PAN AMERICAN SILVER CORP
Form 6-K
April 02, 2013

SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 6-K

Report of Foreign Private Issuer
Pursuant to Rule 13a-16 or 15d-16 of
the Securities Exchange Act of 1934

For the month of, April 2013
Commission File Number 000-13727

Pan American Silver Corp
(Translation of registrant's name into English)

1500-625 Howe Street, Vancouver BC Canada V6C 2T6
(Address of principal executive offices)

Indicate by check mark whether the registrant files or will file annual reports under cover of Form 20-F or Form 40F:

Form 20-F Form 40-F X

Indicate by check mark if the registrant is submitting the Form 6-K in paper as permitted by Regulation S-T Rule 101(b)(1):

Indicate by check mark if the registrant is submitting the Form 6-K in paper as permitted by Regulation S-T Rule 101(b)(7):

DOCUMENTS INCLUDED AS PART OF THIS REPORT

| Document | |
|---|---|
| 1 | Pan American Silver Corp.,TECHNICAL REPORT FOR THE LA COLORADA PROPERTY ZACATECAS, MÉXICO. |

Document 1

TECHNICAL REPORT
FOR THE
LA COLORADA PROPERTY
ZACATECAS, MÉXICO

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Effective Date: December 31, 2012

PREPARED BY:

Michael Steinmann, P.Geo
Martin Wafforn, P.Eng

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1.0 Contents

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## 2.0 SUMMARY

### 2.1. Property Description and Ownership

Information in this section was excerpted and updated from Sharp, et.al. 2007.

The La Colorada mine is located in Chalchihuites district, Zacatecas State, Mexico, approximately 99 km south of the city of Durango and 156 km northwest of the city of Zacatecas. Figure 1 shows the La Colorada location, general co-ordinates: longitude 23°22'N and latitude 103°45'W.The La Colorada mine-site is accessible by road approximately 2½ hours southeast of the city of Durango. The road consists of 120 km of a paved two-lane highway (Highway 45), and 23 km of public, all weather gravel road. The access from Zacatecas takes approximately the same time on similar types of roads. Durango and Zacatecas are serviced by daily flights from México City, other major centers in México and direct flights from some cities in the United States.

Figure 1: La Colorada Location

The La Colorada property was acquired by Pan American Silver Corp. ("PAS") in April 1998, through its wholly owned subsidiary Plata Pan Americana S.A. de C.V. ("Plata"), following the 1997-98 exploration program while the property was under option. The La Colorada property is comprised of 37

exploitation claims totalling 2,864 ha. In addition, PAS also has control over approximately 571 hectares (ha) of surface rights covering the main workings, namely the Candelaria, Campaña, Recompensa and Estrella mines.

## 2.2. Geology and Mineralization

Information in this section was excerpted and updated from Sharp, et.al. 2007.

The La Colorada property is located on the eastern flanks of the Sierra Madre Occidental at the contact between the Lower Volcanic Complex and the Upper Volcanic Complex Supergroups. The La Colorada property lies 16 km southeast of Chalchihuites and 30 km south-southwest of Sombrerete, two mining camps with significant silver and base metal production from veins and associated skarn deposits (San Martin and Sabinas mines).

The oldest rocks exposed in the mine area are Cretaceous carbonates and calcareous clastic rocks of the Cuesta del Cura and Indidura formations. Overlying the calcareous rocks is a conglomerate unit containing clasts derived mostly from the subadjacent sedimentary rocks. In the Chalchihuites district this unit is called the Ahuichila formation and is of early Tertiary age.

Most of the outcrop in the mine area is represented by altered dacite, an intermediate to felsic volcanic rock type of the regional Lower Volcanic Complex. There are several subgroups within this unit, including plagioclase porphyry, crystal to crystal-lapilli tuffs, and volcanic breccias. Generally these sub-units are too small to map.

East to northeast striking faults form the dominant structures in the project area and control mineralization. Most of these faults dip from moderately to steeply to the south and juxtapose younger hangingwall strata against older footwall rocks. Evidence suggests down-dip motion on these faults; however, most of the faults were reactivated at some point so the movement direction during the initial formation is uncertain. Stratigraphic contacts are displaced from ten to over a hundred metres lower on down-dropped blocks.

The mineralized veins at La Colorada contain both oxide and sulphide material. The depth below surface and the permeability of the mineralized zone controls the level of oxidation in the veins. The most common sulphide minerals are galena, sphalerite, tetrahedrite, argentite, and pyrite.

## 2.3. Status of Exploration

The initial exploration program was completed between September 1997 and March 1998 to evaluate potential while the property was under an option agreement. With the encouraging results of that program the decision was made to acquire the mine which was completed in 1998.

Including that original program, 53,253 m of drilling were completed by PAS between 1997 and 2007. From early 2008 to the end of year 2012 an additional 172,570 m of diamond drilling were completed. This additional drill information has resulted in a total of 79.9 million ounces of silver added to the mineral reserves. During the same period the mine produced 31.3 million ounces of silver.

For 2013 the exploration program is budgeted for 31,900 m of combined surface and underground diamond drilling. This program's objectives are to increase the confidence of the geological and grade continuity by infill drilling on known structures in order to upgrade inferred resources to indicated or measured mineral resources, outlining of new inferred mineral resources, and testing the main structures at depth.

## 2.4. Development and Operations

The operation currently typically produces 400 tonnes per day (tpd) of oxide ore and 670 tpd of sulphide ore. Each type of ore is processed through separate circuits which share a single crushing plant. The mining method used is overhand cut and fill. Stoping is undertaken with hand held drills using horizontal drilling for safety reasons in oxides and vertical drilling in the more competent sulphide ore. Back fill comprises either broken waste rock or hydraulic tailings.

Development mining is either by hand held drill or electric hydraulic jumbo drill depending on the size of the excavation required. The mine currently has approximately two years of ore development ahead of stoping. This provides flexibility for planning, and scheduling.

## 2.5. Mineral Resources

Mineral resources at the La Colorada mine at December 31st, 2012 were estimated to be as shown in Table 1. This mineral resource estimate was prepared using a price of $25.00 per ounce of silver, $1,350 per ounce of gold, $1,750 per tonne of zinc, and $1,850 per tonne of lead and was prepared under the supervision of and reviewed by Michael Steinmann, P.Geo., EVP Corporate Development & Geology for PAS, who is a Qualified Person ("QP") as that term is defined in National Instrument 43-101 – Standards of Disclosure for Mineral Projects ("NI 43-101").

Table 1: La Colorada Mineral Resources as of December 31, 2012

Measured and Indicated Resources

| Category | Tonnes (Mt) | Ag (ppm) | Ag Cont. (Moz) | Au (ppm) | Pb % | Zn % |
|---|---|---|---|---|---|---|
| Measured | 0.2 | 161 | 1.1 | 0.12 | 0.66 | 0.95 |
| Indicated | 2.0 | 268 | 17.1 | 0.32 | 0.49 | 0.76 |
| Total M&I Resources | 2.2 | 258 | 18.1 | 0.31 | 0.51 | 0.78 |

Inferred Resources

| Category | Tonnes (Mt) | Ag (ppm) | Ag Cont. (Moz) | Au (ppm) | Pb % | Zn % |
|---|---|---|---|---|---|---|
| Total Inferred Resources | 2.0 | 304 | 20.0 | 0.34 | 1.61 | 2.64 |

Notes:

1. CIM definitions were followed for mineral resources
2. Grades are shown as contained metal before mill recoveries are applied.
3. PAS reports mineral resources and mineral reserves separately. Reported mineral resources do not include amounts identified as mineral reserves.
4.

Mineral resources were diluted including minimum vein width of 2.18 m, planned mining dilution, and floor dilution for stope ore.

5. Mineral resources have been estimated using a mining recovery of 85 to 95% (pillars are left in some thicker zones leading to lower mining recovery). Mineral resources were estimated based on the use of cut and fill mining methods.
6. Mineral resources were estimated using the polygonal method on longitudinal sections.

7. Mineral resources were estimated using a price of $25.00 per ounce of silver, $1,350 per ounce of gold, $1,750 per tonne of zinc and $1,850 per tonne of lead.
8. Environmental, permitting, legal, title, taxation, socio economic, political, marketing or other issues are not expected to materially affect the estimate of mineral resources.
9. Mineral resources that are not mineral reserves do not have demonstrated economic viability.

2.6. Mineral Reserves

Mineral reserves at the La Colorada mine at December 31st, 2012 were estimated to be as shown in Table 2. This mineral reserve estimate was prepared using a price of $25.00 per ounce of silver, $1,350 per ounce of gold, $1,750 per tonne of zinc, and $1,850 per tonne of lead and was prepared under the supervision of and reviewed by Martin Wafforn, P.Eng., Vice President of Technical Services for PAS and a QP as that term is defined in NI 43-101.

Table 2: La Colorada Mineral Reserves as of December 31, 2012

Proven and Probable Reserves

| Category | Tonnes (Mt) | Ag (ppm) | Ag Cont. (Moz) | Au (ppm) | Pb % | Zn % |
|---|---|---|---|---|---|---|
| Proven | 2.0 | 397 | 25.8 | 0.38 | 1.21 | 2.28 |
| Probable | 3.1 | 390 | 39.0 | 0.42 | 1.73 | 3.20 |
| Total Reserves | 5.1 | 393 | 64.8 | 0.41 | 1.53 | 2.84 |

Notes:

1. CIM definitions were followed for mineral reserves.
2. Grades are shown as contained metal before mill recoveries are applied.
3. PAS reports mineral resources and mineral reserves separately. Reported mineral resources do not include amounts identified as mineral reserves.
4. La Colorada mineral reserves have been estimated at a cut off value per tonne of $98.49 for Candelaria oxides, $82.92 for Candelaria sulphides, $99.10 for Estrella oxides, $83.53 for Estrella sulphides and $73.84 per tonne in the Recompensa mine (sulphide ore).
5. Mineral Resources were diluted including minimum vein width of 2.18 m, planned mining dilution, and floor dilution for stope ore.
6. Mineral reserves were estimated using a mining recovery of 85 to 95% (pillars are left in some thicker zones leading to lower mining recovery). Mineral reserves were estimated based on the use of cut and fill mining methods.
7. Mineral reserves were estimated using the polygonal method on longitudinal sections.
8. Mineral reserves were estimated using a price of $25.00 per ounce of silver, $1,350 per ounce of gold, $1,750 per tonne of zinc and $1,850 per tonne of lead.
9. Environmental, permitting, legal, title, taxation, socio economic, political, marketing or other issues are not expected to materially affect the estimate of mineral reserves.

2.7. Qualified Person’s Conclusions and Recommendations

Based on the site visits and reviews the qualified persons draw the following conclusions:

Sampling methods and protocols are consistent with industry standards.

The assaying is done using industry standard methods for the ore types and grades of the deposit.

The geology department has a QA/QC program for assay results, independent from the laboratory.

The geology database is in industry standard software using secure protocols.

There is good understanding of the geology, mineralogy and the deposit model.

Mineral resources and mineral reserves are estimated utilizing an acceptable estimation methodology.

The parameters for the conversion of mineral resources to mineral reserves are based on observations at the operating mine and adjusted periodically based on reconciliation results.

Recoveries and cost estimates are based on actual operating data.

The exploration program has been highly successful increasing the estimated mineral reserves from 19.8 million silver ounces as of December 31st, 2005 to 64.8 million as of December 31st, 2012, net of production.

Plans to increase the sulphide plant capacity are underway to ensure production levels remain constant as oxide ore becomes depleted in the future (as mining progresses deeper).

There are no material issues with the local community or government.

La Colorada mine is certified clean industry by PROFEPA (Mexican federal environmental protection department).

All permits are current.

Recommendations:

Update the resource estimation method to three dimensional and geostatistical methods using commercially available mining/geology software.

Complete a Preliminary Economic Assessment level study on increasing production from the La Colorada mine. It is expected that in order to increase production this study would need to include (but not be limited to) reviews of the potential continuation of the Estrella and Candelaria mines to depth; mine infrastructure; mine development; plant expansion; surface infrastructure, and permitting.

Continue with annual near mine exploration program.

2.8. Cautionary note regarding forward-looking information and statements

Certain of the statements and information in this Technical Report constitute “forward-looking statements” within the meaning of the United States Private Securities Litigation Reform Act of 1995 and “forward-looking information” within the meaning of applicable Canadian Provincial securities laws. All statements, other than statements of historical fact, are forward-looking statements. When used in this Technical Report, the words “estimates”, “expects”, “projects”, “plans”, “contemplates”, “calculates”, “objective”, “potential”, and other similar words and expressions, identify forward-looking statements or information. These forward-looking statements or information relate to, among other things: the future successful development of the La Colorada Mine; the estimates of expected or anticipated economic returns; future production of minerals and mine-life of the La Colorada Mine; future cash costs per ounce of silver; the price of silver and gold; the sufficiency of PAS’ current

working capital, anticipated operating cash flow or its ability to raise necessary funds; the accuracy of mineral resource and mineral reserve estimates; estimated production rates for silver and other payable metals produced at the La Colorada Mine; the cash and total costs of production; the estimate of metallurgical recoveries for silver and gold; the estimate for mining dilution; the estimated cost of and availability of funding necessary for sustaining capital; and ongoing or future development plans and capital replacement, improvement or remediation programmes.

These statements reflect current views with respect to future events and are necessarily based upon a number of assumptions and estimates that, while considered reasonable, are inherently subject to significant business, economic, competitive, political and social uncertainties and contingencies. Many factors, both known and unknown, could cause actual results, performance or achievements to be materially different from the results, performance or achievements that are or may be expressed or implied by such forward-looking statements contained in this Technical Report and assumptions and estimates have been made based on or related to many of these factors. Such factors include, without limitation: fluctuations in spot and forward markets for silver, gold, base metals and certain other commodities (such as natural gas, fuel oil and electricity); fluctuations in currency markets (such as the Mexican Peso versus the United States Dollar); changes in national and local government, legislation, taxation, controls or regulations and political or economic developments, particularly in Mexico and in Canada; risks and hazards associated with the business of mineral exploration, development and mining (including environmental hazards, industrial accidents, unusual or unexpected geological or structural formations, pressures, cave-ins and flooding); employee relations; relationships with and claims by local communities and indigenous populations; availability and increasing costs associated with mining inputs and labour; the speculative nature of mineral exploration and development, including the risks of obtaining necessary licenses and permits and the presence of laws and regulations that may impose restrictions on mining; diminishing quantities of grades of mineral reserves as properties are mined; global financial conditions; challenges to, or difficulty in maintaining, title to properties and continued ownership thereof; the actual results of current exploration activities, conclusions of economic evaluations, and changes in the parameters of the La Colorada Mine to deal with unanticipated economic or other factors; increased competition in the mining industry for properties, equipment, qualified personnel, and their costs; and, with respect to PAS, those factors identified under the caption “Risks related to Pan American’s business” in PAS’ most recent Form 40F and annual information form filed with the United States Securities and Exchange Commission and Canadian provincial securities regulatory authorities. Investors are cautioned against attributing undue certainty or reliance on forward-looking statements. Although PAS has attempted to identify important factors that could cause actual results to differ materially, there may be other factors that cause results not to be as anticipated, estimated, described, or intended. The companies do not intend, and do not assume any obligation, to update these forward-looking statements or information to reflect changes in assumptions or changes in circumstances or any other events affecting such statements or information, other than as required by applicable law.

## 3.0 INTRODUCTION

### 3.1. Purpose and Background

PAS prepared this technical report in compliance with the disclosure requirements of NI 43-101 to support disclosure of the results of mineral resource and mineral reserve estimates at La Colorada. This disclosure includes information from additional mineral resource delineation drilling, updated mineral resource and reserve estimates, updated mine planning, and improved infrastructure. Increases in mineral reserves are due to success in exploration combined with advances in engineering of the mine. Significant improvements in the design of pumping and ventilation now permit safely mining to greater depths, increasing mineral reserves and mine life.

The effective date of this technical report is 31 December, 2012. The drilling cut-off date for mineral resource estimation was 31 December, 2012. The geological, mining, and economic analyses to prepare the mineral resources and mineral reserve estimates was completed as of 31 December 2012. No new material information has become available between these dates and the signature date given on the certificate of the qualified persons. PAS is a silver mining and exploration company listed on the Toronto Stock Exchange (TSX:PAA) and the NASDAQ exchange (NASDAQ:PAAS).

Unless otherwise stated, all units are metric and currencies are expressed in US dollars ($). All tonnages stated in this Technical Report are dry metric tonnes (“dmt”) unless otherwise specified.

### 3.2. Sources of Information

Data, reports, and other information used for the compilation of this Technical Report were obtained from personnel in the PAS offices in Vancouver, British Columbia, the Plata office in Durango, México and from the La Colorada Mine offices in Zacatecas, México. This Technical Report is based on work conducted by PAS geologists, engineers and metallurgists, as well as third party consultants retained by PAS. Specifically, information and data for the mineral resource and mineral reserve estimates were obtained from La Colorada geology department personnel in México and information and data for matters pertaining to metallurgy and processing, cost estimates, environmental and geotechnical investigations, and economic analyses were provided by PAS.

The authors have used the following reports and documents in the preparation of this Technical Report:

Process Research Associates Ltd., Flotation and Cyanidation Study on Samples from La Colorada, May 2000

Lewis Geoscience, Structural Analysis, La Colorada Mine, October 1998

Annual Information Forms, Pan American Silver Corp., 1999 to 2011 inclusive

Pan American Silver Corp., La Colorada Mine Project, Zacatecas, Technical Report, A. Sharp et. al., September 30, 2007

Informe de Visita de Asesoria de Ventilacion, Ing. Ariel H. Orellana Wiarco, November 18-20, 2010

Informe de Visita de Asesoria de Ventilacion, Ing. Ariel H. Orellana Wiarco, December 6-8, 2011

Estudio de calor de mina Candelaria, Ing. Ariel H. Orellana Wiarco, December, 2012

Plan de Restauración y Cierre (PRC), Mina La Colorada, Mpio. De Chalchihuites, Zac. Clifton Associates Ltd., July 2, 2010

Sustainability report, Pan American Silver Corp, Vancouver, BC., 2011

## 3.3. List of Qualified Persons

Table 3 lists the qualified persons and the sections they are responsible for.

Table 3: List of Qualified Persons

| Qualified Person | Section Responsibility |
|---|---|
| Michael Steinmann | 1,2,3,4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 21, 24, 25, 26, 27, 28 |
| Martin Wafforn | 1,2,3,4,14, 16, 17, 18, 19, 20, 22, 23, 26, 27, 28 |

## 3.4. Personal Inspections

Both qualified persons for the preparation of this Technical Report conduct regular site visits to PAS mining operations. Details of the most recent personal inspections are given:

Michael Steinmann last visited the La Colorada mine January 22nd to the 23rd, 2013 to review the 2012 end of year resource estimate. His previous visit was April 28 rd to the 29th 2012 to collect information from planning, geology, safety, and plant personnel and review the exploration programs for 2012. His previous visit was February 24 th to the 25th 2012 to review the 2011 end of year mineral resource and reserve estimates.

Martin Wafforn last visited the La Colorada mine January 22nd to the 23rd, 2013 to review the 2012 end of year reserve estimate. He previously visited September 28th, 2012 to review the mining plans for 2013, operating costs, new mine water pumping installation, ventilation circuit expansion and considered the inclusion of the new exploration results from the Amolillo vein in the life of mine plan. He also visited on July 19th, 2012 to review mining progress in 2012 relative to the mine plan.

# 4.0 RELIANCE ON OTHER EXPERTS

The authors of this Technical Report have not relied upon other experts.

## 5.0 PROPERTY DESCRIPTION AND LOCATION

### 5.1. Property Location

The La Colorada property is located in the Chalchihuites district, Zacatecas State, México, approximately 99 km south of the city of Durango and 156 km north-west of the city of Zacatecas. The La Colorada Mine property general coordinates are longitude 23°22'N and latitude 103°45'W. The La Colorada Mine consists of various mine workings, namely the Candelaria, Campaña, Recompensa and Estrella Mines.

### 5.2. Mineral Tenure

The La Colorada property is comprised of 54 mining claims (7 awaiting title) totalling 8,274.8 ha. The extent of the mineral tenure where the mineral reserves and mineral resources are located and where mining takes place is shown in Figure 2. The claims have been surveyed by a licensed surveyor and filed with Direccion General de Minas government department. Table 4 gives details of each claim, including the title number, total hectares, the annual maintenance cost per hectare, the total annual maintenance cost, and the expiration date of each claim.

