Preliminary Economic Assessment for the

Fenix Project at

MCEWEN MINING INC.'S OPERATIONS IN SINALOA, MEXICO

Prepared for

MCEWEN MINING INC.
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1. SUMMARY

1.1 Location

McEwen Mining Inc. (McEwen) have 100% ownership of Project Fenix (Project) located in north-western Mexico, in Sinaloa state, Mocorito Municipality. Project Fenix is the title for the Project that is combining mineralized material sources from five locations that will be developed in two distinct process plant construction Phases, namely:

Phase 1:

- El Gallo Gold Previously Heap Leached Material;

Phase 2

- El Gallo Silver;
- Palmarito;
- El Encuentro; and
- Carrisalejo.

The Project is located approximately 100 km (60 mi) by air north-west of the Sinaloa state capital city of Culiacan in the western foothills of the Sierra Madre Occidental (SMO) mountain range. The concession area is located approximately 32 km (20 mi) by road from the village of Mocorito, approximately 48 km (30 mi) from the town of Guamuchil. The approximate coordinates for the center of the district are longitude 107°51'W and latitude 25°38'N.

The processing facilities for the Project will be built at the existing El Gallo Gold Heap Leach operations, utilising the existing security, administration, workshop and laboratory facilities.

1.2 Ownership

McEwen owns its interest in the concessions through its 100% ownership of Nevada Pacific Gold Ltd., which owns 100% of Pangea Resources, Inc. Through Pangea Resources' 100% ownership of Compania Minera Pangea, S.A. de C.V. (Minera Pangea), McEwen owns the concessions.

The concessions consist of 1,126 square kilometers (238,320 ac) of land. Concession titles are granted under Mexican mining law and are issued by Secretaria de Economia, Coordinacion General de Minera, Direccion General de Minas (Direccion de Minas). Table 1 summarizes the Company's land position in Mexico as of December 31, 2017.

Mexico Mineral Property Interest	Claims	Square Miles	Square Kilometers
El Gallo Gold Mine	7	8	20
El Gallo Silver Project	5	144	372
Other Mexico Properties	38	283	734
Total Mexico Properties	**50**	**434**	**1126**

Table 1 Company's Land Position as of December 2017

1.3 Geology

The geology of north-western Mexico is dominated by the volcanic plateau of SMO, a 1,200 km long (800 mi) northwest-trending mountainous region that roughly parallels the west coast of Mexico. The volcanic rocks of the SMO and surrounding regions can be broadly grouped into two principal units: the Lower Volcanic Series and Upper Volcanic Series. The Lower Volcanic Series is comprized dominantly of volcanic rocks of andesitic composition, which range in age from Late Cretaceous to Eocene and attain thicknesses of 1 to 1.5 km (0.7 to 1 mi). The Upper Volcanic Series rests uncomfortably on the Lower Volcanic Series and is dominated by rhyodacitic to rhyolitic ignimbrites of Oligocene-Miocene age. It is 1 to 2 km (0.7 to 1.3 mi) in thickness. Coeval granitic plutons are observed intruding the Lower Volcanic Series extrusive rocks. These intrusives are best exposed in the lower-lying coastal regions.

Geographically, McEwen's concessions lie in the Pie de la Sierra physiographic province west of the SMO. The geology of the region is dominated by the presence of the same groups of Late Cretaceous-Tertiary volcanic rocks as occur in the SMO as well as occurrences of the Sinaloa Batholith. McEwen's concessions are all underlain by volcanic rocks of the Lower Volcanic Series and are dominated by andesitic flows, tuffs and intrusions. Rhyolitic and sedimentary rocks are also present but are subordinate. Intrusive rocks of the Sinaloa Batholith occur throughout the region and are exposed in close proximity to El Gallo Silver and El Gallo Gold deposits. Tertiary intrusive rocks also occur.

Faults of north-west, east-northeast, north-east and north-south trend dominate the structural geology of the region. These structures appear to be instrumental in the localization of the silver and gold deposits outlined herein.

El Gallo Silver (GAX)

Silver mineralization is hosted in siliceous breccia zones and quartz stockwork zones within the dominantly andesitic rock package. These zones often occur at lithologic contacts, particularly contacts of Tertiary porphyry intrusions. Multi-lithologic breccias zones are often adjacent to these contacts and these breccias are locally mineralized. Mineral zones commonly have gently-dipping tabular geometry. Often, these zones reflect control by sill contacts of the Tertiary intrusives.

Palmarito (PMX)

Silver mineralization at Palmarito occurs along or near the contact of andesitic-dacitic volcanic country rocks and a Tertiary rhyolite intrusive forming a horseshoe-shaped zone which wraps around the margin of the intrusive. The strongest mineralization in the main Palmarito mineralization occurs along a northeast-trending zone which appears to represent the intersection of two contact structures.

Generally, mineralization occurs in a breccia zone and is associated with strong silicification in the form of siliceous breccia, stockwork veining and silica flooding.

El Gallo Gold (MUX)

The El Gallo Gold Heap Leach Operations (also known as Magistral) is drawing to a close. The Heap Leach Material has residual gold mineralization that has been placed from four deposits along two distinct structural trends. A north-west trend hosted the San Rafael and Samaniego deposits, the second structural trend is northeast-striking and included the Sagrado Corazón, and Lupita deposits.

Mineralization among the various deposits of the El Gallo Gold area is generally very similar, with the individual structural zones consisting of quartz stockwork, breccia, and local quartz vein mineralization occurring within propylitically altered andesitic volcanic rocks. McEwen has placed approximately 9.0 Mt of mineralized material on the current Heap Leach Pad that will be retreated through the grinding, leach and adsorption circuit of Phase 1.

El Encuentro (ENX)

El Encuentro is a shallow oxide and sulphide deposit located less than 10 km from the El Gallo Gold mine and is accessed easily by the same road that provides access El Gallo Gold. The deposit is primarily gold but has values for silver as well.

Carrisalejo (CSX)

Silver mineralization occurs in a near surface low-angle zone that strikes roughly east-west and dips to the south at 20-25°. The thickness of this zone is variable ranging from 3 m to as much as 25 m. Mineralization is characterized by quartz stockwork and breccias associated with silicification. Much of the mineralization occurs at or near surface and is usually oxide; silver, lead, and zinc sulphides are seen below the oxide zone. Apart from the principal low-angle zone, other mineralization occurs in less well-defined structures.

1.4 Resource Estimate

The estimated mineral resources for Project Fenix are detailed in Table 2. Note that these are not reserve estimates. The total combined Project Measured and Indicated silver resource equals 32.3 Moz. Inferred silver resources equal 5.0 Moz. The total measured and Indicated gold resources equals 161 koz. Inferred gold resources equal 148 koz.

El Gallo Silver

In Optimized Pit Shell Potential COG = 50 g/t Ag	Tonnes kt	Silver Grade (g/t)	Silver koz	Gold Grade (g/t)	Gold koz
Measured	1,057	150	5,088	0.09	3
Indicated	4,436	120	17,053	0.13	19
Measured and Indicated	**5,493**	**125**	**22,140**	**0.12**	**22**
Inferred	564	82	1,488	0.38	7

Palmarito

In Optimized Pit Shell Potential COG = 70g/t Ag	Tonnes kt	Silver Grade (g/t)	Silver koz	Gold Grade (g/t)	Gold koz
Measured	1,653	136	7,245	0.38	20
Indicated	11	148	52	0.23	0
Measured and Indicated	**1,664**	**136**	**7,297**	**0.38**	**20**
Inferred	528	133	2,258	0.30	5

Palmarito Dumps

Potential COG = 52g/t Ag	Tonnes kt	Silver Grade (g/t)	Silver koz	Gold Grade (g/t)	Gold koz
Measured	177	177	1,007	0.29	2
Indicated	68	154	338	0.24	1
Measured and Indicated	**246**	**170**	**1,345**	**0.28**	**2**
Inferred	0	0	0	0.00	0

Carrisalejo

In Optimized Pit Shell Potential COG = 46g/t Ag	Tonnes kt	Silver Grade (g/t)	Silver koz	Gold Grade (g/t)	Gold koz
Measured	0	0	0	0.00	0
Indicated	391	116	1,454	0.11	1
Measured and Indicated	**391**	**116**	**1,454**	**0.11**	**1**
Inferred	42	821	1,111	0.02	0

El Encuentro

In Optimized Pit Shell Potential COG = 0.78 g/t Au	Tonnes kt	Silver Grade (g/t)	Silver koz	Gold Grade (g/t)	Gold koz
Measured	0	0	0	0.00	0
Indicated	534	2	42	1.87	32
Measured and Indicated	**534**	**2**	**42**	**1.87**	**32**
Inferred	190	19	117	5.68	35

El Gallo Gold Heap Leach Material

Potential COG = 0 g/t Au	Tonnes kt	Silver Grade (g/t)	Silver koz	Gold Grade (g/t)	Gold koz
Measured	0	0	0	0.00	0
Indicated	4,679	0	0	0.56	84
Measured and Indicated	**4,679**	**0**	**0**	**0.56**	**84**
Inferred	4,352	0	0	0.72	101

Totals

In Optimized Pit Shells Potential COGs variable	Tonnes kt	Silver Grade (g/t)	Silver koz	Gold Grade (g/t)	Gold koz
Measured	2,887	144	13,340	0.27	25
Indicated	10,119	58	18,938	0.42	137
Measured and Indicated	**13,006**	**77**	**32,277**	**0.39**	**161**
Inferred	5,678	27	4,974	0.81	148

Table 2 Project Fenix, Summary of Mineral Resource Estimates

1.5 Mineral Reserves

This PEA does not include any mineral reserves.

1.6 Status of Exploration

McEwen is actively exploring its mineral concessions. The objective of the ongoing exploration programme is to expand the current resources outlined in this Technical Report and to identify new mineralized structures away from the resource where no previous drilling has occurred.

1.7 Metallurgical Testing and Recovery Methods

Preliminary metallurgical test work programs have been conducted from 2017 to 2018 in order to investigate an alternate process flowsheet for treatment of the El Gallo Silver material as well as the potential for recovering gold values from the El Gallo Gold Heap Leach Material.

The preliminary metallurgical test work conducted in 2018 indicated that the El Gallo Gold Heap Leach Material would be amenable to conventional grinding followed by direct cyanidation with relatively high gold extractions achieved after 24 hours of leaching. Test work identified moderate levels of soluble copper and zinc.

From 2017 to 2018, metallurgical test work conducted on the El Gallo Silver material focused on using conventional flotation techniques to separate the slower leaching silver minerals and enable separate cyanide leaching of bulk flotation concentrate and tailings streams to enhance the silver leaching characteristics. Results have proved favorable and an alternative flowsheet for treatment of El Gallo Silver has been adopted.

The Project Fenix processing facility would be designed to process material from several different deposits via separate campaigns. A two-phase approach would be utilized to develop Project Fenix, Phase 1 specifically for the gold bearing Heap Leach Material (HLM) from the El Gallo Gold and Phase 2 for the treatment of mainly silver rich mineralized feed stock from several other resources in the region; El Gallo Silver, Palmarito, Carrisalejo and El Encuentro. Phase 1 would have a throughput rate of 5,000 tonnes per day (tpd). During Phase 2, fresh mineralized material from higher grade silver deposits (El Gallo Silver primarily) would be processed at approximately 3,250 tpd.

Phase 1 operation would target gold recovery from the Heap Leach Material using a conventional ball mill grinding and a hybrid carbon-in-leach (CIL) circuit. Industry standard elution, electrowinning and smelting circuits would be used to produce a doré product. Cyanide in the CIL tailings would be detoxified using the SO_2/Air process, and the detoxified tailings would then be sent to a tailings storage facility in an existing mined-out open pit.

In Phase 2 the process facility would be modified to enable treatment of material from the El Gallo Silver deposit to be followed by other deposits in the Project area. Phase 2 operation would utilize conventional flotation technology, more intensive leaching of concentrates with counter current decantation (CCD) washing used to recover solution for zinc precipitation using the Merrill Crowe process for silver and gold recovery. The Phase 1 CIL plant would be utilized for cyanide leaching of the flotation tailings to maximize overall silver recoveries during Phase 2. Phase 2 would also utilize the existing El Gallo Gold three stage crushing plant to prepare material for delivery to the grinding circuit.

Tailings produced during the operation, starting with Phase 1 would be stored in the mined-out Samaniego pit at the El Gallo Gold. As part of this, in-pit tailings deposition would include a tailings delivery system designed to maximize tailings consolidation and water recovery. Supernatant solution decanted and seepage water would be recovered by the use of underdrainage and recovery bores at the in-pit tailings storage facility.

Process block flow diagrams are included in Figure 1 and Figure 2, showing the difference for the two phases of operation. Phase 2 development utilizes all of the equipment that would be installed in Phase 1 for the treatment of the Heap Leach Material.

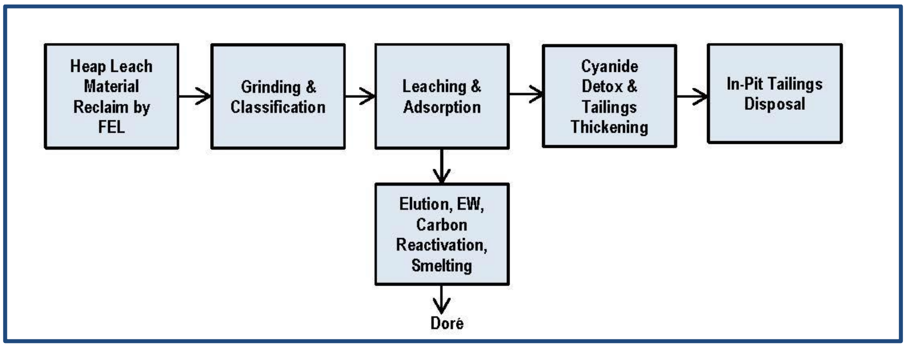


Figure 1 Phase 1 Process Flow Block Diagram

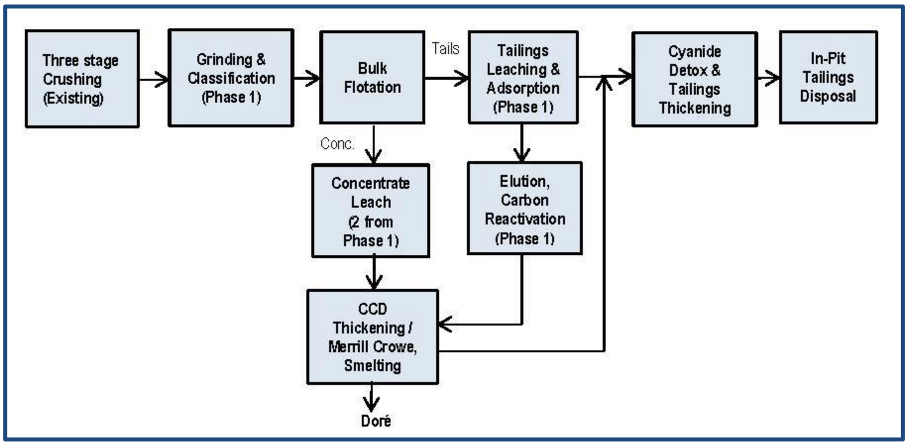


Figure 2 Phase 2 Process Flow Block Diagram

The treatment process for Palmarito and Carrisalejo open pit material has been assumed to be similar to that for El Gallo Silver based on historical test work records along with some scoping test work conducted in 2018. Based on scoping level test work carried out to date the indications are that the El Encuentro material would be amenable to direct cyanidation.

The preliminary metallurgical test work outcomes indicated generic metal recoveries for the El Gallo Gold Heap Leach Material of 88% for gold and for El Gallo Silver Material of 86% for silver and 75% for gold. Scoping level only test work on a proposed Palmarito open pit composite sample indicated generic metal recoveries of 75% for silver and 85% for gold using the Phase 2 flowsheet.

Note the Palmarito, Carrisalejo and El Encuentro deposits included in the production schedule have been subjected only to scoping level metallurgical test work using the selected process flowsheets. Further sampling and test work is required to better understand the response of each of the deposits to the selected flowsheets.

1.8 Environmental Permitting

Project Fenix is in a rural area of Sinaloa state in an agricultural area that has a low population density. Potential environmental impacts to surface soils, water, the ecology and air quality will be mitigated as part of the mining operations.

McEwen will utilize the existing Samaniego Pit for permanent storage of tailings material. The tailings will first be dewatered into a thickened slurry and then pumped into the impoundment using a series of drop legs to maximize areal distribution and tailings consolidation. Key test work such as tailings rheology analysis proved this to be a viable design option. In-pit tailings deposition will significantly mitigate environmental risks commonly associated with tailings impoundments such as:

- Groundwater contamination through seepage is virtually removed;
- Catastrophic tailings breach is eliminated as the pit is all below existing ground level;

- Reduces disturbance footprint and construction material volume required for facility construction;
- Recycling of process water reduces make-up water demand;
- Closure and reclamation performance is significantly enhanced as the rehabilitation process is simplified and the Samaniego Pit and heap leach pad is eliminated.

The Project fully utilizes the existing El Gallo Gold facility footprint and mitigates the existing permanent impacts associated with the existing heap leach pad and Samaniego Pit by milling the Heap Leach Material and backfilling the pit with the tailings from the mill.

In accordance with the general work schedule of the project, should no additional mineralization be found, the closure phase will begin in Year 11. In compliance with permitting regulations, McEwen Mining Inc. will prepare a detailed Closure and Reclamation Plan that will be concurrently developed during the operation phase and completed during the closure phase.

1.9 Economic Analysis

The total capital cost for Project Fenix was estimated to be $80.8 M. This capital cost consists of $71.3 M for the mine and process facilities (which includes a contingency and $5.0 M for mine pre-production), $8.5 M for sustaining capital and $1.0 M for closure and reclamation.

The overall Life of Mine (LOM) operating cost for the facilities is $22.28 /t of material processed and includes mining, processing, refining, royalties, general and administrative (G&A) expenses. An after tax summary of the economic outcomes is included in Table 3.

Description	Downside Case $1,200/oz Au $15/oz Ag 30% Capex Increase	Base Case $1,250/oz Au, $16/oz Ag	Upside Case $1,300/oz Au, $17/oz Ag
Phase 1 Capex	$53.1 million	$40.9 million	$40.9 million
Phase 2 Capex	$39.5 million	$30.4 million	$30.4 million
IRR	14%	28%	33%
NPV@5% Discount Rate	$30 million	$60 million	$75 million
Payback Period	6.5 years	4.1 years	3.9 years

Table 3 Project Fenix After Tax Economic Indicators

The Net Present Value (NPV) was calculated for the pre-tax case and after tax based on metal prices of $16 /oz for silver and $1250 /oz for gold. With an IRR of 28%, the after tax NPV at a 5% discount rate is $60 M, and has a payback period of 4.1 years.The upside scenario in Table 3 considers the gold price at $1,300/oz and silver price at $17/oz and has an IRR of 33%, an after tax NPV of $75 M using a 5% discount rate, and has a payback period of 3.9 years. The downside scenario in Table 3 considers the gold price at $1,200/oz and silver price at $15/oz, as well as 30% increase in project Capex, and has an IRR of 14%, an after tax NPV of $30 M using a 5% discount rate, and has a payback period of 6.5years.

The all in sustaining cost (AISC) per ounce for the project is $853 per oz AuEq, with the AISC for Phase 1 & Phase 2 being $704 per oz AuEq and $877 per oz AuEq respectively. Cash costs are $704 and $857 per ounce AuEq for Phases 1 and 2 respectively.

1.10 Previous Work

In 2012, McEwen Mining completed a feasibility study for the development of El Gallo Silver and Palmarito deposits. At that time the project was fully permitted for the construction of a CIL mill and a drystack tailings facility located adjacent to the proposed El Gallo Silver pit.

Due to the decline in the price of silver and prevailing conditions in the resource market the Company decided not to proceed with the development of the mine. Subsequent internal studies looked at reducing capital expense associated with the permitted project with limited success.

In 2017, McEwen Mining engaged GRES Engineering to investigate the potential for the staged development of the mineral resources available within the El Gallo complex, and to provide a preliminary project plan that would produce adequate financial returns under the prevailing economic conditions. Project FENIX is the result of this investigation.

1.11 Conclusions and Recommendations

The economic indicators calculated for the Project have demonstrated the potential for development. The following additional work is recommended to advance the project:

a) Continued expansion drilling and infill drilling to increase the regional resource and convert existing Measured and Indicated Resources to Proven and Probable Reserves;
b) Develop production water wells on the El Gallo Silver and El Gallo Gold properties to confirm availability and quality of water for the project;
c) Secure a right of way corridor for a new southern access route to El Gallo Gold from El Gallo Silver for mineralized material haulage and services;
d) Collect and assemble fresh metallurgical test work samples for further optimization, variability and LOM testwork for each of the resources considered in the PEA to enable FS level test work to be completed;
e) Advance engineering to support a FS technical report including the development of site layouts and engineering to specific detail to enable project budgets to be established;
f) Advance design of the in-pit tailings storage system to enable the communication and approval process to be advanced; and
g) Continue with the project permitting efforts to secure permits for project advancement.

2. INTRODUCTION

2.1 General

McEwen is a gold and silver producer with headquarters located in Toronto, Ontario, Canada and is traded on the New York Stock Exchange (NYSE) and Toronto Stock Exchange (TSX) under the symbol 'MUX'. The company has:

- San Jose, a producing mine in Argentina;
- El Gallo Gold Heap Leach Operations a producing mine in Mexico;
- Black Fox Complex a producing mine in Timmins, Ontario, Canada;
- Gold Bar Project in Nevada, USA that is currently being developed;
- Los Azules Project in Argentina which is currently being studied;
- Lexam Project at an advanced stage of exploration in Timmins, Ontario, Canada; and
- Project Fenix, in Mexico which is the subject of this Technical Report.

McEwen requested GR Engineering Services Limited (GRES) to undertake a high-level review of the El Gallo Silver Project in 2017, the process of the review resulted in the formation of Project Fenix (Project) which is a two-Phase construction development of a processing plant and facilities at the existing El Gallo Gold Heap Leach Operations in Mexico.

GRES was commissioned to provide the process and infrastructure, capital and operating cost estimates for input into the economic assessment and integrating the work of other consultants and McEwen into the final Preliminary Economic Assessment (PEA) Technical Report.

2.2 Purpose of the Report

The purpose of this report is to present mineral resource estimates, mine production plans, metallurgical testing information, process and infrastructure, capital and operating costs, an economic assessment and other relevant data for Project Fenix consisting of:

Phase 1

- El Gallo Gold Previously Heap Leached Material;

Phase 2

- El Gallo Silver;
- Palmarito;
- El Encuentro; and
- Carrisalejo;

The effective date of this report is 25 May 2018.

2.3 Sources of Information

McEwen acknowledges the assistance in compiling this report and has relied on information provided by additional sources, they include:

- Mr. Dominic Piscioneri – Senior Study Manager, GR Engineering Services Limited (GRES);
- Mr. Nigel Fung, PEng (PEO#100173276) – Mine Engineer, McEwen;
- Ms. Robin Wolf (GIT #10455) – Geologist, McEwen;
- Mr. Ramon Duarte - Exploration Manager, CMP, Mexico;
- Mr. Hernan Beltran, Environmental, Health and Safety Manager, CMP, Mexico;
- Ms. Mimi Friberg – GIS and Database Manager, McEwen;
- Mr. Omar Gallardo – GIS and Database, CMP, Mexico;
- Mr. Peter E. Kowalewski, PE (PECO #32125), Society for Mining, Metallurgy & Exploration (SME) Registered Member (RM#04055322); and
- Mr. Ron Espell, Environmental Director, McEwen.

This report is based on data supplied by McEwen and information developed during the study period by GRES and other third-party consultants. The source documents are summarized in Section 27 of this report.

2.4 Consultants and Qualified Persons (QP's)

McEwen contracted a number of consultants to provide a review of prior and new work on the project and conduct a Preliminary Economic Assessment (PEA) of the development of Project Fenix. GRES was responsible for defining the process and infrastructure facilities and preparing the capital cost estimate, operating cost estimate and integrating the work by other consultants into a final Technical Report that conforms to NI 43-101 standards.

Mr Xavier Ochoa, QP Member of the Mining and Metallurgical Society of America, and a Qualified Person as defined by the Canadian Securities Administrator National Instrument 43-101 "Standards of Disclosure for Mineral Projects" and Chief Operating Officer of McEwen Mining Inc. was responsible for the mining methods and mine plan, the mine capital and operating costs and marketing (Sections 1 – 3, 16, 19 and 21-22, 24-26).

Mr. Luke Willis, PGeo. (APGO#2146), Director of Resource Modelling for McEwen Mining Inc. was responsible for preparation of the property description, access and climate, history, geology, deposit types, exploration, drilling, samples, mineral resource estimate and adjacent properties (Sections 4 to 11, 14 and 23).

Dr. Nathan M. Stubina, FCIM, PEng., Ph.D. (PEO#44888501), Managing Director of McEwen Mining Inc., was responsible for the preparation of QAQC (Section 12).

Mr. Brendan Mulvihill, BAppSc. Metallurgy (Hons.) MAusIMM CP(Met), Senior Process Engineer of GR Engineering Services Limited (GRES) was responsible for the mineral and process testwork, recovery methods, process plant infrastructure and process plant operating and capital costs (Sections 13, 17, part of 18 and part of 21).

Mr. Joel A. Carrasco, Professional Engineer (Civil) registered in the State of Arizona with the Arizona State Board of Licensure for Architects, Professional Engineers and Professional Land Surveyors, License Number 52000; Principal Engineer, Solum Consulting Group was responsible for review of the environmental, permitting and social or community impact (Section 20) and is the QP for this section.

2.5 Definition of Terms Used in this Report

All measurements in this report are in the International System of Units (SI) unless noted otherwise. Currency is expressed in US Dollars unless noted otherwise. Metal values are reported in grams per tonne (g/t) or ounces per tonne (oz/t). Ounces, when used, refer to troy ounces. Acronyms and abbreviations used in this report are noted below in Table 4:

Acronym	Description
ABGPS	Airborne GPS
ADR	Adsorption, Desorption and Recovery
Ag	Silver
Au	Gold
Chemex	ALS Chemex
CIM	The Canadian Institute of Mining, Metallurgy and Petroleum
Cu	Copper
Direccion de Minas	Secretaria de Economia, Coordinacion General de Minera, Direccion General de Minas
g/t	Grams Per Metric Tonne
E	East
HLM	Heap Leach Material
ID	Inverse Distance
kg	Kilograms
km	Kilometers
m	Meters
McEwen	McEwen Mining Inc.
Minera Pangea	Compania Minera Pangea, S.A. de C.V.
ML	Mojonera de Localizacion/Location Point
N	North
NE	North East
NI 43-101	Canadian National Instrument 43-101
NSR	Net Smelter Return
OK	Ordinary Kriging
oz/t	Troy Ounces Per Tonne
oz	Troy Ounce
Pb	Lead
QEM SCAN	Qualitative Evaluation of Materials by Scanning Electron Microscopy
QP	Qualified Person
S	South
SEMARNAT	Secretariat of Environmental and Natural Resources
SGM	Consejo de Recursos Minerales
SMO	Sierra Madre Occidental
t	Metric Ton (2205 Pounds)
Tonne	Metric Ton (2205 Pounds)
µm	Micron
W	West
WAD	Weak Acid Dissociated
Zn	Zinc

Table 4 Definition of Report Terms

3. RELIANCE ON OTHER EXPERTS

McEwen acknowledges that there was no reliance on other experts for information related to legal, political, environmental, or tax matters; or any other matters as defined by the NI 43-101 definition of *Reliance on other Experts.*

4. PROPERTY DESCRIPTION AND LOCATION

4.1 Property Description

The Project consists of 112,635 ha (278,320 ac) of land located in the state of Sinaloa in north-western Mexico. Figure 3 below shows the general location of the Project (El Gallo Complex). Figure 4 shows the claim boundaries and project locations that make up the Project. Five mineralized material areas located inside of McEwen's property position have been considered for Project Fenix and are the basis of the resource estimate reported in this Technical Report as shown on Figure 5.

Figure 3 General Location Map

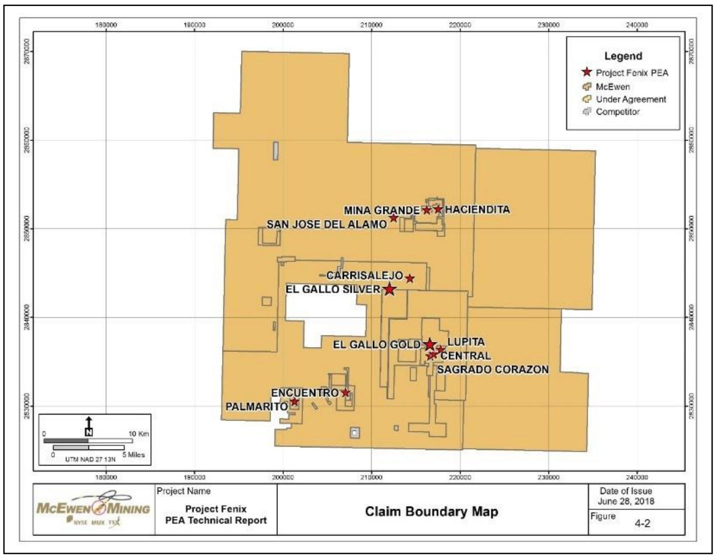


Figure 4 Claim Boundary Map

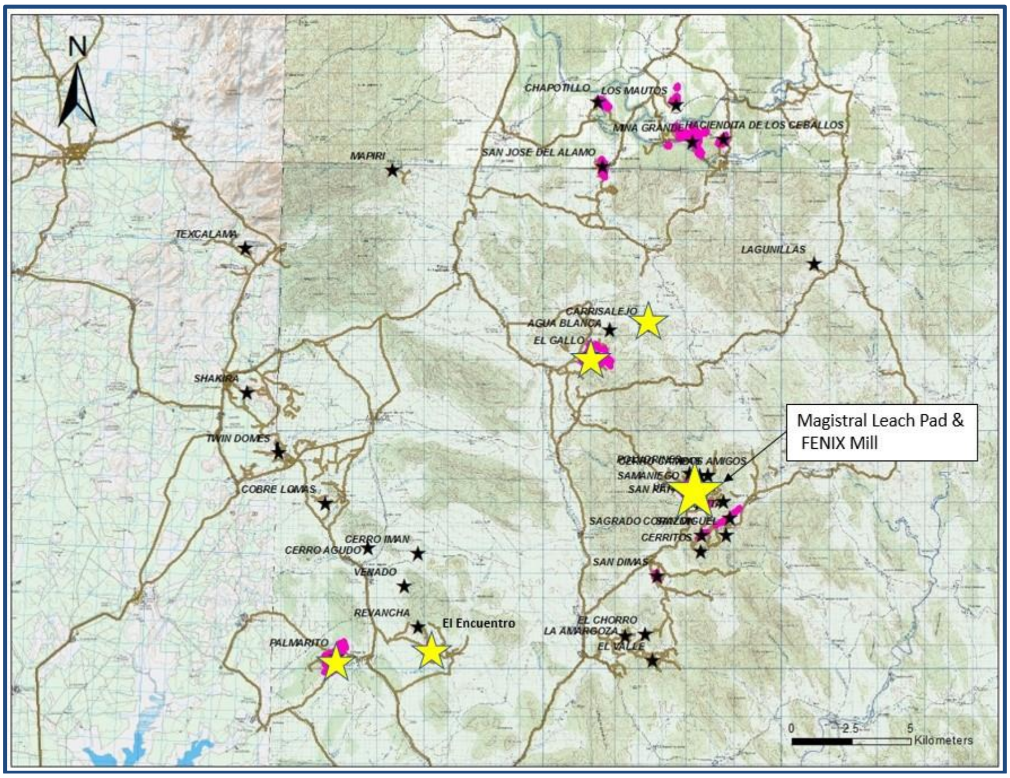


Figure 5 Technical Report Resource Locations

4.1.1 El Gallo Silver

El Gallo Silver was discovered by McEwen's (formerly US Gold Corporation) geologists in November 2008. Based on field observation, historical mining in the immediate area is believed to be limited. While there are additional exploration targets contained within the immediate project area, only known areas of mineralization that make up the resource estimate are contained within this Technical Report. Figure 6 and Figure 7 provide a general overview of the landscape.

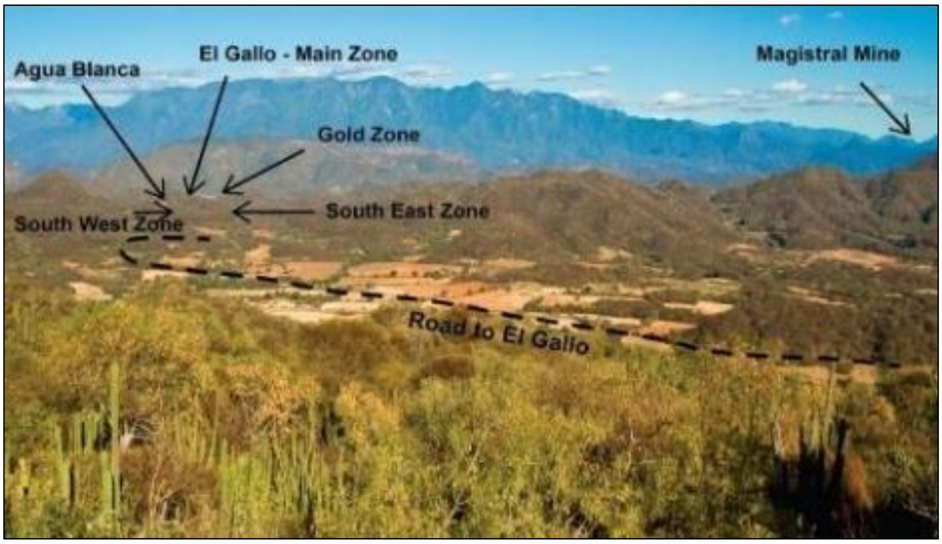


Figure 6 El Gallo Silver Site Photograph

Figure 7 El Gallo Silver Exploration Activity

4.1.2 El Gallo Gold

El Gallo Gold is a heap leach operation that is due to conclude operating in 2020. The deposits treated in the heap leach operation include San Rafael, Samaniego Hill, Sagrado Corazón, and Lupita-Central. Production that occurred before McEwen took ownership of the operation has come from San Rafael and Samaniego Hill, with the original heap leach production ceasing in 2005. The El Gallo Gold Heap Leach Material is included in the resource section in the Technical Report and is to be treated through the new processing plant. See Figure 8 for a general overview of the landscape.

Figure 8 El Gallo Gold Site Photograph

4.1.3 Palmarito

Palmarito is a historic silver producing area. The mineral resource estimate is made up of two separate sources that include in situ mineralization and historic dump material. Production is believed to have ceased in 1950. Palmarito is included in the resource portion in this Technical Report. See Figure 9 for general overview of the landscape.

Figure 9 Palmarito Site Photograph

4.1.4 Carrisalejo

Carrisalejo (CSX) is a silver discovery made by McEwen during 2012. CSX is included as a part of the resource section in this Technical Report.

4.1.5 El Encuentro

El Encuentro is a gold/silver discovery made by McEwen in 2016. El Encuentro is included as a part of the resource section in this Technical Report.

4.2 Location

McEwen's property position is located in Mocorito Municipality, Sinaloa State, north-western Mexico. It is situated approximately 100 km (60 mi) by air north-west of the Sinaloan state capital city of Culiacan in the western foothills of the Sierra Madre Occidental (SMO) mountain range.

The concessions are located approximately 4.0 km (2.5 mi) by road from the village of Mocorito, approximately 16 km (10 mi) from the town of Guamuchil. Access is either by paved or well maintained, two-way, dirt roads. The general coordinates for the center of the concessions are latitude 25°38'N and longitude 107°51'W.

4.3 Project Ownership

McEwen owns its interest in the concessions through its 100% ownership of Nevada Pacific Gold Ltd. which in turn has 100% ownership of Pangea Resources and which in turn owns 100% of Compania Minera Pangea S.A. de C.V (CMP).

All mining concessions in Mexico are required to be surveyed and located in the area with a location point (mojonera de localizacion or ML), which is related to a permanent topographic feature, in addition to corner points indicated by concrete monuments; the ML may represent one or various concessions within the area. The ML must show the concessions' registration data and coverage. Titles are granted under Mexican mining law and are issued by Secretaria de Economia, Coordinacion General de Mineria, Direccion General de Minas (Direccion de Minas). Table 5 gives a description of the claims controlled by McEwen.

Name	Title Number	Expiration Date	Ownership (%)	Surface (ha)	Surface (ac)
Unificación Magistral	214502	28/10/2033	100%	1,325.400	3,275
Lucy	213070	1/3/2051	100%	61.900	153
Lucy	217037	13/06/2052	100%	6,226.100	15,385
El Valle Fracción 1	220297	2/7/2053	100%	41.300	102
El Valle Fracción 2	220298	23/07/2053	100%	13.000	32
Cariño Fracción B	220399	23/07/2053	100%	0.400	1
Pangea	221204	10/12/2053	100%	1,595.300	3,942
Anaibis	209604	2/8/2049	100%	10.200	25
San Gabriel	214852	3/12/2051	100%	81.300	201
Alex	217429	8/7/2052	100%	350.100	865
El Palmarito	182598	11/8/2038	100%	25.900	64
La Palma	218401	4/11/2052	100%	692.400	1,711
Rocio Fracción A	223491	10/1/2055	100%	29,296.700	72,393
Rocio Fracción B	223493	10/1/2055	100%	69.600	172
Rocio 2 Fracción A	223494	10/1/2055	100%	234.300	579
Rocio 2 Fracción B	223495	10/1/2055	100%	40.900	101
Shakira Fracción A	223496	10/1/2055	100%	57,564.870	142,245
Shakira Fracción B	223497	10/1/2055	100%	4.500	11
Shakira II	229715	7/6/2057	100%	4.900	12
Shakira III	229044	27/2/2057	100%	92.300	228
Shakira II Fracc 2	229716	7/6/2057	100%	145.300	359
Shakira II Fracc 3	229717	7/6/2057	100%	0.000	0
Shakira II Fracc 4	229718	7/6/2057	100%	9,904.230	24,473
Shakira IV	229708	5/6/2057	100%	8.900	22
Shakira V	238138	28/7/2061	100%	104.800	259

Name	Title Number	Expiration Date	Ownership (%)	Surface (ha)	Surface (ac)
La Esperanza	211897	27/07/2050	100%	19.800	49
Rocio 3	230899	25/10/2057	100%	893.100	2,207
Magistral II	235312	5/11/2059	100%	1,170.000	2,891
Hallomeck	203318	27/06/2046	100%	42.100	104
Old Parker	202914	1/4/2046	100%	41.700	103
La Revancha	199003	10/2/2044	100%	8.900	22
El Rial	212197	21/09/2050	Option for 100%	114.100	282
El Real del Oro	224617	23/05/2055	Option for 100%	299.900	741
El Real del Oro II	224649	24/05/2055	Option for 100%	199.900	494
San Dimas	187621	16/09/2040	Option for 100%	104.800	259
Mina Grande	191762	18/12/2041	Option for 100%	61.500	152
La Copete Colorado	195791	21/09/2042	100%	100.000	247
Maria de Jesus	195869	22/09/2042	100%	38.000	94
#2 Bioleta	195925	22/09/2042	100%	91.900	227
Cerro Colorado	196057	22/09/2042	100%	153.000	378
Bioleta	195719	22/09/2042	100%	282.900	699
El Grande	241001	20/11/2063	100%	88.971	219
Gracias a Dios	241000	15/11/2062	100%	74.500	184
San Luis	196430	22/07/2043	Pending	143.031	353
Las Milpas	219171	13/02/2053	100%	50.000	123
El Encuentro III	229793	18/06/2057	100%	370.633	915
El Encuentro	209093	22/02/2049	Pending	51.935	128
Fracc El Encuentro	209094	22/02/2049	Pending	1.916	4
El Encuentro I	209095	22/02/2049	Pending	81.748	202
El Encuentro II	209096	22/02/2049	Pending	220.430	545
Total				**112,599.363**	**278,232**

Table 5 McEwen Mining Claim Position in Mexico

4.4 Royalties

El Gallo Silver, El Gallo Gold, and Carrisalejo

Royalties are no longer applicable to these properties.

Palmarito

A 2% NSR royalty exists on certain claims around Palmarito that were optioned from a third party. The NSR affects strike extensions and down dip portions of the in situ resource and the majority of historic tailings. This royalty does not cover any of the proposed mining activities in this study.

El Encuentro

A royalty applies to two mineral claims within the El Encuentro resource area. This royalty equals an NSR of 2% and is payable to the seller of the property, with advance royalty payments of US$100,000 beginning in 2021.

5. ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 Accessibility

Project Fenix can be accessed from the city of Guamuchil which is connected to the south by the paved four-lane Pacific Highway (Highway 15) to the State Capital City of Culiacan (60 mi or 100 km) and to the Port City of Mazatlán (130 mi or 210 km). Both of these cities have international airports with daily flights to numerous cities in the US and Canada, and major cities within Mexico. To the north, Guamuchil is connected to the city of Los Mochis, which has an international airport and the main railroad station for the Pacific and Chihuahua-Pacific railroads.

From Guamuchil a local paved road extends 12.5 mi (20 km) to the east toward Mocorito. McEwen's concessions are located approximately 2.5 mi (4 km) north of Mocorito via a paved and dirt road. Within McEwen's land position several paved and dirt roads provide access between the properties. Figure 5 in section 4, shows the locations of the Project area and the roads that connect to the nearby towns and city.

5.2 Local Resources and Infrastructure

The Project has well developed infrastructure and a local workforce that has been operating the El Gallo Gold Heap Leach Project for a period of 6 years. Guamuchil is the largest population center near the project, with approximately 80,000 inhabitants and has banking, education and other modern facilities. Mocorito, founded in 1548, has a population of about 5,000 and is the nearest town to the projects. Most of the people living in the villages of the area depend on small scale farming and raising livestock.

5.2.1 Access Road

The road from Mocorito to the project area is a good quality two-lane paved road that turns into a dirt road halfway. Single or double lane dirt roads provides access between many of the resource areas.

5.2.2 Buildings

At El Gallo Gold, significant infrastructure is present from the Heap Leach Operations that have been operating since 2012. There is a truck shop that consists of a large steel-frame building with an overhead crane and four bays for servicing heavy mobile equipment. There is also a warehouse, administration and training facilities, core logging facilities, heap leach pad and process ponds, laboratory, three stage crushing plant and an adsorption, desorption and recovery (ADR) process plant. The laboratory is equipped to process all assays (core, chips, soil) and incorporates fire assaying, atomic absorption, and ICP equipment. See Figure 10 for a photo of El Gallo Gold's core facility.

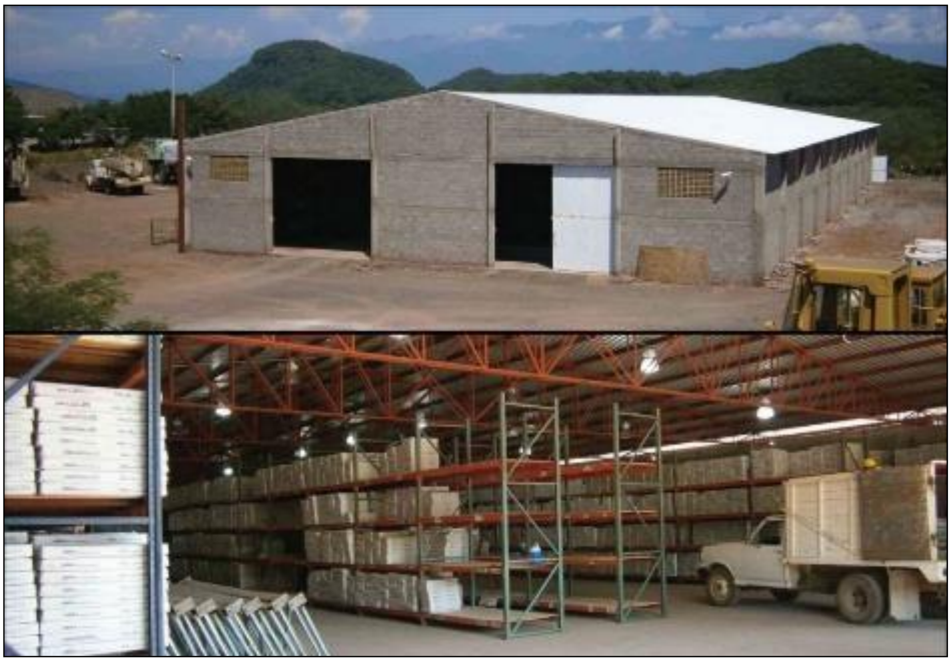


Figure 10 EL Gallo Gold Core Facilities

5.2.3 Communications

Cell phone coverage throughout McEwen's concession area is considered good. McEwen has connection to the local phone network and also Internet access at El Gallo Gold. Supervisory staff and most vehicles are equipped with two-way radios.

5.2.4 Services

Medical service is currently available from a nurse who is present on the day shift and El Gallo Gold is equipped with an ambulance. Fire protection is provided by hand-held extinguishers and a water truck is equipped with a fire-water monitor. Employee transportation is provided by buses.

5.3 Climate and Physiography

During most of the year, the area around McEwen's land position experiences arid to semi-arid climate conditions and has a mean average temperature of 25 °C (77 ºF) (Figure 9). The mean annual precipitation is 825 mm (32"), which mostly comes from storm events during July through to September (Figure 8). These storm events can cause significant flooding along the riverbeds.

The Project area is located in the "Pie de la Sierra" physiographic province, near the boundary with the "Llanura Costera y Deltas de Sonora y Sinaloa" province and is enclosed by the Mocorito hydrologic basin. The terrain is characterized by moderate to steep topography with elevations ranging from 1,000 to 1,500 ft. (300 to 450 m). Vegetation is moderately dense on the hill slopes and consists of bushes and shrubs with widely-spaced deciduous trees.

5.4 Water Supply

McEwen is required to obtain water rights. According to the National Water Commission (CNA), the project is located in Sinaloa River Aquifer (Rio Sinaloa Basin) that was, but is no longer, termed 'Zona de Libre Alumbramiento', meaning a free zone because of excess capacity.

McEwen (CMP) has made a request to CONAGUA to get permission to pay for the volume of water that will be consumed on a per m3 basis.

Upon completion of a water well, the user must register their company name with Organismo de Cuenca, Pacifico Norte (CONAGUA), before consumption can begin.

The project is currently waiting for an identification number with the Public Registry of Water Rights of CONAGUA (Registro Publico de Derechos de Agua de CONAGUA); this permitting process is currently underway.

Water usage will cost approximately \$0.40/ m^3 for El Gallo Silver water wells, while water pumped from wells at El Gallo Gold costs approximately US\$1 per m^3.

5.4.1 Project Fenix Water Supply

Primary water supply for Project Fenix will come from the two currently operating water wells located 1.5 km from the El Gallo Gold Heap Leach facility and will be supplemented by a new water supply pipeline from the El Gallo Silver water wells located around the El Gallo Silver open pit development area. The new wells will be powered by a generator that pumps water into a raw water pond, and it is then used for operations. Combining Sinaloa's annual precipitation (approximately 830 mm) with the sites current water well production capacity, McEwen has sufficient supply for production.

5.5 Road Access

The roads into the project site are a combination of sealed and gravel roads as can be seen in Figure 11. Mineralized material haul roads will be established for remote resources.

Figure 11 General Road Conditions

5.6 Power Supply

The local power grid is situated approximately 15 km from Project Fenix, a new overhead power line will be installed to supply grid power to Project Fenix.

5.7 Climate

5.7.1 Rainfall

The average rainfall in Mocorito shown as a solid line in Figure 12, accumulated over the course of a sliding 31-day period centered on the day in question, with 25th to 75th and 10th to 90th percentile bands; based on a statistical analysis of historical weather reports and model reconstructions from January 1, 1980 to December 31, 2016.

Source: https://weatherspark.com/y/3172/Average-Weather-in-Mocorito-Mexico-Year-Round

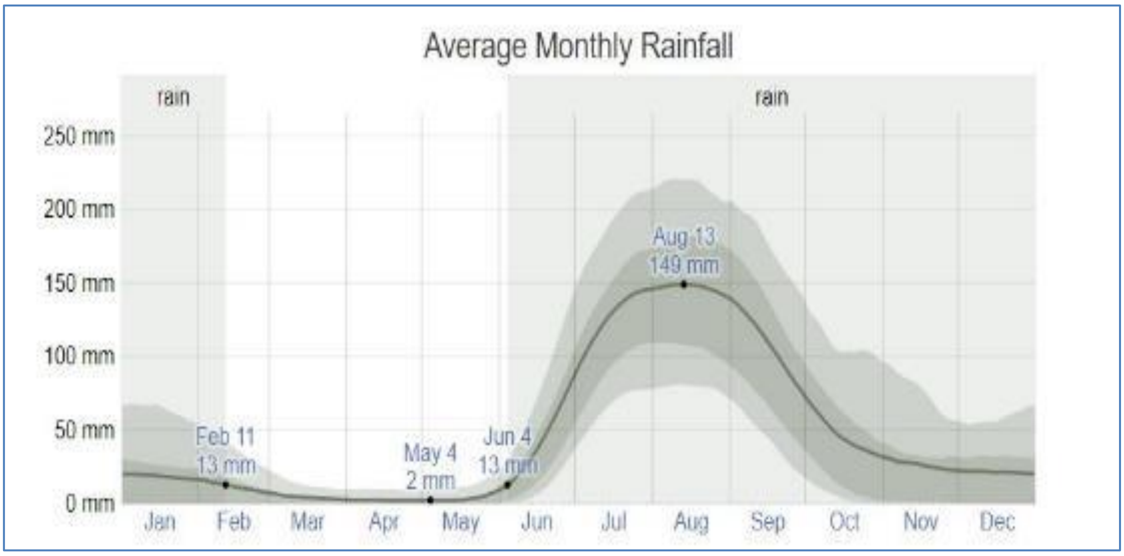


Figure 12 Monthly Precipitation

5.7.2 Temperature

Daily average high and low temperatures are shown as a red and blue lines respectively in Figure 13, with 25th to 75th and 10th to 90th percentile band; based on a statistical analysis of historical weather reports and model reconstructions from January 1, 1980 to December 31, 2016.

Source: https://weatherspark.com/y/3172/Average-Weather-in-Mocorito-Mexico-Year-Round

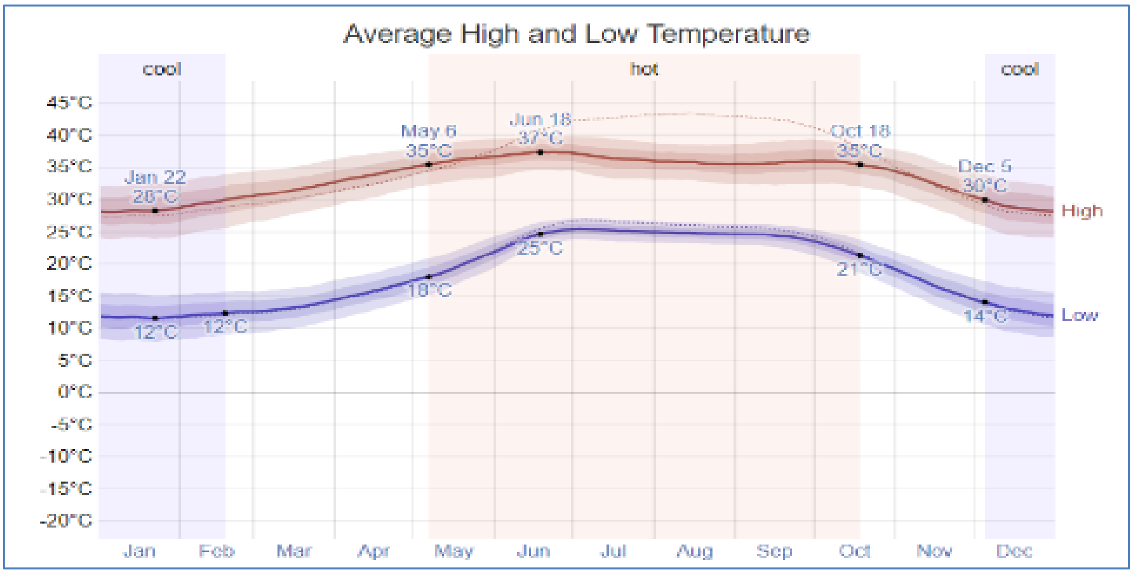


Figure 13 Monthly Temperatures

6. HISTORY

6.1 Overview

The nearby city of Mocorito originated from mining activity, beginning with Palmarito in the mid-1500s. A historical breakdown for each of the five project areas is summarized below:

6.1.1 El Gallo Silver

Based on field observations, only a minimal amount of mining appears to have occurred at El Gallo Silver and there is no recorded history of prior exploration. Nevada Pacific Gold first visited the area in 2007 as part of a reconnaissance program, but no recorded samples were taken. McEwen (then US Gold) acquired El Gallo Silver and the surrounding mineral concessions when it completed its takeover of Nevada Pacific Gold in 2007. McEwen initiated exploration in the district in January 2008 and the first evidence of mineralization at El Gallo Silver occurred in the summer of 2008 when rock samples from surface outcrop returned encouraging silver values. In October 2008, initial rotary drilling started to test for the continuity of mineralization at depth and returned encouraging results; the discovery came from rotary drill hole number 38. McEwen successfully confirmed the grade and thickness of rotary hole 38 with core drilling, which began in January 2009. Results from the rotary drilling are not included in the resource estimate contained within this Technical Report.

6.1.2 Palmarito

Palmarito is considered one of Sinaloa's major historical producers of silver - the project has an estimated historical production of 15 Moz of silver and 49 koz of gold from open pit and underground workings before the cessation of mining in 1950.

In 1969 and 1970, Barranca Corporation Ltd. carried out an exploration program that consisted of surface and underground mapping and sampling, along with 24 core and 11 percussion holes (these are not included in the current database). This work resulted in a resource estimate which is historical in nature and thus considered to be not conforming to current NI 43-101 reporting requirements.

In 1996 a second resource estimate also considered to be non-conforming to NI43-101, was completed by Computer Aided Geoscience Pty based on work that included 74 reverse circulation (RC) drill holes completed by Lluvia de Oro Inc. in the 1990s (Leahey, T.A., 1996).

In 2006 and 2007 Nevada Pacific Gold completed a core drilling program at Palmarito that consisted of 19 holes. The objective of the program was to confirm the integrity of the geologic model and database collected from a number of RC drill holes that were completed by Lluvia de Oro.

6.1.3 El Gallo Gold

Gold mining at El Gallo Gold began in the late 1800s with production continuing sporadically until the 1950s. This mining effort was focused on narrow, high-grade quartz veins, locally present in the structural zones. Underground mine plans and production records are limited. The consulting firm CAG previously estimated that the historic mill tailings contained 274,000 t of material processed from El Gallo Gold.

Later, exploration was conducted by Materias Minerales de Lampazos S.A. de C.V. (a subsidiary of Vitro Industrias Básicas) and by Minera Tormex (a subsidiary of the Lacana/Corona group). Exploration by both companies consisted of geologic mapping and geochemical sampling. Additionally, Vitro drilled 36 holes (not included in the current database).

More recently, Minera Pangea began exploring the project in early 1995, initially for Mogul Mining NL and subsequently for Santa Cruz Gold Inc. From mid-1995 through early 1997, drilling was conducted by Minera Pangea/Santa Cruz Gold on the San Rafael, Samaniego Hill, Lupita, Central and Sagrado Corazón deposit areas. Santa Cruz Gold subsequently took control of all exploration activities on the project and in 1998 conducted a limited amount of additional drilling. This drilling consisted of four core holes for metallurgical testing and 30 RC holes for verification, in-fill and condemnation purposes.

In 1999, after a merger with Santa Cruz Gold, Queenstake Resources Ltd. (Queenstake) conducted a further limited drilling programme to step-out/in-fill drill in the Samaniego Hill deposit (13 RC and two core holes) and to obtain pit-slope geotechnical samples from both the San Rafael (two core holes) and Samaniego Hill (four core holes) deposits. In 2002, additional drilling (45 RC holes) was conducted in La Prieta zone of the Samaniego Hill deposit.

Queenstake began production at El Gallo Gold in July 2002 and continued to operate the mine until near the end of January 2004. In February 2004, Nevada Pacific Gold purchased the mine and continued to operate it until July 2005 when the operations were placed on care and maintenance. Queenstake and Nevada Pacific Gold recovered a total of 70,000 oz of gold.

In 2012 McEwen restarted the El Gallo Gold Heap Leach Operations which have continued to run to the present day. In 2013, McEwen discovered significant mineralization between the Sagrado Corazón and Lupita deposits. Central is believed to be the continuation of Sagrado Corazón and Lupita. The deposit contains low grades at surface, which were detected by previous operators in shallow drill holes at the same time as definition drilling in Sagrado Corazón and Lupita. Central's highest grades occur approximately 250 ft (80 m) below surface.

6.1.4 Carrisalejo

This resource area was a discovery made by McEwen in 2011. There is no recorded history of prior exploration having occurred at Carrisalejo.

6.1.5 *El Encuentro*

This resource area was a new discovery made by McEwen. There is no recorded history of prior exploration having occurred at Encuentro. Drilling by McEwen began in 2016.

6.1.6 *Other Resource Areas*

Mina Grande

Mining at Mina Grande ceased in the late 1990s due to low precious metal prices, and a portion of the claim was relinquished and subsequently staked by Nevada Pacific Gold. The majority of the mineralization was processed through a small mill located on site. The foundation for the mill, assay laboratory and the tailings impoundment remain. McEwen optioned the remaining portion of the Mina Grande claim from the owners and began drilling in 2010. A portion of the Mina Grande resource is the extension of the vein that was mined on the property. However, a large portion of the resource is comprized of previously unidentified parallel veins.

Haciendita

Although Haciendita is believed to be part of the Mina Grande mineral structure, there is no previously recorded mining. McEwen identified the mineralization through surface rock samples. Follow-up drilling proved successful at defining a shallow dipping zone of gold mineralization.

6.2 Resource Estimate History

6.2.1 *El Gallo Silver*

Maiden resource estimates were originally reported by Pincock, Allen & Holt (PAH) for US Gold Corporation (now McEwen) and published in July 2010 (Table 6), and subsequently updated for a PEA in February 2011 (Table 7); previous editions were published in 2002, 2003, 2005 and 2006. An updated resource estimate in July 2012 formed the basis of a Feasibility Study and published by M3 Engineering in September of that year (Table 8) and based on the previous PAH models. Modifications were made to the resource in August 2013 resulting in an updated resource estimate and a small portion of the Inferred resource being upgraded (Table 9). All technical reports have been filed on SEDAR (www.sedar.com) under our issuer profile.

In its most recent iteration for this report, the El Gallo Silver deposit was reviewed and re-modelled to reflect additional drilling data and changes in metal pricing, thus making the 2013 estimate obsolete.

Class	Group	Grade Range	Tonnage (Kt)	Ag ppm	Au ppm	Ounces of Ag	Ounces of Au
Measured	Low-Grade Oxide	25-40 Ag ppm	216	31.3	0.05	217,360	347
	High Grade	>40 Ag ppm	3,802	119	0.1	14,545,882	12,223
Indicated	Low-Grade Oxide	25-40 Ag ppm	269	31.4	0.07	271,558	605
	High Grade	>40 Ag ppm	3,106	100.8	0.08	10,065,676	7,989
Measured + Indicated	Low-Grade Oxide	25-40 ppm	485	31.4	0.06	488,918	953
	High-Grade	>40 Ag ppm	6,908	110.8	0.09	24,611,558	20,212
Total Measured + Indicated			**7,393**	**106**	**0.09**	**25,100,476**	**21,165**
Inferred	Low-Grade Oxide	25-40 Ag ppm	590	32	0.03	606,992	569
	High Grade	>40 Ag ppm	3,900	92.2	0.07	11,560,497	8,777
Total Inferred			**4,490**	**84**	**0.06**	**12,167,489**	**9,346**

Table 6 July 2010 Resource Estimate for El Gallo Silver – OBSOLETE

Class	Group	Grade Range	Tonnage (Kt)	Ag ppm	Au ppm	Ounces of Ag	Ounces of Au
Measured	Low Grade	20-40 Ag ppm	2,519	28.7	0.03	2,321,320	2,537
	High Grade	>40 Ag ppm	4,437	120.5	0.09	17,194,342	13,275
Indicated	Low Grade	20-40 Ag ppm	2,618	28.3	0.02	2,385,463	1,874
	High Grade	>40 Ag ppm	3,024	96.1	0.07	9,342,119	7,195
Measured + Indicated	Low Grade	20-40 ppm	5,136	28.5	0.03	4,706,783	4,411
	High Grade	>40 Ag ppm	7,461	110.6	0.09	26,536,461	20,470
Total Measured + Indicated			**12,598**	**77**	**0.06**	**31,243,244**	**24,881**
Inferred	Low Grade	20-40 Ag ppm	6,485	27.4	0.01	5,721,391	2,972
	High Grade	>40 Ag ppm	3,525	97.2	0.06	11,012,828	7,326
Total Inferred			**10,010**	**52**	**0.03**	**16,734,220**	**10,298**

Table 7 February 2011 Resource Estimate for El Gallo Silver – OBSOLETE

Class	Tonnage (Kt)	Ag ppm	Au ppm	Ounces of Ag	Ounces of Au
Measured	17,134	65	0.05	35,966,692	28,937
Indicated	2,356	44	0.03	3,307,711	2,286
Measured + Indicated	19,490	63	0.05	39,274,403	31,223
Inferred	170	80	0.02	436,216	107

Table 8 September 2012 FS Resource Estimate for El Gallo Silver – OBSOLETE

Class	Tonnage (Kt)	Ag ppm	Au ppm	Ounces of Ag	Ounces of Au
Measured	12,077	84	0.07	32,635,300	25,700
Indicated	1,653	62	0.04	3,295,800	2,100
Measured + Indicated	13,730	81	0.06	35,931,100	27,800
Inferred	247	68	0.01	538,100	100

Table 9 August 2013 Resource Estimate for El Gallo Silver – OBSOLETE

6.2.2 Palmarito

In 1996, a resource estimate was completed by CAG based on work that included 74 RC drillholes completed by Lluvia de Oro in the 1990s (Table 10). These historical mineral resources at Palmarito were estimated using undefined methods for classifying resources and as such do not conform with existing NI 43-101 guidelines and requirements.

The first NI 43-101 Technical Report produced for Palmarito was completed by PAH and filed on SEDAR in December 2008 (Table 11). This estimate included previous drilling completed by Lluvia de Oro, Nevada Pacific Gold and drilling and sampling by McEwen during 2008.

In 2009 and 2010, McEwen conducted additional drilling at Palmarito. This drilling extended the limits of known mineralization and also discovered the new south-west zone. Additional waste dump and tailings sampling was also undertaken to in order to more accurately reflect the tonnes and grade associated with this material. Consequently, the 2010 resource model was updated to reflect this data. McEwen filed this report on SEDAR in December 2010. The 2010 resource is contained in Table 12, Table 13, and Table 14. These three tables break the resource out by in situ, dump and tailings material.

Cut-Off Grade (Au Eq.* g/t)	Tonnage (Mt)	Au Eq. Grade (g/t).	Au Grade (g/t)	Ag Grade (g/t)	Contained Au Eq. (Koz)	Contained Au (Koz)	Contained Ag (Moz)
Drill Indicated Historical Resource							
2	0.659	2.85	0.5	179	60	11	3.8
1.8	0.828	2.66	0.5	165	71	13	4.4
1.6	1.05	2.45	0.46	151	83	16	5.1
1.4	1.29	2.27	0.44	140	94	18	5.8
1.2	1.55	2.11	0.41	129	105	21	6.4
1	1.83	1.96	0.39	119	115	23	7
0.8	2.1	1.82	0.37	111	123	25	7.5
0.6	2.38	1.69	0.35	102	129	27	7.8
0.4	3.11	1.4	0.28	86	140	28	8.5
0.2	5.12	0.97	0.18	60	160	30	10
0	5.75	0.87	0.16	54	162	29	10.1
Dump							
0	0.242	3.53	0.45	235	27	3	1.8
Tailings**							
0	0.2	2.05		158	13		1

**Gold equivalent (Au Eq.) 76 oz of silver =1 oz of gold*

***Tailings were not assayed for gold*

Table 10 1996 Resource Estimate for Palmarito - OBSOLETE

In 2011 and 2012, McEwen completed an extensive drill program, which further expanded Palmarito in several directions. The drilling infilled certain areas of the resource, which upgraded 'Inferred' portions to 'Measured' and 'Indicated'. Lastly, McEwen twinned all of the historic RC holes with core, as the RC holes were believed to have underrepresented the silver grade. These RC holes were subsequently removed from the database. A new block model and resource estimate for Palmarito was generated in July 2012 and then used for the Feasibility Study in September 2012; the density of the historic waste dump material was changed in the Feasibility Study (Table 15). Additional drilling has not been completed since the July 2012 resource estimate but minor modification was made to the resource classification in 2013. The in situ Palmarito resources were divided in to resources above and below 250 m depth; additionally, the cut-off grades were changed (Table 16). However, due to changes in the resource classification, metal pricing and as result of metallurgical testing, the 2013 estimate is considered obsolete.

	Cut-Off Grade	Tonnage	Ag Grade	Contained Ag	Contained Ag	Au Grade	Contained Au	Contained Au
Class	(gAg/t)	(Kt)	(g/t)	(g)	(oz)	(g/t)	(g)	(oz)
Measured	40	2,654.4	70.2	186,366,104.1	5,991,521	0.14	370,194.9	11,901
Indicated	40	1,102.80	70.0	77,156,710.8	2,480,527	0.13	142,530.0	4,582
M+I	**40**	**3,757.2**	**70.1**	**263,522,815.0**	**8,472,048**	**0.14**	**512,724.8**	**16,494**
Inferred	*40*	*1,591.10*	*65.5*	*104,178,079.3*	*3,349,242*	*0.11*	*179443.6*	*5,769*

Table 11 December 2008 Resource Estimate for Palmarito - OBSOLETE

	Cut-Off Grade	Tonnage	Ag Grade	Contained Ag	Contained Ag	Au Grade	Contained Au	Contained Au
Class	(g Ag/t)	(Kt)	(g/t)	(g)	(oz)	(g/t)	(g)	(oz)
Measured	40	2,424	65	157,731,111	5,071,055	0.14	337,872	10,863
Indicated	40	1,023	62	63,021,502	2,026,141	0.12	124,811	4,013
M+I	**40**	**3,447**	**64**	**220,752,613**	**7,097,196**	**0.13**	**462,684**	**14,875**
Inferred	*40*	*1,604*	*58*	*92,770,185*	*2,982,561*	*0.10*	*164,830*	*5,299*

Table 12 December 2010 Resource Estimate for Palmarito In situ - OBSOLETE

	Cut-Off Grade	Tonnage	Ag Grade	Contained Ag	Contained Ag	Au Grade	Contained Au	Contained Au
Class	(g Ag/t)	(Kt)	(g/t)	(g)	(oz)	(g/t)	(g)	(oz)
Measured	40	48	195	9,284,146	298,485	0.28	13,368	430
Indicated	40	72	162	11,578,509	372,249	0.21	14,924	480
M+I	**40**	**119**	**175**	**20,862,655**	**670,734**	**0.24**	**28,292**	**910**

Table 13 December 2010 Resource Estimate for Palmarito Dump- OBSOLETE

	Cut-Off Grade	Tonnage	Ag Grade	Contained Ag	Contained Ag	Au Grade	Contained Au	Contained Au
Class	(g Ag/t)	(Kt)	(g/t)	(g)	(oz)	(g/t)	(g)	(oz)
Measured	40	148	158	23,403,320	752,417	0.12	18,533	596
Indicated	-	-	-	-	-	-	-	-
M+I	**40**	**148**	**158**	**23,403,320**	**752,417**	**0.12**	**18,533**	**596**

Table 14 December 2010 Resource Estimate for Palmarito Tailings - OBSOLETE

	Cut-Off Grade	Tonnage	Ag Grade	Contained Ag	Au Grade	Contained Au
In situ	(g Ag/t)	(Kt)	(g/t)	(oz)	(g/t)	(oz)
Measured	30	4,069	92	12,045,234	0.23	30,089
Indicated	30	129	53	219,948	0.19	794
Inferred	*30*	*10,302*	*47*	*15,562,152*	*0.23*	*74,991*
Tailings						
Measured	44	147	162	763,761	0.14	638
Dumps						
Indicated	26	145	173	805,556	0.28	1,298

Table 15 July 2012 Resource Estimate for Palmarito In situ, Tailings and Dumps - OBSOLETE

In situ >250m	Cut-Off Grade (g Ag/t)	Tonnage (Kt)	Ag Grade (g/t)	Contained Ag (koz)	Au Grade (g/t)	Contained Au (koz)
Measured	33	4,672	91	13,682	0.22	32.8
Indicated	33	387	50	624	0.11	1.3
M+I	**33**	**5,059**	**88**	**14,306**	**0.21**	**34.1**
Inferred	*33*	*4,735*	*59*	*8,945*	*0.16*	*24.5*
In situ <250m						
Measured	*90*	*40*	*141*	*180*	*0.39*	*0.5*
Indicated	*90*	*42*	*96*	*129*	*0.80*	*1.1*
M+I	***90***	***81***	***118***	***309***	***0.60***	***1.6***
Inferred	*90*	*336*	*83*	*893*	*0.70*	*7.6*
Tailings						
Measured	45	148	162	769	0.14	0.6
Dumps						
Measured	28	177	177	1,007	0.29	1.6
Indicated	28	68	154	338	0.24	0.5
M+I	**28**	**246**	**170**	**1,345**	**0.28**	**2.2**

Table 16 August 2013 Resource Estimate for Palmarito In situ, Tailings and Dumps - OBSOLETE

6.2.3 El Gallo Gold

The current resource estimate for El Gallo Gold is the culmination of over 18 years of modelling effort spanning three different property owners (Queenstake, Nevada Pacific Gold, and McEwen). The following discussion of historical resource estimates provides a brief history of the modelling evolution.

The first iteration of the El Gallo Gold resource model constructed by PAH was for the 2000 Feasibility Report prepared for Queenstake Resources ("Feasibility Resource Modelling and Mine Planning – Magistral Project"). As a joint effort between PAH and Queenstake, mineralization was delineated with structural zone boundaries interpreted along north-south and southwest-northwest cross sections.

These boundaries were drawn at a nominal grade of 0.2 g/t. The structural zone interpreted shapes were then digitized and projected to 5 m (16.5 ft) bench plans. Three block models (Samaniego/San Rafael, Lupita and Sagrado Corazón) were constructed around these structural zones with 5 by 5 by 5 m (16.5 by 16.5 by 16.5 ft) block sizes. Gold grades were interpreted for blocks within the structural zones using an inverse distance (ID) cubed method. These resource estimates for the 2000 Feasibility Study are listed in Table 17. In 2003, this resource estimate was incorporated into a NI 43-101 Technical Report and filed on SEDAR by Queenstake. Additional drilling data and production have rendered this estimate obsolete.

In late 2001 and early 2002, Queenstake conducted additional drilling in the Samaniego Hill deposit. This drilling extended the limits of known mineralization within the La Prieta structural zone. Consequently, the 2000 resource model was updated to reflect this data. The modelling approach and parameters used for this update were similar to those used originally for the 2000 Feasibility Study. Table 18 reproduces the 2003 resource estimate. This estimate did not report Inferred Resource and no explanation is given for this omission. In 2003, this resource estimate was incorporated into a NI 43-101 Technical Report and filed on SEDAR by Queenstake. Additional drilling data and production have rendered this estimate obsolete.

Following its acquisition of El Gallo Gold from Queenstake, Nevada Pacific Gold issued an amended NI 43-101 Technical Report. These amendments did not pertain to the resource estimate. As such, the included resource estimate in this Technical Report did not deviate from Table 18.

While the owner of El Gallo Gold, Nevada Pacific Gold generated additional drilling data and production data sufficient to warrant an updated resource estimate in 2006; the Lupita structural zone interpretation was modified as a result of the additional drilling. The production data was reconciled against the 2003 resource estimate and significant discrepancies were noted. PAH found that altering the grade interpolation method from inverse distance cubed to inverse distance to the sixth power yielded a better representation of the production data. As a result, this interpolation method was applied to all models and a new resource estimate was submitted. Table 19 reproduces the 2006 resource estimate. Nevada Pacific Gold filed a NI 43-101 Technical Report on SEDAR stating this resource estimate in 2006.

In 2009, the prior resource estimate was revisited and a problem was discovered. PAH observed that portions of resource within the La Prieta structural zone were tabulated improperly in 2006. Consequently, the resource estimate in Table 20 overestimated Measured and indicated gold ounces by approximately 18%. This issue and additional drilling data have rendered this estimate obsolete. The resource estimate for El Gallo Gold was updated in 2012 and reported as part of the Feasibility Study technical report for the El Gallo Silver and Palmarito deposits Table 21.

As the economic environment changed in 2013, the existing Feasibility Study became obsolete. In 2013 with additional exploration and infill drilling results, McEwen reviewed the Lupita and Central zones and once again changed the interpretation and updated the resource estimates, reported in the August 2013 technical report filed on SEDAR. Results are presented in Table 22.

After significant mining production, additional infill and exploration drilling having taken place in the intervening five years and with changing economic assumptions, the resource estimate for El Gallo Gold is updated in this report thus the August 2013 estimates are now considered obsolete.

Resource Area	Measured			Indicated			Measured and Indicated			Inferred		
	Tonnes	Au	Cont. Au	Tonnes	Au	Cont. Au	Tonnes	Au	Cont. Au	Tonnes	Au	Cont. Au
	(Kt)	(g/t)	(oz)	(Kt)	(g/t)	(oz)	(Kt)	(g/t)	(oz)	(Kt)	(g/t)	(oz)
San Rafael	2,072	1.77	117,900	447	1.24	17,900	2,519	1.68	135,800	10	1.02	300
Samaniego	3,495	1.63	183,000	1,031	1.85	61,200	4,526	1.68	244,200	32	1.28	13,000
Sagrado Corazón	978	1.08	33,900	238	0.82	6,300	1,216	1.03	40,200	6	0.80	200
Lupita	1,257	1.11	44,900	842	1.00	27,000	2,099	1.07	71,900	58	1.63	3,000
Tailings	167	2.17	11,700	65	0.68	1,400	232	1.76	13,100	-	-	-
Total	**7,969**	**1.53**	**391,400**	**2,623**	**1.35**	**113,800**	**10,592**	**1.48**	**505,200**	**106**	**1.42**	**16,500**

Table 17 2000 Resource Estimate for El Gallo Gold - OBSOLETE

Resource Area	Measured			Indicated			Measured and Indicated			Inferred		
	Tonnes	Au	Cont. Au	Tonnes	Au	Cont. Au	Tonnes	Au	Cont. Au	Tonnes	Au	Cont. Au
	(Kt	(g/t)	(oz)	(Kt)	(g/t)	(oz)	(Kt)	(g/t)	(oz)	(Kt)	(g/t)	(oz)
San Rafael	2,133	1.75	120,100	449	1.23	17,800	2,582	1.66	137,900	-	-	-
Samaniego	4,596	1.93	284,900	1,163	1.87	69,900	5,759	1.92	354,800	-	-	-
Sagrado Corazón	978	1.08	33,900	238	0.82	6,300	1,216	1.03	40,200	-	-	-
Lupita	1,257	1.11	44,900	842	1.00	27,000	2,099	1.07	71,900	-	-	-
Tailings	166	2.10	11,200	-	-	-	166	2.10	11,200	-	-	-
Total	**9,130**	**1.69**	**495,000**	**2,692**	**1.40**	**121,000**	**11,822**	**1.62**	**616,000**	**-**	**-**	**-**

Table 18 2003 Resource Estimate for El Gallo Gold - OBSOLETE

Resource Area	Measured			Indicated			Measured and Indicated			Inferred		
	Tonnes (Kt)	Au (g/t)	Cont. Au (oz)	Tonnes (Kt)	Au (g/t)	Cont. Au (oz)	Tonnes (Kt)	Au (g/t)	Cont. Au (oz)	Tonnes (Kt)	Au (g/t)	Cont. Au (oz)
San Rafael/Samaniego	4,699	2.09	315,665	1,378	1.79	79,290	6,077	2.02	394,955	-	-	-
Sagrado Corazón	862	1.28	35,528	170	0.94	5,144	1,032	1.22	40,672	-	-	-
Lupita	1,245	1.55	61,937	832	1.36	36,305	2,077	1.47	98,242	-	-	-
Tailings	118	1.89	7,147	-	-	-	118	1.89	7,147	-	-	-
Total	**6,924**	**1.89**	**420,277**	**2,380**	**1.58**	**120,739**	**9,304**	**1.81**	**541,016**	**-**	**-**	**-**

Table 19 2006 Resource Estimate for El Gallo Gold - OBSOLETE

Resource Area	Measured			Indicated			Measured and Indicated			Inferred		
	Tonnes (Kt)	Au (g/t)	Cont. Au (oz)	Tonnes (Kt)	Au (g/t)	Cont. Au (oz)	Tonnes (Kt)	Au (g/t)	Cont. Au (oz)	Tonnes (Kt)	Au (g/t)	Cont. Au (oz)
San Rafael	806	1.02	26,431	381	0.89	10,901	1,187	0.98	37,332	21	0.75	506
Samaniego	3,565	1.94	222,347	1,415	1.70	77,335	4,980	1.87	299,862	106	1.41	4,805
Sagrado Corazón	1,000	1.13	36,329	276	0.91	8,075	1,276	1.08	44,403	7	0.61	137
Lupita	1,463	1.32	62,085	1,363	1.17	51,269	2,826	1.25	113,354	89	0.95	2,718
Tailings	128	1.87	7,695	-	-	-	-	1.87	7,695	-	-	-
Total	**6,962**	**1.59**	**354,887**	**3,435**	**1.34**	**147,580**	**10,397**	**1.50**	**502,466**	**223**	**1.14**	**8,167**

Table 20 2009 Resource Estimate for El Gallo Gold – OBSOLETE

Category	Cut-Off Grade	Tonnage	Au Grade	Contained Au
El Gallo Gold	(g/t Au)	(Kt)	(g/t)	(koz)
Measured	0.30	6,692	1.59	355
Indicated	0.30	3,435	1.34	148
M+I	**0.30**	**10,127**	**1.54**	**503**
Inferred	*0.30*	*223*	*1.14*	*8*

Table 21 2012 Resource Estimate for El Gallo Gold - OBSOLETE

Category	Cut-Off Grade	Tonnage	Au Grade	Contained Au
El Gallo Gold	(g/t Au)	(Kt)	(g/t)	(koz)
Measured	0.30	10,258	1.62	534
Indicated	0.30	3,680	1.33	158
M+I	**0.30**	**13,938**	**1.54**	**692**
Inferred	*0.30*	*437*	*0.85*	*12*

Table 22 2013 Resource Estimate for El Gallo Gold - OBSOLETE

6.2.4 Other Resource Areas

All other resource areas contained within this Technical Report were initially reported by McEwen in July 2012 and filed on SEDAR. The mineral resources in each of these areas were classified as Inferred (Table 23). McEwen completed infill and expansion drilling in order to increase the confidence level associated with the mineralization and to establish if there was potential to further grow the size of the resources. Models and resources were updated in August 2013 (Table 24).

The El Encuentro deposit has not had any resource estimates calculated or reported previously.

Resource	Tonnage ('000 tonnes)	Silver (oz)	Silver Grade (gpt)	Gold (oz)	Gold Grade (gpt)
Chapotillo					
Inferred (Cut-off Grade 0.44 gpt Au Eq.)	1,475	1,740,941	36.7	21,905	0.46
Haciendita					
Inferred (Cut-off Grade 0.44 gpt Au Eq.)	1,649	1,244,510	23.5	42,083	0.79
Mina Grande					
Inferred (Cut-off Grade 0.44 gpt Au Eq.)	3,801	2,883,040	23.6	74,179	0.61

Resource	Tonnage ('000 tonnes)	Silver (oz)	Silver Grade (gpt)	Gold (oz)	Gold Grade (gpt)
Mina Grande Tailings					
Inferred (Cut-off Grade 0.58 gpt Au Eq.)	463	804,333	54.1	7,523	0.51
Los Mautos					
Inferred (Cut-off Grade 24 gpt Ag Eq.)	965	1,323,642	42.7	3,637	0.12
San Jose del Alamo					
Inferred (Cut-off Grade 0.38 gpt Au Eq)	501	35,539	2.2	13,162	0.82
Las Milpas					
Inferred (Cut-off Grade 24 gpt Ag Eq.)	678	964,316	44.2	1,724	0.08
Carrisalejo					
Inferred (Cut-off Grade 27 gpt Ag Eq.)	672	1,262,048	58.4	846	0.04

Table 23 Resource Estimates for Other Resource Areas – July 2012 – OBSOLETE

Zone Name		Tonnes ('000)	Silver Grade (gpt)	Silver (K Oz.)	Gold Grade (gpt)	Gold (K Oz.)
Chapotillo						
(COG 0.44 gpt Au_EQ)	Measured	427	47.56	653	0.63	9
	Indicated	413	40.32	535	0.57	8
	Measured + Indicated	840	44.00	1,188	0.60	16
	Inferred	126	22.36	91	0.42	2
Haciendita						
(COG 0.43 gpt Au_EQ)	Measured	38	29.92	37	0.91	1
	Indicated	994	29.14	932	0.85	27
	Measured + Indicated	1,033	29.17	969	0.85	28
	Inferred	61	25.48	50	0.72	1
Mina Grande						
(COG 0.50 gpt Au_EQ)	Measured	32	14.42	15	2.00	2
	Indicated	2,052	19.41	1,281	0.98	65
	Measured + Indicated	2,084	19.33	1,295	1.00	67
	Inferred	697	19.28	432	0.89	20
Mina Grande Tailings						
(COG 0.50 gpt Au_EQ)	Measured	38	52.63	64	0.49	1
	Indicated	-	0.00	-	0.00	-
	Measured + Indicated	38	52.63	64	0.49	1
	Inferred	-	0.00	-	0.00	-
Los Mautos						
(COG 29 gpt Ag_EQ)	Measured	-	0.00	-	0.00	-
	Indicated	-	0.00	-	0.00	-
	Measured + Indicated	-	0.00	-	0.00	-
	Inferred	715	49.76	1,144	0.14	3
San Jose del Alamo - Heap Leach						
(COG 0.20 gpt Au_EQ)	Measured	5	9.77	2	1.71	0
	Indicated	264	9.11	77	1.81	15
	Measured + Indicated	269	9.12	79	1.81	16
	Inferred	149	7.07	34	1.32	6
Las Milpas						
(COG 29 gpt Ag_EQ)	Measured	-	0.00	-	0.00	-
	Indicated	-	0.00	-	0.00	-
	Measured + Indicated	-	0.00	-	0.00	-
	Inferred	541	48.97	852	0.08	1
CSX (Carrisalejo)						
(COG 29 gpt Ag_EQ)	Measured	-	0.00	-	0.00	-
	Indicated	388	81.63	1,019	0.09	1
	Measured + Indicated	388	81.63	1,019	0.09	1
	Inferred	190	170.65	1,043	0.06	0

Table 24 Resource Estimates for Other Resource Areas – August 2013 – OBSOLETE

7. GEOLOGICAL SETTING AND MINERALISATION

7.1 Regional Geology

The geology of northwestern Mexico is dominated by the volcanic plateau of the Sierra Madre Occidental (SMO), a 750 mi (1,200 km) long northwest-trending mountainous region that roughly parallels the west coast of Mexico. The SMO is thought to be one of the largest accumulations of calc-alkaline volcanic rocks in the world and is considered to be related to magmatism associated with subduction off the west coast of Mexico from Late Cretaceous to Mid-Tertiary time (e.g. Sedlock et al, 1993; Clark et al., 1982; McDowell and Clabaugh, 1981). The volcanic rocks of the SMO and surrounding regions can be broadly grouped into two principal units: the Lower Volcanic Series and Upper Volcanic Series (Clark et al., 1982) (or Lower Volcanic Complex and Upper Volcanic Supergroup, (McDowell and Keizer, 1977). The Lower Volcanic Series is comprized dominantly of 0.6 - 0.9 mi (1 – 1.5 km) thick Late Cretaceous to Eocene andesites. The 0.6 – 1.2 mi (1 - 2 km) thick Upper Volcanic Series rests unconformably on the Lower Volcanic Series and is dominated by rhyodacitic to rhyolitic ignimbrites of Oligocene-Miocene age. Granitic plutons intrude the Lower Volcanic Series extrusive rocks and are best exposed in lower-lying coastal regions. Age determinations from exposures in southern Sinaloa range from Late Cretaceous to Early Tertiary (Henry, 1975) and, hence, are co-eval with Lower Volcanic Series rocks. The plutonic rocks, ranging in composition from granodiorite to monzonite and quartz-monzonite, occur throughout the state of Sinaloa and have been termed the "Sinaloa Batholith" by Henry (2003). The oldest known rocks in Sinaloa are gneisses tentatively considered to be of Precambrian(?) age which occur in limited exposures in northern Sinaloa (Consejo de Recursos Minerales (SGM), 1992). Paleozoic meta-sedimentary rocks occur throughout the state, with relatively extensive exposures near San Jose de Gracia in north-eastern Sinaloa. Mesozoic rocks are dominated by Early Cretaceous limestone, which occurs as isolated exposures, mainly as erosional remnants. Less extensive Jurassic and Early Cretaceous meta-volcanic and sedimentary rocks have been mapped. In the Bacubirito area, approximately 12 mi (20 km) north of McEwen's concessions, foliated and folded metavolcanic rock and limestone occur. Good exposures of thin-bedded fine-grained calcareous mudstone, limestone and radiolarian cherts overlying pillow basalts and gabbros of a presumed ophiolitic complex have been mapped near the Gustavo Diaz dam in this area.

Late Cretaceous-Tertiary volcanic and volcaniclastic rocks and granitic rocks of the Sinaloa Batholith are dominant in the region. Most of the region is underlain by dark green andesitic flows, tuffs and agglomerates. Minor volcaniclastic mudstone and sandstone and rhyolitic tuff also occur intercalated with the andesitic units. Capping the higher hills and mountains are distinctive light-coloured, cliff-forming rhyolitic-rhyodacitic tuffs of the Upper Volcanic Series.

Regional structures are dominated by NW and NE trends. Major faults of these trends have been mapped regionally by the Servicio Geologico Mexicano and others and are often observable in satellite imagery. Less commonly, EW-striking structures have been mapped, notably in the Tayoltita-San Dimas district on the Sinaloa-Durango border where they host gold-silver mineralisation (Horner and Enriquez, 1999; Conrad et al., 1992). Northwest-striking faults are generally normal faults of variable displacement but some larger faults of this set have documented displacements of >1 km in southern Sinaloa (Henry, 1989). This fault set is believed to represent Basin and Range extension in northwestern Mexico (McDowell and Clabaugh, 1981; Henry, 1989). East-northeast to northeast-striking faults of limited strike-slip displacement have been interpreted in some locations by Henry (1989) as representing 'accommodation' zones between the northwest-striking extensional faults and, as such, are also a component of Basin and Range tectonism.

Structural study in the El Gallo Gold mine area has shown strike-slip and oblique-slip movement on northwest-striking (mineralized) structures (Nelson, 2008). Similarly, Horner and Enriquez (1999) have documented lateral slip on mineralized structures in the Tayoltita district and have interpreted a strike-slip corridor there that served as host for at least part of the mineralisation. Conceivably, however, it is possible that strike-slip movement is a later overprint due to transform tectonics associated with opening of the Gulf of California in the Late Tertiary.

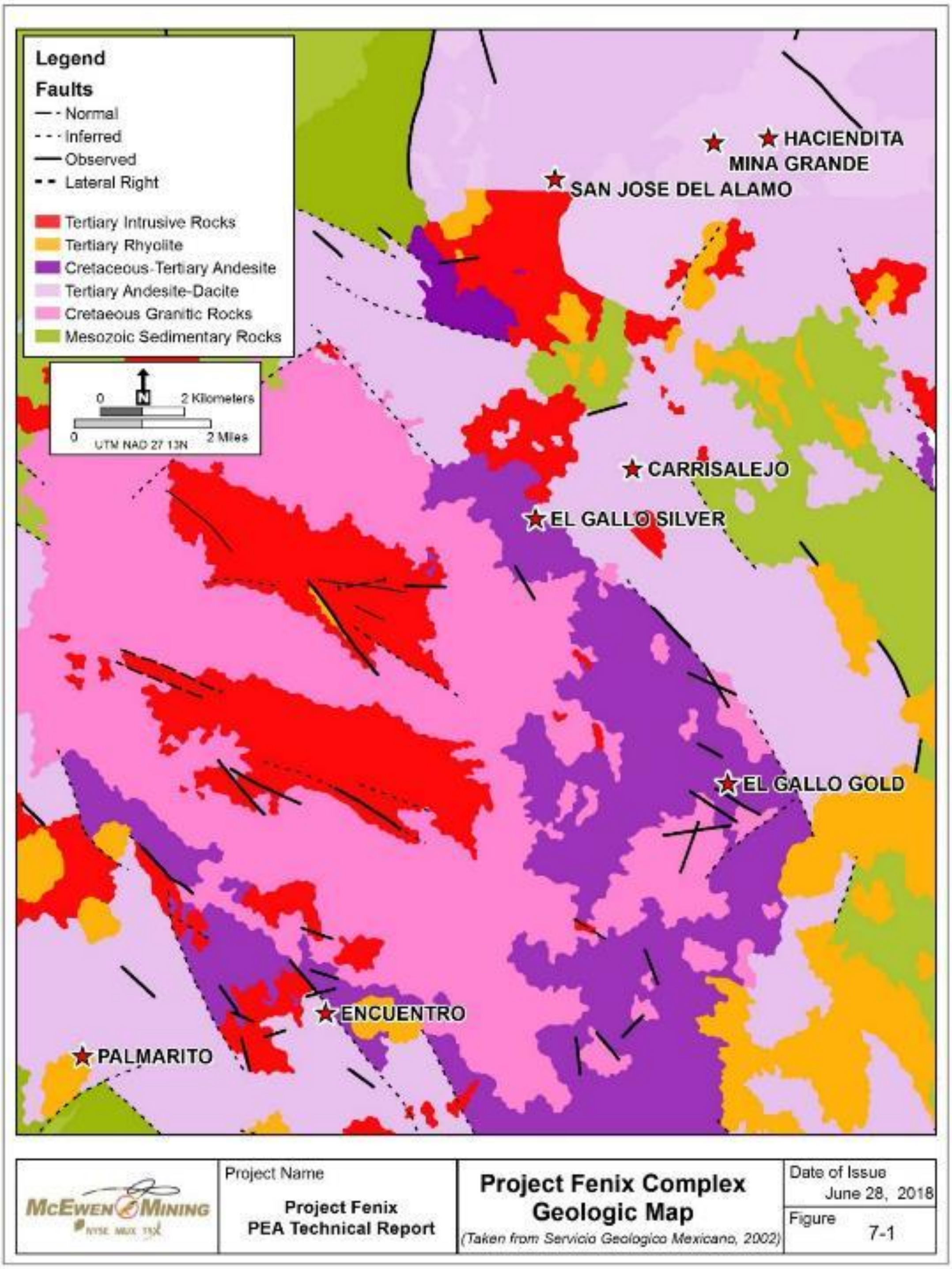


Figure 14 Project Fenix Geological Map

7.2 Local Geology

McEwen's concessions lie west of the SMO in the Pie de la Sierra physiographic province of north-western Mexico. Rocks of the SMO - Late Cretaceous-Tertiary volcanic rocks and the Sinaloa Batholith dominate the local geology. (Figure 14).

7.2.1 El Gallo Silver Local Geology

The El Gallo Silver deposit lies within a region dominated by Late Cretaceous-Early Tertiary andesitic volcanic rocks of the Lower Volcanic Series. It is situated near the north-eastern margin of a large exposure of the Sinaloa Batholith that outcrops between the town of El Gallo and El Gallo Gold mine and further to the south-east (Figure 14).

Local rock units in the project area are described below in order from stratigraphically/structurally lower to higher.

Cretaceous Sedimentary Rocks

Cretaceous sedimentary rocks occur on the periphery of the El Gallo Silver Project. Exposures of thin-bedded, weakly folded hornfels occur on the main road north of the project and broad exposures of hornfelsed/skarned sedimentary rocks occur on Calera Hill north of the project near the village of Agua Blanca. Outcrops of granitized sedimentary rocks also occur 650ft (200 m) north of the North Zone. This part of the stratigraphic section has not been encountered in drill holes. Stratigraphic relations of these rocks with the rest of the section are not totally clear but they appear to underlie the volcanic rocks and have locally been observed to be cut by rhyolitic dikes. A thick sequence of fine-grained black mudstone has been intersected at depth, south of the deposit. The age of these rocks is unknown but presumed to be Cretaceous based on their lithologic similarity to Cretaceous rocks in the region. Though calc-silicate alteration occurs locally, mineralization has not been found in these rocks.

Quartz Monzonite (QM)

Intrusive rocks predominantly of quartz monzonitic composition underlie the rest of the local stratigraphy and constitute 'basement' rock throughout the principal part of the El Gallo Silver deposit. This unit is similar to exposures of the Sinaloa Batholith in the region including exposures in the nearby village of El Gallo. It is variable in color, ranging from white to tan to mottled green-white. It is comprized dominantly of K-feldspar and lesser plagioclase, with quartz usually intergrown with K-feldspar; true quartz phenocrysts are rare. Although commonly the rock is observed devoid of mafic minerals, minerals due to propylitic and/or potassic alteration, locally biotite and hornblende (usually chloritized) are present in amounts up to approximately 10%. Near its contact with the overlying units, the QM commonly, but not always, displays disruption, brecciation and rough foliation. Locally, the QM is cut by dikes or sills of fine-grained andesite, porphyritic andesite, rhyolite or quartz feldspar porphyry (QFP). Petrographic study reveals the presence of microbrecciation in some samples of QM and QFP dike. QM commonly displays weak propylitic alteration (chlorite and epidote). Though economic mineralization has not yet been encountered within the QM, one occurrence of sphalerite associated with brecciated QM near a rhyolite dike has been observed.

In the project area, the upper contact of the QM is subhorizontal or gently east-dipping and usually underlies all other units in the project area, although drilling south of the deposit has not encountered QM basement. Contacts with the overlying units are commonly marked by a multi-lithic breccia, locally up to a few tens of meters thick, that has been interpreted as either tectonic or sedimentary in origin.

Andesite Package.

The dominant rock type at El Gallo Silver and principal host rock for El Gallo mineralization is andesite (AND). A 500 ft (150 m) thick sequence dominated by dark green andesitic flows and intrusives occurs overlying the QM basement throughout the project area. Several different textural variations are present. Internal stratigraphy of the andesite package appears to be complex and attempts to correlate subunits between sections (or between drill holes on section) are often difficult. All units are generally propylitically altered to varying degrees ranging from exhibiting a greenish hue to the occurrence of abundant clots, veins and pervasive epidote. All of these units can be strongly brecciated, particularly near their contacts with each other or with intrusive rocks.

Andesite Porphyry (ANDP). Andesite with white to tan plagioclase>>Kspar phenocrysts in an aphanitic to fine-grained phaneritic groundmass. The most dominant variety of porphyritic andesite has uniformly sized equant phenocrysts in a fine-grained phaneritic groundmass and has been interpreted as a hypabyssal intrusive, probably co-genetic with the rest of the andesitic package. This unit is usually fairly strongly epidotized giving the rock a lime-green color. Although correlating between sections can be difficult, the overall geometry of the ANDP is mostly sub horizontal lenses that occur in multiple horizons. These are interpreted as laccolithic or sill-like intrusive bodies, often with no obvious roots on a given cross-section. The ANDP is the single most abundant host to silver mineralization at El Gallo Silver, often along and near its brecciated margins.

