# NI 43-101 Technical Report
# Preliminary Feasibility Study

## Altaley Mining Corporation
## Tahuehueto Project
## Durango, Mexico

**Effective Date: February 23, 2022**
**Report Date: April 25, 2022**

**Prepared By**
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**DATE AND SIGNATURE PAGE**

NI 43-101 Technical Report, Preliminary Feasibility Study, Altaley Mining Corporation, Tahuehueto Project, Durango, Mexico

The effective date of this report is February 23, 2022

Dated April 21, 2022

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## AUTHOR'S CERTIFICATE - SCOTT WILSON

I, Scott E. Wilson, CPG, SME-RM, of Highlands Ranch, Colorado, as the author of the technical report entitled "NI 43-101 Technical Report, Preliminary Feasibility Study, Altaley Mining Corporation, Tahuehueto Project, Durango, Mexico" (the "Technical Report") with an effective date of February 23, 2022 prepared for Altaley Mining Corporation. (the "Issuer"), do hereby certify:

1. I am currently employed as President by Resource Development Associates, Inc., 10262 Willowbridge Way, Highlands Ranch, Colorado USA 80126.
2. I graduated with a Bachelor of Arts degree in Geology from the California State University, Sacramento in 1989.
3. I am a Certified Professional Geologist and member of the American Institute of Professional Geologists (CPG #10965) and a Registered Member (#4025107) of the Society for Mining, Metallurgy and Exploration, Inc.
4. I have been employed as both a geologist and a mining engineer continuously for a total of 32 years. My experience included resource estimation, mine planning, geological modeling, geostatistical evaluations, project development, and authorship of numerous technical reports and preliminary economic assessments of various projects throughout North America, South America and Europe. I have employed and mentored mining engineers and geologists continuously since 2003.
5. I have read the definition of "Qualified Person" set out in National Instrument 43-101 ("NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "Qualified Person" for the purposes of NI 43-101.
6. I have made several personal inspections of the Tahuehueto Project with the most recent visit November 7, 2016.
7. I am responsible for Sections 1 through 12, 14 through 15, 19 through 20 and 22 through 27 of the Technical Report.
8. I am independent of the Issuer as independence is described in Section 1.5 of NI 43-101.
9. The Issuer retained my services in June 2021 to be the independent qualified person for the project. I have either authored or co-authored three technical reports prior to this technical report.
10. I have read NI 43-101 and Form 43-101F1, and this Technical Report was prepared in compliance with NI 43-101.
11. As of the effective date of this Technical Report, to the best of my knowledge, information and belief, the portions of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the portions of the Technical Report for which I am responsible not misleading.

Dated: April 21, 2022

(signed/sealed) *Scott Wilson*

Scott E. Wilson, CPG, SME-RM

## AUTHOR'S CERTIFICATE – ZEKE BLAKELY

I, Ray "Zeke" Blakeley, QP, SME-RM, of Butte, Montana, as co-author of the technical report entitled "NI 43-101 Technical Report, Preliminary Feasibility Study, Altaley Mining Corporation, Tahuehueto Project, Durango, Mexico" (the "Technical Report") with an effective date of February 23, 2022 prepared for Altaley Mining Corporation. (the "Issuer"), do hereby certify:

1. I am currently a Principle of Minetech – USA, LLC, 129 Denali Lane, Butte, Montana, USA 59701.
2. I graduated with a Bachelor of Science degree in Mining Engineering from Montana College of Mineral Science and Technology (Montana Tech), Butte 1994.
3. I am a Registered Member (#4029863) of the Society for Mining, Metallurgy and Exploration, Inc.
4. I have been employed as a mining engineer continuously for a total of 27 years. My experience includes mine management, mine engineering, project development, economic analysis, and operations for both underground and surface mines. I have co-authored numerous technical reports and preliminary economic assessments of various projects throughout North America. I have employed and mentored mining engineers continuously since 1997.
5. I have read the definition of "Qualified Person" set out in National Instrument 43-101 ("NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "Qualified Person" for the purposes of NI 43-101.
6. I have made a personal inspection of the Tahuehueto Project on March 22-23, 2022.
7. I am responsible for Sections 16 and contributed to Sections 18 and 21 through 22 of this Technical Report. Section 16.1 Geotechnical assessment has been provided by third party from a previous study and appears valid.
8. I am independent of the Issuer as independence is described in Section 1.5 of NI 43-101.
9. The Issuer retained my services in June 2021 to be an independent qualified person for the project. I have co-authored several technical reports prior to this technical report.
10. I have read NI 43-101 and Form 43-101F1, and this Technical Report was prepared in compliance with NI 43-101.
11. As of the effective date of this Technical Report, to the best of my knowledge, information and belief, the portions of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the portions of the Technical Report for which I am responsible not misleading.

Dated: April 21, 2022

(signed/sealed) *Ray Zeke Blakeley*

Ray "Zeke" Blakeley, QP, SME-RM

## AUTHOR'S CERTIFICATE – JEFFREY WOODS

I, Jeffrey L. Woods, MMSA QP, as an author, as the author of the technical report entitled "NI 43-101 Technical Report, Preliminary Feasibility Study, Altaley Mining Corporation, Tahuehueto Project, Durango, Mexico" (the "Technical Report") with an effective date of February 23, 2022 prepared for Altaley Mining Corporation. (the "Issuer"), do hereby certify:

1. I am a member in good standing of Society for Mining, Metallurgy and Exploration,membership #4018591.
2. I graduated from the Mackay School of Mines, University of Nevada, Reno, Nevada,U.S.A., in 1988 with a B.S. in Metallurgical Engineering.
3. I have practiced my profession continuously for 34 years since graduation.
4. I have been directly involved in international mine operations, technical services, project development and consulting for various commodities, metals, deposits, and processes. As a result of my experience and qualifications.
5. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
6. I have not visited the Tahuehueto Project at the time of writing.
7. I am responsible for Sections 13, and 17 contributions to Section 27 of the Technical Report.
8. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
9. I have not had prior involvement with the property that is the subject of the Technical Report.
10. I have read NI 43–101 and the Technical Report sections for which I am responsible have been prepared in compliance with that Instrument.
11. As of the effective date of the Technical Report, to the best of my knowledge, information, and belief, the sections of the Technical Report that I am responsible for, contain all scientific and technical information that is required to be disclosed to make those sections of the technical report not misleading.

Dated April 21, 2022.

(signed/sealed) *Jeffrey L Woods*

Jeffrey L. Woods, QP, SME-RM MMSA-RM

## AUTHOR'S CERTIFICATE – ERIC TITLEY

I, Eric D. Titley, P.Geo., of Vancouver, British Columbia as the author of the technical report entitled "NI 43-101 Technical Report, Preliminary Feasibility Study, Altaley Mining Corporation, Tahuehueto Project, Durango, Mexico" (the "Technical Report") with an effective date of February 23, 2022 prepared for Altaley Mining Corporation. (the "Issuer"), do hereby certify:

1. I am a Consulting Geologist and President of Titley Consulting Ltd. with an office at 3550 13th W, Vancouver, British Columbia, Canada V6R 2S3.
2. I am a Professional Geoscientist registered with Engineers and Geoscientists British Columbia (EGBC), license number 19518.
3. I am a graduate of the University of Waterloo, Waterloo, Ontario with a Bachelor of Science degree in Earth Sciences (geography minor) in 1980.
4. I have practiced my profession continuously since graduation on mineral exploration projects in Canada, United States, Mexico, South Africa, Poland, Brazil, Chile, Ireland and Australia. I have considerable experience related to geological data management and QAQC on mineral exploration projects, including deposits such as Tahuehueto.
5. I have read the definition of "Qualified Person" set out in National Instrument 43-101 ("NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "Qualified Person" for the purposes of NI 43-101.
6. I have not visited the Tahuehueto Project site.
7. I am the author of sections 10, 11 and 12, and jointly responsible for sections 1.3, 25.2, 26 and 27 of the Technical Report.
8. I am independent of the Issuer as independence is described in Section 1.5 of NI 43-101.
9. The Issuer retained my services in November 2021 to be the independent qualified person for the project.
10. I have read NI 43-101 and Form 43-101F1, and this Technical Report was prepared in compliance with NI 43-101.
11. As of the effective date of this Technical Report, to the best of my knowledge, information and belief, the portions of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the portions of the Technical Report for which I am responsible not misleading.

Dated: April 21, 2022

(signed/sealed) *Eric Titley*
Eric D. Titley, P.Geo
(EGBC Permit to Practice Number 1002875)

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# 1 SUMMARY

Altaley Mining Corporation (“Altaley” or the “Company”) requested that Resource Development Associates (“RDA”) prepare a Pre-Feasibility Study (“PFS”) for its 100% owned Tahuehueto Project. This report was authored by Scott E. Wilson of RDA along with contributions from other industry experts.

The Tahuehueto Project (“Tahuehueto” or the “Project) is an advanced-stage mining project nearing completion of construction of a 1,000 tpd underground mining operation. Mineralization consists of epithermal Au-Ag veins and brecciated structures rich in lead, zinc and copper. Tahuehueto is located in northern Durango State within the prolific Sierra Madre Mineral Belt which hosts a series of historic and producing mines along with most of México´s active exploration and development projects.

From 1998 to present day, Real de la Bufa, S.A. de C.V., a Mexican subsidiary of Altaley, has conducted surface and underground sampling and mapping, drilled 252 holes totaling 48,260 m into several mineralized zones and veins, conducted metallurgical testing and pre-production toll milling, as well as geophysics and other geological studies. The Project consists of 28 mining concessions that total 7,492.8 ha.

The Project configuration evaluated in this PFS is a contractor operated 1,000 tpd underground mine that will utilize sublevel open stope mining with conventional mining equipment in a blast/load/haul operation. Mill feed will be processed in a 1,000 tpd comminution circuit consisting of primary and secondary crushing, grinding in a single ball mill followed by three floatation circuits producing lead, copper, and zinc concentrates. The concentrates will be trucked from site for smelting and refining.

The highlights of this Pre-Feasibility Study report include:

- Post-tax Net Present Value (“NPV”), using an 5% discount, of $161M, with an internal rate of return (“IRR”) of 65.5% and a payback period of 2.0 years.
- Pre-tax NPV, using an 5% discount, of $220.0M.
- Financial Analysis completed on base case metal price forecasts of $0.92/lb for lead, $1.14/lb for zinc, $3.60/lb for copper, $1,647.50/oz for gold and $21.64/oz for silver.
- Average monthly earnings before interest, taxes, depreciation, and amortization (“EBITDA”) of $2.13M; Life of Mine (LOM) of $278.441M.
- Proven and Probable Mineral Reserves of 3.6 million tonnes, grading 2.55 g/t gold, 50.06 g/t silver, 0.26% copper, 1.11% lead and 1.92% zinc.
- 10.9-year mine life with average annual production of 25,987 oz of gold, 453,952 oz of silver, 827 tonnes of copper, 3,155 tonnes of lead and 6,123 k-lbs of zinc.
- Life-of-Mine Capital costs of $46.8M.

## 1.1 MINERALIZATION

Mineralization at Tahuehueto occurs as polymetallic epithermal veins with multiple mineralizing events overprinted on one another in the same vein structure. The primary host rock is andesite of the lower volcanic series, but in at least one case, the hydrothermal system penetrated felsic ignimbrite of the upper volcanic series. Breccias are an integral part of the Tahuehueto hydrothermal system and display several genetic styles. Many of the sulfide-mineralized zones display sulfide transport textures.

Overprinting of the lower-temperature, higher-level mineral assemblage onto the higher temperature, deeper-level mineral assemblage is referred to as telescoping. This telescoping may represent the progressive cooling of the hydrothermal system, although in some instances tectonic un-roofing of the cover rocks may also result in a decrease in overburden and progressive deposition of higher crustal level, lower temperature mineral assemblages. Increasing gold and silver grades in the later higher crustal level assemblages without significant base metals is an important element of this telescoping.

The uppermost portions of the mineralized structures are oxidized. In the oxide zone, mineralization consists of malachite, azurite, chalcocite, covellite, limonite, and hematite. Malachite overprints tetrahedrite, and chalcocite and covellite form coatings on sphalerite. The depth of the oxide-sulfide interface varies considerably, but is generally less than 100 m and less than 5% of the mineralization discovered to date is considered oxidized.

Sulfide mineralization lies below the oxidized zone and consists of sphalerite, galena, chalcopyrite, tennantite, tetrahedrite, and probably electrum. Gangue minerals are quartz, pyrite, chlorite, sericite, and calcite. Locally a light green phyllosilicate mineral interpreted to be celadonite forms as gangue and is closely associated with high-grade gold and silver mineralization.

## 1.2 MINERAL RESOURCE ESTIMATE

Mineral resources have been limited to mineralized material that occurs within blocks the size of the selective mining unit ("SMU") of 1.5 meters. These estimates represent mineralization which could be scheduled to be processed based on reasonably defined economic cut-off grades. These blocks demonstrate the reasonable prospects for eventual economic extraction. All other material, smaller than the SMU, was reported as non-mineralized material.

Table 1-1 below, lists the current Mineral Resource estimate for the Project at cut-off grade of 1.35 g/t gold equivalent (AuEq).

**Table 1-1 Tahuehueto Project Measured, Indicated, and Inferred Mineral Resource Estimate Effective date: February 23, 2022. QP: Scott Wilson CPG-AIPG.**

| Classification | kTonnes | Ag Grade (gpt) | Cont Ag kOz | Au Grade (gpt) | Cont Au kOz | Cu Grade (%) | Cont Cu klbs | Pb Grade (%) | Cont Pb klbs | Zn Grade (%) | Cont Zn klbs |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Measured | 3,875 | 48.54 | 6,047 | 2.42 | 302 | 0.27 | 23,215 | 1.11 | 94,967 | 2.01 | 171,481 |
| Total Indicated | 2,385 | 44.43 | 3,407 | 1.60 | 123 | 0.25 | 13,379 | 0.55 | 28,905 | 1.94 | 101,883 |
| **Total Measured and Indicated** | **6,260** | **46.97** | **9,454** | **2.11** | **425** | **0.27** | **36,594** | **0.90** | **123,872** | **1.98** | **273,364** |
| Total Inferred | 918 | 28.46 | 840 | 1.02 | 30 | 0.15 | 3,077 | 1.16 | 23,571 | 1.96 | 39,755 |

Mineral resources are not mineral reserves and do not have demonstrated economic viability. Mineral resource estimates include inferred mineral resources which are considered too speculative geologically to have economic considerations applied that would enable them to be classified as mineral reserves. There is no certainty that inferred mineral resources will be converted to measured or indicated mineral resources. Gold equivalency was estimated using metal selling prices of US$1,650/Oz Au, US$21.02/Oz Ag, US$0.91/Lb Pb, US$1.15/Lb Zn and US$3.70/Lb Cu.

## 1.3 DRILLING, SAMPLING, ANALYSIS, DATA VERIFICATION

Altaley completed 252 holes in 48,260.22 m of drilling in 2004 through 2008, and in 2011 which makes up the entirety of Tahuehueto drill hole database. Of the Altaley holes, 215 were cored drill holes, and 37 were reverse circulation (RC) holes, with the cored drill holes representing 85% the total footage. Of the Altaley core drilling three quarters is HQ size and one quarter is NQ size. No drilling has taken place on the property since four holes were completed in 2011, and no other drill results are known.

The Tahuehueto database of Altaley includes over 20,000 samples from cored drill holes, RC drilling and underground channel samples. Underground adit and cross cut sampling programs took place in 1997, and from 2004 through 2006. Over 75% of the assay results are from drill core samples, and of the remaining, 13% are from RC drilling, and 12% are from underground channel samples. Control samples inserted with the regular samples included blanks and standards, and they account for almost 8% of the total number of samples analyzed. The majority of samples were prepared and analyzed at three well-recognized analytical laboratories, ALS Minerals, Inspectorate and SGS. The analytical methods typically employed were 30 g fire assay for gold, and also some higher-grade silver samples, and four-acid digestion, or sodium peroxide fusion AAS or ICP finish for the determination of silver, copper, lead and zinc. A significant number of multi-element ICP analyses were also completed.

Data verification included a comparison of assay certificates sourced directly from ALS Minerals laboratories and Altaley archived digital files, with the existing Altaley resource database. No significant differences between the two data sets were observed. The verification work conducted lends confidence to the veracity of Altaley database.

## 1.4 MINING ENGINEERING

The geometry and orientation of the Tahuehueto mineralized veins are conducive to sublevel stoping. The Perdido, Creston, and Rey primary development intersects the veins near the midpoint of the target mineralization allowing for bottom-up and top-down sequencing; the Santiago and Cinco veins are developed as top-down mining only. A 3-meter pillar every three sublevels may be utilized to maintain rock integrity and proper backfill sequencing.

Altaley has developed approximately 1,200 meters horizontal and 75 meters of vertical development off the 20 Level and 350 meters plus several ore cuts off the 12 Level. All development completed to date accesses the Perdido and Creston veins in preparation of being in a position to produce ore following commissioning of the mill.

Overhand Cut and Fill mining method with conventional drilling, blasting, mucking and hauling, scaling and ground support installation and backfilling with unconsolidated, mined waste materials was evaluated as a trade-off study. The method provided improved metal extraction; however, it was determined that excessive development was required accessing the levels off the decline resulting in reduced economics. A summary of Project operating metrics is presented in Table 1-2.

**Table 1-2 Tahuehueto Project Operating Metrics**

| Operating Metrics | Units | Value |
|---|---|---|
| Mill Throughput | t/year | 336,000 |
| Mine Life | Years | 10.9 |
| Pre-Production/Development Period | Years | 2 |
| Panel Mining Rate | t/year | 300,000 |
| Sublevel Development Rate | t/year | 36,000 |
| Total Mining Rate | t/year | 336,000 |
| Development Tonnes to Ore Tonnes Ratio* | w/o | 0.6 |

* waste:ore ratio

The mine design and Mineral Reserve estimate have been completed to a level appropriate for pre-feasibility studies. The Mineral Reserve estimate stated herein is consistent with the CIM Standards on Mineral Resources and Mineral Reserves and is suitable for public reporting. As such, the Mineral Reserves are based on Measured and Indicated Resources, and do not include any Inferred Resources.

A mine design was created in the Maptek Vulcan™ model to define access and mining of the stope shapes defined by the Stope Optimizer module within Vulcan™ software. The defined stope shapes and development excavations were scheduled to produce the basis for this economic analysis. The resulting reserve as classified proven reserves and probable reserves (Table 1-3).

**Table 1-3 Tahuehueto Reserve Estimate Summary from Scheduled Stopes**

| Classification | kTonnes | Ag Grade (gpt) | Cont Ag kOz | Au Grade (gpt) | Cont Au kOz | Cu Grade (%) | Cont Cu klbs | Pb Grade (%) | Cont Pb klbs | Zn Grade (%) | Cont Zn klbs |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Proven Reserves | 2,358 | 51.93 | 3,937 | 2.89 | 219 | 0.27 | 14,246 | 1.18 | 61,429 | 2.07 | 107,515 |
| Probable Reserves | 1,227 | 46.48 | 1,834 | 1.90 | 75 | 0.23 | 6,304 | 0.96 | 25,929 | 1.63 | 44,125 |
| **Total Reserves** | **3,585** | **50.06** | **5,770** | **2.55** | **294** | **0.26** | **20,550** | **1.11** | **87,357** | **1.92** | **151,640** |

1. Mineral Reserves are estimated using metal price forecasts of $0.92/lb for lead, $1.14/lb for zinc, $3.60/lb for copper, $1,647.50/oz for gold and $21.64/oz for silver.
2. Totals may not add due to rounding.
3. The foregoing mineral reserves are based upon and are included within the current mineral resource estimate for the Project.

## 1.5 MINERAL PROCESSING

Based on metallurgical tests performed to date, the previous metallurgical campaigns provide sufficient data to reach a level of confidence that the flotation process chosen will work, flotation targets are attainable, and an economical concentrate can be produced. The proposed processing plant is a conventional crushing/milling/flotation/filtering process designed to process 300,000 tonnes per year in 300 operating days, equivalent to 1,000 tonnes per day through the grinding and flotation circuits producing lead, copper, and zinc concentrates. Concentrate recoveries are shown in Table 1-4 and life of mine metal production is shown in Table 1-5.

**Table 1-4 Tahuehueto Average Metallurgical Recoveries**

| Product | kTonnes | Distribution % (Recoveries) | | | | |
|---|---|---|---|---|---|---|
| | | Au | Ag | Cu | Pb | Zn |
| Head | 3,550 | 100% | 100% | 100% | 100% | 100% |
| Pb Concentrate | 58 | 77.1% | 62.8% | 31.6% | 85.5% | 1.6% |
| Cu Concentrate | 18 | 6.8% | 10.3% | 51.4% | 0.6% | 17.1% |
| Zn Concentrate | 108 | 11.0% | 11.7% | 11.5% | 6.1% | 80.0% |
| Tails | 3,096 | 5.4% | 15.2% | 5.4% | 7.8% | 1.3% |

**Table 1-5 Life of Mine Metal Production**

| LOM Metal Production | Units | Value |
|---|---|---|
| Gold | koz | 279 |
| Silver | koz | 4,880 |
| Lead | tonnes | 33,911 |
| Copper | tonnes | 8,893 |
| Zinc | tonnes | 65,821 |

## 1.6 CAPITAL AND OPERATING COST ESTIMATE

Capital and operating costs used for the Tahuehueto Project were developed from cost build up from first principles engineering along with vendor and contractor quotations. In addition, all available project technical data and metallurgical test work were considered to build up a processing operating cost estimate.

**A project configuration which included the underground mines and a central process facility was developed as the basis for capital cost estimation. Preliminary site infrastructure alternatives (process plant, tails storage facility, and power) were examined as a basis to estimate costs. Generalized arrangements were evaluated to establish a physical basis for the capital costs estimates. Cost accuracy is estimated to be + or - 20%. The estimated capital costs are listed in Table 1-6 and operating costs are listed in**

| Capital Category | Initial Investment up to 02/28/2022 ($M) | Investment Remaining as at 02/28/2022 to Generate Positive Cash Flow ($M)* | Investment to Reach Continuous & Sustainable Production ($M)** | Sustaining Capital Expenditures ($M)*** | Total Capital Costs ($M)**** |
|---|---|---|---|---|---|
| Processing facilities | 10.29 | 1.86 | 0.93 | 0.13 | 13.21 |
| Infrastructure facilities | 2.22 | 2.17 | 0.85 | 0.15 | 5.39 |
| Mine equipment | 4.05 | 0.09 | 0.78 | 0.53 | 5.45 |
| Tailings | 0.06 | 0.83 | 0.38 | 1.50 | 2.77 |
| Mine development | 0.48 | 0.25 | 0.98 | 27.18 | 28.89 |
| Mining rights | - | - | 0.11 | 1.10 | 1.21 |
| **Subtotal** | **17.10** | **5.20** | **4.03** | **30.59** | **56.92** |
| Contingency | - | - | 1.19 | 3.06 | 4.25 |
| **Total CAPEX** | **17.10** | **5.20** | **5.22** | **33.65** | **61.17** |

* From Feb 28, 2022 to positive cash flow date
** From reaching positive cash-flow date to January 2023
*** From Jan 2023 to end of mine life

**** Life of mine capital costs and Pre-Jan 2022 capitalized costs

Table 1-7.

**Table 1-6 Tahuehueto Total Capital Costs**

| Capital Category | Initial Investment up to 02/28/2022 ($M) | Investment Remaining as at 02/28/2022 to Generate Positive Cash Flow ($M)* | Investment to Reach Continuous & Sustainable Production ($M)** | Sustaining Capital Expenditures ($M)*** | Total Capital Costs ($M)**** |
|---|---|---|---|---|---|
| Processing facilities | 10.29 | 1.86 | 0.93 | 0.13 | 13.21 |
| Infrastructure facilities | 2.22 | 2.17 | 0.85 | 0.15 | 5.39 |
| Mine equipment | 4.05 | 0.09 | 0.78 | 0.53 | 5.45 |
| Tailings | 0.06 | 0.83 | 0.38 | 1.50 | 2.77 |
| Mine development | 0.48 | 0.25 | 0.98 | 27.18 | 28.89 |
| Mining rights | - | - | 0.11 | 1.10 | 1.21 |
| **Subtotal** | **17.10** | **5.20** | **4.03** | **30.59** | **56.92** |
| Contingency | - | - | 1.19 | 3.06 | 4.25 |
| **Total CAPEX** | **17.10** | **5.20** | **5.22** | **33.65** | **61.17** |

* From Feb 28, 2022 to positive cash flow date
** From reaching positive cash-flow date to January 2023
*** From Jan 2023 to end of mine life
**** Life of mine capital costs and Pre-Jan 2022 capitalized costs

**Table 1-7 Tahuehueto Operating Costs**

| Operating Costs | Unit | Unit Cost $ |
|---|---|---|
| Development Mining | $/meter | 1,278.1 |
| Ore Mining | $/tonne ore | 35.0 |
| Processing | $/tonne ore | 22.0 |
| General and Administrative | $/tonne ore | 3.0 |
| Life of Mine | $/tonne ore | 69.5 |

## 1.7 ECONOMIC RESULTS

The economic performance of the Tahuehueto Project was evaluated with a cash flow based economic model using project costs and revenues as the financial basis. The revenue factors for the project are dependent on metal prices calculating into the net smelter return. Costs are in constant 2022 US$, no escalation of cost has been assumed. Operating costs are generated based on production physicals (tonnes) and unit rates. The Tahuehueto project is expected to yield an after-tax undiscounted LOM net cash flow of $258.8 million, and an NPV of $161.3 million at a discount rate of 5% per year. The results for the Tahuehueto Project economic analysis are summarized in Table 1-8.

**Table 1-8 Tahuehueto Project Economic Results**

| Economic Metrics | Units | LOM Value |
|---|---|---|
| Total Ore Processed | Tonnes/1,000 | 3,540 |
| Contained Gold Produced | Ounces/1,000 | 279 |
| Contained Silver Produced | Ounces/1,000 | 4,880 |
| Contained Lead Produced | tonnes | 33,911 |
| Contained Copper Produced | tonnes | 8,893 |
| Contained Zinc Produced | tonnes | 65,821 |
| | | |
| Total Net Smelter Return (Pb, Zn, Au, Ag, Cu | $Million | 645.5 |
| Gold Net Revenue | $Million | 392.8 |
| Silver Net Revenue | $Million | 87.5 |
| Lead Net Revenue | $Million | 60.5 |
| Zinc Net Revenue | $Million | 78.4 |
| Copper Net Revenue | $Million | 26.2 |
| | | |
| Pre-tax NPV (5%) * | $M | 234.4 |
| Post-tax NPV (5%) | $M | 161.3 |
| Post-tax IRR ** | % | 65.5% |
| Payback Period | Years | 2.0 |

* 5% discount considered reasonable due to advanced state of Tahuehueto construction where 90% of required capital has been invested in the project, advancing construction past 95% completion, with most capital expenditures completed and therefore capital costs are known with substantially increased accuracy.

** IRR is calculated with approximately $34 million of pre-January 2022 expenses on the project. $19 million of pre-2015 costs of exploration, acquisition and carrying costs have been treated as sunk costs.

## 1.8 CONCLUSIONS

Tahuehueto Project resources provide a suitable basis for a project configuration that would include a contractor-operated 1,000 tpd underground mine that will utilize sub-level stoping with conventional mining equipment in a blast/load/haul operation. Mill feed will be processed in a 1,000 tpd comminution circuit consisting of primary and secondary crushing, grinding in a single or double ball mill configuration followed by three floatation circuits producing lead, copper, and zinc concentrates. The concentrates will be trucked from site for smelting and refining.

A project configuration which includes the underground mine and a central process facility was developed as the basis for capital and operating cost estimation. Generalized infrastructure arrangements were evaluated to establish a physical basis for the capital costs estimates. Capital and operating costs used for the Tahuehueto Project were developed from cost build up from first principles engineering along with vendor and contractor quotations. In addition, all available project technical data and metallurgical test work were considered to build up a processing operating cost estimate. An economic analysis of the potential project performance indicated strong economic potential at current metal prices with economic strength still demonstrated at considerably lower metal prices as outlined in the sensitivity analysis of this technical report.

## 1.9 RECOMENDATIONS

Tahuehueto has invested over $40M in exploration, preliminary feasibility studies and mill construction. Contract miners have already mobilized to the Project. A 1,000 tonne per day processing plant is currently being constructed and is nearing 95% completion. Testing of the Tahuehueto Mill commenced April 5, 2022. Commercial production is expected to commence prior to the end of 2022 at which time Altaley will be selling concentrates to generate cash flow. Smelting contracts are already in place.

Continued exploration is warranted for the Project to investigate the possibility for discovery of new resources and reserves that may justify mill expansions and /or extending the life of mine. Current discovered ore bodies remain open in both direction along strike and to depth. Other yet undrilled veins, such as Texcalama, Delores, Tahuehueto, Tres de Mayo, Carolina are known to be mineralized on surface and justify exploration drilling. Extensions to the El Creston, Cinco de Mayo, El Rey, Perdido-Santiago vein structures, where resources and reserves are identified, require further exploration drilling to identify extensions of mineralization that may enhance future mining operations. The Santiago vein is largely undrilled and warrants a focused underground exploration drilling program between El Perdido and Santiago which are interpreted to be the same vein structure.

Metallurgy programs need to be implemented for the Cinco de Mayo structures. Mineralization at Cinco de Mayo shows slightly different characteristics to the near-term mineralization that is expected to be processed at the Tahuehueto mill. Results from the metallurgical tests would guide meaningful modifications to the processing facilities.

**Table 1-9 Proposed Project Work Program**

| Budget Item | Description | Cost (1,000's) |
|---|---|---|
| Resource Expansion Drilling | Drill Santiago and Perdido Vein Extensions and required underground development for drill access. | $3,250 |
| Geology G&A | Core Logging, Drilling management | $250 |
| Geological Modeling | Update Geology Models based on UG pit mapping | $100 |
| Resource Model Updates | Grade Estimation, Resource and Reserve Updates | $100 |
| Assaying | QA/QC, Shipping, Assay Results | $150 |
| Metallurgy | Metallurgical testing of Cinco de Mayo | $250 |
| **Total** | | **$4,100** |

# 2 INTRODUCTION

The Tahuehueto Project is an advanced exploration stage polymetallic project. The mineralization consists of epithermal Au-Ag veins and brecciated structures with lead, zinc and copper. The Project is located in the State of Durango within the prolific Sierra Madre Mineral Belt which hosts a series of historic and producing mines and most of México´s active exploration and development projects.

Altaley Mining Corporation Inc. owns 100% of the project. The Company had undergone several name changes, since first acquiring the project. Telson Mining Corporation, (until May 2021), Telson Resources Inc. (until March 2018), Soho Resources Corp. (until January 2013) and Consolidated Samarkand Resources Inc. (until October 1999). Throughout this report, Soho Resources Corp. and Consolidated Samarkand Resources Inc., Telson Resources Inc, and Telson Mining Corporation are considered to be the same as and referred to as Altaley Mining Corporation. (“Altaley” or the “Company”).

From 1996 to present day, Altaley and Real de la Bufa, S.A. de C.V., a Mexican subsidiary of Altaley, have conducted surface and underground sampling and mapping, drilled 252 holes totaling 48,260 m into several mineralized bodies, and conducted metallurgical testing, as well as geophysics and other geological studies.

Altaley has elected to advance the project into production without the benefit of full feasibility study and initiated construction of a 1,000 tpd mining operation where construction has advanced to a deemed 90-95% completion such that the first ball Purpose of Technical Report

This report was prepared as a National Instrument 43-101 (NI 43-101) Technical Report for Altaley by RDA. The quality of information, conclusions, and estimates contained herein is consistent with the level of effort involved in RDA’s services, based on: i) information available at the time of preparation, ii) data supplied by outside sources, and iii) the assumptions, conditions, and qualifications set forth in this report. This report is intended for use by Altaley subject to the terms and conditions of its contract with RDA and relevant securities legislation. The contract permits Altaley to file this report as a Technical Report with Canadian securities regulatory authorities pursuant to NI 43-101, Standards of Disclosure for Mineral Projects. Except for the purposes legislated under provincial securities law, any other uses of this report by any third party is at that party’s sole risk. The responsibility for this disclosure remains with Altaley. The user of this document should ensure that this is the most recent Technical Report for the property as it is not valid if a new Technical Report has been issued.

This report provides Mineral Resource and Mineral Reserve estimates and classification of resources in accordance with the Canadian Institute of Mining, Metallurgy and Petroleum Standards on Mineral Resources and Reserves: Definitions and Guidelines, November 29, 2019 (CIM).

## 2.1 DETAILS OF CURRENT PERSONAL INSPECTION

Zeke Blakely conducted the current personal inspection of the Property during the week of March 28 2022. While visiting the property, Mr. Blakely inspected the Tahuehueto Project, the mill construction progress, Underground ore development, as well as the overall project layout.

## 2.2 TERMS OF REFERENCE

The terms of reference were to prepare resource and reserve estimates and a Technical Report as defined in Canadian Securities Administrators' National Instrument 43-101, Standards of Disclosure for Mineral Projects, and in compliance with Form 43-101F1 (Technical Report).

All currency amounts in this report are stated in US dollars (US$), as specified, with commodity prices in US dollars (US$). Quantities are generally stated in SI units, the Canadian and international practice.

### 2.2.1 UNITS OF MEASURE – ABBREVIATIONS

| Units of Measure - Abbreviations | | | |
|---|---|---|---|
| Metric | | Imperial | |
| Unit | Description | Unit | Description |
| % | Percent | % | Percent |
| °C | Degrees Celsius | °F | Degrees Fahrenheit |
| cm | Centimeter (Centimetre) | in | Inch |
| m | Meter (Metre) | ft | Foot (12 Inches) |
| g | Grams | oz | ounce |
| g/t | grams per tonne | g/t | grams per tonne |
| ha | Hectare (10,000 $M_2$) | ac | Acres |
| kg | Kilogram | lb | Pounds |
| km | Kilometer (Kilometre) | mi | Miles |
| KW or kW | Kilowatt | hp | Horsepower |
| mm | Millimeters (Millimetres) | in | Inches |
| opt | Ounces Per Ton | opt | Ounces Per Ton |
| ppm | Parts Per Million | ppm | Parts Per Million |
| SG | Specific Gravity | SG | Specific Gravity |
| µm | Microns | in | Inches |
| $ft^3$ | Cubic Feet | $m^3$ | Cubic Meters (Metres) |
| $in^3$ | Cube Inches | $cm^3$ | Cubic Centimeter (Centimetre) |

### 2.2.2 ACRONYMS AND SYMBOLS

| Acronyms and Symbols | |
|---|---|
| **Term** | **Description** |
| Ag | Silver |
| As | Arsenic |
| Au | Gold |
| Ba | Barium |
| Bi | Bismuth |
| Cd | Cadmium |
| CIM | Canadian Institute of Mining, Metallurgy and Petroleum |
| Co | Cobalt |
| Company | Altaley Resources Inc. |
| Cr | Chromium |
| CRD | Carbonate Replacement Deposit |
| Cu | Copper |
| EMT | Emergency Medical Technician |
| ICP | Inductively Coupled Plasma |
| ID5 | Inverse Distance to the Fifth Power |
| K | Potassium |
| Ma | Million Years |
| MMC | Metal Mining Consultants Inc |
| Mn | Manganese |
| Mo | Molybdenum |
| NAD | North American Datum |
| Ni | Nickle |
| NSR | Net Smelter Return |
| Pb | Lead |
| POO | plan of operations |
| Project | Tahuehueto Project |
| QA | Quality Assurance |
| QA/QC | Quality Assurance/Quality Control |
| QC | Quality Control |
| QP(s) | Qualified Person(s) |
| RC or RVC | Reverse Circulation |
| Rdi | Resource Development Inc |
| RQD | Rock Quality Designation |
| Sr | Strontium |
| tpy | Tons per Year |
| V | Vanadium |
| W | Tungsten |
| Zn | Zinc |
| ZnEq | Zinc Equivalent Grade |

# 3 RELIANCE ON OTHER EXPERTS

RDA has reviewed and analyzed exploration data provided by the Company, its consultants and previous explorers of the area, and has drawn its own conclusions therefrom, augmented by its examination. RDA has relied upon data presented by the Company, and previous operators of the project, in formulating its opinion while exercising all reasonable diligence in checking, confirming and testing it.

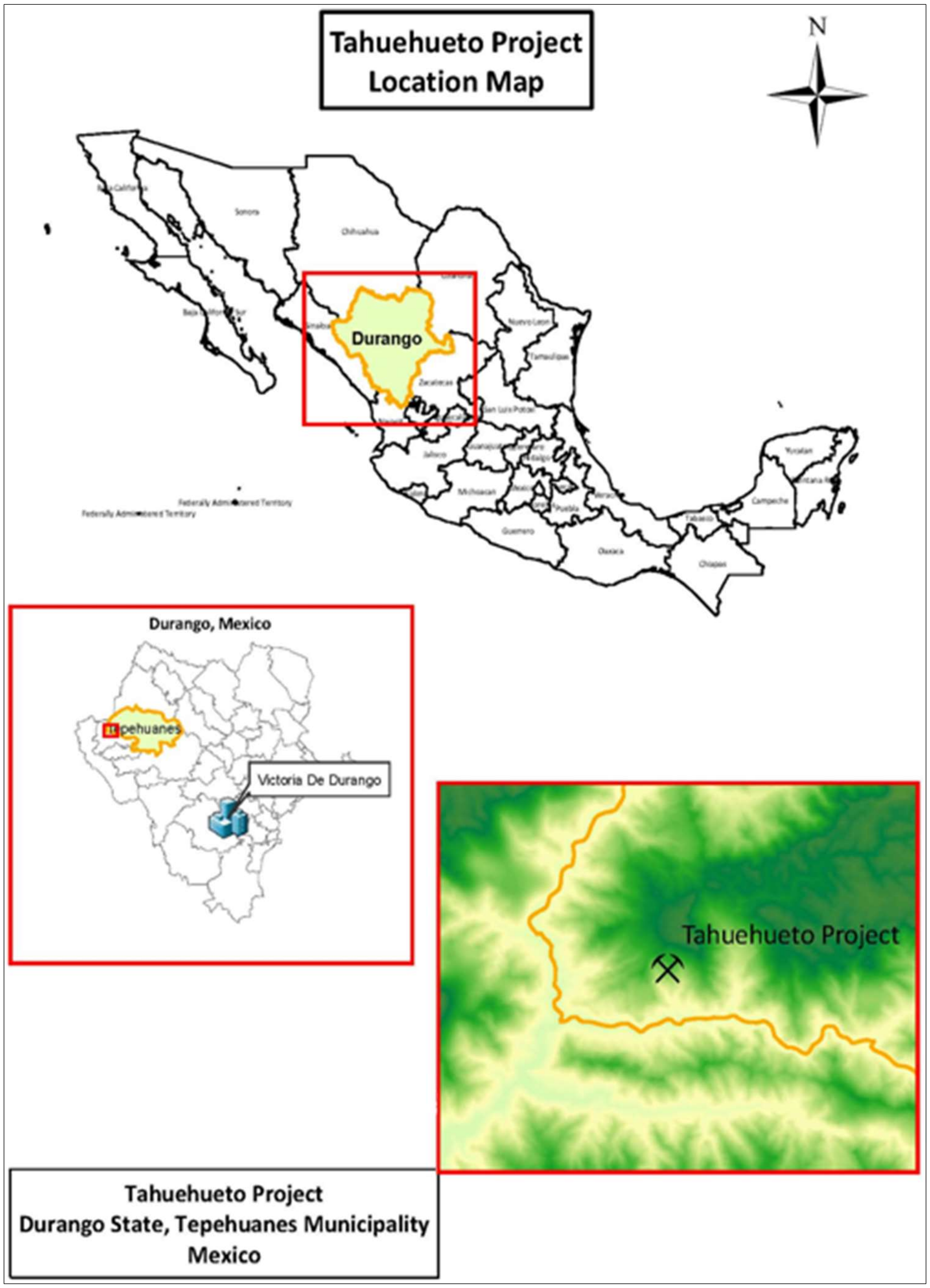
RDA relied on information provided by Altaley, and the Company's legal counsel, as to the legal status of Altaley and related companies, the title of the concessions and agreements comprising the Tahuehueto project, the terms of property agreements, and the existence of applicable royalty obligations, as well as all information concerning environmental issues and permitting. Section 4 in its entirety is based on information provided by Altaley, and the authors offer no professional opinion regarding the provided information.

# 4 PROPERTY DESCRIPTION AND LOCATION

The Tahuehueto Project is located in the northwest portion of the state of Durango (Figure 4-1), about 250 km northwest of Durango, the state capital, and 160 km northeast of the city of Culiacan, Sinaloa. The Project is located about 25 km north of the Topia polymetallic-silver mine, 40 km northwest of the La Cienega gold, silver, base metal mine, 85 km southwest of the Guanacevi silver district, 280 km southeast of the Palmarejo silver and gold mine, and 150 km northwest of the San Dimas mining district, most notable for the Tayoltita silver and gold mine.

The project is approximately centered on UTM coordinates (WGS 84 Zone 13 for México) 337366 m E and 2812659 m N (106°37’1 longitude west and 25°25’19 latitude north).

**Figure 4-1 Location of the Tahuehueto Project**



## 4.1 LAND TENURE

The Tahuehueto property consists of 28 mining concessions that total 7,492.7889 ha. The concessions are shown in Figure 4-2 and listed in Table 4.1. The concessions are located in five non continuous blocks, shown in Figure 4-2. Some of them are subject to royalties of 1.6% of the NSR.

**Figure 4-2 Tahuehueto Project Property Map**

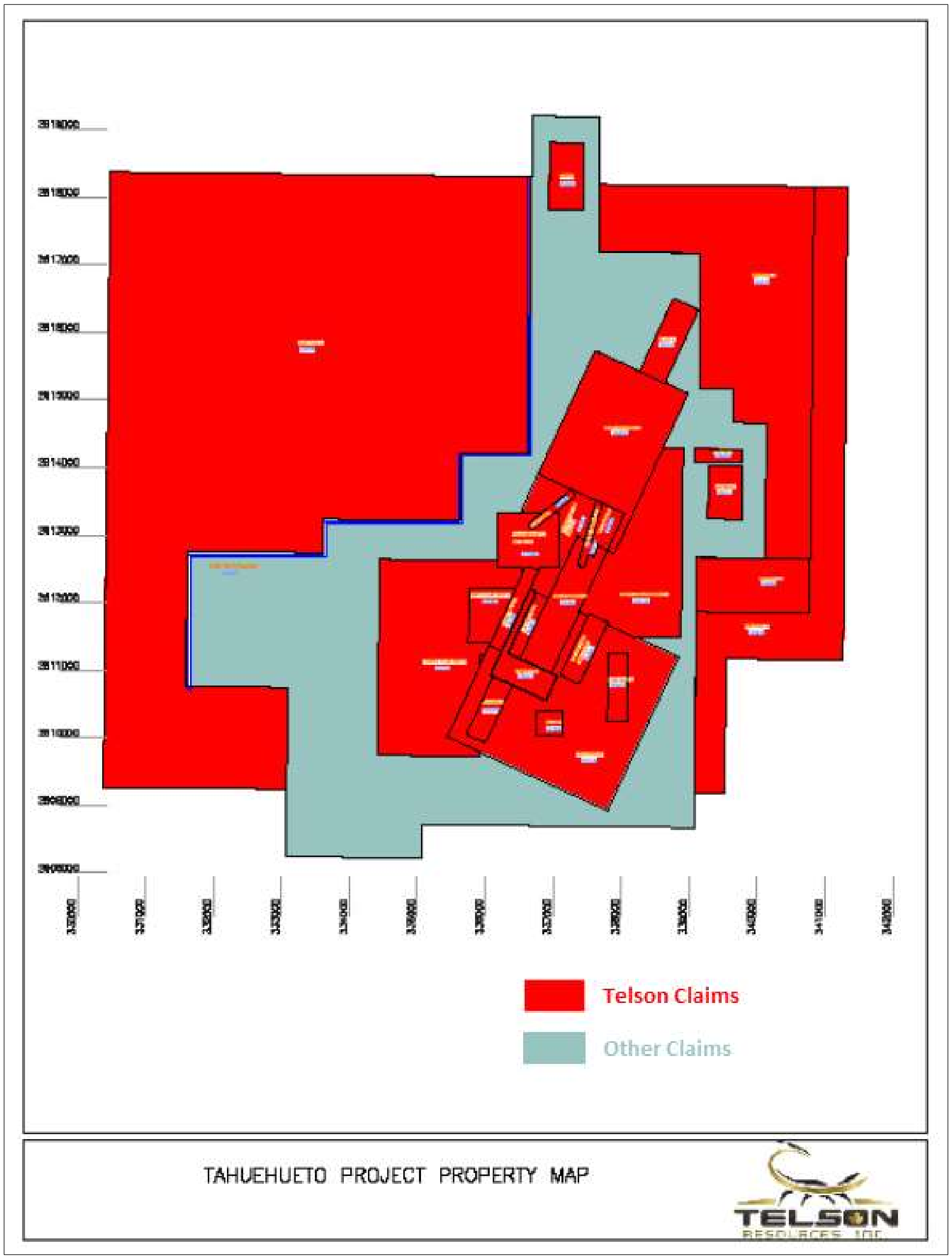


**Table 4-1 Tahuehueto Mining Concessions**

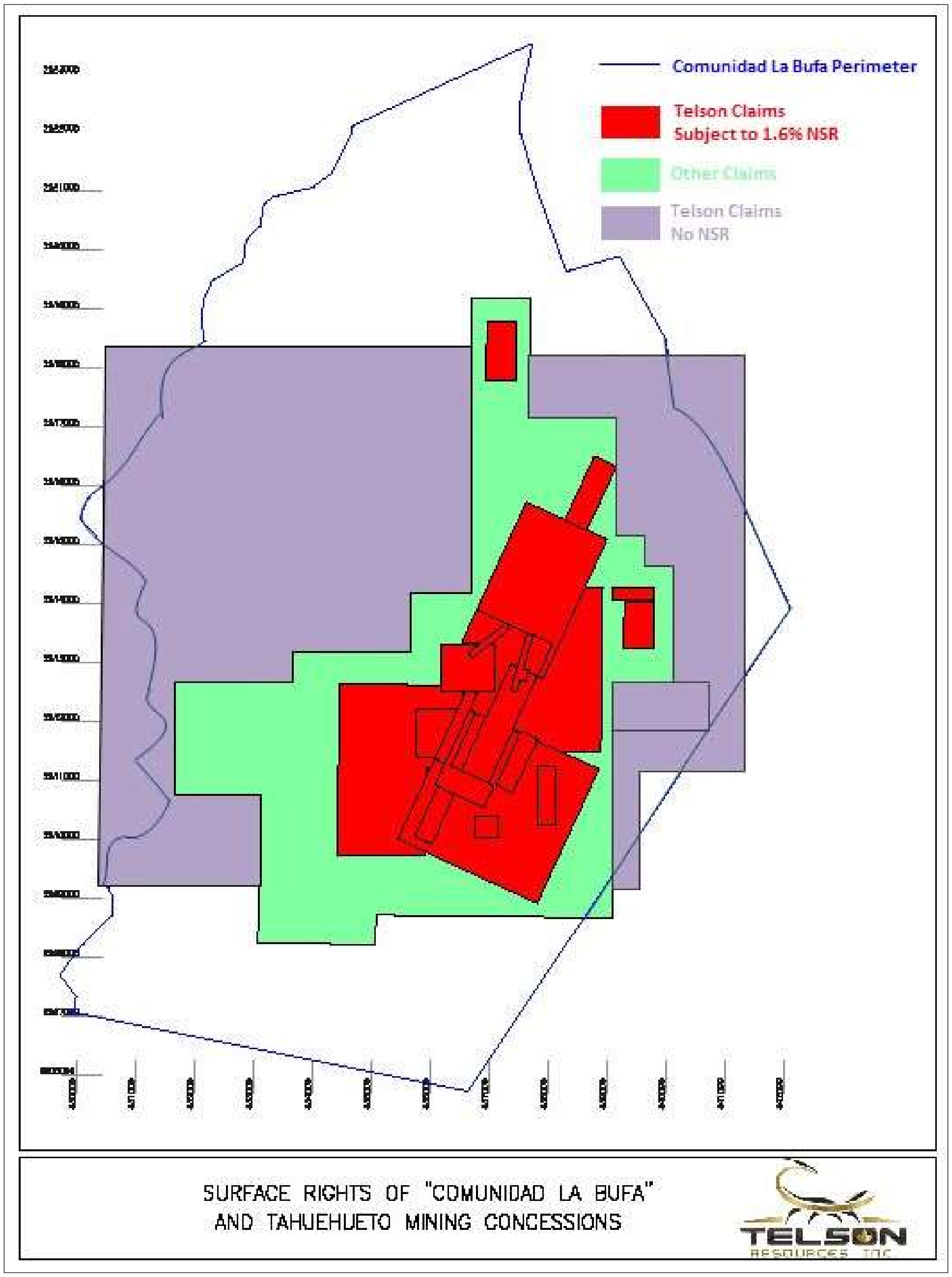
| Tahuehueto Project-Mining Concessions | | | | | | |
|---|---|---|---|---|---|---|
| **Registered Owner** | **Mining Concession** | **Title** | **Granted** | **Expires** | **Hectares** | **Subject to Royalty 1.6%** |
| Real | Dolores | 153893 | 9/Jan/1971 | 8/Jan/2021 | 8.0000 | No |
| Real | Colorado | 160128 | 24/Jun/1974 | 23/Jun/2024 | 410.6622 | No |
| Real | Tahuehueto El Alto | 221990 | 27/Apr/2004 | 26/Apr/2054 | 68.5657 | No |
| Real | Ampl Cinco De Mayo | 221991 | 27/Apr/2004 | 26/Apr/2054 | 40.2384 | No |
| Real | El Tres De Mayo | 150452 | 26/Oct/1968 | 25/Oct/2018 | 30.0000 | Yes |
| Real | Puerta De Oro Ii | 151972 | 12/Nov/1969 | 11/Nov/2019 | 71.0475 | Yes |
| Real | 5 De Mayo | 152274 | 20/Feb/1970 | 19/Feb/2020 | 25.8836 | Yes |
| Real | Eugenia | 152275 | 20/Feb/1970 | 19/Feb/2020 | 28.2288 | Yes |
| Real | Guadalupe De Los Fresnos | 152608 | 18/Mar/1970 | 17/Mar/2020 | 20.0000 | Yes |
| Real | Sacramento | 152634 | 18/Mar/1970 | 17/Mar/2020 | 94.3443 | Yes |
| Real | Maria | 152636 | 18/Mar/1970 | 17/Mar/2020 | 50.0000 | Yes |
| Real | Sacramento | 152716 | 18/Mar/1970 | 17/Mar/2020 | 12.0000 | Yes |
| Real | Libertad | 153872 | 9/Jan/1971 | 8/Jan/2021 | 46.0000 | Yes |
| Real | La Gloria | 153975 | 18/Jan/1971 | 17/Jan/2021 | 20.0000 | Yes |
| Real | Montecristo | 154675 | 12/May/1971 | 11/May/2021 | 305.9668 | Yes |
| Real | La Reyna Del Oro | 155213 | 10/Aug/1971 | 9/Aug/2021 | 30.0000 | Yes |
| Real | Estela | 156835 | 28/Apr/1972 | 27/Apr/2022 | 14.0000 | Yes |
| Real | Yolanda | 158064 | 17/Jan/1973 | 16/Jan/2023 | 18.6311 | Yes |
| Real | Imperio | 158112 | 19/Jan/1973 | 18/Jan/2023 | 40.0000 | Yes |
| Real | Eloy Ii | 160706 | 15/Oct/1974 | 14/Oct/2024 | 47.6740 | Yes |
| Real | El 201 | 221992 | 27/Apr/2004 | 26/Apr/2054 | 14.4114 | Yes |
| Real | Ampl Sacramento | 222123 | 21/May/2004 | 20/May/2054 | 254.6345 | Yes |
| Real | Ii Ampl 5 De Mayo | 222124 | 21/May/2004 | 20/May/2054 | 411.8868 | Yes |
| Real | El Espinal 3 | 228156 | 6/Oct/2006 | 5/Oct/2056 | 836.8595 | No |
| Real | Vueltas 4 | 229396 | 17/Apr/2007 | 16/Apr/2057 | 3863.8992 | No |
| Real | Vueltas 5 (Terrain Correction) | 229397 | 17/Apr/2007 | 16/Apr/2057 | 53.7438 | No |
| Real | El Espinal 5 | 229398 | 17/Apr/2007 | 16/Apr/2057 | 132.3710 | No |
| Real | El Espinal 4 | 229438 | 19/Apr/2007 | 16/Apr/2057 | 543.7403 | No |
| **Total Hectares** | | | | | 7,492.7889 | |

All 28 mining concessions are owned by Real de la Bufa S.A. de C.V. (“Real”), a Mexican subsidiary of the Company, and at present, all taxes owing to the Bureau of Mines of México are paid.

