MINE DEVELOPMENT ASSOCIATES
MINE ENGINEERING SERVICES

# Updated Technical Report on
# Golden Arrow Project
# Nye County, Nevada, U.S.A.

*Prepared for*

ANIMAS RESOURCES LTD.

June 9, 2010


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***Cover photo, taken in 2007, is the headframe over the Gold Bar shaft. This historic structure was destroyed by vandals during the winter of 2007-2008.***

## 1.0 EXECUTIVE SUMMARY

This technical report for the Golden Arrow project was prepared by Mine Development Associates (“MDA”) and consulting minerals geologist Odin D. Christensen, C. P. G. at the request of Animas Resources Ltd. (“Animas”). Animas has entered into an option agreement on the Golden Arrow project with Nevada Sunrise Gold Corporation (“Nevada Sunrise”), a British Columbia corporation, and its wholly owned subsidiary, Intor Resources Corporation (“Intor”), a Nevada corporation, which currently control the Golden Arrow property. This updated report has been prepared to support Animas’ first-time disclosure of mineral resources on the Golden Arrow property. This technical report is written in compliance with disclosure and reporting requirements set forth in the Canadian Securities Administrators’ National Instrument 43-101, Companion Policy 43-101CP, and Form 43-101F1. MDA has made such independent investigations as have been deemed necessary in the professional judgment of the authors to be able to reasonably rely on provided information to make the conclusions and recommendations presented in this report.

### 1.1 Introduction

The Golden Arrow property is located in south-central Nevada, approximately 40mi (60km) east of Tonopah on the western flank of the Kawich Range within the Golden Arrow mining district of central Nye County. Exploration and mining rights are owned or controlled by Intor, and all exploration work by Nevada Sunrise has been conducted through Intor. The property consists of 279 unpatented lode mining claims encircling 17 patented lode mining claims covering an area of approximately 5,684 acres (2,300 hectares) within Sections 15-17, 20-23, and 26-35, Township 2 North, Range 48 East, Mount Diablo Base and Meridian.

The location and climate are favorable for exploration and mining year-round.

### 1.2 Geology and Mineralization

The Golden Arrow property is situated along the northeastern margin of the Walker Lane Structural Belt, a geologic terrane dominated by northwest-striking, right-lateral transcurrent faulting. The district is also located along the western rim of the Kawich Range volcanic caldera. The property is underlain by a suite of Oligocene- to Miocene-age andesitic to rhyolitic volcanic and volcaniclastic rock erupted from the Kawich volcanic center. The oldest rocks exposed are andesite, andesite volcanic breccia, and andesite volcaniclastic sedimentary rocks. The andesite is overlain by a thick sequence of rhyolite ignimbrite sheets, which are intruded by rhyolite domes and associated phreatomagmatic diatremes. These rocks are overlain by rhyolitic maar volcaniclastic sedimentary rocks. Gold and silver mineralization was temporally associated with this rhyolitic igneous episode. All of these units are

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overlain by Pliocene-age basalt flows and Quaternary alluvial deposits. Faulting associated with late caldera collapse and later Walker Lane deformation cuts all rock units.

Gold- and silver-bearing mineralization is typical of both volcanic-hosted low-sulfidation epithermal systems and hot-springs-type, high-sulfidation epithermal systems. Precious metal enrichments are associated with multi-episodic quartz-sulfide (±adularia ±ankerite ±sericite ±barite) veins, veinlets and stockwork zones within high-angle fault zones. Disseminated and stockwork mineralization also occurs within a section of rhyolitic volcaniclastic maar sedimentary rocks. The Golden Arrow mineralization is best described as consisting of low-sulfidation epithermal quartz and precious metal veins overprinted by hot-springs-style, high-sulfidation epithermal alteration and precious metal mineralization.

## 1.3 Exploration and Mining History

Gold was discovered in the Golden Arrow district in 1905, and within months a number of mines were in operation, exploiting high-grade gold/quartz veins to depths of up to around 400ft (~120m). Gold production continued until the 1930s, but then production declined until most mines were closed in 1942. Since 1981, 12 successive companies, including Animas, have conducted exploration programs at Golden Arrow. Their work included geochemical and geophysical testing, geologic investigations, and diamond and reverse-circulation percussion drilling. Limited metallurgical testing has also been conducted.

Two centers of mineralization were defined early in these modern exploration programs, and much of the work has been directed to delineating the near-surface bulk-tonnage potential of the Hidden Hill and Gold Coin zones. The Gold Coin zone measures approximately 2,000 by 900ft (600 by 275m); Hidden Hill is generally circular in plan with a diameter of approximately 750ft (230m). The southern edge of Hidden Hill is approximately 1,600ft (490m) from the northern edge of Gold Coin mineralization. These two centers are associated with the Confidence Mountain rhyolite flow dome and its detrital apron. Both the Gold Coin and Hidden Hill deposit areas were strongly affected by the later high-sulfidation alteration style, which may obscure earlier low-sulfidation veins.

Six of the prior operators at Golden Arrow have made mineral resource estimates. The historic estimates of mineral resources vary considerably, depending upon the date and method of calculation. The historic estimates presented in Section 6.4 should not be relied upon as meeting NI 43-101 reporting requirements, and the terms “resource and reserve” do not meet the standards of those terms as defined by NI 43-101. The first NI 43-101 compliant resource for Golden Arrow, released in 2008, is also included in Section 6.4 and was completed by MDA on behalf of Nevada Sunrise. Section 17 of this report presents the 2009 updated Golden Arrow resource for Animas that meets NI 43-101 reporting criteria.

Nevada Sunrise acquired a considerable archive of exploration data, which the company has been compiling, integrating and reinterpreting, all of which is available to Animas. Exploration activities conducted through 2008 by Nevada Sunrise included:

- compilation, review, and reinterpretation of existing exploration data;
- location and re-surveying of many of the historic drill sites to verify and improve the precision of the drill-collar location data;

- limited geologic mapping, and confirmation and integration of existing geologic maps;
- re-logging of all available drill core and chips;
- acquisition and interpretation of new high-resolution satellite imagery and ASTER spectral data;
- compilation and reinterpretation of the geophysical database;
- compilation and reinterpretation of the historic soil geochemical database;
- completion of a soil geochemical orientation survey and soil geochemical survey, and
- completion of a significant program of drilling for resource definition and exploration.

To date, Animas has only begun exploration and that exploration consists of geophysical surveying.

## 1.4 Drilling and Sampling

Nevada Sunrise's data archives, now available to Animas, include exploration drill information collected by seven companies over the past two decades. More than 400 hammer, air-track, reverse circulation ("RC"), and diamond drill holes exceeding 150,000ft (46,000m) have been drilled to explore for and evaluate gold-silver mineralization on the Golden Arrow property. The vast majority of this drilling has been focused on discovering and delineating the Gold Coin and Hidden Hill mineralized zones. Documentation for a large part of this drilling is available, specifically 291 drill holes for a total of 148,101ft (45,141m). Of these holes, ten are core holes and 281 are RC. Nevada Sunrise has undertaken re-logging of all available core and rock-chip samples.

The drill results demonstrate that precious metals exist in both high-grade vein-hosted mineralization and more widespread disseminated mineralization within both the Gold Coin and Hidden Hill zones.

In 2008, Intor drilled 33 holes, five core holes (3,584ft or 1,092m) and 28 RC holes (16,880ft or 5,145m), for a total of 20,464ft (6,237m) of drilling.

## 1.5 Metallurgical Testing

A total of four known metallurgical studies have been conducted on samples from Golden Arrow and were reviewed for this report. Kennecott completed scoping-level metallurgical testing by analyzing a large suite of core and cuttings samples for gold and silver, both by fire assay and cyanide-extraction atomic absorption. Dawson Metallurgical Laboratories, Inc. conducted preliminary bottle-roll, cyanide-leach tests on seven drill-hole composite samples in 1987. METCON Research Inc. completed 13 bottle-roll tests on five drill-hole composite samples in 1994. McClelland Laboratories, Inc. recently completed a more detailed metallurgical testing program initiated in 2008 on a total of 26 drill core composite samples. The McClelland Laboratories testing included bottle roll cyanidation tests on 23 samples, column leach cyanidation tests (five total) on three "master" composite samples, milling/cyanidation and milling/flotation tests on four high grade samples and gravity concentration tests on seven samples.

Results from cyanidation testing conducted at Dawson, METCON and McClelland Laboratories indicate that the Golden Arrow oxide material is amenable to cyanidation treatment, and that the Golden Arrow sulfide material tends to be more refractory to cyanidation treatment. Results from column testing conducted at McClelland Laboratories indicate that gold recoveries of 55% to 75% can be expected by heap leaching of the Golden Arrow oxide material at a minus 13mm (½”) feed size. Reagent consumptions for heap leaching of the Golden Arrow oxide material are expected to be low to moderate. Gold recovery from heap leaching of the sulfide material is expected to be lower. Additional test work will be required prior to reserve definition and production planning for heap leaching of the Golden Arrow mineralized material.

It should be noted that the calculated head grades for the samples subjected to column testing ranged from 0.039 to 0.077 oz Au/ton, which is significantly higher than the Golden Arrow resources discussed later in this report. Further metallurgical testing will be required to determine the effects of gold grade on heap leach recoveries.