Turkey Track Andesite (TTAND). Field term given to andesite with distinctive lathy porphyritic texture defined by phenocrysts of coarse-grained plagioclase feldspar laths in a dark grey-green aphanitic matrix. The grain size of this unit varies considerably, from fine-grained porphyritic with an aphanitic groundmass to coarse porphyritic with a phaneritic groundmass. The latter textural variation suggests it is possibly intrusive. It often occurs as a sub horizontal unit near the top of the andesite package and is interbedded (or intruded by) ANDP. Locally, centimeter-scale or larger inclusions of TTAND occur within ANDP indicating its relatively older age. TTAND is a host to mineralization, usually along contacts.

Tuff/Volcaniclastic Sediment Package

Tuffaceous rocks, locally accompanied by volcaniclastic sedimentary rocks, occur below the andesite package. The tuffaceous rocks are andesitic (AND) and rhyolitic (RHYT) in composition. The tuffs range in color from light grey-green to white and are generally soft, less competent rocks with a grainy texture, locally exhibiting eutaxitic textures. Commonly they contain lithic fragments.

Very fine-grained light-green to beige volcaniclastic(?) sedimentary rocks are locally present intercalated with the tuff package. They are usually fairly strongly brecciated and can occur interbedded with the multi-lithic breccia which often lies immediately above the QM basement. A probable interpretation is that this package represents basal deposition in small quiet-water sub-basins in a volcano-sedimentary basin.

Rhyolite Porphyry (RHYP)

A white rhyolite porphyry outcrops south-west of the main resource area, in a northwest-trending rectangular outcrop pattern. This has been interpreted as a shallow-level intrusive. Where mapped, its margins are fault contacts with the andesite package.

White to pinkish or orange-pink rhyolite dikes have been observed cutting all lithologies and thus are the youngest unit. These appear to be more abundant in the vicinity of the rhyolite porphyry intrusive.

The rhyolite units are not significant hosts to mineralization, although minor silver occurrences have been encountered on surface in the rhyolite porphyry intrusive.

Quartz Feldspar Porphyry (QFP)

Dikes and intrusive bodies of tan-brown porphyry of quartz monzonite composition cut all other units except the younger rhyolite dikes. The rock is porphyritic with subequal amounts of plagioclase and K-feldspar phenocrysts and less abundant phenocrysts of quartz and biotite. Its main occurrence is as an irregular intrusive body with a general east-west trend in the eastern portion of the main resource area. It extends to the west from there with laccolithic or sill-like geometry. Its composition is similar to the QM basement and maybe co-genetic with it but is clearly younger as it has been observed cutting the basement rocks.

A similar porphyry that contains minor to no quartz phenocrysts has been observed and termed feldspar porphyry (FP). This may be a separate intrusive unit or possibly a variant of QFP.

Mineralization has been encountered within the QFP, most notably in the eastern portion of the main zone. Here, lengthy intercepts of strong silver mineralization have been intersected in brecciated QFP. Elsewhere, mineralization tends to occur along sill-like contacts of the QFP.

Multi-Lithic Breccia

Irregular bodies of breccia with mixed clasts of various lithologies occur throughout the deposit. Generally, the breccias consist of subangular fragments supported by a matrix of pulverized rock(?). Locally, the matrix is a distinctive red (hematitic) clay. Fragment compositions vary locally and include every rock type in the section. Fragment lithology is often dominated by nearby units although these breccias can contain fragments from more distal units. Clasts of granitized rock have been observed. The multi-lithic breccias have a complex history. Altered (propylitic and/or silicified), quartz veined clasts occur in the breccias and very commonly, re-brecciated clasts are present. At least three stages of brecciation have been observed in the multi-lithic breccias. Locally, these breccias have a quartz ± calcite matrix where the hydrothermal event has superposed itself on the breccia.

The multi-lithic breccias are a common host to silver mineralization, particularly in the red-matrix breccias and where silicification and/or quartz stockwork veining has been superposed on them.

As mentioned above, a multi-lithic breccia occurs above the QM basement. This commonly has a dark brown or black muddy matrix and locally exhibits bedding(?) foliation, suggesting a sedimentary origin. This unit is not a host to mineralization. The other multi-lithic breccias occur in irregular geometries that range in thickness from < 3 ft to < 150 ft (< 1 to 10s of m) thick. The most abundant of these breccias encountered to date occurs along the margins of the QFP intrusive in the eastern portion of the deposit. They are currently interpreted as having either a tectonic and/or explosive (phreatic, phreatomagmatic) origin.

El Gallo Silver Structural Geology

The dominant structural pattern in the El Gallo Silver deposit area consists of northwest- and east-northeast-striking structures. These are evident in the trend of mineralization and in field observations. The overall trend of the El Gallo Silver deposit is east-northeast and is possibly controlled by an underlying structure(s) of this orientation, although to date no clear, single major fault has been delineated. The majority of mineralized zones within the deposits and regionally are shallowly dipping, reflecting low angle structures and/or lithological contacts. The most readily observable structures in the field are northwest-striking and many appear to offset silicified zones. The later age of these northwest-striking faults is consistent with the regional structural setting. Some mineralization at El Gallo Silver occurs within northwest-trending zones which seem to be controlled by structures of this set. Although minor post-mineral offsets of several meters are noted on surface and on cross-section, no post-mineral structures of major offset have been delineated. As previously mentioned, mineralized zones commonly exhibit, syn- and post-mineral brecciation which is indicative of long-lived tectonic or explosive activity.

7.2.2 *Palmarito Local Geology*

The dominant rock type in the Palmarito Project area is a dark grey to purple andesite with texture that varies from aphanitic to porphyritic with plagioclase phenocrysts. A very siliceous andesitic (rhyolitic?) tuff is also present. This package is overlain (intruded?) by a quartz-diorite porphyry, generally presenting a brown hematitic groundmass. The contact between this porphyry and the underlying andesite package is commonly a tectonized breccia. Physiographically, the Palmarito area is comprized by a topographic high and thought to be underlain by a rhyolite flow dome. It is not clear if this very siliceous rock represents a hypabyssal intrusive or the siliceous andesitic (rhyolitic?) tuff.

7.2.3 *El Gallo Gold Local Geology*

As at El Gallo Silver, the local geology in the El Gallo Gold Mine is dominated by the same Late Cretaceous-Early Tertiary Lower Volcanic Series rocks of dominantly andesitic composition. The andesite package is intruded by a series of intrusions thought to represent the Sinaloa Batholith, ranging in composition from (grano) diorite to quartz monzonite (QM). As such, it is equivalent to the QM unit that occurs at El Gallo Silver. In addition, a fine-grained monzodiorite intrusive of unknown age is present in the southern portion of the El Gallo Gold mine area. Andesitic and rhyolitic dikes are a minor component of the local geology.

At El Gallo Gold, the andesitic package has been divided into four units based on textural variation: Andesite, Porphyritic Andesite, Agglomeratic Andesite, and “Turkey Track” andesite. With the exception of the texturally distinctive Turkey Track andesite, exact correlation of individual units between the El Gallo Silver and El Gallo Gold projects is difficult.

- Andesite (AND): Massive to aphanitic dark green andesite. The colour is due to weak-to-moderate propylitic alteration, which is ubiquitous in the district.
- Porphyritic Andesite (PAND): Comprized of plagioclase phenocrysts in a fine grained green groundmass. This unit can be of similar appearance to ANDP at El Gallo Silver and may represent a comparable intrusive. PAND has been observed with subvertical contacts in the wall of the Samaniego pit.
- Agglomeratic andesite (AGG): Green andesite with rounded to subrounded clasts of various volcanic rocks, dominantly andesite. This unit can be on the order of tens of meters thick and generally overlies the andesites.
- Turkey Track andesite (TTAND): This is the same unit as occurs at El Gallo Silver. At El Gallo Gold mine, it occurs as a thick sequence underlying the AND and AGG. In the deep La Prieta zone at Samaniego, the Turkey Track andesite forms the floor of the flat-lying mineralized zone.
- Intrusive Rocks. Bodies of diorite and monzonite/quartz-monzonite occur throughout the district and are most prevalent in the Lupita-Sagrado-Central area. At Lupita-Sagrado-Central the mineralized structure often occurs at the contact between the diorite and the andesite package.

El Gallo Gold Mine Structural Geology

Two dominant structural trends are present in the El Gallo Gold Mine area: north-west and north-east. Structures of both of these structural sets are host to gold mineralization. The northwest-striking structures dip moderately to the south-west. The northeast-striking fault set dips steeply south-east to vertical (Sagrado Corazón/Lupita/Central area). Fault kinematic data suggest a dominance of oblique-slip reverse faulting (Nelson, 2008). Dip-slip normal faults are also present. There is an abundance of strike-slip faults, although some of this movement may be post-mineral, related to Late Tertiary regional transform tectonics. Local low-dip angles suggest thrust faulting and this is consistent with the abundance of reverse faults. The deep low-angle La Prieta zone may have formed in a dilational zone along a thrust fault. Mineralized veins are often brecciated, indicating some post- (and syn-) mineral structural movement.

7.2.4 Other Resource Areas

Mina Grande and Haciendita

A mixed package of andesite, aphanitic andesite and agglomeratic andesite comprize the local geology. Minor amounts of QFP have been observed. Principal structural features are the series of stacked northwest-striking, shallowly northeast-dipping stockwork and breccia zones which comprize the mineralization. A northeast-trending structural pattern is also present, manifested by silicified trends and some mineralized veins.

Carrisalejo

The Carrisalejo area is characterized by the many of the same lithologic units as are present at El Gallo Silver. The units at Carrisalejo are from the lower part of the stratigraphy comprising andesite (aphanitic and porphyritic), andesitic tuffs and volcaniclastic sediments. Rhyolitic tuff occurs in minor amounts. Also present are dikes of QFP, which are sometimes spatially associated with mineralization. The area is bordered on the north and south by faults that strike roughly east-west.

El Encuentro

The rocks found in the Encuentro area are dominantly and sites and andesite tuffs, intercalated with rhyolite tuffs. These rocks are intruded by meta-granodiorites and other younger subvocanic bodies (porphyry andesite with variation to dacite). The main alteration of the host rock is propylitic, but there is also lower intensity silicification-hematization and locally feldspathization.

7.3 Mineralization

7.3.1 El Gallo Silver

Mineralization is hosted in siliceous breccia zones and quartz stockwork zones. These zones often occur at lithologic contacts, particularly contacts of the porphyry intrusions (ANDP, QFP). Contacts are usually brecciated and often have adjacent multi-lithic breccia zones. This brecciation is thought to be pre-, syn-, and post-mineral with mineralizing hydrothermal fluids using these zones as a conduit and host. At least one other brecciation event occurred after mineralization as evidenced by many of the breccias containing mineralized clasts. Zones of quartz stockwork veining usually occur adjacent to these breccias.

Mineral zones commonly have tabular geometry oriented sub-horizontally or gently dipping (20 to 30°) both to the north and to the south and often occur in multiple stacked zones. Often, these zones reflect control by sill-like contacts of ANDP or QFP or other lithological contacts but may also reflect shallow-dipping structures. Tabular zones vary in width up to about 165 ft (50 m) thick but average about 50 ft (15 m). Their lateral extent in a north-south sense (across strike) is also variable but is often on the order of 650 ft (200 m). An at-or near-surface sub-horizontal mineralized zone averaging about 50 ft (15 m) thick is dominant in many portions of the resource. This near-surface mineralization constitutes a significant portion of the resource. In the central part of the resource, this near-surface mineralization is continuous for up to 1300 ft (400 m) north-south. In places throughout the deposit, mineral zone geometry is irregular probably reflecting control by higher-angle intrusive contacts or irregularly-shaped pre-existing breccia zones.

Propylitic alteration is the most widespread alteration type in and around El Gallo Silver. Almost all rocks within the resource area exhibit at least weak chloritisation. Epidote is generally ubiquitous but varies greatly in intensity from minor veinlets or partial phenocryst replacement to complete phenocryst replacement and abundant masses or patches. Sericite occurs in minor to moderate amounts, generally replacing plagioclase phenocrysts. The dominant alteration type directly associated with mineralization is silicification in the form of breccia cement, pervasively silicified breccia clasts and, locally, pervasively silicified wall rock and quartz stockwork veining. Stockwork veining occurs as veins and veinlets up to a few centimeters thick usually with no preferred orientation. No through-going, thick quartz veins have been identified. Multiple generations of quartz are present and veins and veinlets are often banded, generally with milky white quartz margins and clearer or amethystine quartz centers. Adularia usually accompanies quartz but in lesser amounts, usually identified in thin-section.

Multiple stages of silver deposition are present. Mineralization most often occurs in white or grey quartz and, although paragenetic stages have not yet been fully defined, mineralization has been observed in relatively early stage veins and as later veinlets cutting amethyst. Mineralization has been observed both restricted to breccia clasts and in the matrix of siliceous-matrix breccias. Figure 15 to Figure 17 illustrate some of the high-grade silver mineralization encountered in El Gallo Silver core samples.

Silver occurs as acanthite with lesser native silver (and possibly silver-sulfosalts) associated with variable pyrite, sphalerite and galena commonly accompanied by minor chalcopyrite. In mineralized zones in core, silver mineralization is usually observed as dark grey metallic pencil-point size grains of acanthite intergrown with sphalerite, ± galena ± chalcopyrite. In high-grade intervals, acanthite can occur in clots up to 2 to 3 cm (0.8 to 1.2 in), usually intergrown with galena. Pyrite is present more or less throughout propylitically altered rocks but tends to be stronger near mineralized zones, though this is not always the case. Besides pyrite, sphalerite is the most common sulphide mineral associated with silver mineralization. Sphalerite is light to honey brown color, reflecting a weak to moderate iron content. Petrographic study shows sphalerite and pyrite to be earlier than chalcopyrite, galena and silver minerals. Another common opaque phase associated with mineralization is very fine-grained hematite which occurs late in the paragenesis. Hematite is very often observed as red wisps or vein selvages at all depths throughout the deposit.

El Gallo Silver is a silver-dominant system with low gold values. However, minor local zones of high-grade gold (in the 1 oz/t or 31gpt range) occur associated with strong silver values. These zones are quite restricted in size and do not contribute significantly to the overall gold content of the deposit. It is not known if the high-grade gold reflects a separate mineralizing stage. A separate mineralized zone called the Gold Zone located approximately 1000ft (300 m) south-east of the eastern portion of the El Gallo Silver deposit hosts gold mineralization with no associated silver. Alteration here is dissimilar to the El Gallo Silver deposit, comprising weak to moderate argillisation and bleaching. This zone is of insignificant size, consisting of a small area of narrow, near-surface mineralization but can host high-grade gold (up to 280 gpt in rock chip samples). Interestingly, the lower mineralized horizon from the eastern portion of the El Gallo Silver main zone has been intercepted at depth in the Gold Zone area.

Reflecting the material mineralogy, elements most strongly associated with El Gallo Silver mineralization are Zn>Pb>Cu. Overall, the mineralization contains <1% concentration of these elements. There is a general correlation of base metal values with silver values. For samples that contain >1,000 g/t silver, zinc averages 1.5% and lead averages 0.7%. Elements typically associated with shallow-level epithermal deposits are generally not significantly elevated in El Gallo Silver mineralization. Arsenic is typically in the tens to low hundreds of ppm, antimony in the low- to mid-tens of ppm (although can be in the hundreds of ppm in high silver zones, reflecting the probable presence of silver sulfosalts). The bulk of El Gallo Silver geochemical data do not include mercury but analysis done in conjunction with metallurgical testing show mercury concentrations below limits of detection.

7.3.2 Palmarito

The principal mineralized zone at Palmarito is siliceous hydrothermal breccia and quartz stockwork which forms a zone that "wraps" around the siliceous rocks of the dome, giving a horseshoe-shaped outcrop pattern. Because of this morphology, the strike of the mineralized zone varies from north-south to almost east-west and dips from 40-50° to the east and to the north. This zone can achieve widths of approximately 65 ft (20 m). Thinner 3-30 ft (1-10 m) parallel structures occur locally in the footwall of the main zone. The principal zone consists of subrounded andesite fragments, commonly strongly silicified to white quartz which often obliterates primary textures. Cockade texture is common. In some parts of the deposit, silicification is less intense and alteration is dominated by pervasive calcite. Locally, amythestine quartz and fine-grained specular hematite are observed. Mineralization is commonly also associated with iron-oxides. A clay-rich tectonic breccia commonly occurs immediately above the siliceous breccia and also hosts silver mineralization.

Strong argillisation and oxidation occurs near surface and locally in structural zones. Generally, surface oxidation reaches depths of 65 to 72 ft (20 to 22 m). The degree of supergene leaching is unknown.

Silver grades within the mineralized zone range from about 10 g/t to 1,025 g/t (0.30 oz/t to +30 oz/t). The mineralization is silver-dominant, with gold grades usually less than 0.5 g/t (0.02 oz/t) and rarely exceeding 1 g/t (0.03 oz/t). In the mineralized zone, silver-gold ratios are generally > 100 and are commonly several thousand. Silver mineralization occurs either as oxide or as acanthite associated with some pyrite, sphalerite and lesser galena. Base metal values can commonly range up to several percent (combined lead and zinc). Petrographic studies indicate that acanthite is the principal silver-bearing mineral, but minor native silver and chlorargyrite (AgCl) have also been observed, as well as minor copper-bearing phases. Total sulphide content is generally less than 1%. Locally, however, lead and zinc concentrations are in excess of 1%, particularly in areas of higher silver grade.

7.3.3 El Gallo Gold

Gold mineralization within the El Gallo Gold Mine area occurs in five deposits along two distinct structural trends. A north-west trending structure hosts the San Rafael and Samaniego deposits. The second structural trend is northeast-striking and includes the Sagrado Corazón, Lupita and Central deposits. Along these structural trends the mineralization is commonly located at flexures and also within numerous substructures that may be parallel, oblique or even perpendicular to the principal trends. These structural trends are characterized by one or more individual structural zones of sheared and brecciated rock resulting from faulting of generally limited displacement.

Within these structures the mineralization occurs as pods that pinch and swell both along strike and down dip. These pods may reach a strike length of up to 330 ft (100 m) and widths of up to 100 ft (30 m) Contacts between mineralized material and barren rocks are typically sharp and well defined, and they often correspond with faults that show minor post-mineral movement. These structures have been shown to flatten at depth in some instances, as is the case with the La Prieta vein at the southern (down dip) extension of the Samaniego deposit.

The various deposits that make up the El Gallo Gold resource are generally similar, with the mineralized structural zones consisting of stockwork, breccia, and locally quartz vein mineralization occurring within propylitically altered or intrusive volcanic rocks. The main alteration assemblage consists of quartz-chlorite/biotite-hematite, and minor sulphides (mostly pyrite with lesser chalcopyrite). Locally, abundant base metal sulfides occur (generally sphalerite > galena); this is most common in the Lupita deposit. Quartz with minor calcite open-space filling of stockworks and breccias is ubiquitous. Typical mineralization consists of banded and brecciated quartz vein material with well-formed colliform bands of prismatic quartz, alternating with dark green chlorite and earthy red hematite bands. Wallrock in proximity to the mineralized structure is pervasively altered to red hematite-specularite-chlorite/biotite, with a sequence of veining including finely banded quartz-chlorite-hematite veins which are locally cut by hematite-rich veins. At the Lupita, Sagrado Corazon and Central deposits mineralization is dominantly stockwork veining and breccias that contain quartz with red hematite selvages. Wallrock displays moderate to strong propylitic alteration. Potassium feldspar alteration has been observed in thin-section. Silicification of the volcanic host rock is variable and limited to the structural zones. The presence of biotite and K-feldspar, the lack of clay minerals, and the overprint of biotite by chlorite indicate that the mineralization formed relatively deep in the epithermal system. Petrographic study and field evidence indicate that gold typically occurs as micron-sized particles of native gold and electrum in quartz. Petrographic study and field evidence indicate that gold typically occurs as micron-sized particles of native gold and electrum in quartz. Petrographic evidence indicates that the gold is not complexed with or in sulphide minerals. Pyrite averages less than 1% of the vein volume. Chalcopyrite is present in minor to moderate amounts, but locally has been found in excess of 1%. Copper grades can reach several percent locally. Silver/gold ratios are highly variable and range from 130:1 in mineral petrographic analysis, however, in blast hole sampling and resource modeling the overall ratio is less than 10: 1.

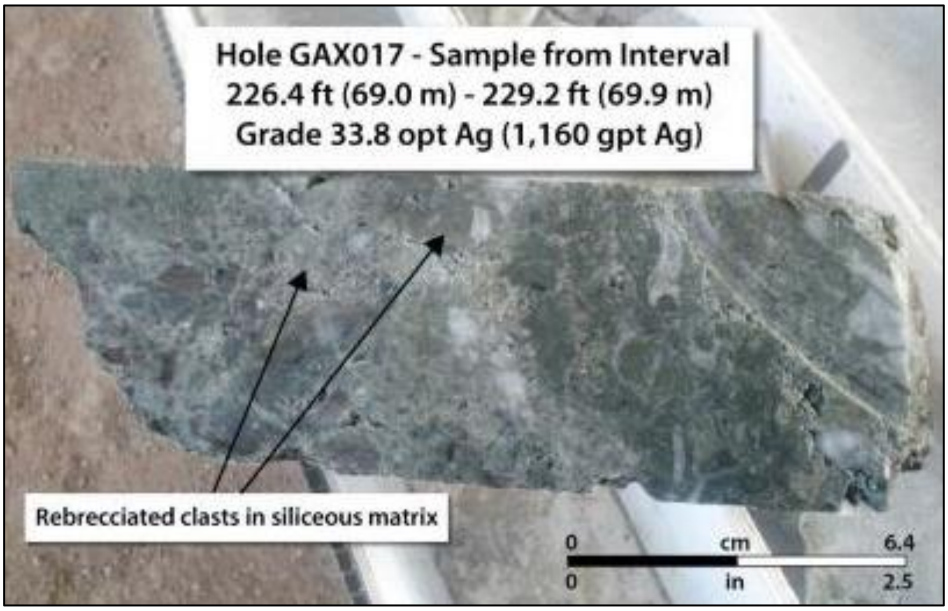


Figure 15 El Gallo Silver High-Grade Core Samples April 2009 – Multi-Stage Breccia with Siliceous Matrix

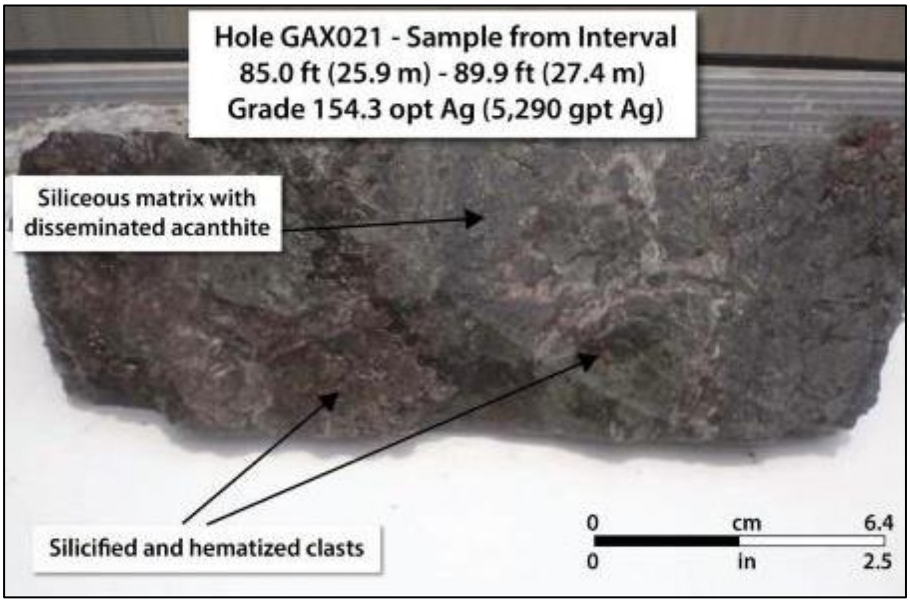


Figure 16 El Gallo Silver High-Grade Core Samples

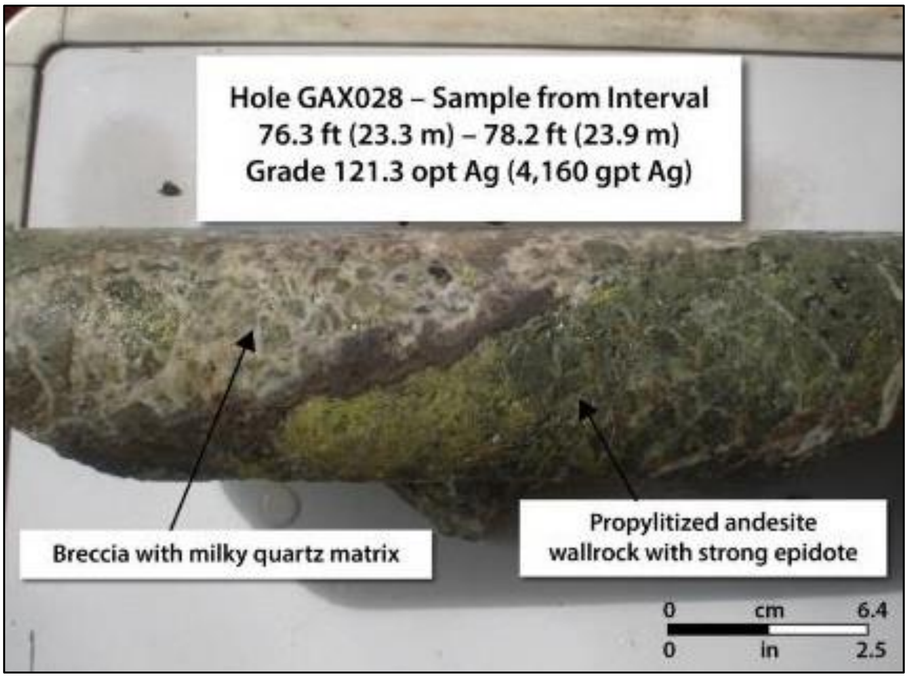


Figure 17 El Gallo Silver High-Grade Core Samples July 2009 – Quartz Breccia Vein Cutting Andesite with Strong Propylitic Alteration

In the structural zones, surface oxidation has transformed the original sulphides into oxides at variable depths, ranging from a few meters to many tens of meters below surface. Minor copper mineralization was leached from shallow depths and was locally re-precipitated at depth as minor chalcocite and covellite.

The five deposits that make up the El Gallo Gold Mine resource area are described in more detail below. Past open pit production has come from two separate pits on the San Rafael and Samaniego deposits and recent production has come from Samaniego, Sagrado Corazon, Lupita and Central deposits.

San Rafael

Gold mineralization occurs along the same structural system as Samaniego and is best developed on an east-west main structure dipping 45˚to the south. This mineralization has largely been mined out. The main zone tended to occur at or near a contact between underlying andesite flows and tuffs (footwall volcanics) and overlying andesitic agglomerate (hanging wall volcanics) that dip at a moderate angle to the south-west. The San Rafael deposit was about 400 m (1,300 ft) along strike and gradually horse-tails and weakens to the east beyond the intersection with the southeast-striking Las Vacas zone. The San Rafael zone extended approximately 250 m (820 ft) down dip where, below an elevation of 325 m (1,070 ft), it was no longer significantly mineralized. The mined-out portion of the deposit ranged from a few meters to several tens of meters in thickness.

Samaniego

Samaniego consists of a complex north- to northwest-trending structural system that dips about 50° to the south-west and has a strike extent of about 600 m (1,970 ft). Samaniego mineralization is continuous for up to nearly 400 m (1,300 ft) down dip. Four main mineralized vein zones, Upper Samaniego Hill, La Prieta, Lower Samaniego Hill, and High Angle occur within the Samaniego deposit. The deposit appears to be connected structurally to the south to the San Rafael deposits, though mineralization is weakly developed in the area between the two pits. The mineralized structures tend to occur at or above the contact between underlying andesite flows and tuffs and overlying agglomeratic andesite. Individual zones can merge with each other or eventually pinch out laterally. The veins range from a few meters to a few tens of meters in thickness. To the north-west, the Samaniego structural trend is truncated by an east-west fault, with the possible structural offset of the Samaniego trend occurring to the east. Along the down dip extent of the La Prieta vein within the Samaniego deposit, the structure flattens and swells to roughly 30 m (100 ft) thick. Gold grades in this pod, which has an aerial extent of approximately 50 by 100 m (160 x 330 ft), average roughly 0.1 oz/t (3g/t) gold, higher than average for the El Gallo Gold deposits.

Sagrado Corazón-Central-Lupita

Sagrado Corazón-Central-Lupita is a northeast-striking mineralized trend on the south end of the El Gallo Gold Mine area. This structural zone is laterally continuous over a distance in excess of 1,800 m (5,900 ft), from Sagrado Corazón in the south-west through Central to Lupita in the north-east. This zone dips steeply to the southeast at 60-85°˚. The structural trend occurs at or near the irregular contact between intrusive rocks (predominantly diorite) to the north-west and volcanic rocks (andesitic flows and agglomerate) to the south-east. Locally along the trend, the mineralized zone splits into one or two subparallel zones. Strong silicification associated with the mineralization is resistant to erosion and forms a prominent ridge. Mineralization gradually weakens to the south-west and north-east along the trend. To the northeast it appears to be truncated by a north-south fault, which places a down-dropped block of probably post-mineral tuffs to the northeast. On the south-west end of the trend (Sagrado Corazón), the steeply dipping mineralized zone is generally a few tens of meters thick and extends down dip in excess of 125 m (410 ft) where it weakens. In the Central part of the trend, mineralization at surface is weak and generally is 1 m (3 ft) to 10 m (33 ft) thick. It extends down dip in excess of 100 m (330 ft), where it weakens but is not completely drilled off in some locations. On the north-east (Lupita) part of the trend, the steeply dipping mineralization is more complex, consisting of one to three subparallel zones, with a combined thickness generally of a few tens of meters. Mineralization extends down dip in excess of 100 m (330 ft), where it appears to be closed off.

7.3.4 Other Resource Areas

Mina Grande and Haciendita

At Mina Grande, the principal mineralized structure (Veta Arturo, Los Registros) strikes N40-45W and dips 45-50° north-east. Mineralized widths on this structure are up to 14 m. Subordinate northeast-striking mineralized structures (Reyna de Oro, Nochebuena) trend N40E and dip roughly 60° SE. These structures are narrower than the northwest-striking structures, generally achieving widths slightly greater than 1 m, but can contain high-grade gold. Mineralization comprizes strong hydrothermal breccia development cemented by white to grey quartz. Quartz stockwork zones are developed in the hanging wall and footwall of the zones at Mina Grande; at Haciendita stockwork generally occurs in the hanging wall. Mineralization is accompanied by galena, sphalerite (both high and low iron varieties), traces of acanthite, and copper oxide minerals. Mineralization also occurs in the shallow oxidized portions of the deposits associated with iron oxides.

Carrisalejo

Silver mineralization occurs associated with the contact of a QFP sill and dike complex, and andesitic rocks. Most mineralization is in a near surface low-angle zone that strikes roughly east-west and dips gently to both the north and south at 20-25° adjacent to the lower contact of the QFP sill. Thickness of this zone is variable ranging from 3 m to as much as 25 m. Mineralization also occurs along high-angle “feeders” on the north and south sides of the low-angle zone. This mineralization is narrower, usually on the order of 10 to 30 ft (several m up to 10 m). Mineralization is characterized by quartz stockwork and breccias associated with silicification. Because much of the mineralization occurs at or near surface, it is most commonly oxidized; silver, lead, zinc sulphides are seen below the oxide zone. Apart from the principal low-angle zone, other mineralization occurs in less well-defined structures. Some low-grade silver mineralization appears to be localized near the east-west fault on the north end of the deposit.

El Encuentro

Mineralization is mostly hosted in an andesite tuff unit and is characterized by quartz breccia-stockwork, in the epithermal-mesothermal range, presenting gold/silver and base metal mineralization. The multi-event breccia-stockwork structures are usually cemented by quartz, iron oxide, epidote and in minor quantity, sulfides. The mineralized structures are 650 to 1300 ft (200 to 400 m) in length and have two preferential directions: N-S and 30-40 NW SE. The alteration of these structures can be extensive, from 65 to 165 ft (20 – 50 m) thick.

8. DEPOSIT TYPES

8.1 Deposits

The resource areas within Project Fenix are classified as low- to intermediate-sulphidation epithermal precious metals deposits. Deposits of this type are common throughout the world and are very common throughout the Sierra Madre province of Mexico. The Project Fenix deposits can be silver dominant (El Gallo Silver, Palmarito, Carrisalejo), gold dominant (El Gallo Gold, Haciendita), or both (Mina Grande). Although the resource areas have differing mineralogy and morphology, all deposits in the Project have quartz stockwork and quartz breccia as the main mineralization hosts.

8.1.1 El Gallo Silver

A low-to-medium sulphidation silver-dominant epithermal precious metal deposit. Silver mineralization is associated with minor gold as well as anomalous lead and zinc. Certain features of the El Gallo Silver deposit distinguish it from many other typical Mexican epithermal deposits. For example, mineralization is not hosted in through-going fault veins instead it is hosted in breccias and quartz stockwork zones associated with hypabyssal intrusions and pre-existing breccia zones. Often, the mineralized zones are shallowly-dipping, controlled by sill-like intrusive contacts and other lithologic contacts or subhorizontal structures.

8.1.2 Palmarito

A low-sulphidation, epithermal silver deposit. Silver mineralization is accompanied by minor gold as well as lead and zinc. Mineralization is hosted in strongly silicified breccias and quartz stockwork and, to a lesser extent, in a hematitic clay-rich tectonic breccia.

8.1.3 El Gallo Gold

El Gallo Gold consists of low- to intermediate-sulphidation epithermal gold and silver mineralization. The majority of the El Gallo Gold deposits are gold dominant and locally contain strongly anomalous base metals. Mineralized zones at El Gallo Gold occur as tabular veins or quartz stockwork zones, sometimes occurring as parallel sets.

8.1.4 Mina Grande and Haciendita

Epithermal gold and silver deposits with base metals. Lead and zinc contents range from very strongly anomalous to several percent within the mineralized zones. Copper is locally moderately anomalous.

8.1.5 El Encuentro

Epithermal gold deposit with some silver and base metal mineralization characterized by quartz-breccia stockwork.

8.1.6 Carrisalejo

Epithermal silver deposit similar to El Gallo Silver in terms of alteration/mineralization style and geochemistry.

9. EXPLORATION

9.1 General

Work on the project areas throughout the various phases of Exploration at the Project has included: geologic mapping; regional satellite image interpretation (ASTER, LandSat); geophysical surveys; rock, soil and stream sediment sampling; rotary, reverse circulation and core drilling.

McEwen has been the sole operator of El Gallo Silver, Haciendita, Mina Grande, Encuentro and Carrisalejo. While some of these resource areas have had prior historic exploration and minor production, the information relied upon herein has been generated by McEwen.

9.2 Geophysical Surveys

Four geophysical surveys have been undertaken: 1) an induced-polarization (IP) survey was conducted by Nevada Pacific Gold to cover the Deep La Prieta target and northwest extension of the Samaniego deposit in the El Gallo Gold area; 2) a ground-based magnetic survey covering the El Gallo Gold deposit area was undertaken by McEwen in 2010; 3) a regional scale airborne magnetic survey was flown by McEwen in 2011; and, 4) a district-scale Ground based CSAMT resistivity survey (Controlled Source Audio-Frequency Magneto-Telluric Survey) was completed in 2016.

Exploration drilling across the Project has been conducted by five companies:

- Mogul Mining;
- Santa Cruz Gold;
- Queenstake;
- Nevada Pacific Gold; and
- McEwen.

9.3 Geologic Mapping

9.3.1 El Gallo Silver

Outcrop geologic mapping was undertaken at a scale of 1:1,000 and described lithology, structure and alteration (see Figure 18).

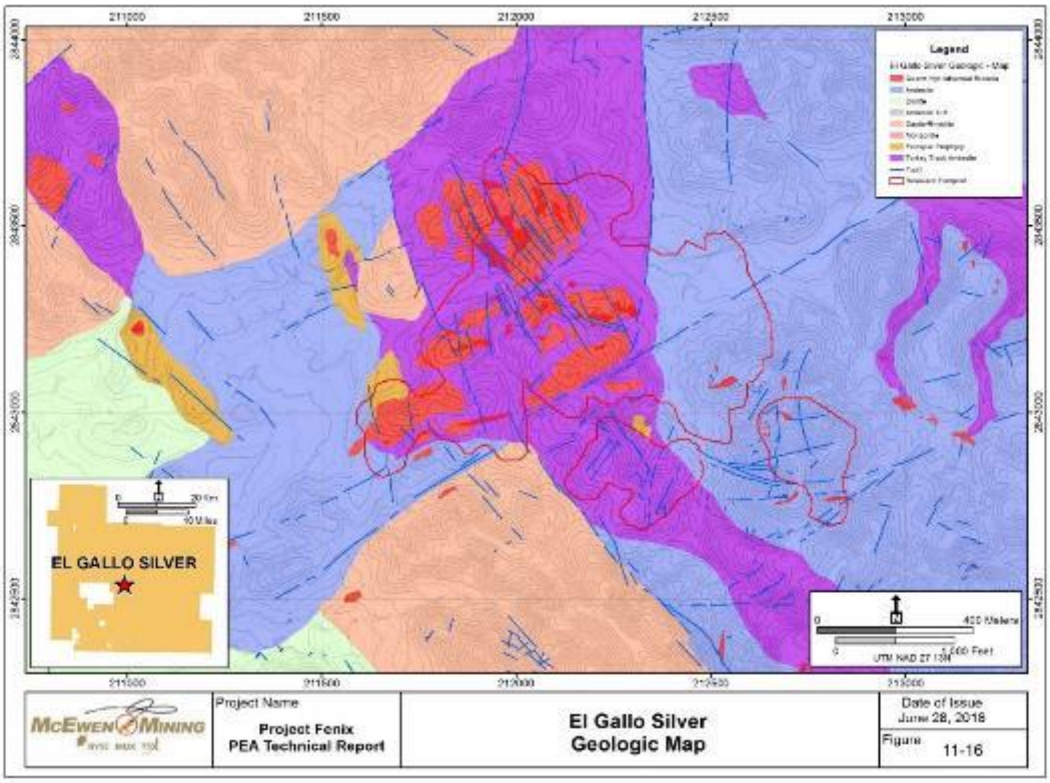


Figure 18 El Gallo Silver Geological Map

9.3.2 Palmarito

Geologic mapping of the area of the Palmarito deposit was undertaken in 1976 by Minerales Prisma S.A. de C.V and again in 1994 to 1995 by Lluvia del Oro. The mapping was of a general nature, breaking out andesitic rocks and the rhyolite intrusive (see Figure 19). Local follow-up geologic mapping has been undertaken by McEwen on the mineralized zone.

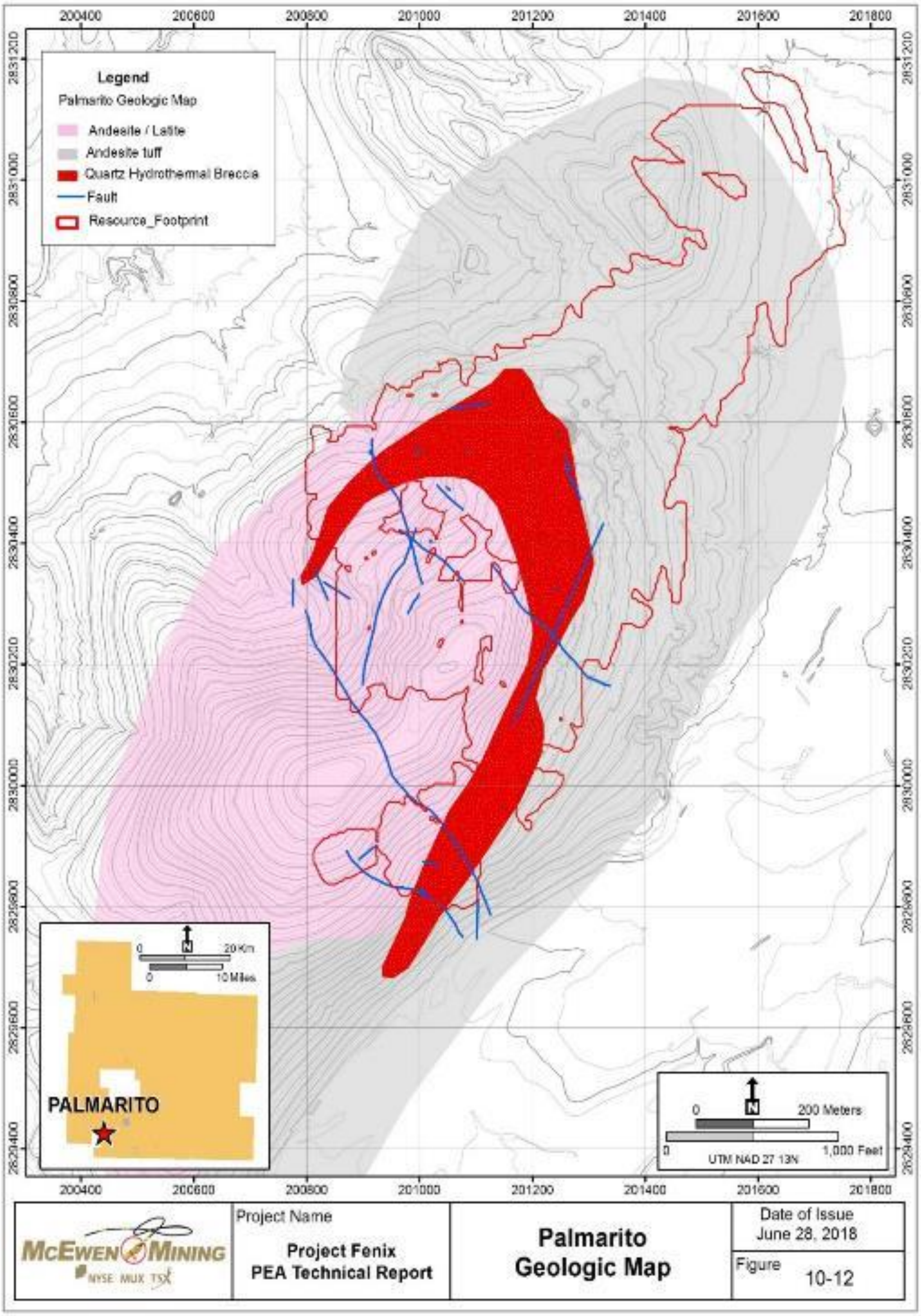


Figure 19 Palmarito Geologic Map

9.3.3 El Gallo Gold

Geologic mapping was undertaken by McEwen and previous companies. The lithologic units and quartz-bearing structural zones were delineated on surface. These include the mineralized zones of the known resource as well as numerous other zones peripheral to the main deposits (Figure 20).

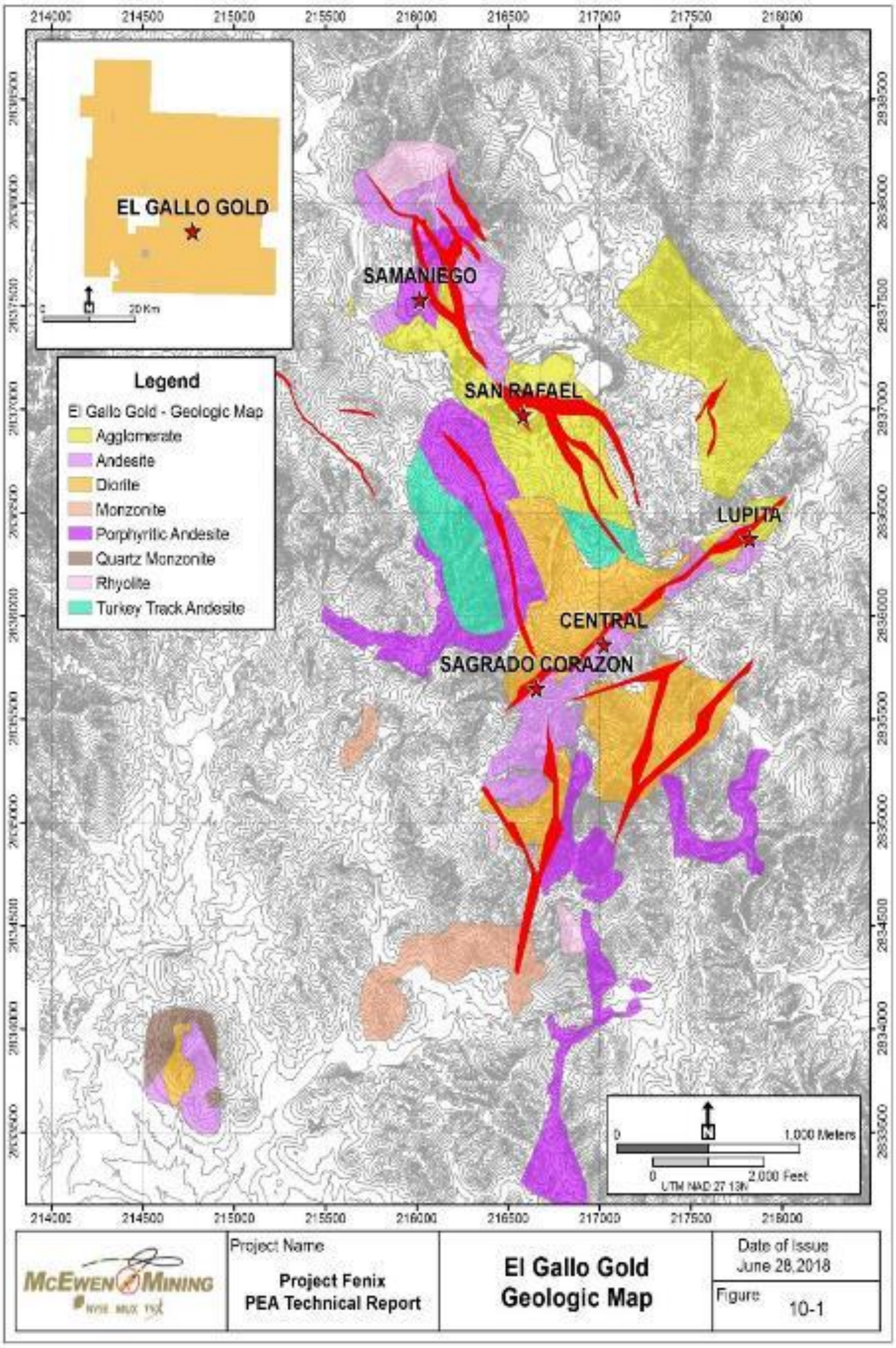


Figure 20 El Gallo Gold Geologic Map

9.3.4 Other Resource Areas

Project-scale geologic mapping has been undertaken at each of the project areas (Haciendita, Mina Grande, Carrisalejo, and El Encuentro) generally at a scale of 1:1,000. Primary emphasis was on delineating mineralized zones and nearby host rock lithologies. The project scale geologic maps for Carrisalejo and EL Encuentro are illustrated in Figure 21 and 0 respectively.

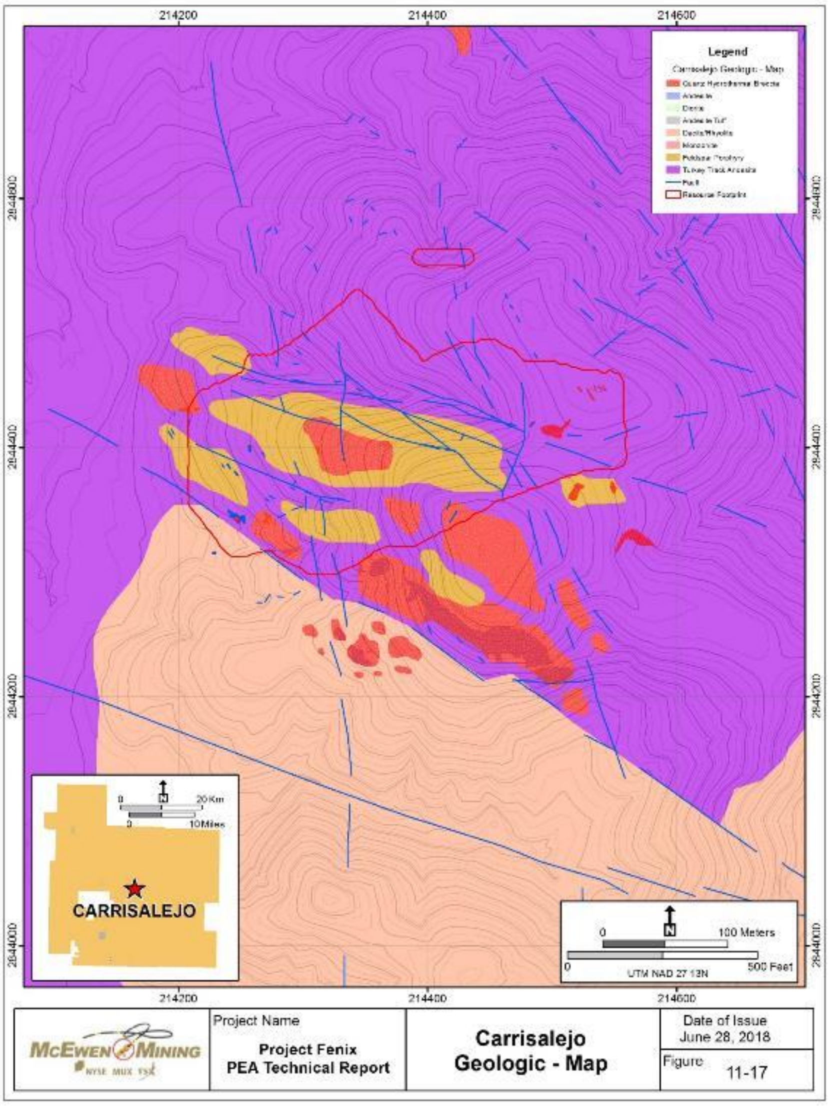


Figure 21 Carrisalejo Geological Map

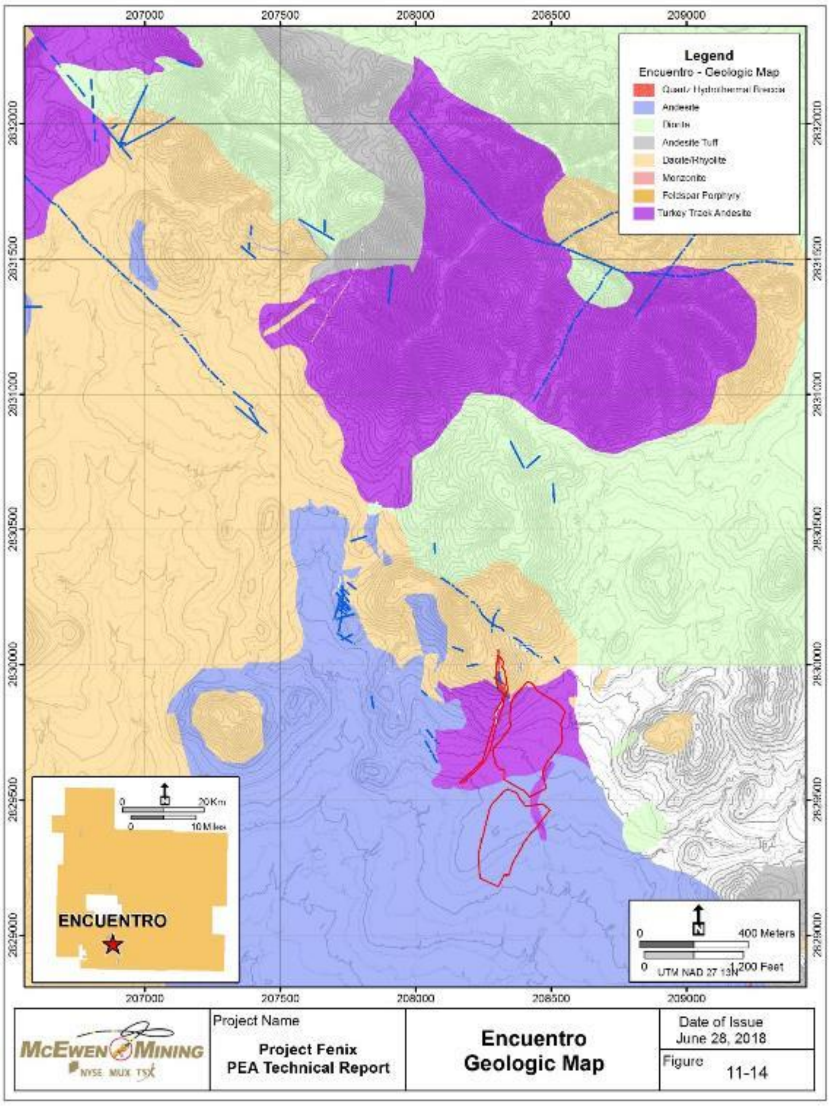


Figure 22 El Encuentro Geological Map

9.4 Geochemistry

9.4.1 El Gallo Silver

A total of 7,670 rock and 19,329 soil samples have been collected over the property by McEwen and previous owners. The majority of samples were analyzed only for gold, silver and copper by McEwen's El Gallo Gold assay laboratory using cyanide leach followed by atomic absorption assay method. Select samples were sent to ALS Chemex (Chemex) laboratories in Hermosillo, Mexico for analysis of gold plus a 33-element suite. Silver in rock chip samples range from less than detection to 3,030 ppm. Gold values range from less than detection to 281 ppm. Anomalies outside the area of existing mineral resource are present. The goal of these geochemical analyses was to delineate prospective areas as well as evaluate possible zoning of major and trace elements of the mineralization at El Gallo Silver.

None of the rock or soil samples have been used in the resource included within this Technical Report. Figure 23 and Figure 24 are maps of the silver geochemistry from rock and soil samples, respectively.

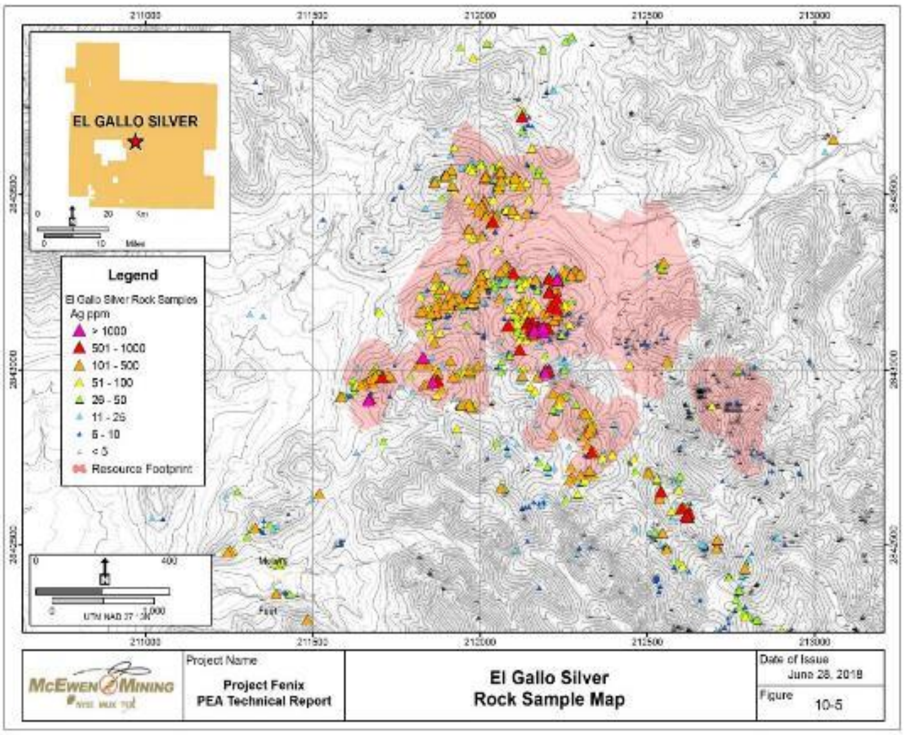


Figure 23 El Gallo Silver Rock Sample Map

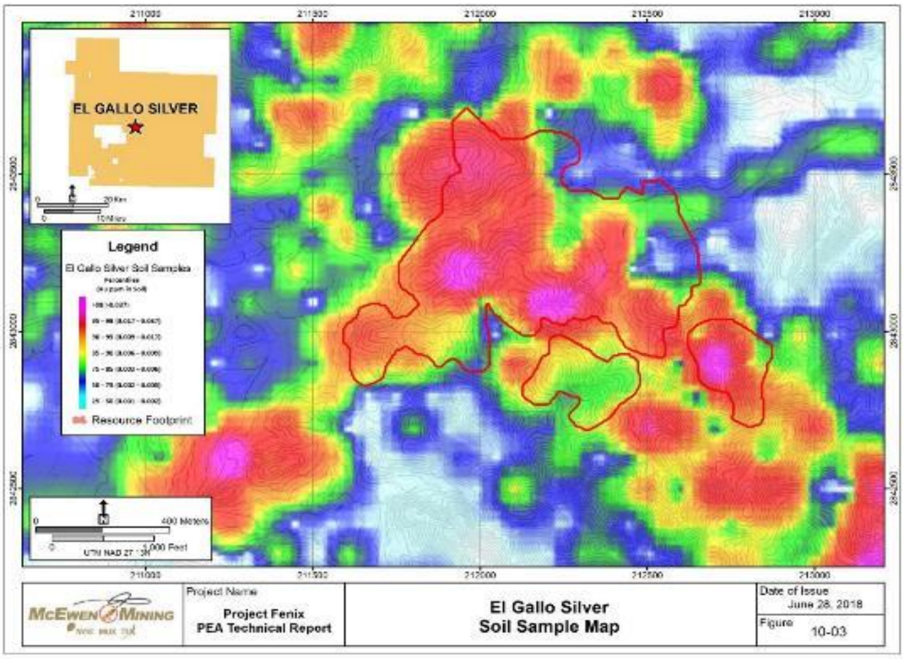


Figure 24 El Gallo Silver Soil Sample Map

9.4.2 Palmarito

A total of 1,521 rock samples have been collected over the property by McEwen and previous owners. Most samples were analyzed only for gold and silver. Silver values range from less than detection to 2,986 ppm. The high gold value is 8.5 ppm. The location and assay results of surface rock samples and surface soil samples from Palmarito are shown graphically in Figure 25.

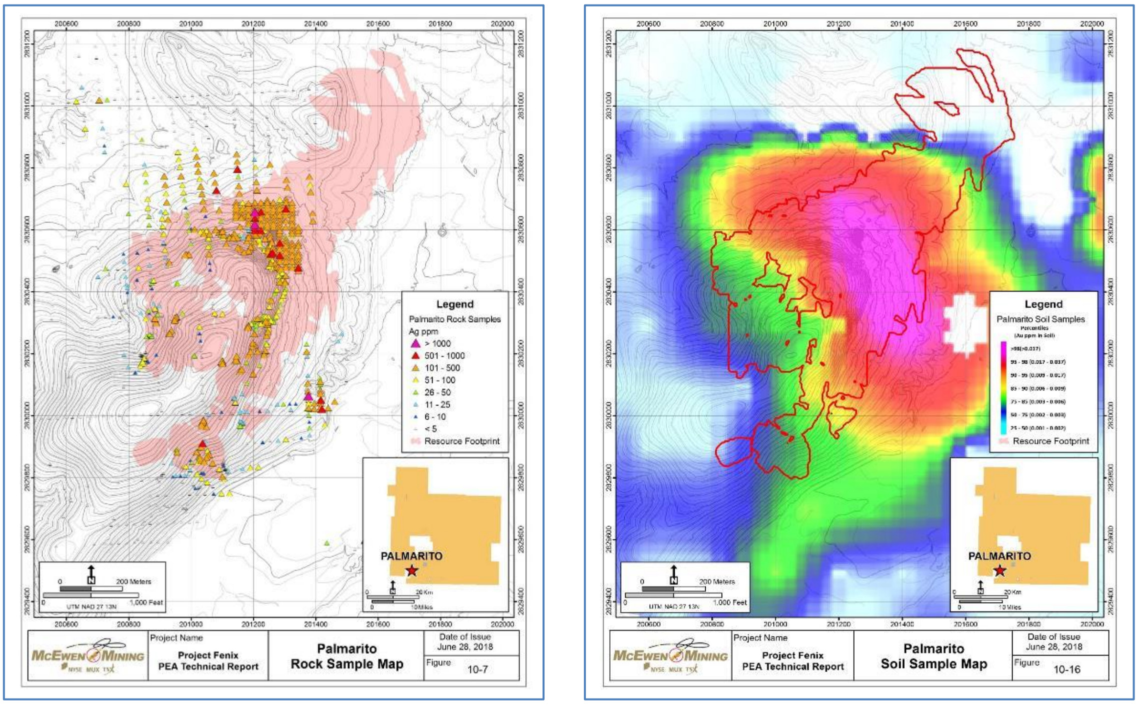


Figure 25 Palmarito Rock and Soil Sample Maps

9.4.3 El Gallo Gold

A total of 9,398 rock samples have been collected over the property by McEwen and previous owners. Most samples were analyzed only for gold, silver and copper. Gold values range from less than detection to 51 ppm. The highest silver value is 2,730 ppm. Anomalies outside the area of existing mineral resource envelopes are present. The location and assay results of surface rock samples and surface soil samples are shown graphically in Figure 26 and Figure 27 respectively.

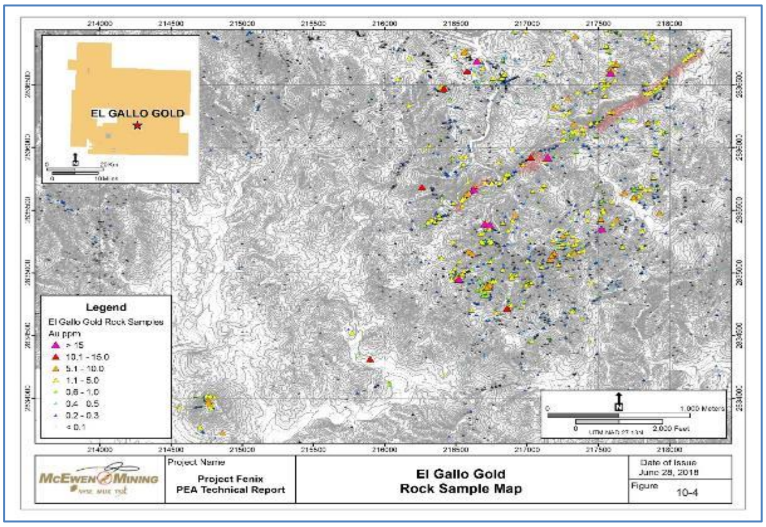


Figure 26 El Gallo Gold Rock Sample Map

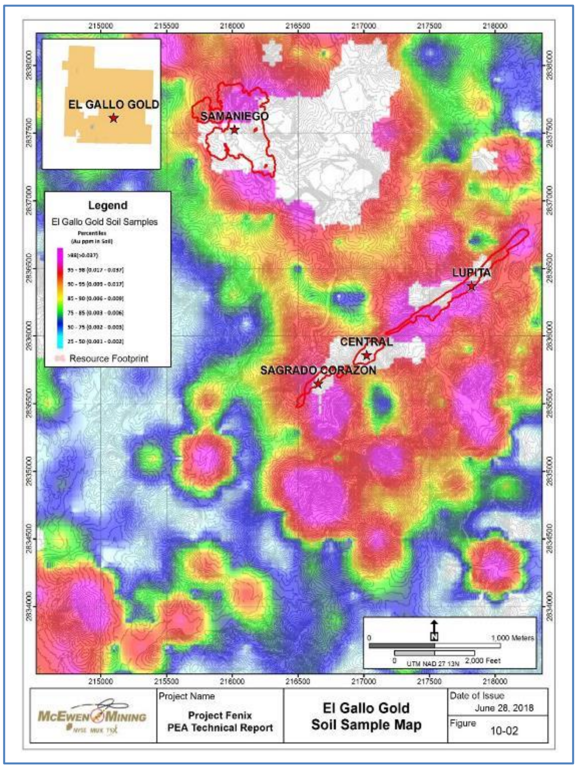


Figure 27 El Gallo Gold Soil Sample Map

In previous years McEwen collected and assayed 17,672 soil samples over the larger Project property. A new district scale soil geochemical program was initiated in mid-2017 and is still in progress.

9.4.4 Other Resource Areas

Mina Grande and Haciendita

A total of 5,571 rock samples have been collected over the property by McEwen. Most samples were analyzed only for gold and silver. Gold values range from less than detection to 160 ppm. The highest silver value is 2,170 ppm. Anomalies outside the area of existing mineral resource envelopes are present.

The location and assay results of surface rock samples and surface soil samples taken at Haciendita are shown graphically in Figure 28.

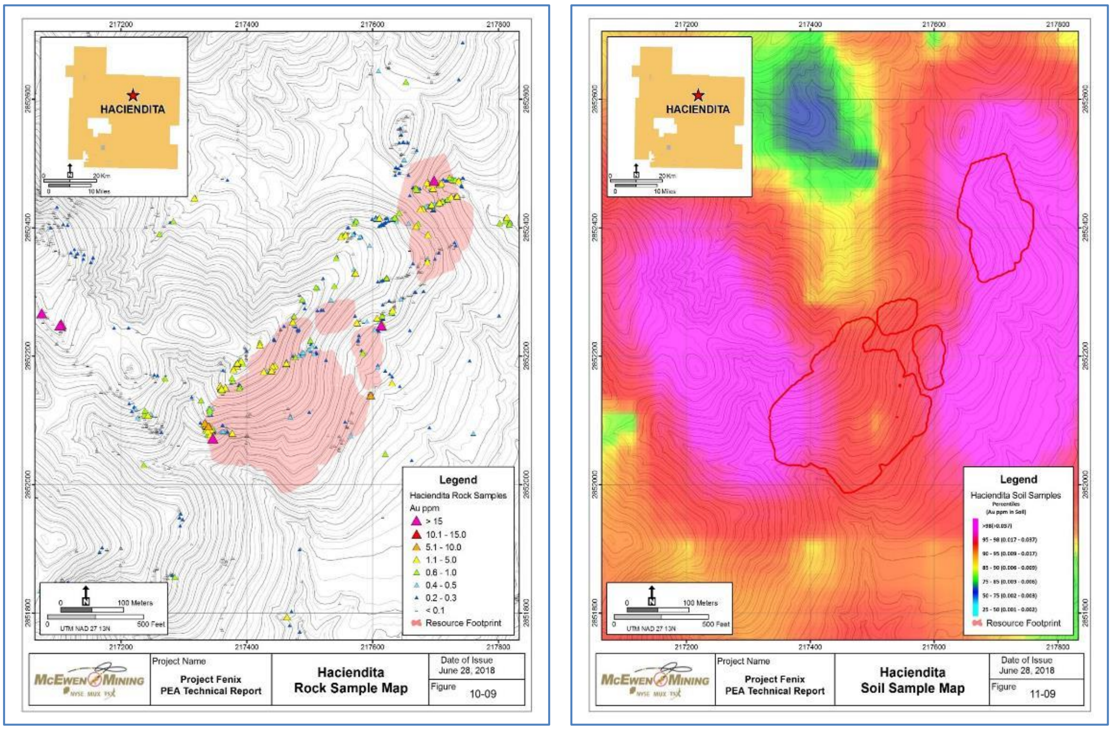


Figure 28 Haciendita Rock and Soil Sample Maps

The location and assay results of surface rock samples and surface soil samples taken at Mina Grande are shown graphically in Figure 29.

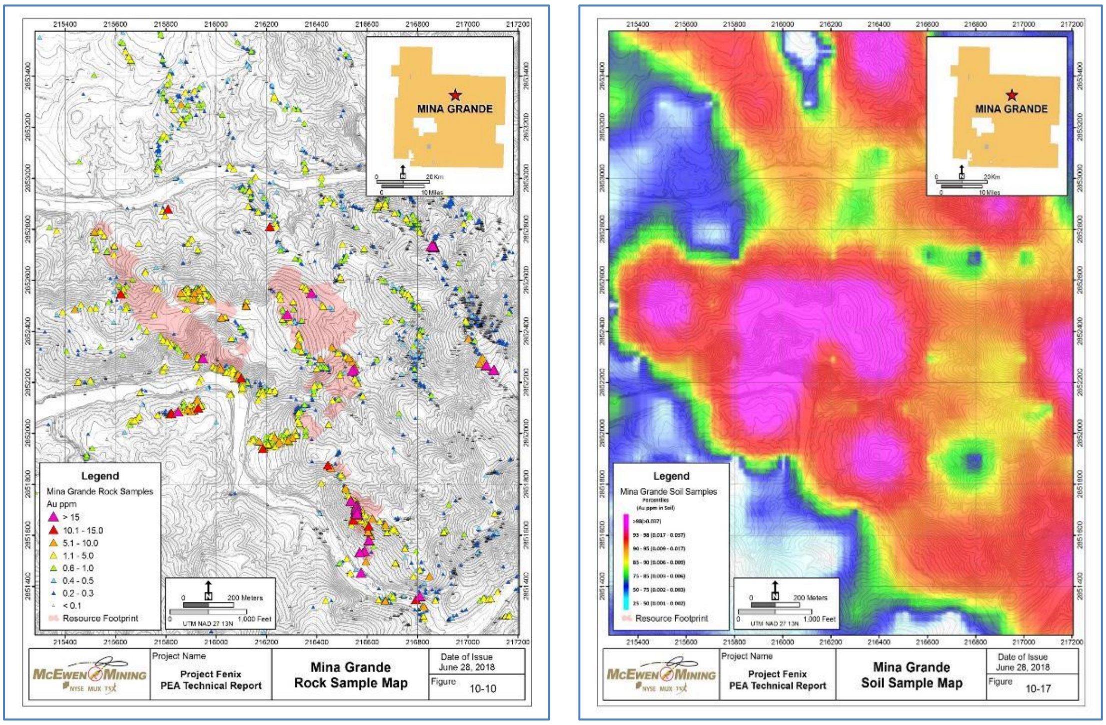
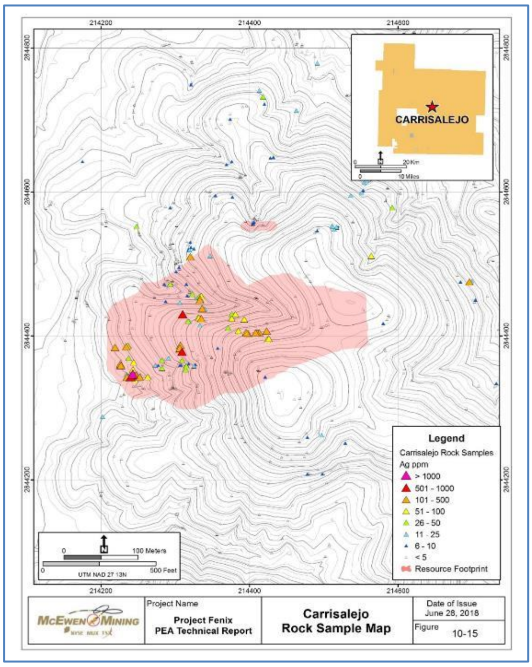


Figure 29 Mina Grande Rock and Soil Sample Maps

Carrisalejo

The location and assay results of surface rock samples and surface soil samples taken at Carrisalejo are shown graphically in Figure 30.



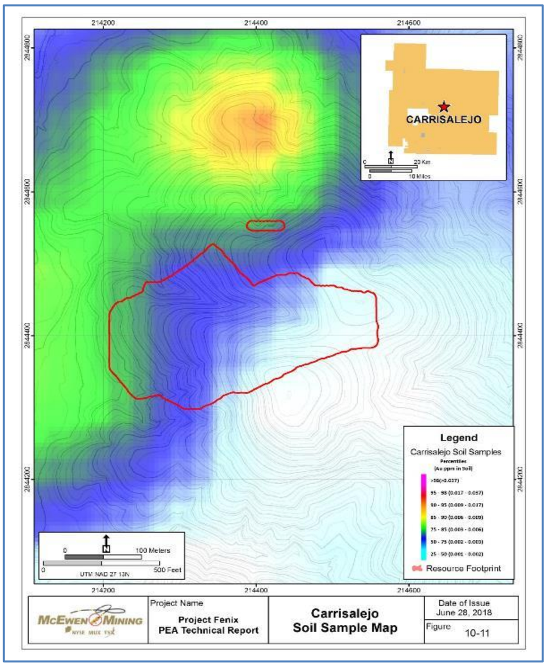


Figure 30 Carrisalejo Rock and Soil Sample Maps

El Encuentro

A total of 1,155 rock samples have been collected over the property by McEwen. Most samples were analyzed only for gold and silver. Gold values range from less than detection to 24 ppm. The highest silver value is 220 ppm. Anomalies outside the area of existing mineral resource envelopes are present. Surface rock and soil samples are shown graphically in Figure 31.

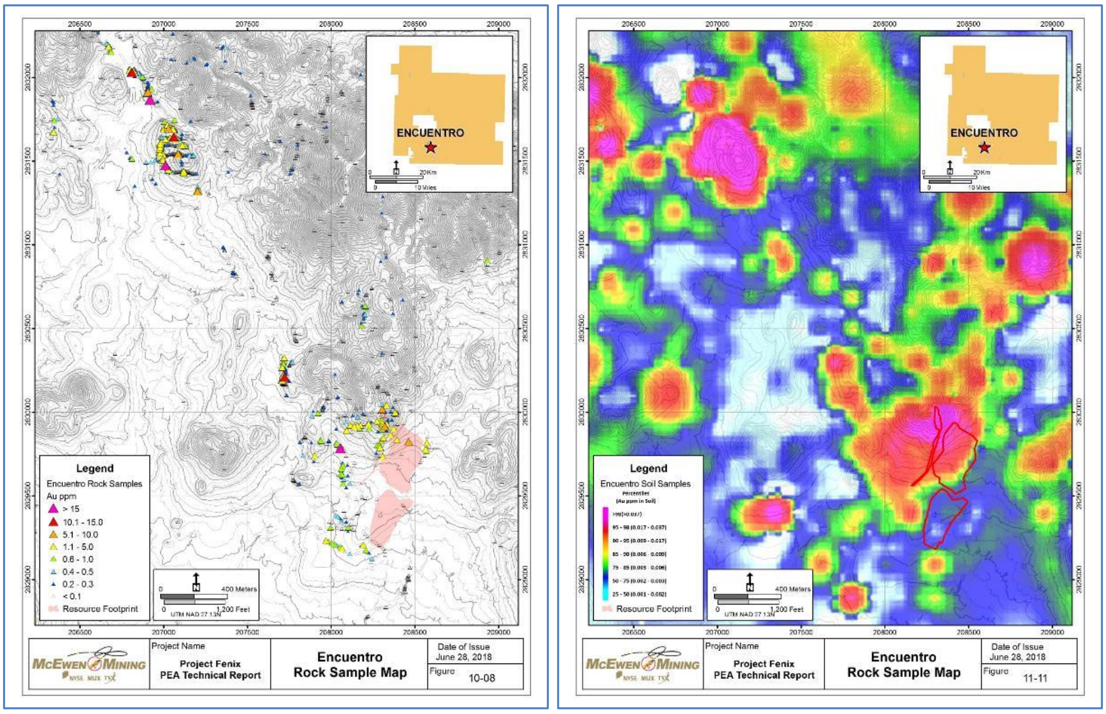


Figure 31 El Encuentro Rock and Soil Sample Map

10. DRILLING

Drilling on all resource areas has been carried out using diamond core drilling and/or reverse-circulation (RC) drilling. McEwen has been the sole operator for all drilling program undertaken since 2008 and drilling was done by contractors under supervision of McEwen personnel. Prior to 2008, some of the projects (described below) had drilling managed by other operators.

The following is a synopsis of drilling methodology and protocols employed by McEwen.

Diamond Drilling:

Core drilling was undertaken using HQ or NQ size bits, generally utilising 3.05 m (10 ft) core barrels. Core is removed from the core barrel by the drillers and placed in plastic core boxes. Individual drill runs are identified with small wooden blocks, where the depth (in meters) and length of drill run are recorded.

Upon arrival at the core logging facilities, the core is subject to the following procedures:

- Quick review of the core;
- Core recovery and rock quality designation (RQD) are measured and recorded;
- Geological logging: This is completed by geologists on paper logging forms in accordance with company protocol which includes header information, lithology description and litho codes, graphic log, and numerically coded mineralisation and alteration attributes. Core logging data are entered digitally into the company's database;
- Based on visual alteration, mineralisation and lithology, the geologist decides where the sample intervals should be placed. Sample intervals are delimited using orange-coloured wood blocks labelled with the depth in meters (representing the end depth of the sample interval);
- After the core is logged and sample blocks inserted, photographs of the core are taken with a white board indicating both the hole and box number; and
- Core cutting and sample collection is discussed in Section 11.

RC Drilling:

RC drilling was carried out by contractors under the supervision of a McEwen/Minera Pangea geologist. Samples were collected at the drill rig on 1.5 m (5 ft) intervals using a cyclone and rotating wet splitter. Field duplicate sample splits were also obtained. All samples were collected by Minera Pangea personnel. Samples were collected in Tyvek bags and labelled with sample footage and hole number. Chip samples are collected for each interval, rinsed and placed into chip trays, labelled with hole number and depth. Logging of the chip trays was conducted by McEwen/Minera Pangea geologists at the El Gallo Gold site.

Neither core nor RC chips are left unattended at the drill rig. Samples are transported daily to McEwen's core logging facility at El Gallo Gold under a geologist's or manager's supervision. Core is transported in closed boxes by company truck. RC chip trays are closed and typically transported inside a vehicle. McEwen has established a written policy that outlines who is authorized to handle and transport samples. Each employee in Mexico is required to read this policy and any future versions. Failure to comply with the policy results in automatic dismissal.

All core and RC chips are stored at the El Gallo Gold. Core boxes and chip trays are stacked on industrial steel racks to an approximate height of 4 m (12 ft).

Collars for holes drilled by McEwen were marked with PVC tubing, labelled with a metal tag and a cement monument placed around the collar (Figure 33). All holes have been surveyed by a contract surveyor.

10.1 El Gallo Silver

McEwen (2009 to 2018)

Cored drillholes are the sole source of geological and grade data for the El Gallo Silver resource estimate. McEwen has been the sole operator of the El Gallo Silver Project since drilling started in January 2009. To date, a combined total of 100,742.8 m of core drilling has been completed. Drilling has been conducted throughout the El Gallo Silver Project area including condemnation drilling that was done for planned mine facilities and infrastructure peripheral to the resource. All core drilling was completed using either HQ or NQ core size. Both vertical and inclined holes have been drilled. A total of 537 of the 561 holes were surveyed downhole. Because of variation in the orientation of, and irregular geometry within, some of the mineralized zones, it should not be assumed that drilled intercept represents true widths. Core logging, recovery/RQD measurement and core splitting were done on site at the El Gallo Gold (described above and in Section 12). Core drilling has been completed by Layne de Mexico, S.A. de C.V., a subsidiary of Layne Christensen Company, based in Hermosillo; Energold de Mexico, S.A. de C.V., a subsidiary of Energold Drilling Corp, based in Mexico City; or Landrill S.A. de RL de C.V. based in Durango.

Table 25 summarizes the Project exploration drillhole database. Figure 32 illustrates the location of drill holes for El Gallo Silver.

Items	# RC holes	# Core holes	Total m	# assays	m assayed Chemex	Max Au grade	Max Ag grade	# holes surveyed
El Gallo Silver	19	561	100,742.79	70,545.00	76,061.53	71.60	18,244.50	537
Palmarito (in situ)	84	244	43,644.72	29,061.00	41,743.32	7.43	5,870.00	25
Palmarito (dumps)	21	31	3,778.09	2,712.00	2,664.34	7.97	2,880.00	52
Samaniego	363	206	84,338.29	55,136.00	18,591.27	80.19	2,260.00	162
San Rafael	282	16	35,716.17	1,861.00	1,234.00	5.84	32.76	10
Sagrado Corazon	64	64	15,718.45	9,988.00	3,854.77	112.50	176.00	40
Lupita-Central	114	159	38,655.89	26,646.00	11,413.56	83.40	499.00	177
Carrisalejo		61	8,499.35	6,084.00	4,393.75	3.43	11,076.00	56
Encuentro	8	99	20,314.62	14,032.00	6,410.42	126.50	338.00	89
Mina Grande		136	21,985.80	15,110.00	11,701.05	57.10	3,150.00	132
Haciendita		66	9,596.14	7,186.00	8,426.45	12.35	788.00	64

**Cut-off date: 31 March 2018*

Table 25 Exploration Database Summary

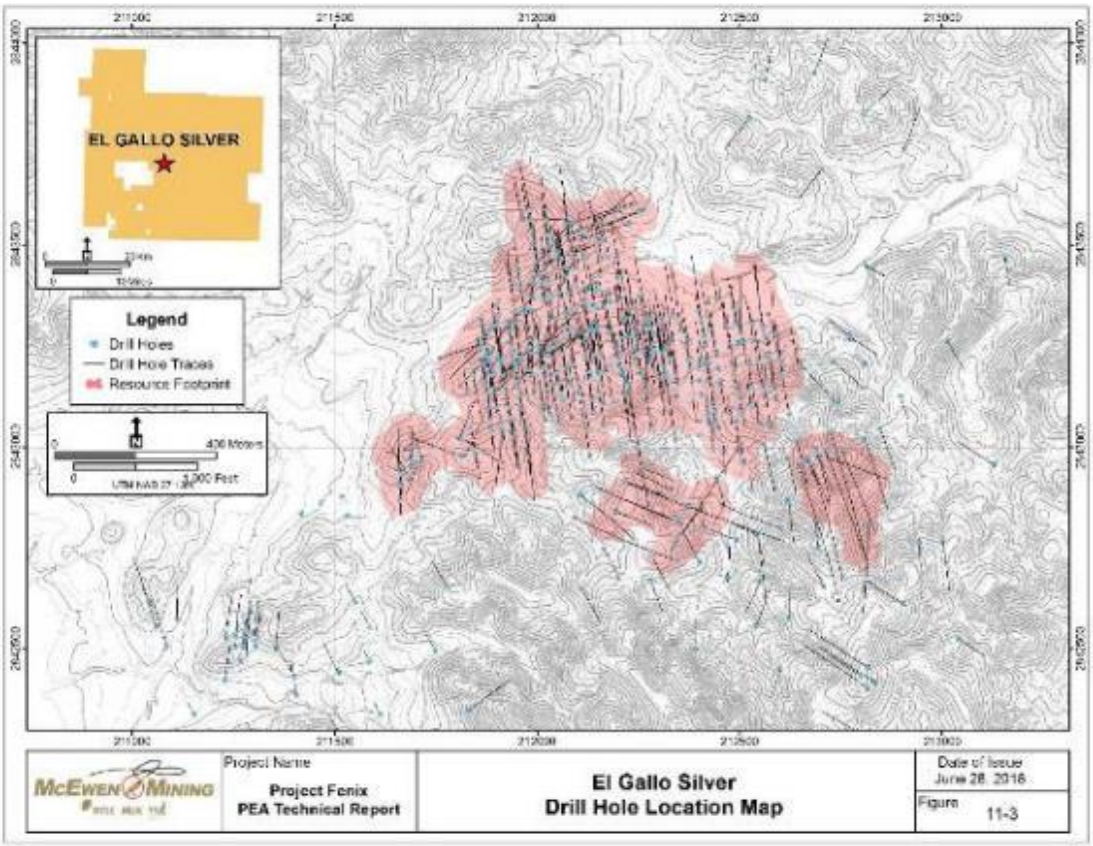


Figure 32 El Gallo Silver Drillhole Location Map

10.2 Palmarito

At Palmarito the resource estimate utilized 380 drill holes (274 core and 105 reverse-circulation) as well as 10 underground channels. Approximately 69% of these holes were drilled at an angle normal to the dipping orebody, 28% of the holes were drilled vertically, and the underground channels are horizontal. Drillhole collar locations were surveyed. Drill collars were monumented and most can be found in the field.

Nevada Pacific Gold (2006 to 2007)

A total of 19 core holes were completed by Can Rock Drilling based in San Luis Potosi State, Mexico. Core holes were drilled using HQ core, with several holes reduced to NQ where drilling conditions necessitated. Out of 19 holes, 15 holes were surveyed downhole.

McEwen (2008 to 2018)

Both RC and core drilling were completed by Major de Mexico S.A. de C.V. Additional core drilling was completed by Layne de Mexico, Energold de Mexico or HD Drilling S.A. de RL de C.V. Hole diameter for the RC drilling was 14.6 cm (5.75 in). Core holes were drilled using HQ core, with several holes reduced to NQ where drilling conditions necessitated. Collars for the McEwen holes were collared with plastic tubing, marked with a metal plate and surveyed. Out of the 313 holes, 231 holes were surveyed downhole. Figure 34 illustrates the location for all of the Palmarito drillholes.

10.3 El Gallo Gold

McEwen has conducted exploration drilling intermittently from 2008 to 2018. This was carried out primarily around the known resources areas of the project. All other exploration drilling was conducted by previous operators. Table 25 summarizes the El Gallo Gold drillhole database as of March 2018. Figure 35 and Figure 36 illustrate the location of these holes on the property.

Queenstake, Santa Cruz Gold and Mogul Mining (1994 to 2002)

Of all the drillholes included in the database for the El Gallo Gold resource estimate that is the subject of this Technical Report, the majority is derived from Queenstake and its predecessors. Core and RC drilling was conducted in the Samaniego, San Rafael, Lupita-Central and Sagrado Corazón areas. RC drilling was conducted within historical tailings piles.

RC drilling consisted of drilling 140 mm diameter holes, with samples collected at 1.5 m (4.9 ft) intervals. Exploration drilling was conducted using air to circulate cuttings out of the hole, until damp or wet conditions required water circulation. Limited groundwater measurements (17 in 1999) show that the groundwater table tends to parallel topography at a depth of 50 to 60 m (165 to 195 ft) on the hillsides and can be very close to the surface in the valleys.

Core drilling consisted of holes that were drilled with NQ (48 mm), with samples collected at 1.5 m (4.9 ft) intervals. The lithology, alteration, and mineralization were recorded on site for each sample.

In the Samaniego and San Rafael areas, 52 core and 633 RC holes were drilled totaling 109,870 m (360,465 ft). These holes were drilled both vertically and inclined to intercept the mineralized structures approximately perpendicular to their local dip. As a result, the mineralized intercepts of these holes closely approximate true thicknesses of the mineralization.

Seven core and 159 RC holes were drilled along the Lupita-Central-Sagrado Corazón trend totaling 14,323 m (36,991 ft). These holes were inclined to intercept the nearly vertical structures. Consequently, the mineralized intercepts of these holes do not approximate the true thicknesses of the mineralization.

Collars for these core and RC holes were cemented, monumented and surveyed. The azimuth and dip of the collars were recorded. These holes were not surveyed downhole.

Figure 33 Drillhole Collar

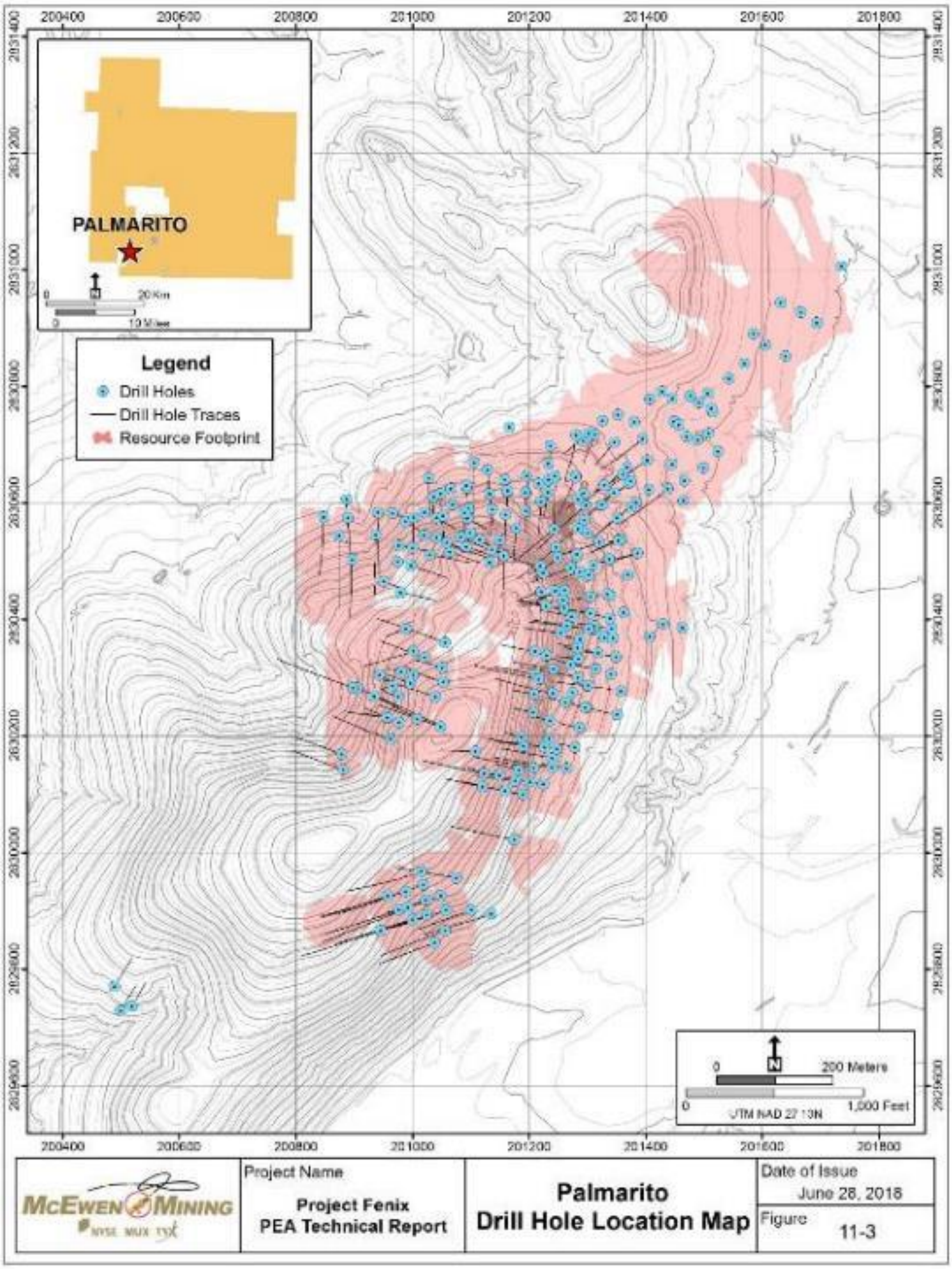


Figure 34 Palmarito Drillhole Location Map

Nevada Pacific Gold (2004 to 2005)

A small number of RC and core holes were drilled by NPG within the Samaniego Hill, San Rafael and Lupita-Sagrado Corazón areas.

Two core and five RC holes were drilled in the Samaniego and San Rafael areas totaling 1,160 m (3,800 ft). These holes were drilled both vertically and inclined to intercept the mineralized structures approximately perpendicular to their local dip. As a result, the mineralized intercepts of these holes closely approximate true thicknesses of the mineralization.

Twenty-five RC holes were drilled along the Lupita-Central-Sagrado Corazón trend totaling 2,995 m (9,825 ft). These holes were inclined to intercept the nearly vertical structures. Consequently, the mineralized intercepts of these holes do not approximate the true thicknesses of the mineralization.

Collars for the Nevada Pacific Gold holes were cemented, monumented and surveyed. The azimuth and dip of the collars were recorded. These holes were not surveyed downhole.

Mineralized intercepts within these holes allowed Nevada Pacific Gold to reinterpret the Lupita envelope. Nevada Pacific Gold's reinterpretation expanded the envelope at depth to the south-east.

McEwen (2008 to 2018)

Core and RC drilling was conducted primarily in the Samaniego Hill, San Rafael, Lupita, Central, Sagrado Corazon areas, in addition to a small amount of drilling in various peripheral prospects within the El Gallo Gold area. All RC drilling was completed by Major de Mexico S.A. de C.V., a subsidiary of Major Drilling International, based in Sonora state, Mexico. Core drilling was completed by Britton Bros. (acquired by Boart Longyear during the drilling programme. Boart Longyear maintains its global headquarters in South Jordan, Utah, United States), Layne de Mexico, Energold Drilling and Landdrill.

For core drilling, HQ core size was used and reduced to NQ where necessary. Core logging, recovery/RQD measurement and core splitting were done on site at the El Gallo Gold location.

A total of 363 RC holes and 206 core holes were drilled in the Samaniego area totaling 84,338.3 m. These holes were drilled both vertically and inclined to intercept the mineralized structures approximately perpendicular to their local dip. As a result, most mineralized intercepts of these holes closely approximate true thickness of the mineralization.

A total of 114 RC holes and 159 core holes were drilled at Lupita-Central totaling 38,655.9m. These holes were inclined to intercept the nearly vertical structures. Consequently, the mineralized intercepts of these holes do not approximate the true thicknesses of the mineralization.

A total of 64 RC holes and 64 core holes were drilled at Sagrado Corazón totaling 15,718.5m. These holes were inclined to intercept the nearly vertical structures. Consequently, the mineralized intercepts of these holes do not approximate the true thicknesses of the mineralization.

A total of 282 RC holes and 16 core holes were drilled at San Rafael totaling 35,716.2m. These holes were inclined to intercept the nearly vertical structures. These holes were inclined to intercept the mineralized structures approximately perpendicular to their local dip. As a result, most mineralized intercepts of these holes closely approximate true thickness of the mineralization.

Of the 1,268 holes, 389 holes were surveyed downhole.

Mineralized intercepts within these holes show continued down-dip extension of the Lupita Zone and Sagrado Corazón, as well as down dip extensions of the Lower La Prieta Zone and Upper Samaniego Zone. This drilling also discovered the Central Zone. Drill hole location maps for El Gallo Gold are show in Figure 35 and Figure 36.

