according to the most frequently sampled length interval (Table 14.3). The composited and raw sample data were compared to ensure no sample length loss or metal loss had occurred.

Table 14.3 Composite length by vein

Vein	Composite length (m)
Animas	2.5
Animas NE	2.5
Bateas	1
Bateas Techo	1
Silvia	1.5
Soledad	1
Santa Catalina	2
Patricia	1
Pilar	1
La Plata	1
Cimoide La Plata	1

The Datamine COMPDH downhole compositing process was used to composite the samples within the estimation domains (i.e. composites do not cross over the mineralized domain boundaries). The COMPDH parameter MODE was set to a value of 1 to allow adjusting of the composite length while keeping it as close as possible to the composite interval; this is done to minimize sample loss.

In the case of Parallel, San Carlos, San Cristóbal and San Pedro the total channel length was used as the composite, i.e. each channel is considered a composite and represents the vein thickness.

Due to the variable thickness of the veins it was noted that composite lengths were still variable with a high proportion being less than the composite length. In previous estimates this composite length variation has been successfully dealt with by weighting the estimate by the composite length. This methodology is further explained in Section 14.8.4.

14.6.2 Statistical analysis of composites

Exploratory data analysis was performed on composites identified in each geological vein (Table14.4). Statistical and graphical analysis (including histograms, probability plots, scatter plots) were investigated for each vein to assess if additional sub-domaining was required to achieve stationarity.

Table 14.4 Univariate statistics of undeclustered drill hole and channel composites by vein

Vein	Grade	Count	Minimum	Maximum	Mean	Variance	Std. Dev.
Animas	Ag (g/t)	19,311	0.5	12,327	**118.33**	86,492	294
	Au (g/t)	19,222	0.0005	168.36	**0.524**	8.07	2.84
	Pb (%)	19,311	0.006	39.76	**1.99**	5.75	2.4
	Zn (%)	19,311	0.001	31.13	**3.49**	9.56	3.09

Vein	Grade	Count	Minimum	Maximum	Mean	Variance	Std. Dev.
Animas NE	Ag (g/t)	6,636	0.5	5,493	**133.17**	24,861	157.67
	Au (g/t)	6,636	0.0005	164.26	**0.45**	8.039	2.84
	Pb (%)	6,636	0.006	44.56	**3.65**	16.2	4.02
	Zn (%)	6,636	0.006	29.69	**4.04**	9.028	3.005
Bateas	Ag (g/t)	2,904	2.0	31,294	**1,109.36**	240,891	2,059
	Au (g/t)	2,904	0.0005	19.05	**0.14**	0.43	0.66
	Pb (%)	2,904	0.002023	8.2	**0.92**	1.09	1.04
	Zn (%)	2,904	0.00934	12.59	**1.33**	2.24	1.5
Bateas Techo	Ag (g/t)	41	0.58	1514.10	**154.20**	79387.17	281.76
	Au (g/t)	41	0.0025	0.39	**0.07**	0.01	0.07
	Pb (%)	41	0.0018	0.53	**0.04**	0.01	0.08
	Zn (%)	41	0.0036	0.72	**0.05**	0.01	0.11
Silvia	Ag (g/t)	951	1.0	2,784	**92.77**	18,426	135.74
	Au (g/t)	951	0.006	62.6	**0.55**	7.49	2.73
	Pb (%)	951	0.014	23.39	**1.82**	5.95	2.44
	Zn (%)	951	0.0158	23.92	**2.63**	5.97	2.44
Soledad	Ag (g/t)	4,829	1.1	52,224	**535**	2,257,364	1,503
	Au (g/t)	4,829	0.00075	109.35	**2.5**	31.67	5.627
	Pb (%)	4,829	0.0018	29.9	**1.31**	3.75	1.936
	Zn (%)	4,829	0.0099	15.5	**1.6**	2.11	1.453
Santa Catalina	Ag (g/t)	1,876	0.5	2,043	**131.43**	25,480	160
	Au (g/t)	1,876	0.0005	86.66	**1.19**	17.31	4.16
	Pb (%)	1,876	0.003	29.65	**1.65**	4.4	2.1
	Zn (%)	1,876	0.0033	14.43	**2.37**	3.78	1.94
Patricia	Ag (g/t)	45	2.00	1948	**214.39**	115742.20	340.21
	Au (g/t)	45	0.03	6.63	**0.73**	2.11	1.45
	Pb (%)	45	0.01	1.08	**0.27**	0.07	0.27
	Zn (%)	45	0.02	1.88	**0.4**	0.19	0.43
Pilar	Ag (g/t)	46	0.50	897.13	**121.43**	28320.69	168.29
	Au (g/t)	46	0.03	44.10	**1.94**	40.55	6.37
	Pb (%)	46	0.01	4.14	**0.53**	0.67	0.82
	Zn (%)	46	0.01	7.19	**0.57**	1.25	1.12
La Plata	Ag (g/t)	434	1.51	14,183	**1,900.33**	6,921,021	2,631
	Au (g/t)	434	0.1	107.6	**2.69**	53.95	7.34
Cimoide La Plata	Ag (g/t)	368	1.32	22,144	**483.88**	2,494,364	1,579
	Au (g/t)	368	0.1	137	**2.35**	98.25	9.91
Paralela	Ag (g/t)	210	20.17	3900	**457.67**	363211	603
	Au (g/t)	210	0.1	2.84	**0.98**	0.54	0.73
San Carlos	Ag (g/t)	294	15.55	3,060	**396.24**	327,777	572.52
	Au (g/t)	106	0.1	21.3	**74.64**	4.79	2.19
San Cristóbal	Ag (g/t)	1,937	18.7	10,398	**268.12**	390125	624.60
	Au (g/t)	501	0.1	69.85	**0.79**	13.658	3.70
San Pedro	Ag (g/t)	752	9.95	4267	**611**	782,996	885
	Au (g/t)	298	0.1	151	**4.06**	144	11.98

14.6.3 Sub-domaining

Exploratory data analysis of the composites indicated the requirement to sub-domain the Bateas vein into three regions. Domain 1 comprises the westerly portion of the vein and is related to a high silver grade region. Domains 2 and 3 have similar grade characteristics but are displaced by a fault structure.

Mineralization in the Animas and Animas NE veins has been explored closer to the surface than any of the other veins. Through the investigation of the mineralogy and grade characteristics an oxide/sulfide horizon has been identified. Samples have been coded as oxide or sulfide for estimation purposes.

Internal waste was also identified as being present in the Animas/Animas NE vein and to a lesser degree in the Bateas vein. These areas of internal waste were sub-domained and samples identified within coded as waste for estimation purposes.

Sub-domaining was not required for any other veins.

14.6.4 Extreme value treatment

Top cuts of extreme grade values prevent over-estimation in domains due to disproportionately high grade samples. Whenever the domain contains an extreme grade value, this extreme grade will overly influence the estimated grade.

If the extreme values are supported by surrounding data, are a valid part of the sample population, and are not considered to pose a risk to estimation quality, then they can be left untreated. If the extreme values are not considered to be a valid part of the population (e.g., they belong in another domain or are simply erroneous), they should be removed from the domain's data set. If the extreme values are considered a valid part of the population but are considered to pose a risk for estimation quality (e.g., because they are poorly supported by neighboring values), they should be top cut. Top cutting is the practice of resetting all values above a certain threshold value to the threshold value.

Fortuna examined the grades of all metals to be estimated (Ag, Pb, Zn, and Au) to identify the presence and nature of extreme grade values. This was done by examining the sample histogram, log histogram, log-probability plot, and by examining the spatial location of extreme values. Top cut thresholds were determined by examination of the same statistical plots and by examination of the effect of top cuts on the mean, variance, and coefficient of variation (CV) of the sample data. Top cut thresholds used for each vein are shown in Table 14.5.

Table 14.5 Topcut thresholds by vein

Vein	Ag (g/t)	Au (g/t)	Pb (%)	Zn (%)
Animas	1,600	6	25	15
Animas NE	1,000	3	19	25
Bateas	13,000	1.2	10	6
Bateas Techo	13,000	1.2	10	6
Silvia	550	6	12	17
Soledad	7,500	40	10	16
Santa Catalina	1,500	15	11	13
Patricia	550	6	12	17
Pilar	550	6	12	17
La Plata	20,000	100	-	-

Vein	Ag (g/t)	Au (g/t)	Pb (%)	Zn (%)
Cimoide La Plata	10,000	60	-	-
Paralela	3,900	-	-	-
San Carlos	3,060	-	-	-
San Cristóbal	2,180	-	-	-
San Pedro	4,270	-	-	-

14.6.5 Boundary conditions

The boundary conditions at Caylloma are well established with underground workings identifying a sharp contact between the mineralized vein structure and the host rock in all veins. Subsequently domain boundaries were treated as hard boundaries. Only samples coded within a vein were used to estimate blocks within that vein, to prevent smearing of high grade samples in the vein into the low grade host rock, and vice versa.

The boundary conditions between oxide and sulfide material in the Animas/Animas NE veins is gradational in nature occurring over tens of meters. This boundary has been treated as a soft boundary with samples from either domain being used for estimation in the vein. This allows a gradational effect in the grade estimates.

14.6.6 Data declustering

Descriptive statistics of sample populations within a domain may be biased by clustering of sample data in particular areas of the domain. To reduce any bias caused by clustering of sample data, Fortuna declustered the input sample data using a grid system. Declustered data statistics are used when comparing estimated grade values and input sample grades during model validation.

14.6.7 Sample type comparison

A comparison between drill hole and channel sample types has not been conducted to-date. This is because the different sampling types do not have the same spatial coverage. Channel samples are clustered around historical and present day workings, whereas drilling is focused on exploring the periphery of the veins and is therefore generally located away from the workings.

The estimation predominately uses channel samples with drill hole samples generally only used to infer resources at the edge of the mineralized envelopes. Both samples types are required to provide a reasonable assessment of the deposit with reconciliation results supporting the usage of channels and drill holes.

14.7 Variogram analysis

14.7.1 Continuity analysis

Continuity analysis refers to the analysis of the spatial correlation of a grade value between sample pairs to determine the major axis of spatial continuity.

The grade distribution has a log-normal distribution therefore traditional experimental variograms tended to be poor in quality. To counteract this, data was transformed into a normal score distribution for continuity analysis.

Horizontal, across strike, and down dip continuity maps were examined (and their underlying variograms) for Ag, Au, Pb, and Zn to determine the directions of greatest and least continuity. As each vein has a distinct strike and dip direction analysis was only required to ascertain if a plunge direction was present.

Continuity analysis confirmed that some veins have insufficient data to allow variogram modeling, including the Bateas Techo, Patricia, Pilar, Paralela, San Carlos, San Cristóbal, and San Pedro veins. In the case of these veins inverse power of distance was used as an alternative estimation technique.

14.7.2 Variogram modeling

The next step is to model the variograms for the major, semi-major, and minor axes. This exercise creates a mathematical model of the spatial variance that can be used by the OK algorithm. The most important aspects of the variogram model are the nugget effect and the short range characteristics. These aspects have the most influence on the estimation of grade.

The nugget effect is the variance between sample pairs at the same location (zero distance). Nugget effect contains components of inherent variability, sampling error, and analytical error. A high nugget effect implies that there is a high degree of randomness in the sample grades (i.e., samples taken even at the same location can have very different grades). The best technique for determining the nugget effect is to examine the downhole variogram calculated with lags equal to the composite length.

After determining the nugget effect, the next step is to model Directional variograms were modeled for the three principal directions for Ag, Au, Pb, and Zn based on the directions chosen from the variogram fans. It was not always possible to produce a variogram for the minor axes, and in these cases the ranges for the minor axes were taken from the downhole variograms, which have a similar orientation (perpendicular to the vein) as the minor axes.

Modeled variograms were back transformed from normal score as grade estimation is conducted without data manipulation. Variogram parameters are detailed in Table 14.6.

Table 14.6 Variogram model parameters

Vein	Metal	Major axis orientation	C_0§	C_1§	Ranges (m)†	C_2§	Ranges (m)†	C_3§	Ranges (m)†
Animas	Ag	00° → 055°	0.43	0.25	18,17,4	0.3	40,50,7	0.14	800,250,999
	Au	00° → 055°	0.54	0.26	14,11.5,5	0.16	42,39.5,9	0.05	800,200,10
	Pb	00° → 055°	0.31	0.14	9.5,8,9	0.33	31,38,10	0.23	300,180,11
	Zn	00° → 055°	0.22	0.22	10,10,6	0.24	28.5,38,8	0.24	283,150,12
Animas NE	Ag	-14° → 079°	0.35	0.27	12,15,4	0.19	24,67,7	0.19	999,130,9
	Au	-14° → 079°	0.33	0.23	6,13,3	0.16	20,35,9	0.28	808,158,11
	Pb	-14° → 079°	0.22	0.36	11,10,5	0.31	38,66,6	0.11	191,322,7
	Zn	-14° → 079°	0.25	0.39	11,12,4	0.19	46,133,6	0.18	170,160,7
Bateas	Ag	00° → 060°	0.21	0.26	6,15,1	0.3	53,25,2	0.22	56,32,3
	Au	00° → 060°	0.43	0.26	8,7,1	0.14	13,16,2	0.17	30,50,3
	Pb	00° → 065°	0.18	0.23	5,18,1	0.3	27,26,2	0.3	30,30,3
	Zn	00° → 060°	0.19	0.17	11,13,1	0.3	32,28,2	0.34	33,50,3

Vein	Metal	Major axis orientation	C_0 §	C_1 §	Ranges (m)†	C_2 §	Ranges (m)†	C_3 §	Ranges (m)†
Silvia	Ag	00° → 085°	0.19	0.32	8,6,2	0.2	35,9.5,3	0.02	41,34,4
	Au	00° → 085°	0.52	0.24	4,5,2	0.09	8,25,3	0.09	150,40,4
	Pb	00° → 085°	0.23	0.38	9,7,1.5	0.16	21,8,2.5	0.16	37,21,3
	Zn	00° → 085°	0.25	0.28	7,6,2	0.24	33,11,3	0.24	34,21,4
Soledad	Ag	00° → 070°	0.46	0.21	9,10,1	0.23	24,24,8	0.09	300,25,1000
	Au	00° → 070°	0.39	0.2	5,10,3	0.19	18,18,5	0.22	100,200,6
	Pb	-85° → 247°	0.28	0.4	11,7.5,1	0.18	16,65,2	0.14	500,68,3
	Zn	00° → 065°	0.34	0.14	10,5,1	0.32	15,19,2	0.2	200,70,2
Santa Catalina	Ag	00° → 065°	0.41	0.23	8,7,1	0.22	38,49,1	0.15	999,51,15
	Au	00° → 065°	0.42	0.24	4.5,5,3	0.27	21,44,7	0.07	999,48,9
	Pb	00° → 065°	0.17	0.42	8,6,1	0.29	26,45,3	0.12	999,48,6
	Zn	00° → 065°	0.23	0.2	9,8,2	0.22	16,34,4	0.35	180,39,6
La Plata	Ag	00° → 065°	0.5	0.23	10,5,1	0.14	13,6,1	0.13	40,13,1
	Au	00° → 065°	0.44	0.38	10,20,1	0.11	15,23,1	0.07	24,24,2
Cimoide La Plata	Ag	00° → 060°	0.5	0.23	10,5,1	0.14	13,6,1	0.13	40,13,2
	Au	00° → 060°	0.44	0.38	10,20,1	0.11	15,23,1	0.07	24,24,2

Note: § variances have been normalised to a total of one; † ranges for major, semi-major, and minor axes, respectively; structures are modelled with a spherical model

14.8 Modeling and estimation

14.8.1 Block size selection

Block size was selected principally based on drill hole spacing, mineralized domain geometry, and the proposed mining method. Quantitative Kriging Neighborhood Analysis (QKNA) was also used to assess the optimum block size based on Kriging Efficiency (KE) and slope of regression (ZZ) in the veins where variogram models had been established (Animas, Animas NE, Bateas, Santa Catalina, Silvia, Soledad, and La Plata). Results were assessed from a centroid likely to be mined in the next 12 months.

The objective of QKNA is to determine the optimal combination of search neighborhood and block size that limits conditional bias and, subsequently provides the best possible estimation with the evaluable data (Vann et al, 2003).

The slope of regression is a measure of the regression between the theoretical actual and estimated values for blocks. The values should be from 0 to 1. Values close to one indicate low conditional bias.

Kriging efficiency indicates the degree of smoothing (averaging) in the estimation. Values close to 100% are not smoothed very much and values close to 0% are highly smoothed. Where the kriging efficiency is negative, the global mean is considered a better estimate of grade than the kriged estimate.

In conjunction with the QKNA process, the veins' geometry and the size of the equipment used in extraction are also considered. The narrow and undulating nature of the vein is a justification to subdivide the blocks into smaller subcells. This ensures the block model is volumetrically representative. The incremental block sizes selected for each vein are detailed in Table 14.7

14.8.2 Block model parameters

Vein structures are generally orientated in a northeast to southwest direction. Such an orientation can be problematic when filling the vein wireframes with blocks as these are orientated orthogonally which can result in large discrepancies in volumes. To counteract this each vein has been rotated so that the vein is orientated in an orthogonal direction (i.e. east to west) for block modeling. Splitting of the parent blocks was allowed to ensure a close fit to the wireframe, although estimation was applied to parent cells only (all sub-cells in a parent cell have the same grade).To ensure a successfully estimation the drill hole and channel composites were also rotated to coincide with the veins. Table 14.7 gives the block model parameters for the 2011 Caylloma Mineral Resource models with coordinates using the WGS84, UTM Zone 19S system.