A limited amount of milling/cyanidation, milling flotation and milling/gravity concentration testing was conducted at McClelland Laboratories. Results showed that higher gold recoveries (82% to 89%) can be obtained from the high-grade oxide and sulfide materials by milling/agitated cyanidation treatment. Earlier testing at METCON on a smaller number of samples indicated lower milling/cyanidation gold recoveries (48% to 60%) for sulfide or mixed (oxide/sulfide) materials.

Testing at McClelland Laboratories showed that higher gold recoveries (67% to 83%) can be obtained from the high-grade sulfide material by milling/flotation treatment, and that the higher grade oxide material responded well (59% to 69% gold recovery) to milling/gravity concentration treatment. The reported flotation and gravity concentration recoveries do not account for losses of gold and silver that may occur during subsequent processing of the respective concentrate products for recovery of gold and silver. Further testing and economic trade-off studies would be required to determine the applicability of these higher-cost processing methods for treatment of the Golden Arrow ore.

## 1.6 Resources

The gold and silver resources reported herein are the same as those reported in the 2009 updated Technical Report on the Golden Arrow project that was prepared by the authors.

MDA estimated the resource as follows:

- Modify the previous estimate’s cross-sectional interpretations on the irregularly spaced sections (average 125ft (38m) spacing), looking northwest and digitize the lithologic contacts;
- Redo the descriptive statistics of the gold and silver assay grades in the database;
- Modify the surfaces and solids of the lithologic types;
- Modify the domains on east-west section;
- Recode model to gold and silver zones (partials) and lithologic types;
- Redo sample- and composite-grade descriptive statistics by zone, and perform geostatistics on the composite data;
- Estimate grade by inverse distance and nearest neighbor separately for gold and then silver;
- Check and validate the estimate; and
- Tabulate the resource.

The outcome of this work is a Measured, Indicated and Inferred resource (Table 1.1). The gold-equivalent calculation used for reporting cutoffs is based on average silver and gold metal prices to arrive at a ratio of 55 to 1, respectively. Gold-equivalent calculations reflect gross metal content and have not been adjusted for metallurgical recoveries or relative processing and smelting costs. The gold-equivalent grades were used only for establishing cutoff grades. Like all resource estimates, additional work is warranted such as sample integrity work.

## 1.7 Summary and Conclusions

For the first technical report prepared for Nevada Sunrise by Ristorcelli and Christensen in 2008, the authors reviewed reports and data from prior exploration efforts and provide a historical summary of prior work. During 2008, Nevada Sunrise, for the first time for this project area, compiled all available historic exploration information into a GIS database for integrated review and interpretation. Furthermore, additional drilling in 2008 validated historic work and upgraded confidence significantly. Geological mapping by Nevada Sunrise and others, soil geochemistry, and geophysical surveys highlight a number of exploration targets within the property, in addition to the known mineralized centers at Hidden Hill and Gold Coin, which have yet to be drill tested. These are considered by Animas to have excellent exploration potential.

## 1.8 Recommendations

The Golden Arrow gold-silver property is a property of merit that warrants continued exploration. MDA and Christensen recommend that Animas undertake continued systematic exploration to discover additional centers of mineralization within the Golden Arrow property.

MDA makes the following suggestions for further work but believes that the most important goal at Golden Arrow is discovery of additional resources through exploration and this eclipses the other recommendations. A budget of US$1.2 million is recommended for the next phase of exploration at Golden Arrow. That budget is dominated by drilling costs of $800,000 and includes a contingency of US$120,000. The drilling includes both RC and core drilling. Other recommended tasks include data acquisition, sample integrity work, compilation, and interpretation, additional metallurgy, geophysics and general project maintenance. Follow-up programs could be several times larger than this if the first tasks are successful.

**Table 1.1 Golden Arrow Project Total Gold and Silver Resources**

| Cutoff | Un-Oxidized | | | | | |
|---|---|---|---|---|---|---|
| AuEq | | AuEq | Au | | Ag | |
| oz/t | Tons | oz/t | oz/t | Ounces | oz/t | Ounces |
| **Measured** | | | | | | |
| Variable | 751,000 | 0.047 | 0.034 | 25,800 | 0.67 | 505,000 |
| **Indicated** | | | | | | |
| Variable | 4,685,000 | 0.038 | 0.030 | 141,500 | 0.42 | 1,949,000 |
| **Measured and Indicated** | | | | | | |
| Variable | 5,436,000 | 0.039 | 0.031 | 167,300 | 0.45 | 2,454,000 |
| **Inferred** | | | | | | |
| Variable | 1,750,000 | 0.026 | 0.019 | 32,700 | 0.42 | 739,000 |
| **Cutoff** | **Oxidized** | | | | | |
| AuEq | | AuEq | Au | | Ag | |
| oz/t | Tons | oz/t | oz/t | Ounces | oz/t | Ounces |
| **Measured** | | | | | | |
| Variable | 1,099,000 | 0.029 | 0.024 | 26,600 | 0.26 | 291,000 |
| **Indicated** | | | | | | |
| Variable | 5,637,000 | 0.022 | 0.018 | 102,600 | 0.22 | 1,263,000 |
| **Measured and Indicated** | | | | | | |
| Variable | 6,736,000 | 0.023 | 0.019 | 129,200 | 0.23 | 1,554,000 |
| **Inferred** | | | | | | |
| Variable | 2,040,000 | 0.013 | 0.009 | 17,700 | 0.25 | 510,000 |
| **Cutoff** | **Total** | | | | | |
| AuEq | | AuEq | Au | | Ag | |
| oz/t | Tons | oz/t | oz/t | Ounces | oz/t | Ounces |
| **Measured** | | | | | | |
| Variable | 1,850,000 | 0.036 | 0.028 | 52,400 | 0.43 | 796,000 |
| **Indicated** | | | | | | |
| Variable | 10,322,000 | 0.029 | 0.024 | 244,100 | 0.31 | 3,212,000 |
| **Measured and Indicated** | | | | | | |
| Variable | 12,172,000 | 0.030 | 0.024 | 296,500 | 0.33 | 4,008,000 |
| **Inferred** | | | | | | |
| Variable | 3,790,000 | 0.019 | 0.013 | 50,400 | 0.33 | 1,249,000 |

Note: cutoff grades are 0.01 oz AuEq/t for oxide and 0.015 oz AuEq/t for sulfide

# 2.0 INTRODUCTION AND TERMS OF REFERENCE

Mine Development Associates ("MDA") and consulting minerals geologist Odin D. Christensen, C. P. G. have prepared this technical report for the Golden Arrow project, Nye County, Nevada, at the request of Animas Resources Ltd. ("Animas"). Animas has entered into an option agreement regarding the Golden Arrow project with Nevada Sunrise Gold Corporation ("Nevada Sunrise"), a British Columbia corporation, and its wholly owned subsidiary, Intor Resources Corporation ("Intor"), a Nevada corporation, who currently controls the Golden Arrow property. The authors prepared the initial Technical Report on the Golden Arrow property for Nevada Sunrise in February 18, 2008 (Ristorcelli and Christensen, 2008) and prepared an updated Technical Report on May 1, 2009 (Ristorcelli and Christensen, 2009). This updated report has been prepared to support Animas' first-time disclosure of mineral resources on the Golden Arrow property.

## 2.1 Project Scope and Terms of Reference

The purpose of this report is to provide a technical review and compilation of historic Golden Arrow project data for Animas, describing the project, past exploration history, and the 2009 NI 43-101-compliant resource estimate. The text of this report is substantially the same as that of the 2009 updated technical report (Ristorcelli and Christensen, 2009), with the addition of a description of Animas' involvement in the project and updated information on land and reclamation (Section 4.0), metallurgy (Section16.0), and recommendations (Section 20.0).

The technical report is written to comply with disclosure and reporting requirements set forth in the Canadian Securities Administrators' National Instrument 43-101 ("NI 43-101"), Companion Policy 43-101CP, and Form 43-101F1. All historic resources described in Section 6.4 are provided for historical purposes only. Mr. Steven Ristorcelli, Principal Geologist of MDA and author of this report, is a Qualified Person under Canadian Securities Administrators' National Instrument 43-101 and is independent of Animas, Nevada Sunrise, and Intor. Dr. Odin Christensen, also a Qualified Person and co-author, is independent of Animas, Nevada Sunrise, and Intor. Jack McPartland, also a Qualified Person, is independent of Animas, Nevada Sunrise, and Intor. MDA and Christensen have reported as much historic information as was presented to MDA by Nevada Sunrise and Intor or that MDA has found. MDA has not made independent investigations of data except where recommendations were made that were based on such information or where otherwise explicitly stated.

The scope of this study included a review of pertinent technical reports and data provided to MDA by Nevada Sunrise but generally authored by other workers on the project relative to the general setting, geology, project history, exploration activities and results, methodology, quality assurance, interpretations, historical resources, and metallurgy. In addition, MDA received a digital database of drill data from Nevada Sunrise for both historic drilling and 2008 drilling. MDA audited that database (see Section 14.0).

MDA has relied on the data and information provided by Animas, Nevada Sunrise, and Intor for the completion of this report. Almost all of the information reviewed by MDA in order to complete this report is the result of work by previous operators on the Golden Arrow project. Most of the conclusions made in this report are based on MDA's and Christensen's review of the work of these operators or from personal experience of Ristorcelli or Christensen.