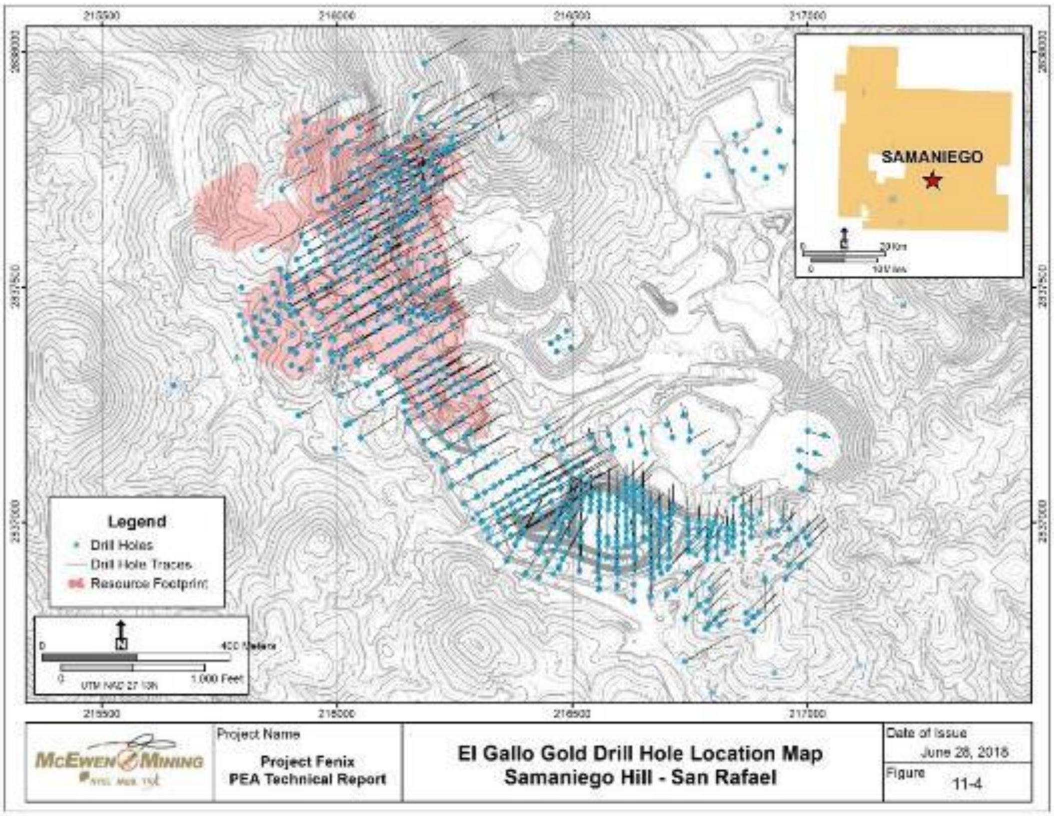


Figure 35 El Gallo Gold Drillhole Location Map Samaniego Hill – San Rafael

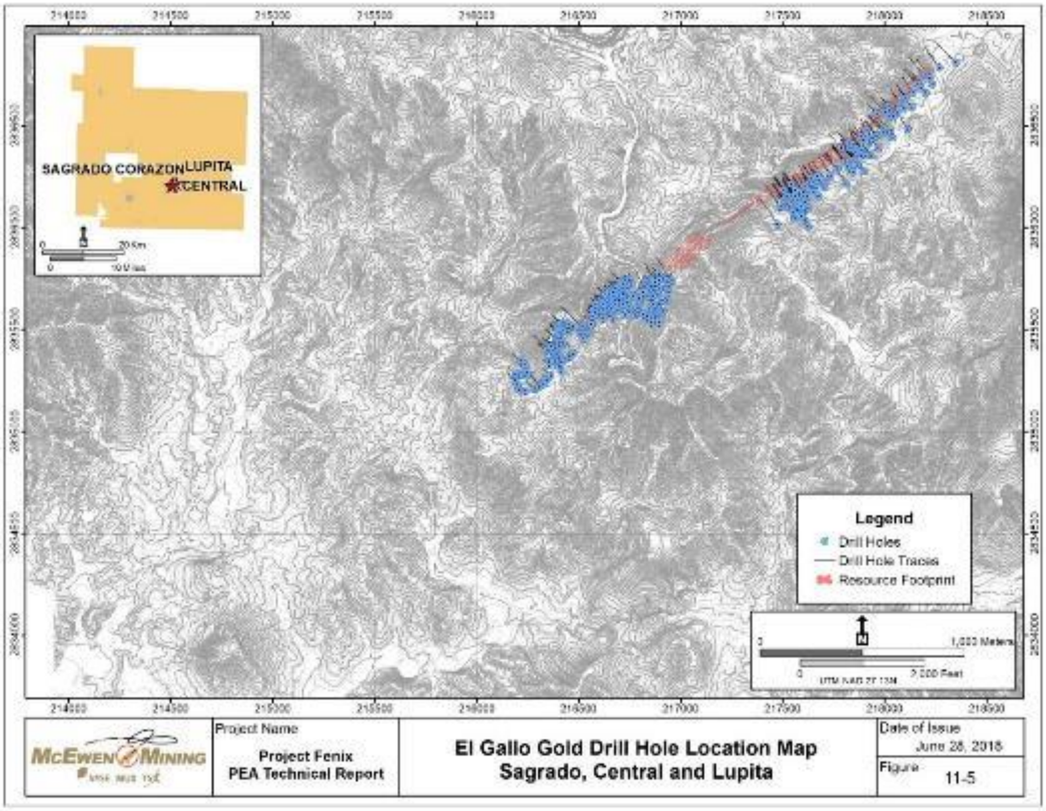


Figure 36 El Gallo Gold Drillhole Location Map Lupita-Central-Sagrado Corazón

Heap Leach Material drilling (2017)

An MPD-1000 Drill Systems rig mounted on a crawler with a compressor were used for drilling the Heap Leach Material and was conducted by Ingenieria y Servicios Ambientales Industriales (MADAI S.A. de C.V).

An RC dual tube drill rod system was used with the sample recovery being made through the internal 4" diameter, 6-meter length pipe. Corrugated casing was 6" in diameter and 6 m length and was left in the hole.

The Heap Leach Material drill program consisted of twenty-one RC holes for a total of 664.22 meters drilled. The location of the drill holes was planned to cover uniformly the Heap Leach Material surface. Each hole depth was calculated to carefully avoid perforating the lower liner and disturbing the remnant leaching solutions within the pile.

10.4 Other Resource Areas

All other resource areas contained within this Technical Report were drilled exclusively by McEwen except for a small amount of drilling at Las Milpas Project were drilled by Nevada Pacific Gold, drilling was carried out by Major Drilling, Layne, Energold or Landrill. Core holes were drilled using HQ core, with several holes reduced to NQ where drilling conditions necessitated. Of the 654 holes, 598 holes were surveyed downhole. Figure 37 to 0 illustrate the location for drillholes at the other resource areas.

10.5 Downhole Surveys

McEwen drilling contractors undertake downhole surveying of holes upon their completion. After reaching final drill depth, a Reflex tool is inserted downhole. Deviation measurements are taken at the hole bottom and nominally every 50 m (165 ft) up the hole to a depth about 6 m (20 ft) below surface casing. The Reflex tool uses magnetic methods to measure azimuth and care must be taken that the tool extends below the drill rod or casing while measurements are taken. The instrument records various data including dip, azimuth, temperature and magnetic field strength. These data are recorded for each measured depth and the data provided to McEwen personnel.

Magnetic declination (11°) is added to the raw azimuth measurement as it is entered into the database. Any spurious-looking measurements are checked by reviewing the magnetic field strength to see if the tool was inside drill rod at the time of reading. This was the case for some measurements. For these, as well as occasions where it appeared the driller incorrectly noted the data (inverted numbers), the specific measurements were not used in the drillhole survey table in the database.

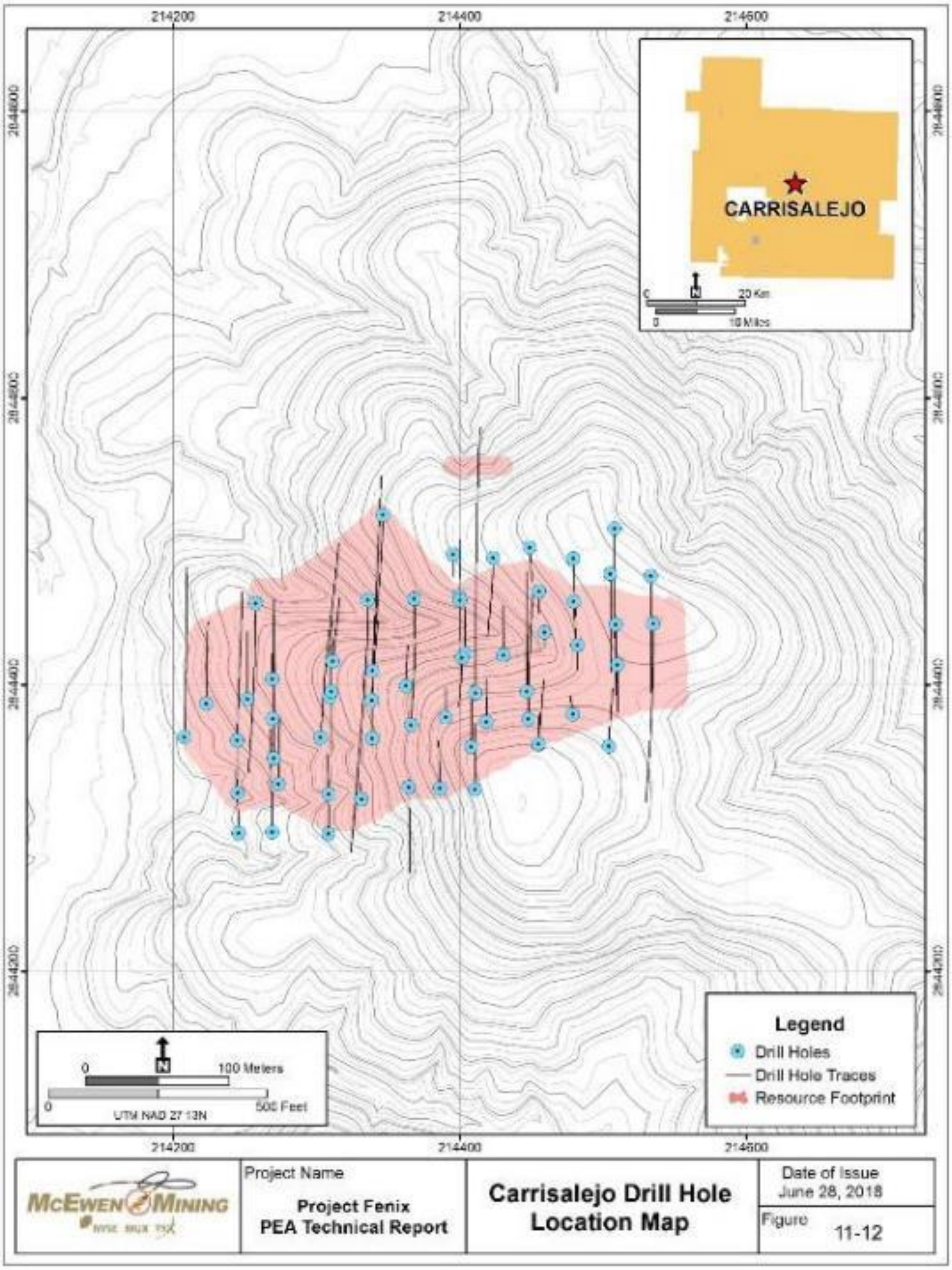


Figure 37 Carrisalejo Drillhole Location Map

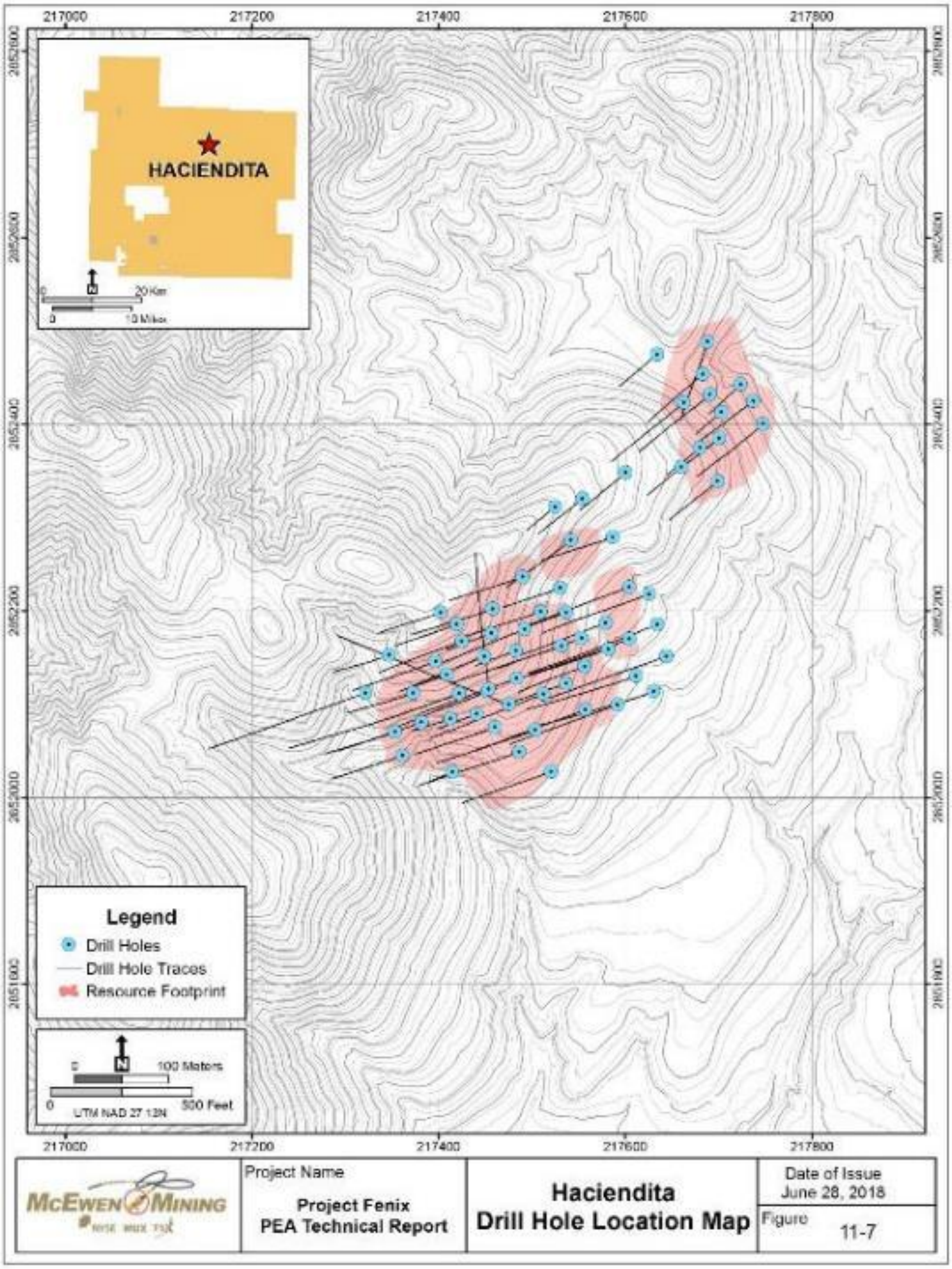


Figure 38 Haciendita Drillhole Location Map

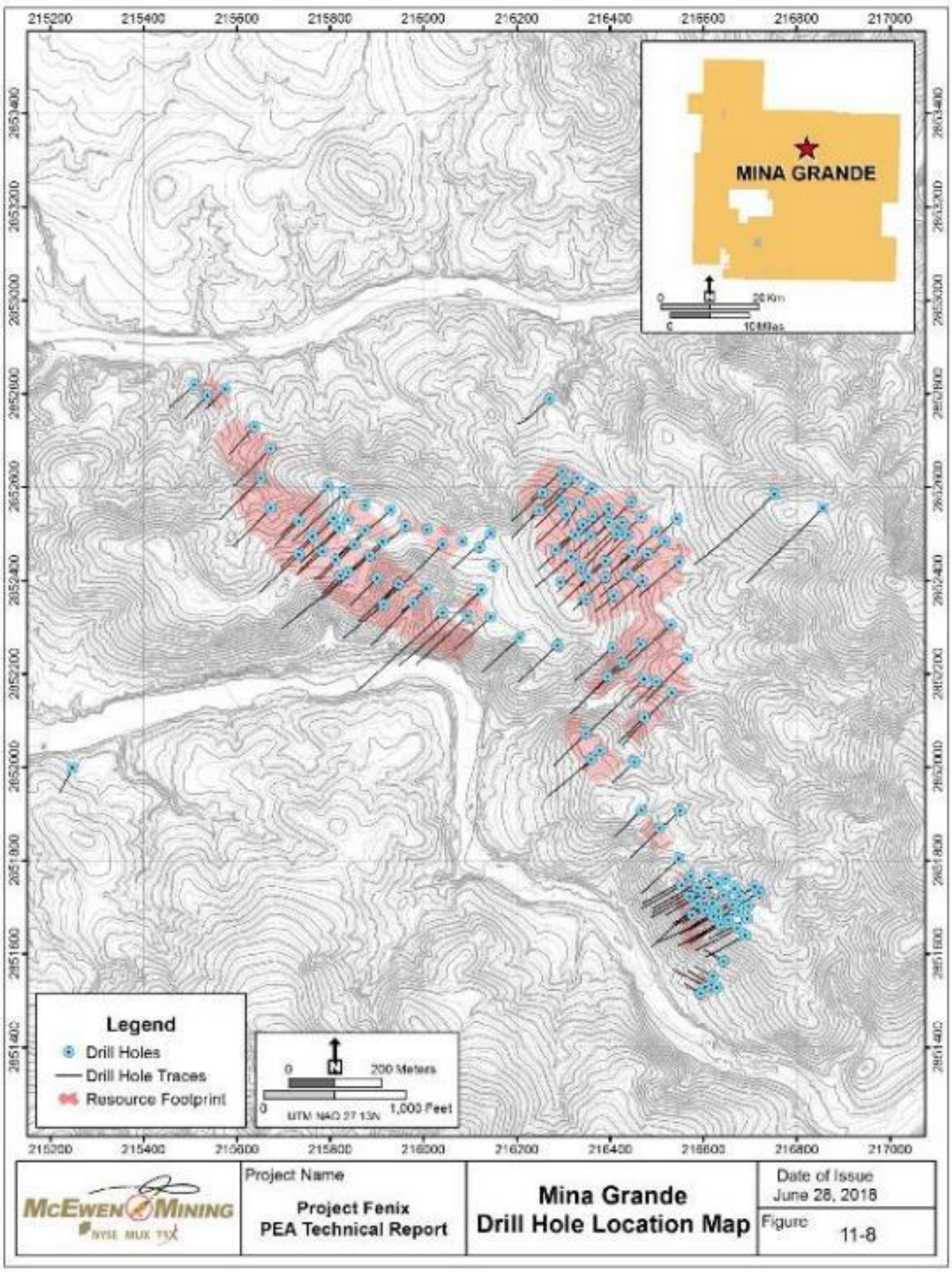


Figure 39 Mina Grande Drillhole Location Map

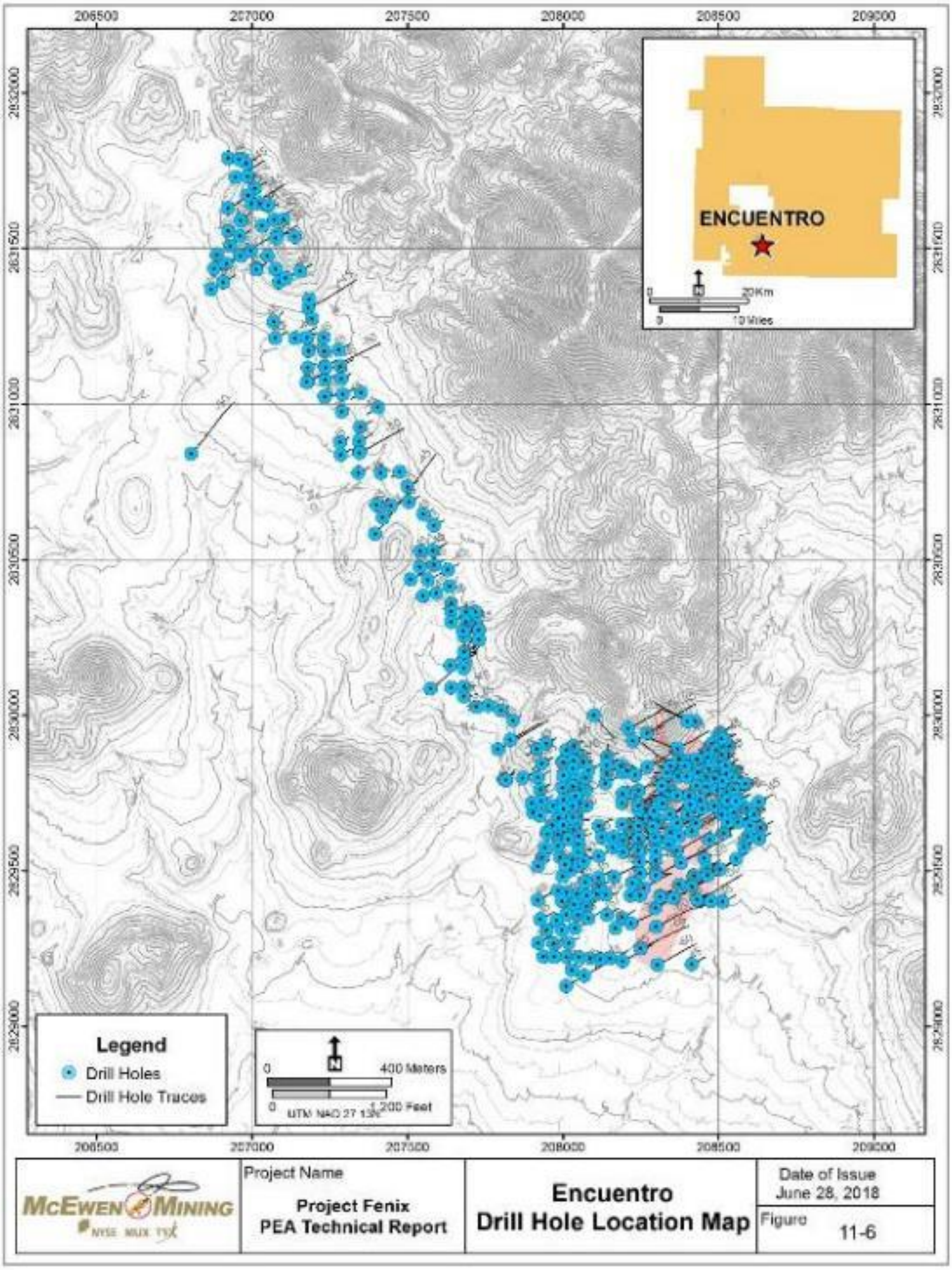


Figure 40 El Encuentro Drillhole Location Map

10.6 Core Recovery and RQD

Core recovery and RQD are measured at the core logging facility by McEwen personnel where the following measurements are recorded:

- Block interval;
- Drill run (meters);
- Measured length (meters);
- Calculated recovery (%);
- RQD measured length (meters); and
- Calculated RQD (%).

Recovery and RQD measurements are recorded in the company's database. The methodology used for measuring recovery was reviewed by Luke Willis, co-author of this Technical Report and is standard industry practice.

Generally speaking for all projects, core recoveries are good, generally greater than 90%, and often greater than 95%. Locally, in fault zones or in alluvial material at the tops of some holes, recoveries can be significantly worse. These occasions constitute a relatively minor occurrence overall. For example, some El Gallo Silver holes were collared in drill pad fill or in dry creek beds where core recovery was difficult. In the worst of these situations, recoveries could be near 0% over short intervals.

As is generally common, there is a tendency for slightly lower core recoveries in the broken rock in the weathered zone at the tops of holes. In some cases, at El Gallo Silver this constitutes mineralized material because many holes were collared on surface mineralization. For the most part, however, mineralized zones at El Gallo Silver exhibit good core recovery.

A strong fault zone at depth in the north-east, down dip extension of the Palmarito deposit was encountered in a few core holes. In this zone core recoveries were low and in three cases (one Nevada Pacific Gold hole and two McEwen holes) the holes had to be abandoned. Locally poor to moderate recoveries have been observed at Carrisalejo where broken brecciated rock has caused difficult drilling conditions.

11. SAMPLE PREPARATION, ANALYSES AND SECURITY

11.1 Sampling Method and Approach

11.1.1 Introduction

Sampling programs in and around the different resource areas have included stream sediment, soil, rock chip, rotary blasthole drill, RC and drillcore samples. All of the sampling conducted by McEwen was carried out by company personnel or contractors. Core and RC drill samples form the basis of the resource estimate for the in situ material for each of the areas. (Results from a minor amount of underground channel sampling were used at Palmarito). Backhoe trench sampling was used to estimate the historic waste dumps and tailings located at Palmarito and Mina Grande.

The current core cutting protocol is as follows:

- After being transported from the field to the El Gallo Gold core facility, core boxes are transferred from the logging tables to the cutting station (approximately 75 ft (25 m));
- Core is cut with a diamond saw. The core is typically cut into three separate parts that includes one half and two quarters of the core;
- Half core (or quarter core for some early drill holes) is collected and bagged and properly identified by labelling the bag and inserting a tag inside the bag. Bagged samples are transferred to ALS Chemex in Hermosillo, Mexico for sample preparation. All samples sent to Chemex are transferred by Chemex personnel or sent by courier;
- For select holes, a quarter core sample is prepared and assayed at McEwen's El Gallo Gold laboratory. McEwen sometimes assays core samples internally to obtain quick turn-around of results in order to better plan its exploration programs; and
- The un-sampled portion of the core remains in the box, in its original orientation, as a permanent record. Certain sections of core no longer exist in their entirety since they were used to perform later metallurgical test work. In these cases, the intervals have been "skeletonized," keeping some representative pieces in the core box.

11.1.2 El Gallo Silver

McEwen (2009 to 2018)

Sampling for resource estimation purposes at El Gallo Silver has been conducted solely through drill core obtained by McEwen between January 2009 and September 2017, and follows the protocol described above.

11.1.3 Palmarito

Nevada Pacific Gold (2006 to 2007)

Drilling was completed using a core drill and NQ core. As many of the NPG holes were twin holes, sampling attempted to correlate the sample intervals of the Lluvia de Oro RC holes. In some zones internal intervals were assigned based on the geological characteristics of the rock. The core sample was halved with a rock saw with one half retained and the other bagged and sealed to form an assay sample.

McEwen (2008 to 2017)

Procedures for core and RC samples are similar to those described in Section 11.1.1 and for El Gallo Gold under Section 11.1.4 below. For Palmarito core samples, the vast majority were shipped to Chemex as half-core samples.

In addition to drilling, nine historic underground adits located in the up-dip portions of the Palmarito deposit were mapped and sampled (ten channel samples) and used for resource estimation purposes.

Underground sampling

Channel sampling of the underground adits was completed to approximate the size of a typical HQ core sample. Sampling was done in the following manner:

- After an initial cleaning of the adit rib (wall), two parallel horizontal cuts were made with a separation of 10 cm using a diamond disc cutter. The cuts were made about 5 cm deep. The adit wall was washed down with water to eliminate any rock powder generated from the sawing;
- Mapping at a scale of 1:500 was done utilising tape and compass to map the trend of the adit as well as the geology. Contiguous samples were marked on the wall with paint using a nominal 1 m interval although they varied somewhat based on alteration contacts;
- A tarpaulin was placed on the floor of the adit to catch rock chips and the for each sample interval the material between the parallel cuts was collected using hammer and chisel. Rock chips were collected and bagged and sent to ALS Chemex for analysis. Sample intervals were based on a marked initial point at the adit portal (taken as zero) and were recorded by the geologist in charge. Sample intervals as well as the azimuth trend of the adit were recorded in the database as drillholes. All adits are horizontal with lengths ranging from 7 – 35 m.

The historic tailings at Palmarito were sampled by backhoe trench using the following procedure:

- Under the supervision of a company geologist or technician, trenches were excavated to a nominal 0.3 m to 0.6 m (1 to 2 ft) below the bottom of tailings material; this was determined visually;
- Samples were collected vertically along the trench wall with a shovel and placed in plastic bags labelled with trench number and sample number. Sample thicknesses varied from 0.2 m to 2.6 m (0.6 ft to 8.5 ft) depending on the visual characteristics of the tailings material. Only tailings material was sampled; soil or bedrock below the level of tailings was not sampled;
- Generally, one sample was collected per trench; two or three samples were collected from some trenches. In the cases where more than one sample was obtained, they were vertically contiguous;
- Field notes were recorded describing the tailings material, underlying material, depth of trench and tailings thickness. A total of 52 trenches were excavated and sampled; and
- Samples were sent directly to Chemex for analysis.

Sixty-four samples from the historic mine dumps at Palmarito were collected using the following procedure:

- An excavator was utilized to dig pits on approximately 20 m (65.5 ft) centers on the accessible portions of the surface of the dump. Pit depths ranging from 4 to 5 m (13 to 16.5 ft) were determined by tape;
- Taking care to avoid sloughed material, the excavator bucket was drawn up along the pit wall from the bottom of the pit to the surface. A representative sample was taken by shovel to obtain samples of approximately 14 kg (30.5 lbs). Samples were bagged in rice bags and transported to the El Gallo Gold laboratory for splitting; and
- After splitting to approximately 10 kg, samples were sent to Chemex for analysis.

11.1.4 El Gallo Gold

Santa Cruz Gold and Queenstake (1994 to 2002)

Sampling methods for RC holes varied by drilling conditions (wet or dry). Table 26 shows a summary of the drilling conditions encountered through the 1999 drilling programme. Dry samples were collected from the cyclone into collection buckets and then split using a Jones riffle splitter. Wet samples were collected from a rotary wet splitter and then further split with a Jones riffle splitter. One-quarter sample splits (10 to 15 kg) were collected for both an analytical sample and a field duplicate. The lithology, alteration, and mineralization were recorded on site for each sample.

Deposit	Dry Holes	Wet Holes	
	Percent Dry Drilling	Percent Wet Drilling	Depth to Start Wet Drilling (Avg. Depth)
San Rafael	41%	59%	1-128 (50)
Samaniego	39%	61%	9-156 (50)
Sagrado Corazón - Lupita	91%	9%	26-80

Table 26 El Gallo Gold Drillhole Water Intercept Summary

RC and core samples were collected at 1.5 m (4.9 ft) intervals. Core samples were often collected at geologic intervals determined by the geologist based on visual evaluation of the core.

Nevada Pacific Gold (2004 to 2005)

Nevada Pacific Gold's sampling protocols were similar to those indicated by Queenstake.

McEwen (2008 to 2018)

RC drillholes were sampled and logged on 1.5 m (5 ft) intervals. Samples were collected using a cyclone and rotating wet splitter. Samples were split at the rig to obtain one assay sample and one field duplicate. Procedures for core samples are the same as described under Section 11.1.1.

El Gallo Gold Heap Leach Material Sampling (2017):

Each sample was collected using an RC cyclone in a 20-liter bucket. After each sample interval of 1.52 m, the sample was homogenized and then split with a Jones Riffle Splitter resulting in two duplicate samples. One sample was sent to the laboratory and the other saved for future test work.

11.1.5 Other Resource Areas

McEwen (2010 to 2018)

Procedures for core drilling (and tailings sampling at Mina Grande) at all other resource areas are similar to those described under Section 11.1.1 (and Palmarito Section 11.1.3), respectively.

11.2 Sample Preparation, Analyses and Security

Sample preparation takes place at Chemex's facility in Hermosillo, Sonora, Mexico. All geochemical and assay analyses are done at Chemex's laboratory in Vancouver, British Columbia, Canada. Chemex is an internationally recognized organization that operates laboratories worldwide and meets all requirements of accreditation and certification under International Standards ISO/IEC 17025:2017 and ISO 9001:2015 at all locations. It is understood that the analytical laboratory is using procedures and equipment that are consistent with industry "Best Practices" and therefore can be used for resource estimating purposes.

Upon receiving the split core samples, Chemex (Mexico) undertakes the following procedure for sample preparation:

- Coding: An internal laboratory barcode is assigned to each sample at reception;
- Drying: Samples are dried by oven at 100° to 110°C;
- Crushing: The entire sample is crushed to obtain nominal 90% at 2 mm;
- Splitting: The sample passes through a nominal 2.5 cm (1 in) Jones splitter, to obtain a split of approximately 250 g. The coarse reject is stored;
- Pulverisation: A 250 g pulp is prepared to achieve nominal 95% passing at 105 µm. A 100 to 120 g aliquot is taken from the master pulp for analysis. The remaining master pulp is stored on site;
- Shipping: The pulps are shipped to Chemex's analytical facility in Vancouver for analysis;
- All equipment is blasted with compressed air between each sample that is processed. Random screen tests are done on crushed and pulverized material to ensure that sample preparation specifications are being met.

All samples submitted to Chemex are analyzed using Chemex Method Au-AA23 for gold and for 33 other elements (including silver) by method ME-ICP61. ME-ICP61 uses a 4-acid digestion followed by ICP determination. The detection limit for silver is 0.5 g/t. Gold is determined using a 30 g fire assay fusion, cupelled to obtain a bead and digested with Aqua Regia, followed by an AAS finish, with a detection limit of 0.005 g/t. Samples returning greater than 1,500 g/t silver or 10 g/t gold are re-analyzed using gravimetric fire assay.

Chemex (Vancouver) reports the results digitally to McEwen via e-mail and submits signed paper certificates. General turnaround time is between 14 to 21 days. Results are uploaded electronically into the company's database at the office in Reno, Nevada. All hard copy certificates are stored in a well-organized manner at that office. Results of analyses, procedures, a full audit trail and internal QAQC processes undertaken by the Vancouver laboratory can be accessed and reviewed at any time by authorized personnel only through the ALS Chemex web portal service. ("Webtrieve")

Since McEwen began exploring the Project area, SGS Laboratories in Durango, Mexico and Inspectorate de Mexico were utilized as the secondary (check) laboratories. All QA/QC work is overseen on behalf of McEwen by Nathan Stubina, co-author of this Technical Report (see Section 12).

11.2.1 El Gallo Silver

McEwen (2009 to 2018)

Sample preparation and analyses of the El Gallo Silver core samples were carried out by Chemex, similar to the procedures described under section 11.2 above.

11.2.2 Palmarito

Nevada Pacific Gold (2006 to 2007)

The core was halved with a saw with one half retained and the other bagged and sealed before being shipped to the Chemex sample preparation facility in Hermosillo and assayed at Chemex's facility in Vancouver. All samples were fire assayed for gold and analyzed for 33 additional elements using a partial digestion ICP method. Selected anomalous silver intervals were analyzed for silver using a four-acid leach total digestion method.

McEwen (2008 to 2012)

Procedures for core samples are similar to those described in Section 11.2. Tailings samples collected in backhoe trenches were bagged and labelled at the sampling site and sent directly to Chemex for analysis. Dump rock samples were crushed at the mine laboratory by jaw crusher and split for submittal to Chemex

11.2.3 El Gallo Gold

Santa Cruz Gold and Queenstake (1994 to 2005)

Samples were delivered to Chemex in Hermosillo for sample preparation pre-2001, while 2001 and 2002 drilling samples were picked up by Chemex at the site. At Chemex, the entire sample (10 to 15 kg) was crushed to 60% passing 2,000 µm (-10 mesh), using jaw and cone crushers. A representative 250 to 300 g split of the crushed sample was obtained using a Jones riffle splitter. The split was then pulverized to 90% passing 105 µm (-140 mesh) using a ring and puck pulverizer. The resultant pulverized sample was then shipped to Chemex's Reno laboratory to assay for gold. A one-assay tonne fire assay (29.17 g) was used, with analysis by atomic absorption. If the atomic absorption value exceeded 10 g/t gold, then it was re-assayed with a gravimetric finish.

Nevada Pacific Gold (2004 to 2005)

NPG continued to apply the same sample preparation, analyses and security protocol as Santa Cruz Gold and Queenstake Resources.

McEwen (2008 to 2018)

All samples (RC and core) were transported from the field to the El Gallo Gold laboratory for staging. Samples were picked up on site by Chemex or couriered to their sample preparation facility in Hermosillo.

Heap Leach Material Sample Analyses

Samples sent to the mine laboratory were dried, crushed, homogenized and pulverized. Three duplicate 120-gram pulps were obtained for each sample. Two out of the three pulps were assayed at the mine laboratory. The third pulp was saved for sending to Chemex. The mine laboratory samples were assayed using the CN-AA method for Au and Ag. Fire assay (FA-AA) was used as an over-limit method for Au. Cu, Pb, and Zn were assayed using the ICP method for 22 elements.

Ten percent of the 120-gram pulp samples were sent to Chemex. The highest and lowest gold sample values were regularly sent to certify these two ranges. The Chemex samples were analyzed using the AA-23 and ME-ICP61 methods. The mine laboratory assay results were replaced in the database by the Chemex assays as they were received.

11.2.4 Other Resource Areas

McEwen (2008 to 2018)

Procedures for core samples are similar to those described Section 11.2 Procedures for tailings samples at Mina Grande are similar to those described under Palmarito in Section 11.2.2.

For McEwen-managed projects all samples are generally shipped via courier to Chemex's sample preparation facility in Hermosillo, Sonora, Mexico. In some cases, samples were picked up at the El Gallo Gold site by Chemex. Sample preparation and analyses are as described in section 11.2.

11.2.5 QA/QC Programme

McEwen's quality assurance/quality control QA/QC programme includes the following procedures:

- Use of blanks and CRM/reference "standards";
- Duplicate sample analysis; and
- Check assay analysis by a secondary laboratory.

Blanks and reference standards in pulp form were purchased from CDN Resource Laboratories Ltd, Shea Clark Smith/Minerals Exploration & Environmental Geochemistry (MEG), and Rocklabs (Auckland, NZ). McEwen uses a variety of standards with a range of known gold (0.055 to 9.5 ppm) and silver (0.248 to 2684 ppm) values. Blanks and standards are inserted into the sample stream at regular intervals (a minimum of one for every 20 samples). Generally, one blank followed by one standard are inserted together at these intervals (nominally 25 samples (every 20 samples for holes drilled since 2010)). The analytical statistics for these standards are provided by the manufacturer and gives McEwen the means to determine the accuracy/precision of the analytical techniques being used.

Sample duplicates: The duplicate sample analysis programme involves the collection/analysis of two samples from the same interval on RC drilling programs at regular intervals, and two quarter core samples from opposite sides of the same interval on core drilling programs. Results of duplicate samples are compared to the original to determine the precision of the analysis and/or inhomogeneity in the sample

Check assays: The check assay programme utilizes an alternate analytical laboratory (SGS and Inspectorate) to check for precision in the analytical techniques. Check assaying is performed on the original pulp. SGS utilized a fire assay/atomic absorption finish for gold and fire assay/gravimetric finish for silver. Analyses by Inspectorate are by fire assay for gold and four-acid digestion with AA determination for silver. Early on in the drilling campaigns of the various projects, samples were selected for check assay by choosing one sample approximately out of every 25. Later a different systematic approach was undertaken. The current protocol for checks assay sample selection is that approximately 5% of the assays are selected at random, a list is given to ALS Chemex where they package the pulps and send them to Inspectorate or SGS to be assayed. These samples are analyzed with respect to the original assay to determine the degree of deviation from the mean and the degree of bias in the dataset. It should be noted that the initial selection process is random, but the final list is reviewed to ensure that all drill holes and a wide array of gold and silver grades are represented. These extra measures ensure that the dataset is not biased. In the case of a standard, blank, or check sample out of control (for blanks and standards defined as outside of three standard deviations from the mean and for check samples defined as a deviation of greater than 30%), the data are first reviewed to identify any labelling/archiving errors; oftentimes issues with standards and blanks are resolved by this. If the issue cannot be resolved in this manner and occurs within or near a mineralized interval a select batch of samples is re-analyzed by Chemex, including the problematic standard/blank. In every case where this was done the re-analyses were not materially different from the original. In the case of check sample out of control, the same pulp is sent to a second check assay laboratory to determine which laboratory is causing the issue. In some instances, new pulps may also be generated from the bulk reject and analyzed by Chemex. All of the new data are analyzed to identify the source of the problem and eliminate systematic error from future assays.

Sample reruns: In addition to samples that were re-assayed in conjunction with evaluating a problem with a standard, blank or check assay, a number of samples of high-grade gold or silver were rerun to check reproducibility of results using the same laboratory with the same pulp. Coarse particle size native gold or silver can create inhomogeneity (nugget effect) during sample preparation. A number of high-grade silver samples from El Gallo Silver and high-grade gold samples from Lupita, and Mina Grande were re-assayed at Chemex using the same pulp (and in some cases also producing a new pulp from the bulk reject). In no case did these re-runs return results significantly different than the original assay suggesting that nugget effect is not a significant issue for these projects.

QA/QC procedures are described below for individual projects. In the case of those projects with previous operators (Palmarito and El Gallo Gold) a review of those operators' procedures is included where sufficient information exists. McEwen has been the sole operator for all other projects.

Blanks and Standards El Gallo Silver

The protocol for insertion of blanks and standards was as described above - every 25 samples for holes GAX-001 through GAX-043 and every 20 samples for holes drilled after GAX-043. In some instances, standards and blanks were inserted more frequently so as to be placed within visually mineralized intervals. Silver values for the standards ranged from 0.248 to 2,684 ppm.

On minor occasions it was noted that Chemex results did not match the accepted values of the standard or blank. For most of these cases, based on similarity of assay results to accepted values for other standards, it was determined that the incorrect standard number had been entered into the database. In some cases, Chemex assays for the lowest grade standard (0.248 ppm) yielded values above the accepted range for this standard. Re-runs by Chemex were usually consistent with their first analyses and it was concluded that analytical consistency was difficult at these levels. Since these values are considerably lower than values of economic or exploration interest, the issue was considered resolved and the use of this standard was discontinued. On a few occasions a blank was determined to have some minor carry-over from a previous high-grade sample (a standard). In one of these cases this carry-over resulted in the blank assaying 1.7 ppm silver, or 0.06% of the previous samples' assay.

Sample Duplicates El Gallo Silver

Duplicate core samples were analyzed for 115 mineralized intervals. For these samples, the opposite half of the quarter--core was collected from the core box and submitted to Chemex.

Check Assay Programme El Gallo Silver

McEwen's check assay procedure involves sending sample pulps directly from Chemex's Hermosillo facility to SGS's laboratories in Durango, Mexico. SGS performs gold and silver analyses by fire assay with AAS finish for gold and gravimetric finish for silver.

For the first phase of drilling (GAX-001 through 043), samples for check assay were chosen systematically with a minimum of one check sample every 25 samples with occasional additional samples in mineralized intervals. For holes drilled after GAX-043, the database was filtered for samples with Chemex results greater than 10 ppm silver and check samples were chosen from this population so as to obtain check assays for a nominal 10% of these and including checks for all holes with mineralized intervals.

Blanks and Standards Palmarito

<u>Nevada Pacific Gold:</u>

Other than standards being used internally by Chemex as part of their routine QA/QC procedures, no evidence exists for blanks and standards being introduced during drill campaigns conducted by previous operators.

McEwen:

Most Palmarito drill holes had blanks and standards inserted with the exception of some of the early drilling.

Sample Duplicates Palmarito

Nevada Pacific Gold:

No duplicate samples were apparently collected from the core drilling conducted by Nevada Pacific Gold.

McEwen:

Field duplicate splits for RC samples were collected at the drill rig. These duplicate samples were utilized for internal laboratory assaying and therefore were not subject to third-party analysis. Thirteen duplicate samples were collected from core drilling undertaken at Palmarito.

Check Assay Programme Palmarito

Nevada Pacific Gold:

No evidence exists as to a check assay programme employed by Nevada Pacific Gold.

McEwen:

Second laboratory check assays were done by SGS for selected drill samples.

Blanks and Standards El Gallo Gold

Santa Cruz Gold, Queenstake, Nevada Pacific Gold:

Other than standards being used internally by Chemex as part of their routine QA/QC procedures, no evidence exists for blanks and standards being introduced during drill campaigns conducted by previous operators.

McEwen:

Blanks and standards were included in most sample shipments to Chemex. Some early exploratory or twin holes in the mine area did not utilize blanks and standards.

Sample Duplicates El Gallo Gold

Santa Cruz Gold:

For RC drilling, field duplicate samples were collected at the drill rig. Some of these samples were sent to Chemex as a check for assay repeatability for given sample intervals. An independent review of this data (Resource and Reserve Update Technical Report, PAH, January 2003) did not indicate any sample repeatability problems. No evidence exists for duplicate samples being taken from core drilling.

Queenstake:

Field duplicate split samples were apparently collected at the drill rig for Queenstake conducted RC drilling; however, no evidence exists for analyses of these field duplicates. No evidence exists for duplicate samples being taken from core drilling.

Nevada Pacific Gold:

No evidence exists for the collection of duplicate samples from their RC or core drilling.

McEwen:

Field duplicate splits for RC samples were collected at the drill rig. These duplicate samples were utilized for internal laboratory assaying and therefore were not subject to third-party analysis. Duplicate samples were not collected from core drilling undertaken at El Gallo Gold.

Check Assay Programme El Gallo Gold

Santa Cruz Gold:

In addition to the Chemex analyses of field duplicate samples described above, Chemex also did re-run analyses for selected pulps to give indication of assay repeatability of prepared material. Second laboratory check assays by Bondar-Clegg laboratories, Vancouver were conducted on both coarse rejects and pulps sent directly from Chemex. An independent review of these data indicated no problems associates with the Chemex re-runs or field duplicate analyses. The review concluded that there was some bias for analyses by Bondar-Clegg of bulk rejects and, to a lesser extent, pulps. For both, Bondar-Clegg yielded lower gold values. For the Bondar-Clegg pulp re-assays the difference was considered minor and within acceptable limits. For the bulk reject check there is an average difference of minus-10% between Chemex and Bondar-Clegg. This was likely the result of ineffective preparation of the bulk reject by Chemex and therefore does not represent an analytical problem.

Queenstake:

No evidence exists as to a check assay programme employed by Queenstake.

Nevada Pacific Gold:

No evidence exists as to a check assay programme employed by Nevada Pacific Gold.

McEwen:

Check assay procedure utilized are as described above. Some exploratory drillholes (MPX- 018 through MPX-030) did not have check assays done.

QA/QC Program for Other Resource Areas

All other resource areas (Haciendita, Mina Grande, El Encuentro and Carrisalejo) utilized the same blank/standard and check assay protocol as that described above. With the exception of minor sampling at Carrisalejo, duplicate samples were not taken on these projects. McEwen was the sole operator of these projects.

Carrisalejo: Duplicate samples were collected from the opposite half of the core for two samples in CSX-001 and 1 sample in CSX-003.

Analysis of QA/QC results is discussed in Section 12.

11.3 Density Analysis

Density determinations were carried out on individual pieces of core selected to be representative of mineralized material for each project. For some projects density of non-mineralized material was also determined. A wax immersion method was used for this testing - samples are sealed with wax followed by immersion in distilled water and measuring the displacement. Some early testing for portions of El Gallo Gold was carried out by previous operators. Density testing for all other projects was carried out by McEwen using SGS Laboratories in Durango Mexico. This testing utilized individual pieces of split HQ (in some cases NQ) core generally measuring roughly 5 to 8 inches (16-26 cm) in length.

11.3.1 El Gallo Silver

Density determinations were carried out on 67 mineralized and 79 non-mineralized (wall rock) core samples by SGS. The average density of the 67 mineralized samples is 2.46 g/cm^3. This value was rounded to 2.5 g/cm^3 (equivalent to tonnes per cubic meter (t/m^3)) for use in block modelling and the subsequent resource calculation.

11.3.2 Palmarito

Density determinations were carried out by McEwen for mineralized rock (drill core), tailings material, and dump material. Procedures for these determinations are outlined below.

Drill Core

Density determinations were carried out on 39 mineralized samples and 21 non-mineralized (wall rock) samples. Samples were taken throughout the deposit and density determinations were done by SGS using wax immersion method. The average density of mineralized samples was 2.55 t/m³.

Tailings

Density determinations were made from three different sample sites in the Palmarito tailings pile. For each site, a level location was created and a hole approximately 40 cm by 40 cm by 15 cm (1.3 ft by 1.3 ft by 0.5 ft) was excavated and all material carefully removed and collected in plastic sample bags. The hole was then lined with thin plastic and filled with water to the level top of the hole. The plastic containing the water was lifted from the hole and the water carefully transferred to 20-liter plastic bottles. The tailings material and water were then transported to the mine laboratory at El Gallo Gold where the water volume was measured to 0.1-liter precision utilising a laboratory beaker. The tailings material was fully dried in the sample prep oven and then weighed. During the process, care was taken in the field to capture all of the tailings material from the hole and to ensure that the plastic liner lined the entire hole with no gaps along the walls and corners of the hole.

Density is given by: Weight of tailings material in grams/water volume in ml (g/cm³).

The three sites yielded density values of 1.51, 1.56, and 1.45 t/m³ (7.6% spread). Average density is 1.51 t/m³.

Historic Dumps

Material from the historic dumps at Palmarito were assigned a bulk density of 2.0 t/m³. This was based on the assumption that the rock had an initial in-place density of 2.55 t/m³ and when placed on the dumps exhibits about 30% swell. This density for dump material or broken rock piles is usually considered appropriate.

11.3.3 El Gallo Gold

Some early density determinations were undertaken by previous operators with follow up testing performed by McEwen. Density measurements were made on 127 samples from San Rafael, 43 samples from Samaniego and 43 samples from Sagrado Corazón-Lupita-Central from mineralized intercepts in the core. The mineralized zone density results on these core samples ranged from 2.25 to 3.09 t/m³, and overall averaged 2.58 t/m³.

Additional core samples of volcanic overburden (waste) drilled for geotechnical purposes (NQ size) were submitted for density testing. Material consisted of volcanic agglomerate and andesite porphyry rock types. A wax immersion method (ASTM C914-95) was used. The density results on these core samples ranged from 2.44 to 2.80 t/m³ and averaged 2.63 t/m³. Additional density tests were conducted on 14 overburden core samples as part of the geotechnical work conducted at the University of British Columbia rock mechanics laboratory and ranged from 2.45 to 2.73 t/m³ and averaged 2.59 t/m³.

The subsequent El Gallo Gold resource is calculated on the basis of a 2.58 t/m^3 density factor for mineralized zones at Samaniego, San Rafael and Sagrado-Corazon, 2.52 t/m^3 at Central and 2.45 t/m^3 at Lupita.

Heap Leach Material density: three composite samples from drillholes across the Heap Leach Material were tested by Blue Coast Group Laboratories of Parksville, BC. The average density result was 1.66 t/m^3.

11.3.4 Other Resource Areas

Haciendita

Eleven core samples of mineralized material were tested using the same protocol and methods as described above. Average density of these 11 samples is 2.58 t/m^3.

Mina Grande

A total of 35 core samples of mineralized material and 28 samples of non-mineralized material were tested using the same protocol and methods as described above. Average density of the mineralized samples is 2.59 t/m^3.

Density determinations were also made for the historic Mina Grande tailings pile. Procedures were similar to those undertaken for the Palmarito tailings pile (see above). Using three sample sites the average density is 1.47 t/m^3.

Carrisalejo

A total of 12 core samples of mineralized material and 35 samples of non-mineralized material were tested using the same protocol and methods as for El Gallo Silver and Palmarito. Average density of the mineralized samples is 2.36 g/cm^3.

El Encuentro

Mineralized intervals from 29 drillholes were tested using the same protocol and methods described above. Values ranged from 2.19 – 3.08 t/m^3 and the average density is 2.63 t/m^3.

11.4 Selection and Representivity of Metallurgical Samples

The sampling locations selected by CMP / McEwen for metallurgical testing are thoughtfully considered so as to represent as closely as possible the material characteristics most likely to be encountered by the mill during its operation and are consistent with generally accepted industry best practices and are therefore adequate to support the metallurgical recoveries used in this PEA study.

11.4.1 El Gallo Gold

The El Gallo Gold Heap Leach Material was extensively sampled for both grade and recovery. The location of the drillhole from which composited metallurgical test samples were taken are illustrated here in Figure 41.

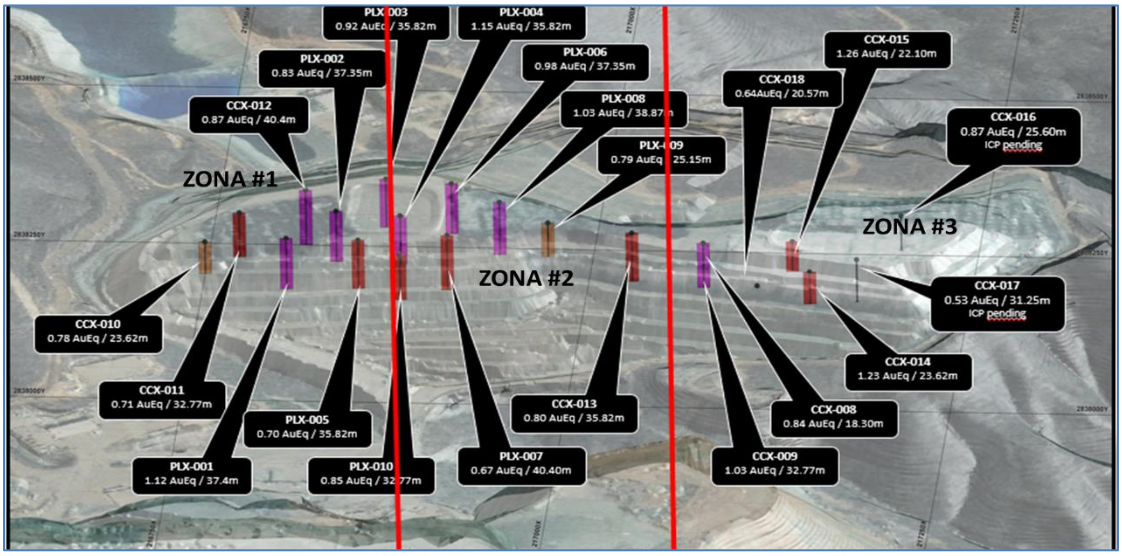


Figure 41 Positioning of the Holes from which Samples for Metallurgical Testing were made.

Composites were made from i) 156 samples for Leach Pad Zone 1; 158 samples for Leach Pad Zone 2; and 111 samples for Leach Pad Zone 3.

11.4.2 El Gallo Silver

Figure 42 shows the position of the drillhole used for samples relative to the lithological model and the pit phase outlines. Consideration was given to try to represent what ROM El Gallo Silver would deliver to the mill by representing the phases and the lithologies of which each is comprized on a proportionally basis. In all sixty-three (63) samples were selected, with twenty (20) from phases 1& 2, thirteen (13) from phase 3, six (6) from phase 4, six (6) from phase 5 and twelve (12) samples from below the pit.

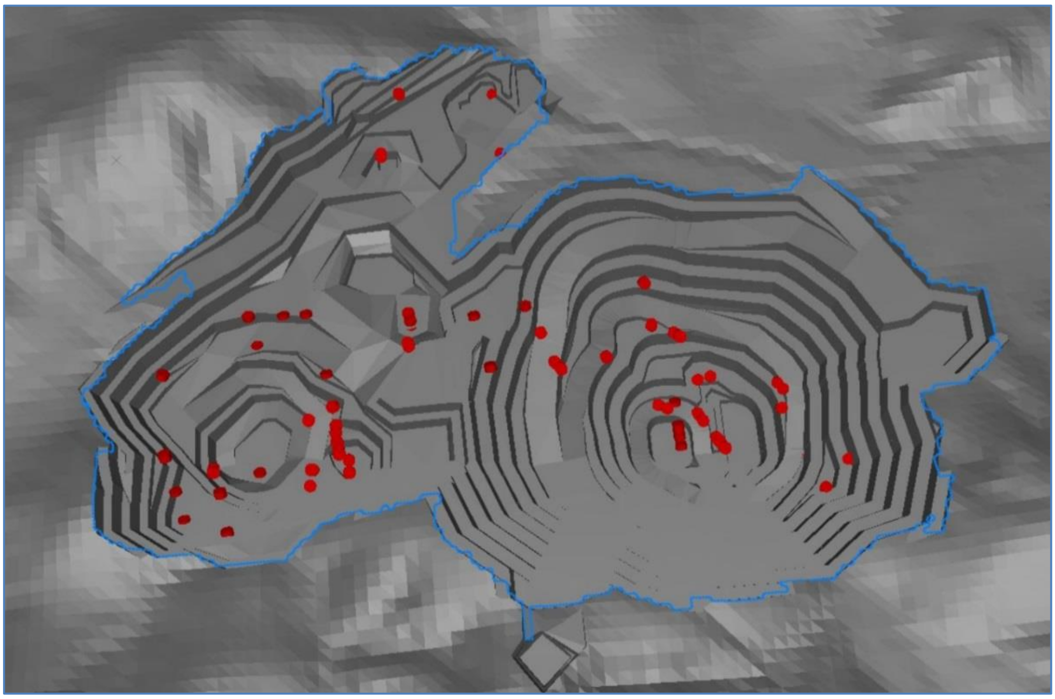


Figure 42 Location of the Metallurgical samples in the El Gallo Silver Pit

Table 27 illustrates the grades represented from the samples taken from each of the phases and used for the metallurgical testing.

EG – Ag Phase	Mill Feed (kt)	EqAg (g/t)	Ag (g/t)	Au (g/t)
1a	510	172.2	153.8	0.33
1b	526	166.0	159.9	0.11
2E	1,092	125.2	116.6	0.15
2W	1,849	101.1	98.4	0.05
3	1,249	120.5	115.4	0.09
4	126	98.8	97.3	0.03
5	69	102.1	101.3	0.02

Total	5,421	123.4	117.2	0.11

Table 27 Tonnes and Grades Represented from each Phase, used to Guide Metallurgical Sampling

11.4.3 Palmarito

The samples from Palmarito were taken from drill holes representing the deposit on all three sides of the hill on which the deposit occurs.

One set of tests was taken from samples that included 175.11 kg from 30 holes and 127.16kg from 43 holes.

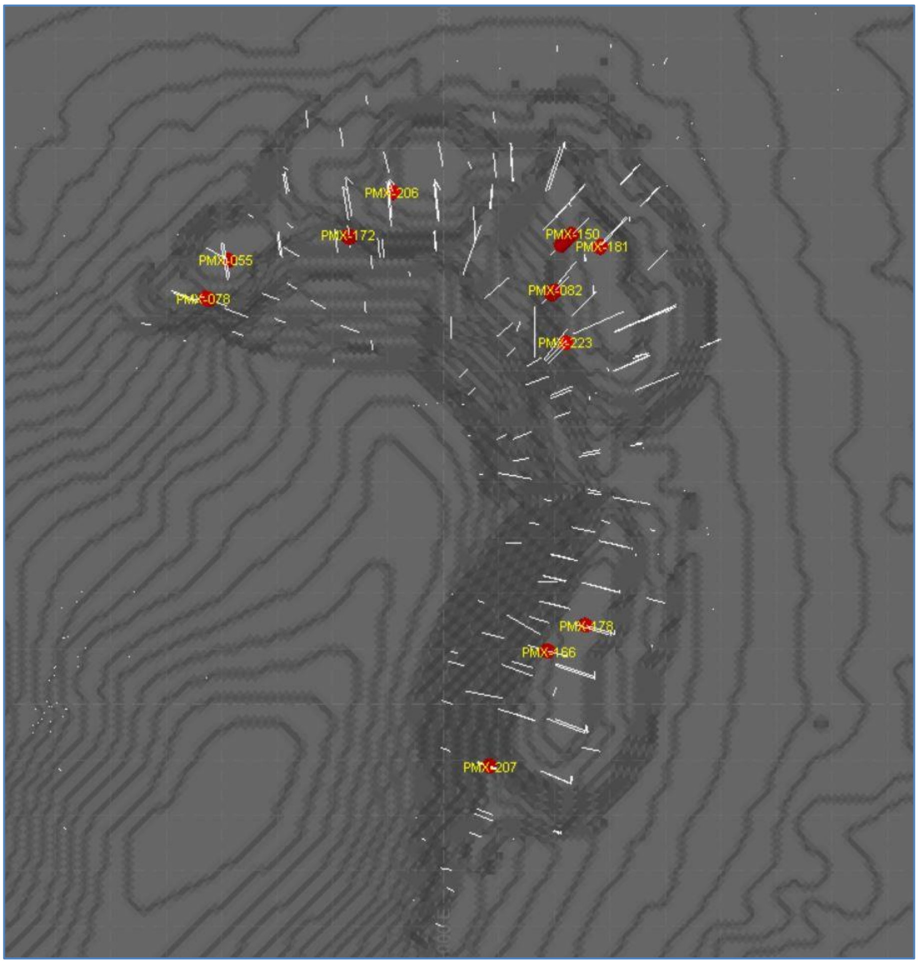


Figure 43 Location of the Drillholes and Metallurgical samples in the Palmarito Pit

11.4.4 Carrisalejo

Samples were sent for some polymetallic sulphide flotation. Carrisalejo samples were tested using the Project Fenix flowsheet since they had high precious metals and not base metals. They were not selected to be representative necessarily but did come from the area within the pits. The samples were selected with the criteria being that the metal content was high enough to float but McEwen also tested to see how they behaved in the grind/cyanide leach flowsheet.

A total of six samples from six drillholes were used for the metallurgical testing. The sample ID's, weights and locations are enumerated in Table 28 and illustrated in Figure 44.

Sample ID	Mass (Kg)	Location
CSX-031	9.89	Lower Pit
CSX-047	9.57	Upper Pit
CXS-001	9.17	Between the Two Pits
CXS-004	5.51	Lower Pit
CXS-053	10.12	Upper Pit
CXS-058	6.02	Lower Pit

Table 28 Carrisalejo Metallurgical Samples

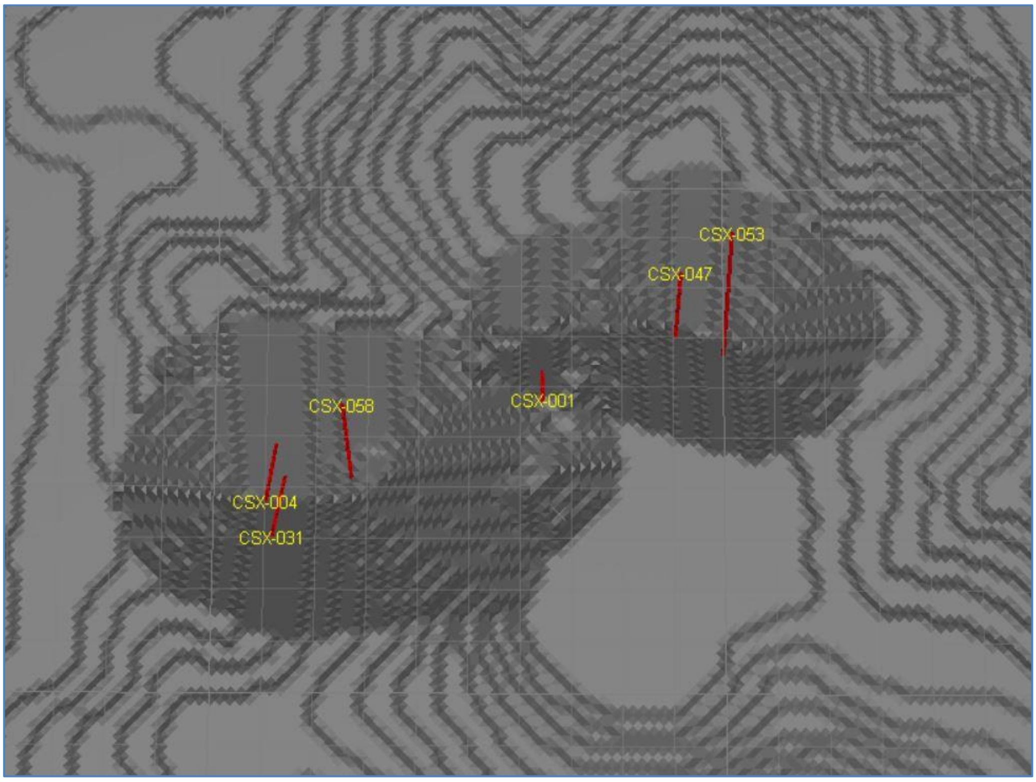


Figure 44 Location of the Drillholes and Metallurgical samples in the Carrisalejo Pits

11.4.5 El Encuentro

Metallurgical Sampling from El Encuentro consisted of samples taken from drill holes that represented the three pits proportional to their relative mill feed content.

For Metallurgical testwork and density testing, A first round pass of metallurgical tests were completed in August and September 2016 with two composite sample sets created for testing:

- Sample A consisting of 36 samples of mostly oxide material; and
- Sample B consisting of 34 samples of mostly sulphide material.

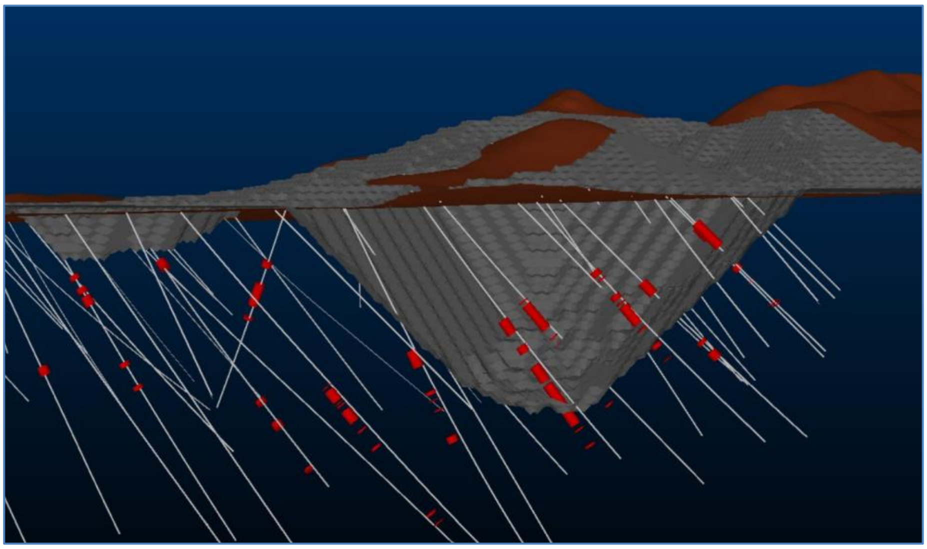


Figure 45 Position of El Encuentro Metallurgical Samples relative to the Pits- Section View

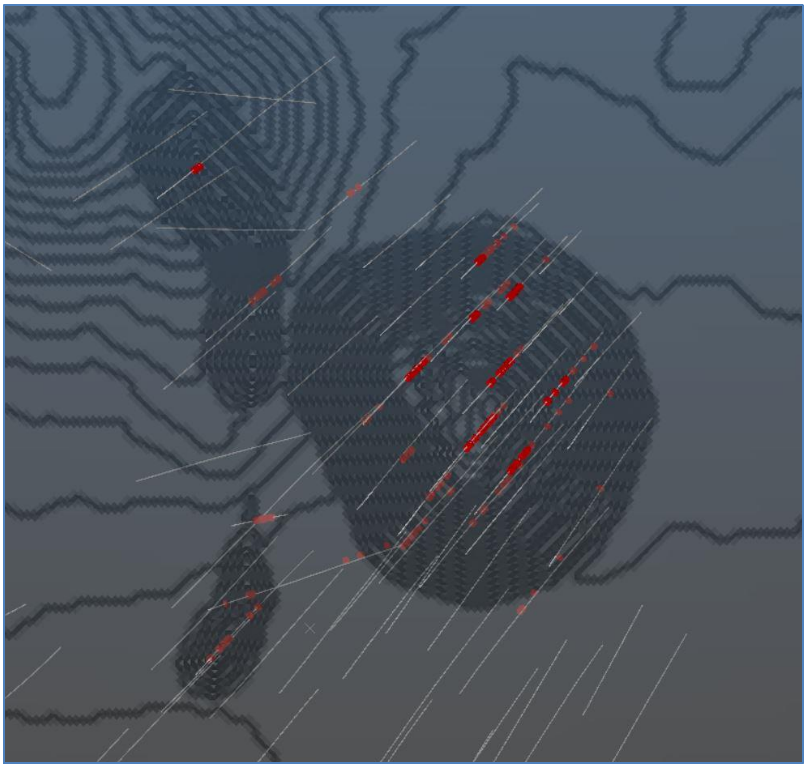


Figure 46 Position of El Encuentro Metallurgical Samples relative to the Pits- Plan View

11.5 Sample Procedure Adequacy

The authors are of the opinion that McEwen's current preparation, analytical and QA/QC procedures and the sample security measures in place are strictly followed and adhere to industry standards and that the samples are acceptable for resource estimation purposes.

12. DATA VERIFICATION

Mr Luke Willis of McEwen Mining Inc. has verified a sample of the data relied upon for this resource estimate. The verification process was designed to investigate the drill hole collar locations, core hole lithology, down-hole deviation, assay values and data entry.

12.1 Drill Collar Surveys

For McEwen-managed projects, at the time of initiating a drill hole, the drill site is located and marked using a handheld GPS receiver. After the hole is completed a contract surveyor surveys the collar. This is done with precise methods, usually utilizing a differential GPS. Generally, there is good agreement between the planned location and the surveyed location. In the event of large discrepancies (i.e. > 10m) between the planned location and the final survey, the hole location is re-checked and usually re-surveyed. In addition, drill holes are plotted on topographic maps; holes that appear to have spurious locations are re-checked and often re- surveyed. Drill holes are also plotted on cross-section and collars checked for elevation discrepancy. If a discrepancy is noted, the collar is re-surveyed.

For earlier drilling not managed by McEwen methods employed by the previous operators are generally assumed to be adequate. A number of historic hole locations have been checked at the El Gallo Gold and Palmarito.

12.2 Lithology

During numerous site visits, Luke Willis has reviewed much of the core drilled by McEwen for El Gallo Silver, El Gallo Gold and the other resource areas. The core was compared against lithological logs and assay data with general good agreement.

12.3 Downhole Survey

Down-hole surveys have been completed at each of the projects. McEwen has examined the records of down-hole surveys and compared them to the digital drill hole database. Mr. Willis observed excellent agreement for this comparison.

At El Gallo Gold down-hole surveying was not done for the historic (pre-McEwen) drilling. 199 drill holes have been surveyed at El Gallo Gold. The deviations in these holes were examined to estimate the potential for deviations in the un-surveyed holes and assess the potential impact on the resource estimate. On average, these holes deviate three degrees in azimuth and less than two degrees in inclination. This assessment indicates that unknown deviations in the un-surveyed holes will not materially affect the resource estimate.

For the remaining resource areas, down-hole surveys for 1,235 holes were also examined and compared to the digital drill hole database. Excellent agreement was observed for this comparison (Table 29).

Resource Area	Number of Holes	Number of Down-Hole Surveys
El Gallo Silver	580	537
Palmarito[1]	380	247
Carrisalejo	61	56
Haciendita	66	64
Mina Grande	136	132
Encuentro	107	89
Total	1,440	1,235

Table 29 Down-Hole Surveys at the Fenix Project (not including El Gallo Gold)

12.4 Assay Data Entry

Assay certificates from Chemex are imported directly into the database without altering or manipulating the datasheets. Prior to the certificate import, the intervals for the different core holes are carefully entered, ensuring the depths of the intervals entered match the samples marked by geologists in core photos and logs. For McEwen managed drilling projects, a portion of the original certificates from Chemex were compared randomly against the reported values in the digital drill hole database. This comparison did not indicate any data entry errors.

12.5 QA/QC Analysis

The QAQC statistics have been summarized in previous published technical reports, namely the El Gallo Complex Phase II Project (2012) and the Resource Estimate for the El Gallo Complex, Sinaloa State, Mexico (2013).

McEwen's approach to QAQC is based on a multi-faceted approach that includes:

- Participation in the "blind" GeoStats round-robin exercise that is held every 6 months
- Adhering to best practices as outlined in McEwen's Sampling and Assay Quality Control Guidelines, written in conjunction with Lynda Bloom, P. Geo and Chantal Jolette, P. Geo of Analytical Solutions Ltd.
- Sending standards, blanks and duplicates to external labs
- Comparison between different external labs

12.5.1 Heap Leach Material

The Phase 3 Heap Leach Material was sampled as described in Section 11.2.3. Blanks and standards were submitted to the internal mine laboratory as well as to ALS Chemex. Both labs used Rocklabs BlankAu85 as the blank standard. For samples sent to ALS Chemex, all 6 data points registered below

[1] Includes pre-McEwen drilling

the detection limit. For samples analyzed at the McEwen Mexican mine laboratory all 21 points were well below the 10 times the detection limit line.

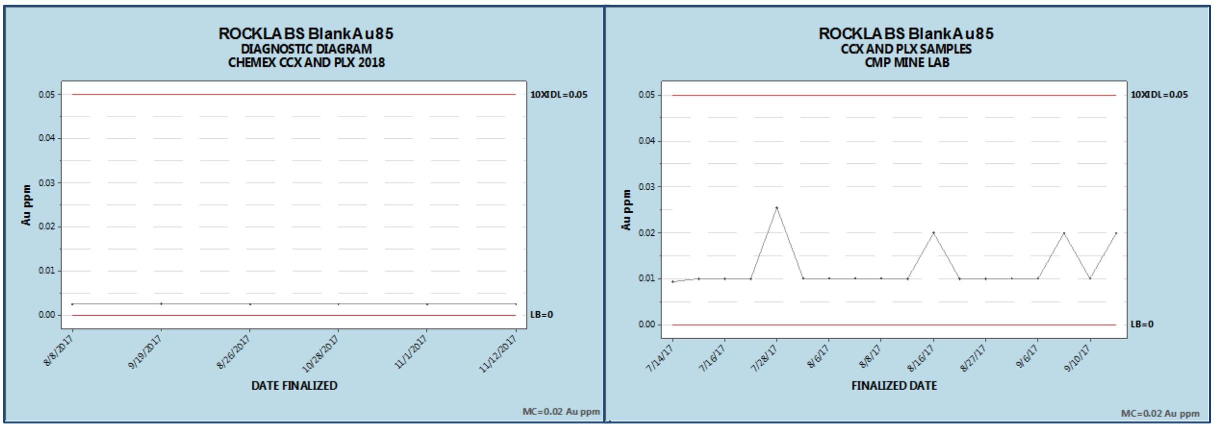


Figure 47 Rocklabs Blanks and Standard – Heap Leach Material

Several standards were also sent to ALS CHEMEX with the samples from the heap leach operation. The following standards were used:

- CDN-ME-1304
- CDN-ME-1306
- CDN-ME-1601
- Rocklabs Oxil21
- Rocklabs OxD128
- Rocklabs OxC145

The regression curve between the assayed data and the expected values from the certificates was satisfactory. The r-squared value was greater than 99%. This indicates that ALS CHEMEX was able to accurately assay for gold in the heap leach operation. Most of the value in reprocessing of the previously leached material is contained in the gold and this was the focus of this exercise

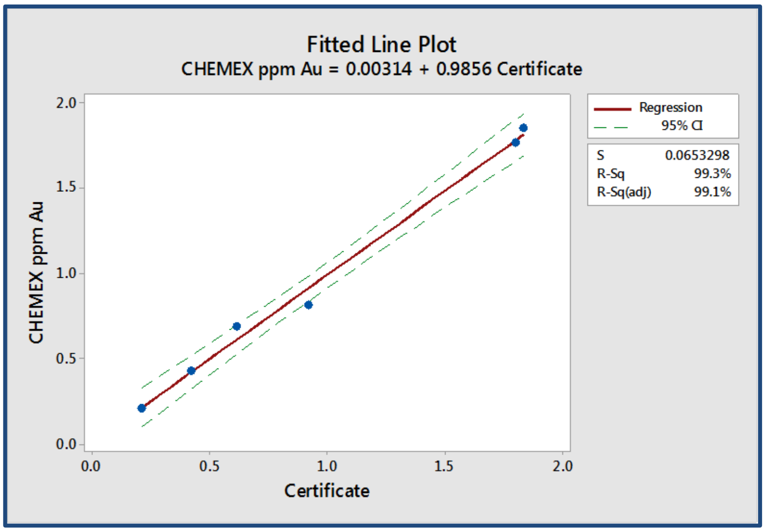


Figure 48 Regression Curve for HLM Reference Material Analysis

A two-sample t-test was performed and the p-value was very high at 0.979; much higher than the a priori selected value of 0.05. This indicates that there is not enough evidence to reject the null hypothesis. The ALS Chemex laboratory agrees very well with the expected values from the certificates.

```
Two-sample T for CHEMEX ppm Au vs Certificate

               N   Mean  StDev  SE Mean
CHEMEX ppm Au  6  0.956  0.691     0.28
Certificate    6  0.967  0.698     0.29


Difference = μ (CHEMEX ppm Au) - μ (Certificate)
Estimate for difference:  -0.011
95% CI for difference:  (-0.918, 0.896)
T-Test of difference = 0 (vs ≠): T-Value = -0.03  P-Value = 0.979  DF = 9
```

Figure 49 Two-Sample T-Test and CI: CHEMEX ppm Au, Certificate

Samples of crushed mineralized material from El Gallo Gold operation are routinely sent to both their internal mine laboratory as well as to ALS Chemex.

An "orthogonal" regression plot Figure 50 shows that the two labs are highly correlated (approximately 98%). Crusher samples are the same material that are placed on the heap leach pads. This indicates that McEwen's internal mine laboratory gives similar results as the external accredited ALS Chemex assay laboratory. The equation of the line:

CHEMEX Result (Au ppm) = 0.014 + 0.978 CMP Result (Au ppm)

indicates that the slope is close to unity and the off-set is negligible.

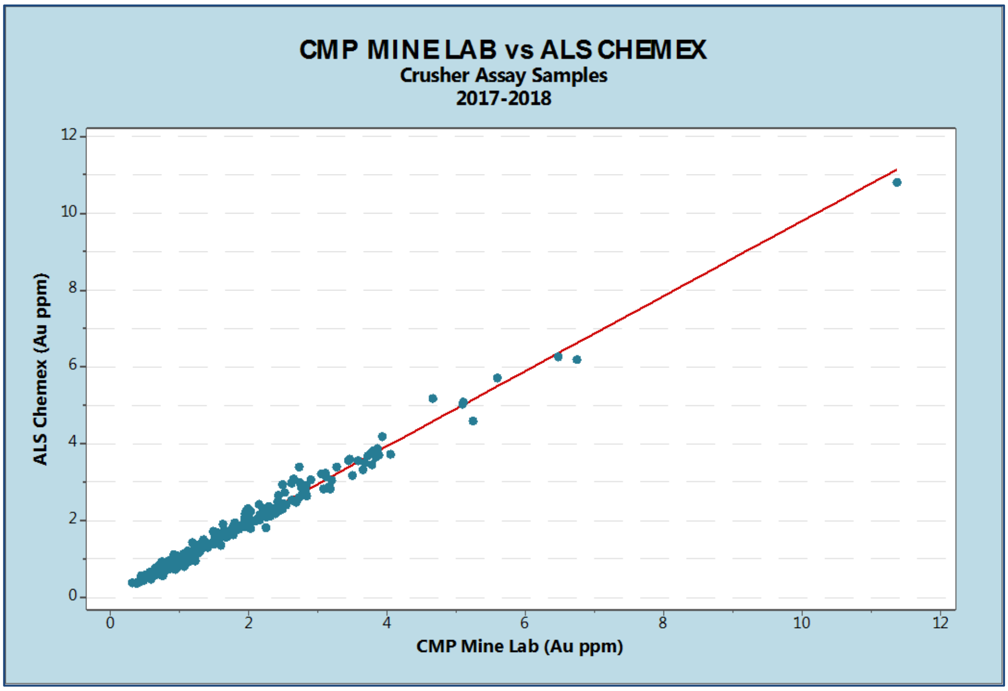


Figure 50 Orthogonal Regression Plot – Heap Leach Material

For the Heap Leach Material, a graph of primary versus pulp duplicates is shown below. Again, the two sets of data are highly correlated (99.7%). These data are for samples that were submitted to the internal mine laboratory in duplicate. No issues were recorded.

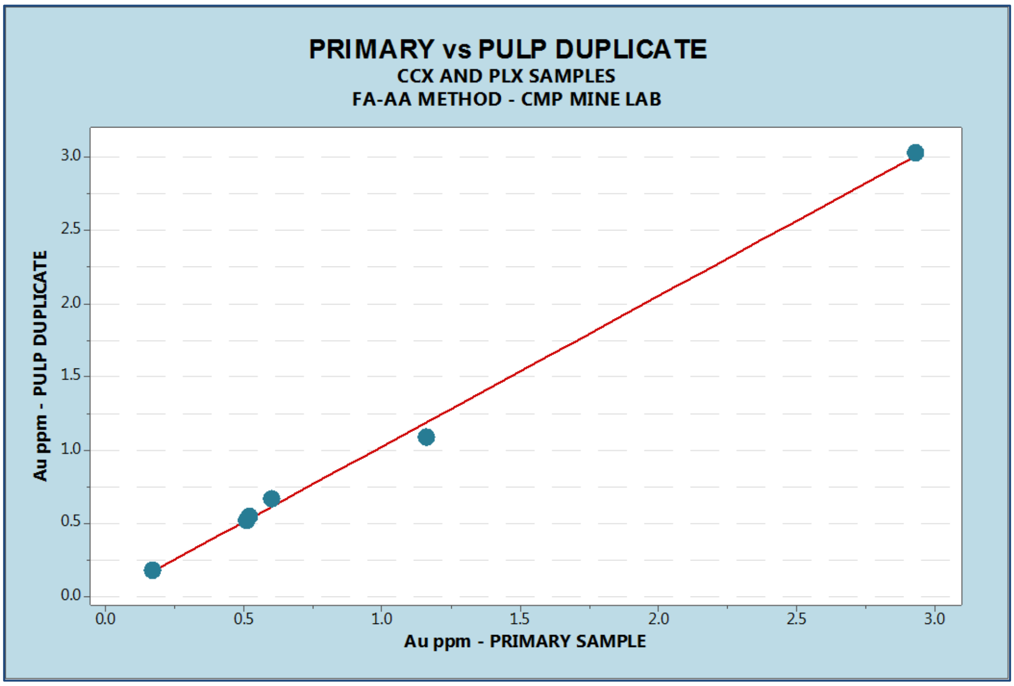


Figure 51 Primary versus Pulp Duplicates – Heap Leach Material

QAQC

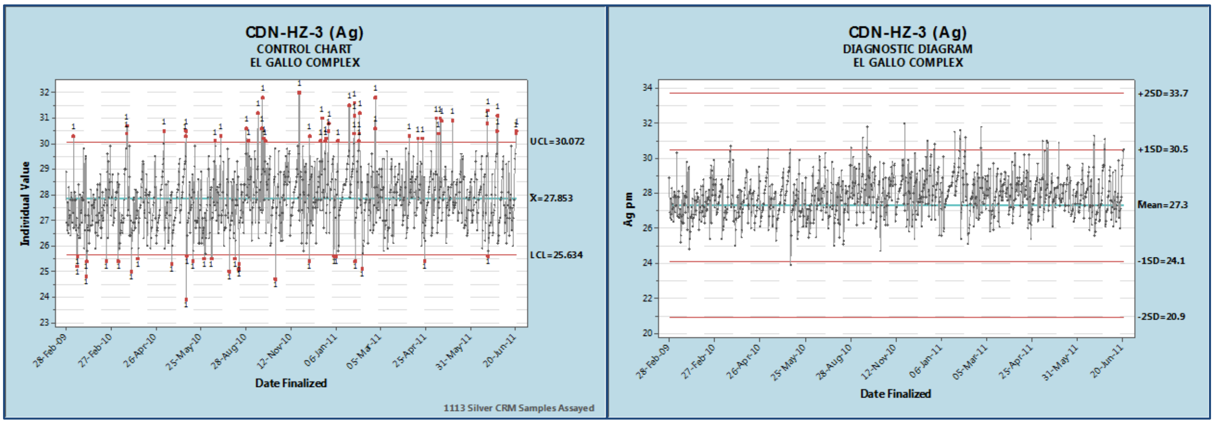
SPC and diagnostic charts are shown below for the following reference materials:

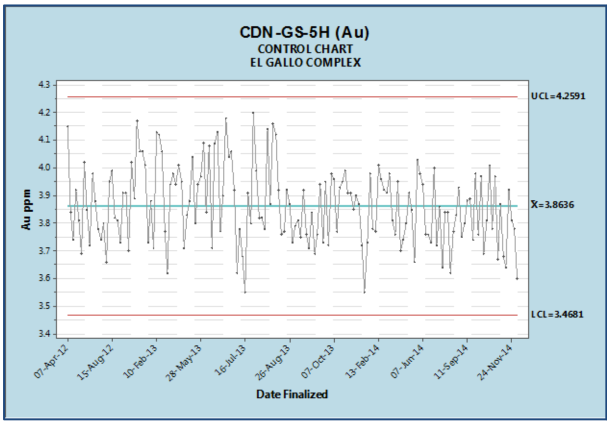
ID	Metal	Data Points	Years
CDN-HZ-3	Ag	1113	2009 - 2011
CDN-GS-5H	Ag, Au	163	2012 - 2014
CDNME-1301	Ag, Au	63	2013 - 2015
CDN-ME-17	Ag, Au	119	2012 - 2017
CDN-ME-15	Ag, Au	299	2011 - 2013

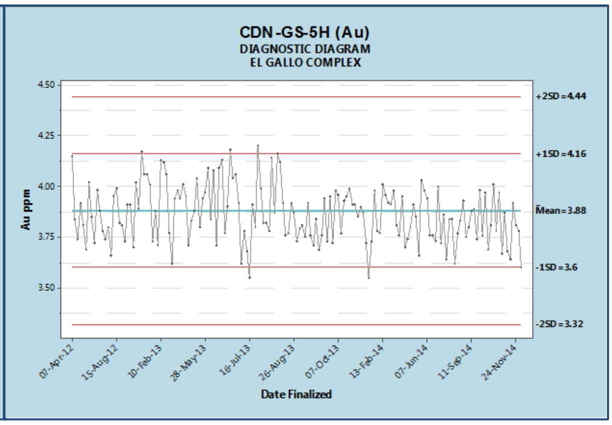
Table 30 Reference Materials - HLM

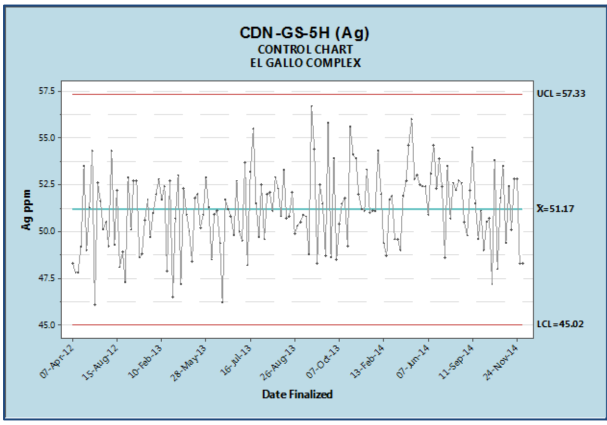
The data points pertain to the various projects described in this technical report. These were assayed at the ALS CHEMEX laboratory. For each Control Chart, the mean value is generated based on the assayed values. The UCL (upper control limits) and LCL (lower control limits) are also generated from the data. Any out of control trends are based on the Western Electric rules as defined in the Minitab software used to generate the charts.

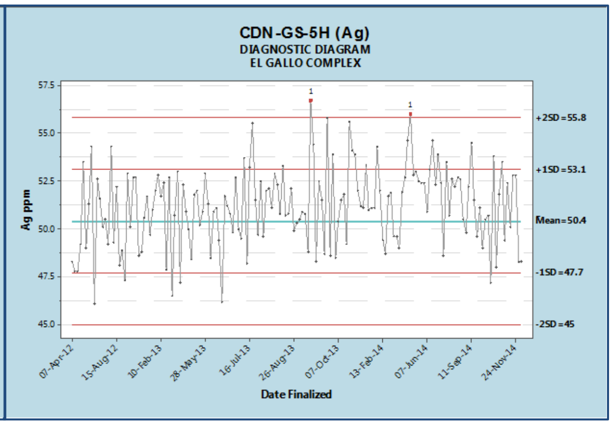
The mean and standard deviation values for the Diagnostic Diagrams are based on the values provided for each certified reference materials (as provided by the supplier). Any obvious outliers, that is, above the UCL or below the LCL were flagged in the database and were re-assayed.

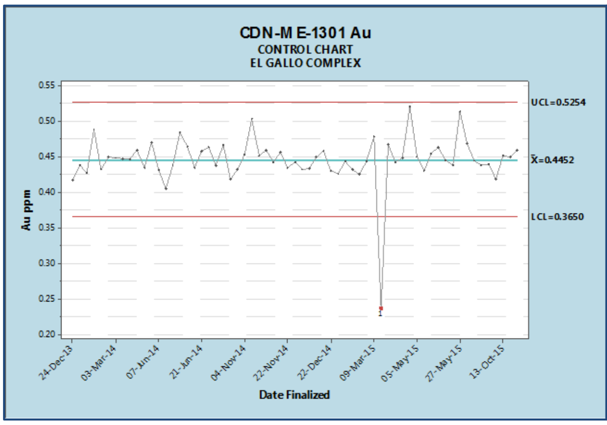


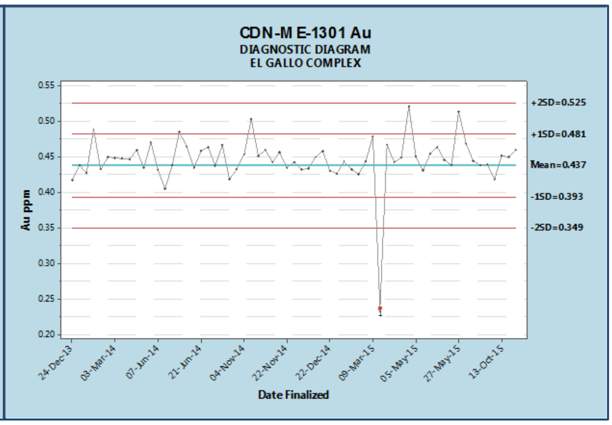

CDN-GS-5H (Au)
CONTROL CHART
EL GALLO COMPLEX
UCL=4.2591
X̄=3.8636
LCL=3.4681
Au ppm
Date Finalized

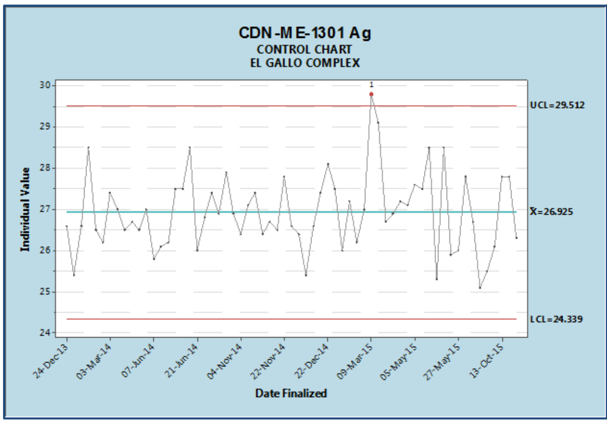

CDN-GS-5H (Au)
DIAGNOSTIC DIAGRAM
EL GALLO COMPLEX
+2SD=4.44
+1SD=4.16
Mean=3.88
-1SD=3.6
-2SD=3.32
Au ppm
Date Finalized

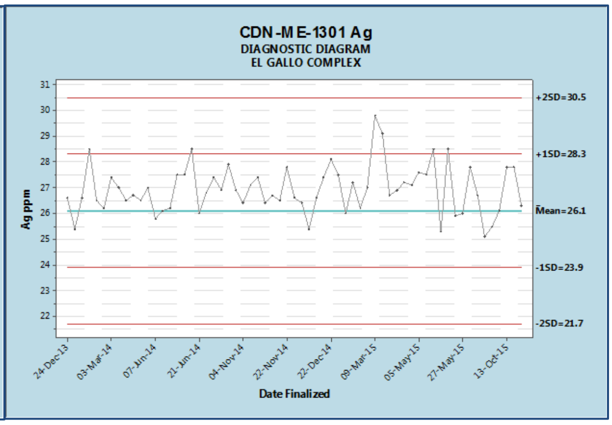

CDN-GS-5H (Ag)
CONTROL CHART
EL GALLO COMPLEX
UCL=57.33
X̄=51.17
LCL=45.02
Ag ppm
Date Finalized

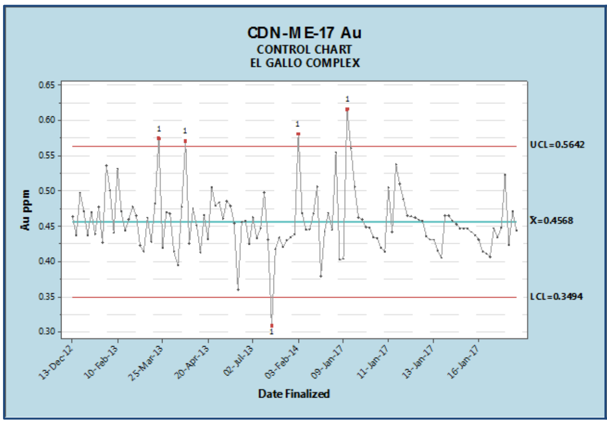

CDN-GS-5H (Ag)
DIAGNOSTIC DIAGRAM
EL GALLO COMPLEX
+2SD=55.8
+1SD=53.1
Mean=50.4
-1SD=47.7
-2SD=45
Ag ppm
Date Finalized

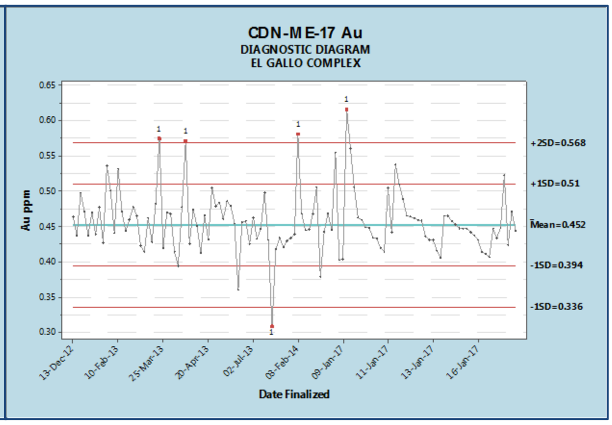

CDN-ME-1301 Au
CONTROL CHART
EL GALLO COMPLEX
UCL=0.5254
X̄=0.4452
LCL=0.3650
Au ppm
Date Finalized

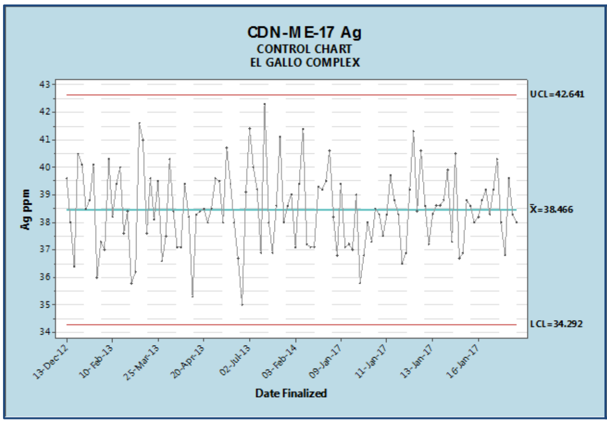

CDN-ME-1301 Au
DIAGNOSTIC DIAGRAM
EL GALLO COMPLEX
+2SD=0.525
+1SD=0.481
Mean=0.437
-1SD=0.393
-2SD=0.349
Au ppm
Date Finalized

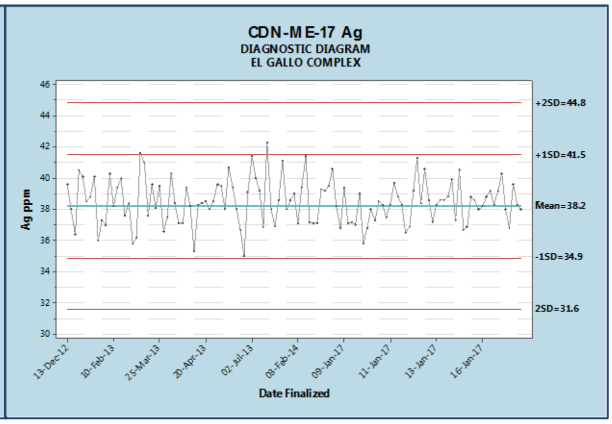

CDN-ME-1301 Ag
CONTROL CHART
EL GALLO COMPLEX
Individual Value
UCL=29.512
X̄=26.925
LCL=24.339
24-Dec-13
03-Mar-14
07-Jun-14
21-Jun-14
04-Nov-14
22-Nov-14
22-Dec-14
09-Mar-15
05-May-15
27-May-15
13-Oct-15
Date Finalized


CDN-ME-1301 Ag
DIAGNOSTIC DIAGRAM
EL GALLO COMPLEX
Ag ppm
+2SD=30.5
+1SD=28.3
Mean=26.1
-1SD=23.9
-2SD=21.7
24-Dec-13
03-Mar-14
07-Jun-14
21-Jun-14
04-Nov-14
22-Nov-14
22-Dec-14
09-Mar-15
05-May-15
27-May-15
13-Oct-15
Date Finalized


CDN-ME-17 Au
CONTROL CHART
EL GALLO COMPLEX
Au ppm
UCL=0.5642
X̄=0.4568
LCL=0.3494
13-Dec-12
10-Feb-13
25-Mar-13
20-Apr-13
02-Jul-13
03-Feb-14
09-Jan-17
11-Jan-17
13-Jan-17
16-Jan-17
Date Finalized


CDN-ME-17 Au
DIAGNOSTIC DIAGRAM
EL GALLO COMPLEX
Au ppm
+2SD=0.568
+1SD=0.51
Mean=0.452
-1SD=0.394
-1SD=0.336
13-Dec-12
10-Feb-13
25-Mar-13
20-Apr-13
02-Jul-13
03-Feb-14
09-Jan-17
11-Jan-17
13-Jan-17
16-Jan-17
Date Finalized


CDN-ME-17 Ag
CONTROL CHART
EL GALLO COMPLEX
Ag ppm
UCL=42.641
X̄=38.466
LCL=34.292
13-Dec-12
10-Feb-13
25-Mar-13
20-Apr-13
02-Jul-13
03-Feb-14
09-Jan-17
11-Jan-17
13-Jan-17
16-Jan-17
Date Finalized


CDN-ME-17 Ag
DIAGNOSTIC DIAGRAM
EL GALLO COMPLEX
Ag ppm
+2SD=44.8
+1SD=41.5
Mean=38.2
-1SD=34.9
2SD=31.6
13-Dec-12
10-Feb-13
25-Mar-13
20-Apr-13
02-Jul-13
03-Feb-14
09-Jan-17
11-Jan-17
13-Jan-17
16-Jan-17
Date Finalized

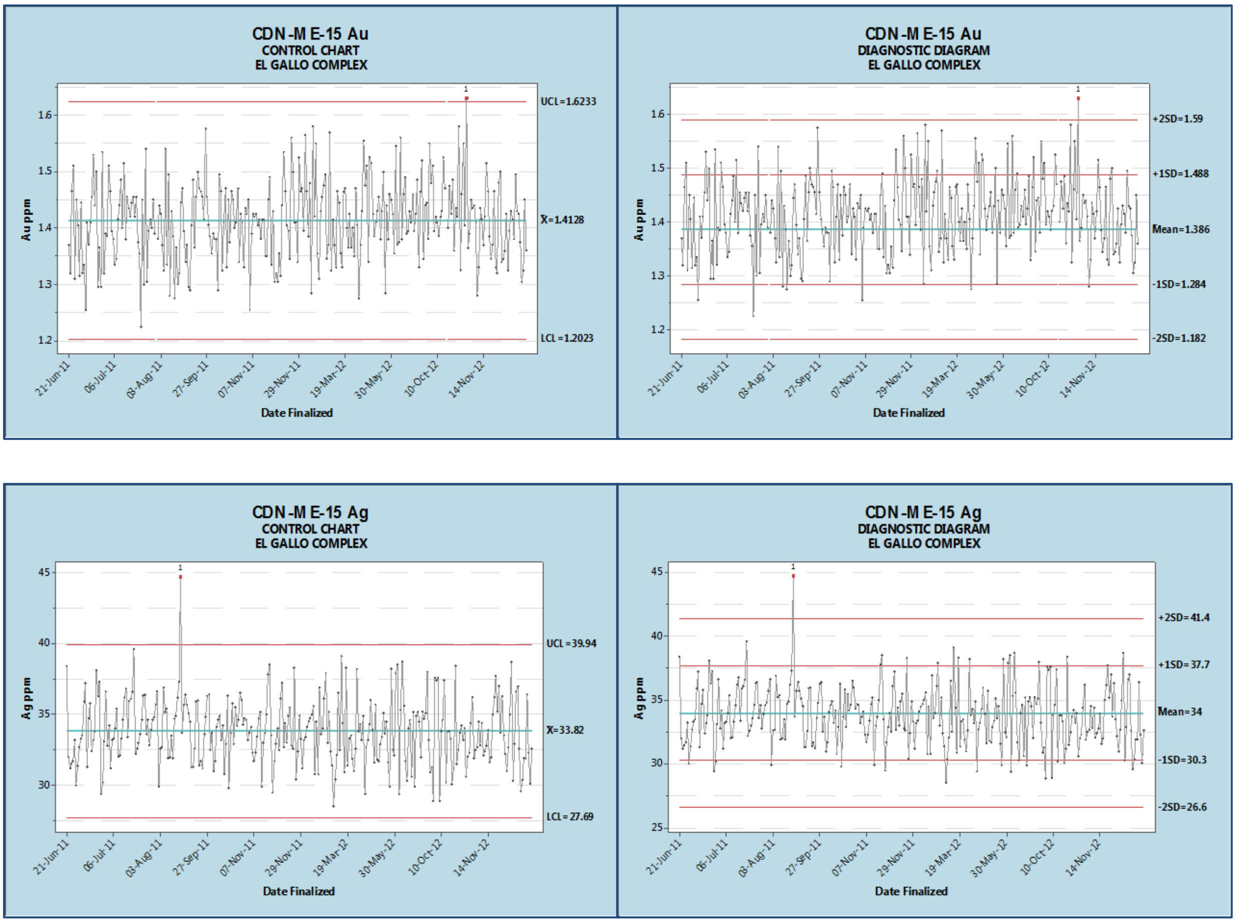


Figure 52 SPC and Diagnostic Charts for All Material from the Fenix Project except for Heap Leach Material

A 1-sample t-test can be used to assess how close the data approaches the expected values. For example, for silver for the CDN-ME-15 reference material, the results of the t-test are presented below. The p-value of 0.176 is greater than 0.05, even with the obvious outlier. There is not enough evidence to reject the null hypothesis. The assay laboratory is able to get reasonably close values to the expected silver value of 34 as given on the reference certificate.

```
One-Sample T: Ag_Final_ppm - CDN-ME-15

Test of μ = 34 vs ≠ 34

Variable                  N    Mean  StDev  SE Mean        95% CI            T      P
Ag_Final_ppm - CDN-ME-15  299  33.816  2.342    0.135  (33.550, 34.083)  -1.36  0.176
```

Figure 53 Summary Report for Ag_Final_ppm - CDN-ME-15

Quality assurance/quality control (QAQC) statistics were calculated for all resource areas individually. The dataset from each resource area was analyzed based on check assays, standards, and blanks. Check assays are analyzed for deviation from the original assay and any bias towards a particular analytical laboratory. The check assay deviation is calculated by finding the difference between the original and check assay (Δoriginal-check = Auoriginal (gpt) – Aucheck (gpt)). The difference is converted to a percent deviation by normalizing the difference by the mean of the original and check:

$$\Delta_{original-check}(\%) = ((\Delta_{original-check}/(\frac{[Au]_{original}+[Au]_{check}}{2})) * 100$$

30% deviation was used as the upper control limit for the check assay datasets and any sample exceeding that limit is considered out of control. The percentage of samples out of control in a particular dataset is calculated and used to report the overall deviation.