On April 26th, 2016 Real de la Bufa renewed and extended a temporary land use agreement (the “Agreement”) with the Comunidad La Bufa (hereinafter “Comunidad”), holders of certain surface rights at Tahuehueto. The renewed Agreement allows the Company to explore, develop and produce minerals within an area of 2,062 ha over a period of 30 years beginning on the date of the Agreement and may be extended upon request by Real. This 30-year Agreement is obligatory to Comunidad, not for Real. Real will pay to Comunidad a fee of US $46,540.00 or the equivalent amount in Mexican Pesos for each 365-day period as compensation for the temporary land use for mining exploration and exploitation. Payments will be due yearly on the anniversary date of the Agreement and will be subject to annual increase of 5% on the value of the preceding year’s payment.

The Surface Rights Agreement allows Real unrestricted access to explore, develop and mine metals within the area covered under the agreement and other areas are open to negotiate any agreement for further exploration as shown in Figure 4-3. The Agreement, applies to the internal 23 concessions. The 23 internal concessions are those subject to the 1.6% NSR as listed in Table 4.1.

**Figure 4-3 Surface Rights of the Comunidad La Bufa and the Tahuehueto Mining Claims**



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

## 5.1 ACCESS

Access to the Project by land is by paved Mexican Highway 45 from the city of Durango 53 km to the turnoff to Santiago Papasquiaro, then west on paved Mexican Highway 23 for 122 km through Santiago Papasquiaro and on to Tepehuanes. From Tepehuanes, an unnumbered paved road runs west through El Tarahumar.

The pavement ends approximately 65 km after Tepehuanes, and access is then by 120 km of unimproved dirt road to the project. The approximately 175 km trip by road from Tepehuanes to Tahuehueto takes about 5 to 6 hours of driving.

There is also access via fixed-wing aircraft from either Culiacan or Durango. A serviceable gravel airstrip is located 20 km by road north of Tahuehueto at El Purgatorio. This airstrip is maintained by Altaley and is suitable for single-engine aircraft.

Narrow gravel roads in steep terrain provide access to various locations within the project limits.

## 5.2 CLIMATE

The climate of the region is moderate. Available climate data shows a warm-hot season from June through October, with 55 to 113 cm of precipitation possible; it is relatively dry from February to May. Annual precipitation ranges between 80 to 140 cm. Freezing temperatures were not recorded in the region between 1961 and 1990, although occasional snow has been reported (CONSEJO DE RECURSOS MINERALES, 1983a). Soho estimates that winter temperatures range from 5˚ to 24˚C, with summer temperatures in the range of 25˚ to 42˚C (Knight Piesold, 2005).

## 5.3 LOCAL RESOURCES AND INFRASTUCTURE

The nearest sizeable community to the project area is Tepehuanes, which is located approximately 175 km by road east of the property and has a population of approximately 15,000. A 34.5 kv power line and telephone service extends as far as Tepehuanes; diesel generators presently supply power to the project site.

Topia, also serviced with a power grid is located about 25 km southeast of the Project by air, is the nearest community of any size, with a population of about 1,200.

Altaley first obtained water for the project from an underground adit above the camp; water is available from levels 16 and 14 of the El Creston underground workings, from all four levels of the El Rey underground workings and also from an artesian well recovered from one of Altaley exploration drill holes. During exploration drilling, water has been pumped up to the project site from the Rio las Vueltas, which flows some 800 m year-round below the camp. Water to supply mining operation will be sourced from flooded underground exploration adits in the Tres de Mayo area and pumped to the mill site.

## 5.4 PHYSIOGRAPHY

The Tahuehueto project is on the western side of the Sierra Madre Occidental, a mountain range that forms the central spine of northern Mexico and is largely composed of Tertiary volcanic rocks. Tahuehueto is in a sub-province called Barrancas, which means ravines in Spanish and accurately describes the project area.

The terrain at the Project is very steep to precipitous in places. Elevations range from about 600 m in river valleys in the southern part of the property to over 2,500 m on high-level plateaus in the northern part of the property. El Creston, the most important of the mineralized zones identified to date, is located along a northeast-trending ridge that spans an elevation range of 1,400 to 1,800 m. Aerial views of the areas are shown in Figures 5-1 – 5-3.

In the treeless barrancas, scrub alpine bushes and cacti with minor underbrush make up the vegetation. Thicker underbrush, similar to willow, occurs in creek bottoms, while Ponderosa pine trees grow on the high plateaus.

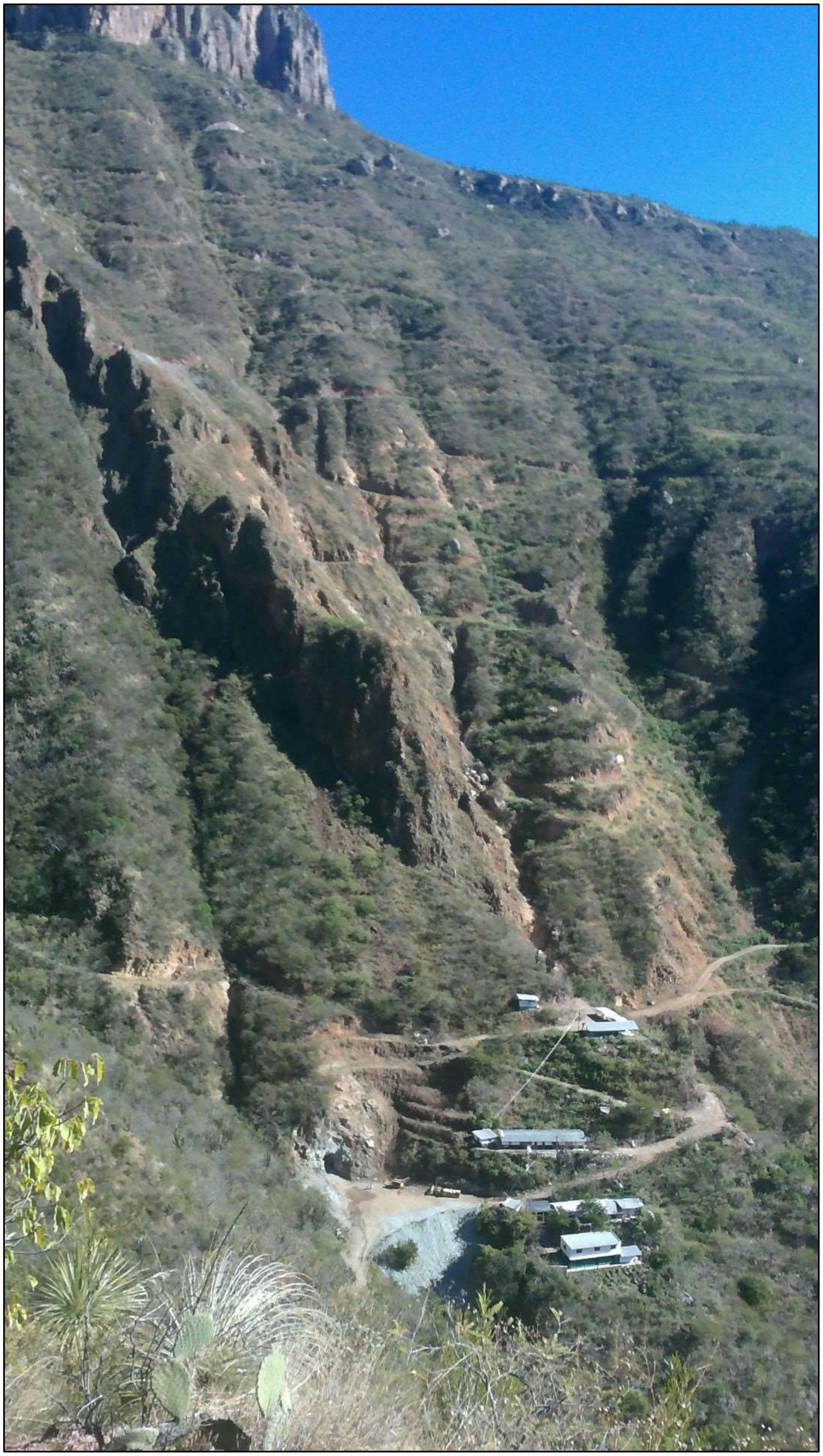
The region is drained by the Rio las Vueltas, which flows continuously all year from east to west and is located south of the camp at an elevation of 600 to 625 m. There is one major drainage basin in the Tahuehueto project area that feeds the Rio las Vueltas. Most streams in the area are seasonal.

The Project is in a relatively quiet seismic area that has seen no major earthquakes within about 400 km, based on the National Geophysical Center/NOAA's Significant Earthquake Database that contains information on destructive earthquakes from 2150 BC to the present.

**Figure 5-1 Aerial View of the Tahuehueto Project**

**Figure 5-2 View of the El Creston/El Perdido Area**

**Figure 5-3 View of the El Creston/El Perdido Area**



# 6 HISTORY

Historic exploration has been focused along a series of exposed veins, silicified zones and color anomalies that are common within the Tahuehueto project area. The information in this subsection is taken from Brown (1998b, 2004) unless otherwise referenced. Gold and silver vein mineralization was discovered in the Tahuehueto area in the nineteenth century by Spanish explorers. The veins were examined and found to contain good gold and silver values hosted in sulfides, which at that time could not be processed.

The first recorded exploration was in 1904 (Cavey, 1994) when an English company began development on the Veta 20-93 (El Creston) at the Sacramento de la Plata mine. The actual starting date of the limited production is not recorded.

Companía Minera Sacramento de la Plata, a predecessor company of Real de la Bufa, was founded in 1966 and developed over 700 m of underground workings on the El Rey and El Creston structures in 1971. A 50 tpd plant was constructed to process the mined material and was operated in the 1970s. Concentrates from the mill were flown to Santiago Papasquiaro and then driven to the smelter at Torréon. Total production from Tahuehueto appears to have been limited. ASARCO sampled El Creston and other veins in the region. Tadmex, S.A. de C.V. developed Level 16 of the El Creston vein (Pedroza Cano, 1991). RDA has no detailed information on these programs.

A company called Emijamex, S.A. de C.V. ("Emijamex") conducted geochemical and rock sampling, detailed geological investigations, drifting, and crosscutting at the Sacramento de la Plata mine from 1975 through 1977 (Kamono, 1978), including Levels 11, 12, 13 and 14 (Pedroza Cano, 1991). They also submitted an auriferous lead/zinc sample for metallurgical study that is described in Section 16 (Rios et al., 1977a, 1977b).

The Consejo de Recursos Minerales, a Mexican government geological organization that is currently called the Servicio Geológico Mexicano or "SGM", drilled 28 surface and underground holes that tested the El Creston and Cinco de Mayo structures in the early 1980s. This appears to have been the only drilling done on the project prior to that of Soho, but no data from the Consejo de Recursos Minerales program are available. The Consejo de Recursos Minerales also conducted an induced polarization ("IP") study over an area of about 3 by 0.4 km that included the El Creston, Cinco de Mayo, and Texcalama zones. The lines were 300m long and spaced 50m apart, and measurements were recorded every 20m at El Creston and 25m at Texcalama and Cinco de Mayo. The IP study identified anomalies that correspond to the continuation of the known structures (Consejo de Recursos Minerales, 1983b).

Castle Minerals Inc. of Vancouver ("Castle"; subsequently changed to Castle Rock Exploration Corp.) optioned Tahuehueto from Sacramento in 1994. At that point, the property consisted of 17 concessions totaling 1,261 ha. Cavey (1994) stated that Castle's intention was to undertake a surface and underground exploration program to verify historic reserve estimates and to evaluate the potential for the existence of a much larger, lower grade open pit minable deposit.

Prior to the time that Castle acquired the property there were at least 15 documented mineralized zones. Many of these have since been determined to be parts of larger structures. The El Creston vein structure had been exposed in 10 horizontal levels, with 2.000m of total development in adits, drifts and crosscuts (Cavey, 1997) over a vertical distance of approximately 490m. The Cinco de Mayo vein system had been explored by 3 adits, one of which was inaccessible in 1997, if not so in 1994. The Texcalama structure had been explored by at least five separate single level adits along as much as 300m of exposure.

The report by Cavey (1997) presented a geological appraisal of the Tahuehueto project, describes the work completed by OREQUEST Consultants in 1994 for Castle, and made recommendations for further work.

Castle collected 459 rock samples, including 247 from the El Creston structure, 21 from the Cinco de Mayo structure, and 191 from other sites on the property. The samples included both surface chip samples and underground chip-channel samples.

At El Creston seven of the ten crosscuts examined were mapped and sampled in 1994 (Cavey, 1997) to determine the width of the vein and the general dimensions of the stockwork beyond the walls of the vein. Historic mining of the El Creston structure was over 3.0-6.0m widths, primarily within the zone of the most obvious sulfide mineralization, but the breccia/stockwork zone is locally up to 50m wide (Cavey, 1997). The best exposure of the mineralized vein system in 1994 was from level 11. The entire 39m of the vein exposure sampled averaged 5.50 g/t Au, 34.03 g/t Ag, 2.3% Zn and 0.92% Cu over an average width of 1.19m. Several of the samples were encouraging as they contained vein material as well as footwall and hanging wall material; these samples averaged 1.30 g/t Au, 5.0 g/t Ag, 0.7% Zn and 0.33% Pb over a true width of 13m.

Brown (2004) stated that the sampling by Castle in 1994 appeared to indicate that the El Creston vein is not continuous in the eight levels sampled as would be expected in a vein structure containing massive sulfides. Cavey (1997) did mention the presence of post-mineral faults within the El Creston structure creating up to 20m of offsets along the mineralization.

Sampling on the Cinco de Mayo structure by Castle in 1994 showed an average grade of 4.91g Au/t over an average width of 1.5m along 138m of the vein exposed in the underground workings; samples were taken approximately every 15-20 m (Cavey, 1997). One footwall sample returned a value of 9.73 g/t Au over 5.0m, and hanging wall samples returned gold values of 6.96 g/t over 1.5m, 0.74 g/t over 1.1m, 2.06 g/t over 5.0m, 0.56 g/t over 5.0m and 2.86 g/t over 5.0m. Several of the vein samples combined with either hanging wall or footwall samples resulted in nearly continuous chip samples that produced values of 4.78g Au/t over 11.3m, 1.63g Au/t over 6.3m, and 1.57g Au/t over 12.0m.

Cavey (1997) concluded that "*the 1994 sampling was unable to reproduce the grades obtained by others in the resource calculations done on the El Creston structure*" but that "*the 1994 Castle sampling confirmed the grades previously obtained in the Cinco de Mayo area.*"

Castle dropped their option within two years without having drilled any holes. Brown (1998b) reports that 5,900m of underground development and exploration workings at El Creston, Cinco de Mayo, and El Rey had been completed by previous operators, among whom he identified Asarco, Peñoles, Consejo de Recursos Minerales, and DOWA Mining Company.

# 7 GEOLOGICAL SETTING

## 7.1 REGIONAL GEOLOGY

The Tahuehueto project lies near the western edge of the Sierra Madre Occidental, a 1,200 km long north-northwest-trending volcanic plateau that is 200 to 300 km in width. This mountainous plateau separates the southward extension of the Basin and Range Province of the southwestern United States into two parts; Sedlock et al. (1993) suggested calling these two areas of extension the eastern and western Mexican Basin and Range provinces. Tahuehueto is near the boundary between the Sierra Madre Occidental and western Mexican Basin and Range Province.

Basement rocks in the Sierra Madre Occidental are obscured by Cenozoic volcanic flows, tuffs, and related intrusions, but are inferred to include Proterozoic basement rocks, overlying Paleozoic shelf and eugeosynclinal sedimentary rocks, possibly scattered Triassic-Jurassic clastic rocks, and Mesozoic intrusions (Sedlock et al., 1993; Salas, 1991). These basement rocks are not exposed in the project area (Figure 7-1).

Cenozoic magmatic rocks in northern Mexico, including the Sierra Madre Occidental, are generally thought to reflect subduction-related continental arc magmatism that slowly migrated eastward during the early Tertiary and then retreated westward more quickly, reaching the western margin of the continent by the end of the Oligocene (Sedlock et al., 1993).

The eastward migration is represented in the Sierra Madre Occidental by the Late Cretaceous- Paleocene "lower volcanic series", or Nacozari Group, of calc-alkaline composition. Over 2,000m of predominantly andesitic volcanic rocks, with some inter-layered ash flows and associated intrusions, comprise the lower volcanic series.

There was a period of approximately 10 million years between eruption of the lower volcanic series and the onset of the next phase of felsic volcanism, referred to as the upper volcanic series. A number of stocks intrude andesites of the lower volcanic series. These stocks are generally of granodiorite composition and are believed to be a late phase of the Sinaloa batholith (Henry et al., 2003). At Topia, it is during the hiatus in volcanism that the lower series was faulted, tilted, deeply dissected, and then intruded by the granodiorite stocks, and a northeast-trending set of faults was mineralized as Ag-Zn-Pb-Au-Cu rich fissure veins (Loucks et al, 1988).

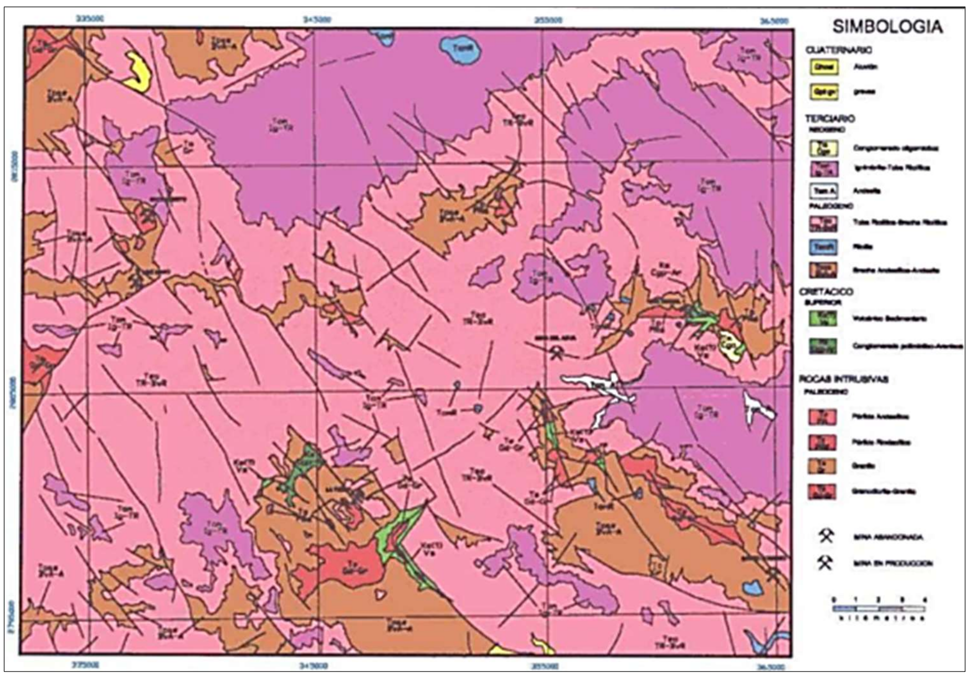
A similar scenario is envisioned at Tahuehueto. K-Ar dating at Topia of igneous rocks and mineralization yield an age of 46.1 Ma for one of the granodiorite stocks, ages between 43.5 Ma and 44.0 Ma for the hydrothermal system, and 37.9 Ma for the lowermost rhyolite welded tuff of the upper volcanic series (Loucks et al, 1988).

Rhyolitic ignimbrites and flows, with subordinate andesite, dacite, and basalt, formed during Eocene and Oligocene caldera eruptions. These volcanic rocks form a 1 km-thick unit that unconformably overlies the lower volcanic series andesitic rocks and constitutes the "upper volcanic super group" of the Sierra Madre Occidental (Sedlock et al., 1993), also commonly referred to as the upper volcanic series or Yecora Group.

The upper volcanic series ignimbrites are moderately west dipping in the Tahuehueto region. Loucks et al. (1988) report that the ignimbrites are warped into a broad north-south anticline. Tahuehueto lies in the western limb of this large regional structure. As the magmatic arc retreated to the western edge of the continent, becoming inactive by the end of middle Miocene time, late Oligocene to Miocene (24 to 17 Ma) basaltic andesites were erupted in a back-arc basin in the Sierra Madre Occidental. These basaltic andesites may have been deposited in a sub-aqueous environment.

Still younger alkalic basalts related to Basin and Range extension are found in and east of the range; these youngest basalts are present just north of the city of Durango. Although there appears to have been little late Cenozoic extension in the Sierra Madre Occidental itself, extensional Basin and Range-type structures and ranges formed to the east and west.

**Figure 7-1 Regional Geological Setting of Tahuehueto Project**




## 7.2 PROPERTY GEOLOGY

The property contains four main rock types: lower volcanic series andesite, granodiorite stocks, polymictic conglomerate, and felsic ash-flow tuffs of the upper volcanic series. The majority of the project area is underlain by andesite flows, tuffs, and volcaniclastic rocks of the lower volcanic series. A geologic map and stratigraphic column and geologic map of the Tahuehueto area are shown in Figure 7-2 and Figure 7-3, respectively.

The lower volcanic series remains generally undifferentiated. A volcaniclastic unit distinct from the andesite flows exists in the Texcalama and Cinco de Mayo areas and an andesite lithic lapilli tuff exists in the footwall of the El Creston structural zone. Granodioritic stocks intrude the andesites and are exposed at surface in the footwall of the El Creston structural zone and the El Rey mine area.

The andesites and granodiorite are overlain by a basal polymictic conglomerate unit that is tens of meters thick and marks the unconformity between the lower and upper volcanic series. Amygdaloidal basalt flows occur locally within the conglomerate unit. In some areas, thin units of ignimbrite were deposited before the conglomerate. Late Tertiary or Quaternary landslides obscure outcrop patterns in the El Creston-El Perdido area and are likely to be present in other areas of steep topography within the project area.

A series of northeast-striking veins that formed within a series of normal faults with subordinate left-lateral displacement hosts the Mineral Resources described in Section 14. The principal, through going veins have a general strike of 045° to 060° and dip between 65° and 80° to the southeast. This vein set includes Cinco de Mayo, El Catorce, and El Perdido and extends northeastward to Santiago. Other veins with the same orientation include El Rey, Dolores, Tahuehueto, Texcalama, El Espinal, and Tres de Mayo. Within the core area of the Mineral Resources, the El Creston series of veins, striking about 035° and dipping 60° to 80° east, formed in a strongly dilatant zone between the through-going El Perdido and El Rey structures.

**Figure 7-2 Geology of the Tahuehueto Project Area**

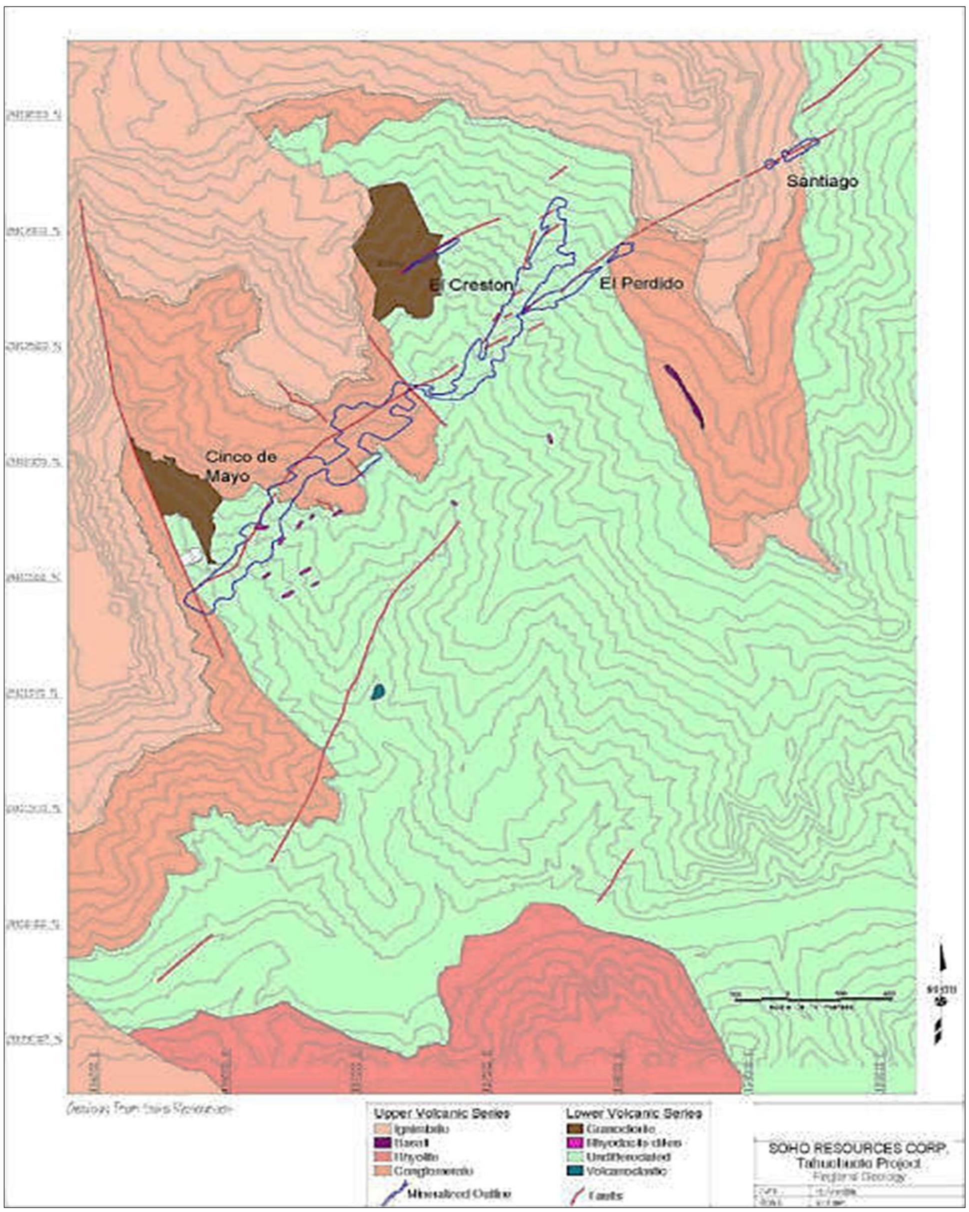
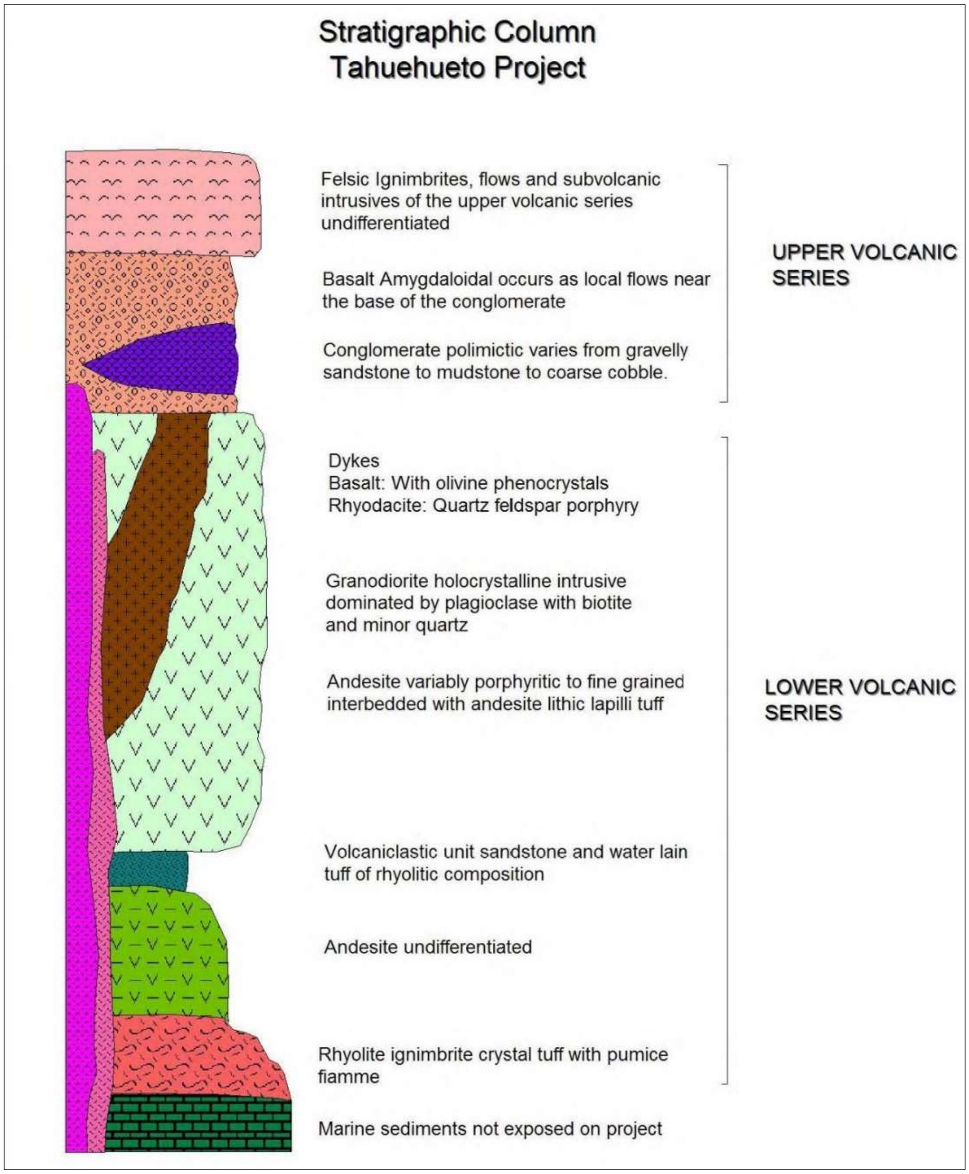


**Figure 7-3 Stratigraphic Column of the Tahuehueto Project**



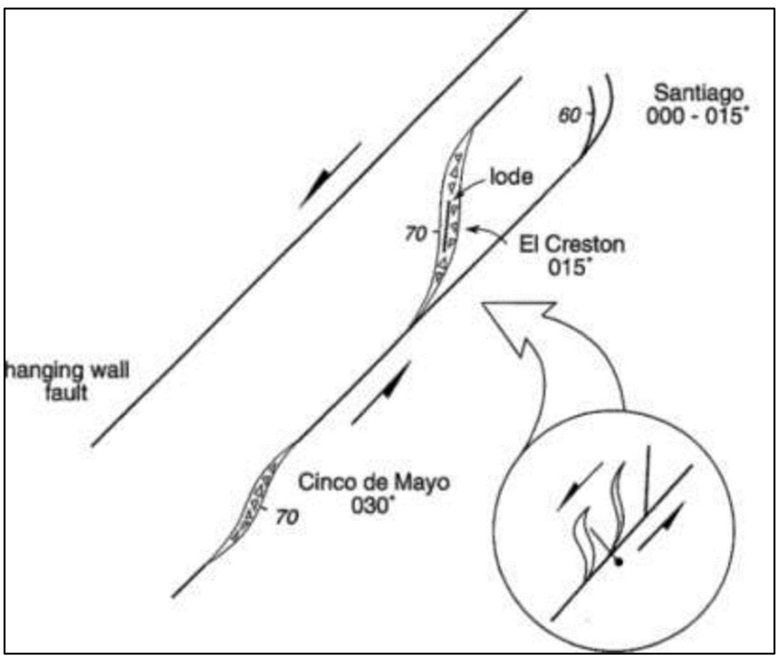
# 8 DEPOSIT TYPE

## 8.1 GEOLOGICAL MODEL

Mineralization at Tahuehueto is classified as intrusion related epithermal low sulfidation polymetallic Ag-Au style (Corbett, 2007), with Au and Ag accompanied by Cu, Pb, and Zn mineralization. These types of deposits are interpreted to have been derived from porphyry intrusion source rocks at depth.

A northeast-striking corridor of steep east dipping fractures and normal faults, traced for about 3 km from Cinco de Mayo in the south to Santiago in the north, represents the main control to mineralization at Tahuehueto. North-northeast trending subsidiary structures, such as at El Creston, are less continuous and commonly display more open vein textures typical of a dilational setting. Figure 8-1 schematically represents the interpreted structural elements present at Tahuehueto that localize mineralization at Cinco de Mayo, El Creston and at Santiago. In many vein systems much of the mineralization is confined to structural shoots that are commonly developed within dilational structures (Corbett, 2007).

**Figure 8-1 Structural Elements Present at Tahuehueto**




Mineralization at Tahuehueto is strongly telescoped, with early high temperature mineralization and alteration overprinted by intermediate temperature and then by younger epithermal mineralization and alteration assemblages. The multiple mineralizing events obscure vertical zonation patterns that are commonly found in other epithermal vein deposits.

Mineralized zones are characterized by pervasive silicification, quartz-filled expansion breccias, and sheeted veins. Multiple phases of mineralization produced several phases of silica, ranging from chalcedony to comb quartz (Corbett, 2007). The surface expression of known mineralization occurs over a vertical distance of at least 850m between Cinco de Mayo and Santiago. The El Creston mineralized zone has been developed by 10 levels over 490m vertical distance.

Cinco de Mayo occurs at the deepest crustal level, where alteration and breccias (below) are indicative of buried porphyry. The Santiago area occurs at the highest elevation where crystalline and chalcedonic quartz veins are consistent with the pronounced overprinting relationships recognized elsewhere on the property, and hypogene hematite in the chalcedony vein is indicative of lower temperature epithermal mineralization (Corbett, 2007).

## 8.2 MINERALIZATION

Mineralization at Tahuehueto occurs as polymetallic epithermal veins with multiple mineralizing events overprinted on one another in the same vein structure. The primary host rock is andesite of the lower volcanic series, but in at least one case, the hydrothermal system penetrated felsic ignimbrite of the upper volcanic series. Styles of mineralization identified by Corbett (2007) include:

- Initial pervasive propylitic-potassic alteration with local specular hematite develops as intrusion-related alteration.
- Early chalcopyrite-pyrite mineralization, locally with quartz-barite typically forms early and at deeper crustal levels in polymetallic Ag-Au vein systems.
- Polymetallic Ag-Au mineralization comprising pyrite-galena-sphalerite ± chalcopyrite ± chalcopyrite ±Ag sulfosalts ± barite represents the volumetrically most apparent mineralization and displays pronounced vertical variation discerned as changes in the sphalerite color from dark brown Fe-rich high temperature sphalerite formed early and at depth to red, yellow and less commonly white sphalerite as the Fe-poor low temperature end member that typically develops at higher crustal levels and as a later stage. Much of this mineralization occurs as sulfide lodes or as breccia infill. Bulk lower grade mineralization occurs as fine-grained Au and Ag sulfosalts deposited within base metal sulfides as part of the main polymetallic mineralization, rising to higher grade Ag with increased base metal contents. These events evolve to mineralization with a more epithermal character and locally higher Au-Ag grades at later stages where base metal sulfides are overprinted by Ag-rich tetrahedrite (freibergite).
- Highest Ag-Au grades locally occur in the absence of Cu-Pb-Zn in ores described as the epithermal end member of polymetallic Ag-Au mineralization which is strongly structurally controlled. High grade Ag may occur as freibergite with celadonite in combination with white sphalerite and dark chlorite commonly with later stage opalchalcedony. Semi-massive to banded chlorite locally occurs with celadonite-pyrite-opal and displays elevated Au with significantly lower Ag: Au ratios. Hypogene hematite occurs with banded quartz as an epithermal assemblage which accounts for elevated Au grades overprinting earlier sulfide-rich mineralization.

Overprinting of the lower-temperature, higher-level mineral assemblage onto the higher temperature, deeper-level mineral assemblage is referred to as telescoping. This telescoping may represent the progressive cooling of the hydrothermal system, although in some instances tectonic un-roofing of the cover rocks may also result in a decrease in overburden and progressive deposition of higher crustal level, lower temperature mineral assemblages. Increasing gold and silver grades in the later higher crustal level assemblages without significant base metals is an important element of this telescoping (Corbett, 2007).

Breccias are an integral part of the Tahuehueto hydrothermal system and display several genetic styles. Corbett (2007) notes that many of the sulfide-mineralized zones display sulfide transport textures; typical of fluidized breccias. Milled breccias are those in which the clasts have undergone significant working while being transported from deeper to elevated crustal settings. These breccias typically contain rounded clasts in a matrix of milled rock flour which has undergone hydrothermal alteration. Expansion breccias, in which the fragments have been moved apart and filled in with carbonate or quartz in a jigsaw pattern, are typical in dilational structural settings. Magmatic hydrothermal breccias typically occur in near porphyry environments and contain clasts of porphyry intrusions and alteration in a milled matrix. Shingle breccias with elongate, parallel shingle-like fragments, are thought to have been formed by collapse following the explosive escape of volatiles from an underlying magma chamber. Figures 8-2 through 8-6 present examples of these breccias.

The uppermost portions of the mineralized structures are oxidized. In the oxide zone, mineralization consists of malachite, azurite, chalcocite, covellite, limonite, and hematite. Malachite overprints tetrahedrite, and chalcocite and covellite form coatings on sphalerite. The depth of the oxide-sulfide interface varies considerably, but is generally less than 100m.

Sulfide mineralization lies below the oxidized zone and consists of sphalerite, galena, chalcopyrite, tennantite, tetrahedrite, and probably electrum. Gangue minerals are quartz, pyrite, chlorite, sericite, and calcite. Locally a light green phyllosilicate mineral interpreted to be celadonite (Loucks, et al 1988) forms as gangue and is closely associated with high-grade gold and silver mineralization.

Corbett (2007) observed supergene enrichment in both mine workings and in drill hole DDH07- 081 from the upper part of the El Creston zone. The oxide-sulfide interface occurs at about 37m in depth in that hole. Corbett (2007) states that silver and zinc were leached from the oxide zone, with silver and copper being enriched below the base of oxidation. Silver increases from 39.1g Ag/t between 34.95 to 37m to 270g Ag/t at 37 to 40.05m in the hole. Gold is concentrated at the base of the zone of oxidation.

**Figure 8-2 Fluidized Breccia**

**Figure 8-3 Milled Breccia**

**Figure 8-4 Carbonate Filled Expansion Breccia**

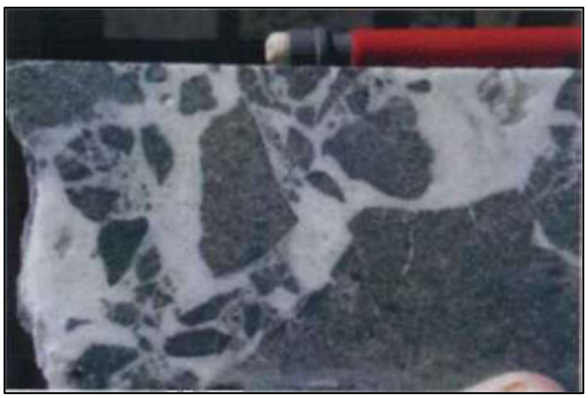


**Figure 8-5 Magmatic Hydrothermal Breccia**

**Figure 8-6 Shingle Breccia**

# 9 EXPLORATION

Altaley entered into a "Promise to Contract" agreement in 1996, after Castle dropped their interest in Tahuehueto, whereby the owners of a majority of the outstanding shares of Sacramento agreed to enter into a Share Purchase Agreement. This agreement was executed in March 1997.

Altaley conducted both surface and underground sampling in 1997 to verify historic mineral inventory estimates and to evaluate the potential for a much larger, lower grade open pit deposit (Brown, 1998b, 2004). The following summary of Soho's 1997 work is from Brown (2004):

The initial part of the work program consisted of both detailed rock channel sampling at the El Creston, along with camp construction. The second half of the work program was devoted to the continued channel sampling of the El Creston underground workings, and the preliminary geological mapping of the El Creston workings. Approximately 1,200 underground and surface channel samples were taken from the El Creston zone, with a few samples taken at Dolores, Cinco de Mayo and Los Burros. Channel samples taken in cross cuts were generally a 1.5 m width, while channel samples from drifts along the structures were from a 1.0-1.5 m width depending on the width of the drift. Along drifts, channel samples were taken at 2.5 m centers.

Altaley geologists created a relational database to store and manipulate all of the sample location, description and analytical data. All the previous surveyed underground workings were digitized, and all the sample data has been plotted, level by level at El Creston, on sample number, gold, silver, copper, lead, and zinc maps. Altaley geologists mapped the underground workings at El Creston, but Altaley either in a reconnaissance or property scale manner did no geological mapping, this will have to be addressed in the following exploration programs.

Altaley resumed exploration at Tahuehueto in the spring of 2004 (Soho, 2004). Initial focus was to prove continuity between the two existing highly mineralized El Creston and Cinco de Mayo zones and thereby demonstrate the potential for a large scale gold deposit (Soho, 2004b).

Subsequent exploration, as detailed below, has included continued exploration along the mineralized corridor between Cinco de Mayo and Santiago, while testing some of the additional mineralized zones on the property.

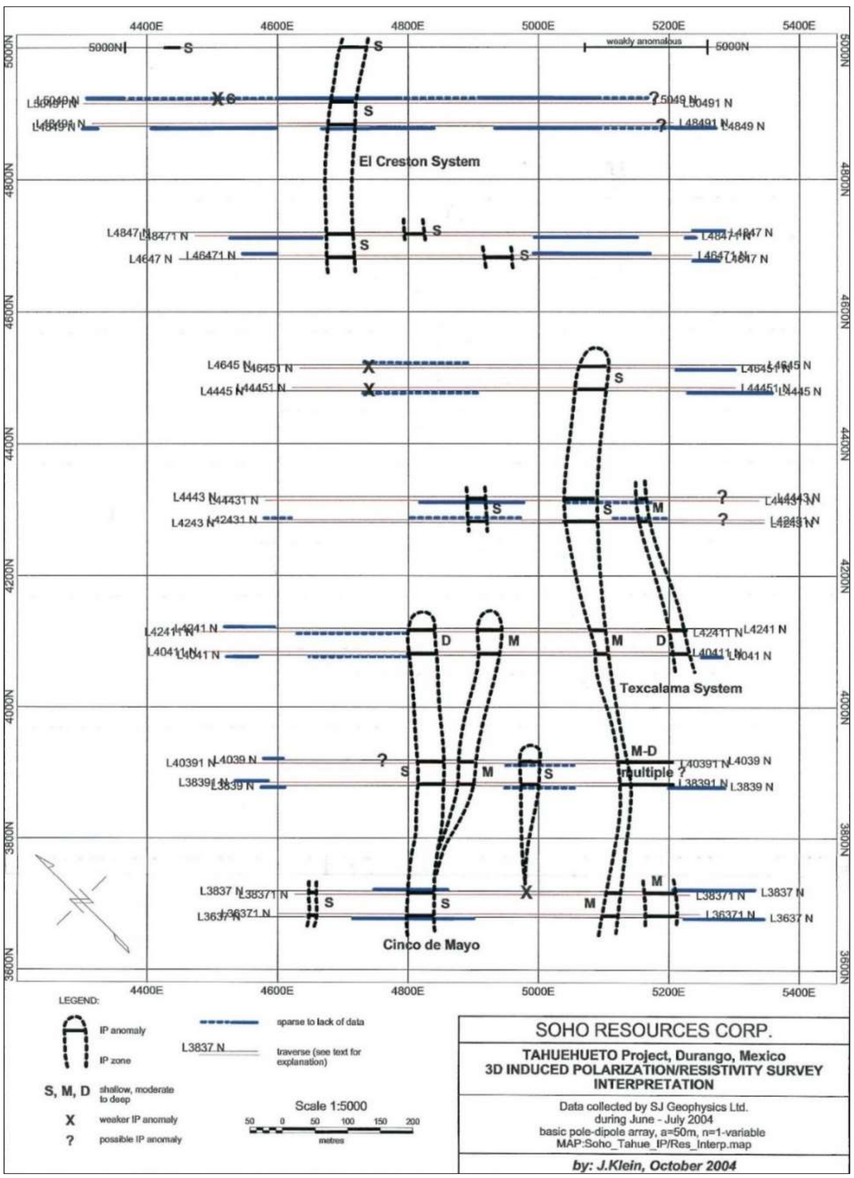
A geophysical survey was implemented in 2004 to prove continuity between the known mineralized zones at El Creston and Cinco de Mayo, followed by a drilling program to test El Creston, Cinco de Mayo, and any anomalies generated from the geophysical study.

SJ Geophysics Ltd. conducted the geophysical survey that included resistivity and IP measurements taken on approximately 18.5 km of grid using an Elrec 6 IP receiver and an Androtex 10 Kw transmitter (Visser, 2004). The configuration used for this survey was a 3Denhanced equivalent form of dipole-dipole IP with a 12 m by 50 m dipole array. Data were analyzed using the DCINV2D and 3D inversion program, which converts surface IP/resistivity measurements into a realistic "Interpreted Depth Section". The 3D IP survey was designed to examine the sulfide mineralization at El Creston, Cinco de Mayo, and Texcalama, and to test the intervening area for possible extensions of these mineralized zones. The following summarizes the results of this survey:

- The survey conditions were favorable, good electrical contact to the ground was established and high quality data was recorded across the entire survey grid.
- The portions of the El Creston, Cinco de Mayo and Texcalama mineralized zones surveyed returned significant anomalous chargeability responses. Discontinuously extending between these zones, which bracket the survey grid, run a suite of highly chargeable features.
- There does not appear to be a strong resistivity association with the known mineralization. The El Creston and Cinco de Mayo exhibit elevated resistivities. The Texcalama vein system is cross cut by a significant NW-SE trending resistive feature and may reflect a lithological contact between the Lower Volcanic Series and the “El Rey” Intrusive Suite (Visser, 2004).

Klein (2004) later reviewed the data from the geophysical program; his interpretive results are shown in Figure 9-1.

**Figure 9-1 3D Induced Polarization/Resistivity Survey Interpretation**



In November 2004 Dateline Internacional, S.A. De C.V. was contracted and drilled 34 reverse circulation ("RC") holes to test the induced polarization ("IP") geophysical chargeability anomalies located within and between the El Creston and Cinco de Mayo zones along the El Creston-Cinco de Mayo Trend as well as to test the chargeability responses along the Texcalama Trend. The RC drilling program commenced in December 2004 (Soho, 2004d).

Drill related activities had been the primary focus at Tahuehueto from 2005 thru 2008. Altaley has undertaken a number of other exploration related activities since 2004 (Soho, 2004b,c, 2006a,c,d,e,f). Surface and underground sampling programs include:

- Underground at Cinco de Mayo South
- Surface and underground at Texcalama
- Surface at Santiago
- Surface at El Pitallo
- Underground at Espinal
- Underground at El Rey
- Surface along the northern Cinco de Mayo trend
- Follow up surface at Santiago
- Surface and underground at the numerous prospects & color anomalies on the property

Surface geologic mapping was initiated in 2004 and suggested that mineralization is closely related to coeval faulting, felsic volcanism, and sedimentation, and that mineralizing structures continue from the lower volcanic units, where they are most pronounced, into the upper volcanic units (Soho, 2004b).

Several petrographic and fluid inclusion reports have been generated on samples from Tahuehueto. A total of 32 rock samples were sent to PetraScience Consultants Inc. for petrographic study in 2004, from which 30 were selected for petrographic analyses (Dunne, 2004b). Eight of these samples (2 from El Creston; 4 from Cinco de Mayo, 1 from Texcalama, and 1 from El Rey,) were selected for fluid inclusion petrography and micro-thermometry (Dunne, 2004a). The eight samples from the El Creston Zone comprise a variety of quartz veins, breccias and quartz vein breccias with primary and replacement vein textures and alteration assemblages indicative of the low sulphidation (adularia-sericite type) epithermal environment (Dunne, 2004b). The seven breccias/quartz vein breccias/vein stockwork samples from the Cinco de Mayo Zone showed alteration assemblages indicative of the lower crustiformcolloform and crystalline superzones of a low sulphidation epithermal environment and possibly transitional to polymetallic gold-silver veins or the quartz-sulphide-gold-copper environment describe by Corbett (2002). Two of the four samples from the Texcalama Zone may contain former porphyritic rock fragments. The two samples from El Rey were similar to those from level 3 at El Creston. One of four samples from the Tres de Mayo Zone contains "wispy quartz" texture characteristic of metamorphosed or deep vein systems (Dunne, 2004b).

Fluid inclusion evidence for boiling is present from two samples from Cinco de Mayo and one from Texcalama. Mineralogical evidence for boiling (lattice-bladed or ghost-bladed textures that pseudomorph lattice carbonate exist in samples from level 3 at El Creston, and from Texcalama and El Rey. Dunne

(2004a) stated that homogenization temperatures and salinities fall in the expected range for epithermal deposits and fall in the classification of shallow, boiling low-sulphidation epithermal deposits.

Five additional rock samples were submitted for petrographic analysis to PetraScience Consultants Inc. in 2005. An additional three samples were included for fluid inclusion analysis, but were deemed of little value so were not analyzed (Dunne and Thompson, 2005). The samples were described as variably altered volcanic or volcaniclastic rocks. Alteration consisted of early pervasive K-feldspar alteration followed by assemblages consisting of variable amounts of chlorite, calcite, hematite, sericite, and quartz. Spatial information was not included, so the data are of limited value. Eleven drill-core samples were sent to Kathryn Dunne for petrographic analysis in 2007.

Fourteen polished thin sections were prepared from these samples; and ten doubly polished fluid inclusion plates were prepared from eight of the samples (Dunne, 2007a; Dunne, 2007b).

The results from these samples were consistent with the observations and conclusions previously reported by Dunne (2004b). Drill cuttings samples from drill hole RC-018 from El Creston were submitted to Vancouver Petrographics Ltd in 2005. The samples were from six consecutive 1.5 m intervals from 67.06 to 76.2 m containing high-grade gold values (11.05-62.3 g/t Au). Both a screened fine grained sample and a coarse grained sample were included for all but the 67.1 to 68.6 m interval. The detailed descriptions of the samples focused on the distribution of native gold which occurred in almost all samples in a variety of textures (Payne, 2005). "*Most commonly it forms inclusions in pyrite, in part associated with other sulphides and in part alone*. *Less commonly it is associated with chalcopyrite or galena; in most of these occurrences, chalcopyrite and galena are associated with pyrite, either as inclusions or fracture-filling patches. Also, widespread but not abundant are disseminated, isolated, small grains in sphalerite. A few free grains of native gold are present. One grain of native gold occurs in sericite. No native gold was seen in quartz. Grain size of native gold is mainly from 0.01- 0.05 mm, with a few grains up to 0.15 mm long. Grains smaller than 0.007 mm in size are not abundant and commonly occur near larger grains of native gold, mainly as inclusions in pyrite.*"

Six samples (type and locations not identified) were submitted to Vancouver Petrographics Ltd. in 2007. They are described by Leitch, (2007) as being "*strongly to intensely silicic/phyllic/advanced argillic altered and veined felsic volcanic rocks. Alteration locally obscures the original rock type, especially where it is associated with brecciation and significant to pervasive silicification and comb or cockade-textured, vuggy to drusy quartz veining.*"

A second suite of 14 samples, taken from core holes, was later submitted to Vancouver Petrographics Ltd. in 2007. Seven or eight of the samples were described as pre-mineral hypabyssal quartz latite porphyries; two as being "micro diorite" and four as "late" dikes of latite to trachyandesite composition (Leitch, 2007). Alteration ranges from propylitic through transitional propylitic/potassic to potassic.