Each vein has been block modeled separately with care taken to ensure that overlapping blocks do not exist. The Bateas vein was split into three parts based on the sub-domains detailed in Section 14.6.3. Additional to this each block in the vein has been coded using the field name "TIPO" as being either oxide (OX) sulfide (SR) or internal waste (RD). This code corresponds to that assigned to the sample data and has been used for estimation and reporting purposes.

The veins estimated in 2010 (Paralela, Ramal Paralela, San Carlos, San Pedro, and San Cristóbal) used an alternative methodology to that described above. The block models for these veins are two dimensional with blocks being rotated so that they are perpendicular to the vein (along strike and down dip) being 2 m by 2 m in size. Thickness and grade were then estimated into each block.

Table 14.7 Caylloma block model parameters

Vein	Rotation	Direction	Minimum	Maximum	Increment
Animas	53	X	193,176	194,465	8
		Y	8,317,005	8,318,135	2
		Z	4,369	4,939	8
Animas NE	72	X	194,386	195,136	4
		Y	8,317,699	8,318,650	2
		Z	4,419	4,823	4
Bateas	70	X	192,900	193,400	6
		Y	8,319,900	8,320,139	1
		Z	4,400	4,659	6
Bateas Techo	80	X	193,069	193,500	6
		Y	8,319,960	8,320,070	1
		Z	4,400	4,850	6
Silvia	85	X	194,300	194,800	8
		Y	8,320,210	8,320,309	1
		Z	4,551	4,913	6

Vein	Rotation	Direction	Minimum	Maximum	Increment
Soledad	73	X	194,300	195,101	8
		Y	8,320,235	8,320,542	1
		Z	4,610	4,899	6
Santa Catalina	67	X	194,455	194,805	5
		Y	8,320,495	8,320,655	1
		Z	4,640	4,775	5
Patricia	75	X	194,340	194,870	8
		Y	8,320,325	8,320,510	1
		Z	4,650	4,850	6
Pilar	75	X	194,300	194,710	8
		Y	8,320,150	8,320,325	1
		Z	4,600	4,965	6
La Plata	60	X	193,660	194,990	6
		Y	8,316,760	8,317,640	1
		Z	4,460	4,860	6
Cimoide La Plata	60	X	193,983	194,957	6
		Y	8,317,050	8,317,539	1
		Z	4,460	4,812	6

14.8.3 Sample search parameters

Quantitative kriging neighborhood analysis (QKNA) was undertaken on the Caylloma veins to determine the optimal search parameters for the Mineral Resource estimates. This study, which was consistent with Fortuna's experience with the deposit, showed that the best estimation results in terms of slope of regression, kriging efficiency, and kriging variance were obtained using the following search strategy:

- A search range of approximately 20 m to 30 m along strike and down dip and 2 m to 5 m across the vein.
- A minimum of 10 composites per estimate.
- A maximum of 20 composites per estimate.
- A maximum of 3 samples from a single channel or drill hole.

The search ellipsoid used to define the extents of the search neighborhood has the same orientation as the continuity directions observed in the variograms.

Distances used were designed to match the configuration of the drill hole data (i.e., areas of sparse drilling have larger ellipses than more densely drilled or sampled areas). This was achieved by using a dynamic search ellipsoid where a second search equal to two times the maximum variogram range and requiring a minimum of six composites was used wherever the first search did not encounter enough samples to perform an estimate; if enough samples were still not encountered, a third search equal to three times the maximum variogram range and requiring one composite was used. If the minimum number of samples required will still not encountered, no estimate was made.

14.8.4 Grade interpolation

Estimation of grades into blocks was performed using either ordinary kriging (OK) or inverse power of distance (Table 14.8) based on the success of generating a variogram model.

Table 14.8 Estimation method by vein

Vein	Block Model Type	Estimation Method
Animas	3D	Ordinary Kriging
Animas NE	3D	Ordinary Kriging
Bateas	3D	Ordinary Kriging
Bateas Techo	3D	Inverse Power of Distance (power=2)
Silvia	3D	Ordinary Kriging
Soledad	3D	Ordinary Kriging
Santa Catalina	3D	Ordinary Kriging
Patricia	3D	Inverse Power of Distance (power=2)
Pilar	3D	Inverse Power of Distance (power=2)
La Plata	3D	Ordinary Kriging
Cimoide La Plata	3D	Ordinary Kriging
Paralela	2D	Inverse Power of Distance (power=2)
San Carlos	2D	Inverse Power of Distance (power=2)
San Cristóbal	2D	Inverse Power of Distance (power=2)
San Pedro	2D	Inverse Power of Distance (power=2)

Parameters were derived from block size selection (Section 14.8.1), search neighborhood optimization (Section 14.8.3), and variogram modeling (Section 14.7.2). The sample data were composited (Section 14.6.1) and, where necessary, top cut (Section 14.6.4) prior to estimation.

The sample data and the blocks were categorized into mineralized domains for the estimation (Section 14.6.3). Each block is discretized (an array of points to ensure grade variability is represented within the block) into 4 points along strike by 4 points down dip by 2 points across strike and grade interpolated into parent cells (Datamine ESTIMA parameter PARENT=1).

Due to the variable lengths of the composites a weighting system has been employed to nullify this support issue when estimating into the 3D block models, which involves the following steps: -

1. Generation of a grade aggregate in the sample file by multiplying the grade of the composite by its length.
2. Estimation of the grade aggregate into the block model using the parameter files detailed above.
3. Estimation of the composite length into the block model by inverse distance weighting (power = 2) using the same search and estimation parameters as were used to estimate the grade aggregate.
4. Estimated aggregate grades are divided by the corresponding composite length estimate to provide the final grade.

This procedure was employed for the previous Mineral Resource estimates and reconciliation results indicated a positive result. The methodology has therefore been maintained for the 2011 Mineral Resource update.

Veins estimated in 2010 (Paralela, Ramal Paralela, San Carlos, San Pedro, and San Cristóbal) used inverse power of distance to estimate gold, silver and thickness attributes.

14.8.5 Density

There have been a total of 1,984 density measurements taken by Minera Bateas as of June 2011. Of these 1,947 were taken from underground and 37 from drill core. Density analysis was performed on each vein separately with ten samples regarded as the minimum to ensure representative statistics (Table 14.9). Extreme values that were thought not to be representative of the sample population were removed so as not to bias the results.

Due to the insufficient spatial coverage of density measurements estimation was regarded as being inappropriate. Subsequently each vein's mean density value has been applied to all blocks in that vein. The La Plata and Cimoide La Plata veins have insufficient density measurements for density determination. A density of 3.17t/m^3 was assigned to mineralized blocks in these veins as it was deemed that the most reliable density measurements were associated with the Animas vein.

A density of 3.36 t/m^3 was assigned to Patricia and Pilar as these veins have a similar mineralogy to Silvia. The Bateas Techo vein density was set at 3.06 t/m^3, the same as Bateas. Veins estimated in 2010 (San Pedro, San Carlos, Paralela, San Cristóbal) were assigned a density of 3.0 t/m^3, being the global average density for all veins in June 2010.

Table 14.9 Density statistics by vein

Vein	No. of samples	Mean (t/m^3)	Minimum	Maximum	Variance
Animas	1,190	**3.17**	2.46	3.92	0.1
Animas NE	267	**3.22**	2.59	3.95	0.08
Bateas	166	**3.06**	2.57	3.65	0.08
Silvia	82	**3.36**	2.6	4.19	0.12
Soledad	232	**3.08**	2.49	3.78	0.09
Santa Catalina	18	**3.19**	2.52	3.63	0.09

14.9 Model validation

The techniques for validation of the estimated tonnes and grades included visual inspection of the model and samples in plan, section, and in three-dimensions; cross-validation; global estimate validation through the comparison of declustered sample statistics with the average estimated grade per domain; and local estimate validation through the generation of slice validation plots.

14.9.1 Cross validation

In defining the modeled variograms, estimation and search neighborhoods there are a range of potential values that can be set. In order to optimize these values cross validation, or jack-knifing, was performed. This technique involves excluding a sample point and estimating a grade in its place using the remaining composites. This process is repeated for all the composites being used for estimation and the average estimated grade is compared to the actual average grade of the composites.

Using this methodology a variety of estimation techniques, search neighborhoods and variographic models were tested to establish the parameters that provided the most accurate result. Table 14.10 displays the estimated mean values for each element in each vein, as compared to the composite mean.

Table 14.10 Cross validation results

Vein	Ag (g/t)		Au (g/t)		Pb (%)		Zn (%)	
	Composite	Estimate	Composite	Estimate	Composite	Estimate	Composite	Estimate
Animas	108	108	0.40	0.40	1.96	1.97	3.49	3.50
Animas NE	131	131	0.36	0.36	3.63	3.65	3.67	3.68
Bateas	1,021	1,031	0.10	0.10	0.92	0.92	0.93	0.93
Silvia	88	89	0.41	0.41	1.81	1.83	1.82	1.83
Bateas Techo	142	118	0.07	0.07	0.03	0.03	0.04	0.04
Soledad	495	494	2.42	2.43	1.30	1.30	1.32	1.33
Santa Catalina	131	132	1.00	1.00	1.62	1.63	1.66	1.66
Patricia	153	162	0.56	0.56	0.37	0.38	0.52	0.54
Pilar	112	95	1.14	1.04	0.53	0.49	0.57	0.56
La Plata	2,346	2,350	3.63	3.59				
Cimoide La Plata	446	431	2.12	2.13				

Results of the cross validation confirmed that ordinary kriging is the best estimation method for all veins with the exception of Bateas Techo, Patricia and Pilar where inverse power of distance proved a superior estimation technique. Cross validation also assisted in the fine tuning of the variograms and search neighborhoods.

14.9.2 Global estimation validation

Global validation of the estimate involves comparing the mean ordinary kriged grade for each vein against the mean declustered grade generated using a nearest neighbor (NN) estimation approach. Analysis was performed by classification to ensure low confidence areas do not distort the results from higher confidence regions (Table 14.11, Table 14.12, and Table 14.13).

The results for blocks classified as Measured is good, with differences being generally less than 7% for the majority of veins with the exception of Silvia and La Plata. The reason for the large discrepancy in Silvia is due to the nearest neighbor using a small number of high grade samples in the estimate. It is believed that the OK estimate is more representative of the grades in this region. The reason for the large discrepancy between the OK and NN estimate for La Plata is related to the small tonnage the Measured Resource represents, just 4,200 t. The estimate is in a high grade region of the deposit and is regarded as reasonable for this area.

Table 14.11 Global validation statistics of Measured Resources at a zero cut-off grade (COG)

Vein	Ag (g/t)			Au (g/t)			Pb (%)			Zn (%)		
	OK-Ac	NN	Diff (%)	OK-Ac	NN	Diff (%)	OK-Ac	NN	Diff (%)	OK-Ac	NN	Diff (%)
Animas	105	109	3.8	0.35	0.35	0.0	1.53	1.52	-0.7	2.76	2.79	1.1
Animas NE	117	119	1.7	0.33	0.34	3.0	3.31	3.50	5.7	3.33	3.49	4.8
Bateas	662	659	-0.5	0.08	0.08	0.0	0.59	0.63	6.8	0.59	0.63	6.8
Silvia	88	100	13.6	0.36	0.48	33.3	1.76	2.02	14.8	1.79	2.03	13.4
Soledad	346	339	-2.0	1.70	1.81	6.5	1.32	1.26	-4.5	1.36	1.30	-4.4
Santa Catalina	110	109	-0.9	0.88	0.91	3.4	1.34	1.37	2.2	1.35	1.39	3.0
La Plata	3,204	3,266	1.9	5.02	2.96	-41.0						

Table 14.12 Global validation statistics of Indicated Resources at a zero COG

Vein	Ag (g/t)			Au (g/t)			Pb (%)			Zn (%)		
	OK-Ac	NN	Diff (%)	OK-Ac	NN	Diff (%)	OK-Ac	NN	Diff (%)	OK-Ac	NN	Diff (%)
Animas	105	103	-1.9	0.28	0.26	-7.1	0.94	0.90	-4.3	1.85	1.76	-4.9
Animas NE	82	80	-2.4	0.27	0.28	3.7	2.16	2.04	-5.6	2.13	2.06	-3.3
Bateas	341	257	-24.6	0.10	0.10	0.0	0.36	0.25	-30.6	0.33	0.26	-21.2
Bateas Techo*	240	261	-8.0	0.09	0.08	11.1	0.02	0.015	25.0	0.03	0.02	33.0
Silvia	64	60	-6.3	0.70	0.61	-12.9	1.08	1.00	-7.4	1.07	1.05	-1.9
Soledad	244	225	-7.8	1.12	1.23	9.8	0.90	0.83	-7.8	0.99	0.79	-20.2
Santa Catalina	56	59	5.4	0.33	0.30	-9.1	0.72	0.71	-1.4	0.73	0.72	-1.4
La Plata	1,535	1,044	-32.0	2.05	0.94	-54.1						
Cimoide La Plata	515	460	-10.7	2.67	2.49	-6.7						

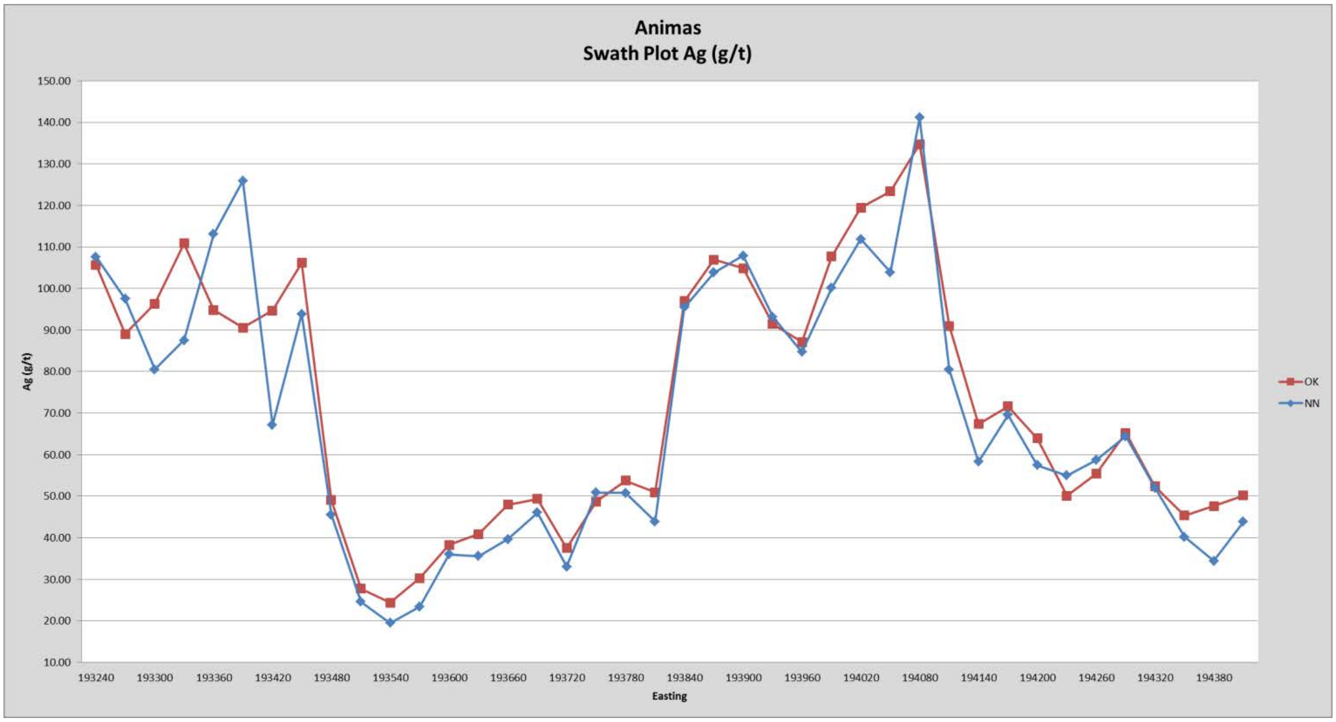
Table 14.13 Global validation statistics of Inferred Resources at a zero COG

Vein	Ag (g/t)			Au (g/t)			Pb (%)			Zn (%)		
	OK-Ac	NN	Diff (%)	OK-Ac	NN	Diff (%)	OK-Ac	NN	Diff (%)	OK-Ac	NN	Diff (%)
Animas	55	49	-10.9	0.20	0.16	-20.0	0.79	0.60	-24.1	1.65	1.33	-19.4
Animas NE	48	44	-8.3	0.13	0.19	46.2	1.19	1.07	-10.1	1.18	1.09	-7.6
Bateas	265	174	-34.3	0.10	0.15	50.0	0.30	0.21	-30.0	0.32	0.23	-28.1
Bateas Techo*	225	282	25.3	0.08	0.08	0.0	0.05	0.07	40.0	0.07	0.09	28.6
Silvia	43	32	-25.6	0.72	0.48	-33.3	0.69	0.51	-26.1	0.78	0.61	-21.8
Soledad	187	163	-12.8	0.58	1.26	117.2	0.15	0.41	173.3	0.24	0.45	87.5
Santa Catalina	31	37	19.4	0.16	0.14	-12.5	0.43	0.24	-44.2	0.40	0.24	-40.0
Patricia*	143	126	-11.9	0.49	0.39	-20.4	0.39	0.37	-5.1	0.56	0.52	-7.1
Pilar*	165	190	15.2	1.23	1.37	11.4	0.42	0.49	16.7	0.33	0.34	3.0
La Plata	168	166	-1.2	0.67	0.64	-4.5						
Cimoide La Plata	171	124	-27.5	1.31	1.01	-22.9						

14.9.3 Local estimation validation

Slice validation plots of estimated block grades and declustered input sample grades were generated for each of the veins by easting, northing, and elevation to validate the estimates on a local scale. Validation of the local estimates assesses each model to ensure over-smoothing or conditional bias is not being introduced by the estimation process and an acceptable level of grade variation is present. An example slice (or swath) plot for Animas is displayed in Figure 14.1.