The authors' mandate was to compile public and private documents and technical information into one report that would comply with NI 43- 101 and to use this technical framework to guide and constrain development of a compliant Mineral Resource Estimate to be included within the Report. The mandate included on-site inspections and the authors' observations, conclusions, and recommendations. Both Ristorcelli and Christensen have personal experience with the Golden Arrow property extending back several years. Odin Christensen visited the property numerous times during the years 2006 – 2009. He was actively involved in re-logging some 131,240ft (40km) of drill core and cuttings during 2007, and he personally directed the drilling program on-site during May – August 2008. His most recent visit to the property was on April 8, 2010. Mr. Ristorcelli made a site visit on November 12, 2007.

## 2.2 Frequently Used Acronyms, Abbreviations, Definitions, and Units of Measure

The historical and technical records for past exploration of the Golden Arrow district report in a mixture of Imperial and international measures. All drill intervals, for example, are reported in feet, yet drill collar coordinates are in UTM meter-based coordinates. Gold values for rock chip samples are commonly reported in troy ounces per short ton, while gold concentrations in geochemical samples are reported as parts per million or grams per metric tonne. In this report, historical results are mainly reported in the Imperial units in which they were originally reported, with converted metric values in parenthesis.

| | |
|---|---|
| AA | atomic absorption spectrometry |
| Ag | silver |
| Au | gold |
| core | diamond drill drilling method |
| $C^o$ | degrees Centigrade |
| $F^o$ | degrees Fahrenheit |
| FA-AA | fire assay with an atomic absorption finish |
| ft | feet or foot |
| g | grams |
| g/t | grams per metric tonne |
| gpm | gallons per minute |
| ha | hectares |
| in | inch |
| kg | kilogram |
| km | kilometers |
| L | liter |
| Ma | million years ago |
| m | meters |
| mi | miles |
| mm | millimeter |
| mt | metric tonne |
| µm | microns |

| | |
|---|---|
| NaCN | sodium cyanide |
| NSR | net smelter return |
| opt | troy ounces per short ton |
| oz/ton | troy ounces per short ton |
| ppb | parts per billion (parts per $10^{-9}$) |
| ppm | parts per million (parts per $10^{-6}$) |
| RC | reverse circulation drilling method |
| t | tonnes |
| UTM | Universal Transverse Mercator geographic coordinate system |

**Currency** Unless otherwise indicated, all references to dollars ($) in this report refer to currency of the United States.

## 3.0 RELIANCE ON OTHER EXPERTS

This report by Steven Ristorcelli and Odin Christensen is an update of work and reporting done principally in the fall of 2007 culminating in a report completed in 2008, updated in the first half of 2009, and now in May 2010. Minor additions relating to land, geophysics, metallurgy, and recommendations were added in order to update the Technical Report for Animas. The authors are personally familiar with the geology of the Golden Arrow mining district and the geology of Nevada in general. The authors have reviewed numerous historical reports and documents regarding the Golden Arrow district, as cited in the References section (Section 21.0) of this report. Much of the information herein reported has been extracted from these references.

The authors are not qualified to offer a legal opinion regarding property ownership and have relied upon information received from Nevada Sunrise but prepared by Richard W. Harris, Esq., of the law firm of Harris & Thompson of Reno, Nevada addressing claim status with respect to annual filing and underlying agreements. The most recent legal opinion regarding property ownership was done specifically for this report being prepared for Animas.

MDA and Christensen are not qualified persons with respect to environmental issues and have relied upon a report by Mr. Joseph Martini with Enviroscientists, Inc., which is summarized in Section 4.4 and included as Appendix B of this report.

MDA has relied on Mr. Jack McPartland for compilation and review of the metallurgical data. Mr. McPartland is a Qualified Professional, certified by the Mining and Metallurgical Society of America, and an independent consultant with McClelland Laboratories in Reno, Nevada.

In several instances, Mr. William Henderson is mentioned as having taken samples and surveyed drill holes and staked claims. This is here mentioned only because Mr. Henderson is President of Nevada Sunrise and Intor and is not independent. MDA and Christensen have no reason to discount any of the work completed by Mr. Henderson and have made conclusions and recommendations based on his work. In the case of the surveying, MDA did check drill-hole locations and found those checked to be properly located.

# 4.0 PROPERTY DESCRIPTION AND LOCATION

## 4.1 Location

The Golden Arrow property is located in south-central Nevada, approximately 40mi (60km) east of Tonopah, the county seat of Nye County, Nevada (Figure 4.1). The property is situated approximately six miles (10 km) from the northern boundary of the Tonopah Test Range of Nellis Air Force Base. Golden Arrow is on the western flank of the Kawich Range and on the eastern margin of Stone Cabin Valley within the Golden Arrow mining district.

The Golden Arrow property is situated in all or portions of Sections 15-17, 20-23, and 26-35, Township 2 North, Range 48 East, Mount Diablo Base and Meridian. The property is generally centered on the topographic feature of Confidence Mountain at UTM coordinates 535,200 East; 4,205,500 North; North American Datum 1927 Zone 11, or 37° 59' North latitude and 116° 37' West longitude. The Stone Cabin Ranch SE, Stone Cabin Ranch SW, Stinking Spring, and Stinking Spring NW 7.5-minute topographic maps of the United States Geological Survey cover the project area; the property lies on the line between the Goldfield and Tonopah 1° by 2° topographic map sheets.

## 4.2 Land Area

The information presented in this section is based on information provided to MDA by Nevada Sunrise and Richard Harris, Esq., a Reno, Nevada, mining attorney. Mr. Harris has reviewed and edited Sections 4.1, 4.2, and 4.3 of this report. MDA and Christensen are not qualified persons for land matters in Nevada and present this information for completeness and regulatory requirement.

The Golden Arrow project is primarily located on land controlled by the U.S. Department of Interior, Bureau of Land Management ("BLM") in Sections 15-17, 20-23, and 26-35, Township 2 North, Range 48 East, Mount Diablo Base and Meridian. Intor controls approximately 5,684 acres (2,300 ha) of mineral rights through a total of 279 unpatented lode mining claims and 17 patented lode mining claims. These are controlled through one lease agreement and by unpatented and patented claims located or purchased by Intor. The claims are contiguous. Figure 4.2 shows the general location of the Golden Arrow property controlled by Intor. Although the property has not been surveyed, the unpatented lode claims staked by Intor were laid out in a GIS (Geographical Information System) program and were located in the field using high-precision GPS (Global Positioning System) surveying equipment.