A lithostructural Interpretation using satellite imagery was conducted by Technologies Earthmetric Inc., Montreal, Quebec, Canada on the Tahuehueto Project and surrounding areas for Soho in 2007 (Moreau, 2006). A series of maps at variable scales show interpreted regional and local structural features, interpreted veins and altered areas, along with target areas for exploration generated from the structural interpretation. Although of interest, Altaley has not specifically targeted drill holes based on this data.

# 10 DRILLING

A substantial amount of drilling has been completed on the Tahuehueto project by Altaley in 2004 through 2008, and in 2011, for a total of 252 holes and 48,260.22 m drilled. Of the Altaley holes, 215 were cored drill holes, and 37 were reverse circulation (RC) holes, with the cored drill holes representing 85% the total footage. Of the Altaley core drilling three quarters is HQ size and one quarter is NQ size. The bulk of the drilling took place during successive campaigns in a four-year period from December 2004 to August 2008. Footage completed during this time comprises 98% of the footage drilled by Altaley. No drilling has taken place on the property since Altaley completed four holes in 2011.

The only drilling known to have taken place prior to Altaley's involvement was conducted by Mexican Government organization Consejo de Recursos Minerales, (now known as SGM) in the early 1980s. SGM drilled 2,451.27 m in 28 surface and underground drill holes. Altaley has not been able to obtain drill logs, collar locations, or results from this drilling. Table 10-1 is a summary of the drilling by year, operator and type.

**Table 10-1 Summary of Drilling by Year, Operator and Type**

| Year | No. of Holes | Length (m) | Drill Hole Names | Group | Type | Group No. of Holes | Group Length (m) |
|---|---|---|---|---|---|---|---|
| 1980s | 15 | 2,026.87 | Unknown | SGM | Core | 28 | 2,451.27 |
| | 13 | 424.40 | | | UG | | |
| 2004 | 1 | 70.10 | RC-001 | Altaley | RC | 37 | 3,668.26 |
| 2005 | 36 | 3,598.16 | RC-002 to RC-034* | | | | |
| | 36 | 4,953.88 | DDH05-001 to DDH05-036 | | Core | 215 | 44,591.96 |
| 2006 | 32 | 7,575.35 | DDH06-037 to DDH06-064‡ | | | | |
| 2007 | 74 | 16,219.63 | DDH07-065 to DDH07-138 | | | | |
| 2008 | 69 | 14,864.75 | DDH08-139 to DDH08-207 | | | | |
| 2011 | 4 | 978.35 | DDH11-208 to DDH11-211 | | | | |
| **Total** | **280** | **50,711.49** | | **Altaley Total** | | **252** | **48,260.22** |

* Including holes RC-006A, RC-008A and RC-028A. ‡ Including holes DDH06-037A, DDH06-042A, DDH06-049A and DDH06-051A.

## 10.1 CONSEJO DE RECURSOS MINERALES DRILLING

The only drilling known to have been undertaken prior to Altaley's involvement at Tahuehueto was conducted by Consejo de Recursos Minerales (SGM). Although 28 surface and underground drill holes were reportedly drilled on the El Creston and Cinco de Mayo structures (Consejo de Recursos Minerales, 1983b), Altaley was unable to obtain drill logs, collar locations, or results from this drilling, and it is not known if this information still exists

According to the Consejo de Recursos Minerales (1983b), 15 angle holes totaling of 2,026.87 m were drilled from the surface using Longyear 34 and Longyear 24 rigs. Six of these holes, totaling 813.17 m, were drilled at El Rey; six more, totaling 858.15 m, were drilled at Cinco de Mayo; one 131.60 m hole was drilled at El Creston; and two holes, totaling 223.95 m, were drilled at Tres de Mayo. An additional 13 holes, for a total of 424.40 m, were reportedly drilled underground with a Pack Sack JKS25. Four of these holes (119.20 m) were drilled at El Rey; seven (234.50 m) were drilled at Cinco de Mayo; and two (70.70 m) were drilled at El Creston.

## 10.2 ALTALEY DRILLING

Altaley first began drilling at Tahuehueto in December 2004 and completed 37 RC holes (RC-001 to RC034, including RC-006A, RC-008A, and RC-028A) by July 2005; Six holes were drilled at Cinco de Mayo, three at El Catorce, three at Texcalama and the remaining 25 holes at El Creston. Dateline Internacional, S.A. de C.V. of Hermosillo, Mexico was the drill contractor for this program. The RC holes were drilled at various inclinations from 45 to 70 degrees. All but five of these holes were drilled to the northwest or to the north.

The RC rig was demobilized and replaced by an LF 70 core rig from Mexcore, S.A. de C.V. ("Mexcore") in June 2005 (Soho, 2005c). A total of 50 core holes were drilled with this rig from June 2005 to July 2006; 36 of these holes were drilled in 2005, two at El Catorce, and the remainder at El Creston. The holes were drilled at various inclinations from 45 to 80 degrees. The dominant drilling direction was to the west and northwest.

Altaley expanded its core drilling to two rigs in August 2006, a UDR 200 and a JT 3000 rig from Major Drilling de Mexico, S.A. de C.V. ("Major"). The two Major rigs completed 76 holes before their contract terminated in July 2007, DDH06-49 through DDH06-064 (including DDH06-051A), DDH07-065 through DDH07-121, and DDH07-123. A total of 32 holes were drilled in 2006, 13 at El Creston, seven at El Catorce, six at El Rey, four at El Perdido, and one each at Santiago and Texcalama. Orientations of the holes varied from 45 degrees to vertical, with the predominant drilling direction to the northwest.

Core drilling resumed in August 2007 with a Longyear 38 rig contracted through Tecmin Servicios, S.A. de C.V. ("Tecmin") of Zacatecas, Mexico. Tecmin drilled 15 holes through January 2008, including DDH07-122, DDH07-124 through DDH07-126, and DDH07-128 through DDH07-138. Major drilled the remaining 58 holes, with the exception of DDH07-127. A total of 74 holes were drilled in 2007, 32 at El Creston, 14 at El Perdido, 13 at Cinco de Mayo, eight at El Catorce and seven at Santiago. The orientations of the holes varied from 45 to 75 degrees, dominantly to the northwest.

After attempts at establishing road access and drill sites at the intersection of the El Creston and El Perdido structures failed due to extremely steep topography, Altaley developed ten remote drill sites and drilled one core hole (DDH07-127) using a fly-capable rig purchased by Altaley (Soho, 2007d). The rig was transported to the drill pad by helicopter and operated by Altaley.

At the end of 2007, Altaley contracted with Falcon Perforaciones Mexico, S.A. de C.V., who began core drilling in January 2008 (Soho, 2007g). During 2008, an additional 69 core holes were completed before drilling was shut down in August 2008. Drilling took place in seven different areas in 2008, including holes in the following areas: 17 at El Catorce, 14 at El Perdido, 10 at Cinco de Mayo, nine at El Creston, nine at Santiago, seven at Texcalama and three at El Espinal. All holes were drilled in a northwesterly direction, with inclinations that varied from 45 to 70 degrees.

Four holes were drilled by Tecmin in 2011 including, three in Cinco de Mayo, and one in El Creston. All were inclined at 50 degrees and drilled in a northwesterly direction.

Figure 10-1shows the locations of the drill collars within the various project areas, with the trace orientations for the core and RC drill holes, along with the projected trace of the underground development. Table 10-2 is a summary of drilling by area and by core or RC type, as completed by Altaley. All of the core rigs were skid-mounted.

## 10.3 CORE SIZES

Seventeen of the Mexcore holes, including DDH05-004 through DDH05-011, DDH05-026 through DDH05-031, DDH05-034, DDH05-035 and DDH05-036, as well as hole DDH07-127 drilled by Altaley's fly rig, were drilled entirely with NQ core. The remaining holes were drilled with HQ core, which was reduced to NQ when required by ground conditions. Of the Altaley drilling, 34,381 m, or 77% of the total footage drilled, was HQ core size (6.35 cm diameter), 9,362 m, or 21%, was NQ core size (4.76 cm diameter), and 849 m, or 2%, was casing in the upper, unmineralized portions of the holes that was not recovered, logged, sampled or assayed.

**Figure 10-1 Plan of Altaley Core and RC Drilling by Area**

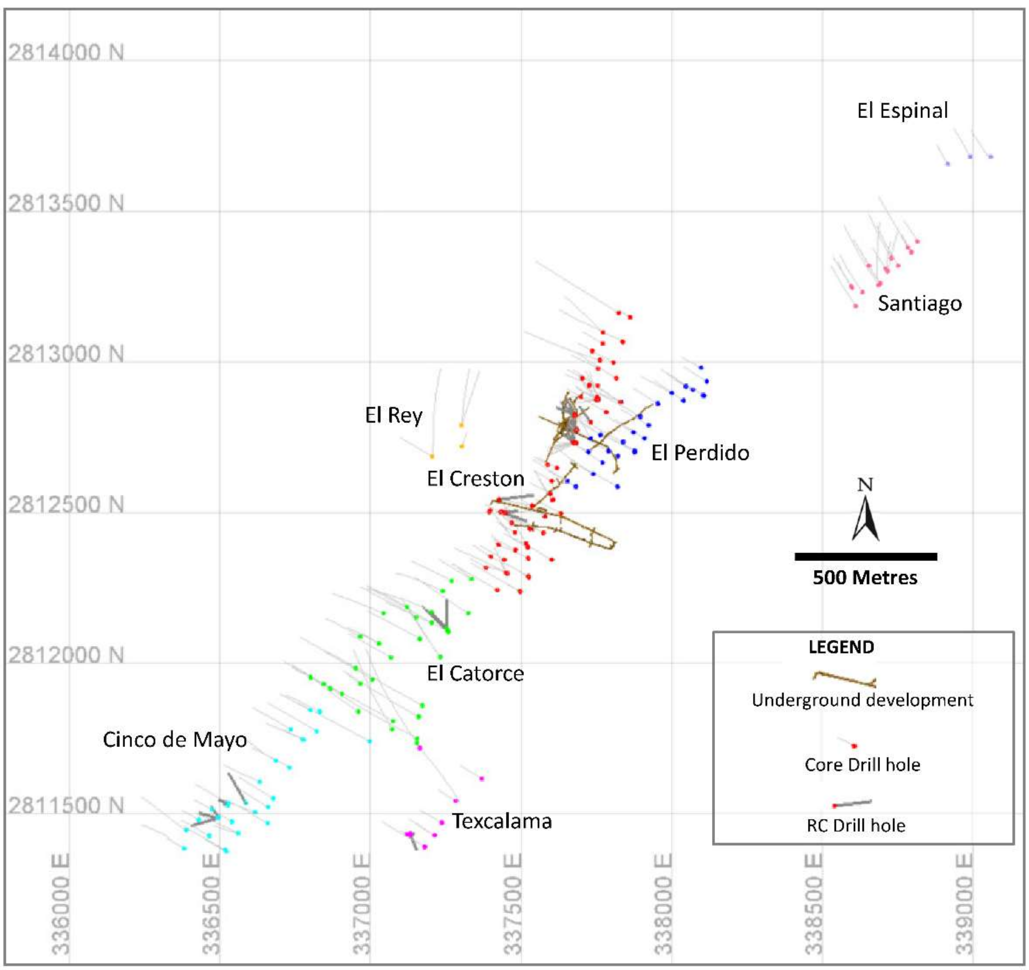


**Table 10-2 Summary of Altaley Drilling by Area**

| Area | No. of Holes | Total Core (m) | Total RC (m) | Total Drilled (m) | Percent of Total |
|---|---|---|---|---|---|
| El Creston | 114 | 13,949.00 | 2,510.03 | 16,459.03 | 34.1 |
| El Catorce | 37 | 10,350.67 | 498.35 | 10,849.02 | 22.5 |
| Cinco de Mayo | 32 | 5,762.29 | 537.96 | 6,300.25 | 13.1 |
| El Perdido | 32 | 6,289.73 | 0.00 | 6,289.73 | 13.0 |
| Santiago | 17 | 4,279.47 | 0.00 | 4,279.47 | 8.9 |
| Texcalama | 11 | 1,866.85 | 121.92 | 1,988.77 | 4.1 |
| El Rey | 6 | 1,630.55 | 0.00 | 1,630.55 | 3.4 |
| El Espinal | 3 | 463.40 | 0.00 | 463.40 | 0.9 |
| **Total** | **252** | **44,591.96** | **3,668.26** | **48,260.22** | **100.0** |

## 10.4 DRILL COLLAR SURVEYING

The drill-hole collar locations were surveyed by a variety of methods. A total of 192 of the holes were surveyed using a differential GPS instrument; the elevations for six of these holes were assigned by PhotoSat using photogrammetry, and the elevations for three of the holes were assigned by Altaley using the project topography. Total station equipment was used to survey 30 holes. Seven holes (six used in the resource estimation) were surveyed using handheld GPS, and 17 (16 used in the resource estimation) were surveyed by chain-and-compass.

## 10.5 DOWNHOLE SURVEYING

Core holes drilled in 2005 were surveyed with a Tropari, Reflex EZ-SHOT, or Flexit. All core holes drilled in 2006 were surveyed with a Flexit, and 2007 and 2008 core holes were surveyed with either a Flexit or a Reflex EZ-SHOT. Surveys were typically taken every 50 metres downhole. The down-hole survey data indicate that the hole deviations are typically minor, usually steepening by less than two degrees.

A total of 26 core holes have no down-hole survey data. Nine of these holes were abandoned or not assayed, some are relatively short, and one is located outside of the resource modeling area. No RC holes have down-hole surveys.

## 10.6 CORE HANDLING PROCEDURES

Altaley reports the core handling procedures as follows. The core is laid out on logging tables that can accommodate up to 60 boxes of core. The core is re-assembled, washed by technicians, and a geologist reviews the core blocks for significant recovery or re-assembly problems. Technicians then measure RQD and recovery. Geologists log the core, mark sample intervals, and draw cut lines using a wax crayon. After logging, the core is photographed with the sample tags in place.

## 10.7 DRILL HOLE DATABASE

QP Titley was provided with a drill hole database that included collar, survey, and geology data tables. The resources reported in this report were estimated using the Altaley database, which includes a total of 252 holes drilled by Altaley at Tahuehueto from 2004 to the end of 2008, including the four holes drilled in 2011. This includes 37 RC holes and 214 cored drill holes (Table 10-1).

**Table 10-3 Tahuehueto Resource Drilling Summary**

| RC | | Core | | Total Drill Holes | Total Meters |
|---|---|---|---|---|---|
| No | Meters | No | Meters | | |
| 37 | 3,668 | 215 | 44,592 | 252 | 48,620 |

Most of the holes were angled towards the northwest in order to cut the southeast-dipping mineralized structures, although the challenging topography hindered drill pad locations and many of these holes were not strictly orthogonal to the structures. Several holes, especially at El Creston, were collared in the footwall and angled back towards the structures, which yields intercepts significantly in excess of true thicknesses.

The drill hole database used for the Tahuehueto Mineral Resource estimation is summarized in Table 10-3 and Table 10-4. An isometric view of the Project area with drill hole collars highlighted is presented in Figure 10-2. Figure 10-3 shows a plan map of the Tahuehueto project area with the surface projection of the drill holes. In addition to the drill hole information, the project database includes assays for a total of 1,788 underground samples, including 88 from the Cinco de Mayo workings, 450 from El Rey, and 1,250 from El Creston. Table 10-5 lists the drillholes that were not sampled or assayed in the Tahuehueto database.

**Table 10-4 Summary of Drilling Database used for Resource Estimation**

| Item | Value |
|---|---|
| Number of Holes | 252 |
| Total Length (m) | 48,260 |
| Average Length (m) | 192 |
| Meters Sampled & Assayed | 21,839 |
| Drill hole Samples with Assays | 19,109 |
| Core Holes with Downhole Surveys | 189 |
| RC Holes with Downhole Surveys | 0 |

**Table 10-5 Drill Holes with No Samples or Assays**

| Year | Area | Drill Hole | Total Depth (m) | Notes |
|---|---|---|---|---|
| 2005 | Creston | DDH05-004 | 111.86 | Not Assayed |
| | El Creston | DDH05-026 | 166.73 | Not Assayed |
| | | DDH05-036 | 17.38 | Abandoned |
| | Texcalama | RC-011 | 3.05 | Abandoned |
| 2006 | El Creston | DDH06-045 | 66.14 | Not Assayed |
| | El Rey | DDH06-049 | 12.20 | Redrilled as DDH06-49A |
| | El Creston | DDH06-051 | 24.00 | Redrilled as DDH06-51A |
| 2007 | El Perdido | DDH07-079 | 46.65 | Abandoned |
| | El Creston | DDH07-108 | 50.50 | Abandoned |
| | | DDH07-110 | 73.15 | Not Assayed |
| | | DDH07-123 | 72.15 | Not Assayed |
| | | DDH07-124 | 68.40 | Not Assayed |

| Year | Area | Drill Hole | Total Depth (m) | Notes |
|---|---|---|---|---|
| 2008 | El Creston | DDH08-153 | 27.45 | Abandoned |
| | El Perdido | DDH08-188 | 69.15 | Not Assayed |
| | | DDH08-202 | 16.80 | Abandoned |

**Figure 10-2 Isometric View of Tahuehueto Drill Hole Locations Showing Topography**

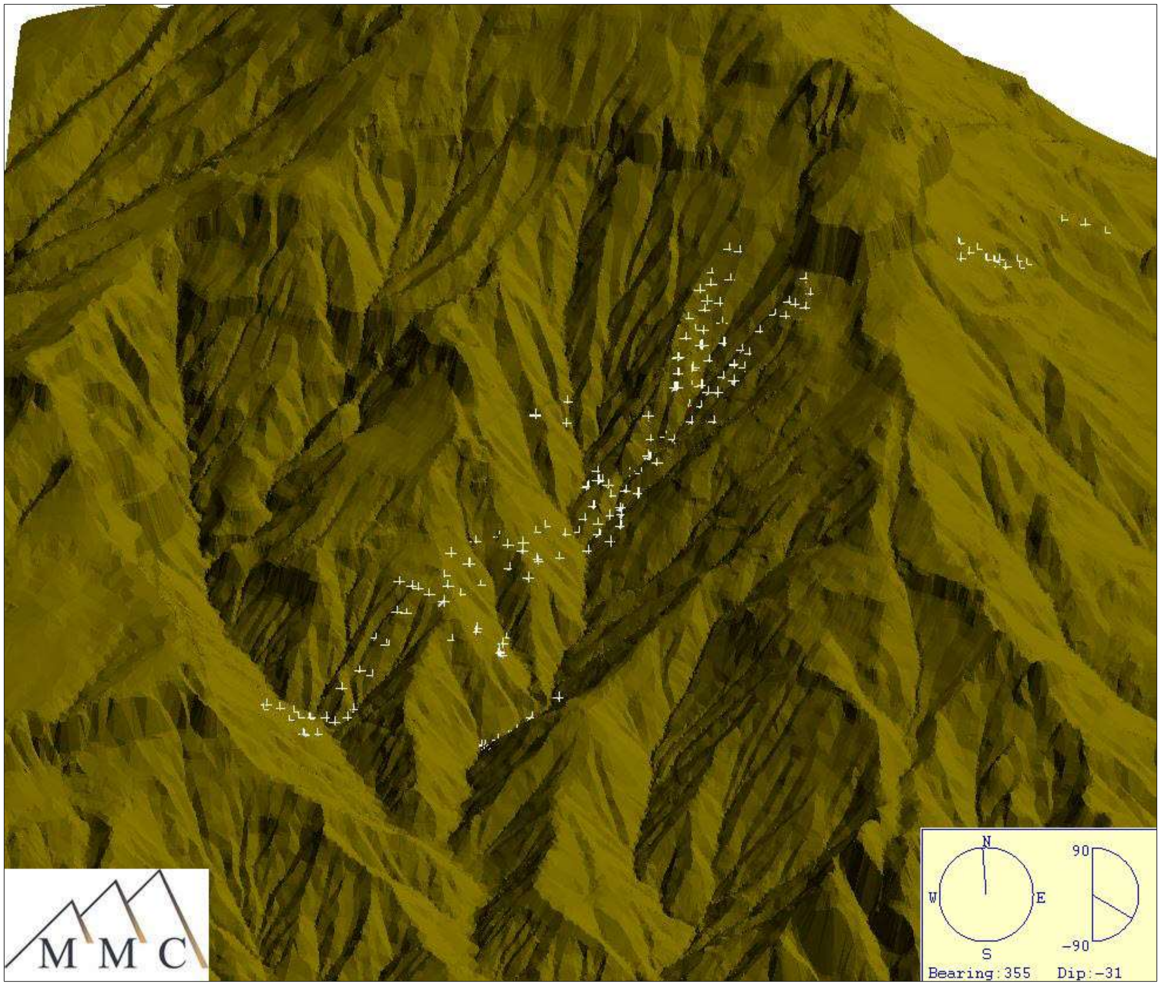
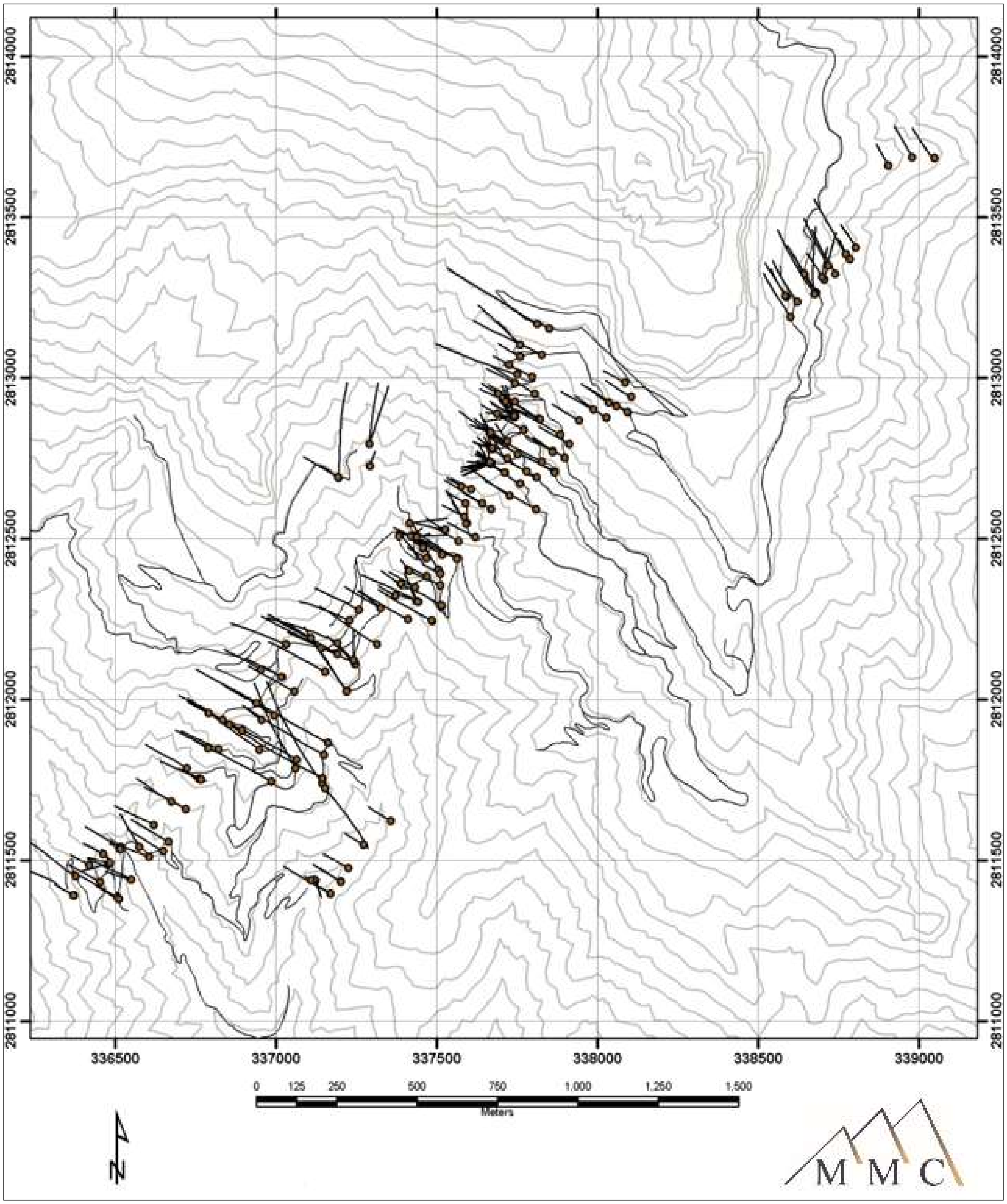


**Figure 10-3 Tahuehueto Drill Hole Locations and Down Hole Traces and Topography**



## 10.8 CONCLUSIONS

The Altaley drilling and sampling programs were carried out in a proficient manner consistent with industry standard practices at the time the programs were completed. The arrangement, alignment and depth of drilling is suitable for the exploration and delineation of the deposit targets as modeled. Altaley initiated a seven-month RC drill program in late 2004 that provided valuable early-stage exploration information on several deposit targets at Tahuehueto. This work was immediately followed by significant HQ and NQ core drilling programs over the next three years, and in 2011, that now comprises 85% of the Altaley footage. Of the core drilling, 77% is HQ size, 21% is NQ size and the remaining 2%, although un-recovered, is in the upper portion of the holes well outside the deposit target areas. No significant factors of drilling or sampling that impact the accuracy and reliability of the results were observed. QP Eric Titley considers the drill programs to be reasonable and adequate for the purposes of Mineral Resource estimation.

# 11 SAMPLE PREPARATION, ANALYSIS AND SECURITY

The Tahuehueto database of Altaley includes over 20,000 samples from cored drill holes, RC drilling and underground channel samples. Underground adit and cross cut sampling programs of took place in 1997, and from 2004 through 2006. Drill hole sampling programs took place from late 2004 through 2008 and in 2011. Assayed samples in the Altaley database include, 15,266 from core drilling, 2,714 from RC drilling and 2,436 from underground adits and cross cuts. Additionally, over 1,700 control samples that were included with the sampling and analytical programs and used to monitor quality control and quality assurance (QAQC) are also in this database. The overall proportion of regular samples is 75% core, and 13% RC and 12% from underground. Control samples, including blanks and standards, account for almost 8% of the total number of samples analyzed.

Qualified Person Eric Titley believes that the drill core, RC and underground sampling programs of Altaley provided samples that are sufficiently representative and of sufficient quality for use in the Mineral Resource estimation discussed in Section 14.

Table 11-1 summarizes the sample preparation and analytical laboratories and methods used on various types of Altaley samples by year processed.

**Table 11-1 Summary of Sampling, Sample Preparation and Analysis of Altaley Samples by Year**

| Year | Sample Type | Sample Preparation & Analytical Laboratories | Analytical Methods |
|---|---|---|---|
| 1997 | Underground channel | ALS Hermosillo, Son., preparation<br>ALS North Vancouver, BC analysis<br>SGS and Atocha laboratories for analysis, locations unknown | Au, Ag, Cu, Pb & Zn, methods unknown. |
| 2004<br>2005 | RC chips<br>Underground channel | ALS, Guadalajara, Jal. preparation<br>ALS North Vancouver, BC analyses | Au-, Ag-GRA21 – fire assay gravimetric finish<br>Ag, Cu, Pb, Zn-AA62 – 4-acid, AAS<br>ME-ICP61 – 4-acid, 27 element ICP |
| 2006 | Underground channel and surface | SGS, Durango, Dgo. preparation<br>SGS, Toronto, ON analysis | Methods unknown |
| 2005<br>2006 | Drill core | SGS, Durango, Dgo. preparation<br>SGS, Toronto, ON analysis | Au FAA313, FAG303 – AAS or grav. finish<br>Ag AAA50 – Na2O2 fusion AAS<br>Cu, Pb, Zn-ICA50 – Na2O2 fusion ICP<br>ICA40B – 4-acid, 31 element ICP |
| 2005<br>2006<br>2007 | Drill core | Inspectorate, Durango, Dgo. preparation<br>Inspectorate, Sparks, NV analysis | Au FA-AA, Au, Ag-Grav – AAS or grav. finish<br>Ag, Cu, Pb, Zn Assay – Aqua Regia, AAS finish<br>30 Element ICP – Aqua Regia, ICP finish |
| 2005<br>2006<br>2007<br>2008<br>2011 | Drill core | ALS, Guadalajara, Jal. preparation<br>ALS North Vancouver, BC analysis | Au-AA23, Au-GRA21 FA, AAS or grav. finish<br>Ag, Cu, Pb, Zn-AA62 – 4-acid, AAS<br>Ag-GRA21 FA, AAS or gravimetric finish<br>ME-ICP61 – 4-acid, 27 element ICP |

## 11.1 HISTORIC SAMPLING

SGM collected a total of 301 surface samples, 3,009 underground samples, and 116 drill samples during their exploration programs at the El Rey, Cinco de Mayo, El Creston, Texcalama, and Tres de Mayo zones (Consejo de Recursos Minerales, 1983b). No further details of these programs, including the sample and drilling locations corresponding results, are known to Altaley.

Castle collected 459 surface chip and underground chip-channel samples in 1994; 247 from the El Creston structure, 21 from the Cinco de Mayo structure, and 191 from other sites on the property (Brown, 2004). Altaley does not have the results or any further details on the sample locations or sampling methods.

## 11.2 SAMPLING BY ALTALEY

### 11.2.1 ALTALEY CHANNEL SAMPLING

In 1997, Altaley undertook channel sampling in ten of the underground levels on the El Creston vein. Approximately 1,200 underground and surface channel samples were taken from the El Creston zone, with a few samples taken at Dolores, Cinco de Mayo and Los Burros.

Channel samples were taken with chisel and hammer, and represent no more than a 1.5 m sample width. Channel samples taken in crosscuts were generally 1.5 m in width, while channel samples from drifts along the mineralized structure were from 1.0 to 1.5 m widths, depending on the width of the drift. Along the drifts, channel samples were taken at 2.5 m centers. Forty-two check panel samples were taken over channel sample sites to confirm the analytical results. Select channel and panel samples were then re-assayed from reject material to check laboratory accuracy (Brown, 2004).

Drift channel samples were taken across the back (roof), perpendicular to the mineralized zone, while crosscut channel samples were taken at waist height on the crosscut wall.

Altaley undertook detailed underground sampling in 2004 of the Cinco de Mayo South, Cinco de Mayo North 1, Texcalama 1, 2, and 3 adits to determine possible extensions of the El Creston zone (Soho, 2004b). Sample locations, at 2.5 m intervals, were delineated by straight chain and demarked with spray paint to allow for further reference and repeat sampling. All samples within adits (as opposed to crosscuts) were acquired across the back (ceiling) of the adit in a continuous hammer and chisel channel sample. The entire width of the adit was sampled. If the adit width exceeded 2 m, the sample was split into two or more samples. Where crosscuts were encountered, several samples were collected across the entire crosscut width, and each individual sample did not exceed 2 m in width. Each sample was a continuous hammer and chisel channel sample across the inward wall of the crosscut.

The channel sampling technique for the adit sampling program consistently utilized a 4 lb short-handled sledge hammer and chisel to cut a channel continuously across the adit back or crosscut walls. Attention and best effort was paid to acquiring consistent volumes of material across each sample. To ensure that sufficient representative material was acquired, each sample averaged in the 2.5 to 3 kg range.

All samples were labeled, bagged and sealed with cable ties on location. The samples were then transported by burro to the camp office where they were sorted, grouped and sealed in rice sacks for transportation to Durango by company truck. At Durango, the samples were transferred to the company's subcontractor, Engineer Artemio Terrazas, for immediate delivery to the ALS Minerals ("ALS", formerly

ALS Chemex) sample preparation laboratory in Guadalajara, Mexico. Once prepared, ALS shipped the samples to the ALS laboratory in North Vancouver, BC for analysis.

In 2005-2006, Altaley undertook additional underground and surface sampling at the Santiago, Pitallo, Espinal, and El Rey mineralized zones (Soho, 2006a and 2006d). The channel samples did not exceed a maximum length of 1.5 m, with the limits of sampled material respecting geological contacts. The channels were cut across the structure at El Rey at a 330° azimuth, and individual samples were collected across lengths of 1.0 m or less. Over 150 m of vein structure was sampled (Canova, 2006a). The 450 underground channel samples taken from the El Rey adit in 2005 were sent to the ALS sample preparation laboratory in Guadalajara, and the prepared pulps sent to the ALS laboratory in North Vancouver, BC for analysis. Additional samples taken from the Altaley 2005 and 2006 surface and underground channel sampling programs are reported in Wilson et al (2017) at the Santiago, Pitallo, Espinal, and El Rey mineralized zones. They were prepared at the SGS facility in Durango and analyzed at the SGS laboratory in Toronto.

Channels were cut every 4 m across the structure that trends 060° and dips 80° to the southeast with widths of 1.0 m to 2.0 m. A total of 38 channels were cut across the structure. The structure is generally 1.8 m wide and consists of quartz-carbonate veining with visible mineralization of sphalerite, galena, and weak chalcopyrite. The structure cuts across a grey, fine to medium grain granodiorite that is massive. The structure is narrow, linear, and contains gold, silver, lead and zinc. (Canova, 2006a).

Locations were surveyed in by straight chain and Brunton compass, and tied to the adit portals. The resulting coordinates for the channel samples were then calculated based on the surveyed portal location data at that time. The sampling conducted along the adit entry tunnels took place along the eastern walls of the adit at a height of approximately 1.4 m. In the vein portion of the adit, samples were taken along the back of the drift (adit ceilings). The width of the channel for the continuous chip / channel samples was approximately 15 cm. Sample size varied due to variable sample lengths. Unlike the first sampling conducted in Cinco de Mayo, that were channels across the entire adit backs (ceilings) unless the adit width exceeded 2 m, the El Rey sampling was broken into contiguous footwall, vein and hanging wall segments (Gustin, 2008).

A grid was established on the Santiago structure in early 2006 oriented with a 060° bearing along the Santiago structure and covering a strike length of more than 180 m (Canova, 2006b). Eight channels were cut across the structure. A total of 124 samples were collected, and the results indicated that the width of the structure was between 7 and 16.5 m.

The overall average underground channel sample length of samples in the Altaley database is 1.2 m.

### 11.2.2 ALTALEY REVERSE-CIRCULATION SAMPLING

Altaley drilled 37 RC holes at Tahuehueto, from December 2004 through July 2005. RC chip samples from 1.52 m (5 ft) intervals down the 10.2 cm (4 inch) diameter RC holes were collected from a cyclone splitter at the rig with about 30 kg of material recovered per sample. Every 1.52 m run was split into quarters with a riffle splitter. A one-quarter portion representing the sample for analysis was bagged and sealed for shipment to the assay laboratory. The remaining three-quarters of reject material was bagged, sealed, and stored at the project's field facilities. For every fifth sample, a duplicate sample (equal to one quarter of the total sample) was collected for quality-control purposes. At the field office, samples were recorded, sorted into batches and sealed in large rice sacks. Altaley personnel drove the samples from the project site to Durango, where they were shipped by secure courier to the sample preparation facilities of ALS in Guadalajara, Mexico.

### 11.2.3 ALTALEY CORE SAMPLING

Altaley began core drilling in mid-2005 using HQ and NQ size core, depending on drilling conditions. Overall, 77% of the Altaley footage drilled was HQ core, a size that provides a 78% greater core volume per unit length drilled than does NQ core.

Sample lengths varied from 0.5 to 2.0 m, averaging 1.2 m overall. Core samples were cut in half longitudinally with a rock saw at the project site, with one-half sent for assay and the remaining half boxed, sealed and stored at the project site. Samples were recorded, batched, and sealed in large rice sacks at the field office, and then shipped by Altaley staff to the sample preparation facilities. The facilities used are as follows: SGS Minerals Services (“SGS”) in Durango in 2005 and 2006 (Soho, 2007a), Inspectorate de Mexico S.A. de C.V. (“Inspectorate”) in Durango in 2007 through to September 2007 (Soho, 2007a), and the ALS sample preparation facility in Guadalajara from September 2007 to June 2008, and in June 2011, (Soho, 2007e).

Altaley reports that the core was generally sampled over regular intervals that varied from 30 cm to 1.50 m, with sample intervals coinciding with major lithological boundaries and veins. In intervals where core recovery was less than 70%, samples within a 3.05 m drill run were sampled as the full 3.05 m interval. Samples were split lengthwise with a diamond saw, with one half taken for assay and the remainder retained for future reference. One blank sample was inserted at random every 25 samples and was placed after a highly mineralized zone, if possible. One standard sample was inserted into each batch of 24 core samples.

The following description of the chain of custody procedures for the drill core and samples for holes DDH07-077 through DDH08-207 was provided by Altaley. Core was in the custody of the drill crew until Altaley geologists picked it up twice a day at about 9:00 AM and 6:00 PM. The core was taken to a fenced core-logging facility, where it was stacked until logging and sampling took place. At the end of each day, the bagged samples were moved into the portal of an adit near the core shed, which was secured with a locked gate. Samples were shipped from the project site to Durango in Altaley vehicles by Altaley personnel. In Durango, samples were shipped to ALS in Hermosillo by Paqueteria y Mensajeria en Movimienito (a secure courier with a long-term contract with ALS).

## 11.3 SAMPLE PREPARATION

Samples prepared at the SGS facility in Durango were processed under SGS code PRP-89. The samples were logged in, dried, crushed to 80% passing 2 mm (10 mesh), a 250 g riffle split subsample taken, and the resulting subsample pulverized to better than 85% of the sample passing 75 micron (200 mesh).

Samples shipped to the Inspectorate sample preparation facility in Durango were logged in, dried, crushed to 75% passing 2 mm, a 250-300 g riffle split subsample taken, and the resulting subsample pulverized to better than 95% of the sample passing 89 micron (150 mesh).

Samples prepared at the ALS facility in Guadalajara were prepared under ALS code PREP-31. The samples were logged in, dried, crushed to better than 70% passing 2 mm, a 250 g riffle split subsample taken, and the resulting subsample pulverized to better than 85% of the sample passing 75 micron.

## 11.4 SAMPLE ANALYSIS

### 11.4.1 REVERSE-CIRCULATION SAMPLES

The Altaley RC chip samples were prepared at the ALS sample-preparation facilities in Guadalajara and the pulps were shipped to the ALS laboratory in North Vancouver, BC for analysis (Soho, 2005a). ALS was ISO 9001:2000 registered at the time of analysis.

At ALS North Vancouver, gold analysis was conducted by fire assay ("FA") fusion of a 30 g sample followed by a gravimetric finish (ALS method Au-GRA21). Silver, copper, lead, and zinc and 23 additional elements were analyzed by four-acid digestion (HF-HNO3-HClO4-HCl) followed by an inductively coupled plasma atomic emission spectroscopy ("ICP-AES") finish (method ME-ICP61).

Over-limit silver, copper, lead, and zinc results (100 ppm for Ag and 10,000 ppm for the base metals) were re-assayed by four-acid digestion, with an atomic absorption spectroscopy ("AAS") finish (method AA62). Approximately 2% of the samples were also analyzed for silver by 30 g fire assay with a gravimetric finish (method Ag-GRA21). Specifications of the ALS analytical methods are listed in three tables, precious metal assays in Table 11-2, base metal assays in Table 11-3, and multi-element analyses in Table 11-4.

**Table 11-2 ALS Precious Metal Fire Assay Analytical Methods**

| Element | Symbol | Method Code | Instrument | Sample Mass (g) | Units | Lower Limit | Upper Limit |
|---|---|---|---|---|---|---|---|
| Gold | Au | Au-AA23 | AAS | 30 | ppm | 0.005 | 10 |
| Gold | Au | Au-GRA21 | Gravimetric | 30 | ppm | 0.05 | 1000 |
| Silver | Ag | Ag-GRA21 | Gravimetric | 30 | ppm | 5 | 10,000 |

**Table 11-3 ALS Base Metal Assay Analytical Methods**

| Element | Symbol | Method Code | Digestion | Instrument | Sample Mass (g) | Units | Lower Limit | Upper Limit |
|---|---|---|---|---|---|---|---|---|
| Copper | Cu | Cu-AA62 | Four-acid | AAS | 0.2 to 2.0 | % | 0.01 | 50 |
| Copper | Cu | Cu-OG62 | Four-acid | ICP-AES | 0.4 | % | 0.001 | 40 |
| Lead | Pb | Pb-AA62 | Four-acid | AAS | 0.2 to 2.0 | % | 0.01 | 30 |
| Lead | Pb | Pb-OG62 | Four-acid | ICP-AES | 0.4 | % | 0.001 | 20 |
| Zinc | Zn | Zn-AA62 | Four-acid | AAS | 0.2 to 2.0 | % | 0.01 | 30 |
| Zinc | Zn | Zn-OG62 | Four-acid | ICP-AES | 0.4 | % | 0.001 | 30 |

**Table 11-4 ALS Four-Acid Digestion Multi-Element Method ME-ICP61**

| Element | Symbol | Units | Lower Limit | Upper Limit |
|---|---|---|---|---|
| Silver | Ag | ppm | 0.5 | 100 |
| Aluminum | Al | % | 0.01 | 25 |
| Arsenic | As | ppm | 5 | 10,000 |
| Barium | Ba | ppm | 10 | 10,000 |
| Beryllium | Be | ppm | 0.5 | 1000 |
| Bismuth | Bi | ppm | 2 | 10,000 |
| Calcium | Ca | % | 0.01 | 25 |
| Cadmium | Cd | ppm | 0.5 | 500 |
| Cobalt | Co | ppm | 1 | 10,000 |
| Chromium | Cr | ppm | 1 | 10,000 |
| Copper | Cu | ppm | 1 | 10,000 |
| Iron | Fe | % | 0.01 | 25 |
| Potassium | K | % | 0.01 | 10 |
| Magnesium | Mg | % | 0.01 | 15 |

| Element | Symbol | Units | Lower Limit | Upper Limit |
|---|---|---|---|---|
| Manganese | Mn | ppm | 5 | 10,000 |
| Molybdenum | Mo | ppm | 1 | 10,000 |
| Sodium | Na | % | 0.01 | 10 |
| Nickel | Ni | ppm | 1 | 10,000 |
| Phosphorus | P | ppm | 10 | 10,000 |
| Lead | Pb | ppm | 2 | 10,000 |
| Sulphur | S | % | 0.01 | 10 |
| Antimony | Sb | ppm | 5 | 10,000 |
| Strontium | Sr | ppm | 1 | 10,000 |
| Titanium | Ti | % | 0.01 | 10 |
| Vanadium | V | ppm | 1 | 10,000 |
| Tungsten | W | ppm | 10 | 10,000 |
| Zinc | Zn | ppm | 2 | 10,000 |

### 11.4.2 CORE SAMPLES

Core holes DDH05-001 through 05-031 and DDH05-033 through DDH06-048 were analyzed at the SGS laboratory in Toronto, Canada; SGS was an ISO/IEC 17025 and ISO/IEC 9002 registered laboratory at the time of the analysis. The half core samples were sent for sample preparation to the SGS facilities in Durango, Mexico, and the prepared pulps were shipped to the SGS Toronto, ON laboratory. Gold grade was determined by fire assaying of 30 g charges and finishing with AAS (SGS method FAA313); over-limit (>10 g/t) analyses were completed by fire assaying 30 g charges and completing with gravimetric finish (method FAG303). Table 11-5 lists the specifications of the SGS precious metal analytical methods.

Silver, copper, lead, and zinc and 27 additional elements were determined for all samples using a four-acid digestion method followed by inductively coupled plasma optical emission spectroscopy ("ICP-OES", similar to ICP-AES) finish (method ICP40B). The elements analyzed and the detection limits of this method are listed in Table 11-6.

Silver over limits (>10 ppm) for samples from holes DDH06-037 through 06-048 were determined by AAS after three-acid digestion (method AAS21E); over-limits for the earlier holes were by a similar four-acid digestion method AAS40E. Methods AAS21E and AAS40E both had an upper threshold of 300 ppm silver. Samples exceeding this limit were analyzed by method AAA50. AAS40E and AAS21E analyses for silver were also completed on a number of the samples that were below the range of the ICP40B over-limits.

Copper, lead, and zinc over-limits results were determined by sodium peroxide fusion followed by an ICP-OES finish, (method ICA50), reported in percent. The specifications of the SGS base metal assay methods are listed in Table 11-7.

**Table 11-5 SGS Precious Metal Assay Analytical Methods**

| Element | Symbol | Method Code | Instrument | Sample Mass (g) | Units | Lower Limit | Upper Limit |
|---|---|---|---|---|---|---|---|
| Gold | Au | FAA313 | AAS | 30 | ppb | 5 | 10,000 |
| Gold | Au | FAG303 | Gravimetric | 30 | ppm | 0.05 | 1,000 |
| Silver | Ag | AAS21E | Three-acid | 2 | ppm | 0.3 | 300 |
| Silver | Ag | AAS40E | Four-acid | 2 | ppm | 0.3 | 300 |
| Silver | Ag | AAA50 | Four-acid | 1 | g/t | 10 | 10,000 |

**Table 11-6 SGS Four-Acid Digestion Multi-Element Method ICP40B**

| Element | Symbol | Units | Lower Limit | Upper Limit |
|---|---|---|---|---|
| Silver | Ag | ppm | 2 | 100 |
| Aluminum | Al | % | 0.01 | 25 |
| Arsenic | As | ppm | 3 | 10,000 |
| Barium | Ba | ppm | 1 | 10,000 |
| Beryllium | Be | ppm | 0.5 | 1000 |
| Bismuth | Bi | ppm | 5 | 10,000 |
| Calcium | Ca | % | 0.01 | 25 |
| Cadmium | Cd | ppm | 1 | 500 |
| Cobalt | Co | ppm | 1 | 10,000 |
| Chromium | Cr | ppm | 1 | 10,000 |
| Copper | Cu | ppm | 0.5 | 10,000 |
| Iron | Fe | % | 0.01 | 25 |
| Potassium | K | % | 0.01 | 10 |
| Lanthanum | La | ppm | 0.5 | |
| Lithium | Li | Ppm | 1 | |
| Magnesium | Mg | % | 0.01 | 15 |

| Element | Symbol | Units | Lower Limit | Upper Limit |
|---|---|---|---|---|
| Manganese | Mn | ppm | 2 | 10,000 |
| Molybdenum | Mo | ppm | 1 | 10,000 |
| Sodium | Na | % | 0.01 | 10 |
| Nickel | Ni | ppm | 1 | 10,000 |
| Phosphorus | P | % | 0.01 | 10 |
| Lead | Pb | ppm | 2 | 10,000 |
| Sulphur | S | % | 0.01 | 10 |
| Antimony | Sb | ppm | 5 | 10,000 |
| Strontium | Sr | ppm | 0.5 | 10,000 |
| Titanium | Ti | % | 0.01 | 10 |
| Vanadium | V | ppm | 2 | 10,000 |
| Tungsten | W | ppm | 10 | 10,000 |
| Yttrium | Y | ppm | 0.5 | |
| Zinc | Zn | ppm | 0.5 | 10,000 |
| Zirconium | Zr | ppm | 0.5 | |

**Table 11-7 SGS Base Metal Assay Analytical Methods**

| Element | Symbol | Method Code | Digestion | Instrument | Sample Mass (g) | Units | Lower Limit | Upper Limit |
|---|---|---|---|---|---|---|---|---|
| Copper | Cu | ICA50 | Na2O2 | ICP-OES | 0.2 | % | 0.004 | 40 |
| Lead | Pb | ICA50 | Na2O2 | ICP-OES | 0.2 | % | 0.007 | 30 |
| Zinc | Zn | ICA50 | Na2O2 | ICP-OES | 0.2 | % | 0.004 | 30 |

Inspectorate analyzed the core samples from drill holes DDH05-032 and DDH06-049A through DDH07-121 in their Sparks, NV facility on pulps prepared at the Inspectorate sample preparation facility in Durango, Mexico. Gold was analyzed by 30 g fire assay with an AAS finish (method Au-FAA); all results >3 g Au/t were re-assayed by 30 g fire assay with a gravimetric finish (method FAGRAV). Over 2,000 samples from 2005 and 2006 were analyzed for silver, copper, lead and zinc by an aqua regia digestion assay method with an AAS finish. A further 1,200 samples from these years were analyzed by an aqua regia digestion multi-element ICP-AES method that included determinations for silver, copper, lead and zinc, reported in ppm, and also included 26 additional elements. Over-limits samples by these two methods for silver, copper, lead or zinc concentrations >10,000 ppm was determined by an aqua regia digestion assay level method with an AAS finish reported in percent. A few silver analyses were also determined by 30 g fire assay fusion with an AAS finish to an upper limit of 200 ppm, and over-limit analyses on these silver samples were determined by 30 g fire assay fusion with a gravimetric finish.

Samples from core holes DDH07-122 through DDH08-207 were analyzed by ALS. Sample pulps were prepared at the ALS facility in Guadalajara, Mexico. The prepared sample pulps were first shipped by ALS to their analytical laboratories in Lima, Peru (Soho, 2007e), then to the ALS laboratory in Vancouver, Canada for analysis between September and December 2007; in January 2008 the pulps were once again being sent to the Lima laboratory (Soho, 2008a). The QP was not able to determine which samples or which methods, were analyzed by the ALS facility in Lima, if any, as described (Soho 2007e and Soho 2009a), and which were analyzed by ALS North Vancouver, as the assay certificates and method codes do not provide this information. However, it is noted that all the assay certificates are signed by the ALS North Vancouver laboratory manager. Gold assays were first done on 30 g charges by fire assaying with an AAS finish (method Au-AA23); over-limit (>10 g/t) analyses were completed using the Au-GRA21 method described in Section 11.4.1. Silver, copper, lead, and zinc were analyzed by method OG62 (similar to AA62). Specifications for the various ALS analytical methods are listed in Table 11-2, Table 11-3 and Table 11-4.

### 11.4.3 Underground Samples

The following description of the Altaley surface and underground channel sampling programs of 1997 is described in Wilson et al (2017). The work was conducted and supervised by three Canadian geologists, including Brown. Samples were prepared by ALS at their facility in Hermosillo, Mexico, and the pulps were sent to ALS laboratory in North Vancouver, BC, Canada for analysis (Brown, 2004), although Brown, 1998a, states that the 1997 channel samples were shipped directly to the Vancouver laboratory for both sample preparation and analysis. Brown (1998a) reports that samples were assayed for gold and a 30 element ICP package. Gold was initially assayed by fire assay with an AAS finish using a 30 g charge. Samples with gold above 12 g Au/t were re-assayed by one-assay-ton fire assay with a gravimetric finish. Samples with silver greater than 200 ppm were re-assayed by fire assay with a gravimetric finish. Samples with lead or zinc exceeding 50,000 ppm were re-assayed by atomic absorption using nitric-HCl-acid digestion. For 475 underground channel samples taken at El Creston and 311 samples taken at El Perdido by Altaley in 1997, SGS is listed as the analytical laboratory for the silver, gold, copper, lead and zinc analysis. The analytical methods for the SGS analyses are unknown. For a further 66 underground channel samples taken in 1997 at El Creston, Atocha is listed as the analytical laboratory for the silver, gold, copper, lead and zinc analysis. The location and the analytical methods of this laboratory are also unknown.

For Altaley's 2004 sampling program, samples were prepared by ALS at their sample preparation laboratory in Guadalajara, Mexico and the pulps were shipped to the ALS Vancouver laboratory for analysis.