Figure 14.1 Slice validation plot for Animas



The slice plots display a good continuity between the ordinary kriged estimates and declustered nearest neighbor estimates indicating that the kriging is not over-smoothing. Areas that do not have a good correlation, such as the far west of the Animas vein are related to areas where sample numbers are limited. Based on the above results it was concluded that ordinary kriging was a suitable interpolation method and provided reasonable global and local estimates of all economical metals.

14.9.4 Ore reconciliation

The ultimate validation of the block model is to compare actual grades to predicted grades using the established estimation parameters. Evaluation of the mineral in-situ from channel samples taken from June 2010 to July 2011 provided an estimation of the actual grades. In order to test the ability of the estimation process to predict grades in areas that channel sampling had yet to be performed all samples collected post June 2010 were filtered from the database and the estimation run using the remaining samples. The results of this evaluation are displayed in Table 14.14.

Table 14.14 Reconciliation of the Mineral Resource estimate against Mineral In-situ extracted between July 2010 and June2011

Vein	Mineral In Situ					Block Model					Error (%)				
	Tonnes	Ag (g/t)	Au (g/t)	Pb (%)	Zn (%)	Tonnes	Ag (g/t)	Au (g/t)	Pb (%)	Zn (%)	Tonnes	Ag	Au	Pb	Zn
Animas	226,056	201	0.44	1.56	2.66	211,307	175	0.37	1.33	2.41	**7**	**14**	**19**	**17**	**10**
Animas NE	177,341	167	0.50	4.21	4.25	160,844	161	0.50	4.03	4.04	**10**	**4**	**-1**	**5**	**5**
Bateas	9,358	887	0.13	0.94	0.94	8,474	875	0.13	0.88	0.87	**10**	**1**	**-2**	**6**	**8**
Silvia	8,126	95	0.39	1.99	2.00	9,988	88	0.37	1.80	1.84	**-19**	**4**	**7**	**6**	**7**
Total	598,223	190	0.47	3.13	3.57	551,457	176	0.44	2.91	3.33	**8**	**8**	**5**	**8**	**7**

Comparison of the total mineral in-situ extracted against the Mineral Resource indicates a reasonable estimate with a difference of less than 10% for tonnes and grades. It also should be noted that the estimate is conservative in its prediction of both tonnes and grade.

By examining the reconciliation for individual veins it is apparent that the greatest discrepancy occurs in the Animas vein. It is believed that there are two main reasons for the discrepancy in grades.

- Animas vein occasionally encounters high grade veinlets or pods that boost the grade of the mineral in-situ. It is not possible to predict the location of these high grade pods and therefore a more conservative background grade is applied through the kriging estimate.
- The operation mines according to short term metal prices different to those used in the long term Mineral Resource model.
- The operation is able to mine to a level of selectivity that the model is unable to represent.

In conclusion the ore reconciliation results indicate the estimation tends to be conservative in nature, reporting lower tonnes and grade than is generally encountered underground, but the error is within expected levels of tolerance for Measured or Indicated Resource reporting.

14.9.5 Mineral Resource depletion

All underground development and stopes are regularly surveyed using Total Station methods at Caylloma as a component of monitoring the underground workings. The survey information is imported into Datamine and used to generate 3D solids defining the extracted regions of the mine. Each wireframe is assigned a date corresponding to when the material was extracted providing Minera Bateas a detailed history of the progression of the mining since 2006.

The 3D solids are used to identify resource blocks that have been extracted and assign a code that corresponds to the date of extraction. Table 14.15 details the codes stored in the resource block model and the date ranges that they represent.

Blocks with a ZONE code of one or greater are excluded from the reported Mineral Resources.

Table 14.15 Depletion codes stored in the resource block model

ZONE	Description
0	Mineral In-situ (not extracted)
1	Mineral extracted prior to June 2010
2	Mineral extracted from July to December 2010
3	Mineral extracted from January to June 2011
4	Mineral extracted from July to December 2011

Removal of extracted material often results in remnant resource blocks being left in the model that will likely never be exploited. These represent inevitable components of mining such as pillars and sills, or lower grade peripheral material that was left behind. To take account of this, areas were identified by the mine planning department as being fully exploited, and any remnant blocks within these areas were identified in the block model using the code "RM = 1" and excluded from the reported Mineral Resources.

14.10 Resource classification

Resource confidence classification considers a number of aspects affecting confidence in the Resource estimation, such as:

- Geological continuity (including geological understanding and complexity)
- Data density and orientation
- Data accuracy and precision
- Grade continuity (including spatial continuity of mineralization)
- Estimation quality

14.10.1 Geological continuity

There is substantial geological information to support a good understanding of the geological continuity at the Caylloma property. Detailed surface mapping identifying vein structures are supported by extensive exploration drilling.

The Minera Bateas exploration geologists log drill core in detail including textural, alteration, structural, geotechnical, mineralization, and lithological properties, and continue to develop a good understanding of the geological controls on mineralization.

Understanding of the vein systems is greatly increased by the presence of extensive underground workings allowing detailed mapping of the geology. Underground observations have greatly increased the ability to accurately model the mineralization. The proximity of resources to underground workings has been taken into account during resource classification.

14.10.2 Data density and orientation

The estimation relies on two types of data, channel samples and drill holes. Minera Bateas has explored the Caylloma veins using a drilling pattern spaced roughly 50 m apart along strike. Each hole attempts to intercept the vein perpendicular to the strike of mineralization but this is rarely the case, with the intercept angle being between 70 to 90 degrees.

Exploration drilling data is supported by a wealth of underground information including channel samples taken at approximately 3 m intervals perpendicular to the strike of the mineralization. Geological confidence and estimation quality are closely related to data density and this is reflected in the classification of Resource confidence categories.

14.10.3 Data accuracy and precision

Classification of resource confidence is also influenced by the accuracy and precision of the available data. The accuracy and the precision of the data may be determined through QAQC programs and through an analysis of the methods used to measure the data.

Analysis of standards and blanks for the Bateas laboratory indicate acceptable levels of accuracy for silver, lead, zinc, and gold grades. The results of the blanks submitted indicate that contamination or mislabeling of samples is not a material issue at the Bateas laboratory. Preparation and laboratory duplicates indicate acceptable levels of precision in the Bateas laboratory for silver, lead, zinc, and gold grades.

The high levels of accuracy and lack of contamination indicate that grades reported from the Bateas laboratory are suitable for Mineral Resource estimation.

Although Fortuna were unable to verify the accuracy and precision of the CMA channel data there is sufficient supporting information from underground workings to indicate the reported grades are reasonably reliable.

14.10.4 Spatial grade continuity

Spatial grade continuity, as indicated by the variogram, is an important consideration when assigning Resource confidence classification. Variogram characteristics strongly influence estimation quality parameters such as kriging efficiency and regression slope.

The nugget effect and short range variance characteristics of the variogram are the most important measures of continuity. At the Caylloma deposits, the variogram nugget effect for Ag and Au is between 19% and 54% of the population variance, and for Pb and Zn is between 17% and 34%, with the exception of the La Plata and Cimoide La Plata which displays higher variability with the nugget being approximately 50% for all metals.

14.10.5 Estimation quality

Estimation quality is influenced by the variogram, the scale of the estimation, and the data configuration. Estimations of small volumes have poorer quality than estimations of large volumes. Measures such as kriging efficiency, kriging variance, and regression slope quantify the quality of local estimations.

Fortuna used the estimation quality measures to aid in assignment of Resource confidence classifications. The classification strategy has resulted in the expected progression from higher to lower quality estimates when going from Measured to Inferred Resources.

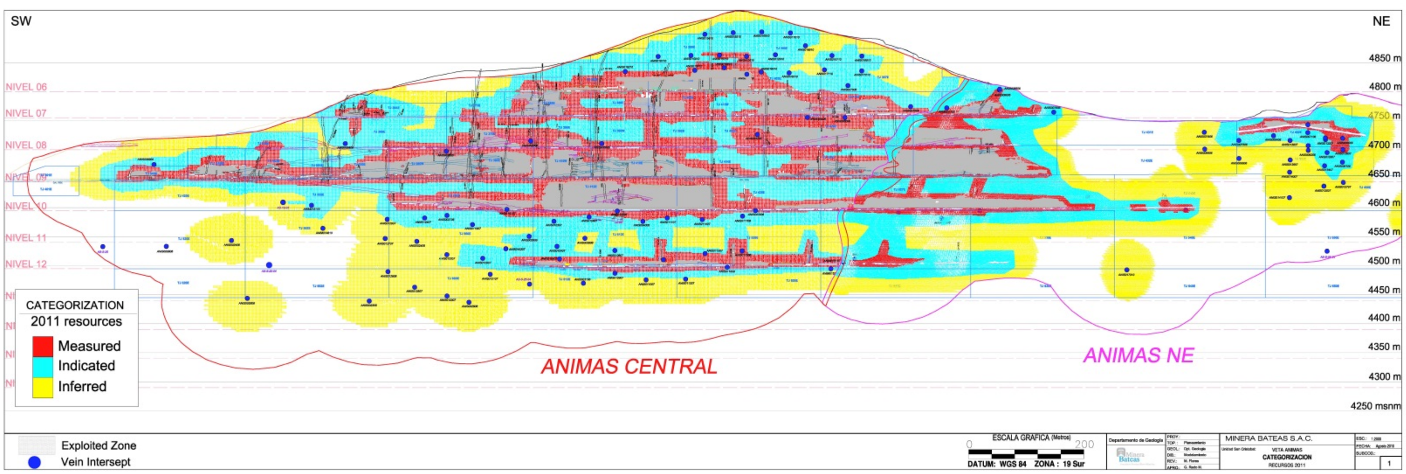
14.10.6 Classification

The Mineral Resource confidence classification of the Caylloma Mineral Resource models incorporated the confidence in the drill hole and channel data, the geological interpretation, geological continuity, data density and orientation, spatial grade continuity, and estimation quality. The Resource models were coded as Inferred, Indicated, and Measured in accordance with CIM standards. Classification was based on the following steps:

- Blocks estimated using primary search neighborhoods were considered for the Measured Resource category.
- Blocks estimated using secondary search neighborhoods were considered for the Indicated Resource category.
- Blocks estimated using tertiary search neighborhoods were considered as Inferred Resources.
- Kriging efficiency (KE) and regression slope (ZZ) values were assessed and the classification adjusted to take into account this information.
- Perimeter strings were digitized in Datamine and the block model coded as either CAT=1 (Measured), CAT=2 (Indicated) or CAT =3 (Inferred) based on the above steps.

The above criteria ensure a gradation in confidence with making it impossible that Inferred blocks are adjacent to Measured. It also ensures that blocks considered as Measured are informed from at least three sides, blocks considered as Indicated from two sides, and blocks considered as Inferred from one side. An example of a classified vein is provided in Figure 14.2.

Figure 14.2 Mineral Resource Classification for Animas vein



14.11 Mineral Resource reporting

A net smelter return (NSR) for each element was calculated to take into consideration the commercial terms for 2011, the average metallurgical recovery, average grade in concentrate and long term metal prices. In this way the value of all metals produced at the operation could be taken into account during Mineral Resource reporting

Metallurgical parameters and concentrate characteristics have been based on those reported from the concentrator plant in the first half of 2011.

Metal prices were defined using a three year trailing average at (60%) and the two year projection (40%) price evaluation as of May 31, 2011 (CAM, 2011).

The various parameters used to determine the NSR for each metal were reviewed by Mr. Edgard Vilela, with the methodology determined as being reasonable according to industry best practices. Details of the values for each parameter used in the NSR determination are displayed in Table 14.16.

Table 14.16 Parameters used in Net Smelter Return (NSR) estimation

ZINC and LEAD			
Item	**Unit**	**Zinc**	**Lead**
Concentrate			
Metal Price (a)	**US$/t**	**2,028**	**2,116**
Concentrate grade (b)	%	51.70	58.18
Deduction	%	85.00	95.00
Minimum deduction	%	8.00	3.00
Payable grade (e)	%	43.70	55.18
Payment per tonne (f)	**US$/t**	**886**	**1,168**
Smelting costs	US$/t	-192	-160
Escalator1	US$/t	0	0
Escalator2	US$/t	0	0
Escalator3	US$/t	9	0
Penalties	US$/t	-8	0
Total Charges (g)	**US$/t**	**-191**	**-160**
Concentrate value (h)	**US$/t**	**695**	**1,008**
Metallurgical recovery (i)	**%**	**88.0**	**93.0**
Value per percent (j)	**US$/%**	**11.83**	**16.11**
Note: f = (a x e)/100 h = (f – g) j = ((h x i)/(100 x b))			

GOLD and SILVER			
Item	**Unit**	**Silver**	**Gold**
Metal Price (a)	**US$/oz**	**26.59**	**1,279**
Deduction (b)	%	95.00	95.00
Refining Charges (c)	US$/oz	1.2	10.00
Value after Met. Recovery (d)	US$/oz	21.80	575.69
Payable metal (e)	US$/oz	20.71	546.91
Metallurgical recovery (f)	**%**	**82.0**	**45.0**
Value per ounce (g)	**US$/oz**	**19.78**	**542.63**
Value per gram (h)	**US$/g**	**0.64**	**17.45**
Note: d = (a x f) e = (d x b)/100 g = (e – ((c x b x f)/1000) h = 9/31.1035			

The cut-off grade (COG) used for reporting Mineral Resources is based on average operating costs for the operation in 2010 determined by Fortuna's finance department (Table 14.17).

Table 14.17 Costs used for cut-off grade determination

Area	Activity	US$/t
Mine	Hauling and loading	0.43
	Mine Power	0.29
	Preparation	3.05
	Filling	3.37
	Extraction	9.08
	Auxiliary services	1.53
	Support	1.54
	Transportation	1.78

Area	Activity	US$/t
Plant	Plant power	0.64
	Thickening	0.07
	Filtering	0.14
	Flotation	1.44
	Grinding	2.33
	General services	0.41
	crushing	1.22
General	Power	2.47
	Chemical laboratory	0.16
TOTAL		**29.94**

The COG used for reporting Mineral Resources has been rounded to US$30/t and all material with a NSR greater than this value is regarded as having the potential for economic extraction. The COG applied is the same as that used in previous Mineral Resource reporting.

Mineral Resource estimates are reported as of December 31, 2011. Tonnes and grades have been reported above a US$30/t cut-off grade. Oxide Mineral Resources (Table 14.18) have been reported separately from sulfide Mineral Resources (Table 14.19).

Table 14.18 Mineral Resources (Oxide) as of December 31, 2011

Category	Vein	Tonnes	Ag (g/t)	Au (g/t)	Pb (%)	Zn (%)
Measured Resources	Animas	161,400	158	0.30	1.06	1.46
	Animas NE	67,500	170	0.56	2.97	3.06
	Total	**228,900**	**162**	**0.38**	**1.62**	**1.93**
Indicated Resources	Animas	712,000	219	0.37	0.58	0.90
	Animas NE	136,100	141	0.52	2.18	2.17
	Total	**848,100**	**207**	**0.39**	**0.84**	**1.10**
Measured + Indicated Resources	**Total**	**1,077,000**	**197**	**0.39**	**1.00**	**1.28**
Inferred Resources	Animas	457,000	153	0.27	0.46	0.92
	Animas NE	87,000	92	0.28	1.02	1.04
	Total	**544,000**	**143**	**0.27**	**0.55**	**0.94**

Please see qualifying notes below sulfide table.