## Figure 4.1 Location Map of the Golden Arrow Project

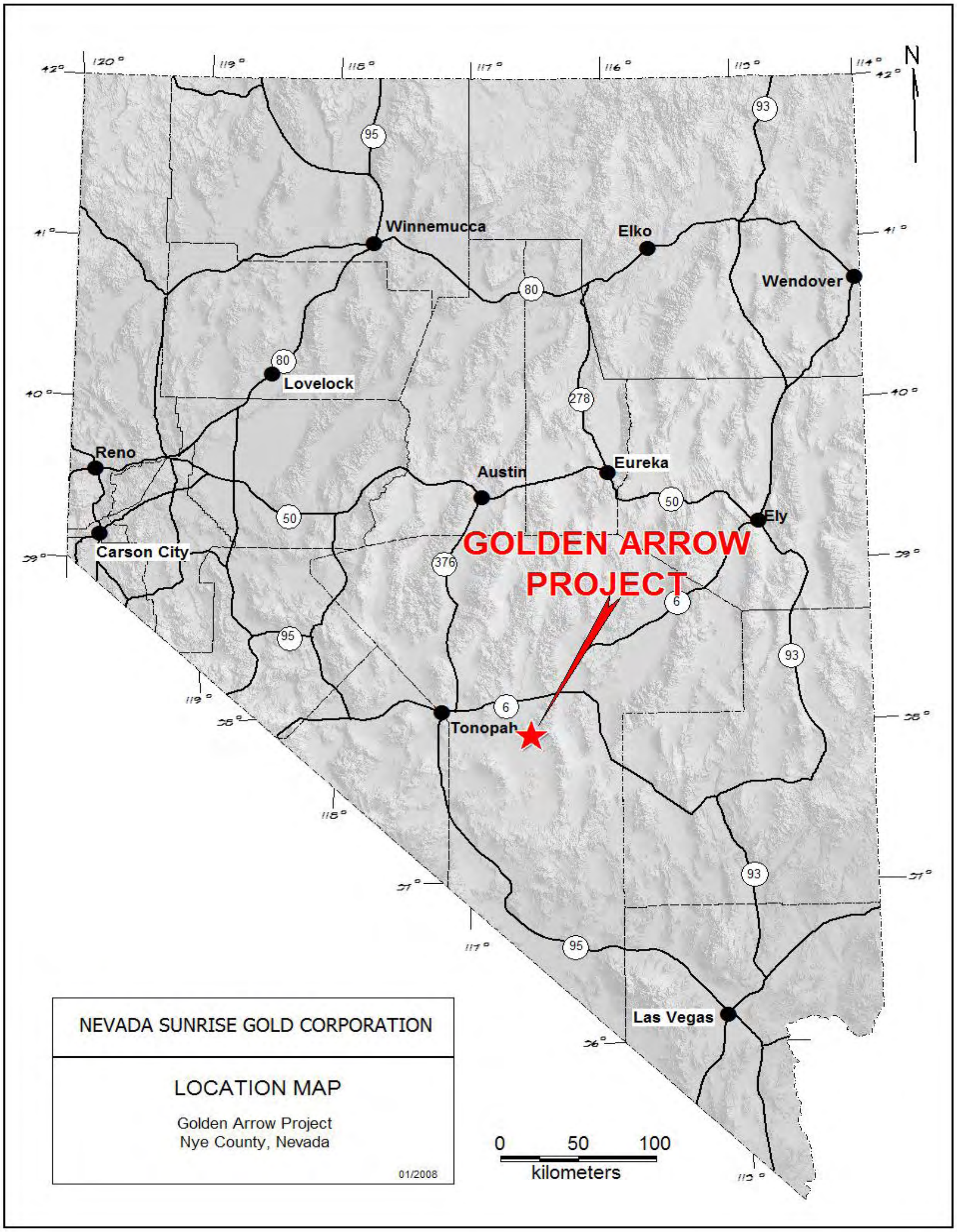
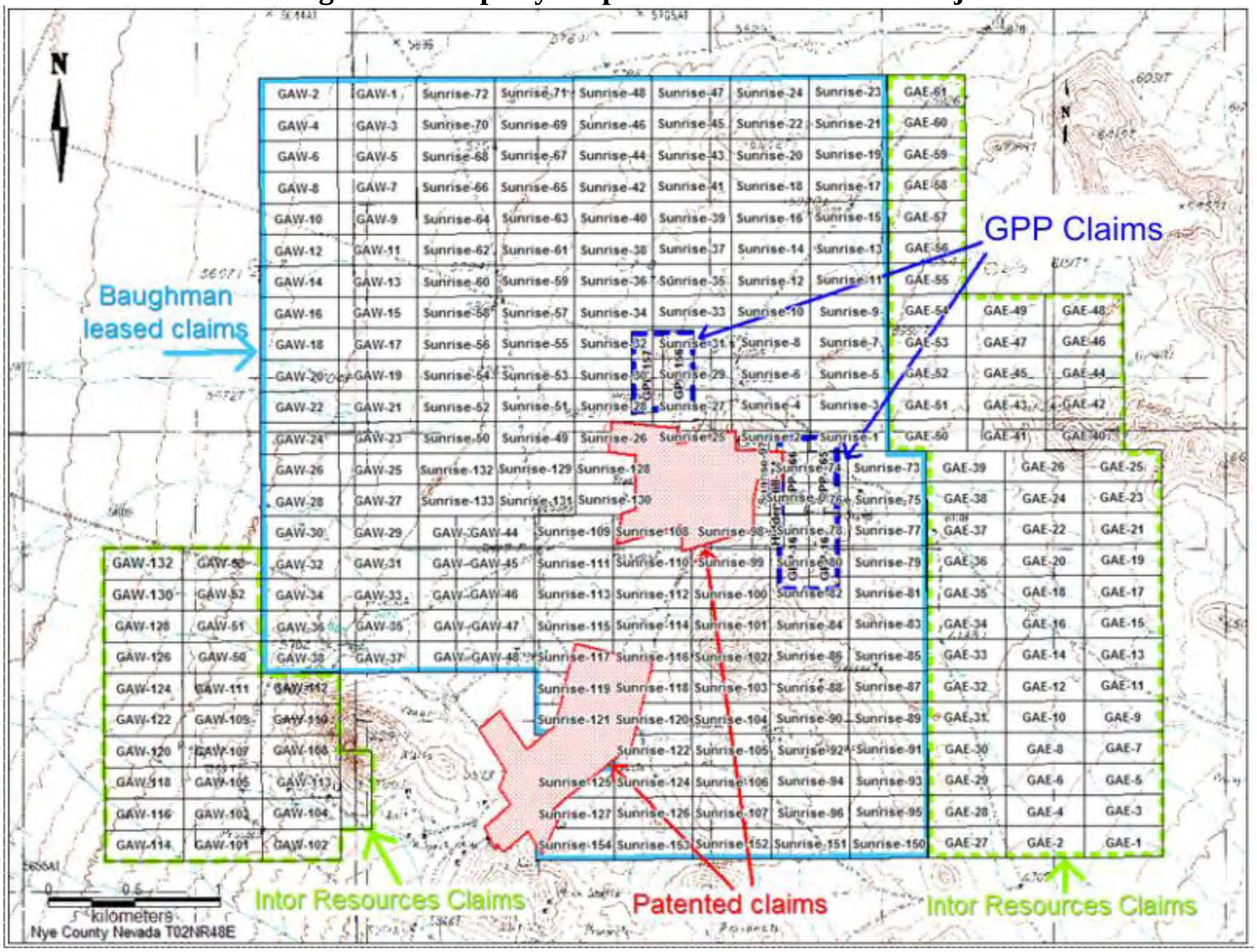


**Figure 4.2 Property Map of the Golden Arrow Project**




## 4.3 Agreements and Encumbrances

The following information was supplied by Nevada Sunrise and by Richard Harris, Esq., a Reno, Nevada mining attorney.

Intor was originally created by the owners of Nevada Sunrise LLC in 2005. In May of 2007, Nevada Sunrise Gold Corporation acquired all of the issued and outstanding shares of Intor in exchange for 10,800,000 shares issued to the shareholders of Intor. As of May 15, 2007, Intor became a wholly owned subsidiary of Nevada Sunrise Gold Corporation.

Intor purchased seventeen patented lode mining claims in two noncontiguous blocks by way of various written agreements with Clogau (Nevada) Inc., a Nevada corporation ("Clogau") (Table 4.1). The claims are located in Sections 21, 27-28, and 33, Township 2 North, Range 48 East. The claims were conveyed to Intor by means of a "Quitclaim Deed" dated March 12, 2008 and recorded in Nye County, Nevada on June 19, 2008 as Document No. 710728. Intor made its final purchase payment to Clogau on January 15, 2009, and the Deed of Trust securing the payment obligation was released by way of a

Substitution of Trustee and Deed of Reconveyance recorded in Nye County on May 12, 2009 as Document No. 726943. The Golden Arrow patents are subject to a one percent (1%) net smelter return royalty to prior owners. The patented claims are also subject to a one percent (1%) royalty on "gross revenues of [Intor], after payment of all royalties and net of operating costs…" reserved by Global Natural Energy PLC in an agreement dated May 6, 2003 with Vector International Inc., which previously held an interest in the Property.

**Table 4.1 Patented Lode Mining Claims Purchased from Clogau**

| Claim Name | Mineral Survey Number | Patent Number |
|---|---|---|
| Apache | 4164 | 472971 |
| Best of All | 4164 | 472971 |
| Big Hope | 4164 | 472971 |
| Fayette | 4164 | 472971 |
| King of All | 4164 | 472971 |
| Moki | 4164 | 472971 |
| Papoose | 4164 | 472971 |
| Washington | 4164 | 472971 |
| Waucoma | 4164 | 472971 |
| Confidence | 4535 | 895516 |
| Desert | 4535 | 895516 |
| Golden Bar | 4535 | 895516 |
| Golden Anchor | 4535 | 895516 |
| Fortunatus | 4535 | 895516 |
| Lucky Strike | 4535 | 895516 |
| Summit | 4535 | 895516 |
| Wedge | 4535 | 895516 |

Intor purchased six unpatented mining claims from Pomroy Neighbors, *et al.*, by way of various written agreements (Table 4.2). The GPP claims were transferred to Intor by means of a "Quitclaim Deed with Reserved Royalty" dated July 16, 2007. The Deed was recorded in Nye County on July 27, 2007 as Document No. 690939 and filed with the Nevada Bureau of Land Management on July 27, 2007. The Deed has been modified by an "Addendum to Quitclaim Deed with Reserved Royalty" (recorded in Nye County as Document No. 714392) and a "Correction to Addendum to Quitclaim Deed with Reserved Royalty" (recorded in Nye County as Document No. 715839). The claims are subject to a three percent (3%) NSR production royalty, with Intor retaining the right to purchase up to two points (one point being equal to a one-percent royalty interest), with $100,000.00 payable for each point. Beginning June 1, 2008, Intor will make annual advance royalty payments until production commences. An annual payment of $10,000 is due on June 1, 2009, increasing to $25,000.00 per year beginning June 1, 2010 and continuing in all subsequent years. The advance royalty payment shall accumulate as a credit toward production royalty payments.