Figure 2: La Colorada Mine Concessions

Table 4: Mining Claims

| Claim Name | Title | Hectares | Pesos per Hectare | Total Pesos | Expiration Date |
|---|---|---|---|---|---|
| Unif Victoria Eugenia | 188078 | 286 | 125 | 35,629 | 21/11/2040 |
| Victoria Eugenia I | 204862 | 23 | 125 | 2,909 | 12/05/2047 |
| Victoria Eugenia II | 211166 | 49 | 125 | 6,112 | 10/04/2050 |
| Victoria Eugenia III | 204756 | 1 | 125 | 140 | 24/04/2047 |
| Victoria Eugenia IV | 217627 | 37 | 125 | 4,607 | 05/08/2052 |
| Marieta | 171833 | 9 | 125 | 1,123 | 14/06/2033 |
| Cruz del Sur | 170155 | 11 | 125 | 1,384 | 16/03/2032 |
| Unificacion Canoas | 211969 | 19 | 125 | 2,308 | 15/03/2023 |
| San Cristobal | 170095 | 10 | 125 | 1,247 | 15/03/2023 |
| Ampl de San Cristobal | 170097 | 29 | 125 | 3,633 | 15/03/2023 |
| Unif el Conjuro | 170592 | 45 | 125 | 5,598 | 01/06/2023 |
| Tepozan Segundo | 163260 | 14 | 125 | 1,689 | 03/09/2028 |
| Ampl. Al Tepozan | 182730 | 11 | 125 | 1,345 | 15/08/2038 |
| Victoria 2 | 217628 | 17 | 71 | 1,186 | 05/08/2052 |
| Victoria 3 Fracc A | 217629 | 459 | 71 | 32,557 | 05/08/2052 |
| Victoria 3 Fracc B | 217630 | 14 | 71 | 1,004 | 05/08/2052 |
| El Real | 214498 | 20 | 125 | 2,495 | 01/10/2051 |
| Nueva Era | 214659 | 30 | 125 | 3,707 | 25/10/2051 |
| La Reforma | 218667 | 136 | 71 | 9,610 | 02/12/2052 |
| Platosa | 216290 | 41 | 125 | 5,119 | 29/04/2052 |
| San Francisco | 221728 | 8 | 125 | 967 | 29/01/2048 |
| Victoria 5 | 226310 | 693 | 35 | 24,582 | 05/12/2055 |
| Victoria Eugenia | 211587 | 36 | 125 | 4,501 | 15/06/2050 |
| Sn Fco Fracc 1 | 223953 | 166 | 125 | 20,650 | 14/03/2055 |
| Sn Fco Fracc 2 | 223952 | 3 | 125 | 416 | 14/03/2055 |
| La Cruz | 211085 | 9 | 125 | 1,062 | 30/03/2050 |
| Creston | 213594 | 9 | 125 | 1,123 | 17/05/2051 |
| Escalera Fracc 11 | N/T | 2 | 0 | 0 | - |
| Escalera Fracc 21 | N/T | 3 | 0 | 0 | - |
| Escalera Fracc 31 | N/T | 2 | 0 | 0 | - |
| Escalera Fracc 41 | N/T | 1 | 0 | 0 | - |
| Escalera Fracc 51 | N/T | 7 | 0 | 0 | - |
| Escalera Fracc 61 | N/T | 6 | 0 | 0 | - |
| Escalera Fracc 71 | N/T | 6 | 0 | 0 | - |
| El Real 2 | 228945 | 561 | 18 | 9,889 | 20/02/2057 |

| | | | | | |
|---|---|---|---|---|---|
| Melisa | 217670 | 70 | 71 | 4,931 | 05/08/2052 |
| Lizette | 221172 | 23 | 71 | 1,658 | 02/12/2053 |
| Tres Flores | 229893 | 14 | 18 | 240 | 25/06/2057 |
| Fatima 1 | 233147 | 241 | 18 | 4,250 | 11/12/2058 |
| Fatima | 233977 | 288 | 9 | 2,457 | 12/05/2059 |
| Fatima Fraccion | 234041 | 0 | 9 | 1 | 21/05/2059 |
| Fatima Fraccion 1 | 234042 | 3 | 9 | 30 | 21/05/2059 |
| Fatima Fraccion 2 | 234043 | 1 | 9 | 7 | 21/05/2059 |
| Fatima Fraccion 3 | 234044 | 1 | 9 | 8 | 21/05/2059 |
| Fatima Fraccion 4 | 234045 | 7 | 9 | 60 | 21/05/2059 |
| Fatima Fraccion 5 | 234046 | 3 | 9 | 24 | 21/05/2059 |
| Fatima Fraccion 6 | 234047 | 0 | 9 | 2 | 21/05/2059 |
| Fatima Fraccion 7 | 234048 | 4 | 9 | 34 | 21/05/2059 |
| Jul | 232538 | 25 | 18 | 435 | 25/08/2058 |
| Pan Am | 233733 | 4,333 | 9 | 36,913 | 07/04/2059 |
| Manto 1 | 238175 | 19 | 6 | 111 | 08/08/2061 |
| Manto 2 | 238757 | 1 | 6 | 5 | 24/10/2061 |
| TOTAL | | 7,804 | | 237,759 | |

Note:

1 The Escalera Fracc 1, Escalera Fracc 2, Escalera Fracc 3, Escalera Fracc 4, Escalera Fracc 5, Escalera Fracc 6 and Escalera Fracc 7 claims are awaiting grant of legal title.

5.3. Nature and Extent of Title

The above listed claims, with the exceptions of the Escalera Fracc group of claims, are wholly owned by PAS through its wholly owned subsidiary, Plata. Concessions Escalera Fracc 1, 2, 3, 4, 5, 6 and 7 were staked, however, the Direccion General de Minas (DGM), the department of the Mexican Government which issues concessions, has registered these claims under two different names, as listed above and also as Laurita. The DGM will need to decide which of the two valid claims to cancel. These claims are not material to the La Colorada mineral reserves and mineral resources estimate or the mine operation and the decision either way does not affect the mine operation or the current economics of the mine in any way.

In addition, Plata also has control over approximately 751 ha of surface rights covering the mine workings, namely the Candelaria, Campaña, Recompensa and Estrella Mines, all of which form part of the La Colorada Mine. The concession Unificada Victoria Eugenia contains all of the mineral resources and mineral reserves, most of the mine workings, part of the mine plant, buildings and offices, the San Fermin Mine portal, the Candelaria Mine portal, the Recompensa Mine portal, the Estrella Mine workings, and the El Aguila shaft.

The Veta Dos portal, and some of the mine workings are located on Victoria 2. Victoria 3 Fraccion B also contains some mine workings. The tailings dam and storage area are located on Victoria 5 and Victoria 3 Fraccion A. The remainder of the mine plant, buildings and offices are located on Victoria 3 Fraccion A.

5.4. Royalties

The La Colorada mine is not subject to any royalties, back-in rights, payments or other agreements and encumbrances known to PAS.

5.5. Environmental Liabilities

An Environmental Impact Statement and risk assessment was authorized by the Mexican federal environmental authority in November of 1999. On November 8, 2010 the authorization was renewed for an additional 5 years effective October 22, 2010. To the best of the authors' knowledge, Plata is currently in compliance with all applicable environmental laws. Known environmental liabilities are associated with mining disturbances. The cost of closure of the La Colorada Mine is discussed in section 21.4.

5.6. Permits and Agreements

Foreign Trade Services Department

On September 19, 2005, Plata was designated by the Mexican Ministry of Economy as an "ALTEX", or high level exporting company, and was registered as such with the Mexican Ministry of Economy under Certificate No. 2005/5838. That certificate was last reissued on May 25th, 2012. As an ALTEX, Plata is entitled to carry out importing and exporting activities in relation to its operations and to obtain fiscal benefits and refunds related to such activities.

National Registry of Foreign Investment
To the best of the authors' knowledge, Plata is in compliance with the quarterly and annual filing requirements of this registry.

Federal Labour Delegation
To the best of the authors' knowledge, Plata is in compliance with the requirements of the applicable labour laws of Mexico, and all registrations, as required, for the Federal Labour Delegation, in the State of Zacatecas, have been filed.

Federal Board of Conciliation and Labour Arbitration
To the best of the authors' knowledge, there are no labour lawsuits against Plata.

Real Estate
To the best of the authors' knowledge, title to the concessions held by Plata associated with La Colorada have been registered in the Public Registry of Property of Sombrerete, Zacatecas and are free of any liens or encumbrances.

Ministry of Finance
To the best of the authors' knowledge, all filings with the Mexican Ministry of Finance in respect of income and sales taxes have been made on time and as prescribed.

Mexican Social Security Institute ("IMSS")
To the best of the authors' knowledge, Plata is in compliance with the payment of dues to IMSS in respect of both employer and employee withholdings.

General Management of the Federal Registry of Firearms and Explosives (Secretaria de la Defensa Nacional ("SEDENA")
Plata was granted General Permit (2917-Zacatecas) in 2000 authorizing the purchase, storage and use of explosives subject to Plata continuing to meet permit requirements. This is revalidated on an annual basis; the last permit is effective as of December 31st, 2012. To the best of the authors' knowledge, Plata is in compliance with the monthly reporting requirements of this permit.

Federal Bureau of Environmental Protection (Secretaria de Medio Ambiente y Recursos Naturales: SEMARNAT) and National Ecology Institute (Institutio Nacional de Ecología: Direccion General de Ordenamiento Ecologico e Impacto Ambiental)
Following submission of an environmental impact statement, named the Manifestación de Impacto Ambiental-Modalidad General ("EIS") and environmental risk assessment study, named the Estudio de Riesgo Ambiental Modalidad Análisis de Riesgo, the federal environmental authority granted approval ("the Dictamen") for new project construction under D.O.O.DGOEIA.- 007244 on November 11, 1999. Plata received a second continuation of this permit for a period of 5 year, effective from October 22, 2010.

National Water Commission (Comisión Nacional del Agua: Conagua)

Mining generates tailings, which are materials considered to be potentially hazardous wastes. Plata filed an application to become a hazardous waste generator in January 1999 and the required permit was received March 26, 2001. This permit does not have an expiry but requires regular reporting which is in good standing.

Plata holds a permit (Concesión 03ZAC103761/11EQGE02) dated September 19, 2002, which permits the discharge of waters into the subsurface of the La Colorada property. Pursuant to a new National Waters Law (Ley de Aguas Nacionales), Plata is permitted to make use of waters obtained from the exploitation of a mine without having to apply to the National Water Commission for a permit or authorization.

### 5.7. Significant Factors or Risks

No significant factors or risks which could affect access, title, or the right or ability to perform work on the property are known to PAS.

## 6.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

Information in this section was excerpted and updated from Sharp, et.al. 2007.

### 6.1. Physiography

The physiography of the region is characterized by wide flat valleys and narrow, relatively low mountains ranges and hills. Elevations near the Candelaria, Recompensa and Campaña Mine sites are between 2,100 m and 2,550 m above sea level.

### 6.2. Access

The La Colorada mine is accessed primarily from Durango by a continuously maintained 120 kilometre all-weather, paved, two lane highway (Highway 45) and a 23 kilometre public, all-weather, gravel road. The mine is also accessible from the city of Zacatecas by similar types of roads.

### 6.3. Location and Transport

La Colorada is located in a major silver mining region of Mexico. The cities of Durango and Zacatecas are the major industrial and supply centers for the region. Flights to both cities are scheduled daily from México City and other major commercial and industrial centers in México.

The closest municipality to the La Colorada property is the city of Chalchihuites, which is 16 km northwest of La Colorada Mine, with a population of approximately 1,000.

### 6.4. Climate

The climate is arid to semi-arid and vegetation typically includes mesquite and cactus. The rainy season is from July to September. Table 5 gives the precipitation statistics measured at the local government weather station. Winter temperatures are around freezing at night. The mine operates throughout the entire year.

Table 5: Chalchihuites Rain and Evaporation

| | Averages from 1966 to 2011 in millimetres | | |
|---|---|---|---|
| Month | Max rain in 24 hours | Max rain per month | Evaporation |
| January | 14 | 34 | 135 |
| February | 8 | 33 | 144 |
| March | 3 | 44 | 198 |
| April | 2 | 15 | 214 |
| May | 14 | 30 | 231 |
| June | 71 | 74 | 173 |
| July | 133 | 105 | 129 |
| August | 141 | 56 | 140 |
| September | 98 | 74 | 107 |
| October | 31 | 44 | 135 |
| November | 12 | 33 | 114 |
| December | 14 | 25 | 133 |

6.5. Local Resources and Infrastructure

The La Colorada mine surface infrastructure is located on PAS owned land. No additional surface rights are anticipated being required over the life of the mine.

La Colorada has agreements in place with the national power utility, Comisión Federal de Electricidad (CFE), for the supply of 12.5 megawatts (MW) of power, an amount sufficient for the current operating plans. Electrical power is brought to the mine substation from the national power grid at 34.5 kilovolts (kV). A second, independent 34.5 kV transmission line was brought to the mine in 2007 to meet increasing ventilation and dewatering demands and address power outages that resulted in part due to reliance on a single transmission line. Power is stepped down to 13.2 kV at the mine for distribution.

The mine also maintains three 1.2 MW diesel generators onsite to provide backup power for mine dewatering pumps during power outages. The reliability of power supplied by the national grid improved significantly with the second 34.5 kV line and the need for site generated power is minimal at this time.

La Colorada operates two separate tailings storage facilities (“TSF”). Both TSFs are permitted and lined. Construction of the initial TSF was completed in June 2003. This facility has been expanded several times since initial construction: Lift 6 of the TSF was completed in 2008; earthworks for Lift 7 were initiated at the end of 2012. Lift 7 is the final stage for this facility due to site constraints. Lift 7 is expected to be used exclusively for oxide ore tailings going forward and is anticipated to provide storage capacity for approximately three years. The second TSF was brought online in 2011. This facility is located near the initial TSF in an area that will allow expansion to provide sufficient storage capacity for current mineral reserves.

Waste disposal is not necessary as 100% of waste rock is used as backfill material for the cut and fill stope mining.

Water for the mining operation is supplied from the underground mine dewatering. As permitted by Mexican law, underground water is pumped to the surface and stored in head tanks for use in the milling process and for domestic services. Underground water is also pumped to a water treatment plant, which was constructed in 2002 and upgraded in 2008, to provide potable water. The current water supply is adequate for existing and planned future requirements of the mine.

A long history of silver mining in Zacatecas State has resulted in an experienced workforce in the region. La Colorada also has a camp on site to house 302 workers and provides daily transport locally for employees.

## 7.0 HISTORY

The production history of the Chalchihuites district began during pre-colonial times when indigenous people produced silver and malachite. The village of Chalchihuites was founded during the 16th century Spanish colonization, and intermittent exploitation of the mineral deposits in the area commenced. By the 19th century, the Spanish mines were operating continuously and important silver production was recorded. The Mexican War of Independence curtailed production from this and many other silver producing areas between 1910 and 1920.

### 7.1. Prior Ownership

The La Colorada claims have changed hands several times, often with several companies owning different claims that now form the La Colorada mine:

1925 Dorado Family
1929 Candelaria y Canoas S.A. (“Candelaria Co.”), a subsidiary of Fresnillo S.A.,
1935 La Campaña de Industrias Peñoles
1949 Compañía Minas Victoria Eugenia S.A. de C.V. (“Eugenia”)
1994 Minas La Colorada S.A. de C.V. (“Minas”)
1997 Under option to Plata, the wholly owned subsidiary of PAS
1998 Plata, the wholly owned subsidiary of PAS

### 7.2. Historic Exploration

Exploration prior to PAS’ ownership consisted of 131 diamond drill holes for a total of 8,665 m completed by Minas. Historical exploration was in the form of development drifting on vein followed by exploitation. This work was successful to identify the structures but was limiting in estimating mineral reserves and mineral resources. The lack of information ahead of mining made mine planning risky.

Only four historic holes for which PAS had core available for reassay were used in Mineral Resource and Mineral Reserve estimation.

7.3. Historic Production

Historic production of the Chalchihuites district is believed to be on the order of 30 million ounces of silver and 39,000 ounces of gold. The relative distribution of metal by ore type is given in Table 6.

Table 6: Chalchihuites Historic Production

| Ore type | Mt | Au (ppm) | Ag (ppm) | Pb (%) | Zn (%) |
|---|---|---|---|---|---|
| Veins | 1.0 | 0.6 | 600 | 1.5 | 1.5 |
| Breccia | 2.0 | 0.3 | 150 | 3.0 | 3.0 |

8.0 GEOLOGICAL SETTING AND MINERALIZATION

Information in this section was excerpted and updated from Sharp, et.al. 2007.

8.1. Regional and Local Geology

The La Colorada property is located on the eastern flanks of the Sierra Madre Occidental at the contact between the Lower Volcanic Complex and the Upper Volcanic Supergroup. The La Colorada property lays 16 km southeast of Chalchihuites and 30 km south-southwest of Sombrerete, two mining camps with significant silver and base metal production from veins and associated skarn deposits.

The oldest rocks exposed in the mine area are Cretaceous carbonates and calcareous clastic rocks of the Cuesta del Cura and Indidura formations. Overlying the calcareous rocks is a conglomerate unit containing clasts derived mostly from the subadjacent sedimentary rocks. In the Chalchihuites district this unit is called the Ahuichila Formation and is of Early Tertiary age. Figure 3 is the chronological order of geological events at La Colorada Mine.

Most of the outcrop in the mine area is represented by intermediate to felsic volcanic rocks (dacites) of the regional Lower Volcanic Complex. There are several subgroups within this unit, including plagioclase porphyry, crystal to crystal-lapilli tuffs, and volcanic breccias. Generally these sub-units are too small or inconsistent to be mapped.

The stratigraphically highest rock unit in the mine area are felsic tuffs within the Upper Volcanic Sequence. These tuffs unconformably overlie the dacite along the southern property boundary and are distinctly maroon coloured and show varying degrees of welding.

Thirteen breccia pipes have been mapped at surface or in underground workings. All of the pipes are located along or to the south of the HW and NC2 vein complexes. The pipes are round to ovoid in shape, up to 100 m in diameter, and can extend vertically more than 400 m below the surface. The breccias contain clasts of limestone and dacite (often mineralized) in an altered dacite matrix. Clasts of vein material have been found in the breccias suggesting that they postdate the vein emplacement.

The structures present at La Colorada represent a deformational sequence comprising at least three significant events, including Laramide folding and faulting, post-Laramide east to northeast trending faulting, and regional tilting events.

Figure 3: Chronology of Geological Events at La Colorada

Regional deformation during the Laramide Orogeny, which occurred between 80 and 35 million years ago, is expressed by the widespread development of folds and contractional faults within the Cretaceous-aged stratified sequence. These units show an abundance of folds and faults cutting shallowly to steeply across bedding where the rock units are exposed in the western portion of the La Colorada property and in the underground workings.

East to northeast striking faults form the dominant structures in the project area and play a strong role in local mineralization. Most of these faults dip moderately to steeply to the south and juxtapose younger hangingwall strata against older footwall rocks. Evidence suggests down-dip motion on these faults; however, most of the faults have been reactivated at some point, making the movement direction during the initial formation uncertain. Stratigraphic contacts are displaced from ten to over a hundred metres lower on down dropped blocks.

The dacite unit displays an eastward tilting that may reflect displacements on regional, orogen-parallel structures outside of the project area. This tilting probably reflects the final episode of deformation. The structural model for La Colorada, in which the mineralization and alteration occurred, is a low horizontal stress tectonic setting. In this regime, the four pre-existing steeply dipping structures were favourably orientated for re-activation and subsequent emplacement of mineralizing hydrothermal fluids. The dominantly eastern strike of the veins indicates slightly greater extension in a northerly direction. The north and north-easterly dipping faults accommodated mostly transverse movement associated with the dilation of the steeply dipping, easterly striking structures.

## 8.2. MINERALIZED ZONES

There are four dominant styles of mineralization at La Colorada, including breccia pipes, vein-hosted mineralization, replacement mantos within limestone, and deeper seated transitional mineralization.

Mineralization in the breccia pipes generally has lower silver values and elevated base metal values. The majority of the Campaña Breccia was historically bulk mined with reported grades of 80 ppm Ag and 5% combined Pb and Zn. Mineralization is associated with intense silicification and occurs as disseminated galena and sphalerite with minor chalcopyrite and bornite. Sulphides are found in both the clasts and the matrix. These breccia pipes do not form part of the estimated mineral reserves or mineral resources.

Most mineralized veins on the property strike east to northeast and dip moderately to steeply to the south. Veins occur in the dacite and limestone units and cut across the bedding and contacts with little change in the width or grades of the vein. Mineralized widths in the veins are generally less than 2 m, but may be significantly wider. The HW corridor strikes east-west, dips moderately to the south, with average widths up to 15 m, but most of the economic mineralization is located in quartz veins which are on average 1 to 2 m wide. In some cases the vein fillings consist of quartz, calcite, and locally barite and rhodochrosite. Where the veins are unoxidized, galena, sphalerite, pyrite, native silver and silver sulfosalts are present. The major mineralized veins are strongly brecciated and locally oxidized, obscuring original textural features. Less deformed veins show mineralogical layering, crystal-lined open vugs, and hydrofracture vein breccias, indicating typical multi-stage growth.

The depth to the surface and the permeability of the mineralized zone control the level of oxidation in the veins. These factors result in an uneven, but generally well-defined reduction oxidation (redox) boundary.

Manto style mineralization is found near vein contacts where the primary host rock is limestone. This style of mineralization was mined at Recompensa and can also be seen in areas of the Candelaria Mine.