Sampling of the Cinco de Mayo and Texcalama adits and gold was determined by fire assaying with an AAS finish. Samples with values exceeding the 10 g/t upper limit of the method were then assayed by fire assay with a gravimetric finish. In addition, analysis of a suite of an additional 33 elements, including silver, gold, copper, lead and zinc, was done by four-acid digestion ICP-AES (method ME-ICP61). Where the upper limits were exceeded for silver or base metal elements by the multi-element method, the samples were re-analyzed by an assay level a four-acid digestion AAS method. An appropriate standard was inserted at regular intervals in the sample series, and the laboratory performed duplicate analyses on every 40th sample in a run. In addition, the laboratory inserted a blank at the beginning of each run as well as standards at random intervals. For the Cinco de Mayo and Texcalama 1 and 2 adits, blanks and standards were inserted by Altaley into the sample sequence (every 20th sample) for assay quality control. For the Texcalama 3 adit, duplicate samples were taken every 20th sample (10th, 30th, 50th etc.) in addition to the above quality-control measures.

Altaley completed an underground and surface sampling program at the Santiago, Pitallo, Espinal, and El Rey mineralized zones in 2005 and 2006. Altaley reports that blank samples were inserted randomly within each series of 25 samples and standards were inserted every 25th sample during this program. Pulps from the Altaley 2005 and 2006 surface and underground channel samples from the Santiago, Pitallo, Espinal, and some from the El Rey mineralized zones were prepared at the SGS facility in Durango. The pulps were sent to the SGS Toronto, ON laboratory for analyses.

## 11.5 HIERARCHY OF ANALYTICAL DATA

Some samples were analyzed by more than one analytical method for silver, gold, copper, lead and zinc. In order to properly record all original assay data in the database, as well as to have unique fields for use in the resource estimation, gold, silver, copper, lead, and zinc fields were created in the database that are separate from the original raw assay data. These fields are assigned one of the assays for each of the five metals for any given sample based on a consistent hierarchy of analytical methods that considers which method of analysis is most appropriate for the grade range encountered. For example, gold and silver fire assay results with a gravimetric finish, typically run-on high-grade samples, are given a higher priority than fire assay results with an AAS finish. Single element "ore grade" or "over-limits" assay methods for copper, lead, and zinc are also assigned a higher priority than multi-element ICP analysis methods. Application of this hierarchy in the database was verified to have been correctly applied for the use of this information in this report.

## 11.6 QUALITY CONTROL QUALITY ASSURANCE PROGRAM

Quality control samples including duplicate samples, analytical standards, and blanks were inserted by Altaley into the sampling streams of the drilling and sampling programs in a manner that is consistent with good industry practice, as described in the sampling sections of this report. The internal laboratory QAQC procedures that were documented for the main laboratories used, ALS, SGS and Inspectorate, were also reviewed, and deemed consistent with best laboratory practices at the time the analyses were performed.

### 11.6.1 BLANKS

Blank samples are used to test for cross contamination and sample sequencing issues between samples during sampling in the field, and in sample preparation and analysis at the analytical laboratory. A common form of cross contamination typically occurs during the sample preparation stages of crushing, splitting and pulverization. For this reason, coarse blanks are often used, as they are required to go through the same crushing, splitting and pulverization stages as the regular samples. To provide the most benefit, these blanks are placed immediately after well-mineralized samples in the sample stream to monitor for possible carry-over from one sample to the next, (from higher grade to lower grade in this case), in the processing sequence.

Altaley inserted nominal blank samples into the sample stream at Tahuehueto since drilling began in late 2004. The coarse blank material used is derived from an outcrop within the project area of post-mineral rhyolitic tuffs of the upper volcanic series that lies above the mineralized lower volcanic series rocks. Daniels (2007) reviewed the QAQC of the Altaley inserted blanks and standards at a relatively early stage of project development. This review indicated that about 1-2% of blank samples monitored had much higher than anticipated results for gold and base metals. Altaley was advised that these blanks contained high values for gold and base metals, and that follow up was recommended to determine if these results were due to sample mis-identification or data entry errors in the field, or if they resulted from actual cross-contamination in the laboratory. It is also possible that the some of the source rock material used, and described as a nominal blank, was not entirely homogenously low grade, and may be mineralized to some extent in some instances.

### 11.6.2 REFERENCE STANDARDS

To increase the integrity of the sample handling process, from collection to shipment to assay, Altaley inserted standards in the sample stream at a rate of one standard and one blank for every 25 drill samples. Most of the reference standards used were prepared by WCM Minerals (“WCM”), a division of WCM Sales, Ltd. of Burnaby, BC, Canada (Table 11-8). Reference standards are used to evaluate the analytical accuracy of the assay laboratory. Of the ten WCM standards used, six are gold only, three are silver, lead, zinc and copper standards, one is a gold, silver, copper, lead zinc standard, and one is a gold, silver copper standard. The use of the WCM standards, started with drill hole DDH05-032. Prior to that, Altaley inserted a number of other standards in their sampling programs. Information on these standards is poorly documented, and the results of this early part of the control sample insertion program are difficult to assess. QP Eric Titley considers the WCM standards employed since hole DDH05-032 to be in suitable grade ranges for monitoring the results of the Tahuehueto mineralized zones.

**Table 11-8 WCM Reference Standards Used**

| Standard ID | Au g/t | Ag g/t | Cu % | Pb % | Zn % |
|---|---|---|---|---|---|
| CU135 | 5.93 | 31 | 0.18 | - | - |
| PB109 | - | 30 | 0.50 | 1.47 | 4.16 |
| PB117 | 0.31 | 52 | 0.59 | 2.22 | 1.46 |
| PB129 | - | 23 | 0.28 | 1.24 | 2.00 |
| PB130 | - | 83 | 0.25 | 0.72 | 1.44 |
| PM409 | 1.13 | - | - | - | - |
| PM416 | 2.06 | - | - | - | - |
| PM419 | 1.97 | - | - | - | - |
| PM424 | 1.17 | - | - | - | - |
| PM914 | 10.40 | - | - | - | - |
| PM416 | 2.06 | - | - | - | - |

Similar issues with some of the results of the Altaley inserted standards were identified in the QAQC review by Daniels (2007), as noted for the inserted blanks. The results for a considerable number of control samples for all elements fell outside the designated control limits, and the overall quality control failure rate was deemed unacceptably high. At the, time it was acknowledged that part of the high failure rate could be attributable to a general lack of good data entry and data management practices at the Tahuehueto site during the earlier stages of project development prior to 2007. QP Eric Titley was unable to determine if individual issues with any specific controls samples were fully resolved with respect to these standards and blanks. However, in discussion with Altaley, QP Eric Titley was advised that data entry and data labeling errors identified by Daniels, were corrected after this review, and that these changes were made in the Altaley database. Altaley also stated that this review triggered an increased level of care and diligence on the part Altaley, and that this was applied to subsequent portions of their sampling, analytical and QAQC programs.

### 11.6.3 DUPLICATES

A significant number of duplicate samples were taken by Altaley during their core and RC drilling and underground sampling programs. Duplicate types included analytical method type, assay pulp, coarse reject, half core and half channel sample duplicates, and also included within-laboratory and inter-laboratory duplicates and checks. QP Eric Titley considers the quality, quantity, type and results of the duplicate samples in the Altaley QAQC program to be suitable and appropriate.

## 11.7 CONCLUSION

QP Titley reviewed the sampling, preparation, security and analytical information, including sampling databases, analytical certificates, descriptions of sampling methods and procedures, security procedures, sample preparation, analytical methods and analytical QAQC information provided by Altaley and reported on by previous workers. All aspects of these programs were deemed to be of a suitable standard.

# 12 DATA VERIFICATION

## 12.1 VALIDATION AND VERIFICATION OF SAMPLE AND ASSAY DATA

QP Titley completed validation and verification procedures on the sample tables, raw assay results, QAQC tables and the resource database of Tahuehueto provided by Altaley. QP Titley requested and received 155 assay certificates for 102 core and RC drill holes representing 10,850 samples from the 2005, 2007, 2008 and 2011 drill programs of Altaley directly from ALS laboratories in North Vancouver, BC. The assay results received comprise approximately 50% of the total number of results used in the resource estimate. These results were imported and digitally compared with the corresponding results provided by Altaley for the regular samples. An additional 120 digital assay certificates provided by Altaley for 116 core and RC drillholes and underground channels from the 2004 through 2008 programs were also re-imported to the database from the assay certificates provided as an additional basis for comparison. The newly imported assay results from these certificates were directly compared with the existing assay results for the corresponding samples in the existing Altaley resource database.

Core drill hole DDH08-152 was not used in the resource estimate, and the absence of this 73.7 m long hole was reviewed. It was observed that an earlier, 24.36 m long hole (DDH-148) that was collared from the same drill pad with a location less than 1 m away. Similar mineralized zones were encountered in the top 10 m of both holes, and both holes are oriented at the same azimuth and dip, so the pair are essentially twinned holes. It was also noted during the comparison that 704 samples representing 914 m of sampled core from 25 drill holes were also not included in the Tahuehueto resource database. Review of sample certificate data revealed that all of these results were from previously unsampled sections of these holes that were sampled and analyzed in 2008, well after the original sampling had occurred. Of these holes, a section of DDH07-117 above 104 m downhole that was sampled in 2008 returned results indicating a moderately mineralized zone up to 4 m above the original 2007 samples. Other than this hole, and one sample in DDH07-114, none of the samples were >1 gold equivalent (as defined in section 15). It is recommended that the rationale for excluding the samples from these holes be discussed with Altaley geologists and reviewed prior to subsequent resource estimates.

A number of minor rounding errors in the assay results for various elements, presumably resulting from truncation of lower decimal places during data processing, were also noted in the Altaley database comparison. A few other errors in comparison of the imported assay certificates were noted, and none that were deemed substantial enough to have significant impact on the resource estimation.

The verification work conducted lends confidence to the veracity of Altaley database. In the QP's opinion the data is adequate for the purposes of mineral resource estimation.

# 13 MINERAL PROCESSING AND METALLURGICAL TESTING

## 13.1 INTRODUCTION

Tahuehueto mineralization has been analyzed in several metallurgical testing programs as well as several toll processing runs at an established flotation concentrator.

The first registered test was carried out in 1977 by the Comision de Fomento Minero (CFM) and the second was conducted by Westcoast Mineral Testing during 2009 and 2010. A third test was performed by Altaley in order to verify the metallurgical parameters required to process, by flotation the El Creston and El Perdido mineralization. Detailed discussion of the historical metallurgical test work has been completed by Mr. Bill Pennstrom and reported under separate cover. For the sake of brevity, Mr. Pennstrom's test work discussion follows in Section 13.2.

Altaley processed ore via toll milling over a three-year period beginning January 2018 through December 2020. During the toll mill campaigns, 83.9 kt of zinc concentrate and 17.8 kt of lead concentrate. Concentrates were of suitable quality for sale resulting is a modest cashflow. This demonstrated that the processing of the Tahuehueto was feasible and help with the decision to complete construction of the processing facilities. A more in-depth discussion follows in Section 13.6

## 13.2 HISTORICAL TESTING

### 13.2.1 COMISION DE FOMENTO MINERO TESTINGS

CFM, (currently referred to as Fideicomiso de Fomento Minero, FIFOMI) is a Government Institution that supports the mining industry with loans and technical assistance and with large and well-equipped facilities for metallurgical test and process design. These metallurgic laboratories are now operated by the Mexican Geological Service.

The metallurgical testing was performed by CFM under request of the company Emijamex, S.A., a company with Japanese participation. This company tested a 150 kg sample from the El Creston and El Rey veins. The objective of this study was defining the parameters for designing a flotation process plant to process mineralization at 50 tpd.

The metallurgic research carried out included spectrographic qualitative assay, chemical qualitative assay, X-ray diffraction, chemical quantitative assay, mineralogy characterization, mill grinding indices development, and mill testing. In total 10 metallurgic tests were conducted using different parameters, reagents, PH, etc., in order to obtain the best recoveries and concentrates. The quantitative analysis of the sample is indicated in Table 13-1. The mineralogy obtained by CFM is shown in Table 13-2.

**Table 13-1 Quantitative Analysis**

| Element | Assay | Unit |
|---|---|---|
| Au | 3.00 | g/t |
| Ag | 53.00 | g/t |
| An | 6.40 | % |
| Pb | 3.50 | % |
| Cu | 0.24 | % |
| Fe | 4.80 | % |
| S | 4.64 | % |

| Element | Assay | Unit |
|---|---|---|
| $SiO_2$ | 68.19 | % |
| $Al_2O_3$ | 4.67 | % |
| CaO | 1.18 | % |
| MgO | 6.29 | % |
| $CaCO_3$ | 1.23 | % |

**Table 13-2 Sample Mineralogy**

| Mineral | % |
|---|---|
| Sphalerite | 9.55 |
| Galena | 4.04 |
| Chalcopyrite | 0.7 |
| Pyrite | 1.33 |
| Calcite | 1.23 |
| Quartz, etc. | 83.15 |
| Total | 100 |

The mill particle size test results, indicates that below -65 mesh 82.7% of the Zn, 82.8% of the Pb and 80.5% of the copper are free and that a – 100 mesh grind size is required to meet grind size parameters for flotation.

Table 13-3 provides a summary of the 10 metallurgic tests that were carried out by CFM in order to define the best parameters for processing material from Creston and El Rey. The parameters recommended by CFM are from test number 2 and are shown in Table 13-4.

## Table 13-3 CFM Metallurgic Test Work Summary

| Description | | Test Number | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | | 8 | | 9 | | 10 | |
| Concentrate | | Pb | Zn | Pb | Zn | Pb | Zn | Pb | Zn | Pb | Zn | Pb | Zn | Pb | Zn | Pb | Zn | Pb | Zn | Pb | Zn |
| Assays | Au g/t | 32.0 | 1.7 | 31.8 | 2.4 | 24.5 | 4.2 | 12.4 | 3.3 | 17.1 | 2.0 | 32.5 | 3.7 | 34.5 | 4.1 | 24.0 | 5.6 | 22.4 | 3.5 | 19.1 | 3.0 |
| | Ag g/t | 602.0 | 123.0 | 782.0 | 72.0 | 480.0 | 108.0 | 273.0 | 70.0 | 345.0 | 115.0 | 739.0 | 120.0 | 746.0 | 50.1 | 554.0 | 145.0 | 488.0 | 94.0 | 473.0 | 117.0 |
| | Pb% | 43.6 | 0.1 | 45.0 | 0.4 | 28.0 | 0.4 | 11.5 | 0.3 | 22.0 | 0.3 | 41.0 | 0.4 | 44.0 | 0.4 | 30.0 | 0.7 | 26.0 | 0.4 | 28.0 | 0.5 |
| | Zn% | 7.4 | 56.0 | 8.0 | 55.8 | 8.0 | 65.0 | 8.0 | 52.5 | 7.8 | 60.5 | 8.0 | 49.4 | 7.5 | 49.3 | 9.0 | 52.5 | 9.5 | 48.8 | 8.5 | 60.0 |
| | Fe% | 6.4 | 3.0 | 6.5 | 11.3 | 7.0 | 11.5 | 7.0 | 11.8 | 7.0 | 8.3 | 7.5 | 15.5 | 7.0 | 19.7 | 6.4 | 17.0 | 6.8 | 13.0 | 7.2 | 9.6 |
| Distribution % | Au | 87.8 | 12.2 | 81.1 | 2.4 | 81.0 | 4.5 | 92.9 | 7.1 | 89.1 | 4.4 | 87.2 | 12.8 | 86.0 | 14.0 | 87.2 | 12.8 | 88.6 | 11.4 | 92.3 | 7.7 |
| | Ag | 77.2 | 22.8 | 87.6 | 70.0 | 86.0 | 10.8 | 92.2 | 7.8 | 85.2 | 13.8 | 81.7 | 18.3 | 79.7 | 20.3 | 84.8 | 15.1 | 85.5 | 14.5 | 85.9 | 14.1 |
| | Pb | 97.1 | 0.7 | 97.2 | 0.4 | 98.6 | 0.4 | 98.1 | 0.7 | 99.5 | 0.5 | 97.1 | 0.9 | 97.3 | 0.9 | 96.4 | 1.5 | 96.9 | 1.2 | 97.0 | 0.8 |
| | Zn | 9.3 | 85.5 | 10.5 | 55.8 | 14.9 | 65.0 | 28.7 | 70.5 | 19.8 | 78.7 | 9.7 | 88.0 | 9.0 | 88.7 | 16.6 | 78.4 | 17.2 | 80.2 | 15.9 | 81.1 |
| | Fe | 11.1 | 29.8 | 12.3 | 9.6 | 18.9 | 11.5 | 31.4 | 20.9 | 20.2 | 8.1 | 14.3 | 38.1 | 11.2 | 38.1 | 17.5 | 28.2 | 20.8 | 31.5 | 21.1 | 10.6 |
| CR | | 12.8 | 10.5 | 11.9 | 10.1 | 7.9 | 11.6 | 4.3 | 11.6 | 6.0 | 11.6 | 13.3 | 9.1 | 12.9 | 8.6 | 8.9 | 12.0 | 7.7 | 8.5 | 8.5 | 11.8 |

## Table 13-4 Number 2 Test Recommended by CFM

| Product | WT % | Assays | | | | | Distribution % | | | | | CR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Au g/t | Ag g/t | Pb % | Zn % | Fe % | Au | Ag | Pb | Zn | Fe | |
| Feed | 100.0 | 3.3 | 75.0 | 3.9 | 6.4 | 4.4 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | |
| Pb Conc | 8.4 | 31.8 | 782.0 | 45.0 | 8.0 | 6.5 | 81.1 | 87.6 | 97.2 | 10.5 | 6.5 | 11.9 |
| Zn Conc | 15.7 | 1.4 | 51.0 | 0.2 | 55.8 | 9.6 | 6.0 | 8.3 | 0.8 | 88.3 | 15.0 | 10.1 |
| Tails | 75.9 | 0.6 | 4.0 | 0.1 | 0.1 | 4.3 | 12.9 | 4.1 | 2.0 | 1.2 | 72.7 | |

### 13.2.2 WESTCOAST MINERAL TESTING

The second set of metallurgical tests were performed during 2009 and 2010 by Westcoast Mineral Testing Inc. from North Vancouver, B.C., Canada. Westcoast commentaries about the CFM test are as follows:

- There is very good recovery and distribution of metals into two flotation concentrates.
- Of particular significance and economic importance are the elevated recoveries of gold and silver into the lead-copper (actually "bulk") concentrate.
- The composite contains galena and chalcopyrite in a ratio of 5.8:1. The recovery of copper, although not reported, was likely to be quite high based upon subsequent testing by Westcoast Mineral Testing Inc. This partially explains the low 45 % Pb grade of the lead concentrate, since a clean lead concentrate typically grades > 65 % Pb.
- The deposit contains significant visible gold, so there will be some temptation to consider a gravity concentration stage. This needs to be investigated, but the potential for theft of a highly valuable gravity concentrate also needs to be considered.
- The zinc concentrate grade at 55.8 % Zn with a very modest 2.6 % Fe indicates that the zinc is not significantly marmatitic, and either the modest pyrite (Py) content in the feed (1.3 % Py) did not float with the zinc or the Py was easily depressed with lime. Both of these flotation characteristics will improve concentrate grade and metal recovery.
- The testing reported excellent concentrate values, in part because of the good payable grades of gold and silver in the lead concentrate.

From 1977 when Fomento Minero ran its metallurgical test to 2009, a number of changes in practices of mineral processing were adopted in the industry and these were undertaken by Westcoast for its investigation. The 2009 testing program carried out by Westcoast included ten bench scale flotation tests to investigate three process variables: collectors, frothers and pH.

In October 2009, Altaley prepared five metallurgical composites, each of about 20 kg, all from diamond drill core assay rejects. From 40 to 69 individual samples were used to prepare each of four "zone" composites. An "overall composite" was prepared and was weight averaged to reflect the resource tonnage by zones, as shown in Table 13-5 and Table 13-6.

**Table 13-5 Distribution of "Overall Composite"**

| Zone | % Mass |
|---|---|
| Cinco de Mayo | 17 |
| El Creston | 42 |
| El Perdido | 14 |
| El Catorce | 27 |

**Table 13-6 Composite Assays**

| Zone | Au g/t | Ag g/t | Cu % | Pb % | Zn % |
|---|---|---|---|---|---|
| Cinco de Mayo | 1.70 | 58.00 | 0.45 | 0.92 | 2.29 |
| El Creston | 2.89 | 37.00 | 0.36 | 1.41 | 2.11 |
| El Perdido | 1.42 | 35.00 | 0.25 | 1.07 | 1.50 |
| El Catorce | 1.53 | 27.00 | 0.07 | 0.81 | 1.97 |
| **Overall Composite** | **2.11** | **38.00** | **0.28** | **1.12** | **2.02** |

Westcoast found that some of the composites exhibited modest oxidation of the base metals, averaging <5%. With that modest degree of oxidation, it is unlikely that economic justification exists to incur additional capital and operating costs to recover any oxidized base metals. Consequently, Westcoast did not develop processing performance characteristics for the oxidized material and Reyna agree with this consideration.

The composites were subjected to 15 bench scale flotation tests by Westcoast Mineral Testing of North Vancouver, BC (Hawthorn 2010). This test series evaluated flotation response to the following conditions including primary grind in the range P80 = 90 – 230 microns, several sphalerite depressants in the bulk Cu/Pb rougher stage, and Cu/Pb separation from the final bulk concentrate.

A summary of the copper – lead (bulk) rougher flotation stage results, showing only the "depressants" is shown in Table 13-7. Reagent additions are reported in g/t of feed. The best overall rougher stage recoveries and best selectivity, at nominal primary grinds of 60 % passing 200 mesh (P80 of 100 microns), are tabulated in Table 13-8.

**Table 13-7 2009 Flotation Testwork Results**

| Test | Comp | Grind $P_{80}$ (µm) | $ZnSo_4$ | NaCN | NaMBS | Rec to Cu/Pb Rougher Conc | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Cu % | Pb % | Zn % |
| 09-11 | Overall | 230 | | | | 61.9 | 74.9 | 52.5 |
| 09-12 | Overall | 105 | | | | 64.0 | 65.8 | 41.3 |
| 10-12 | Overall | 230 | 1000 | 200 | | 58.9 | 67.0 | 25.9 |
| 10-16 | Overall | 103 | 1000 | 200 | | 77.8 | 84.5 | 23.6 |
| 10-17 | Overall | 91 | 1000 | 200 | | 78.5 | 83.8 | 17.9 |
| 09-14 | Cinco | 230 | | | | 74.6 | 83.4 | 48.7 |
| 09-15 | Cinco | 230 | 500 | 100 | | 81.3 | 88.4 | 27.6 |
| 10-02 | Cinco | 230 | 1000 | | | 76.5 | 87.1 | 59.4 |
| 10-04 | Cinco | 117 | 1000 | 200 | | 79.8 | 87.6 | 26.3 |
| 10-05 | Cinco | 117 | | | 2000 | 75.7 | 83.0 | 72.8 |
| 10-06 | Cinco | 98 | 500 | 100 | | 88.6 | 98.8 | 16.4 |
| 10-03 | Creston | 92 | 1000 | | | 60.0 | 82.4 | 25.4 |
| 10-07 | Creston | 99 | 500 | 100 | | 81.6 | 87.7 | 30.6 |
| 10-09 | Creston | 100 | 500 | 100 | | 7.9 | 85.3 | 14.7 |
| 10-08 | Perdido | 92 | 500 | 100 | | 84.8 | 93.6 | 56.0 |

**Table 13-8 Best Westcoast Overall Rougher Flotation**

| Zone | Test | % Recovered | | | | |
|---|---|---|---|---|---|---|
| | | Au | Ag | Cu | Pb | Zn |
| Cinco de Mayo | 10-06 | 91.5 | 91.4 | 88.6 | 98.8 | 97.2 |
| El Creston | 10-07 | 83.4 | 78.7 | 81.6 | 87.7 | 53.2 |
| El Perdido | 10-08 | 82.5 | 74.2 | 84.8 | 93.6 | 64.9 |
| El Catorce | 10-09 | 87.2 | 83.5 | 73.9 | 98.3 | 87.7 |
| Arithmetic Average | | 86.1 | 82.0 | 82.2 | 94.6 | 75.8 |
| Overall Composite | 10-16 | 85.6 | 90.1 | 87.9 | 86.7 | 88.1 |

Although only preliminary in scope, the testing determined that a significant portion of the sphalerite is naturally floatable to the extent of 50 – 70 %.

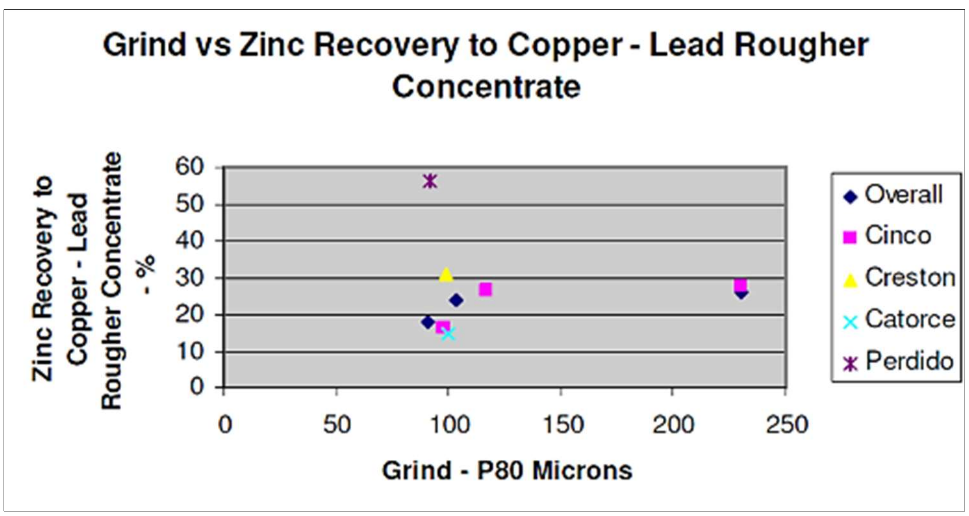
The addition of 2 kg/t of sodium metabisulphite (a source of sulphur dioxide) was not effective as a depressant, and neither was the addition of zinc sulphate without cyanide.

At this stage of the investigation, with the exception of El Perdido, 500 g/t of ZnSO4 and 100 g/t of NaCN is considered to be reasonably effective as a depressant, in that it reduces the zinc recovery into the bulk rougher concentrate to < 20 % at a grind of P80 of 90 – 100 microns.

Figure 13-1shows grind size versus Zn recovery to Cu/Pb rougher concentrate for only those tests in which both $ZnSO_4$ and NaCn were used. Note that primary grinds finer than P80 of 90 microns were not investigated, but it should be, since Figure 13-1 clearly shows decreasing zinc recovery into the copper rougher concentrate at finer grinds for both the "overall" and the Cinco de Mayo composites.

Although there are more data points for "Overall" and Cinco de Mayo, the data indicates that the selectivity is not as favorable for Creston and Perdido, consistent with the observations that were reported in Lehne (2009b).

**Figure 13-1 Grind Size vs Zn Recovery to Cu/Pb Rougher Concentrate**



Several tests included attempts to separate the copper and lead into two concentrates from the final bulk concentrate. The results were not consistent, but they suggest that NaCN is at least partially successful in depressing copper. Lehne (2009a) indicated that liberation is not an issue.

The typical best metallurgical balance from the "overall" composite, from test W-10-16, is shown in Table 13-9and Table 13-10.

The most effective reagent usage to date is shown in Table 13-11. ICP analyses for trace elements have identified the significant metals in the three flotation concentrates shown in Table 13-12 that will be considered to estimate the concentrates payment conditions.

**Table 13-9 Best Metallurgical Balance for Overall Composite (Grades)**

| Product | Mass % | Au g/t | Ag g/t | Cu % | Pb % | Zn % | Fe % | S % |
|---|---|---|---|---|---|---|---|---|
| Pb Conc | 1.7 | 95.9 | 1007.0 | 7.9 | 53.9 | 8.1 | 12.4 | 24.1 |
| Cu Conc | 0.7 | 49.9 | 1154.0 | 10.0 | 4.6 | 22.0 | 15.1 | 26.1 |
| Bulk 1 CC | 2.4 | 82.4 | 1050.0 | 8.5 | 39.4 | 12.2 | 13.2 | 24.7 |
| Bulk 1 CT | 2.9 | 1.2 | 71.0 | 0.5 | 1.2 | 6.7 | 8.1 | 5.5 |
| Bulk RC | 5.4 | 37.6 | 511.0 | 1.1 | 18.4 | 9.2 | 10.4 | 14.1 |
| Zn 2 CC | 2.4 | 5.6 | 106.4 | 0.9 | 0.8 | 55.3 | 8.6 | 33.2 |
| Zn 1/2 CT | 4.7 | 1.9 | 37.9 | 0.3 | 0.6 | 0.9 | 18.8 | 14.9 |
| Zn RC | 7.1 | 3.2 | 61.3 | 0.3 | 0.8 | 19.5 | 15.3 | 21.2 |
| O/A Rougher Conc | 12.4 | | | | | | | |
| Rougher Tail | 87.6 | 0.4 | 4.0 | 0.0 | 0.2 | 0.3 | 3.8 | 1.0 |
| Feed - Calc | 100.0 | 2.6 | 35.2 | 0.3 | 1.2 | 2.1 | 5.0 | 3.1 |

**Table 13-10 Best Metallurgical Balance for Overall Composite (Distribution)**

| Product | Au g/t | Ag g/t | Cu % | Pb % | Zn % | Fe % | S % |
|---|---|---|---|---|---|---|---|
| Pb Conc | 62.2 | 48.5 | 46.0 | 77.0 | 6.4 | 4.2 | 13.0 |
| Cu Conc | 13.5 | 23.2 | 24.4 | 2.7 | 7.3 | 2.1 | 5.9 |
| Bulk 1 CC | 75.7 | 71.4 | 70.4 | 79.7 | 13.7 | 6.4 | 18.9 |
| Bulk 1 CT | 1.3 | 6.0 | 5.1 | 3.0 | 9.3 | 4.8 | 5.2 |
| Bulk RC | 77.0 | 77.7 | 75.5 | 82.7 | 23.0 | 11.2 | 24.1 |
| Zn 2 CC | 5.2 | 7.3 | 7.6 | 1.6 | 63.0 | 4.2 | 25.7 |
| Zn 1/2 CT | 3.4 | 5.0 | 4.8 | 2.5 | 2.0 | 17.7 | 22.2 |
| Zn RC | 8.6 | 12.4 | 12.4 | 4.1 | 65.0 | 21.9 | 47.9 |
| O/A Rougher Conc | 85.6 | 90.1 | 87.9 | 86.7 | 88.1 | 33.0 | 72.0 |
| Rougher Tail | 14.4 | 9.9 | 12.1 | 13.3 | 11.9 | 67.0 | 28.0 |
| Feed - Calc | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

**Table 13-11 Optimal Reagent Additions from Testwork**

| Event | Reagent (g/t feed) | | | | | | |
|---|---|---|---|---|---|---|---|
| | DF250 | 3418A | CuSO5H20 | ZnSo4 | Ca(OH)2 | NaCN | pH |
| Grind | | | | 1000 | | 200 | |
| Bulk Rougher | yes | 14 | | | | | |
| Zn Conc | | 4 | 500 | | 2000 | | 10.5 |
| Zn Rougher | | | | | | | |
| Bulk Separation | yes | 25 | | | | 500-1000 | |
| Zn Cleaning | | 10 | | | yes | | 11.5 |

**Table 13-12 Flotation Concentrate Detailed Assays**

| Element | Unit | Pb Conc | Cu Conc | Zn Conc |
|---|---|---|---|---|
| Au | g/t | 66 | 125 | 4 |
| Ag | g/t | 1080 | 1450 | 100 |
| Cu | % | 10 | 10 | 0.7 |
| Pb | % | 50 | 10 | 0.6 |
| Zn | % | 5 | 18 | 62 |
| Fe | % | 13 | 18 | 5 |
| S | % | 23 | 23 | 31 |
| As | ppm | 230 | 270 | 70 |
| Sb | ppm | 1390 | 923 | 100 |
| Hg | ppm | 13 | 84 | 100 |
| Bi | ppm | 780 | 180 | 3 |
| Cd | ppm | 110 | 350 | 1350 |

The following parameters determined by Westcoast for the overall composite are as follows:

- The optimum primary grind will be P80 of 90 microns or finer.
- The role of regrinding, if there is any requirement at all, is unknown.
- Initial testing to separate the bulk copper / lead concentrate, was partially successful. Although the zinc grade was higher than that of the copper in the “copper concentrate” in test W-10-16 (Hawthorn 2010), it is anticipated that this product will be marketed as a copper concentrate to maximize the revenue from gold and silver.
- Future testing will need to focus on the optimum conditions for copper-lead separation.
- Future testing will need to evaluate the potential to divert the 7% of the zinc that reports to the copper concentrate, into the zinc flotation circuit.
- The overall composite responded reasonably well to the addition of 500 g/t of $ZnSO_4$ and 100 g/t of NaCN, suggesting that blending of fresh and supergene material may be satisfactory in the overall project.
- If El Perdido and to a lesser extent El Creston, represent a large portion of the plant feed at any time, the circuit may benefit from sequential feeding. This observation has not been evaluated, but it does represent a cautionary note for future testing.

The Westcoast recommendation for future testing was as follows:

- Alternative depressants and alternative addition rates in the bulk rougher circuit
- Alternative depressants in the copper-lead separation stage
- The role of finer primary grinding on zinc selectivity in the bulk rougher flotation stage. That may lead to the use of zinc depressants in the bulk cleaner circuit in an attempt to divert more of the zinc to the zinc concentrate.
- The role of regrinding
- Work Index testing
- Processing variability between the “fresh” and the “supergene” zones and the effect of randomly comingling of feed types.

### 13.2.3 EMIJAMEX TESTING

The following information is taken from the report of that study by Fomento (Rios, Castrejon, and Nieto, 1977a) and its English translation (Rios, Castrejon, and Nieto, 1977b). During Emijamex's exploration at the Sacramento de la Plata mine between 1975 and 1977, they sent a single 150 kg sample for flotation test work. The sample contained sphalerite and galena with minor chalcopyrite in a gangue of quartz, chlorite, hematite, pyrite, and limonite. Geochemical analysis of the sample is listed in Table 13-13. According to the translation of the metallurgical report (Rios, Castrejon, and Nieto, 1977b), "The screening of pulverized material through a -65 mesh indicates a degree of recovery of 82.7, 82.8 and 80.5% of free zinc, lead and copper respectively". The report concluded that milling should be between -65 and -100 mesh and that "the studied ore adapts easily to the process of concentration by flotation" (Rios, Castrejon, and Nieto, 1977b).

**Table 13-13 El Creston – Perdido Mineable Resource Grades**

| Au g/t | Ag g/t | Cu% | Pb% | Zn% |
|---|---|---|---|---|
| 3.00 | 53.00 | 0.24 | 3.50 | 6.40 |

In 2009 Hawthorn of Westcoast Mineral Testing Inc reviewed the Fomento report and stated that the results of this met test were very encouraging. It was observed that subsequent to the 1970's a number of processing changes have been either adopted or are preferred. These include:

- The zinc sulphate and sodium cyanide combination, although technically effective, is no longer preferred for sphalerite (Sph) depression in lead rougher flotation, having been "replaced" by sulphur dioxide in one of several chemical forms. SO2 is generally as effective as zinc sulphate – cyanide, and its use will eliminate the transport of the significantly more hazardous sodium cyanide. At this stage of the testing, the requirement for a Sph depressant has not been determined in any case, so the first test in any future testing program should be performed without any Sph depressant to investigate the natural partitioning of galena (Ga) and Sph.
- The use of cresylic acid (cresilico) as a frother has been replaced by glycol and MIBC, so it would not be used in any future investigation.
- In the case of the various collectors that were investigated, there are now more recent introductions that will provide improved selectivity.

### 13.2.4 COMPAÑIA MINERA SACRAMENTO DE LA PLATA HISTORIC CONCENTRATE PRODUCTION

Compañia Minera Sacramento de la Plata constructed a 50 tpd flotation plant to process mined material from El Creston and El Rey and operated in the 1970s for around 2 years.

Concentrates obtained during this period were delivered to the Peñoles smelter at Torreon, Coahuila. Data from the Servicio Geologico Mexicano published in the "Monografia Geologica Minera del Estado de Durango" indicate the concentrates produced in this plant and are shown in Table 13-14.

**Table 13-14 Historic Concentrates Production by Compañia Minera Sacramento de la Plata**

| Year | Au g/ton | Ag g/ton | Pb % | Cu % |
|---|---|---|---|---|
| 1979 | 90 | 615 | 52 | 0.93 |
| 1979 | 35 | 754 | 38 | 3.05 |
| 1980 | 18 | 903 | 41 | 5.4 |

## 13.3 METALLURGICAL TESTWORK REVIEW

For the metallurgic testwork review, it is important to take into consideration that Altaley is looking to initiate the exploitation of Tahuehueto in the El Creston – Perdido areas, based on the accessibility and quality of the resource. Table 13-15 shows a summary of the mineable resource defined for the El Creston and El Perdido areas. The metallurgic test performed by CFM comes from a composite taken from channel samples from different exposed old levels mainly in El Creston and El Rey. The Westcoast composite sample comes from core drilling of all the existing areas. This data is shown in Table 13-16.

**Table 13-15 El Creston – Perdido Mineable Resource Grades**

| Au g/t | Ag g/t | Cu% | Pb% | Zn% |
|---|---|---|---|---|
| 4.52 | 45.96 | 0.35 | 1.48 | 2.90 |

**Table 13-16 Comparative Assays from Composites and Mineable Resources**

| Area | Au g/t | Ag g/t | Cu % | Pb % | Zn % |
|---|---|---|---|---|---|
| El Crestón Cutoff 6 Mineable Resources | 5.11 | 44.88 | 0.31 | 1.40 | 2.96 |
| El Perdido Cutoff 6 Mineable Resources | 1.98 | 50.56 | 0.51 | 1.82 | 2.63 |
| El Crestón – Perdido Cutoff 6 Mineable Resources | 4.52 | 45.96 | 0.35 | 1.48 | 2.90 |
| Composite El Crestón By Drilling Core | 2.89 | 37.00 | 0.36 | 1.41 | 2.11 |
| Composite El Perdido By Drilling Core | 1.42 | 35.00 | 0.25 | 1.07 | 1.50 |
| Crestón – El Rey CFM Sample | 3.00 | 35.00 | 0.24 | 3.50 | 6.40 |

The assay of the sample used for CFM indicates much higher head grades for Pb and Zn in comparison to the 2009 resource estimated by Altaley. However, gold and silver grades were much closer to estimated grades.

The metallurgic investigation performed by Westcoast was based on a sample mainly composited from Creston and Cinco de Mayo areas and these zones show a different mineralogy and operating parameters from one to another.

Table 13-17 shows the parameters of the independent rougher metallurgical test for El Creston and El Perdido areas. The best Westcoast metallurgical balance for overall composite (grades) is indicated in Tables 13-9 and 13-10.

**Table 13-17 Westcoast Metallurgic Result from El Crestón and El Perdido Areas**

| Test | Area | Grind $P_{80}$ (µm) | ZnSO4 | NaCN | NaMBS | Rec to Cu/Pb Rougher Conc | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Cu % | Pb % | Zn % |
| 10-03 | Creston | 92 | 1000 | | | 60.0 | 82.4 | 25.4 |
| 10-07 | Creston | 99 | 500 | 100 | | 81.6 | 87.7 | 30.6 |
| 10-08 | Perdido | 92 | 500 | 100 | | 84.8 | 93.6 | 56.0 |

## 13.4 TESTWORK ANALYSIS

In order to confirm the previous metallurgical parameters, Altaley prepared a new bulk sample from the El Creston area only. The sample was integrated with samples from the different existing levels and in selected zones of the vein that meet the cut off 6 g/t Au of the mineable resource grades in order to have a more accurate representation of the grades that will be mined in a selective way and processed in future mill.

The sample was sequentially reduced to 25 kg for the metallurgic test; the assay of this sample resulted in the highest average of the minable resources and is shown in Table 13-18

**Table 13-18 Assay of the Composite Creston Sample to Confirm Previous Results**

| Au g/t | Ag g/t | Cu% | Pb% | Zn% |
|---|---|---|---|---|
| 7.76 | 65.0 | 0.14 | 4.90 | 6.58 |

The mineralogy, mineral characteristics, grindability, along with the other pertinent parameters discussed in the previous tests were considered for inclusion in this test program to prove up and confirm that process parameters will be similar for the ores developed from the El Creston areas with similar recoveries, and marketable concentrates.

Table 13-19 provides the metallurgic results for the Altaley confirmation Test 1. This test was carried out using the parameters and reagents defined by Comision de Fomento Minero, confirming that the material is suitable for a flotation process and that it is possible to produce a commercial Bulk Pb–Cu and Zn concentrates. The reagents used in the Test 1 are shown in Table 13-20.

**Table 13-19 Metallurgic Test 1 (CFM Parameters)**

| PRODUCT | MASS | ASSAYS | | | | | RECOVERY | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Au g/t | Ag g/t | Cu % | Pb % | Zn % | Au | Ag | Cu | Pb | Zn |
| Feed | 4000.00 | 8.66 | 89.05 | 0.178 | 3.89 | 6.69 | 100 | 100 | 100 | 100 | 100 |
| Conc Pb | 219.75 | 96.00 | 682.50 | 1.264 | 56.80 | 9.40 | 68.08 | 47.70 | 35.47 | 76.93 | 7.13 |
| Conc Zn | 407.00 | 3.00 | 71.70 | 0.283 | 0.79 | 48.80 | 3.94 | 9.28 | 14.71 | 1.99 | 68.57 |
| Medios Pb | 229.20 | 17.40 | 213.80 | 0.701 | 7.60 | 11.57 | 12.87 | 15.59 | 20.52 | 10.74 | 9.15 |
| Medios Zn | 248.57 | 3.20 | 56.80 | 0.306 | 2.50 | 3.09 | 2.57 | 4.49 | 9.71 | 3.83 | 2.65 |
| Tails | 2895.48 | 1.34 | 24.91 | 0.053 | 0.37 | 1.25 | 12.55 | 22.94 | 19.60 | 6.79 | 12.49 |
| Feed Calc | | 7.75 | 78.60 | 0.196 | 4.06 | 7.242 | 100 | 100 | 100 | 100 | 100 |
| Rec Calc | | | | | | | 87.45 | 77.06 | 80.40 | 93.49 | 87.51 |

**Table 13-20 Reagents of Test 1**

| Reagent | Time | PH | ZnSO4 | NaCN | AF-242 | CAL | CuSO4 | AF-211 | X-343 | Mibc 70 |
|---|---|---|---|---|---|---|---|---|---|---|
| Molienda #1 | 30 min | 7.5 | 4 g | 0.5 g | | | | | | |
| Molienda #2 | 30 min | 7.5 | 4 g | 0.5 g | | | | | | |
| Flot PB-CU | 10 min | 7.5 | | | 20g/t | | | | | 30 g/t |
| LIMPIA PB-CU#1 | 2 min | 7.5 | | | | | | | | |
| FLOT ZN | 10 min | 11.5 | | | | | | 40 g/ton | 40 g/t | 20 g/t |
| LIMPIA ZN #1 | 2 min | 11.5 | | | | | | | | |
| ACOND PB-CU | 5 min | 7.5 | | | 40 g/t | | | | | |
| ACOND ZN | 5 min | 11.5 | | | | 3 g/kg | 2 g/kg | | | |

Based on the results of the Test 1, a second test was performed, using the same sample in order to confirm the results of the Test 1 but using innovative reagents like Xantato, promoters AF-404 and AF-242, and canceling the use of NaCN for environmental considerations.

The metallurgical balance of the confirmation Test 2 is indicated in Table 13-21 and Table 13-22 lists the parameter and reagents used in the Test 2. No leaching test were run due to the minimum amount of lead concentrates remaining and available. NaCN will be cancelled with AF 404 and AF 242 promotors

**Table 13-21 Metallurgic Test 2**

| Product | Weight | Assays | | | | | Content Tons | | | Content KG | | Recuperations | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Cu % | Pb % | Zn % | Au g/t | Ag g/t | Cu | Pb | Zn | Au | Ag | Cu | Pb | Zn | Au | Ag |
| Head | 4000 | 0.178 | 3.890 | 6.690 | 8.660 | 89.050 | 7.120 | 155.600 | 267.600 | 34.640 | 356.200 | 100 | 100 | 100 | 100 | 100 |
| Conc Pb | 219.75 | 1.264 | 56.800 | 9.400 | 96.000 | 682.500 | 2.778 | 124.820 | 20.660 | 21.100 | 149.980 | 35.47 | 76.93 | 7.13 | 68.08 | 47.7 |
| Conc Zn | 407 | 0.283 | 0.790 | 48.800 | 3.000 | 71.700 | 1.152 | 3.232 | 198.620 | 1.220 | 29.180 | 14.71 | 1.99 | 68.57 | 3.94 | 9.28 |
| Medios Pb | 229.2 | 0.701 | 7.600 | 11.570 | 17.400 | 213.800 | 1.607 | 17.419 | 26.520 | 3.990 | 49.000 | 20.52 | 10.74 | 9.15 | 12.87 | 15.59 |
| Medios Zn | 248.57 | 0.306 | 2.500 | 3.090 | 3.200 | 56.800 | 0.761 | 6.214 | 7.680 | 0.800 | 14.120 | 9.7 | 0.83 | 2.65 | 2.57 | 4.49 |
| Colas | 2895.5 | 0.053 | 0.370 | 1.250 | 1.340 | 24.910 | 1.535 | 10.569 | 36.190 | 3.890 | 72.130 | 19.6 | 6.79 | 12.49 | 12.55 | 22.94 |
| Calc Head | | 0.196 | 4.060 | 7.242 | 7.750 | 78.600 | 7.831 | 162.250 | 289.670 | 30.990 | 314.420 | 100 | 100.28 | 100 | 100 | 100 |
| **Recoveries Using Calculated Head** | | | | | | | | | | | | **80.4** | **93.49** | **87.51** | **87.45** | **77.06** |

**Table 13-22 Parameters of Metallurgic Test 2**

| Parameter | | Time | pH | $ZnSO_4$ | NaCN | Af-242 | Cal | $CuSO_4$ | AF-211 | X-343 | Mibc 70 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Molienda #1 | 2000 | 30 min | 7.5 | 4 g | 0.5 g | | | | | | |
| Molienda #2 | 2000 | 30 min | 7.5 | 4 g | 0.5 g | | | | | | |
| Flot Pb-Cu | | 10 min | 7.5 | | | 20 g/t | | | | | 30 g/t |
| Limpia Pb-Cu#1 | | 2 min | 7.5 | | | | | | | | |
| Flot Zn | | 10 min | 11.5 | | | | | | 40 g/t | 40 g/t | 20 g/t |
| Limpia Zn #1 | | 2 min | 11.5 | | | | | | | | |
| Acond Pb-Cu | | 5 min | 7.5 | | | 40 g/t | | | | | |
| Acond Zn | | 5 min | 11.5 | | | | 3 g/t | 2 g/t | | | |

## 13.5 RECOMMENDATIONS BASED ON TESTWORK

Based on metallurgical tests performed to date, the following conclusions and recommendations were made for the mill design:

- The previous metallurgical campaigns provide sufficient data to reach a high level of confidence that the floatation process chosen will work, flotation targets are attainable, and an economical concentrate can be produced.
- For the economic analysis and plant design it is recommended to use the result of the last confirmation metallurgical test run by Altaley, specifically for the use of new reagents and have extra capacity for processing high grade ores.
- Primary grind the material for processing to under 80% passing 200 mesh (P80 of 100 microns).
- Use reagents recommended by Altaley Test 2, indicated in Table 13.22.
- Consider in the mill design the installation of a copper flotation section.
- Run a two more industrial tests of 3,500 to 5,000 tonne from the lower portion of the El Creston zone and the other from Cinco de Mayo Zone to test and determine recoveries for the different types of ore mineralization within those zones.
- Sell the produced concentrates of the industrial test, in order to prove the sales term for the Tahuehueto concentrates.
- If the industrial test result proves an economic benefit and cash generator for Altaley, continue processing the material produced from the mine development until the Tahuehueto mill is ready to work.

Based on metallurgical tests performed to date, along with independent mass balance calculations, and production metrics from similar polymetallic milling operations, the following is the recommended distribution percentages for the mill design and economic analysis. The metallurgical recoveries are presented in Table 13-23.

**Table 13-23 Tahuehueto Average Metallurgical Recoveries**

| Product | kTonnes | Distribution % (Recoveries) | | | | |
|---|---|---|---|---|---|---|
| | | Au | Ag | Cu | Pb | Zn |
| Head | 3,550 | 100% | 100% | 100% | 100% | 100% |
| Pb Concentrate | 58 | 77.1% | 62.8% | 31.6% | 85.5% | 1.6% |
| Cu Concentrate | 18 | 6.8% | 10.3% | 51.4% | 0.6% | 17.1% |
| Zn Concentrate | 108 | 11.0% | 11.7% | 11.5% | 6.1% | 80.0% |
| Tails | 3,366 | 5.4% | 15.2% | 5.4% | 7.8% | 1.3% |

## 13.6 TOLL TREATMENT RUNS

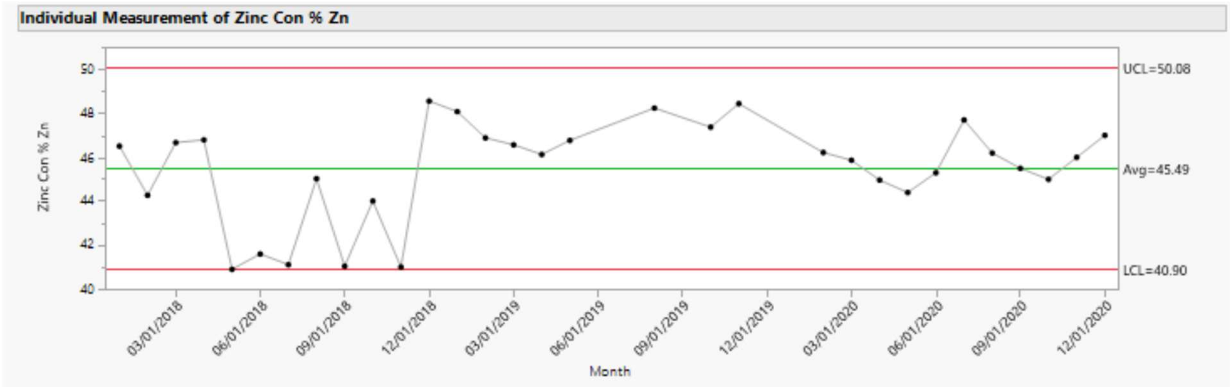
During the period Jan 2018 through December 2020, ore from Tahuehueto was toll processed to make independent zinc and lead concentrates. A total of 83.9 kt of zinc concentrate were produced and sold with an average Zn grade of 45.5 percent and average silver grade of 444.2 g/t. Lead concentrates produced totaled 17.8 kt with an average lead grade of 26.2 percent with silver and gold grades averaging 880.8 g/t and 32.3 g/t respectively. Monthly concentrate production KPIs are presented in Table 13-24.