Table 14.19 Mineral Resources (Sulfide) as of December 31, 2011

Category	Vein Type	Vein	Tonnes	Ag (g/t)	Au (g/t)	Pb (%)	Zn (%)
Measured Resources	**Silver Veins**	Bateas	33,200	493	0.07	0.42	0.42
		La Plata	4,200	1,142	1.74	-	-
		Total	**37,300**	**565**	**0.25**	**0.37**	**0.37**
	Polymetallic Veins	Animas	1,170,000	77	0.31	1.35	2.57
		Animas NE	355,000	117	0.35	3.13	3.15
		Santa Catalina	17,800	91	0.61	1.11	1.13
		Soledad	47,100	270	1.43	0.84	0.81
		Silvia	10,600	81	0.36	1.37	1.41
		Total	**1,600,400**	**92**	**0.35**	**1.73**	**2.62**
Total Measured Resources			**1,637,900**	**103**	**0.35**	**1.69**	**2.57**
Indicated Resources	**Silver Veins**	Bateas	111,100	478	0.09	0.42	0.40
		Bateas Techo	9,300	240	0.09	0.02	0.03
		Cimoide La Plata	50,300	529	2.67	0.01	0.02
		La Plata	26,000	1,011	1.09	-	-
		Paralela	29,300	465	0.05	0.04	0.08
		San Carlos	19,700	305	0.02	0.01	0.04
		San Cristóbal	405,200	325	0.12	0.03	0.04
		San Pedro	64,100	534	1.60	0.00	0.00
		Total	**715,100**	**411**	**0.46**	**0.09**	**0.09**
	Polymetallic Veins	Animas	1,857,600	81	0.31	1.09	2.32
		Animas NE	942,500	87	0.27	2.58	2.54
		Santa Catalina	77,700	77	0.47	0.98	0.97
		Soledad	99,100	208	1.13	1.22	1.32
		Silvia	49,300	72	0.72	1.19	1.23
		Total	**3,026,200**	**89**	**0.34**	**1.62**	**2.41**
Total Indicated Resources			**3,741,200**	**149**	**0.36**	**1.28**	**1.88**
Total Measured + Indicated Resources			**5,379,100**	**135**	**0.36**	**1.41**	**2.09**
Inferred Resources	**Silver Veins**	Bateas	111,000	271	0.09	0.33	0.34
		Bateas Techo	33,000	261	0.09	0.06	0.09
		Cimoide La Plata	185,000	205	1.51	0.04	0.11
		La Plata	181,000	239	0.92	0.08	0.37
		Paralela	19,000	330	0.05	0.73	0.96
		Ramal Paralela	5,000	1,595	0.45	2.16	5.01
		San Carlos	13,000	216	0.01	0.07	0.23
		San Cristóbal	43,000	166	0.08	0.54	0.38
		San Pedro	17,000	533	0.19	0.93	1.89
		Total	**608,000**	**253**	**0.77**	**0.21**	**0.37**
	Polymetallic Veins	Animas	1,087,000	43	0.19	1.36	2.6
		Animas NE	705,000	54	0.15	1.61	1.59
		Santa Catalina	54,000	55	0.28	0.75	0.75
		Soledad	115,000	269	0.82	0.39	0.5
		Silvia	78,000	64	0.94	1.03	0.86
		Patricia	32,000	171	0.58	0.28	0.43
		Pilar	36,000	175	1.35	0.47	0.40
		Total	**2,107,000**	**64**	**0.27**	**1.33**	**1.97**
Total Inferred Resources			**2,714,000**	**106**	**0.38**	**1.08**	**1.61**

Notes on Mineral Resources

- Mineral Resources are as defined by CIM Definition Standards on Mineral Resources and Mineral Reserves 2010.
- Mineral Resources and Mineral Reserves are estimated as of June 30, 2011 and reported as of December 31, 2011 taking into account production-related depletion for the period of July 1, 2011 through December 31, 2011.
- Mineral Resources are inclusive of Mineral Reserves.
- Mineral Resources which are not Mineral Reserves do not have demonstrated economic viability.
- The estimate of Mineral Resources may be materially affected by environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues.
- Resources are reported above a NSR cut-off grade of US$30/t.
- Metal prices used in the NSR evaluation are US$26.59/oz for silver, US$1,279.31/oz for gold, US$2,116/t for lead and US$2,028/t for zinc.
- Metallurgical recovery values used in the NSR evaluation are 82% for silver, 45% for gold, 93% for lead, and 88% for zinc.
- Oxide material is not amenable to processing in the existing plant; subsequently metallurgical recoveries for oxide material could be significantly lower than those stated above.
- Point metal values (taking into account metal price, concentrate recovery, smelter cost, metallurgical recovery) used for NSR evaluation are US$0.64/g for silver, US$17.45/g for gold, US$16.11/% for lead, and US$11.83/% for zinc.
- The quantity and grade of the Inferred Resources reported in this estimation are conceptual in nature, and it is uncertain if further exploration will result in upgrading of the Inferred Resources to Indicated or Measured Resources.
- Measured and Indicated Resource tonnes are rounded to the nearest hundred, and Inferred Resource tonnes are rounded to the nearest thousand.
- Totals may not add due to rounding.

14.11.1 Comparison to previous estimates

The press release by Fortuna in April 12, 2011 details the Mineral Reserves and Mineral Resources of Caylloma as of June 30, 2010. The June 2010 Mineral Resource estimate is summarized in Table 14.20 and Table 14.21 being inclusive of Mineral Reserves. Mineral Resources are based on estimated NSR values using 2010 long term metal prices of US$16.63/oz Ag, US$1066.68/oz Au, US$1984/t Pb and US$1962/t Zn; historic metallurgical recovery rates of 87% for Ag, 43% for Au, 91% for Pb and 89% for Zn; and historic operating costs adjusted for inflation. Mineral Resources are reported above an NSR cut-off grade of US$30/t.

Table 14.20 Summary of Mineral Resources (Oxide) reported as of June 30, 2010

Category	Tonnes	Ag (g/t)	Au (g/t)	Pb (%)	Zn (%)
Measured	172,700	141	0.38	1.63	2.02
Indicated	658,300	216	0.38	0.97	1.11
Measured + Indicated	**831,000**	**200**	**0.38**	**1.10**	**1.30**
Inferred	**678,000**	**176**	**0.30**	**0.50**	**0.91**

Table 14.21 Summary of Mineral Resources (Sulfide) reported as of June 30, 2010

Category	Tonnes	Ag (g/t)	Au (g/t)	Pb (%)	Zn (%)
Measured	2,113,150	169	0.35	1.57	2.43
Indicated	3,000,800	131	0.39	1.64	2.53
Measured + Indicated	**5,113,950**	**147**	**0.37**	**1.61**	**2.49**
Inferred	**2,655,000**	**105**	**0.37**	**1.19**	**2.31**

Measured and Indicated Resource tonnes have increased from 831,000 t to 1,077,000 t for oxide and from 5,113,950 t to 5,379,100 t for sulfide whereas as silver grades have decreased by approximately 5%. The primary reasons for these changes are:

- Depletion of material extracted from June 30, 2010 to December 31, 2011.
- Upgrading of Inferred to Indicated and Indicated to Measured Resources through new underground developments.
- Change in long term metal prices allowing lower grade material that was previously below the cut-off grade to be incorporated into the Mineral Resources.

15 Mineral Reserve estimates

The following chapter describes in detail the Mineral Reserves estimation methodology based on the Mineral Resources updating as of June 2011. Mineral Reserves are reported as of December 2011 and take into account depletion that has taken place through production between July 1st and December 31st, 2011.

Mineral Resources have been reported in three categories, Measured, Indicated, and Inferred. The Mineral Reserve estimate has considered only Measured and Indicated Mineral Resources as only these categories have sufficient geological confidence to be considered Mineral Reserves (CIM, 2010). Measured Resources may become Proven Reserves and Indicated Resources may become Probable Reserves.

15.1 Mineral Reserve methodology

The Mineral Reserve estimation procedure for Minera Bateas is defined as follows:

- Review of Mineral Resources.
- Identification of accessible Mineral Resources using current mining practices.
- Removal of inaccessible areas and material identified as oxide as presently the concentrator plant cannot treat oxidized mineral.
- Removal of Inferred Resources.
- Dilution of tonnages and grades for each vein based on a dilution factor determined from the operational history of each vein.
- After obtaining the resources with diluted tonnages and grades, the value per tonne of each block is determined based on metal prices and metallurgical recoveries for each metal.
- A break even cut-off grade (BECOG) is determined for each vein based on operational costs of production, processing, administration, commercial, and general administrative costs. If the net smelter return (NSR) of a block is higher than the break even cut-off grade (BECOG), the block is considered a part of the Mineral Reserve.

Each vein has a different operating cost; therefore, Mineral Reserve evaluation was performed for each individual vein.

15.2 Mineral Resource handover

The Mineral Resource reported by the Mineral Resource Group (Tables 14.18 and 14.19) are comprised of Measured, Indicated and Inferred categories.

Upon receipt of the block model a review was conducted to confirm the Mineral Resource was reported correctly and to validate the various fields in the model.

For estimating Mineral Reserves, only Measured and Indicated Resources that are sulfides and considered accessible have been considered. Table 15.1 shows the total of Measured and Indicated Resources that were considered for conversion into Mineral Reserves.

Table 15.1 Measured and Indicated Resources considered for Mineral Reserves

Category	Vein	Tonnes	Ag (g/t)	Au (g/t)	Pb (%)	Zn (%)
Measured Resources	Animas	1,170,000	77	0.31	1.35	2.57
	Animas NE	355,000	117	0.35	3.13	3.15
	Santa Catalina	17,800	91	0.61	1.11	1.13
	Soledad	47,100	270	1.43	0.84	0.81
	Silvia	10,600	81	0.36	1.37	1.41
	Bateas	33,200	493	0.07	0.42	0.42
	La Plata	4,200	1,142	1.74	-	-
	Total	**1,637,900**	**103**	**0.35**	**1.69**	**2.57**
Indicated Resources	Animas	1,857,600	81	0.31	1.09	2.32
	Animas NE	942,500	87	0.27	2.58	2.54
	Santa Catalina	77,700	77	0.47	0.98	0.97
	Soledad	99,100	208	1.13	1.22	1.32
	Silvia	49,300	72	0.72	1.19	1.23
	Bateas	111,100	478	0.09	0.42	0.40
	Cimoide La Plata	50,300	529	2.67	0.01	0.02
	La Plata	26,000	1,011	1.09	-	-
	Paralela	29,300	465	0.05	0.04	0.08
	San Carlos	19,700	305	0.02	0.01	0.04
	San Cristóbal	405,200	325	0.12	0.03	0.04
	San Pedro	64,100	534	1.60	0.00	0.00
	Total	**3,741,200**	**149**	**0.36**	**1.28**	**1.88**
Measured +Indicated Resources	**TOTAL**	**5,379,100**	**135**	**0.36**	**1.41**	**2.09**

This is the total of Mineral Resources to which dilution factors were applied for the estimation of Mineral Reserves.

15.3 Dilution factor calculation

The dilution factor applied to each vein has been calculated based on historical reports from 2010 and 2011. The dilution factor considers geometric dilution, loading and haulage dilution.

Geometric dilution is measured in meters and is calculated using the height of exploitation (hc), inclination of the mineralized structure (dip) and the contouring factor (FC) with the application of the following formula:

$$hc * \cos(dip)$$

For the Animas vein, the formula for Geometric dilution has the following variation:

$$hc * \cos(dip) * (1-FC).$$

FC being a contouring factor in the range of <0,1> related to how similar (in geometry) the final workings are in relation to the hanging and footwall of the vein. For Animas, the FC is 90% based on the results observed at the operation.

Blasting dilution is measured in lineal meters and its application is given perpendicular to the vein and accounts for overbreak of waste that occurs in the hangingwall and footwall during blasting.

Loading and haulage dilution depends on the type of loading equipment and is measured as the percentage of waste that is taken in respect to ore during loading. There are three loading scenarios encountered at the Caylloma operation that dictate the percentage of loading dilution to be applied:

1. Loading and haulage dilution = 3.85% if the vein is over 3.5 m wide and loading is by scoop tram.
2. Loading haulage dilution = 2.78% if the vein is over 2 m and under 3.5 m wide and loading is by scraper.
3. Loading haulage dilution = 2.70% if the vein is less than 2 m wide and loading is by scraper.

Based on the above the total dilution applied is as follows:

Total dilution (DT) = D3 + (D1 + D2) / (Vein width + D1 + D2) x 100

Where:

D1 = Geometric dilution.

D2 = Blasting dilution.

D3 = Haulage dilution.

Based on this dilution factor, diluted tonnages and grades were calculated as follows:

Diluted tonnage (TD) = Initial tonnage (TI) / (1 –Total dilution (DT))

Diluted grade (LD) = Initial grade (LI) x Initial tonnage (TI) / Diluted tonnage (TD)

Based on these formulae, the dilution factor was calculated for each vein included in the Measured and Indicated Resources. The results are shown in Table 15.2.

Table 15.2 Dilution Factors by vein

Vein	Dilution Factor (%)
Animas	15.32
Animas NE	10.43
Bateas	33.13
Silvia	18.17
Soledad	31.58
Cimoide La Plata	31.47
La Plata	29.90
Santa Catalina	22.82
Paralela	37.07
San Carlos	51.72
San Cristóbal	18.58
San Pedro	24.00

15.4 Prices, metallurgical recovery and NSR values

Metal prices, metallurgical recoveries and the application of a net smelter return (NSR) are performed as a component of the Mineral Resource estimation and are detailed in Section 14.11.

15.5 Operating costs

The breakeven cut-off grades (BECOG) were determined for each vein based on all variable and fixed costs applicable to the operation. These include exploitation and treatment costs, general expenses and administrative and commercialization costs (including concentrate transportation). As operations are not centralized, each vein has a different operating cost, mainly due to transportation (mine to plant), support, and power consumption. Cut-off grades are in US dollars per tonne so as to match the estimated NSR of each block. BECOG used for Mineral Reserve estimation are detailed in Table 15.3.

Table 15.3 Breakeven cut-off grade applied to each vein

Vein	BECOG (US$/t)
Animas	52.73
Animas NE	52.73
Bateas	151.60
Silvia	56.66
Soledad	88.42
Cimoide La Plata	52.73
La Plata	52.73
Santa Catalina	56.66
Paralela	88.42
San Carlos	80.60
San Cristóbal	55.20
San Pedro	80.60

The operating costs and therefore the BECOG have changed significantly for the Bateas vein in 2011 with respect to previous years (approximately 80 US$/t). The primary reason for this sharp increase in costs is a change in exploitation methodology. Prior to 2011, the Bateas vein was exploited using conventional methodology; in 2011 the system changed to semi-mechanized mining and required the development of larger ramps and passes to accommodate the mechanized machinery. As a consequence of these changes, extraction costs and the related BECOG have risen sharply.

Operating costs are regarded as reasonable for an operation of this size and are similar to those experienced in 2010 (with the exception of Bateas as described above). Investments to optimize the ore extraction system in 2011 (preparation of main ore passes and main level extraction) should result in lower extraction costs for all veins in 2012, especially Animas and Bateas.

15.6 Mineral Reserves

Blocks whose NSR values are higher than the operating cost (BECOG) have been reported within the Mineral Reserve inventory. Table 15.4 shows Mineral Reserves estimated as of December 31, 2011. Measured Resources have been converted to

Proven Reserves and Indicated Resources have been converted to Probable Reserves. There are no mining, metallurgical, economic, legal, environmental, social or governmental issues that would result in Measured Resources being classified as Probable Reserves. Mineral Resources exclusive of Mineral Reserves as of December 31, 2011 are reported in Table 15.5.

Table 15.4 Mineral Reserves as of December 31, 2011

Category	Vein	Tonnes	NSR (US$/t)	Ag (g/t)	Au (g/t)	Pb (%)	Zn (%)	Width m
Proven	Animas	981,100	99	73	0.27	1.26	2.33	4.73
	Animas NE	270,700	161	110	0.32	3.04	3.06	6.96
	Santa Catalina	3,400	129	116	1.25	1.19	1.19	2.67
	Soledad	55,600	171	214	1.03	0.60	0.57	1.41
	Silvia	7,300	94	78	0.38	1.34	1.39	3.69
	Bateas	21,900	413	628	0.04	0.38	0.38	1.37
	La Plata	4,200	662	993	1.50	0.00	0.00	1.74
	Total	**1,344,200**	**121**	**98**	**0.32**	**1.57**	**2.35**	**4.97**
Probable	Animas	1,546,200	101	82	0.30	1.07	2.22	5.08
	Animas NE	834,800	131	85	0.25	2.63	2.58	6.20
	Santa Catalina	27,500	101	93	0.71	1.05	1.06	2.11
	Soledad	100,600	155	172	0.86	1.05	1.11	1.38
	Silvia	33,700	88	68	0.61	1.20	1.26	3.97
	Bateas	97,500	316	477	0.08	0.34	0.31	1.36
	Cimoide La Plata	67,500	284	389	1.98	0.01	0.01	1.89
	La Plata	27,500	584	884	0.97	0.09	0.00	1.54
	Paralela	41,700	211	327	0.04	0.03	0.05	1.68
	San Carlos	10,600	192	297	0.02	0.02	0.07	1.16
	San Cristóbal	424,600	195	300	0.11	0.03	0.04	2.38
	San Pedro	85,100	276	398	1.21	0.00	0.00	1.80
	Total	**3,297,400**	**143**	**150**	**0.34**	**1.23**	**1.76**	**4.52**
Total Proven + Probable Reserves		**4,641,600**	**137**	**135**	**0.33**	**1.33**	**1.93**	**4.65**

Notes

- Mineral Reserves and Mineral Resources are as defined by CIM Definition Standards on Mineral Resources and Mineral Reserves.
- Reserves are reported above a NSR breakeven cut-off grade of US$52.73/t for Animas, Animas NE, Cimoide La Plata, and La Plata; US$151.60/t for Bateas; US$88.42/t for Soledad, and Paralela; US$56.66/t for Santa Catalina, and Silvia; US$80.60/t for San Carlos and San Pedro; and US$55.20/t for San Cristóbal.
- Metal prices used in the NSR evaluation are US$26.59/oz for silver, US$1,279.31/oz for gold, US$2,116/t for lead and US$2,028/t for zinc.
- Metallurgical recovery values used in the NSR evaluation are 82% for silver, 45% for gold, 93% for lead, and 88% for zinc.
- Point metal values (take into account metal price, concentrate recovery, smelter cost, metallurgical recovery) used for NSR valuation are US$19.78/oz for silver, US$542.63/oz for gold, US$16.11/% for lead, and US$11.83/% for zinc.
- Milling and administrative costs were estimated based on 2011 actual costs.
- Proven Reserve tonnes are rounded to the nearest hundred, Probable Reserve tonnes are rounded to the nearest hundred.
- Totals may not add due to rounding.