The deep seated transition mineralization, also known as NC2 Deep, consists of both vein type mineralization and more diffuse stockwork and breccia zones. Lewis ( 1998) theorized that there are seven distinct zones within the transitional zone, and these can be sub-grouped into three main categories:

- vein mineralization, including the down dip extension of HW and NC2 and veins in the hangingwall and footwall of both;
- a peripheral stockwork vein zone that envelopes the NC2 structure; and
- sub-horizontal mantos-like stockwork zones in the NC2 hangingwall.

Deep drilling in 2009 and 2012 has defined a restricted manto replacement body at the 1000 m level and remains open to depth. This new body has low precious metal (Ag-Au grades) and higher base metal (Pb-Zn grades). It is adjacent to the known vein system which continues at that depth.

Figure 4 is a geological map showing the main mineralized structures.

Figure 4: Site Geology with Main Mineralized Structures

Candelaria System
HW vein and HW corridor – The average orientation is 60°/075°. The HW vein is a one to two metre thick vein which transitions from oxide ore to sulphide ore at various depths along strike. This structure is cut by the Candelaria breccia at the east, but does continue on the other side. The strike length is over 1.1 km where it exits the La Colorada claims package. Mineral reserves are estimated down to the 700 level. Mineral resources are estimated to the west and inferred material below the 600 level.

The HW corridor consists of four additional structures. Two structures are brecciated-altered zones in the hangingwall of the HW vein, named the HW-footwall and HW-hangingwall. The other two structures of the footwall side are named FW and Intermedia 3, which are controlled by a broad mineralized shear in limestone containing one or more quartz veins parallel to the orientation of the shear. The majority of the silver mineralization in these structures is found in the quartz veins which average 2 m width at medium grades and widen up to 7 m at the intersections with the HW vein.

NC2 and splits – The average orientation 60°/135°. NC2 is a 1 to 7 m wide sulphide vein that contains a large part of the current sulphide resources. It has a strike length of over 900 m where it is cut by a trachyte dyke. 2012 drilling and drifting have confirmed its continuation in both width and grade on the other side of the dyke where it remains open to the east. NC2 is developed down to the 468 level and has been drilled to below the 600 level where inferred mineral resources have been estimated.

NC1, NC4, NC5, NC6, Intermedia 1 and Intermedia 2 are narrow (1.0 to 1.50 m) splits from vein NC2. They are formed due to extensional fracturing on the east side of the mine. They average in strike length between 50 to 140 m. Estimated mineral reserves are located between the 405 and 528 level.

NC3 – Average orientation 80°/175°. NC3 is a narrow (0.80 to 1.0 m average width), high grade split from NC2 vein to the southwest with a strike length of 200 m. It is currently developed below the 468 level. Estimated mineral reserves are located between the 320 and 528 levels with inferred mineral resources below the 528 level.

4235 – Average orientation 65°/165°. 4235 is approximately 1 m wide split of the NC3 vein with 140 m of strike length which dips in the opposite direction to the major veins. It has been exposed by development on the 295 level, recently developed on the 408 level and contains a small amount of mineral reserves.

Santa Juana – Average orientation 60°/145°. Part of the extensional fractures system between HW-NC2 and Amolillo vein, this vein has an average of 1 m width with a strike length from 200 m. This structure holds a small quantity of oxide mineral resources.

Veta 2 – Average orientation 60°/132°. A split on the south side of NC2, it has an average width of 1 m and a strike length from 300 m. This structure contains estimated oxide and sulphide mineral reserves between the 200 and 240 levels and mineral resources below the 240 level.

La Libertad – Average orientation 60°/160°. A parallels structure to the HW vein located 500 m to the south with an average width of 1.0 to 1.5 m and strike length of 400 m. This vein has small old mine workings near surface. It contains estimated inferred mineral resources.

San Fermin – Average orientation 65°/160° dip. San Fermin is a breccia at the junction of Santa Juana, San Juan and HW structures. It is sub-parallel to the HW vein, with an average width of 11 m and a strike length from 130 m.

Amolillo System
Amolillo – Average orientation 59°/150°. Amolillo is an oxide vein transitioning to sulfide ore at depth. It is located 500 m north of the NC2 and HW vein complex and to the east (approximately along strike) of the Recompensa vein with an average width of 1.5 m and strike of 900 m. The vein lies mostly within dacite host rock transitioning into limestone hosted at depth. Significant drilling was completed in 2012 and as a result a significant increase in the estimated mineral resource and mineral reserves.

Recompensa – Average orientation 75°/355°. Recompensa is a combination of vein and manto mineralization located more than 1 km northwest of the NC2 and HW vein complex. The vein mineralization is narrow (less than 1 m and averages 1.8 m for the economic zone). Recompensa contains a minor amount of oxide but mostly sulphide material.

Erika Vein – Average orientation 85°/350°. Erika is a hangingwall split from the Recompensa vein and narrow (less than 1 m and averages 1.0 m for the economic zone). It contains only sulphide material.

## 9.0 DEPOSIT TYPES

La Colorada represents a typical epithermal silver/gold deposit, with a transition in the lower reaches of the deposit to a more base metal predominant system. The geological model used for exploration as

well as the mineral resource estimation is that of an epithermal vein deposit. A local analogy of this type of deposit is the San Martin Mine, where earlier in the mine life epithermal veins were mined and now the mine production comes from skarn mineralization hosted by the same limestone unit found in La Colorada Mine.

Deep drilling completed in 2012 confirmed the current vein structures containing similar grades down to 1500 m elevation (above sea), approximately 1,000m below surface. Skarn mineralization or indications of skarn mineralization have not yet been encountered. Further study is required to confirm the possibility of skarn mineralization or alteration at depth.

## 10.0 EXPLORATION

The La Colorada mine had been mined for several decades prior to any specific exploration work. During that time most major structures became known by mine development. The production mapping and sampling data were used by mine geologist to design the diamond drilling programs which comprises the bulk of the Plata exploration programs since 1997. For those reasons there have been little surface sampling or geophysics and other surveys.

### 10.1. Surveys

During the September 1997 to March 1998 exploration program a geophysical survey was conducted by Plata as part of the project evaluation. The survey comprised orientation surveys using in-house very low frequency (VLF) capacity and induced polarization (IP) techniques. The results of both techniques were believed to be successful and included in the interpretation of mineralized structures.

### 10.2. Channel Sampling

Channel sampling is performed in all ore development workings and stopes. That information is used for ore control purposes and to collect close spaced data for mineral resource estimation. Channel sampling is performed every 3 m in development headings and every 5 m in stopes by sampling crews under the supervision of the section mine geologist.

The procedure is to measure the distance from a survey station where the samples are to be taken. Two parallel lines perpendicular to the structure is marked across the back or roof. Those line are separated into individual sample width, usually at the lithological contacts, and marked with short paint lines. Vein and wall rock are sampled separately. The sampler uses a hammer and chisel to take a representative, approximately 2 kg sample, across the marked location. Samples are taken regardless of expected grade. A sample tag is inserted into the sample bag and the bag is closed to prevent contamination.

### 10.3. Sampling Results

The channel sample data is used to reconcile the mineral reserve to mined ore on a monthly basis. The results of these reconciliations are usually within ±5%. The channel sample results are also used to predict mill feed grade, reconciled to the plant head grade monthly, and are usually in the ±2% range. Reconciliation results since 2010 are listed in Table 7.

Channel sample results are used, either on their own or in conjunction with diamond drill results for estimation of proven and probable mineral reserves or measured and indicated mineral resources.

Table 7: Reconciliation by Year

| | Reserve | | Mined | | Plant | |
|---|---|---|---|---|---|---|
| Year | tonnes | Ag (ppm) | tonnes | Ag (ppm) | tonnes | Ag (ppm) |
| 2010 | 346,898 | 395 | 346,898 | 406 | 345,697 | 379 |
| 2011 | 382,046 | 368 | 402,745 | 385 | 404,533 | 369 |
| 2012 | 396,542 | 356 | 420,163 | 376 | 417,957 | 370 |

## 11.0 DRILLING

### 11.1. Diamond Drilling

All drilling at La Colorada is diamond core drilling. Drilling is performed using industry standard wire line method from both surface and underground types. The work is performed by either company employees with a company owned drill or by specialized drilling contractors. All diamond drilling is performed under the supervision of the La Colorada mine geology department.

The only drilling done prior to PAS were 14 holes completed by Minas in 1997. Of those only four holes, which were re-assayed by PAS, were used in the mineral resource and mineral reserve estimate.

PAS' initial program was from September 1997 to March 1998 while the property was under option from Minas. Drilling completed during that program included 2,039 m of underground core drilling, and 3,953 m of surface core drilling. Based on the results of this program the decision to acquire the property was made.

Since that first program PAS has used diamond drilling for exploration purposes. From 2007 to present, the objectives of the annual drilling programs are: to test potential at wide spacing and estimate inferred mineral resources, followed by infilling at tighter spacing to increase confidence allowing an upgrade to indicated and measured mineral resources. The measured and indicated mineral resources could then be converted to mineral reserves should they be economically minable.

Under PAS' management, as of 31 December, 2012, a total of 172,570 m have been drilled. Between 1997 and September 2007, PAS drilled 154, NQ sized holes from surface and 225 holes from underground. Underground holes were drilled BQ size until 2000 when drilling in the HW corridor was changed to HQ size to improve core recovery. From 2008 to present the surface hole size has been increased to HQ and underground to HQ, NQ and BQ sizes depending on location and/or depth of the holes. Table 8 list the drill campaigns by year as surface drilling, underground drilling and total in both hole count and metres.

Table 8: List of Drilling Campaigns by Year

| Year | Surface Drilling | | Underground Drilling | | Total Drilling | |
|---|---|---|---|---|---|---|
| | # of Holes | Metres | # of Holes | Metres | # of Holes | Metres |
| 19971 | 6 | 1,026 | 8 | 1,477 | 14 | 2,503 |
| 1998 | 28 | 8,026 | 28 | 7,853 | 56 | 15,879 |
| 1999 | 11 | 2,650 | 49 | 5,104 | 60 | 7,754 |
| 2000 | | | 42 | 5,228 | 42 | 5,228 |
| 2002 | 4 | 963 | | | 4 | 963 |
| 2005 | 17 | 2,380 | | | 17 | 2,380 |
| 2006 | 46 | 7,446 | 20 | 1,437 | 66 | 8,883 |
| 2007 | 33 | 4,608 | 61 | 5,056 | 94 | 9,664 |
| 2008 | 50 | 4,481 | 85 | 11,187 | 135 | 15,668 |
| 2009 | 27 | 4,564 | 102 | 13,522 | 129 | 18,086 |
| 2010 | 12 | 5,527 | 109 | 17,515 | 121 | 23,042 |
| 2011 | 22 | 8,921 | 82 | 13,902 | 104 | 22,822 |
| 20122 | 43 | 20,535 | 98 | 19,163 | 141 | 39,698 |
| Total | 299 | 71,127 | 684 | 101,443 | 983 | 172,570 |

Notes: 1 These holes were drilled prior to PAS acquiring ownership of the La Colorada property.

11.2. Accuracy and Reliability

There were some problems of core recovery for underground drilling in the HW corridor prior to 2000 which was rectified by increasing the drilling core size from BQ to HQ. That change improved both core recovery and core quality. The sample data is considered by the author to be acceptable for mineral resource and mineral reserve estimation purposes. Available core recovery records begin in 2006 and are stated by year in Table 9.

Table 9: Core Recovery by Year

| Year | Core Recovery |
|---|---|
| 2006 | 93% |
| 2007 | 93% |
| 2008 | 90% |
| 2009 | 89% |
| 2010 | 94% |
| 2011 | 93% |

2012 96%

11.3. Author's Opinion

In the opinion of the authors of this Technical Report the samples are of an acceptable quality for mineral resource and mineral reserve estimation. To the best of the authors' knowledge, core recovery issues were rectified and the number and location of the affected holes are not material to the current mineral resource and mineral reserve estimate.

## 12.0 SAMPLE PREPARATION, ANALYSIS AND SECURITY

Channel samples taken underground and core samples drilled either underground or from surface rigs are both used in mineral resource and mineral reserve estimation. Sample from underground are brought directly from one of the portals to the on-site laboratory. Core samples come from the core shack, which is fenced and locked when there are no geology department employees present.

Upon being transferred to the laboratory a work order accompanies the samples. The work order is signed by a geology representative and, upon reception and verification of the samples, signed by the laboratory representative with two copies staying at the laboratory and the original being returned to the geology department.

Results are safeguarded using a secure database for which each user has only the access he or she requires. The geology database is directly linked to the laboratory information management system (LIMS) eliminating the need to manually enter or import the results. The samples are also labeled with bar codes which are read at regular points from reception of the sample through to the final result within the laboratory.

### 12.1. Sample Collection

Drill Core

The core is brought to the surface core shack and cleaned prior to logging by a geologist using industry standard methods. The geologist marks the beginning and end of the samples to be taken with a china marker. Each core box is photographed, with a sign identifying the hole number, box number and the from and to depth of the core within the box. The digital photos are stored on the network drive for future reference.

Trained staff then cut the core of the marked samples in half using a diamond blade equipped saw. One half of the core is placed in a sample bag, and the other half is returned to the core box and stored in the core library. A two piece sample tag with bar code is filled out with information relevant to the sample. One half of the tag is inserted in the sample bag with the half core and the other section is used for scanning into the geology database. The samples are transported to the laboratory at the end of each shift or as needed during the shift. The core shack area is enclosed by a chain link fence and locked when no geology staff are present.

Channel Samples

The channel location is measured from a survey point. Two parallel lines are painted perpendicular to the structure strike, across the width of the drift or stope. The width from the left wall to the right wall is separated into individual samples based on lithology. One member of the sampling team holds the bag to catch the sample while the other takes the sample with a hammer and chisel. A two part sample tag is filled with relevant information with one half going in the sample bag and the other half brought to the office to be scanned into the geology database. The samples are transported from underground directly to the laboratory.

12.2. Laboratory

All samples are prepared and analysed at the La Colorada mine laboratory which is not a certified laboratory. The steps followed at the laboratory for each sample are as follows:

The samples are received at the laboratory with a corresponding work order signed by a geology employee. The work order lists the samples sent and the analysis to be completed. The laboratory representative signs the work order confirming receipt of the samples.

The samples are logged into laboratory information management system (LIMS) using a bar code reader.

The sample bags are emptied into a clean drying pan, and sample dried in a 110°C to 120°C oven for one hour.

The dried sample are crushed to -1/4 inch using a jaw crusher followed by a cone crusher.

A 300 g portion of the sample is taken using a Jones Splitter, which is then pulverised to 80% at -200 mesh (-0.075mm) and placed in an envelope for transfer out of the sample preparation area.

10 g of pulverized material from each sample is weighed and fire assayed with gravity finish for gold and silver.

100 mg sample is taken for acid digestion with atomic absorption finish for base metals (Pb, Zn, Cu, Fe, Mn).

The remaining pulverised material is returned to the geology department. They are stored and used as needed for quality control purposes.

All instruments, including scales and the atomic absorption spectrometer, are linked to LIMS eliminating manual data entry. The LIMS database transfers the results directly to the geology database.

External laboratories, at this time, are used for check assaying pulps as part of the QA/QC program. In the past the following laboratories were used for analysing exploration samples:

ITS Bondar Clegg, 130 Pemberton Ave., North Vancouver, BC, Canada. This laboratory is registered to ISO 9001: 2000 for the “provision of assay and geochemical analytical services” by QMI Quality Registers. This laboratory has also received ISO 17025 accreditation from the Standards Council of Canada. This laboratory was acquired by ALS Chemex on December 01, 2001.

ALS Chemex, 212 Brooksbank Ave., North Vancouver, BC, Canada. This laboratory is registered to ISO 9001: 2000 for the “provision of assay and geochemical analytical services” by QMI Quality Registers. This laboratory has also received ISO 17025 accreditation from the Standards Council of Canada.

Luismin Laboratories, De Selenio y Aluminio, Cd Industrial Durango, Durango, México. Prior to 2003 Luismin laboratory was certified under ISO 9000. In February, 2006 the laboratory was acquired by SGS SA and operates as SGS de México S.A. de C.V. Laboratorio de Durango. The laboratory is currently in the process of re-certification.

ALS Chemex de México, Ignacio Salazar 688, Hermosillo, Sonora, México. This laboratory is used for sample preparation with prepared samples sent to the ALS Chemex laboratory in North Vancouver, British Columbia, Canada. This laboratory is registered to ISO 9001: 2000 for the "provision of assay and geochemical analytical services".

ALS Guadalajara, Francisco Silva Romero 1140 San Carlos Guadalajara Jalisco 44460 Mexico. This laboratory is registered to ISO 9001: 2000 for the "provision of assay and geochemical analytical services".

12.3. Quality Assurance / Quality Control (QA/QC)

The La Colorada mine geology department conducts a QA/QC program that is independent from the laboratory. The program includes insertion of standards and blanks, and pulp checks with an external laboratory.

The standard results are reviewed daily by the onsite geologist and presented in graphs showing warning lines at 2 standard deviations and action line at 3 standard deviations. . The QA/QC results are reviewed monthly by Michael Steinmann P.Geo. The graphs in Figure 5 are the results of the oxide and sulphide standards analysis which demonstrate acceptable accuracy of the mine laboratory for silver analysis. Figure 6 is a graph of the pulp checks with an external laboratory showing acceptable precision for silver analysis.

Figure 5: QA/QC Standard Results

Figure 6: La Colorada Laboratory Vs ALS Checks Samples

## 12.4. Author's Opinion

It is the author's opinion that the sample preparation, analysis, and security are to industry standard. Further the results of the QA/QC program demonstrate that the laboratory repeatability and accuracy is acceptable for mineral resource and mineral reserve estimation.

# 13.0 DATA VERIFICATION

The La Colorada geology database was audited by an external independent consultant, over several site visits, who was contracted by the authors of this technical report. Only minor transcription errors were found. Any discrepancies in the data were verified with the original core logs or channel sample records and corrected.

The database software has built in validation tools that are used regularly along with visual verifications on plans and sections. Assay data is transferred directly from LIMS to the geology database eliminating possible errors from manual data entry.

It is the authors' opinion that the data quality and reliability is to industry standard and sufficient for use in mineral resource and mineral reserve estimation and mine planning.

## 14.0 MINERAL PROCESSING AND METALLURGICAL TESTING

### 14.1. Mineral Processing

Two distinct types of ore are being treated at the La Colorada mine, oxide ore and sulphide ore. Bench scale metallurgical testing and full-scale plant operations have determined optimum processing methods of cyanidation for the oxide ore and selective lead/zinc sulphide flotation for the sulphide ore. Table 10 illustrates the metal recovery estimates and the predicted head grades for La Colorada life of mine ("LOM") plan based on metal recoveries achieved in previous years and confirmed by bench scale metallurgical testing.

Table 10: Predicted Metal Recoveries

| | | 2013 – 2024 Projected Plant Recoveries |
|---|---|---|
| Sulphide Plant | Silver Rec. % | 92.5% |
| | Gold Rec. % | 71.9% |
| | Pb Rec. % | 84.4% |
| | Zn Rec. % | 81.6% |
| Oxide Plant | Silver Rec. % | 81.4% |
| | Gold Rec. % | 68.4% |

Historical Plant Performance
Table 11 and Table 12 show the actual metal recoveries and actual grades achieved in the process plant during 2008, 2009, 2010, 2011 and 2012. In 2012, 93.2% of the contained silver was recovered from the sulphide plant in concentrate and 82.4% of the contained silver was recovered from the oxide plant in Doré.

Table 11: Metal Recoveries Achieved 2008 - 2012

| | | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|
| Sulphide Plant | Tonnes | 166,076 | 151,334 | 180,265 | 235,181 | 263,867 |
| | Silver Rec. % | 92.2% | 91.2% | 92.2% | 93.0% | 93.2% |
| | Gold Rec. % | 68.4% | 76.2% | 73.4% | 73.6% | 70.1% |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Pb Rec. % | 77.1% | 83.4% | 83.3% | 86.0% | 85.6% |
| | Zn Rec. % | 67.8% | 71.2% | 77.8% | 80.6% | 82.1% |
| | Tonnes | 211,768 | 173,582 | 165,432 | 169,352 | 155,724 |
| Oxide Plant | Silver Rec. % | 81.8% | 81.9% | 83.1% | 83.5% | 82.4% |
| | Gold Rec. % | 77.2% | 76.9% | 75.1% | 73.1% | 69.1% |

Table 12: Achieved Head Grades 2008 - 2012

| | | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|
| Sulphide Plant | Tonnes | 166,076 | 151,334 | 180,265 | 235,181 | 263,867 |
| | Silver ppm | 397 | 414 | 390 | 400 | 397 |
| | Gold ppm | 0.43 | 1.22 | 0.68 | 0.45 | 0.41 |
| | Lead % | 0.79% | 0.96% | 0.91% | 0.12% | 1.26% |
| | Zinc % | 1.61% | 2.14% | 0.21% | 2.36% | 2.61% |
| Oxide Plant | Tonnes | 211,768 | 173,582 | 165,432 | 169,352 | 155,724 |
| | Silver ppm | 351 | 357 | 366 | 326 | 333 |
| | Gold ppm | 0.42 | 0.47 | 0.35 | 0.41 | 0.39 |

14.2. Laboratory Analysis

The metallurgical balance requires metal concentration information from the feed material, the final product, tailings and at various sampling points throughout the process. Two distinct analytical processes are used to determine those values. Head and tails grade analysis uses the procedure outlines in section 12.2 while slurry samples are analyzed as described below.