**Table 13-24: Pertinent Toll Treatment KPIs**

| | Zinc Con | | | | Lead Con | | | |
|---|---|---|---|---|---|---|---|---|
| Month | tones | % Zn | (g/t) Ag | (g/t) Au | tones | % Pb | (g/t) Ag | (g/t) Au |
| Jan-18 | 2,667.58 | 46.51 | 598.42 | 11.41 | 596.91 | 32.37 | 1,492.97 | 116.38 |
| Feb-18 | 3,070.97 | 44.28 | 398.00 | 2.24 | 366.96 | 24.34 | 582.24 | 9.05 |
| Mar-18 | 3,137.09 | 46.67 | 494.20 | 8.86 | 662.89 | 35.99 | 1,665.76 | 117.60 |
| Apr-18 | 3,890.68 | 46.80 | 424.79 | 7.48 | 748.02 | 39.61 | 1,743.81 | 115.21 |
| May-18 | 4,512.01 | 40.91 | 362.96 | 1.23 | 562.47 | 28.10 | 678.78 | 5.92 |
| Jun-18 | 3,340.74 | 41.61 | 372.53 | 0.95 | 893.65 | 25.24 | 592.86 | 4.73 |
| Jul-18 | 3,521.15 | 41.12 | 310.97 | 1.06 | 653.20 | 23.53 | 563.91 | 4.34 |
| Aug-18 | 4,853.74 | 45.03 | 456.26 | 9.14 | 891.41 | 31.56 | 1,468.56 | 74.93 |
| Sep-18 | 1,200.68 | 41.05 | 308.40 | 0.95 | 406.75 | 23.31 | 710.88 | 3.94 |
| Oct-18 | 4,384.73 | 44.02 | 398.39 | 7.28 | 912.76 | 32.88 | 1,567.29 | 67.54 |
| Nov-18 | 3,199.73 | 41.01 | 349.52 | 1.12 | 463.58 | 20.85 | 652.24 | 3.80 |
| Dec-18 | 2,797.41 | 48.56 | 511.15 | 6.91 | 1,225.48 | 30.61 | 1,534.15 | 74.69 |
| Jan-19 | 3,423.03 | 48.08 | 517.16 | 6.81 | 803.42 | 18.23 | 1,492.16 | 5.01 |
| Feb-19 | 2,754.26 | 46.89 | 564.93 | 10.45 | 785.11 | 32.09 | 635.12 | 85.56 |
| Mar-19 | 3,194.58 | 46.57 | 540.19 | 1.19 | 750.17 | 28.72 | 651.57 | 4.16 |
| Apr-19 | 3,330.89 | 46.13 | 529.98 | 1.53 | 885.31 | 24.67 | 606.55 | 4.93 |
| May-19 | 3,326.65 | 46.77 | 416.82 | 1.07 | 608.26 | 24.44 | 718.22 | 3.97 |
| Aug-19 | 230.24 | 48.24 | 109.00 | 10.90 | 168.23 | 39.99 | 862.00 | 115.25 |
| Oct-19 | 1,135.531 | 47.38 | 474.18 | 8.66 | 30.373 | 34.33 | 1,014.50 | 77.86 |
| Nov-19 | 37.538 | 48.44 | 525.50 | 29.60 | 205.779 | 26.88 | 703.00 | 33.96 |
| Feb-20 | 1,647.30 | 46.22 | 503.39 | | 561.93 | 19.68 | 635.51 | 3.74 |
| Mar-20 | 3,839.50 | 45.87 | 435.84 | | 564.03 | 22.04 | 771.26 | 4.16 |
| Apr-20 | 808.83 | 44.97 | 374.20 | | 170.92 | 21.59 | 737.50 | 4.70 |
| May-20 | 804.02 | 44.40 | 411.00 | | 262.62 | 18.24 | 946.00 | 4.50 |
| Jun-20 | 3,582.42 | 45.30 | 425.78 | | 761.31 | 21.30 | 827.51 | 6.94 |
| Jul-20 | 2,057.78 | 47.70 | 445.00 | | 506.16 | 21.80 | 660.00 | 4.50 |
| Aug-20 | 1,353.94 | 46.20 | 450.00 | | 462.92 | 22.10 | 530.00 | 5.20 |
| Sep-20 | 3,068.42 | 45.50 | 460.00 | | 663.21 | 22.60 | 560.00 | 6.60 |
| Oct-20 | 3,148.79 | 45.00 | 500.00 | | 692.60 | 21.50 | 500.00 | 6.00 |
| Nov-20 | 4,001.84 | 46.00 | 560.00 | | 91.74 | 22.00 | 590.00 | 3.80 |
| Dec-20 | 1,570.17 | 47.00 | 540.00 | | 478.87 | 22.05 | 610.00 | 23.00 |
| Total | 83,892.22 | | | | 17,837.04 | | | |
| Average | | 45.49 | 444.15 | 6.44 | | 26.21 | 880.79 | 32.32 |

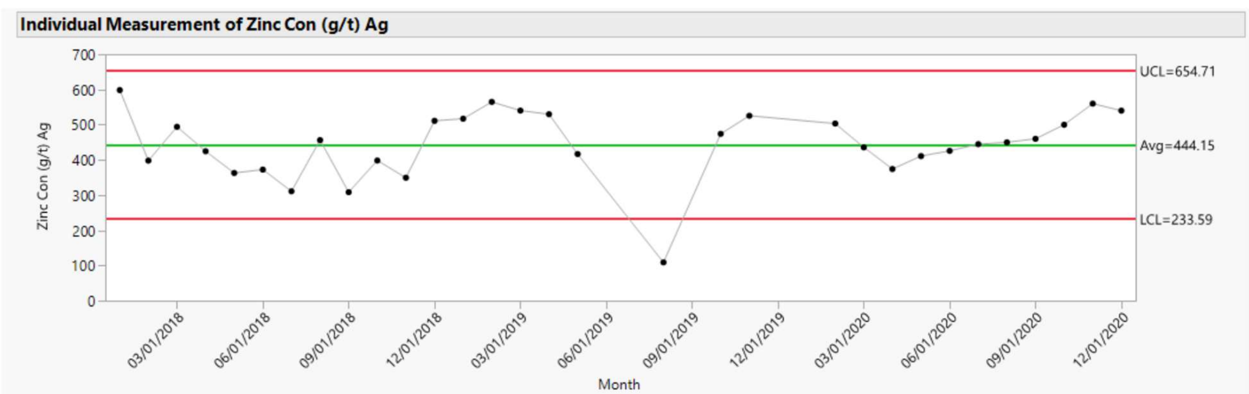
Figures 13-2 through 13-5 present control charts of the various monthly concentrate production KPIs. As shown initial Zinc concentrate Zn grades varied considerably until stabilizing in December 2018, this is likely due to a change in ore source.

**Figure 13-2: Toll Treatment Zinc Con Zn Grade Control Chart**




Zinc concentrate silver grades were fairly stable throughout the campaigns except for the month of July 2019. The root cause of this drop is unknown at the time of writing, but highly likely owing to a change in ore type.

**Figure 13-3: Toll Treatment Zinc Con. Ag Grade Control Chart**




Lead concentrate lead grades were a bit erratic until May 2019, but stabilized beginning October 2019. Lead concentrate silver grades we also erratic until January 2019. Both of these periods with compared the Zinc concentrate grades indicate a variability in ore type.

**Figure 13-4: Toll Treatment Lead Con. Pb Grade Control Chart**

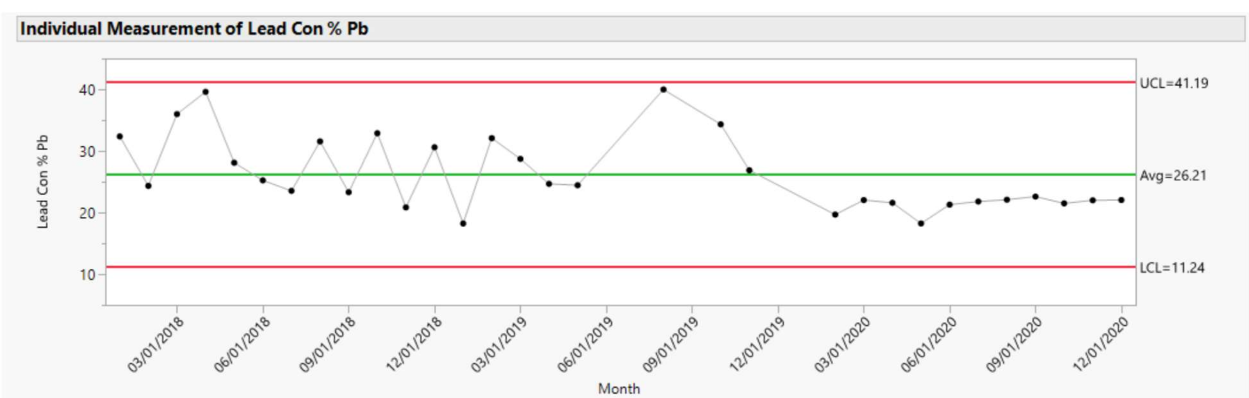
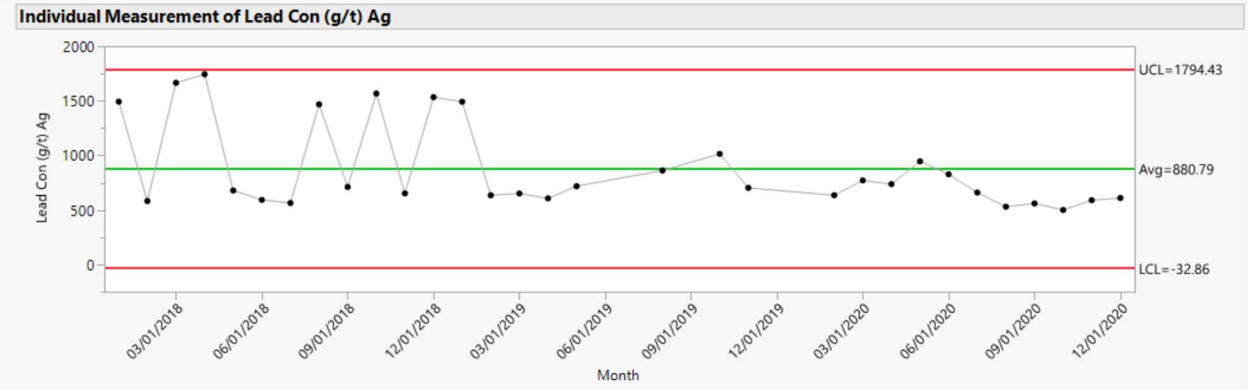


**Figure 13-5: Toll Treatment Lead Concentrate Ag Grade Control Chart**




Metallurgical performance during the toll treatment campaigns, although not performed in a "optimized circuit configuration", provide more than enough evidence that the Tahuehueto ore types are amenable to flotation processing.

# 14 MINERAL RESOURCE ESTIMATES

The global mineral resource estimate was prepared based on a resource model constructed using Vulcan Geomodeller® scientific software. The Tahuehueto mineral resource was estimated using Inverse Distance Weighting (IDW) interpolation techniques.

Tahuehueto hosts a polymetallic assemblage of mineralization. Mineralization contains anomalous quantities of gold (Au), silver (Ag), copper (Cu), lead (Pb) and zinc (Zn). These metals are present in large continuous vein systems which have been identified throughout the Property. Three-dimensional vein models were used as the sources for the volumetric determinations of the resource model. Metals contained within each model block were estimated using Inverse Distance Cubed (ID3) interpolation methods.

Mineral Resources for the Project were determined based on a statistical analysis of data from 215 diamond drillholes totaling 44,857m, 37 reverse circulation drillholes totaling 3,668m and 1,812 underground channel samples totaling 3,644m. A three-dimensional geology model combining veins and stratigraphic units was used to constrain the Mineral Resource Estimate. Two resource models were built to encompass the seven areas of El Creston, El Perdido, El Catorce, Cinco de Mayo, El Rey, Santiago and Texcalama. The resource models use block sizes ranging from 1.5 x 1.5 x 1.5 meters to 3 x 3 x 3 meters depending on geologic continuity and geometry. Resource classification into measured, indicated, and inferred categories was based on the number of drillholes, distances to nearest drillholes and visually.

## 14.1 RESOURCE DATABASE

A model was created for estimating the gold, silver, copper, lead, and zinc resources at Tahuehueto from data generated by Altaley, including detailed geologic mapping, RC and core drilling data, underground sampling, and project topography derived from one-meter resolution IKONOS imagery. These data were incorporated into a digital database using the UTM Zone 13 NAD27 Mexico coordinate system

## 14.2 SOLID BODY MODELING

Various structures provide the primary controls of the mineralization at Tahuehueto. The Cinco de Mayo (including the El Catorce area), El Perdido, and Santiago mineralization lie along a structural zone that strikes 045˚ to 055˚ and dips 60˚ to 80˚ to the southeast. The El Rey deposit lies to the northwest along a subparallel structure striking 060˚ and dipping very steeply to the southeast, and mineralization at El Creston is primarily controlled by a structural zone that strikes 030˚ to 035˚ and dips to the southeast. Mineralization in most of these structures consists more of a zone of irregular veins and veinlets than single, well-defined veins. The strongest and most continuous zones of mineralization generally correlate positively with quartz veining and, in unoxidized zones, increases in sulfide minerals.

Altaley provided RDA with a three-dimensional wireframe interpretation of the principal mineralized structures at Tahuehueto. These were used as hard boundaries for the extrapolation of mineralized grades.

Oxidized and partially oxidized zones were delineated from unoxidized zones by means of a three-dimensional surface created by Altaley staff. RDA used this surface in the modeling of the resources, as discussed below, after checking it against drill-hole oxidation codes in the project database.

There is a relatively minor amount of underground workings within the Cinco de Mayo, El Creston, and El Rey areas. These workings consist primarily of exploration-type drifts along mineralized structural zones and minor crosscuts. There is no modern stoping in any of the El Creston or Cinco de Mayo workings, but two raises have been developed between levels 9 and 10 in El Creston. There is one raise to surface from the Cinco de Mayo South adit, and there is a small stope in El Rey between levels 3 and 4.

The underground workings were either surveyed, when possible, but more commonly, digitized plan maps of the workings created by previous operators were used; the plan maps of the workings are located in UTM space based on the surveyed entrances of the portals.

Vertical cross sections oriented orthogonal to the average strike of each mineralized area at Tahuehueto were used to develop 3-D geologic vein models. The sections were spaced at 50 m intervals at Cinco de Mayo and 25 m intervals at El Creston, El Perdido, and Santiago; some sections at Cinco de Mayo were skipped due to lack of drill data, leading to occasional 100 m-spaced sections. The drill-hole traces, underground sample data, topographic profile, surface structural mapping data, were all used in the definition of the Tahuehueto geologic model.

The models are meant to capture the gross geological sense of the mineral deposit. In this case the stockwork was modeled and then the veins internal to the stockwork were modeled. The interpretations of the two zones lead the creation of solid geologic models of the mineral body. These solid are used for coding a block model with the different material types and to ensure that geologic controls are used in the grade estimation process.

## 14.3 GRADE CAPPING

Treatment of outliers is generally a perplexing problem. There is no generally accepted solution of handing outliers; however, diligence needs to be exerted with the assay database to ensure the ability to estimate the true average grade of the mineral deposit. Therefore, a generally accepted practice of capping grades at the 90$^{th}$ through 99$^{th}$ percentile has been employed to limit the impact of high-grade outliers for the deposit Table 14-1 lists the grade capping parameters for each of the five metal grades.

**Table 14-1 Capping values**

| Au g/t | Ag g/t | Cu % | Pb % | Zn % |
|---|---|---|---|---|
| 30 | 120 | None | 10 | 10 |

## 14.4 COMPOSITING

Compositing reduces the impact of short assay intervals and helps to better estimate the average grade of the deposit. Compositing incorporates a certain amount of dilution into the raw assay data prior to estimation. The mining operation envisioned for the Project, underground, will be at a larger scale than the assays sampled for the deposit. The selective mining unit for the Project is expected to be 1.5 m, therefore, the assays for the database have been composited to 1.5 m. Composites are length weighted down hole composites of the capped metal assay values.

## 14.5 BLOCK MODEL

The resource block models for the Tahuehueto Project subdivide the deposit into 3m-by-3m-by-3m cubed blocks. The contact between stockwork and veins was further subdivided into 1.5m by 1.5m by 1.5m blocks. All of the required information about the deposit is stored in each individual block. This includes estimated characteristics of Au, Ag, Cu, Pb and Zn. grades. Statistical characteristics such as kriging variances, number of samples used in an estimate, distances to the nearest drill hole, etc., are also stored in each individual block for descriptive evaluations. Physical information stored in the blocks can include rock types, bulk densities, contained metal and alteration is stored in order to evaluate engineering, production and geotechnical parameters that might be utilized to determine the viability of mining the deposit.

Due to the nature and complexity of the geologic model of Tahuehueto, two separate block models were created to handle the deposit. The model dimensions are listed in Table 14-2 and Table 14-3 .

**Table 14-2 Cinco de Mayo/Catorce/Texcalama Model Dimensions**

| Item | X | Y | Z |
|---|---|---|---|
| Orientation/Bearing | 38 | 308 | Vertical |
| Model Origin | 336857 | 2811000 | 690 |
| Minimum Block Offset | 0 | 0 | 0 |
| Maximum Block Offset | 1350 | 750 | 600 |
| Minimum Block Size | 1.5 | 1.5 | 1.5 |
| Maximum Block Size | 3 | 3 | 3 |
| Number of Blocks | 900 | 500 | 400 |

**Table 14-3 El Creston/El Perdido/Santiago/El Rey Model Dimensions**

| Item | X | Y | Z |
|---|---|---|---|
| Orientation/Bearing | 52 | 322 | Vertical |
| Model Origin | 337407 | 2812277 | 1990 |
| Maximum Block Offset | 1860 | 660 | 960 |
| Minimum Block Size | 1.5 | 1.5 | 1.5 |
| Maximum Block Size | 3 | 3 | 3 |
| Number of Blocks | 1240 | 440 | 640 |

## 14.6 RESOURCE ESTIMATION METHODOLOGY

Metal grades for the mineral resource are estimated using Inverse Distance Weighting. Inverse distance methods are a suite of weighted average estimation methods. These result in estimates that are smoothed versions of the original sample data. Inverse distance methods are based on calculating weights for the samples based on the distance from the samples to the centroid of a model block. This is essentially a linear estimate where sample weights are assigned to composite values for all composites used in the estimate. The calculation of the weights is based on the inverse of the distance between the composite and the center of the block being estimated. Sample weights are standardized to a sum of 1 to ensure there is not a globally biased estimate. In the mining industry there are two common exponents used, Inverse Distance squared (ID2) and Inverse Distance cubed (ID3). ID3 is used when large weights are desired for the closest composites. This is applicable when the variable being estimated is erratic and the current data spacing is large relative to the data that would be available for mineral boundary decision making. Such as with poly-metallic grade distributions. ID3 methodologies are widely used in the mining industry and have proven through the decades to be an acceptable and reliable methodology for the estimation of metal distributions in numerous mineral deposits. Metal grades were estimated using Inverses Distance to the third power. The general procedure for creation of the metal model was as follows:

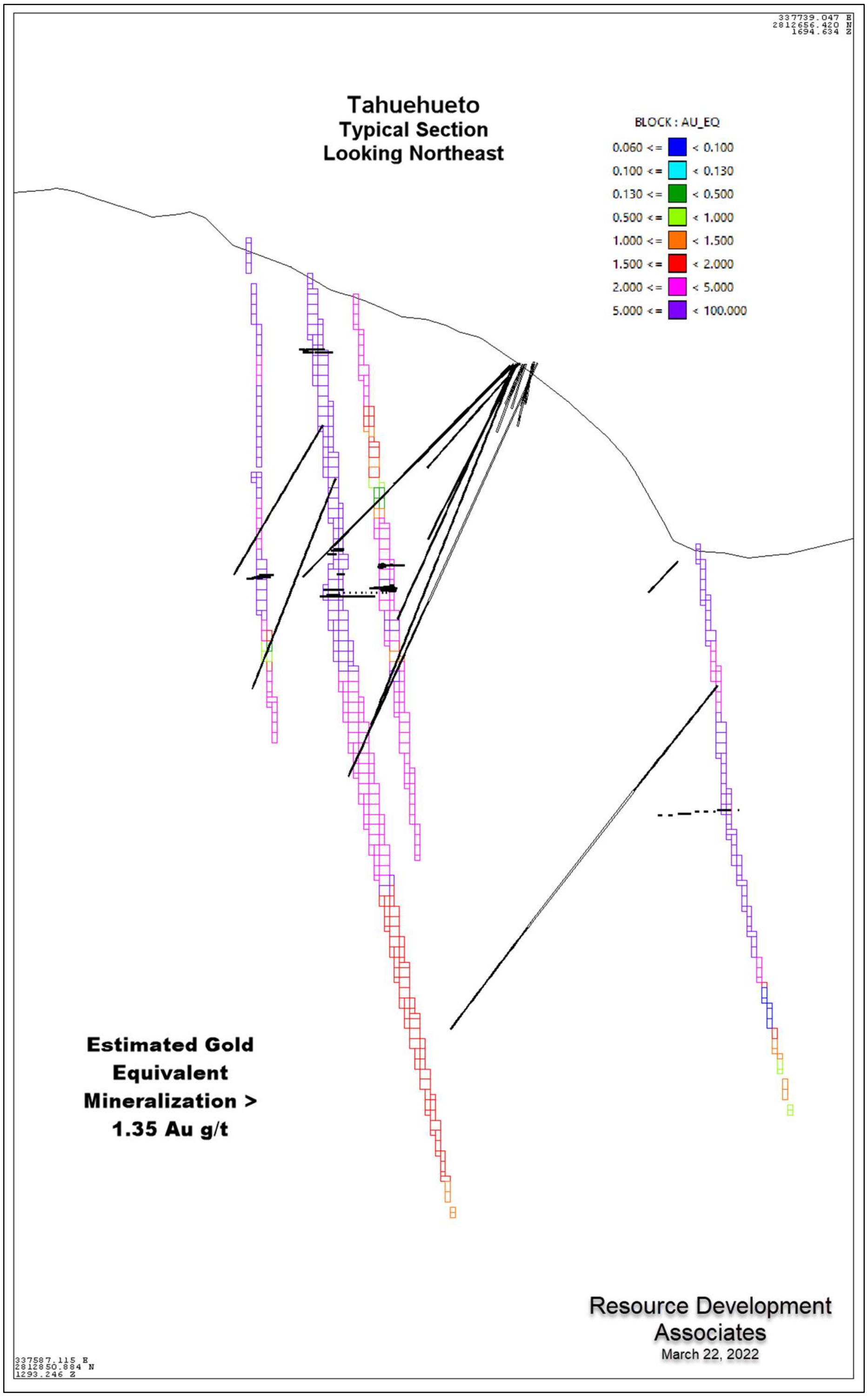
- The major axis of the search ellipse was oriented at the same angles as the geologic structures of each deposit.
- A composite had to be a minimum of 1 m, or half the SMU, in order to be used in the grade estimation run.
- Estimates were calculated in 3 passes to recognize increasing levels of confidence in the estimate of mineralization. This is a critical step to determine mineral classification for the deposits.
- Gold, Silver, Copper, Lead and Zinc are estimated using similar parameters.

The grade estimation parameters are listed in Table 14-4. Figure 14-1 shows a typical section through Creston and El Perdido.

**Table 14-4 Tahuehueto Estimation Parameters in Vulcan Format**

| Deposit | Estimation Pass | Rotation about Z Axis | Rotation about X Axis | Rotation about Y Axis | Major Axis Length | Semi Major Axis Length | Minor Axis Length | Minimum Samples | Maximum Samples |
|---|---|---|---|---|---|---|---|---|---|
| Cinco de Mayo | 1 | 12 | 51 | -51 | 30 | 15 | 20 | 2 | 15 |
| | 2 | 12 | 51 | -51 | 90 | 45 | 20 | 2 | 15 |
| | 3 | 12 | 51 | -51 | 300 | 240 | 45 | 2 | 15 |
| El Catorce | 1 | 12 | 51 | -51 | 30 | 15 | 20 | 2 | 15 |
| | 2 | 12 | 51 | -51 | 90 | 45 | 20 | 2 | 15 |
| | 3 | 12 | 51 | -51 | 300 | 240 | 45 | 2 | 15 |
| El Creston | 1 | 33 | 72 | 84 | 60 | 30 | 25 | 2 | 15 |
| | 2 | 33 | 72 | 84 | 120 | 60 | 35 | 2 | 15 |
| | 3 | 33 | 72 | 84 | 240 | 120 | 45 | 2 | 15 |
| El Perdido | 1 | 44 | 61 | -80 | 60 | 30 | 25 | 2 | 15 |
| | 2 | 44 | 61 | -80 | 120 | 60 | 35 | 2 | 15 |
| | 3 | 44 | 61 | -80 | 240 | 120 | 45 | 2 | 15 |
| Santiago | 1 | 39 | 61 | -61 | 60 | 30 | 25 | 2 | 15 |
| | 2 | 39 | 61 | -61 | 120 | 60 | 35 | 2 | 15 |
| | 3 | 39 | 61 | -61 | 240 | 120 | 45 | 2 | 15 |
| El Rey | 1 | 70 | -85 | -75 | 60 | 30 | 25 | 2 | 15 |
| | 2 | 70 | -85 | -75 | 120 | 60 | 35 | 2 | 15 |
| | 3 | 70 | -85 | -75 | 240 | 120 | 45 | 2 | 15 |
| Texcalama | 1 | 12 | 51 | -51 | 30 | 15 | 20 | 2 | 15 |
| | 2 | 12 | 51 | -51 | 90 | 45 | 20 | 2 | 15 |
| | 3 | 12 | 51 | -51 | 300 | 240 | 45 | 2 | 15 |

**Figure 14-1 Cross Section through Section 3075 Looking 30 Northeast**



## 14.7 MINERAL RESOURCE CLASSIFICATION

The mineral resources in this report were estimated in accordance with the definitions contained in the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Standards on Mineral Resources and Reserves Definitions and Guidelines that were prepared by the CIM Standing Committee on Reserve Definitions and adopted by the CIM Council.

Mineral resource classification for the Project is based on the three passes that were used for mineral estimation. As described in Table 14-4:

- Pass 1 = Measured Mineral Resources
- Pass 2 = Indicated Mineral Resources
- Pass 3 = Inferred Mineral Resources

## 14.8 MINERAL RESOURCE ESTIMATE

Mineral resources have been limited to mineralized material that occurs within the mineralized blocks and which could be scheduled to be processed based on a defined cut-off grade. All other material was characterized as non-mineralized material.

The "reasonable prospects for eventual economic extraction" requirement generally imply that the quantity and grade estimates meet certain economic thresholds and that the mineral resources are reported at an appropriate cut-off grade that takes into account extraction scenarios and processing recoveries. The deposit metallic mineralization is amenable for extraction by conventional underground mining methods. In order to determine the quantities of material offering "reasonable prospects for eventual economic extraction" for mining, the author determined an internal economic cut-off grade based on gold equivalence. Metal values were calculated to a gold price per gram basis to be combined with gold grades to estimate gold equivalence. Calculations and metal prices used to determine AuEq grades are listed in Table 14-5 and Table 14-6, respectively.

**Table 14-5 Gold Equivalence Grade Calculations**

| Gold Equivalence Grade Calculations |
|---|
| Ag Value = (Ag gpt*Ag Price)/Au Price |
| Cu Value = ((((Cu%/100) *sg*volume) *1,000,000) *Cu Price)/Au Price/(sg*volume) |
| Pb Value = ((((Pb%/100) *sg*volume) *1,000,000) *Pb Price)/Au Price/(sg*volume) |
| Zn Value = ((((Zn%/100) *sg*volume) *1,000,000) *Zn Price)/Au Price/(sg*volume) |
| **AuEq gpt = Au gpt + Ag Value + Cu Value + Pb Value + Zn Value** |

**Table 14-6 Metal Prices Used for Mineral Resource Estimates**

| Metal | Units | Value |
|---|---|---|
| Gold | $/oz | 1,650 |
| Silver | $/oz | 21.02 |
| Copper | $/lb | 3.70 |
| Lead | $/lb | 0.91 |
| Zinc | $/lb | 1.15 |

Mineral resources for the Tahuehueto Project are reported at an AuEq grade of 1.35 g/t. Table 14-7 lists the current Mineral Resource Estimate by classification and mineralized inventory for the Project.

**Table 14-7 Tahuehueto Project Measured, Indicated, and Inferred Mineral Resource Estimate**

| Classification | kTonnes | Ag Grade (gpt) | Cont Ag kOz | Au Grade (gpt) | Cont Au kOz | Cu Grade (%) | Cont Cu klbs | Pb Grade (%) | Cont Pb klbs | Zn Grade (%) | Cont Zn klbs |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Measured | 3,875 | 48.54 | 6,047 | 2.42 | 302 | 0.27 | 23,215 | 1.11 | 94,967 | 2.01 | 171,481 |
| Total Indicated | 2,385 | 44.43 | 3,407 | 1.60 | 123 | 0.25 | 13,379 | 0.55 | 28,905 | 1.94 | 101,883 |
| **Total Measured and Indicated** | **6,260** | **46.97** | **9,454** | **2.11** | **425** | **0.27** | **36,594** | **0.90** | **123,872** | **1.98** | **273,364** |
| Total Inferred | 918 | 28.46 | 840 | 1.02 | 30 | 0.15 | 3,077 | 1.16 | 23,571 | 1.96 | 39,755 |

Mineral resources are inclusive of mineral reserves. Mineral resources that are not mineral reserves do not have demonstrated economic viability. Mineral resource estimates do not account for mineability, selectivity, mining loss and dilution. These mineral resource estimates include inferred mineral resources that are normally considered too speculative geologically to have economic considerations applied to them that would enable them to be categorized as mineral reserves. There is also no certainty that these inferred mineral resources will be converted to measured and indicated categories through further drilling, or into mineral reserves, once economic considerations are applied.

Sections 14.8.1 through 14.8.7 include tables of Mineral Resource Estimates by classification and mineralized inventory for the different deposits: El Creston, El Perdido, El Catorce, Cinco de Mayo, El Rey, Texcalama and Santiago.

### 14.8.1 EL CRESTON MINERAL RESOURCES

The following Mineral Resources are reported at an AuEq grade of 1.35 g/t. Table 14-8 lists El Creston mineral resources. Mineral resources are not mineral reserves and do not have demonstrated economic viability.

**Table 14-8 El Creston Measured, Indicated, and Inferred Resources**

| Classification | kTonnes | Ag Grade (gpt) | Contained Ag kOz | Au Grade (gpt) | Contained Au kOz | Cu Grade (%) | Contained Cu klbs | Pb Grade (%) | Contained Pb klbs | Zn Grade (%) | Contained Zn klbs |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Measured | 1,682 | 42.29 | 2,287 | 2.65 | 143 | 0.20 | 7,260 | 1.19 | 44,052 | 2.31 | 85,662 |
| Total Indicated | 341 | 41.17 | 452 | 1.84 | 20 | 0.20 | 1,542 | 0.95 | 7,130 | 1.80 | 13,533 |
| **Total Measured and Indicated** | **2,023** | **42.11** | **2,739** | **2.51** | **163** | **0.20** | **8,802** | **1.15** | **51,182** | **2.22** | **99,195** |
| Total Inferred | 51 | 30.94 | 51 | 1.96 | 3 | 0.12 | 138 | 0.69 | 774 | 0.87 | 975 |

### 14.8.2 EL PERDIDO MINERAL RESOURCES

The following Mineral Resources are reported at an AuEq grade of 1.35 g/t. Table 14-9 lists El Perdido mineral resources. Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability.

**Table 14-9 El Perdido Measured, Indicated, and Inferred Resources**

| Classification | kTonnes | Ag Grade (gpt) | Contained Au kOz | Au Grade (gpt) | Contained Ag kOz | Cu Grade (%) | Contained Cu klbs | Pb Grade (%) | Contained Pb klbs | Zn Grade (%) | Contained Zn klbs |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Measured | 990 | 43.98 | 1,400 | 2.69 | 86 | 0.40 | 8,698 | 1.02 | 22,222 | 1.46 | 31,848 |
| Total Indicated | 271 | 32.32 | 281 | 2.30 | 20 | 0.26 | 1,541 | 0.83 | 4,924 | 1.23 | 7,339 |
| **Total Measured and Indicated** | **1,261** | **41.46** | **1,681** | **2.61** | **106** | **0.37** | **10,239** | **0.98** | **27,146** | **1.41** | **39,187** |
| Total Inferred | 38 | 23.81 | 29 | 1.51 | 2 | 0.20 | 166 | 1.05 | 870 | 1.44 | 1,193 |

### 14.8.3 EL CATORCE MINERAL RESOURCES

The following Mineral Resources are reported at an AuEq grade of 1.35 g/t. Table 14-10 lists El Catorce mineral resources. Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability.

**Table 14-10 El Catorce Measured, Indicated, and Inferred Resources**

| Classification | kTonnes | Ag Grade (gpt) | Contained Au kOz | Au Grade (gpt) | Contained Ag kOz | Cu Grade (%) | Contained Cu klbs | Pb Grade (%) | Contained Pb klbs | Zn Grade (%) | Contained Zn klbs |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Measured | 350 | 55.08 | 620 | 1.25 | 14 | 0.13 | 1,018 | 1.08 | 8,357 | 2.25 | 17,370 |
| Total Indicated | 910 | 42.37 | 1,239 | 1.23 | 36 | 0.17 | 3,427 | 1.11 | 22,301 | 2.40 | 48,144 |
| **Total Measured and Indicated** | **1,260** | **45.89** | **1,859** | **1.23** | **50** | **0.16** | **4,445** | **1.10** | **30,658** | **2.36** | **65,514** |
| Total Inferred | 612 | 27.90 | 549 | 0.93 | 18 | 0.12 | 1,558 | 1.38 | 18,678 | 2.39 | 32,307 |

### 14.8.4 CINCO DE MAYO MINERAL RESOURCES

The following Mineral Resources are reported at an AuEq grade of 1.35 g/t. Table 14-11 lists Cinco de Mayo mineral resources. Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability.

**Table 14-11 Cinco de Mayo Measured, Indicated, and Inferred Resources**

| Classification | kTonnes | Ag Grade (gpt) | Contained Au kOz | Au Grade (gpt) | Contained Ag kOz | Cu Grade (%) | Contained Cu klbs | Pb Grade (%) | Contained Pb klbs | Zn Grade (%) | Contained Zn klbs |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Measured | 322 | 75.53 | 783 | 2.75 | 28 | 0.58 | 4,122 | 1.13 | 8,050 | 2.10 | 14,939 |
| Total Indicated | 559 | 55.28 | 993 | 1.73 | 31 | 0.47 | 5,769 | 1.02 | 12,596 | 1.62 | 19,942 |
| **Total Measured and Indicated** | **881** | **62.70** | **1,776** | **2.08** | **59** | **0.51** | **9,891** | **1.06** | **20,646** | **1.80** | **34,881** |
| Total Inferred | 135 | 34.67 | 151 | 0.71 | 3 | 0.35 | 1,046 | 0.71 | 2,131 | 1.13 | 3,385 |

### 14.8.5 EL REY MINERAL RESOURCES

The following Mineral Resources are reported at an AuEq grade of 1.35 g/t. Table 14-12 lists El Rey mineral resources. Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability.

**Table 14-12 El Rey Measured, Indicated, and Inferred Resources**

| Classification | kTonnes | Ag Grade (gpt) | Contained Au kOz | Au Grade (gpt) | Contained Ag kOz | Cu Grade (%) | Contained Cu klbs | Pb Grade (%) | Contained Pb klbs | Zn Grade (%) | Contained Zn klbs |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Measured | 210 | 99.47 | 670 | 0.87 | 6 | 0.20 | 931 | 2.11 | 9,730 | 3.79 | 17,513 |
| Total Indicated | 97 | 89.67 | 280 | 0.74 | 2 | 0.24 | 512 | 1.67 | 3,578 | 3.60 | 7,708 |
| **Total Measured and Indicated** | **307** | **96.25** | **950** | **0.81** | **8** | **0.21** | **1,443** | **1.97** | **13,308** | **3.73** | **25,221** |
| Total Inferred | 8 | 65.79 | 16 | 0.73 | 0 | 0.26 | 45 | 1.18 | 203 | 2.95 | 507 |

### 14.8.6 SANTIAGO MINERAL RESOURCES

The following Mineral Resources are reported at an AuEq grade of 1.35 g/t. Table 14-13 lists Santiago mineral resources. Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability.

**Table 14-13 Santiago Measured, Indicated, and Inferred Resources**

| Classification | kTonnes | Ag Grade (gpt) | Contained Au kOz | Au Grade (gpt) | Contained Ag kOz | Cu Grade (%) | Contained Cu klbs | Pb Grade (%) | Contained Pb klbs | Zn Grade (%) | Contained Zn klbs |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Measured | 302 | 27.29 | 265 | 2.32 | 23 | 0.17 | 1,116 | 0.25 | 1,686 | 0.42 | 2,780 |
| Total Indicated | 151 | 21.07 | 102 | 1.87 | 9 | 0.12 | 387 | 0.20 | 677 | 0.33 | 1,107 |
| **Total Measured and Indicated** | **453** | **25.20** | **367** | **2.20** | **32** | **0.15** | **1,503** | **0.24** | **2,363** | **0.39** | **3,887** |
| Total Inferred | 60 | 14.35 | 28 | 1.66 | 3 | 0.05 | 72 | 0.16 | 216 | 0.25 | 339 |

### 14.8.7 TEXCALAMA MINERAL RESOURCES

The following Mineral Resources are reported at an AuEq grade of 1.35 g/t. Table 14-14 lists Texcalama mineral resources. Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability.

**Table 14-14 Texcalama Measured, Indicated, and Inferred Resources**

| Classification | kTonnes | Ag Grade (gpt) | Contained Au kOz | Au Grade (gpt) | Contained Ag kOz | Cu Grade (%) | Contained Cu klbs | Pb Grade (%) | Contained Pb klbs | Zn Grade (%) | Contained Zn klbs |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Measured | 19 | 35.86 | 22 | 2.92 | 2 | 0.17 | 70 | 2.11 | 870 | 3.33 | 1,369 |
| Total Indicated | 56 | 33.60 | 60 | 2.94 | 5 | 0.16 | 201 | 2.25 | 2,774 | 3.34 | 4,110 |
| **Total Measured and Indicated** | **75** | **34.01** | **82** | **2.90** | **7** | **0.16** | **271** | **2.20** | **3,644** | **3.31** | **5,479** |
| Total Inferred | 14 | 33.83 | 16 | 2.94 | 1 | 0.16 | 52 | 2.22 | 699 | 3.33 | 1,049 |

## 14.9 GRADE SENSITIVITY ANALYSIS

Mineral resources at Tahuehueto are sensitive to the selection of the reporting cut-off grade. To illustrate this sensitivity, the block model quantities and grade estimates within the interpreted vein models are presented in Table 14-15 at linear increases in the cut-off grades for measured, indicated and inferred Au mineral resources at Livengood. The same results are presented graphically in Figure 14-2. The reader is cautioned that Table 14-15 should not be misconstrued as a mineral resource. The reported quantities and grades are only presented as a sensitivity of the resource model to the selection of cut-off grade. Mineral resources are not mineral reserves and do not have demonstrate economic viability.

**Table 14-15 Tahuehueto Resource by Cut-Off**

| | Measured | | | Indicated | | | Measured + Indicated | | | Inferred | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cutoff | Tonnes | Au Grade (gpt) | Au kOz | Tonnes | Au Grade (gpt) | Au kOz | Tonnes | Au Grade (gpt) | Au kOz | Tonnes | Au Grade (gpt) | Au kOz |
| 1.00 | 4,149 | 2.28 | 305 | 2,566 | 1.52 | 126 | 6,715 | 1.99 | 430 | 1,040 | 0.98 | 33 |
| 1.25 | 3,964 | 2.37 | 302 | 2,453 | 1.58 | 125 | 6,417 | 2.07 | 427 | 946 | 1.04 | 32 |
| 1.50 | 3,744 | 2.49 | 299 | 2,294 | 1.67 | 123 | 6,038 | 2.18 | 422 | 875 | 1.08 | 30 |
| 1.75 | 3,509 | 2.62 | 296 | 2,165 | 1.74 | 121 | 5,674 | 2.28 | 417 | 810 | 1.13 | 29 |
| 2.00 | 3,233 | 2.79 | 290 | 1,994 | 1.85 | 118 | 5,227 | 2.43 | 408 | 724 | 1.20 | 28 |
| 2.25 | 3,077 | 2.89 | 285 | 1,847 | 1.95 | 116 | 4,924 | 2.53 | 401 | 652 | 1.27 | 27 |
| 2.50 | 2,894 | 3.01 | 280 | 1,693 | 2.04 | 111 | 4,587 | 2.65 | 391 | 571 | 1.36 | 25 |
| 2.75 | 2,693 | 3.14 | 272 | 1,520 | 2.16 | 106 | 4,213 | 2.79 | 378 | 501 | 1.44 | 23 |
| 3.00 | 2,503 | 3.28 | 264 | 1,345 | 2.28 | 99 | 3,848 | 2.93 | 362 | 431 | 1.48 | 21 |
| 3.25 | 2,346 | 3.41 | 257 | 1,196 | 2.45 | 94 | 3,542 | 3.08 | 351 | 353 | 1.59 | 18 |
| 3.50 | 2,207 | 3.54 | 251 | 1,082 | 2.58 | 90 | 3,289 | 3.23 | 341 | 267 | 1.58 | 14 |
| 3.75 | 2,055 | 3.71 | 245 | 963 | 2.76 | 86 | 3,018 | 3.40 | 330 | 205 | 1.57 | 10 |
| 4.00 | 1,907 | 3.89 | 239 | 830 | 3.05 | 81 | 2,737 | 3.64 | 320 | 161 | 1.69 | 9 |

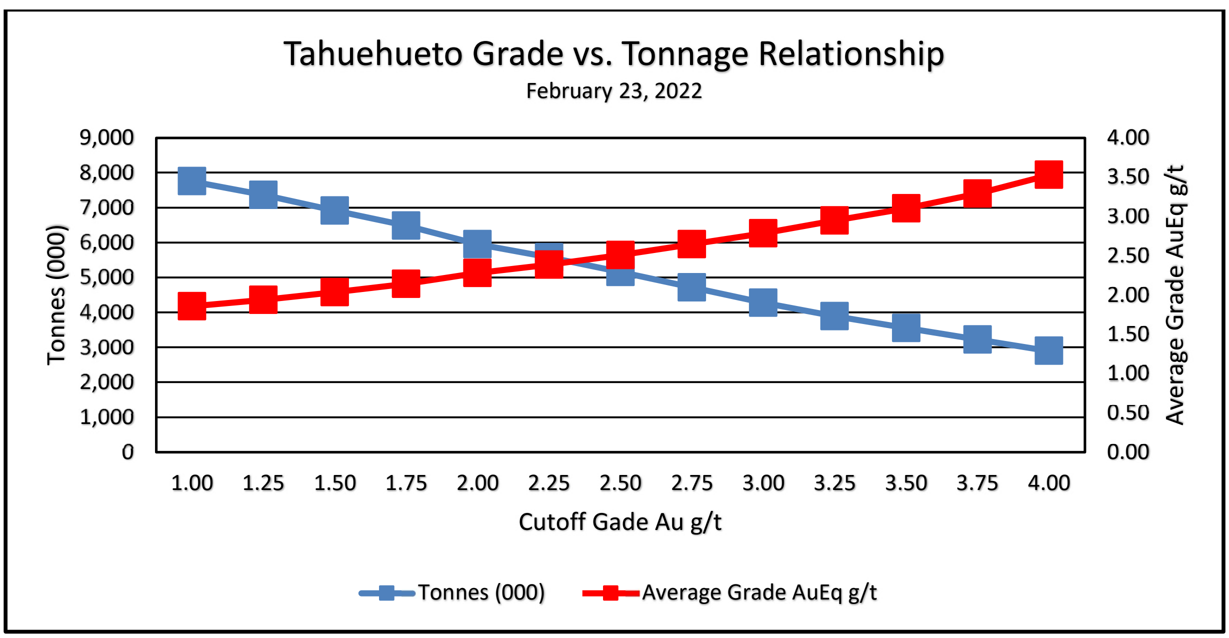



**Figure 14-2 Tahuehueto grade vs tonnage relationship**

# 15 MINERAL RESERVE ESTIMATE

## 15.1 INTRODUCTION

The mine design and Mineral Reserve estimate have been completed to a level appropriate for pre-feasibility studies. The Mineral Reserve estimate stated herein is consistent with the CIM Standards on Mineral Resources and Mineral Reserves and is suitable for public reporting. As such, the Mineral Reserves are based on Measured and Indicated Resources, and do not include any Inferred Resources.

## 15.2 MINERALIZED ZONES

The Tahuehueto Resource Block Models were used in conjunction with the Stope Optimizer module within Maptek Vulcan™ software to identify mineable shapes within five mineralized vein systems in the four Tahuehueto resource block models. In this approach, the resource model blocks have attributes of volume, density, and metal grades for gold, silver, lead, zinc and copper. Other inputs for the analysis were the estimated production unit cost ($78.55 per tonne) and a Net Smelter Recovery model that calculates the economic value of the block based on input parameters of metal recovery, smelter tariffs, royalties and metal price assumptions. The software outlined mineable volumes considering input parameters of vertical stope interval (15 m sill to sill), minimum mining width (3.5 m for sublevel development and 2.1 m for panels), and test for mining continuity and production cost against NSR economic value. The model developed stope geometries on 15 m vertical intervals. Mineable shapes were defined in five veins at Tahuehueto; Creston, Perdido, Rey, Cinco and Santiago.

The NSR calculations coded to the resource model and used as inputs for the Stope Optimizer runs are not the same calculations as the NSR used for the economic analysis of the project. The economic model from the previous technical report was used to estimate the percentage value (Table 15.4) of each commodity in terms of metal values listed in Table 15.1. Copper value was not included in the NSR calculation although the current revenue stream does include a copper revenue later in the mine life. The NSR was based on the inputs and calculations presented in Tables 15.1 through 15.4.

**Table 15-1 Metal Prices Used for NSR Calculations**

| Metal | Units | Value |
|---|---|---|
| Gold | $/oz | 1,500 |
| Silver | $/oz | 20.00 |
| Lead | $/lb | 0.90 |
| Zinc | $/lb | 1.15 |

Table 15-2 Lead **Concentrate NSR Input Parameters**

| Item | Au | Ag | Cu | Pb | Zn |
|---|---|---|---|---|---|
| **Distribution % (Recoveries)** | 77.1 | 62.8 | 0.0 | 85.5 | 9.0 |
| **Payable %** | 95.0 | 95.0 | 0.0 | 95.0 | 0.0 |
| **Deductions & Penalties $/DMT** | 188.60 | | | | |
| **Treatment Charge $/DMT** | 120.00 | | | | |

Table 15.3 Zinc **Concentrate NSR Input Parameters**

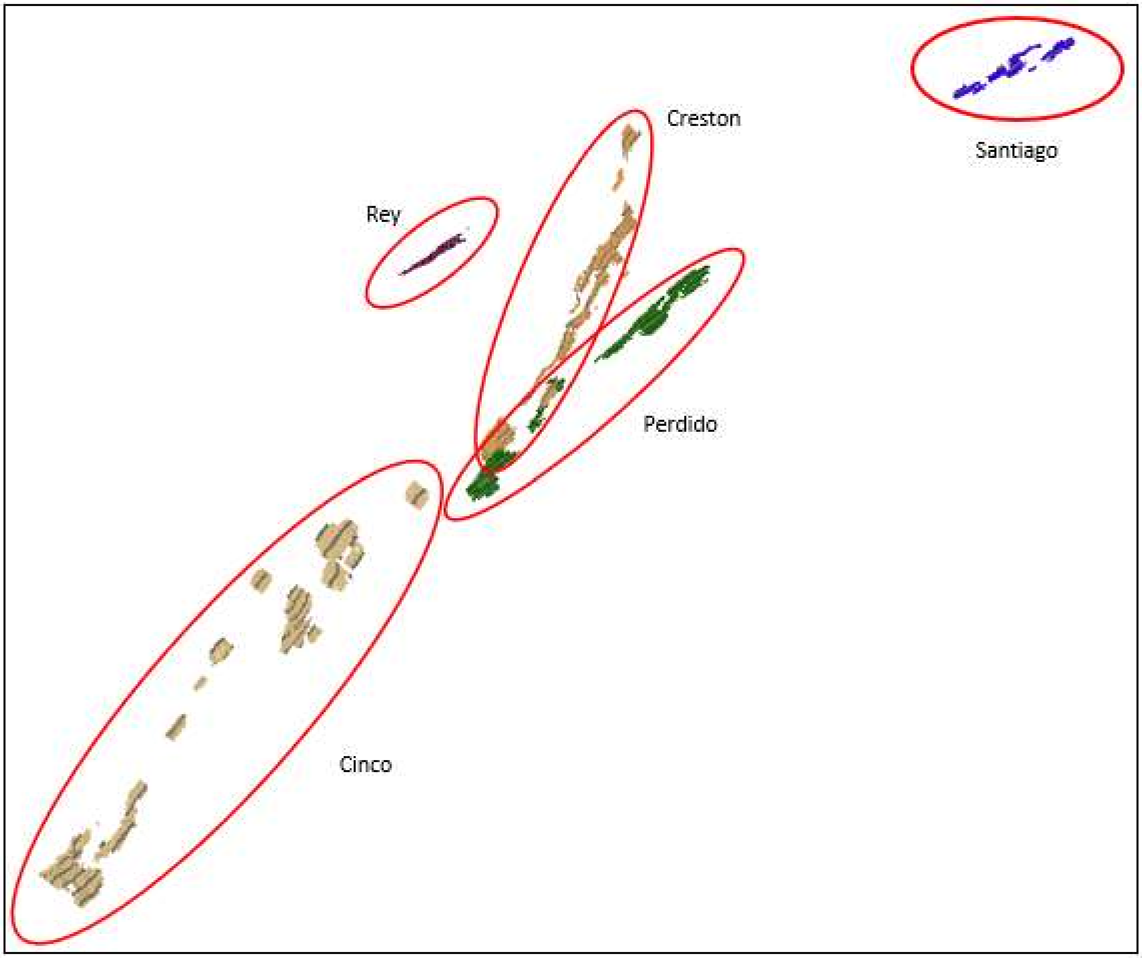
| Item | Au | Ag | Cu | Pb | Zn |
|---|---|---|---|---|---|
| **Distribution % (Recoveries)** | 11.00% | 11.70% | 0.00% | 2.00% | 80.00% |
| **Payable %** | 70.00% | 70.00% | 0.00% | 0.00% | 85.00% |
| **Penalties $/DMT** | 85.90 | | | | |
| **Treatment Charge $/DMT** | 215.00 | | | | |

Table 15.4 NSR **Calculations**

| Commodity | Mine Life Average Percentage of Price Realized |
|---|---|
| **Zinc Price Percentage Realized per Ore Tonne** | 50.84% |
| **Lead Price Percentage Realized per Ore Tonne** | 75.23% |
| **Gold Price Percentage Realized per Ore Tonne** | 73.15% |
| **Silver Price Percentage Realized per Ore Tonne** | 59.04% |

Mining shapes defined by the Stope Optimizer software have vertical and horizontal continuity, and are illustrated in Figure 15-1 for the five veins. Output for each stope shape consisted of volume, tonnage, grades, NSR Values, and density for the Measured and Indicated portion of the individual stope shapes. The data then was tabulated in an inventory spreadsheet segregating panels (11 m high) and sublevel development (4 m high). Both the panels (3.5 m width) and sublevel development stopes (varied widths) were generated in 10 m horizontal increments along strike. The NSR value for each tonne of ore in the mine plan was calculated by the sum of the Individual Commodity Price times the Realized Commodity Price Percentage times the Model Projected Metal Contained (% or Ounce/tonne)

**Figure 15-1 Optimized Stope Shapes for the Five Veins**




### 15.2.1 EXTRACTION RATIO AND DILUTION ASSUMPTIONS

Design rules were applied to the individual sublevel development and panel shapes. The optimizer produced stope blocks based upon the rules. The minable reserve estimation was determined utilizing the designed shapes cut against the block model. Measured and indicated blocks inside the mine shapes produced the mineralization results. Blocks outside the measured and indicated, typically inferred or waste blocks was also included in the volume; however, these fractions were applied zero grade resulting in the planned internal dilution.