Table 15.5 Mineral Resources exclusive of Mineral Reserves as of December 31, 2011

Category	Vein	Tonnes	NSR (US$/t)	Ag (g/t)	Au (g/t)	Pb (%)	Zn (%)	Width m
Measured	Animas	424,400	97	90	0.27	0.91	1.68	3.65
	Animas NE	101,700	166	137	0.46	2.48	2.55	3.72
	Santa Catalina	15,100	89	81	0.43	1.04	1.06	1.68
	Soledad	9,700	91	86	1.01	0.65	0.69	0.86
	Silvia	3,800	76	63	0.25	1.11	1.12	1.53
	Bateas	18,800	96	136	0.07	0.29	0.29	0.78
	La Plata	400	76	117	0.05	0	0	0.65
	Total	**573,900**	**109**	**100**	**0.31**	**1.17**	**1.75**	**3.45**
Indicated	Animas	1,167,300	123	148	0.3	0.61	1.14	3.16
	Animas NE	294,500	183	155	0.58	2.64	2.67	3.17
	Santa Catalina	60,300	67	63	0.28	0.78	0.77	1.64
	Soledad	23,100	103	107	0.85	0.61	0.78	0.73
	Silvia	15,700	72	53	0.76	0.9	0.89	1.65
	Bateas	43,700	103	147	0.06	0.3	0.3	0.77
	Cimoide La Plata	3,900	57	86	0.11	0	0	0.95
	La Plata	3,800	64	99	0.03	0	0	0.75
	Paralela	100	210	327	0	0	0	0.40
	San Carlos	13,100	140	219	0.01	0	0	0.51
	San Cristóbal	56,100	47	72	0.01	0.01	0.01	1.86
	San Pedro	2,300	95	148	0	0	0	1.01
	Total	**1,684,000**	**128**	**131**	**0.30**	**0.74**	**1.11**	**2.92**
Total Measured + Indicated Resources		**2,257,900**	**113**	**123**	**0.30**	**0.85**	**1.28**	**3.06**
Inferred	Animas	1,544,000	94	75	0.21	1.09	2.10	0.07
	Animas NE	792,000	83	58	0.16	1.54	1.53	0.06
	Santa Catalina	54,000	61	55	0.28	0.75	0.75	0.17
	Soledad	115,000	199	269	0.82	0.39	0.50	0.12
	Silvia	78,000	85	64	0.94	1.03	0.86	0.28
	Bateas	111,000	184	271	0.09	0.33	0.34	0.17
	Bateas Techo	33,000	170	261	0.09	0.06	0.09	0.07
	Cimoide La Plata	185,000	160	205	1.51	0.04	0.11	0.02
	La Plata	181,000	174	239	0.92	0.08	0.37	0.04
	Paralela	19,000	235	330	0.05	0.73	0.96	0.15
	Ramal Paralela	5,000	1,123	1,595	0.45	2.16	5.01	0.63
	San Carlos	13,000	142	216	0.01	0.07	0.23	0.01
	San Cristóbal	43,000	121	166	0.08	0.54	0.38	0.38
	San Pedro	17,000	382	533	0.19	0.93	1.89	0.20
	Pilar	36,000	148	175	1.35	0.47	0.40	0.06
	Patricia	32,000	129	171	0.58	0.28	0.43	0.05
Total Inferred Resources		**3,258,000**	**112**	**112**	**0.36**	**0.99**	**1.50**	**0.08**

Note:

- Mineral Reserves and Mineral Resources are as defined by CIM Definition Standards on Mineral Resources and Mineral Reserves.
- Mineral Resources are exclusive of Mineral Reserves.
- Mineral Resources which are not Mineral Reserves do not have demonstrated economic viability.

- Mineral Resources are reported above a NSR cut-off grade of US$30/t.
- Measured and Indicated Resource tonnes are rounded to the nearest hundred, and Inferred Resource tonnes are rounded to the nearest thousand.
- The estimate of Mineral Resources may be materially affected by environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues.
- The quantity and grade of the Inferred Resources reported in this estimation are conceptual in nature, and it is uncertain if further exploration will result in upgrading of the Inferred Resources to Indicated or Measured Resources.
- Mineral Resources include oxide material that is not amenable to processing in the existing plant. Measured and Indicated Oxide Resources are estimated at 1,077,000 tonnes averaging 197 g/t Ag, 0.39 g/t Au, 1.00 % Pb, 1.28 % Zn. Inferred Oxide Resources are estimated at 544,000 tonnes averaging 143 g/t Ag, 0.27 g/t Au, 0.55 % Pb, 0.94 % Zn.
- Totals may not add due to rounding.

16 Mining methods

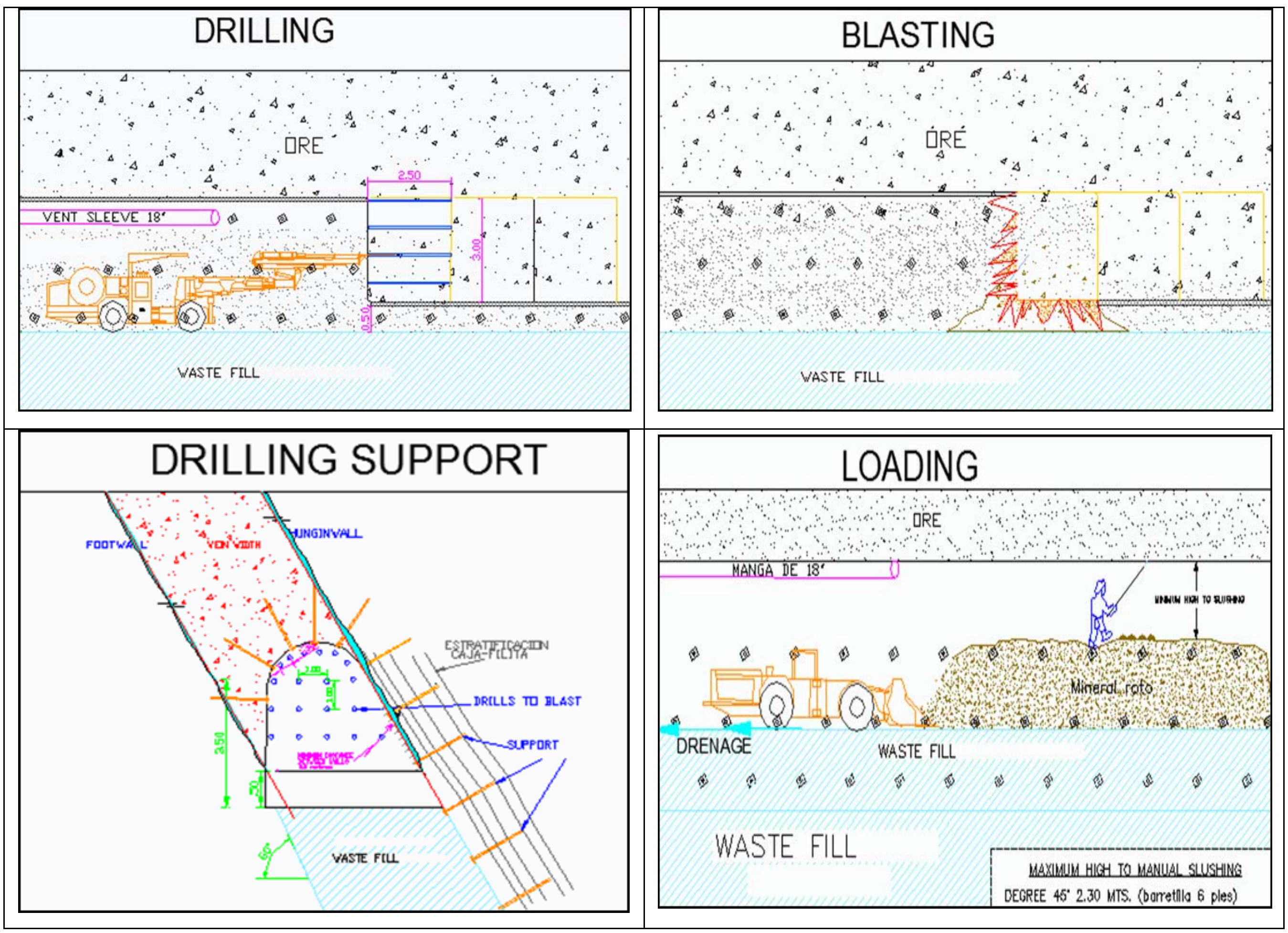
The mining method applied in the exploitation of the three main veins (Animas, Bateas, and Soledad) is overhand cut and fill using either a mechanized, semi-mechanized or conventional extraction methods. All mining is undertaken in a southwest to northeast direction following the strike of the veins. Production capacity at the mine is approximately 1,300 tpd.

16.1 Mechanized mining

Mechanized mining utilizes a Jumbo drill rig and scoop tram for loading. The ore haulage is made with trucks with support applied through rock bolts and shotcrete. The average mining width ranges between 3.5 m and 17 m. Mechanized mining is regarded as only being suitable in the Animas vein based on the geological structure and geotechnical studies (Section 16.4). This results in 90% of production coming from the Animas vein.

The mechanized mining sequence is demonstrated in Figure 16.1 and includes: drilling (with a Jumbo drill rig), blasting, support, loading (with a scoop tram) and haulage.

Figure 16.1 Mechanized Mining Sequence

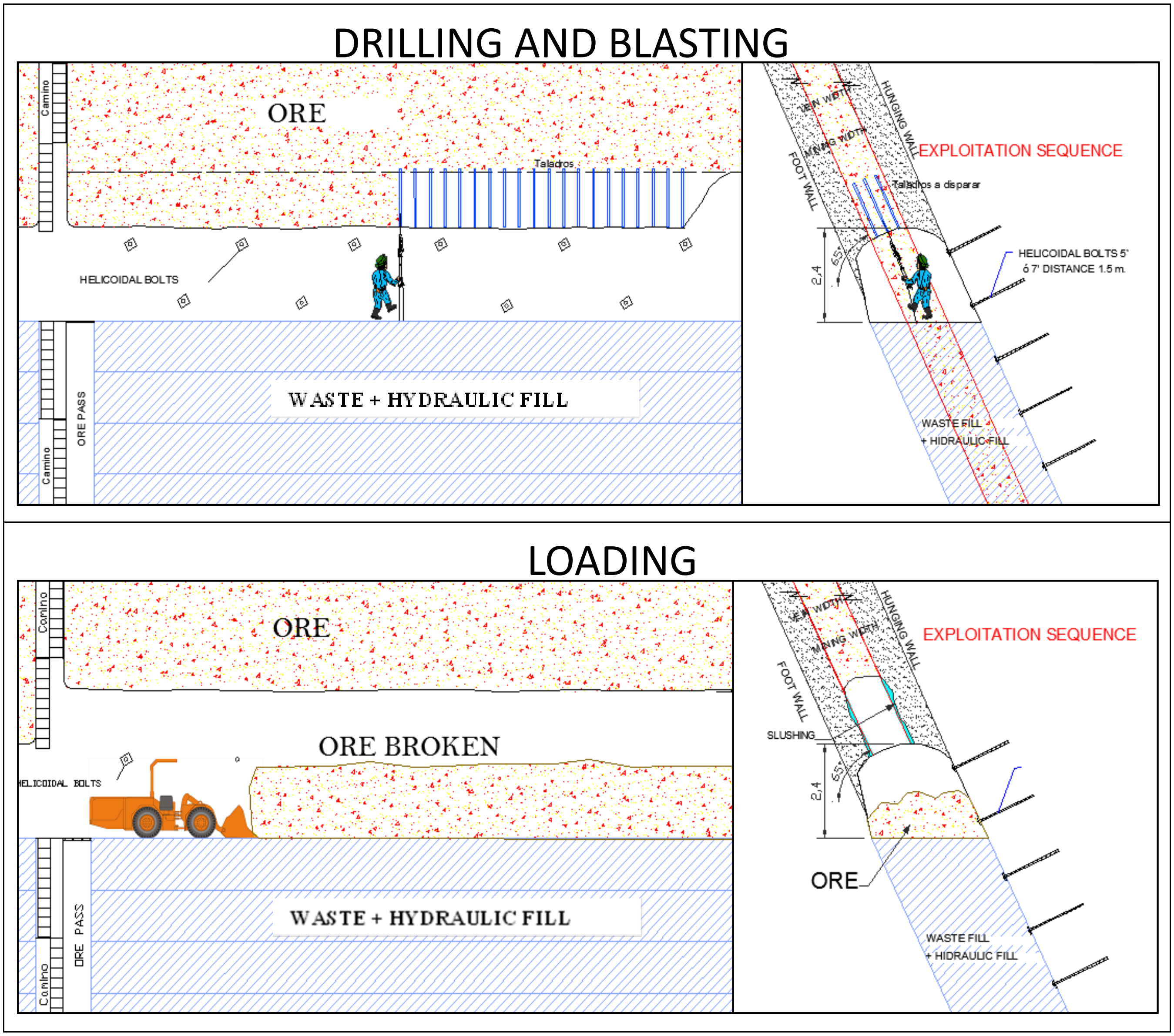


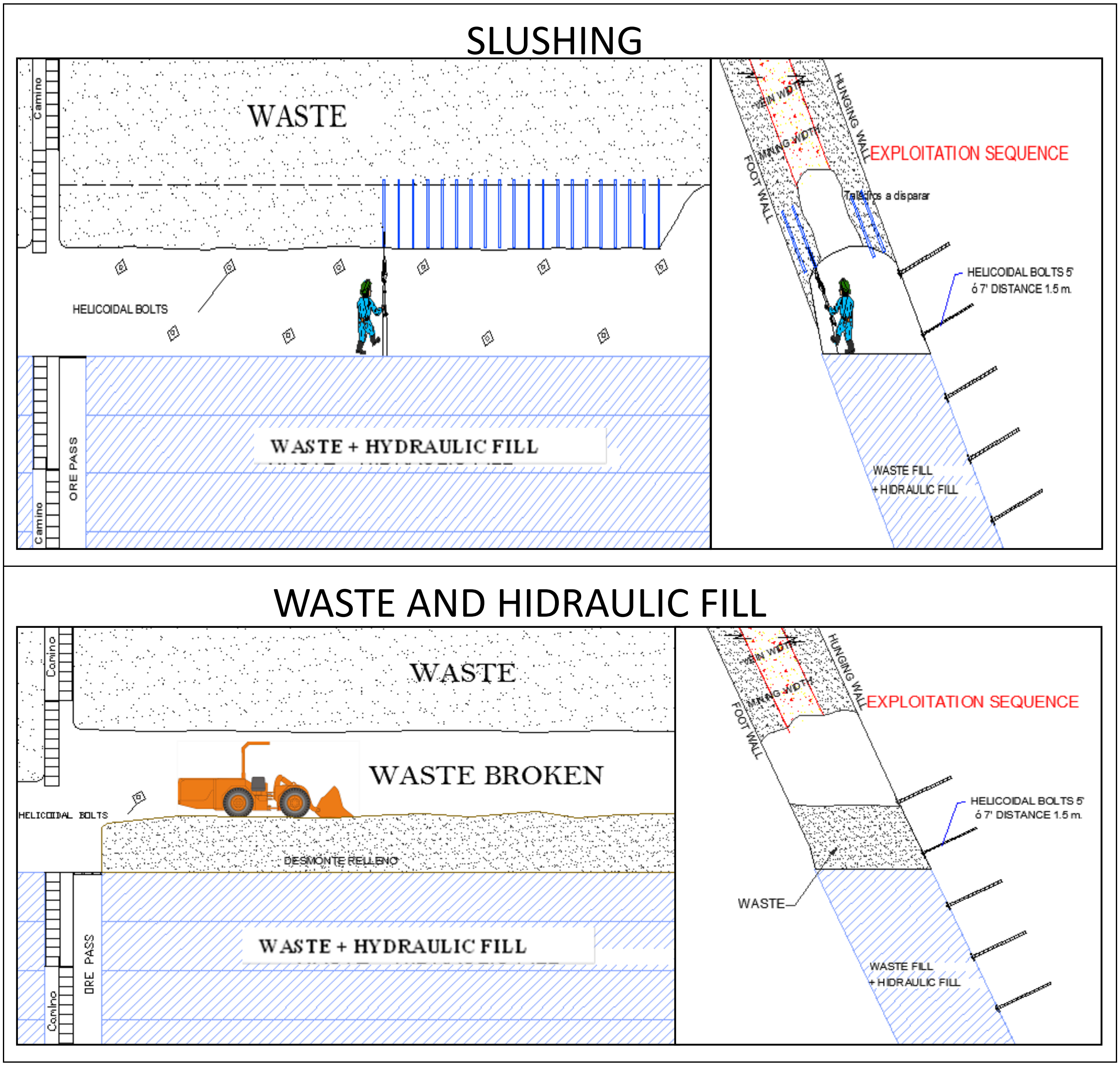
16.2 Semi-mechanized mining

Semi-mechanized mining is performed using handheld drilling equipment (jacklegs) and micro scoops (0.75 cubic yards) for loading. Ore haulage is via train and rail system as well as truck. Support is supplied through rock bolts in manual form. This method of mining is applied in narrow veins with average widths between 0.8 m and 2.0 m.