Slurry samples from the plant are received at the laboratory as solids suspended in solution. Those samples are taken to be representative and considered to be of good quality. Both the solids and the liquid contain metal concentrations and must both be analyzed independently. A rotary wet splitter is used to separate the solids from the liquids. The decanted solution is then analyzed using a lead boat or Chiddy method with atomic absorption (“AA”) finish for gold. Silver concentrations are high enough for analysis directly by AA. The solids are filtered, rinsed with neutral water, dried, and then fire assayed with gravimetric finish.

Base metals analysis for ore material is performed by acid digestion with AA finish. Analysis of base metals in the concentrates is be done by volumetric titration due to the high base metal grades.

Doré and concentrate samples are taken by drilling and auguring respectively. The samples are handled as described in section 12.2.

14.3. 2012 Metallurgical Test Results

Table 13 and Table 14 shows the metallurgical testing results conducted with composite samples that are representative of the life of mine plan (LOM). Testwork was conducted at the metallurgical laboratory of the La Colorada mine under typical conditions.

Table 13: Metallurgical Test Work Results 2012

| | | |
|---|---|---|
| | Silver Rec. % | 92.8% |
| Sulphide Ore | | |

| | | |
|---|---|---|
| | Gold Rec. % | 70.8% |
| | Pb Rec. % | 86.9% |
| | Zn Rec. % | 87.4% |
| Oxide Plant | Silver Rec. % | 80.6% |
| | Gold Rec. % | 76.3% |

Table 14: Composited Metallurgical Test Sample Grades 2012

| | | |
|---|---|---|
| Sulphide Plant | Silver ppm | 415 |
| | Gold ppm | 0.37 |
| | Lead % | 2.53% |
| | Zinc % | 4.75% |
| Oxide Plant | Silver ppm | 353 |
| | Gold ppm | 0.41 |

14.4. Metallurgical Testing

The metallurgical assumptions used for the economic analysis in this Technical Report are based on historic plant performance and confirmed by metallurgical bench scale testing of samples collected to represent the LOM planned feed. Bench scale metallurgical testing and full-scale plant operations have determined the optimum processing methods are cyanidation for oxide ore and selective lead/zinc sulphide flotation for sulphide ore at the La Colorada Mine. Projected future metal recoveries in the LOM plan are based on historic recoveries and confirmed by metallurgical testing conducted at La Colorada metallurgical laboratory. Historic metallurgical testwork was described by Sharp, et.al. 2007, and is summarized here in chronological order.

1999 Testwork

During 1999, metallurgical testwork is reported to be concentrated on flotation and cyanidation leach testing. Fresh samples of vein material were obtained from the 295 level drift and from diamond drill intercepts for both the oxide and sulphide ore types. These samples were representative of the mineralogy of the two ore types, namely sulphide ore and oxide ore.

Selective flotation tests were conducted by Process Research Associates Ltd. (“PRA”) on both ore types, as well as gravity plus cyanidation tests for the oxide ore.

Cyanide leach testing was conducted on oxide ore from a narrow zone above the 295 level drift. The grind used for the test was approximately 80% minus 70 micron. Silver recovery after 96 hours leaching was 92.7% from a head grade of 649 ppm of Ag. Gold recovery after 96 hour leaching was 89.5% from a head grade of 1.64 ppm of Au.

The sulphide ore test floated a clean bulk Ag-Pb concentrate with relatively high recoveries. Initially the production of a zinc concentrate in the test resulted in depressing the zinc, which reported to the lead concentrate. This problem was improved by additional tests with collectors. It was shown that flotation recovery and mineralogical conduct are affected by grind size and reagent use. With those test results the projected sulphide ore metal recoveries from the combined lead and zinc concentrates were 91.25% Ag and 85.8% Au, the Pb recovery of 85% in the lead concentrate, and Zn recovery of 80% in the zinc concentrate.

Bond work index tests were run for both oxide and sulphide ores from narrow veins. Results ranged from 15.9 to 20.0 kilowatt hours per tonne, with the majority of samples needing approximately 18

kilowatt hours per tonne. All flotation testwork after the initial scoping tests were conducted with a grind of 80% minus 74 micron targeted.

2000 Testwork
Testwork in 2000 was conducted by PRA in Vancouver, BC, Canada, on the NCP corridor drill core samples (Process Research Associates, May 2000). The work consisted of locked cycle bottle roll tests starting with flotation followed by cyanidation.

Six drill holes were shipped to PRA's Vancouver facilities for testing consisting of drill holes PIC 35, 36, 37, 39, 40 and 41. All samples, except PIC 35, were complete mineralized intercepts. The drill holes were characterized geologically to represent material that ranged from mostly oxide to mixed oxide and sulphide mineralization.

Locked cycle bottle roll cyanidation testing results after 96 hours leaching were 83.8% recovery from a head grade of 266 ppm for silver, 69.5% recovery from a head grade of 0.40 ppm for gold from the oxide sample, 79.9% recovery from a head grade of 658 ppm for silver, and 69.0% recovery from a head grade of 0.70 ppm gold from the mixed sample.

Flotation testwork was conducted on each drill core samples and also on both composite samples. The oxide and mixed ore composites were subjected to separate flotation test for lead and zinc concentrates. Results from flotation of both the oxide and mixed samples were poor, especially the oxide samples. Silver recoveries in combined lead concentrate and zinc concentrate were 15.7% and 76.7% for the oxide and mixed sample respectively. These results confirm that the preferred method for treatment of oxide ore is cyanidation.

Pre-operational Oxide Plant Bench Scale Testing
Bench scale metallurgical test-work conducted prior to the commissioning of the oxide cyanidation plant in mid-2003 was completed at the La Colorada metallurgical laboratory and two independent commercial laboratories averaging 84.4% Ag recovery and 82.5% Au recovery.

2012 Testwork
Additional testing has been conducted on-site with samples representing the LOM planned feed. The samples used were the laboratory rejects (the part of the crushed sample split not used for analysis) of mineralized drill core. The testwork was conducted at the La Colorada metallurgical laboratory.

Representativity of LOM Samples for Metallurgical Testing 2012
The objective of the program was determining the metallurgical response of the different veins which are in the mineral reserve inventory of the La Colorada Mine over the LOM. The samples were selected on the premise that the main variations in mineralogical assembly (galena-sphalerite-chalcopyrite) and metal values of Ag-Au-Pb-Zn-Cu change relative to depth. The sampling methodology is considered an acceptable representation of the mineral reserves of the La Colorada Mine. General samples criteria and silver grades are presented in Table 15.

Table 15: Metallurgical Samples

| Sample | Mine | Mineral Type | Level Taken | Ag (ppm) | Weight (kg) |
|---|---|---|---|---|---|
| 1 | Candelaria | Sulphide | 360, 370, 390, 425, 405, 438 | 355 | 80 |
| 2 | Candelaria | Sulphide | 445, 453, 468, 483, 498 | 495 | 157 |
| 3 | Candelaria | Sulphide | 528 | 474 | 284 |
| 4 | Candelaria | Sulphide | 558, 600 | 357 | 78 |
| 5 | Candelaria | Oxide | 423, 468, 498 | 376 | 56 |
| 6 | Estrella | Oxide | 245, 275, 305 | 440 | 80 |
| 7 | Estrella | Oxide | 335, 365, 395, 435 | 264 | 69 |
| 8 | Estrella | Sulphide | 435, 535 | 269 | 61 |
| 9 | Recompensa | Sulphide | 175 | 350 | 26 |

Sample Analysis, Test conditions and Results with LOM samples
Sample content for important metals are presented in Table 16 for the sulphide samples and in Table 17 for the oxide samples. Test conditions in the flotation circuit were targeting a grind size of 70% passing 200 mesh. The reagents additions for the flotation tests are presented in Table 18.

Table 16: Sulphide Sample Analysis

| Sample Number | Au(ppm) | Ag(ppm) | Cu(%) | Pb(%) | Zn(%) | Fe(%) | Mn(%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.20 | 355 | 0.13 | 1.37 | 2.71 | 2.82 | 0.39 |
| 2 | 0.28 | 495 | 0.19 | 2.01 | 4.18 | 3.07 | 0.69 |
| 3 | 0.30 | 474 | 0.22 | 3.25 | 5.15 | 2.97 | 0.86 |
| 4 | 0.73 | 357 | 0.31 | 3.54 | 7.39 | 3.57 | 0.92 |
| 8 | 0.16 | 269 | 0.08 | 1.40 | 1.79 | 2.42 | 0.42 |
| 9 | 0.24 | 350 | 0.18 | 4.28 | 4.56 | 2.61 | 2.50 |

Table 17: Oxide Sample Analysis

| Sample Number | Au(ppm) | Ag(ppm) | Cu(%) | Pb(%) | Zn(%) | Fe(%) | Mn(%) |
|---|---|---|---|---|---|---|---|
| 5 | 0.53 | 376 | 0.08 | 0.76 | 0.75 | 2.13 | 0.32 |
| 6 | 0.49 | 440 | 0.09 | 1.23 | 1.70 | 2.41 | 0.64 |
| 7 | 0.33 | 264 | 0.08 | 1.06 | 1.80 | 2.75 | 0.62 |

Table 18: Reagents for Sulphide Flotation Tests

| Added | Complex 10% ppm | Aerophina 3407 direct ppm | Frother No. 603 ppm | Xanthate at 1% ppm | Copper Sulphate al 10 % ppm | Lime ppm |
|---|---|---|---|---|---|---|
| Mill | 500 | 36 | | | | |
| Rougher | | 36 | 41 | 30 | | |
| Pb Cleaner | 70 | | | | | |
| Zn Rougher | | | 14 | 31 | 600 | 2100 |
| TOTAL | 570 | 72 | 55 | 61 | 600 | 2100 |

Test results of each of the two sample types were consistent within their category. Summary of the test results are presented in Table 19 for sulphide samples and Table 20 for oxide samples.

Table 19: Flotation Test Results

| Sulphide Samples | Recoveries, % | | | |
|---|---|---|---|---|
| | Au | Ag | Pb | Zn |
| 1 | 65.1 | 91.9 | 82.1 | 84.2 |
| 2 | 70.0 | 95.4 | 85.8 | 87.7 |
| 3 | 72.3 | 92.6 | 88.1 | 85.2 |
| 4 | 78.1 | 91.3 | 91.8 | 93.7 |
| 8 | 56.2 | 92.3 | 86.4 | 79.1 |
| 8 | 68.3 | 92.8 | 80.2 | 87.7 |

Table 20: Cyanide Leach Test Results

| Oxide Sample | Retention Time | NaCN Concentration | Recovery | | Consumption | |
|---|---|---|---|---|---|---|
| | | | | | NaCN | CaO |
| | | | Au (%) | Ag (%) | kg/ton | kg/ton |
| 5 | 96 Hrs. | 0.10% NaCN | 78.0 | 76.7 | 1.53 | 4.8 |
| 6 | 96 Hrs. | 0.10% NaCN | 83.3 | 83.5 | 1.53 | 4.8 |
| 7 | 96 Hrs. | 0.10% NaCN | 69.2 | 78.1 | 1.22 | 4.8 |

Continuous Testwork and Control
Metallurgical test programs are being conducted annually with representative samples to further evaluate the metallurgical variability, optimize metal extractions, reduce operating costs, and increase productivities.

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## 14.5. Author's Conclusion and Recommendations

The metallurgical testing programs have shown:

- The primary characteristic of the ore deposit that controls the metallurgical responsiveness either in the cyanidation or flotation circuit is the degree of oxidation.
- The metallurgical performance of either the cyanidation or flotation circuits are inversely proportional to the intensity of grinding with marked metallurgical improvements obtained with finer grinds.
- The amount of clay material in the ore and the intensity of grinding can negatively impact the performance of the thickening wash circuit in the oxide plant.
- The concentration of "true-free" cyanide in the leaching and Merrill Crowe circuits is crucial to optimum cyanidation plant performance.

Additional flotation studies conducted on-site support the conclusions of the various historical laboratory test results presented above and support the estimations for future recoveries based on previous year's operational results.

Recommendations

Metallurgical performance in the existing plants is well established at La Colorada. The author recommends continuing the ongoing metallurgical testing program and that any variation in the mineralization identified by the geology department or the process department be tested as part of the program.

## 15.0 MINERAL RESOURCE ESTIMATES

Mineral resources quoted in this technical report have been estimated using accepted industry practices and are in accordance with the Canadian Institute of Mining, Metallurgy and Petroleum definitions on mineral resources and mineral reserves.

Mineral resources at the La Colorada mine as of December 31st, 2012 are as stated in Table 21.

Table 21: La Colorada Mineral Resources as at 31 December 2012

Measured and Indicated Resources

| Category | Tonnes (Mt) | Ag (ppm) | Ag Cont. (Moz) | Au (ppm) | Pb % | Zn % |
|---|---|---|---|---|---|---|
| Measured | 0.2 | 161 | 1.1 | 0.12 | 0.66 | 0.95 |
| Indicated | 2.0 | 268 | 17.1 | 0.32 | 0.49 | 0.76 |
| Total M&I Resources | 2.2 | 258 | 18.1 | 0.31 | 0.51 | 0.78 |

Inferred Resources

| Category | Tonnes (Mt) | Ag (ppm) | Ag Cont. (Moz) | Au (ppm) | Pb % | Zn % |
|---|---|---|---|---|---|---|
| Total Inferred Resources | 2.0 | 304 | 20.0 | 0.34 | 1.61 | 2.64 |

Notes:

1. CIM definitions were followed for mineral resources
2. Grades are shown as contained metal before mill recoveries are applied.

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3. PAS reports mineral resources and mineral reserves separately. Reported mineral resources do not include amounts identified as mineral reserves.
4. Mineral resources were diluted including minimum true vein width of 2.18 m, planned mining dilution, and floor dilution for stope ore.
5. Mineral resources have been estimated using a mining recovery of 85 to 95% (pillars are left in some thicker zones leading to lower mining recovery). Mineral resources were estimated based on the use of cut and fill mining methods.
6. Mineral resources were estimated using the polygonal method on longitudinal sections.
7. Mineral resources were estimated using a price of $25.00 per ounce of silver, $1,350 per ounce of gold, $1,750 per tonne of zinc and $1,850 per tonne of lead.
8. Environmental, permitting, legal, title, taxation, socio economic, political, marketing or other issues are not expected to materially affect the estimate of mineral resources.
9. Mineral resources that are not mineral reserves do not have demonstrated economic viability.

15.1. Method and Parameters

Mineral resources were estimated using the polygonal method. This method, with some parameter updates, has been consistent since PAS took ownership of the property. The grades and tonnage of the structures are estimated based on the data collected and analysed from both diamond drilling and underground channel samples. The data is plotted on sections and plans, for review and interpretation by the geologist. Once the data is confirmed to represent the appropriate structure a long section is produced of each structure to visualize each structure in its entirety. The data is processed using Excel software structure by structure which is then combined to arrive at the total mineral resource estimate tonnage and grades.

The mineral resources are updated annually with new information and updated geological interpretations.

15.2. Bulk Density

The bulk density of the oxide ore and sulphide ores are a function of the lead and zinc grade contained within the ore. The calculations are derived based on 302 samples which were measured for bulk density at the ALS-Chemex laboratory in Vancouver, Canada. Table 22 shows the bulk density formulas used to estimate the tonnes of mineral reserves and mineral resources for the La Colorada Mine.

Table 22: Bulk density

| Ore Type | Bulk density ore | Bulk density wallrock |
|---|---|---|
| Oxides and Sulphides | = 2.7 + (%Pb + %Zn) * 0.0237 | 2.70 |

15.3. Dilution and Ore Loss

Dilution is applied for several different circumstances and reasons. First a minimum of 2.18 m true width is applied to the structure. This provides a minimum horizontal width of 2.4 m in order to permit access for the scoop trams. Veins of less than 2.18 m true thickness have added wall dilution to a total of 2.18 m true thickness. Planned dilution is then added to account for the mining method. Different quantities are used for the development phase and the stoping phase as shown in Figure 7 and Figure 8. Additional dilution of 3% is applied to account for backfill which is inadvertently mucked each lift during the cut and fill stoping. An additional 5% unplanned dilution is also applied in order to match reconciliation data.

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Ore loss is considered to be between 5% and 15% depending on vein width (i.e. mining recovery is assumed to be between 85% ad 95%). This figure is based on experience and observation at the La Colorada Mine and takes into account losses of ore in permanent pillars, losses into the backfill and other losses such as those that may be caused by ground failures or other geomechanical conditions. The mine workers attempt, where possible, to recover all pillars, however, some crown pillar ore and some safety pillars inevitably remain to ensure safe working conditions for the miners in the stopes.

Figure 7: Development Dilution

Figure 8: Stope Dilution

15.4. Disclosure Requirements

The mineral resource was estimated with the data cut off of December 31st, 2012. It was completed by the mine geology department at the mine site and under the supervision of the authors of this Technical Report.

- Resource classifications follow the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) guidelines. Classifications are based on proximity and density of geological and grade information, as well as the complexity of the geological interpretation.
- Measured mineral resource blocks are adjacent to mine excavations, either development or stopes, which have been channel sampled as described in item 9.2. Projected distances for measured resources are 50 m vertical and 30 m horizontal.
- Indicated mineral resource blocks are adjacent to measured blocks. They extend 30 m vertically from measured blocks, but do not extend horizontally further than measured blocks. Indicated blocks are also estimated where diamond drilling confirms grade and geological continuity and holes are spaced 50 m or closer to each other or to channel samples.
- Inferred mineral resource blocks are estimated where there is sufficient data, geological and grade, to reasonably assume continuity but not enough to confirm or verify said continuity.

## 15.5. Multiple Commodities

The procedure used to handle multiple commodities in the estimation is to give monetary value for each metal based on their respective grades and add them to give the total value per unit of weight. The term used for this is value per tonne (VPT). The VPT is calculated based on the net smelter return (NSR). The factors taken into account are the value paid for each metal, insurance, penalties, treatment cost, refining and transport, and are described in more detail in Section 19, Market Studies and Contracts. The VPT is a factor which is applied to the estimated value of each metal.

# 16.0 MINERAL RESERVE ESTIMATE

Mineral reserves in this Technical Report have been estimated using accepted industry practices and are in accordance with the Canadian Institute of Mining, Metallurgy and Petroleum definitions on mineral reserves.

The mineral reserves were estimated with the data cut off of December 31st 2012. The estimate was completed by the mine geologists, at the La Colorada mine site, under the supervision of the authors of this Technical Report.

Mineral reserves at the La Colorada mine as of December 31st, 2012 are as stated in Table 23.

Table 23: La Colorada Mineral Reserves as of 31 December 2012

Proven and Probable Reserves

| Category | Tonnes (Mt) | Ag (ppm) | Ag Cont. (Moz) | Au (ppm) | Pb % | Zn % |
|---|---|---|---|---|---|---|
| Proven | 2.0 | 397 | 25.8 | 0.38 | 1.21 | 2.28 |
| Probable | 3.1 | 390 | 39.0 | 0.42 | 1.73 | 3.20 |
| Total Reserves | 5.1 | 393 | 64.8 | 0.41 | 1.53 | 2.84 |

Notes:

1. CIM definitions were followed for mineral reserves.
2. Grades are shown as contained metal before mill recoveries are applied.
3. PAS reports mineral resources and mineral reserves separately. Reported mineral resources do not include amounts identified as mineral reserves.
4. La Colorada mineral reserves have been estimated at a cut off value per tonne of $98.49 for Candelaria oxides, $82.92 for Candelaria sulphides, $99.10 for Estrella oxides, $83.53 for Estrella sulphides and $73.84 per tonne in the Recompensa mine.
5. Mineral Resources were diluted including minimum vein true width of 2.18 m, planned mining dilution, and floor dilution for stope ore.
6. Mineral reserves were estimated using a mining recovery of 85 to 95% (pillars are left in some thicker zones leading to lower mining recovery). Mineral reserves were estimated based on the use of cut and fill mining methods.
7. Mineral reserves were estimated using the polygonal method on longitudinal sections.
8. Mineral reserves were estimated using a price of $25.00 per ounce of silver, $1,350 per ounce of gold, $1,750 per tonne of zinc and $1,850 per tonne of lead.
9. Environmental, permitting, legal, title, taxation, socio economic, political, marketing or other issues are not expected to materially affect the estimate of mineral reserves.

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16.1. Method and Parameters

Mineral resources are converted to mineral reserves if they can be economically mined. Some mineral resources may not be converted to mineral reserves for various reasons including poor location, accessibility, mining recovery, or because the grade of the resource is not economic to mine. The actual production costs of the previous year are used to define the economic limit. The cut off value for the different structure and/or ore types are as stated in Table 24.