## 15.3 TAHUEHUETO RESERVES

A mine design was created in the Vulcan™ model to define access and mining of the stope shapes defined by the Stope Optimizer. The resulting design is shown in Figure 15-2. The defined stope shapes and development excavations were scheduled to produce a basis for economic analysis. The resulting reserve is classified as Probable, and is listed in Table 15.5. No Proven Reserves were defined due to the limited definition resource drilling, limited definition by exploratory mining and the lack of geotechnical data that addresses underground mining.


**Figure 15-2 Tahuehueto Reserve Mining Shapes and Developments (Looking North, NTS)**

**Table 15-5 Tahuehueto Reserve Estimate Summary from Scheduled Stopes**

| Classification | kTonnes | Ag Grade (gpt) | Cont Ag kOz | Au Grade (gpt) | Cont Au kOz | Cu Grade (%) | Cont Cu klbs | Pb Grade (%) | Cont Pb klbs | Zn Grade (%) | Cont Zn klbs |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Proven Reserves | 2,358 | 51.93 | 3,937 | 2.89 | 219 | 0.27 | 14,246 | 1.18 | 61,429 | 2.07 | 107,515 |
| Probable Reserves | 1,227 | 46.48 | 1,834 | 1.90 | 75 | 0.23 | 6,304 | 0.96 | 25,929 | 1.63 | 44,125 |
| **Total Reserves** | **3,585** | **50.06** | **5,770** | **2.55** | **294** | **0.26** | **20,550** | **1.11** | **87,357** | **1.92** | **151,640** |

1. Mineral Reserves are estimated using metal price forecasts of $0.92/lb for lead, $1.14/lb for zinc, $3.60/lb for copper, $1,647.50/oz for gold and $21.64/oz for silver.
2. Totals may not add due to rounding.

The foregoing mineral reserves are based upon and are included within the current mineral resource estimate for the Project

# 16 MINING METHODS

## 16.1 MINERALIZED CONFIGURATION

Mineralization at Tahuehueto occurs in several near vertical veins under mountainous terrain, as can be seen in Figure 16-1. The figure demonstrates surface expression of the mineralization, an elaborate network of surface roads, current portal locations, and surface infrastructure. Following completion of the June 2021 Resource Block Model and utilizing the NSR determination discussed in Section 15, five veins were identified as reserves; Creston, Perdido, Cinco, Rey, and Santiago.

## 16.2 MINING METHOD

The geometry and orientation of the Tahuehueto mineralized veins are conducive to sublevel stoping. The Perdido, Creston, and Rey primary development intersects the veins near the midpoint of the target mineralization allowing for bottom-up and top-down sequencing; the Santiago and Cinco veins are developed as top-down mining only. A 3-meter pillar every three sublevels may be utilized to maintain rock integrity and proper backfill sequencing. Figures 16-2 and 16-3 demonstrate sublevel top-down sequencing and bottom-up sequencing, respectively. Detailed mining methodology is discussed in Section 16.3

Altaley has developed approximately 1,200 meters horizontal and 75 meters of vertical development off the 20 Level and 350 meters plus several ore cuts off the 12 Level. All development completed to date accesses the Perdido and Creston veins in preparation of being in a position to produce ore following commissioning of the mill.

Overhand Cut and Fill mining method with conventional drilling, blasting, mucking and hauling, scaling and ground support installation and backfilling with unconsolidated, mined waste materials was evaluated as a trade-off study. The Cut and Fill results improved metal extraction; however, it was determined that excessive development was required accessing the levels off the decline resulting in reduced economics. Table 16-1 provides the Sublevel versus Cut and Fill Trade-Off Results Comparison.

## Table 16-1 Sublevel versus Cut and Fill Trade-Off Results

| | Mining Method | | Variance (CF v Sub | |
|---|---|---|---|---|
| | Sublevel Stoping | Cut and Fill | Value | % |
| **Physicals** | | | | |
| Tonnes | | | | |
| Drift Mining (CF, Sublevel Dev) | 835,065 | 3,807,255 | 2,972,190 | 78% |
| Bulk Mining (Sublevel) | 2,705,182 | - | (2,705,182) | 0% |
| *Total Tonnes* | *3,540,247* | *3,807,255* | *267,008* | *7%* |
| Backfill | 2,793,176 | 2,665,079 | (128,098) | -5% |
| Grades | | | | |
| Au, (g/t) | 2.6 | 2.7 | 0.1 | 4% |
| Ag, (g/t) | 50.5 | 51.4 | 1.0 | 2% |
| Cu, (%) | 0.27% | 0.26% | 0.00% | -1% |
| Pb, (%) | 1.11% | 1.12% | 0.01% | 1% |
| Zn, (%) | 1.91% | 1.93% | 0.02% | 1% |
| Metal | | | | |
| Au, (ozs) | 294,141 | 329,852 | 35,711 | 11% |
| Ag, (ozs) | 5,749,043 | 6,297,361 | 548,318 | 9% |
| Cu, (t) | 9,413 | 10,004 | 591 | 6% |
| Pb, (t) | 39,372 | 42,614 | 3,242 | 8% |
| Zn, (t) | 67,735 | 73,508 | 5,773 | 8% |
| Development | | | | |
| Capital - Horizontal, m | 21,641 | 26,283 | 4,642 | 18% |
| Capital - Vertical, m | 2,133 | 2,705 | 572 | 21% |
| Capital - Shaft, m | 666 | 536 | (130) | -24% |
| Expensed, Horizontal, m | 17,430 | 44,513 | 27,083 | 61% |
| Expensed, Vertical, m | - | - | - | 0% |
| **Economics - Costs** | | | | |
| Capital Costs | | | | |
| Capital - Horizontal, $USD | $ 24,349,062 | $ 23,250,391 | $ (1,098,671) | -5% |
| Capital - Vertical, $USD | $ 667,800 | $ 768,678 | $ 100,878 | 13% |
| Capital - Shaft, $USD | $ 399,600 | $ 321,600 | $ (78,000) | -24% |
| Operational Costs | | | | |
| Expensed Development, $USD | $ 21,951,400 | $ 53,605,457 | $ 31,654,057 | 59% |
| Opex - Drift Mining, $USD | $ 15,992,514 | $ 69,858,120 | $ 53,865,606 | 77% |
| Opex - Bulk Mining, $USD | $ 37,845,384 | $ - | $ (37,845,384) | 0% |
| Opex - Backfill, $USD | $ 2,888,505 | $ 4,400,974 | $ 1,512,469 | 34% |
| Supplies | $ 36,871,330 | $ 43,235,164 | $ 6,363,834 | 15% |
| Haulage | $ 3,553,412 | $ 3,545,872 | $ (7,540) | 0% |
| Equipment Maintenance | $ 2,093,710 | $ 2,173,855 | $ 80,145 | 4% |
| Quality Costs | $ 2,548,656 | $ 2,606,580 | $ 57,924 | 2% |
| Direct Mining Unit Cost | | | | |
| Total OPEX Cost, $USD | $ 123,744,911 | $ 179,426,022 | $ 55,681,111 | 31% |
| OPEX Unit Cost, $USD/t | $ 34.95 | $ 47.13 | $ 12.17 | 26% |
| Total OPEX + CAPEX, $USD | $ 149,161,373 | $ 203,766,690 | $ 54,605,318 | 27% |
| OPEX + CAPEX Unit Cost, ($USD/t) | $ 42.13 | $ 53.52 | $ 11.39 | 21% |

**Figure 16-1 Tahuehueto General Surface Arrangement (Looking North East) with Projected Surface Mineralization Contact**

**Figure 16-2 Schematic Sublevel Bottom-Up Sequencing**

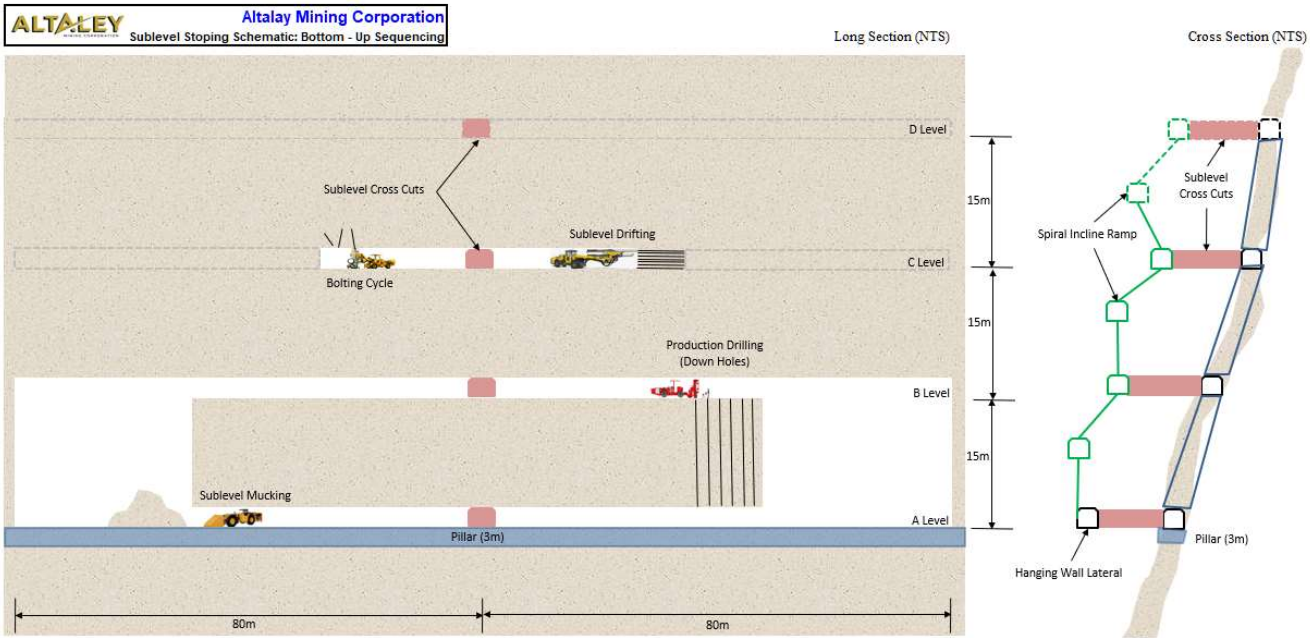
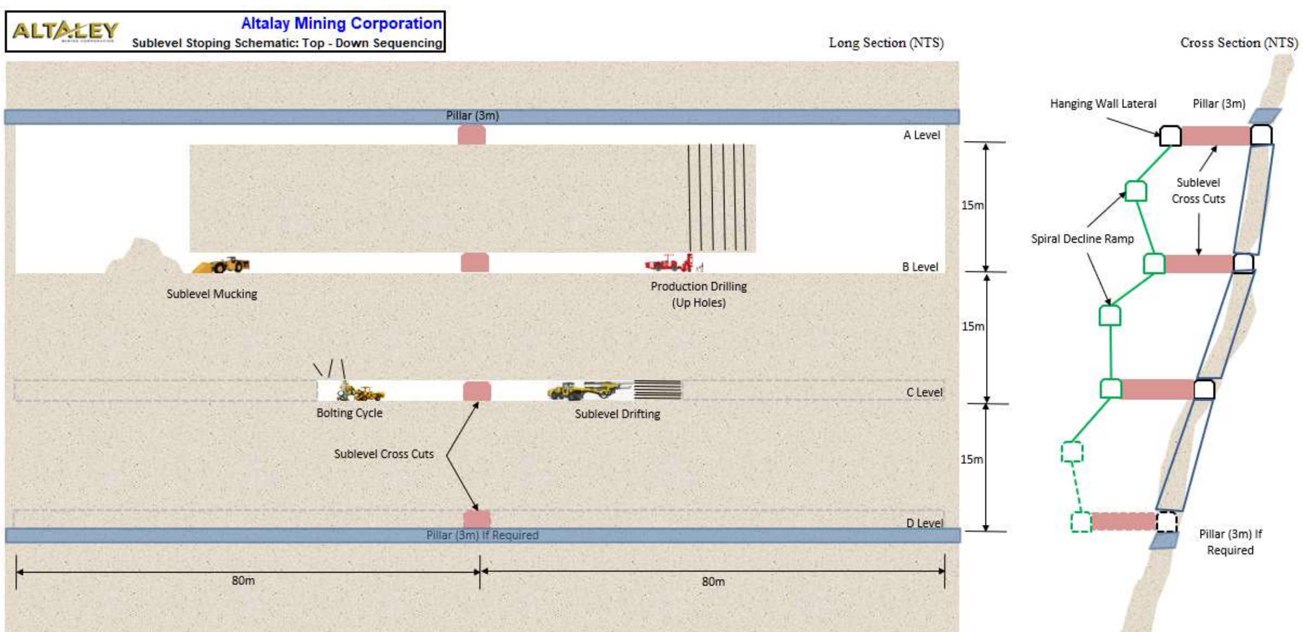



**Figure 16-3 Schematic Sublevel Top-Down Sequencing**



## 16.2 GEOTECHNICAL FINDINGS AND ASSUMPTIONS

In 2019, Altaley commissioned Real De La Bufa SA. DE CV to complete a geotechnical study for the Andesite and Diorite rock mass as well as the exposed Creston and Perdido mineralization. The study has been completed utilizing two separate methodologies, the RMR classification and Q System. Based on the parameters of the characterization of both RMR and Q, it shows good rock quality results for the lithological units resulting in no ground support requirements. The geomechanical behavior of the Andesite and Dirorite are affected by the rock water content, as it decreases the resistance of the rocks to rupture (the rock is more easily deformable) and facilitates the displacement of some blocks with respect to others according to the directions parallel to the rupture planes, by acting as a "lubricant". Due to the dry underground environment this is not a concern; however, mining crews need to be aware of potential risks when encountering wet conditions.

Based on the geotechnical structural surveys of the veins, it has been observed that the Creston and Perdido veins off level 12 have at least 3 fracturing systems or families, predominate faults trending NW-SE. These main characteristics are taken into account for the calculation of the rock mass rating. The RMR and Q methodologies generate a slightly different classification in the veins; however, both estimations classify the mineralization as good quality rock. The vein as such has a strong salting so it behaves very stable even for spans more than 6 meters. The generated results from the study indicate there is no requirements for ground support in the veins. The contact between the mineralization and waste produces the lowest Q values and could have stability problems. The contact may require systematic support especially when it is developing. Constant inspections must be performed as typical underground work and variability of lithologies present risks.

In the Author's opinion, the rock stability of the excavated drifts is sufficient as a preliminary design basis, but confirming rock mechanics and geotechnical assumptions should be performed to verify the mining approach and details of the PFS layout and design.

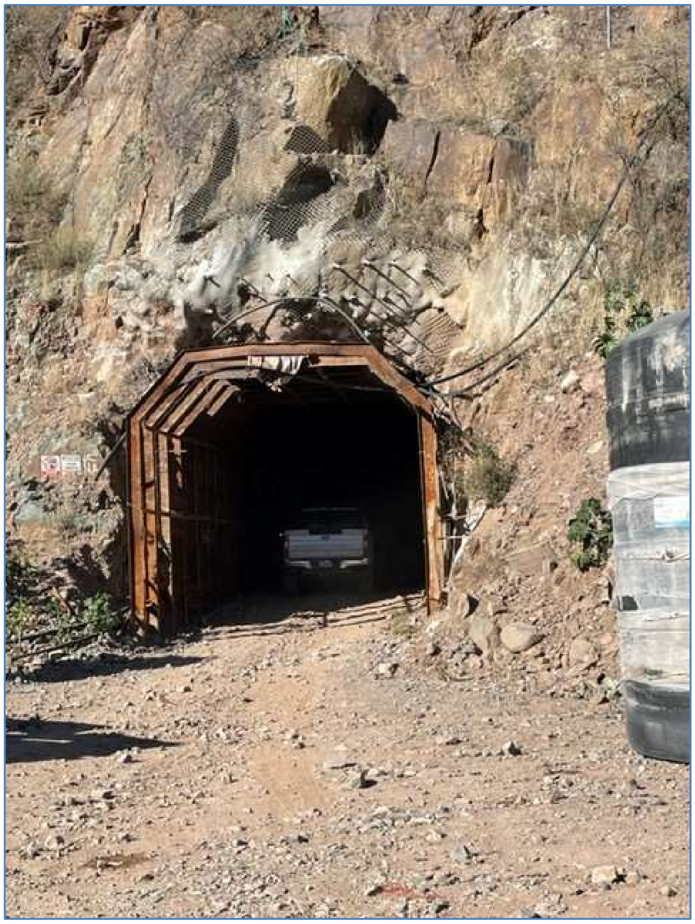
Nominal development drifting at Tahuehueto is3.5 m x 4.0 m utilizing conventional drill and blast mining methods. In general, the mining excavations had no rock support installed during construction. Figure 16-4 is a recent photograph of the portal of one of the previously excavated drift excavations, reflecting strong rock and generally good local rock conditions at the portal access. No rock bolting or surface support system was employed for the excavations, and the excavations are reported by Altaley to remain in generally good condition.

**Figure 16-4 Photograph of the Rock Conditions in the Portal Excavation at Level 10**

In 2016, the pre-existing excavation at Level 10 was enlarged to 5 m x 5 m to produce the mill test sample discussed in Sections 13.5 and 24 of this report. A photograph of the rock conditions in the enlarged drift is shown in Figure 16-5, and indicated generally good rock conditions at the excavated dimensions. No rock bolting or surface support was installed inside the excavation during or after construction. Chain-link mesh had been installed to protect the entryway from loose rock on the exterior portal face, however, no rock bolts or other surface support was installed in the rock surfaces during enlargement of the drift to 5 m x 5 m. Figure 16-6 is a photograph demonstrating the rock integrity of the Level 20 portal.

**Figure 16-5 Photograph Showing Rock Conditions at Level 10**

**Figure 16-6 Level 20 Portal Rock Integrity**



### 16.2.1 EMPIRICAL GEOTECHNICAL DESIGN ASSUMPTIONS

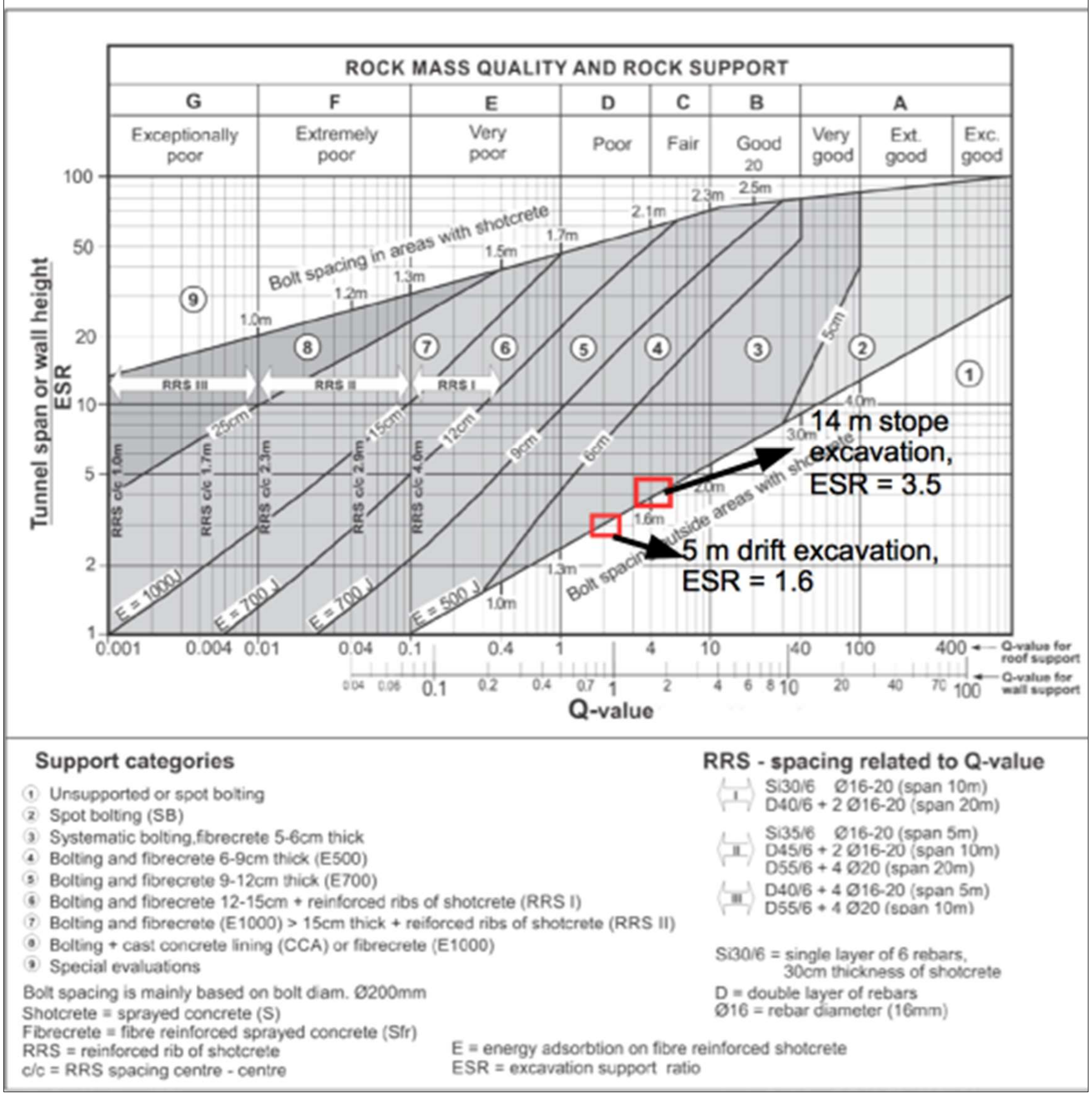
The geotechnical assumptions have not changed from the previous submittal: NI43-101 Technical Report Preliminary Feasibility Study dated January 20, 2017. An empirical design approach from the Norwegian Geotechnical Institute (NGI – Q System (Barton, 1974)) has been used to estimate the rock mass quality indicated by Tahuehueto existing mining excavations. In this approach, a rock mass quality parameter (Q) is correlated with a dimension index (Equivalent Span) and also correlated with ground support installed as indicated by case history data for tunnel excavations used in the system. The estimated rock mass quality based on the dimensions and performance of the existing excavations that have been constructed at Tahuehueto are shown in the design chart in Figure 16-7 (Barton, 1974). The design points are plotted at the boundary between the “No Support Required”, Region 1, and the regions requiring support.

In Figure 16-7, the maximum span produced in existing production mining at Tahuehueto was approximately 14 m square, which assuming an Engineering Support Ratio (ESR) value of 3.5 for temporary mining excavations, gives an Equivalent Span of 4 m. The design point for standard development drifts assumed for the Tahuehueto PFS of 5 m spans, adjusted for an ESR value of 1.6 for permanent mine openings would be 3.1 m. The indicated range in Q for stable excavations without support or spot bolting would be Q =2-4, or relative rock quality of "poor".

The geotechnical design for Tahuehueto was guided by the mining excavation dimensions indicated by the design chart in Figure 16-7, with the additional condition that systematic rock support would be applied on a proportion of the excavated roof area based on the excavation span and by adjustment of the extraction ratio based on the average width of mineralization on each 11 m vertical lift.

**Figure 16-7 NGI Q-System Empirical Tunnel Support Design System showing Maximum Size Stope Excavation from Tahuehueto Existing Mining and PFS Drift Dimensions**

| Type or use of underground opening | ESR |
|---|---|
| Temporary mine openings | 3.5 |
| Vertical shafts, rectangular and circular respectively | 2.0 - 2.5 |
| Water tunnels, permanent mine openings, adits, drifts | 1.6 |
| Storage caverns, road tunnels with little traffic, access tunnels, etc. | 1.3 |
| Power stations, road and railway tunnels with heavy traffic, civil defence shelters, etc. | 1.0 |
| Nuclear power plants, railroad stations, sport arenas, etc. | 0.8 |

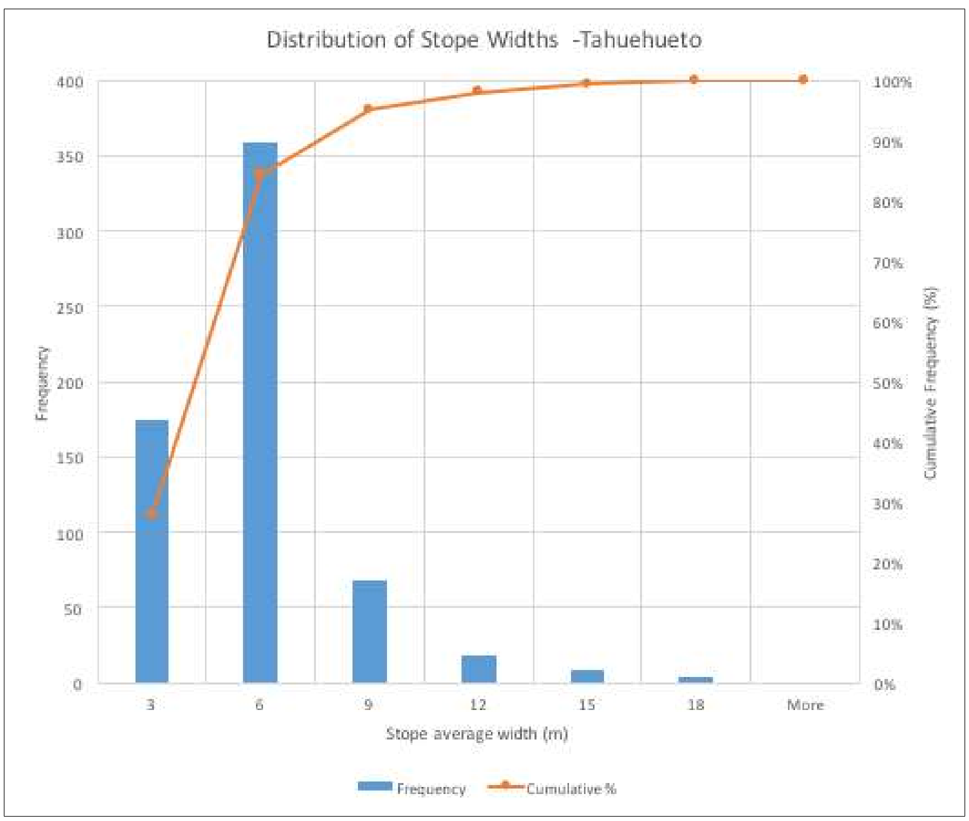


### 16.2.2 EXTRACTION RATIO ADJUSTMENT

The sublevel mining method exposes operators to the rock surface during the development of the sublevels. If the ground conditions deteriorate, then artificial support shall be installed to maintain integrity. Sublevels (nominally 3.5 m wide by 4 m high) are developed on 11 m centers along the mineralized dip, panel blast rings are drilled along dip of the mineralization nominally on 1 m centers. The stope mining would then proceed horizontally 3 m increments. During the excavation of the panel, mucking operations shall be performed utilizing remote loaders. The minimum mining width was assumed to be 3.5 m, so diluting material would be added to increase any mining width under 3.5 m. For all other mineralization widths, it was assumed that 0.25 m of waste material (at zero (0) grade) would be extracted on both walls (ribs) of the stope advance.

An extraction ratio was calculated based on the width (span) of the stope for 15 m vertical lifts. The extraction ratio was based on a transition of the stope from full stope width (for mining widths up to 6 m), to stopes with 5 m long (along stope strike) alcoves between 5 m strike pillars. The alcove was assumed to be excavated to the mineralization boundary perpendicular to the stope strike axis. If the average width of the stope was greater than 6 m, the extraction ratio was calculated assuming a 5 m strike drift, with 5 m alcove cuts perpendicular to strike between 5 m rib pillars. Histograms showing the resulting distribution of the stope widths and stope extraction ratios are presented in Figure 16-8.

**Figure 16-8 Distribution of Average Stope Widths for Tahuehueto Vulcan Stope Optimizer Output**



### 16.2.3 GROUND SUPPORT ASSUMPTIONS

The rock stability in the existing Tahuehueto excavations of limited extent was assumed to be representative of the conditions that will occur with the progress of vertical sublevel stoping at Tahuehueto, or of the more extensive drift development required for the mine development. If ground conditions deteriorate artificial ground support consisting of 1.8 m friction rock stabilizers (rock bolts) on a 1.2 m pattern in the back, with welded wire mesh and steel straps shall be utilized on the specified portion of the development drifts and stope excavations.

In the operating assumptions used for cost, manpower and equipment, ground support was assumed to be installed after each blast event (either drift round or slab round). The ground support operation would consist of inspection and scaling of the freshly blasted area during and after loading (mucking) the blasted material. Scaling was assumed to be performed with the LHD bucket of the surface area roof and sidewalls.

## 16.3 WASTE BACKFILL

Due to limited surface area for a waste dump, a mine plan had to be generated utilizing underground waste rock placement. Sublevel stoping bottom-up sequencing quickly provides the necessary platform for waste rock storage underground. Following the extraction of the panel between two sublevels; waste fill can immediately be placed; which will then be utilized for the mucking platform for the next panel; see Figure 16-2. All backfill requirements are produced from waste development and coordinated with the production sequencing for direct underground placement in the open voids. Blasted waste assumes a swell factor of 30%; therefore, over the life of mine ore volumes exceed available waste by 24%. This variance is favorable as there is enough underground capacity to house all of the waste generated. The lack of backfill does not impact the production schedule as the sublevel mining sequence allows for unfilled stopes.

## 16.4 MINING LAYOUT

The mining layout is illustrated in Figure's 16-8, 16-9, and 16-10 providing isometric views of the mining and development layout of the Creston and Perdido Veins, Santiago Vein, and the Cinco and Rey Veins; respectively. NSR values determined economic parameters and the block model dictated the nominal dimensions and orientation of the excavations. These parameters were applied to the Vulcan Stope Optimizer which produced the individual mining blocks containing volume, grade, and NSR values.

The development layout in the Vulcan model is produced by strings (lines), a primitive attribute was applied to theses strings producing a volume. Main development drifts are shown as red lines and provide the routes to get equipment from the surface to the stope excavations. Green lines are used to denote access crosscut ramps that allow the equipment to gain entry to the stopes; purple lines denote vertical ventilation raises, and blue lines represent ventilation cross cuts. The light-blue line in the Cinco vein system denotes a vertical production shaft allows deep ore to be economically hoisted to surface; the light-blue line in the Creston/Perdido vein structure dictates a vertical ore pass.

**Figure 16-9 Creston and Perdido Isometric View (NTS)**

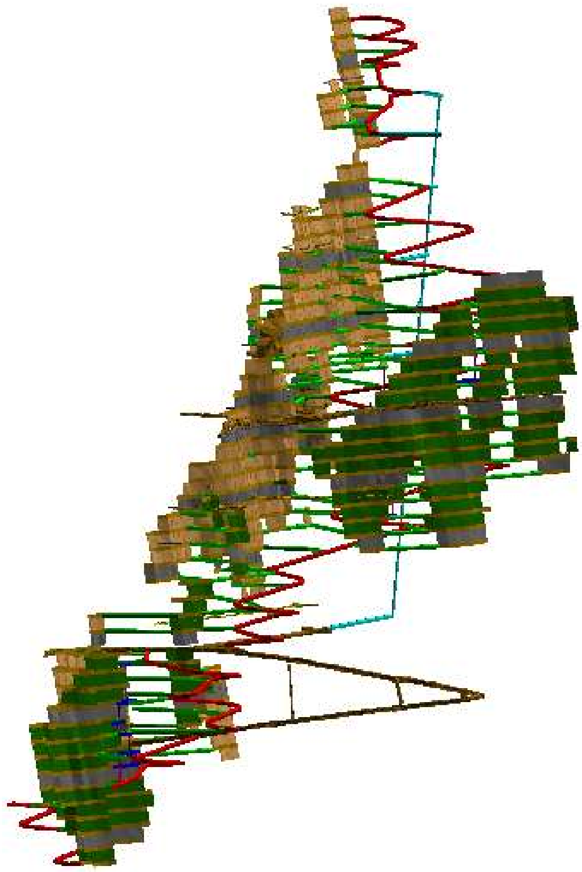


**Figure 16-10 Santiago Isometric View (NTS)**

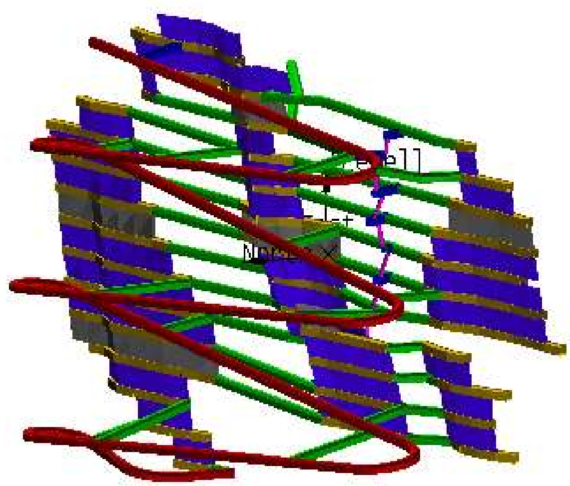
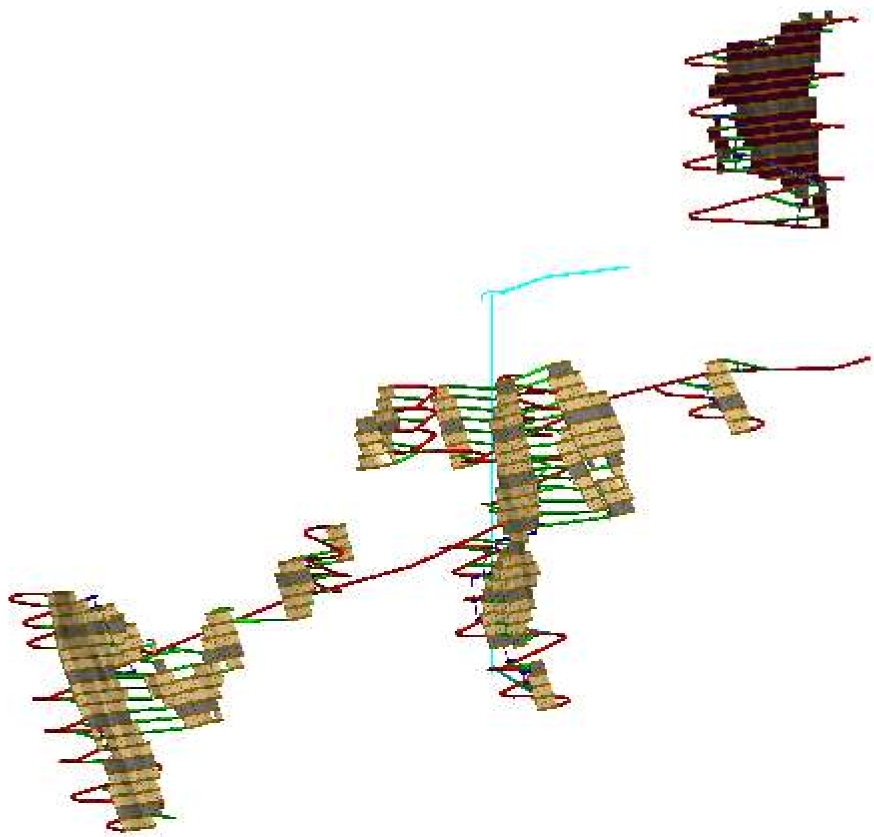


**Figure 16-11 Cinco and Rey Isometric View (NTS)**



The mine is accessed from surface is via existing portals or by new portals excavated at various locations on the mountain side. The location of the new portals is governed by the existing road network on the mountain side.

For upper Creston and Perdido the mined ore would be hauled by 20 tonne capacity underground haul trucks from the stopes to the central ore pass. The bottom of the ore pass is located at the 20 Level where the ore will be rehandled and hauled directly to the mill facility. For Lower Creston, Rey, and Santiago, the mineralization would be hauled by underground trucks directly to the mill. Ore from Cinco will be transported to draw points in the vertical shaft where it will be hoisted to surface and dumped into ore stockpile. Surface haul fleet will rehandle the material and deliver to the mill.

Ventilation air would be drawn into the mine from surface portals (either existing mined excavations or newly developed ramps) and into the stopes. Ventilation raises (purple lines) would be excavated vertically along the stope blocks and would be connected between the main ventilation levels (intake and exhaust) before production could begin in the stope block. Ventilation raises (3.0 m x 3.0 m) would be constructed at each location with a short ventilation access drift connecting to the stope. The ventilation raises would provide conduits for electrical power, compressed air, make up water into the stope blocks, and a secondary egress ladder network would also be constructed.

Rock mechanics analysis of the layout should be conducted to project rock stability impacts of the planned geometry. No analysis of ramp locations in the hanging wall has been conducted, and interactions between upper parts of Creston and Perdido need to be simulated. Stand-off distances of ramps and ventilation raises need to be evaluated to assure stability of the raise and infrastructure as the mining proceeds vertically. Table 16.2 illustrates Material Densities, Moisture Contents and Design Criteria.

**Table 16.2 Material Densities, Moisture Contents and Design Criteria**

| Development Waste | Units | | Comments |
|---|---|---|---|
| Insitu Density - Development Waste | 2.750 | tonne / m3 | Altaley |
| Insitu Tonnage Factor- Development Waste | 0.364 | m3 / tonne | Calculated |
| Swell - Development Waste | 30% | | Altaley |
| Broken Density - Development - Dry | 2.115 | tonne / m3 | Calculated |
| Broken Tonnage Factor - Development - Dry | 0.473 | m3 / tonne | Calculated |
| Moisture | 6% | weight | TBD |
| Broken Density for Development - Wet | 2.242 | tonne / m3 | TBD |
| Broken Tonnage Factor Development - Wet | 0.446 | m3 / tonne | Calculated |
| **Production Ore** | **Units** | | **Comments** |
| Insitu Density - Ore | 2.830 | tonne / m3 | Altaley |
| Insitu Tonnage Factor - Ore | 0.353 | m3 / tonne | Calculated |
| Swell - Ore | 30% | | Altaley |
| Broken Density - Ore Dry | 2.1769 | tonne / m3 | Calculated |
| Broken Tonnage Factor - Ore Dry | 0.459 | m3 / tonne | Calculated |
| Moisture | 6% | weight | TBD |
| Broken Density for Production - Wet | 2.2423 | tonne / m3 | TBD |
| Broken Tonnage Factor for Production - Wet | 0.446 | m3 / tonne | Calculated |
| Overbreak/Dilution LHS | | | TBD |
| Miscellaneous | | | |
| Backfill Density | 2.242 | tonne / m3 | Waste ROM |
| Backfill Tonnage Factor | 0.446 | m3 / tonne | Calculated |
| **Development Criteria** | **Units** | | **Comments** |
| Maximum Grade on Ramps | 14.0% | | |
| Design Grade on Ramps | 14.0% | | |
| Minimum Grade on Horizontal ramps draining to Sumps | 1.0-3% | | |
| Maximum Grade Curved Ramps | 14% | | |
| Maximum Grade at intersections | 3% | | |
| Minimum Curve Radius - Main Ramps | 15.0 | m | Equipment Dependent |
| Minimum Curve Radius -Secondary Access | 15.0 | m | Equipment Dependent |
| Minimum Pillar between Ramps | 15.0 | m | |
| Nominal Dimensions to Arch X-Section | 96.0% | | of flat back neatline |
| **Production Criteria** | **Units** | | **Comments** |
| Target Tonnes/Monthe ore rate | 28,000 | Tonnes/Month | |
| LOM Average Material Move Tonnes/Day | 1,500 | Tonnes/day | |
| Haulage Design Operating Hours per Day | 18.0 | | 75% Availability |
| Design Operating Days per Year | 360 | | |
| Design Milling Rate | 1,000 | Tonnes/day | |
| Operating Hours per Day | 24 | | Continuous operation |

## 16.5 MINING PRODUCTION

The Vulcan™ Stope Optimizer inventory of stope shapes and development strings were scheduled utilizing Microsoft Excel. The resulting schedule produced the development and production schedule including the metal profile.

Mine scheduling was controlled by the development primary ramps and ventilation circuits to provide fresh air to the working areas. For individual stoping blocks, a ramp would be developed between the lower and upper extents of the contiguous stope areas, which would be connected by a vertical raise. The ventilation raises would also provide secondary egress from the stope working area and provide the pathways for electrical, compressed air and make-up water services required for mining. Sustaining development to the various stope production areas was scheduled to maintain a sufficient buffer of stopes ahead of required ore production.

Development and production schedules were driven by the peak mill throughput of 336,000 tonnes per year. Operating schedule is based on 24 hour – 7 day a week, 360 days per year.

The development rates of advance per underground operating day used for the scheduling were:

- Ramps and access drifts = 3 meters/day (single heading); 13 meters/day (Mine Total)
- Sublevel Advance = 3 meters/day (single heading); 6 meters/day (Mine Total)
- Sublevel Extraction = 4 rings/day (single stope); 8 rings/day (Mine Total)

The development for the mine focuses on creating the access and ventilation circuit for the first stoping block in the upper Creston and Perdido, extending the ramp system for mining of the upper Creston, and on creating the drift development for the haulage level. Initial ore production would begin in the Upper Creston and Perdido veins at a nominal rate of 350 tonnes/day ramping up to 1,000 tonnes per day over 4 months. Expansion of the number of stoping blocks would allow ore production to reach its nominal steady state rate of 1,000 tonnes/day (underground operating day). Ore production is scheduled predominantly from the Creston and Perdido through year 6; following development and mining into the Cinco with supplemental feed from the Santiago and Rey veins for LOM.

The physical units in the underground production schedule are listed in Table 16.3 and 16.4, for the detailed mine output, the Production Schedule and Development Schedule by year, respectively.

## Table 16.3 Tahuehueto Underground Production Schedule by Year

| | | LOM | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MINE TOTAL - PRODUCTION SCHEDULE | | | | | | | | | | | | | | |
| Sublevel Drive | Tonnes | 835,065 | 90,862 | 91,207 | 85,962 | 90,557 | 78,483 | 81,379 | 90,274 | 89,660 | 74,253 | 33,220 | 29,208 | - |
| Grades | AG (g/t) | 47.2 | 33.0 | 35.7 | 38.3 | 39.9 | 40.5 | 42.0 | 67.5 | 57.7 | 82.5 | 39.5 | 32.6 | - |
| | AU (g/t) | 2.42 | 4.27 | 3.15 | 2.13 | 2.27 | 2.47 | 2.48 | 1.98 | 1.62 | 1.21 | 2.20 | 2.44 | - |
| | CU (%) | 0.25 | 0.22 | 0.29 | 0.29 | 0.24 | 0.13 | 0.17 | 0.28 | 0.31 | 0.30 | 0.19 | 0.25 | - |
| | PB (%) | 1.06 | 0.84 | 0.80 | 1.05 | 1.14 | 1.16 | 1.17 | 1.21 | 1.32 | 1.45 | 0.40 | 0.31 | - |
| | ZN (%) | 1.85 | 0.94 | 1.09 | 1.96 | 2.51 | 2.06 | 2.29 | 2.15 | 2.25 | 2.45 | 0.67 | 0.46 | - |
| Metal | Ag (ozs) | 1,267,442 | 96,402 | 104,628 | 105,949 | 116,281 | 102,295 | 109,934 | 195,861 | 166,361 | 196,903 | 42,235 | 30,593 | - |
| | Au (ozs) | 64,868 | 12,474 | 9,232 | 5,881 | 6,616 | 6,222 | 6,489 | 5,757 | 4,665 | 2,891 | 2,345 | 2,295 | - |
| | Cu (t) | 2,075 | 200 | 266 | 253 | 217 | 100 | 140 | 256 | 282 | 226 | 63 | 73 | - |
| | Pb (t) | 8,866 | 761 | 733 | 905 | 1,032 | 909 | 953 | 1,096 | 1,179 | 1,073 | 134 | 90 | - |
| | Zn (t) | 15,423 | 858 | 992 | 1,688 | 2,271 | 1,618 | 1,860 | 1,942 | 2,019 | 1,818 | 223 | 133 | - |
| Value | nsr ($/t) | 142.84 | 187.86 | 150.65 | 130.68 | 144.69 | 146.28 | 150.41 | 141.48 | 127.69 | 127.21 | 107.17 | 109.08 | - |
| | nsr ($) | 119,278,441 | 17,069,489 | 13,740,502 | 11,233,646 | 13,102,327 | 11,480,131 | 12,240,087 | 12,771,864 | 11,448,477 | 9,445,866 | 3,560,151 | 3,185,901 | - |
| Panel | Tonnes | 2,705,182 | 140,988 | 244,793 | 250,038 | 245,443 | 250,155 | 253,561 | 245,726 | 246,340 | 261,747 | 302,780 | 263,611 | - |
| Grades | AG (g/t) | 51.5 | 41.4 | 40.1 | 40.2 | 37.9 | 38.5 | 41.9 | 43.4 | 61.6 | 93.6 | 71.2 | 46.5 | - |
| | AU (g/t) | 2.64 | 3.32 | 2.83 | 3.30 | 3.82 | 3.02 | 2.58 | 2.80 | 2.09 | 1.64 | 1.87 | 2.28 | - |
| | CU (%) | 0.27 | 0.34 | 0.27 | 0.31 | 0.21 | 0.27 | 0.21 | 0.13 | 0.18 | 0.26 | 0.41 | 0.38 | - |
| | PB (%) | 1.13 | 1.46 | 1.22 | 0.95 | 0.85 | 0.98 | 1.31 | 1.14 | 1.17 | 1.50 | 1.16 | 0.81 | - |
| | ZN (%) | 1.93 | 1.71 | 1.48 | 1.06 | 1.66 | 1.98 | 2.29 | 2.61 | 2.45 | 2.63 | 2.18 | 1.08 | - |
| Metal | Ag (ozs) | 4,481,610 | 187,550 | 315,254 | 323,018 | 299,195 | 309,851 | 341,654 | 342,994 | 487,769 | 787,403 | 692,951 | 393,973 | - |
| | Au (ozs) | 229,273 | 15,050 | 22,256 | 26,518 | 30,123 | 24,297 | 21,054 | 22,089 | 16,567 | 13,788 | 18,248 | 19,283 | - |
| | Cu (t) | 7,338 | 477 | 670 | 763 | 527 | 676 | 534 | 325 | 436 | 679 | 1,250 | 1,001 | - |
| | Pb (t) | 30,506 | 2,058 | 2,995 | 2,363 | 2,075 | 2,445 | 3,318 | 2,794 | 2,880 | 3,925 | 3,521 | 2,133 | - |
| | Zn (t) | 52,313 | 2,408 | 3,624 | 2,648 | 4,084 | 4,955 | 5,808 | 6,412 | 6,045 | 6,897 | 6,597 | 2,835 | - |
| Value | nsr ($/t) | 154.33 | 176.66 | 152.34 | 159.41 | 183.15 | 161.34 | 156.11 | 165.75 | 146.29 | 149.71 | 138.62 | 123.77 | - |
| | nsr ($) | 417,502,256 | 24,907,596 | 37,291,089 | 39,857,394 | 44,953,057 | 40,361,226 | 39,582,466 | 40,729,598 | 36,035,956 | 39,186,207 | 41,969,865 | 32,627,802 | - |
| Total (Sub+Panel) | Tonnes | 3,540,247 | 231,850 | 336,000 | 336,000 | 336,000 | 328,638 | 334,940 | 336,000 | 336,000 | 336,000 | 336,000 | 292,819 | - |
| Grades | AG (g/t) | 50.5 | 38.1 | 38.9 | 39.7 | 38.5 | 39.0 | 41.9 | 49.9 | 60.6 | 91.1 | 68.1 | 45.1 | - |
| | AU (g/t) | 2.58 | 3.69 | 2.91 | 3.00 | 3.40 | 2.89 | 2.56 | 2.58 | 1.97 | 1.54 | 1.91 | 2.29 | - |
| | CU (%) | 0.27 | 0.29 | 0.28 | 0.30 | 0.22 | 0.24 | 0.20 | 0.17 | 0.21 | 0.27 | 0.39 | 0.37 | - |
| | PB (%) | 1.11 | 1.22 | 1.11 | 0.97 | 0.92 | 1.02 | 1.28 | 1.16 | 1.21 | 1.49 | 1.09 | 0.76 | - |
| | ZN (%) | 1.91 | 1.41 | 1.37 | 1.29 | 1.89 | 2.00 | 2.29 | 2.49 | 2.40 | 2.59 | 2.03 | 1.01 | - |
| Metal | Ag (ozs) | 5,749,053 | 283,952 | 419,882 | 428,967 | 415,476 | 412,146 | 451,588 | 538,855 | 654,130 | 984,306 | 735,186 | 424,565 | - |
| | Au (ozs) | 294,141 | 27,524 | 31,489 | 32,399 | 36,739 | 30,520 | 27,543 | 27,846 | 21,232 | 16,679 | 20,592 | 21,579 | - |
| | Cu (t) | 9,413 | 677 | 936 | 1,016 | 745 | 777 | 673 | 581 | 717 | 905 | 1,312 | 1,074 | - |
| | Pb (t) | 39,372 | 2,819 | 3,727 | 3,269 | 3,107 | 3,354 | 4,271 | 3,890 | 4,059 | 4,998 | 3,656 | 2,223 | - |
| | Zn (t) | 67,735 | 3,266 | 4,616 | 4,335 | 6,355 | 6,573 | 7,668 | 8,354 | 8,064 | 8,715 | 6,820 | 2,968 | - |
| Value | nsr ($/t) | 151.62 | 181.05 | 151.88 | 152.06 | 172.78 | 157.75 | 154.72 | 159.23 | 141.32 | 144.74 | 135.51 | 122.31 | - |
| | nsr ($) | 536,780,697 | 41,977,085 | 51,031,591 | 51,091,040 | 58,055,385 | 51,841,356 | 51,822,553 | 53,501,462 | 47,484,433 | 48,632,073 | 45,530,016 | 35,813,703 | - |
| Sublevel Development Stats | | | | | | | | | | | | | | |
| Sub Advance Average (m/Year) | | 20,982 | 2,283 | 2,292 | 2,160 | 2,275 | 1,972 | 2,045 | 2,268 | 2,253 | 1,866 | 835 | 734 | - |
| Sub Advance Average (m/day) | | 5 | 6 | 6 | 6 | 6 | 5 | 6 | 6 | 6 | 5 | 2 | 2 | - |

## Table 16.4 Tahuehueto Underground Capital and Expensed Development by Year

| | LOM | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MINE TOTAL | | | | | | | | | | | | | |
| Capital Development | | | | | | | | | | | | | |
| Horizontal | | | | | | | | | | | | | |
| Ramps, m | 18,157 | 954 | 954 | 954 | 954 | 1,329 | 1,888 | 1,692 | 2,093 | 2,592 | 2,604 | 2,143 | - |
| Ore Cross Cuts, m | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ventilation Cross Cuts, m | 3,175 | 195 | 195 | 195 | 195 | 268 | 346 | 309 | 323 | 457 | 378 | 314 | - |
| Shaft Level Station Access, m | 309 | - | - | - | - | 56 | 98 | 87 | 68 | - | - | - | - |
| Vertical | | | | | | | | | | | | | |
| Shaft, m | 666 | - | - | - | - | - | 198 | 103 | 190 | 100 | 75 | - | - |
| Ventilation Raise & Ore Pass, m | 2,133 | 149 | 68 | 141 | 141 | 183 | 206 | 179 | 210 | 434 | 228 | 194 | - |
| Total Capital Horizontal Development, m | 21,641 | 1,149 | 1,149 | 1,149 | 1,149 | 1,653 | 2,332 | 2,088 | 2,484 | 3,049 | 2,982 | 2,457 | - |
| Total Capital Horizontal Development, tonnes | 1,178,325 | 62,563 | 62,563 | 62,563 | 62,563 | 90,006 | 126,950 | 113,692 | 135,254 | 166,018 | 162,370 | 133,784 | - |
| Total Capital Vertical Advance, m | 2,799 | 149 | 68 | 141 | 141 | 183 | 404 | 282 | 400 | 534 | 303 | 194 | - |
| Total Capital Vertical Waste, tonnes | 31,373 | 1,287 | 587 | 1,218 | 1,218 | 1,581 | 5,628 | 3,549 | 5,507 | 5,693 | 3,428 | 1,676 | - |
| Expensed Development | | | | | | | | | | | | | |
| Horizontal | | | | | | | | | | | | | |
| Crosscuts and Laterals, m | 17,430 | 1,296 | 1,296 | 1,296 | 1,296 | 1,536 | 1,860 | 1,716 | 1,692 | 1,560 | 1,882 | 2,000 | - |
| Vertical | | | | | | | | | | | | | |
| Miscellaneous Raises, m | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total Expensed Horizontal Development, m | 17,430 | 1,296 | 1,296 | 1,296 | 1,296 | 1,536 | 1,860 | 1,716 | 1,692 | 1,560 | 1,882 | 2,000 | - |
| Total Expensed Horizontal Development, tonnes | 949,064 | 70,567 | 70,567 | 70,567 | 70,567 | 83,635 | 101,277 | 93,436 | 92,129 | 84,942 | 102,475 | 108,900 | - |
| Total Expensed Vertical Advance, m | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total Expensed Vertical Waste, tonnes | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Development Stats | | | | | | | | | | | | | |
| Total Horizontal Development Advance (m/year) | 39,071 | 2,445 | 2,445 | 2,445 | 2,445 | 3,189 | 4,192 | 3,804 | 4,176 | 4,609 | 4,864 | 4,457 | - |
| Total Horizontal Development Advance (m/day) | | 7 | 7 | 7 | 7 | 9 | 11 | 10 | 11 | 13 | 13 | 12 | - |
| Total Horizontal Development Waste Tonnes (t/year) | 2,127,389 | 133,130 | 133,130 | 133,130 | 133,130 | 173,641 | 228,227 | 207,128 | 227,383 | 250,960 | 264,845 | 242,684 | - |
| Total Horizontal Development Waste Tonnes (t/day) | | 365 | 365 | 365 | 365 | 476 | 625 | 567 | 623 | 688 | 726 | 665 | - |

## 16.6 MINE MOBILE EQUIPMENT

MGS Contratista Minera S.A De C.V. is the current contractor on site preparing the mine for production. The contractor has committed the necessary resources to mee the production profile. Currently, Altaley is expecting to maintain this relationship and rely on the contractor to supply the necessary equipment to meet the targets. Therefore, underground equipment determination is not required and relies entirely on MGS.