Each reference standard and blank have a particular standard mean and standard deviation provided by the manufacturer. The deviation of a particular sample's assay value from its mean is calculated and any deviation exceeding three standard deviations is out of control. The following are the date ranges of data for each project included in this QA/QC analysis:

- El Gallo Silver: January 2009 –2017;
- Palmarito: March 2008 – April 2012;
- Haciendita: December 2010 – 2012;
- Mina Grande: November 2010 –2017;
- Carrisalejo: November 2011 – 2014; and
- Encuentro: 2016 – 2017.

During the timeframe of interest, a total of 6,958 blank samples were submitted to ALS Chemex. The out-of-spec red line on the graph is defined as greater than 10 times the detection limit. Only a few data points barely exceeded the 10x the detection limit. No issues were recorded for blank samples.

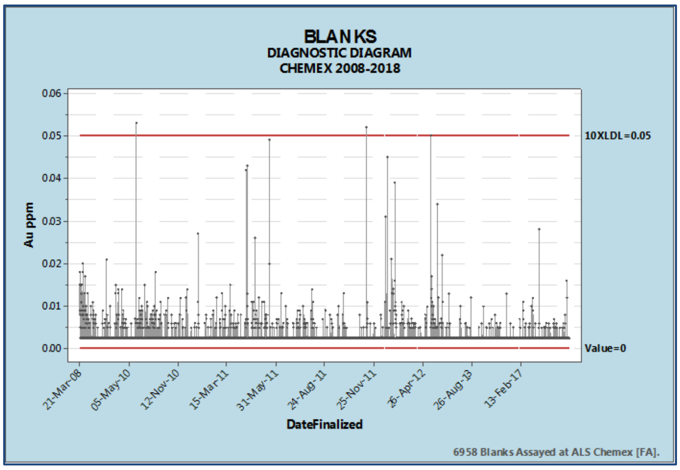


Figure 54 Blanks Diagnostic Diagram

12.5.2 El Gallo Silver

For the El Gallo Silver deposit, both gold and silver standards were sent to ALS CHEMEX and duplicate labs such as Inspectorate or SGS. Graphs for the following standards are shown below:

- CDN-ME-2;
- CDN-HZ-3; and
- CDN-ME-8.

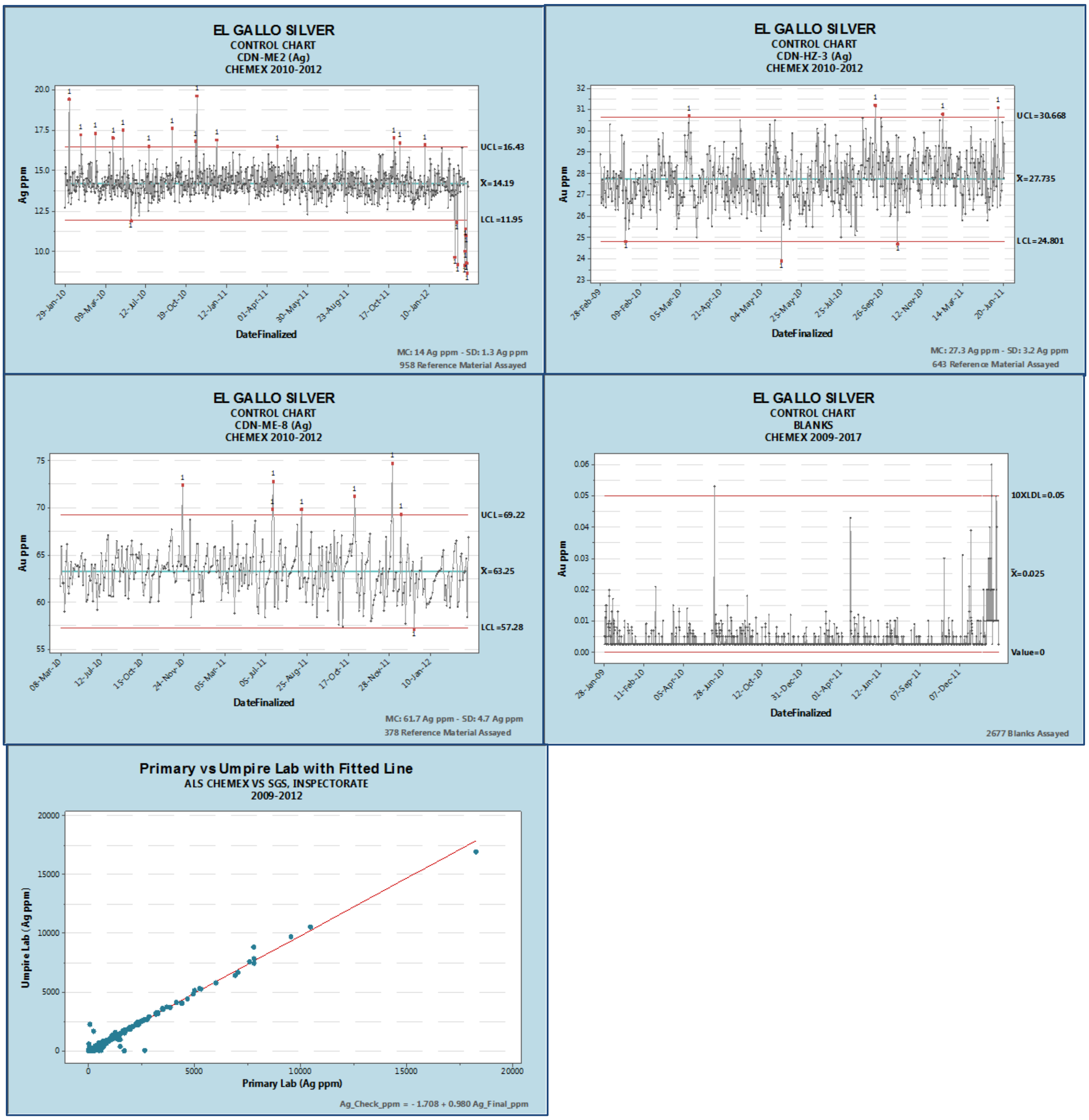


Figure 55 Sample Duplicate Testing Results El Gallo Silver

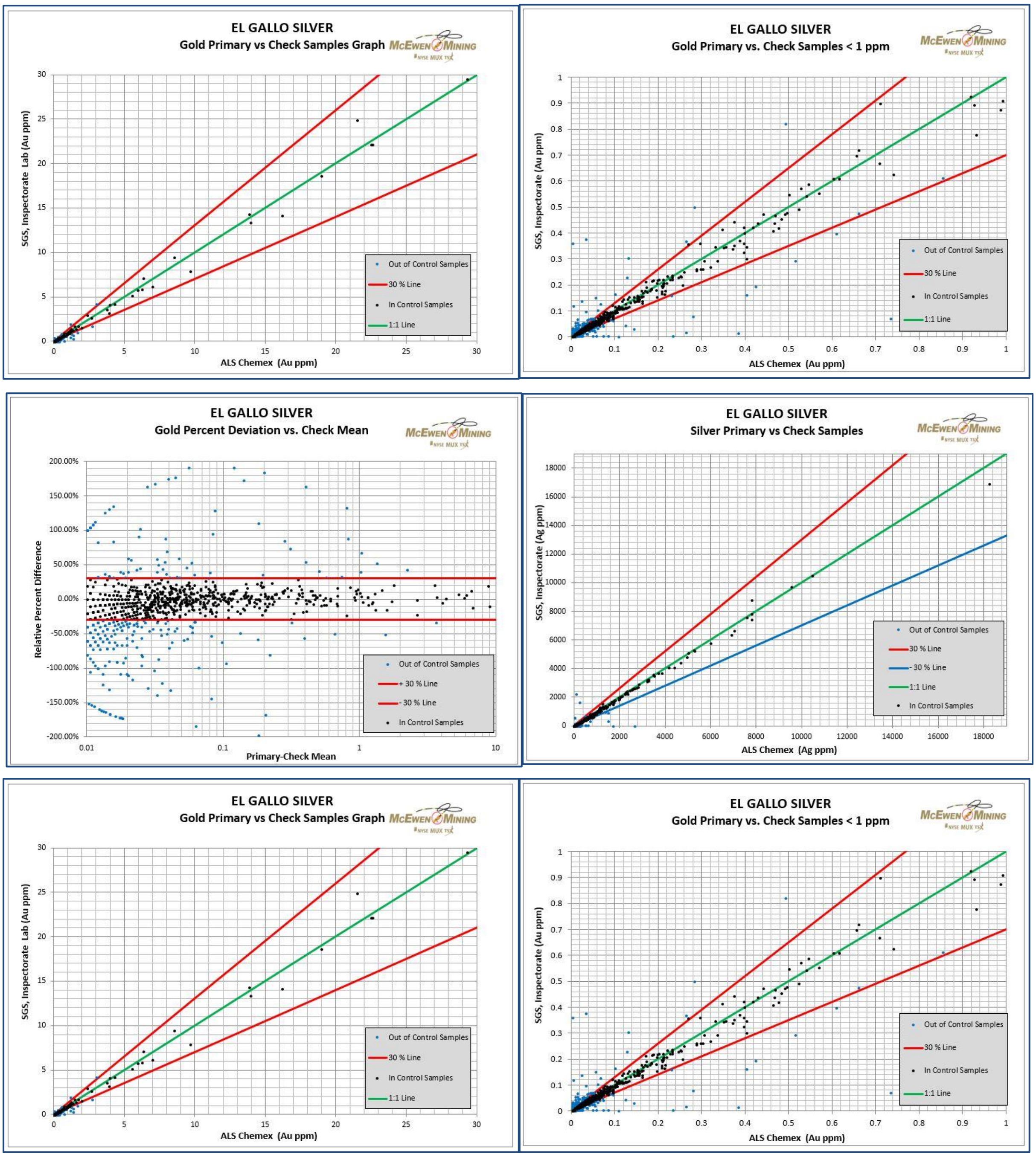


Figure 56 Sample Duplicate Test Results – El Gallo Silver

The expected values and the Lower and Upper control limits (3 sigma) are shown on the charts. No major issues were reported, either for the mean of the values or the number of times the values fell outside of the control limits.

Graphs are also shown comparing the primary laboratory (ALS Chemex) versus the duplicate laboratory. Chemex and SGS use methods with detection limits for gold of 0.005 g/t and 0.01 g/t, which are then recorded in the database as 0.0025 and 0.005, respectively. Comparison of these yields an “artificial” deviation.

It should be pointed out that the deviations at these low gold levels are acceptable given the very low gold grade represented by these samples and the fact that El Gallo Silver is a primary silver deposit with low gold values.

12.5.3 Other Resources and Areas

Quality control graphs were also prepared for other deposits/areas:

Other Resources

- Palmarito;
- Carrisalejo;
- El Encuentro;
- Mina Grande; and
- Haciendita.

These are shown below for the various deposits.

Palmarito

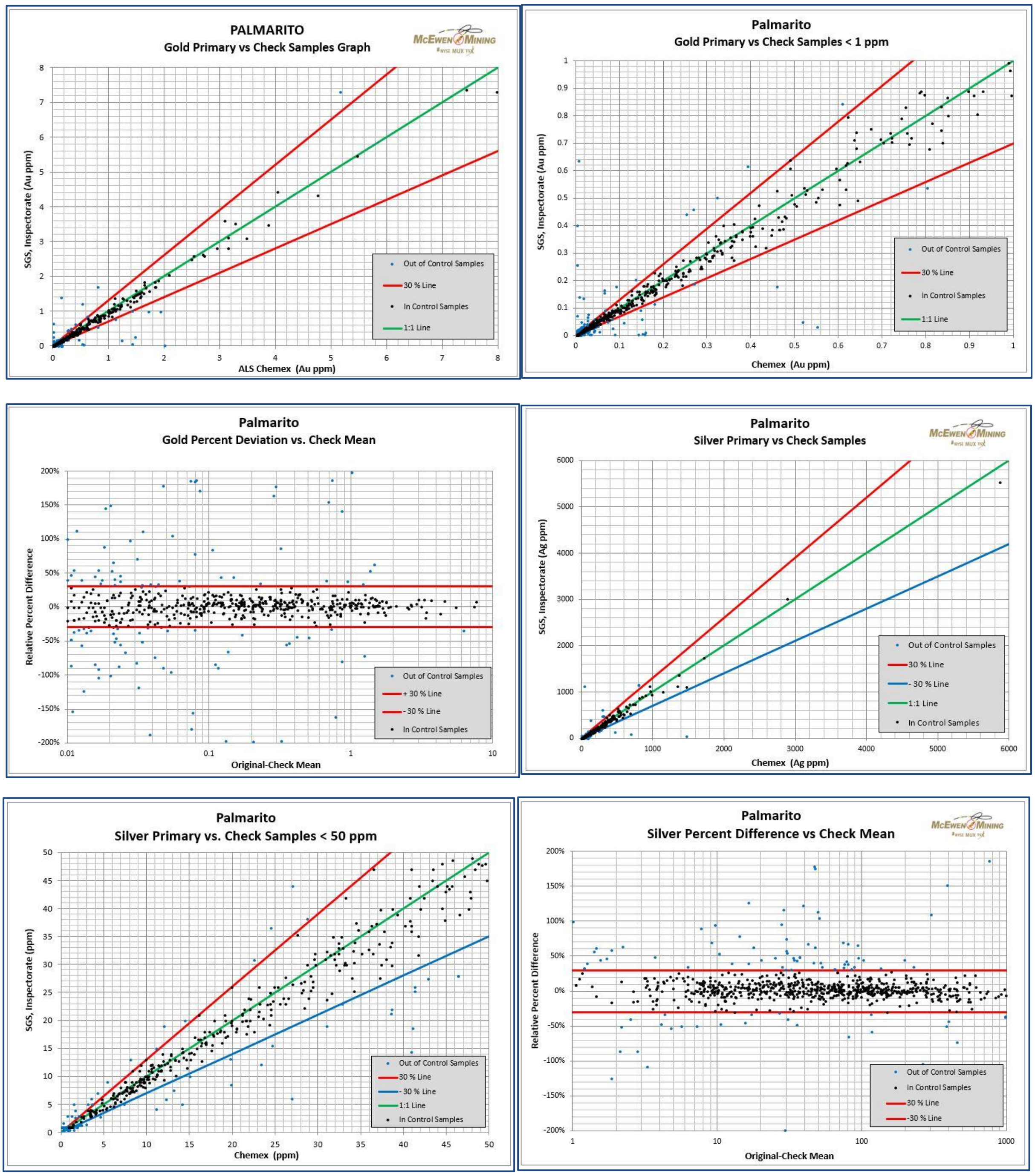


Figure 57 Sample Duplicate Test Results – Palmarito

Carrisalejo

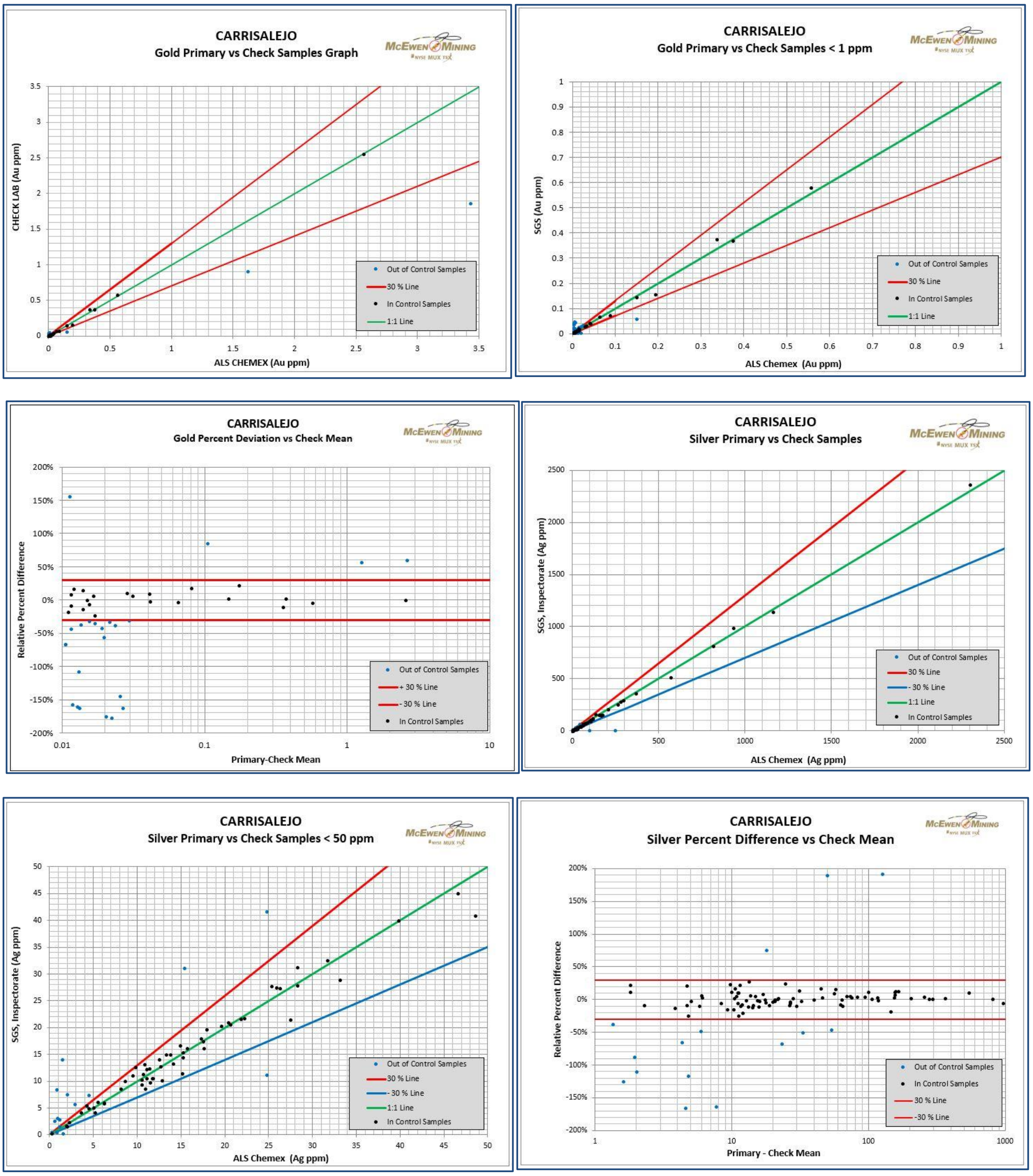


Figure 58 Sample Duplicate Test Results – Carrisalejo

El Encuentro

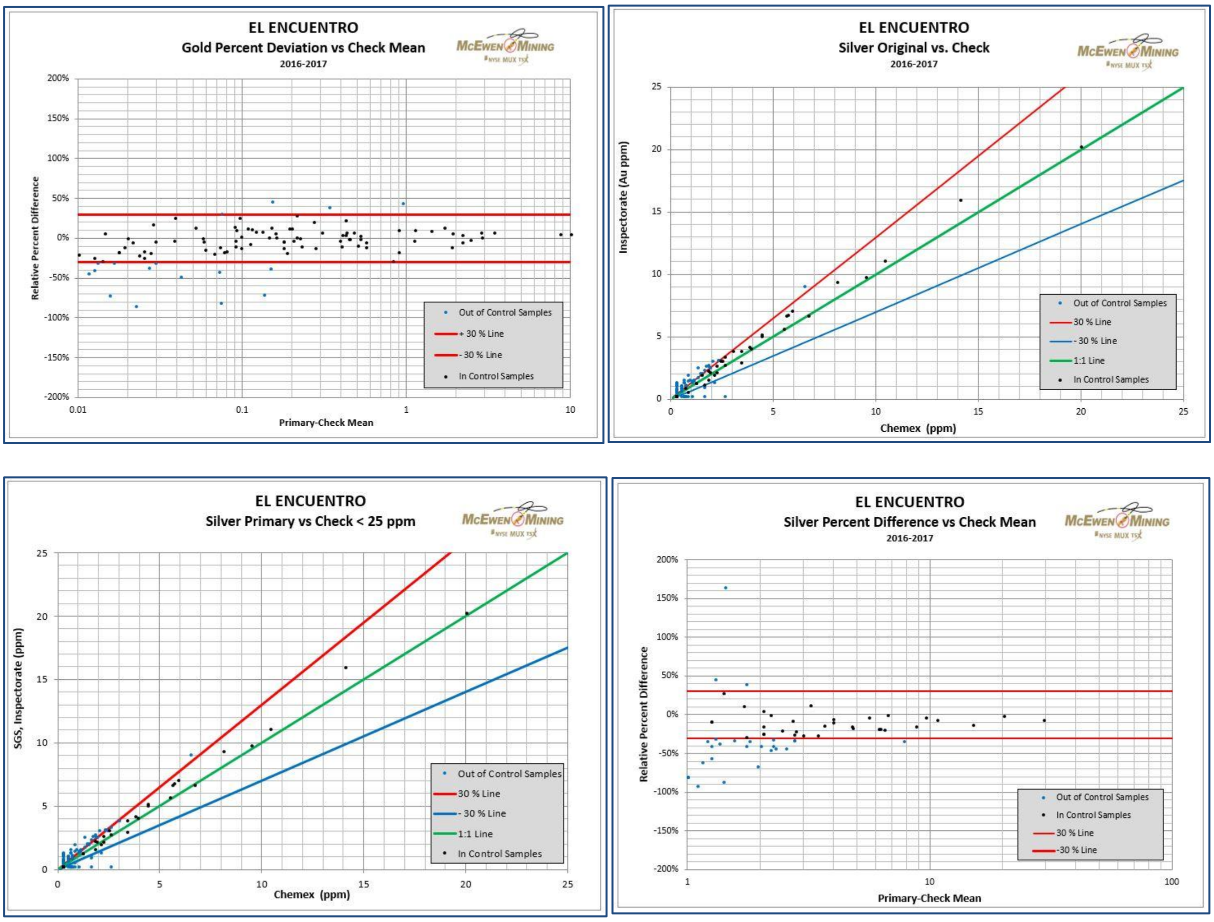


Figure 59 Sample Duplicate Test Results – El Encuentro

Mina Grande

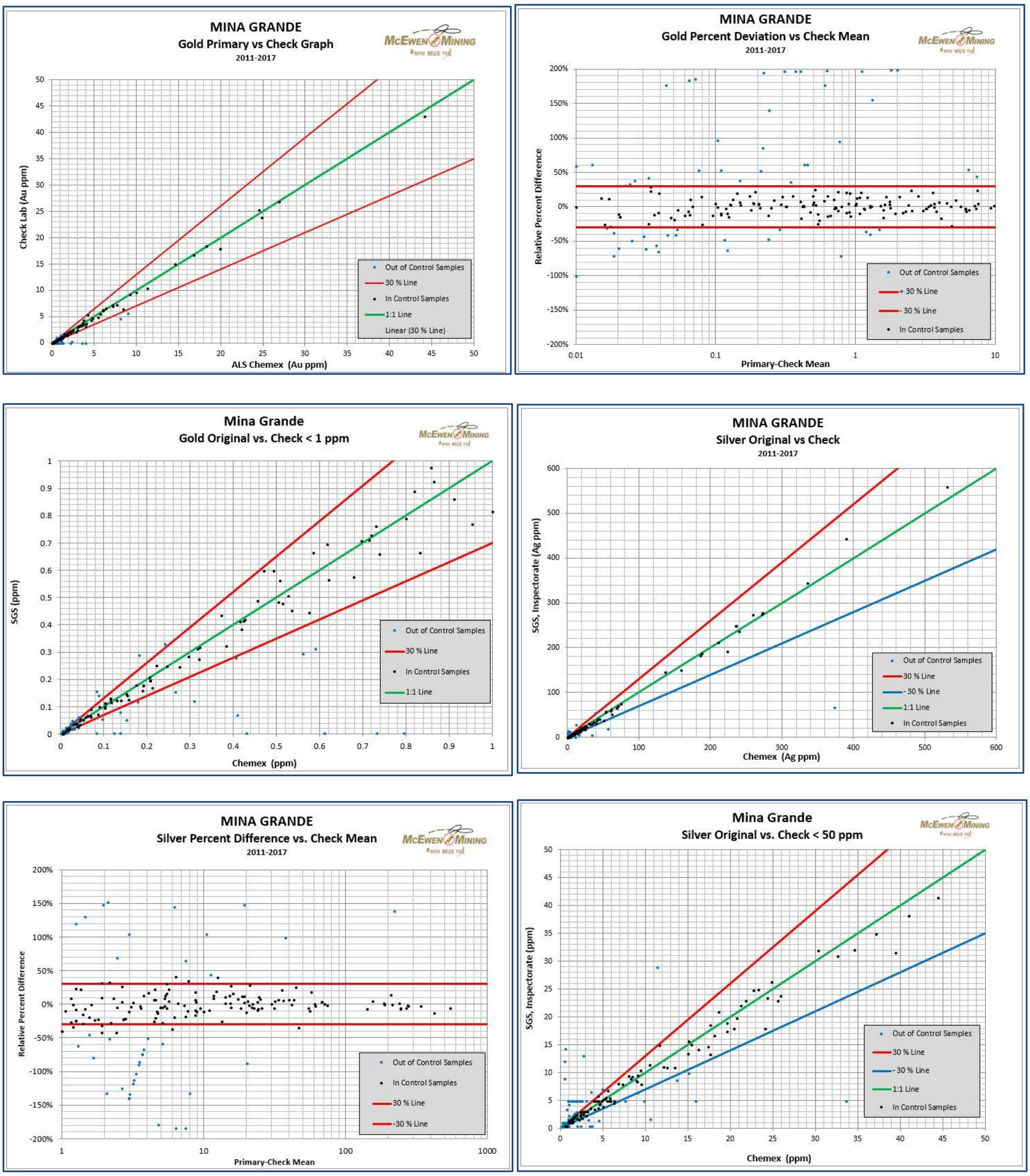


Figure 60 Sample Duplicate Test Results – Mina Grande

Haciendita

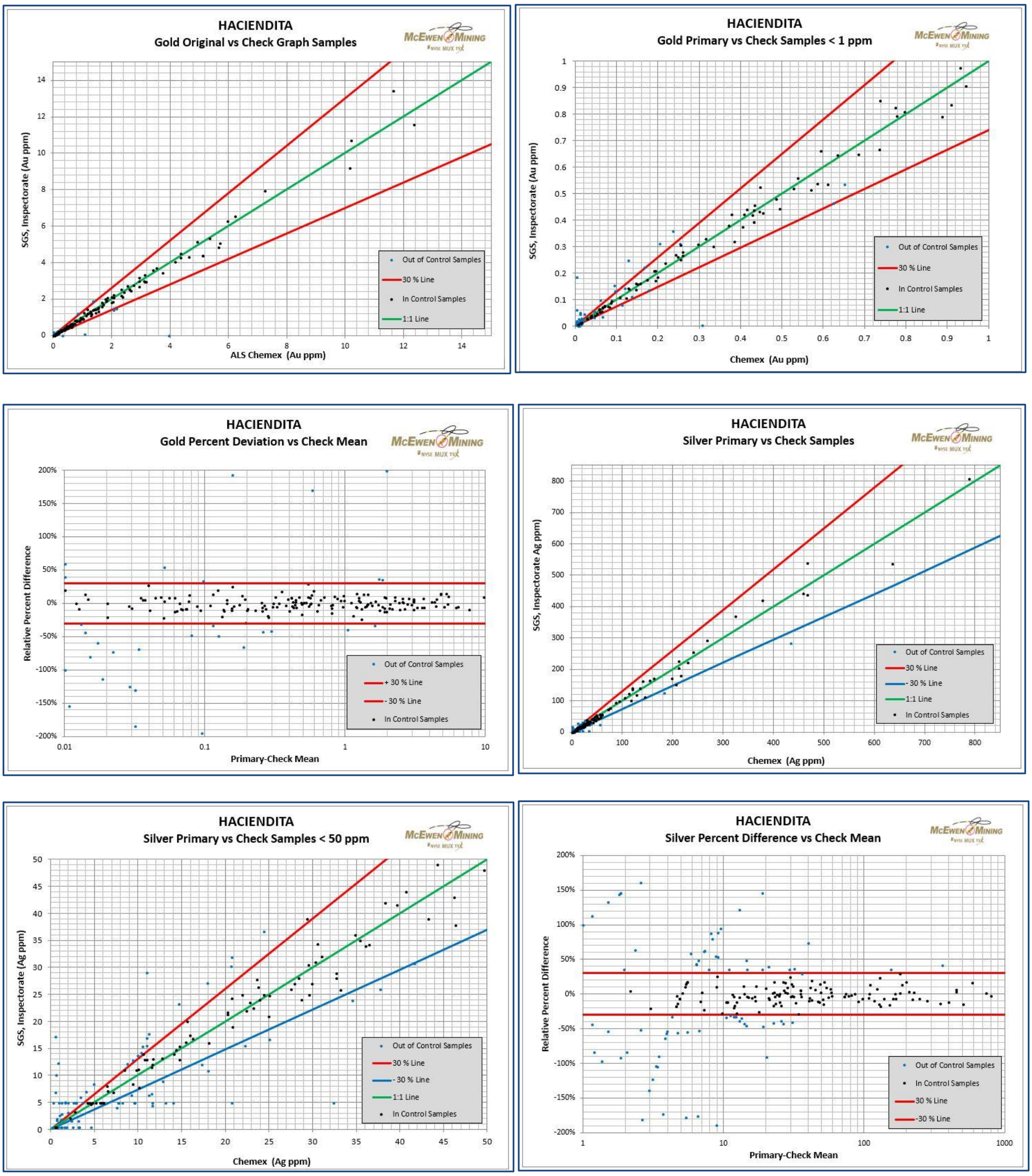


Figure 61 Sample Duplicate Test Results – Haciendita

12.5.4 GeoStats Round-Robin

In April 2018, 223 laboratories took part in the round-robin exercise. McEwen's internal mine laboratory in Mexico took part in a number of categories.

GeoStats of Australia organizes a round-robin of commercial and mine site laboratories that provide valuable information to both mining houses and the analytical industry. These surveys commenced in 1992 and take place twice per annum. The results of these surveys are compiled and charted showing overall error and overall bias. This is done by standardising the individual analyses and averaging performance on each element. Outlier assays are identified using population statistics and removed from final averages and standard deviations.

The results of this survey are a measure of the ability of a laboratory to accurately analyze a pre-prepared pulp. Individual sample results are shown using the standardized "Z" score. Outliers are highlighted and assigned a Z value of +3.00 or -3.00. General statistics are listed at the top of each table. The "Z" score is a common statistical parameter and is defined as:

Z = (McEwen Assay – Mean of all the labs)/(standard deviation of all laboratory results).

A "fail" is when the Z-score is greater than or less than 3. For the 10 "gold standards", McEwen passed all 10 readings, The Z-scores are generally low, which is a desired result. The highest Z-score was 1.72. Several of the Z scores are close to zero, which is the ultimate goal. The best result was a result of -0.12.

The mine laboratory used a FA (fire assay) technique followed by an AAS finish.

FA50 Gold Round Robin - Summary Statistics, Assays, Standardised Values and Graphs - April 2018

Standard Reference	G318-1	G318-2	G318-3	G318-4	G318-5	G318-6	G318-7	G318-8	G318-9	G318-10
MEAN (ppm)	1.05	2.04	0.72	5.93	3.90	2.70	0.31	0.79	1.15	4.58
STDEV (ppm)	0.04	0.07	0.03	0.20	0.13	0.10	0.01	0.03	0.05	0.17
95% CI (ppm)	0.01	0.01	0.00	0.03	0.02	0.01	0.00	0.00	0.01	0.03
95% CI (%)	0.62%	0.54%	0.67%	0.50%	0.48%	0.54%	0.72%	0.59%	0.63%	0.55%
MIN (ppm)	0.92	1.85	0.63	5.50	3.56	2.45	0.28	0.71	1.01	4.13
MEDIAN (ppm)	1.04	2.05	0.72	5.90	3.89	2.69	0.30	0.79	1.15	4.59
MAX (ppm)	1.16	2.25	0.81	6.47	4.22	2.96	0.34	0.87	1.28	5.04
IQR (ppm)	0.05	0.08	0.04	0.25	0.15	0.11	0.02	0.03	0.06	0.21
COUNT	177	179	172	175	172	174	159	172	175	175

Standard Reference	G318-1		G318-2		G318-3		G318-4		G318-5		G318-6		G318-7		G318-8		G318-9		G318-10		Method	Reading
Lab Reference	assay	z-score	assay	z-score	assay	z-score	assay	z-score	assay	z-score	assay	z-score	assay	z-score	assay	z-score	assay	z-score	assay	z-score		
MAXXAM ONTARIO	1.07	0.57	2.05	0.12	0.72	0.01	6.30	1.85	4.10	1.59	2.60	-1.00	0.31	0.02	0.78	-0.22	1.17	0.36	4.80	1.31	NAA	
MCEWEN BLACK FOX	1.08	0.80	2.05	0.12	0.75	0.94	6.05	0.60	4.01	0.87	2.72	0.22	0.32	1.00	0.82	1.07	1.18	0.57	4.76	1.08	FA	AAS
MCEWEN MEXICO	1.04	-0.12	2.14	1.33	0.74	0.63	6.05	0.60	3.87	-0.24	2.74	0.43	0.31	0.30	0.84	1.72	1.17	0.36	4.63	0.31	FA	AAS

Figure 62 FA50 Gold Round Robin Summary Statistics

McEwen also participated in the ore grade silver category. This is an element that is of vital importance for Project Fenix. The results are shown below.

Ore Grade Silver Round Robin - Summary Statistics, Assays, Standardised Values and Graphs - April 2018

Standard Reference	GBM318-11	GBM318-12	GBM318-13	GBM318-14	GBM318-15	GBM318-16
MEAN (ppm)	86.0	59.8	18.6	67.9	21.4	41.1
STDEV (ppm)	3.9	2.9	1.1	3.9	1.3	1.6
95% CI (ppm)	0.7	0.6	0.2	0.7	0.2	0.3
95% CI (%)	0.86%	0.95%	1.13%	1.06%	1.13%	0.75%
MIN (ppm)	75.4	51.8	15.7	58.0	18.0	36.8
MEDIAN (ppm)	86.1	59.6	18.5	67.8	21.4	41.0
MAX (ppm)	94.3	68.0	21.1	78.0	25.0	45.0
IQR (ppm)	5.2	3.4	1.0	5.2	1.2	2.0
COUNT	106	104	99	110	109	108

Standard Reference	GBM318-11		GBM318-12		GBM318-13		GBM318-14		GBM318-15		GBM318-16		Method	Reading
Lab Reference	assay	z-score	assay	z-score	assay	z-score	assay	z-score	assay	z-score	assay	z-score		
MAXXAM ONTARIO	80.0	-1.56	56.0	-1.28	15.0	-3.00	58.0	-2.57	19.0	-1.87	39.0	-1.26	NAA	
MCEWEN MEXICO	78.0	-2.07	62.0	0.75	19.0	0.42	65.0	-0.76	22.0	0.47	43.0	1.20	AR	ICP

Figure 63 Ore Grade Silver Round Robin Summary Statistics

McEwen's Mexican laboratory passed all six samples in this category.

McEwen's Mexican internal mine laboratory compares extremely well with commercial and mine labs around the world.

12.5.5 Sample Duplicates

During the period 2012-2018, 201 pulp duplicates were sent to ALS Chemex for duplicate gold assays. For silver, the corresponding number is 209 samples. Orthogonal regression lines for gold and silver are shown below. The corresponding regression equations are as follows:

Chemex Duplicate (Au ppm) = 0.002 + 0.951 Result Chemex Primary (Au ppm)

Chemex Duplicate Ag (ppm) = - 0.89 + 1.022 Result Chemex Primary Ag (ppm)

The off-set for gold is negligible, whereas for silver it is less than 1 gpt Ag. Both lines are highly correlated, indicating that ALS Chemex is able to produce acceptable results for duplicate samples for this project.

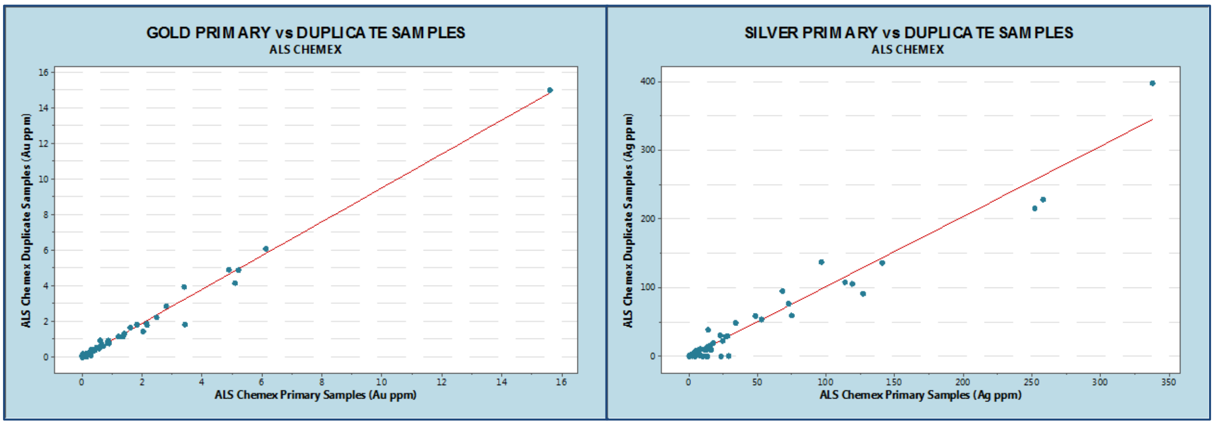


Figure 64 Orthogonal Regression Lines for Gold and Silver Duplicates

The method employed by ALS Chemex has a detection limit of 0.5 gpt for silver. Assays below the detection limit are recorded in the database with a value equal to one-half of the detection limit, so that a sample that returned below detection at ALS Chemex would have a database value of 0.25 gpt Ag.

12.6 QA/QC Analysis Summary

QA/QC investigation was carried out during the course of exploration on all project areas discussed in this chapter. This was done by means of analyses of standards and blanks, duplicate check assays and certified reference materials.

The analysis of the standards and blanks provides a way of monitoring the true accuracy of the analytical method by analyzing a sample of a standard reference material with a known standard mean and standard deviation. The analyses of the standard/blank datasets for each project indicate a high level of accuracy/precision in the analytical techniques used by ALS Chemex.

Based on the QA/QC analyses described here, as well as the results from the 2012 and 2013 published technical report and resource update, the drill assay datasets for these projects are suitable for use in resource estimation. These comments also apply to the newly sampled Phase 3 Heap Leach Material.

13. MINERAL PROCESSING AND METALLURGICAL TESTING

13.1 Historical Metallurgical Testing

Extensive metallurgical test work was conducted on samples from the Project from 2010 to 2012. The results of the historical metallurgical test work were reported in the previous NI 43-101 report submitted related to the previous feasibility study in September 2012, with flowsheet development based on results for El Gallo Silver and Palmarito silver deposits.

The historical test work indicated the El Gallo Silver and Palmarito deposits would respond to direct agitated cyanide leaching technology to extract silver and gold. Preliminary gravity and flotation test work was also conducted to compare the overall extractions with direct cyanide leaching. However, the results showed significantly lower recovery for both gold and silver using an all flotation approach with no leaching of the concentrate and tailings fractions. The subsequent process design for the previous feasibility study submitted in September 2012 resulted in a plant facility that adopted a process flowsheet which included three-stage crushing and a single stage ball mill followed by direct cyanidation, CCD washing and the Merrill Crowe process for recovery of precious metals from solution and tailings filtration. However, the slow leaching characteristics of the silver minerals resulted in a large, capital intensive leaching circuit to achieve a total leach retention time of 144 hours.

With the aim of improving project economics, additional metallurgical test work programs have been conducted from 2017 to 2018 in order to investigate an alternate process flowsheet for treatment of the El Gallo Silver material as well as the potential for recovering gold values from the El Gallo Gold Heap Leach Material, by conventional grinding followed by direct cyanidation. The alternate flowsheet for El Gallo Silver addressed the slow silver leaching characteristics observed in the historical test work programs by including a conventional flotation stage ahead of separate cyanide leach circuits for the concentrate and flotation tailings streams.

Portions of the earlier test work are relevant to the PEA and only these data have been discussed. The reader is directed to consult the test work reports listed in the previous feasibility study for additional information and the full historical description of metallurgical test work.

13.2 Current Study Metallurgical Testing

The 2017 and 2018 metallurgical test work programs for the PEA were conducted at AuTec Innovative Extractive Solutions Ltd (AuTec) of Vancouver, British Columbia, Canada and Blue Coast Research Ltd. (BCR) of Parksville, British Columbia, Canada.

13.2.1 Testwork Samples

Selection and representivity of the composite samples used for metallurgical testing are discussed in section 11.4 of this document.

Heap Leach Material

The preliminary test work for El Gallo Gold Heap Leach Material was conducted on composites prepared by McEwen from the three main zones of the existing gold heap leach. These samples did not include material from the Zone 4 and Patio Viejo, both of which have been scheduled in the conceptual production plan. The resource tonnages indicated so far for these materials represent approximately 45% of the total resource tonnage and these would require additional testing.

For El Gallo Silver a weighted composite sample representing the potential open pit mining phases was prepared by McEwen for the 2017 test work program. An additional three composite samples representing the early years of material from the preliminary production plan were prepared by McEwen for the 2018 metallurgical testwork program.

13.2.2 Mineral Characterization (El Gallo Gold Heap Leach Material)

Mineralogy

Gold mineralization among the various deposits of the El Gallo Gold area (San Rafael, Samaniego, Sagrado Corazon and Lupita) is similar, in what has been classified as low to medium sulphidation gold dominant epithermal precious metal deposits. Mineralization consists of quartz stockwork, breccia zones within andesite rocks.

Historical petrographic studies (referred to in the Resource Estimate for the El Gallo Complex July 2012) indicated gold typically occurs as microscopic sized particles of native gold and electrum in quartz and the gold is not typically associated with other sulphide minerals. Chalcopyrite ($CuFeS_2$) was present in moderate to minor amounts.

Head Assays

Each of the three El Gallo Gold Heap Leach Material composite samples was subjected to detailed head assay analysis. Head assays for these composite samples are summarized below in Table 31.

Element	Units	Zone 1 Composite	Zone 2 Composite	Zone 3 Composite
Au (screened metallic)	g/t	0.79	0.50	1.80
Au (average)	g/t	0.52	0.57	0.75
Ag	g/t	2.4	3.4	3.1
C_{TOTAL}	%	0.099	0.098	0.091
$C_{ORGANIC}$	%	<0.05	<0.05	<0.05
S_{TOTAL}	%	0.31	0.24	0.34
Cu	%	0.062	0.053	0.067
Cyanide Soluble Cu (2.5 g/L CN)	%	0.006	0.007	0.006
Cyanide Soluble Cu (10 g/L CN)	%	0.009	0.009	0.009
Acid Soluble Cu (2% H_2SO_4)	%	0.011	0.012	0.008
Acid Soluble Cu (5% H_2SO_4)	%	0.013	0.012	0.009
Zn	ppm	2,020	2,170	1,940
Pb	ppm	868	1,060	1,000
As	ppm	21	21	16
Hg	ppb	<10	<10	<10
Ni	ppm	16	15	16
Sb	ppm	2	2	2

Table 31 Head Assay Results for El Gallo Gold Heap Leach Material

The gold assays reflect the relatively low gold grades anticipated from the previous Heap Leach Material. The gold assay values for the Zone 1 and Zone 2 composite sample were relatively consistent and repeatable which is indicative of fine gold in the Heap Leach Material. However, the screen metallic analysis for the Zone 3 composite in particular, revealed the gold occurrence was skewed somewhat towards the coarser sized fraction. This suggests the presence of some moderately coarse free gold or alloys of gold and silver (electrum). The silver assays showed higher values, indicating that the adsorption and elution circuits will require excess capacity to allow for silver loadings. However, the silver to gold ratio is not considered high enough to favor the use of the Merrill Crowe process over carbon adsorption.

The quantity of sulphur contained in the three composites was indicative of material from low to medium sulphidation epithermal deposits in the region. The samples analyzed contained low to moderate levels of cyanide soluble copper. These were below the level where significant cyanide consumptions would be likely to result in leaching. However, copper adsorption onto carbon would need to be controlled and suppressed using excess cyanide during leaching and adsorption and a cold cyanide washing step incorporated prior to elution.

The base metal concentrations of lead and zinc would also need to be monitored during operations. Base metals such as zinc, lead and nickel would also consume cyanide in the leach process and potentially load onto the carbon and need to be reduced by acid washing prior to elution. Copper and zinc cyanide in the plant tailings would need to be detoxified to prevent accumulation in process waters. The mercury (Hg), arsenic (As) and antimony (Sb) levels detected in the composite samples were relatively low.

13.2.3 Mineral Characerization (El Gallo Silver)

Mineralogy

The El Gallo Silver mineralization is predominantly andesite-hosted, in what has been classified as low to medium sulphidation silver dominant epithermal deposits. Mineralization is hosted in the siliceous breccia zones and quartz stockwork veining.

Historical mineralogical test work done in 2012 on samples from the El Gallo Silver deposit identified the silver occurred mainly as silver sulphide (65% to 92%), various other silver-copper-base metal sulphides (3% to 27%) and as halides (4% to 16%). Pyrite was the dominant sulphide mineral identified (0.4% to 9.6%). The samples contained minor to trace amounts of sphalerite, galena and copper sulphides. Non-sulphide minerals were mainly quartz and feldspar, with chlorite, micas, carbonates and iron oxides also present. The early mineralogy tests indicated the silver minerals occurred mainly as complex particles and middlings in association with other sulphides and non-sulphide minerals and a fine nature to the silver minerals.

Each of the Year 1 to 3 El Gallo Silver composites and a bulk flotation product sample were subject to mineralogical examination in the 2018 test work program. Full details are included in BCR report PJ5242. Pyrite was the dominant sulphide mineral ranging from 1.7% to 3.1% and appeared to be well liberated. The samples also contained minor to trace amounts of sphalerite, galena and chalcopyrite. Non-sulphide minerals were mainly quartz and feldspar, with chlorite and relatively minor amounts of iron oxides and carbonates also present.

Silver was present mainly as the silver sulphide acanthite (Ag_2S), but also native silver, chlorargyrite ($AgCl$) and polybasite (Ag_9CuS_4) $(Ag,Cu)_6(Sb,As)_2S_7$. The mineralogy of the Year 1 to 3 composites and bulk flotation concentrate also indicated a relatively fine nature to the silver minerals and significant compositing of the silver minerals with other sulphide minerals and non-sulphide minerals. This suggests that recovery of silver could be maximized by producing a bulk rougher-scavenger concentrate from flotation for subsequent leaching at high cyanide concentrations.

Head Assays

Each of the three El Gallo Silver composite samples was subjected to detailed head assay analysis. Principal head assays for these composite samples are summarized below in Table 32.

Element	Units	Year 1 Composite	Year 2 Composite	Year 3 Composite	Year 1 to 3 Composite
Ag (average)	g/t	170	155	119	145
Au (average)	g/t	0.1	0.03	0.12	0.05
S_{TOTAL}	%	1.1	1.5	0.9	1.2
Cu	ppm	161	273	161	167
Zn	ppm	1,080	1,340	2,930	1,810
Pb	ppm	380	463	1,920	841
As	ppm	43	47	41	42
Hg	ppb	50	80	120	100
Ni	ppm	22	15	22	19
Sb	ppm	6	12	9	7

Table 32 Head Assay Results for El Gallo Silver Material

The silver and gold assays reflect the metal grades anticipated based on the El Gallo Silver conceptual production schedule. The Year 1 Composite sample shows higher grade silver in line with the maximum grades expected to be treated.

The quantity of sulphide sulphur contained in the Year 1 to 3 composites is indicative of low to medium sulphidation epithermal deposit. Higher sulphur levels are contained in these samples compared to El Gallo Gold as expected.

The base metal concentrations of lead and zinc in the Year 1 to 3 composites would also need to be monitored during operations. The copper grades were relatively low in all composites but copper deportment into the concentrate and subsequent leach solution will require further investigation and consideration. It is anticipated that the maintenance of free sodium cyanide level throughout the leach train will be required to maximize recovery of silver and also to assist with minimising copper deposition.

The mercury (Hg) and arsenic (As) levels detected in the composite samples were relatively low but mercury deportment into the concentrate will also require further investigation and consideration in gold room work practices. If it is subsequently found there are likely to be short term peaks in mercury levels, a retort system would have to be considered for the gold room.

13.2.4 Mineral Characterization (Palmarito)

Historical mineralogical test work done in 2012 on samples from the Palmarito Silver deposit identified the silver occurred mainly as acanthite (74% to 99%) with lesser amounts of native silver (7% to 24%) and trace amounts of silver chloride and other silver-copper-base metal sulphides. The Palmarito silver mineralization was also characterized by very fine grains.

13.2.5 Comminution

Comminution test work has included Bond ball mill work index determinations for the El Gallo Gold Heap Leach Material while for El Gallo Silver samples SAG Mill Comminution (SMC) parameter determinations, crushing work index, Bond rod and ball mill work index determinations and abrasion index tests were completed in 2010 and 2012.

El Gallo Gold Heap Leach Material

The Bond ball mill work index was determined for the El Gallo Gold Heap Leach Material composite samples in 2017 and 2018 to determine the milling characteristics and enable preliminary mill sizing and throughput calculations. Given the samples had already been finely crushed for heap leaching they were too fine to conduct Bond rod mill or abrasion index determination tests. Table 33 summarizes the results from the comminution test work completed for this study on the Heap Leach Material composite samples. A total of ten BWi determinations were performed. Complete results are included in BCR report PJ5245.

Parameter	BWi kWh/t
Average	16.9
Minimum	13.8
Maximum	19.3
75^{th} percentile	18.6

Table 33 Heap Leach Material BWi Summary of Testwork Results

The BWi determinations mostly used a 106 µm closing screen size resulting in a finer product size compared to the target P_{80} of 120 µm grind size. However, the overall results remained consistent with the values established from the tests which used a 150 µm closing screen size. The Bond ball mill work index determinations indicated that the material would be moderately hard to hard and high grinding power input would be required.

The ball mill selection for Project Fenix was based on reprocessing the Heap Leach Material and utilized the measured values for the Bond ball mill work index. The 75th percentile of the test work dataset has been used. The ratio of RWi to BWi of 0.9 was used for design purposes in the absence of measured rod mill work indices for the Heap Leach Material on the basis that it exhibits similar rock lithologies to the El Gallo Silver material.

El Gallo Silver

There have been two comminution test work programs that included El Gallo Silver samples completed in 2010 and 2012. The comminution test work programs consisted of SMC and JK drop weight tests and Bond abrasion, impact, rod mill and ball mill work index tests. Bond ball mill work index determinations were conducted using a 150 µm closing screen. The first specific comminution test work was carried out in 2010 on 21 individual samples.

A total of five Bond rod mill work index were completed with values ranging from 16.8 kWh/t to 19.1 kWh/t for these samples. The Bond ball mill work indices from the ten samples tested ranged from 16.6 kWh/t to a high of 20.5 kWh/t indicating that the material would be moderately hard to hard. The measured abrasion index values ranged from 0.36 to 0.70 indicating that the material is generally moderately abrasive with some highly abrasive components, likely due to the siliceous breccia hosting the mineralization.

The crushing work index values ranged from 5.6 kWh/t to 7.4 kWh/t indicating that the material has low impact resistance and a tendency to break easily at the coarser sizes. The SMC and JK breakage data indicated variable rock competency with individual samples ranging from low to high competency. The JK drop weight tests returned quite different results with A x b values ranging from 38 and 113 and resistance to fine abrasion grinding with ta values of 0.35 and 1.10. The SMC tests also indicated the samples tested generally exhibited moderate competency, four of the five samples displayed an impact breakage parameter A x b values ranging from 43 and 53 and average resistance to abrasion grinding parameter ta of 0.49 (range 0.45 to 0.52).

Another program of comminution test work program was conducted on five El Gallo Silver composite samples in 2012. These samples comprized intersections from various drill holes based on spatial distribution.

The 2012 comminution test work results indicated that the material trended from soft to relatively hard. The ratio of RWi to BWi ranged from 0.54 to 1.00, which indicated little potential for accumulation of a critical size in a semi-autogenous grinding mill. However, it also indicated that sufficient competent media may be lacking at times and a high ball charge would be needed in a semi-autogenous (SAG) mill. Measured Bond abrasion indices were low to moderate (0.20 to 0.34) indicating average liner wear and steel media consumption would be expected in crushing and grinding.

The Bond ball mill work index was determined for both the main GAX composite and the El Gallo Silver Year 1 to 3 high grade production composite sample used in the 2017 and 2018 flotation test work programs to supplement the data determined from the previous test work programs. Table 34 outlines the results from the comminution test work completed for this study.

Sample ID Description	Units	Year 1 to 3 High Grade Composite	El Gallo Silver GAX Composite
Ball Mill Work Index			
- F_{80}	µm	2,256	2,590
- P_{80}	µm	91	77
- Work Index	kWh/t	19.9	14.5

Table 34 Summary of Comminution Tests Conducted on El Gallo Silver Composite Samples

The Bond ball mill work index for the El Gallo Silver high grade production composite and GAX composite samples used in the 2017 and 2018 flotation test work programs indicated moderate to hard material.

A process flowsheet including three-stage crushing and ball mill grinding has been retained for the El Gallo Silver deposit. The variations in the material breakage characteristics would result in fluctuating plant treatment rates in a SAG mill operation. To maintain a consistently fine grind from the comminution circuit a stable throughput rate and power draw are required. These requirements and would favor the selection of the three-stage crushing option.

The existing El Gallo Gold three stage crushing plant would be utilized for Project Fenix to prepare material for delivery to the grinding circuit in the Phase 2 operation. Operating data reviewed from 2017 have indicated that the crushing circuit has operated consistently at the crushing rate required to generate a product having P_{80} of 8 mm. The design throughput rate adopted for Phase 2 would be 196 t/h at 75% overall utilisation. The required crushing capacity was determined by working backwards from the anticipated grinding capacity. The crushing plant would operate in the present configuration with feed material crushed to a product P_{80} of 10 mm.

The mill throughput rate when treating El Gallo Silver material was estimated using the measured values for the Bond rod and ball mill work indices. The 75th percentile of the test work dataset has been used. The throughput rate would be expected to vary from 147 t/h for El Gallo Silver to 226 t/h for El Gallo Gold Heap Leach Material.

13.2.6 Bulk Flotation

El Gallo Silver

Historical scoping level test work was conducted in 2012 on samples from the El Gallo Silver deposit to establish the potential gold and silver extraction using a combination of gravity separation and flotation. The results showed significantly lower recovery for both gold and silver using an all flotation approach with a cleaning stage included. The total gold and silver extractions were 81.7% and 73.9%, respectively. No leaching tests were performed on the flotation concentrate or tailings fractions.

2017 and 2018 Flotation Program Summary

Additional flotation test work programs were conducted on El Gallo Silver composite samples in 2017 and 2018. These flotation test programs included conventional bulk sulphide flotation at a P_{80} of 75 µm and P_{80} of 106 µm (including rougher flotation kinetics, investigation of different reagent schemes, effect of pulp density and water quality). Following selection of the most favorable test work parameters in the 2018 test work program, larger scale bulk flotation tests were carried out to provide the samples for cyanidation tests on the concentrate and tailings fractions to generate sufficient sample for cyanide destruction and dewatering tests.

The 2017 flotation test work program (AuTec R2018-016) was conducted mainly on a master composite sample referred to as the GAX composite which was selected to resemble the proposed open cut material from the El Gallo Silver deposit. High, medium and low silver grade variability samples were also tested in the 2017 program.

The 2018 El Gallo Silver flotation test work program focused initially on validating the results achieved in the 2017 program because a different laboratory was used and then subsequently on achieving further improvements. The main composite used for bulk flotation tests in 2018 was the Year 1 to 3 composite, selected to resemble the average silver grades for the deposit and sourced from material to be processed in the first three years of the conceptual production schedule. The most favorable conditions were then applied to each of the individual yearly composites. High and lower silver grade materials were also tested in the 2018 program.

The majority of the flotation test work performed in 2017 and 2018 was done using Vancouver (Nanaimo) tap water. The flotation test flowsheet consisted of conventional rougher-scavenger flotation in open circuit.

The tests completed in this 2018 program on the Year 1 to 3 composite have been used predominantly in the basis of design for the PEA. BCR conducted a total of nineteen 1 kg batch tests on the Year 1 to 3 composites. The program of larger scale bulk flotation work that followed optimisation work included seven individual batch flotation tests using 7 kg charges of composite. The bulk rougher flotation test results for GAX composite, Year 1 to 3 composites and the variability samples are summarized in Table 35. Complete results are included in BCR report PJ5242

Report	Sample Description	Test	Grind	Calculated Feed		Recovery to Concentrate			Tail
			P80 µm	g/t Ag	%S	%Mass	%Ag	%S	g/t Ag
PJ5242	Year 1-3 Composite	F-11	75	148	1.2	18	92	96	14
		F-12	106	132	1.2	17	88	95	19
		F-13	75	131	1.3	16	91	94	16
		F-14*	75	137	1.2	19	88	92	18
		F-15	75	133	1.2	16	89	94	17
	Year 1 Composite	F-20A	75	170	1.2	14	90	96	20
	Year 2 Composite	F-21A	75	155	1.6	15	91	95	16
	Year 3 Composite	F-22A	75	111	0.9	15	86	90	18
	Year 1 Low Grade	F-17	75	85	-	15	82	-	18
	Year 2 Low Grade	F-18	75	90	-	15	79	-	23
	Year 3 Low Grade	F-19	75	79	-	15	80	-	19
	High Grade Composite	F-2	75	518	0.9	25	96	94	27
		F-3	75	483	0.9	42	94	93	50
		F-4	75	523	0.9	33	93	90	57
	Year 3 High Grade	F-5	75	314	1.0	11	91	87	31
R2018-016	GAX Composite	GAX F2	106	114	0.7	23	85	90	22
		GAX F3	75	120	0.7	22	86	89	21
		GAX F6	75	146	0.6	25	88	97	24
		GAX F9	75	128	0.6	22	87	96	22
		GAX F10	75	128	0.6	25	87	96	22
		GAX F11	75	144	0.6	20	86	98	24
		GAX F12	75	154	0.6	22	87	99	25
		GAX F13	75	132	0.5	20	86	98	22
		GAX F15	75	141	0.6	31	89	94	23
		GAX F17	75	149	0.7	12	86	93	24
		GAX F18	125	144	0.7	27	86	92	26
		GAX F19	75	132	0.7	22	87	94	22
		GAX F20	75	165	0.6	22	89	97	24
		GAX F21	75	151	0.7	24	88	98	25
	High Grade	VF1	75	168	1.6	31	92	99	20
	Medium Grade	VF2	75	138	0.8	28	94	99	11
	Low Grade	VF3	75	62	0.6	29	88	98	10

Test F14 was done at higher feed density of 30% solids

***Tests on GAX composite all done at 30% solids except for GAX F17 at 20% solids*

Table 35 2017 and 2018 El Gallo Silver Rougher Flotation Tests Summary

The 2017 and 2018 flotation test work programs have demonstrated that conventional bulk flotation can potentially be used to recover a high proportion of the contained silver into a bulk flotation concentrate for subsequent cyanidation. The bulk flotation test work conducted in 2018 (BCRPJ5242) indicated that flotation at lower densities significantly improved the flotation kinetics and selectivity of the silver minerals with respect to the non-sulphide minerals. The results indicated improved flotation kinetics and selectivity at densities in the range of 23 to 24% solids. Mass pull to the concentrate ranged from 14% to 16% for the tests done on the Year 1 to 3 composites at the lower pulp densities. The 2017 and 2018 test work also investigated the use of various chemical dispersants but these appeared to be less effective.

Results of the mass pull versus recovery for the 2018 test series is shown in Figure 65. The silver flotation recovery also showed good linear correlation with sulphur recovery as shown in Figure 66 indicating that a high proportion of the silver minerals occur in association with sulphide minerals for the samples tested.

The results of tests to determine the influence of grind size on grade and recovery (F-12, GAX F2, GAX F18) for El Gallo Silver samples indicated that a finer grind P_{80} of 75 µm generally gave a slightly higher grade and recovery although there is no clear trend. A grind size P_{80} of 75 µm was subsequently selected for the El Gallo Silver material for the PEA to maximize selectivity in flotation and overall leach extractions on the concentrate and tailings streams.

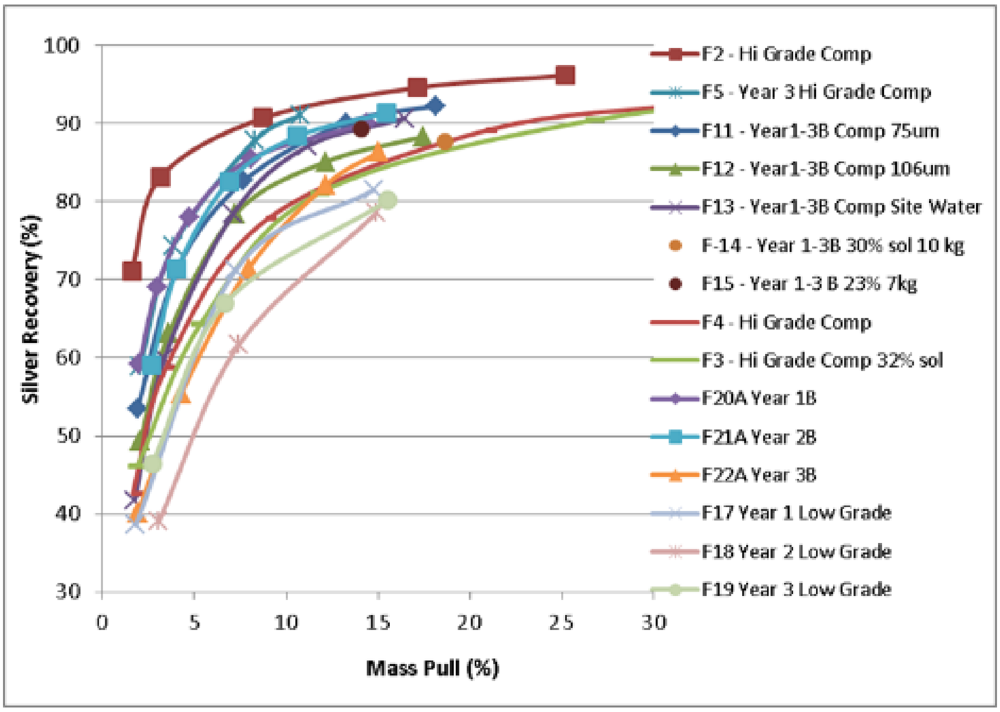


Figure 65 Bulk Flotation Mass Pull – Recovery Curves 2018 Test Work

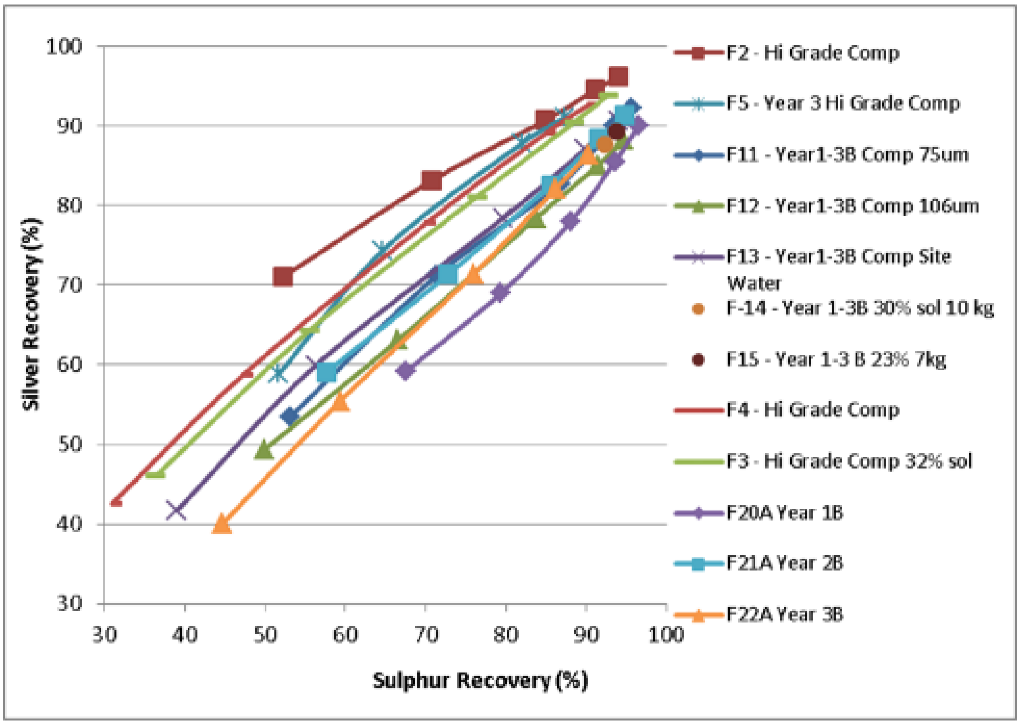


Figure 66 Relationship Between Silver and Sulphur Flotation Recovery 2018 Test Work

Flotation conditions and the results of the 7 kg bulk flotation tests conducted at BCR on the Year 1 to 3 composite samples to generate concentrate for the subsequent cyanide destruction and dewatering test work are summarized in Table 36. The overall results were consistent with the bench scale batch tests on the Year 1 to 3 composite samples.

Sample	Year 1 to 3 Composite
Total Sample Mass	49 kg
Test ID	BF 1-7
Water	Vancouver (Nanaimo)
Head Grade	
- g/t Ag Assay	145
- g/t Ag Calculated	138
-% S Assay	1.2
-% S Calculated	1.3
- Grind Size P_{80} (µm)	75
Rougher-scavenger	
- Collector	25 g/t Aero31
	40 g/t PAX
- Frother	15 g/t F150
- Other Reagent	50 g/t Copper Sulphate
- pH	Natural (7.6 to 7.9)
- Time (min)	15

Sample	Year 1 to 3 Composite
Rougher Concentrate	
Mass Pull% (total feed)	15
Assay	
g/t Ag	831
% S	8
Recovery %	
Ag	89
S	95
Rougher Tail Assay	
g/t Ag	18
%S	0.1

Table 36 Test Conditions and Results of 7 kg Bulk Flotation Tests on Year 1 to 3 Composite

The overall results from bulk flotation testing showed that potential El Gallo Silver open pit material would produce a bulk flotation concentrate grading approximately 800 g/t Ag with average silver recovery of 89%, from a feed grade of 138 g/t Ag. Mass pull to concentrate was approximately 15%.

Tank flotation cells of 50 m³ volume were selected for rougher and scavenger flotation based on a scale up of laboratory residence time with checks to ensure that area and lip length capacities were not exceeded. Laboratory rougher flotation times were scaled-up by a factor of 2.6 to 39 minutes. The improved flotation kinetics would largely offset any increase in the required capacity of the flotation circuit resulting from flotation at lower densities.

13.2.7 Cyanidation Test Work

El Gallo Gold Previous Heap Leached Material

BCR performed preliminary cyanidation test work in 2018 on the Zone 1 to 3 composite samples to determine how the Heap Leach Material would respond to direct cyanidation following conventional grinding. Variation in grind size and cyanide concentration was investigated. The series of 24 hour monitored direct cyanidation bottle roll tests were done at 40% solids, pH of 10.5 to 11 with initial cyanide solution strengths of 1,000 ppm to 750 ppm sodium cyanide. Samples were taken at timed intervals of 2, 6, 12 and 24 hours to establish leach curves for varying conditions. Complete results are included in BCR report PJ5245

Table 37 and Figure 67 summarize the key results of the direct cyanidation test work recently completed.

Sample Description	Test	Grind	Oxygen	Calc. Head	% Gold Extraction	Residue	Consumption kg/t	
		p80 µm		g/t Au	24 h	g/t Au	Lime	NaCN
Zone 1 Composite	CN-1	129	air	0.51	89.5	0.05	0.27	0.62
Zone 1 Composite	CN-2	103	air	0.52	90.7	0.05	0.19	0.76
Zone 2 Composite	CN-3	126	air	0.59	88.7	0.07	0.22	0.76
Zone 2 Composite	CN-4	106	air	0.55	88.0	0.07	0.17	0.84
Zone 3 Composite	CN-5	127	air	1.05	92.3	0.08	0.27	0.84
Zone 3 Composite	CN-6	108	air	0.76	89.5	0.08	0.26	0.92
Zone 1 Composite	CN-7	107	air	0.60	91.4	0.05	0.38	0.90
Zone 2 Composite	CN-8	104	air	0.85	91.3	0.07	0.33	0.96
Zone 3 Composite	CN-9	106	air	1.53	92.7	0.11	0.41	0.90
Zone 1 Composite	CN-10	119	air	0.67	90.6	0.06	0.42	0.37
Zone 2 Composite	CN-11	123	air	0.59	84.2	0.09	0.33	0.45
Zone 3 Composite	CN-12	124	air	2.04	93.6	0.13	0.37	0.38
Zone 1 to 3 Composite	CN-13	107	air	0.72	92.5	0.05	0.80	0.15
	Average				90.4			

Table 37 El Gallo Gold Direct Cyanidation Results

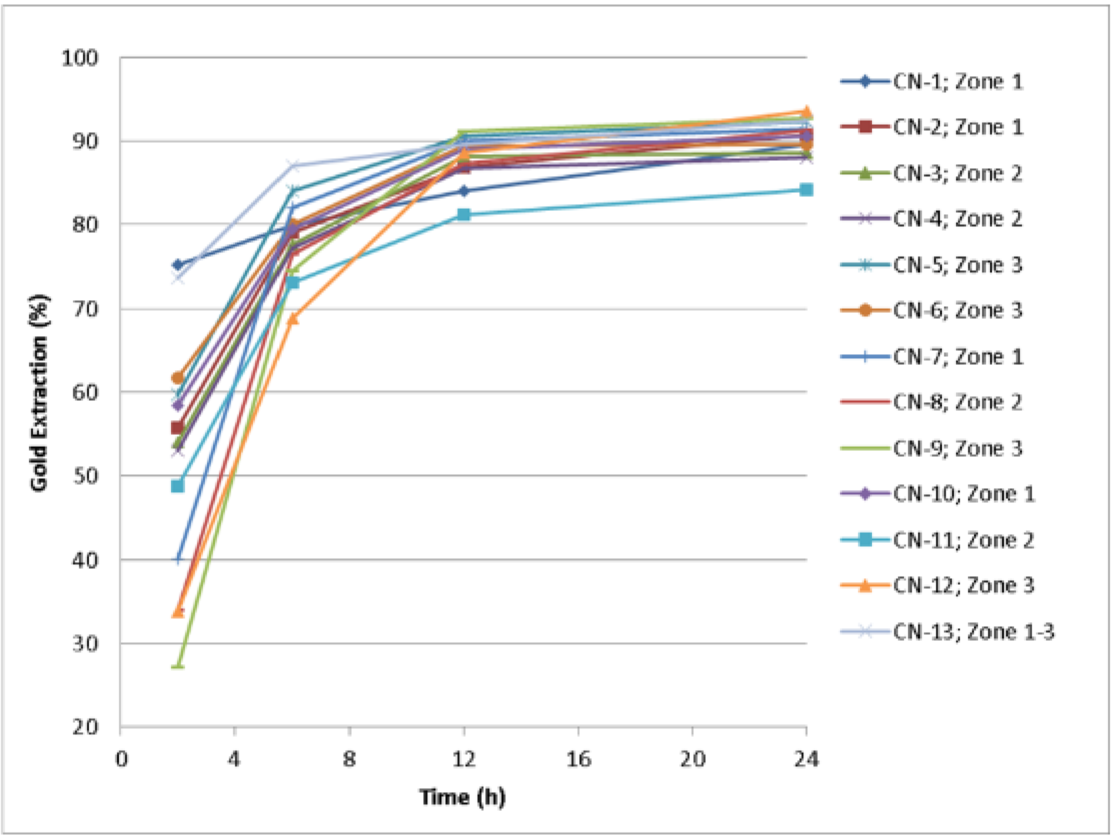


Figure 67 El Gallo Gold Direct Cyanidation Extraction Kinetics

The results showed that the Heap Leach Material would be amenable to direct cyanidation following conventional grinding. Final leach extractions for gold in the samples tested ranged 84% and 94%. The direct cyanidation test work indicated the Heap Leach Material leached relatively quickly. Dissolution of the gold approached steady state after 16 hours and then continued to leach, although at a low rate for a further 8 hours at least in most cases. Dissolved oxygen levels ranged from 5 to 8 ppm.

The overall results obtained for the Heap Leach Material were relatively consistent. Some inconsistencies were noted between the calculated and measured head assays in some of the tests done. This was confirmed by the screen metallic analysis of the Zone 1 and 3 composite samples which showed variation in gold assays possibly due to the presence of moderately coarse free gold or some electrum.

The results indicated little difference in the overall gold extraction between a P_{80} of 125 µm and a P_{80} of 106 µm grind sizes. The differences were within the normal variation shown by other tests and no clear trend was apparent. The cyanide consumption increased slightly at the finer grind size for each of the composites tested. A grind size P_{80} of 120 µm was subsequently selected for the Heap Leach Material for the PEA pending further grind sensitivity test work in the next study phase if required.

The recent test work has not investigated the use of lead nitrate. Lead and other divalent metal cations can have a positive effect on gold dissolution rate. Future test work should also investigate lead nitrate addition. Positive results from this test work can be easily accommodated by the inclusion of a very simple dosing system.

The average cyanide consumption in the leach tests done on the individual Year 1, 2 and 3 composites were 0.72 kg/t mill feed. Detailed analyses of the leach solutions suggested moderate levels of soluble copper and zinc from the samples tested. A general operating principle for a CIL operation in these circumstances is to ensure a cyanide to copper molar ratio of greater than 4:1 in order to minimize copper adsorption onto the carbon. A residual sodium cyanide concentration of approximately 250 ppm has therefore been allowed for this study pending further optimisation of the leach conditions. Allowing for the residual sodium cyanide concentration of 250 ppm and 226 t/h of CIL tails solution, the calculated leach sodium cyanide addition is approximately 1.4 kg/t.

Gold adsorption efficiencies were based on assumed parameters. Carbon adsorption and loading test work would be required in the next phase to enable further leach and adsorption modelling to be conducted to verify the number of adsorption stages and the elution circuit design.

El Gallo Silver

The initial phase of cyanidation test work on flotation concentrate and tailings samples produced from the GAX composite and high, medium and low-grade variability samples ground to a P_{80} of 75 µm generally gave high extractions for silver. The use of higher cyanide concentrations at the commencement of concentrate leaching was sufficient to extract 92% to 96% of the silver without regrinding. Leach kinetics also tended to be faster when the cyanide concentration was highest. The extraction of silver was 96% to 98% after regrinding to a P_{80} size of 15 µm. The leach extraction of silver from the flotation tailings was 53% to 68%. In total, over 90% of the silver contained in the samples was able to be extracted by separate leaching of the flotation concentrate and tailings.

Table 38 summarizes the key results of concentrate and flotation tailings leach test work performed by AuTec in 2017. Complete results for both silver and gold are included in AuTec report R2018-016.

Sample Description	Test	Calc. Head	% Silver Extraction	Consumption kg/t		Residual NaCN
		g/t Ag	48 h	Lime	NaCN	g/L
High Grade VF1 Conc 'As is'	DCN-V16	722	93	2.2	8.2	5.8
Medium Grade VF2 Conc 'As is'	DCN-V17	582	96	2.5	8.7	5.5
Low Grade VF3 Conc 'As is'	DCN-V18	208	95	3.6	7.5	6.0
GAX Composite F23 Conc 'As is'	GAX DCN-21	425	94	4.0	7.5	6.0
GAX Composite F24 Conc 'As is'	GAX DCN-22	922	92	5.0	11.1	4.2
GAX Composite F24 Conc 'As is'	GAX DCN-24	1,000	80	5.3	7.1	1.8
High Grade VF1 Conc 'Reground'	DCN-V19	629	96	2.3	7.9	5.9
Medium Grade VF2 Conc 'Reground'	DCN-V20	366	98	2.6	6.7	6.4
Low Grade VF3 Conc 'Reground'	DCN-V21	225	97	4.2	7.5	6.0
GAX Composite F23 Conc 'Reground'	GAX DCN-23	405	95	3.4	7.7	5.8
High Grade VF1 'Tails'	DCN-V22	18	58	0.8	0.2	0.9
Medium Grade VF2 'Tails'	DCN-V23	11	68	1.4	0.2	0.9
Low Grade VF3 'Tails'	DCN-V24	9	53	1.6	0.2	0.9
GAX Composite F23 'Tails'	GAX DCN-25	28	62	2.8	0.3	0.9
GAX Composite F24 'Tails'	GAX DCN-26	31	63	2.4	0.2	0.9

Table 38 El Gallo Silver Flotation Concentrate and Tailings Leach Test Summary 2017

This series of 48 hour agitated tank concentrate leach tests were done at 35% solids, pH of 11.5, with initial cyanide solution strengths of 0.5% to 1% sodium cyanide. Based on previous direct cyanidation optimisation test work conducted in 2016 (SGS final report 15130-001), a pre-treatment with 250 g/t lead nitrate was also included with a further 750 g/t lead nitrate added into the leach itself. These tests were conducted without the injection of oxygen or air. Dissolved oxygen levels ranged from 6 to 9 ppm.

The 48-hour flotation tailings bottle roll cyanidation tests were done at 40% solids, pH of 11.5 with initial cyanide solution strength of 1,000 ppm sodium cyanide. These tests were also conducted without the injection of oxygen or air. Dissolved oxygen levels were 6 ppm to 7 ppm.

BCR performed additional cyanidation test work on flotation concentrate and tailings samples in 2018 to confirm the concentrate and tailings leach extractions obtained from previous test work and optimize cyanide concentrations. Concentrate from bulk flotation test work on the Year 1 to 3 composite samples was used predominantly for the additional cyanide leaching test work. Variation in cyanide and oxygen concentration, addition of lead nitrate (in various dosages) and effect of pulp density were investigated for the concentrate leach to establish relationships with silver extraction.

The series of 24, 48 and 72 hour monitored agitated tank concentrate leach tests were done at pH of 11.5. Leach densities tested were 20%, 25% and 35% solids and the initial cyanide solution strengths were varied from 0.3%, 0.6% to 1.0% sodium cyanide. Samples were taken at timed intervals of 2, 6, 12, 24, 48 and 72 hours to establish leach curves for varying conditions. Table 39 summarizes the key results of concentrate leach test work performed by BCR in 2018. Complete results are included in BCR report PJ5242.

Sample Description	Test	Calc. Head	% Silver Extraction			Addition kg/t	Consumption kg/t	
		g/t Ag	24 h	48 h	72 h	NaCN	Lime	NaCN
Year 1-3 Composite	F-14 Conc, CN-5	640	86	90	-	14.3	4.5	4.5
	F-14 Conc, CN-6	658	86	93	-	24.5	4.1	7.1
	F-14 Conc, CN-7	683	87	93	-	18.4	4.7	4.0
	F-14, F-15, F-16 Conc, CN-8	848	84	91	-	18.4	4.4	5.4
	F-14, F-15, F-16 Conc, CN-10	838	74	86	-	10.7	4.5	3.3
	F-14, F-15, F-16 Conc, CN-11	906	83	86	-	11.4	4.5	4.1
	F-14, F-15, F-16 Conc, CN-12	794	71	70	85	6.6	5.3	3.5
	F-14, F-15, F-16 Conc, CN-13	790	77	80	89	11.6	2.9	7.2
	F-14, F-15, F-16 Conc, CN-14	785	86	94	-	18.4	4.6	6.7
	BF1-7 Conc, CN30	870	82	91	92	11.1	6.3	6.3
Year 1 Composite	F-20 Conc, CN-20	1,043	78	85	86	11.1	4.8	4.6
Year 2 Composite	F-21 Conc, CN-21	871	70	83	87	11.1	3.6	5.1
Year 3 Composite	F-22 Conc, CN-22	705	85	93	92	11.1	5.6	5.2
Year 1 Low Grade	F-17 Conc, CN-17	437	90	94	93	11.1	5.6	6.5
Year 2 Low Grade	F-18 Conc, CN-18	505	79	85	87	11.1	3.6	7.3
Year 3 Low Grade	F-19 Conc, CN-19	392	70	90	93	11.5	6.0	7.0
High Grade Composite	F-7, F-8 Conc, CN-1	2,235	93	-	-	40.8	3.9	5.2
	F-7, F-8 Conc, CN-2	2,223	90	-	-	24.5	4.8	7.9
	F-9 Conc, CN-3	1,923	89	-	-	40.8	3.8	5.6

Table 39 El Gallo Silver Flotation Concentrate Leach Test Summary 2018

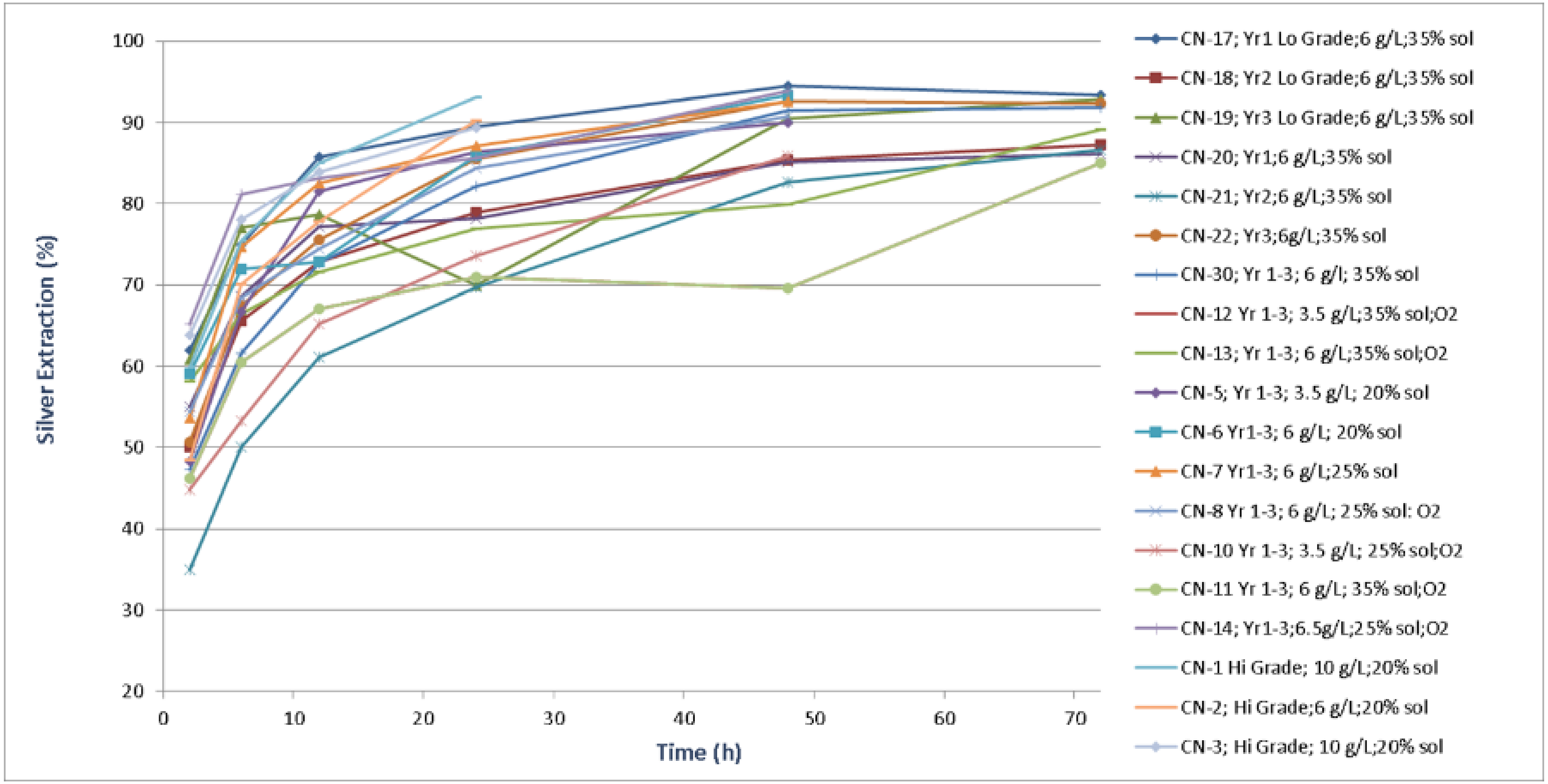


Figure 68 Concentrate Silver Leach Kinetics 2018 Test Work

The 2018 test work confirmed that high extraction rates were achievable for silver using intensive cyanidation of flotation concentrate. Final leach extractions silver in the samples tested ranged from 85% and 93%. During the tests, attempts were made to reduce cyanide addition by extending the leaching time and improve leach extraction by varying dosage of lead nitrate.

What the laboratory work has demonstrated is that the silver concentrate leach kinetics and final extractions would be strongly related to free cyanide concentration. There also appeared to be an advantage of maintaining a high pH with lime. The test work indicated a sodium cyanide concentration of at least 6 g/L or 0.6% at the commencement of leaching was required in combination with maintenance of a free sodium cyanide level of approximately 3 g/L throughout the leach process to achieve high extraction rates after 48 to 72 hours of leaching. Higher cyanide additions resulted in faster silver leach kinetics.

Silver leach kinetics did not appear to increase significantly by reducing the pulp density from 35% solids to 20% solids. The subsequent leaching optimisation and variability tests were conducted at a pulp density of 35% solids and this density has been nominated for the PEA design. The majority of concentrate leach tests were conducted without the injection of oxygen or air. Dissolved oxygen levels were 6 ppm to 8 ppm.

Oxygen addition throughout the first 12 hours of leaching did not appear to improve silver extraction rate and final extractions. The process design would provide for agitators in the concentrate leach tanks to be equipped for air addition down the agitator shaft. Confirmation of the oxygen requirement would be provided once test work is completed.

The concentrate leaching circuit design has included a pre-leach tank to enable pre-conditioning of the feed slurry prior to the concentrate leaching as performed in the 2017 and 2018 test work. It is envisaged that two of the leach tanks required for Phase 1 operation and an additional new leach tank would be used for leaching of the flotation concentrate. The total retention time for concentrate leaching would be approximately 70 hours at the design treatment rate.

The 48-hour flotation tailings bottle roll cyanidation tests were done at 40% solids, pH of 11.5 with initial cyanide solution strength of 500 ppm sodium cyanide. Table 40 summarizes the key results of flotation tailings leach test work performed by BCR in 2018.

Sample Description	Test	Calc. Head	% Silver Extraction			Additi on kg/t	Consumption kg/t	
		g/t Ag	24 h	38 h	48 h	NaCN	Lime	NaCN
Year 1-3 Composite	F14 Tails, CN-9	20	61	-	-	1.5	3.4	0.1
	F14 Tails, CN-15	20	53	-	-	0.8	1.6	0.3
	BF1-7 Tails, CN31	19	55	58	-	0.8	3.7	0.01
	BF1-7 Tails, CN31R	19	53	55	-	0.8	3.7	0.1
Year 1 Composite	F20 Tails, CN-26	21	66	64	-	0.8	3.1	0.1
Year 2 Composite	F21 Tails, CN-27	17	66	68	-	0.8	3.9	0.1
Year 3 Composite	F22 Tails, CN-28	16	50	52	-	0.8	2.5	0.01
Year 1 Low Grade	F17 Tails, CN-23	18	61	62	-	0.8	3.9	0.05
Year 2 Low Grade	F18 Tails, CN-24	19	49	54	-	0.8	3.2	0.01
Year 3 Low Grade	F19 Tails, CN-25	18	60	63	-	0.8	4.4	0.01
High Grade Composite	F7 Tails, CN-4	56	60	-	68	1.5	2.7	0.2

Table 40 El Gallo Silver Flotation Tailings Leach Test Summary 2018

The leach extraction of silver from the flotation tailings ranged from was 49% to 66%. The use of high pH appeared to improve overall tailings leach silver extraction and reduce the cyanide consumption. Based on the high residual sodium cyanide levels measured in the majority of these tests, there appears scope to further optimize leach conditions to reduce operating costs. It is envisaged that the flotation tailings circuit would utilize one of the leach tanks and the carbon adsorption tanks required for Phase 1 operation. The total retention time for the flotation tailings leach would be approximately 34 hours at the design treatment rate. Combining the concentrate leach residue directly with the flotation tailings prior to leaching the tails resulted in lower overall silver extraction.

13.2.8 Cyanide Destruction

Historical test work was completed for cyanide destruction of the El Gallo Silver and Palmarito leach tailings in 2012 (SGS final report 12-09 DU14591). The historical cyanide destruction test work demonstrated that the SO_2/air (INCO) process reduced free cyanide levels in the final tailings samples containing 1,000 ppm of free cyanide to less than 2 ppm. The residual weak acid dissociable (WAD) cyanide levels achieved in the cyanide destruction tests were not reported.

2017 and 2018 Cyanide Destruction Test Work

The leach tailings from both the El Gallo Gold Heap Leach Material and El Gallo Silver composite samples were also tested for cyanide destruction using the SO_2/air (INCO) process in 2017 and 2018. This work was reported in Kemetco reports K3412 (December 2017) and L1304 (May 2018).

The final parameters and the values established from the test work are summarized in Table 41.

Parameter	Unit	El Gallo Gold 2018 (Test 6)	El Gallo Silver 2018	El Gallo Silver 2017 (Test 8)
Initial WAD cyanide	ppm	370	180	707
Sulphur Dioxide dose	g SO_2 /g WAD cyanide	3.2	5.2	4.1
pH	-	8.0	8.0	7.5
Lime dose	g $Ca(OH)_2$/g SO_2	0.4	Not used	0.4
Copper concentration	ppm	Not used	Not used	Not used
Retention time	min	45	78	60
Residual WAD cyanide (CN_p)	ppm	2	10	5
Residual total cyanide (calculated)	ppm	2	13	9

Table 41 2017 and 2018 Cyanide Destruction Test Work Summary

The preliminary design for El Gallo Gold Heap Leach Material was based on the test work outcomes using a sulphur dioxide dose of 3.2 g SO_2 per g of WAD cyanide, a lime dose of 0.4 g of hydrated lime per g of SO_2 without the addition copper sulphate. A total retention time of 60 minutes was used in the preliminary design for El Gallo Gold Heap Leach Material.