Table 24: Reserve Cut Offs

| Location /Ore Type | VPT Cut Off |
|---|---|
| Candelaria Oxides | $ 98.49 |
| Candelaria Sulphides | $ 82.92 |
| Estrella Oxides | $ 99.10 |
| Estrella Sulphides | $ 83.53 |
| Recompensa Sulphides | $ 74.84 |

16.2. Classification

Mineral reserve classifications follow the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) guidelines. Classifications are based on proximity and density of geological and grade information, as well as continuity.

Proven mineral reserve blocks are those measured mineral resource blocks, and probable mineral reserve blocks are those Indicated mineral resource blocks, that are economic and are mineable. The grade of the proven or probable mineral reserve block must be equal to or higher than the VPT cut off for the respective location shown in Table 24. The proven or probable mineral reserve block must also be located such that it can support the cost of the development and infrastructure necessary to mine that block. In the deeper parts of the La Colorada mine the provision of ventilation and pumping water are significant costs. The author (M. Wafforn) has placed limits on the depth to which a measured or indicated mineral resource block may be converted to a proven or probable mineral reserve block until data is available to allow a reasonable projection of those costs. Pan American Silver continues to monitor water inflows, rock temperature and ambient air quality in order to determine future ventilation and pumping requirements and costs. The increased capital and operating costs necessary to purchase and install a system for mine refrigeration is not expected to be required in order to mine the mineral reserves presented in this Technical Report, although with continued exploration success at depth it is a possibility in the future (Orellana Wiarco, 2010 and 2011).

17.0 MINING METHOD

La Colorada produces oxide and sulphide ores from three separate underground mines: Candelaria accessed via Las Minas and San Fermin portals, Estrella and Recompensa. El Aguila shaft is used for extracting mineral from the Candelaria mine. Figure 9 is a general site plan showing the location of the three mines relative to one another and surface infrastructure.

Figure 9: La Colorada Mine General Site Plan with Infrastructure

In prior years, oxide ore accounted for 60% of the total tonnes processed. In 2012, sulphide ore accounted for 63% of the tonnes processed and going forward, sulphide ore will account for nearly 80% of total tonnes processed due to depletion of the oxide resource

In all three mines, overhand cut and fill stoping is used for ore extraction. Mechanized and semi-mechanized overhand cut and fill mining method at La Colorada is employed at many underground mines, especially in Mexico. This method of mining is considered safe and efficient for the type of geologic conditions found at La Colorada.

Cut and fill stoping requires good-to-fair stability of the footwall and hanging wall surrounding the ore zone. When these conditions are present, cut and fill stoping provides improved ore recovery and selectivity from irregular, steeply dipping veins. The method also provides ground support by backfilling the voids creating by mining with development rock or mill tailings as ore extraction advances. All of the conditions for efficient cut and fill stoping are present in the La Colorada Mine and the method is applied in all mining areas.

Table 25 provides actual mine production data by ore type and total ore for years 2005 through 2012.

Table 25: Historic Production areas at La Colorada.

| Year | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | Total |
|---|---|---|---|---|---|---|---|---|---|
| Oxide Ore | | | | | | | | | |
| Tonnes Mined | 211,854 | 213,187 | 211,714 | 211,769 | 173,582 | 165,432 | 169,352 | 155,724 | 1,512,614 |
| Ag ppm | 513 | 539 | 429 | 351 | 357 | 365 | 324 | 333 | 409 |
| Au ppm | 0.55 | 0.59 | 0.51 | 0.42 | 0.47 | 0.33 | 0.37 | 0.39 | 0.46 |
| Sulphide Ore | | | | | | | | | |
| Tonnes Mined | 0 | 20,557 | 119,353 | 166,075 | 151,334 | 180,265 | 235,181 | 263,867 | 1,136,632 |
| Ag ppm | 0 | 462 | 451 | 397 | 414 | 390 | 400 | 397 | 406 |
| Au g/t | 0.00 | 0.50 | 0.45 | 0.43 | 1.22 | 0.68 | 0.45 | 0.41 | 0.58 |
| Pb% | 0.00 | 1.05 | 0.76 | 0.79 | 0.95 | 0.91 | 1.18 | 0.01 | 0.73 |
| Zn% | 0.00 | 1.51 | 1.50 | 1.61 | 2.14 | 2.09 | 2.36 | 0.03 | 1.53 |
| Total Ore | | | | | | | | | |
| Tonnes Mined | 211,854 | 233,744 | 331,067 | 377,844 | 324,916 | 345,697 | 404,533 | 419,591 | 2,649,246 |
| Ore Type | | | | | | | | | |
| Oxide | 100% | 91% | 64% | 56% | 53% | 48% | 42% | 37% | 57% |
| Sulphide | 0% | 9% | 36% | 44% | 47% | 52% | 58% | 63% | 43% |
| Ore Source | | | | | | | | | |
| Candelaria | 100% | 100% | 82% | 77% | 72% | 82% | 79% | 79% | 82% |
| Estrella | 0% | 0% | 18% | 22% | 18% | 6% | 11% | 13% | 12% |
| Recompensa | 0% | 0% | 0% | 1% | 10% | 12% | 9% | 8% | 5% |

Overhand cut and fill stoping begins at the bottom of the ore zone and works upward in horizontal slices that follow the strike, dip and width of the ore zone. Prior to mining, stopes are developed by preparing access, water drains and ventilation raises. Ore extraction begins by cutting a slice from the bottom of the ore zone and removing the broken ore from the stope. As each successive slice of the stope is taken, the void below is backfilled to support the hanging wall and foot wall and to provide a stable working platform for mining the next ore slice. At La Colorada, individual slices through the ore zone are designed to be 2 meters thick.

Figure 10 presents the typical La Colorada mining sequence. (1) The cut sequence begins with drilling. Using ore broken in the previous advance as a work platform, miners use jacklegs and stopers to drill blastholes into the face above the work platform. (2) After drilling, blasting agent is loaded into the holes, the material is broken and dropped to the floor below. This material then becomes the working platform for advancing the cut. (3) After blasting, and after the atmosphere in the stope is determined to be safe, roof support is completed by removing loose rocks from the newly exposed area and installing rock bolts. (4) As the drill face advances, broken ore is removed from the stope. Ore removal lags approximately 10 meters behind the drill platform to provide a safe working distance between drilling and ore extraction. (5) The “fill” sequence is completed by bringing in backfill material and placing in the void created by ore extraction. The advancing face of the backfill material is separated from the ore to limit ore dilution. The complete cut and fill cycle is made up of steps 1 through 5, which are repeated to advance the length of the planned stope. Each cycle of the full sequence results in an

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approximate 2.5 meter advance. Typically, blasting occurs twice per shift in each active stope. Mining is conducted on two ten hour shifts per day, seven days per week.

Figure 10: La Colorada- Mining Sequence

Ground Support

Typical ground support at La Colorada is split set friction rock bolts, with the addition of cemented rock bolts, mesh, and shotcrete as needed in specific areas. In areas with high clay content, cement grout cartridges are inserted into the split set bolts in order to improve their pull out strength.

During drilling operations, drillers are required to set mechanical roof jacks for additional roof support.

Mine Equipment

Mining equipment used at La Colorada consists of single-boom electric hydraulic drill jumbos and hand operated jackleg type drills for drilling; 1.5 cubic meter, 2.0 cubic meter and 3.75 cubic meter scoop trams for tramming ore and rock backfill to and from stopes; and low-profile 9-tonne to 12-tonne capacity haul trucks for underground ore haulage. Table 26 lists the current La Colorada fleet of mobile mining equipment.

Table 26: La Colorada Mobile Mine Equipment Fleet

| Type | Description | Manufacturer and Model | Number in Fleet |
|---|---|---|---|
| Drill Jumbo | Single Boom Rock Drill | Atlas Copco S1 D | 2 |
| Scoop Tram | 1.9 C. Meter Scoop | Sandvik Toro 151D | 3 |
| Scoop Tram | 1.9 C. Meter Scoop | Sandvik LH 203 | 9 |

| Type | Description | Manufacturer and Model | Number in Fleet |
|---|---|---|---|
| Scoop Tram | 2.7 C. Meter Scoop | Sandvik LH 307 | 5 |
| Haul Truck | 15 Tonne Load | Sandvik EJC 417 | 6 |
| Haul Truck | 15 Tonne Load | Sandvik TH 315 | 1 |
| Scissor Lift | 3.5 Meter Lift | Normet 6330 X | 1 |

17.1. Underground Infrastructure

Mine Access and Development

Personnel and equipment access into all mines is by a decline ramp. The Candelaria Mine and the Estrella Mine have two access ramps each; the Recompensa Mine is accessed by a single ramp.

Main access ramps and haulage drifts are designed to be 3.5 m wide by 3.5 m high with a maximum gradient of 15%. Cross cuts to access ore stopes are designed to be 2.4 m wide by 2.4 m tall. In the ore stopes, minimum cut dimensions are 2.4 m wide by 2.0 m tall. The first cut ore extraction and backfill ramps into the stopes are carried at a maximum grade of 22%. Secondary egress from a stope is required at each 100 m of stope length. Main levels at Candelaria have a vertical interval of 30 meters in order to provide dewatering in advance of mining. Main levels at Estrella are planned to be at 45 meter vertical intervals as the area has been dewatered by pumping of the Candelaria mine.

Mine development occurs concurrently with stope mining to provide an uninterrupted flow of ore to the mill. At the time of this report, La Colorada has approximately 24 months of ore developed ahead of production stoping.

Ore Streams

At La Colorada, ore is segregated into oxide or sulphide types for processing. Mixed ore, a combination of the two ore types that occurs in transition zones, is typically processed through the oxide circuit.

Both primary ore types, oxide and sulphide, are shipped to the mill from the Candelaria Mine. The majority of ore produced from the Estrella Mine is shipped and treated as oxide, however small zones of sulphide ore have been encountered and shipped to the mill in the past. All ore produced from the Recompensa Mine is treated as sulphide.

Ore Transport to Surface

Ore extracted from the Candelaria Mine is hoisted to the surface through the El Aguila Shaft. The ore is dumped from the 438 haulage level into one of two 300 t underground dump pockets. The two bins are used to segregate sulphide and oxide/mixed ore. Ore from the dump pockets is transferred to a skip and hoisted approximately 450 m to surface, where it is dumped into one of two 200 t coarse ore storage bins, which again correspond to ore type. The ore is removed from the bins and hauled to the appropriate mill crusher stockpile by 12 t surface haul trucks. When required, Candelaria ore can be hauled up to the surface using one of the mine access ramps.

Ore extracted from the Estrella and Recompensa Mines is hauled to the surface by the La Colorada underground mine truck fleet. Estrella and Recompensa ores are stockpiled on the surface near the mine portals. The ore is then reclaimed from the stockpile and hauled to the appropriate mill crusher stockpile by 12 t surface haul trucks.

In 2007, the Candelaria ore hoist was replaced to increase hoisting capacity and provide improved reliability. The current hoist is a 1.68 m diameter double drum, two skip unit powered by a 400 horsepower (hp) drive. Each skip carries approximately 3 t per trip, with the actual load dependent on the density of the material hoisted. The hoist system is capable of delivering approximately 900 t per day to the surface. Mechanical and electrical availability of the hoist system exceeds 85%.

Dewatering
The Candelaria Mine requires dewatering to mine the deeper levels of the mine. Dewatering of the Estrella and Recompensa Mines is not required for mining.

The Candelaria pump station is currently located on the 558 level, which will support mining to the 588 level of the mine. The pump station is comprised of sixteen 150 hp pumps, which includes a set of fully redundant standby units for periods of peak flows and maintenance. The pumps are connected to the mine power distribution system, with three 1.2 MW generators located on surface for backup. Water from the mine is collected in and pumped from a 7,000 m3 sump. Mine dewatering during 2012 was approximately 50% of installed capacity averaging 605 m3 of water per hour.

Mine Ventilation
La Colorada has an engineered air ventilation network at all three mines to prevent build up of dangerous gasses, provide fresh air to the mines, and to cool hot areas.

Up to a point, excess heat in a mine can be dealt with in the same manner as contaminant gasses by providing enough ventilating air volumetric flow rate to reduce heat to an acceptable level. When the heat becomes so high that it is no longer economic to provide increasing ventilating air volumetric flow rate then refrigeration of the ventilating air is considered.

The heat sources in a mine include the heat generated by diesel and electrical equipment, heat transferred from the rock, oxidation of minerals, auto compression of air, people and in the case of La Colorada heat from ground water. The Candelaria mine (the deepest) is divided with oxide mineralization to the west and sulphide mineralization to the east. The veins in both zones are permeable and allow water flow, in the deeper levels the water in the sulphide areas currently flows into the mine at 44° C and the water in the oxide areas is 36° C.

The mine ventilation system is designed to deal with the heat in the mine and the conclusion of the ventilation studies is that refrigeration of the ventilating air will not be required to develop and mine the mineral reserves stated in this technical report (Orellana Wiarco, 2012). However, as mineralization at the La Colorada mine has been shown by diamond drilling information to extend some 425 meters below the deepest level being developed at the time of this report it is possible that refrigeration will be required beyond the mine life presented here.

The Candelaria Mine has two 2.4 m bored ventilation raises, current ventilation volume is 286,000 CFM.

Ventilation for the Estrella and Recompensa mines is provided by a single 150,000 cfm and 170,000 cfm fan respectively.

Stope Backfill
Wherever possible waste development rock is stored underground for use as backfill in the cut and fill stopes.

In 2011, La Colorada commissioned a new hydraulic backfill plant to provide material for backfilling sulphide stopes in the Candelaria Mine. The plant processes sulphide mill tailings to separate a coarse size fraction for use as backfill underground. Plant equipment includes cyclones, a slurry pumping station, slurry stock tank and agitator. The plant is located at the Candelaria mill and backfill is returned to the mine through the El Aguila shaft.

Cement is added to the first section of backfill placed at the bottom of the stopes to facilitate mining of ore left in pillars between stopes.

Power
Electrical power is distributed underground at 4.16 kV and 2.30 kV. Local transformers reduce the voltage to 480 v as needed.

Compressed Air and Drill Water
Compressed air for mining is supplied by electric powered air compressors located on the surface at each mine. The Candelaria Mine compressed air plant is comprised of two compressors, each capable of supplying 45 ft3 per minute of air. The compressed air plants at the Estrella and Recompensa Mines are comprised of one compressor at each mine, each capable of supplying 45 ft3 per minute of air. Compressed air is distributed underground through a network of steel pipes.

Water for drilling is provided by the mine dewatering system. Water is distributed throughout the mines via a network of steel and high density polyethylene (HDPE) pipes.

17.2. Life of Mine Plan (LOM)

Long Term Production Plan
La Colorada reviews and updates mineral reserves and long term production plans on an annual basis. Planning at La Colorada relies on historical productivities achieved at the property for ore extraction and stope development. Mining of individual ore stopes is scheduled to provide reasonably consistent ore quality for processing and maintaining consistent silver production levels.

The current long term plan spans the twelve year period from 2013 to 2024 inclusive. The plan is based on reported mineral reserves and the current plan ends with the last full year of production from the current reserve. In this plan, the rate of ore extraction averages approximately 1,200 t per day over the remaining life of mine. The plan includes provisions for ongoing underground

development to support the planned ore extraction. The Candelaria Mine supplies 74% of total mill feed going forward, the Estrella mine supplies 25% of the mill feed and 1% is sourced from the Recompensa Mine.

The mine plan projects that ore shipped to the mill will be 35% oxide and 65% sulphide during the seven year period from 2013 to 2019 inclusive. Following this period, the mine plan projects that ore sent to the mill will be 100% sulphide for the remainder of the currently planned mine life.

The mine plan projects shipping an average of 420 t per day of oxide ore and 780 t per day of sulphide ore to the mill for processing during the period 2014 through 2019 inclusive, followed by no oxide ore and 1,260 tonnes per day of sulphide ore during the remainder of the planned mine life.

Underground manpower, including mining, development, maintenance, and supervision, averages 463 regular employees and 41 contract employees between 2014 and 2018. The remainder of the plan sees elimination of the contract employees and an increase of direct labour to 500 employees. That level is consistent with current staffing levels.

Table 27 presents selected data summarizing the current long term mine plan.

Table 27: La Colorada Long Term Plan

| Year | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oxide Ore | | | | | | | | | | | | |
| Tonnes Mined | 132,064 | 154,018 | 154,018 | 154,018 | 154,018 | 154,018 | 154,018 | 0 | 0 | 0 | 0 | 0 |
| Ag ppm | 302 | 345 | 345 | 345 | 345 | 345 | 345 | 0 | 0 | 0 | 0 | 0 |
| Au ppm | 0.37 | 0.52 | 0.52 | 0.52 | 0.52 | 0.52 | 0.52 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Sulphide Ore | | | | | | | | | | | | |
| Tonnes Mined | 292,307 | 284,180 | 284,180 | 284,180 | 284,180 | 284,180 | 284,180 | 460,924 | 460,924 | 460,924 | 460,924 | 460,92 |
| Ag ppm | 416 | 389 | 389 | 389 | 389 | 389 | 389 | 389 | 389 | 389 | 389 | 389 |
| Au ppm | 0.39 | 0.37 | 0.37 | 0.37 | 0.37 | 0.37 | 0.37 | 0.37 | 0.37 | 0.37 | 0.37 | 0.37 |
| Pb% | 1.62 | 1.85 | 1.85 | 1.85 | 1.85 | 1.85 | 1.85 | 1.85 | 1.85 | 1.85 | 1.85 | 1.85 |
| Zn% | 3.04 | 3.43 | 3.43 | 3.43 | 3.43 | 3.43 | 3.43 | 3.43 | 3.43 | 3.43 | 3.43 | 3.43 |
| Total Ore | | | | | | | | | | | | |
| Tonnes Mined | 424,371 | 438,198 | 438,198 | 438,198 | 438,198 | 438,198 | 438,198 | 460,924 | 460,924 | 460,924 | 460,924 | 460,92 |
| Ore Type | | | | | | | | | | | | |
| Oxide | 31% | 35% | 35% | 35% | 35% | 35% | 35% | 0% | 0% | 0% | 0% | 0% |
| Sulphide | 69% | 65% | 65% | 65% | 65% | 65% | 65% | 100% | 100% | 100% | 100% | 100% |
| Ore Source | | | | | | | | | | | | |
| Candelaria | 79% | 69% | 69% | 69% | 69% | 69% | 69% | 81% | 81% | 81% | 81% | 81% |
| Estrella | 12% | 31% | 31% | 31% | 31% | 31% | 31% | 18% | 18% | 18% | 18% | 18% |
| Recompensa | 9% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% |
| Development | | | | | | | | | | | | |
| Meters | 5,118 | 4,274 | 4,154 | 3,631 | 3,633 | 3,631 | 3,633 | 3,633 | 3,633 | 3,633 | 3,633 | 3,633 |
| Headcount | | | | | | | | | | | | |
| Employees | 439 | 447 | 447 | 458 | 463 | 463 | 498 | 500 | 500 | 500 | 500 | 500 |
| Contractors | 45 | 45 | 43 | 41 | 41 | 41 | 0 | 0 | 0 | 0 | 0 | 0 |

## 18.0 RECOVERY METHODS

Ore processing at La Colorada is comprised of separate oxide and sulphide circuits. Except for a common crushing plant, the two ore processing streams operate independently. The daily processing capacity of the oxide plant is 650 t of ore per day and the capacity of the sulphide plant is 750 t per day. The crushing plant currently does not have sufficient capacity to supply both plants to their maximum capacity.

Mixed ore from the mine, comprising material mined from the transition zone between the oxide and sulphide zones, is typically treated as oxide ore for processing.

Ore processing is conducted on two twelve hour shifts per day, seven days per week. The crushing plant is also staffed for two twelve hour shifts per day, seven days per week; however, eighteen hours of operation is typically sufficient to maintain mill feed.

### Ore Processing Rate

The ore processing rate at La Colorada has steadily increased over time. In 2003, the year before startup of the oxide processing plant, La Colorada processed a total of 56,000 tonnes of ore. In 2007, 331,000 tonnes of ore was processed and in 2012 420,000 tonnes of ore was processed.

In addition to increasing processing rates, the relative mix of oxide and sulphide ore processed at La Colorada is also changing with time. In 2003, 100% of the ore processed was sulphide. In 2007, 64% of the total ore processed was treated as oxide. In 2012, 63% of the total ore processed was treated as sulphide. This trend of increasing sulphide ore will continue as oxide mineral reserves become depleted at La Colorada. Figure 11 is a chart that shows, in both actual and estimated numbers, annual tonnes processed and the relative breakdown of mill feed by ore type for the years 2001 through 2024 inclusive.

Figure 11: Processing Rate (Actual and Estimated) by Ore Type

Table 28 summarizes ore processing production statistics realized during the years 2008 through 2012.