Aside from the surface support equipment, Altaley will be responsible for all primary material haulage of anything further than 200m from the working levels. Therefore, an engineering study was developed to determine the quantity of the required Altaley truck fleet, Table 16.5 Altaley Truck Fleet presents the findings.

**Table 16.5 Altaley Truck Fleet**

| | LOM | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TOTAL HAULAGE: 2-12 Hour Shifts** | | | | | | | | | | | | | |
| Scheduled Trucks | | | | | | | | | | | | | |
| Ataley Owned Trucks | | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 4 | 4 | 4 | - | - |
| Contractor Owned Trucks | | - | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | - |
| Costs to Operate | | | | | | | | | | | | | |
| Ataley Owned Trucks | 2,898,234 | 193,300 | 203,899 | 189,565 | 218,323 | 238,106 | 233,541 | 220,175 | 279,328 | 415,828 | 423,702 | 282,468 | - |
| Contractor Owned Trucks | 2,208,422 | - | 150,524 | 200,698 | 183,973 | 212,875 | 255,008 | 238,155 | 274,023 | 233,522 | 237,714 | 221,930 | - |
| Total Costs | 5,106,657 | 193,300 | 354,422 | 390,263 | 402,296 | 450,981 | 488,549 | 458,330 | 553,351 | 649,350 | 661,415 | 504,398 | - |
| Total Fuel Consumptions (gallons) | 631,352 | 27,358 | 38,465 | 41,177 | 44,043 | 51,440 | 58,435 | 52,808 | 70,501 | 88,376 | 90,622 | 68,129 | - |

## 16.7 UNDERGROUND MINE MANPOWER

The mine underground operating workforce is provided by MGS Contratista Minera S.A De C.V. This includes mine contractor administration, operating labor, and direct maintenance. Altaley General and Administrative workface are described in Section 21-2. MGS has agreed to the development and production targets and have committed the necessary manpower resources to meet the targets. However, MGS has provided an expected work force necessary to achieve the targets. The projected numbers of underground mine personnel are summarized in Table 16.6.

**Table 16.6 Underground MGS Contractor Workforce**

| Contractor Workforce | Quantity | |
|---|---|---|
| | per Shift | per Day |
| **Mine Operators** | | |
| Jumbo Operator | 2 | 4 |
| Jumbo Helper | 2 | 4 |
| Loader Operator | 3 | 6 |
| Blaster | 2 | 4 |
| Blaster Helper | 2 | 4 |
| Long Hole Driller | 2 | 4 |
| LH Driller Helper | 2 | 4 |
| Miner | 2 | 4 |
| Truck Operator | 2 | 4 |
| subtotal | 19 | 38 |
| **Maintenance** | | |
| Mechanic | 4 | 8 |
| Mechanic Helper | 4 | 8 |
| Electrician | 2 | 4 |
| Electrician Helper | 2 | 4 |
| subtotal | 12 | 24 |
| **Support** | | |
| Service | 2 | 4 |
| Backhoe Operator | 1 | 2 |
| subtotal | 3 | 6 |
| **Administration** | | |
| Surveyor | 1 | 1 |
| Surveyor Helper | 1 | 1 |
| Security | 2 | 4 |
| Supervisor | 1 | 2 |
| Assistant | 1 | 2 |
| Resident | 1 | 2 |
| Administrator | 1 | 1 |
| Warehouse | 1 | 2 |
| Lantern | 1 | 1 |
| Driver | 1 | 1 |
| subtotal | 11 | 17 |
| Mine Total | 45 | 85 |

## 16.8 UNDERGROUND VENTILATION

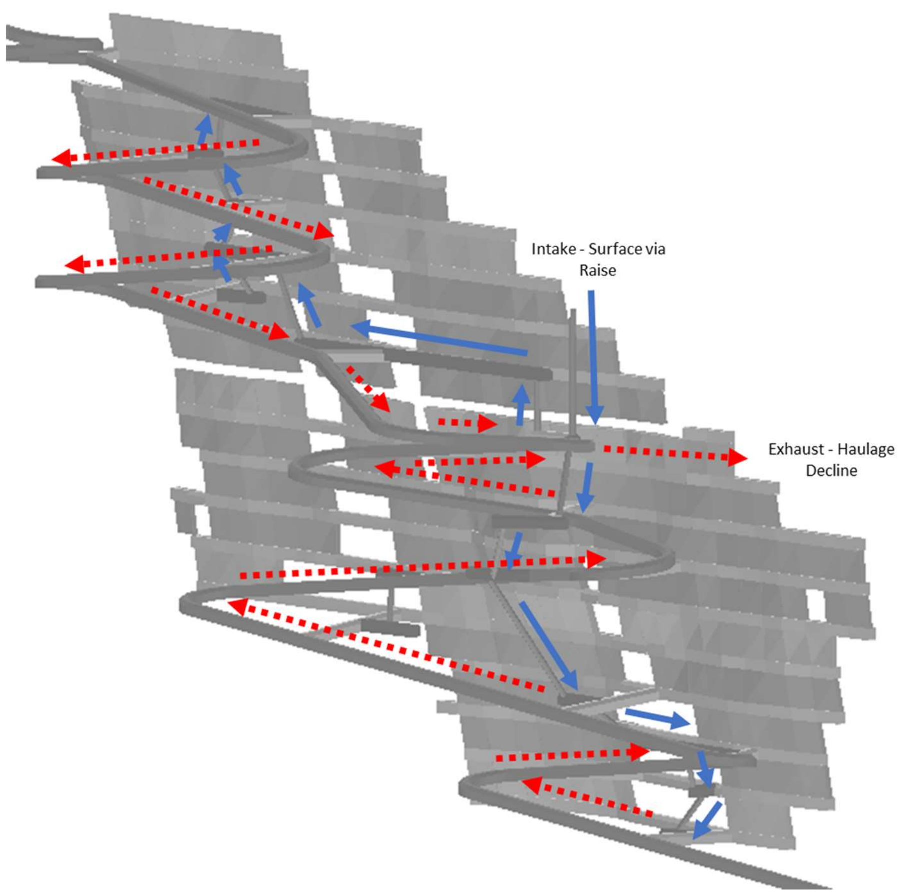
The Tahuehueto mine layout is based on sublevel stoping of different vein bodies which are located relatively close to the hillside topographic surface. Existing mining excavations have been constructed at various elevations to allow earlier sampling of these veins, and some have been incorporated into the mine access and ventilation system concepts for the PFS. The general ventilation system concept is the same for development of all of the vein systems and would rely on multiple intake and exhaust surface points controlled by fans in bulkheads. The establishment of individual vein ventilation circuits would follow the steps of:

- Develop primary access and haulage ramp and sublevel cross cuts;
- Construct a ventilation raise (3.0 m x 3.0 m) to surface off first cross cut at a nominal setback distance from the vein to direct intake air to the working faces;
- Install fans in bulkheads on the ventilation cross cut to draw air from the surface;
- Develop next raise on subsequent vent cross cuts and tie in with raise to pull fresh to the next level.
- Fresh air reports to the working areas and exhaust out primary ramp.

This configuration based on the current estimates are designed to supply 3540 m^3/min (125,000 cfm) to the working headings. Fan specification is 298 kW (400 hp), which is projected to be more than sufficient for the pressure drops estimated along the working faces, access drift, raises, and exhaust.

As mining develops in the stope areas, several raise fan installations would be working in parallel resulting in the total ventilation intake substantially exceeding the requirements of the operating equipment. Figure 16-12 illustrates the ventilation concept in the Perdido Vein. The ventilation raises would be cast up and down with the individual raise fans controlling the split of air flow, and serial flow mixing as the air moves towards the exhaust level. The series of ventilation raises also act as a secondary egress.

**Figure 16-3 Perdido Vein Conceptual Ventilation System**



## 16.9 UNDERGROUND INFRASTRUCTURE

Tahuehueto mine is scheduled to produce 28,000 tonnes per month with direct shipment to the process facility. Dry mining conditions are assumed based on the existing mine excavations, the proximity of the veins to the mountain side, and the elevation of the mining above the local river drainage. No extensive mine pumping system has been included in the design however a cost concession has been included in the economic analysis to purchase and operate pumps if required.

Underground electrical power is sourced via diesel generators located at the surface portals. The underground contractor has included diesel generator for the underground mining requirements and Altaley will supply additional generators as needed. Diesel consumption has been determined based on estimated electrical loads identified in Table 16-7. The power cable will be installed during the excavation of the of the primary ramp to working areas. Mine Load Centers (MLC) and switchgear will be strategically placed next to the working areas. As mining progresses, the power MLC will be advanced corresponding to development and production. Voltage loss shall occur with long runs; therefore when applicable boreholes will be drilled and power cable installed to minimize run length.

Make up water would be supplied by a pipe network that connects to tanks located at the portal areas through boreholes and piping in the ramps.

Infrastructure utility costs of $27.12/meter of waste development has been estimated and applied in the economic analysis.

# Table 16.7 Projected Underground and Mine Support Electrical Loads

| | Quantity | Rated Power (HP) | "Electric Load (kW) | Comment | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SURFACE LOADS FOR MINING | | | | | | | | | | | | | | | | |
| Ventilation - Primary | | | | | | | | | | | | | | | | |
| Creston | 1 | 400 | 298 | kW Load based on Zone Production | 298 | 298 | 298 | 298 | 298 | 298 | 298 | - | - | - | - | - |
| Perdido | 1 | 400 | 298 | kW Load based on Zone Production | 298 | 298 | 298 | 298 | 298 | - | - | - | - | - | - | - |
| Cinco | 1 | 500 | 373 | kW Load based on Zone Production | - | - | - | - | 373 | 373 | 373 | 373 | 373 | 373 | 280 | - |
| Santiago | 1 | 500 | 373 | kW Load based on Zone Production | - | - | - | - | - | - | - | - | - | 373 | 280 | - |
| Rey | 1 | 500 | 373 | kW Load based on Zone Production | - | - | - | - | - | - | - | 373 | 373 | - | - | - |
| Compressor | | | | | | | | | | | | | | | | |
| Creston | 1 | 150 | 112 | Electric Compressor (if Required, see comment) | 112 | 112 | 112 | 112 | 112 | 112 | 112 | - | - | - | - | - |
| Perdido | 1 | 150 | 112 | Electric Compressor (if Required, see comment) | 112 | 112 | 112 | 112 | 112 | - | - | - | - | - | - | - |
| Cinco | 1 | 150 | 112 | Electric Compressor (if Required, see comment) | - | - | - | - | 112 | 112 | 112 | 112 | 112 | 112 | 84 | - |
| Santiago | 1 | 150 | 112 | Electric Compressor (if Required, see comment) | - | - | - | - | - | - | - | - | - | 112 | 84 | - |
| Rey | 1 | 150 | 112 | Electric Compressor (if Required, see comment) | - | - | - | - | - | - | - | 112 | 112 | - | - | - |
| Hoist | 1 | 500 | 373 | Hoist Estimate | - | - | - | - | - | 373 | 373 | 373 | 373 | 373 | 280 | - |
| | | | | *Surface Subtotal kW* | 821 | 821 | 821 | 821 | 1,306 | 1,268 | 1,268 | 1,343 | 1,343 | 1,343 | 1,007 | - |
| | | | | *Monthly Surface Subtotal kW-hrs* | 610,526 | 610,526 | 610,526 | 610,526 | 971,292 | 943,541 | 943,541 | 999,043 | 999,043 | 999,043 | 749,282 | - |
| **Estimated Surface Loads for Mining** | **90%** | **Duty Cycle** | | **Surface Consumption (kW)** | 739 | 739 | 739 | 739 | 1,175 | 1,141 | 1,141 | 1,209 | 1,209 | 1,209 | 906 | - |
| | | | | **Monthly Surface Consumption (kW-hrs)** | 549,474 | 549,474 | 549,474 | 549,474 | 874,163 | 849,187 | 849,187 | 899,139 | 899,139 | 899,139 | 674,354 | - |
| UNDERGROUND LOADS | | | | | | | | | | | | | | | | |
| Dewatering System | | | | | | | | | | | | | | | | |
| Creston | 3 | 100 | 224 | Three Pumping Stations 1-100HP pumps | 224 | 224 | 224 | 224 | 224 | 224 | 224 | - | - | - | - | - |
| Perdido | 0 | 100 | - | Natural Dewatering | - | - | - | - | - | - | - | - | - | - | - | - |
| Cinco | 4 | 100 | 298 | Four Pumping Stations 1-100HP pumps | - | - | - | - | 298 | 298 | 298 | 298 | 298 | 298 | 224 | - |
| Santiago | 2 | 100 | 149 | Two Pumping Stations 1-100HP pumps | - | - | - | - | - | - | - | - | - | 149 | 112 | - |
| Rey | 2 | 100 | 149 | Two Pumping Stations 1-100HP pumps | - | - | - | - | - | - | - | 149 | 149 | - | - | - |
| Mine Equipment | | | | | | | | | | | | | | | - | |
| Jumbo (2 per zone) | 1 | 210 | 157 | Atlas Copco M Series | 313 | 313 | 313 | 313 | 470 | 313 | 313 | 313 | 313 | 313 | 235 | - |
| Production Drills (2 per zone) | 1 | 160 | 119 | Atlas Copco Simba Series | 239 | 239 | 239 | 239 | 358 | 239 | 239 | 239 | 239 | 239 | 179 | - |
| Ventilation - Secondary Fans | | | | | | | | | | | | | | | - | |
| Creston | 6 | 75 | 336 | Level Fans (50k cfm/fan) | 336 | 336 | 336 | 336 | 336 | 336 | 336 | - | - | - | - | - |
| Perdido | 4 | 75 | 224 | Level Fans (50k cfm/fan) | 224 | 224 | 224 | 224 | 224 | - | - | - | - | - | - | - |
| Cinco | 6 | 75 | 336 | Level Fans (50k cfm/fan) | - | - | - | - | 336 | 336 | 336 | 336 | 336 | 336 | 252 | - |
| Santiago | 2 | 75 | 112 | Level Fans (50k cfm/fan) | - | - | - | - | - | - | - | - | - | 112 | 84 | - |
| Rey | 2 | 75 | 112 | Level Fans (50k cfm/fan) | - | - | - | - | - | - | - | 112 | 112 | - | - | - |
| Miscellaneous | 2 | 500 | 746 | Entire Mine Life | 746 | 746 | 746 | 746 | 746 | 746 | 746 | 746 | 746 | 746 | 560 | - |
| Shop (1 per Zone) | 1 | 500 | 373 | Surface or UG Mine | 746 | 746 | 746 | 746 | 1,119 | 746 | 746 | 746 | 746 | 746 | 560 | - |
| | | | | *Underground Subtotal kW* | 2,827 | 2,827 | 2,827 | 2,827 | 4,110 | 3,238 | 3,238 | 2,939 | 2,939 | 2,939 | 2,204 | - |
| | | | | *Monthly Underground Subtotal kW-hrs* | 2,103,541 | 2,103,541 | 2,103,541 | 2,103,541 | 3,058,182 | 2,408,804 | 2,408,804 | 2,186,795 | 2,186,795 | 2,186,795 | 1,640,096 | - |
| **Estimated Underground Loads for Mining** | **70%** | **Duty Cycle** | | **Underground Consumption (kW)** | 1,979 | 1,979 | 1,979 | 1,979 | 2,877 | 2,266 | 2,266 | 2,057 | 2,057 | 2,057 | 1,543 | - |
| | | | | **Monthly Underground Subtotal kW-hrs** | 1,472,479 | 1,472,479 | 1,472,479 | 1,472,479 | 2,140,728 | 1,686,163 | 1,686,163 | 1,530,756 | 1,530,756 | 1,530,756 | 1,148,067 | - |
| **Tahuehueto Estimated Mine Loads - Surface and Undergound** | | | - | **Surface and Underground Consumption (kW)** | 2,718 | 2,718 | 2,718 | 2,718 | 4,052 | 3,408 | 3,408 | 3,266 | 3,266 | 3,266 | 2,449 | - |
| | | | | **Monthly Surface/Underground kW-hrs** | 2,021,952 | 2,021,952 | 2,021,952 | 2,021,952 | 3,014,890 | 2,535,350 | 2,535,350 | 2,429,895 | 2,429,895 | 2,429,895 | 1,822,421 | - |
| Mega Watts | | | | | 2.7 | 2.7 | 2.7 | 2.7 | 4.1 | 3.4 | 3.4 | 3.3 | 3.3 | 3.3 | 2.4 | - |

### 16.10 MINING OPERATING COST

Mine operating costs have been provided by MGS Contratista Minera S.A De C.V. The MGS quote provided parameter specific unit costing for excavations; nominal drifting of 5m x 4m at +5 to +12% is $1,411.65/meter and nominal drifting of 5m x 4m at -5 to -12% is $1,428.51/meter. The equipment size and ventilation requirements indicated that a nominal drift of 4.5m x 4m is sufficient; therefore, a proportional analysis from the supplied quote was completed to determine the unit costing of $1,278/meter. The MGS estimate includes only labor, equipment, supervision and haulage up to 200 meters from the working face. Altaley shall provide diesel fuel, blasting agents, and ground support consumables in addition to hauling blasted rock beyond the 200 meters. A schedule and costing were developed identifying the quantity of trucks Altaley will require to maintain target haulage numbers. Table 16.8 identifies operating costs.

**Table 16.8 Mine Operating Cost**

| Mine Operating Costs | $/Unit | LOM | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lateral Development | 1,278.07 | 22,276,760 | 1,656,379 | 1,656,379 | 1,656,379 | 1,656,379 | 1,963,116 | 2,377,210 | 2,193,168 | 2,162,494 | 1,993,789 | 2,405,328 | 2,556,140 | - |
| Sublevel Development | 19.00 | 16,026,253 | 1,726,378 | 1,732,933 | 1,633,278 | 1,720,583 | 1,631,055 | 1,566,341 | 1,715,206 | 1,703,540 | 1,410,807 | 631,180 | 554,952 | - |
| Long hole open stoping | 14.00 | 37,872,548 | 1,973,832 | 3,427,102 | 3,500,532 | 3,436,202 | 3,502,170 | 3,549,854 | 3,440,164 | 3,514,462 | 3,664,458 | 4,238,920 | 3,624,852 | - |
| Backfilling | 2.00 | 1,180,882 | 127,206.80 | 127,689.80 | 120,346.80 | 126,779.80 | 120,183.00 | 115,414.60 | 126,383.60 | 125,524.00 | 103,954.20 | 46,508.00 | 40,891.20 | - |
| Maintenance | 0.38 | 1,346,443 | 87,968.97 | 127,485.75 | 127,485.75 | 127,485.75 | 127,485.75 | 127,485.75 | 127,485.75 | 129,266.38 | 127,485.75 | 127,485.75 | 109,321.31 | - |
| Supplies | | | | | | | | | | | | | | |
| Diesel | 2.12 | 7,519,597 | 1,229,181 | 1,121,532 | 641,044 | 561,536 | 563,142 | 565,872 | 570,911 | 574,414 | 579,876 | 579,876 | 532,215 | - |
| Power Generation | 16.84 | 59,771,885 | 6,435,166 | 5,277,415 | 5,787,058 | 5,338,447 | 5,326,462 | 5,328,213 | 5,351,351 | 5,357,485 | 5,371,285 | 5,392,607 | 4,806,395 | - |
| Explosives | 4.11 | 14,599,204 | 916,417 | 1,205,734 | 1,209,090 | 1,206,150 | 1,309,590 | 1,447,088 | 1,389,769 | 1,453,421 | 1,508,681 | 1,569,362 | 1,383,903 | - |
| Consumables | 27.12/wst m | 82,950,278 | 8,647,073 | 7,670,989 | 7,703,502 | 7,172,440 | 7,285,680 | 7,454,846 | 7,415,195 | 7,498,572 | 7,584,838 | 7,673,757 | 6,843,387 | - |

# 17 RECOVERY METHODS

## 17.1 MAJOR PROCESS DESIGN CRITERIA

The flotation circuit is designed to process a peak of 300,000 tpy in 300 operating days, equivalent to 1000 tonnes per day and 45.8 tph through the grinding and flotation circuits. The Projects key drivers are presented in Table 17-1.

**Table 17-1 Tahuehueto Project Key Drivers**

| Description | Units | Value |
|---|---|---|
| **Operating Metrics** | | |
| Operating Days | dpy | 300 |
| Capacity | tpd | 1000 |
| Tonnes per Year | tpy | 300,000 |
| Total Ore Processed | kt | 3,550 |
| **Head Grade** | | |
| Gold | gpt | 2.58 |
| Silver | gpt | 50.5 |
| Copper | % | 0.3% |
| Lead | % | 1.1% |
| Zinc | % | 1.9% |

The life of mine concentrate production metallurgic balance is indicated in Table 17-2. This metallurgic balance was prepared from the different metallurgic research discussed in Section 13 and is based on the production schedule detailed in Section 16.4 using the basic plant design criteria. The annual mill production schedule is presented in Table 17-3.

**Table 17-2 Tahuehueto Average Metallurgical Recoveries**

| Product | kTonnes | Distribution % (Recoveries) | | | | |
|---|---|---|---|---|---|---|
| | | Au | Ag | Cu | Pb | Zn |
| Head | 3,550 | 100% | 100% | 100% | 100% | 100% |
| Pb Concentrate | 58 | 77.1% | 62.8% | 31.6% | 85.5% | 1.6% |
| Cu Concentrate | 18 | 6.8% | 10.3% | 51.4% | 0.6% | 17.1% |
| Zn Concentrate | 108 | 11.0% | 11.7% | 11.5% | 6.1% | 80.0% |
| Tails | 3,079 | 5.4% | 15.2% | 5.4% | 7.8% | 1.3% |

## 17.2 PLANT DESIGN

Based on metallurgical tests performed to date and the toll processing metallurgical campaigns provide sufficient data to reach a level of confidence that the flotation process chosen will work, flotation targets are attainable, and an economical concentrate can be produced. For this reason, Altaley decided to proceed with construction of the Tahuehueto processing facilities in 2021. At the time of writing, construction is substantially complete with commissioning anticipated to begin during the second quarter of 2022. The high-level design criteria is shown in Table 17-4.

**Table 17-3 High Level Design Criteria**

| Item | Value |
|---|---|
| Peak Tonnes of dry ore processed by year | 165,000 |
| Days per year | 300 |
| Tonnes by day | 1000 |
| Crushing hours by day | 12 |
| Tonnes per hour crushing | 45.8 |
| Grinding and Filtering hours per day | 24 |
| Tonnes per hour grinding and filtering | 41.7 |
| Pb tonnes per month | 263 |
| Zn tonnes per month | 510 |
| Cu tonnes per month | 69 |
| Life of operation (years) | 10.9 |

The processing flow sheet is a conventional crushing/milling/flotation/thickening/filtration process which is being built out in three phases as follows:

Phase I: Single primary ball mill operating at 550 tpd producing Pb and Zn Concentrates. (This is the current flow sheet which includes enough Pb and Zn capacity to process 1000 tpd)

Phase II: The addition of a second ball mill to increase throughput to 1000 tpd.

Phase III: The addition of a Cu flotation circuit to process an independent copper concentrate.

The Phase I process flow sheet is shown in Figure 17-1.

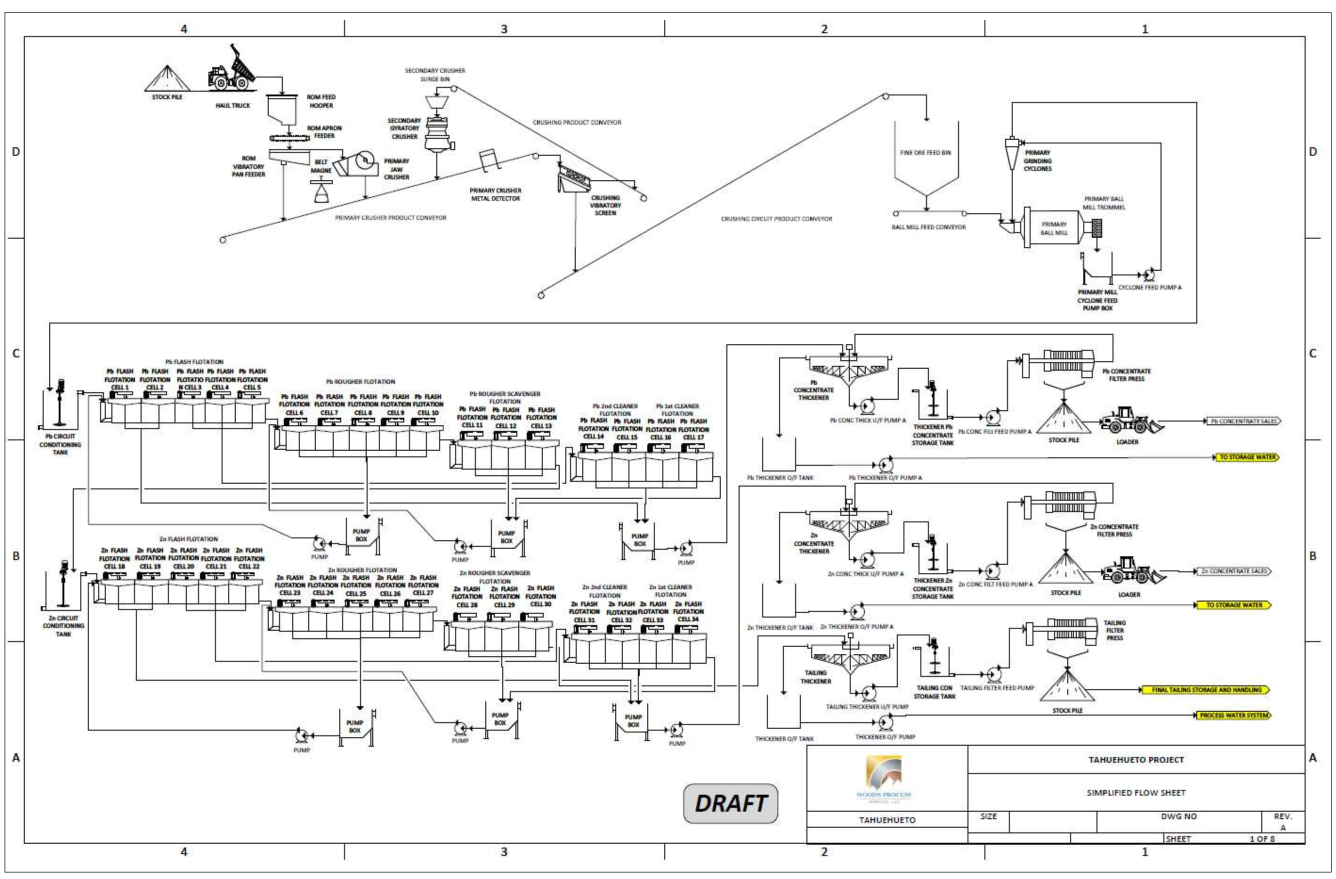
### 17.2.1 PHASE I EQUIPMENT DESCRIPTION

One coarse ore bin with capacity to receive 20-ton trucks and total storage capacity of 80 tons and a mesh to control the rock size of 50 x 80 cm
One Apron feeder with capacity to convey 20 to 60 tonnes per hour of ore.
One Primary Jaw crusher 76 cm x 90 cm to process 20 to 60 tonnes per hour. (Note: Jaw crusher is sized for 1 ktpd production rate)
Secondary cone crusher to produce the mill feed at a minus 10 mm particle size.
One vibratory screen operating in closed circuit with the secondary cone crusher producing a mill feed product at minus 10 mm
Fine ore bin with capacity of 550 tons of fine ore
A single 2.40 m x 2.40 m ball mill, with 300 HP for mill the ore to a P80 or 90 microns at a rate of 21tonnes per hour.
Cyclone circuit operating in closed circuit with the ball mill to produce flotation feed product at -90 microns (80% - 200 mesh).
One conditioner tank for Pb flotation.
One bank of Primary or Flash Pb flotation cells.

One back of Pb Rougher Flotation Cells.
One back of 2nd Pb Rougher Flotation Cells (Rougher-Scavenger)
One bank of Pb First Cleaner Flotation Cells.
One bank fo Pb 2nd Cleaner flotation cells.
One conditioner tank for Zn flotation.
One bank of Primary or Flash Zn flotation cells.
One back of Zn Rougher Flotation Cells.
One back of 2nd Zn Rougher Flotation Cells (Rougher-Scavenger)
One bank of Zn First Cleaner Flotation Cells.
One bank for Zn 2nd Cleaner flotation cells.
One thickener for Pb concentrate.
One thickener for Zn concentrate.
One thickener for tailings.
One filtration circuit for Pb concentrate.
One filtration circuit Zn concentrate.
One filtration circuit for tailings.

All the concentrates will be shipped in bulk and trucked in 30 tons trucks. The Pb concentrate will be sent to the port of Manzanillo, Colima and the Zn concentrates to Matehuala, San Luis Potosí.

**Figure 17-1 Plant Flowsheet Section**



## 17.3 PROCESS PLANT DESCRIPTION: PHASE I

### 17.3.1 CRUSHING CIRCUIT

This crushing circuit is scheduled to operate 12 hours per day and will receive ore from the mine in 20 t capacity dump trucks discharged to the coarse ore feed bin with a capacity of 80 t. The feed bin will have a 46 cm grizzly. The oversize ore material will be reduced with the use of pneumatic rock breaker.

The ore from the coarse ore bin, reports to the primary jaw crusher by an apron feeder, and then reports to a vibratory grizzly pan feeder. Pan feeder undersize reports to the primary crusher product conveyor (CV-01). Pan feeder oversize reports to the Primary Jaw Crusher (JC-01). The Primary Jaw Crusher product reports to the Primary Crusher Conveyor.

The Primary Crusher Conveyor discharges to the Secondary Crusher Vibratory Screen (VS-01), The Vibratory Screen undersize reports to the Final Product Conveyor (CV-02). The Vibratory Screen Oversize reports to the Secondary Crusher Feed Conveyor (CV-03) which in turn discharges to the Secondary Crusher Feed Surge Bin (SB-01). Material from the Surge Bin reports to the Secondary Cone Crusher with the Cone Crusher product reporting to the Primary Crusher Product Conveyor (CV-01) where it is added to the product from the Primary Jaw Crusher. The mixed ore is subsequently processed through the Secondary Vibratory Screen with the screen undersize reporting to the Final Product Conveyor (CV-02). The final Product Conveyor reports to the Fine Ore Bin (FB-01)

### 17.3.2 GRINDING CIRCUIT

Fine ore from the Fine Ore Bin discharges to the Ball Mill Feed Conveyor (CV-04) and feed into the Primary Ball Mill (BM-01). Water is mixed with the ore to maintain a slurry density of 70 percent solids (wt:wt) in the mill. The Ball Mill discharges to Ball Mill Discharge Trommel when the oversize is returned to the mill and undersize passes to the Cyclone Pump Box (PB-01). Water is added to the pumpbox to dilute the slurry to 30 percent solids (wt:wt) before being pumped to the Cyclones (CY-01) via one of the two Cyclone Feed Pumps (PP0-01A/B). Cyclone underflow reports back to the ball mill feed with the cyclone overflow reporting to the Pb Flotation Conditioning Tank (TK-01).

### 17.3.3 FLOTATION CIRCUIT

#### 17.3.3.1 LEAD FLOTATION

The ore slurry is conditioned with reagents in the Pb Flotation Conditioning Tank (TK-01), where the ore is conditioned with reagents as required before reporting to the Pb flotation cells. Conditioned slurry reports to the first set of flotation cells known as the Primary PB Roughers Flotations Cells. Concentrate from the Primary Pb Roughers reports to the final concentrate pumpbox (PB-04) or the Pb 1st/2nd Cleaner Flotation Cells depending on grade. Primary Pb Flotation Tailings report to the 1st Pb Rougher Flotation Cells. Concentrate from the 1st Pb Rougher Flotation Cells reports back to the Primary Pb Floatation Cells. Tailings from the 1st Pb Rougher Flotation Cells reports to the 2nd Pb Rougher Flotation Cells. Concentrate from the 2nd Pb Rougher Flotation Cells report to the 1st Pb Rougher Pump Box with the 2nd Pb rougher Flotation Cell tailings reporting to the Zn Flotation Conditioning Tank.

Concentrates from the 1st/2nd Pb Cleaner Flotation Cells report to the final Pb Concentrate Pump Box (PB-04) Final Pb Concentrate is pumped from the Final Pb Concentrate Pump Box (PB-04) via one of two Pb Concentrate Thickener Feed Pumps (PP-04A/B).

#### 17.3.3.2 ZINC FLOTATION

The Zn flotation tailings conditioned with reagents in the Zn Flotation Conditioning Tank (TK-02 before reporting to the Zn flotation cells. Conditioned slurry reports to the first set of flotation cells known as the Primary Zn Roughers Flotations Cells. Concentrate from the Primary Zn Roughers reports to the final concentrate pump box (PB-07) or the Zn 1st/2nd Cleaner Flotation Cells depending on grade. Primary Zn Flotation Tailings report to the 1st Zn Rougher Flotation Cells. Concentrate from the 1st Zn Rougher Flotation Cells reports back to the Primary Zn Floatation Cells. Tailings from the 1st Zn Rougher Flotation Cells reports to the 2nd Zn Rougher Flotation Cells. Concentrate from the 2nd Zn Rougher Flotation Cells report to the 1st Zn Rougher Pump Box with the 2nd Zn rougher Flotation Cell tailings reporting to the Final Tailings Thickener.

Concentrates from the 1st/2nd Zn Cleaner Flotation Cells report to the final Zn Concentrate Pump Box (ZN-04) Final Zn Concentrate is pumped from the Final Zn Concentrate Pump Box (PB-07) via one of two Zn Concentrate Thickener Feed Pumps (PP-07A/B)

A summary of the Reagents type, application and amount used in the flotation process are indicated in Table 17-5.

**Table 17-4 Reagents Type and Consumption**

| Reagent | Application | Quantity (g/t) |
|---|---|---|
| CaO | (pH control) | 2,000 |
| $ZnSO_4$ | (Zn depressant) | 1,100 |
| AF-242 | (Promoter - Collector Pb - Cu) | 70 |
| AF-404 | (Promoter- Collector Pb – Cu) | 70 |
| Mibc-70 | (Frother) | 50 |
| $CuSO_4$ | (Zn activator) | 1,000 |
| AF-211 | (Zn promotor) | 80 |
| X-343 | (Zn collector) | 30. |
| Xanthate | (Collector) | 30 |

### 17.3.4 LIQUID/SOLIDS SEPERATION

Lead and Zinc concentrates are collected and transferred to the respective concentrate thickeners, namely TH-01 and TH-02 respectively. Thickener underflow density is expected range between 50% to 60% solids (wt:wt). Thickener overflow, primarily process water, will be recycled back into the circuit.

## 17.4 TAILINGS DISPOSAL

Tailings storage will be by dry stack tailings method.

## 17.5 PROCESS PLANT MANPOWER

The plant is going to operate two; 12 hours shifts each day, on the basis of 20 working days by 6 off. Table 17-5 indicates the 58 personnel required to operate and manage the processing plant at Tahuehueto.

Process manpower includes personnel involved in direct supervision and operation of the mill and processing operation. This includes administration, operating labor, and direct maintenance. The grouping and the numbers of personnel are summarized in Table 17-8. Maintenance requirements were estimated based on ratios of maintenance manpower to operating manpower.

Operating hours were determined by estimated equipment productivities. Equipment operating hours in a given 12 hour operating shift were based on the assumed utilization. Operating man hours were then factored to account for the 12 hour paid shift, no reassignment to other tasks was assumed. The operation was scheduled for 300 operating days per year on a 6 day work week.

For costing, the man hours were rounded up to the totals in each group. Altaley supplied labor rate assumptions were used for labor cost estimation. For the economic analysis of the project, general site administration has been added to the processing plants manpower estimates. These general and administration (G&A) personal requirements are presented in

Table 17-6.

**Table 17-5 Process Plant Manpower by Group and Function**

| Assigned Group | Function | Number of Personnel |
|---|---|---|
| **Mill Administration** | Mill Manager | 1 |
| | Mill Superintendent | 1 |
| | Metallurgist | 2 |
| | Mill Operations Foreman | 4 |
| | Maintenance Superintendent | 1 |
| | Maintenance Foreman | 3 |
| | Plant Electrical Foreman | 1 |
| | Metallurgical Accountant | 2 |
| | Mill Administrative Assistant | 1 |
| | **Total Mill Admin** | **16** |
| **Plant Operators** | Crushing Control Room | 4 |
| | Crush and Convey | 8 |
| | Grinding and Flotation | 4 |
| | Regrind/Cleaner Float | 4 |
| | Thickener and Filtration | 4 |
| | Sampler | 4 |
| | Packing/Shipping/Reagents | 2 |
| | Tailings/Water Treatment | 2 |
| | **Total Plant Operators** | **32** |
| **Mill Maintenance** | Crusher | 8 |
| | Grinding and Flotation | 4 |
| | Regrind/Cleaner/Filter/ Packing | 8 |
| | Electrician | 4 |
| | Interment Technician | 4 |
| | **Total Mill Maintenance** | **10** |
| **Total Mill Personnel** | | **58** |

**Table 17-6 Project General and Administration Manpower**

| Assigned Group | Function | Number of Personnel |
|---|---|---|
| **General Administration** | General Manager | 1 |
| | Administrative Assistant | 1 |
| | Controller | 1 |
| | Accountant | 2 |
| | Human Resources Manager | 1 |
| | Human Resources Generalist | 1 |
| | Regional Supply Manager | 1 |
| | Contracts Manager | 1 |
| | Supply Superintendent | 1 |
| | Warehouse Supervisor | 1 |
| | Warehouse Clerks | 4 |
| | Buyer/Coordinator | 2 |
| | Plant Engineer | 1 |
| | Environmental Engineer | 1 |
| | Industrial Hygienist | 1 |
| | Health and Safety Technician | 2 |
| **Total G&A Personnel** | | **22** |

## 17.6 PLANT CAPITAL COST

The capital cost of the plant is made up of the plant equipment, plant and service buildings, and plant construction. The total capital cost required is USD $14,350,000 without contingency and is indicated in detail in Table 17-7.

**Table 17-7 Plant Equipment and Buildings Capital Cost**

| Costing Area | Cost ($k) |
|---|---|
| **Direct Costs** | |
| Crushing, Conveying, and Storage | 2,840 |
| Grinding | 1,600 |
| Flotation | 1,520 |
| Filtration, Packing, and Shipping | 1,180 |
| Fresh and Process Water | 1,350 |
| Ancillary Facilitates | 1,000 |
| Tailings Storage Facility | 300 |
| Main Plant Substation | 940 |
| General Site Earthwork and Grading | 300 |
| **Indirect Costs** | |
| Mobilization | 100 |
| Freight | 250 |
| Operations Overhead | 120 |
| Construction Overhead | 620 |
| Engineering, Procurement, and Construction Management | 1,860 |
| Vendor Support, Spares | 250 |
| Capital Spares, First Fills | 120 |
| **Total Processing Capital Costs** | **14,350** |

## 17.7 PLANT OPERATING COST

The operating costs are based on first principal engineering cost buildups for processing operations as shown in Table 17-8. These costs were derived from materials, power, and labor for each unit operation. For costing, the mine maintenance man hours were incorporated with mill labor along with the power requirements for the underground mine. This was done to reflect the power distribution of the Project site and the management structure, respectively. Operating consumables and maintenance consumables were based on costing services.

**Table 17-8 Plant Operating Cost**

| Costing Area | LOM Cost ($k) | Unit Cost ($/t) |
|---|---|---|
| Salaried Labor | 10,264 | 3.14 |
| Hourly Labor | 37,552 | 11.50 |
| Crushing and Grinding | 23,795 | 7.29 |
| Flotation | 15,607 | 4.78 |
| Filtration, Packing, and Shipping | 3,447 | 1.06 |
| Tailings Storage Facility | 5,056 | 1.55 |
| Mine Power Requirements | 4,808 | 1.47 |
| **Total Processing Operating Costs** | **100,529** | **30.80** |

# 18 PROJECT INFRASTRUCTURE

Site infrastructure and ancillary facilities will comprise of the following components complying with all municipal, state and federal government regulations, and adhering to excellent engineering and construction practices.

## 18.1 SITE ACCESS ROAD

Access to the Tahuehueto project by land from Tepehuanes is by paved road for approximately 40 km to Ciniega de Los Frailes and then an additional 80 km of unpaved road and the last 40 km is a dirt road that needs new design in some areas to accommodate large trucks. The average time from Tepehuanes to the property is 5 hours.

According to the municipality authorities there is an approved budget for paving another 10 km of the Tepehuanes - Tahuehueto road, and there is the possibility that the State Government and the communication minister of the Federal Government, can further invest in the road to the property.

For the construction stage of the project, it will be necessary to invest in improving some curves of the roads, in order to give access to large trucks that will supply equipment and materials as gas, diesel and gasoline and also for the transport of the future concentrate production to the customers.

## 18.2 AIRPLANE ACCESS

There are 2 gravel airstrip sites for fixed-wing aircraft, El Purgatorio and Mesa de Toros, but both require renewal of the permit for use of the land. Mesa de Toros is also in need of repair to the access road.

The Company is working on renewing the permit for El Purgatorio, which will be used for the Community and Altaley personnel, to have the ability to receive small planes like a Cessna 206 for 6 passengers.

Access can be from either Culiacan or Durango. El Purgatorio airstrip is located 20 km by road north of Tahuehueto and Mesa de Toros is located 5 km by road west of Tahuehueto. The flight from Durango is 45 minutes and from Culiacan 30 minutes. These airstrips will be maintained by Altaley.

## 18.3 POWER SUPPLY AND DISTRIBUTION

The electricity required in the Tahuehueto project for a 1,000 tpd operation is divided into two 12 hours shifts. The first or daily shift requires power for the full operation of the mine. During the second shift the water pumping and crushing section in the plant as well as the mine are not operating, reducing the demand.

Power lines from CFE (Comision Federal de Electricidad) are not available to provide electricity in Tahuehueto, and the closer lines in Topia 25 km south of Tahuehueto have limited capacity. The investment needed to build a power line to the project at this stage is not an economic option. The options evaluated to supply the 2,500 kW of electricity required for the project has indicated the use of gas engine generators as the method of power generation for this study. The gas generators option is more expensive than the diesel generators in terms of capital cost, but in the short term this difference is compensated for by the fuel saving and in the long term is a better option than diesel engine generators.

Gas engine generators are a common option when a gas pipeline is available and the cost for gas is less than diesel. Gas has a lower price in relation to the diesel and is more efficient. There are no gas pipelines available in Tahuehueto or nearby areas, therefore, the gas would be delivered to the project by tanker truck from Durango.

This option considers two Caterpillar 1,827 kW gas generators, switchgear and synchrony system at 13.8 kV and transformation to 0.48 kV.

### 18.3.1 HYBRID SOLAR PANEL GENERATORS WITH GAS GENERATORS

There is an option that combines the use of solar panels with the gas generators. During the daytime 30% of the power required can be supplied by solar panels and during nighttime, the power is supplied by the fuel generators.

Solar panels can only supply power during the day and only for a maximum of 30% of the total demand and also require a large piece of land for their installation. The investment on this option is high in terms of units of power generated, but the fuel consumption, operating cost, and pollution are reduced. This option must be considered for long term operation.

The power in any option will be generated at 4,160 volts and transported by power lines to the operating area. In each are by the use of electric substations will be reduced to 440, 220 and 110 volts.

The larger electric engines of the mine, mill and water pumps equipment will use 440 volts, some maintenance and service motors will use 220 volts and general services for housing and camp will be at 110 volts.

## 18.4 WATER SUPPLY AND DISTRIBUTION

During the exploration stage, Altaley was supplying water for drilling and services from the Vueltas River, that is located at the bottom of the canyon at an elevation of 660 m, the plant at 1300 m and the main fresh water tank at 1700 m. The estimated water demand for the mill will be approximately 175 m3/day.

Water for mining and milling operations will be supplied from an underground pumping station within underground mine workings at Tres de Mayo, near Las Vueltas River at approximate coordinates; Latitude 25°24'5.24"N and Longitude 106°36'47.01"W, elevation 680m. Pumped first to the water storage tank 1 at approximate coordinates of 1425m elevation, then gravity fed to two water storage tanks at the mill site.

Process water will be recycled within the milling circuit with an estimate of approximately 70% of mill process water being recovered and reused in ongoing milling operations.

## 18.5 ADMINSTATION BUILDING

Designed and constructed to provide sufficient working space for management, engineering, mine supervisors, geology, and all the operations support staff. This facility will be built in the called Industrial area between the mill and tailings dam where there is enough space for this purpose.

This 300 $m^2$ surface area building will have working space for 8 private offices and a general working area for 18 persons, along with 3 meeting rooms for 20, 12 and 6 persons that will be used for operation meetings and capacitation. The private offices will be for the General Manager and for the head people of each area of the mine.

## 18.6 MAINTENANCE

A maintenance warehouse facility is provided to service mobile equipment and for storage of equipment spares. The maintenance area includes an overhead crane and is fully equipped including lube racks, washer system, tools control, etc. This maintenance warehouse will include areas for electric and combustion engines and also an office for the head of maintenance.

## 18.7 WAREHOUSE

A general warehouse will be built for the storage and control of all materials and spare parts required for the total operation of the Mine. Due to the remote location of the property, it will be necessarily having this facility permanently stock the materials and spare parts for all the equipment and installation.

This warehouse will have a 500 $m^2$ surface and will include an office for the warehouse personnel. This area will also include the plant, metallurgic lab, hospital and truck wash.

## 18.8 PROPANE STORAGE

An open area with a slab on grade has been provided to accommodate butane gas and built following all regulatory requirements. It must be installed near the actual natural gas & diesel storage and from this place, will be conducted to the power plant facility and other areas by pipe. The installation will have 4 gas tanks for storage 30 $m^3$ each one for a total capacity of 120 $m^3$.

## 18.9 OPEN AREA STORAGE

A chain-link fence with gate and concrete posts, this open storage area is provided for equipment and materials that can be stored outside. It will be necessary to cover 8 weeks of supplies plus all the "C" materials, due to the remoteness of the mine. This open area will be ready for the construction stage in order to have control of the equipment and materials that will be installed on the Mine Unit.

## 18.10 TRUCK WASH

Trucks and equipment will be washed in an open area near the maintenance building, with the facilities required for a thorough job. It will include a concrete slab and installations to separate water from fuel and lube oils.

## 18.11 MINE DRY

A separate mine dry, plant and maintenance facility will be provided, that will include showers and lockers to be used by mine, plant and maintenance personnel. The facilities will also have a water treatment system for recycling.

## 18.12 CAMP

In the main area there isn't specialized manpower, local people of the community will be trained, but some professionals and specialist persons will come from other areas and in the mine zone there are no facilities for stay. Accommodations will be needed for the estimated 55 professionals and specialists required for the full mine as well as the suppliers and contractors that will be visiting and doing temporary work for the operation.

Three accommodation areas will be built for these personnel. The first one will have accommodations for 25 persons for the senior management of the mine, the second camp will have accommodations for another 30 persons from specialized areas of the operation and the third camp, will be the actual accommodations that will be redesigned and will operate like a hotel for contractors and suppliers.

The 3 camp areas will have cooking and dining facilities. The community personnel will supply his lunch. The restaurants will have a complete kitchen and eating and entertainment areas. Breakfast will be served from 6 to 9 am, lunch from 12:30 to 3:30 pm and dinner from 6 to 9 pm. Staff will work in 2 shifts with 2 cooks, and 4 cooks assistants and will serve food to an average of 55 persons. The camps will also have a laundry rooms. Figure 20-13 shows the camp areas and the Figure 20-14 the existing camp that will be redesigned to accommodate visitors.

## 18.13 ASSAY LABORATORY

Facilities for the assay laboratory will include sample preparation with drying, crushing and pulverizing. An AA spectrometer for multi metal analysis, fire assaying for gold-silver and complete equipment for metallurgical testing is considered. Staff will include 5 people. This lab will have the capacity to assay 150 samples per day from exploration and mine control, from the plant for operation control, from concentrates shipments, water, tailings, etc.

## 18.14 FUEL STORAGE

Diesel fuel for the equipment will be transported to the mine from PEMEX distributors and stored in 2 existing tanks with 20,000 l of capacity each.

Gasoline will be stored in a 10,000 l tank near the warehouse for use in some gasoline vehicles. Most of the vehicles, pickups, trucks and equipment will use diesel engines.

The natural gas consumption for the power plant generators will be 250,000 l per month and around 10,000 more for the camp and lab. The gas storage will be in 4 tanks with 30,000 l capacity each, for a total storage capacity of 120,000 l.

All the fuel storage tanks and fuel transport equipment will meet existing regulations and safety requirements.

## 18.15 COMMUNICATION SYSTEMS

A fiber optic network will be installed on site with hot-spots that will handle data, radio, RFID for personnel and equipment. Such system will include underground workings with monitoring ventilation gases etc. thus providing real time control. Everything linked to a satellite communication facility linked to corporate offices.

All the offices, camp and inclusive surrounding areas to the mine will have access to internet and cellular phone services. This will be a contribution of the company to the community.

## 18.16 WASTE DISPOSAL

The waste water will be treated in a plant and will be used as process water for significant savings in fresh water use.

The solid waste, like oil and maintenance shop discards, will be treated following environmental regulation. Some of this material will be shipped out of the property by a licensed corporation. Other hazardous wastes like batteries will be handled by a third party certified by federal authorities.