**Table 4.2 Unpatented Lode Mining Claims Purchased by Intor**

| Claim Name | BLM Numbers |
|---|---|
| GPP 156-157 and 165-168 | NMC 882200-882205 |

Several claim blocks totaling 185 unpatented lode mining claims are held through a lease between Intor and Gerald W. and Fabiola Baughman, originally dated May 22, 2002 with an effective date of January 1, 2002, subsequently amended on May 1, 2003 and June 30, 2004, and assigned from Nevada Sunrise LLC to Intor on July 19, 2006. These claims include 48 GAW- claims, one Hidden Hill claim, and 136 Sunrise- claims (Table 4.3). The lease had an initial term of ten years. The initial lease term was extended by five years to December 31, 2016 by means of Amendment No. 3 to Mining Lease (Golden Arrow Property) effective March 1, 2010 between Intor and Nevada Eagle Resources, LLC, successor-in-interest to the Baughmans. The lease can be extended after 2016 through payment of annual advanced royalties on an escalating schedule or by mineral production and processing. The advance royalty payments upon achieving production will be $250,000 per year. Production from the claims is subject to a 2% NSR royalty to the owners. Intor makes annual advance minimum royalty payments of $50,000 to the owners, and in a letter to MDA dated May 26, 2010, Mr. William Henderson, President of Intor, stated that "*All contractual payments due to Gerald W. Baughman, Nevada Eagle Resources, and Gryphon Gold Corporation under the terms of our mining agreement originally dated May 22, 2002 as amended through March 1, 2010 are current.*"

**Table 4.3 Unpatented Lode Mining Claims Leased from the Baughmans**

| Claim Name | BLM Numbers |
|---|---|
| Hidden Hill 34 | 825234 |
| Sunrise 1-18 | 831053 - 831070 |
| Sunrise 25-42 | 831071 - 831088 |
| Sunrise 49-66 | 831089 - 831106 |
| Sunrise 99 | 831108 |
| Sunrise 108-111 | 831109 - 831112 |
| Sunrise 128-133 | 831113 - 831118 |
| GAW 1-48 | 848482 - 848529 |
| Sunrise 19-24 | 848530 - 848535 |
| Sunrise 43-48 | 848536 - 848541 |
| Sunrise 67-96 | 848542 - 848571 |
| Sunrise 98 | 848572 |
| Sunrise 100-107 | 848573 - 848580 |
| Sunrise 112-122 | 848581 - 848591 |
| Sunrise 124-127 | 848592 - 848595 |
| Sunrise 150-154 | 848596 - 848600 |

Intor staked additional unpatented lode mining claims (Table 4.4). These claims are subject to the Area of Interest provision set forth in the Mining Lease with Gerald and Fabiola Baughman, as described above.

Past exploration has defined two centers of gold mineralization, the Hidden Hill and Gold Coin zones. Both are situated well within the limits of the property, as are the principal exploration targets identified by Nevada Sunrise geologists.

**Table 4.4 Unpatented Lode Mining Claims Staked by Intor**

| Claim Name | BLM Numbers |
|---|---|
| GAE 1-61 | 967180 – 967240 |
| GAW 50-53 | 967123 – 967126 |
| GAW 101-114 | 967142 – 967155 |
| GAW 116 | 967156 |
| GAW 118 | 967157 |
| GAW 120 | 967158 |
| GAW 122 | 967159 |
| GAW 124 | 967160 |
| GAW 126 | 967161 |
| GAW 128 | 967162 |
| GAW 130 | 967163 |
| GAW 132 | 967164 |

## 4.4 Environmental Reports and Liabilities

Mineral exploration on the unpatented lode mining claims will require approval of the BLM, which will also require an archeological survey of the potential work site prior to the approval of any exploration or development work. This approval has not been sought or received by Nevada Sunrise or Animas. According to Nevada Sunrise, approval for typical exploration and development activities in this location should be routine. Exploration drilling in 2008 was completed under of Notice of Intent with the Tonopah office of the BLM.

There are a number of excavations and open shafts on the property, some of which have been fenced.

Neither Mr. Ristorcelli nor Dr. Christensen is qualified regarding environmental issues. Mr. Joseph Martini of Enviroscientists, Inc. prepared a report on assessment of site conditions on the Golden Arrow property (Martini, 2007) that is included as Appendix B of this report.

Regarding the small mining operation briefly mention in Section 6.0 of this report, Martini (2007) noted:

> *During 1980, SSHK, Inc. with Einar C. Erickson as the consulting geologist, was conducting mining operations at a small open in pit in Section 32, T2N, R48E, and had constructed a small heap facility and three solution ponds to process the ore in Sections 29 and 32, T2N, R48E. The heap leach operations also included a monitoring well, a small processing building, a small open pit mine, and a waste rock dump. With the exception of the open pit and a portion of the waste rock dump, all components are located on the Property.*
>
> *In January 1981, the BLM, Tonopah Field Station was notified of SSHK Inc.'s intention to conduct a small heap leach operation in Sections 29 and 32, T2N, R48E. According to the Notice, which is included as Attachment A, the heap leach facility was constructed by spreading a 12 inch layer of clay/silt over compacted earth. The clay/silt layer was then compacted, sprayed with a water repellent polyelectrolyte solution, and overlain with a six inch layer of*

*crushed gravel. Ore was stacked to a maximum height of 12 feet. The notice described SSHK, Inc.'s intention to begin processing ore in a closed cycle leach system with the use of sodium cyanide solution and zinc powder precipitation process. Average cyanide concentration in the solution was expected to be approximately five pounds per ton.*

*The base of the leach facility was completed; however, only a small portion of the facility was loaded with ore. The ore that was placed on the facility was run of mine and likely originated from the small open pit as well as from several of the historic ore and waste stockpiles located throughout the Property. Solution was applied to the leach facility via rainbird style sprinklers, and solution was collected in an open ditch and delivered to the three lined ponds.*

*On September 19, 1982, the NDEP conducted a site visit of the heap leach facility in response to a report of wildlife mortalities. According to the December 1, 1982 report, which is included as Attachment A, no moribund animals were discovered; however, the facility was abandoned and had not been completely reclaimed. NDEP requested in the report that the liners from the ponds be removed to allow free drainage of meteoric waters, and the removal of several drums and containers of caustic soda and other chemicals.*

*Discussions with the BLM, NDEP, and NDOW produced no further information on the heap leach operation; however, it should be noted that the personnel from NDEP and NDOW that were identified in the correspondences described above no longer worked at the agencies. Mr. Steve Dondero of the BLM who was provided a courtesy copy of the NDEP site visit report, had no recollection of the any issues related to the operation. In addition, a search of available local, state, federal, and tribal environmental records on the Property was conducted by EDR The search was negative.*

Martini (2007) further described the current status of the remnants of SSHK's mining operation:

*The SSHK mining operation includes a heap leach facility, three solution ponds, and waste rock dump. The base of the heap leach facility looks as if it were completed. Plastic liner is visible in several locations around the facility. At certain locations two layers of the plastic are visible. In general the visible plastic material is ripped and brittle. The plastic is covered with a thin layer of crushed material, and a layer of medium size smooth cobble. Several stockpiles of the crushed material and cobble were identified around the facility.* [Figure 4.3, an image made in November, 2007, illustrates fragments of liner, crushed rock and sized-gravel overliner material, stacked ore, and a waste-rock dump.] *Approximately 50 percent of the facility is loaded with ore to approximately ten feet high. Ore appeared to be run of mine and had a wide range of sizes. Several shallow irrigation trenches approximately two inches deep and eight inches wide have been dug along the length of the surface of the ore. No piping was found on or around the facility. The only indication of a working operation was one rainbird style sprinkler found on the surface of the ore. No sulfide ore was identified on the surface of the heap.*

**Figure 4.3 View of the Heap Leach Operation Area Looking Eastward**
(From Martini, 2007, Appendix C)

In the immediate foreground are fragments of polyethylene liner, crushed rock and sized-gravel overliner material. To the right in the picture is stacked ore. The waste-rock dump is in the middle distance. (Description from Odin Christensen)

*Three small solution ponds are located to the west of the heap. A shallow open trench which appears to be designed to gravity feed the solution from the heap leach facility to the closest pond was identified. No visible connection between the closest pond and the other two was identified. There was a small amount of liquid in the bottom the pond closest to the heap leach facility.* [Figure 4.4, an image made in November 2007, shows the solution ponds with standing water.] *Livestock tracks were visible in and around the pond to the level of liquid. No moribund wildlife was found. There was no visual evidence that the ponds remained lined; however, because the area receives very little precipitation and there was standing water in the pond, it is possible that the liners remain.*

**Figure 4.4 View Looking Westward over the Solution Ponds**
(From Martini, 2007, Appendix C)

Note standing water as described in text.

Finally Martini (2007) summarized:

> *Based on the observation during the site visit, and except as discussed below, the Property does not have any fatal flaws with regard to identified environmental liability. Wastes generated from, and structures associated with historic mining and exploration activities will affect any future actions that require compliance with the National Environmental Policy Act (NEPA), or the National Historic Preservation Act. In addition, the existence of the heap leach facility in Sections 29 and 32, T2N, R48E, poses a potential and currently unqualified liability. The quantity of processing that occurred at this facility (i.e., quantity and concentration of solution,) and the housekeeping at the operations (i.e., spill and leaks) are unknown. There are no records of spills or leaks and no orders of non-compliance on file with the regulatory agencies; however, this does not mean that contamination of soils or groundwater from either heap leach solution or other processing chemicals did not occur. Enviroscientists recommends a detailed analytical survey of the soils and ground water in the vicinity of the heap leach operation be completed by IRC* [Intor] *prior to any future actions in the immediate area of the heap leach.*

The heap leach facility in Sections 29 and 32 referenced above lies over 2km southwest of the resource described in Section 0.

# 5.0 ACCESS, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

## 5.1 Access

The Golden Arrow property is readily accessible year-round from the town of Tonopah, Nevada. The most direct route is by driving 35mi (57km) east from Tonopah on paved US Highway 6 to the "Silverbow-Golden Arrow" road near the center of Stone Cabin Valley; then south on this graded gravel road for 8mi (13km); and then approximately 3mi east (5km) on unmaintained gravel roads to reach the property. Local access within the property is possible by four-wheel-drive vehicle. Except for occasional days of exceptional snow or rain, the property is accessible for exploration all year.