Low range residual WAD cyanide levels would be targeted when treating El Gallo Silver to minimize any effect on the flotation process of cyanide containing process water, recycled after cyanide destruction. The preliminary design for El Gallo Silver material was based on the outcomes from 2017 test work which achieved WAD cyanide levels of less than 5 ppm using a sulphur dioxide dose of 4.1 g SO_2 per g of WAD cyanide, a lime dose of 0.4 g of hydrated lime per g of SO_2 without the addition copper sulphate. A total time of 60 minutes was used for most of this test work.

The cyanide destruction system for El Gallo Gold Heap Leach Material in Phase 1 would also be used to treat the combined El Gallo Silver tailings streams in the proposed Phase 2 operations. As the El Gallo Silver material would be processed at a reduced throughput rate, the total time for cyanide destruction of the El Gallo Silver would increase to approximately 105 minutes. Therefore, a lower sulphur dioxide dose of 4.1 g SO_2 per g of WAD cyanide from 2017 test work has been used for the PEA. The trade-off between the retention time and reagents usage would be investigated further in any subsequent study phase.

The levels of copper and zinc produced in the leaching test work meant that the cyanide destruction tests did not need to be catalyzed with copper sulphate. The natural copper and zinc levels in the material to be treated would be high enough to sustain the detoxification reaction. However, the design would make provision for addition of copper sulphate solution due to the variable copper and zinc grades and mineralogy. Thiocyanate, produced as a by-product of the leaching process, is not considered to have the potential to detrimentally affect the process. Typically, less than 10% of the thiocyanate is oxidized by the SO_2/air process.

13.2.9 Dewatering

Historical thickening test work was done in 2012 on El Gallo Silver and Palmarito direct leach tailings samples. The El Gallo Silver tailings samples settled at a much slower rate compared to Palmarito. Results of dynamic thickening tests for high rate thickeners and an average loading rate of 3.5 $m^3/m^2/h$ indicated underflow density range for the El Gallo Silver tailings material would be 51% to 55% solids.

A further dewatering test work program on El Gallo Gold Heap Leach Material and El Gallo Silver bulk flotation concentrate samples was still in progress at Responsible Mining Solutions (RMS) at the time of writing this report for the PEA.

El Gallo Gold Heap Leach Material

A conventional specific settling flux rate of 0.7 t/m^2h was adopted for the HLM in calculating the required settling area for a high rate thickener in the absence of specific settling test work. Based on this, a 20 m diameter tailings thickener would be required, to achieve a target density of approximately 55% solids for tailings disposal.

El Gallo Silver

A solid/liquid separation step would be necessary after concentrate leaching to provide the pregnant solution as feed for the Merrill Crowe circuit. The particle size distribution analysis for the bulk flotation concentrate indicated a relatively high proportion in the minus 10 μm size fraction. Consequently, the rheology of the concentrate leach slurry is a significant aspect for option, design and equipment selection to recover the pregnant solution for the Merrill Crowe.

Options would include:

- Counter Current Decantation (CCD) washing circuit;
- Filtration and cake washing; and
- Combination of thickening and filtration with cake washing.

A conventional CCD washing circuit has been selected for the PEA to minimize capital costs pending the outcomes from the dewatering test work on the flotation concentrate leach residue and a further trade-off study to investigate downstream cost benefits of filtration and cake washing.

For the PEA it has been assumed that the concentrate leach residue would be amenable to CCD washing pending the results of the additional dewatering testwork. A reduced specific settling rate has been assumed for the CCD duty in the absence of concentrate thickening test work and due to the fineness of the concentrate.

The CCD design has been based on a five-stage circuit using a wash ratio of four cubic meters of wash solution per cubic meter of tailings (underflow) solution to achieve high silver wash efficiency from the higher-grade concentrate leach solutions. The pregnant solution may carry a higher than normal amount of suspended solids due to the fineness of the flotation concentrate so additional clarification capacity has been allowed prior to the Merrill Crowe circuit.

A 20 m diameter high rate thickener has been selected for the flotation tailings duty to maintain common thickener size with the tailings thickener from Phase 1.

Merrill Crowe

The high silver content of the concentrate leach solution has dictated the selection of cementation of the precious metals onto zinc powder rather than adsorption onto carbon. Scoping level zinc cementation test work done prior to the cyanide destruction tests, indicated silver could be effectively precipitated at a high efficiency using a normal zinc addition rate. The concentrate leach solution contained moderately high copper concentrations but only very low amounts of copper were precipitated in the test work. Impurities such as selenium, cadmium and bismuth which can incur a penalty from the refinery were present only at low levels in the pregnant solution and precipitate samples tested to date.

13.2.10 Metallurgical Recoveries

The generic metal recoveries nominated for the PEA are shown in Table 42.

Deposit	Overall Recovery %	
	Gold	Silver
El Gallo Gold HLM	88	-
El Gallo Silver	75	86
Palmarito	85	75
Carrisalejo	75	85
El Encuentro	90	60

Table 42 Generic Metal Recoveries for Gold and Silver

The overall metal recoveries have been estimated from the flotation and leach extraction data from the test work completed for this study with anticipated solution losses from the carbon adsorption and CCD/Merrill Crowe processes factored into the estimates.

13.2.11 Comments on Section 13

The metallurgical test work and analytical procedures were performed by recognized test facilities.

Samples selected for the 2017 and 2018 metallurgical test work programs were prepared and described in section 11.5.4. The preliminary test work conducted was considered appropriate for the styles of mineralization however additional metallurgical sampling and test work would be required to better understand the variability of the metallurgical response for each of the deposits to the selected flowsheets. Scoping level test work only has been conducted on the Palmarito, Carrisalejo and El Encuentro open pit deposits using the selected flowsheets. Given the Phase 2 flowsheet would be largely reliant on bulk flotation, it is considered important to test individual variability samples in addition to the GAX and Year 1 to 3 composites tested to date.

The El Gallo Silver Year 1 to 3 and GAX composite samples used for the 2017 and 2018 test work programs were assembled from drill core which had been stored from previous drilling campaigns. It has been recommended that some future test work be done on samples comprising fresh drill core from the El Gallo Silver and Palmarito open pit deposits to better reflect normal mine operation.

Preliminary metallurgical test work conducted in 2018 indicated that the El Gallo Gold Heap Leach Material would be amenable to direct cyanidation following conventional grinding with relatively high gold recoveries achieved after 24 hours of leaching. Test work identified moderate levels of soluble copper but these were below the level where significant cyanide consumptions would be likely to result in leaching and adsorption.

Some inconsistencies were noted between the calculated and measured head assays in some of the leach tests done on the El Gallo Gold Heap Leach Material. This was confirmed by the screen fire assay values which showed variation in gold assays for some of the Heap Leach Material. Loss of gold due to moderately coarse gold (or electrum) would not be expected to be significant. Further test work has been recommended to confirm how the gold occurs and its grain size distribution, optimisation of the leach conditions and to investigate potential for gravity separation ahead of cyanidation for the higher-grade zones.

From 2017 to 2018, metallurgical test work conducted on the El Gallo Gold Silver material focused on using conventional flotation techniques to separate the slower leaching silver minerals and enable separate cyanide leaching of bulk flotation concentrate and tailings streams to enhance the silver leaching characteristics. Results have proved favorable and a flowsheet incorporating bulk flotation and separate leaching of bulk flotation concentrates and tailings for treatment of El Gallo Silver has been adopted based on the preliminary test work outcomes.

The El Gallo Silver bulk flotation test work conducted in 2018 indicated that flotation at lower densities significantly improved the flotation kinetics and selectivity of the silver minerals with respect to the non-sulphide minerals. The flotation concentrate leach characteristics for silver were particularly sensitive to the free cyanide concentration. The maintenance of free cyanide level throughout the concentrate leach would be used to maximize silver extraction and also to assist with minimising copper deposition at the subsequent cementation stage.

The leach extraction of silver from the flotation tailings in the recent test work was sufficient to support separate leaching of both concentrate and tailings fractions. Optimisation of leach conditions has not been performed. The marginal economics of silver recovery from flotation tailings could be improved further through optimisation. The El Gallo Silver and Palmarito deposits generally exhibit low and somewhat variable sulphur content, maintaining relatively high silver recoveries would likely depend on the flotation tailings being leached.

14. MINERAL RESOURCE ESTIMATES

14.1 Introduction

This section describes the resource estimation methodologies and summarizes key assumptions considered during the resource estimation processes for all the resource areas. In the opinion of McEwen, the resource evaluations reported are a reasonable representation of the gold and silver mineral resources found at the Project at the current level of sampling. The in situ mineral resources were estimated in conformity with generally accepted CIM Estimation of Mineral Resource and Mineral Reserves Best Practices Guidelines and are reported in accordance with NI 43-101. Mineral resources are not mineral reserves and have not demonstrated economic viability. There is no certainty that all or any part of the mineral resource will be converted into mineral reserves.

The database used to estimate the mineral resources is administered by McEwen and undergoes periodic review, internal audit and continual update. McEwen believes the current drilling information is sufficiently reliable to interpret with confidence the boundaries for mineralization and that the assay data are sufficiently reliable to support mineral resource estimation.

All drill hole database importing and construction, 3D digital modelling, block model generation, interpolation, classification and validation is performed using Datamine's Studio RM v1.3.35.0 geological modelling software.

14.2 El Gallo Silver

14.2.1 Mineral Resource Summary

Two lithological boundaries were interpreted for use in block modelling. These are:

- Top of volcanic sediments/tuff boundary, and
- Top of intrusive basement boundary.

The block model was constrained by interpreted 3D wireframes for the andesite domain and volcaniclastic sediment domain. The andesite domain was further delineated into several separate breccia or contact zones of higher silver grade. Silver and gold grades were estimated into blocks using Ordinary Kriging interpolation.

At a potential cut-off grade of 50 gpt Ag, the El Galo Silver deposit contains an in-pit Measured and Indicated resource of 5.49 Mt grading 125 gpt silver and 0.12 gpt gold and an Inferred resource of 0.564 Mt grading 82 gpt silver and 0.39 gpt gold.

14.2.2 Database

A digital database of all core drilling at the El Gallo Silver deposit was used as the basis for the resource estimate. The database included 587 drillholes and 71,865 assay intervals. Not all of these holes were included in the resource estimate as some were condemnation, geotechnical or metallurgical holes and some lay on the fringes of the drilling area within additional exploration target areas. A total of 475 holes containing 60,142 assay intervals were used in the block model interpolation.

14.2.3 Geologic Model

A detailed description of the geological units can be found in Section 7 of this report. Geology solids were constructed based on a review of digitally imported original, hand drawn interpretations drafted on N-S trending cross-sections at 25 m spacings. These vertical sections run through the entire length of the deposit. Lithologic groups were defined by the logged geology and were grouped into three main units:

- Andesite package;
- Tuff/volcaniclastic sediment package; and
- Quartz monzonite basement.

The tenure of mineralisation for the volcanic sediment and tuff units is different than that of the andesite suite. Therefore, from a grade modelling perspective, defining the boundary between these groups of lithologies is important. The boundary has been interpreted as 2D polylines on vertical, west-facing sections on which were plotted lithological interpretations of the core holes. These lines were then used to generate a 3D surface.

Interpretation of this boundary is subjective in places. The nature of this contact is characterized by successive andesite bodies intruding the older volcanic sediments and tuff units. Dikes of andesite are often encountered in the volcanic sediments and tuff units. Additionally, xenoliths of volcanic sediments and tuff are often found within the larger andesite body. The approach to these challenges to interpreting this boundary was to first, consider the dominant rock type and second, consider the tenure of mineralisation. In other words, where the boundary is ambiguous the boundary has been interpreted where the dominant rock type ceases to be andesite and transitions to volcanic sediments and tuff. If this method yields an unacceptably subjective result, the tenure of silver mineralisation is then considered, such that higher-grade material is included with the andesites and the lower-grade material is isolated to the volcanic sediments and tuff.

The andesite package is the dominant rock type at El Gallo Silver and the principle host rock for the El Gallo Silver mineralisation. Eight 'high-grade' zones were further delineated within the andesite package based on an approximate 30 gpt silver cut-off as well as loose lithological constraints such as siliceous breccia zones and porphyry intrusive contact zones that appear to host the higher-grade mineralisation. McEwen believes that the current geological interpretation is of a reasonable completeness to support mineral resource estimation.

The wireframe volume and drilling information for all domains is shown in Table 43. Figure 69 to Figure 71 show the property geology as mineralized solids and the drillholes used to complete the interpolation.

Domain	Volume (m³)	Number of Drillholes	Assayed Length of Drill Core (m)
Andesites	-	531	60,138.08
HG_IN1	119,020	8	392.65
HG_IN2	1,547,720	169	2,907.66
HG_IN3	66,605	28	217.87
HG_IN4	150,026	18	175.65
HG_IN5	120,301	24	291.83
HG_IN6	651,851	70	818.53
HG_IN7	157,641	26	452.88
HG_IN8	173,319	24	329.65
GZ1-3	67,727	5	111.95
SW1-4	167,886	9	59.90
Volc. Sed.	-	450	18,343.41

Table 43 El Gallo Silver, Wireframe Volume and Drilling Information for All Domains

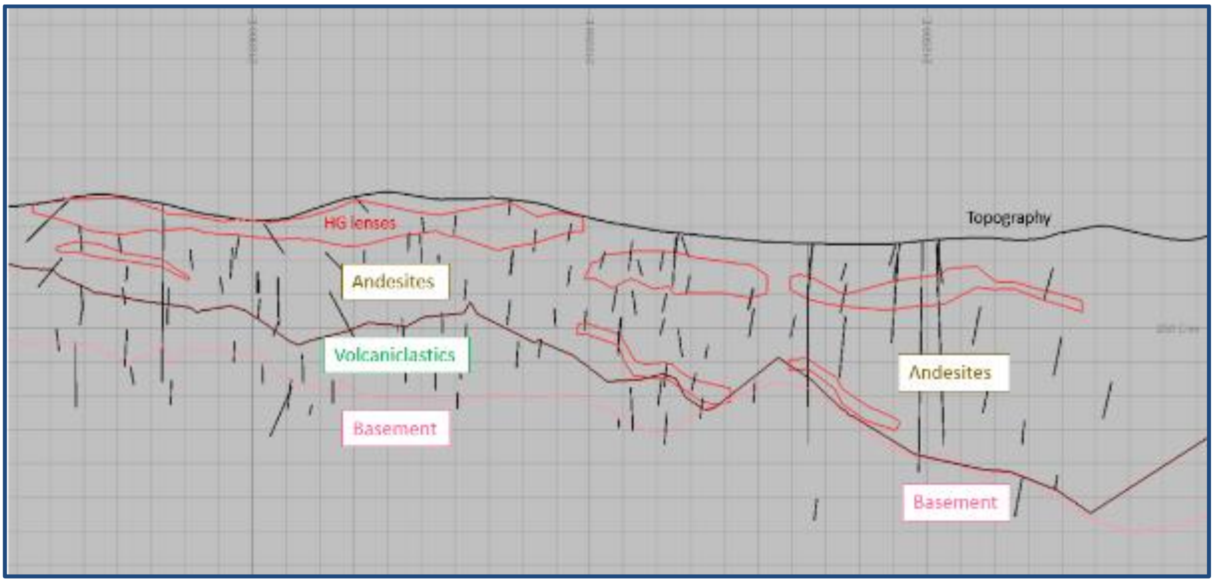


Figure 69 El Gallo Silver cross-section looking North showing high grade lenses, drillhole traces, topography and lithologies

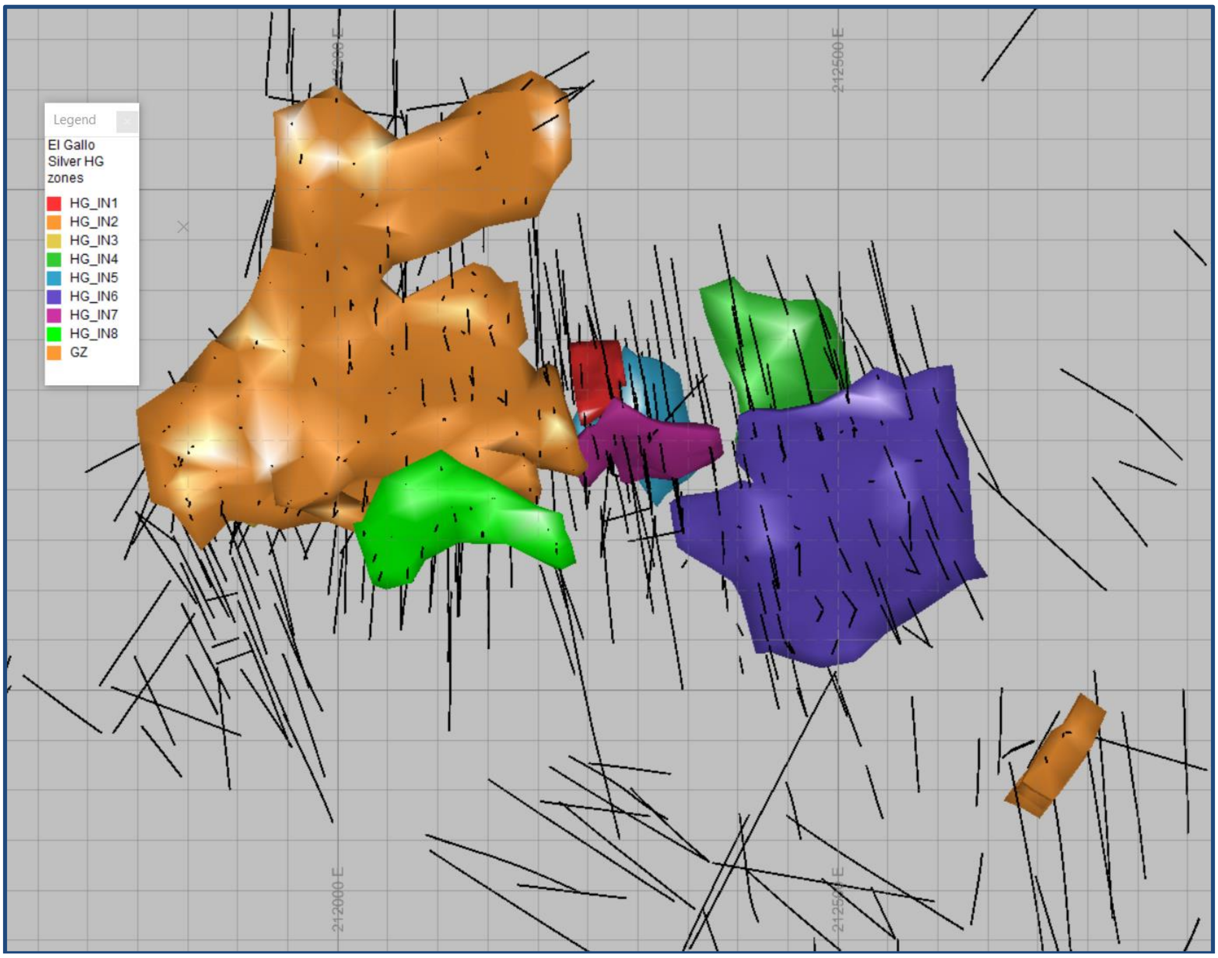


Figure 70 El Gallo Silver Plan view showing high grade lenses and drillhole traces

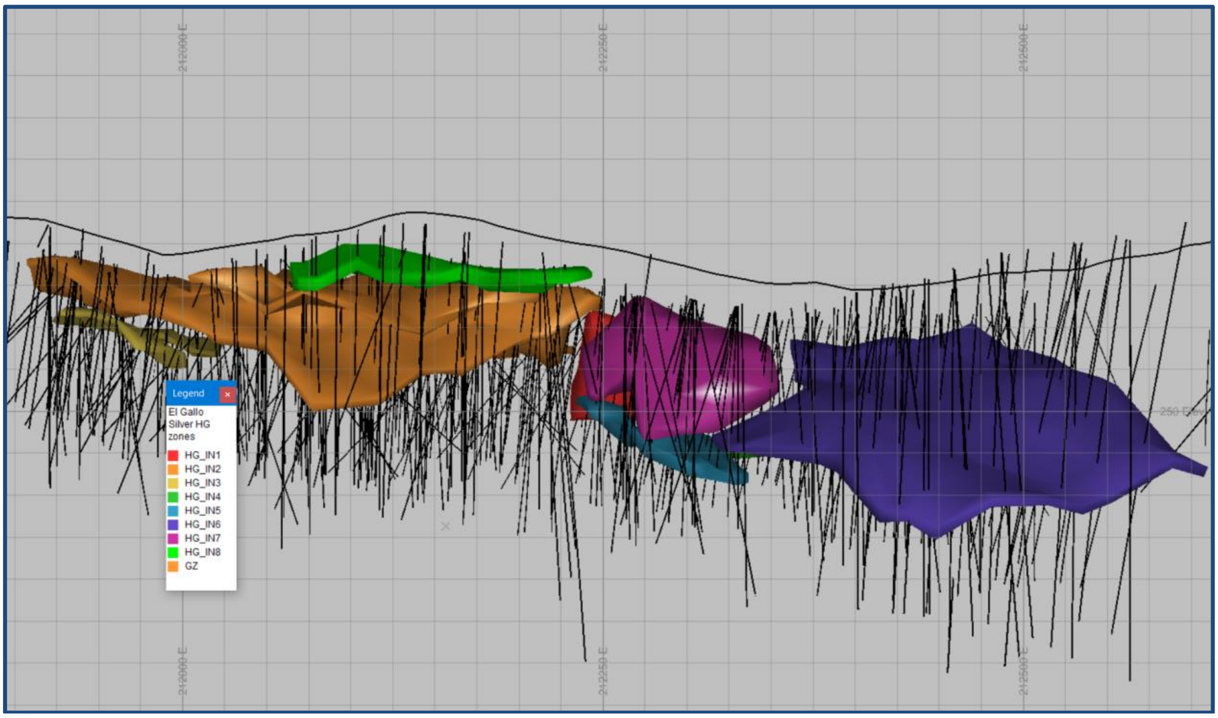


Figure 71 ***El Gallo Silver Looking North showing high grade lenses, drillhole traces and topography***

14.2.4 Topography DTM Generation

IntraSearch Inc. performed an aerial survey of the project area to obtain topographic contours. The area was flown on 24 April 2010 by Keystone Aerial Surveys (Keystone AS) using a Cessna 206 aircraft equipped with a TracAir flight management system and airborne GPS (ABGPS) equipment.

The flight was designed by IntraSearch and refined by Keystone AS. Four flight strips were flown to encompass the desired mapping area, obtaining 40 colour stereo exposures at a scale of 1:9,900. The flight design and scale of photography are suitable to compile and capture photogrammetrically 1 m (3 ft) contours and planimetrics at a 1:1,000 scale by typical mapping industry standards. The film-based aerial camera used is a highly equipped Wild RC-30 camera with technologies including ABGPS. Kodak 2444 Aerial film was the colour negative roll film used.

Eight suitable ground targeted photo control points were requested and supplied by Terra Group, a surveyor company based in Hermosillo. Differential ABGPS techniques were used to increase photo control accuracy for each exposure. Onboard GPS satellite and universal base station recordings were made during the flight mission. Upon film processing and receipt of ABGPS post-processing reports, aero-triangulation was used to tie and adjust all exposure positions as well as calculate relative tip, tilt, and swing of all images. Upon this model, relative GPS and drift corrections for all aerials were made set to the ground control point values from our aero-triangulation software. All accuracy reports show the mission was within standard deviations for a typical 1 m (3 ft) contour mapping effort.

14.2.5 Bulk Density

As per the description in Section 11, density determinations were carried out on 67 mineralized core samples by SGS Laboratories. The samples were sealed with wax followed by immersion in distilled water and measured displacement. The average density of the 67 samples is 2.46 t/m^3 which was rounded to 2.50 t/m^3 and applied to all blocks in the El Gallo Silver resource model.

14.2.6 Assay Statistics

Assay intervals were coded by selected domain wireframes. Block estimation was then restricted to those domains and coded assay intervals. Assay statistics by domain are shown in Table 44. Data analysis was performed by creating cumulative probability and histogram plots of the data.

Assay Statistics – Ag g/t						
Domain	Number of Records	Minimum	Maximum	Mean	Standard Deviation	Coefficient of Variation
Andesite	43,631	0.01	7790	11.73649	110.31	9.40
Andesite >30 g/t Ag	2,333	30.00	7790	160.9402	450.56	2.80
All HG Zones	***5,337***	***0.25***	***18244.5***	***149.71***	***536.44***	***3.58***
HG_IN1	365	1.20	2430	143.39	251.57	1.75
HG_IN2	2,661	0.25	10461	128.52	446.25	3.47
HG_IN3	207	0.25	18244.5	370.01	1428.95	3.86
HG_IN4	173	0.25	3510	113.89	305.19	2.68
HG_IN5	295	0.25	4390	224.96	443.11	1.97
HG_IN6	792	0.25	2260	72.91	133.10	1.83
HG_IN7	544	1.40	12616	315.41	888.57	2.82
HG_IN8	300	1.80	1755	41.64	136.41	3.28
SW zone	46	0.60	2400	140.12	370.29	2.64
GZ zone	110	0.25	17.7	1.93	2.74	1.42
Volc. Seds.	12,625	0.01	4100	4.96777	73.97	14.89

Assay Statistics – Au g/t						
Domain	Number of Records	Minimum	Maximum	Mean	Standard Deviation	Coefficient of Variation
Andesite	43,631	0.0025	39.30	0.02	0.37	18.67
Andesite >30 g/t Ag	2,333	0.0025	39.30	0.11	1.08	10.20
All HG Zones	***5,337***	***0.0025***	***71.60***	***0.14***	***1.65***	***11.96***
HG_IN1	365	0.0025	3.21	0.05	0.22	4.10
HG_IN2	2,661	0.0025	71.60	0.19	2.26	11.68
HG_IN3	207	0.0025	1.62	0.03	0.14	4.85
HG_IN4	173	0.0025	2.71	0.05	0.21	3.99
HG_IN5	295	0.0025	21.50	0.18	1.30	7.41
HG_IN6	792	0.0025	16.20	0.09	0.63	7.33
HG_IN7	544	0.0025	3.95	0.07	0.19	2.94
HG_IN8	300	0.0025	8.53	0.11	0.62	5.74
SW zone	46	0.003	39.30	1.68	6.11	3.63
GZ zone	110	0.008	29.30	1.52	4.36	2.87
Volc. Seds.	12,625	0.0025	1.49	0.01	0.02	3.04

Table 44 El Gallo Silver, Assay Statistics by Domain

14.2.7 Compositing

After reviewing length histograms of the raw assay intervals (Figure 72) for the different domains, it was considered appropriate to composite samples to a maximum of 2 m lengths down the hole, while still respecting the boundaries of the various domains described above. This results in some composites that are shorter than 2 m. Those that are longer than 1.0 m are left as is, while those that are shorter than 1.0 m are dropped. Table 45 shows the composite statistics summary information by domain used in the mineral resource.

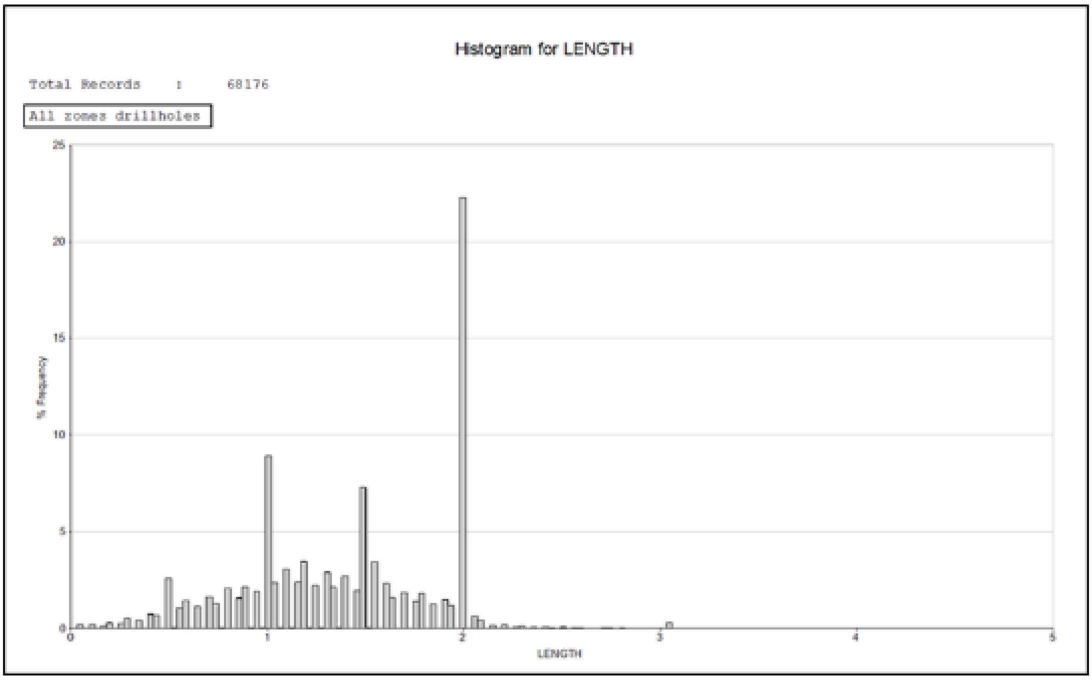


Figure 72 Length histogram of the raw (uncomposited) drill hole assay intervals for El Gallo Silver indicating a preferred 2m composite length should be used.

Composite Statistics (2 m) – Ag g/t						
Domain	Number of Records	Minimum	Maximum	Mean	Standard Deviation	Coefficient of Variation
Andesite	29,915	0.01	5610.6	8.63	65.76	7.62
Andesite >30 g/t Ag	1,390	30.00	5610.6	116.74	283.30	2.43
All HG Zones	***2,832***	***0.25***	***7735.1***	***127.82***	***327.91***	***2.57***
HG_IN1	204	1.20	1009.5	118.54	145.72	1.23
HG_IN2	1,451	0.25	7735.1	116.77	337.21	2.89
HG_IN3	111	0.80	2690.2	219.97	433.91	1.97
HG_IN4	89	3.25	1392.4	104.71	179.88	1.72
HG_IN5	149	0.25	1437.7	207.88	278.21	1.34
HG_IN6	411	0.25	907.9	66.90	86.91	1.30
HG_IN7	250	3.10	5254.4	282.33	582.72	2.06
HG_IN8	167	2.16	616.2	33.35	66.76	2.00
SW zone	30	0.60	714.0	110.39	166.42	1.51
GZ zone	57	0.25	11.4	1.99	2.46	1.24
Volc. Seds.	9,176	0.01	2132.4	3.50	42.27	12.08

Composite Statistics (2 m) – Au g/t						
Domain	Number of Records	Minimum	Maximum	Mean	Standard Deviation	Coefficient of Variation
Andesite	29,915	0.0025	12.15	0.01	0.13	10.85
Andesite >30 g/t Ag	1,390	0.003	12.15	0.06	0.46	7.23
All HG Zones	***2,832***	***0.003***	***57.91***	***0.12***	***1.28***	***10.66***
HG_IN1	204	0.0025	1.53	0.05	0.16	3.40
HG_IN2	1,451	0.0025	57.91	0.17	1.75	10.53
HG_IN3	111	0.0025	1.62	0.03	0.15	5.35
HG_IN4	89	0.0025	0.75	0.05	0.10	2.07
HG_IN5	149	0.0025	10.78	0.17	0.91	5.38
HG_IN6	411	0.0025	6.50	0.07	0.35	5.14
HG_IN7	250	0.0025	2.07	0.07	0.15	2.21
HG_IN8	167	0.0025	3.15	0.08	0.30	3.94
SW zone	30	0.003	10.05	1.03	2.36	2.28
GZ zone	57	0.009	16.92	1.31	3.13	2.40
Volc. Seds.	9,176	0.0025	0.81	0.01	0.01	2.22

Table 45 Assay statistics for El Gallo Silver 2m composited drillhole intervals by domain

14.2.8 Capping

After reviewing a combination of log histograms, probability plots, decile analysis, metal loss calculations and CoV sensitivities for the Ag and Au assays for the domain composites, some capping of grades was performed as follows (see Figure 73 for an example of log histograms):

Domain	Ag	Au
IN1	600	-
IN2 & 3	2600	16
IN4 & 5	-	-
IN6 & 7	2000	-
IN8	450	-
GZ	-	6
SW	-	4
AND	600	4.5
VSED	1200	-

Table 46 Capping grades for different domains

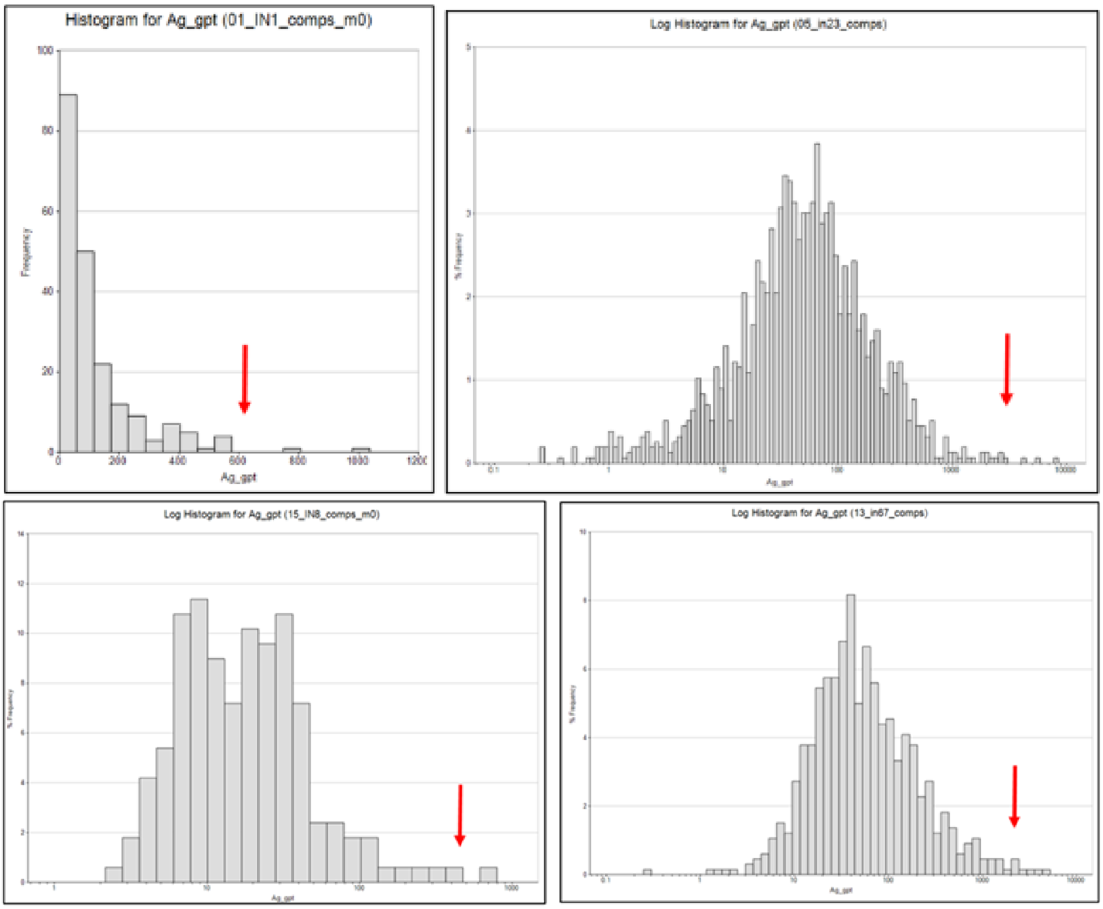


Figure 73 El Gallo Silver: examples of capping grades in the HG zones (IN1, IN2&3, IN&7, IN8)

14.2.9 Spatial Analysis

Spatial analysis for each domain was undertaken to determine the appropriate continuity, orientation and size of search ellipses in the estimation process.

Results of the analysis are tabled below in Table 47.

Domain	Nugget	Rotation1	Rotation2	Rotation3	DistX	DistY	DistZ
HG_IN1	0.21	-60	30	-60	66	40	40
HG_IN2&3	0.12	-20	170	0	52	93	39
HG_IN4&5	0.21	-40	160	-20	32	91	90
HG_IN6&7	0.14	10	170	-30	121	114	23
HG_IN8	0.14	-20	150	-90	43	71	18
Andesite	0.06	0	0	-100	100	65	40
Volc. Seds	0.07	20	10	-30	100	65	40
GZ	0.6	0	0	0	30	30	30
SW	0.6	67	-33	0	40	40	14

Table 47 El Gallo Silver, Interpolation Search Parameters

14.2.10 Resource Block Model

An unrotated block model consisting of 1,257,596 blocks was created in the 3D software. Blocks were coded to the specific domains which thus also matched the corresponding drillhole composite files. Most blocks were 5m x 5m x 5m with some additional subcelling down to half that distance of 2.5 m where domain, lithology or topography boundaries occurred. Blocks were clipped to topography with no "air blocks" present. There has been no historical mining in the area so there is no need to remove or deplete the model for underground or surface workings.

	Minimum	Maximum	Block Size
Easting	210,800	213,005	441
Northing	2,842,300	2,843,715	283
Elevation	-20	445	93

Table 48 El Gallo Silver, Block Model Limits

14.2.11 Interpolation Plan

The interpolation plan for the El Gallo Silver resource estimation model was completed using Ordinary Kriging (OK). Additional runs using the Nearest Neighbour (NN) and Inverse Distance Squared (ID2) methods were also compiled for comparison and later validation.

Search distances were defined based on the variography and drill hole spacing. The OK estimation method used a weighting by length of composite. Grade was estimated into each block using the following samples:

- For HG_IN1 to 8 and GZ & SW coded blocks: a minimum of four and maximum of 15 composite samples from a minimum of two drill holes. Where a second pass was necessary to code grade into empty blocks, the search distance increased by a half and required a minimum of five samples from two drillholes;
- For Andesite and Volcaniclastic coded blocks: a minimum of three and maximum of 15 composite samples from three drillholes. A second pass increased the search ellipse and required a minimum of five samples;

All contacts between lithological domains and the high-grade domains are treated as hard-boundaries, meaning that only composites tagged to each domain are used to estimate the grade within that domain.

14.2.12 Validation

The block model was validated by:

- A visual comparison of block grades and informing sample data on plan and section views to ensure the estimation visually reflected the supporting data (example sections in Figure 74);
- Swath plots (section by section) comparison between ordinary kriging (OK), Inverse Distance estimation (ID) and the original declustered dataset (5 metre composites interpolated by nearest neighbourhood method) at a zero cut off (Figure 75);

The results of the validation show that the block model acceptably reflects the assay sample data.

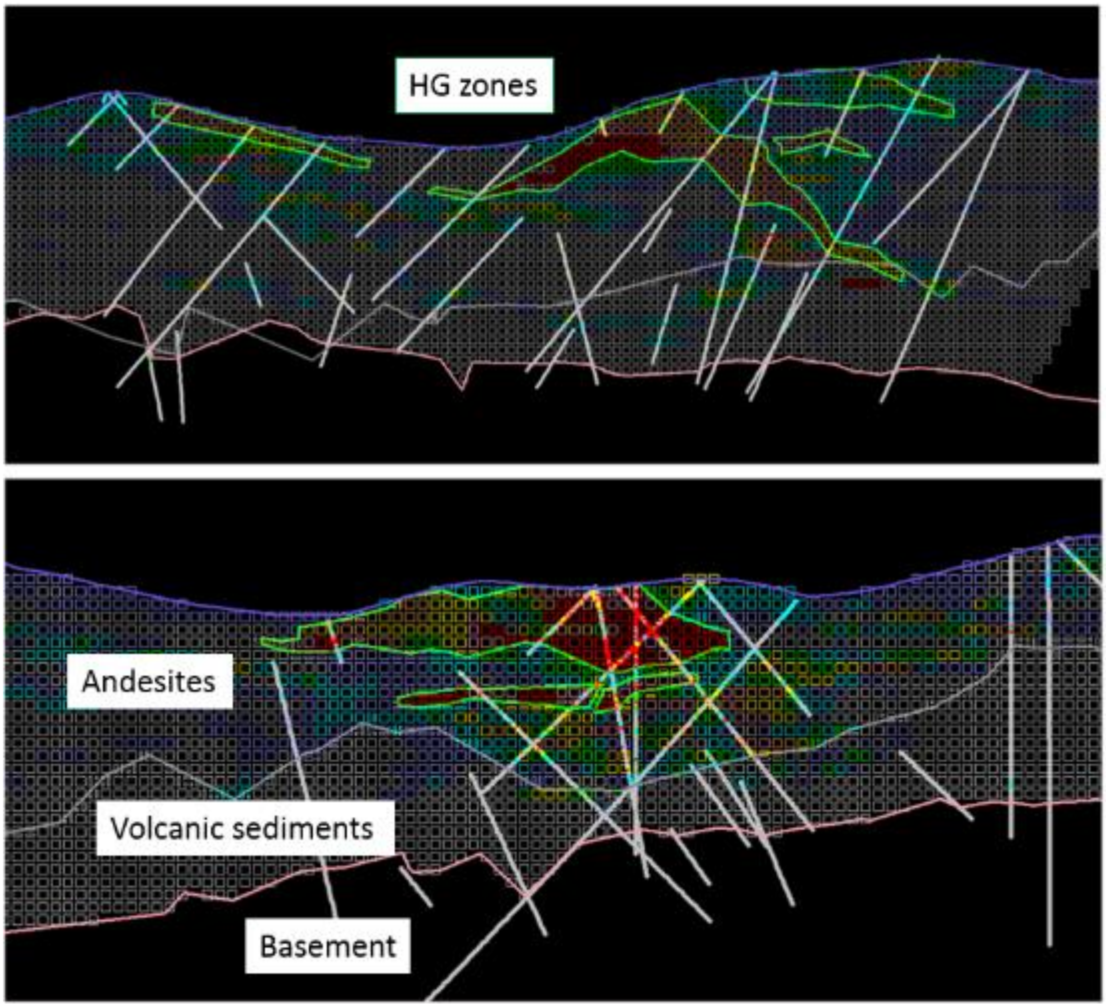


Figure 74 Validation El Gallo Silver: example cross-sections showing block model grades against drillhole intervals

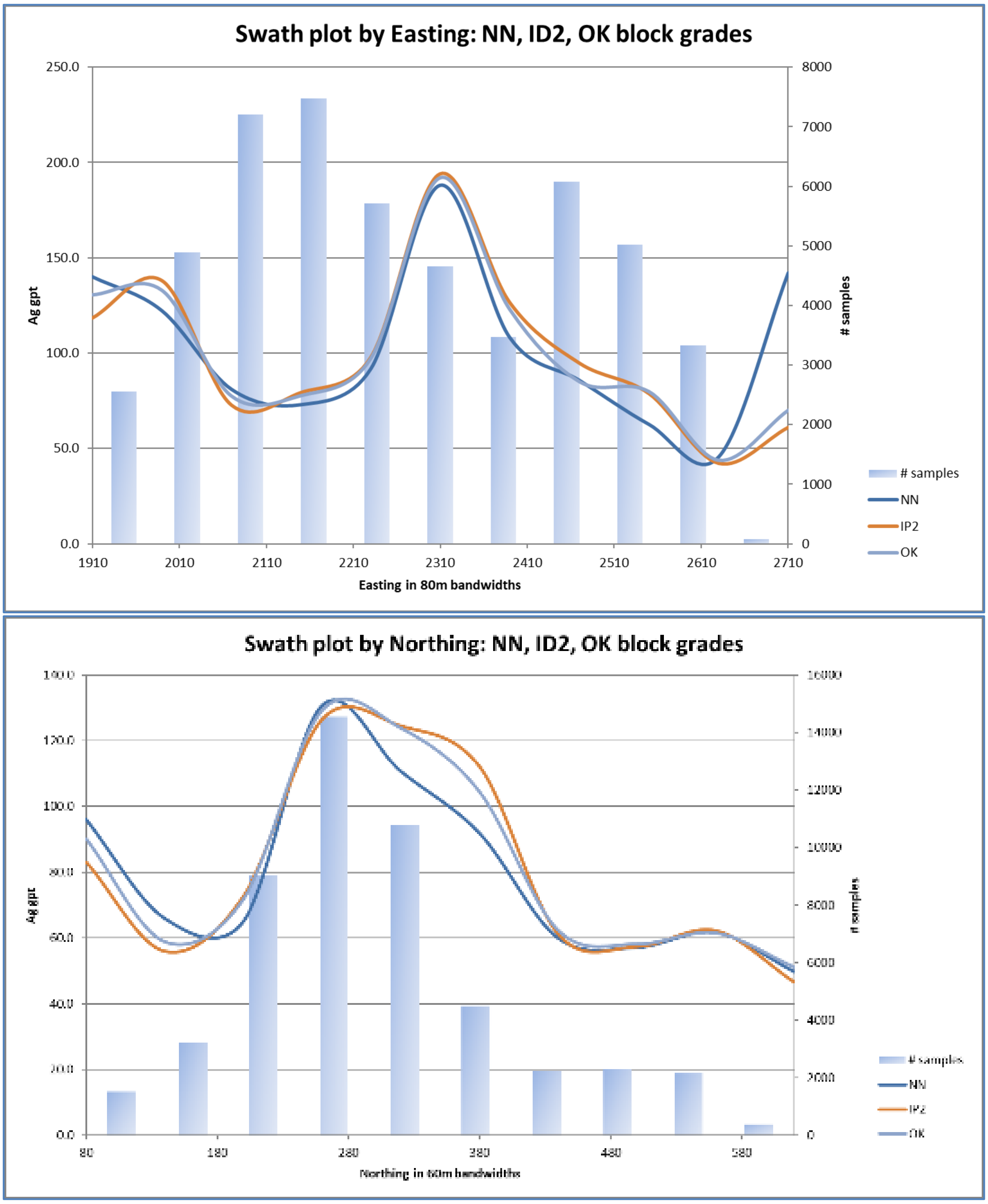


Figure 75 Validation El Gallo Silver: swath plots in Easting and Northing bands comparing OK, ID and NN estimations

14.2.13 Classification

Classification usually considers confidence in the geological continuity of mineralized structures and the quality and quantity of informing data. McEwen is satisfied that the mineralization model honors the informing data where the location and accuracy of assay data are sufficiently reliable to support resource evaluation in the high grade mineralized structures and lower grade peripheral mineralization in the andesites and volcanic sediments.

Classification into Measured, Indicated and Inferred categories was dependent on the spacing of drillholes, the number of composite samples and the number of samples that could be used from each drillhole. The general rule of thumb initially followed was to use 1/3x, 2/3x and 1x the search ellipse dimensions for the Measured, Indicated and Inferred categories and progressively requiring a minimum of seven samples from either four, three and two drillholes respectively. Secondly, where areas of obvious continuity, in either category were temporarily interrupted by another category, a recoding by manual intervention was undertaken. Any block not classified outside of the main Inferred domain was labelled as absent and removed from the model.

Additionally, because NI 43-101 and CIM guidelines stipulate that a resource exists "in such form and quantity and of such a grade or quality that it has reasonable prospects for eventual economic extraction," the resource is being reported within an optimized pit that uses reasonable metal prices and reasonable mining and processing costs for deposits of this nature and for the expected mining conditions and methods and metallurgical extraction.

14.2.14 Mineral Resource Statement

Table 49 below reports the in-pit mineral resource inventory at El Gallo Silver:

Potential COG 50gpt Ag	Tonnes	Silver Grade gpt	Silver oz	Gold Grade gpt	Gold ozs
Measured	1,057,000	150	5,088,000	0.09	2,900
Indicated	4,436,000	120	17,053,000	0.13	18,600
Meas. & Ind.	***5,493,000***	***125***	***22,140,000***	***0.12***	***21,500***
Inferred	565,000	82	1,488,000	0.38	6,900

Table 49 Mineral Resource Statement for El Gallo Silver.

Notes:

- CIM definitions and guidelines were followed for the estimation of mineral resources.
- Reasonable metal prices of $18/oz silver and $1,250/oz gold were used for the optimized pit. Milling recovery assumptions of 87.6% silver and 79.2% gold. Mining costs of $1.95/t, processing and G&A costs of $23.29/t milled were used. Resource models have been developed based on gold and silver recoveries from historical testwork programs, which were based on a different process flow sheet to what has been adopted for the project.
- Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability. There is no certainty that all or any part of the Mineral Resources estimated will be converted into Mineral Reserves. Numbers in the table have been rounded to reflect the accuracy of the estimate and may not sum due to rounding.

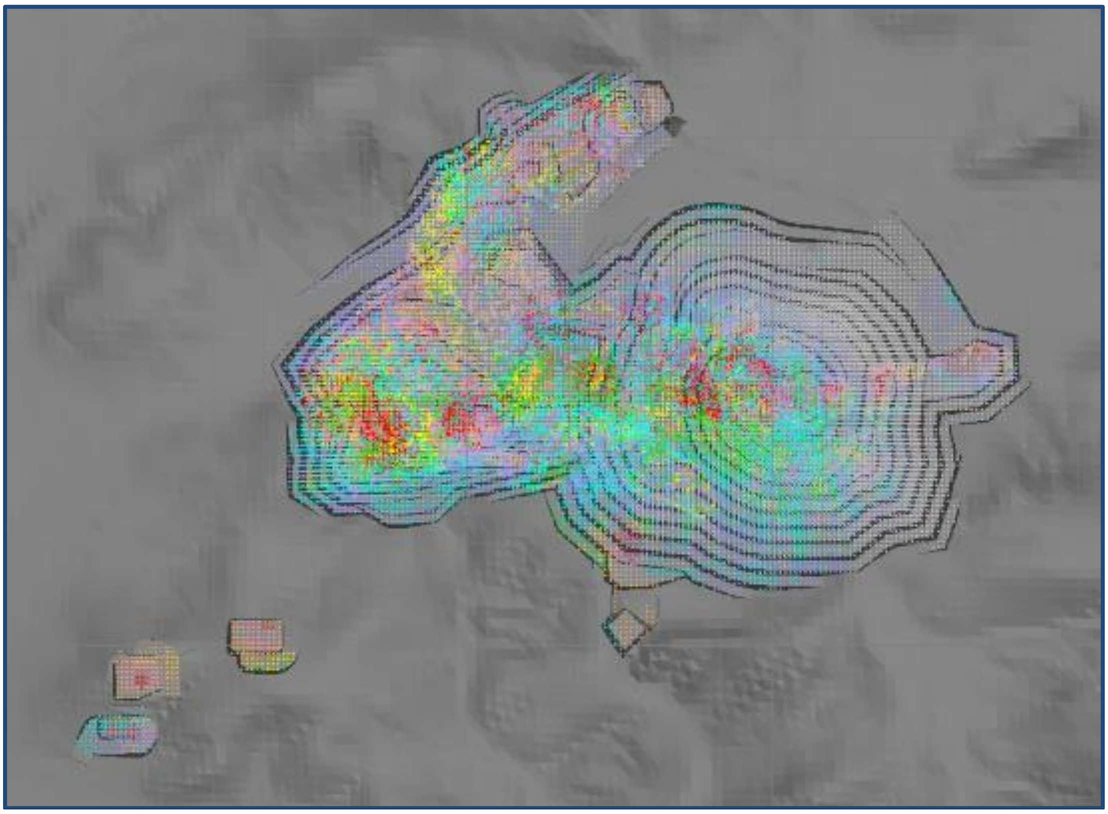


Figure 76 In-pit resource: El Gallo Silver resource blocks lying within the optimized pit shell

14.3 Palmarito

14.3.1 Introduction

The Palmarito resources are partitioned into three categories i) in situ material; ii) historic dumps and iii) historic tailings.

The in situ resources consist of the material undisturbed by past mining activity. The dump resources consist of material that was mined in the past, but not processed. This material currently resides in waste piles proximal to the old mine workings at Palmarito. The tailings piles are the mill tailings from the previous processing operations at Palmarito. This material currently resides in a dry tailings pond south of the old mine workings and are not yet considered a resource but may be considered at a later date if sampling, assaying and metallurgical testing studies warrant further investigation. They are not considered further in this report. Where appropriate, the following discussion of the resource estimate for Palmarito will address the in situ and dump resources separately.

14.3.2 Topography

There are two sources of topographic data used to help estimate the resources for Palmarito. The first is an aerial survey of the entire project site. The second is a ground survey of the waste dumps.

Aerial photography and photogrammetry of the project area was completed by Intrasearch Inc. in April 2011 using fixed stations as control points for the aerial survey.

The dumps were surveyed in August 2008 and March 2011 by Geotopografia y Construcción (Guasave, Sinaloa, Mexico). A total of 646 points were surveyed using a geodesic Trimble 5800 GPS.

14.3.3 Drill hole database

The in situ and dump resource estimates are based on two drill hole and sampling databases established and maintained by McEwen. Core and reverse circulation (RC) holes were used mostly for the in situ resource estimate; however, some were collared in the dump material. As a result, the dump intercepts of these holes were used to model the Dump material. The second database contains data for pits excavated within the dump domains.

Table 50 and Table 51 summarize the drill hole statistics for the data used to model the in situ and dump resources, respectively.

Parameter	Value
Number of Holes	304
Average Hole Length (m)	134.15
Minimum Depth	20
Maximum Depth (m)	506
Metres of Total Drilling	40,781.73
Underground Channel Samples	10
Average Sample Length (m)	1.47
Number of Sampled Intervals	27,085
Total Metres Sampled	39,747.54
Average Silver Grade (g/t)	12.17*
Minimum Silver Grade (g/t)	<0.5 (Detection Limit)
Maximum Silver Grade (g/t)	5,870
Average Gold Grade (g/t)	0.04*
Minimum Gold Grade (g/t)	<0.005 (Detection Limit)
Maximum Gold Grade (g/t)	7.97

Note: *Sample statistics exclude intercepts within the dump material. *Weighted by sample length*

Table 50 Palmarito In Situ drill hole data statistics

Parameter	Value
Number of Dump Holes	64
Average Hole Length (m)	2.15
Minimum Depth	0.6
Maximum Depth (m)	4.2
Average Silver Grade (g/t)	187.93*
Minimum Silver Grade (g/t)	3.2
Maximum Silver Grade	654
Average Gold Grade (g/t)	0.28*
Minimum Gold Grade (g/t)	0.007
Maximum Gold Grade (g/t)	0.935

Note: *Sample statistics exclude intercepts within the dump material. *Weighted by sample length*

Table 51 Palmarito Dumps drill hole data statistics

14.3.4 Definition of Model Domains

For the in situ and dump material, McEwen has defined finite volumes which restrict the bounds of the resource estimates. These finite volumes are referred to as domains. The following is a description of McEwen's methods for defining these domains in each material type.

In Situ Domains

There are two separate zones of mineralization identified at Palmarito. The first is the Main Zone, which has a tabular form and takes the shape of a folded antiform that plunges to the northeast. The second, called the West Zone, is a tabular zone that strikes to the north/northeast and dips to the east at 60 degrees. In previous models, domains intended to restrict grade interpolation to these two zones. Because of the "antiform-like" geometry of the Main Zone, three distinct but contiguous domains were created (these domains are referred to as North Limb, Nose and South Limb). A separate domain was created for the West Zone. Figure 77 illustrates the in situ domains for Palmarito. A three-dimensional wireframe was generated for each of these domains. The contacts for these domains were drawn to approximate the 10 gpt silver (0.32 troy ounces) limit of the mineralized zone. The grade limit of 10 gpt silver was chosen as it represents a natural statistical break in the drill hole data. Where the deposit is open (typically down-dip), the domain has been extrapolated up to 492.1 ft (150 m) beyond the drill hole data. Further constraints are applied to the extrapolation of the resource estimate by the search ellipse. This is described below.

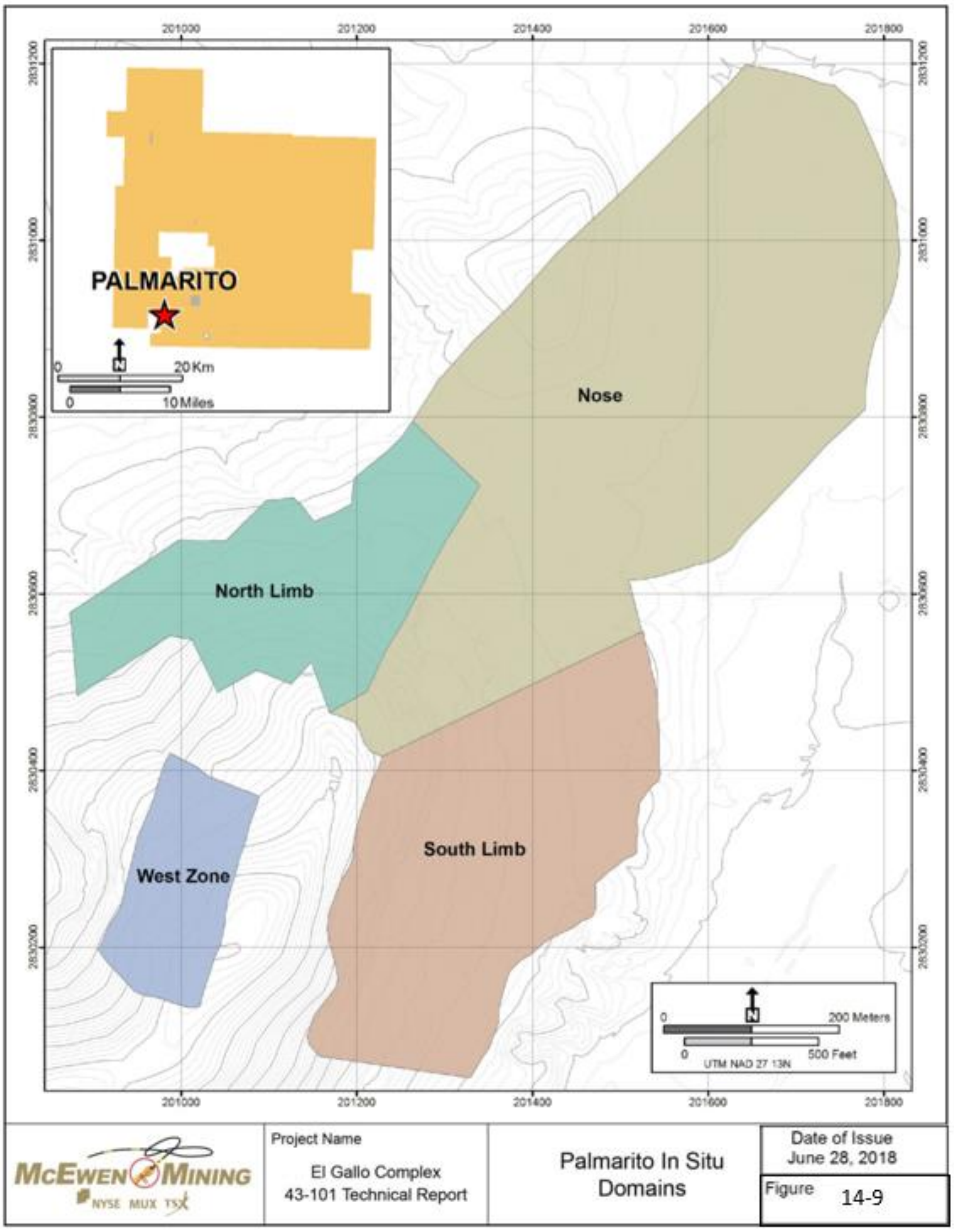


Figure 77 Palmarito In situ domains

The domains (wireframes) generated previously by Pincock Allen and Holt were also used in the current resource modeling iteration as no significant changes to them were deemed necessary. As in previous estimates, variography and grade interpolation were done separately for each domain (see below).

Underground Workings

The historic underground workings (consisting of an open "glory-hole" leading into a cross-cut adit at depth) were originally modeled by Pincock Allen and Holt based on drill holes that intersected the workings. A three-dimensional wireframe was created representing the shape of the workings. This wireframe was updated by McEwen on the basis of more recent infill drilling which further defined the location of the workings. During block modeling of the in situ domains, blocks that fell within the workings were removed from the model.

Dump Domains

As described above, a detailed survey of the dump material was conducted in 2008 and a topographic map was produced from this survey. After studying this topographic map, it was previously concluded that the dump material was deposited in a series of six lifts. It was deemed likely that each lift represents material from a discrete episode of historic mining. Another possibility is that these lifts were used to segregate different grades of material. In either case, it was concluded that the silver and gold content of one lift is representative of the others. As a result, the domain around each individual lift was constructed as shown in Figure 78.

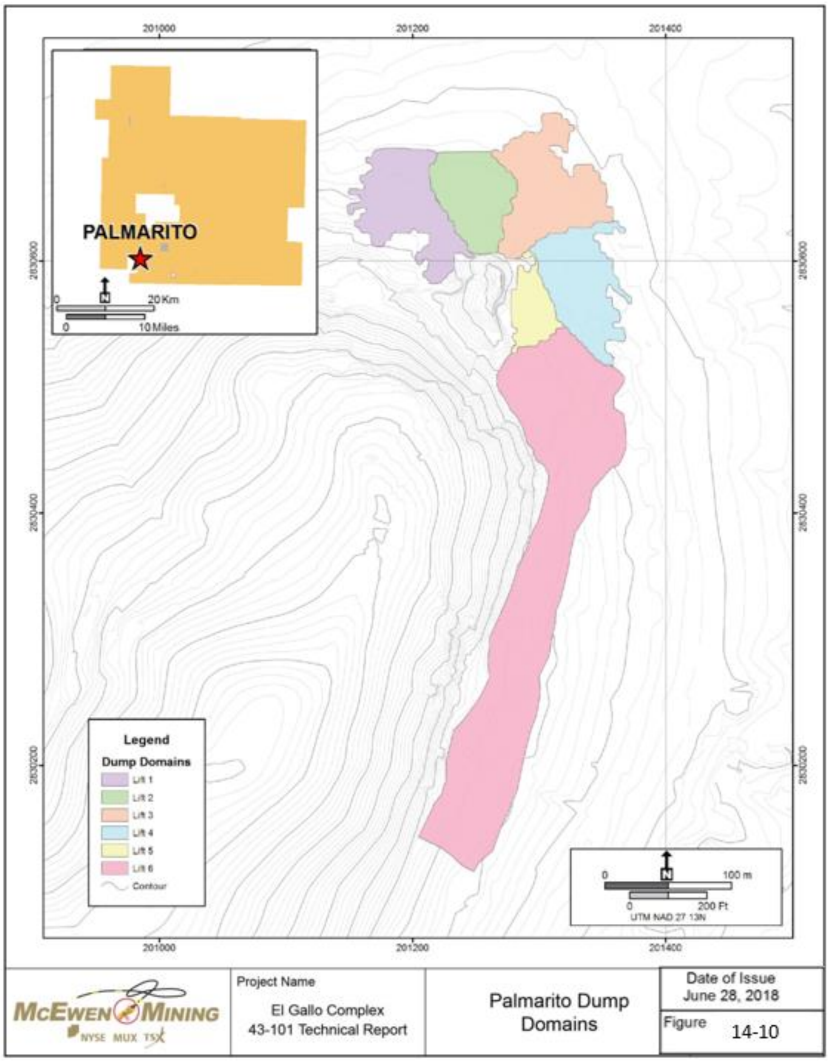


Figure 78 Palmarito Dump domains

Aside from the boundaries between lifts, the top, bottom and horizontal boundaries of the dump material were established. The top of the dump is defined by the topographic map referenced in the previous paragraph. The horizontal limits of the dump material are defined by the limits of the survey. The bottom of the dump was previously interpreted and used in this estimate. This was done using information from the drillhole database and the topographic map of the greater project area. In general, the dump bottom accounted for the dimensions of the pits and drillholes that intercepted the dump material. Also, the overall shape of the dump bottom was designed to mimic the natural grade of the surrounding hillside.

14.3.5 Compositing

In situ Composites

Prior to grade modelling, the silver and gold assay sample data from drillhole intercepts of in situ material were composited. This was done to normalize the sample lengths. The compositing logic is as follows:

1. Composite length is 5 m (16.4 ft).
2. Composite lengths are measured down the hole.
3. Truncated composites at the bottom of holes containing less than 50% of the composite length were not used.
4. Composite grades are calculated as the weighted average by volume of samples within the composite interval.

Dump Composites

Drillholes and sample pits provide the assay information for the dump material. For each pit, a single composite sample was taken representing the grade of the full depth of the excavation. For these samples, no further compositing was done. The drillhole samples were composited to the full length of the dump intercept for each hole. This was done to remain consistent with the pit samples. As with the in situ composites, the composite grades for these drillholes were calculated as the weighted average by volume of samples within the composite interval.

14.3.6 Block Models

Each material type (in situ, dump) was modelled separately. Furthermore, the four domain wireframes for the in situ material were interpolated separately and then combined to estimate a total resource within the wireframes. A global in situ model was also created to estimate mineralized resource both within and outside of the four wireframes. Care was taken to ensure that there was no overlap in models where the in situ resource is proximal to the dump resource. The geometry of these block models is detailed in Table 52.

Four-Domain In situ Model (Wireframes Combined)	X	Y	Z
Origin	200,882.5	2,829,802.5	-439.5
Block Size	5	5	5
Rotation	No Rotation		
Number of Columns	195		
Number of Rows	296		
Number of Levels	128		
Global In situ Model (Material In and Out of Wireframes)	**X**	**Y**	**Z**
Origin (UTM NAD 27)	200,797.5	2,829,797.5	-439.5
Block Size, m	5	5	5
Rotation	No Rotation		
Number of Columns	212		
Number of Rows	295		
Number of Levels	134		
Dump Model	**X**	**Y**	**Z**
Origin	201,138	2,830,412	150
Block Size	5	5	2
Rotation	No Rotation		
Number of Columns	50		
Number of Rows	65		
Number of Levels	127		

Table 52 Palmarito Block Model Geometries

14.3.7 Grade Modeling

The composited assay data were used to populate the block models with silver and gold grades. In situ material modelling utilized drillholes and nine underground workings. The dump model used drillholes (some of which were collared in dump material) and sample pits.

Grade Capping

No grade capping or restriction was applied to assays or composites prior to interpolation. In general, Palmarito mineralization exhibits good grade consistency with few high-grade assays. McEwen investigated the possibility of grade capping by analyzing composite histograms and cumulative frequency plots to identify outliers in the population (Figure 79). It was concluded that such outliers were not present and that there was low risk of unreasonable stretching of high grades during interpolation. Grade capping was thus deemed not necessary.

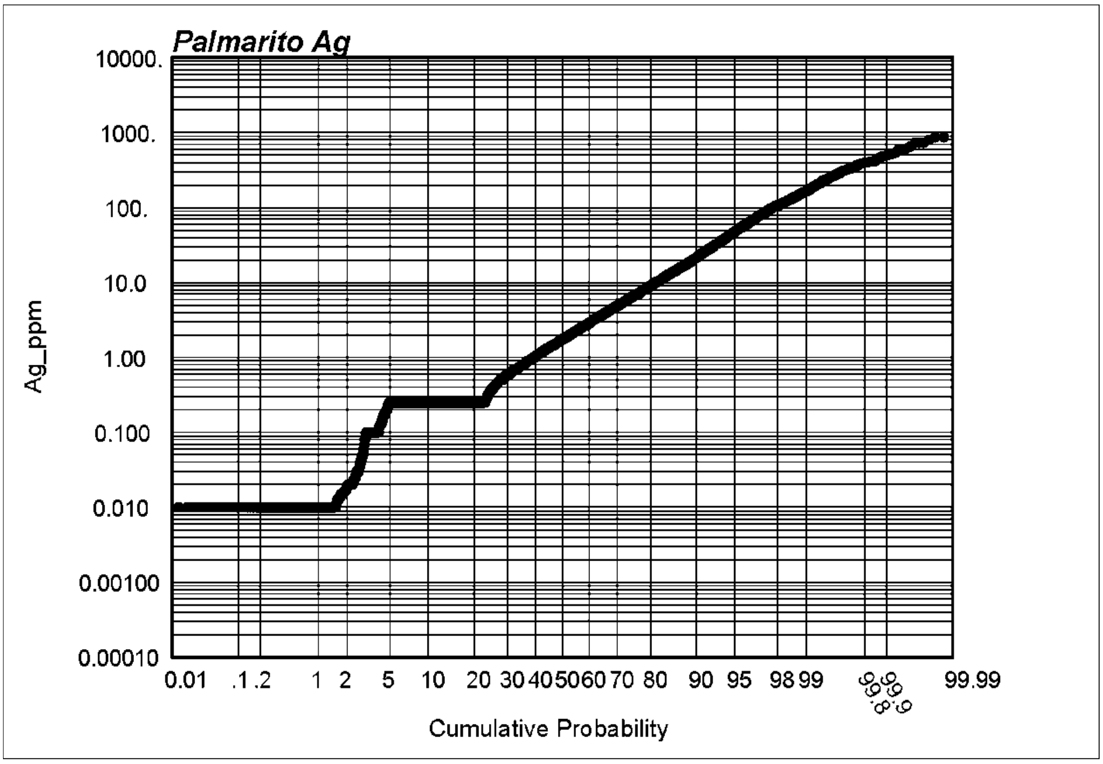


Figure 79 Palmarito Cumulative probability plot for composite samples

Variography of In situ Data

McEwen conducted variography analysis of the silver grades in the in situ material. This was done to assess the possibility of using OK for modelling silver grades, define semi-variogram models to be used with OK and establish search ellipse parameters to be used during modelling.

Within each domain, McEwen generated directional semi-variograms along several orientations. From these, a primary axis of continuity was picked for each domain. The semi-variograms for the primary axes all showed sufficient structure that they could be modelled for use in OK. Semi-variograms were then generated in several directions normal to the primary axes, from which the secondary axes of continuity were picked. The structures of the semi-variograms for the secondary axes were less pronounced. By default, the tertiary axis of continuity is normal to both the primary and secondary axes. As should be expected, this axis is normal to the orientation of the tabular mineral deposit. Silver variogram parameters for the dominant structure for each domain are listed in Table 53.

Parameter	In situ Domain			
	North Limb	South Limb	Nose	West Zone
Nugget	0.119	0.167	0.246	0.027
Sill	0.649	0.515	0.375	0.029
Rotation about Z Axis	-61.5	32.5	-22.7	-58.1
Rotation about X Axis	1.4	-52.1	34.5	-6.1
Rotation about Y Axis	20.5	7.9	12.6	31.5
Range along Z Axis, m	11.8	5.3	22.8	3.9
Range along X Axis, m	47.1	24.1	99.1	18.9
Range along Y Axis, m	28.7	238.3	360.5	138.9

Note: *All rotations are according to the GSLIB conventions (Deutsch & Journal, 1998). First, rotate around the Z axis according to the left-hand rule. Second, rotate around the rotated X axis according to the right-hand rule. Third, rotate around the rotated Y axis according to the right-hand rule*

Table 53 Palmarito in situ variography parameters

In situ Grade Estimation

McEwen interpolated the silver grade for qualifying blocks using OK. Gold was interpolated separately. Interpolations used a minimum of two and a maximum of four composites to assign grades to a block. A 250 m omnidirectional search was used with weighting assigned according to the variography. Because the domains are not treated as hard boundaries, composites outside of the bounds of a given domain may influence the grade of a block within those bounds. Grade modelling for each of the four domains was restricted to those blocks that were at least 50% within the defined wireframe representing that domain. As mentioned above, blocks that fell within the underground workings wireframe were omitted from the model. The block model was also trimmed to topography by removing any block from the model whose midpoint extended above the topographic surface.

Dump Grade Estimation

The dump model is restricted to those blocks that are within the mineralized dump domains. Only blocks that have at least 50% of their volume contained within a domain qualify to receive an interpolated silver and gold grade.

Blocks were then tagged with a code representing in which of the six domains they are found. These domains are treated as hard boundaries during the interpolation process. Consequently, the interpolated grades for a block within a given domain will only be influenced by composites of the same domain.

Both silver and gold grades were interpolated using the same methods. Blocks grades were calculated using the ID^2 interpolation algorithm and a spherical search radius of 300 m (985 ft). Any qualifying block with at least one composite in its search ellipse receives a grade. A block is limited to only the closest 12 composites during interpolation.

14.3.8 *Grade Model Validation*

The modelling methods described above are the result of iterative modelling undertaken over a period of three years. Original grade modelling by PAH in 2010 and 2011 explored several interpolation methods. In addition, PAH had undertaken a validation of the 2010 in situ, dump and tailings models by comparing the OK models to NN models and concluded that OK was a reasonable representation. Furthermore, all the block models created were reviewed by McEwen on cross-section. Such reviews were designed to determine if the block grades are a fair and reasonable representation of both the composite data and McEwen's understanding of the deposit geology. It is McEwen's conclusion that the current model is a reasonable representation of the deposit.

14.3.9 *Densities*

Two density values were used while generating the resource estimate for Palmarito. The values below are used for the in situ and dump material:

- In situ material: 2.55 t/m^3;
- Dump material: 2.00 t/m^3;

These values are consistent with the average densities calculated from the density determinations described in Section 11.

14.3.10 *Classification*

Blocks in the in situ model were classified according to the following scheme.

For blocks contained within the four domain wireframes:

- Measured: Used minimum of three drill holes with the closest hole less than 25 m;
- Indicated: Used a minimum two holes with the closest hole less than 50 m; and
- Inferred: Used a minimum of two holes.

Blocks located outside of the four-domain wireframes were classed as Inferred. Blocks that fell outside of this pit shell were also classified as Inferred (most of these blocks would have also been located outside of the four-domain wireframes).

Dump Classification

All blocks within the Dumps model are assigned a classification of Indicated.

14.3.11 Mineral Resource Estimate

The estimated mineral resources for the in situ and dump material at Palmarito are detailed in Table 54. Because NI 43-101 and CIM guidelines stipulate that a resource exists "in such form and quantity and of such a grade or quality that it has reasonable prospects for eventual economic extraction," the resource is being reported within an optimized pit (for in situ material) that uses reasonable metal prices and reasonable mining and processing costs for deposits of this nature and for the expected mining conditions and methods and metallurgical extraction. The dump material is not constrained by a pit.

Resource	Tonnage (Kt)	Silver (koz)	Silver Grade (g/t)	Gold (koz)	Gold Grade (g/t)
Palmarito in situ	(Potential Cut-Off Grade = 70 g/t Ag)				
Measured	1,653	7,245	136	20	0.38
Indicated	11	52	148	0	0.23
Meas. & Ind.	***1,664***	***7,297***	***136***	***20***	***0.38***
Inferred	528	2,258	133	5	0.30
Palmarito Dumps	(Potential Cut-Off Grade = 52 g/t Ag Eq.)				
Measured	177	1,007	177	0.29	2
Indicated	68	338	154	0.24	1
Meas. & Ind.	***246***	***1,345***	***170***	***0.28***	***2***

Table 54 Palmarito Mineral Resource Estimates (in-pit resources)

Notes:

- CIM definitions and guidelines were followed for the estimation of mineral resources.
- Reasonable metal prices of $18/oz silver and $1,250/oz gold were used for the optimized pit. Milling recovery assumptions of 57.2% silver and 88.4% gold and 81.5% silver and 87.4% gold for the in situ and dump material respectively. Mining costs of $1.95/t in situ and $1.00/t dump, processing and G&A costs of $23.29/t (in situ and dump) milled were used. Resource models have been developed based on gold and silver recoveries from historical testwork programs, which were based on a different process flow sheet to what has been adopted for the project.
- Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability. There is no certainty that all or any part of the Mineral Resources estimated will be converted into Mineral Reserves. Numbers in the table have been rounded to reflect the accuracy of the estimate and may not sum due to rounding.

14.4 El Gallo Gold

14.4.1 Introduction

The mineral resources for El Gallo Gold are reported for five distinct areas: Samaniego-San Rafael, Lupita, Central, Sagrado Corazon and the Heap Leach Material (HLM). All resources constitute the current working areas of the El Gallo Gold which has been in continual production by McEwen since September 2012, but as described in earlier chapters, has been operated and mined in different guises for many years before this. The current resource (except for the HLM) as it stands today is largely considered to be mined out and is expected to cease mineral extraction from the open pits and stacking of new material onto the heap leach in mid-2018. A recent Google Maps satellite image of the El Gallo Gold area is shown below (see Figure 80).

Figure 80 Google Maps Satellite Image of the El Gallo Gold

14.4.2 Coordinate Conversion

As part of the resource model, all of the spatial data, structural zone interpretations and block models was converted from the local grid system historically used at El Gallo Gold to the Universal Transverse Mercator (UTM) zone 13, using North American Datum (NAD) 27.

14.4.3 Topography

The topography at the El Gallo Gold is covered by the same aerial survey conducted by IntraSearch Inc. in 2010 as described in section 14.2.3 above. Contours are provided at 3 ft (1 m) intervals.

At El Gallo Gold, daily production rates and mine reconciliations are completed using MineSight software. Working faces are surveyed daily using a Trimble R-8 GPS unit with a Leica TS02 total station to determine daily production rates.

14.4.4 Drillhole Database

The drillhole database for El Gallo Gold consists largely of RC (843) and an increasing number of core holes (445). Table 55 shows the contents of the sample database. Drill holes were generally sampled at 1.5 m (5 ft) intervals. Database sample intervals consistently include data for gold and sporadically for silver and copper. Samples with less than detectable gold values are recorded in the database at the detection limit or at a percentage of this limit, depending on when the work was done. Earlier threshold results that constitute the bulk of the database are recorded at 40% of the detection limit (40% of 0.030 g/t or 0.012 g/t). It is noted that locally these 0.012 g/t values have been rounded to 0.010 g/t. Subsequent drilling has been recorded at the analytical threshold (0.005 g/t).

Deposit	Number of Holes	Total Metres	Number of Samples
Samaniego/San Rafael	867	120,054	56,997
Sagrado Corazón	128	15,718	9,988
Lupita-Central	273	38,655	26,646
Heap Leach Material	20	643	412

Table 55 El Gallo Gold Drillhole Database

14.4.5 Compositing Procedures

Samaniego, San Rafael, Sagrado Corazon

Samples were composited to a consistent 5 m (16 ft) length down the hole, starting at the drillhole collar. Composite statistics for the San Rafael and Samaniego Hill structural zones are similar and show relatively lognormal populations. The upper Samaniego zone (zone 9) shows similar gold grade distribution, but atypical silver and copper distributions.

Heap Leach Material

Each drillhole through the Heap Leach Material was sampled on a consistent 1.5 m basis, except for a few holes where the last sample length increased to accommodate the end of hole depth – these samples were no more than 1.9 m. Therefore, compositing would not benefit the estimation process in this instance. Sample intervals remained at their original lengths.

Lupita and Central

Samples were composited to 1.5 m lengths down the hole starting at the collar. Samples were coded to the name of each discrete wireframe they passed through to assist in the interpolation process.

14.4.6 Grade capping

Samaniego, San Rafael, Sagrado Corazon

A statistical analysis of gold composite grades was completed in order to locate high grade outliers within the population. One outlier was identified in hole M-130. This composite has a grade of 38.05 grams gold per tonne, which is over 55 percent greater than the next highest composite grade of 24.41 grams gold per tonne. During block grade interpolation, the grade of this outlier was cut to 24.41 grams gold per tonne.

Heap Leach Material

The gold distribution within the leach pile is shown on a log histogram in Figure 81. Because the leach pile is still considered actively leaching, there are some higher grades towards the top being the more recently placed material and lower grades towards the base which has spent the longest time under the leaching conditions. Maximum grades of only 4.5 gpt indicate there would be no excessive smearing of higher grades (with no capping) in the estimation process. Due to the significant amount of re-handling through mining, crushing, stockpiling and loading of the pile it is considered that there is sufficient blending of mineral grades across the pile.

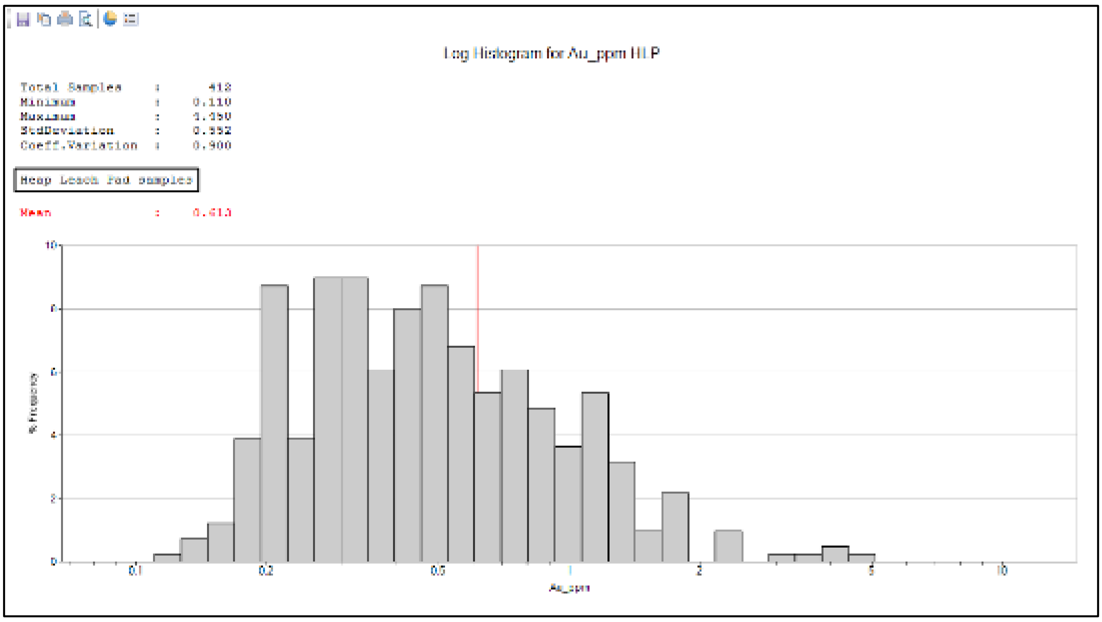


Figure 81 Heap Leach Material Log Histogram for Au Grades in Sample Intervals

Lupita-Central

A statistical analysis of gold composite grades was undertaken to determine if capping higher grades was necessary. It was determined that a cap grade of 40 gpt Au (located at the break of the log probability plot and log histogram of Au composite grades in Figure 82) would be suitable for the Lupita-Central model.

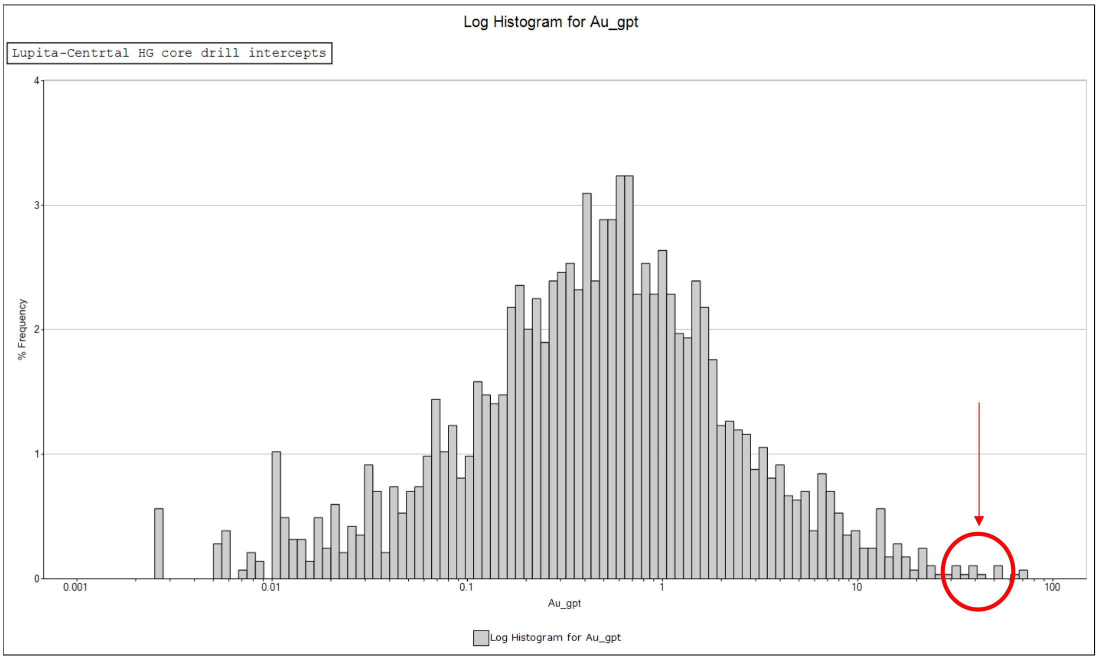


Figure 82 Lupita-Central log histogram for Au showing 40gpt cap chosen

14.4.7 Definition of model domains

Samaniego, San Rafael, Sagrado Corazon

Geological interpretations of the structural zone trends were conducted on geologic cross sections. Zone boundaries were delineated at a nominal 0.2 g/t gold grade in concert with other geologic considerations. Generally, one sample-interval points were not included in the zone boundary unless directly along the trend of a specific mineralized zone and even then, a minimum of three consecutive sample intervals were generally included. Longer mineralized intervals were not included if they could not be correlated to at least one adjacent drillhole. The structural zone interpreted shapes were then digitized and projected to 5 m (16 ft) bench plans. A further geologic interpretation was made on the bench plans, guided by the projections from the cross sections. The resulting structural zone shapes from the bench plans were used to build the block model representations of the structural zones.

Table 56 lists all domains by name and code.

Domain	Domain Code
San Rafael	1
La Zacatera	2
La Vaca	3
Los Tajos	4
Nidada	5

Lower Samaniego	6
Samaniego High Angle	8
Upper Samaniego A and B	91/92
San Rafael North Trend	10
Samaniego East Trend	11
San Rafael East Trend	12
La Prieta	
Upper	71
Middle	72
Lower	73
Sagrado Corazón	100

Table 56 El Gallo Gold, Samaniego, San Rafael and Sagrado Corazon domain codes

Heap Leach Material

The Heap Leach Material at El Gallo Gold has been divided into three distinct domains:

- Patio Viejo ("Old leach pads"): Loading of the pile first occurred during mining by Nevada Pacific Gold in the early 2000's. Historic records of the loading patterns, grade and tonnage profiles and production recovery records are held at the mine offices by McEwen;
- Phase 1-3: when McEwen started production in 2012, the historic Patio Viejo piles were covered by a liner and loading took place on top; residual leaching is still active;
- Phase 4: an extension to the Phase1-3 pile on the northern boundary; loading and leaching of the pile is still active.

All phases have had detailed load patterns, tonnages and grade recorded so the location of monthly lifts is well known and ongoing production and recovery results can be matched accordingly.

The in situ (Samaniego, San Rafael) and Heap Leach Material domain locations are illustrated in Figure 83 The Lupita-Central and Sagrado Corazon domains are shown in Figure 84.

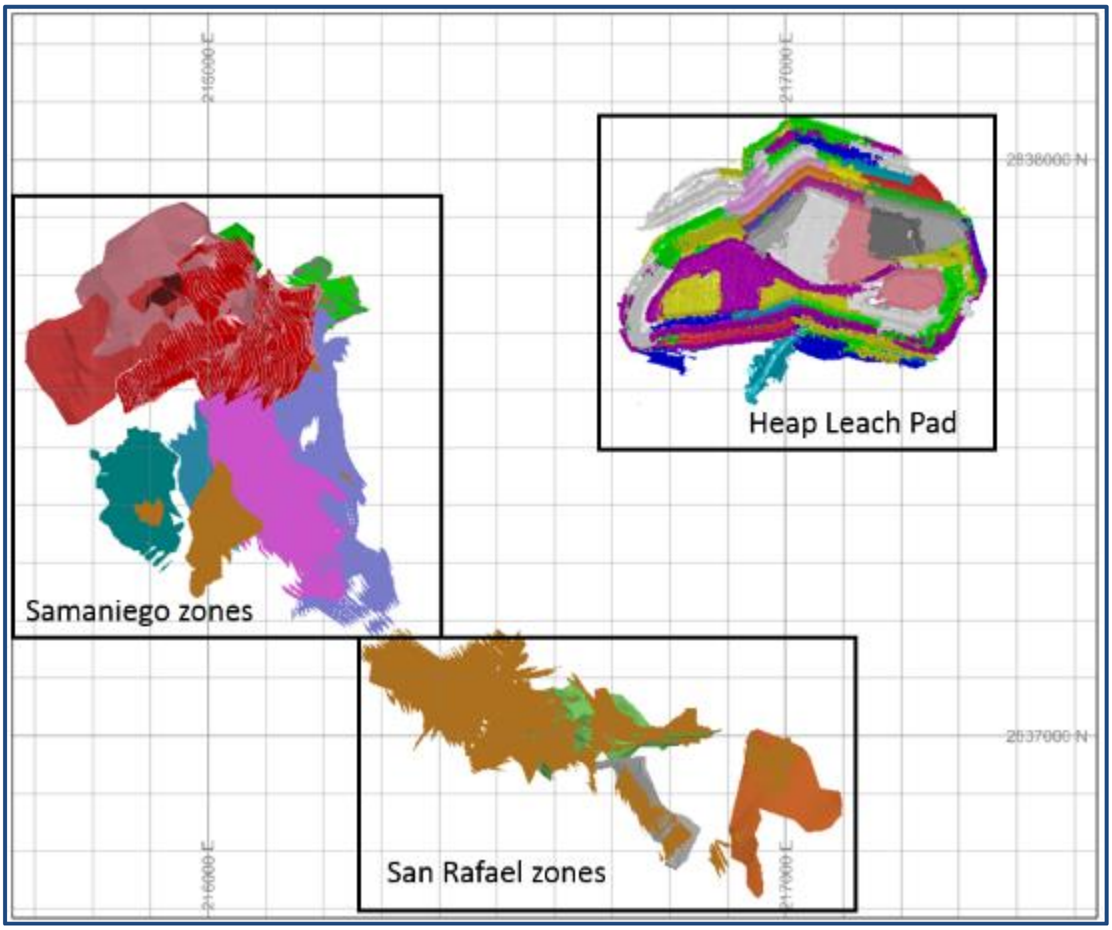


Figure 83 Locations of the Samaniego, San Rafael and Heap Leach Material domains at the El Gallo Gold

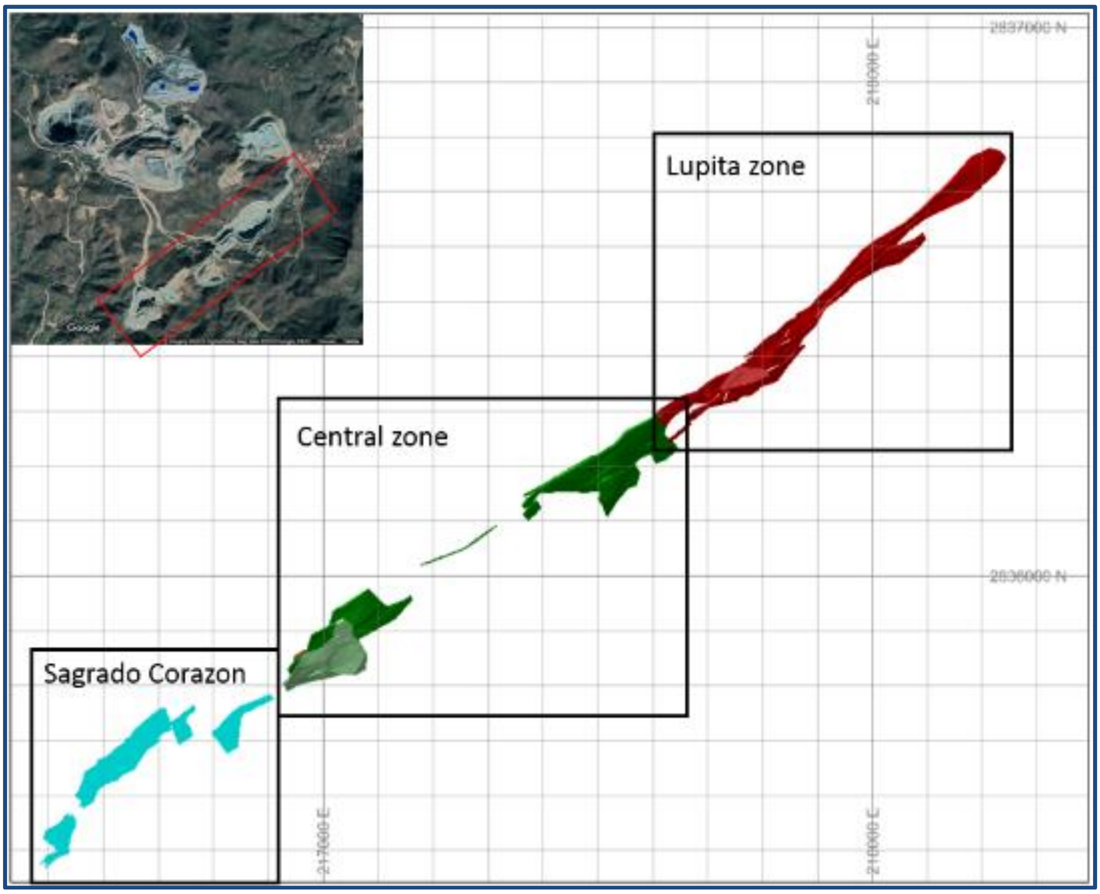


Figure 84 Locations of the Sagrado Corazon, Lupita and Central domains at the El Gallo Gold

Lupita and Central

When reviewing cross-sections along the strike length of Lupita and Eastern Central, it becomes apparent that there are two distinct zones that can be identified. An anomalously higher grade "core" zones was delineated at a 0.3 gpt gold grade and was generally restricted to the more favorable brecciated quartz stockwork zones. Enveloping these higher-grade zones were areas of still anomalous, but noticeably lower, gold grades. These were characterized by less extensive zones of favorable alteration and a less intense breccia zone. These were grouped together and labelled the lower grade "halo" zone.

The remaining south westerly portion of the Central area included only the higher grade "core" zone of in situ mineralization, the lower grade "halo" had diminished along strike from the Lupita area.

Where anomalous grade was discontinuous between sections and without further geological evidence nearby to suggest continuity, wireframe shapes were extended to halfway between drillholes. On the periphery of the drillhole dataset, shapes would be extended a reasonable distance of 15-20 m.

Underground workings domains

Although records from previous underground mining at San Rafael/Samaniego Hill and at Lupita are limited, underground workings have been noted through mapping and drilling activities on the property. The locations of known workings were included in the sectional and bench plan interpretations for the deposits and were subsequently incorporated into the block model along with the structural zones in which they occurred. It is believed that the large percentage of the historic underground workings is accounted for in the model and are not a significant part of the tonnage being considered by McEwen. It is noted that the underground workings are locally backfilled with mineralized material that has not been included in this resource tabulation due to its variable nature but constitutes potential additional mineralized tonnage.

As El Gallo Gold is coming towards the end of its current planned mine life (excepting Project Fenix described in this report), the open pit voids at Samaniego, San Rafael (currently backfilled with waste), Lupita, Central and Sagrado Corazon have been regularly surveyed and up to date topographies have been used to deplete the mineral resources described herein. Mining depletion within these pits up to the end of December 2017 have been considered.

14.4.8 Block model

Five block models were constructed representing five different areas of known mineralization on the property. These models are referred to as Samaniego, San Rafael, Sagrado Corazon, Lupita-Central and the Heap Leach Material. The geometry of these block models is detailed in Table 57.

Block Domain Codes, Percent's and Density: Samaniego, San Rafael Sagrado Corazon

Blocks are assigned domain codes reflecting the structural zone domain, if any, that each block is in contact with. Frequently, only a fraction of a given block is located within a domain, so each block has been assigned a percent value representing the percentage of a block within a domain.

All blocks at least 50% below topography were assigned a density of 2.58 t/m³. Blocks lying above the topography were removed from the model.