Table 28: Plant Production 2008-2012

| Year | 2008 | 2009 | 2010 | 2011 | 2012 | Total |
|---|---|---|---|---|---|---|
| Oxide Ore | | | | | | |
| Tonnes Processed | 211,769 | 173,582 | 165,432 | 169,352 | 155,724 | 875,859 |
| Ag ppm | 351 | 357 | 366 | 326 | 333 | 347 |
| Au ppm | 0.42 | 0.47 | 0.35 | 0.41 | 0.39 | 0.41 |
| Ag Recovery, % | 81.8 | 81.9 | 83.0 | 83.5 | 82.4 | 82.48 |
| Au Recovery, % | 77.9 | 76.9 | 75.0 | 73.1 | 69.1 | 74.66 |
| Ag Produced, t oz | 1,956,649 | 1,629,647 | 1,616,583 | 1,481,688 | 1,371,153 | 8,055,720 |
| Au Produced, t oz | 2,209 | 2,014 | 1,393 | 1,611 | 1,270 | 8,497 |
| Sulphide Ore | | | | | | |
| Tonnes Processed | 166,075 | 151,334 | 180,265 | 235,181 | 263,867 | 996,722 |
| Ag ppm | 397 | 414 | 390 | 400 | 397 | 399 |
| Au ppm | 0.43 | 1.22 | 0.68 | 0.45 | 0.41 | 0.59 |
| Pb% | 0.79 | 0.95 | 0.91 | 1.18 | 1.26 | 1.05 |
| Zn% | 1.61 | 2.14 | 2.09 | 2.36 | 2.61 | 2.22 |
| Ag Recovery, % | 92.2 | 91.2 | 92.2 | 93.0 | 93.2 | 92.51 |

| Year | 2008 | 2009 | 2010 | 2011 | 2012 | Total |
|---|---|---|---|---|---|---|
| Au Recovery, % | 68.7 | 76.2 | 73.5 | 73.6 | 70.0 | 72.21 |
| Pb Recovery, % | 77.2 | 83.4 | 83.5 | 86.0 | 85.7 | 83.60 |
| Zn Recovery, % | 68.5 | 71.2 | 78.0 | 80.6 | 82.1 | 77.07 |
| Ag Produced, t oz | 1,954,182 | 1,838,209 | 2,084,986 | 2,814,095 | 3,059,958 | 11,751,430 |
| Au Produced, t oz | 1,565 | 4,540 | 2,919 | 2,493 | 2,309 | 13,826 |
| Pb Produced, dmt | 1,011 | 1,205 | 1,366 | 2,388 | 2,766 | 8,736 |
| Zn Produced, dmt | 1,835 | 2,311 | 2,940 | 4,466 | 5,599 | 17,151 |
| Ore Type Processed | | | | | | |
| Oxide | 56% | 53% | 48% | 42% | 37% | 47% |
| Sulphide | 44% | 47% | 52% | 58% | 63% | 53% |
| Combined Production | | | | | | |
| Ag Produced, t oz | 3,910,831 | 3,467,856 | 3,701,569 | 4,295,783 | 4,431,111 | 19,807,150 |
| Au Produced, t oz | 3,774 | 6,554 | 4,312 | 4,104 | 3,578 | 22,322 |
| Pb Produced, dmt | 1,011 | 1,205 | 1,366 | 2,388 | 2,795 | 8,765 |
| Zn Produced, dmt | 1,835 | 2,311 | 2,940 | 4,466 | 5,538 | 17,090 |
| Overall Recoveries (Pb & Zn Sulphide Ore Only) | | | | | | |
| Ag Recovery, % | 86.7 | 86.6 | 88.0 | 89.5 | 89.6 | 87.8 |
| Au Recovery, % | 73.8 | 76.4 | 74.0 | 73.4 | 69.7 | 73.4 |
| Pb Recovery, % | 77.2 | 83.4 | 83.5 | 86.0 | 85.7 | 83.6 |
| Zn Recovery, % | 68.5 | 71.2 | 78.0 | 80.6 | 82.1 | 77.1 |

Metallurgical Recovery

Metallurgical recoveries at La Colorada have been relatively constant over the past five years of production. For the period from January 2008 through the year end 2012, silver recovery has averaged 82% from the oxide processing circuit and 92% from the sulphide processing circuit.

Metallurgical recoveries at La Colorada are tracked by ore type and ore zone. Recoveries assumed for the long term plan are based on actual recoveries achieved for each ore type, ore zone and results from metallurgical testing. Recoveries are assigned to each ore type and ore zone identified in the mine plan and the overall recovery reported for a given period is a function of the planned processing mix. Table 29 and Table 30 provide historic and projected recoveries for each payable metal by ore type.

Table 29: Oxide Circuit Recovery

| | Ag Recovery, % | | Au Recovery, % | |
|---|---|---|---|---|
| Year | Actual | LTP | Actual | LTP |
| 2008 | 81.8% | --- | 77.9% | --- |
| 2009 | 81.9% | --- | 76.9% | --- |

| | | | | |
|---|---|---|---|---|
| 2010 | 83.0% | --- | 75.0% | --- |
| 2011 | 83.5% | --- | 73.1% | --- |
| 2012 | 82.4% | --- | 69.1% | --- |
| 2013 | --- | 80.6% | --- | 68.4% |
| 2014 | --- | 79.1% | --- | 68.4% |

| | Ag Recovery, % | | Au Recovery, % | |
|---|---|---|---|---|
| Year | Actual | LTP | Year | Actual |
| 2015 | --- | 79.1% | --- | 68.4% |
| 2016 | --- | 79.2% | --- | 68.4% |
| 2017 | --- | 85.6% | --- | 68.4% |
| 2018 | --- | 85.6% | --- | 68.4% |
| 2019 | --- | 85.5% | --- | 68.4% |
| 2020 | --- | 85.5% | --- | 68.4% |
| 2021 | --- | 85.5% | --- | 68.4% |
| 2022 | --- | 85.5% | --- | 68.4% |
| 2023 | --- | 85.5% | --- | 68.4% |
| 2024 | --- | 85.5% | --- | 68.4% |
| Average | 82.5% | 81.5% | 74.8% | 68.4% |

Table 30: Sulphide Circuit Recovery

| | Ag Recovery, % | | Au Recovery, % | | Pb Recovery, % | | Zn Recovery, % | |
|---|---|---|---|---|---|---|---|---|
| Year | Actual | LTP | Actual | LTP | Actual | LTP | Actual | LTP |
| 2008 | 92.2 | --- | 68.6 | --- | 77.2 | --- | 68.5 | --- |
| 2009 | 91.2 | --- | 76.2 | --- | 83.4 | --- | 71.2 | --- |
| 2010 | 92.2 | --- | 73.5 | --- | 83.5 | --- | 78.0 | --- |
| 2011 | 93.0 | --- | 73.6 | --- | 86.0 | --- | 80.6 | --- |
| 2012 | 93.2 | --- | 70.0 | --- | 85.7 | --- | 82.1 | --- |
| 2013 | --- | 92.5 | --- | 71.9 | --- | 84.4 | --- | 81.6 |
| 2014 | --- | 92.5 | --- | 71.9 | --- | 84.4 | --- | 81.6 |
| 2015 | --- | 92.5 | --- | 71.9 | --- | 84.4 | --- | 81.6 |
| 2016 | --- | 92.5 | --- | 71.9 | --- | 84.4 | --- | 81.6 |
| 2017 | --- | 92.5 | --- | 71.9 | --- | 84.4 | --- | 81.6 |
| 2018 | --- | 92.5 | --- | 71.9 | --- | 84.4 | --- | 81.6 |
| 2019 | --- | 92.5 | --- | 71.9 | --- | 84.4 | --- | 81.6 |
| 2020 | --- | 92.5 | --- | 71.9 | --- | 84.4 | --- | 81.6 |
| 2021 | --- | 92.5 | --- | 71.9 | --- | 84.4 | --- | 81.6 |
| 2022 | --- | 92.5 | --- | 71.9 | --- | 84.4 | --- | 81.6 |
| 2023 | --- | 92.5 | --- | 71.9 | --- | 84.4 | --- | 81.6 |
| 2024 | --- | 92.5 | --- | 71.9 | --- | 84.4 | --- | 81.6 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Avg | 92.5 | 92.5 | 73.2 | 71.9 | 84.1 | 84.4 | 77.8 | 81.6 |

Hydraulic Backfill Plant

La Colorada constructed and commissioned a new hydraulic backfill plant in 2011. The new plant:

- Offsets declining availability of development waste for stope backfill as mining in oxide areas winds down.
- Reduces storage and re-handle cost of development waste underground.
- Improves stope cycle times by providing a ready source of backfill material.

- Reduces the cost of surface tailings storage by returning sulphide tailings underground versus building additional surface storage capacity.

Operation of the plant and use of sulphide tailings for backfill underground has been reviewed and approved by the Mexican regulatory agencies responsible for this activity.

Planned manpower for ore processing, including plant and tailings operations, plant maintenance and supervision, totals 106 regular employees through the year 2019, the period when the oxide and sulphide plants are running. Processing of oxide ore is scheduled to end in the year 2019, and planned manpower for ore processing decreases to 86 for the balance of the current long term plan. Planned manpower levels are consistent with current staffing levels.

## 18.1. CRUSHING PLANT

A single, two-stage crushing plant is used to crush oxide and sulphide ore at La Colorada. The material is batched through the plant, and after crushing, the product is stored separately by process type (oxide versus sulphide). Table 31 lists the major crushing equipment installed at La Colorada. A description of unit operations is provided in the following sections.

Table 31: La Colorada Crushing Equipment

| Equipment Type/Function | Manufacturer | Description | Number in Circuit |
|---|---|---|---|
| Primary Feeder | Svedala | FW 434 apron feeder | 1 |
| Primary Crusher | Minyu | 600 mm x 900 mm jaw | 1 |
| Secondary Crusher | Symons | 1.3 m short head cone | 1 |
| Final Product Size Classifier | Deister | 1.8 m x 4.3 m vibrating screen | 1 |

Ore is reclaimed from the coarse ore stockpile by loader and passed through a stationary grizzly with 600 mm x 900 mm openings for sizing prior to crushing. Primary crushing is performed with a 900 mm x 600 mm jaw crusher. Product from the jaw crusher is conveyed to a 1.8 m x 4.3 m vibrating screen for size classification. Material off the screen oversize deck reports to a 1.3 m secondary cone crusher in a closed loop for further size reduction.

Depending on material type, the screen undersize material reports to a fine ore stockpile (oxide) or fine ore bin (sulphide) for grinding. Material is directed to the proper fine ore stockpile or bin by a diverter gate and pant leg chute.

## 18.2. OXIDE PLANT

The oxide plant is a conventional cyanide leach flowsheet comprised of crushing, grinding, leaching, Merrill Crowe zinc precipitation and on-site refining to produce precious metal doré. Construction of the oxide plant began in July 2002 and the first production of doré occurred in August 2003. The oxide plant was originally designed for a rated capacity of 600 t per day; however incremental operating improvements realized since start-up have provided an additional 50 t per day in oxide ore processing capacity over original design.

Table 32 lists the major equipment used for processing oxide ore at La Colorada and Figure 12 provides the current flow sheet for the oxide plant.

Table 32: Oxide Plant Equipment

| Equipment Type/Function | Manufacturer | Description | Number in Circuit |
|---|---|---|---|
| Ball Mill | Norberg | 2.9 m x 3.4 m | 1 |
| Ball Mill | Norberg | 2.4 m x 3.0 m | 1 |
| Leach Thickeners | Eimco | 7.9 m x 2.4 m | 2 |
| Leach Tanks w/ Mixers | Philadelphia (Mixers) | 7.6 m x 8.4 m | 11 |
| Countercurrent Rinse Tanks | Eimco | 7.9 m x 2.4 m | 4 |

Figure 12: Oxide Flow Diagram

Crushing
Crushing equipment and operations are the same for oxide and sulphide ore. After crushing oxide ore, the final crushed ore product is delivered to a fine ore stockpile, where it is held for processing through the oxide circuit.

Grinding
Crushed ore is reclaimed from the fine ore stockpile by a 610 mm variable speed belt feeder and conveyed to a 2.9 m x 3.4 m ball mill that is charged with 76 mm diameter grinding balls for grinding. Product from this mill is pumped to a bank of 510 mm diameter cyclones for size classification. Cyclone underflow, the coarser grinding product, reports to a second 2.4 m x 3.0 m ball mill that is charged with 64 mm diameter balls for additional grinding. Cyclone overflow, the finer grinding product, reports to the primary leach thickener ahead of the leach circuit. Product from the second mill returns to the cyclone for classification to form a closed loop within the grinding circuit. The grinding feed rate is automatically controlled by a belt scale installed on the ball mill feed conveyor. Dilute cyanide solution is used in the grinding circuit to initiate leaching of gold and silver.

Leaching
Following grinding, slurry from the cyclone overflow reports to a 7.9 m x 2.4 m primary leach thickener. Clear solution overflow from this thickener reports to the pregnant solution tank and slurry underflow reports to a series of seven agitated leach tanks. Normally, five of the seven tanks are used for leaching and two tanks are on standby. The slurry passes through each tank in series for leaching and after passing through the active leach tanks, the slurry reports to a 7.9 m x 2.4 m intermediate leaching thickener. Clear solution overflow from the thickener reports to the pregnant solution tank and the slurry underflow reports to a series of four additional agitated leach tanks for continued leaching. Residence time within the leaching circuit is approximately 117 hours for 400 t per hour processed through nine active leach tanks.

Rinsing and Tails Disposal
After exiting the leach tank, the leached solids are sent through a four stage, countercurrent rinsing process comprised of four 7.9 m x 2.4 m thickeners to further recovery of precious metals and reduce cyanide content in the tailings before sending to a tailings storage facility. The rinse process is counter-current: solids are introduced to rinse stage 1 and pass sequentially from rinse stage 1 to rinse stage 4; and fresh water is introduced at rinse stage 4 and the rinse solution flows in the opposite direction from rinse stage 4 to rinse stage 1. Clear solution from the stage 1 rinse tank reports to the mill water tank for re-use in the recovery process. Slurry from the stage 4 rinse tank reports to a lined tailings storage facility.

Tailings at the storage facility are distributed in a manner to form a “beach” of solids and direct clear solution to a solution recovery pumping station. Solution recovered from the tailings storage facility is returned to the plant for re-use.

Merrill Crowe Precipitation

The dissolved silver and gold is removed from the pregnant leach solution by the Merrill Crowe Zinc Precipitation Process. Pregnant solution from the pregnant solution tank is first pumped through a set of clarifiers to remove suspended solids and produce the very clear solutions needed for efficient precipitation. After clarification, the solution passes through a vacuum tower to remove dissolved oxygen. Zinc dust is added to the solution stream when exiting the vacuum tower, which results in the immediate precipitation of gold, silver and other dissolved metals. The solution with the now solid metal precipitate then passes through a set of plate and frame filter presses to separate the metal precipitate from the solution stream. After leaving the filter press, the process solution, now termed barren solution, is returned to the oxide plant process water tank for re-use in the recovery process.

Refining

After filtering, the filtered precipitate is mixed with refining fluxes and heated to approximately 980°C in a gas fired furnace in order to melt and separate the contained metal from impurities. After melting, the molten metal is poured into molds and allowed to solidify into doré bars for shipping. Doré bars produced at La Colorada typically contain 98% precious metal, primarily silver, and 2% impurities.

Monitoring for lead, mercury, arsenic, cadmium and other potential health risks is performed on refinery workers and inside the refinery on a regular basis. La Colorada takes action to reduce exposures to acceptable limits when an issue is identified and no significant exposures are known to exist at the time of this report.

18.3. SULPHIDE PLANT

The sulphide plant has a conventional flotation flowsheet comprised of crushing, grinding and selective lead and zinc froth flotation circuits to recover precious and base metals into separate lead and zinc concentrates. The original sulphide plant was in place when PAS acquired the La Colorada property in 1998, at that time it was rated at 120 t per day and produced lead concentrate only. In June 2002, La Colorada expanded sulphide processing capacity to 200 t per day through the addition of a second ball mill for grinding and addition of new flotation cells for increased throughput and to recover a separate zinc concentrate. Since that time, La Colorada has implemented a number of equipment, flow sheet and operating improvements within the sulphide plant to achieve the current 750 t per day processing capacity. A description of the sulphide plant is provided in this section.

Table 33 lists the major equipment used for processing sulphide ore at La Colorada. Figure 13 provides the current flow sheet for the sulphide plant.

Table 33: Sulphide Plant Equipment

| Equipment Type/Function | Manufacturer | Description | Number in Circuit |
|---|---|---|---|
| Primary Feeder | Svedala | FW 434 Apron Feeder | 1 |
| Primary Crusher | Minyu | 600 mm x 900 mm Jaw | 1 |
| Secondary Crusher | Symons | 1.3 m Short Head Cone | 1 |
| Final Product Size Classifier | Deister | 1.8 m x 4.3 m Vibrating Screen | 1 |

Crushing
Crushing equipment and operations are the same for sulphide and oxide ore. After crushing sulphide ore, the final crushed ore product is delivered to a fine ore bin, where it is held for processing through the sulphide circuit.

Grinding
Crushed ore is reclaimed from the fine ore bin by a 610 mm variable speed belt feeder and conveyed to two ball mills that operate in parallel for grinding. Sulphide Ball Mill #1 is a 1.8 m diameter x 2.4 m long mill that is charged with 64 mm diameter grinding balls; Sulphide Ball Mill #2 is a 2.6 m diameter x 3.7 m long mill that is charged with 76 mm diameter grinding balls. Product from this mill is pumped to a bank of four 510 mm diameter cyclones for size classification. Cyclone underflow is returned to the ball mills for additional grinding to form a closed loop within the grinding circuit. Cyclone overflow reports to the lead flotation circuit. The grinding feed rate to both mills is automatically controlled by belt scales installed on the ball mill feed conveyors.

Figure 13: Sulphide Flow Diagram

Lead Flotation
Properly sized grinding product flows by gravity from the grinding cyclone classifiers to the lead flotation circuit. This circuit is comprised of a single 42.5 m3 rougher flotation machine, followed by one 28.3 m3, three 9.9 m3 and one 4.2 m3 flotation machines arranged to provide two cleaner and one scavenger stages in the circuit. Cyclone overflow reports to the rougher flotation machine and flotation reagents added. Flotation concentrate from the rougher cell reports to the lead flotation cleaner circuit; tailings from the rougher cell reports to the lead scavenger circuit. Flotation concentrate from the two stage cleaner circuit reports to the lead concentrate thickener; tailings from the two stage cleaner circuit are returned to the lead rougher machine. Tailings from the lead scavenger circuit report to the zinc flotation circuit conditioning tank.

Zinc Flotation
Tailings from the lead scavenger circuit report to the zinc flotation circuit conditioning tank where the reagents necessary for zinc flotation are added. Following the conditioning tank, the zinc flotation equipment and process is similar to the lead flotation circuit.

The zinc flotation circuit is comprised of a single 42.5 m3 rougher flotation machine, followed by one 28.3 m3, three 9.9 m3 and one 4.2 m3 flotation machines arranged to provide two cleaner and one scavenger stages in the circuit. Cyclone overflow reports to the rougher flotation machine and flotation reagents are added. Flotation concentrate from the rougher cell reports to the zinc flotation cleaner circuit; tailings from the rougher cell reports to the zinc scavenger circuit. Flotation concentrate from the two stage cleaner circuit reports to the zinc concentrate thickener; tailings from the two stage cleaner circuit are returned to the zinc rougher machine. Tailings from the zinc scavenger circuit report to the tailings system feed box for classification and disposal.

Tailings Disposal
Tailings from the zinc scavenger circuit report to the tailings system feed box for classification and disposal. Slurry is pumped from the tailings system feed box to a bank of two 510 mm diameter tailings sizing cyclones for classification into two sizes. Coarser material from the cyclones is directed to the hydraulic backfill plant feed tank for re-use underground as backfill in sulphide stopes. Less coarse material from the cyclones is directed to a single 9.0 m x 2.4 m tailings thickener for ultimate disposal at a lined tailings storage facility. Clear solution from the tailings thickener is used in preparation of the hydraulic backfill or returned to the sulphide plant process water tank for re-use in the recovery process.

Concentrate Thickening and Filtering
Two flotation concentrates are produced: lead and zinc. Concentrate thickening and filtering is performed in two parallel circuits, one for each product. In each circuit, the final flotation concentrate from each flotation circuit reports to a 4.6 m x 2.4 m concentrate thickening tank, (one tank for each product.) After thickening, the slurry underflow product reports to a plate and frame filter press for dewatering. After filtering, the filter cake is removed from the press and stored in a concentrate

holding area for shipping to a smelter. Clear solution overflow from the concentrate thickeners is returned to the sulphide plant process water tank for re-use in the recovery process.

Monitoring for lead, mercury, arsenic, cadmium and other potential health risks is performed on workers assigned to concentrate handling operations on a regular basis. La Colorada takes action to reduce exposures to acceptable limits when an issue is identified and no significant exposures are known to exist at the time of this report.

## 19.0 PROJECT INFRASTRUCTURE

### Roads

The La Colorada mine is accessed primarily from Durango by a continuously maintained 120 km all-weather, paved, two lane highway (Highway 45) and a 23 km public, all-weather, gravel road. The mine is also accessible from the city of Zacatecas by similar types of roads.

Consumables and other material are transported to the mine from Durango on the above described road. Doré is shipped via armored vehicle and concentrates in covered trucks by a contractor specializing in secure transport of valuables.