## 5.2 Climate

The climate is typical for the arid high desert. In all seasons, daily temperature ranges can be extreme. For the closest weather reporting station of Tonopah, the July average daily high is 92°F (33°C), with an average daily low of 56°F (13°C). The January daily high is 45°F (7°C) with an average daily low of 20°F (-7°C). The extreme temperatures reported for Tonopah are 104°F (40°C) and -15°F (-27°C). Annual precipitation is 5.84in. (14.8cm); although March is typically the wettest month, precipitation is received throughout the year.

Vegetation is sparse. Various grasses, cacti, sage, Russian thistle, and rabbit brush are dominant species. Animals seen during visits to the property include various lizards and snakes, rabbits, transient wild horses and antelope, and insects.

The location and climate are favorable for exploration and mining year-round without particular weather difficulties.

## 5.3 Local Resources and Infrastructure

The Golden Arrow property is in an historic mining district with a few scattered remnants of old mine buildings and facilities but no infrastructure except for a network of old tracks and trails. The town of Tonopah is the nearest population center and is the county seat of Nye County, Nevada. In 2006, Tonopah's estimated population was 2,600 (website of the Nevada State demographer, 2007). It has many of the services and experienced exploration and mining personnel to support exploration and mining activities.

The major regional commercial, transportation, and service centers of Las Vegas, Reno, and Salt Lake City are located 210, 240 and 400mi (340, 390, and 640km) away, respectively, by excellent paved highways. Winnemucca and Elko, Nevada, major mining service centers, are located 300 and 360mi (480 and 580km) away, respectively, also by excellent paved highways.

Power lines run parallel to US Highway 6 between Tonopah and Warm Springs, and multiphase power lines service the Tonopah Test Range situated south of the property.

Water for exploration drilling may be obtained from wells in the Stone Cabin alluvial valley. The presence of large irrigated fields within the valley between Golden Arrow and US Highway 6 attests to the presence of water sources.

## 5.4 Physiography

The regional topography is typical for the Basin and Range Province of Nevada, characterized by generally north-trending rugged mountain ranges rising to heights over 9,000ft (2,750m) above broad alluvial valleys at elevations of 5,100 to 5,400ft (1,550 to 1,650m).

The Golden Arrow property is marked by a few low hills rising to elevations of 6,391ft (1,948m) above a gentle west-dipping alluvial plain at about 5,900ft (1,800m). The property is crossed by several shallow arroyos, which flood during infrequent storms, but there are no permanent streams or water bodies. Records from the historic mines suggest that the ground water at Golden Arrow occurs at a depth of about 400ft (122m).

The property position is adequate to accommodate anticipated mining access and infrastructure. There are no characteristics of site topography, climate, bedrock geology, or hydrology that present significant impediments to exploration and mining.

The property has a number of favorable attributes for exploration and development of mineral resources: gentle topography, mild climate, available ground water, and close proximity to highways and towns.

## 6.0 HISTORY

Gold was discovered in the Golden Arrow mining district in June 1905, and by 1917 deposits were being explored at the Golden Arrow, Gold Bar, and Desert shafts (Ernst, 1990; Cornwall, 1972). Gold production continued until the 1930s from several shafts up to 500ft (150m) deep (Bonanza Exploration, 2001). Historic production was from veins and tabular breccias bodies with ore occurring in lenses and shoots. Roy Neighbors, a local property owner and miner, has told Nevada Sunrise personnel that he mined in several of the shafts with his father during the Depression. The Neighbors also processed dump material through a homemade ball mill and concentrating table.

A report by Breckon (1949) discussed mines still open as of 1949. The Golden Arrow mine had a 400ft (122m), $65^{o}$ decline with a two-compartment shaft. Workings were developed at 100ft (30m) levels, with the most extensive development – 1,000ft (300m) of lateral drifting – at the 300ft (90m) level. The Gold Bar mine had a 520ft (160m), $45^{o}$ decline with drifts at 100ft (30m) interval levels. The most extensive development was a 1,000ft (300m) drift at the 500ft (150m) level. Ore at both mines was said to occur as lenses and shoots that averaged 4ft (1m) thick. Recorded ore shipments to the McGill, Nevada smelter had gold grades between 0.344 and 1.50 oz Au/ton (11.794 and 51.43 g Au/t).

Total historic gold production from the district is not known. Ferguson (1917) reported very little production of gold and silver during the early years of the district. Kral (1951) estimated gold production of 600 ounces from about 900 tons of rock during the 1940s.

Sometime during the 1980s, a small mine was opened and cyanide heap leach pads constructed by Einar Erickson and associates immediately to the north of Deadhorse Hill, on unpatented claims on and adjacent to the property now controlled by Nevada Sunrise. Geological review and sampling by Nevada Sunrise geologists indicated that the material mined apparently contained very little gold or silver; mineralized material present on the leach pads appears to have been moved from historic mine dumps not on the Erickson claims.

### 6.1 Summary of Historic Exploration Programs

The Golden Arrow property has been explored by a succession of companies since 1981. This work has included geological mapping, geochemical and geophysical surveys, and drilling. The historical ownership and exploration work were summarized by Ernst (1990), Seedorff *et al.* (1991), Murray (1997), Bonanza (2001), and Blanchflower (2003).

B. M. Clem and Golden American Joint Venture explored the property from 1981 to 1984. They drilled 24 rotary holes totaling 4,130ft (1,259m) in the vicinity of the Gold Bar shaft, mostly to a depth of 200ft (60m). The joint venture conducted column-leach tests of waste-dump samples, minor geological mapping, and rock-chip sampling (254 samples). Drill results were mostly negative with a few anomalous intercepts ranging up to 0.04 oz Au/ton (1.37 g Au/t) over 40ft (12m) (Ernst, 1990). Nevada Sunrise and Animas has no records of this exploration work.

From 1984 to 1985, Vector Exploration, Inc. (also referred to by its successor's name of Vector International in some reports) – Hydromet, Ltd. Joint Venture completed backhoe trenching (4,200ft

(1,300m)), dozer scrapes (1,500ft (460m)), and geochemical sampling (600 samples), and drilled 19 hammer holes from 8 to 28ft (2 to 9m) in depth. All of this work was conducted on the west slope of Confidence Mountain. Nevada Sunrise has no records of this work, but Jennings (1988) reported that sampling of the new exposures indicated the presence of a large 0.01 to 0.03 oz Au/ton (0.34 to 1.03 g Au/t) zone on the north and west flank of Confidence Mountain. Although Ernst (1990) and Seedorff *et al.* (1991) allude to two reports by R. J. Rongey on geology and development from this activity, Nevada Sunrise, Christensen and MDA were unable to locate copies.

In 1986, Clogau Gold Mines (also described as Clogau, Ltd. and Clogau (Nevada) Inc. in old reports) ("Clogau") acquired 100 percent interest in the property. From 1986 to 1987, Mining Transactions, Inc. was contracted by Clogau to conduct aerial photography, produce orthophoto and topographic maps, conduct district-scale geological mapping, and drill 89 air-track holes totaling 4,540ft (1,384m) to follow up on Vector's trenching results (Jennings, 1988). The holes were drilled on 50ft (15m) spacing along seven widely spaced north-south lines. No record of this drilling was found by Nevada Sunrise, MDA, or Christensen, although Jennings (1988) reported that "*numerous .01 to .03 oz./ton gold intercepts were cut in these holes.*" Although Ernst (1990) and Seedorff *et al.* (1991) refer to two reports by D. A. Pelham on mapping and drilling from this exploration, MDA was unable to locate copies.

Homestake Mining Company ("Homestake") leased the property from Clogau in 1987 and carried out exploration to 1988. Homestake conducted geological mapping (1:2,400), rock-chip and trench sampling (151 samples), and drilled 38 reverse-circulation ("RC") holes totaling 16,580ft (5,054m) (Jennings, 1988). This work led to the discovery of the Gold Coin zone. Homestake completed a mineral resource estimate for this zone as discussed in Section 6.4. In August 1987, Homestake commissioned Dawson Metallurgical Laboratories, Inc. to conduct preliminary bottle-roll and cyanide-leach tests on seven samples (described in Section 16.0 of this report).

From 1989 to 1990, Western Gold Exploration and Mining Company ("Westgold") joint ventured the property from Clogau and carried out geological mapping, rock-chip and trench geochemical sampling, an induced-polarization ("IP") electrical survey, gravity and magnetic surveys, and drilling (Ernst, 1990; Seedorff *et al.*, 1991). Westgold expanded the Gold Coin mineral resource on the north and east and discovered the alluvium-covered Hidden Hill deposit as well as gold-silver mineralization in the vicinity of drill hole GA90-78 that is located about 1,000ft (300m) from Hidden Hill (two holes subsequently drilled to offset GA90-78 did not contain gold).

Independence Mining Company ("Independence") acquired Westgold's interest in the property in 1990 and evaluated the property during 1991 and 1992. They completed a property-wide airborne magnetic and electromagnetic survey and drilled 13 RC exploration holes totaling 6,795ft (2,071m) [Murray (1997) reported 11 RC holes totaling 5,595ft (1,705m), but lithologic logs reviewed by MDA support the 6,795 footage in 13 holes]. Independence then returned the property to the owners. Animas and Nevada Sunrise have maps but no reports from the Independence exploration.