The semi-mechanized mining sequence is shown in Figure 16.2 and involves: drilling (with jacklegs), blasting, support, loading (via a scoop tram with a 0.75 cubic yard shovel) and haulage. Bateas, Silvia, and Soledad veins are presently worked by semi-mechanized mining methodologies.

Figure 16.2 Semi mechanized mining sequence





16.3 Conventional mining

Conventional mining is performed using handheld drilling equipment (jacklegs) and scrapers for loading. The ore haulage is done with trains and rail system and the support is applied with rock bolts in manual form. This system is applied in narrow veins with average widths between 0.5 m and 0.8 m. Only the Bateas Vein (Level 13) is presently mined using conventional mining methods.

16.4 Mining infrastructure

The exploitation infrastructure required to service mechanized mining is similar to that used to service semi-mechanized mining. This includes a center ramp connecting to sub level development running parallel to the vein. A cross cut from the sub level is developed to intersect perpendicular to the vein and allow exploitation. Each cross cut allows the exploitation of a 150 m long stope by mechanized mining or a 90 m long stope by semi-mechanized mining. Additionally development may include chimneys used for ventilation, service systems or as ore passes adjacent to stopes.

Conventional mining requires less development. A center chimney is sunk into the vein to allow access for exploitation and extraction, giving access to a 60 m long stope (30 m each side of the chimney). Two additional chimneys allow for access, ventilation and services.

16.5 Geotechnical, hydrological and other parameters relevant to mine designs

The Geotechnical department of Minera Bateas continuously undertakes geotechnical evaluation through the classification of rock mass using RQD, RMR and Q systems. Results of the geotechnical evaluations for the different veins indicate the quality of the rock mass ranges from regular to good which is consistent with the behavior observed underground and allows openings with dimensions of up to 20 m wide, 6 m high, and 50 m long in the Animas vein.

The average indexes of rock mass for the mine (Animas, Bateas and Soledad veins) are: RQD 60%, RMR 42 to 75 and Q 0.8 to 31. Based on these values the mining method of overhand cut and fill (with hydraulic and waste fill) is regarded as the most suitable. It is possible that a bulk mining method, such as sub level stopping, could be applied however the dip of the Animas vein (43° average), which is responsible for 90% of production, would make this more difficult.

16.6 Production Rates, Mine Life, Dimensions and Dilution Factors

At the beginning of 2011, the mine production rate was 1,250 tpd. For the last three months of the year, the production rate increased to 1,300 tpd.

Mineral Reserves are estimated as 4.6 million tonnes, which is sufficient for a 10 year life of mine considering 353 days in the year for production. Expectation is for an average annual production of 1.9 million of ounces of silver based on a 160 g/t Ag head grade. Achieving the projected life of mine relies on the expectation that the Mineral Resources will be expanded through exploration as the present Mineral Reserves have an average head grade of 133 g/t Ag which would require the depletion of higher grade material to achieve the expected head grade.

Dilution factors are estimated to be approximately 12% in veins such as Animas. In narrow veins, such as Bateas, Silvia and Soledad, dilution can be up to 25%. This can be reduced by using suitable equipment (scoop trams and micro scoop trams) and better blasting control.

16.7 Requirements for underground development and backfilling

The mine plan includes a program for mine development. This development can be divided into three types: development, preparation and mine exploration. In order to produce 1,300 tpd, approximately 1,000 m of new development is required each month. Development includes the main infrastructure of the mine (ore passes, ramps, bypasses, ventilation shafts); preparation consists of all workings for exploitation purposes (sub levels, galleries, access, short shafts, ramps); and mine exploration is to assist with the exploration of the deposits.

Fill required by the mine to complete the mining sequence is provided by waste fill and hydraulic fill. Waste fill is generated by underground development and preparation however the quantity produced is generally insufficient to provide the mine with the total required fill. To supplement the waste fill, hydraulic fill is produced by a small plant on the surface. The proportion of waste fill and hydraulic fill is 60% and 40% respectively. The total volume of fill that will be required by the mine is estimated to be 13,000 m^3 per annum.

16.8 Required Mining Fleet and Machinery

The mining fleet consists of:

- Seven Trucks of 15 m^3.
- Two Mining trucks (dumper) of 10 m^3.
- Five scooptrams with 4.2 cubic yard shovel.
- Two scooptrams with 2.2 cubic yard shovel.
- Two scooptrams with 0.75 cubic yard shovel.
- Two scooptrams with 3.5 cubic yard shovel.
- Four Jumbos electric hydraulic.
- Three electric trains (trolley).
- Two battery trains.

Minera Bateas employs contractors to undertake mining at the operation. Canchanya Ingenieros Contratistas (CIS) operate in the Animas vein and Topacio operate in the Bateas, Silvia, Soledad and San Cristóbal veins. All equipment is provided and maintained by the contractors.

17 Recovery methods

The Bateas processing plant is a typical operation and consists of five stages: crushing; milling; flotation; thickening and filtering; tailing disposal. Each of the main stages is comprised of multiple sub-stages. A summary of each stage is as follows:

- Crushing: includes three stages, primary, secondary, and tertiary.
- Milling: includes two stages, primary and secondary.
- Flotation: consists of two flotation circuits: Lead – Silver flotation circuit and Zinc flotation circuit.
- Thickening and filtering is performed separately for all the concentrates, which after filtering undergo a drying process before being placed in their respective storage bins to await transportation.
- Tailings disposal from the flotation and filtering circuits are routed via a tank prior to being pumped into a cyclone. The underflow from the cyclone is deposited onto a concrete pad and transported to the mine to be used as hydraulic fill. The overflow is sent to a metallic tank before being pumped to the tailing dumps. The current tailings disposal facility is located near the plant.

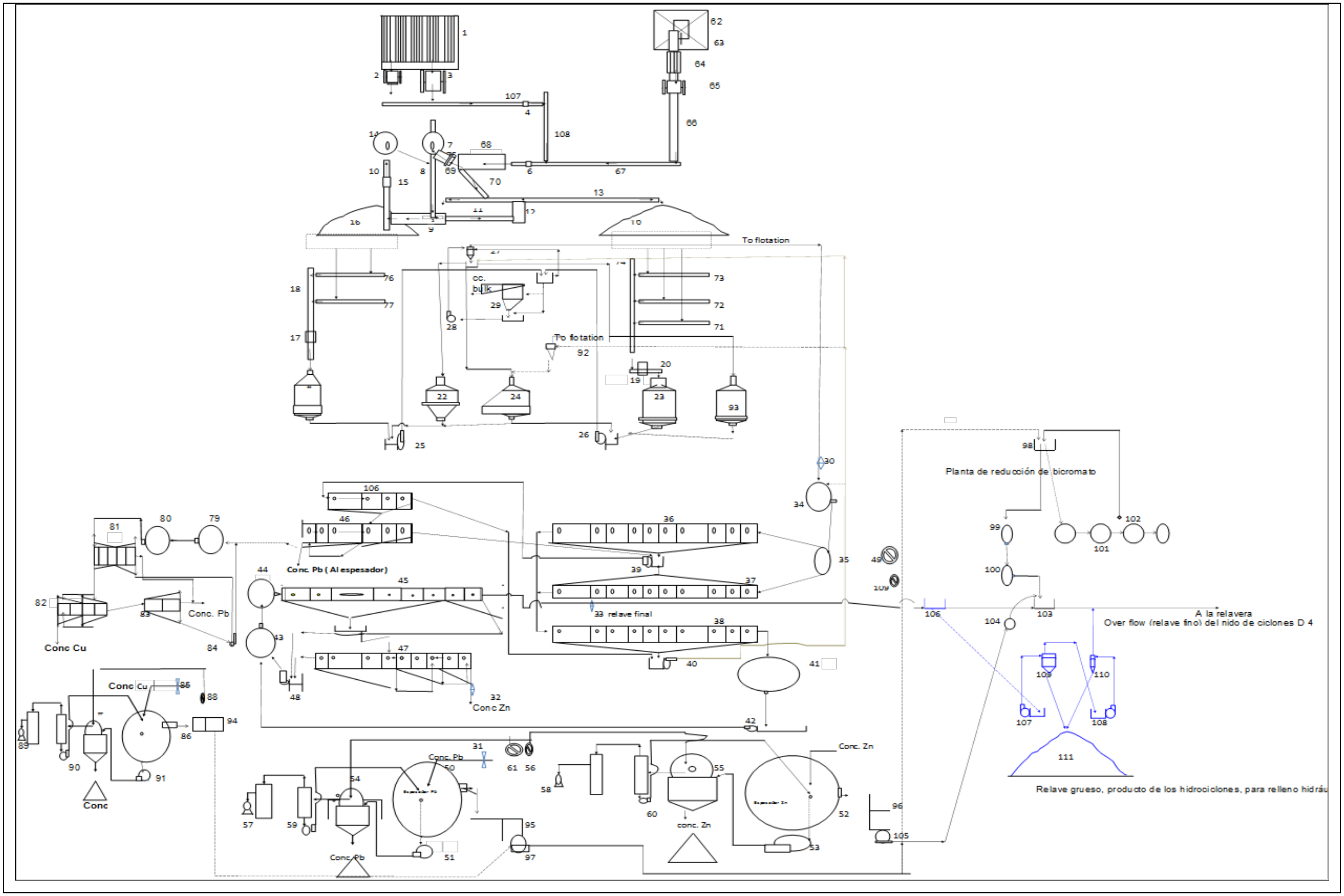
A flow sheet diagram detailing the configuration of the process plant is provided in Figure 17.1. Details of the equipment shown in the flow sheet are also provided in Figure 17.1

The Caylloma concentrator plant resumed operations in October 2006, treating 600 tpd of polymetallic mineral. Capacity increased progressively and, with the installation of a 6 ft by 8 ft ball mill in 2009, it reached a treatment capacity of 1,250 tpd. The treatment process is differential flotation. Initially, two concentrates were obtained: lead-silver and zinc. From late 2009 to January 2011, a copper-silver concentrate was also produced, but due to unfavorable commercial terms the production of copper concentrate was suspended and the copper circuit put on standby.

17.1 Crushing and milling circuits

The crushing and milling circuits are displayed in Figure 17.1. The crushing process starts at the 10,000 t capacity stock pile used for ore storage and blending. The process commences to the coarse hopper, which has a 450 t active capacity with 12 inch separation grates. The mineral is extracted from the coarse hopper through the apron feeder that feeds the vibrating grizzly with variable separation that, in turn, feeds the Kurimoto jaw crusher, resulting in a product size varying between 3 inch and 3.5 inch. The mineral is transported on two conveyor belts 1-A and 2-A to the two-deck vibrating sieve. The sieve's undersize is fed to the stock pile through belt 3-A and the oversize to the Sandvik H-2800 secondary crusher through belt 4-A, the product of which goes to the two-deck vibrating sieve through belt 1, the undersize of this sieve feeds the stock pile through belts 3, 4 and 5, and the oversize is fed through conveyor belt 2 to the Sandvik CH-430 tertiary crusher, the discharge of which returns to belt 1, closing the circuit.

Figure 17.1 Crushing and milling circuits at the Caylloma processing plant



Item	Count	Description	Item	Count	Description	Item	Count	Description
1	1	Coarse hopper, 12" grate	38	10	Flotation cell Agitair -48,scavenger	75	1	Metal detector
2	1	Kueken crusher	39	2	Pump SRL	76	1	Conveyor belt 12
3	1	Kueken crusher	40	2	Pump SRL	77	1	Conveyor belt 13
4	1	Permanent magnet	41	1	Conditioner 1 for Zinc	78	0	N/A (removed from process)
5	1	Conveyor belt 18	42	2	Pump SRL	79	1	Conditioner Cu
6	1	Permanent magnet	43	1	Conditioner 2 for Zinc	80	5	Conditioner Cu
7	1	Sandvik cone crusher	44	1	Conditioner 3 for Zinc	81	4	Flotation cells Sub A 18 SP
8	1	Conveyor belt 1	45	8	Cell Outokumpu OK -8U	82	2	Flotation cells Sub A 18 SP
9	1	Cedazo vibrator	46	6	Cell de flotation sub-A 24	83	1	Flotation cells Sub B 18 SP
10	1	Conveyor belt 2	47	9	Cell flotation sub- A 30	84	1	Vertical pump
11	1	Conveyor belt 3	48	2	Pump SRL	85	1	Sampler automatic Cu.
12	1	Conveyor belt 4	49	1	Continental air compressor	86	1	Thickener copper
13	1	Conveyor belt 5	50	1	Thickener lead Outokumpu	87	1	Raldy filter disc
14	1	Sandvik cone crusher	51	2	Pump SRL	88	1	Air compressor
15	1	Electromagnet	52	1	Thickener zinc Outokumpu	89	2	Nash empty pump
16	1	Stockpile	53	2	Pump SRL	90	2	Hidrostal pump
17	1	Ramsey electronic balance	54	1	Comesa filter disc	91	6	Pump SRL
18	1	Conveyor belt 15	55	1	Raldy filter disc	92	1	Cyclone
19	1	Ramsey electronic balance	56	1	Air compressor	93	1	Libertad ball mill
20	1	Conveyor belt 16	57	1	Nash vacuum sealed pump	94	1	Recovery pond for copper
21	1	Denver mill bowls	58	1	Nash vacuum sealed pump	95	1	Recovery pond for lead
22	1	Hardinge cone mill bowls	59	1	Hidrostal pump	96	2	Recovery pond for zinc
23	1	Comesa mill bowls	60	1	Hidrostal pump	97	1	Hidrostal pump
24	1	Magensa mill bowls	61	1	Air compressor	98	1	Tank pass
25	2	2 x Pump SRL	62	1	Coarse hopper, 14" grate	99	1	Reducer conditioner dichromate
26	2	2 x Pump SRL	63	1	Apron feeder	100	4	Conditioner neutralizer
27	2	2 x Cyclone	64	1	Grizzly vibrator	101	1	Contingency Tank
28	2	2 x Warman Pump	65	1	Kurimoto jaw crusher	102	1	Grindex sump pump
29	1	SK-240 cell	66	1	Belt 1A	103	1	Box pass
30	1	Automatic head sampling	67	1	Belt 2A	104	2	Tank pass
31	1	Automatic sampling Pb.	68	1	Allis Falco sieve vibrator	105	4	Pump horizontal
32	1	Automatic sampling de Zn	69	1	Belt 4A	106	1	Flotation cell sub-A 24
33	1	Tailing automatic sampler	70	1	Belt 3A	107	1	Transporter belt 19
34	1	Conditioner Pb	71	1	Transporter belt 7	108	1	Transporter belt 20
35	1	Pulp distributor	72	1	Transporter belt 8	109	1	Hartmann air compressor
36	10	Flotation cell Agitair -48,rougher	73	1	Transporter belt 9	110	1	Conditioner
37	10	Flotation cell Agitair -48,rougher	74	1	Transporter belt 10	111	1	Overflow

Additionally, there is a standby primary crushing circuit that starts at a 100 t capacity coarse hopper. From the hopper, the mineral is fed to a Kueken jaw crusher through a Ross chain feeder. The discharge from this crusher goes via conveyors 19 and 20 to conveyor 2-A. There are three permanent magnets and one electromagnet on the conveyors to prevent the entry of metal pieces.

The grinding circuit has two stages. The primary grinding circuit consists of two ball mills, a Comesa 8 ft by 10 ft and a Denver 7 ft by 7 ft. The secondary grinding circuit consists of three ball mills, a Magensa 6 ft by 6 ft, a Hardinge 8 ft by 36 in and a Liberty 6ft by 8ft. The final product of the grinding circuit is 56% passing 75 microns.