The waste produced by the camp and living activities, will be stored in the existing storage facility that meets all existing regulations.

## 18.17 MILL CONSTRUCTION PROGRESS

Mill construction is more than 95% complete as of the effective date of the report.

# 19 MARKET STUDIES AND CONTRACTS

The concentrates produced in the Tahuehueto mine will be sold to Trafigura Mexico under a 10-year offtake agreement where metals are sold at spot prices at time of delivery under industry standard terms and CIBC Benchmark future estimated metal pricing is used to estimate revenues for the operation.

# 20 ENVIRONMENTAL STUDIES, PERMITING AND SOCIAL OR COMMUNITY

The Tahuehueto Project will consist of the exploitation of the underground mineral deposits. All the exploration work completed by Altaley has been carefully constructed and adequate closure and restoration measures, as well as erosion control measures, were observed in the exploration areas.

There have been past mining activities at the Project site including the 50 tpd flotation mill operation, tailings dam for this operation, offices, houses, and more than 5000 m in underground exploration developments and exploitation works. Therefore, Tahuehueto Project is an impacted terrain and a preventive analysis and MIA the (Environmental Impact Study) has been presented to the environmental authorities and approved. All required permits to allow the mining operations to commence are in place, as follows. The following Figure 20-1 shows a list of approved permits in place at Tahuehueto.

The mineralized material from the deposit will be processed at a central process plant. With the development of this project, the main permanent impacts will be the mineral processing facility, the surface portals, the waste rock facility and the tailing disposal facility. The underground cut and fill mining method will eliminate the need for permanent surface waste rock facilities as all waste is schedule to be used in the mine excavation as backfill. The waste rock will need temporary stockpiles near portals until it is needed to backfill the stoped-out production areas.

The project site is not located within or near any natural protected area or fragile environment. The environmental controls that will be applied during the development and abandonment of the project will considerably diminish the level of risk and impacts to the natural environment.

Tailing characterization test will be performed to define the environmental protection measures during the construction, operation, maintenance and abandonment of the tailing facility.

The Project is subject mainly to regulation from the Federal level, through its different stages of development, especially those related to environmental permits for construction and operation, which involves the environmental impact, environmental risk and land use change studies and resolutions. Air emissions, water use, water discharge and hazardous residues handling are also regulated by Federal laws.

## Figure 20-1 Tahuehueto Environmental Permits

REAL DE LA BUFA SA. DE CV

**ESTADO ACTUAL DE PERMISOS Y LICENCIAS AMBIENTALES AUTORIZADOS POR SEMARNAT**

FECHA: 25-Apr-22

**OBRAS CONTEMPLADAS EN CADA PERMISO AUTORIZADO POR SEMARNAT (EN MATERIA DE IMPACTO AMBIENTAL)**

| "Reactivación de Operaciones para la Explotación y Beneficio de Minerales Tahuehueto" | 02-Oct-17 | Autorización para la Reactivación de Operaciones para Explotación y Beneficio de Minerales Vencimiento (1 año Const. 06-oct-2018), (10 años Operac. 06-oct-2028), (2 años Abandono 06-oct-30) | Construcc. 1a. Etapa Concluido |
|---|---|---|---|

| Obras Mineras | Sup. (has) Requeridas | Sup. (has) Con CUS | Sup. (has) Sin CUS | AVANCE A LA FECHA |
|---|---|---|---|---|
| a) Mina subterránea | N/A | N/A | N/A | N/A |
| b) Tepetateras y portales (socavones Actuales): Portal 5 de Mayo; Tepetatera 5 de Mayo; Portal SL0; Portal CCSL0; Portal CCSL1; Portal HL Nivel de Acarreo; Tepetatera HL Nivel de Acarreo | 0.4220 | | 0.4220 | 100% |
| c) Tepetateras y portales (socavones Nuevos): Portal Margen del Río; Tepetatera Margen del Río; Portal CCSL7; Tepetatera CCSL7; Portal CCSL5; Tepetatera CCSL5; Portal CCSL6; Tepetatera CCSL6; Portal CCSL4; Tepetatera CCSL4; Tepetatera SL0; Tepetatera CCSL0; Tepetatera CCSL1; Portal CCSL2; Tepetatera CCSL2; Portal CCSL3; Tepetatera CCSL3 | 1.5630 | 1.5630 | | 100% |
| d) Polvorín subterráneo. | N/A | N/A | N/A | N/A |

| Construcción de Obras Asociadas o Provisionales | Sup. (has) Requeridas | Sup. (has) Con CUS | Sup. (has) Sin CUS | AVANCE A LA FECHA |
|---|---|---|---|---|
| e) Mantenimiento de los caminos existentes | N/A | N/A | N/A | N/A |
| f) Campamento nuevo | 0.4970 | 0.4970 | | 100% |

| Rehabilitación de Obras | Sup. (has) Requeridas | Sup. (has) Con CUS | Sup. (has) Sin CUS | AVANCE A LA FECHA |
|---|---|---|---|---|
| g) Planta de beneficio | 0.1630 | | 0.1630 | 100% de 1a. Etapa |
| h) Laboratorio | 0.0230 | | 0.0230 | |
| i) Unidad médica | 0.0230 | | 0.0230 | |
| j) Campamento: Oficinas; Baños; Dormitorios; Comedor; Almacenes | 0.0750 | | 0.0750 | 100% |
| k) Polvorines | 0.0860 | | 0.0860 | 100% |
| l) Tanques de almacenamiento | 0.0200 | | 0.0200 | 100% |
| TOTALES | 2.8710 | 2.0600 | 0.8110 | |

La segunda Etapa está Autorizada en el Proyecto "Línea de Conducción de Agua y Ampliación de Infraestructura Tahuehueto".

Parte de estas Obras (Dormitorios, Comedor), se Reubicaron en el área de Presa de Jales (I).

| "Presa de Jales I, para el Proyecto Reactivación de Operaciones para la Explotación y Beneficio de Minerales Tahuehueto" Aut. SG/130.2.1.1/001869/17 | 15-Aug-17 | Autorización para la Construcción y Operación de la Presa de Jales I, para el Proyecto Reactivación de Operaciones para Explotación y Beneficio de Minerales Vencimiento (2 años 15-ago-2019) | Se desechó esta Presa de Jales |
|---|---|---|---|

| Obras Asociadas | Sup. (has) Requeridas | Sup. (has) Con CUS | Sup. (has) Sin CUS | AVANCE A LA FECHA |
|---|---|---|---|---|
| a) Presa de Jales (I) | 3.7800 | 2.6730 | 1.1090 | 100% |
| TOTALES | 3.7800 | 2.6730 | 1.1090 | |

Esta Área NO será utilizada como Presa de Jales, aquí se reubicaron las Instalaciones de "Campamentos"

| "Presa de Jales II, para el Proyecto Reactivación de Operaciones para la Explotación y Beneficio de Minerales Tahuehueto" Aut. SG/130.2.1.1/001870/17 | 14-Aug-17 | Autorización para la Construcción y Operación de la Presa de Jales II, para el Proyecto de Explotación y Beneficio de Minerales Vencimiento (13 años 14-ago-2030) | Permiso Vigente |
|---|---|---|---|

| Obras Asociadas | Sup. (has) Requeridas | Sup. (has) Con CUS | Sup. (has) Sin CUS | AVANCE A LA FECHA |
|---|---|---|---|---|
| a) Presa de Jales (II) | 9.3870 | 9.3870 | | 100% |
| TOTALES | 9.3870 | 9.3870 | | |

| "Proyecto de Exploración Minera Tahuehueto Municipio de Tepehuanes Dgo." Aut. SG/130.2.1.1/2642/18 | 12-Oct-18 | Habilitación de 6 Planillas de Barrenación, dos tramos de Camino de Acceso y un Patio de Maniobras en una Sup. de 21,273.22 m2, Vencimiento (3.5 años 12-abr-2022) | Permiso Vigente |
|---|---|---|---|

| Obras de Exploración | Sup. (has) Requeridas | Sup. (has) Con CUS | Sup. (has) Sin CUS | AVANCE A LA FECHA |
|---|---|---|---|---|
| a) Obras Exploración | | | | |
| Planillas de Barrenación (6) | 0.0900 | 0.0900 | | 0% |
| Socavón | 0.0006 | 0.0006 | | 100% |
| Patio de Maniobras | 0.0298 | 0.0298 | | 100% |
| Caminos de Acceso (longitud total) | 2.0069 | 2.0069 | | 5% |
| TOTALES | 2.1273 | 2.1273 | | |

Parte de este camino, se Reubicó y Autorizó en el Proyecto "Línea de Conducción de Agua y Ampliación de Infraestructura Tahuehueto".

| "Línea de Conducción de Agua y Ampliación de Infraestructura Tahuehueto" Aut. SG/130.2.1.1/0148/19 | 27-Mar-19 | Autorización para la Construcción y Operación de la Línea de Conducción de Agua y Ampliación de Infraestructura; Vencimiento (2 años Const. 27-mar-2021), + (1a. Ampl. 1 año al 04-mar-2022), (11 años Operac. 27-mar-1932), (2 años Abandono 27-mar-34) | Permiso Vigente |
|---|---|---|---|

| Obras Mineras | | Sup. (has) Requeridas | Sup. (has) Con CUS | Sup. (has) Sin CUS | AVANCE A LA FECHA |
|---|---|---|---|---|---|
| OM- | Depósito superficial de tepetate Nivel 10. | 5.5735 | 5.5735 | | 100% |
| OM- | Ampliación tepetatera de acarreo y depósito de | 0.7471 | 0.7226 | 0.0245 | 100% |
| OM-03 | Ampliación de la planta de beneficio (Operación del sistema de flotación). | 3.0959 | 2.3616 | 0.7343 | 100% |
| OM- | Patio de Stock de mineral. | 0.7459 | | 0.7459 | 100% |

La primera Etapa está Autorizada en el Proyecto "Reactivación de Operaciones para la Explotación y Beneficio de Minerales Tahuehueto".

| Obras Auxiliares | | Sup. (has) Requeridas | Sup. (has) Con CUS | Sup. (has) Sin CUS | AVANCE A LA FECHA |
|---|---|---|---|---|---|
| OA-01 | Taller electromecánico, patio de maniobras y almacén temporal de residuos peligrosos. | 2.3462 | 2.2156 | 0.1307 | 100% |
| OA-02 | Campamento temporal contratistas (GERMO). | 0.4758 | 0.4197 | 0.0561 | 100% |
| OA-03 | Campamento para el personal de Real de la Bufa. | 0.1933 | 0.0000 | 0.1933 | 100% |
| OA-04 | Línea de conducción de agua, estaciones de bombeo y red de distribución. | 1.1479 | 0.7274 | 0.4205 | 0% |
| OA-05 | Depósito de residuos sólidos no peligrosos. | 0.1000 | 0.1000 | | 100% |
| OA-06 | Camino de libramiento de la Unidad Minera | 2.1185 | 2.1185 | | 100% |
| | TOTALES | 16.5441 | 14.2388 | 2.3053 | |

| "Segunda Ampliación del Proyecto Minero Tahuehueto" Aut. SG/130.2.1.1/0416/20 | 13-Mar-20 | Autorización para la Construcción y Operación de la Presa de Jales II, para el Proyecto de Explotación y Beneficio de Minerales Vencimiento (3 años Const. 13-mar-2023), (10 años Operac. 13-mar-1933), (3 años Abandono 13-mar-36) | Permiso Vigente |
|---|---|---|---|

| Obras Mineras | | Sup. (has) Requeridas | Sup. (has) Con CUS | Sup. (has) Sin CUS | AVANCE A LA FECHA |
|---|---|---|---|---|---|
| OM- | Depósito superficial de tepetate Nivel 23. | 0.7967 | 0.7967 | | 40% |
| OM-02 | Depósito superficial de tepetate 1 del socavón 3 de mayo | 0.1375 | 0.1375 | | 100% |
| OM-02 | Depósito superficial de tepetate 2 del socavón 3 de mayo | 0.4651 | 0.4651 | | 62% |

| Obras Auxiliares | | Sup. (has) Requeridas | Sup. (has) Con CUS | Sup. (has) Sin CUS | AVANCE A LA FECHA |
|---|---|---|---|---|---|
| OA-01 | Tanque de agua cambio de régimen | 0.1635 | 0.1635 | | 20% |
| OA-02 | Planta de generación de energía eléctrica | 0.0375 | | 0.0375 | 100% |
| OA-03 | Estación de abastecimiento de gas natural | 0.0080 | | 0.0080 | 100% |
| OA-04 | Cuneta de desvió de agua pluvial | 0.0400 | 0.0165 | 0.0235 | 100% |
| OA-05 | Modificación de trazo al camino de libramiento tres | 3.3313 | 3.3313 | | 100% |
| | TOTALES | 4.9796 | 4.9107 | 0.0690 | |

| "Pileta de Filtraciones y Camino de Acceso" Aut. Pendiente | | Autorización para la Construcción y Operación de una Pileta de Filtraciones y su Camino de Acceso aguas abajo de la Presa de Jales Vencimiento (Pendiente de recibir Oficio de Autorización) | Permiso en Trámite ante SEMARNAT |
|---|---|---|---|

| Obras Auxiliares | | Sup. (has) Requeridas | Sup. (has) Con CUS | Sup. (has) Sin CUS | AVANCE A LA FECHA |
|---|---|---|---|---|---|
| OA-01 | Acceso a pileta de contención y bordo iniciador de la presa de jales. | 0.5317 | 0.5317 | | 0% |
| OA-02 | Banco de material de préstamo. | 0.0704 | 0.0704 | | 0% |
| Oa-03 | Tanque de agua 1. | 0.2185 | 0.2185 | | 0% |
| OA-04 | Área de pileta de contención. | 0.6149 | 0.6149 | | 0% |
| OA-05 | Filtrado de jales. | 0.3256 | 0.3256 | | 0% |
| OA-06 | Rampa de acceso. | 0.4569 | 0.4569 | | 0% |
| OA-07 | Almacén de reactivos. | 0.0137 | | 0.0137 | 0% |
| | TOTALES | 2.2317 | 2.2180 | 0.0137 | |

La Autorización de estas Obras será emitida por la SEMARNAT en el transcurso del mes de abril 2022. (LEGALMENTE YA ESTÁ AUTORIZADO)

**PENDIENTE DE ENTREGAR DOCUMENTACIÓN LEGAL DEL PREDIO PARA PODER INGRESAR EL TRÁMITE A LA SEMARNAT**

| "Estación de Transferencia El Pinto" Aut. Pendiente | | Autorización para la Construcción y Operación de una Estación de Transferencia para almacenamiento temporal de insumos mineros y concentrados de Mineral Vencimiento (En Proceso de Definición) | Permiso en Proceso de Definición |
|---|---|---|---|

| Obras Auxiliares | | Sup. (has) Requeridas | Sup. (has) Con CUS | Sup. (has) Sin CUS | AVANCE A LA FECHA |
|---|---|---|---|---|---|
| OA-01 | EN PROCESO DE DEFINICIÓN | | | | |
| OA-02 | EN PROCESO DE DEFINICIÓN | | | | |
| Oa-03 | EN PROCESO DE DEFINICIÓN | | | | |
| OA-04 | EN PROCESO DE DEFINICIÓN | | | | |
| . | EN PROCESO DE DEFINICIÓN | | | | |
| . | EN PROCESO DE DEFINICIÓN | | | | |
| . | EN PROCESO DE DEFINICIÓN | | | | |

Falta Documentación Legal de la Comunidad para poder ingresar este Proyecto a Autorización por la SEMARNAT.

**AUTORIZACIONES EN MATERIA DE CAMBIO DE USO DE SUELO**

| "Explotación y Beneficio de Minerales Tahuehueto" | 14-Jun-18 | Autorización para Cambio de Uso de Suelo en 15.2298 has; Vencimiento (01 año 14-jun-2019) + (1a. Ampl. 1 año al 24-jun-2020) + (2a. Ampl. 1 año al 22-sep-2021) + (3a. Ampl. 6 meses al 12-abr-2022) | Permiso Vigente |
|---|---|---|---|

AMPARA LOS SIGUIENTES PROYECTOS:

- "Reactivación de Operaciones para la Explotación y Beneficio de Minerales Tahuehueto"
- "Presa de Jales I, para el Proyecto Reactivación de Operaciones para la Explotación y Beneficio de Minerales Tahuehueto"
- "Presa de Jales II, para el Proyecto Reactivación de Operaciones para la Explotación y Beneficio de Minerales Tahuehueto"

| "Línea de Conducción de Agua y Ampliación de Infraestructura Tahuehueto" | 01-Feb-19 | Autorización para Cambio de Uso de Suelo en 14.2388 has; Vencimiento (02 años 01-feb-2021) + (1a. Ampl. 2 año al 01-feb-2023) | Permiso Vigente |
|---|---|---|---|

AMPARA LOS SIGUIENTES PROYECTOS:

- "Proyecto de Exploración Minera Tahuehueto Municipio de Tepehuanes Dgo."
- "Línea de Conducción de Agua y Ampliación de Infraestructura Tahuehueto"

| "Segunda Ampliación del Proyecto Minero Tahuehueto" | 18-Aug-20 | Autorización para Cambio de Uso de Suelo en 4.9106 has; Vencimiento (02 años 18-ago-2022) | Permiso Vigente |
|---|---|---|---|

AMPARA LOS SIGUIENTES PROYECTOS:

- "Segunda Ampliación del Proyecto Minero Tahuehueto"

| "Pileta de Filtraciones y Camino de Acceso" Fecha... | 16-Dec-21 | Autorización para Cambio de Uso de Suelo en 2.218 has; Vencimiento (En espera del Oficio de Autorización) | Permiso en Trámite ante SEMARNAT |
|---|---|---|---|

AMPARA LOS SIGUIENTES PROYECTOS:

- "Pileta de Filtraciones y Camino de Acceso"

**PENDIENTE DE ENTREGAR DOCUMENTACIÓN LEGAL DEL PREDIO PARA PODER INGRESAR EL TRÁMITE A LA SEMARNAT**

| "Estación de Transferencia El Pinto" | | Autorización para Cambio de Uso de Suelo en xxxx has; Vencimiento (En Proceso de definición) | Permiso en Proceso de Definición |
|---|---|---|---|

AMPARA LOS SIGUIENTES PROYECTOS:

- "Estación de Transferencia El Pinto"

## 20.1 ENVIRONMENTAL CONSIDERATIONS

### 20.1.1 REGULATORY REQUIREMENTS

Mine permitting in Mexico is primarily administered by the federal government body, the Secretaría de Medio Ambiente y Recursos Naturales (SEMARNAT). Following from objectives outlined in the Ley General del Equilibrio Ecológico y la Protección al Ambiente, an Environmental Impact Assessment called a Manifestación de Impacto Ambiental (MIA) has been granted for construction and operation. Additional regulatory triggers may require that the MIA for the infrastructure includes a Risk Assessment. Additionally, as a part of the land tenure process, a Change in Land Use Application called a Cambio de Uso de Suelo (CUS), supported by a Technical Supporting Study called an Estudio Técnico Justificativo has been granted for all areas of land disturbance.

### 20.1.2 PREVIOUS STUDIES

To date a study has been carried out by Knight Piésold titled Preliminary Project Development Options and Baseline Data Collection, March 2005. The study considered various options for storage of tailings at the project site. Additionally, there were some recommendations for follow up work. As part of the recommendations, an automated weather station has been installed at site to collect relevant weather data.

The metallurgical studies included limited studies for acid rock drainage. The samples were acid generating but had a neutralizing potential as well.

### 20.1.3 PROPOSED STUDIES

A baseline database has been collected and will be continued and expanded upon for, climate, soils, surface hydrology, flora, fauna, and socio-economic factors. An ongoing environmental monitoring program has also been initiated during initial development and will continue throughout mining and milling operations.

More detailed studies including acid base accounting (ABA) and humidity cell testing to determine if the overall samples are acid generating will be needed to determine future storage requirements for the tailings and waste rock.

As part of ongoing QC/QA of the climatological data collected at site by the automated weather station, readings are be taken for temperature, humidity and rainfall. Manual readings are simple and inexpensive to collect yet give warning of any component failure in an automated weather station. Manual readings can be taken with a simple thermometer, hygrometer and clear view rain gauge.

In addition to the data currently collected, it is recommended that a fauna sighting register begin at the site. The register would consist of a log book and list all animals viewed in the field listing species, location, date and time, observer, weather conditions, period of observation and comments. This can provide good background for the baseline fauna study to be completed.

### 20.1.4 IDENTIFIED ISSUES

No other environmental issues have been identified that would alter or compromise Project planning. The project is located outside of any protected natural areas or some other conservation program at the municipal, state or federal level.

## 20.2 ENVIRONMENTAL PROGRAM

The Tahuehueto Project will comply with all the environmental regulations and standards in place in Mexico as well as applicable international criteria. The mining works and supporting facilities will be designed, constructed and operated in such a way as to minimize the impact to the natural environment. An environmental management plan, an emergency response plan, a residues management plan and a closure and reclamation plan will be some of the most important documents to develop and implement early in the development of this project. A systematic environmental monitoring program of surface and underground water, creek sediments, soil, air, flora and wildlife conditions will be implemented, before, during and after mining operations.

### 20.2.1 SURFACE WATER MANAGEMENT

All the mining facilities will be protected from pluvial waters by means of a system of diversion channels such as channels and/or road-gutters constructed around the different facilities footprint to direct water runoff further downstream.

Fine particle migration will be the main potential impact to surface water from the waste storage facilities. Surface drainage from the different mine areas, such as waste rock facilities, tailings or other disturbed area, will be directed into sedimentation basins or ponds for sediment settlement before discharging into natural water courses. Ponds and process areas will be constructed on an impermeable double layer system and will operate on a close circuit with no discharge to the natural environment. The capacity of the containment ponds will be estimated based on a 100 yr-24 hr rain event.

A sampling program of main surface streams at the project area should be implemented on a quarterly basis as part of the environmental baseline studies.

### 20.2.2 GROUNDWATER MANAGEMENT

A hydrogeology study should be done to investigate the depth of the underground water and the aquifer vulnerability at the area where the tailing site is projected. The hydrogeology evaluations should also support the installation of wells for monitoring purposes. A monitoring program of underground water should be implemented, at least twice a year, on wells located close and upstream and downstream from the tailing site, leach pad, process plant and the waste storage facilities.

### 20.2.3 AIR QUALITY MANAGEMENT

No air quality data is available for the project area. The type of air pollution expected from the mining development will be the emission of particles (dust) mainly from the material handling operations, the service road traffic and the rock crushing therefore the concentration of PST (total suspended particles) and PM-10 (suspended particle less than 10 microns) should be monitored in the surrounding environment before and during the mine operations. Potential emissions from the Dore production furnace should also be monitored, if produced on site.

### 20.2.4 WILDLIFE MANAGEMENT

Prior to any vegetation clearing a rescue and protection program will be executed to relocate any flora species of interest. The wood to be produced from the clearing of the areas may be provided to the nearby communities for its management. No hunting will be allowed to workers and contractors of the Project, adequate fencing will be maintained on all operational areas, to protect wild life.

### 20.2.5 SOIL MANAGEMENT

Previous to the stripping and excavation of the land, the fertile layer of soil will be recovered and stored for future ecological restoration of the disturbed areas. Hydraulic works will be constructed for erosion control and soil conservation purposes. The works may consist of ditches, gabions, berms and/or rock mulch structures.

## 20.3 RECLAMATION AND CLOSURE ACTIVITIES

A detailed Closure and Reclamation Plan (CRP) will be prepared should this project proceed with the construction. In general terms, the CRP for the Tahuehueto Project will address the principles and guidelines of environmental regulation in Mexico as well as international best practices for the closure of this type of project. Concurrent reclamation will take place during the mine operation, although the majority of the work will occur after completion of mining and processing.

The objectives of the CRP will be based on the post-mining use of the land in addition to the following objectives: protection of public health and safety, protect the water resources, landforms stabilization and revegetation, preparation of the land for long term productive use and/or establishment of wildlife habitat.

### 20.3.1 MINE OPENINGS

Surface water diversion structure will be constructed around the mine openings. The end of mine design will leave stable pit walls. A protection fence and/or berms will be installed around mine openings to restrict the access of persons and fauna. Land scarification and seeding will be done on the surface disturbances to promote the development of vegetation cover. Partial backfilling of the openings and portals with waste rock produced during mining will be evaluated.

### 20.3.2 WASTE ROCK AND TAILINGS STORAGE FACILITIES

Slopes should be adjusted to provide a static and dynamic stability conditions. Erosion control structures will be constructed as necessary, such as rock armoring on the exterior slopes of the embankment and slope grading for stability.

The waste rock and tailings storage facilities will be contoured and graded for adequate surface water drainage. Water diversion features to control runoff around and within the tailing facility will be enhanced to avoid long term impact on the surface and underground water.

The waste rock and tailings should be characterized to determine the potential for acid drainage generation and metal leaching. Based on the results of the geochemical characterization of the material, a cover with inert and impermeable material may be necessary to avoid water infiltration and formation of toxic leachate to the natural environment. On top of this layer, another layer of top soil or organic material will be placed and native seeds planted to promote the development of a vegetation cover. Downstream sedimentation ponds will function as sediment traps for runoff water, before reaching the natural water courses.

### 20.3.3 PONDS

The solutions remaining in the ponds should be unloaded or evaporated in a safe manner. After the removal of pumping equipment, the plastic liner should be removed and the pond should be filled back with inert material and soil, allowing a good drainage out of this area. Land scarification, seeding and reforestation will complete the restoration of the pond sites

### 20.3.4 PROCESS FACILITY

All remaining substances and residues will be removed from the process areas. The Hazardous residues generated will be delivered to an authorized firm for final disposal or recycling. Tanks containing chemical substances and fuels will be cleaned before removing them from the site. All facilities and equipment will be dismantled and buildings demolished.

### 20.3.5 POST CLOSURE ACTIVITIES

After closure of the mine, the reclamation activities may be completed in short order, a periodic monitoring and maintenance program will continue for the necessary years until stable and safe conditions are achieved in all disturbed areas. Mine design, construction and operation should incorporate measures to minimize the requirements for care and maintenance at the abandonment stage.

The post-closure monitoring actions will include: underground opening closures, safety conditions, surface and underground water quality, air quality, vegetation development and wildlife reestablishment.

The quality of underground water and surface water bodies should be done on a quarterly basis. The monitoring sites should be within the drainage paths influenced by the tailing facility and the waste rock dumps.

Drainage and erosion control features should be maintained and/or constructed until stable conditions are observed on the soil and vegetation cover that will prevent from further erosion.

As the restored areas are functioning and the environmental monitoring indicates no harmful conditions, the frequency and intensity of the inspections and monitoring will be reduced until delivering the land for a post-mining use. An important goal of the mine reclamation will be the re-establishment of the vegetation cover, encouraging the natural succession of native species.

## 20.4 SOCIAL AND COMMUNITY

The closest important community to Tahuehueto is Tepehuanes (10,745 inhabitants), which has infrastructure and public services coverage such as: hotels, restaurants, electricity, cellular phone service, potable water, sewage system, landfill and airstrip for small planes.

Main economic activities at the region where the Tahuehueto project is located are cattle raising, agriculture, and forestry. The Project seems to be very well accepted and expected by most of the people living in the region. Job opportunities, services infrastructure improvement and technical training of local people are some of the most important benefits that the development of the Project will provide to the region. The local populace will also have access to potential employment opportunities, subject to the evaluation of individual qualifications, education, experience, as well as expectations for strict compliance with the code of conduct established for the Altaley workforce and contractor staff.

There are no known archaeological sites or areas of significant cultural interest within the Project concession. Implementation of a Community Relations Management Plan for the Project will also provide the means of detecting and appropriately responding to any changing stakeholder views with respect to cultural heritage concerns, as well as employment or contracting opportunities, health and safety, and other social considerations.

## 20.5 CURRENT PROJECT ENVIRONMENTAL PROCEDURES

Altaley, on April 13, 2016, filed a preventative report named “Informe Preventivo – Exploracion Nom 120” with SEMARNAT, the Mexican government responsible authority for filing of notices of work. This document notified and established Altaley’s plans to commence underground exploration activities, as well as the rehabilitation of existing roads and other additional infrastructure. Included in the company’s work plans was the rehabilitation of the on-site mill processing and benefit plant. The rehabilitation of the benefit plant does not require authorization in environmental matters, according to the article 5, section L, subsection III, of the regulation of the Ley General del Equilibrio Ecologico y Protección al Ambiente and, for this reason, those rehabilitation activities were able to commence at any time.

On October 12, 2016, Altaley submitted an environmental impact study named a “Manifestacion de Impacto Ambiental” (MIA) to SEMARNAT, the responsible Mexican governmental authority. This MIA outlined the company’s plans to recommence commercial exploitation/production at Tahuehueto with the construction of new portals, access roads, establishment of waste rock and ore storage patios, construction of a new camp, rehabilitation of the existing tailing disposal and other infrastructure items.

# 21 CAPITAL AND OPERATING COST

Capital and operating costs used for the Tahuehueto Project were developed from cost build up from first principles engineering along with vendor and contractor quotations. In addition, all available project technical data and metallurgical test work were considered to build up a processing operating cost estimate.

A project configuration which included the underground mines and a central process facility was developed as the basis for capital cost estimation. Preliminary site infrastructure alternatives (process plant, tails storage facility, and power) were examined as a basis to estimate costs. Generalized arrangements were evaluated to establish a physical basis for the capital costs estimates. Cost accuracy is estimated to be + or - 20%.

## 21.1 CAPITAL COSTS

Capital costs were developed based production rates and from design assumptions. The costs are collected in two separate categories; initial capital (construction costs to initiate mining operations including Engineering, Procurement, and Construction Management (“EPCM”), mining and processing equipment, and contingency), and sustaining capital (additional equipment and equipment rebuilds). The estimated capital costs are listed in Table 21-1. Contingency was calculated on applicable items at a rate of 20%. Contingency was applied to all direct initial capital cost items. The contingency rate was determined based on confidence levels on capital used in the cost build up.

It can be noted that Altaley has already invested the majority of capital costs with 95% of capital equipment purchased and on site and has advance construction to 95% of completion such that capital costs are known with a very high level of certainty.

**Table 21-1 Tahuehueto Total Capital Costs**

| Capital Category | Initial Investment up to 02/28/2022 ($M) | Investment Remaining as at 02/28/2022 to Generate Positive Cash Flow ($M)* | Investment to Reach Continuous & Sustainable Production ($M)** | Sustaining Capital Expenditures ($M)*** | Total Capital Costs ($M)**** |
|---|---|---|---|---|---|
| Processing facilities | 10.29 | 1.86 | 0.93 | 0.13 | 13.21 |
| Infrastructure facilities | 2.22 | 2.17 | 0.85 | 0.15 | 5.39 |
| Mine equipment | 4.05 | 0.09 | 0.78 | 0.53 | 5.45 |
| Tailings | 0.06 | 0.83 | 0.38 | 1.50 | 2.77 |
| Mine development | 0.48 | 0.25 | 0.98 | 27.18 | 28.89 |
| Mining rights | - | - | 0.11 | 1.10 | 1.21 |
| **Subtotal** | **17.10** | **5.20** | **4.03** | **30.59** | **56.92** |
| Contingency | - | - | 1.19 | 3.06 | 4.25 |
| **Total CAPEX** | **17.10** | **5.20** | **5.22** | **33.65** | **61.17** |

* From Feb 28, 2022 to positive cash flow date
** From reaching positive cash-flow date to January 2023
*** From Jan 2023 to end of mine life
**** Life of mine capital costs and Pre-Jan 2022 capitalized costs

### 21.1.1 INITIAL CAPITAL COSTS

The initial capital costs are listed in Tables 21.2 and 21.3 for mining and processing respectively. They consist of costs essentially incurred after project approval, and after construction and operating permits were received. The costs were assumed to occur in years -1 and -2, and include all capital costs up to the start of production. The scope of the initial capital includes direct capital costs and indirect costs. Direct capital costs include construction process facilities, establishment of the mining facilities, and purchase of fixed and mobile mining equipment as necessary considering that Altaley will use contract mining services for the mine operation. Mining and milling equipment costs are based on quotations for specific units and mining cost services where specific quotes were not available. Major equipment is either brand new or refurbished equipment. Building and facilities procurement and construction costs are estimated by contractor quotations based on dimensions, average construction costs, plus the extra cost for building in a remote area and were already built are incorporated at cost incurred.

**Table 21-2 Mine Initial Capital Costs**

| Mine Capital Category | Cost $M |
|---|---|
| Mine Mobile Equipment Purchases | 7.3 |
| Mine Fixed Equipment Purchases | 0.9 |
| Mine Development | 4.2 |
| Contingency (20%) | 2.5 |
| **Total CAPEX** | **14.9** |

**Table 21-3 Processing Initial Capital Costs**

| Process Capital Category | Cost $M |
|---|---|
| Mill Equipment Purchases | 9.5 |
| Mill Construction | 3.3 |
| Tailings and Earthwork | 0.6 |
| Infrastructure | 0.9 |
| Contingency (20%) | 2.9 |
| **Total CAPEX** | **17.2** |

### 21.1.2 SUSTAINING CAPITAL COSTS

Mining fixed equipment sustaining capital was primarily related to purchase of ventilation fans and mine development sustaining capital was for extension of the ore pass system. Sustaining capital costs are shown in Table 21.4.

**Table 21-4 Sustaining Capital Costs**

| Mine Capital Category | Cost $M |
|---|---|
| Mine Mobile Equipment Rebuilds | 3.7 |
| Mine Fixed Equipment Purchases | 0.3 |
| Mine Development | 0.6 |
| Contingency (20%) | 0.9 |
| **Total CAPEX** | **5.4** |

## 21.2 OPERATING COSTS

Operating unit costs are based on first principal engineering cost buildups for mining and processing operations. These costs were derived from materials, power, fuel consumption, and labor for each unit operation. Labor costs for the Project were estimated based on actual labor costs plus labor overheads for mine workers in Mexico supplied by Altaley. Consumables and fuel were primarily based on vender quotes, however equipment operating consumables and maintenance consumables were based on costing services. The mining cost build up on a total tonne basis (ore or waste) was similar to a comparable cost structure supplied by a contractor estimate for drift development mining of 5 m drifts at Tahuehueto. Operating costs are listed in Table 21.5.

**Table 21-5 Tahuehueto Unit Operating Costs**

| Operating Costs | Unit | Unit Cost $ |
|---|---|---|
| Development Mining | $/meter | 1,278.1 |
| Ore Mining | $/tonne ore | 35.0 |
| Processing | $/tonne ore | 22.0 |
| General and Administrative | $/tonne ore | 3.0 |
| Life of Mine | $/tonne ore | 69.5 |

# 22 ECONOMIC ANALYSIS

The economic performance of the Tahuehueto Project was evaluated with a cash flow based economic model using project costs and revenues as the financial basis. The revenue factors for the project are dependent on metal prices calculating into the net smelter return. The metal prices used for analysis are shown in Table 21-1. The NSR of the three concentrates produced in the mill are summarized in Table 22-2.

**Table 22-1 Metal Prices for Economic Analysis**

| Economic Metrics | Units | LOM Value |
|---|---|---|
| Gold Price | $/oz | 1,650 |
| Silver Price | $/oz | 21.02 |
| Copper Price | $/lb | 3.70 |
| Lead Price | $/lb | 0.91 |
| Zinc Price | $/lb | 1.15 |

**Table 22-2 Net Smelter Return Summary**

| Item | Gross Revenue (k$) | Deductions (k$) | NSR (k$) |
|---|---|---|---|
| Lead Concentrate | 455,088 | 29,521 | 425,567 |
| Copper Concentrate | 47,659 | 18,313 | 29,346 |
| Zinc Concentrate | 104,145 | 25,992 | 78,153 |
| **TOTAL** | **606,892** | **89,300** | **533,065** |

* Totals may not sum due to rounding.

## 22.1 NET SMELTER RETURN

The economic driver of the project is based on the net smelter return. The costs and payable metal values from the produced concentrates are calculated to give the NSR. The detailed NSR from the Tahuehueto mill productions is detailed in Table 22-3, Table 22-4 and Table 22-5.

**Table 22-3 Lead Concentrate NSR**

| Item | Au | Ag | Cu | Pb |
|---|---|---|---|---|
| Distribution (% Recoveries) | 77.1% | 62.8% | 31.6% | 85.5% |
| Payable (%) | 94.9% | 94.9% | 83.6% | 94.5% |
| Gross Revenue (k$) | 324,300 | 46,000 | 21,000 | 63,600 |
| Deductions (k$) | 18,400 | 3,300 | 4,200 | 13,900 |
| Revenue (k$) | 305,900 | 42,700 | 16,800 | 49,700 |
| | | | | |
| Freight & Marketing (k$) | 4,700 | | | |
| **NSR (k$)** | **410,400** | | | |

**Table 22-4 Copper Concentrate NSR**

| Item | Au | Ag | Cu |
|---|---|---|---|
| Distribution (% Recoveries) | 6.8% | 10.3% | 51.4% |
| Payable (%) | 94.8% | 94.9% | 95.8% |
| Gross Revenue (k$) | 28,800 | 7,500 | 32,700 |
| Deductions (k$) | 1,500 | 400 | 2,800 |
| Revenue (k$) | 27,300 | 7,100 | 30,000 |
| | | | |
| Freight & Marketing (k$) | 400 | | |
| **NSR (k$)** | **64,000** | | |

**Table 22-5 Zinc Concentrate NSR**

| Item | Au | Ag | Zn |
|---|---|---|---|
| Distribution (% Recoveries) | 11.0% | 11.7% | 80.0% |
| Payable (%) | 93.5% | 89.9% | 84.8% |
| Gross Revenue (k$) | 46,200 | 7,500 | 118,400 |
| Deductions (k$) | 3,200 | 800 | 39,800 |
| Revenue (k$) | 42,900 | 6,700 | 78,600 |
| | | | |
| Freight & Marketing (k$) | 11,800 | | |
| **NSR (k$)** | **116,400** | | |

## 22.2 CASH FLOW

The production schedules presented in Section 16 and 17 have been used in conjunction with the cost data discussed in Section 21 to create a model for the Altaley's Project's economic performance. Costs are in constant 2021 US$, no escalation of cost has been assumed. Operating costs are generated based on production physicals (tonnes) and unit rates. The detailed cash flow model for the Tahuehueto Project is presented in Table 22-6. The results for economic analysis are summarized in Table 22-7.

## Table 22-6 Tahuehueto Project Cash Flow

| | LOM | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Costs ($k) | | | | | | | | | | | | | |
| Mining Operating | 77,356 | 5,484 | 6,944 | 6,911 | 6,940 | 7,217 | 7,609 | 7,475 | 7,506 | 7,173 | 7,322 | 6,777 | - |
| Processing Operating | 38,219 | 2,497 | 3,619 | 3,619 | 3,619 | 3,619 | 3,619 | 3,619 | 3,669 | 3,619 | 3,619 | 3,103 | - |
| Concentrate TC/RC, Penalties, Shipping | 73,825 | 4,847 | 6,311 | 6,145 | 6,660 | 6,765 | 7,272 | 7,381 | 7,444 | 8,497 | 7,768 | 4,735 | - |
| G&A, Maintenance, Other | 131,054 | 11,501 | 11,682 | 11,491 | 11,370 | 11,702 | 12,428 | 12,372 | 12,630 | 13,341 | 12,578 | 9,959 | - |
| **Subtotal OPEX** | **320,455** | **24,329** | **28,556** | **28,164** | **28,588** | **29,302** | **30,927** | **30,847** | **31,250** | **32,630** | **31,287** | **24,574** | - |
| Corporate G&A | 8,250 | 647 | 784 | 791 | 886 | 801 | 782 | 804 | 725 | 742 | 726 | 563 | - |
| Reclamation Costs | 7,729 | 606 | 735 | 741 | 830 | 750 | 733 | 753 | 680 | 695 | 680 | 527 | - |
| Capital Expenditures Sustaining | | - | - | - | - | - | - | - | - | - | - | - | - |
| **Subtotal G&A, Reclamation, Sustaining** | **15,980** | **1,253** | **1,519** | **1,531** | **1,715** | **1,551** | **1,515** | **1,558** | **1,405** | **1,437** | **1,406** | **1,090** | - |
| Capital Expenditures | 42,540 | 11,944 | 3,381 | 1,621 | 1,621 | 2,392 | 3,384 | 2,897 | 3,612 | 4,340 | 4,040 | 3,309 | - |
| Contingency (10%) | 4,254 | 1,194 | 338 | 162 | 162 | 239 | 338 | 290 | 361 | 434 | 404 | 331 | - |
| **Total All-In Cost** | **383,228** | **38,720** | **33,793** | **31,479** | **32,087** | **33,485** | **36,165** | **35,591** | **36,628** | **38,840** | **37,136** | **29,304** | - |
| Discounted Cash Flow ($k) | | | | | | | | | | | | | |
| EBIT | 278,441 | 28,836 | 32,577 | 31,997 | 38,512 | 27,865 | 27,450 | 28,714 | 20,546 | 18,352 | 16,163 | 7,429 | - |
| + Depreciation | 79,276 | 3,613 | 5,018 | 5,286 | 5,513 | 5,809 | 5,872 | 6,376 | 7,235 | 8,722 | 11,222 | 14,610 | - |
| - Capital Expenditures plus 10% Contingency | 46,793 | 13,139 | 3,719 | 1,783 | 1,783 | 2,631 | 3,722 | 3,186 | 3,973 | 4,774 | 4,444 | 3,639 | - |
| - Taxes | 93,634 | 8,222 | 6,968 | 7,799 | 12,343 | 9,053 | 9,057 | 10,289 | 8,184 | 7,969 | 7,971 | 5,778 | - |
| - Interest | 5,186 | 2,250 | 1,911 | 838 | 186 | - | - | - | - | - | - | - | - |
| - Increase in NWC | 90 | 296 | (45) | 82 | (14) | (78) | (29) | (8) | 20 | (25) | (30) | (79) | - |
| - Reclamation Costs | 7,593 | 479 | 520 | 564 | 612 | 664 | 720 | 782 | 848 | 920 | 998 | 486 | - |
| **Fee Cash Flow** | **204,421** | **8,063** | **24,523** | **26,217** | **29,115** | **21,404** | **19,851** | **20,841** | **14,755** | **13,437** | **14,001** | **12,214** | - |

| | | | | |
|---|---|---|---|---|
| **Discounted Cash Flow** | | **10%** | **8%** | **5%** |
| **Asset NPV** | **USD $k)** | **130,777** | **141,795** | **161,287** |

**Table 22-7 Tahuehueto Project Economic Results**

| Economic Metrics | Units | LOM Value |
|---|---|---|
| Total Ore Processed | Tonnes/1,000 | 3,540 |
| Contained Gold Produced | Ounces/1,000 | 279 |
| Contained Silver Produced | Ounces/1,000 | 4,880 |
| Contained Lead Produced | tonnes | 33,911 |
| Contained Copper Produced | tonnes | 8,893 |
| Contained Zinc Produced | tonnes | 65,821 |
| | | |
| Total Net Smelter Return (Pb, Zn, Au, Ag, Cu | $Million | 645.5 |
| Gold Net Revenue | $Million | 392.8 |
| Silver Net Revenue | $Million | 87.5 |
| Lead Net Revenue | $Million | 60.5 |
| Zinc Net Revenue | $Million | 78.4 |
| Copper Net Revenue | $Million | 26.2 |
| | | |
| Pre-tax NPV (5%) * | $M | 234.4 |
| Post-tax NPV (5%) | $M | 161.3 |
| Post-tax IRR ** | % | 65.5% |
| Payback Period | Years | 2.0 |

* 5% discount considered reasonable due to advanced state of Tahuehueto construction where 90% of required capital has bee invested in the project, advancing construction past 95% completion, with most capital expenditures completed and therefore capital costs are known with substantially increased accuracy.

** IRR is calculated with approximately $34 million of pre-January 2022 expenses on the project. $19 million of pre-2015 costs of exploration, acquisition and carrying costs have been treated as sunk costs.

## 22.3 SENSITIVITY ANALYSIS

**Table 22-8 Sensitivity of NPV, IRR and to varying gold prices - After-Tax**

| Gold Price ($/Oz) | After Tax ($M) | | | | IRR (%) | Payback (Years) |
|---|---|---|---|---|---|---|
| | NPV (0%) | NPV (5%) | NPV (8%) | NPV (10%) | | |
| 1,450 | 171.6 | 134.2 | 117.3 | 107.8 | 50.5% | 2.6 |
| 1,550 | 187.7 | 146.9 | 128.5 | 118.2 | 55.9% | 2.3 |
| 1,650 | 204.4 | 161.3 | 141.8 | 130.8 | 65.5% | 2.0 |
| 1,750 | 219.7 | 172.3 | 151.0 | 139.0 | 66.7% | 2.0 |
| 1,850 | 235.7 | 185.1 | 162.2 | 149.4 | 72.2% | 1.9 |

**Table 22-9 Sensitivity of NPV, IRR and to varying gold mill recoveries - After-Tax**

| Mill Recovery Gold (%) | After Tax ($M) | | | | IRR (%) | Payback (Years) |
|---|---|---|---|---|---|---|
| | NPV (0%) | NPV (5%) | NPV (8%) | NPV (10%) | | |
| 85.0% | 170.2 | 134.1 | 117.7 | 108.5 | 53.3% | 2.4 |
| 90.0% | 190.1 | 149.9 | 131.7 | 121.4 | 60.5% | 2.2 |
| 95.0% | 204.4 | 161.3 | 141.8 | 130.8 | 65.5% | 2.0 |
| 97.0% | 210.4 | 166.0 | 146.0 | 134.7 | 67.6% | 2.0 |

*PFS Baseline

## 23 ADJACENT PROPERTIES

There is no relevant information of adjacent properties which materially affect the opinion offered in this report.

# 24 OTHER RELEVANT DATA AND INFORMATION

# 25 INTERPRETATION AND CONCLUSIONS

The Tahuehueto project is expected to yield an after-tax undiscounted LOM net cash flow of $258.8 million, and an NPV of $161.3 million, $141.8 Million and $131. 8 Million at a discount rate of 5%, 8% and 10% per year respectively.

The conclusions and recommendations of this report are based on the use of Mineral Reserves that have been classified as Proven Reserves and Probable Reserves for the Tahuehueto project. These Mineral Reserves have been used in the economic evaluation of the Project. The Mineral Resources estimated for the Project are not Mineral Reserves and as such do not have demonstrated economic viability. There is no certainty that Mineral Resources can be converted to Mineral Reserves.

## 25.1 GEOLOGY, MINERALIZATION AND RESOURCE

The exploration work completed by Altaley has demonstrated the existence of an epithermal deposit. Historic exploration has been focused along a series of exposed veins, silicified zones and color anomalies that are common within the Tahuehueto project area. The veins were examined and found to contain good gold and silver values hosted in sulfides. Mineralization at Tahuehueto is classified as intrusion related epithermal low sulfidation polymetallic, with Au and Ag accompanied by Cu, Pb, and Zn mineralization. These types of deposits are interpreted to have been derived from porphyry intrusion source rocks at depth.

Mineral Resources for the Project are based on the statistical analysis of data from 252 drill holes totaling 48,260 m and 1,788 underground samples within a small part, under 4 square km, of a much larger district scale model area covering of 2,672 square km. Sampling of the identified deposit indicates that its grade is potentially economic under an underground mining scenario.

The work completed by Altaley has resulted in sufficient drill sample density, and confidence in the geological interpretation, for RDA to reasonably estimate Mineral Resources and Mineral Reserves for Tahuehueto.

## 25.2 DRILLING, SAMPLING, ANALYSIS, DATA VERIFICATION

Altaley drilled 252 holes on the Tahuehueto project from late 2004 through 2011. These drilling and sampling programs were carried out in a proficient manner consistent with industry standard practices at the time the programs were completed. The arrangement, alignment and depth of drilling is suitable for the exploration and delineation of the deposit targets as modeled. HQ and NQ core drilling programs comprises 85% of the Altaley footage, and of this, 77% is HQ size. No significant factors of drilling or sampling that impact the accuracy and reliability of the results were observed. QP Eric Titley considers the drill programs to be reasonable and adequate for the purposes of Mineral Resource estimation.

The sampling, sample preparation, security and analytical procedures, used by Altaley were reviewed. All aspects of these programs were deemed to be of a suitable standard. The verification procedures employed found few errors, and none were deemed substantial enough to have a significant impact on the resource estimation.

It is recommended that site geological staff receive a copy of the assay certificate comparison database created by QP Titley to ensure corrections are made to the Altaley database of the minor errors and omissions identified in this comparison. It is also recommended that the site geological staff diligently input any additional information necessary to fully compile the analytical QAQC portion of the drill hole and underground sampling database, and to continue this work in any future drilling and sampling programs to allow ongoing QAQC monitoring on a timely basis.

## 25.3 MINING AND PROCESSING

Tahuehueto Project resources provide a suitable basis for a project configuration that would include a contractor-operated 1,000 tpd underground mine that will utilize sub-level stoping with conventional mining equipment in a blast/load/haul operation. Mill feed will be processed in a 1,000 tpd comminution circuit consisting of primary and secondary crushing, grinding in a ball(s) mill followed by three floatation circuits producing lead, copper, and zinc concentrates. The concentrates will be trucked from site for smelting and refining.

A project configuration which included the underground mine and a central process facility was developed as the basis for capital and operating cost estimation. Generalized infrastructure arrangements were evaluated to establish a physical basis for the capital costs estimates. Capital and operating costs used for the Tahuehueto Project were developed from cost build up from first principles engineering along with vendor and contractor quotations. In addition, all available project technical data and metallurgical test work were considered to build up a processing operating cost estimate. An economic analysis of the potential project performance indicated strong economic potential at current metal prices with economic strength still demonstrated at considerably lower metal prices as outlined in the sensitivity analysis of this technical report.

# 26 RECOMMENDATIONS

Tahuehueto has invested over $40M in exploration, preliminary feasibility studies and mill construction. Contract miners have already mobilized to the Project. A 1,000 tonne per day processing plant is currently being constructed and is nearing 95% completion. Testing of the Tahuehueto Mill commenced April 5, 2022. Pre-production activities are expected to start in May 2022 and commercial production is expected to commence prior to the end of 2022. Altaley will be selling concentrates to generate cash flow starting with pre-production sales and continuing at full capacity concentrate sales after announcement of commercial production. Smelting contracts are already in place.

Continued exploration is warranted for the Project to investigate the possibility for discovery of new resources and reserves that may justify mill expansions and /or extending the life of mine. Current discovered ore bodies remain open in both direction along strike and to depth. Other yet undrilled veins, such as Texcalama, Delores, Tahuehueto, Tres de Mayo, Carolina are known to be mineralized on surface and justify exploration drilling. Extensions to the El Creston, Cinco de Mayo, El Rey, Perdido-Santiago vein structures, where resources and reserves are identified, require further exploration drilling to identify extensions of mineralization that may enhance future mining operations. The Santiago vein is largely undrilled and warrants a focused underground exploration drilling program between El Perdido and Santiago which are interpreted to be the same vein structure.

Metallurgy programs need to be implemented for the Cinco de Mayo structures. Mineralization at Cinco de Mayo shows slightly different characteristics to the near-term mineralization that is expected to be processed at the Tahuehueto mill. Results from the metallurgical tests would guide meaningful modifications to the processing facilities.

Subsequent phases are not recommended.

**Table 26-1 Proposed Project Work Program**

| Budget Item | Description | Cost (1,000's) |
|---|---|---|
| Resource Expansion Drilling | Drill Santiago and Perdido Vein Extensions | $3,250 |
| Geology G&A | Core Logging, Drilling management | $250 |
| Geological Modeling | Update Geology Models based on UG pit mapping | $100 |
| Resource Model Updates | Grade Estimation, Resource and Reserve Updates | $100 |
| Assaying | QA/QC, Shipping, Assay Results | $150 |
| Metallurgy | Metallurgical testing of Cinco de Mayo | $250 |
| **Total** | | **$4,100** |

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