Block Domain Codes, Percent's and Density: Lupita-Central

During the wireframing process, each individual resource shape is labelled with a zone domain code. Any blocks that are subsequently contained within those shapes are then assigned those domain codes. Because of the sub-celling feature available in the Studio RM software, there are no "percentages of a block" within the model – it is assumed that all of the blocks fill the wireframe void accordingly.

The block model was trimmed to topography by removing any block whose centroid lay above the topographic surface. All blocks below surface were then assigned a density of either 2.45 t/m³ for Lupita or 2.52 t/m³ at Central.

Samaniego	X	Y	Z
Origin *	215,530.1608	2,836,596.9541	208
Block Size (m)	5	5	5
Rotation	1.15° clockwise		
Number of Blocks	320	300	84
Number of Blocks	8,064,000		
San Rafael	**X**	**Y**	**Z**
Origin *	215,775	2,836,695	235
Block Size (m)	5	5	5
Rotation	0		
Number of Columns	235	391	76
Number of Blocks	6,983,260		
Lupita/Central	**X**	**Y**	**Z**
Origin *	216,610	2,835,890	121
Block Size (#subcells) (m)	5 (4)	5 (4)	5 (4)
Rotation	54° clockwise		
Number of Columns	112	409	77
Number of Blocks	3,527,216		
Sagrado Corazón	**X**	**Y**	**Z**
Origin *	216,217.94	2,835,483.13	308
Block Size (m)	5	5	5
Rotation	46.15° clockwise		
Number of Columns	100	180	50
Number of Blocks	900,000		
Heap Leach Material	**X**	**Y**	**Z**
Origin *	216,680	2,837,540	430
Block Size (m)	5	5	5
Rotation	0		
Number of Columns	137	110	17
Number of Blocks	256,190		

Table 57 El Gallo Gold Block Model Geometries

Block Domain Codes, Percent's and Density: Heap Leach Material

The blocks in the Heap Leach Material model were labelled according to which distinct phase of loading they were contained within: Patio Viejo, Phase1-3, Phase 4. In addition, Phase 4 was split further into monthly lift volumes and labelled accordingly. Generally, each lift of the heap leach pad is around 5 m, so the 5 m blocks fit into the volumes reasonably well. Some partial blocks "daylighted" at the edges and surfaces of the pile, but these are considered to be cancelled out by non-filled voids adjacent to these "overfilled" blocks. The density of the Heap Leach Material was set at 1.7t/m3 based on testwork described in Section 11.

Block Grade Modelling: Samaniego, San Rafael, Sagrado Corazon

Gold grades were assigned to blocks based on the surrounding drillhole composite grades using an ID to the sixth power method. Blocks of a given domain code were only assigned grade based on composites within the same domain. Search ellipses were used to limit the maximum distance between a block and the composites used to interpolate that block's grade. These search ellipses vary by domain and are listed in Table 58. A block must have at least two composites within its search ellipse before receiving a grade and use no more than the closest 12 composites.

Block Grade Modelling: Lupita-Central

Gold and silver grades were assigned to blocks based on the surrounding drill hole composite grades using an inverse distance squared method. Blocks of a given domain code (High grade "core" or low grade "halo") were only assigned grade based on composites within those same domains. Search ellipsoids were used to limit the maximum distance from a block to the composites used to interpolate that block's grade. The search ellipsoids are listed in Table 58. A block must have at least five composites within its search ellipsoid before receiving a grade and use no more than the closest 15 composites.

		Primary Axis	Primary Axis	Primary Axis	Secondary Axis	Tertiary Axis
Domain	Domain Code	Ax. (Degrees)	Dip Degrees	Radius (m)	Radius (m)	Radius (m)
San Rafael	1	205	45	45	45	15
La Zacatera	2	0	0	45	45	15
La Vaca	3	245	40	45	45	15
Los Tajos	4	240	30	45	45	15
Nidada	5	235	40	45	45	15
Lower Samaniego	6	250	50	45	45	15
Sam. High Angle	8	250	60	45	45	15
Upper Samaniego A	91	255	40	45	45	15
Upper Samaniego B	92	255	40	45	45	15

Domain	Domain Code	Primary Axis Ax. (Degrees)	Primary Axis Dip Degrees	Primary Axis Radius (m)	Secondary Axis Radius (m)	Tertiary Axis Radius (m)
S.R. North Trend	10	280	75	45	45	15
Sam. East Trend	11	190	40	45	45	15
S.R. East Trend	12	340	75	45	45	15
La Prieta						
Upper	71	240	50	45	45	15
Middle	72	240	50	45	45	15
Lower	73	0	0	45	45	15
Sagrado Corazón	100	135	80	45	45	15
Central	HG/LG	50	-80	50	50	15
Lupita	HG/LG	50	-80	50	50	15

Table 58 Heap Leach Material Search Ellipsoid Parameters

Block Grade Modelling: Heap Leach Material

Because of the unique histories and current conditions of the HLM, the three domains were estimated separately as described below. The progression of the heap leach loading showing the three domains is shown in Figure 85and a cross-section through the pile showing different phases in Figure 86.

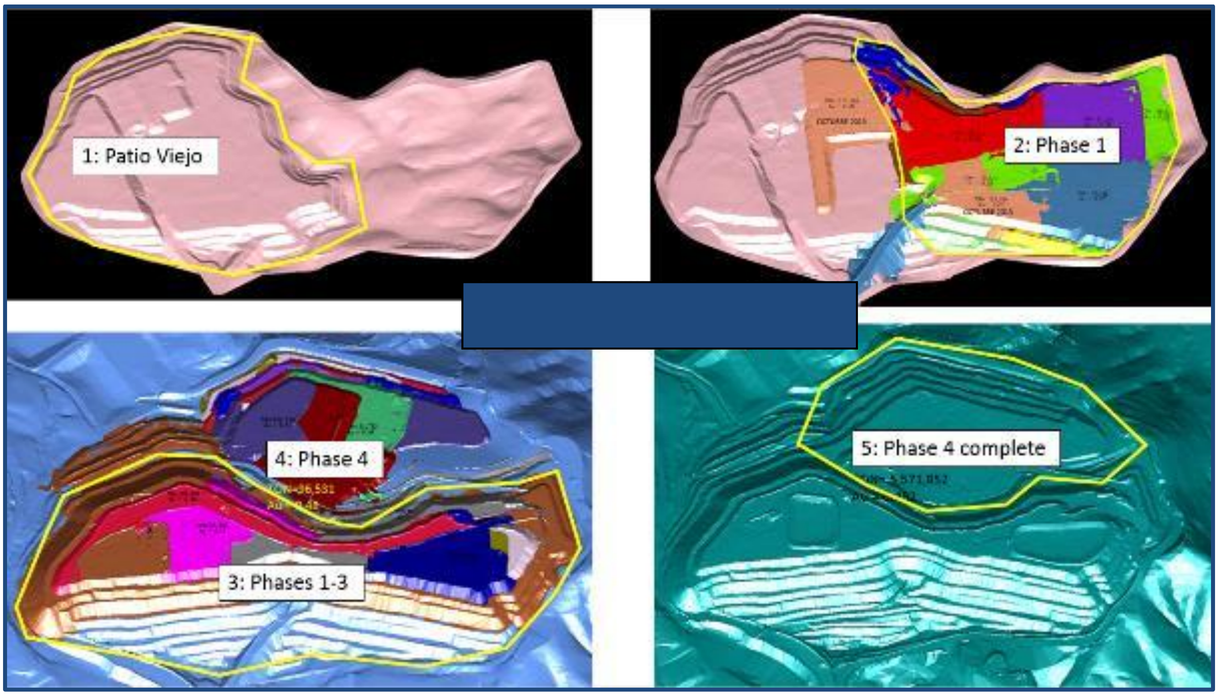


Figure 85 Heap Leach Material Domain Progression

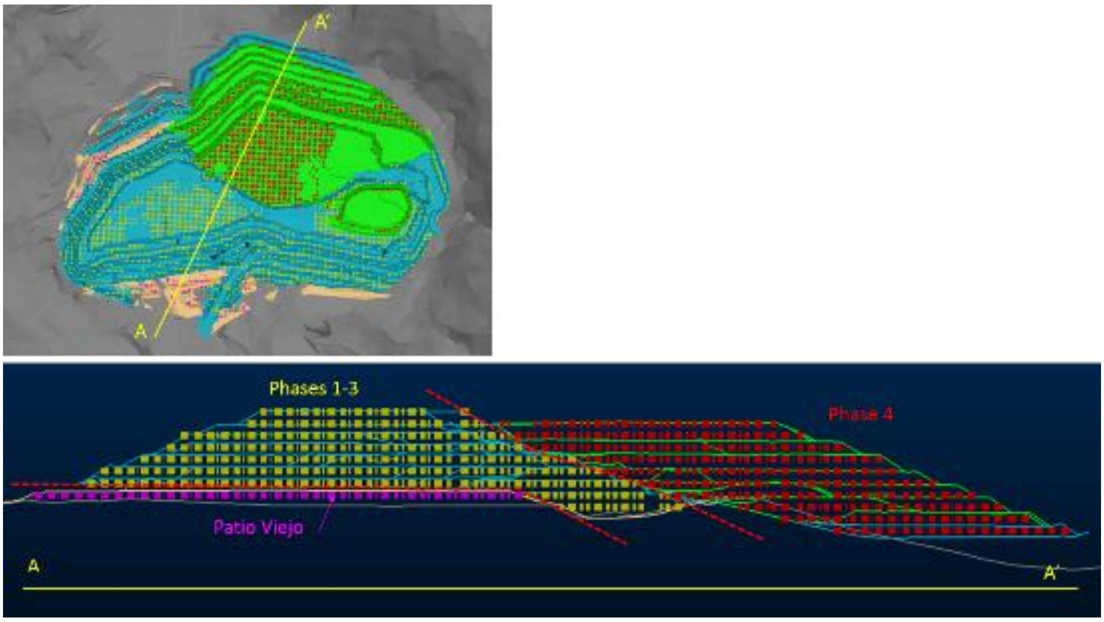


Figure 86 Example Cross-Section Through the Heap Leach Material Showing the Different Phases

Patio Viejo (PV): this portion of the heap leach pile (22%) lies directly beneath Phases 1-3 and forms the lower western portion of the HLP. Because Phases 1-3 (P1-3) are still actively leaching through residual fluid flow, the drilling program was careful to not perforate the liner that separates the PV from the newer material to obtain direct samples for the estimation. Before the new P1-3 was loaded, an accurate topographic survey was taken which delineated the volume of the PV material present (Figure 87). Historic production records and maps located in the mine offices indicated the location, tonnage and grade of crushed mill feed loaded to the pile; similarly, accurate records of leaching, production and recovery results were also available (Table 59).

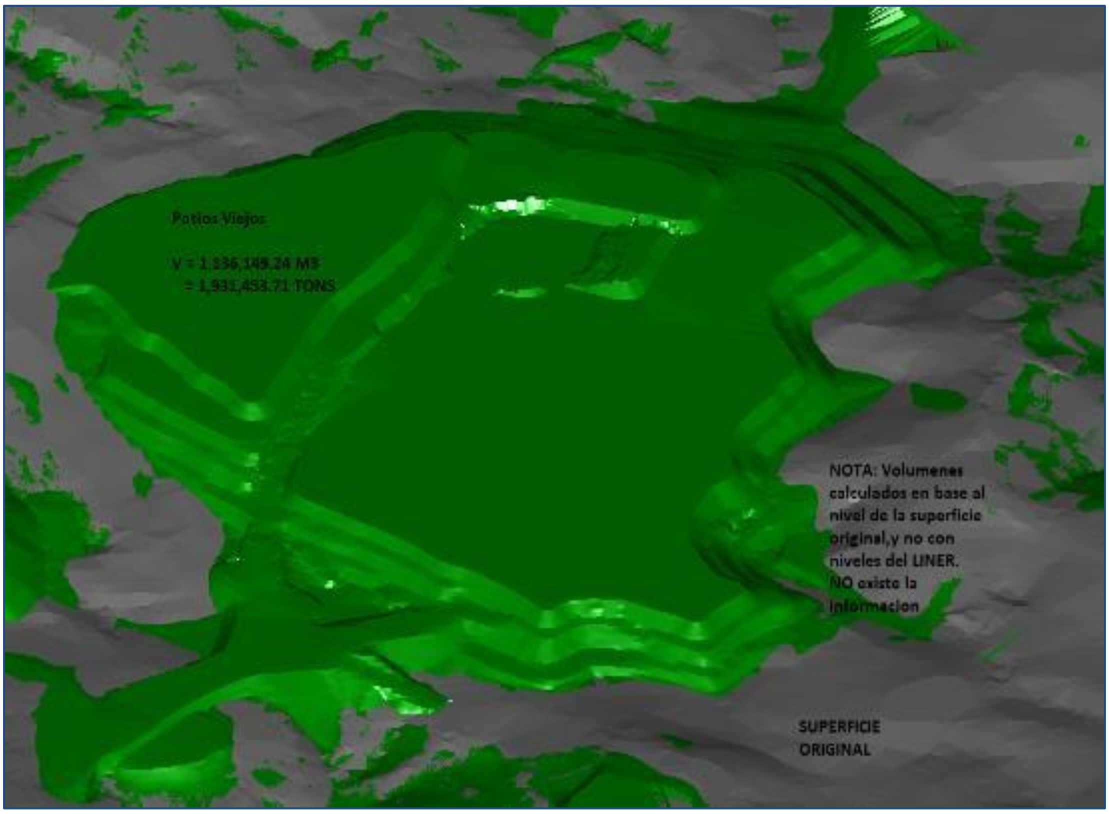


Figure 87 Topographic survey of the Patio Viejo material at the HLP before Phase 1 loading.

Fiscal Year	Gold oz placed	Gold oz recovered	Recovery %
2003	34,030	17,543	51.5%
2004	29,614	19,520	65.9%
2005	43,498	19,526	44.9%
2006	2,313	12,850	556%
2007	-	924	-
Total	109,455	70,363	64.3%
Remaining		39,092	

Table 59 Historic Patio Viejo Production Records 2003-2007

Because the PV pile is no longer leaching (due to the liner above it) it is considered that these records could be used as an estimator of the remaining tonnes and grade of leached material. Table 60 calculates the grade:

Parameter	Value
Patio Viejo tonnage (surveyed topography)	1,931,453
Patio Viejo tonnage (production records)	2,143,678
Patio Viejo tonnage (block model)	1,989,744
Density	1.7 t/m^3
Estimated Au oz remaining (prod records)	37,776
Estimated grade remaining	0.55 gpt

Table 60 Historic Patio Viejo grade estimation

There is good comparison between the tonnage determined from the surveyed topography, production records and block model.

Given the calculated remaining ounces from production records, all blocks within the Patio Viejo domains were coded with an across-the-board grade of 0.55 gpt Au.

Phases 1-3: The largest portion (52%) of the HLP is composed of material loaded between September 2012 and June 2016. Monthly load patterns, tonnages and grades are kept on record at the mine offices. The Heap Leach Material was drilled as described in Section 11 with samples recovered every 1.5 m. These samples were used to estimate the grade distribution within the pile using a standard search ellipse and interpolation algorithm with the parameters listed in Table 61.

Parameter	
Search radius m	100 x 100 x 3
Rotation of ellipse	0° (flat lying)
Min/Max samples used	3/10
Max number of samples per hole	2
Estimation method	ID3

Table 61 Estimation Parameters for Phases 1-3 of the Heap Leach Material

The flat search ellipse ensured that only samples from similar time frames were being used to estimate grade across the pile, rather than from different time periods above and below. Similarly, a third power inverse distance weighting ensured that samples proximal to the informed block had a higher influence.

Phase 4: Containing 26% of the Heap Leach Material tonnage, Phase 4 has been loading since April 2016 until the present day where loading and leaching is still taking place. The resource estimate takes the cut-off date at January 2018.

Because Phase 4 was still active during the drilling process on Phases 1-3, it was not logistically or practically possible to perform a similar drill sampling approach without disrupting ongoing processing activities, so an alternative method to estimate resources on the pile was taken. As with the Patio Viejo and Phases 1-3 Heap Leach Material, detailed records on production rates, loading patterns, tonnage and grade of the crushed mill feed that is delivered to the pile are kept on a daily basis and reconciled monthly to produce surveyed topographies from which accurate estimates of monthly volumes can be determined.

The block model was developed by drafting 3D wireframes from the topographic surveys for each monthly lift and then infilling with 5 m blocks coded to each month's individual wireframe volume. Loaded grade and calculated recovery rates were applied and used to code each monthly domain (see Table 62). Figure 88 shows the color coded monthly lift sub-domains within Phase 4.

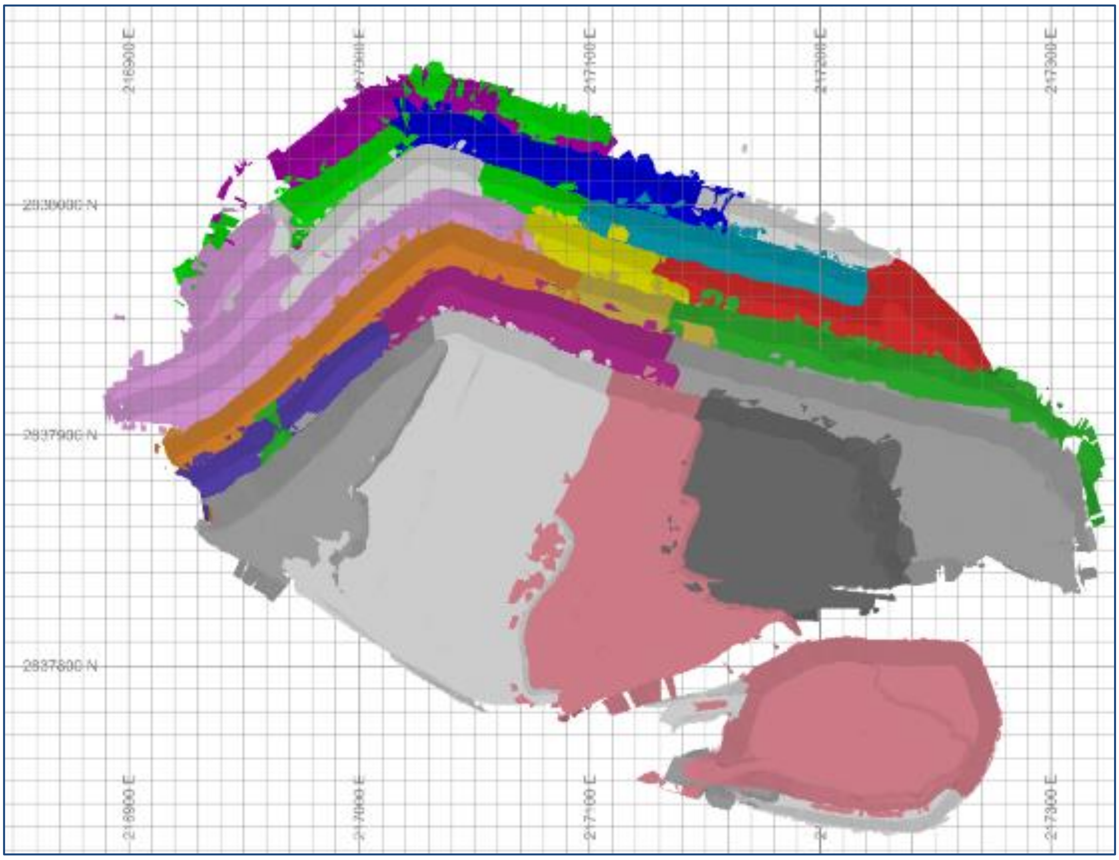


Figure 88 HLM – Phase 4 Monthly Lift Progression

Month	Loaded, pre-leached grade Au gpt	Residual, leached grade Au gpt @ 53.61% recovery	Tonnage by BM
Apr-16	1.905	0.884	24,012
May-16	1.659	0.770	109,650
Jun-16	3.413	1.584	29,325
Jul-16	1.019	0.473	104,550
Aug-16	1.518	0.704	79,687
Sep-16	1.713	0.795	84,362
Oct-16	2.056	0.954	85,637
Nov-16	1.127	0.523	113,687
Dec-16	0.980	0.455	102,850
Jan-17	1.292	0.599	76,925
Feb-17	1.498	0.695	152,365
Mar-17	1.046	0.485	133,238
Apr-17	1.054	0.489	111,987
May-17	1.780	0.826	88,400
Jun-17	1.910	0.886	145,563
Jul-17	3.140	1.457	116,238
Aug-17	2.820	1.308	41,225
Sep-17	2.170	1.007	127,713
Oct-17	2.780	1.290	192,100
Nov-17	2.670	1.239	236,937
Dec-17	2.160	1.002	153,425
Jan-18	0.780	0.362	44,625
			2,362,575[2]

Table 62 Monthly Load Statistics for Phase 4

14.4.9 Validation

Samaniego, San Rafael, Sagrado Corazon

Composite gold grades were visually compared with the block model on vertical sections oriented approximately perpendicular to the structures. This sectional review attempts to locate discrepancies between composite and block grades as well as ensure the block model results are consistent with McEwen's understanding of the deposit. The final sectional review did not raise any problematic issues.

A nearest neighbor (NN) gold grade model was created for each domain to compare against the ID models. The average gold grades for both the NN and ID models are compared for each domain in

[2] BM tonnages reconciles closely to the monthly averages

Table 63. Four domains show a discrepancy of greater than five percent. A more detailed sectional review of these domains was conducted. Following this review, McEwen is satisfied with the ID interpretation of gold grade.

Lupita-Central

NN comparison: During the interpolation process, a Nearest Neighbor gold estimate was generated alongside the Inverse Distance estimate for comparison. Average gold grades with at a zero-cut-off applied are compared for different methods and against the composite sample grades and presented in Table 63 below. The differences between the three datasets are less than 5% and therefore considered acceptable by McEwen.

Capped

Mean gpt	Comps gpt	Au_IP gpt	Au_NN gpt	Diff IP v NN
All	0.660	0.681	0.669	1.76%
Core zone	1.552	1.294	1.269	1.93%
Halo zone	0.137	0.136	0.139	2.20%

Table 63 Comparison of NN vs ID block grades for Lupita-Central

Swath plots: Figure 89 show grade plots generated by 50 m easting bandwidths for the Lupita-Central trend comparing NN vs ID estimates. The plots show a generally good agreement between the two. Also shown are the mean grades of the composite drillhole intervals used in the estimations as well as the level of support for the block grades. Again, there is good correlation between the datasets.

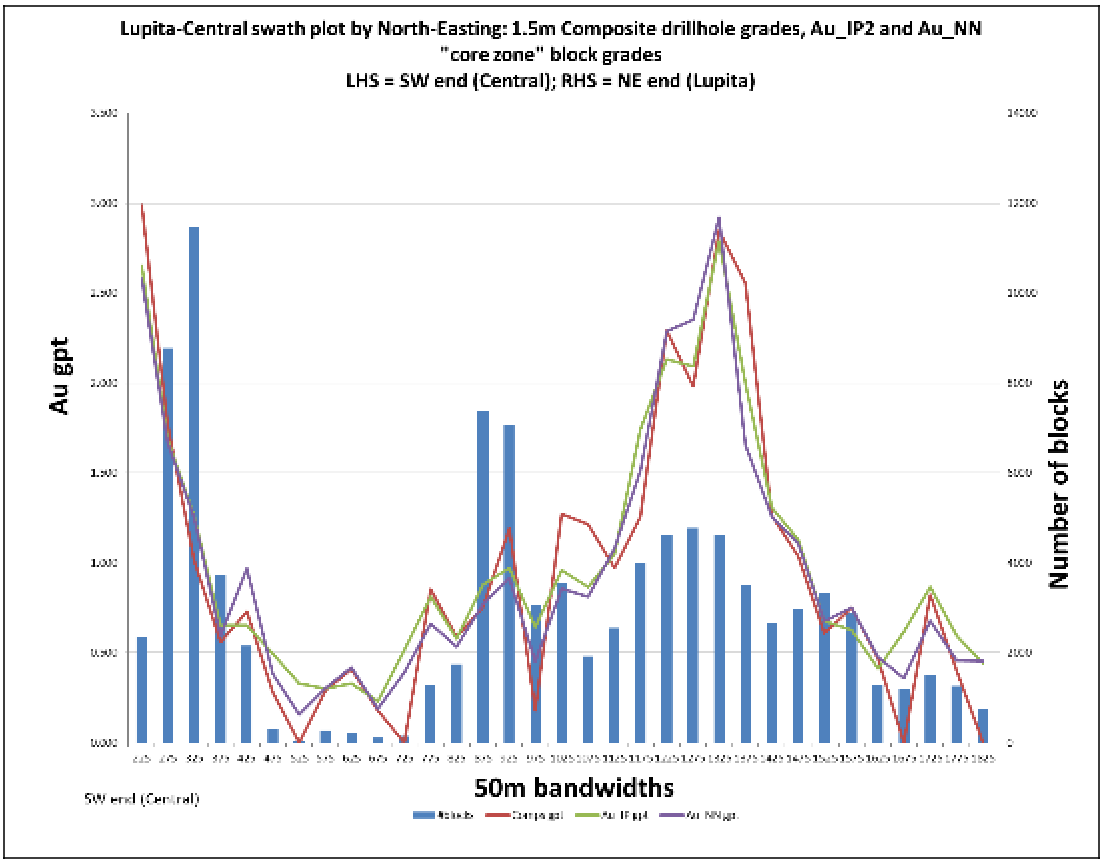


Figure 89 ***Swath plot in Easting bands at Lupita-Central comparing NN v ID v composite grades***

Visual comparison: vertical section plots across the models were generated comparing the composite assay grades with the block model grades to see if there were any discrepancies between them. There did not appear to be any apparent inconsistencies with the block model reflecting comparing positively against the composite sample intervals supporting the estimate.

Heap Leach Material

Phase 1-3: Swath plots across the Heap Leach Material comparing original drillhole sample grades, block grades by Inverse Distance and by Nearest Neighbor were constructed at different bandwidths – see Figure 90 for the Easting plot. The plots compare well across the pile for the three datasets.

Figure 90 shows an example cross-section across the material with the block grades and corresponding drillhole sample intervals which show good correspondence between the two and also highlights how the flat lying search ellipse captured only sample data from similar (horizontal) time frames.

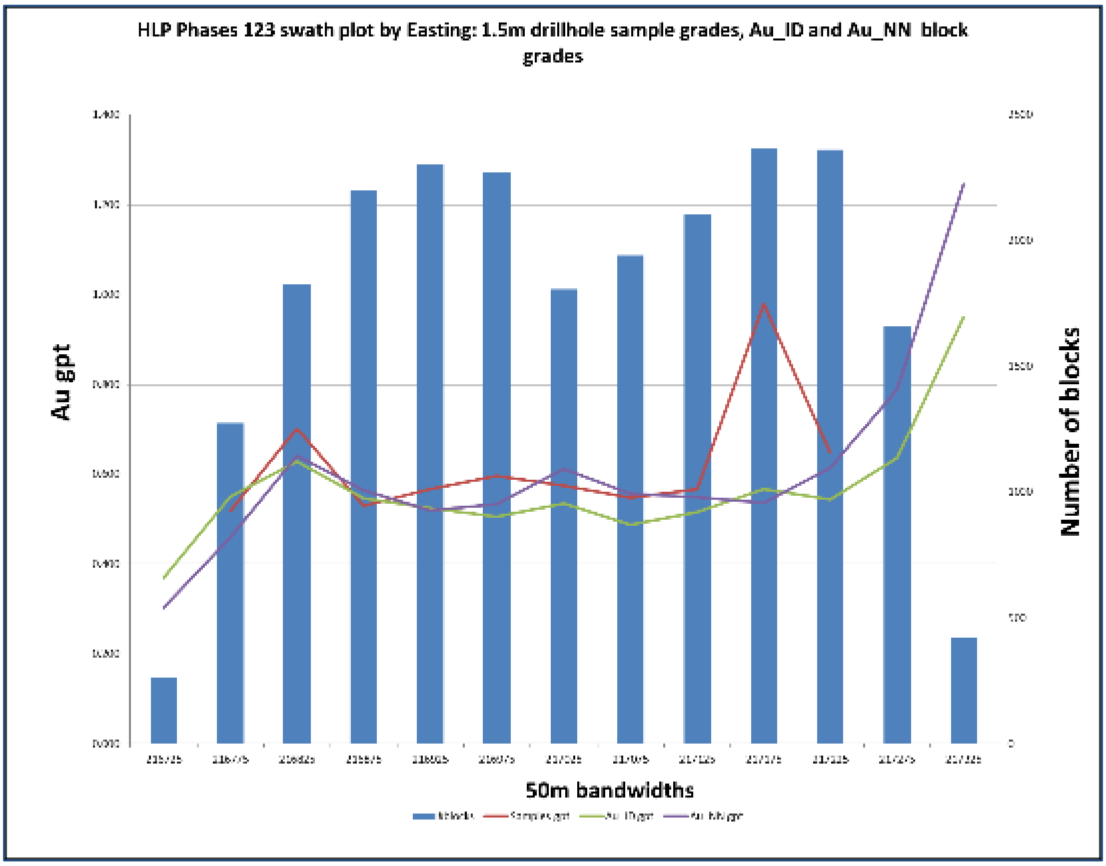


Figure 90 Swath plot in Easting bands at Heap Leach Material Comparing NN v ID v sample grades

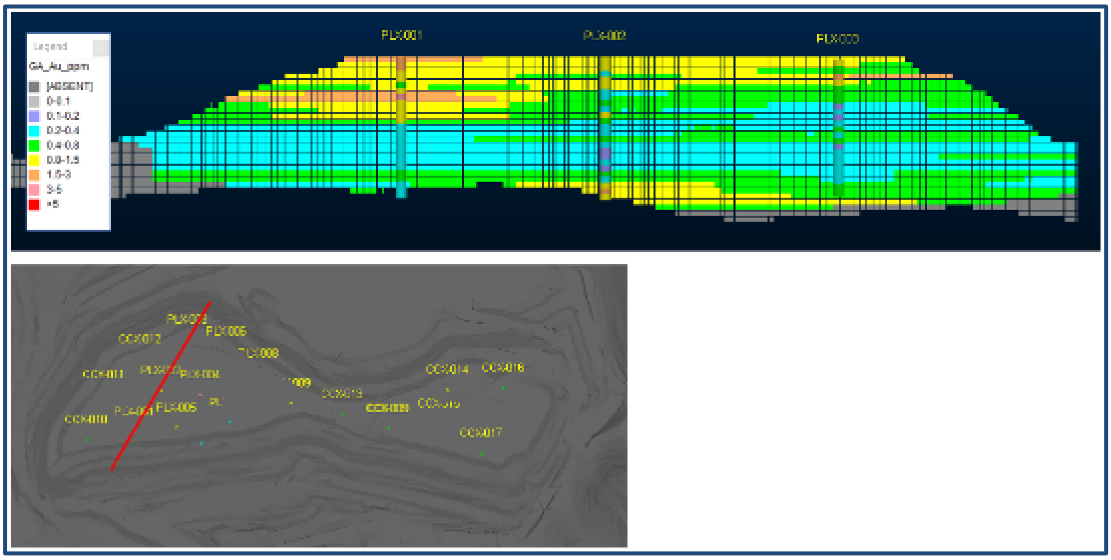


Figure 91 Example Cross-Section - Phase 1-3 HLM Sampled Drillholes and Block Model Grade Distribution.

Phase 4 and Patio Viejo: the best comparisons we can make for Phase 4 and Patio Viejo block estimates are with the production records detailing load patterns, grade and tonnage descriptions and calculated recoveries in Table 64.

Parameter	Production Records	Block Model	By survey	% diff prod v model
Phase 4 tonnage (Apr 2016 – Jan 2018)	2,303,568t	2,362,575t		2.5%
Phase 4 grade loaded	1.90	1.873		1.4%
Phase 4 grade residual (53.61% recovery)	0.88	0.869		1.2%
Phase 4 oz remaining	64,761	66,008		1.9%
Patio Viejo tonnage	2,143,678	1,989,744	1,931,454*	2.9%*
Patio Viejo grade residual (65.26% recovery)	0.55	0.55	0.63	0%
Patio Viejo ounces remaining	37,776	35,184	39,092	6.8%
Phases 1-4 tonnage	6,319,261	6,360,188		0.6%

***Note:** It was noted in production records that some material from Patio Viejo's had been removed and used during construction of Phase 1 leach pad in 2012. The surveyed topography in this case is probably more reliable so a percent comparison is used here.*

Table 64 Patio Viejo and Phase 4 comparison of production records and block model estimations

14.4.10 Classification

Samaniego, San Rafael, Sagrado Corazon

The in situ material is classified by block based on the distance between the block's center and the nearest composite used to assign the block's grade. Blocks that met the grade interpolation criteria and were within 15 m (50 ft) of the nearest composite are classified as Measured, 15 m to 30 m (50 ft to 100 ft) for Indicated and 30 m to 45 m (100 ft to 150 ft) for Inferred.

Lupita-Central

Blocks that met the grade interpolation criteria were subsequently coded with a classification code based on the guidelines in Table 65 below:

Category	Range X	Range Y	Range Z	Min #	Max #
Measured	10	10	5	4	20
Indicated	40	40	20	4	20
Inferred	80	80	40	3	20

Table 65 Block Parameters for Assigning Class – Lupita-Central

After classification, all blocks were reviewed for "category continuity" – where drill spacing and geological continuity allowed, a manual intervention was performed to either upgrade or downgrade isolated outliers to smooth the classification pattern.

Heap Leach Material

The Heap Leach Material has been carefully monitored on a continual basis during McEwen's production period from 2012. Accurate records of loaded tonnage, locations, grades and recoveries are kept updated and provide an excellent inventory of what is expected to be contained in the pile.

The resource estimate for Phases 1-3 used drillhole sampling and validated satisfactorily to consider classifying these as Indicated resources.

Phase 4 and the historic Patio Viejo also have excellent record keeping linked to them, however due to the impracticality of not being able to directly sample them at this stage of the project, both portions of the HLM have been classified as Inferred resources. It is expected that once mining activity reduces and active loading and leaching ceases, we will be in a position to sample these portions of the Heap Leach Material directly and upgrade the resource classifications.

As of the time of this technical report's effective date, the HLP remains part of an active processing facility. As such, the addition of remaining mineral from open pit mining (until mid-2018) and the continuing active leaching operations up until the commissioning of Project Fenix will create variations in residual metal content and grades of the HLM. It is believed that these variations will not represent a material change to the contents of this technical report. Nonetheless, accounting for these differences will be incorporated into later evaluation studies of Project Fenix.

14.4.11 Mineral Resource Estimates

The estimated mineral resources for the in situ and Heap Leach Material at El Gallo Gold are detailed in Table 66. Because NI 43-101 and CIM guidelines stipulate that a resource exists "in such form and quantity and of such a grade or quality that it has reasonable prospects for eventual economic extraction," the in situ resources are being reported within an optimized pit that uses reasonable metal prices and reasonable mining and processing costs for deposits of this nature and for the expected mining conditions and methods and metallurgical extraction.

The Heap Leach Material is not constrained by a pit as it is considered to be "mined" in its entirety removing it layer by layer until the pile is fully depleted, so it is reported at a zero-cut-off grade.

Resource Area	Tonnage (t)	Silver (oz)	Silver Grade (g/t)	Gold (oz)	Gold Grade (g/t)
Samaniego (Potential Cut-Off Grade = 0.415 g/t Au)					
Measured	136,000	0	0.00	9,000	2.05
Indicated	300,000	97,000	10	14,000	1.50
Meas. & Ind.	***436,000***	***97,000***	***7***	***23,000***	***1.67***
Inferred	5,000	400	2	300	1.97
San Rafael/Sagrado Corazon (Potential Cut-Off Grade = 0.39 g/t Au)					
No reported in-pit resources					
Lupita-Central (Potential Cut-Off Grade = 0.43 g/t Au Central; 0.53gpt Au Lupita)					
Measured	28,000	4,000	4	2,000	2.36
Indicated	925,000	140,000	5	56,000	1.87
Meas. & Ind.	***954,000***	***144,000***	***5***	***58,000***	***1.88***
Inferred	31,000	70,000	71	500	0.47
Heap Leach Material					
Indicated	4,679,000	0	0	84,000	0.56
Inferred	4,352,000	0	0	101,000	0.72

Table 66 El Gallo Gold Mineral Resource Estimates (in-pit resources, except HLM)

Notes:

- *CIM definitions and guidelines were followed for the estimation of mineral resources for the in situ material.*
- *Reasonable metal prices of $18/oz silver and $1,250/oz gold were used for the optimized pit. Recovery assumptions of 35.0% silver and 70.0% gold (leaching) and 90% gold (milling) for the in situ and Heap Leach Material respectively. Mining costs of $1.95/t in situ and $1.00/t Heap Leach Material, processing and G&A costs of $23.29/t milled were used. Resource models have been developed based on gold and silver recoveries from historical testwork programs.*
- *Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability. There is no certainty that all or any part of the Mineral Resources estimated will be converted into Mineral Reserves. Numbers in the table have been rounded to reflect the accuracy of the estimate and may not sum due to rounding.*

14.5 Other Resource areas

14.5.1 Carrisalejo (CSX)

Database

A digital database of all core drilling was used as the basis for the resource estimate. The database included 61 core drillholes (CSX-001 to 061) totalling 8,500 m of drilling producing 6,090 assay intervals that were used to generate the resource estimate.

Geological model

A series of six, essentially nested, mineralized envelopes were wireframed in 3D. The mineralized zones appear to conform to the contact of a folded QFP breccia zone similar to that seen at El Gallo Silver and striking roughly EW. The mineralized zones are folded into an anti-form type structure that is constrained by two EW trending, convergent fault and which abut a volcanic sediment package and dips both to the north and south. The northerly limb extends deeper than the southerly limb. Figure 92 shows a view of the folded mineralized zone.

There have been no historic workings noted at Carrisalejo so no modelled blocks have been removed. The model was trimmed to a 2m contoured topographic survey.

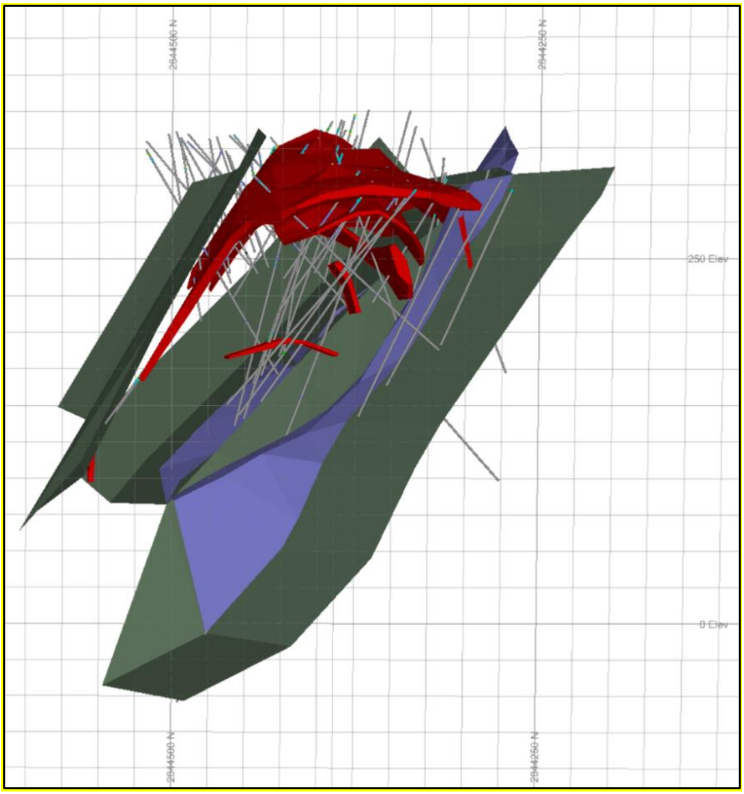


Figure 92 Carrisalejo: long view looking East showing the mineralized zone (red) constrained by converging fault planes (grey) and the informing drillholes.

Density

A density value of 2.36 t/m^3 was used based on density testing described in Section 11.3.7.

Assay statistics

Assay intervals that intersected individual wireframes were coded by domain wireframes. Block estimation was then restricted to those domains and coded assay intervals. Assay statistics by domain for raw, selected, composited and capped categories are shown in Table 67.

Assay Statistics – Ag g/t						
Domain	Number of Records	Minimum	Maximum	Mean	Standard Deviation	Coefficient of Variation
All holes	6,090	0.01	11,076	12	166.3	14.04
Selected intervals (all)	671	0.5	11,076	92	493.8	5.38
1m Composites (all)	775	0.5	5,049	86	311.4	3.61
Capped Composites (all)	775	0.5	2,000	78	218.6	2.81

Table 67 Assay statistics for Carrisalejo

Compositing and capping

Data analysis was performed by creating histograms, log histograms and cumulative probability plots of the datasets to determine a suitable compositing length (1m shown in Figure 93) and capping grade for Silver assays (2000gpt shown in Figure 94).

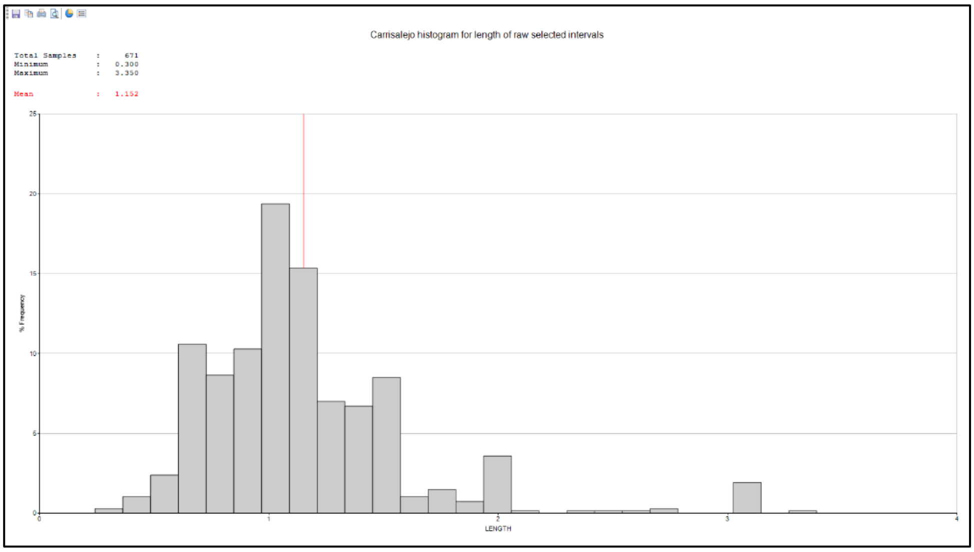


Figure 93 Carrisalejo: length histogram indicating a 1m composite length

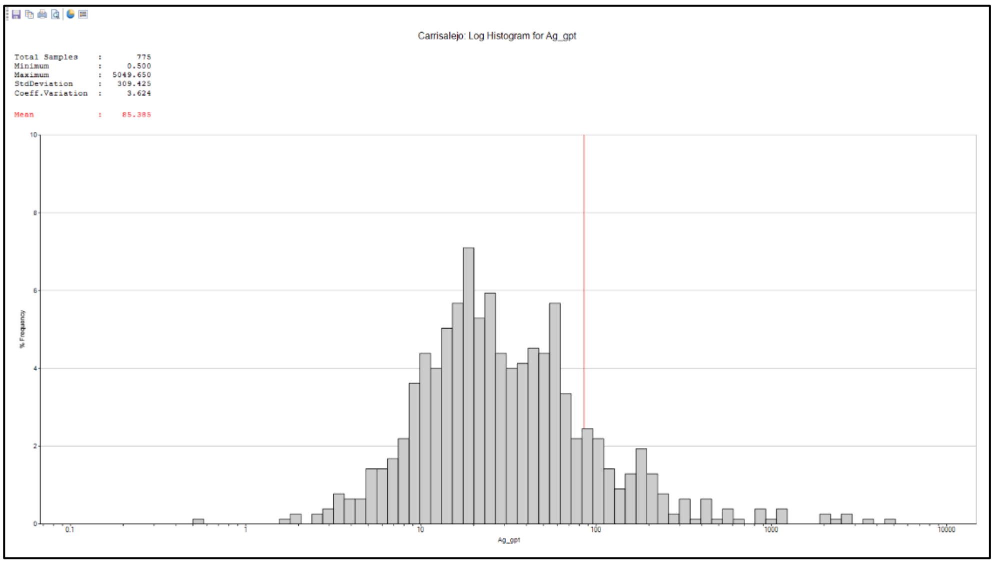


Figure 94 Carrisalejo: log histogram and log probability plot indicating a 2000gpt Ag cap grade

A top cut set at mean+3SD (c.1000gpt Ag) was determined to be too low as it removed approx. 21% of the metal content. A cap grade of 2000gpt Ag was deemed more appropriate as it would cut nearly 1% of samples and approximately 10% metal content and was located on a natural break in the population distribution.

Block modelling and interpolation

Due to the “antiform-like” nature of the E-W striking mineralized zones, dips are variable and either to the North or South. Because of the unique geometry, a singly orientated search ellipsoid could not be used in the interpolation estimate as usual. However, a feature in the Studio RM software called Dynamic Anisotropy enables a search ellipsoid to be rotated according to the attitude of the wireframe triangles during the interpolation process. This ensures that no matter which block in the model was being evaluated, the search ellipsoid at that point would be oriented correctly and would be using the composite data within that correctly oriented volume. The block model geometry and search parameters are listed in Table 68 and Table 69 respectively. Interpolation was done using the inverse distance squared method using Dynamic Anisotropy.

Carrisalejo	X	Y	Z
Origin	214,000	2,844,100	90
Block Size (m) (#subcells)	5 (2)	5 (2)	5 (2)
Rotation	None		
Number of Blocks	152	132	52
Number of Blocks	1,043,328		

Table 68 Carrisalejo block model geometry

	Rotation			Search distance				
Estimation Parameter	X	Y	Z	Radius 1 (m)	Radius 2 (m)	Radius 3 (m)	Min # samples	Max # samples
IN1-7	Variable – Dynamic Orientation			40	60	10	3	10
Class: Measured	Variable – DA			4	10	2	4	5
Class: Indicated	Variable – DA			30	50	10	4	5
Class: Inferred	Variable - DA			60	90	30	2	10

Table 69 Search parameters for Carrisalejo

Classification

Classification of the model was also determined using the DA process with a variably oriented search ellipse of increasing size for Measured, Indicated and Inferred categories (see parameter table above). Regardless of grade or category, any lens that had only one drillhole passing through was tagged as Inferred; this affected two lenses (IN4 & IN6).

Validation

A Nearest Neighbour estimate was run simultaneously to compare against the inverse power model. A swath plot by 25m eastings is shown in Figure 95. It compares the Inverse Power (IP^2) interpolated silver estimate to the Nearest Neighbour (NN) estimate with the composite sample grades across the model. The plots show generally good agreement between the three datasets.

Figure 96 shows selected cross-sections through the model showing a good correlation between interpolated block model silver grades and the informing composite samples.

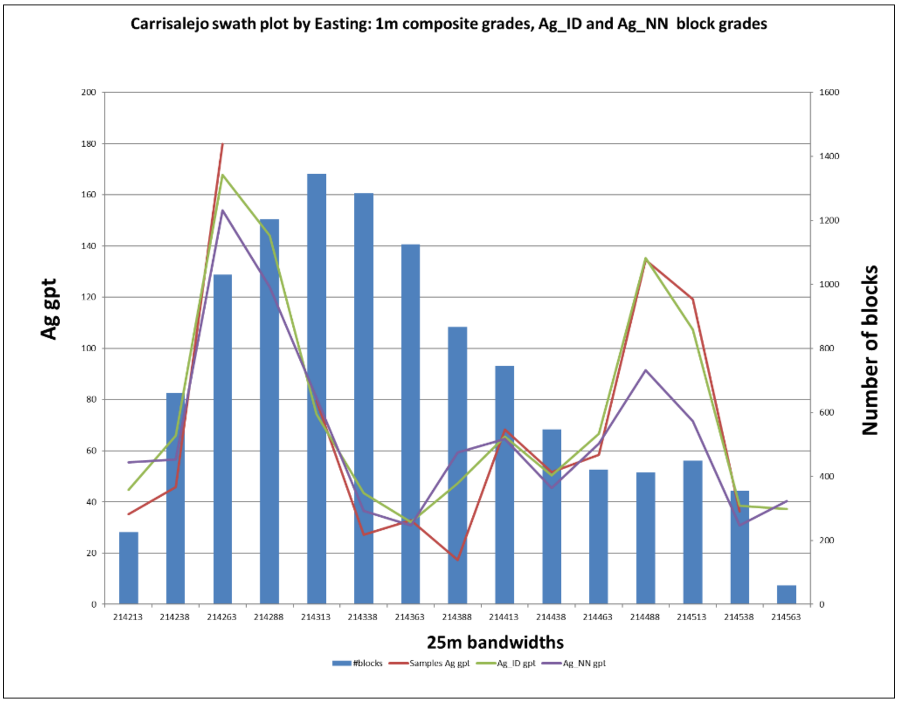


Figure 95 Carrisalejo: swath plot in Eastings

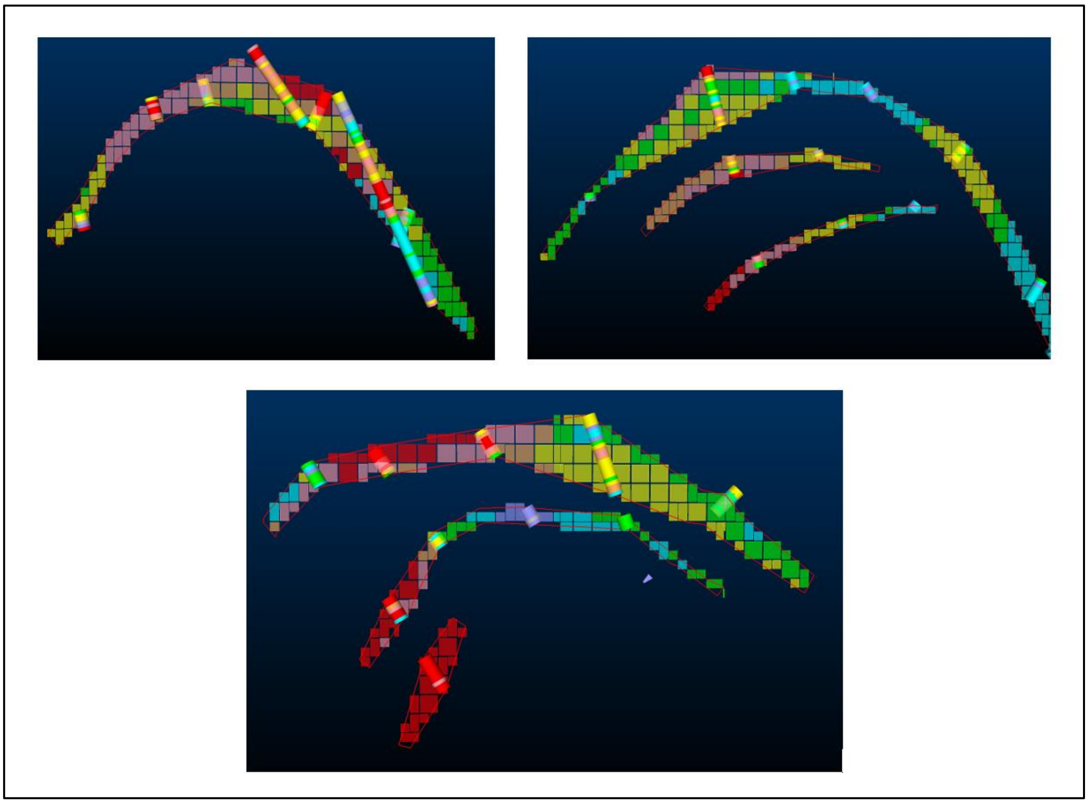


Figure 96 Carrisalejo: section reviews comparing block model grades with composite sample grades. Silver grade legends are the same.

Mineral Resource Estimate

The estimated mineral resources for the in situ material at Carrisalejo are detailed in Table 70 below. Because NI 43-101 and CIM guidelines stipulate that a resource exists “in such form and quantity and of such a grade or quality that it has reasonable prospects for eventual economic extraction,” the resource is being reported within an optimized pit that uses reasonable metal prices and reasonable mining and processing costs for deposits of this nature and for the expected mining conditions and methods and metallurgical extraction.

Resource	Tonnage (t)	Silver (oz)	Silver Grade (g/t)	Gold (oz)	Gold Grade (g/t)
Carrisalejo (Potential Cut-Off Grade = 46 g/t Ag)					
Measured	0	0	0	0	0
Indicated	391,000	1,454,000	116	1,300	0.11
Meas. & Ind.	**391,000**	**1,454,000**	**116**	**1,300**	**0.11**
Inferred	42,000	1,111,000	821	34	0.02

Table 70 Carrisalejo In-Pit Mineral Resource Estimates

Notes:

- *CIM definitions and guidelines were followed for the estimation of mineral resources for the in situ material.*
- *Reasonable metal prices of $18/oz silver and $1,250/oz gold were used for the optimized pit. Recovery assumptions of 87.6% silver and 79.2% gold for the in situ material. Mining costs of $1.95/t in situ, processing and G&A costs of $23.29/t were used. Resource models have been developed based on gold and silver recoveries from historical testwork programs.*
- *Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability. There is no certainty that all or any part of the Mineral Resources estimated will be converted into Mineral Reserves. Numbers in the table have been rounded to reflect the accuracy of the estimate and may not sum due to* rounding.

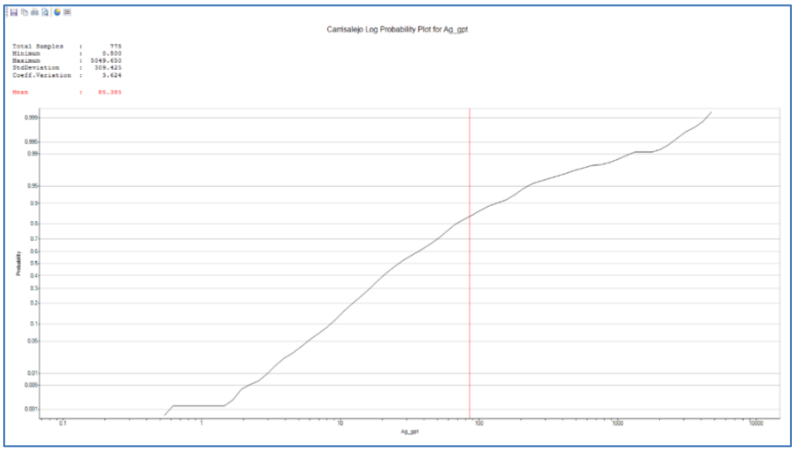


Figure 97 Swath Plot by Easting - Carrisalejo

14.5.2 El Encuentro

Database

A digital database of all core drilling was used as the basis for the resource estimate. The database included 8 RC holes, 99 core drillholes totalling 20,315m of drilling producing 14,032 assay intervals. Not all of these holes were used in the current resource estimate, as some were planned as follow up exploration targets in the general area.

Geological model

Mineralization at El Encuentro is mostly hosted in andesite tuff unit and is characterized by quartz breccia-stockwork zones. Six mineralized zones were identified within the project area – a relatively flat-lying sequence (20°-30° SW) of five layered units. These outcrop at surface as two higher grade zones, with three distinctly separated and lower grade deeper units to the SW – see Figure 98. The remaining mineralized zone is a sub-vertical structure that outcrops at surface as a prominent ridge in slightly higher ground to the north. This can be traced via the drilling to around 80m depth and along strike to the SW. One interpretation is that this is a major structural feature that has offset the flat lying zones we see to the SE – there may be additional zones on the other side that may warrant further exploration.

There have been no historic workings noted at the mineralized zones at El Encuentro so no blocks have been removed. The model was trimmed to a 2 m contoured topographic survey.

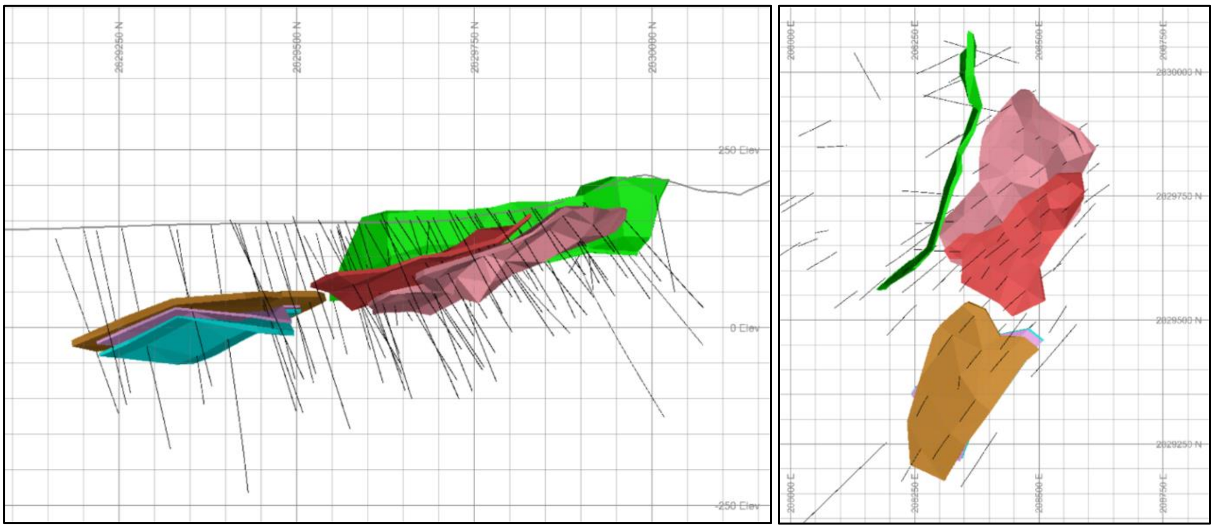


Figure 98 El Encuentro: long view (NW) and plan view showing mineralized zones and drilling at surface to c. 200 m depth.

Density

A density value of 2.63 t/m^3 was used based on density testing described in Section 11.3.7.

Assay statistics

Drillhole intervals that intersected individual wireframes were coded to those named wireframes. Block estimation was then restricted to those domains and the matching coded assay intervals. Assay statistics by domain for raw, selected, composited and capped categories are shown in Table 71.

Assay Statistics – Au gpt						
Sample type	Number of Records	Minimum	Maximum	Mean	Standard Deviation	Coefficient of Variation
All core holes	12,948	0	126.5	0.135	1.38	10.24
Selected intervals	818	0.0025	126.5	1.157	5.11	4.42
1m Composites	807	0.0025	57.52	0.972	2.83	2.91
Capped Composites	807	0.0025	20.00	0.904	1.92	2.12
Assay Statistics – Ag gpt						
All core holes	12,948	0.01	112	0.928	3.18	3.42
Selected intervals	818	0.25	79.9	2.01	5.48	2.71
1m Composites	807	0.25	63.73	1.76	4.07	2.31
Capped Composites	807	0.25	50.00	1.64	2.98	1.81

Table 71 El Encuentro drillhole statistics

Compositing and capping

Data analysis was performed by creating histograms, log histograms and cumulative probability plots of the datasets to determine a suitable compositing length (1m shown in Figure 99) and capping grade for gold assays (20gpt shown in Figure 100).

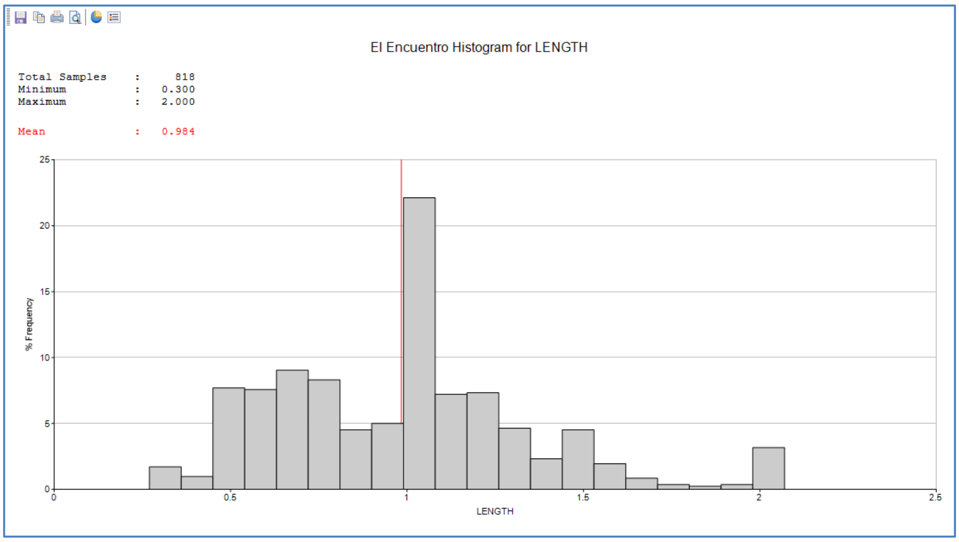


Figure 99 El Encuentro: length histogram indicating a 1m composite length

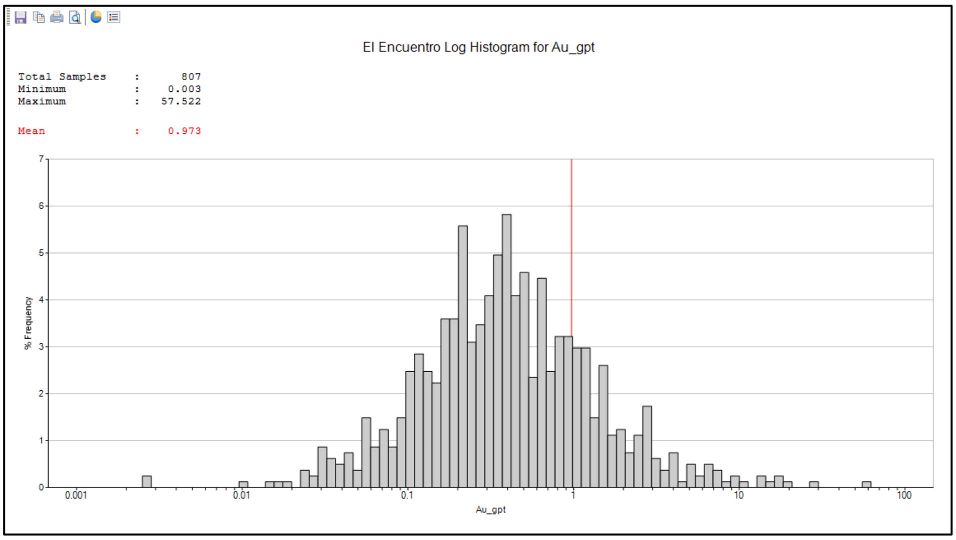


Figure 100 El Encuentro: log histogram indicating a 20gpt Au cap grade

Block modelling and interpolation

The mineralized wireframes were infilled with rotated blocks as per the geometry shown in Table 72 below.

El Encuentro	X	Y	Z
Origin	207,820	2,829,110	-65
Block Size (m) (#subcells)	5 (5)	5 (5)	5 (5)
Rotation	16° clockwise		
Number of Blocks	152	245	60
Number of Blocks	2,234,400		

Table 72 El Encuentro block model geometry

Parameter	In situ Domain		
	IN1,3	IN2	IN4,5,6
Rotation about Z Axis	115	0	115
Rotation about X Axis	0	0	0
Rotation about Y Axis	-15	0	-15
Range along Z Axis, m	14	55	12
Range along X Axis, m	50	55	30
Range along Y Axis, m	55	55	45

Table 73 Search ellipse parameters for El Encuentro

A minimum of five samples from three drillholes with no more than 12 samples were used to interpolate grade.

Classification

The flat lying structures (IN1,3-6) showed good continuity and were well drilled generally on 25m spacings in the main portions of the zones. At the edges of the mineralized zones, some areas did not get coded with grade on their first pass estimates. The search ellipse was increased by half again so that there were no absent grade coded blocks. Those blocks estimated in the first pass were coded with an Indicated category and those within the second pass were Inferred.

The sub vertical IN2 structure can be mapped on surface and is intersected in wider spaced drillholes along strike and at depth but shows less confirmed continuity. All of this zone was coded as Inferred.

Validation

Figure 101 shows a selected cross-section through the model showing a good correlation between interpolated block model grades and the informing composite samples. McEwen believes the model interpolation is a good representation of the current dataset.

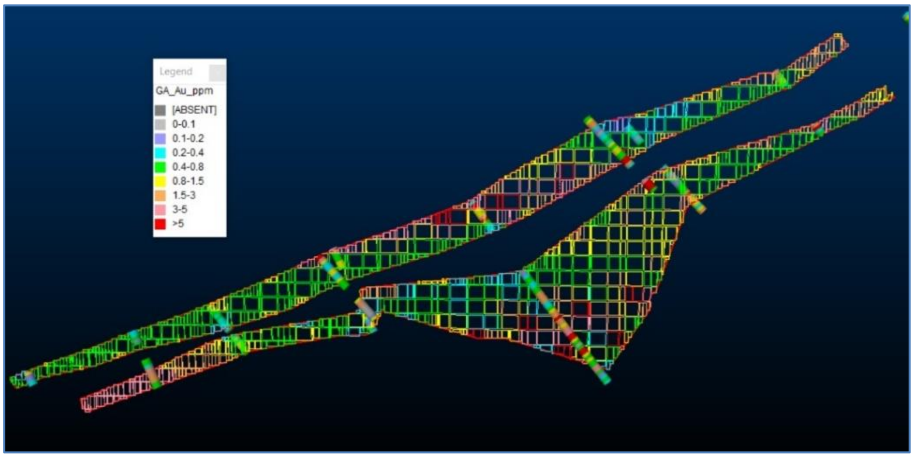


Figure 101 El Encuentro: example cross-section comparing block grades and composite grades

Mineral Resource Estimate

The estimated mineral resources for the in situ material at El Encuentro are detailed in Table 74 below. Because NI 43-101 and CIM guidelines stipulate that a resource exists "in such form and quantity and of such a grade or quality that it has reasonable prospects for eventual economic extraction," the resource is being reported within an optimized pit that uses reasonable metal prices and reasonable mining and processing costs for deposits of this nature and for the expected mining conditions and methods and metallurgical extraction.

Resource	Tonnage (t)	Silver (oz)	Silver Grade (g/t)	Gold (oz)	Gold Grade (g/t)
El Encuentro	(Potential Cut-Off Grade = 0.78 g/t Au)				
Measured	0	0	0	0	0
Indicated	534,000	42,000	2	32,000	1.87
Meas. & Ind.	***534,000***	***42,000***	***2***	***32,000***	***1.87***
Inferred	190,000	117,000	19	35,000	5.68

Table 74 Mineral Resource Estimate for El Encuentro

Notes:

- CIM definitions and guidelines were followed for the estimation of mineral resources for the in situ material.
- Reasonable metal prices of $18/oz silver and $1,250/oz gold were used for the optimized pit. Recovery assumptions of 65.2% silver and 43.7% gold for the in situ material. Mining costs of $1.95/t in situ, processing and G&A costs of $23.29/t were used. Resource models have been developed based on gold and silver recoveries from testwork programs.
- Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability. There is no certainty that all or any part of the Mineral Resources estimated will be converted into Mineral Reserves. Numbers in the table have been rounded to reflect the accuracy of the estimate and may not sum due to rounding.

14.6 Minor Resource Areas

The remaining resource areas at the Project include Mina Grande and Haciendita. These are not a part of the overall Project Fenix this report describes, however there has been enough exploration, drilling and sampling to establish them as in-pit resources. The following sections briefly describe the technical details for each resource area which are viewed as ongoing exploration targets with the eventual expectation to be developed at some point in the future.

14.6.1 Mina Grande

Database

A digital database of all drilling was used as the basis for the resource estimate. The database included 136 core drillholes totalling 21,985m of drilling producing 15,110 assay intervals. Not all of these holes were used in the current resource estimate, as some were planned as follow up exploration targets in the general area.

Geological model

Three separate domains (East, Main, Registros) were identified (by location, orientation and dip) and wireframed into 32 individual lenses used in the interpolation.

Mina Grande contains a minor amount of underground workings (simple adits) that were surveyed and digitized. Blocks that fell inside of these workings were removed from the model as described above. The model was also clipped to topography.

Density

A density value of 2.6 t/m³ was used based on density testing described in Section 11.3.7.

Assay statistics

Drillhole intervals that intersected individual wireframes were coded to those named wireframes. Block estimation was then restricted to those domains and the matching coded assay intervals. Assay statistics by domain for raw, selected, composited and capped categories are shown in Table 75.

Assay Statistics – Au gpt						
Sample type	Number of Records	Minimum	Maximum	Mean	Standard Deviation	Coefficient of Variation
All core holes	15,153	0.0025	57.1	0.110	1.043	9.46
Selected intervals	931	0.0025	57.1	1.119	3.605	3.22
1m Composites	941	0.0025	40.69	1.000	2.713	2.71
Capped Composites	941	0.0025	20	0.906	1.946	2.14
Assay Statistics – Ag gpt						
All core holes	15,153	0.01	3,150	2.64	34.99	13.27
Selected intervals	931	0.1	3,150	19.16	128.77	6.72
1m Composites	941	0.108	2,070	15.41	75.46	4.89
Capped Composites	941	0.108	200	12.34	28.50	2.30

Table 75 Mina Grande drillhole statistics

Compositing and capping

Data analysis was performed by creating a length histogram to determine a suitable compositing length of 1m for all domains.

Similarly, the dataset was reviewed using log histograms and probability plots to determine capping grades as in Table 76:

Domain	Au gpt	Ag gpt
Main	7.7	200
East	7	70
Registros	20	N/A

Table 76 Mina Grande capping grades

Block modelling and interpolation

The mineralized wireframes were infilled with rotated blocks as per the geometry shown in Table 77 below.

Mina Grande	X	Y	Z
Origin	216,600	2,851,200	115
Block Size (m) (#subcells)	5 (3)	5 (3)	5 (3)
Rotation	-45° anti-clockwise		
Number of Blocks	220	424	47
Number of Blocks	4,384,160		

Table 77 Mina Grande block model geometry

Interpolation by Inverse Distance squared and Nearest Neighbour using the following parameters:

Parameter	Main	East	Registros	Min /Max
Rotation around Z	-40	-40	0	
Rotation around X	0	0	0	
Rotation around Y	45	75	0	
Range Z, X, Y (m)	10, 50, 80	15, 50, 80	40, 40, 40	
Min / Max samples	3 / 6	3 / 10	3 / 10	
Measured (m)	2,4,10	2,4,10	5,5,5	4 / 5
Indicated (m)	10,30,50	10,30,50	25,25,25	2 / 5
Inferred (m)*	30,60,90	30,60,90	40,40,40	2 /10

Note*: *any mineralized lens with only one drillhole passing through, regardless of grade or classification was coded as Inferred.*

Table 78 Search Ellipse Parameters

Validation

A review in cross-section and plan across the model show good correlation between interpolated block model grades and the informing composite samples. McEwen believes the model interpolation is a good representation of the current dataset.

A Nearest Neighbour estimate represents a theoretical unbiased estimate of the average grade when no cut-off grade is imposed. Mean grades for the inverse distance model (0.669 Au gpt) were compared to the nearest neighbour estimate (0.645 Au gpt) giving a difference of only 3.7% which is considered to be suitable for comparative purposes.

Mineral Resource Estimate

The estimated mineral resources for the in situ material at Mina Grande are detailed in Table 79 below. Because NI 43-101 and CIM guidelines stipulate that a resource exists "in such form and quantity and of such a grade or quality that it has reasonable prospects for eventual economic extraction," the resource is being reported within an optimized pit that uses reasonable metal prices and reasonable mining and processing costs for deposits of this nature and for the expected mining conditions and methods and metallurgical extraction.

Resource	Tonnage (t)	Silver (oz)	Silver Grade (g/t)	Gold (oz)	Gold Grade (g/t)
Mina Grande	(Potential Cut-Off Grade = 0.66 g/t Au)				
Measured	19,000	10,000	17	2,000	2.89
Indicated	663,000	577,000	27	33,000	1.54
Meas. & Ind.	***682,000***	***588,000***	***27***	***35,000***	***1.58***
Inferred	108,000	100,000	29	5,000	1.47

Table 79 Mineral Resource Estimate for Mina Grande

Notes:

- *CIM definitions and guidelines were followed for the estimation of mineral resources for the in situ material.*
- *Reasonable metal prices of $18/oz silver and $1,250/oz gold were used for the optimized pit. Recovery assumptions of 59.4% silver and 87.3% gold for the in situ material. Mining costs of $1.95/t in situ, processing and G&A costs of $23.29/t were used. Resource models have been developed based on gold and silver recoveries from testwork programs.*
- *Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability. There is no certainty that all or any part of the Mineral Resources estimated will be converted into Mineral Reserves. Numbers in the table have been rounded to reflect the accuracy of the estimate and may not sum due to rounding.*

14.6.2 Haciendita

Database

A digital database of all drilling was used as the basis for the resource estimate. The database included 66 core drillholes totalling 9,596m of drilling producing 7,206 assay intervals. Not all of these holes were used in the current resource estimate, as some were planned as follow up exploration targets in the general area.

Geological model

Two separate domains (A and B) were identified (by location and metal dominance) and wireframed into 11 individual lenses used in the interpolation. Despite having generally similar orientations (strike and dip) Zone A is higher in gold values and lower in silver, whilst Zone B shows the opposite, possibly indicating two mineralising events.

There are no previous workings at Haciendita. The model was clipped to topography.

Density

A density value of 2.6 t/m^3 was used based on density testing described in Section 11.3.7.

Assay statistics

Drillhole intervals that intersected individual wireframes were coded to those named wireframes. Block estimation was then restricted to those domains and the matching coded assay intervals. Assay statistics by domain for raw, selected, composited and capped categories are shown in Table 80.

Assay Statistics – Au gpt						
Sample type	Number of Records	Minimum	Maximum	Mean	Standard Deviation	Coefficient of Variation
All core holes	7,206	0.0025	12.35	0.101	0.484	4.78
Selected intervals	696	0.0025	12.35	0.808	1.34	1.65
1.5 m Composites	430	0.006	6.42	0.749	1.01	1.35
Capped Composites	430	0.006	6.42	0.749	1.01	1.35
Assay Statistics – Ag gpt						
All core holes	7,206	0.01	788	4.36	23.56	5.40
Selected intervals	696	0.25	788	29.7	70.29	2.36
1.5 m Composites	430	0.6	636	28.8	60.75	2.10
Capped Composites	430	0.6	200	24.7	36.78	1.48

Table 80 Haciendita drillhole statistics

Compositing and capping

Data analysis was performed by creating a length histogram to determine a suitable compositing length of 1.5 m for all domains.

Similarly, the dataset was reviewed using log histograms and probability plots to determine capping grades as in Table 81:

Domain	Au gpt	Ag gpt
Zone A	None	100
Zone B	None	200

Table 81 Haciendita capping grades

Block modelling and interpolation

The mineralized wireframes were infilled with non-rotated blocks as per the geometry shown in Table 82 below. Interpolation by Ordinary Kriging, Inverse Distance Squared and Nearest Neighbour using parameters in Table 83 as below.

Haciendita	X	Y	Z
Origin	216,606.383	2,851,393.877	168.612
Block Size (m) (#subcells)	5 (2)	5 (2)	2 (2)
Rotation	0°		
Number of Blocks	375	332	100
Number of Blocks	12,450,000		

Table 82 Haciendita block model geometry

Parameter	Zone A Au	Zone Ag	Zone B Au	Zone B Ag	Min / Max
Rotation around Z	127	160	0	0	
Rotation around Y	0	24	0	0	
Rotation around X	40	33	0	0	
Range X, Y, Z (m)	33,38,5	50,93,4	49,49,49	23,23,23	
Min / Max samples	3/6	3/6	3/6	3/6	
Measured (m)	10,10,5	10,10,5	10,10,5	10,10,5	4,5
Indicated (m)	30,30,10	30,30,10	30,30,10	30,30,10	2,5
Inferred (m)*	50,50,20	50,50,20	50,50,20	50,50,20	2,5

Table 83 Interpolation parameters

Validation

Average mean gold grades for Nearest Neighbour (NN), Ordinary Kriging (OK) and Inverse Distance (IP) for the area are as follows:

Au NN Mean gpt	Au IP Mean gpt	Au OK Mean gpt	% diff NN-IP	% diff NN-OK	% diff IP-OK
0.730	0.716	**0.712**	**1.92**	**2.47**	**0.56**

Table 84 Comparison of global mean grades at Haciendita

These percentage differences are within generally accepted guidelines.

A visual review in vertical cross-sections and horizontal plans across the model show good correlation between interpolated block model grades and the informing composite samples. McEwen believes the model interpolation is a good representation of the current dataset as there did not appear to be any major discrepancies between the two.

Mineral Resource Estimate

The estimated mineral resources for the in situ material at Haciendita are detailed in Table 85 below.

Resource	Tonnage (t)	Silver (oz)	Silver Grade (g/t)	Gold (oz)	Gold Grade (g/t)
Haciendita	(Potential Cut-Off Grade = 0.65 g/t Au)				
Measured	26,000	29,000	34	1,000	1.04
Indicated	623,000	690,000	34	20,000	1.02
Meas. & Ind.	***649,000***	***719,000***	***34***	***21,000***	***1.02***
Inferred	19,000	21,000	34	1,000	0.89

Table 85 Haciendita Mineral Resources

Notes:

- *CIM definitions and guidelines were followed for the estimation of mineral resources for the in situ material.*
- *Reasonable metal prices of $18/oz silver and $1,250/oz gold were used for the optimized pit. Recovery assumptions of 81.4% silver and 95% gold for the in situ material. Mining costs of $1.95/t in situ, processing and G&A costs of $23.29/t were used. Resource models have been developed based on gold and silver recoveries from testwork programs.*
- *Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability. There is no certainty that all or any part of the Mineral Resources estimated will be converted into Mineral Reserves. Numbers in the table have been rounded to reflect the accuracy of the estimate and may not sum due to rounding.*

15. MINERAL RESERVE ESTIMATES – NOT USED

16. MINING METHODS

16.1 Mining Sequence Description

The Project Fenix starts off by mining (unloading) of the Heap Leach Material from the EL Gallo Gold Heap Leach Material and processing it in the Phase 1 mill that will be located immediately adjacent to the heap leach pad.

The mining of the Heap Leach Material will occur during years one to four of the project and then will stop for three years before recommencing in the eighth year of the project and continuing until the twelfth and final year of the project.

The El Gallo Silver open pit will come on line in year three and will supply 98% of the mineralized rock to the mill in that year. In year four it will supply 89% of the mill feed with the balance supplied by the Heap Leach Material. El Gallo Silver open pit mine will operate continuously for six years in succession, with the eighth year of the project being its final year of operation.

In year five of the project Palmarito open pit will begin and will supply 10% of the mill feed that year with the balance coming from El Gallo Silver pit.

Palmarito will also continue to mine for six years in succession with year ten of the project being its final year.

In the same year that Palmarito stops, the Carrisalejo Open Pit will begin production for just two years, helping to supplement the mill feed with 8% and 10% of its throughput in years ten and eleven respectively.

El Encuentro will begin some production late in the ninth year of the project with a total contribution of 4% to the mill feed that year and will continue until the end of year eleven of the project, contributing 17% and 29% of the mill feed in years ten and eleven respectively.

The final year of the project sees the mill return to processing only feed from the Heap Leach Material at 60% of its rated annual capacity.

16.2 Combined Mining Production Schedule

The mine production schedule is based on delivering mineralized material to a mill at the rate of 5,000 t/d or 1,825 Kt/a from the HLM and at reduced tonnages for remote resources due to changes in mill feed BWi. About 52% of the mill feed will come from the El Gallo Gold Heap Leach Material (LOM average 750kT/a),31% of the mill feed is from El Gallo Silver (LOM average 450kT/a), 10% from Palmarito (LOM average 150 kT/a), 4% from Carrisalejo (LOM average 22kT/a), and 4% from El Encuentro (LOM average 61kT/a).

Mining Production	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Total
El Gallo Gold Heap Leach Material															
Mill Feed Tonnes ('000's)	0	0	1,825	1,825	28	210	0	0	0	364	1,411	1,152	1,116	1,092	9,024
Waste Tonnes ('000's)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Au g/t	0	0	0.92	0.71	1.12	0.60	0	0	0	0.45	0.43	0.51	0.55	0.60	0.64
Ag g/t	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
El Gallo Silver															
Mill Feed Tonnes ('000's)	0	0	0	0	1,168	1,050	1,066	935	705	489	0	0	0	0	5,413
Waste Tonnes ('000's)	0	0	0	0	3,032	3,708	4,034	4,165	4,395	1,134	0	0	0	0	20,468
Au g/t	0	0	0	0	0.28	0.07	0.05	0.08	0.04	0.09	0	0	0	0	0.11
Ag g/t	0	0	0	0	137.9	118.9	97.0	104.0	109.2	145.6	0	0	0	0	117.2
Palmarito															
Mill Feed Tonnes ('000's)	0	0	0	0	0	0	130	271	518	496	235	147	0	0	1,796
Waste Tonnes ('000's)	0	0	0	0	0	0	0	805	1,643	1,622	1,448	0	0	0	5,518
Au g/t	0	0	0	0	0	0	0.30	0.36	0.44	0.40	0.38	0.14	0	0	0.37
Ag g/t	0	0	0	0	0	0	183.8	168.0	152.3	140.9	117.1	161.2	0	0	149.9
Carrisalejo															
Mill Feed Tonnes ('000's)	0	0	0	0	0	0	0	0	0	0	0	120	143	0	263
Waste Tonnes ('000's)	0	0	0	0	0	0	0	0	0	0	0	1,044	428	0	1,472
Au g/t	0	0	0	0	0	0	0	0	0	0	0	0.51	0.67	0	0.60
Ag g/t	0	0	0	0	0	0	0	0	0	0	0	77.3	109.8	0	95.0
El Encuentro															
Mill Feed Tonnes ('000's)	0	0	0	0	0	0	0	0	0	0	63	250	424	0	737
Waste Tonnes ('000's)	0	0	0	0	0	0	0	0	0	0	0	4,977	684	0	5,661
Au g/t	0	0	0	0	0	0	0	0	0	0	1.12	1.51	1.65	0	1.56

Mining Production	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Total
Ag g/t	0	0	0	0	0	0	0	0	0	0	1.8	2.5	2.2	0	2.2
Combined Production															
Mill Feed Tonnes ('000's)	0	0	1,825	1,825	1,196	1,260	1,196	1,206	1,223	1,349	1,709	1,669	1,683	1,092	17,233
Waste Tonnes ('000's)	0	0	0	0	3,032	3,708	4,034	4,970	6,038	2,756	1,448	6,021	1,112	0	33,119
Au g/t	0	0	0.92	0.71	0.30	0.16	0.07	0.15	0.21	0.30	0.45	0.63	0.84	0.60	0.48
Ag g/t	0	0	0	0	134.62	99.11	106.40	118.36	127.45	104.62	16.14	20.12	9.89		54.9

Table 86 Combined Mine Plan Schedule for Project Fenix PEA

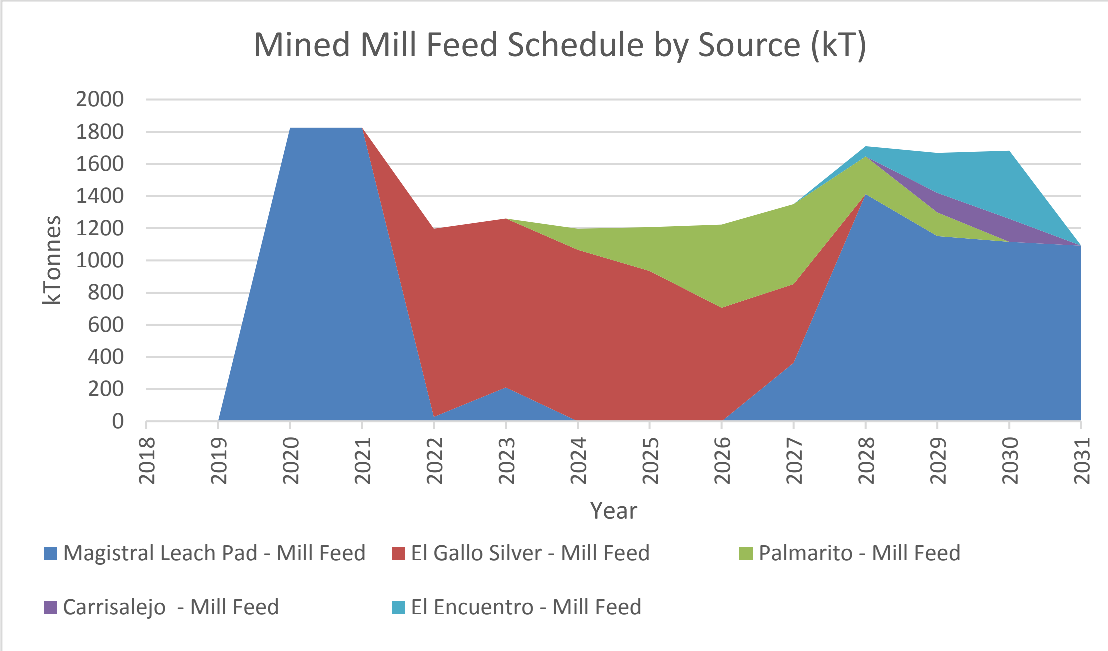


Figure 102 Project Fenix PEA Mill Feed Mined by Source Schedule

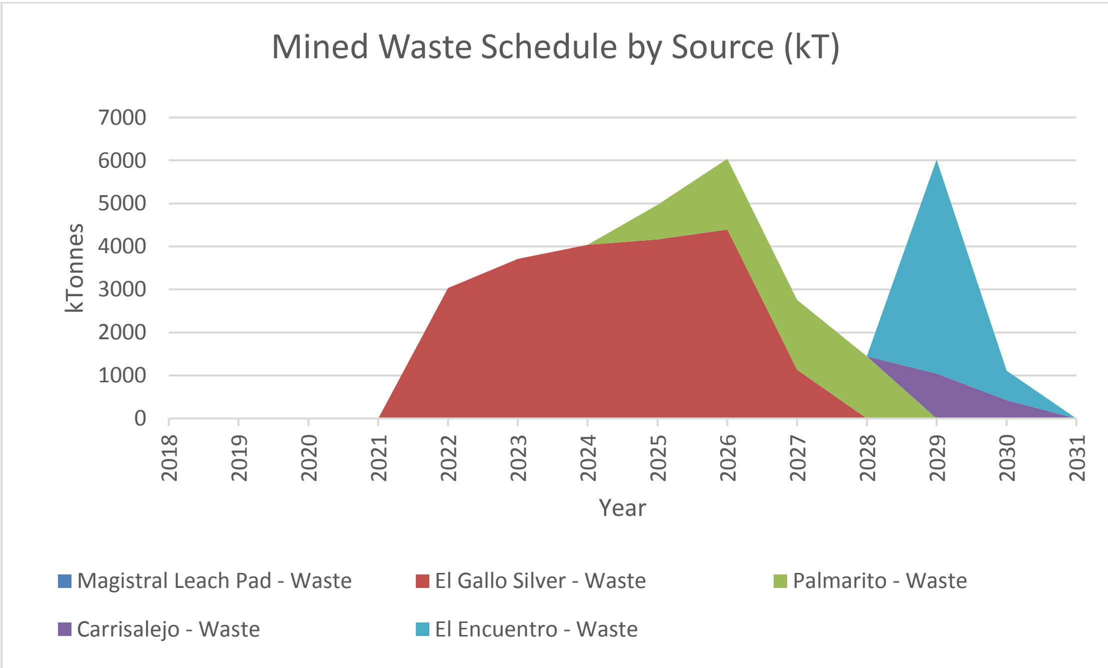


Figure 103 Project Fenix PEA Waste Mined by Source Schedule

16.3 Operating Parameters and Criteria

16.3.1 Pit Design Parameters

The pit design parameters are based on those was used successfully in the four pits mined at the McEwen El Gallo Gold from 2012 -2018 (Samaniego, Sagrado Corazon, Lupita and Central Pits).

Pit design Parameters are generally as follows unless otherwise indicated by geotechnical data.

- Bench Height: 5m
- Batter angle: 75 degrees
- Catch benches 8m wide every 3 benches (can vary above 8m to facilitate shallower pit slopes where ramps do not decrease the overall pit slop angle adequately)
- Inter Ramp Angle: 51.2 (3 x 5 benches at 75 degrees + 8m catch bench
- Overall Pit slopes: 42 to 45 degrees
- Ramp widths 20 – 25 m where two-way 777 traffic is required; 15m where 2-way ADT or 1 -way 777 traffic is required and 10m where one-way ADT traffic is adequate (i.e. at pit bottoms).
- Ramp angles: generally, 10 degrees (8 degrees in some of the shallower benches to maximize productivity over the mine life) up to 12 degrees in the bottoms of the pits to help minimize strip ratio required).

16.3.2 Unstacking the Heap Leach Material

One hundred percent of the resource in the Heap Leach Material will be reprocessed in the mill. Despite the fact that a small amount of the material in the material is below the COG it will be difficult to segregate it and send it to waste as the Heap Leach Material is not consolidated.

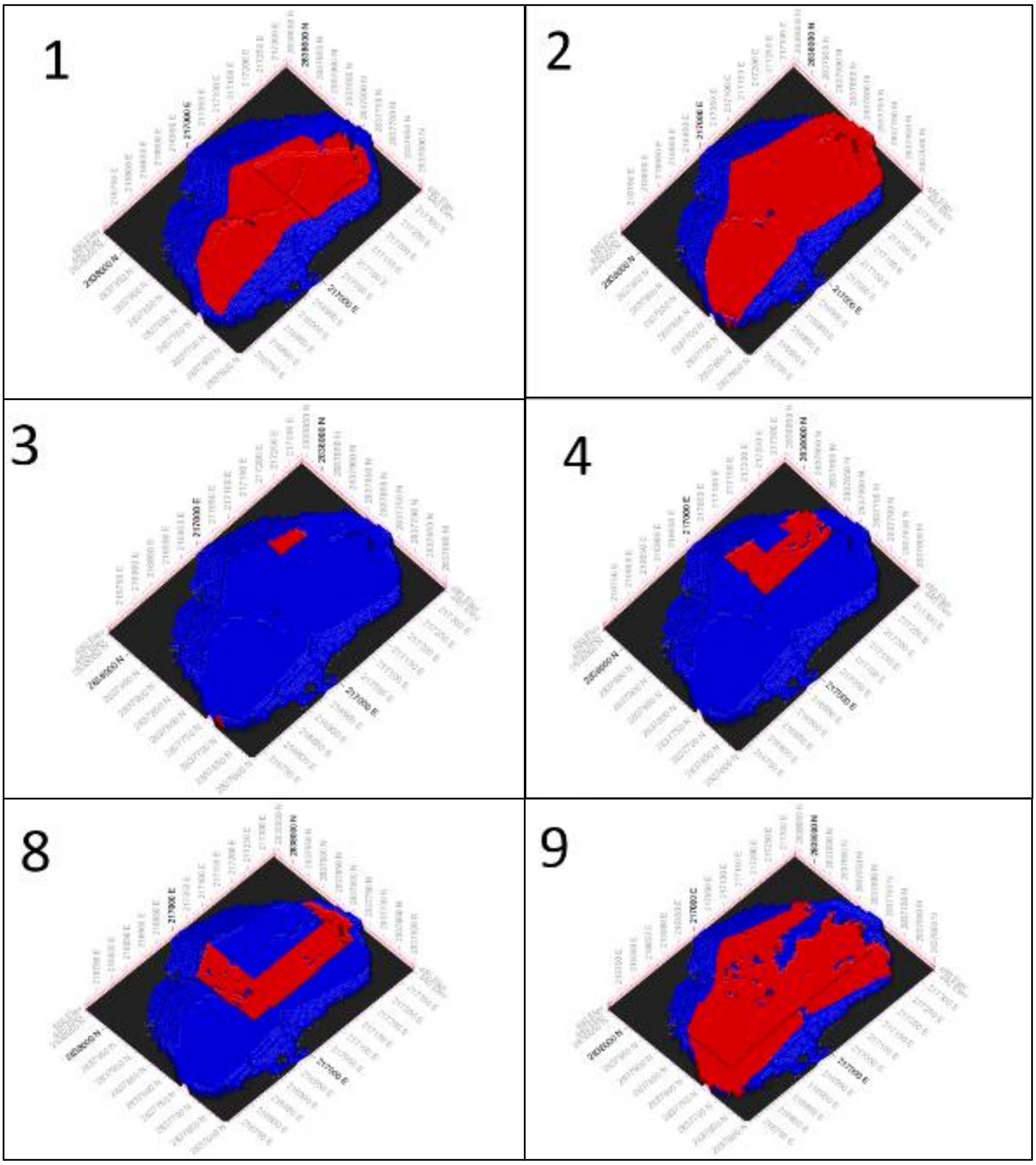
The unstacking of the Heap Leach Material will be conducted in years 1-4 and 8-12 of the project as illustrated in Figure 103 and Figures16.3 a-i

Year	Total	Grade	Ounces
	tonnes	Au gpt	Mined
1	1,825,163	0.92	54,248
2	1,824,950	0.71	41,459
3	28,050	1.12	1,007
4	209,950	0.60	4,049
5	-	-	-
6	-	-	-
7	-	-	-
8	363,588	0.45	5,277
9	1,411,213	0.43	19,591
10	1,152,388	0.51	18,734

Year	Total	Grade	Ounces
	tonnes	Au gpt	Mined
11	1,116,475	0.55	19,683
12	1,092,250	0.60	21,089
Total	9,024,027	0.64	185,137

Table 87 Heap Leach Unloading Schedule

The unloading of the head leached material will be conducted in two 12-hour shifts per day for 350 days per year. This will require three mining crews.


1
2
3
4
8
9

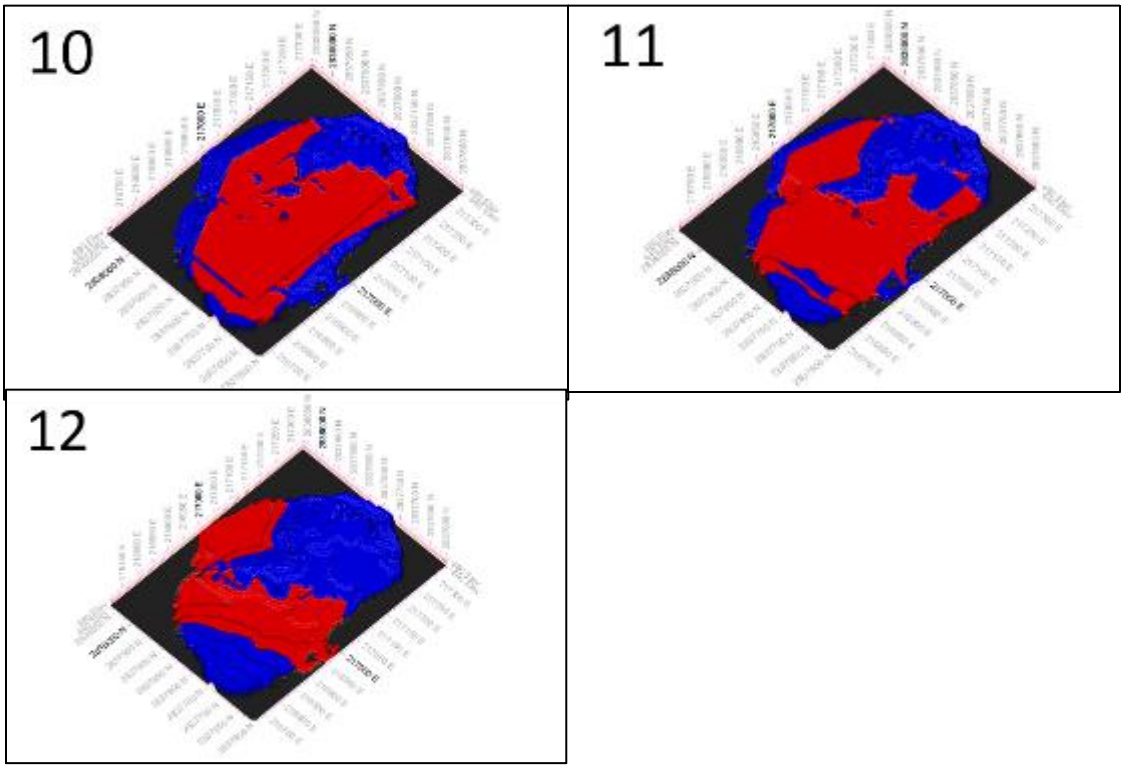


Figure 104 Unloading Sequence of the El Gallo Gold Heap Leach Material for Reprocessing for Project Fenix PEA a) Year 1, b) Year 2, c) Year 3, d) Year 4, e) Year 8, f) Year 9 g) Year 10, h) Year 11, i) Year 12

16.3.3 Mining of the Satellite Pits

To supplement the mill feed coming from the Heap Leach Material, mine plans were developed for the El Gallo Silver, Palmarito, Carrisalejo and El Encuentro mineral deposits based on delivering mineralized material to the Project Fenix mill at varying rates between 3,250 tpd and 4,000tpd due to varying hardness. About 31% of the total mill feed is from El Gallo Silver (LOM average 450 kT/a), 10% from Palmarito (LOM average 150 kT/a), 4% from Carrisalejo (LOM average 22 kT/a), and 4% from El Encuentro (LOM average 61 kT/a).