### Power

La Colorada has agreements in place with the national power utility, Comisión Federal de Electricidad (CFE), for the supply of 12.5 MW of power, an amount sufficient for the current operating plans. Electrical power is brought to the mine substation from the national power grid at 34.5 kV. A second, independent 34.5 kV transmission line was brought to the mine in 2007 to meet increasing ventilation and dewatering demands and address power outages that resulted in part due to reliance on a single transmission line. Power is stepped down to 13.2 kV at the mine for distribution.

The mine also maintains three 1.2 MW diesel generators onsite to provide backup power for mine dewatering pumps during power outages. The reliability of power supplied by the national grid improved significantly with the second 34.5 kV line and the need for site generated power is now minimal.

### Water

Water for the mining operation is supplied from the underground mine dewatering. As permitted by Mexican law, underground water is pumped to the surface and stored in head tanks for use in the milling process and for domestic services. Underground water is also pumped to a water treatment plant, which was constructed in 2002 and upgraded in 2008, to provide potable water. The current water supply is adequate for existing and planned future requirements of the project.

### Tailings Storage

La Colorada operates two separate TSFs. Both TSFs are permitted and lined.

Construction of the initial TSF was completed in June 2003. This facility has been expanded several times since initial construction: Lift 6 of the TSF was completed in 2008; earthworks for Lift 7 were

initiated at the end of 2012. Lift 7 is the final stage for this facility due to site constraints. Lift 7 is expected to be used exclusively for oxide ore tailings going forward and is anticipated to provide storage capacity for approximately three years.

The second TSF was brought online in 2011. This facility is located near the initial TSF in an area that will allow expansion to provide sufficient storage capacity for current reserves.

## 20.0 MARKET STUDIES AND CONTRACTS

La Colorada is a mature operation with a demonstrated history of doré and concentrate sales. PAS has not completed any recent market studies beyond the review of potential refining and smelting options as existing contracts for doré refining and concentrate smelting expire.

All precious metal doré produced at La Colorada is sent to arm's length refineries for refining. The doré is refined by one of two precious metals refineries under fixed term contracts. PAS generally retains the risk and title to the precious metals throughout the process of refining and therefore the operation is exposed to the risk that the refineries will not be able to perform in accordance with the refining contract and that the mine may not be able to fully recover its precious metals in such circumstances. PAS maintains insurance coverage against the loss of precious metals at mine sites, in-transit to refineries and while at the refineries.

After refining, the silver and gold is sold in the spot market to various bullion traders and banks. Credit risk is present with these transactions because payment is not received at the time of delivery, a typical element of spot sale contracts.

PAS' current policy is to not hedge the price of silver and therefore PAS is fully exposed to fluctuations in the price of silver. This strategy may have a material adverse effect upon financial performance, financial position and results of operations.

All lead and zinc concentrate produced at La Colorada is sold to arm's length smelters and concentrate traders under negotiated fixed term contracts. Credit risk is present with these transactions as the delivered concentrate has a value greater than the payment received at the time of delivery. Additionally, should any of the smelters or traders not honor supply arrangements, or should any of them become insolvent, the mine may incur losses for products already shipped and be forced to sell its concentrates in the spot market or it may not have a market for its concentrates and therefore future operating results may be materially adversely impacted.

Table 34 summarizes the doré refining and concentrate sales contracts currently in place at La Colorada.

Table 34: Current Doré Refining and Concentrate Sales Contracts

| Mine Product | Contract With | Quantity | Contract Duration | Terminates |
|---|---|---|---|---|
| Doré | Johnson Matthey, Inc. | as shipped | 36 months | Dec-2014 |
| Lead Concentrate | METAGRI S.A. de C.V. | 2,200 dmt | 12 months | Dec-2013 |
| Lead Concentrate | MK Metal Trading GmbH | 4,500 dmt | 12 months | Feb-2014 |
| Zinc Concentrate | METAGRI S.A. de C.V. | 8,600 dmt | 12 months | Dec-2013 |

To date, PAS has not experienced difficulty with renewing existing or securing new contracts for the sale of the La Colorada doré or concentrates, however, there can be no certainty it will always be able to do so or what terms will be available in the future.

PAS regularly reviews the terms of smelting and refining agreements and terms are considered to be within industry norms.

Table 35 summarizes revenue from metal sales realized by PAS from La Colorada for the last full three calendar years.

Table 35: Annual Revenue from Metal Sales

| Year | Product | Quantity | Revenue |
|---|---|---|---|
| 2012* | Doré | Silver: 1,371,153 t. oz; Gold: 1,270 t. oz | $44.3 million |
| | Lead Concentrate | 6,610 tonnes | $88.1 million |
| | Zinc Concentrate | 9,507 tonnes | $10.5 million |
| 2011 | Doré | Silver: 1,368,405 t. oz; Gold: 1,320 t. oz | $49.9 million |
| | Lead Concentrate | 5,935 tonnes | $88.2 million |
| | Zinc Concentrate | 7,410 tonnes | $9.5 million |
| 2010 | Doré | Silver: 1,554,500 t. oz.; Gold: 1,718 T. Oz. | $31.5 million |
| | Lead Concentrate | 3,769 tonnes | $36.7 million |
| | Zinc Concentrate | 5,175 tonnes | $5.2 million |
| 2009 | Doré | Silver: 1,500,221 t. oz.; Gold 1,525 t. oz. | $23.5 million |
| | Lead Concentrate | 3,994 tonnes | $27.7 million |
| | Zinc Concentrate | 4,350 tonnes | $3.1 million |

*2012 from production based report (PBR)

1 Consists of sales to arm’s length customers.
2 Calculated as gross revenue less treatment and refining charges.

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## 21.0 ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT

The La Colorada Mine is within an area of historic mining activity. The mine was constructed and is operated using internationally recognized techniques and practices designed to minimize new environmental impacts.

### 21.1. Environmental Studies and Permits

The EIS was completed in 1999 by Clifton Associates Ltd. S.C.. PAS initiated a voluntary environmental audit February 18, 2003 completed by Ing. Eduardo Escárcega Rangel, Director General of the company 'Soluciones de Ingeniería y Calidad Ambiental S.A. de C. V.,' and certified auditor for Procuraduría Federal de Protección al Ambiente (PROFEPA). From this audit an action plan was developed and was monitored for compliance thru reporting to PROFEPA. One of the recommendations was updating the EIS, which was completed by Clifton Associates Ltd. in 2006.

Mining generates tailings, which are materials considered to be potentially hazardous wastes. Plata filed an application to become a hazardous waste generator in January 1999 and the required permit was received on March 26, 2001.

To the author's knowledge, La Colorada is in compliance with all environmental regulations and holds all necessary permits to operate the mine.

Permits:

Environmental Impact Statement "Manifestacio de Impacto Ambiental" for construction was submitted and granted approval under D.O.O.DGOEIA.- 007244 by the Secreteria de Medio Ambiente Recursos Naturales y Pesca (SEMARNAT) on November 11, 1999, renewed for five years on October 7, 2005 and again for another five years on November 8, 2010. To the author's knowledge La Colorada is in compliance with reporting requirements of this permit.

Permit number 251/99/MA, October 6, 2000, from Delegacion Federal en Zacatecas Subdelegacion de Recursos Naturales Departamento de Suelos for a change in land use to construct tailings dam 6

Permit 32/DM-0040/12/10, December 2, 2010 from SEMARNAT for the construction of tailings dam 7

Plata holds a permit (Concesión 03ZAC1037661/11EQGE02) dated September 19, 2002 which permits the discharge of waters into the surface of the La Colorada property.

Pursuant to a new national Waters Law /Ley de Aguas nacionales), Plata is permit to make use of waters obtained from the exploration of a mine without having to apply to the National Water Commission for a permit or authorization.

### 21.2. Waste and Tailings Disposal

All broken waste rock and a portion of tailings are currently disposed of as fill during the cut and fill mining cycle. There are no known environmental issues with this form of disposal.

Tailings disposable is covered in section 18 "Project Infrastructure – Tailings Storage".

21.3. Social and Community

There are currently no social issues with the communities in proximity of La Colorada, although there is potential for this to change which could impact the operation. This is mitigated through programs in building sustainable community relations through cultural respect and socio economic support and in environmental stewardship (PAS, Sustainability Report, 2011).

21.4. Closure Plan

The closure plan was last updated July 2, 2010 by Clifton and Associates Ltd. The final closure cost in that report was estimated at $45 million Mexican pesos, which in US dollar, is approximately $4 million dollars (Clifton, 2010).

Mexican law does not require the submission of a closure plan and therefore does not require a bond or other form of advance payment for reclamation. They do however apply the principle of “el que contamina paga” (those who contaminate pay). PAS voluntarily adheres to international standards for mining operations and chose to prepare the initial closure plan and update it as necessary. The closure plan is to both World Bank and International Finance Corporation (IFC) standards.

The closure requirements are:

- Demolish building and physical infrastructure
- Close and fill surface accesses to the mine such as access ramps. Plug apertures such as shafts and raises
- Stabilize and eliminate access to mine areas, stopes, and raises
- Restore roadways and building sites
- Monitor stability and drainage of tailings and waste dumps

22.0 CAPITAL AND OPERATING COST

La Colorada is a mature operation with a documented history of capital and operating costs. This history forms the basis of projecting future costs for budgeting and financial modeling. Actual costs realized in the past and costs projected for the future are presented in this section.

22.1. Capital Costs

Each year, PAS approves capital projects for operational upgrades to sustain, improve, or expand production at Company operations, provide for equipment additions or replacements, and to make infrastructure improvements for local communities. Capital costs include exploration, mine development, equipment purchases, engineering studies of long term projects, design costs, site infrastructure, construction of new or expansion of TSFs, etc.

During the four year period from 2008 to 2012, capital spending at the La Colorada Mine totaled $54.3 million. Of this total, 61% went to mine operations, 28% went to ore processing operations, and 11% went to general and administration projects. During this period, annual spending on capital programs at La Colorada averaged $10.9 million, and ranged from $2.3 million in 2009 to $20.0 million in 2012. Table 36 summarizes capital spending for the period 2008 to 2012.

Table 36: La Colorada Capital Spending Actual 2008-2012 (000$)

| Year | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Operation Summary | | | | | |
| Mine | $9,005 | $1,346 | $5,445 | $6,105 | $11,156 |
| Ore Process | $2,239 | $956 | $1,117 | $4,617 | $6,403 |
| Surface Facilities | $862 | $24 | $732 | $1,856 | $2,421 |
| Total Capital Program | $12,106 | $2,326 | $7,295 | $12,578 | $19,980 |
| Mine | | | | | |
| Exploration | $1,847 | $0 | $1,666 | $1,721 | $5,860 |
| Development | $3,736 | $0 | $0 | $0 | $0 |
| Mine Equipment | $1,907 | $768 | $2,222 | $3,202 | $500 |
| Mine Ventilation | $686 | $0 | $0 | $513 | $1,520 |
| Mine Dewatering | $51 | $452 | $500 | $264 | $2,516 |
| Mine Backfill System | $431 | $0 | $763 | $0 | $0 |
| Mine Infrastructure Other | $345 | $126 | $295 | $405 | $760 |
| Total Mine | $9,005 | $1,346 | $5,445 | $6,105 | $11,156 |
| Ore Process | | | | | |
| Ore Crushing | $0 | $0 | $0 | $0 | $0 |
| Oxide Processing | $137 | $0 | $0 | $74 | $0 |
| Sulphide Processing | $250 | $69 | $329 | $573 | $0 |
| Tailings Storage | $1,812 | $887 | $699 | $3,882 | $3,772 |
| Plant Infrastructure | $40 | $0 | $89 | $88 | $2,631 |
| Total Ore Process | $2,239 | $956 | $1,117 | $4,617 | $6,403 |
| Operations Support | | | | | |
| Community Works | $0 | $0 | $209 | $268 | $524 |
| Mobile Equipment | $161 | $24 | $42 | $17 | $7 |
| Voice & Data Systems | $134 | $0 | $155 | $74 | $356 |
| Fire & Security Systems | $118 | $0 | $0 | $573 | $457 |
| Total Operations Support | $862 | $24 | $732 | $1,856 | $2,421 |

PAS will continue to invest capital in La Colorada in the future in order to sustain operations and provide support for the local communities. Future capital requirements are forecast in the LOM. Future capital costs are estimated by PAS using information obtained through past equipment purchases and quotes, estimates based on experience with similar projects completed at the mine site, and new quotes and estimates received from vendors and consultants.

The current LOM, which spans the years 2013 through 2024, projects total capital requirements at La Colorada at $122.8 million. Of this total, 24% is for mine expansion, 40% is for sustaining mine operations; 28% is for ore

processing operations; and 7% is for general and administration projects. Over the twelve year period encompassed by the plan, average annual spending on capital projects is forecast at $10.2 million. Annual capital requirements range from $2.0 million in 2022 to $14.8 million in 2013.

Table 37 summarize sustaining capital spending program projected for the future during the period 2013 to 2020.

Table 37: La Colorada Sustaining Capital Spending Long Term Plan 2013-2020 (000$)

| Year | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|
| Mine | $8,425 | $5,100 | $5,100 | $4,400 | $4,900 | $4,100 |
| Ore Process | $3,995 | $5,000 | $5,000 | $2,000 | $5,000 | $1,000 |
| Surface Facilities | $2,405 | $1,070 | $1,070 | $920 | $795 | $795 |
| Total Capital Program | $14,825 | $11,170 | $11,170 | $7,320 | $10,695 | $5,895 |

| Year | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|
| Mine | $4,600 | $4,100 | $2,000 | $2,000 | $2,000 | $2,715 |
| Ore Process | $5,882 | $2,315 | $2,237 | $0 | $1 | $1,745 |
| Surface Facilities | $795 | $795 | $500 | $0 | $0 | $0 |
| Total Capital Program | $11,277 | $7,210 | $4,737 | $2,000 | $2,001 | $4,459 |

Any mine expansion beyond that contemplated in the LOM plan presented in this Technical Report will require additional capital expenditures but would only be undertaken if the overall economics of the LOM plan were improved sufficiently to be justified.

## 22.2. Operating Costs

Operating costs are tabulated by La Colorada on a monthly basis using industry standard accounting software and in accordance with accounting principles generally accepted in Canada. Operating costs include labor and benefits for operating, maintenance and administration employees, contractor costs, materials and supplies, power, water, fuel and lubes, etc. The total annual cost to operate La Colorada averaged $37.3 million per year during the five year period 2008 through 2012, or $103.43 per ore tonne mined (PAS AIF, 1999 to 2011) .

Actual operating costs realized at La Colorada during years 2008 through 2012 are summarized in Table 38.

Table 38: La Colorada Summary Operating Costs Actual 2008-2012

| Year | 2008 | | 2009 | | 2010 | |
|---|---|---|---|---|---|---|
| Ore Tonnes Mined | 377,844 | | 324,916 | | 345,697 | |
| Operating Cost Summary | $000 | $/Tonne | $000 | $/Tonne | $000 | $/Tonne |
| Mining | $19,046 | $50.41 | $18,126 | $55.79 | $20,994 | $60.73 |
| Processing | $7,966 | $21.08 | $7,067 | $21.75 | $8,263 | $23.90 |
| G&A | $7,488 | $19.82 | $5,525 | $17.00 | $7,581 | $21.93 |
| Total | $34,500 | $91.31 | $30,718 | $94.54 | $36,838 | $106.56 |

| Year | 2011 | | 2012 | | 5-Year Average | |
|---|---|---|---|---|---|---|
| Ore Tonnes Mined | 404,533 | | 349,459 | | 360,490 | |
| Operating Cost Summary | $000 | $/Tonne | $000 | $/Tonne | $000 | $/Tonne |
| Mining | $24,213 | $59.85 | $20,887 | $59.77 | $20,653 | $57.29 |
| Processing | $9,724 | $24.04 | $10,244 | $29.31 | $8,653 | $24.00 |
| G&A | $10,737 | $26.54 | $8,570 | $24.52 | $7,980 | $22.14 |
| Total | $44,674 | $110.43 | $39,702 | $113.60 | $37,286 | $103.43 |

Costs used for the long term plan are based on expected staffing levels and organization chart, current pricing for power, materials and supplies, etc. Projected costs are adjusted for known and assumed price increases, and operating experience. Labor costs include salaries, benefits and overtime. Smelting, refining and transportation costs are based on current contracts, adjusted for expected changes in contract terms. Consumption rates for reagents, fuel, oils, power, etc. are based on actual experience at the operation and metallurgical testing.

Operating costs are broken into fixed and variable categories and applied to planned mine and process tonnes, ore types and labor schedule for estimating.

During the Years 2013 through 2024, the period covered by the current long term plan, total operating costs at La Colorada are projected to range from $125.01 to $134.60 per ore tonne mined, versus an average cost of $103.00 per tonne cost realized during the five-year period ending with 2012. Operating costs projected by the long term plan are summarized in Table 39.

Table 39: La Colorada Operating Costs Long Term Plan 2013-2024

| Year | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ore Tonnes Mined | 424,371 | | 438,198 | | 438,198 | | 438,198 | | 438,198 | | 438,198 | |
| | Total $ | $/Tonne | Total $ | $/Tonne | Total $ | $/Tonne | Total $ | $/Tonne | Total $ | $/Tonne | Total $ | $/Tonne |
| Mining | $29,339 | $69.13 | $30,595 | $69.82 | $34,634 | $79.04 | $34,798 | $79.41 | $35,564 | $81.16 | $35,563 | $81.16 |
| Processing | $11,591 | $27.31 | $12,144 | $27.71 | $12,143 | $27.71 | $12,084 | $27.58 | $9,292 | $21.20 | $9,292 | $21.20 |
| G&A | $12,121 | $28.56 | $12,083 | $27.58 | $12,083 | $27.58 | $12,100 | $27.61 | $12,083 | $27.58 | $12,083 | $27.58 |
| Total | $53,051 | $125.01 | $54,822 | $125.11 | $58,860 | $134.32 | $58,982 | $134.60 | $56,939 | $129.94 | $56,938 | $129.94 |

| Year | 2019 | | 2020 | | 2021 | | 2022 | | 2023 | | 2024 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ore Tonnes Mined | 438,198 | | 460,924 | | 460,924 | | 460,924 | | 460,924 | | 460,924 | |
| | Total $ | $/Tonne | Total $ | $/Tonne | Total $ | $/Tonne | Total $ | $/Tonne | Total $ | $/Tonne | Total $ | $/Tonne |
| Mining | $35,961 | $82.07 | $36,869 | $79.99 | $36,825 | $79.89 | $36,822 | $79.89 | $36,822 | $79.89 | $36,867 | $79.98 |
| Processing | $9,111 | $20.79 | $9,693 | $21.03 | $9,687 | $21.02 | $9,687 | $21.02 | $9,687 | $21.02 | $9,693 | $21.03 |
| G&A | $12,083 | $27.58 | $12,100 | $26.25 | $12,083 | $26.22 | $11,971 | $25.97 | $11,971 | $25.97 | $12,100 | $26.25 |
| Total | $57,156 | $130.43 | $58,662 | $127.27 | $58,595 | $127.12 | $58,480 | $126.88 | $58,480 | $126.88 | $58,659 | $127.26 |

## 23.0 ECONOMIC ANALYSIS

PAS updates long range mine plans and financial models for each of its operations to demonstrate economic viability. Inputs to the long term plans and financial models include current mineral resource and ore reserve tabulations, long term production schedules, current forecasts for metal prices and operating costs, current forecasts for future smelting and refining contract terms, capital spending, mine reclamation and closure, and royalty and tax assumptions

The current La Colorada Long Term Plan spans the twelve year period from the year 2013 through 2024. La Colorada is a mature operation with a documented history of production, operating and capital costs, and financial reporting. This history forms the basis of long term planning for La Colorada. Annual cash flow projections for La Colorada are estimated over the remaining life of the mine based on estimates of capital expenditures, production costs and sales revenue developed specifically for this project.

Table 42 presents highlights from the current La Colorada long term plan and financial model. Discussion of specific elements and analysis of the current financial model prepared for La Colorada are provided in the following sections.

### 23.1. Production Base

5.4 million tonnes of mineral resource containing 65.6 million ounces of silver are mined and processed through the current Plan. Of this total, 5.1 million tonnes (95.5% of the total material processed) is classified as proven and probable mineral reserves, and 0.23 million tonnes (4.5% of the total material processed) is classified as measured and indicated mineral resources which will be processed as incremental ore as it is required to be mined to access mineral reserve blocks in the LOM.

Inferred mineral resources are not considered in the long term plan and are not included in the financial model. Drilling is ongoing to upgrade and add mineral resources, and subsequently increase mine life, at La Colorada.

### 23.2. Planned Production

The Plan projects production of 55.9 million payable ounces of silver, 46.4 thousand payable ounces of gold, 101.6 thousand tonnes of payable zinc and 63.3 thousand tonnes of payable lead over the remaining life of mine.

Rates used to calculate payable quantities of metal production are based on current concentrate smelting and doré refining contracts.

### 23.3. Revenue

La Colorada revenue is reported on the basis of net smelter return. Smelting and refining terms used to calculate net smelter return in the financial model are based on current contracts. An allowance for

deleterious elements penalties is included in the financial model based on past experience with La Colorada concentrates.