Coeur Exploration ("Coeur") leased the property from Clogau from mid-1993 to 1994 and conducted a gradient-array resistivity and self-potential survey and property-scale structural analysis (Murray, 1994, 1997). Coeur apparently drilled 25 RC holes for about 17,050ft (5,197m) and four core holes totaling 3,007.5ft (916.7m) (Murray, 1994, 1997), although it has also been reported that Coeur's drilling was

21,352ft (6,508m) in three core and 28 RC holes (Murray, 1997). The available records are not consistent, and the conflicting information from Murray cannot be resolved. The drill-hole database reviewed for the present report indicates there were 25 RC and four core holes totaling 20,160ft (6,145m). Drilling results were interpreted to indicate the presence of higher-grade mineralized veins at depth along the northwestern side of Confidence Mountain. Coeur discovered mineralization including shallow high-grade mineralization (0.6 oz Au/ton (20.6 g Au/t)) in drill hole GA94-172 along the northwest side of Confidence Mountain (Murray, 1997). In 1994, Coeur commissioned METCON Research Inc. to conduct preliminary cyanidation metallurgical test work on samples from Golden Arrow (Ortega, 1994; described in Section 16.0 of this report).

Kennecott Exploration Company ("Kennecott") leased the property from Clogau in 1995 and drilled eight exploration holes totaling 5,570ft (1,678m) in 1996 (Murray, 1997). According to Murray (1997), Kennecott never produced a summary report of their exploration work.

Tombstone Exploration Co. Ltd. ("Tombstone") assumed the Kennecott lease in March 1997 and undertook geological mapping, rock-chip and soil geochemical sampling, and geophysical surveying. In addition, Tombstone drilled 86 RC exploration holes totaling 39,910ft (12,615m) (Murray, 1997; the database shows a total of 40,150ft, (12,238m) which is what is shown on Table 11.2). Tombstone suspended work on the property in October 1997.

Bonanza Explorations Inc. ("Bonanza") acquired the Golden Arrow property in late 1999 and through mid-2001 conducted detailed geological mapping, surface geochemical sampling, compilation of available exploration data, and three-dimensional geological modeling; Bonanza did no drilling during their tenure on the property Bonanza's target was specifically high-grade structures, not necessarily large-tonnage low-grade deposits, focusing on numerous narrow zones of structurally controlled mineralization with grades between 1 and 3 oz Au/ton (34 and 103 g Au/t) (Bonanza, 2001). Their detailed mapping indicated that district-scale mineralization was controlled by north-northeast-trending structures with a separate set of northwest- to west-northwest-trending structures (Bonanza, 2001).

In 2002, Nevada Sunrise LLC, a Nevada corporation affiliated with Nevada Sunrise Gold Corporation, secured a lease to the unpatented lode mining claims owned by the Baughmans, followed by a lease in 2003 on additional unpatented claims owned by Pomroy Neighbors *et al.*, as described in Section 4.3. In 2004, a lease-purchase agreement was executed with the owners of the patented mining claims, consolidating control of the district.

In 2003, Pacific Ridge Exploration Ltd. ("Pacific Ridge") optioned the unpatented claims from Nevada Sunrise LLC and explored the property until 2004. Like Bonanza, Pacific Ridge was focused on higher-grade veins and vein stockworks that could support underground mining, rather than bulk-tonnage and consequently lower-grade deposits (Blanchflower, 2003). Pacific Ridge conducted reconnaissance geological mapping and lithogeochemical sampling over the Gold Coin and Confidence Mountain areas, completed a property-wide soil geochemical survey, drilled 29 reverse-circulation drill holes totaling 18,721ft (5,706m) in seven separate target areas on the property (Bowen, 2004; the database used by MDA says 30 holes totaling 19,041ft (5,804m)), and completed a mineral resource model. Pacific Ridge's exploration was directed exclusively toward discovery of a high-grade gold resource. Ironically, Pacific Ridge did not control the patented mining claims on which all of the historic mining of high-grade ore had occurred.

Nevada Sunrise initiated preliminary exploration activities on the Golden Arrow property in 2006 that are described in Section 10.0. During this time, Nevada Sunrise acquired a considerable archive of exploration data, which the company is continuing to compile, integrate and reinterpret. Exploration activities conducted prior to 2008 by Nevada Sunrise included:

- compilation, review, and reinterpretation of existing exploration data;
- location and re-surveying of many of the historic drill sites to verify and improve the precision of the drill-collar location data;
- re-logging of all available drill core and chips;
- acquisition and interpretation of new high-resolution satellite imagery and ASTER spectral data;
- compilation and reinterpretation of the geophysical database;
- compilation and reinterpretation of the historic soil geochemical database;
- completion of a soil geochemical orientation survey; and
- completion of a significant program of drilling dominated by exploration but not at the exclusion further resource definition.

In 2010, Animas entered into an option agreement with Nevada Sunrise and Intor to participate in exploration of the Golden Arrow property. To date, Animas has only conducted a geophysical survey on the property.

## 6.2 Geochemical Exploration Programs

Nearly all of the historic exploration programs have included collection and analysis of geochemical samples; records of only a small portion of this work remain. Nevada Sunrise compiled all available geochemical data within their exploration GIS database, and has made this data available to Animas to guide future exploration.

All historic rock-chip geochemical sampling has been selective sampling; no systematic grid sampling program has been completed. The Nevada Sunrise archive contains data from Kennecott (29 samples), Newmont (43 samples), Tombstone (30 samples), and Nevada Sunrise (27 samples). The results of these rock-chip geochemical sampling programs are, as expected, highly variable. Selective samples of vein material from the vicinity of historic mines or from mineralization exposed at the Gold Coin zone contain gold and silver concentrations up to several ounces per ton; most samples contain little to no gold and silver.

Tombstone completed a limited soil geochemical exploration program covering approximately 3mi$^2$ (8km$^2$) south of the area of known mineralization, consisting of five north-south lines at approximately 1,640ft (500m) spacing and samples taken at 100ft (30m) intervals; 619 samples were taken and analyzed by Chemex Laboratories for gold, silver, and 31 other elements (Jeanne, 1997; Christensen, 2006c). Although preliminary results of this sampling yielded a number of single or paired anomalies and a number of longer runs of low-grade anomalies, Tombstone terminated their exploration program before analysis and follow-up could be completed (Jeanne, 1997).

Pacific Ridge contracted Nevada Sunrise LLC to complete a soil geochemical grid over the Golden Arrow property in 2003 (Nevada Sunrise, LLC & Pacific Ridge Ltd. Joint Venture, 2003; Bowen, 2004; Christensen, 2006c). A total of 1,671 samples were collected along 29 east-west-oriented lines on a grid of 528 x 264ft (161 x 80m). Lines had 518ft (158m) line spacing with 260ft (79m) sample spacing. A total of 1,670 samples were analyzed by Activation Laboratories Ltd. for a suite of 60 elements by inductively coupled plasma mass spectrometry ("ICP-MS") with an *aqua regia* digestion. Unfortunately, the laboratory has acknowledged that there were problems with their sample preparation or analysis. The analytical data exhibit notable batch effects, which the laboratory has acknowledged were probably introduced during sample preparation. The geochemical results, however, exhibit coherent patterns of multi-element concentrations that are reasonable and consistent with the observed geology. Nevada Sunrise reinterpreted this information, as discussed in Section 10.2.

## 6.3 Geophysical Exploration Programs

Geophysical exploration surveys have been completed as a component of several of the Golden Arrow exploration programs. There is limited interpretive documentation in the archives (Christensen, 2006d), the most significant being included in reports by Seedorff *et al.* (1991) and Murray (1997). It is fair to say that both of these geologists emphasized the application of geophysics for the detection of anomalies distinctly associated with mineralization. However, experience has demonstrated that Nevada gold deposits rarely have distinct associated geophysical anomalies. Rather, the highest value of geophysics is for mapping geology, and from that information inferring where gold deposits may occur.

As an element of their 1989 exploration program, Westgold contracted with Great Basin Geophysical, Inc. ("Great Basin") to design a survey of 80 line-miles of ground magnetics and to conduct an orientation IP-resistivity survey using a dipole-dipole array with both 50ft (15m) and 200ft (61m) dipole lengths. Westgold staff conducted the survey using an OMNI IV magnetometer, while Great Basin plotted the data and interpreted the results of the magnetic survey. Great Basin conducted the IP-resistivity survey using a Zonge Engineering model TIP-16, six-channel receiver and Geotronics FT-20, 20kW transmitter. After evaluation of the orientation IP-resistivity survey results, MPH International, Inc. was contracted to run five line-miles of IP-resistivity surveys, which used a pole-dipole electrode array with 200ft (61m) dipole lengths. The purpose of these geophysical surveys was to determine the geophysical signature of the known mineralization at Gold Coin and to identify areas with similar geophysical characteristics. Westgold geologists noted that Gold Coin is characterized by a low magnetic response relative to the surrounding alluvium. The Gold Coin area also exhibits a resistivity high coincident with the known silicification and mineralization. The response, however, was not distinct or definitive. According to Lide (1989), electrode contact resistance was high, and the ground geophysical crews had difficulty with their chargeability readings; in many cases, this was not even plotted. It is inferred that there were not significant measurable chargeability responses. A subtle zone of low magnetic response, situated to the northwest of the Gold Coin zone, was later drilled with the resulting discovery of the Hidden Hill deposit. According to Ernst (1990), this magnetic low corresponds to the buried paleo-topographic high at Hidden Hill, and the magnetic signature here may be due to shallow alluvium.