The mill feed from the satellite pits will be trucked over public and purpose-built roads to Project Fenix processing facilities. The estimated total distance that the mineralized material needs to be hauled is as follows.

- El Gallo Silver 10-12 km depending on route selected;
- Palmarito 26 km;
- Carrisalejo 15 km; and
- El Encuentro 10 km

The position of the satellite pits relative to El Gallo Gold are illustrated in Figure 105.

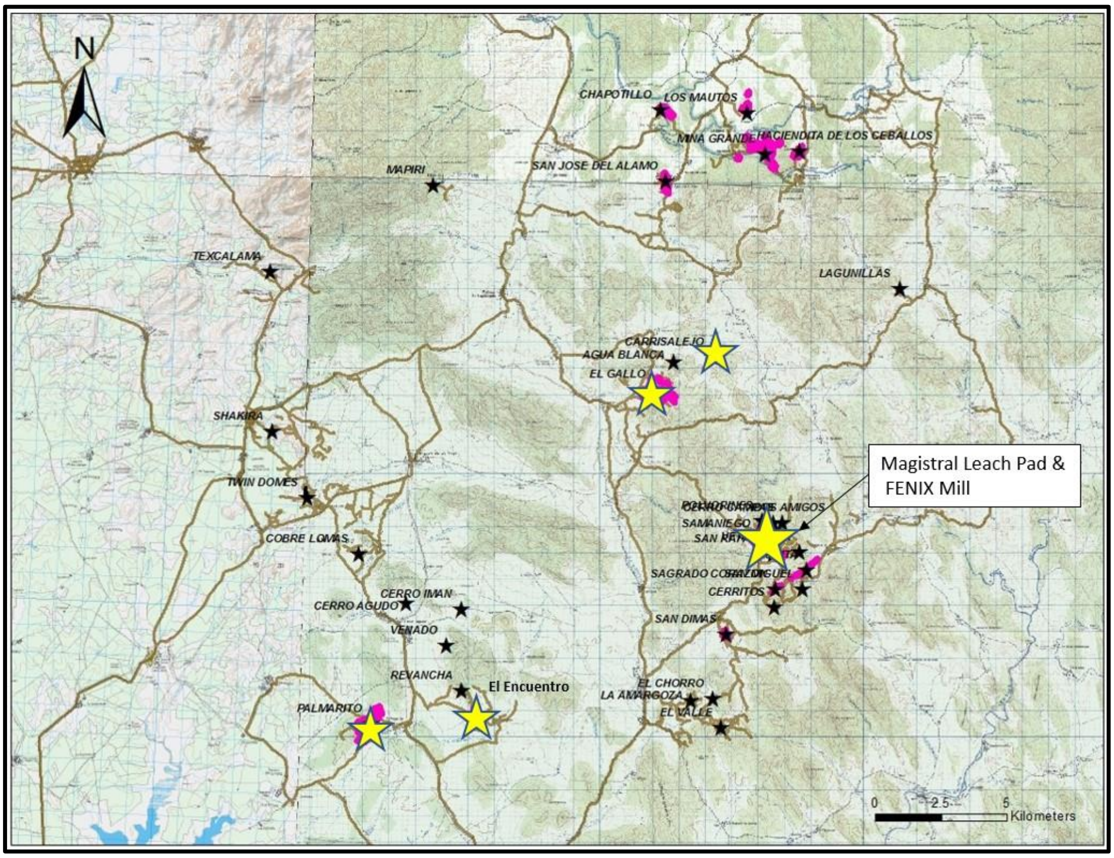


Figure 105 Position of Satellite Pits with positions of those relevant to Project Fenix highlighted with yellow stars

The mining of the El Gallo Silver, Carrisalejo and El Encuentro pits will be conducted two 10-hour shifts per day for 350 days per year. This will require three mining crews. Palmarito mining will be conducted during two 10-hour shifts per day for 250 days per year (five days per week, due to proximity to the village) and will require two mining crews.

With the current mine production schedule, the commercial project life is 12 years after a brief pre-production period.

16.4 Pit and Mining Phase Design

16.4.1 El Gallo Silver

Five mining phases were designed for El Gallo Silver. Figure 106 shows the final pit design. The final pit phase designs are based on an optimized pit shell run at commodity prices of $21 silver and $1,250 gold.

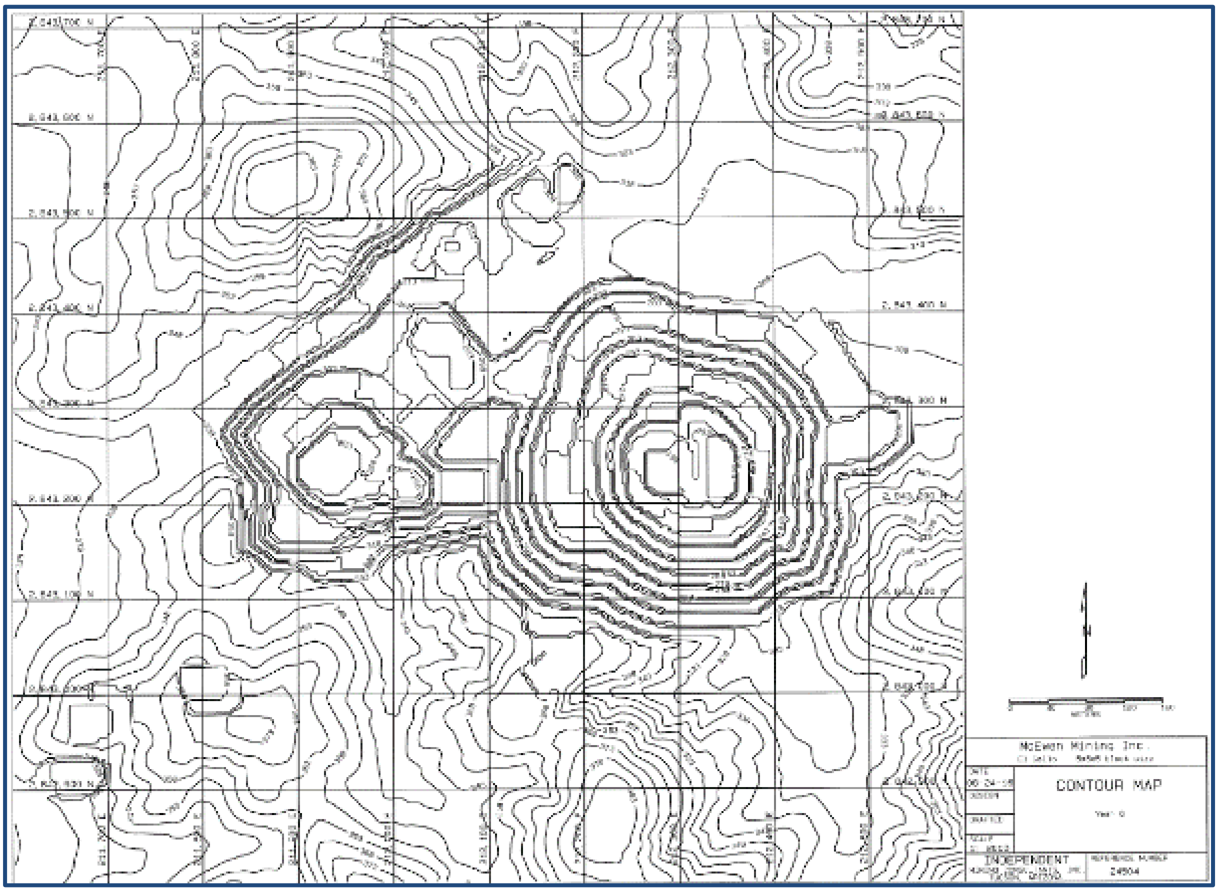


Figure 106 El Gallo Silver Final Pit (Per the Fenix Schedule and IMC Study August 2016)

Inter-ramp slope angles are based on a study conducted by Itasca S.A. and documented in the report "El Gallo Open Pit Preliminary Stability Analysis", dated back to February 2012. The Itasca analysis was based on dividing a preliminary El Gallo Silver pit design into nine design sectors, based on the dip direction of the pit wall. The study presented various graphs of estimated inter-ramp angles versus bench face angles for each sector.

Haul roads were designed 25 m wide at a maximum grade of 10% to accommodate trucks of about 90 t such as the Caterpillar 777 class trucks. The designs are also based on triple benching three 5 m benches so there are 15 m between catch benches 8m in width.

Table 88 shows the phase tonnages by mill feed and stockpiled material based on the economics and cut-off grades as follows:

Independent Mining Consultants, Inc. (IMC) have developed a mine production schedule for the El Gallo Silver Resource in Sinaloa, Mexico based on the updated mining phases received in August of 2016 by Nigel Fung (McEwen Mining). The schedule was based on delivering mineralized material to a mill at the rate of 875 kt per year, or about 2,500 tonnes per day. This memo is accompanied by the Excel Spreadsheet Production Schedule 24Aug2016.xls. This mine schedule is accelerated to accommodate the 5,000 tpd mill throughput for Project Fenix. However, neither the mining sequence nor the pit shapes required changing, whereas the shape and grade of the mineralized rock produces very similar optimized pit shells at cutoff grades for both $21 Ag and $16 Ag.

Table 88 shows the proposed mine production schedule created by IMC in August 2016. Year 1 and 2 are shown by quarter year periods; the rest of the time periods are by year. Yr1 Q1 mill feed is the 23 kt of material mined during preproduction plus the 196 kt mined during Yr1 Q1. This is 219 kt of material, or 100% of the production rate, i.e. the schedule assumes full production the first quarter of mill operations. It can be seen that there is a mineralized material shortfall in Years 5; low grade will be used supplement mine feed. Under Total Tonnes and Waste near the bottom of Table 1 it can be seen that preproduction is only 300,000 tonnes. Year 1 and 2 total material is 3.9 million and 4.8 million tonnes respectively. The peak material movement is 5.1 million tonnes per year during Years 3, 4, and 5.

The 47 g/t cutoff is to cover plant/G&A costs plus a rehandle cost of about $1 per tonne. Mill cutoff grades for El Gallo Silver start at 90 g/t equivalent silver for preproduction and the first quarter of Year 1. After this the cutoff grade fluctuates from 45.8 g/t silver equivalent (internal cutoff grade) to 67 g/t to balance the mining rate and plant capacity by period. For this schedule, silver equivalent is defined as silver + 55.8 x gold. Between the operating cutoff grade for each year and a low-grade stockpile cutoff of 47 g/t equivalent silver there is 717 kt of low grade over the mine life.

Table 89 shows the proposed mill production schedule and the various sources for the mineralized material. As previous mentioned, El Gallo Silver Yr1 Q1 includes mill feed mined during preproduction. Note that 717 kt of the low-grade stockpile is reclaimed during Years 5, 6, and 7 on a last in-first out basis.

In addition to this schedule, the accompanying spreadsheet shows the details of the mineralized material and low-grade production in terms of benches and percent of benches by phase by time period. It also shows the details of the low-grade reclamation schedule that may also be utilized as part of the Project Fenix production schedule.

EL GALLO SILVER PRODUCTION SCHEDULE																		8/24/2016
MINE PRODUCTION SCHEDULE:	**Units**	**PP**	**Yr1 Q1**	**Yr1 Q2**	**Yr1 Q3**	**Yr1 Q4**	**Yr2 Q1**	**Yr2 Q2**	**Yr2 Q3**	**Yr2 Q4**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**TOTAL**	
El Gallo Silver Mill																		
Silver Equivalent Cutoff Grade	(g/t)	90	90	62	67	63	60	56	63	57	57	51	45.8	45.8				
Mineralized Material Kt	(kt)	23	196	219	219	219	219	219	219	219	875	875	705	489			4,696	
Silver Equivalent	(g/t)	150.8	218.0	182.9	190.3	155.4	165.2	131.6	112.8	136.0	110.1	112.7	111.3	150.8			133.9	
Silver	(g/t)	133.3	173.5	165.6	183.3	143.8	159.3	128.8	109.7	131.5	107.3	107.9	109.2	145.6			127.2	
Gold	(g/t)	0.314	0.797	0.312	0.125	0.207	0.107	0.05	0.056	0.08	0.050	0.087	0.036	0.093			0.119	
El Gallo Silver Low Grade Mill Stockpile:																		
Silver Equivalent Cutoff Grade	(g/t)	47	47	47	47	47	47	47	47	47								
Mineralized Material Kt	(kt)	38	87	63	66	38	27	35	68	44	191	60					717	
Silver Equivalent	(g/t)	65.0	67.7	54.1	56.6	54.3	54.0	51.4	55.2	51.5	51.8	48.9					55.3	
Silver	(g/t)	60.8	60.2	50.5	52.6	48.5	52.1	50.0	52.3	49.2	49.9	47.3					52.0	
Gold	(g/t)	0.075	0.134	0.064	0.072	0.105	0.034	0.026	0.052	0.042	0.035	0.028					0.060	
Total Tonnes and Waste:																		
El Gallo Silver Mill Mineralized Material	(kt)	23	196	219	219	219	219	219	219	219	875	875	705	489			4,696	
El Gallo Silver Low Grade	(kt)	38	87	63	66	38	27	35	68	44	191	60	0	0			717	
Total El Gallo Silver Mineralized Material	(kt)	61	283	282	285	257	246	254	287	263	1,066	935	705	489			5,413	
El Gallo SilverTotal Kt	(kt)	300	750	1,050	1,050	1,050	1,050	1,239	1,247	1,222	5,100	5,100	5,100	1,623			25,881	
El Gallo Silver Waste Kt	(kt)	239	467	768	765	793	804	985	960	959	4,034	4,165	4,395	1,134			20,468	
El Gallo Silver Waste to Mineralized Material Ratio (LG as Mineralized Material)	(none)	3.92	1.65	2.72	2.68	3.09	3.27	3.88	3.34	3.65	3.78	4.45	6.23	2.32			3.78	
Stockpile Rehandle	(kt)		23										170	386	161		740	

Table 88 El Gallo Silver Mine Schedule from 2016 Study which is Used as a base for the El Gallo Silver Mining sequence in this PEA;

EL GALLO SILVER MILL PRODUCTION SCHEDULE																	8/24/2016
MILL PRODUCTION SCHEDULE	**Units**	**PP**	**Yr1 Q1**	**Yr1 Q2**	**Yr1 Q3**	**Yr1 Q4**	**Yr2 Q1**	**Yr2 Q2**	**Yr2 Q3**	**Yr2 Q4**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**TOTAL**
Mineralized Material Kt(kt)			219	219	219	219	219	219	219	219	875	875	875	875	161		5,413
Silver Equivalent(g/t)			210.9	182.9	190.3	155.4	165.2	131.6	112.8	136.0	110.1	112.7	99.5	108.0	64.0		123.5
Silver(g/t)			169.3	165.6	183.3	143.8	159.3	128.8	109.7	131.5	107.3	107.9	97.5	103.8	58.2		117.2
Gold(g/t)			0.746	0.312	0.125	0.207	0.107	0.050	0.056	0.080	0.050	0.087	0.035	0.075	0.104		0.111
From El Gallo Silver Pit:																	
Mineralized Material Kt(kt)			219	219	219	219	219	219	219	219	875	875	705	489			4,696
Silver Equivalent(g/t)			210.9	182.9	190.3	155.4	165.2	131.6	112.8	136.0	110.1	112.7	111.3	150.8			133.9
Silver(g/t)			169.3	165.6	183.3	143.8	159.3	128.8	109.7	131.5	107.3	107.9	109.2	145.6			127.2
Gold(g/t)			0.746	0.312	0.125	0.207	0.107	0.050	0.056	0.080	0.050	0.087	0.036	0.093			0.119
From Low Grade Stockpile:																	
Mineralized Material Kt(kt)													170	386	161		717
Silver Equivalent(g/t)													50.8	53.7	64.0		55.3
Silver(g/t)													49.0	50.8	58.2		52.0
Gold(g/t)													0.033	0.053	0.104		0.060

Table 89 El Gallo Silver Mill Schedule from 2016 Study

Potential leach material is no longer considered in this PEA. Total material in the pit design is 25.88Mt. This is a waste to Mineralized Material ratio of 3.78 to 1. The total mill feed and material are consistent with the L-G Pit Shell results for the base case shell. The phase tonnages compared well with the base case cone tonnages. Mining Sequence Summary by Year for El Gallo Silver is shown in Figure 107 to Figure 111 and remains unchanged from the 2016 study.

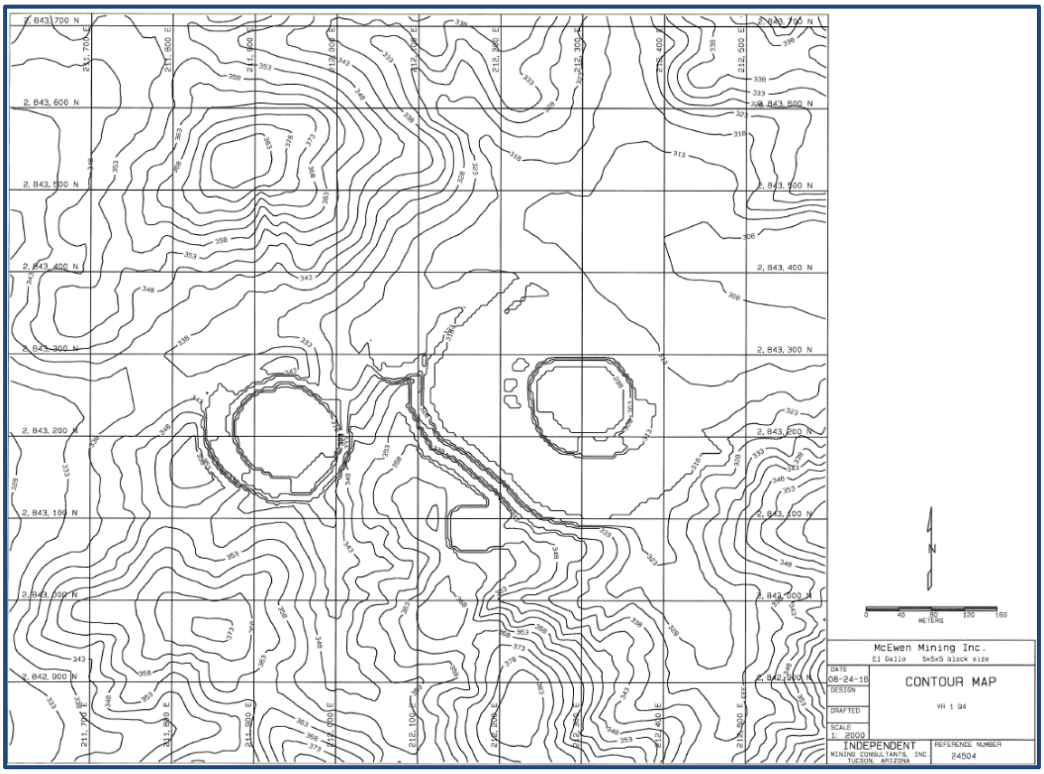


Figure 107 El Gallo Silver End of Year 1 (per IMC Study August 2016)

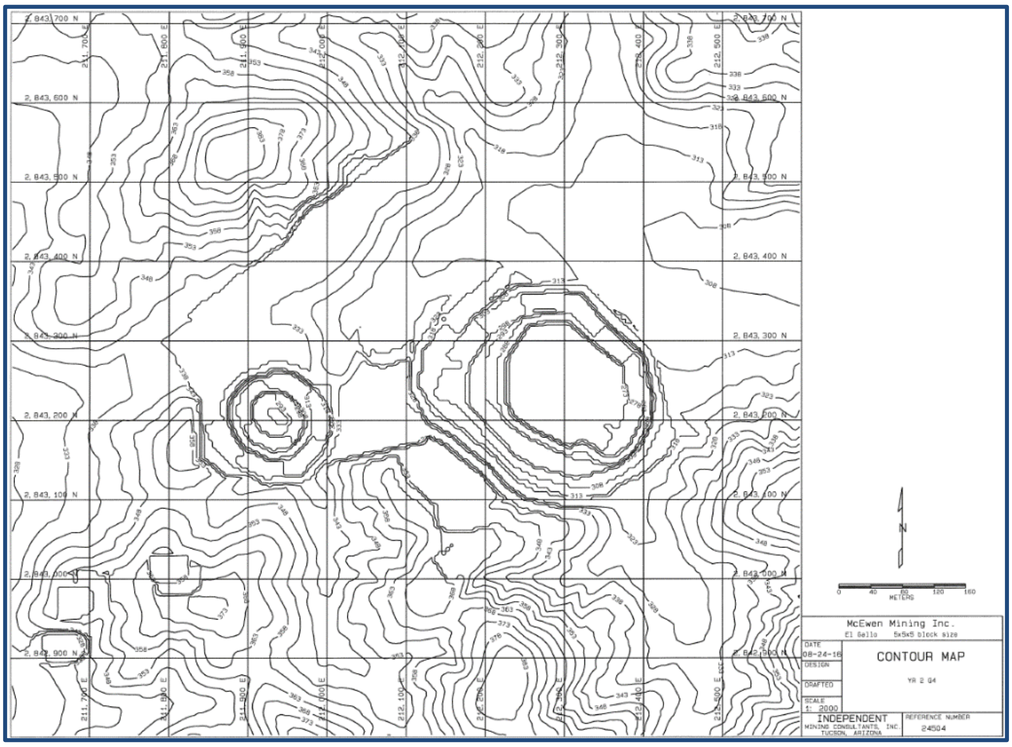


Figure 108 El Gallo Silver End of Year 2 (per IMC Study August 2016)

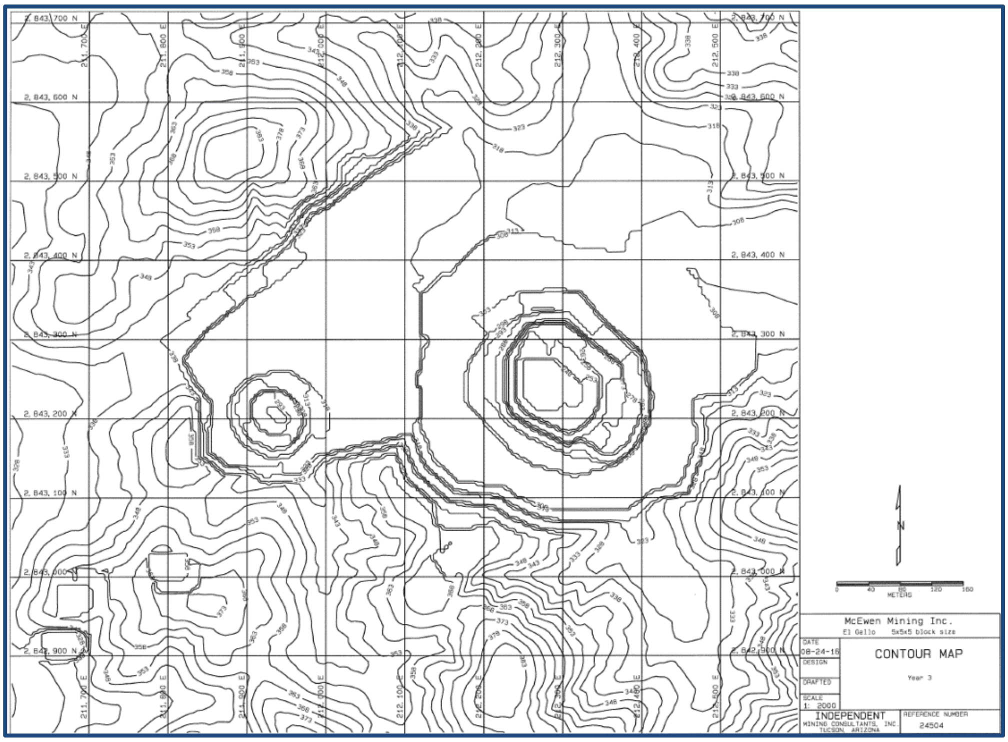


Figure 109 El Gallo Silver End of Year 3 (per IMC Study August 2016)

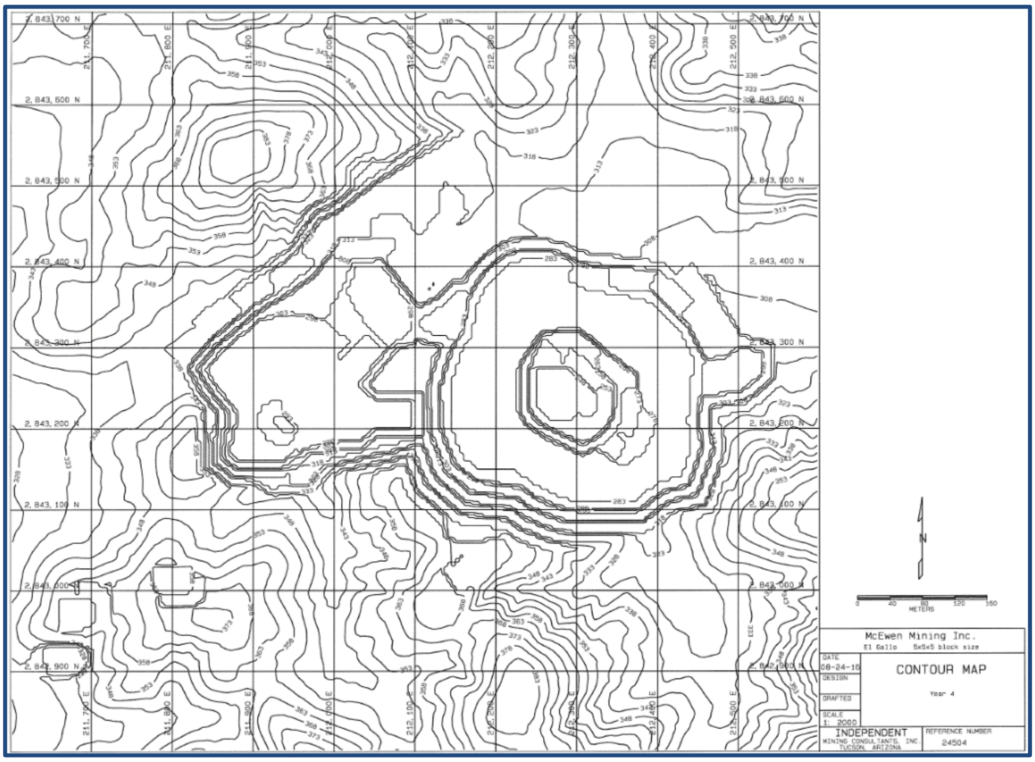


Figure 110 El Gallo Silver End of Year 4 (per IMC Study August 2016)

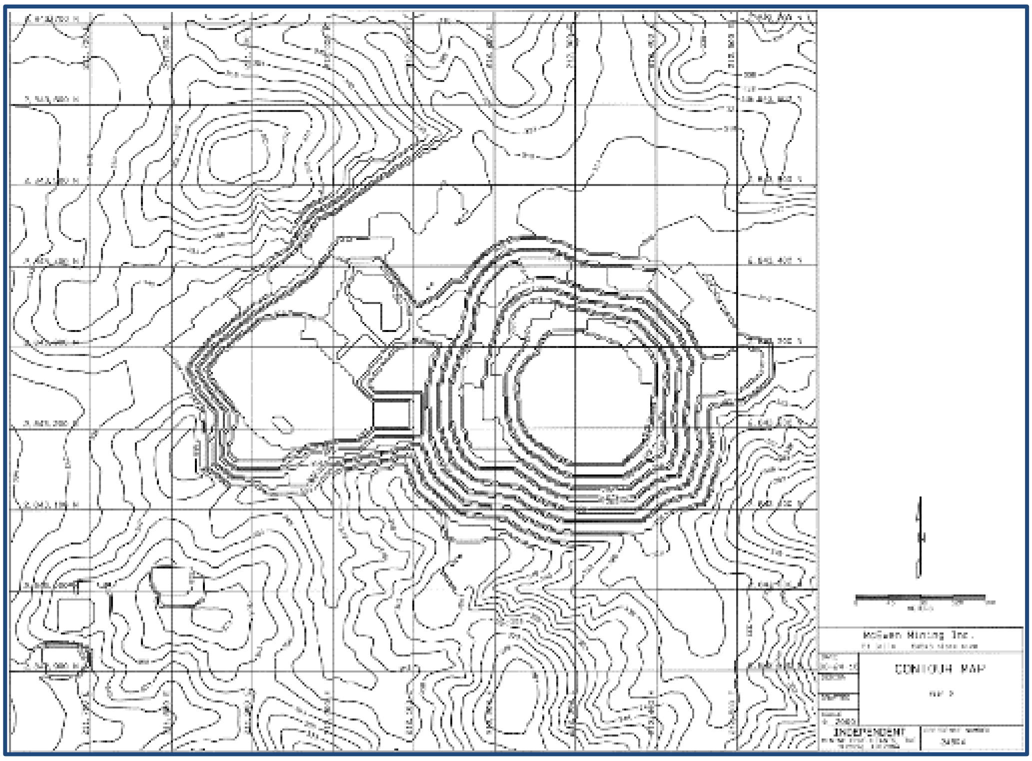


Figure 111 El Gallo Silver End of Year 5 (per IMC Study August 2016)

This mine plan was the basis for the mining sequence currently incorporated into the Project Fenix mining schedule the only difference is the rate at which the mining occurs so as to blend the feed going to the mill with Heap Leach Material from El Gallo Gold in year 3 to 4 & 8 (2022-2023 & 2027); and with Palmarito Feed in years 4 to 8 (2024 – 2027).

16.4.2 Palmarito

Three mining phases were designed to mine the Palmarito pit (in situ resource). Figure 112 shows the final pit design as at the end of Phase 3, with Phase 1 being the north Pit, Phase 2 the NE Pit & Phase 3 the Southernmost Pit. The final pit was based on commodity prices of $25 silver and $1,300 gold but does not change significantly with current gold and silver prices. Note: Original design done at these prices is still valid for $21Au and $1250Au and cheaper whereas the mineralized rock lies on the outer perimeter of a hillside and the geometry of the optimized pit shells are practically identical across a wide range of metal prices. The only difference is that some lower grade material below the new cut-off grade within the same pit gets recategorized as waste

As with the El Gallo Silver Pit, the Inter-ramp slope angles are based on a study conducted by Itasca and documented in the report "El Palmarito Open Pit Preliminary Stability Analysis", dated February 2012. The Itasca analysis was based on dividing a preliminary Palmarito pit design into six design sectors, based on the dip direction of the pit wall.

As an additional constraint on the L-G Pitshell evaluation, deep mineralized rock below about the 100m elevation in the north-east pit area were marked as sulphide blocks and excluded from the analysis. Metallurgical testing indicated low recovery in this area.

The roads are 15 m wide to accommodate 35 to 40 t trucks that may also travel public roads. All roads are at a maximum grade of 10%.

Table 90 shows the phase tonnages of mill feed based on the 48 g/t equivalent silver cut-off grade. Mill feed tonnage is 1.80 Mt at 177.9 g/t silver equivalent, 149.9 g/t silver, and 0.370 g/t gold. Total material is 5.82 Mt for a 2.24 to 1 waste to mill feed ratio.

Table 90 shows only the material net of the historic dump and tails, i.e. this material is assumed to be removed before mining the in situ resource commences. The dump and tails within the pit limits amounted to 234 Kt total and is not considered in the economics of this PEA. A small amount (14 Kt) of potential in situ resource was also contained in blocks designated as dump resource and was also excluded from the 16.3. As previously discussed, the historic dump and tailings material is incorporated into separate block models which are available for economic analysis outside the scope of this PEA (they will add a small positive increase to the economics of the project, but not significant enough to be included here nor as a resource currently).

Phase	Potential Mill Feed (+48 g/t Eq. Ag)				Waste Kt	Total Kt	Strip Ratio
		Ag Eq.	Silver	Gold			
	Kt	(g/t)	(g/t)	(g/t)			
1	580	187.2	157.7	0.421	810	1,390	1.40
2	703	125.2	104.4	0.298	1,577	2,280	2.24
3	546	132.6	108.8	0.340	1,604	2,150	2.94
Total	**1,829**	**147.1**	**122.6**	**0.350**	**3,991**	**5,820**	**2.18**

Table 90 Palmarito Mining Phase Summary from Earlier Study Used as a Guide for FENIX

Palmarito Tailings will not be mined in this PEA as the metallurgical recoveries of less than 50% render them uneconomical at current gold and silver price assumptions.

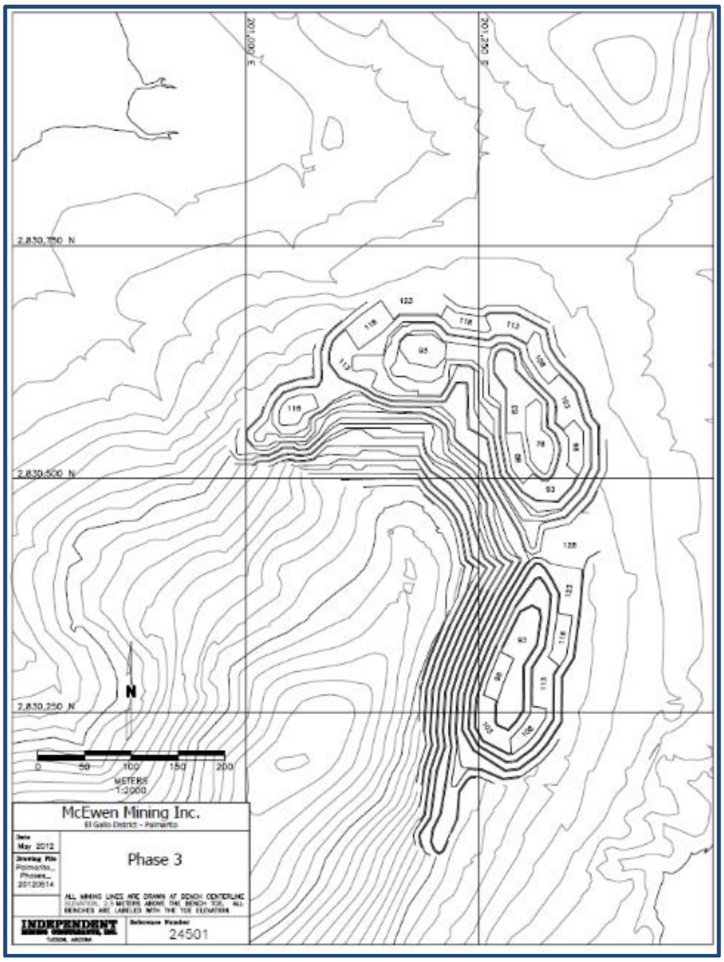


Figure 112 Palmarito Final Pit (End of Phase 3)

16.4.3 Carrisalejo

Carrisalejo will be mined over two years (2029 and 2030) in three push backs that are illustrated in Figure 113.

The two pits can be mined separately although it could be preferable to mine the lower pit first and then backfill it with waste from the upper pit.

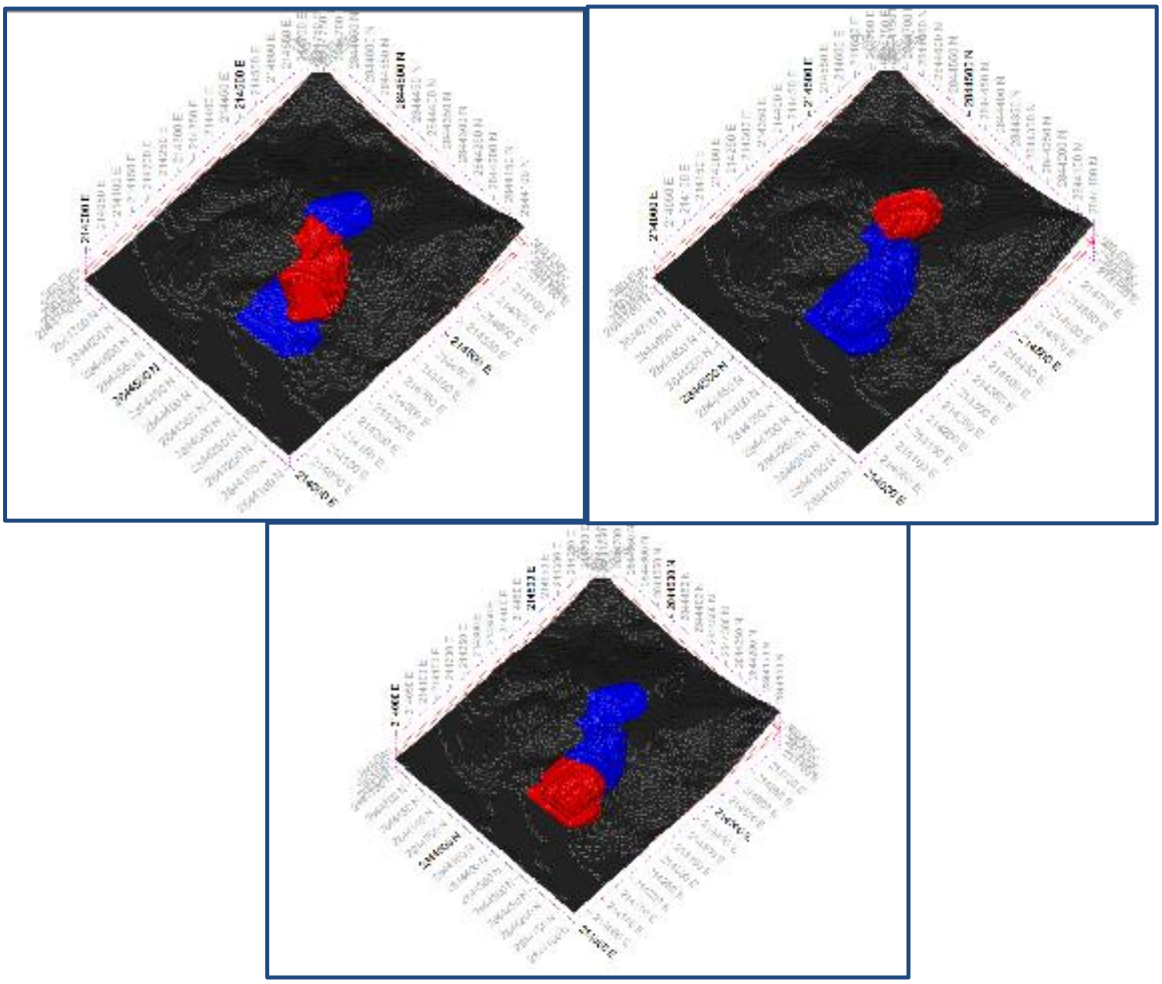


Figure 113 Carrisalejo Pit a) Pushback 1; b) Pushback 2; c) Pushback 3

The first of the three pushbacks straddle the upper and lower pits. Pushback two is the lower pit and pushback 3 is the upper pit.

The mine schedule mines Carrisalejo over 2 years, Figure 114 illustrates what the pit will look like this at the end of year 10 and year 11 respectively.

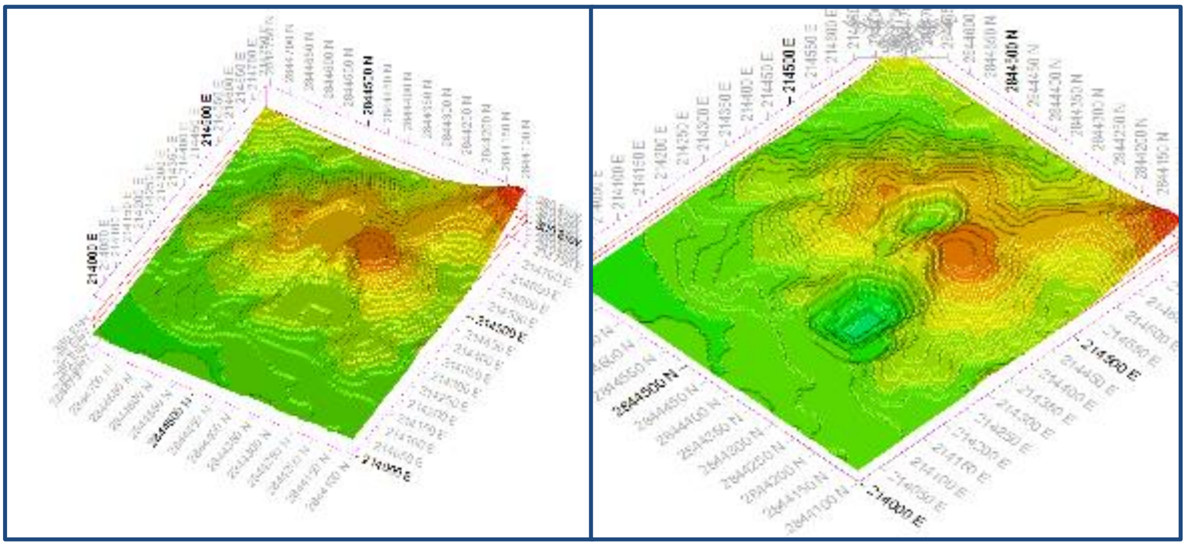


Figure 114 Carrisalejo End of Year 10 (2029) and Carrisalejo Final Pit – End of year 11 (2030)

The mine schedule shown in Table 91 is based on the mine designs, pushbacks and sequence illustrated in the figures 10 & 11.

Description	Year 10 (2029)	Year 11 (2030)	Total
Mill feed tonnes	120,028	143,149	263,177
Ag Grade	77.31	109.85	95.01
Au Grade	0.51	0.67	0.60
AuEq Grade	2.49	2.17	2.25
Ag Ounces	298,352	505,554	803,905
Au Ounces	1,971	3,074	5,045
AuEq Oz	5,965	9,799	15,763
Waste Tonnes	1,044,204	427,900	1,472,104
Total Tonnes	1,164,232	571,049	1,735,281
Strip Ratio	8.70	2.99	5.59

Table 91 Carrisalejo Mine Schedule

16.4.4 El Encuentro

The El Encuentro pit is the closest of the satellite pits to the Project Fenix Mill at just under 10 km from El Gallo Gold and en route to the El Gallo Gold site when coming from Guamuchil via Mocorito.

El Encuentro will be mined for just over two years starting in 2028 (through until 2030) in three separate pits that are illustrated in Figure 115. The two smaller pits have mineral at surface while the large pit requires significant removal of waste before getting down to significant mineralized rock at a depth below surface of 40 meters.

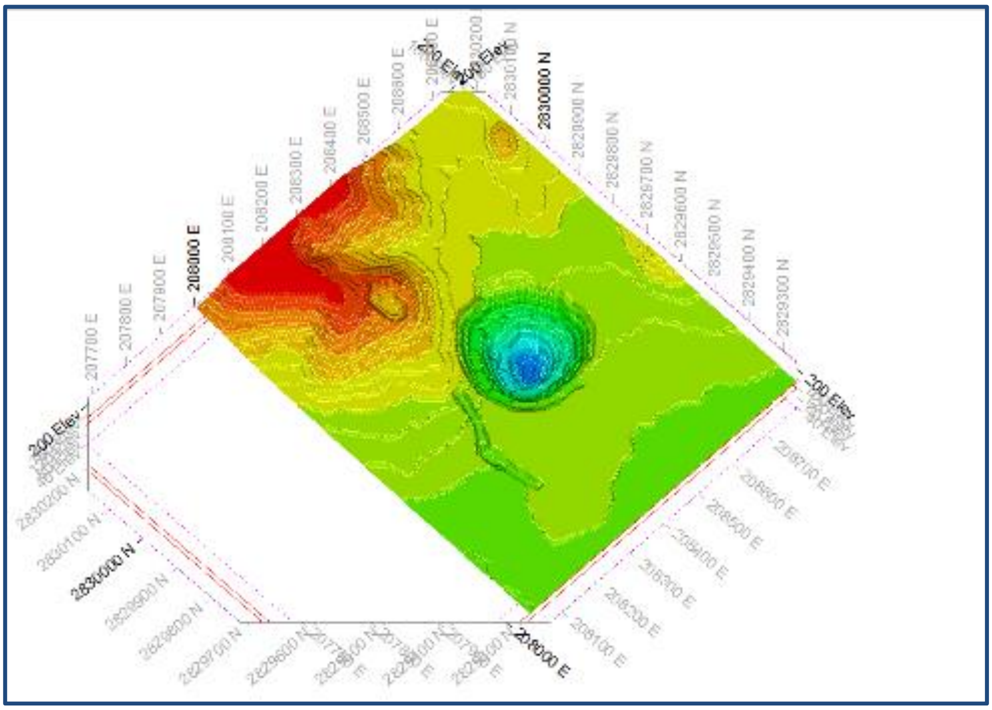


Figure 115 El Encuentro Pit Model

The larger of the three pits cannot be phased as the mineralized rock begins fairly deep down. The smaller pits have mineralized rock right at the surface.

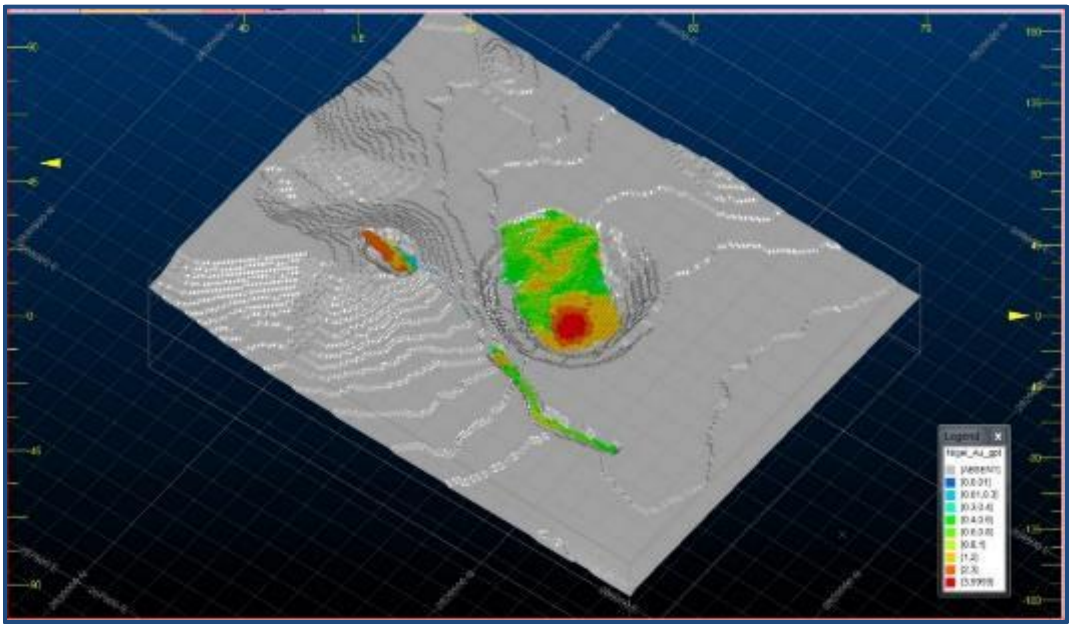


Figure 116 El Encuentro Three Pits

The three pits will be mined separately with the smaller pits being the first to be mined, with the smaller pit at the top of the hill being mined first (almost as a bulk sample), whereas it has the most easily accessed mineralized material with the better grade of the two small pits. The second small pit is long and narrow and can be mined almost as at trench in just two benches depth.

The large pit will begin to be mined during 2029 and requires significant amount of waste mining before mineralized rock with significant ounces is reached.

The mining schedule for the El Encuentro Pit is shown in Table 92, note that there is no waste mined initially as the two smaller pits have mineralized mill feed available at the surface.

	Year 9 (2028)	Year 10 (2029)	Year 11 (2030)	Total
Mineralized Material Tonnes	62,799	250,016	423,725	736,540
Ag Grade	1.84	2.49	2.17	2.25
Au Grade	1.12	1.51	1.65	1.56
AuEq Grade	1.84	2.49	2.17	2.25
Ag Ounces	3,714	19,977	29,500	53,191
Au Ounces	2,267	12,163	22,540	36,970
AuEq Oz	2,316	12,429	22,934	37,678
Waste Tonnes	0	4,976,783	684,162	5,660,945
Total Tonnes	62,799	5,226,799	1,107,887	6,397,485
Strip Ratio	0.00	19.91	1.61	7.69

Table 92 El Encuentro Mine Schedule for the PEA

16.5 Waste Rock and Stockpile Storage Areas

16.5.1 El Gallo Silver Waste Rock and Stockpile Storage

Several waste rock storage areas and stockpiles were designed to manage El Gallo Silver waste and low-grade materials. Figure 117 shows these various facilities at the end of open pit operations. Waste storage facilities are as follows:

- The south-east waste storage facility contains 15.4 Mt of waste and is active most of the project life;
- The Phase 4 SW pits are mined during Year 2 and are backfilled to original contour the last two quarters of Year 2;
- During the final year's 5.1 Mt of waste can are placed into the west side of the main pit (Phase 2 west areas) as backfill;
- Two stockpiles were also designed;
- A low-grade mill feed stockpile north of the pit was designed to hold about 675,000 t. This stockpile is reclaimed, and the low grade mineralized rock can be processed through the mill, at the end of mining;

The south-east waste storage facility and leach stockpile are designed in 15 m lifts at angle of repose with a set-back between lifts so the overall slope angle is at 2.5H:1V. This is amenable to long term stability and reclamation.

The low-grade mill stockpile is designed in 5 m lifts at angle of repose; this is not a permanent facility.

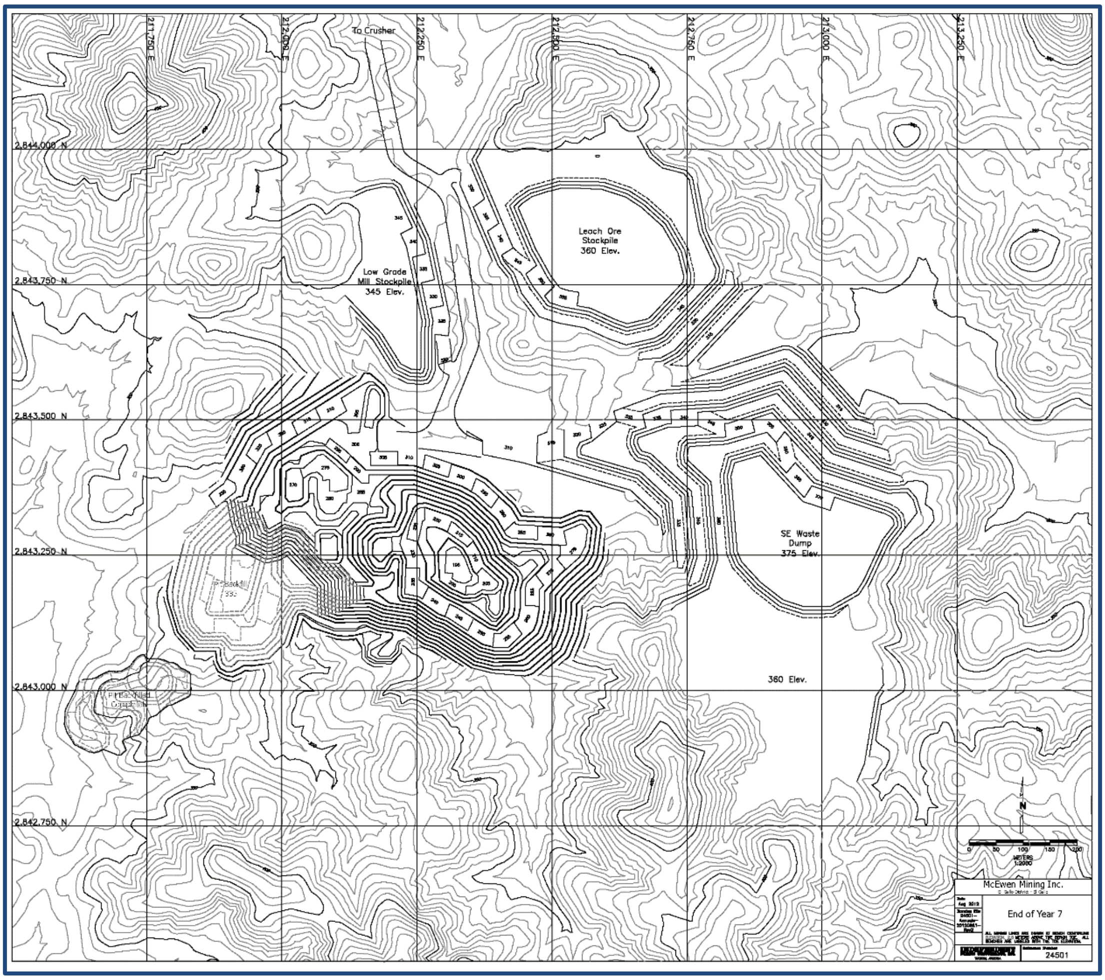


Figure 117 El Gallo Silver Waste and Stockpile Areas

16.5.2 Palmarito Waste Rock Storage Areas

Mine waste is stored in two facilities for Palmarito. Figure 118 shows the facilities at the end of mining:

- The main waste storage facility is east of the main pit. At the end of mining it contains 3.5 Mt of waste;
- During the final year of mining Phase 3, about 465,000 t of waste will be placed in the Phase 2 pit as backfill.

The east waste storage facility is designed in 15 m lifts at angle of repose with a set-back between lifts so the overall slope angle is at 3H:1V. This is amenable to long term stability and reclamation.

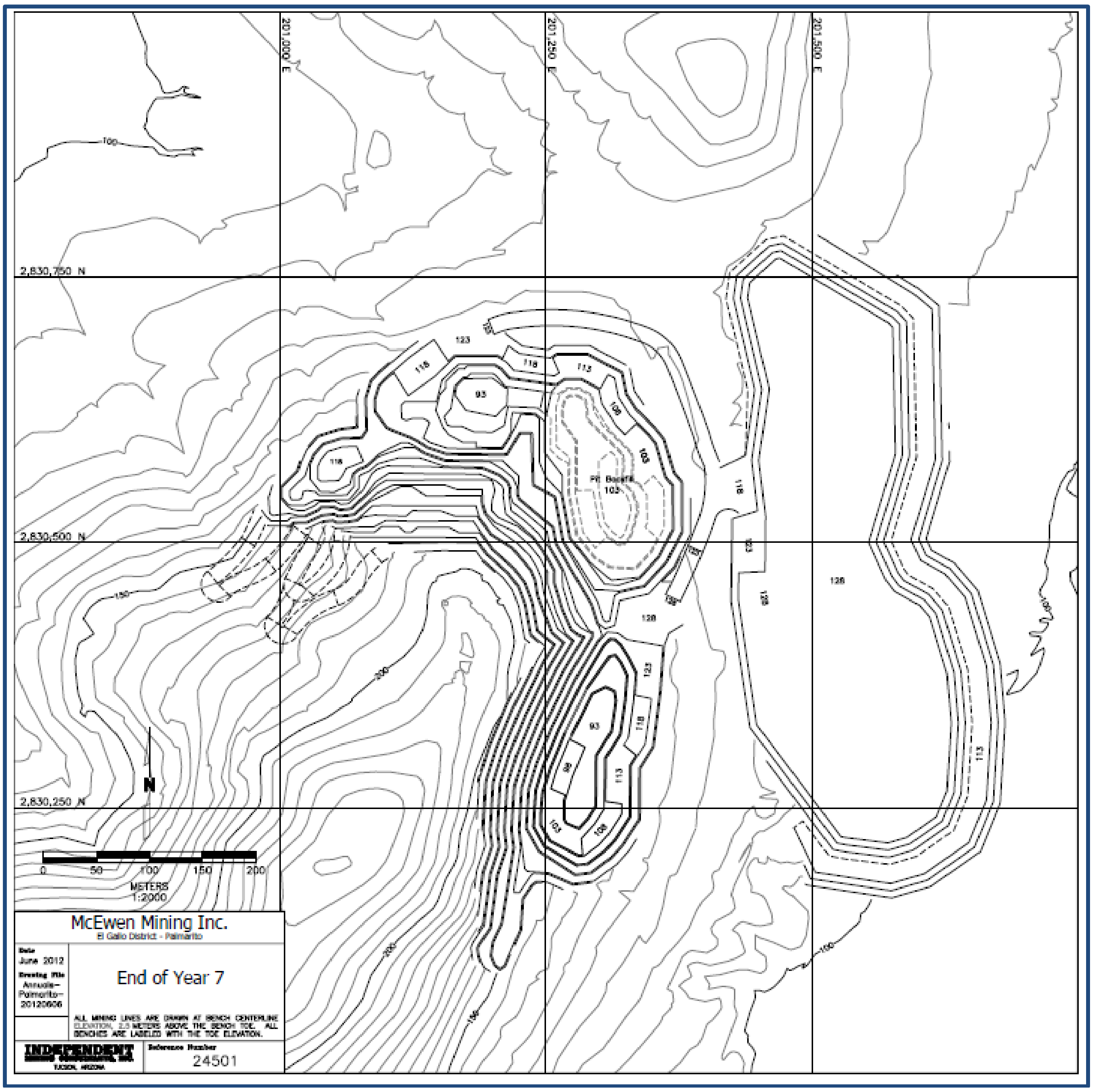


Figure 118 Palmarito Waste Storage Areas

16.5.3 Carrisalejo Waste Rock Storage Areas

The total waste rock storage requirement from the Carrisalejo mine will be a total of 1,472,104 T in the combined plan) tonnes that will occupy a volume of approximately 0.8M m3 (assuming loose density of 1.8mT /m3). The dump will require an area 27K m2 (165m x165m) stacked to a height of 30m. This area is available but it is likely to be more environmentally acceptable to backfill some or all of this waste into the El Gallo Silver Pit.

16.5.4 El Encuentro Waste Rock Storage Areas

The total waste rock storage requirement from the El Encuentro mine will be a total of 5,660,945 tonnes that will occupy a volume of approximately 3.1M m3. The dump will require an area 78K m2 (280m x280m) stacked to a height of 40m. This area is available but it may be more environmentally acceptable to backfill some or all of this waste into one of the El Gallo Gold pits.

16.6 Mining Equipment

16.6.1 Heap Leach Material Unstacking

The Heap Leach Material will be unstacked using 980 sized wheel loaders feeding direct into the mill feed hopper and D10 dozer to push material close to the hopper reducing the tramming distance for the loader.

16.6.2 Remote Resources General

Mine major equipment requirements for remote resources were sized and estimated on a first principles basis based on the mine production schedule, the mine work schedule, and estimated equipment productivity rates. The work schedule is based on two 10-hour shifts per day for 350 days per year. For remote resources mineralized material will be hauled to the Project Fenix mill by a contractor since this will be over public and purpose-built roads. Other than material haulage, the mine equipment estimate is based on owner operation and assumes a well-managed mining operation with a well-trained labour pool, and that all the equipment is new at the start of mining.

This mine equipment lists represent the equipment required to perform the following duties:

- Developing access roads from the mine to the crusher and waste dumps;
- Mining and transporting mineralized mill feed to the crusher;
- Mining and transporting waste to the various waste storage facilities; and
- Maintaining the haul roads and dumps.

The equipment list does not include equipment required for construction or operation of any physical plant at the mine. This type of work will be handled by contractors or equipment borrowed from the El Gallo Gold mine.

Equipment requirements have been optimized to reflect the multiple remote resources, this optimisation process has assumed if equipment is down for repair for a prolonged period of time at a remote resource then a replacement unit will be brought from El Gallo Silver or the El Gallo Gold Heap Leach Material unloading project.

16.6.3 El Gallo Silver Mining Equipment

Table 93 shows major equipment requirements by time period for El Gallo Silver within the context of the combined mine plan being evaluated in this PEA.

Equipment Type	Capacity/ Power	Time Period						
		PP (2021)	Y3 (2022)	Y4 (2023)	Y5 (2024)	Y6 (2025)	Y7 (2026)	Y8 (2027)
Caterpillar MD6240 Drill	(210 mm)	1	2	2	2	2	2	1
Cat 992K Wheel Loader	(10.7 m³)	1	2	2	2	2	1	1
Cat 777F Truck	(90 Mt)	2	4	4	4	4	3	2
Cat D9T Track Dozer	(306 kW)	3	3	3	3	3	3	3
Cat 824H Wheel Dozer	(264 kW)	1	1	1	1	1	1	1
Cat 14M Motor Grader	(193 kW)	1	1	1	1	1	1	1
Water Truck – 8,000 gal	(30,000 l)	1	1	1	1	1	1	1
Cat 321D Excavator	(1.7 m³)	1	1	1	1	1	1	1
Atlas Copco ECM 590 RC Drill	(102 mm)	1	1	1	1	1	1	1
Total		**12**	**16**	**16**	**16**	**16**	**14**	**12**

Table 93 Mine Major Equipment Fleet – El Gallo Silver

16.6.4 Palmarito Mining Equipment

Table 94 shows major equipment requirements by time period for Palmarito within the context of the Project Fenix multi pit mine schedule being evaluated in this PEA.

Equipment Type	Capacity/ Power	Time Period						
		PP	Y5 (2024)	Y6 (2025)	Y7 (2026)	Y8 (2027)	Y9 (2028)	Y10 (2029)
Atlas Copco ECM 720 Drill	(121 mm)	0	1	1	1	1	1	1
Komatsu PC2000 Hyd Shovel	(11 m³)	0	1	1	1	1	1	1
Cat 988H Wheel Loader	(6.1 m³)	0	1	1	1	1	1	1
Cat 770 Truck	(36 Mt)	0	1	1	2	2	2	1
Cat D8T Track Dozer	(231 kW)	0	1	1	1	1	1	1
Cat 824H Wheel Dozer	(264 kW)	0	1	1	1	1	1	1
Cat 12M Motor Grader	(118 kW)	0	1	1	1	1	1	1
Water Truck – 5,000 gal	(19,000 l)	0	1	1	1	1	1	1
Cat 321D Excavator	(1.7 m³)	0	1	1	1	1	1	1
Total		**0**	**8**	**8**	**8**	**8**	**9**	**9**

Table 94 Mine Major Equipment Fleet Requirement – Palmarito

Only two mining trucks are required since mineralized material haulage is by contractor over public roads. The mining trucks will be used for waste and site development activities. There is also only one loader and drill in the optimized equipment list.

16.6.5 Carrisalejo Mining Equipment

As the Carrisalejo mine begins after El Gallo Silver has been completed and as the Palmarito Mine is shutting down it will take advantage of the equipment already having been used at both projects.

Table 95 shows major equipment requirements by time period for Carrisalejo within the context of the Project Fenix multi pit mine schedule being evaluated in this PEA.

Equipment Type	Capacity/ Power	Time Period		
		PP (2028)	Y10 (2029)	Y11 (2030)
Atlas Copco ECM 720 Drill	(121 mm)	1	2	2
Komatsu PC2000 Hyd Shovel	(11 m³)	0	1	1
Cat 777F Truck	(90 Mt)	0	1	1
Cat 988H Wheel Loader	(6.1 m³)	0	1	1
Cat 770 Truck	(36 Mt)	1	1	2
Cat D8T Track Dozer	(231 kW)	1	1	1
Cat 824H Wheel Dozer	(264 kW)	1	1	1
Cat 12M Motor Grader	(118 kW)	1	1	1
Water Truck – 5,000 gal	(19,000 l)	1	1	1
Cat 321D Excavator	(1.7 m³)	1	1	1
Total		**7**	**11**	**12**

Table 95 Mine Major Equipment Fleet Requirement – Carrisalejo

Only two mining trucks are required since mineralized material haulage is by contractor over public roads. The mining trucks will be used for waste and site development activities. There is one shovel for operating in the mountainous terrain, and a wheel loader brought in once adequate space on the pit floors have been established.

16.6.6 El Encuentro Mining Equipment

As the El Encuentro mine begins after El Gallo Silver has been completed and as the Palmarito Mine is shutting down it will take advantage of the equipment already having been used at both projects. The production that begins in last quarter of 2028 uses the prior quarters of 2028 as pre-production time.

Table 96 shows major equipment requirements by time period for El Encuentro within the context of the Project Fenix multi pit mine schedule being evaluated in this PEA.

Equipment Type	Capacity/ Power	Time Period		
		PP/Y9 (2028)*	Y10 (2029)	Y11 (2030)
Caterpillar MD6240 Drill	(210 mm)	1	2	1
Cat 992K Wheel Loader	(10.7 m³)	1	2	1
Cat 777F Truck	(90 Mt)	1	3	2
Cat 770 Truck	(36 Mt)	1	1	0
Cat D9T Track Dozer	(306 kW)	1	2	1
Cat 824H Wheel Dozer	(264 kW)	1	1	1
Cat 12M Motor Grader	(118 kW)	1	1	1
Cat 14M Motor Grader	(193 kW)	0	1	0
Water Truck – 8,000 gal	(30,000 l)	1	1	1
Cat 321D Excavator	(1.7 m³)	1	1	1
Total		**9**	**15**	**9**

* Starts in Q4

Table 96 Mine Major Equipment Fleet Requirement – El Encuentro

Four mining trucks are estimated during the bulk of production in 2029 when average daily production will be approximately 15,000 tpd.

Mineralized mill feed haulage is by contractor over public roads. The mining trucks will be used for waste and site development activities. There is one shovel for operating in the mountainous terrain, and a wheel loader brought in once adequate space on the pit floors have been established.

17. RECOVERY METHODS

17.1 Introduction

The Project Fenix processing facility would be designed to process material from several different deposits via separate campaigns. The facility would initially be designed to treat the previously treated gold rich Heap Leach Material from the existing El Gallo Gold heap leach operation. The facility, with some additional processing equipment added, would then treat silver rich fresh mineralized feed stock from several other deposits in the region – El Gallo Silver, Palmarito, Carrisalejo and El Encuentro.

A two-phase approach would be utilized to develop Project Fenix, Phase 1 specifically for the gold bearing Heap Leach Material (HLM) from the El Gallo Gold heap leach operation and Phase 2 for the treatment of silver mineralized feed stock from El Gallo Silver.

In Phase 1 the Project Fenix processing facility would initially target gold recovery from the HLM by conventional grinding, cyanide leaching and adsorption of gold onto activated carbon. The treatment facility would initially incorporate the following unit process operations;

- HLM reclamation;
- Primary ball milling and classification;
- Direct cyanide leaching and adsorption;
- Elution and electrowinning;
- Gold recovery and gold room operations;
- Cyanide detoxification;
- Tailings thickening and in-pit disposal;
- Reagent mixing, storage and distribution;
- Services and ancillaries.

In Phase 2 it is intended to install further unit processes after an initial operating period to enable treatment of material from the El Gallo Silver deposit. This would include the separate cyanide leaching of the bulk flotation concentrate and flotation tailings streams to enhance the silver leaching characteristics. Due to the high silver to gold ratio for this deposit counter–current decantation (CCD) and the Merrill Crowe (zinc precipitation) process would also be included for the recovery of precious metals from the concentrate leach solution.

The additional processing stages would include:

- Three stage crushing using the existing El Gallo Gold crushing plant with direct mill feed via a transfer bin and emergency dead stockpile;
- Bulk rougher-scavenger flotation;
- Bulk concentrate thickening;

- Cyanide leaching of the flotation concentrate (using two of the leach tanks installed for Phase 1 operation and an additional leach tank);
- Counter current decantation (CCD) thickening to recover concentrate leach pregnant solution;
- Flotation tailings thickening;
- Flotation tailings leaching and adsorption (using a single leach tank and adsorption circuit installed during Phase 1);
- Zinc precipitation and Merrill Crowe technology for recovery of precious metals from the concentrate leach pregnant solution and flotation tailings leach eluate;
- Refining facilities for treatment of precipitate cake to bullion;
- Additional reagent mixing, storage and distribution services.

Mill throughput rate and product size would be material dependent. The HLM would be designed to be processed at a throughput rate of 5,000 tpd, while the fresh mineralized material from the silver sulphide deposits would be processed at an equivalent of 3,250 tpd. The difference in treatment rate is due to the finer grind size being targeted for treatment of the silver deposits and the difference in grinding characteristics of the materials to be processed.

Based on scoping level test work carried out to date the indications are that the Carrisalejo mineralization would perform similarly to the El Gallo Silver deposit with respect to silver recovery. Sighter test work conducted from 2017 to 2018 showed only modest silver recovery from flotation for the Palmarito samples. However, separate cyanide leaching of the bulk flotation concentrate and flotation tailings streams achieved positive results. The treatment process for Carrisalejo and Palmarito open pit material has therefore also been assumed as per that required for El Gallo Silver deposit pending additional sampling and metallurgical test work.

El Encuentro is known at present as a gold dominant resource with low silver and moderate levels of base metals. Based on scoping level test work carried out to date the indications are that the El Encuentro material would be amenable to direct cyanidation. The treatment process for El Encuentro open pit material has therefore also been assumed as per that required for El Gallo Gold Heap Leach Material (HML).

Process flow schematic diagrams are included as Figure 119 and Figure 120 below, showing the difference for the two phases of operation.

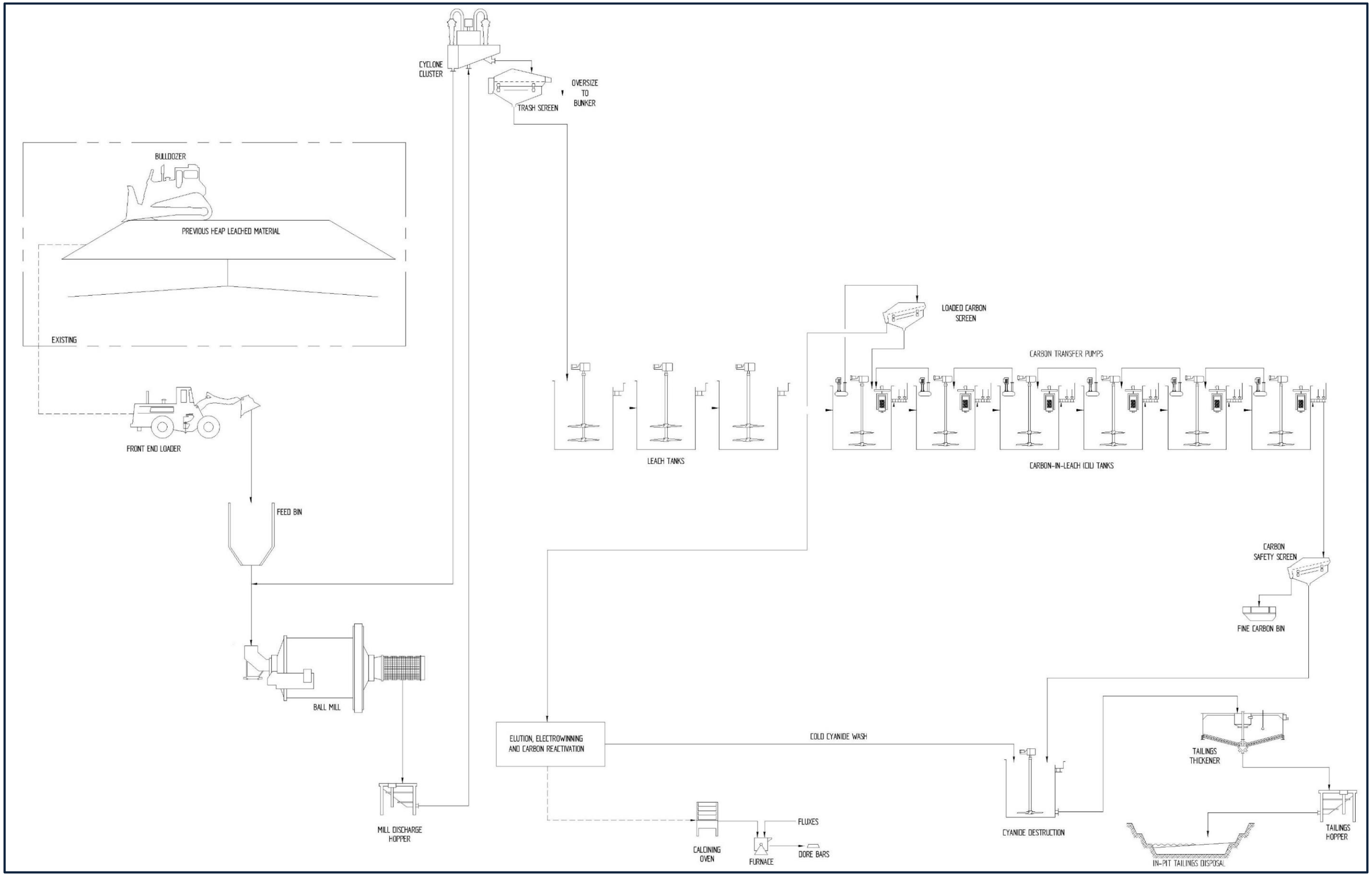


Figure 119 Project Process Flow Schematic Diagram – Phase 1

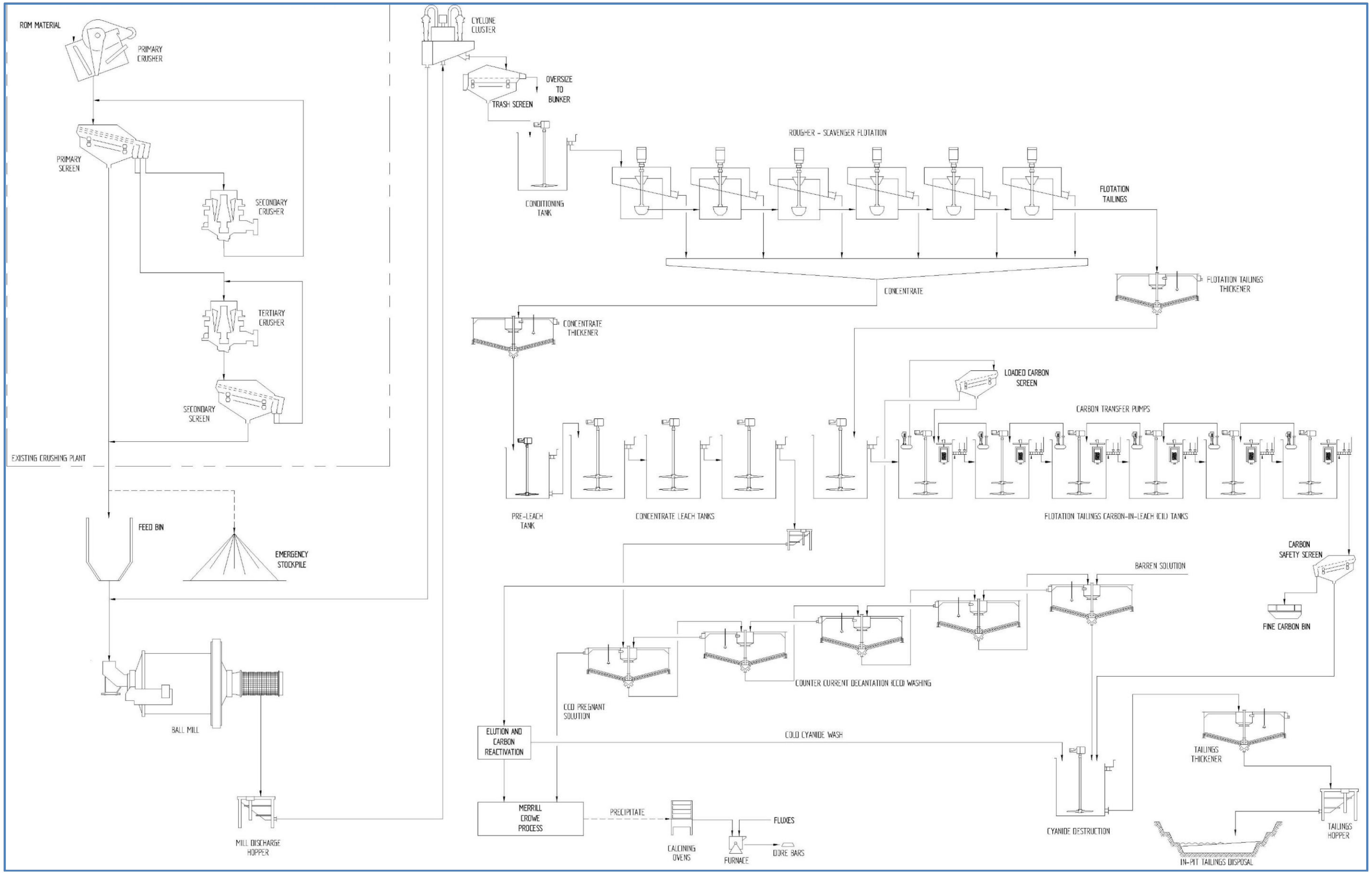


Figure 120 Project Process Flow Schematic Diagram – Phase 2

17.2 Process Design Basis – Phase 1 (El Gallo Gold Heap Leach Material)

The El Gallo Gold Heap Leach Material would be designed to be processed at a throughput rate of 5,000 tpd, equating to 1,825,000 tpa. The plant would be scheduled to operate seven days per week, 24 hours per day at a nominal treatment rate of 226 dry t/h based on an annual availability of 92%.

The key design criteria for the processing plant are summarized in Table 97.

Design Parameter	Units	Value
Plant throughput	tpd	5,000
	t/h dry	226
Plant availability	%	92
Heap leach material grades - design	g/t Au	1.0
	g/t Ag	1.8
Heap leach material grades - nominal	g/t Au	0.64
Heap leach material F_{80} size	mm	8
Heap leach material in situ moisture	%	6
Primary grind P_{80} size	µm	120
Circulating load	%	300
Bond ball mill work index (75th percentile)	kWh/t	18.6
Leach system	-	Hybrid CIL
Leach slurry density	% solids w/w	40
Total leach and adsorption time	h	24
Elution system (new)	-	Split AARL
Overall recovery	% Au	88
Final tailings cyanide destruction technique	-	SO_2/Air

Table 97 Phase 1 Process Design Basis

17.3 Process Design Basis – Phase 2 (El Gallo Silver)

The El Gallo Silver mineralized material would be designed to be processed at a throughput rate of 3,250 tpd, equating to 1,186,250 tpa. The plant would be scheduled to operate seven days per week, 24 hours per day at a nominal treatment rate of 147 dry t/h based on an annual availability of 92%.

The key design criteria for the processing plant are summarized in Table 98:

Design Parameter	Units	Value
Plant throughput	tpd	3,250
	t/h dry	147
Plant availability	%	92
Feed grades - design	g/t Ag	165
	g/t Au	0.13
Feed grades - nominal	g/t Ag	117
Mill feed F_{80} size	mm	10
Primary grind P_{80} size	µm	75
Circulating load	%	300
Bond rod mill work index (75th percentile)	kWh/t	17.1
Bond ball mill work index (75th percentile)	kWh/t	19.6
Bulk flotation feed density	% solids w/w	25
Laboratory rougher-scavenger flotation time	min	15
Rougher-scavenger scale-up ratio	-	2.6
Mass pull to bulk concentrate	%	15
Concentrate leach	-	Direct cyanidation
Concentrate leach slurry density	% solids w/w	35
Concentrate leach retention time	h	72
Concentrate leach precious metals recovery	-	CCD/Merrill Crowe
CCD wash efficiency	%	99
Flotation tailings leach system	-	Hybrid CIL
Flotation tailings leach slurry density	% solids w/w	40
Flotation tailings leach and adsorption time	h	34
Flotation tailings leach elution system	-	Split AARL
Overall combined recovery	% Ag	86
	% Au	75
Final tailings cyanide destruction technique	-	SO_2/Air

Table 98 Phase 2 Process Design Basis

17.4 Process Plant Description

17.4.1 Phase 1 (El Gallo Gold Heap Leach Material)

Heap Leach Material Reclamation

The existing HLM would be recovered by a simple operation that would involve bulldozing in situ crushed material for reclaim by front end loader, which would then tip this material into a feed bin. The feed bin would have a capacity of 55 tonnes, equivalent to approximately fifteen minutes of milling circuit demand at the design processing rate. A static grizzly would be fitted to the feed bin to remove foreign material from within the heap. The HLM would be withdrawn from the feed bin at a controlled rate by a variable speed belt feeder and would be discharged onto the mill feed conveyor.

Grinding and Classification

The grinding circuit would consist of a single stage overflow ball mill that would operate in closed circuit with hydro-cyclones. The ball mill procured by McEwen following the El Gallo Complex Phase II Project Feasibility Study in 2012 would be utilized for Project Fenix. This reduces capital costs and offers a pragmatic compromize between throughput capacity of the processing plant and maximizing gold recoveries.

The ball mill is 5.5 m diameter inside shell by 8.1 m EGL and fitted with a 4,100 kW motor. The mill is currently configured to operate at 72% of critical speed. Installed motor power would cater for a maximum ball charge of 35% by volume when the mill has new liners fitted. During normal operation at the ball charge of 35% by volume the predicted pinion power draw would be 3,800 kW. The mill can be upgraded with a 4,500 kW motor capable of driving the mill with an increased ball charge of 39% for increased power draw to generate a finer grind size P_{80} of 106 µm pending a trade-off study to be conducted during the next phase. Pulp density within the mill would be designed to be 70% solids.

The mill size prediction was calculated using the conventional Bond – Rowland method for the power required to reduce the HLM from a F_{80} of 8.0 mm to a P_{80} of 120 µm at a rate of 226 tonnes per hour.

Pulp discharging from the ball mill would passing through the mill trommel screen and be diluted to the correct cyclone feed density and then pumped to the cyclone cluster for classification. The cyclone cluster consists of sixteen outlets with fourteen 250CVX10 cyclones fitted and eleven operating. Overflow from the cyclones would be gravitate from the grinding circuit and be delivered to the trash screen feed box ahead of the leaching and adsorption circuit.

Leaching and Adsorption

Cyclone overflow would be screened on the vibrating trash screen. The oversize would report to a trash bin, while the underflow would report to the leach feed distribution box. Lime slurry would be added to the ball mill feed and/or trash screen underflow chute to achieve the required pH for cyanidation.

The selected leach and adsorption circuit design is a hybrid CIL design with three leach tanks and six adsorption tanks. The use of three leach tanks would result in a higher gold loading on the carbon than a straight CIL circuit. These tanks have a capacity of 1,140 m³ each, resulting is a total leach retention time of 24 hours. Each tank would be fitted with a mechanical agitator to ensure uniform mixing. Leaching would be conducted at approximately 40% solids using a solution of between 0.5 to 1.0 g/L sodium cyanide. Provision would be made in the design to allow for staged cyanide addition.

Air would be introduced down the hollow shafts of the tank agitators.

The adsorption tanks would each be fitted with a single 8 m^2 mechanically swept intertank screen to retain the carbon. Removal of the intertank screens, loaded carbon pump and agitator gearboxes would be facilitated by a gantry hoist that will traverse the leach and CIL tanks.

Fresh carbon, or regenerated carbon returned from the elution system and reactivation kiln, would enter the circuit via CIL tank 6 and is moved counter-current to the leached slurry flow. The carbon movement would be accomplished by using by a series of recessed impeller pumps, with one pump located in each of the six CIL tanks. It is anticipated carbon would be advanced at an average rate of approximately 6.5 tonnes per day. Washed loaded carbon would gravitate directly into carbon transfer vessels for transport to an elution and gold room facility located adjacent to the existing ADR plant on site for gold recovery and reactivation.

Pulp outflow from the CIL tank 6 would be screened on a vibrating carbon safety screen. The carbon safety screen oversize reports to the fine carbon box while the screen undersize flows to the detoxification circuit.

Elution and Gold Room

The following operations would be carried out in the elution and gold room areas:

- Acid washing of carbon (to remove calcium and other acid soluble species);
- Cold cyanide washing (to reduce copper present on the carbon);
- Elution of gold from loaded carbon;
- Reactivation of carbon;
- Electrowinning of gold and silver from pregnant solution;
- Smelting of electrowinning products.

The existing adsorption, desorption and refining (ADR) plant includes a Pressure Zadra elution circuit which comprizes of an acid wash tank, 1.5 tonne and 2 tonne capacity elution columns and three electrowinning cells in the gold room for precious metals recovery. Operating data indicates that the existing elution circuit currently performs 13 cycles per week. It is envisaged that a stand-alone elution system and additional electrowinning cells would be provided to supplement the existing acid washing, elution and goldroom operations.

Design of the new elution circuit would be based on the split Anglo-American Research Laboratory (AARL) process to provide the required flexibility and to reduce fresh water consumption. The 3 tonne capacity AARL elution circuit would have capacity to perform more than 10 cycles per week due to the duplication of electrolyte storage tanks, with one tank dedicated for electrowinning. The number of elution sequences per week is eighteen (total for both new and existing circuits). It is anticipated that electrowinning would mostly be performed independently of elution using the new AARL circuit.

A new horizontal gas fired carbon reactivation kiln would be provided. The proposed arrangement would include a dewatering screen, kiln feed hopper/pre-dryer, kiln and an exhaust incinerator for treatment of the carbon off-gas exhaust stream. Barren carbon would be reactivated at a temperature of between 650°C to 850°C, quenched with water and then loaded into the carbon transfer vessels for transport to the CIL circuit. The transfer of barren carbon from the reactivation kiln into the last adsorption tank would be done manually.

Gold Room

The existing gold room facility would be upgraded in Phase 1 to include additional electrowinning cells. The loaded stainless-steel wool cathodes would be pressure washed to recover precious metals sludge, filtered, calcined, mixed with fluxes and smelted using the existing gold room facility on site.

Cyanide Detoxification

The INCO air/SO_2 process would be utilized for cyanide detoxification. The cyanide detoxification circuit would consist of a single agitated tank with an air sparging facility. CIL tailings, various spillage lines and the neutralized acid tailings from the acid wash and elution column, spent cold cyanide rinse solution would enter the cyanide destruction tank and discharge via overflow launder into the tailings hopper.

The SO_2 source would be sodium meta-bisulphite (SMBS) which would be dosed into the cyanide destruction tank as a 20% w/v solution. Copper sulphate would be added into the cyanide destruction tank as a 15% w/v solution when required. Oxygen is required as part of the chemical process and would be supplied by sparging air into the cyanide destruction tank using dedicated blowers. Hydrated lime slurry would be added to the cyanide destruction tank to maintain the pH in the range 8.0 to 9.0.

Tailings Thickening

The tailings thickener would be a 20-meter diameter high rate unit fitted with an auto-dilution feed system. Flocculant would be added as a solution to assist in the thickening process. It is anticipated that the thickener underflow density would be maintained at approximately 55% solids. Two underflow lines would gravitate into the final tailings hopper, whilst the overflow solution would be recycled to the process plant via the process water tank.

Tailings Disposal

The detoxified thickened tailings and various spillage lines would be combined into the tailings hopper. The tailings from the tailings hopper would be pumped to an in-pit tailings storage facility for deposition.

Supernatant solution decanted and seepage water recovered by the use of underdrainage and recovery bores at the in-pit tailings storage facility would be returned to the plant by the return water pumps.

Reagents, Storage and Distribution

The following process additives would be necessary to operate the processing facility for treatment of the Heap Leach Material:

- Hydrated Lime;
- Sodium Cyanide;
- Sodium Metabisulphite;
- Copper Sulphate;
- Flocculant;
- Caustic soda;
- Hydrochloric or Nitric Acid;
- Antiscalant;
- Activated carbon: and
- Smelting Fluxes.

Packaged reagents would be delivered to site by road and placed in the reagent storage shed subject to appropriate chemical storage separation and demarcation. Reagents would be mixed, to the required concentration in dedicated mixing tanks, prior to being pumped to their respective holding tanks or added direct to the process streams. Reagents would be metered to the respective process usage points by dedicated reagent metering pumps or would operate on a ring main via flow meters and flow valve arrangements.

Water Services and Reticulation

Raw water would be sourced from existing wells and stored in the raw water tank. The raw water would be pumped by raw water pumps arranged in a duty/standby configuration and will be used for the following purposes:

- Reagent mixing where it is not possible to use process water;
- Acid rinse;
- Carbon transfer; and
- Process water make-up via overflow of raw water tank.

The process water would be recovered from the tailings thickener overflow and in-pit tailings storage facility return water, with raw water make-up as required. This water would be stored in one the redundant heap leach solution ponds. Process water would be pumped from the storage pond to a new process water tank. Under normal operating conditions the process water tank would continually overflow and process water gravitates back to the process water pond. Duty and standby process water pumps would draw directly from the process water tank to supply the process plant.

The lower portion of the process water pond would provide a dedicated fire water reservoir for the fire water system.

Projected Energy, Water and Process Material Requirements

The projected energy and process material requirements for the Phase 1 operation are itemized in Table 99.

Item	Usage
Hydrated Lime - Leaching (kg/t)	0.5
Hydrated Lime – Cyanide destruction (kg/t)	0.6
Sodium Hydroxide - Elution (kg/t)	0.2
Sodium Cyanide – Leaching (kg/t)	1.4
Sodium Cyanide – Elution (kg/t)	0.2
Sodium Metabisulphite – Cyanide destruction (kg/t)	2.7
Copper Sulphate - Cyanide destruction (kg/t)	Provisional
Acid – Acid washing carbon (kg/t)	0.1
Flocculant – Thickening (kg/t)	0.02
Activated Carbon – Adsorption (kg/t)	0.02
Antiscalant– Water treatment (kg/t)	0.02
Smelting Fluxes (kg/t)	0.02
Grinding Balls (kg/t)	1.1
LPG – Elution, carbon regeneration (L/t)	0.4
Water (m^3/t)	0.14
Power (kWh/t)	26

Table 99 Phase 1 - Projected Energy, Water and Process Material Requirements

Process Water Balance

During stable operation at design throughput, it is estimated that the Phase 1 processing facility will consume 31 m^3/h of make-up water based on an average operating hour of the process plant.

Preliminary design from in-pit tailings consultants for this study has indicated a high rate of water being returned from the in-pit tailings facility (supernatant solution decanted and seepage water recovered by the use of underdrainage and recovery bores) and this been factored into the current water balance estimate for the process plant.

17.4.2 Phase 2 (El Gallo Silver)

Three Stage Crushing Using the Existing El Gallo Gold Plant

Material would be delivered by haul trucks to the existing ROM pad. The mineralized feed stock would be reclaimed and delivered to the crushing plant feed bin by a front-end loader (FEL).

The existing El Gallo Gold three stage crushing plant would be used to prepare the material for delivery to the grinding circuit. The existing crushing circuit would be required to operate 7 days per week, 24 hours per day at 75% utilization, allowing for routine crushing circuit maintenance. The crushing plant product would have an 80% passing particle size P_{80} of 10 mm.

Material would be reclaimed from the crushing plant feed bin by a vibrating grizzly feeder. Grizzly feeder oversize is fed to a 1,250 mm by 1,000 mm (50 inch by 40 inch) single toggle jaw crusher. Jaw crusher product and grizzly undersize together with the discharge of the secondary crusher would be conveyed to a triple deck, primary screen 2.4 m wide by 6.1 m long (8 feet by 20 feet) that would produce an undersize having a P_{80} of 10 mm.

The oversize from top deck of the primary screen would be conveyed to the secondary crushing stage. The secondary crushing circuit comprizes of a 30 tonne capacity surge bin fitted with a vibrating pan feeder which in turn feeds the secondary crusher feed conveyor. The secondary crusher is a Sandvik HP440 standard head cone crusher operating with a closed side setting of 18 mm. The secondary crusher currently operates in closed circuit with the primary screen.

Oversize material from the bottom decks of the primary screen would be conveyed to the tertiary crushing stage. The tertiary crushing circuit comprizes of a 30 tonne capacity surge bin is fitted with a vibrating pan feeder which in turn feeds the tertiary crusher feed conveyor. The tertiary crusher is a Sandvik HP440 short head cone crusher operating with a closed side setting of 13 mm. The tertiary crusher operates in closed circuit with a secondary double deck screen 2.4 m wide by 6.1 m long (8 feet by 20 feet) that would produce an undersize having a P_{80} of 10 mm.

Undersize from both screens would report to the crusher product conveyor which in turn feeds the feed bin feed conveyor. Crushed product would report to a feed bin designed to smooth out fluctuations in the mill feed rate caused by crusher feed surges. A belt plough would be installed to permit excess crushed product to be redirected to an emergency dead stockpile. The emergency stockpile material would be re-introduced as mill feed by FEL via the feed bin when building crushed product stocks and during periods of maintenance or breakdown.

Grinding and Classification

The grinding circuit would be common for each phase, as described in section 17.4.1. It is intended to operate the ball mill at close to the maximum power draw during each campaign. Ten 250CVX10 cyclones operating would be required for the Phase 2 operation. Cyclone overflow pulp density would be 34% solids due to the finer grind size of 80% passing 75 µm being targeted. Underflow from the trash screen would flow to the conditioning tank ahead of the bulk flotation circuit.

Bulk Flotation

The bulk flotation circuit would consist of a conditioning stage and conventional, forced air addition flotation cells for the roughing and scavenging duties. The rougher feed conditioning tank would act as a surge tank and allow contact time for flotation reagents to prepare mineral surfaces for bulk flotation. The rougher cell feed would also be diluted to the target feed density at the conditioning tank using non-cyanide process water at close to neutral pH.

The rougher and scavenger flotation circuit would consist of two 50 m^3 rougher tank cells followed by four 50 m^3 capacity scavenger flotation tank cells arranged to produce a single bulk concentrate. Pinch valves and level elements would be used for level control of the cells. Individual flotation cells would be supplied with air mass flow control. The froth crowder/launder combination would be selected to ensure cell area and lip length capacities are consistent with industry guidelines

Concentrate from these cells would be pumped to the concentrate thickener. The scavenger flotation tail would discharge via a pinch valve to the scavenger tail hopper. The addition of frother, collector and promoter would be via dedicated pumps or lines running off individual ring mains to feed the individual flotation cells. Duty and standby flotation air blowers would be included in the design.

Concentrate Thickening

The bulk flotation concentrate would be thickened in a 10 m diameter high rate concentrate thickener fitted with an auto-dilution feed system to increase the settling rate. Flocculant would be added as a solution to assist in the thickening process.

Concentrate thickener overflow would gravitate to the non-cyanide process water tank for re-use in the grinding and flotation circuits. The concentrate thickener underflow would be pumped to the pre-leach tank.

Concentrate Leaching

The concentrate leaching circuit would consist of one 300 m^3 pre-leach tank and three 1,140 m^3 agitated leach tanks. The thickened concentrate would be pumped to the pre-leach tank ahead of the concentrate leaching circuit, where it would be diluted to a density of approximately 35% solids. Lime slurry and lead nitrate solution would be added to enable pre-conditioning of the feed slurry prior to the concentrate leaching circuit.

The pre-leach tank would be fitted with a leach feed pump, which will pump the conditioned leach slurry to a feed box ahead of the concentrate leaching circuit. It is envisaged that two of the leach tanks required for Phase 1 operation and an additional new leach tank would be used for leaching of the flotation concentrate. The total retention time for concentrate leaching would be approximately 70 hours when the pulp density is 35% solids at the design treatment rate.

Leach feed would be dosed with cyanide solution, additional lead nitrate solution and lime slurry as required. The free cyanide level would be maintained throughout the leach train via staged addition of cyanide solution. Mixing of the slurry would be carried out by agitators fitted with dual axial flow impellers and a hollow shaft for air addition. The last concentrate leach tank would discharge into a transfer hopper fitted with leach product pumps which will pump the leached concentrate slurry to the CCD train.