The La Colorada Long Term Plan results in $1.57 billion in gross revenue from metal sales, after smelting, refining and transportation costs. 80% of this amount is projected to come from the sale of silver, 10% from zinc, 7% from lead, and 4% from gold.

## 23.4. Costs

The La Colorada financial model includes the mining, processing, general and administration operating costs presented and discussed in this technical report. In addition to operating costs, the model includes allowances for corporate overhead, reclamation, and exploration costs. All costs and expenses used for the financial model reflect current experience at La Colorada.

- The long term capital program discussed in this report is included in the financial model.
- Mexico corporate taxes are included in the financial model at current tax rates
- Potential salvage value of equipment at the end of the mine life is not considered in the financial model.
- Operating and capital costs are not escalated in the financial model.

The average cash operating cost over the remaining life of mine is projected to be $10.07 per payable ounce of silver produced. In the La Colorada financial model, cash operating costs are the sum of mine, process and general administrative operating costs plus smelting, refining, and product transportation charges less revenues generated by gold, lead and zinc sales.

The average total production cost over the remaining life of mine is projected to be $11.29 per payable ounce of silver produced. Total production cost is calculated as the sum of total cash operating cost plus royalties, reclamation and closure costs, depreciation and salvage value.

## 23.5. Cash Flow

Including capital invested in the operation to the date of this Technical Report, the current long term plan generates $509.1 million in undiscounted cash flow over the remaining life of mine. Table 40 presents the net present value of total cash flow generated during this period and the capital payback period calculated for several discount rates.

Table 40: NPV Cash Flow and Capital Payback

| Discount Rate | Capital Invested | Resulting Revenue | NPV Cash Flow | Capital Payback Years |
|---|---|---|---|---|
| 0 | ($122,759) | $631,859 | $515,273 | 1.7 |
| 5 | ($120,073) | $459,311 | $344,123 | 2.4 |
| 10 | ($103,769) | $348,269 | $248,398 | 2.7 |
| 15 | ($91,620) | $273,923 | $185,451 | 3.0 |

Sensitivity analysis was completed to determine the sensitivity of cash flow to changes in metal prices, mineral grades, metallurgical recovery, operating costs and capital cost. A summary of the analysis is provided below and in Table 41.

- Silver price, grade and recovery variables are the largest drivers to the La Colorada cash flow model, followed by operating costs.
- Cash flow is most sensitive to changes in silver price, followed by changes in silver grade or silver recovery. Modeled cash flow changes 2.0% for every 1% change in silver price; while a 1% change in silver grade or silver recovery results to a 1.9% change in cash flow.
    - Cash flow changes 0.9% for every 1% change in operating costs.
    - Cash flow changes 0.2% for every 1% change in capital costs.

Changes in base metal and gold variables have limited impact on cash flow, due to the minor contribution to revenue coming from these sources. For example, a 1% change in individual base metal variables result in a 0.3% change in cash flow; while a 1% change in individual gold variables result in a 0.1% change in cash flow.

Table 41: La Colorada Long Term Plan Cash Flow Sensitivity

| Sensitivity Variable | Variable % Change | Cash Flow Total LTP | Cash Flow % Change |
|---|---|---|---|
| Silver Price | | | |
| Increase Metal Price | 10% | $609,612 | 20% |
| Base Case (LTP) | 0% | $509,101 | 0% |
| Decrease Metal Price | -10% | $408,589 | -20% |
| Silver Grade | | | |
| Increase Silver Head Grade | 10% | $605,418 | 19% |
| Base Case (LTP) | 0% | $509,101 | 0% |
| Decrease Silver Head Grade | -10% | $412,783 | -19% |
| Silver Recovery | | | |
| Increase Silver Recovery | 5% | $557,259 | 9% |
| Base Case (LTP) | 0% | $509,101 | 0% |
| Decrease Silver Recovery | -5% | $460,942 | -9% |
| Operating Cost | | | |
| Decrease Operating Cost | 10% | $464,983 | -9% |
| base case | 0% | $509,101 | 0% |
| Increase Operating Cost | -10% | $553,218 | 9% |
| Sustaining Capital Cost | | | |
| Decrease Sustaining Capital Cost | 10% | $500,942 | -2% |
| base case | 0% | $509,101 | 0% |
| Increase Sustaining Capital Cost | -10% | $517,260 | 2% |

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Table 42: Summary Data from La Colorada Financial Model

| Year | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|---|
| Ore Processing | | | | | | | | | | |
| Tonnes Milled | 424,371 | 438,198 | 438,198 | 438,198 | 438,198 | 438,198 | 438,198 | 460,924 | 460,924 | 460,924 |
| Ag g/t | 381 | 373 | 373 | 373 | 373 | 373 | 373 | 389 | 389 | 389 |
| Au g/t | 0.38 | 0.42 | 0.42 | 0.42 | 0.42 | 0.42 | 0.42 | 0.37 | 0.37 | 0.37 |
| Pb% (Sulfide Ore Only) | 1.62 | 1.85 | 1.85 | 1.85 | 1.85 | 1.85 | 1.85 | 1.85 | 1.85 | 1.85 |
| Zn% (Sulfide Ore Only) | 3.04 | 3.43 | 3.43 | 3.43 | 3.43 | 3.43 | 3.43 | 3.43 | 3.43 | 3.43 |
| Ag Recovery, % | 89.7 | 88.5 | 88.5 | 88.5 | 88.5 | 88.5 | 88.5 | 92.5 | 92.5 | 92.5 |
| Au Recovery, % | 70.8 | 70.4 | 70.4 | 70.4 | 70.4 | 70.4 | 70.4 | 71.9 | 71.9 | 71.9 |
| Pb Recovery, % (Sulfide Ore) | 84.4 | 84.4 | 84.4 | 84.4 | 84.4 | 84.4 | 84.4 | 84.4 | 84.4 | 84.4 |
| Zn Recovery, % (Sulfide Ore) | 81.6 | 81.6 | 81.6 | 81.6 | 81.6 | 81.6 | 81.6 | 81.6 | 81.6 | 81.6 |
| Metal Price | | | | | | | | | | |
| Ag, $/Toz | $25.00 | $25.00 | $25.00 | $25.00 | $25.00 | $25.00 | $25.00 | $25.00 | $25.00 | $25.00 |
| Au, $/Toz | $1,350.00 | $1,350.00 | $1,350.00 | $1,350.00 | $1,350.00 | $1,350.00 | $1,350.00 | $1,350.00 | $1,350.00 | $1,350.00 |
| Pb, $/DMT | $1,850.00 | $1,850.00 | $1,850.00 | $1,850.00 | $1,850.00 | $1,850.00 | $1,850.00 | $1,850.00 | $1,850.00 | $1,850.00 |
| Zn, $/DMT | $1,750.00 | $1,750.00 | $1,750.00 | $1,750.00 | $1,750.00 | $1,750.00 | $1,750.00 | $1,750.00 | $1,750.00 | $1,750.00 |
| Production - Total Metal | | | | | | | | | | |
| Silver Ounces Produced | 4,656,721 | 4,656,721 | 4,656,721 | 4,656,721 | 4,656,721 | 4,656,721 | 4,656,721 | 5,328,319 | 5,328,319 | 5,328,319 |
| Gold Ounces Produced | 3,684 | 4,171 | 4,171 | 4,171 | 4,171 | 4,171 | 4,171 | 3,927 | 3,927 | 3,927 |
| Lead Tonnes Produced | 4,006 | 4,444 | 4,444 | 4,444 | 4,444 | 4,444 | 4,444 | 7,208 | 7,208 | 7,208 |
| Zinc Tonnes Produced | 7,240 | 7,959 | 7,959 | 7,959 | 7,959 | 7,959 | 7,959 | 12,910 | 12,910 | 12,910 |
| Production - Payable Metal | | | | | | | | | | |
| Silver Ounces Produced | 4,416,548 | 4,435,230 | 4,435,230 | 4,435,230 | 4,435,230 | 4,435,230 | 4,435,230 | 4,974,633 | 4,974,633 | 4,974,633 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Gold Ounces Produced | 3,548 | 4,041 | 4,041 | 4,041 | 4,041 | 4,041 | 4,041 | 3,730 | 3,730 | 3,730 |
| Lead Tonnes Produced | 3,806 | 4,222 | 4,222 | 4,222 | 4,222 | 4,222 | 4,222 | 6,848 | 6,848 | 6,848 |
| Zinc Tonnes Produced | 6,154 | 6,765 | 6,765 | 6,765 | 6,765 | 6,765 | 6,765 | 10,973 | 10,973 | 10,973 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Net Smelter Return - Metal Basis | | | | | | | | | | | |
| Silver | $110,414 | $110,881 | $110,881 | $110,881 | $110,881 | $110,881 | $110,881 | $124,366 | $124,366 | $124,366 | $ |
| Gold | $4,790 | $5,455 | $5,455 | $5,455 | $5,455 | $5,455 | $5,455 | $5,036 | $5,036 | $5,036 | $ |
| Lead | $7,041 | $7,811 | $7,811 | $7,811 | $7,811 | $7,811 | $7,811 | $12,668 | $12,668 | $12,668 | $ |
| Zinc | $10,232 | $11,839 | $11,839 | $11,839 | $11,839 | $11,839 | $11,839 | $19,203 | $19,203 | $19,203 | $ |
| Trans, Smelt, Ref | ($13,245) | ($12,830) | ($13,415) | ($13,415) | ($13,415) | ($13,415) | ($12,164) | ($18,401) | ($18,401) | ($18,401) | ( |
| Total | $119,231 | $123,156 | $122,571 | $122,571 | $122,571 | $122,571 | $123,822 | $142,872 | $142,872 | $142,872 | $ |
| Net Smelter Return - Product Sold Basis | | | | | | | | | | | |
| Precious Metal Doré | $27,159 | $36,194 | $36,194 | $36,194 | $36,194 | $36,194 | $36,194 | $0 | $0 | $0 | $ |
| Lead Concentrate | $81,626 | $75,067 | $74,482 | $74,482 | $74,482 | $74,482 | $74,482 | $121,170 | $121,170 | $121,170 | $ |
| Zinc Concentrate | $10,445 | $11,894 | $11,894 | $11,894 | $11,894 | $11,894 | $13,145 | $21,702 | $21,702 | $21,702 | $ |
| Total | $119,231 | $123,156 | $122,571 | $122,571 | $122,571 | $122,571 | $123,822 | $142,872 | $142,872 | $142,872 | $ |
| Income Statement | | | | | | | | | | | |
| NSR | $119,231 | $123,156 | $122,571 | $122,571 | $122,571 | $122,571 | $123,822 | $142,872 | $142,872 | $142,872 | $ |
| Royalties | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $ |
| Op Costs | ($53,051) | ($54,822) | ($58,860) | ($58,982) | ($56,939) | ($56,938) | ($57,156) | ($58,662) | ($58,595) | ($58,480) | ( |
| Depreciation & Amortization | ($5,402) | ($5,578) | ($5,578) | ($5,578) | ($5,578) | ($5,578) | ($5,578) | ($5,868) | ($5,868) | ($5,868) | ( |
| Reclamation Provision | ($300) | ($332) | ($332) | ($332) | ($332) | ($332) | ($332) | ($332) | ($332) | ($332) | ( |
| Equipment Salvage Value | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $ |
| Exploration | ($2,473) | ($2,300) | ($2,000) | ($2,000) | ($2,000) | ($2,000) | ($2,000) | ($2,000) | ($1,000) | $0 | $ |
| Taxes | ($16,822) | ($16,835) | ($15,624) | ($15,590) | ($16,162) | ($16,162) | ($16,452) | ($21,283) | ($21,283) | ($21,283) | ( |
| Net Income | $41,184 | $43,289 | $40,177 | $40,089 | $41,559 | $41,560 | $42,304 | $54,728 | $55,795 | $56,909 | $ |
| Cash Flow Statement | | | | | | | | | | | |
| Net Income | $55,275 | $46,873 | $44,421 | $40,813 | $42,284 | $42,285 | $43,035 | $55,811 | $56,878 | $57,993 | $ |
| Operating Activities | $9,909 | $6,512 | $5,244 | $5,226 | $5,180 | $4,465 | $4,438 | $4,647 | $4,348 | $3,756 | $ |
| Investing Activities | ($14,825) | ($26,170) | ($22,320) | ($10,695) | ($5,895) | ($11,277) | ($7,210) | ($4,737) | ($2,000) | ($2,001) | ( |
| Cash Flow | $50,359 | $27,215 | $27,345 | $35,344 | $41,569 | $35,473 | $40,263 | $55,721 | $59,226 | $59,748 | $ |

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| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Per Tonne Milled | | | | | | | | | | | | | |
| Net Smelter Return per Tonne | $281 | $281 | $280 | $280 | $280 | $280 | $283 | $310 | $310 | $310 | $310 | $310 | $293 |
| Total Cost per Tonne | $125 | $125 | $134 | $135 | $130 | $130 | $130 | $127 | $127 | $127 | $127 | $127 | $127 |
| Margin per Tonne | $156 | $156 | $145 | $145 | $150 | $150 | $152 | $183 | $183 | $183 | $183 | $183 | $164 |
| Per Silver Ounce Produced - Total | | | | | | | | | | | | | |
| Cash Cost | $11 | $10 | $11 | $11 | $11 | $11 | $11 | $9 | $9 | $9 | $9 | $9 | $10 |
| Non-Cash Costs | $1 | $1 | $1 | $1 | $1 | $1 | $1 | $1 | $1 | $1 | $1 | $1 | $1 |
| Production Cost | $12 | $12 | $13 | $13 | $12 | $12 | $12 | $10 | $10 | $10 | $10 | $10 | $11 |
| Per Silver Ounce Produced - Payable | | | | | | | | | | | | | |
| Cash Cost | $10 | $10 | $11 | $11 | $10 | $10 | $10 | $8 | $8 | $8 | $8 | $8 | $9 |
| Non-Cash Costs | $1 | $1 | $1 | $1 | $1 | $1 | $1 | $1 | $1 | $1 | $1 | $1 | $1 |
| Total Production Cost | $11 | $11 | $12 | $12 | $12 | $12 | $11 | $9 | $9 | $9 | $9 | $9 | $11 |

## 24.0 ADJACENT PROPERTIES

There is no relevant information on adjacent properties to report.

## 25.0 OTHER RELEVANT DATA AND INFORMATION

No other data or information is relevant for the review of the La Colorada project.

## 26.0 INTERPRETATION AND CONCLUSIONS

La Colorada was evaluated by PAS while under option from Minas between September 1997 and March 1998. The decision was taken to purchase the property and develop a feasibility study to increase production from what Minas was achieving. With a feasibility study construction was initiated.

La Colorada mine has been operated under PAS' management safely and economically since early 2001. Production has greatly increased due to capital investment which has been used to increase processing capacity and underground infrastructure including pumping and ventilation. Investment in exploration, particularly diamond drilling, has added significant mineral reserves and made mining and planning more reliable.

This Technical Report demonstrates that the proven and probable mineral reserves presented in this report will be economic with the forecast metal prices and other assumptions presented herein. Based on the current mineral reserve, the mine is projected to operate until the end of 2024. This projected mine life may increase if additional mineral resources are defined and can be converted to mineral reserves.

In the authors' opinion, the diamond drilling and channel sampling information that has been collected is of sufficient spacing and quality for mineral resource and reserve estimation. The reliability of the mineral resource and reserve estimates have been confirmed by reconciliations between production to the mineral reserve and plant to production data.

This report details the methodology employed and demonstrates why the authors conclude that the continued operation of the La Colorada mine is technically feasible and economically viable. It is the opinion of the authors of this Technical Report that the data contained herein is of sufficient quality and reliability to make these conclusions.

### 26.1. Risks

The management of the mine continuously analyses and studies the potential for risk. They plan, budget and execute projects needed to ensure continuous production levels.

The most significant risks are those affecting the entire industry such as costs escalation and skilled labour shortages. Another risk of operating in Mexico is the drug cartel wars and related violence

which could affect transport of goods and personnel, property security, property loss and personnel safety.

## 27.0 RECOMMENDATIONS

It is the authors' recommendation to continue the exploration efforts and improvements to infrastructure which could lead to increases in mineral reserves and mine production. As the mine is currently in operation, the work programs necessary to maintain annual updates to the mineral reserve estimates are in place and conducted on a daily basis by a full complement of technical and operating staff at the mine. The costs for these work programs are included in the annual operating budgets, mine plan and life of mine plan.

It is recommended that PAS continue to follow the life of mine plan and make the capital investments that are detailed in that plan. It is further recommended to continue to follow the current sampling and quality control programs as may be revised from time to time by the authors of this Technical Report. It is also recommended to continue with the diamond drilling program and the related sampling and quality control programs in order to assure sufficient data density and reliability for future new mineral resource additions in deeper or lateral parts of the mine as well as for satellite deposits. The mine has a budget in 2013 of US$3.4M in order to conduct exploration and definition drilling programs in an attempt to convert inferred mineral resources to mineral reserves, add new inferred mineral resources and to locate new orebodies. These exploration programs are closely supervised and revised by Michael Steinmann P.Geo., EVP Business Development & Geology.

The authors of this Technical Report recommend that the mine should continue to operate.

## 28.0 REFERENCES

Process Research Associates Ltd., Flotation and Cyanidation Study on Samples from La Colorada, May 2000

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29.0 CERTIFICATES of QUALIFIED PERSONS

CERTIFICATE of QUALIFIED PERSON

I, Dr. Michael Steinman, Executive Vice President, Corporate Development and Geology of Pan American Silver Corp., 1500-625 Howe St, Vancouver, BC, V6C 2T6, Canada do hereby certify that:

(a) I am the co-author of the technical report titled “Technical Report for the La Colorada Property, Zacatecas, Mexico”, with an effective date of December 31, 2012 (the “Technical Report”).

(b) I graduated with a Master of Science in Geology degree from the University of Zurich, Switzerland, in 1993. I also earned a Doctor of Natural Science in Geology degree from the Swiss Federal Institute of Technology, Zurich, Switzerland, in 1997. I am a Professional Geologist in good standing with The Association of Professional Engineers and Geoscientists of the Province of British Columbia. My experience is primarily in the areas of mining geology and exploration and I have worked as a geologist for a total of 19 years since my graduation from the University of Zurich.

(c) 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 fulfil the requirements of a ‘qualified person’ for the purposes of the Instrument.

(d) I am responsible for the preparation of the sections of the Technical Report as detailed in Table 3 – List of Qualified Persons.

(e) I am currently employed as the Executive Vice President, Corporate Development and Geology for Pan American Silver Corp., the owner of the La Colorada Property, and by reason of my employment, I am not considered independent of the issuer as described in section 1.5 of the Instrument.

(f) I have had prior involvement with the La Colorada Property that is the subject of the Technical Report; I am an executive with Pan American Silver Corp. and was the co-author of the technical report titled “Technical Report for the La Colorada Property, Zacatecas, Mexico” dated effective September 30, 2007. I have conducted numerous site visits to the La Colorada Property, most recently on January 22-23, 2013.

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

(h) As of the effective date of the Technical Report, 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, British Columbia, this 28th day of March, 2013.

“Signed”

Michael Steinmann, P.Geo, Ph.D

CERTIFICATE of QUALIFIED PERSON

I, Martin Wafforn, Vice President, Technical Services of Pan American Silver Corp., 1500-625 Howe St, Vancouver, BC, V6C 2T6, Canada do hereby certify that:

(i) I am the co-author of the technical report titled "Technical Report for the La Colorada Property, Zacatecas, Mexico", with an effective date of December 31, 2012 (the "Technical Report").

(j) I graduated with a Bachelor of Science in Mining degree from the Camborne School of Mines in Cornwall, England in 1980. I am a Professional Engineer in good standing with The Association of Professional Engineers and Geoscientists of the Province of British Columbia. I am also a Chartered Engineer in good standing in the United Kingdom. My experience is primarily in the areas of mining engineering and I have worked as a engineer in the mining industry for a total of 30 years since my graduation from the Camborne School of Mines.

(k) 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 fulfil the requirements of a 'qualified person' for the purposes of the Instrument.

(l) I am responsible for the preparation of the sections of the Technical Report as detailed in Table 3 – List of Qualified Persons.

(m) I am currently employed as the Vice President, Technical Services for Pan American Silver Corp., the owner of the La Colorada Property, and by reason of my employment, I am not considered independent of the issuer as described in section 1.5 of the Instrument.

(n) I have had prior involvement with the La Colorada Property that is the subject of the Technical Report; I am an executive with Pan American Silver Corp. and was the co-author of the technical report titled "Technical Report for the La Colorada Property, Zacatecas, Mexico" dated effective September 30, 2007. I have conducted numerous site visits to the La Colorada Property, most recently on January 22nd and 23rd, 2013.

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

(p) As of the effective date of the Technical Report, 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, British Columbia, this 28th day of March, 2013.

"Signed"

Martin Wafforn, P. Eng.

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

PAN AMERICAN SILVER CORP
(Registrant)

| | | | | |
|---|---|---|---|---|
| Date: | April 2, 2013 | By: | /s/ Delaney Fisher | |
| | | | Name: | Delaney Fisher |
| | | | Title: | Corporate Secretary |