Conveyor belts 7, 8 and 9 independently feed conveyor belt 10 that in turn feeds conveyor belt 16, which sends the ore to the Comesa primary ball mill. The discharge feeds a horizontal pump which sends pulp to the MCC 125 Warman pump that in turn feeds the D-20 LB cyclone. The cyclone's overflow goes to the flotation circuit and the underflow feeds the secondary ball mills which operate in closed circuit with the D – 20 LB cyclone.

Conveyor belts 12 and 13 independently feed conveyor belt 15 that feeds the Denver primary ball mill. Discharge from the mill feeds a horizontal pump, which sends pulp to the MCC 125 Warman pump that in turn feeds the D-20 LB cyclone. The cyclone's overflow goes to the flotation circuit and the underflow feeds the secondary ball mills that operate in a closed circuit with the D – 20 LB cyclone. The cyclone's fines go to flotation.

17.2 Metallurgical Treatment

Metallurgical treatment is through a process of differential flotation; the first step is the flotation of lead - silver followed by zinc flotation.

Lead-silver flotation circuit

The D-20 LB cyclone overflow is fed to a conditioner and then goes to a pulp distribution box that feeds two rougher flotation banks, consisting of ten 50 cubic feet Agitair cells per bank. The scavenger concentrate, as well as the cleaner tailings join the D-20 LB cyclone underflow returning to the secondary grinding stage.

The rougher concentrate is fed to the primary cleaner cells, four 50 cubic feet Sub-A24 cells. The primary cleaner concentrate is fed to the secondary cleaner cells, three 50 cubic feet Sub-A24 cells. The secondary cleaner concentrate is fed to the tertiary cleaner cells, three 50 cubic feet Sub-A24 cells. The tertiary cleaner concentrate is the final lead-silver concentrate.

Zinc flotation circuit

The lead-silver flotation tailings are sent to three conditioners. The conditioned pulp is fed to the rougher flotation stage, consisting of six 8 m^3 OK8U cells. The rougher tailings are fed to the scavenger stage, consisting of two 8 m^3 OK8U cells. The scavenger concentrate is sent to a conditioner returning it to the rougher circuit. The scavenger tailings is the final tailings that goes through an automatic sampler.

The rougher concentrate is fed to the cleaner flotation circuit, comprised of three stages consisting of four, three and two 100 cubic feet Sub-A30 cells. The three cleaner stages work in series, the cleaner tailings of each stage is sent to the conditioner returning to the rougher circuit. The third cleaning concentrate is the final zinc concentrate that goes through an automatic sampler and then is sent to the zinc thickener.

The flotation process achieves a lead concentrate containing 55% lead and a zinc concentrate containing 51.5% zinc with metallurgical recoveries of 91.5% for lead, 81.5% for silver (in Lead concentrate) and 87.5% for zinc.

Concentrate grades and metallurgical recoveries obtained for each metal, are as expected and sufficient to meet the estimated annual production of silver ounces, and pounds of lead and zinc.

The plant could achieve better silver recoveries if the ore contained lesser quantities of manganese oxide with recoveries of 84% possible as was observed in 2009 and 2010.

17.3 Requirements for energy, water, and process materials

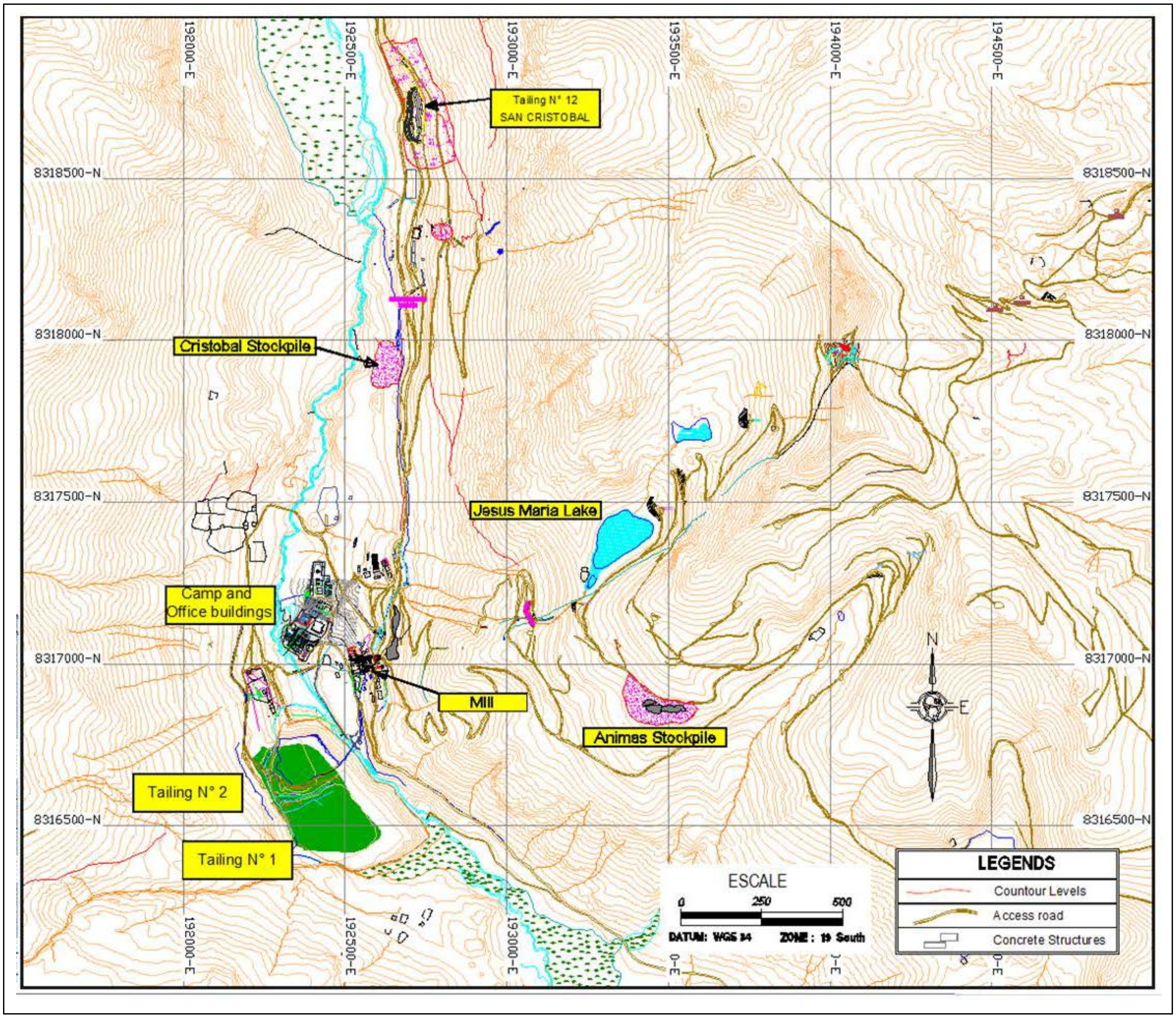
All energy requirements are provided from the Callalli substation, being the largest in the area. The camp requires 3.6 megawatts of energy and the plant uses an additional 1.8 megawatts. The mine also has three diesel generators that are available in case of emergencies that can provide power to the plant and mine if there was a power outage from the main substation.

All process materials are available from Arequipa and Lima. Reagents are provided from local service representatives representing international reagent suppliers.

18 Project Infrastructure

The Caylloma property has a well-established infrastructure used to sustain the operation. The infrastructure includes roads, tailing disposal facilities, mine waste disposal facilities, mine ore stockpiles, camp facilities, concentrate transportation, power generation and communications systems (Figure 18.1).

Figure 18.1 Plan view of mine camp



18.1 Roads

Roads on the property are shown in Figure 18.1. Access roads are unpaved but are in good condition due to semi-continual maintenance. Water tankers are used in summer to dampen the roads to reduce dust pollution. Roads interconnect all the facilities on the property and allow access through various portals to the underground operations.

18.2 Tailing disposal facilities

As of December 2011 tailings are disposed of in Tailing Facility N° 2 which has capacity to store tailings until August 2012. The first stage of the new tailing facilities (San Francisco) is being prepared in accordance with proposed plans as set out in the independent study conducted by Geoservice (2009).

In May 2011, Fortuna submitted to the MEM, in Peru, the application for construction permit of the new tailings facility. Fortuna received notification on April 3, 2012 from the MEM outlining its observations on the construction permit of the new tailings facility and granting thirty days for a response. The principal observations were to surface title documentation for various parcels and minor technical observations. Fortuna has responded to all the observations and does not view them as material at this point. In parallel, a positive engineering study has been concluded to expand the holding capacity of the current tailings facility for an additional five months of operation. The project has a budget of US$0.5 million and will be concluded within three months. This expansion will provide for stand-by holding capacity for any contingency.

18.3 Mine waste stockpiles

The mine currently has six waste stockpiles used for storing waste material that could not be effectively disposed of underground. The stockpiles are named after the location from where the waste was extracted. The six waste stockpiles are as follows:

- San Cristóbal level 10
- San Cristóbal level 12
- Animas level 8
- Animas level 12
- Bateas level 12
- San Pedro

18.4 Ore Stockpiles

The mine currently has seven ore stockpiles which store low grade silver ore, or oxide material pending evaluation. This material is evaluated because it is ore mixed with some oxide material or may require additional sampling to establish its grade. Once the results are obtained the geology department in accordance with the mine and planning departments take the decision on whether to transport this material to the plant.

18.5 Concentrate transportation

Concentrate transportation is carried out using 30 tonne capacity trucks. Before the trucks depart camp they are weighed at the mine balance. All trucks are systematically registered and controlled so that the delivered concentrate weighed at the storage port reconciles with that which left the mine.

18.6 Power generation

Power supply to the mine is through the Callalli electrical substation (main line of Caylloma district).

Currently, a consulting group is completing a Feasibility study which will develop alternatives to capture more energy to the mine.

18.7 Communications systems

The mine is equipped with cellular and fixed telephones, intranet, internet and video conferencing. The telephone and internet signal is provided by an antenna located in the Caylloma district (6 km from the mine) and sent to the mine. The signal is captured by an amplifier and sent to the camp via a relay station located in the top level of the mine (Level 5.5 of the Animas vein).

18.8 Camp facilities

As part of the policy to improve the work condition for the personnel, new offices and camps were budgeted. In December 2011 a US$2 million construction project was completed providing new offices for planning, geology and mine management as well as new dining facilities with a capacity of 180 people.

In 2012 the company's "Urban Planning Project" was approved with an investment of US$ 4.5 million. This project will improve the camp facilities and expand the number of rooms available for onsite staff and technical personnel.

Food is catered by a contractor (Aramark) and is provided on a seven days per week schedule in the newly constructed mess hall.

19 Market studies and contracts

Fortuna Silver Mines Inc has signed a contract for all zinc and lead concentrates produced by Minera Bateas with Glencore Peru SAC for 2011. A total of 15,000 wet tonnes of lead and 23,000 wet tonnes of zinc were sold.

All the commercial terms entered between Glencore and Minera Bateas are within the standards and industry norms.

20 Environmental studies, permitting and social or community impact

20.1 Environmental compliance

Minera Bateas operates pursuant to environmental regulations and standards set out in Peruvian law, and are complying with all laws, regulations, norms and standards for each stage of the mines operation.

20.2 Environmental considerations

Minera Bateas is in compliance with Environmental Regulations and Standards set in Peruvian Law and has complied with all laws, regulations, norms and standards at every stage of operation of the mine.

The Caylloma operation (legally referred to as the Economic Management Unit of San Cristóbal) has fulfilled its PAMA (Program for Environmental Compliance and Management) requirements, as approved by the Directorial Resolution No. RD 087-97-EM/DGM dated June 3, 1997 as set out by the Ministry of Mines.

The PAMA identified a number of programs to complete in order for the operation to conform to regulations and standards. The main projects outlined in the PAMA program was: the construction of a retaining wall at the base of the old tailings, vegetation of the old tailings, building a retaining wall at the base of the active tailings and monitoring and treatment of mine water. The budgeted cost of the program was US$365,000.

In 2002 the Ministry of Mines through the Mining Inspection Department conducted an audit of the programs specified in the PAMA document and approved on November 8, 2002 with a formal resolution 309-2002-EM/DGM RD.

The regulations required the approval of the mine closure plan, at a conceptual level, which was approved by WSF Directorial Resolution No. 328-207 MEM / AAM dated 10th December, 2007 by the Ministry of Mines.

The mine closure plan was approved by Executive Resolution No. 365-2009-MEM/AAM dated November 13, 2009.

The Sanitary Authorization for Treatment System Water was approved with Directorial Resolution No. 2307-2009/DIGESA/SA on May 18, 2009.

An Environmental Impact Study for the "Expansion of Mine and processing plant Huayllacho to 1,500 tpd from 1,030 tpd" was approved with Directorial Resolution 173-2011-MEM/AAM dated June 8, 2011. The “Mine Closure Plan” must be submitted by June 8, 2012 before for the EIA can be issued.

Through Resolution No. 351-2010-MEM-DGM/V authorization of the disposal of tailings in Tailings Deposit No. 2 Huayllacho has been confirmed.

20.3 Environmental permitting

The major permits that have been granted to allow Minera Bateas to operate at the Caylloma property are as follows:

- The Caylloma Mining Unit (Administrative Economic Unity St. Cristobal) was granted under the Ministry of Mines Resolution No. 139-89-EM-DGM/DCM. The required minimum investment has been made and the permission is permanent in nature.
- The permit for mineral processing in the Caylloma district was granted by resolution of the Ministry of Mines dated October 21, 1908. This permit is permanent.
- Authorization of the treatment plant for operation was granted by Resolution No. 102-80-EM/DCFM, dated July 7, 1980. The permit is permanent.
- Authorization for the operation of the Huayllacho beneficiation plant was awarded by resolution of the Ministry of Mines PB-0015-2010/MEM-DGM-DTM, dated January 14, 2010. The permit is permanent.
- Authorization to restart activities in wastewater treatment plant was awarded with awarding of resolution No.1078-2006-MEM-DGM / V, dated September 6, 2006. The permit is permanent.
- The 2010 Consolidated Annual Declaration (DAC) was provided to the MEM on June 23, 2011.
- The Tax Stability Agreement was granted for a period of ten years in relation to the investment plan detailed in the study of technical and economic feasibility (stability of the tax) through Executive Resolution No.370-2006 mine MEM-DGM, dated August 21, 2006.
- The Certificate for Mining Operations (COM 2012) was approved on December 6, 2011 under resolution No. 066-2012-C.
- Authorization for the development of thermal power generation activities with energy above 500 KW was granted by order of the Ministry of Mines No. 391-2005-MEM/DM, dated September 12, 2005. The permit is permanent.
- Global Expansion Authorization H2 2011 was approved by Executive Resolution No. 4356-2011-IN-1703-2 on November 16, 2011.
- The renewal of Powder Explosives License was approved by Executive Resolution No. 1124-2011-IN-1703-2 as of March 28, 2011.
- The license for the use of water for mining activities was granted by Administrative Resolution No. 013-2006, GRA / PR-DRAG-ATDR.CSCH, dated February 13, 2006. The license is permanent.
- Authorization for direct discharge of effluent solids was granted on June 25, 2004 by Resolution No. 0744-2004-DIGESA/SA and is permanent.
- Authorization for the use of gasoline and diesel storage tanks was registered through resolution CDFJ No.001-04-2004, dated May 26, 2006. It is permanent.
- Authorization for the development of a 15 kV transmission was granted by order of the Ministry of Mines No. 052-2010-EM, dated August 21, 2010. The permit is permanent.

- Authorization of the disposal of tailings in Tailings Deposit No. 2 consistent with the approved mine closure plan through Resolution No. 351-2010-MEM-DGM / V.
- Authorization for water use by a population for mining purposes through administrative Order No. 013-2006.GRA/PR-DRAG-ATDR.CSCH, dated February 13, 2006. The permit is permanent.
- Authorization to operate the concentrator plant with an expanded capacity of 1,030 tpd was granted by resolution No. 007-2010-MEM-DGM / V, dated January 14, 2010.
- Directorial Resolution No. 1035-2007/DIGESA/SA of March 22, 2007, authorizes the usage of a sanitary system for domestic wastewater treatment and disposal in the ground, with permanent effect.
- Directorial Resolution No. 0231-2011-ANA-DGCRH of November 22, 2011, authorizing the suspension of monitoring station EF-5 used for monitoring treated mine water from the Don Luis II level 12. The resolution is valid for two years.
- Approval of the Mine Closure Plan of San Cristóbal and UEA through directorial resolution No. 365-2009 MEM / AAM, dated November 13, 2009.
- Authorization of the construction, installation and refurbishment of the regrowth of tailings No.2 through resolution No. 902-2009-MEM/DGM/V dated November 25, 2009.
- Directorial Resolution No. 0031-2010-ANA-DCPRH of March 24, 2010, authorizing the suspension of monitoring station E-03 used for monitoring Pumahuasai Bateas effluent. The resolution is valid for two years.
- Directorial Resolution No. 103-2010-ANA-DGCRH of December 10, 2010, authorizing the suspension of monitoring station E-5 used for monitoring treated mine water from the San Cristóbal level 12. The resolution is valid for two years.
- Directorial Resolution No. 192-2011-ANA-DGCRH, 20 September 2011, authorizing the suspension of monitoring station E-8 used for monitoring treated mine water from the San Cristóbal level 11, effluent waste water from the tailings deposit, and E-12 industrial wastewater effluent from the concentrator. The resolution is valid for two years.
- Approval of the Environmental Impact Study included in the report entitled "Expanding mine and processing plant Huayllacho 1030 TMD to 1500 TMD" through resolution N ° 173 -2011-MEM/AAM dated June 8, 2011.
- Approval of the environmental impact study in the semi-detailed exploration project entitled "Accumulation Caylloma 1, 2 and 3" through resolution N ° 374 - 2011-MEM/AAM dated December 20, 2011.