Counter Current Decantation (CCD)

The CCD circuit would recover dissolved precious metals from the leached concentrate slurry. Washing would be undertaken in a five stage CCD circuit consisting of 10 m diameter high rate thickeners fitted with an auto-dilution feed system to increase the settling rate. Flocculant would be added to the circuit to improve settling characteristics. It is anticipated that the underflow density from each thickener would be controlled at nominally 50% to 55% solids.

The underflow of each thickener would be mixed with the overflow of the thickener downstream, from where the diluted slurry would then gravitate as feed to the relevant CCD thickener. The overflow of the first thickener would be transferred to a hopper clarifier to remove suspended solids and the underflow of the final CCD thickener pumped to the cyanide detoxification circuit. Optional circuit design would allow for the underflow to be redirected to the head of the flotation tailings leach circuit. Wash water would be made up with barren solution from the Merrill Crowe zinc precipitation circuit.

Merrill Crowe

The overflow from the hopper clarifier would gravitate to the existing pregnant solution tank before being pumped to the Merrill Crowe circuit. The existing heap leach pregnant solution pond (nominal capacity 11,800 m³) would be used to provide additional operational surge capacity via overflow of the pregnant solution tank. The Merrill Crowe circuit would be a vendor supplied package with a nominal volumetric capacity of 110 m³/h. It would be designed to handle pregnant tenors between 140 ppm to 200 ppm silver.

The Merrill Crowe plant would comprize pressure filtration to further clarify the pregnant solution, a de-aeration tower and vacuum pump to remove oxygen from the pregnant solution, a zinc addition system, a pre-coat and body coat addition system, zinc precipitate filter feed pumps and zinc precipitate filtration.

The Merrill Crowe barren solution would flow to the existing barren solution tank. The existing heap leach intermediate pond (nominal capacity of 15,400 m³) would be used to provide additional operational surge capacity via overflow of the barren solution tank. The design envisions recycling the barren solution to the CCD circuit as wash liquor. Provision would be made to recycle some barren solution to the leach feed to make optimal use of cyanide and also for a small volume of barren solution to be bled to the detoxification circuit to control levels of soluble zinc and other metals that would not be recovered to the precipitate.

Flotation Tailings Thickening

The flotation tailings would report to the scavenger tails hopper, from where the slurry will be pumped to the flotation tailings thickener. The flotation tailings thickener would be a 20-meter diameter high rate unit fitted with an auto-dilution feed system. Flocculant would be added as a solution to assist in the thickening process. It is anticipated that the thickener underflow density would be maintained at approximately 55% solids.

Tailings thickener overflow would gravitate to the non-cyanide process water tank for re-use in the grinding and flotation circuits. Thickener underflow would gravitate into the flotation tailings thickener underflow hopper where it would be diluted to a density of approximately 40% solids before being pumped to the flotation tailings leach feed distributor box. Lime slurry would also be dosed before feeding to the leaching circuit to achieve a pH suitable for cyanidation.

Flotation Tailings Leaching and Adsorption

It is envisaged that flotation tailings thickener underflow would be pumped to the leaching and adsorption circuit, as described in section 17.4.1. One of the leach tanks and the carbon adsorption tanks required for Phase 1 operation would be used for leaching and adsorption of the flotation tailings to maximize precious metal recovery from the flotation tailings prior to disposal in the TSF.

Flotation tailings leaching would be conducted at 40% solids using a relatively low concentration of cyanide solution at pH of 11.5. Cyanide would be added via the addition fresh cyanide solution and recycled barren solution as required to extent allowable by the water balance. The total retention time for the flotation tailings leach would be approximately 34 hours at the design treatment rate.

Elution

The elution circuit would operate, as described in section 17.3.1 except the pregnant solution would be transferred periodically to the pregnant solution tank before being pumped to the Merrill Crowe circuit with the rest of the precious metal solutions.

Residual flotation reagents would rapidly contaminate the carbon and would require steam heating to volatilize the organics and reactivate the carbon. The new carbon reactivation kiln for Phase 1 would be used to maintain carbon activity.

Gold room

The existing gold room facility would be expanded for the Phase 2 operation. Tray loads of precipitate recovered from the filters would be heated in calcine ovens to remove residual sulphides present. Following calcination, the sludge would then be direct smelted with fluxes to produce doré bars.

Multiple charges and pours would be required to process the metal quantity on a day shift basis. The slag would be crushed in a small jaw crusher and periodically returned to the milling circuit. Off-gases from the calcine oven and smelting furnace would be exhausted to atmosphere via a dry scrubber.

Cyanide Detoxification

Underflow from the final CCD thickener would be combined with slurry discharged from the final CIL tank and pumped to the detoxification circuit, as described in section 17.4.1.

Low range residual WAD cyanide levels would be targeted in the Phase 2 operation to minimize any effect on the flotation process of cyanide containing process water. The WAD cyanide level would be reduced to less than 5 ppm using this circuit.

Tailings Thickening and Disposal

The thickened tailings from cyanide destruction would be pumped to the tailings thickener for thickening to approximately 55% solids prior to disposal in the tailings storage facility, as described in section 17.4.1.

Reagents, Storage and Distribution

Treatment of the higher-grade silver deposit by separate cyanide leaching of the bulk flotation concentrate and flotation tailings streams would require the following additional reagents for mineral recovery, concentrate leach supplement and precious metal precipitation:

- Promoter: Aerofloat®31;
- Frother: Flottec®F150 (or equivalent);
- Collector: Potassium Amyl Xanthate (PAX);
- Diatomaceous earth;
- Lead nitrate; and
- Zinc Dust.

Water Services and Reticulation

The water circuits would operate, as described in section 17.3.1 except a new containment system would be provided for non-cyanide water storage and the process water distribution system would be upgraded to supply the additional areas of the process plant.

Non-cyanide process water from the concentrate thickeners and the flotation tailings thickener would be recycled directly back to the non-cyanide process water pond. The post cyanide detoxification water recovered from the tailings thickener overflow as well as the supernatant and seepage water returned from the in-pit tailings storage facility would also report to the non-cyanide process water pond. As all water entering the non-cyanide process pond will be relatively cyanide free, this pond would be used to supply water to all areas of the plant.

Projected Energy, Water and Process Material Requirements

The projected energy and process material requirements for the Phase 2 operation are itemized in Table 100.

Item	Usage
Frother (kg/t)	0.02
Promoter (kg/t)	0.04
Potassium Amyl Xanthate (kg/t)	0.04
Copper Sulphate – flotation (kg/t)	0.05
Hydrated Lime - Leaching (kg/t)	6.2
Hydrated Lime – Cyanide destruction (kg/t)	2.0
Sodium Hydroxide - Elution (kg/t)	0.1
Sodium Cyanide – Concentrate Leaching (kg/t)	2.1
Sodium Cyanide – Tailings Leaching (kg/t)	0.4
Sodium Cyanide – Elution (kg/t)	0.1
Lead Nitrate (kg/t)	0.2
Zinc – precipitation (kg/t)	0.2
Diatomaceous Earth (kg/t)	0.1
Sodium Metabisulphite – Cyanide destruction (kg/t)	4.2
Copper Sulphate - Cyanide destruction (kg/t)	Provisional
Acid – Acid washing carbon (kg/t)	0.1
Flocculant – Thickening (kg/t)	0.2
Activated Carbon – Adsorption (kg/t)	0.02
Antiscalant– Water treatment (kg/t)	0.02
Smelting Fluxes (kg/t)	0.2
Grinding Balls (80 mm) (kg/t)	1.45
LPG – Elution, carbon regeneration, smelting (L/t)	0.6
Water (m^3/t)	0.16
Power (kWh/t)	46

Table 100 Phase 2 - Projected Energy, Water and Process Material Requirements

Process Water Balance

During stable operation at design throughput, it is estimated that the Phase 2 processing facility will consume 24 m^3/h of make-up water based on an average operating hour of the process plant. It is also anticipated that a high rate of water would be returned from the in-pit tailings facility.

More detailed water balance modelling would be required in the next phase of the Project to confirm make-up water requirements.

17.4.3 Comments on Section 17

The process design developed for Project Fenix is based on preliminary metallurgical test work results, experience and knowledge obtained from operations treating similar materials. The design considers the outcomes from previous studies and the projected inputs from mining, environmental and financial factors. The Project Fenix treatment plant would utilize conventional and proven mineral processing and precious metal recovery technologies.

Preliminary metallurgical test work has indicated that the El Gallo Gold HLM would be amenable to direct cyanidation following conventional grinding. Phase 1 operation would target gold recovery from the HLM using a single stage ball mill and a hybrid carbon-in-leach (CIL) circuit. Industry standard elution, electrowinning and smelting circuits would be used to produce a doré product. Cyanide in the CIL tailings would be detoxified using the SO_2/Air process, and the detoxified tailings would then be sent to an in-pit tailings storage facility.

The plant throughput rate selected for treatment of the HLM (5,000 tpd) is considered appropriate given the low gold grade of the HLM and the need to minimize capital and operating costs using economy of scale. The ball mill procured previously by McEwen following the El Gallo Complex Phase II Project Feasibility Study in 2013 is in good condition and would be utilized for Project Fenix. This reduces capital costs and offers a pragmatic compromize between throughput capacity of the processing plant and maximizing gold recoveries. The ball mill can be upgraded to draw additional power, for a relatively small incremental increase in capital cost (~$0.8M), if a finer primary grind size is deemed to be required in the next phase.

Copper adsorption onto carbon would be controlled and suppressed using excess cyanide during leaching and adsorption and cold cyanide washing step incorporated prior to elution. Copper and zinc cyanide in the plant tailings would be detoxified to prevent accumulation in process waters.

Further test work and modelling would be required in the next phase of the Project to verify the selected number of leaching and adsorption stages and the elution circuit design. The exact operation of the existing ADR plant is not currently clear and the design assumptions made in regards the existing ADR plant would need to be ratified during any subsequent study phase. The design assumes that the existing ADR plant and associated equipment would be utilized solely for Project Fenix once the heap leach operations have finished.

The 2012 feasibility study design selected a treatment process for the El Gallo Silver material which included three stage crushing and a single stage ball mill followed by direct cyanidation, CCD washing and the Merrill Crowe process for recovery of precious metals from solution.

The process flowsheet has been modified for this study to incorporate bulk flotation and separate cyanide leaching of the flotation concentrate and tailings streams based on recent test work outcomes. The reduced mass required to be treated by concentrate leaching, CCD and Merrill Crowe circuits has resulted in a reduction in overall equipment size and capital costs compared to the 2012 study. The CIL circuit required for Phase 1 operation would be utilized to maximize precious metal recovery from the flotation tailings.

Site operating data indicates the existing El Gallo Gold three crushing plant would achieve the crushing rate required for the Phase 2 operation.

Dewatering test work on a bulk concentrate sample is still in progress and yet to be completed and reported for this study. The CCD circuit selection and thickener sizing has therefore been based on assumed design parameters pending completion of this test work. Filtration and cake washing would also be considered for recovery of precious metals from the concentrate leach solution in any subsequent phase.

The Palmarito, Carrisalejo and El Encuentro deposits included in the production schedule have been subjected only to scoping level metallurgical test work using the selected process flowsheet. Further sampling and test work is required to better understand the response of all of the deposits to the selected flowsheet.

18. PROJECT INFRASTRUCTURE

18.1 General Layout

Project Fenix process facilities are located at the existing El Gallo Gold Heap Leach Operations and utilize the existing offices, laboratory and workshop infrastructure. The process facilities and mine site are shown on Figure 121 and Figure 122 at the end of this section.

The new process facilities location has been selected based on proximity to the Heap Leach Material, land currently permitted for use, use of gravity flow of slurry through process stages where possible and proximity to Samaniego Open Pit for in-pit tailings storage.

18.2 Process Buildings

The process buildings are planned to be constructed in two phases as described in previous sections of this report.

18.2.1 Facility Structures

The majority of the process plant will be installed in open structures with grated flooring access levels for maintenance and operation. The structures will be installed on bulk earthworks pads with concrete foundations and slab with containment walls and sump pumps:

Contained areas for tankage related to the leach and adsorption area and the reagents mixing area will be designed to have a capacity of 110% of the largest tank volume.

A number of enclosed buildings will be provided for either security or protection of process streams from weather. The steel-clad buildings will surround grated flooring access levels for maintenance and operation, structures will be installed on bulk earthworks pads with concrete foundations and slab with containment walls and sump pumps. The enclosed buildings will include:

- Reagents storage shed;
- Compressed air equipment;
- Gold recovery; and
- Merrill Crowe facility.

18.2.2 Prefabricated Buildings

A number of prefabricated buildings will be installed for the process facilities, these include switchrooms, control rooms and operator offices as follows:

- The mill control room and grinding area switchroom will be located adjacent to the grinding structure;
- HV switchroom;

- Tailings switchroom;
- Leaching and adsorption switchroom; and
- Flotation and CCD switchroom (Phase 2).

Switchrooms will be fabricated from suitable materials and include smoke detection systems, lighting and small power distribution panel, PLC control panel and connection for emergency generator power supply for essential services.

18.3 Ancillary Buildings

Ancillary buildings necessary to support the Project include new and existing buildings:

- New: reagent storage facilities and mine support facilities at the external resources;
- Existing: stores and warehouse, maintenance, medical facilities, an analytical laboratory, mine truck shop, gatehouse, ablution facilities and fuel storage. The general administration functions will be conducted at the existing El Gallo Gold administration building.

18.3.1 Warehouse/Plant Maintenance Building/Medical Facility

The existing facilities will provide warehousing, mill maintenance and first aid services.

18.3.2 Analytical Laboratory

The existing laboratory will provide analytical services for the plant. The facilities are furnished with sample preparation equipment, wet chemistry and analytical instrumentation, ventilation and offices. The laboratory will provide fire assaying and other services for the mine.

18.3.3 Mine Truck Shop

The existing mine truck shop will be relocated to make way for the new process facilities. In the new location it will provide maintenance services for the mine haul trucks. The enclosed building will be utilized for vehicle maintenance, warehouse and offices. The building is of steel construction with corrugated roofing and siding. Tire changing and truck washing are performed in a covered open-sided structure.

18.3.4 Main Gatehouse

The existing gate house and security facilities will remain unchanged.

18.3.5 Fuel Storage and Dispensing Facilities

The existing fuel storage and dispensing facilities will be utilized for mine trucks and in-plant vehicles. New facilities at the remote resources will be constructed as required during the project development.

18.4 Access Roads

A new 8.5 km (5.3 mi) haul road will be constructed between El Gallo Silver mine and Project Fenix site. Some of the roads connecting Palmarito, El Encuentro and Carrisalejo will be expanded and constructed during the project development.

18.5 Power Supply and Distribution

Electrical power will be supplied from the Comision Federal de Electicacidad (CFE) power grid. A 115 KV transmission line will run for 16.0 km from the grid to the main substation on the property. CFE has confirmed power availability.

18.6 Water Supply and Distribution

The project currently has three constructed wells that yield approximately 10 l/s all located within 8 km of the process facilities. McEwen is currently in the process of completing two additional water wells to make up the remaining water balance.

Fresh water from the site will be pumped from the wells and stored in a 250 m^3 raw water tank which will overflow to the existing lined water pond at the ADR plant.

18.7 Waste Management

It is assumed that the existing private landfill on the property for non-hazardous solid waste will continue to be used. This facility will not accept any off-site wastes and will be used primarily for construction debris, non-putrescible materials and waste from maintenance and operations meeting the definition of inert or non-hazardous materials; such as air filters, gloves, boxes, non-recyclable packaging materials, hoses, piping, etc.

Recyclable materials that are non-hazardous, such as scrap metal, paper, used oil, batteries, wood products, etc., will be collected in suitable containers and disposed of through recyclers.

Hazardous materials such as contaminated greases, chemicals, paint, reagents, etc. will be collected, shipped off site for destruction or disposal. Some hazardous materials may also be recycled through appropriate recyclers.

18.8 Transportation and Shipping

Sinaloa state has three international airports: Mazatlán, Culiacan, and Los Mochis. There are 16,335 km (10,146 mi) of roads. Culiacan has a highly developed highway network, including a four-lane highway direct to the United States. The railroad network links Sinaloa with the rest of Mexico. There are 1,234 km (766 mi) of railway. There are major ports at Mazatlán and Topolobampo.

18.9 Accommodation

No accommodation will be provided, all employees would reside in local townships or commute from regional cities.

18.10 Communications

The telecommunications system for any new facilities will be integrated with the on-site data network system utilising a voice over I/P (VoIP) phone system.

A process control system will support the screen, historian and alarm servers connected to the control room computers as well as programmable logic controllers (PLC).

Internal communications within the plant will utilize the existing phone system, which will provide direct dial to other phones throughout the plant site. Mobile radios and cell phones will also be used by operating and maintenance personnel for daily communications while outside the office.

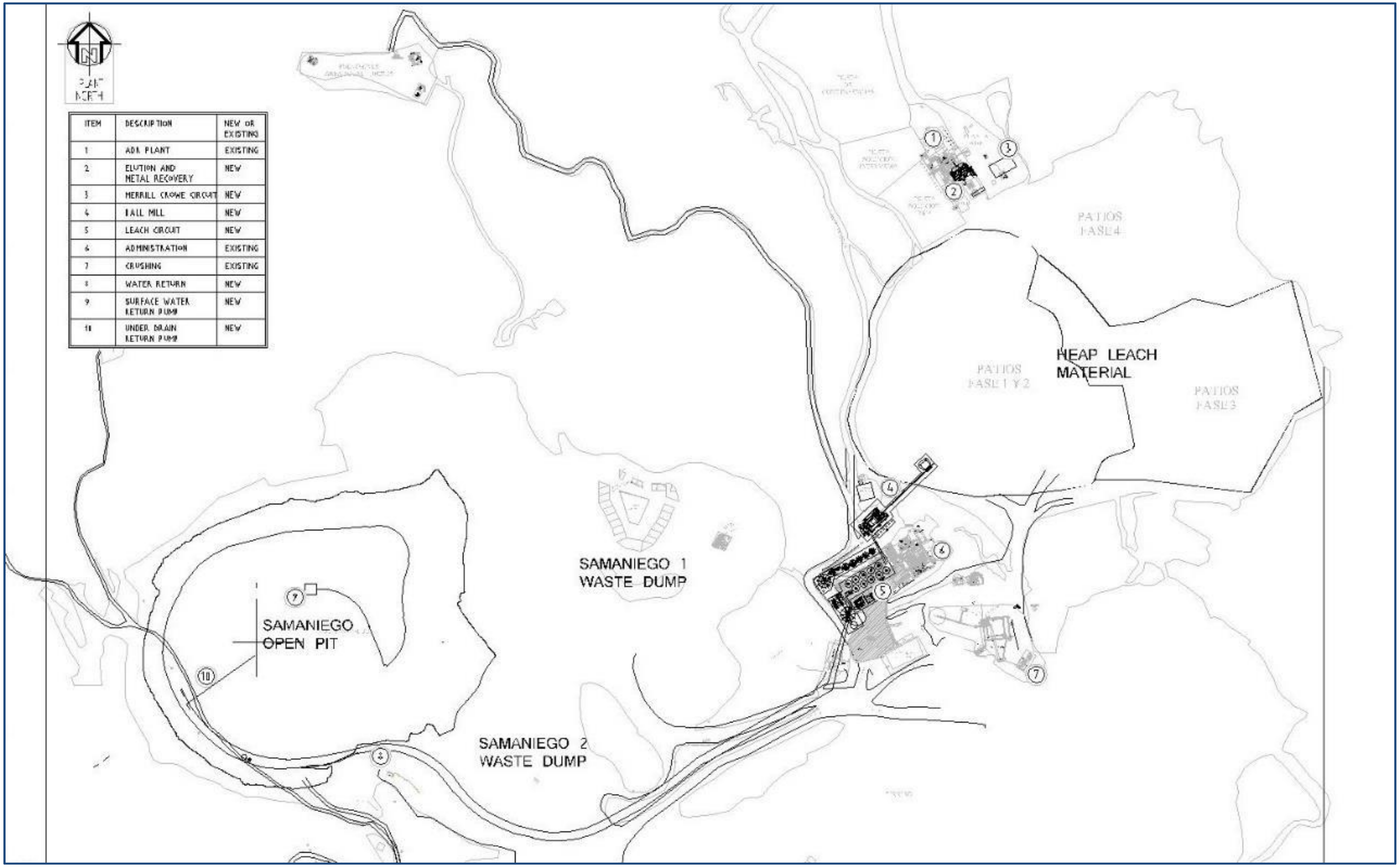


Figure 121 Project Fenix Site Development Overall Site Layout

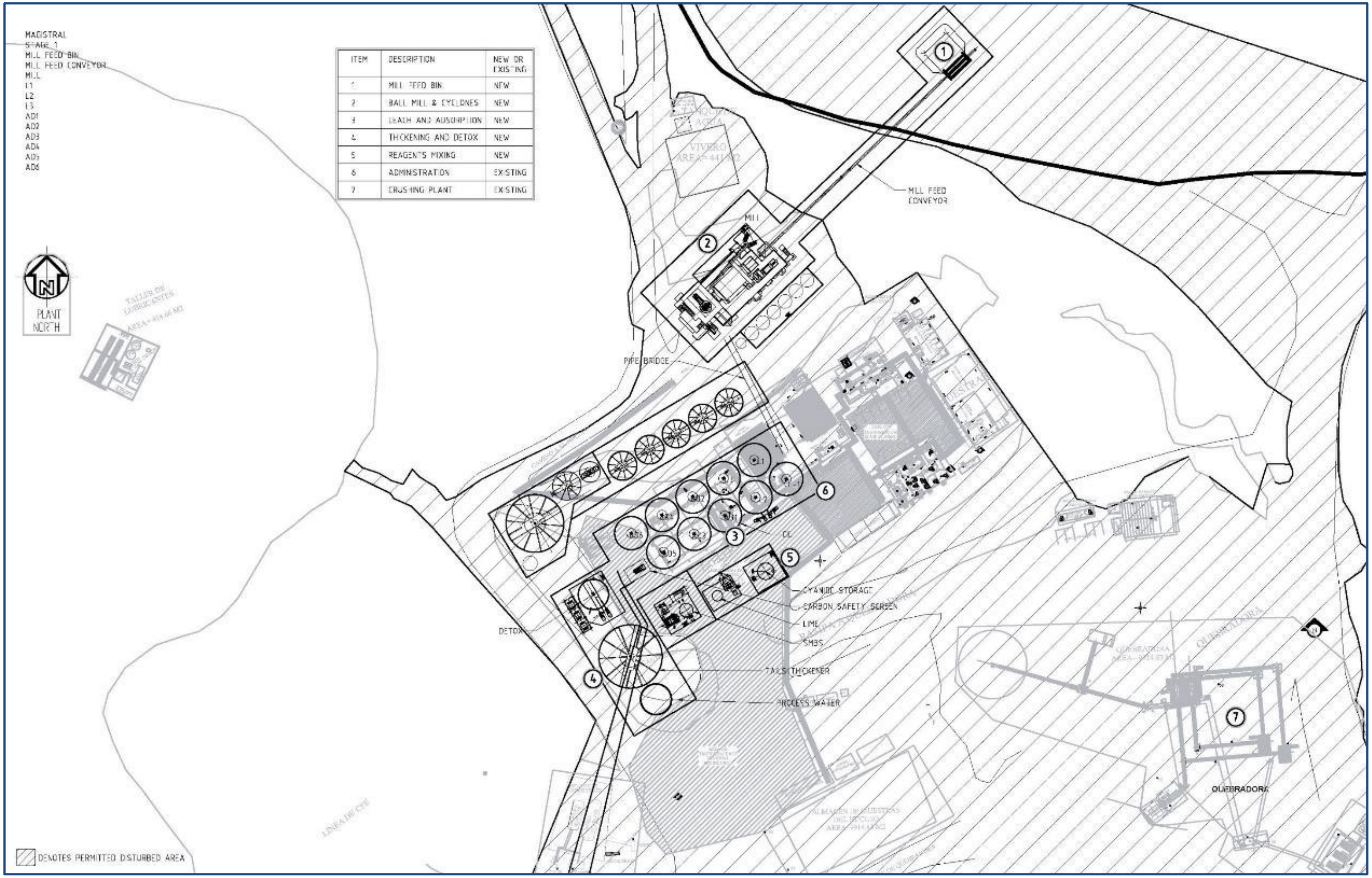


Figure 122 Project Fenix Overall Process Area

19. MARKET STUDIES AND CONTRACTS

The primary economic product of Project Fenix deposits will be doré consisting of silver and gold. There is a well-developed, mature market for doré throughout the world at favorable refining rates. The entrance of new producers to the global silver and gold market does not materially impact metal prices.

19.1 Markets

Markets for doré are readily available. Gold and silver markets are mature, global markets with reputable smelters and refiners located throughout the world. Demand has been stable in 2017 and 2018, with gold prices fluctuating mostly in the range of US$1,200 to US$1,350 per ounce of gold, and US$16.00 to $18.00 per ounce of silver. The 36-month average London PM gold price fix through June 1, 2018 is US$1,238 per ounce of gold, and $16.66 per ounce of silver.

19.2 Contracts

There are no known contracts material to the operation of Project Fenix.

20. ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT

20.1 Environmental Overview

Project Fenix is in a rural area of Sinaloa state in an agricultural area that has a low population density. Potential environmental impacts to surface soils, water, the ecology and air quality will be mitigated as part of the mining operations.

McEwen will utilize the existing Samaniego Pit for permanent storage of tailings material. The tailings will first be dewatered into a thickened slurry and then pumped into the impoundment using a series of drop legs to maximize areal distribution and tailings consolidation. Key test work such as tailings rheology analysis proved this to be a viable design option. In-pit tailings deposition will significantly mitigate environmental risks commonly associated with tailings impoundments such as:

- Catastrophic tailings release due to dam breach is eliminated as there is no tailings dam;
- Reduces disturbance footprint and construction material volume required for facility construction;
- Recycling of process water reduces make-up water demand;
- Closure and reclamation performance is significantly enhanced as the rehabilitation process is simplified and the Samaniego Pit and heap leach pad is eliminated.

The Project fully utilizes the existing El Gallo Gold facility footprint and mitigates the existing permanent impacts associated with the existing heap leach pad and Samaniego Pit by milling the Heap Leach Material and backfilling the pit with the tailings from the mill. The permanent impacts for the new process facilities to be permitted will be the mine open pits that are not backfilled with tailings and waste rock dumps. The impacts of mining will be mitigated through planned concurrent reclamation and reforestation methods. The permanent impacts associated with the heap leach pad and Samaniego Pit will be significantly reduced or eliminated by the removal of the heap and the backfilling of the pit.

Surface preservation and mitigation measures planned include impermeable retention areas where chemical substances or process solutions are handled, implementation of a hazardous and non-hazardous waste handling program, monitoring program for surface and groundwater quality, and storm water diversion around disturbed areas, where required.

Prevention and mitigation measures contemplated to protect groundwater quality include an engineered containment design for all processing facilities and implementing a tailings management plan for tailings disposal in the Samaniego Pit. The tailings management plan will outline procedures to maximize water recovery from the tailings through initial thickening of the tailings at the process plant followed by recovery of supernatant water from the top of the tailings, installation of an in-pit underdrain network to ensure recovery of water draining from the tailings and a down-gradient fence of pump back wells to capture any water that could flow from the pit. The groundwater quality will be monitored on a routine basis using monitor wells located up-gradient and down-gradient of the mining facilities.

Actions that are planned to mitigate vegetation impacts include compensation payments to the forest fund for land use rights, organic growth medium recovery during clearing and reuse of this material in the closure phase, and implementation of a flora and fauna species protection program during all stages of the project.

Waste generated during development and mining operations will be handled according to the provisions of the General Law for Prevention and Integrated Waste Management (Ley General para la Prevencion y Gestion Integral de los Residuos, last revised May 3, 2012).

20.2 Environmental Permitting

There are two SEMARNAT permits required to be modified during the first phase of permitting prior to construction of the facilities at the El Gallo Gold area: The Environmental Impact Statement (MIA), and the Risk Analysis (RA). During the second phase of permitting the El Gallo Silver MIA will be modified to reflect the elimination of the mill and tailings impoundment, the Risk Analysis (RA) will be updated, a Change of Land Use (ETJ) will be submitted and a construction permit is required from the local municipality with an archaeological release letter is required from the National Institute of Anthropology and History (INAH). An explosives permit is currently in place from the Ministry of Defense (SEDENA) for El Gallo Gold and will need to be modified during the second phase of permitting to include additional mining areas. The key permits and the stages at which they are required are summarized below in Table 101.

Key Environmental Permits				
Permit	**Mining Stage**	**Action Phase 1**	**Action Phase 2**	**Agency**
Environmental Impact Statement – MIA	Construction/Operation/ Post-operation	Modify	Acquire permit	SEMARNAT
Land Use Change – ETJ	Construction/Operation	None	Acquire permit	SEMARNAT
Risk Analysis – RA	Construction/Operation	Update	Update	SEMARNAT
Construction Permit	Construction	None	Acquire Permit	Municipality
Explosive & Storage Permits	Construction/Operation	None	Acquire permit	SEDENA
Archaeological Release	Construction	None	Obtain Letter	INAH
Water Use Concession	Construction/Operation	Modify	Modify	CNA
Water Discharge Permit	Operation	None	None	CNA
Unique License	Operation	Update	Update	SEMARNAT
Accident Prevention Plan	Operation	Update	Update	SEMARNAT
Environmental Impact Statement – MIA	Construction/Operation/ Post-operation	Modify	Acquire permit	SEMARNAT
Power supply	Operation	None	Acquire authorization	CFE-CENACE
			Acquire right of way	RAN

Table 101 Permitting Requirements

In accordance with the general work schedule of Project Fenix, should no additional mineralization be found, the closure phase will begin in Year 11. In compliance with permitting regulations, McEwen Mining Inc. will prepare a detailed Closure and Reclamation Plan that will be concurrently developed during the operation phase and completed during the closure phase.

20.3 Environmental Studies

20.3.1 General Description of Environmental Considerations

The area of the proposed Fenix Project is characterized by moderate to steep topography with elevations ranging from 1,000 to 1,500 ft. (300 to 450 m). It is located in the "Pie de la Sierra" physiographic province, near the boundary with the "Llanura Costera y Deltas de Sonora y Sinaloa" province. During most of the year, the area experiences arid to semi-arid climatic conditions, with almost all the approximately 825 millimeters of annual precipitation coming from storm events during July to September.

The proposed mine site is not located within any areas specially designated by the regulatory agency or government for environmental protection, and all related mining work is considered as an acceptable risk to the environment due to the environmental controls that are both currently in place and proposed in the permit modification documents. Appropriate controls measures have been studied and will be implemented to maintain environmental system integrity for all environmental resources potentially impacted including, but not limited to; flora and fauna species identified at the site, surface and ground water, and air quality.

Landscape will be affected initially by clearing and grubbing, road construction activities, and by construction of mining facilities. Ultimately, permanent impacts that currently exist from the heap leach pad and the Samaniego Pit will be mitigated through heap removal and pit backfilling, respectively. The only remaining permanent facilities at closure will be the pits that are not backfilled and waste rock dumps. Impacts of mining due to these remaining facilities will be minimized through implementation of planned reclamation and reforestation.

To avoid adverse effects to receiving water quality during mining, a series of prevention and mitigation measures will be implemented. These measures will include spill prevention, proper waste collection and disposal, and routine equipment maintenance. Surface and ground water quality will be monitored throughout the mine life (including post-closure) for impacts from mine operations that could impact the surficial or shallow subsurface soils and water quality.

Surface Hydrology

During most of the year, the area experiences arid to semi-arid climatic conditions, with almost all the approximately 825 millimeters of annual precipitation coming from storm events occurring during the months of July through September. The Sinaloa and Mocorito Rivers are the main hydrological water resources in the area. The two principal creek tributaries are Corralejo and El Palmar.

Subsurface Hydrology

There is an existing unconfined aquifer located within the project boundary with functioning wells (approximate depth of 3 to 17 meters). Ground water quality will continue to be monitored throughout the mine life by monitor wells located up-gradient and down-gradient from the major process facilities and will be expanded to include the in-pit tailings facility. The project area is enclosed by the Mocorito and Sinaloa hydrologic basins.

Vegetation

The moderately dense vegetation on the hill slopes consists of bushes and shrubs with widely-spaced deciduous trees averaging approximately 12-15 meters in height. Much of the flat area in the region is used for agriculture.

Based on field surveys and sample collection, the area has 97 perennial species dominated by the arboretum with 40 species; followed by shrubs with 34 species; and 23 herbaceous and climbing species.

Fauna

An independent regional survey found 139 species of fauna in the project area, none of which will have an impact on planned operations in the area.

Other Baseline Collection

In addition to various biological baseline collections, noise, air quality, and an archeological investigation were completed for both the El Gallo Gold and El Gallo Silver areas. This information is mandatory and has been included in the major permits currently in place. No artifacts or other historical sites were found during the archeological investigation and all necessary background information regarding noise and air quality was accurately collected.

20.3.2 Waste Management, Site Monitoring and Water

Waste Management

Waste generated during development and mining operations will be handled per the provisions of the General Law for Prevention and Integrated Waste Management (Ley General para la Prevencion y Gestion Integral de los Residuos, last revised May 3, 2012). Proper waste management practices will be implemented onsite through various disposal techniques to prevent any soil or water contamination in full compliance with NOM-052-SEMARNAT-2003, NOM-053-SEMARNAT-1995, and NOM-054-SEMARNAT-1995. Solid waste material will be placed into onsite containers and transported offsite to designated recycling or waste facilities per the existing waste management plan.

Testing of will be performed by ALS Indequim, Monterrey, Mexico, per the specifications of NOM-157 & NOM-141 SEMARNAT-2009 to confirm that the site waste material overall is not acid generating.

Noise and other pollutants caused by emissions from operating machinery will be mitigated. All machinery will be subject to routine maintenance services to ensure optimal operating performance. Additionally, the use of noise-protection equipment will be employed where possible.

Reagent and fuel storage areas will be built in compliance set forth in various Mexico regulations. Secondary containment, capable of storing 110% of the volume of the largest vessel plus the runoff volume from the 100-year 24-hour storm event, will be provided for each uncovered storage area.

Monitoring Requirements

Mexican laws require that mandatory monitoring programs are implemented under the Environmental Protection Agency SEMARNAT. For El Gallo Silver and El Gallo Gold, the following monitoring programs have been established by SEMARNAT for the life of mine Table 102.

Action	Criteria/Variables to Consider	Applicable Norms	Monitoring Point	Frequency
Groundwater quality monitoring	Parameters stated by applicable norm	NOM-127-SSA1-1994 Compared with baseline	Monitoring wells	Quarterly
Surface water quality monitoring	In accordance with quality criteria which depend on the use of receiving body of water	NOM-001-SEMARNAT -1996	Several monitoring sites, sampling during wet & dry season	Quarterly
Creek sediment quality monitoring	Total metals (As, Cu, Ni, Cd, Pb, Au, Ag, Se, Hg, Cr)	Baseline conditions	Various sediment sampling	Annual
Air quality monitoring	CO2, CO, PST PER, PM 10, 2.5, Hg, Pb, Cd, SO_2, SO_3, H_2SO_4 fog particles	NOM-085-SEMARNAT-2011 NOM-043-SEMARNAT-1993	Various locations	Annual (COA)
Perimeter noise	Decibels	NOM-081-SEMARNAT-1994	Project boundaries	Annual
Fauna registry	Species and amount	Compensation commitment	All project areas	Annual
Flora species rescue records and nursery plant production	% of survival, amount and type of plants produced	Compensation/restoration commitment	Replanting and safeguard areas	Annual
Soil	Collection and safeguard of organic soils Application of remediation techniques on polluted soils. Erosion control works	Compensation commitment	Soil safeguard areas. Remediation sites. Roads and banks	Annual
Cleared surface and restored/reforested registry	Surface (hectares)	Compensation/restoration commitment		Biannual or when needed

Table 102 Established Monitoring Programs for El Gallo Silver and El Gallo Gold

20.4 Reclamation and Closure

20.4.1 Overview

In accordance with the general work schedule for Project Fenix, should no additional mineralization be found, abandonment phase will begin in Year 11. In compliance with permitting regulations, McEwen Mining Inc. will prepare a detailed Closure and Reclamation Plan that will be concurrently developed during the operation phase and implemented during the abandonment phase.

Conditions of the final closure plan will depend on land use once mining is complete. It is expected that site land will be used in one or more of the following ways after operations:

- Natural habitat for wild flora and fauna;
- Livestock and agricultural activities;
- Tourist and or recreational activities.

The closure strategy involves returning the mine site and affected areas to viable and, wherever practicable, self-sustaining ecosystems that are compatible with a healthy environment and human activities. Key activities of closure will be decommissioning equipment and waste management; demolition of physical structures and management of infrastructure; characterization and mitigation of contaminated soils; regrading and contouring to allow for storm water drainage; and revegetation of disturbed land. Typical guidelines for closure and reclamation for specific facilities are as follows:

20.4.2 Open Pits

Pit slopes must be structurally stable, and barriers will be constructed around the perimeter of the pit for safety during operations. Relevant restoration activities will include diverting water towards the non-backfilled pits and reclaiming or proper grading of access roads for proper cultivation promoting native flora growth.

20.4.3 In-Pit Tailings Facility

The in-pit tailings facility will be domed during final tailings deposition and reclaimed with an engineered cover to achieve a more natural looking slope and to provide for a radial pattern of surface water drainage away from the pit. The design of the tailings facility will minimize leachate due to the low permeability of the fully consolidated tailings. No additional measures will be required to protect groundwater from leachate. Permanent surface water diversions will be placed around the in-pit tailings impoundment to minimize erosion and to reduce infiltration into the tailings. The final tailings surface will be covered with a minimum of one meter of waste rock, plus a soil cover and revegetated.

20.4.4 Waste Rock Dumps

Acid base accounting (ABA) testing is being completed to confirm that waste rock will not generate acid mine drainage and thus, is not considered hazardous waste. No special treatment or isolation during closure will be required.

Waste rock dumps will be smoothed and graded to prevent ponding. Current designs have mitigated any potential for blocked drainage waterways; however, earthworks will be done should this become a problem. Final waste dumps will be covered with topsoil and planted with native seeds.

20.4.5 Process Plant and Other Related Facilities

The process plant and related facilities will be dismantled or demolished. All useful major equipment and material will be salvaged and sold to third parties. Foundations will be removed and excavated areas will be filled with native topsoil to restore naturally sloping topography where feasible.

20.4.6 Roads

Several roads will remain to access the property to perform closure and environmental monitoring activities. Roads not required for closure monitoring access will be ripped, leveled, and graded to facilitate plant and other vegetation growth. Topsoil will be applied along with proper seeding and cultivation techniques.

20.4.7 Environmental Monitoring

Surface water and groundwater quality will be monitored after closure for evidence of environmental impacts through annual sampling events. Visual inspections will be conducted to monitor the physical stability of remaining facilities and the condition of the closure covers and revegetation. Planned visual inspections will take place quarterly and after significant storm events.

Environmental monitoring will be conducted until all closure requirements are accepted as complete. Monitoring records will be maintained at Project Fenix offices.

20.4.8 Community Impact

McEwen hired a third-party consultant to complete a social baseline study for Project Fenix and surrounding villages that included 8 separate communities in Mocorito municipality A follow-up baseline study was conducted throughout the El Gallo Gold Project study area that included 28 communities. Information was gathered from 329 houses (inhabitants) over a 30-day period. The goal of this study was to determine socioeconomic characteristics of the population; to assess the perceptions and views of the residents regarding mining and the company; and to evaluate/quantify a potential workforce. These objectives were completed.

The first phase of study was conducted from April 27 to May 7th, 2018. 329 houses were surveyed in 8 communities around El Gallo Gold seeking for information related to closure of EGG and other issues related with future development of mining in the area of influence. Results of first phase survey include:

- 86.6% of informed population in the surrounding and closest communities of EGG agree with future mining Projects development.
- 83.0 % of informed populations opinion in the surrounding and closest communities of EGG is that CMP should continue working in the area.

20.4.9 Reclamation and Closure Funding

$1.0 million was calculated for the final cost of reclamation and closure of Project Fenix and has been included in the cash flow projection; continual concurrent reclamation is done throughout the life of the mine.

21. CAPITAL AND OPERATING COSTS

21.1 Process Plant and Infrastructure Capital Costs

The capital cost for Project Fenix has been developed based on a process facility being developed in two phases at the location of the existing El Gallo Gold Heap Leach Operations. The design basis for the Project Fenix is described in previous sections of this report.

The initial capital cost for the process facility was estimated by GRES to be approximately $40.9 M for Phase 1 and a further $30.4 M for Phase 2, based on first quarter 2018 US Dollars and is considered to be at a ± 30% level of accuracy. Actual costs could, therefore, range from 30% above the estimate amount to 30% below the estimate amount.

The estimate accuracy is separate from contingency; which accounts for costs that are expected to be incurred, but which cannot be quantified with the level of information available at this time. No allowances have been provided for escalation, interest, hedging, or financing during construction. Taxes and IVA (value added tax) have not been included in the capital costs.

The summary of the capital cost estimate is shown in Table 103 below split into the two phases of project development.

Description	Phase 1 ($M)	Phase 2 ($M)	Sustaining ($M)
Process Plant Direct Costs	28.9	16.6	-
Infrastructure & Owners	1.4	0.8	4.5
Indirect Costs	7.4	6.0	-
Contingency	3.2	2.0	-
Mining	0.0	5.0	5.0
Total	**40.9**	**30.4**	**9.5**
Project Total		**80.8**	

Table 103 Capital Cost Summary

The ball mill for Project Fenix along with all ancillary equipment, including spare motor and major spares for the mill are already owned by McEwen, the capital costs include for the freight of all these items to the project site.

21.1.1 Direct Costs

The direct costs include the supply, fabrication, transport to site and installation of the following items:

- Bulk earthworks;
- Concrete works;
- Equipment;
- Structural steel and platework;
- Piping and instrumentation;
- Electrical and controls;

- Spares and first fills; and
- Power supply.

The direct costs are those costs that are completely attributed to the process plant flow sheet, described in previous sections of this report which includes reclaim, grinding and classification, leach and adsorption, thickening and detoxification circuits, reagents storage and mixing facilities, CCD and concentrate leach circuits, gold recovery and elution circuits, Merrill Crowe circuit and materials handling from the existing crushing plant.

Quantities for earthworks, concrete works, structural steel and platework were developed based on similar projects for each of the project areas. A schedule of rates based on recent in-country fabrication, supply and installation rates were applied to the quantity take-off to establish all in rates.

Construction equipment requirements were based on project schedule and in-country rates for the cranes and equipment required for construction.

Budget quotes were obtained for major equipment and materials from vendors in the United States, China, Europe and Mexico with all quotes based on delivery to port in Mexico. The construction labour and small tools equipment rates were based on recent in-country labour rates for similar projects in Mexico.

Capital and commissioning spares were factored based on plant equipment costs. Initial fills of grinding media, reagents and lubricants were determined by GRES quantities based on one-month consumption rates utilising supply rates for each item from existing suppliers to the current operations.

21.1.2 Infrastructure and Owners Costs

The infrastructure and owner's costs include for the supply, fabrication, transport and installation of the requirements for overhead powerline supply, water supply, in-pit tailings and site office requirements. As the existing operation at El Gallo Gold is in the process of closing down the owner's team on site will be utilized to manage the EPCM contractor in charge of constructing the process facilities, aiming to minimize owner's costs.

21.1.3 Indirect Costs

The indirect capital costs were developed based on in-house estimation of manning levels for design, project and construction management based on an EPCM model. The indirect costs include the EPCM engineers design team, in-country team, site construction team and also includes mobilization and demobilization allowances for construction infrastructure.

21.1.4 Contingency

A moderate level of contingency has been applied to the project based on a number of factors, including:

- Current operations and experience in constructing in Mexico for McEwen;
- Recent project information utilized for the project capital costs;
- Relatively simple flow sheet for Phase 1;
- All equipment pricing is based on recent budget quotations;

- Ball Mill, being the most expensive item, is currently owned by McEwen;

Contingency is included as follows:

- Process plant specific contingency of 10% (8% of overall costs);
- Mining, owners' costs and sustaining capital are inclusive of contingency.

The contingency allowance adopted for the estimates was based on the Project scope outlined in this study and do not include for changes to the process flow sheet, process plant design or major equipment selections. Contingencies in this regard are defined as an allowance for errors or omissions based on data assumed and equipment detailed as the basis for this study. Contingency is not included to accommodate any project growth allowances.

21.1.5 Project Area Cost Summary per Phase

Table 104 and Table 105 show the breakdown of the capital costs per area for each Phase of the project. The total cost amounts include supply, freight, installation and contingency for each area.

Area	Total Cost (US$M)
200 Earthworks	0.3
320 Crusher Product Storage & Handling	0.7
330 Grinding & Classification	2.6
341 Leach/CIL	6.5
350 Gold/Silver Recovery	2.0
360 Reagents	0.9
370 Power Reticulation	2.3
375 Power Supply (OHP Line & HV Yard)	5.0
390 Water Storage & Reticulation	0.5
391 Water Supply	0.4
400 Tails Thickening & Disposal	1.1
401 Cyanide Destruction	0.6
402 In-Pit Tailings Storage Facility	1.1
420 Air Services Supply & Reticulation	0.1
430 Administration Buildings & Offices	0.1
499 Plant Piping	1.4
500 Project Management	1.6
501 Engineering and Drafting	3.6
502 Site Supervision and Management	1.5
503 Site Construction Cranes & Equipment	2.1
504 Site Construction Facilities	0.1
505 Commissioning	0.5
580 Owner's Equipment	2.1
602 Initial Fills	2.3
603 Spare Parts	0.5
840 Mobilization/Demobilization/Indirect Costs	0.9
Total Phase 1	**$40.9**

Table 104 Phase 1 Capital Cost Breakdown by Area

Area	Total Cost (US$M)
310 Crushing & Screening	0.3
336 Flotation	3.0
340 Concentrate Leaching	1.4
341 Leach/CIL	0.9
342 CCD Washing	2.8
350 Gold/Silver Recovery	4.3
360 Reagents	0.3
370 Power Reticulation	1.7
420 Air Services Supply & Reticulation	0.1
430 Administration Buildings & Offices	0.1
499 Plant Piping	1.1
500 Project Management	1.7
501 Engineering and Drafting	3.0
502 Site Supervision and Management	0.9
503 Site Construction Cranes & Equipment	2.0
504 Site Construction Facilities	0.1
505 Commissioning	0.4
602 Initial Fills	0.3
603 Spare Parts	0.4
840 Mobilisation/Demobilisation/Indirect Costs	0.6
Mining	5.0
Total Phase 2	**30.4**

Table 105 Phase 2 Capital Cost Breakdown by Area

The total direct costs for Phase 1 and Phase 2 for the process plant and facilities is $66.3M and an additional $5M for mining and haul roads for Phase 2 is required to enable El Gallo Silver material to be transported to Project Fenix process plant. Sustaining capital of $8.5M is included for the additional resources mining, haul road and infrastructure development over the life of mine and $1M for reclamation costs which brings the total capital costs to $80.8M.

21.1.6 Mining

For the HLM treatment there is no capital requirement for mining. The cost of the loader and dozer for reclaim of the HLM is included in the process plant capital costs.

Ongoing mining capital is included for each of the resource locations, these costs include the establishment of haul roads and minor infrastructure for mining operations.

The existing infrastructure at El Gallo Gold will be utilized to support the mining requirements for each of the resource locations as much as possible.

21.2 Operating Costs

21.2.1 *Mine Operating Costs*

The mine operating costs were prepared by McEwen.

The mine operating costs provided by McEwen are based on a contract mining approach. The mine operating costs for drilling, loading, hauling, and roads and dumps are based on contractor quotes per tonne of material moved and the amount of mineralized material and mine waste to be removed for each resource. Blasting cost is based on the explosives vendor supplying the product and loading the holes.

The average LOM operating cost for Project Fenix is $4.59/t of mill feed ($1.57/t of total material mined). The average annual LOM operating cost for each resource is summarized in Table 106 below.

Resource	Mineralized Material (t)	Waste (t)	LOM Cost ($M)	$/t
El Gallo Gold HLM	9,024,027	-	$4.8	$0.53
El Gallo Silver	5,413,000	20,468,000	$46.6	$8.61
Palmarito	1,796,194	5,518,199	$13.2	$7.33
Carrisalejo	263,177	1,472,104	$3.1	$11.87
El Encuentro	736,540	5,660,945	$11.5	$15.63
Processed Tonnes	**17,232,938**	**33,119,248**	**$79.1**	**$4.59**

Table 106 Annual LOM Mining Operating Cost

The mine operating costs exclude haulage costs for the remote resources, the unit rates per tonne of mineralized material is included in Table 107

Resource	$/t
El Gallo Silver	$2.00
Palmarito	$7.00
Carrisalejo	$2.00
El Encuentro	$6.00
Overall Total	**$1.64**

Table 107 Mineralized Material Haulage costs for Remote Resources

The mineralized material haulage costs were based on existing contractor quotes for the current operations at El Gallo Gold.

21.2.2 Process Plant Operating Costs

The process plant operating costs were developed by B. Mulvihill, MAusIMM CP (Met), GRES.

The El Gallo Gold HLM and El Gallo Silver processing costs have been developed on annual basis for the LOM based on the campaign treatment of each material. The costs have been developed from first principal calculations based on reagent and grinding media rates from test work, budget price quotations for delivered reagents, in-country labour rates and power supply charges supplied by McEwen, based on grid power.

The average annual power cost was estimated based on power draws calculated for each drive from the installed powers and application of utilization factors, at a unit cost of $0.08/kWh. The annual maintenance (excluding labour) cost was based on scaling maintenance spares from the capital cost estimate.

The LOM total process plant operating costs by major cost center and cost per tonne of material processed for HLM retreatment and El Gallo Silver treatment are summarized below in Table 108 and Table 110 respectively. The plant operating cost estimates are based on first quarter 2018 US Dollars and are considered to be at a ± 30% level of accuracy.

Cost Centre	Annual LOM Operating Cost	
	($M/yr)	$/t
Labour	1.5	0.81
Power	3.7	2.03
Reagents and Grinding Media	12.8	7.04
Maintenance	0.9	0.49
Linings	0.3	0.13
Other	0.5	0.27
TOTAL – Processing Plant	**19.7**	**10.77**

Table 108 Process Plant Operating Cost by Cost Centre for HLM Treatment in Phase 1

Table 111 provides the breakdown reagents costs and consumables summary for HLM reprocessing.

Item	Consumption (kg/t)	Unit Cost ($/kg)	Annual Cost ($M/yr)	Cost ($/t)
Hydrated Lime	1.1	0.20	0.4	0.23
Sodium Cyanide (Leaching)	1.4	2.20	5.6	3.08
Sodium Metabisulphite (Detox)	2.7	0.60	2.9	1.61
Flocculant (Thickening)	0.02	4.29	0.2	0.09
Sodium Cyanide (Elution)	0.2	2.20	0.9	0.47
Sodium Hydroxide (Elution)	0.2	0.32	0.1	0.07
Acid (Elution)	0.07	0.43	0.05	0.03
LPG	0.4	0.45	0.3	0.17
Smelting Fluxes	0.02	1.50	0.01	0.00
Carbon	0.02	4.15	0.2	0.10
Antiscalant	0.02	2.47	0.1	0.04
Total Reagent Cost			**10.7**	**5.88**
Grinding Balls	1.1	1.10	2.1	1.17
Overall Total			**12.8**	**7.04**

Table 109 Average Reagent Consumption and Cost for HLM

The main contributors to the plant operating costs for HLM reprocessing in Phase 1 are the reagents and grinding media and power, which represent around 65% and 19% of the operating cost respectively. The cost of the sodium cyanide is around 30% of the total plant operating cost. Further test work to optimize of the addition of the reagents has the potential to reduce operating costs.

Cost Centre	Annual LOM Operating Cost	
	($M/yr)	$/t
Labour	1.8	1.50
Power	4.3	3.66
Reagents and Grinding Media	16.9	14.28
Maintenance	1.5	1.24
Linings	0.4	0.31
Other	0.6	0.51
TOTAL – Processing Plant	**25.5**	**21.50**

Table 110 Process Plant Operating Cost by Cost Centre for El Gallo Silver Treatment in Phase 2

Table 111provides the breakdown reagents costs and consumables summary for El Gallo Silver processing.

Item	Consumption (kg/t)	Unit Cost ($/kg)	Annual Cost ($M/yr)	Cost ($/t)
Frother	0.02	3.50	0.1	0.07
Promoter	0.04	7.80	0.4	0.31
Potassium Amyl Xanthate	0.04	4.10	0.2	0.16
Copper Sulphate (Flotation)	0.05	4.20	0.3	0.21
Hydrated Lime	8.2	0.20	1.9	1.64
Sodium Cyanide (Tailings Leaching)	0.4	2.20	0.8	0.71
Sodium Cyanide (Concentrate Leaching)	2.1	2.20	5.6	4.74
Lead Nitrate (Concentrate Leaching)	0.2	2.40	0.4	0.36
Sodium Metabisulphite (Detox)	4.2	0.60	3.0	2.52
Diatomaceous Earth	0.1	1.15	0.1	0.12
Zinc	0.2	2.90	0.8	0.60
Flocculant (Thickening)	0.2	4.29	0.3	0.24
Lead Nitrate (Merrill Crowe)	0.01	2.50	0.02	0.02
Sodium Cyanide (Elution)	0.1	2.20	0.3	0.22
Sodium Hydroxide (Elution)	0.1	0.32	0.04	0.03
Acid (Elution)	0.1	0.43	0.05	0.04
LPG	0.6	0.45	0.3	0.28
Smelting Fluxes	0.2	1.50	0.3	0.30
Carbon	0.02	4.15	0.1	0.09
Antiscalant	0.02	2.47	0.05	0.04
Total Reagent Cost			**15.0**	**12.69**
Grinding Balls	1.45	1.10	1.9	1.59
Overall Total			**16.9**	**14.28**

Table 111 Average Reagent Consumption and Cost for El Gallo Silver

The main contributors for the plant operating costs in Phase 2 are also reagents and grinding media, which represent around 65% operating cost. Of the reagents, sodium cyanide is the biggest contributor to operating costs at $5.40/t of material processed.

The plant processing costs for the other deposits included in the preliminary production plan have been estimated to an order of magnitude level of accuracy. The plant operating costs for Palmarito and Carrisalejo have been estimated to be similar to the El Gallo Silver processing costs at $ 21.50 / t of material treated. The El Encuentro processing costs has been estimated at $15 / t of material treated for the PEA by factoring from the processing costs developed for El Gallo Gold HLM.

21.2.3 General & Administration (G&A) Cost

This G&A cost was prepared by McEwen.

The average annual LOM G&A cost for the facility is $4.6 M or $2.50/t of material processed for the HLM processing. The G&A labour is the largest component at $1.8 M/a. The G&A labour staffing is based on 100 people including management, security, HR, environmental and community relations personnel.

In the early years, the G&A functions do have some cross over with the El Gallo Gold Heap Leach Operations, however Project Fenix has been treated as a stand-alone project in terms of G & A.

Allowances are provided for non-labour components of the G&A expenses; including office supplies, fuels, communications, office maintenance, claims assessments, legal and auditing, insurance, travel, meals and expenses, and janitorial services. The breakdown of G&A costs and labour detail are shown in Table 112 Summary and Table 113.

Total LOM G&A Cost	Annual Cost ($M)
Equipment Hire	0.02
General Consumables	0.03
Maintenance Consumables	0.01
Maintenance Spares & Consumables	0.01
Power for Administration Facilities	0.21
Security Costs	0.25
Medical Costs	0.15
Insurances on Site	0.15
Product Handling on Site	0.20
Catering and Miscellaneous	0.24
Road Maintenance Materials	0.10
Diesel	0.09
Flights & Accommodation (Senior Staff Travel)	0.14
Safety	0.04
Training	0.20
Corporate Visit and Consultant Visit Costs	0.03
Consultants	0.20
Vehicle Costs	0.05
Phones	0.01
Licences (Software etc.)	0.05
Stationary	0.03
Salaries (includes on costs)	1.90
Miscellaneous	0.05
Contingency	0.44
Total G & A	**4.60**

Table 112 G&A Cost Summary

The G & A has been assumed to be constant across each resource for differing treatment rates, this has resulted in a variable G & A allowance for each tonne of material treated as per Table 113.

Resource	G & A $/t
El Gallo Gold HLM	$2.50
El Gallo Silver	$3.85
Palmarito	$3.57
Carrisalejo	$3.13
El Encuentro	$3.13
Overall Total	**$3.07**

Table 113 G&A Summary per Resource

The G& A costs do not include refinery charges and doré freight, they are included as separate line items in the financial model.

21.2.4 Salvage Value

The process plant salvage value has been assessed as being neutral for the purposes of the financial model, meaning any residual value in the process plant would be offset by the removal and rehabilitation of the process plant area. A further $1M is included in the sustaining capital as additional closure allowance.

21.2.5 Risk and Opportunity Allowances

In addition to the contingency included in the capital costs there is an allowance in the financial model of $7.6M that has been applied as a risk and opportunity allowance for the project.

22. ECONOMIC ANALYSIS

22.1 Introduction

The financial evaluation presents the determination of the NPV, payback period (time in years to recapture the initial capital investment), and the IRR for the project. Annual cash flow projections were estimated over the LOM based on the estimates of capital expenditures, production cost and sales revenue. The sales revenue is based on the production of a gold/silver doré. The estimates of capital expenditures and site production costs have been developed specifically for this project and have been presented in Section 21 of this report.

The all in sustaining cost (AISC) per ounce for the project is $853 per oz AuEq, with the AISC for Phase 1 & Phase 2 being $704 per oz AuEq and $877 per oz AuEq respectively. Cash costs are $704 and $857 per ounce AuEq for Phases 1 and 2 respectively.

22.2 Mine Production Statistics

Mine production is reported as resources and waste from the mining operation.

The annual production figures were obtained from the Mine plans for each resource area and the LOM quantities and grades are presented in Table 114.

Resource	Au [g/t]	Ag [g/t]	Resource [tonne]	Waste [tonne]	Strip Ratio	Contained Metal [oz AuEq]	Recovered Metal [oz AuEq]
Heap Leach Material	0.64	0.00	9,024,027	0	N/A	185,179	162,958
El Gallo Silver	0.11	117.2	5,413,000	20,468,000	3.8	291,432	248,502
Palmarito	0.37	149.91	1,796,194	5,518,199	3.1	136,948	104,863
Carrisalejo	0.60	95.01	263,177	1,472,104	5.6	15,763	12,894
El Encuentro	1.56	2.2	736,540	5,660,945	7.7	37,678	33,733
TOTALS	**1.20 AuEQ**		**17,232,938**	**33,119,248**	**N/A**	**667,001**	**562,950**

Table 114 LOM Resource, Waste Quantities, and Grade[3]

22.2.1 Revenue

Annual revenue is determined by applying estimated gold and silver prices to the annual payable metal estimated for each operating year. These prices have been applied to all LOM production without escalation or hedging. The silver to gold ratio utilized for modelling is 75:1.

[3] Table 114 was included in McEwen Mining Inc. announcement dated May 25, 2018 titled "MCEWEN MINING ANNOUNCES NEW PRELIMINARY ECONOMIC ASSESSMENT EXTENDING LIFE AN ADDITIONAL 10 YEARS IN MEXICO" and has been corrected for recovered metal ounces associated with the Heap Leach Material and the gold equivalent ounces unsing a ratio of 75:1, silver to gold. This amendment does not impact the project financial model.

22.3 Shipping and Refining

The gold and silver doré will be shipped to a precious metal refinery and the refining charges are negotiable at the time of agreement. Table 115 shows the terms that are included in the financial analysis for refining.

Description	Value
Charges applied years 1 and 2	
Payable Gold	99.94%
Payable Silver	99.00%
Gold/Silver Refining ($/oz)	$0.45
Insurance ($/$1,000 value)	$0.20
Charges applied beyond year 3	
Payable Gold	99.95%
Payable Silver	99.92%
Gold/Silver Refining ($/oz)	$0.21
Insurance ($/$1,000 value)	$0.20

Table 115 Doré Refining Terms

In addition to these charges a freight charge has been included in the selling expenses for the financial model allowing for four shipments per month of operation at the following rates:

- Years 1 and 2: $5,432 per shipment for road freight and $12.65 per kg for air freight;
- Years 3 and on: $8,990 per shipment for road freight.

Due to the majority of freight being large quantities of silver from year 3 all freight will be direct by road to the refinery.

22.4 Operating Cost

The average cash operating cost over the LOM is presented below with respect to each resource, the LOM operating cost is $22.30/t. The operating costs shown in Table 116 include mining, process plant, general and administration, refining and transportation, but excluding the cost of the capitalized pre-stripping.

Resource	Processing ($/t)	Mining ($/t)	Haulage ($/t)	G & A ($/t)	Total Opex ($/t)
El Gallo Heap Leach Material	$10.77	$0.53	$0.00	$2.50	$13.80
El Gallo Silver	$21.50	$8.61	$2.00	$3.85	$35.96
Palmarito	$21.50	$7.33	$7.00	$3.57	$39.40
Carrisalejo	$21.50	$11.87	$2.00	$3.13	$38.50
El Encuentro	$15.00	$15.63	$6.00	$3.13	$39.76

Table 116 LOM Operating Cost per Resource Tonne

22.4.1 *Royalty*

There is a royalty for all the resources and it is estimated to be $11.4 M.

22.4.2 *Depreciation*

Depreciation is calculated using the straight-line method starting with first year of production. The initial capital and sustaining capital are used with a nine-year life. The last year of production is the catch-up year if the assets are not fully depreciated by that time.

22.5 Taxation

22.5.1 *Corporate Income Tax (ISR)*

Income tax is calculated at a 30% flat rate applied to the net taxable income, which is computed by subtracting the allowable deductions and carry forward losses from revenues. The estimated taxes paid are $29.4 M.

22.6 Net Income After Tax

The net income after tax is $96.3M.

22.7 NPV and IRR

The financial analysis resulting indicators for the base case and upside case after taxes are presented in Table 117.

The Net Present Value (NPV) was calculated for the pre-tax case and after tax based on metal prices of $16 /oz for silver and $1250 /oz for gold. With an IRR of 28%, the after tax NPV at a 5% discount rate is $60 M, and has a payback period of 4.1 years.The upside scenario in Table 117 considers the gold price at $1,300/oz and silver price at $17/oz and has an IRR of 33%, an after tax NPV of $75 M using a 5% discount rate, and has a payback period of 3.9 years. The downside scenario in Table 3 considers the gold price at $1,200/oz and silver price at $15/oz, as well as a 30% increase in Capex, and has an IRR of 14%, an after tax NPV of $30 M using a 5% discount rate, and has a payback period of 6.5 years.

Description	Downside Case $1,200/oz Au, $15/oz Ag 30% Capex Increase	Base Case $1,250/oz Au, $16/oz Ag	Upside Case $1,300/oz Au, $17/oz Ag
Phase 1 Capex	$53.1 million	$40.9 million	$40.9 million
Phase 2 Capex	$39.5 million	$30.4 million	$30.4 million
IRR	14%	28%	33%
NPV@5% Discount Rate	$30 million	$60 million	$75 million
Payback Period	6.5 years	4.1 years	3.9 years

Table 117 After Tax Economic Indicators

22.8 Sensitivities

The following chart shows the sensitivity of the economic indicators for ±20% change in capital, operating or grade for Project Fenix.

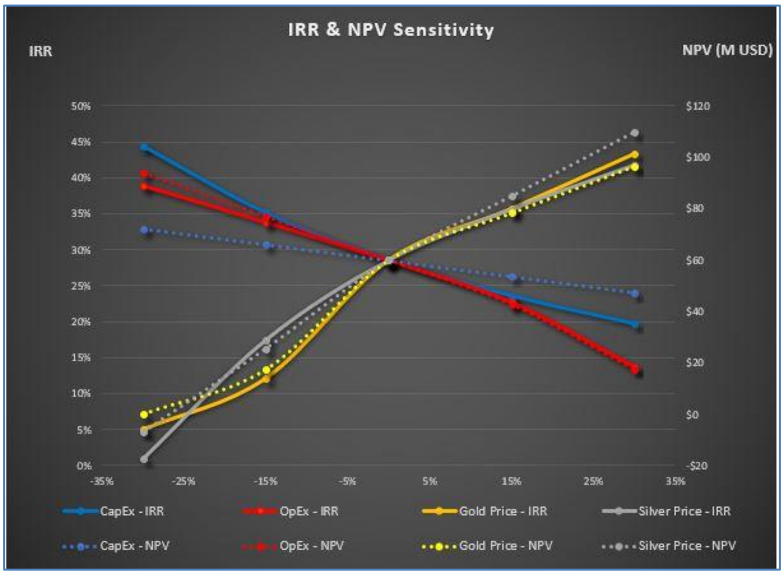


Figure 123 Sensitivity Graph for Project Fenix

Project Fenix is most sensitive to gold and silver prices across all resources, closely followed by the capital costs associated with the process plant. The sensitivity graphs are based on fixed recoveries and grades for each resource.

23. ADJACENT PROPERTIES

There are no other adjacent properties to Project Fenix as defined by NI 43-101.

24. OTHER RELEVANT DATA AND INFORMATION

24.1 Project Development

Project Fenix will be developed through three main stages from the completion of this PEA, these stages include:

- Permitting and feasibility study development;
- Front end engineering design and long lead item procurement; and
- Project Implementation.

As outlined in section 24.5 it is envisaged that the timeline to complete these activities would be approximately 18 to 20 months.

24.2 Permitting and Feasibility Study Development

During this stage the project team will undertake the following tasks:

- Design development to support all environmental and permitting application processes;
- Advance towards compilation of a feasibility study technical report;
- Further environmental and metallurgical testwork and definition of resources to produce the feasibility study inputs; and
- Confirm project financing and contract requirements.

24.3 Front End Engineering Design

The purpose of this stage of the project is to develop the following:

- Complete sufficient design to enable execution of major site works contracts;
- Commitment to long lead items to reduce/mitigate schedule risk;
- Provide further definition into project budgets; and
- Establish project implementation key performance indicators.

24.4 Project Implementation Plan

It is the intention of McEwen to undertake all implementation work on Project Fenix under an EPCM style of Contract.

McEwen will establish a client's representative team to manage the requirements for the delivery of the Project.

24.4.1 EPCM Contractor

The EPCM contractor will undertake the engineering, design, drafting, major equipment procurement, construction management and specification of the process plant and infrastructure. The EPCM contractor will work together with a local company (or subsidiary) to assist with in-country project management, procurement, contract management, construction management and commissioning of the process plant facilities and associated infrastructure.

The contracting strategy would typically involve engagement of local contractors to take on horizontal and vertical packages that will include but not be limited to:

- Site buildings and general civil installation;
- Bulk earthworks;
- Concrete works;
- Structural, mechanical and piping (SMP) works;
- Electrical and instrumentation works;
- In-Pit tailings storage construction;
- Fuel systems;
- Overhead power line and substation installation; and
- Water wells, pumping and piping systems.

These packages can be further spilt or rolled up vertically upon further investigation. Competitive tendering of fixed price contracts will be sourced within Mexico. For most installations, the contractor's materials will be free issued under the co-ordination of the EPCM contractor (purchased by McEwen) except for consumables, some bulk items and minor equipment.

24.4.2 Client's Representative/Owner's Team Role

McEwen will establish a client's representative team to undertake:

- Provision of project management services in Mexico and to oversee the in-country Engineer's tasks;
- Co-ordination of sub-consultants to McEwen for the provision of infrastructure items including:
  - In-Pit tailings storage facility design; and
  - Power supply design.
- Management of project meetings and co-ordination between the design and imported equipment management and the in-country Engineer;
- Provision of site construction expertise for the overseeing and management of site works in conjunction with the in-country Engineer;
- Formulation and management of the mining contract; and
- Liaison with community and authorities for project reporting and approvals.

24.4.3 *EPCM Scope of Services*

The EPCM contractor will provide a range of project management, engineering, drafting, international and in country procurement, contract management and commissioning services necessary to provide a complete, safe, quality and technically compliant Project. This will also include working with the client's representative team to oversee and undertake all procurement and contract management, construction management, and commissioning and handover requirements. The scope of services will be established as follows:

- Project Management and Controls;
- Equipment and Services Procurement and Contract Management;
- Materials Fabrication and Delivery;
- Transport and Logistics;
- Engineering and Drafting;
- Construction Management;
- Commissioning Management; and
- Client Training, Asset Management System Development and Handover.

24.5 Project Implementation Schedule

It is envisaged that the project will be developed over an 18 to 20-month period from the commencement of the feasibility study and permitting inputs.

Milestone	Commence Month Number
Permitting and FS Design Commencement	0
FEED Commencement	4
FS Completion and Publication	5
Commencement of international and long lead procurement	5
Completion of FEED	6
Mobilization of earthworks contractor	7
Mobilization of concrete contractor	8
Completion of detailed engineering	12
Commencement of SMP works	12
Completion of concrete works	12
Mobilization of E&I contractor	13
Completion of SMP works	17
Completion of E&I works	17
Commencement of dry commissioning	18
Commencement of wet commissioning	19
Commissioning Complete	20
Operator Training and Handover Complete	21

Table 118 Key Milestones for Project Implementation

25. INTERPRETATION AND CONCLUSIONS

The intent of this Technical Report is to incorporate previous resource information prepared earlier with metallurgical testing and cost information to validate the decision to advance the project to a feasibility-study level. The results of this PEA suggest that development of Project Fenix is technically feasible utilizing agitated cyanide leaching technology for Phase 1 and adding in flotation and Merrill Crowe technology for Phase 2 to extract gold and silver; and is economically viable based on the modelled metal prices and the mine resources, grade, and recovery information presented to date.

25.1 Mineral Resources

Based on a combination of NI 43-101 conforming resource estimates, the resource base of this Technical Report is composed of the following resources which are considered as part of the LOM plan:

- El Gallo Silver. This resource had been previously estimated and has been subject of prior technical studies;
- Palmarito. This resource had been previously estimated and has been subject of prior technical studies;
- El Gallo Gold Heap Leach Material. This resource represents a newly quantified estimate not subject of prior technical studies;
- Carrisalejo. This resource had been previously estimated and has been subject of prior technical studies; and
- El Encuentro. This resource had been previously estimated and has not been subject of prior technical studies.

These resource estimates are summarized in Table 119.

25.2 Resource Estimate

The estimated mineral resources for Project Fenix are detailed in Table 119. Note that these are not reserve estimates. The total combined Project Measured and Indicated silver resource equals 32.3 Moz. Inferred silver resources equal 5.0 Moz. The total measured and Indicated gold resources equals 161 koz. Inferred gold resources equal 148 koz.

El Gallo Silver

In Optimized Pit Shell Potential COG = 50 g/t Ag	Tonnes kt	Silver Grade (g/t)	Silver koz	Gold Grade (g/t)	Gold koz
Measured	1,057	150	5,088	0.09	3
Indicated	4,436	120	17,053	0.13	19
Measured and Indicated	**5,493**	**125**	**22,140**	**0.12**	**22**
Inferred	564	82	1,488	0.38	7

Palmarito

In Optimized Pit Shell Potential COG = 70g/t Ag	Tonnes kt	Silver Grade (g/t)	Silver koz	Gold Grade (g/t)	Gold koz
Measured	1,653	136	7,245	0.38	20
Indicated	11	148	52	0.23	0
Measured and Indicated	**1,664**	**136**	**7,297**	**0.38**	**20**
Inferred	528	133	2,258	0.30	5

Palmarito Dumps

Potential COG = 52g/t Ag	Tonnes kt	Silver Grade (g/t)	Silver koz	Gold Grade (g/t)	Gold koz
Measured	177	177	1,007	0.29	2
Indicated	68	154	338	0.24	1
Measured and Indicated	**246**	**170**	**1,345**	**0.28**	**2**
Inferred	0	0	0	0.00	0

Carrisalejo

In Optimized Pit Shell Potential COG = 46g/t Ag	Tonnes kt	Silver Grade (g/t)	Silver koz	Gold Grade (g/t)	Gold koz
Measured	0	0	0	0.00	0
Indicated	391	116	1,454	0.11	1
Measured and Indicated	**391**	**116**	**1,454**	**0.11**	**1**
Inferred	42	821	1,111	0.02	0

El Encuentro

In Optimized Pit Shell Potential COG = 0.78 g/t Au	Tonnes kt	Silver Grade (g/t)	Silver koz	Gold Grade (g/t)	Gold koz
Measured	0	0	0	0.00	0
Indicated	534	2	42	1.87	32
Measured and Indicated	**534**	**2**	**42**	**1.87**	**32**
Inferred	190	19	117	5.68	35

El Gallo Gold Heap Leach Material

Potential COG = 0 g/t Au	Tonnes kt	Silver Grade (g/t)	Silver koz	Gold Grade (g/t)	Gold koz
Measured	0	0	0	0.00	0
Indicated	4,679	0	0	0.56	84
Measured and Indicated	**4,679**	**0**	**0**	**0.56**	**84**
Inferred	4,352	0	0	0.72	101

Totals

In Optimized Pit Shells Potential COGs variable	Tonnes kt	Silver Grade (g/t)	Silver koz	Gold Grade (g/t)	Gold koz
Measured	2,887	144	13,340	0.27	25
Indicated	10,119	58	18,938	0.42	137
Measured and Indicated	**13,006**	**77**	**32,277**	**0.39**	**161**
Inferred	5,678	27	4,974	0.81	148

Table 119 Project Fenix Resources

25.3 Mining Methods

All mining to be conducted as part of Project Fenix will be conducted using conventional open pit mining methods.

Mining of in situ material will be conducted via rotary drilling of blastholes with load and haul performed using front end loaders and 80-100 tonne class haul trucks for material extraction.

Removal of Heap Leach Material and stockpile reclaim will be conducted using front end loaders.

Long haul material transportation from El Gallo Silver to the Fenix Plant will be conducted using 80-100 tonne class haul trucks. Material transportation from Palmarito and El Encuentro to the Fenix Plant will be conducted using heavy duty on-highway dump trucks.

The Project Fenix starts off by mining (unloading) of the Heap Leach Material from the El Gallo Gold Heap Leach Material and processing it in the Phase 1 mill that will be located adjacent to the heap leach pad.

The mining of the Heap Leach Material will occur during years one to four of the project and then will stop for three years before recommencing in the eighth year of the project and continuing until the twelfth and final year of the project.

The El Gallo Silver open pit will come on line in year three and will supply 98% of the mineralized rock to the mill in that year. In year four it will supply 89% of the mill feed with the balance supplied by the Heap Leach Material. El Gallo Silver open pit mine will operate continuously for six years in succession, with the eighth year of the project being its final year of operation.

In year five of the project Palmarito open pit will begin and will supply 10% of the mill feed that year with the balance coming from El Gallo Silver pit.

Palmarito will also continue to mine for six years in succession with year ten of the project being its final year.

In the same year that Palmarito stops, the Carisallejo Open Pit will begin production for just two years, helping to supplement the mill feed with 8% and 10% of its throughput in years ten and eleven respectively.

El Encuentro will begin some production late in the ninth year of the project with a total contribution of 4% to the mill feed that year and will continue until the end of year eleven of the project, contributing 17% and 29% of the mill feed in years ten and eleven respectively.

The final year of the project sees the mill return to processing only feed from the leach pad at 60% of its rated annual capacity.

25.4 Metallurgy

Initial metallurgical test work conducted to date indicates that the El Gallo Gold HLM would be amenable to conventional grinding followed by direct cyanidation for extraction of gold values. The results indicated little difference in the overall gold extraction between a P_{80} of 125 µm and a P_{80} of 106 µm grind sizes. Test work identified moderate levels of soluble copper but below the level where significant cyanide usage would be required in leaching and adsorption.

Initial metallurgical test work conducted to date on samples of El Gallo Silver material indicates that conventional flotation techniques can potentially be used to recover a high proportion of the slower leaching silver minerals into a bulk concentrate and enable separate cyanide leaching of bulk flotation concentrate and tailings streams to enhance the silver leaching characteristics. Test work indicated that flotation at lower densities significantly improved the flotation performance. The maintenance of free cyanide level throughout the concentrate leach would be used to maximize silver extraction. The extraction of silver from the flotation tailings cyanidation test work was sufficient to support separate leaching of both concentrate and tailings fractions.

25.5 Economic Assessment

The economic assessment was based on a total capital cost for the mines and both stages of process facilities of $80.8M, including the sustaining capital. The average overall LOM operating cost of $22/t (average across all resources) of material processed, including refining charges, royalties and a by-product credit for gold.

The NPV was calculated for the pre-tax case and after tax based on metal prices of $16/oz of silver and $1,250/oz of gold. The project will generate an after-tax NPV of $60M at a 5% discount rate with an IRR of 28% and a payback period of 4.1 years.

McEwen has concluded that the economic indicators for Project Fenix have demonstrated the potential value of developing Project Fenix. Further optimisation of the process is recommended with additional metallurgical testing to confirm recoveries and reagent consumptions for all resources.

25.6 Risks

The potential risks to the project identified at this time are noted below. Using a staged approach to advance the project to full production will allow McEwen to adequately assess the risks and associated costs and develop mitigation strategies.

a) Not achieving the metal recoveries nominated in this report would result in lower revenues and economic indicators. Preliminary metallurgical test work on HLM and El Gallo Silver material has not included a full variability program. The Palmarito, Carrisalejo and El Encuentro deposits included in the production schedule have been subjected only to scoping level metallurgical test work using the selected process flowsheet. Additional sampling and metallurgical test work on fresh samples would be required to better understand the metallurgical response for each of these deposits and define the most probable range in the metal recoveries;

b) CCD wash efficiency not being achieved will result in losses in gold and silver recovery and cyanide. Filtration and cake washing may be needed to achieve the target wash efficiency due to the fine particle size distribution of the concentrate;

c) Increased operating costs will result in lower economic indicators. Confirmation of future labour rates, detailed labour staffing plans, and reagent consumption rates will increase the level of confidence in the operating costs;

d) Increased capital costs will result in lower economic indicators for the project. Additional engineering to quantify construction materials will increase the level of confidence in the capital cost estimate;

e) Lower metal prices at time of operation will reduce revenues and lower the economic indicators. Project Fenix has a relatively short operating horizon for projecting metal prices.

f) Design pit slope angles are steep and will require specialty blasting and attention to detail to maintain them. If the angles are not achieved there will be mineralized material shortfalls or significant additional costs/delays in mineralized material extraction;

g) Permitting requirements and conditions imposed upon granting of the permit requiring unplanned capital and operating expenses for implementation of the proposed in-pit tailings disposal system;

h) Timing of permitting approvals for in-pit tailings disposal delaying commencement of the project; and

i) Palmarito mineralized material haulage will be a considerable disturbance to local communities along the haulage route;

j) Better than expected metallurgical performance of the residual leaching process on the HLM resulting in lower amounts, or grades, of residual metal available to be obtained from processing in the Project Fenix mill.

25.7 Opportunities

The following opportunities are to be explored during the project development:

a) The opportunity exists that further metallurgical test work can improve gold and silver recoveries and reduce operating costs for both HLM and El Gallo Silver material;

b) Trade-off studies to optimize mineral processing options and also investigate alternative sources for reagents and reagent supply contracts;

c) Investigation of the potential value of any dissolved precious metals and residual reagents contained in El Gallo Gold HLM in situ moisture;

d) Investigate use of existing infrastructure at the existing El Gallo Gold heap leach operation, including the Sulfidization, Acidification, Recycle and Thickening (SART) circuit recently installed, to assist in achieving optimal use of cyanide;

e) Investigation of the potential future treatment of other polymetallic resources in the region with the required modifications to the plant;

f) Expansion of the Palmarito and El Encuentro resources through additional exploration of sulfidic material extensions;

g) Development of minable resources at Mina Grande and Haciendita;

h) Tradeoff between upgrading the existing low voltage grid to site and connecting substation as an option to the base case construction of a new dedicated medium voltage transmission line through new rights of way as a schedule enhancement, reduction in land disturbance and cost reduction opportunity.

26. RECOMMENDATIONS

Based on the results of the PEA study, it is recommended that McEwen progress the project to the next phase. The priority next steps should be:

a) In-fill drilling;
b) Continue with the current process of submitting applications for the operating permits;
c) Conduct additional sampling and metallurgical test work to better understand the metallurgical response and assess the variability for each resource using the proposed process flow sheets;
d) Continue development of production water wells on the property to confirm availability and quality of fresh water for the project;
e) Undertake trade-off studies to optimize mineral processing, mine sequencing, material transportation, infrastructure solutions and tailings disposal options;
f) Investigate an alternate route for the power supply along existing easements through upgrades of existing electrical infrastructure;
g) Secure a right of way corridor for a new southern access route to El Gallo Gold from El Gallo Silver for mineralized material haulage and services;
h) Advance the engineering for the project to a feasibility level of engineering to develop detailed material quantities for construction and a higher level of accuracy in the capital cost estimate as input for a feasibility study technical report;
i) The currently owned ball mill is inspected, as it has been in storage for a number of years and a condition report established to ensure all components are suitable for installation, and arrangements made for transportation to site;
j) Conduct a detailed review of the existing infrastructure proposed to be used for Project Fenix; and
k) Better than expected metallurgical performance of the current leaching process on the HLM prior to Project Fenix will result in lower amounts (and grades) of the residual metal available to be obtained from processing during Project Fenix.

26.1 Geological

a) Conduct infill drilling as required in all deposits to upgrade the resource estimation to measured category to ensure adequate support for mining purposes; and
b) Validate and conduct condemnation drilling in the periphery of the proposed pits and at all locations where project infrastructure is to be located.

26.2 Resource Estimation

a) As of the time of this technical report's effective date, the HLP remains part of an active processing facility. As such, the addition of remaining mineral from open pit mining (until mid-

2018) and the continuing active leaching operations up until the commissioning of Project Fenix will create variations in residual metal content and grades of the HLM. Consequently, this requires that a new residual metal estimate be conducted to update values at a date closer to commissioning of Project Fenix based on performance of the current metallurgical process.

26.3 Hydrogeology

a) Secure through detail hydrogeological prospecting, investigation and testing sufficient water wells for project makeup water requirements; and

b) Complete the investigation of water protection and isolation measures required for tailings seepage control from the Samaniego open pit when used for tailings disposal.

26.4 Geotechnical

a) Conduct detail pit slope investigations and designs for the proposed open pits.

26.5 Mining

a) Conduct a multi-mine sequencing evaluation for optimization of mining rate requirements and material delivery profile to the mill from all planned open pits; and

b) Conduct detail waste dump designs for the open pits.

26.6 Mineral Processing and Metallurgical Test Work

a) Review of previous mineral characterization for each deposit with mining, geology to assist with selection of representative samples for the next phase of test work to support more detailed feasibility study outcomes;

b) Mineralogical studies on samples of the HLM to better understand how the gold occurs and its grain size distribution;

c) Investigate potential for gravity gold extraction prior to leaching from the expected higher-grade areas of the HLM, El Encuentro and other resources;

d) Additional comminution, flotation and cyanidation optimisation and variability test work where applicable for each of the deposits;

e) Additional grind sensitivity test work to establish optimum grind size for HLM and the higher silver grade deposits;

f) For the El Gallo Silver and Palmarito deposits conduct additional flotation and cyanidation test work on samples comprising fresh drill core to better reflect normal mine operation and for comparison with the recently completed tests;

g) Use data from the variability test work programs with block model and proposed mine schedules to more clearly define metal recoveries and optimize production outcomes;

h) Carbon adsorption loading test work to provide process design criteria for the proposed leaching and adsorption circuit;

i) Additional zinc precipitation test work, CCD modelling and development of a more detailed material, metal balance particularly for Phase 2 flow sheet;

j) Additional rheology and viscosity tests should be carried out to assist with selections of leach conditions and maintain carbon in suspension, pumping and agitation design;

k) Oxygen uptake tests for confirmation of oxygen requirements;

l) Additional dewatering test work to enable a trade-off study to be conducted to determine most cost-effective solution for concentrate washing in Phase 2 operation;

m) Additional cyanide destruction test work to confirm low range WAD and total cyanide levels are achievable for each of the deposits;

n) Additional detailed analyses to better understand the levels and deportment of base metals and other potential deleterious elements for each of the deposits.

26.7 Environmental

a) Permitting of Project Fenix should be advanced expeditiously. Focus should be placed on the permit modifications required at the El Gallo Gold site for introduction of a mill with agitated leaching, reprocessing of the Heap Leach Material and tailings disposal as a first phase of permitting; and

b) A second phase of permitting will be required to implement all additional elements of the project configuration and mill circuit additions for fresh mineralized material processing from the open pits.

c) Establish detailed environmental closure and reclamation costs for Project Fenix as a stand-alone entity.

26.8 Budgetary Requirements for Proposed Work

A preliminary budget for the recommended work is estimated to be approximately $3.58 M as shown in Table 120 below. The work is expected to take 6 to 10 months to complete.

Description	Cost
Expansion and Infill Drilling	$1,200,000
Operation Permit Applications (2018)	$380,000
Additional Metallurgical Testing	$550,000
Develop Production Water Wells	$150,000
Right of Way for Alternate South Access Road	$100,000
Advance Engineering for FS (30% Engineering)	$1,200,000
Total	**$3,580,000**

Table 120 Estimated Cost for Proposed Work

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28. QUALIFIED PERSONS LETTERS AND SIGNATURES

CERTIFICATE OF QUALIFIED PERSON

To Accompany the report entitled: **Technical Report -PEA for the Fenix Project, Sinaloa, Mexico, Canada; June 28th, 2018**.

I, Xavier Ochoa, residing at 3845 Convent Street #1, Dallas Texas, 75204, USA do hereby certify that:

1) I am the Chief Operating Officer with the firm of McEwen Mining Inc. (McEwen) with an office at Suite 2800 - 150 King Street West, Toronto, Ontario, Canada; M5H 1J9

2) I am a graduate of the University of Arizona; I have practiced my profession of Mining Engineer continuously since 1991; My relevant experience over the past 27 years includes: Mine Evaluation, Due Diligence, Financial Analysis, Costs Estimation, Study Management, Permitting, Mine Design, Project Design, Project Management, Commissioning, Mine Operations, Process Operations, Site Management, and Closure.

3) I am a Professional Engineer, Member of the Mining and Metallurgical Society of America, and a Qualified Person as defined by the Canadian Securities Administrator National Instrument 43-101 "Standards of Disclosure for Mineral Projects" and Chief Operating Officer of McEwen Mining Inc.

4) I have personally inspected the subject project on more than one occasion from 2016 to 2018;

5) I have read the definition of Qualified Person set out in National Instrument 43-101 and certify that by virtue of my education, affiliation to a professional association, and past relevant work experience, I fulfill the requirements to be a Qualified Person for the purposes of National Instrument 43-101 and this technical report has been prepared in compliance with National Instrument 43-101 and Form 43-101F1;

6) I am not an independent of the issuer as defined in Section 1.5 of National Instrument 43-101;

7) I, as a QP, am the co-author of this report and responsible for Sections 1-3,16, 19,21-22 and 24-27; and accept professional responsibility for those sections of this technical report;

8) I am currently an employee of McEwen Mining Inc. which is the owner of Compañía Minera Pangea S.A. de C.V. which owns the assets reported upon in this report;

9) I have read National Instrument 43-101 and confirm that this technical report has been prepared in compliance therewith; and

10) That, as of the date of this certificate, to the best of my knowledge, information and belief, this technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Effective Date
May 25, 2018

["signed and sealed"]

Signed Date
June 28, 2018
Toronto

Xavier Ochoa, QP
McEwen Mining
Chief Operating Officer

CERTIFICATE OF QUALIFIED PERSON

To Accompany the report entitled: **Technical Report -PEA for the Fenix Project, Sinaloa, Mexico; June 28th, 2018**.

I, William Luke Willis, residing at 3 Bryant Road, Ajax, Ontario, Canada, L1S 2Y5 do hereby certify that:

1) I am the Director – Resource Modelling with the firm of McEwen Mining Inc. (McEwen) with an office at Suite 2800 - 150 King Street West, Toronto, Ontario, Canada; M5H 1J9;
2) I graduated with a Bachelor of Science degree in Exploration and Mining Geology from the University of Wales, College of Cardiff, in 1995.
3) I am a certified Professional Geoscientist and a member in good standing with the Canadian Institute of Mining and the Association of Professional Geoscientists of Ontario (No. 2146). I have practiced my profession continuously for a total of 20 years.;
4) I have personally inspected the subject project on more than one occasion from 2013 to 2018;
5) I have read the definition of Qualified Person set out in National Instrument 43-101 and certify that by virtue of my education, affiliation to a professional association, and past relevant work experience, I fulfill the requirements to be a Qualified Person for the purposes of National Instrument 43-101 and this technical report has been prepared in compliance with National Instrument 43-101 and Form 43-101F1;
6) I am not independent of McEwen Mining applying the criteria set out in Section 1.5 of NI 43-101.
7) I am the co-author of this report and responsible for Sections 4,5,6,7,8,910,11, 14 & 23 and accept professional responsibility for those sections of this technical report;
8) I am currently an employee of McEwen Mining Inc. which is the owner of Compañía Minera Pangea. which owns the assets reported upon in this report;
9) I have read National Instrument 43-101 and confirm that this technical report has been prepared in compliance therewith; and
10) That, as of the date of this certificate, to the best of my knowledge, information and belief, this technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

    I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their websites accessible by the public.

Effective Date
May 25, 2018 — *["signed and sealed"]*

Signed Date
June 28, 2018

William Luke Willis, P. Geo
McEwen Mining
Director, Resource Modeling and Senior Geologist

CERTIFICATE OF QUALIFIED PERSON

To Accompany the report entitled: Preliminary Economic Assessment for the Fenix Project at MCEWEN MINING INC.'S OPERATIONS IN SINALOA, MEXICO, Canada; June 28th, 2018.

I, Nathan M. Stubina, residing at 2393 Hertfordshire Way, Oakville, Ontario, Canada, L6H 7M8 do hereby certify that:

1) I am Managing Director, Innovation of McEwen Mining Inc., 150 King Street West, Suite 2800, Toronto, Ontario Canada, M5H 1J9;
2) I am a graduate of McGill University in 1980, I obtained a B. Eng. (Metallurgical Engineering). I also am a graduate of the University of Toronto in 1987 with a Ph.D. in Metallurgy and Materials Science. I have practiced my profession continuously since 1987. My relevant experience over the past 30 years includes: plant operations, plant design, plant management and corporate roles involving technology development, lab management, financial evaluations and mergers and acquisitions. I have worked and lived in Norway, Belgium, Sweden, Ontario and Québec;
3) I am a professional Engineer registered with the Professional Engineers of Ontario, License Number 44888501;
4) I have personally inspected the subject project on more than one occasion between April 2014 and March, 2018;
5) I have read the definition of Qualified Person set out in National Instrument 43-101 and certify that by virtue of my education, affiliation to a professional association, and past relevant work experience, I fulfill the requirements to be a Qualified Person for the purposes of National Instrument 43-101 and this technical report has been prepared in compliance with National Instrument 43-101 and Form 43-101F1;
6) I am currently an employee of McEwen Mining Inc which owns the assets reported upon in this report;
7) I am a co-author of this report and responsible for Section 12 and accept professional responsibility for those sections of this technical report;
8) I have read National Instrument 43-101 and confirm that this technical report has been prepared in compliance therewith; and
9) That, as of the date of this certificate, to the best of my knowledge, information and belief, this technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Effective Date
May 25, 2018

["Signed and Sealed"]

Signed
June 28, 2018
Toronto

Nathan M. Stubina, FCIM. Ph.D., P. Eng.
McEwen Mining Inc.
Managing Director, Innovation

CERTIFICATE OF QUALIFIED PERSON

To Accompany the report entitled: Preliminary Economic Assessment for the Fenix Project at MCEWEN MINING INC.'S OPERATIONS IN SINALOA, MEXICO, Canada; effective May 25th, 2018.

I, Brendan Mulvihill, residing at 26 Charles Glen Street, Daisy Hill, Queensland, Australia 4127 do hereby certify that:

1) I am a Senior Process Engineer at GR Engineering Services Limited, Building 3, Level 3, Kings Row Office Park 42 McDougall Street, Milton QLD 4064

2) I graduated from the La Trobe University Bendigo, Australia (B.App.Sc.Metallurgy (Hons.), in 1995. I have practiced my profession for 23 years in the minerals industry and have experience in preliminary and feasibility studies, process optimisation, process engineering design and operation of mineral processing plants. I have been directly involved in feasibility studies and process engineering design of base metal and precious metal extraction plants in Australian and International projects.

3) I am a Chartered Professional Member of the Australasian Institute of Mining and Metallurgy and Registered Professional Engineer of Queensland under the discipline of Metallurgy.

4) I have personally inspected the subject project between October 9, 2017 and October 10, 2017;

5) I have read the definition of Qualified Person set out in National Instrument 43-101 and certify that by virtue of my education, affiliation to a professional association, and past relevant work experience, I fulfill the requirements to be a Qualified Person for the purposes of National Instrument 43-101 and this technical report has been prepared in compliance with National Instrument 43-101 and Form 43-101F1;

6) I, as a Qualified Person, I am independent of the issuer as defined in Section 1.5 of National Instrument 43-101;

7) I am the co-author of this report and responsible for Sections 13, 17, 18, 21 (excluding 21.2.1, 21.2.3) and accept professional responsibility for those sections of this technical report;

8) I have read National Instrument 43-101 and confirm that this technical report has been prepared in compliance therewith; and

9) That, as of the date of this certificate, to the best of my knowledge, information and belief, this technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Effective Date
May 25, 2018

["signed and sealed"]

Signed Date — Brendan Mulvihill B.App.Sc. Metallurgy (Hons.), MAusIMM CP (Met)
June 28, 2018 — GR Engineering Services Limited
Brisbane — Senior Process Engineer

CERTIFICATE OF QUALIFIED PERSON

To Accompany the report entitled: Preliminary Economic Assessment for the Fenix Project at MCEWEN MINING INC.'S OPERATIONS IN SINALOA, MEXICO; June 28th, 2018.

I, Joel A Carrasco, residing at 350 S Jackson St #454, Denver, Colorado, United States of America, 80209 do hereby certify that:

1) I am a Principal Engineer at Solum Consulting Group, LLC., 350 S. Jackson St, Suite 454, Denver, Colorado, USA 80209;
2) I am a graduate of Texas Tech University in 2000/2001, I obtained a B. Architecture (Structures) and a B.Sc. (Civil Engineering). I have practiced my profession continuously since 2001. My relevant experience over the past 17 years includes: hydrology, channel and flood plain hydraulics, field investigation programs, heap leach facilities, tailings facilities, waste rock, and water management facility design, permitting, construction, operations, and closure; management and corporate roles involving business development, personnel and project management, and general business operations. I have worked in various locations that include the United States, Canada, Mexico, Central America, South America, Southeast Asia, and Africa;
3) I am a Professional Engineer (Civil) registered in the State of Arizona with the Arizona State Board of Licensure for Architects, Professional Engineers and Professional Land Surveyors, License Number 52000;
4) I have personally inspected the subject project on April 16, 2018;
5) I have read the definition of Qualified Person set out in National Instrument 43-101 and certify that by virtue of my education, affiliation to a professional association, and past relevant work experience, I fulfill the requirements to be a Qualified Person for the purposes of National Instrument 43-101 and this technical report has been prepared in compliance with National Instrument 43-101 and Form 43-101F1;
6) I, as a Qualified Person, I am independent of the issuer as defined in Section 1.5 of National Instrument 43-101;
7) I am the co-author and reviewer of this report and responsible for Section 20, and accept professional responsibility for those sections of this technical report;
8) Solum Consulting Group, LLC. was retained by McEwen Mining Inc to prepare section 20;
9) I have read National Instrument 43-101 and confirm that this technical report has been prepared in compliance therewith; and
10) That, as of the date of this certificate, to the best of my knowledge, information and belief, this technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Effective Date
May 25, 2018

["signed and sealed"]

Joel A Carrasco
Solum Consulting Group.
Principal Engineer

Signed Date
June 28, 2018