In addition to these norms and permits obtained from the environmental department, the operation also ensures all environmental activities are regularly monitored and recorded as part of the quality control measures that are presented to the Ministry of Energy and Mining.

Of particular importance is monitoring of the quality of river water in the area. This activity involves monitoring the Santiago River, being the main river that crosses the property, employing people from the local communities to certify the results.

In the case of water monitoring, Bateas mine has seven points of control along the Santiago River. These sampling points were selected based on the likely discharge locations of the different levels of the mine and the concentrator plant. The samples obtained are sent to the ALS Chemex laboratories in Lima and Arequipa with the results being presented to representatives of the local community to confirm the water quality meets or exceeds the required standards.

Minera Bateas has also obtained and maintains its ISO 14001 Environmental Management Certification since 2008. The mine works continually to improve its operational standards.

20.4 Social or community impact

Bateas Mine has a significant commitment to community development. The community relationship department works closely with the local communities and has many proactive programs to improve the welfare of local residents. These include:

1. **Educational assistance**. The mine provided a computer room with personal computers (including educational programs) and specialized teachers with the target of increasing the educational level of the population of Caylloma (children and adults).
2. **Agricultural and livestock programs.** These programs bring better technology to the communities in order to improve the agricultural and animal husbandry techniques.
3. **Camp familiarization**. This is a special program that consists of regular visits to the mine camp by the community population (especially children) in order to describe all of the processes of the mine, be transparent in our activities and permit the children to see and understand what their fathers or mothers do for a living.

The increased employment that the mine brings to the area has resulted in the generation of secondary and tertiary employment through companies servicing the operation. This has greatly increased employment in the area and resulted in local people creating their own companies. Examples of communal companies working at the mine are Etramin SRL and San Servicios SRL (SRL: Limited Responsibility Service).

20.5 Mine Closure

Closure of the mine is also included in the environmental program. An annual investment of $US 350K has been budgeted for meeting the ongoing closure plan and environmental liabilities. Each step of the closure plan is performed to ensure compliance with the programs and plans submitted to the Ministry of Energy and Mining.

21 Capital and operating costs

Minera Bateas capital and operating cost estimates for Caylloma are based on 2011 costs (Summarized in Table 21.1 and Table 22.2). The analysis includes forward estimates for sustaining capital. Inflation is not included in the cost projections and exchange rates remain unchanged.

Capital costs include all investments in mine development, equipment and infrastructure necessary to upgrade the mine facilities and sustain the continuity of the operation.

Table 21.1 Summary of projected major capital budget for 2012

Capital Item	Cost (MUS$)
Mine Development	
Development & Infrastructure	4.45
Brownfields Exploration	8.50
Total Mine Development and Exploration	**12.95**
Equipment and Infrastructure	
Mine	0.16
Plant	8.21
Tailings Facility	4.84
Maintenance & Energy	1.11
Safety	0.10
IT	0.43
Logistics, Camp, Geology, Exploration, Planning	4.82
Laboratory	0.36
Environment	0.53
Total Equipment and Infrastructure	**20.58**
Total Capital Expenditure	**33.53**

Table 22.2 Summary of projected major operating costs for 2012

Operating Item	Cost US$/t
Cash cost	
Mine (*Mine Cash Cost per tonne was calculated using extracted ore*)	**38.54**
Plant	**13.11**
Cash Cost	**51.65**
Operation's Expenses	
General services	**16.64**
Administration mine	**7.69**
Total Operation's Expenses	**24.32**
Total Cash Cost & Operation's Expenses	**75.97**

21.1 Sustaining Capital costs

A total of US$33.53 million is budgeted for 2012 in order to improve the mine facilities and sustain the operation. Capital costs are split into two areas, 1) mine development and 2) equipment and infrastructure.

21.1.1 Mine development

Mine development includes the main development and infrastructure of the mine through the generation of ramps, ore and waste shafts, ventilation shafts, and level extraction. Brownfield exploration (diamond drilling) is included under mine development costs as this activity has the objective of discovering new Mineral Resources in order to increase the life of mine. The budget for these activities in 2012 is US$13 million.

21.1.2 Equipment and infrastructure

Equipment and infrastructure costs are attributed to all departments of the mine including; mine, plant, tailing dumps, maintenance and energy, safety, information technology, administration and human resources, logistic, camps, geology, planning, laboratory and environmental. The budget for these areas is US$9.4 million with the most important project being the new tailings facility having a budget of US$2.8 million (15% of the total budget).

The capital cost budget in 2011 was US$19.2 million with yearend capital costs totaling US$22.7 million. The overrun of US$3.5 million was from additional contractor costs as the construction of the new tailing dumps was advanced in an attempt to complete the project by the end of the 2011.

Capital costs for 2012 are regarded as reasonable based on the large ongoing projects, such as the construction of the new tailings facility and Brownfield exploration which are required to expand the life of mine.

21.2 Operating costs

Operating costs include the cash costs (US$51.65/t) and operating expenses (US$24.32/t) for the operation. The sum of these operating costs (US$75.97/t) has been used in the estimation of Mineral Reserves (Section 15.5).

Cash costs relate to activities that are performed on the property including mine, plant, general services, and administrative service costs. Operating expenses include costs associated with distribution, general and administrative services, and community support activities.

21.2.1 Mine operating costs

Mining costs include drilling, blasting, support, loading and haulage. The budget for mining was US$ 13.85 million which is based on the extraction of 445,000 t of material and represents an equivalent unit cost of US$ 31.09/t. The budget is based on the mine operating costs for 2011 which had a unit mining cost of US$ 32.83/t for the production of 457,000 t. The increased cost for 2011 is due to significantly more meters being required to prepare the Bateas vein for mining. This is due to changing the mining method from conventional to semi-mechanized.

21.2.2 Mill operating costs

The mill operating costs have been estimated based on the 2011 figures of US$5.18 million (budget). The total mill operating cost is distributed over five areas (crushing, milling, flotation, thickening and filtering, and tailings disposal) and was predicted to be US$11.62/t in 2011, with actual results for the year being US$11.54/t, comparable to the budget. The unit cost of US$11.54/t was achieved through milling a total of 457,000 t.

21.2.3 General Service costs

General Service costs were estimated based on the 2011 figures of US$5.45 million (budget). The budgeted costs cover operations management, energy, maintenance, geology, planning, safety, environmental and laboratory costs and were estimated to be US$12.15/t for 2011, with actual results for the year being US$11.87/t, comparable to the budget.

21.2.4 Administrative costs

Administrative costs have been estimated based on figures for 2011 at US$2.75 million (budget). Administrative service costs include administration, human resources, storage, hospital, legal, communication systems, accounting and cash, social assistance, community relations, camps, energy for the camp, and depreciation and amortization for equipment. Estimated costs for 2011 were US$6.18/t with the actual costs for the year being US$6.94/t. The extra US$0.80/t was due to additional work being undertaken with the local communities than was budgeted for.

21.2.5 Operating expenses

Operating expenses were estimated based on 2011 figures at US$7.5 million (budget). Total operating expenses are shared between distribution (transport and supervision of concentrate), general and administrative services (Lima office) and community support activities (jobs with communities) with costs for 2011 estimated at US$16.82/t. Actual results for the year were US$14.95/t, being US$0.9/t lower than the budget.

The 2011 budget for total operating costs was US$77.87/t with the actual cost for the year coming in at US$78.13/t. The extra US$0.5/t was primarily due to additional costs in mine preparation associated with development of the Bateas vein to accommodate semi-mechanized mining as opposed to the originally planned conventional mining methodology.

Operating costs are comparable to other operations with similar production levels located in this region.

22 Economic analysis

A description of the economic analysis has not been included in the Technical Report as the Caylloma mine is currently in production and there has been no material expansion in current production since the previous Technical Report (CAM, 2009).

23 Adjacent properties

There is no information regarding adjacent properties applicable to the Caylloma property for disclosure in this report.

24 Other relevant data and information

Fortuna considers that the Technical Report contains all the relevant information necessary to ensure the report is understandable and not misleading.

25 Interpretation and conclusions

Minera Bateas continues to successfully manage the Caylloma operation, processing almost 450,000 t of ore annually from its underground mining operations. In 2011 Caylloma produced 2.0 Moz of silver while investing heavily in improving the mine infrastructure.

Fortuna believes there is good potential for the significant increase of the Mineral Resources at the Caylloma property particularly from the continuity of the current veins in operation as well as from the discovery of new veins. The 2011 property mapping project identified multiple exploration targets that are to be investigated in 2012 and in future years.

Proven and Probable Mineral Reserves total 4.6 Mt at an average grade of 135 g/t Ag, 0.33 g/t Au, 1.33 % Pb, and 1.93 % Zn as of December 31, 2011. The conversion of Mineral Resources to Mineral Reserves considered different cut-off grade for each vein in accordance with the operation costs, metal prices and plant performance data.

The mining operation has been developed under strict compliance of norms and permits required by public institutions associated with the mining sector. Furthermore, all work follows quality and safety international norms as set out in ISO 14,001 and OHSAS 18000.

Minera Bateas continues developing annual sustainable programs to benefit the local communities including educational, nutritional and economical programs.

The socio–environmental responsibilities outlined above ensure a good relationship between the company and local communities. This will help the growth and continuity of the mining operation while local communities improve their economies and living standards.

Operating costs are reasonable for production rates in a mine of this size and are comparable to other mines in the area with similar characteristics.

Sustaining capital costs are regarded as reasonable in order to improve the camp facilities and ensure continuity and sustainability of the mining operation.

26 Recommendations

Short term mine plans need to be developed in accordance with long term mine plans to ensure production matches forecasts.

Underground mine and surface operations require ongoing investment to ensure the projects infrastructure remains habitable and working conditions are maintained or improved (camps and offices).

Recommended projects to improve the operation include the following:

1. **Construction of tailing facility N° 3, San Francisco.** This project requires an investment of US$10 M for the first and second stage, which includes the construction of new tailing facilities to store the tailings of the operation for the next seven years. Currently, the new tailings facility N° 3, San Francisco, is following the schedule established in the independent study conducted by Geoservice (2009). Fortuna is awaiting the construction permit for the tailings facility from the MEM as detailed in Section 18.2.

2. **Construction of new camp facilities.** Includes the reengineering and restructuring of the camp infrastructure and construction of new buildings in order to expand and improve accommodation facilities at the operation. Total required investment is estimated at US$9 million; the first stage planned for 2012 is budgeted at US$4.5 million and the second stage is planned for completion in 2013.

3. **Exploration**. In 2012 exploration is focused on expanding or discovering new Mineral Resources to increase the life of mine. The company is committed to this exploration program, budgeting US$8.5 million in 2012 with the intention of drilling a total of 23,400 m from surface and underground.

4. **Underground development.** The most important mine project is the completion of 1,200 m of Raise Boring to improve ventilation and service access underground. Costs for the raise boring are estimated at US$1.2 million. Construction of the main ore extraction tunnel for the Bateas vein is another important project for the operation. This includes the development of a 1,000 m long tunnel and ore pass, along with associated facilities that will allow the operation to optimize ore extraction from the Bateas vein and is predicted will save approximately 4.8 US$/t from extraction costs, improve ventilation, and provide a new and faster route into and out of the mine. Total investment required to complete this project is estimated to be US$1.2 million. It is recommended that these projects be commenced early in 2012.

In addition to the confirmed projects for 2012 the following work is recommended:

- The primary target for exploration needs to be the expansion of high-grade silver veins in order to increase and support the Mineral Resource inventory that can be converted to Mineral Reserves.

- Additional metallurgical testwork should be performed to optimize the performance of the plant in an attempt to improve silver recovery to levels achieved in 2009 and 2010. Silver recovery in those years was approximately 84% rather than the 81.5% achieved in 2011. The reduction in recovery is thought to be primarily due to the inclusion of manganese oxide minerals in the ore. Metallurgical studies should be conducted to see if the plant can be altered to better cope with this mixed oxide-sulfide material.

- Increase the number of bulk density measurements in veins that lack sufficient values for a meaningful statistical analysis. In addition to this it is also recommended that a study be performed to improve the understanding of the bulk density in the deposit. If a correlation between density and mineralogy could be established it may provide a superior alternative than the presently used global density assignment.

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Certificates

CERTIFICATE of QUALIFIED PERSON

(a) I, Eric N. Chapman, Mineral Resource Manager of Fortuna Silver Mines Inc., 650-200 Burrard St, Vancouver, BC, V6C 3L6 Canada; do hereby certify that:

(b) I am the co-author of the technical report titled Fortuna Silver Mines Inc. Caylloma Property, Caylloma District, Peru dated May 7, 2012 (the "Technical Report").

(c) I graduated with a Bachelor of Science (Honours) Degree in Geology from the University of Southampton (UK) in 1996 and a Master of Science (Distinction) Degree in Mining Geology from the Camborne School of Mines (UK) in 2003. I am a Professional Geologist of the Association of Professional Engineers and Geoscientists of the Province of British Columbia (Registration No. 36328) and a Chartered Geologist of the Geological Society of London (Membership No. 1007330). I have been preparing resource estimates for approximately nine years and have completed more than twenty resource estimates for a variety of deposit types such as epithermal gold veins, porphyry gold deposits, banded iron formations and volcanogenic massive sulfide deposits. I have completed at least five Mineral Resource estimates for polymetallic projects over the past four years.

I have read the definition of 'qualified person' set out in National Instrument 43-101 ("the Instrument") and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I fulfill the requirements of a 'qualified person' for the purposes of the Instrument.

(d) I last visited the property from December 13 to December 15, 2011;

(e) I am responsible for the preparation of sections 1: Summary; 2: Introduction; 3: Reliance on other experts; 4: Property description and location; 5: Accessibility, climate, local resources, infrastructure and physiography; 6: History; 7:Geological setting and mineralization; 8: Deposit types; 9: Exploration; 10: Drilling; 11: Sample preparation, analyses and security; 12: Data verification; 14: Mineral Resource estimates; 23: Adjacent properties; 24: Other relevant information; 25: Interpretation and conclusions; 26: Recommendations; 27: References of the Technical Report.

(f) I am an employee of the issuer, Fortuna Silver Mines Inc.

(g) I have been an employee of Fortuna and involved with the property that is the subject of the Technical Report since May 2011.

(h) I have read the Instrument and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

(i) As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all the scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated at Vancouver, BC, this 7th day of May 2012.

[signed]

Eric N. Chapman, P. Geo., C. Geol. (FGS)

CERTIFICATE of QUALIFIED PERSON

(a) I, Edgard A. Vilela Acosta, Corporate Manager of Technical Services of Fortuna Silver Mines Inc., Piso 5, Avenida Jorge Chavez # 154, Miraflores, Lima, Peru; do hereby certify that:

(b) I am the co-author of the technical report titled Fortuna Silver Mines Inc. Caylloma Property, Caylloma District, Peru dated May 7, 2012 (the "Technical Report").

(c) I graduated with a Bachelor of Science Degree in Mining from the Pontifical Catholic University of Perú in 2000, I have a Diploma in Finances from CENTRUM business school (Perú) in 2007 and a Diploma in Business Administration from Pontifical Catholic University of Perú. I am a Professional in Mining of the Engineer College of Perú (Registration No. 93802) and a Chartered Professional (CP) of the Australasian Institute of Mining and Metallurgy - AusIMM (Membership No. 992615). I have practiced my profession for 12 years. I have been directly involved in underground operations, mining consulting, and assisting in the development of mining projects in Perú, Argentina, Chile, Uruguay, Ecuador, and Mexico.

I have read the definition of 'qualified person' set out in National Instrument 43-101 ("the Instrument") and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I fulfill the requirements of a 'qualified person' for the purposes of the Instrument.

(d) I last visited the property from November 27 to December 15, 2011;

(e) I am responsible for the preparation of sections 1: Summary; 2: Introduction; 13: Mineral processing and metallurgical testing; 15: Mineral Reserve estimate; 16: Mining Methods; 17: Recovery methods; 18: Project Infrastructure; 19: Market studies and contracts; 20: Environmental studies, permitting and social or community impact; 21: Capital and operating costs; 22: Economic analysis; 25: Interpretation and conclusions; 26: Recommendations; 27: References of the Technical Report.

(f) I am an employee of the issuer, Fortuna Silver Mines Inc.

(g) I have been an employee of Fortuna and involved with the property that is the subject of the Technical Report since Dec 2010.

(h) I have read the Instrument and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

(i) As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all the scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated at Lima, Peru, this 7th day of May 2012.

[signed]

Edgard A. Vilela Acosta, P. Min., CP. Mining. (AusIMM)