During 1991, Independence contracted for an airborne magnetic and electromagnetic survey of the Golden Arrow district. The survey was conducted by Aerodat Limited over an area measuring approximately 5mi (8km) north-south by 4.7mi (7.5km) east-west. The survey was flown with 328ft-spaced (100m) east-west oriented lines. Available records of this work consist of the following data recorded in map layers:

- VLF-EM Total Field Contours;
- Apparent Resistivity Contours 500 Hz;
- Apparent Resistivity Contours 4600 Hz;
- Geophysical Interpretation Map;
- Reduced-to-pole magnetic contours; and
- Calculated vertical magnetic gradient.

Together the surveys reveal considerable variation in the magnetic and electrical character of the rock lying beneath the Golden Arrow property (see Figure 10.4 and accompanying description).

Kennecott completed a gravity survey over the property in 1996. District-scale gravity readings were gathered along roads and traverses, and a smaller, more detailed, grid survey was completed over the Hidden Hill zone. The contoured Complete Bouguer gravity anomaly image is dominated by a northeast-oriented elliptical anomaly measuring approximately 3.1mi by 1.25mi (5km by 2km) (see Figure 10.3 and accompanying description). The eastern margin of the gravity anomaly is in part coincident with the Page fault. In general, the anomaly is centered on the intrusive neck of Deadhorse Hill.

Coeur contracted with Practical Geophysics to complete a gradient-array resistivity and self-potential survey in 1993 (see Figure 10.5 and accompanying description). Measurements were completed at 200ft (61m) stations along north-south lines spaced at 400ft (122m). The grid covered an area 8,000ft (2,440m) north-south by 6,000ft (1,830m) east-west centered on Confidence Mountain. Confidence Mountain and the Gold Coin mineral zone occur on the end of a prominent northwest-oriented zone of elevated resistivity. Confidence Mountain itself exhibits a ring-shaped resistivity pattern, with a less resistive central core surrounded by a ring of greater resistivity, interpreted as silicification. The correspondence between the mapped resistivity and the distribution of gold within the Gold Coin zone is striking. It is also observed that nearly all of the mapped prospects and shafts in the Confidence Mountain area are located within the ring of elevated resistivity. Hidden Hill did not reveal a strong characteristic resistivity signature. Although one test IP line was run, chargeability problems were again encountered, which made the generated data suspect (Murray, 1997).

Tombstone Exploration expanded the geophysical coverage in 1997. Quantech Consulting Inc. of Reno, NV, was contracted to conduct ground magnetic surveying of the DH claims south of Deadhorse Hill, and numerous anomalies were identified (Jeanne, 1997). Several identified geophysical anomalies were not tested, and others were not adequately tested due to depth limitations of the drilling. Nevada Sunrise does not have the geophysical data collected by Tombstone.

## 6.4 Historic Resource Estimates

Table 6.1 lists the historic resource estimates that have been made on the Golden Arrow deposits by previous operators. All but the 2008 estimate were prepared prior to the adoption of Canadian NI 43-101. Accordingly, these resource figures are presented here as historic documentation and are "historical estimates" as defined in NI 43-101. As required for disclosure in NI 43-101, the qualified persons have not done sufficient work to classify the historical estimate as current mineral resources or mineral reserves; the issuer is not treating the historical estimates as current mineral resources or mineral reserves as defined in sections 1.2 and 1.3 of the Instrument; and the historical estimate should not be relied upon. The terms "resource, reserve, inferred, measured, and indicated" as used in these historical estimates do not meet the standards of those terms as defined by NI 43-101. The resource completed by Nevada Sunrise in 2008 and updated in 2009 is the resource reported herein for Animas and is the only 43-101 compliant resource on the Golden Arrow property (Section 17.0).

In 1988, Homestake estimated a "geologic diluted inventory" for what is now referred to as the Gold Coin zone (Jennings, 1988). Using a gold cutoff of 0.02 oz Au/ton, a tonnage factor of 12 $ft^3$/ton, and a projected cross-sectional method, the inventory was 1,248,916 tons with 0.052 oz Au/ton and 0.47 oz Ag/ton. According to Jennings (1988), "*The mineralization, with the exception of a small pod west of Confidence Mountain, does not occur in mineable configurations*."

Westgold expanded the geologic resource in the Gold Coin zone by drilling more holes and discovered the Hidden Hill mineralization. In January 1991, they estimated a "geologic resource" at a cutoff grade of 0.015 oz Au/ton of 3,457,000 tons with an average grade of 0.033 oz Au/ton (1.131 g Au/t) for 114,081 oz Au at Hidden Hill and 2,105,000 tons with an average grade of 0.035 oz Au/ton for 73,675 oz Au at Gold Coin for a total "geologic resource" of 187,756 oz of gold (Seedorff *et al.*, 1991). As described by Seedorff *et al.* (1991), the majority of the resource at Hidden Hill "*is contained in a block 350 x 250 x 400 feet centered on drill holes 81, 83 and 123. Gold mineralization is higher grade and more continuous within this block than outside of it. However, significant gold intercepts (≥10 feet grading ≥0.010 opt Au) are present over an area 1000 feet by 700 feet and at depths below surface of 50 to 630 feet*." Westgold's resource was estimated using the inverse-distance-cubed method and Micromodel software (Seedorff *et al.*, 1991).

In 1994, Coeur estimated the Golden Arrow resources using the cross-sectional polygonal method with cross sections 100ft (30m) apart and an area of influence extending 50ft (15m) either side of the section line. In addition to the Gold Coin and Hidden Hill mineralized zones, Murray (1994) estimated a resource for Confidence Mountain. At a cutoff of 0.01 oz Au/ton, Murray (1994) estimated that the total oxide and sulfide resource at Gold Coin, Hidden Hill, and Confidence Mountain was 12,357,110 tons with a grade of 0.039 oz Au/ton for a total of 477,402 oz Au and a grade of 0.51 oz Ag/ton for a total of 6,263,753 oz Ag [Murray reported both "6,263,753" and "6,273,753"]. Murray (1994) noted that the known mineralization had not been completely drilled and suggested that further drilling would increase the resource.

Kennecott commissioned MDA to prepare a preliminary resource estimate for the Golden Arrow project in 1996 (Ristorcelli, 1996), which was completed by an author of the current report. MDA used Kennecott's database for the estimate. That resource, which included the Gold Coin and Hidden Hill areas, was classified as inferred "*…because there is little supporting data other than drill information, the sample integrity is somewhat in question, and the geology is not well understood*" (Ristorcelli, 1996). Ristorcelli (1996) went on to comment, "*The sole purpose of this estimate is to provide an order of magnitude estimate of the gold and silver resources at Golden Arrow. Check assays, density data, alteration, structure, lithology, and metallurgy are all required for a more definitive estimate*." At a gold cutoff of 0.02 oz Au/ton, Ristorcelli (1996) estimated a resource of 5,608,092 tons with a grade of 0.037 oz Au/ton for a total of 209,437 oz Au and a grade of 0.46 oz Ag/ton for a total of 2,600,321 oz Ag.

Tombstone made resource estimates of the project in 1997 using a variety of methods (Murray, 1997). Initially they made polygonal resource estimates of the Hidden Hill zone, hand calculated using both the plan and cross-sectional methods (these results are not shown on Table 6.1. The plan method estimated the Hidden Hill resource at 4,446,209 tons averaging 0.026 oz Au/ton for a total of 115,953 oz Au. The cross-sectional method estimated the resource at 3,522,017 tons averaging 0.034 oz Au/ton for a total of 118,139 oz Au. Later in 1997, they constructed solid models of both the Hidden Hill and Gold Coin/Confidence areas and calculated the resource using an inverse-distance-squared method and Surpac 2000 software. Resources were tabulated using two different cutoffs (Table 6.1). At a gold cutoff of 0.01 oz Au/ton, Murray (1997) estimated a combined resource for the Hidden Hill and Gold Coin/Confidence zones of 7,549,063 tons averaging 0.03 oz Au/ton for a total of 226,472 oz Au. Murray (1997) also estimated a global resource using just the block model constrained only by topography, which yielded a resource of 242,006,625 tons averaging 0.01 oz Au/ton. According to Murray (1997), the global block model probably overstated the tonnage by smearing the grade but does show "*…there is a very large low grade resource in just the Gold Coin/Confidence zones about half of which is oxide*." MDA must state that this procedure inflates the resource to unbelievable levels considering only existing drilling and cannot be used to make any assessment or judgment on the project; it is reported for historic reasons and complete disclosure only but is not included in Table 6.1. This estimate is not relevant and not reliable and has been superseded by the resource estimates in Section 17.0 of this report. Readers are strongly cautioned to put no reliance on this estimate.

Due to time constraints, Tombstone modeled silver for the Gold Coin and Confidence resource areas only, but Murray (1997) noted that a significant number of holes were not assayed for silver. Murray (1977) summarized that the hand-calculated plan method more accurately reflected the tonnage than the cross-sectional method, which more accurately reflected grade; the solids-model constrained computer model greatly understates the tonnage, but the grade was very similar to that calculated using cross-sections.

Pacific Ridge commissioned geologic modeling and resource estimations for the Golden Arrow property in 2004 (Parent, 2004). Parent (2004) indicated that his estimates do not conform to NI 43-101 requirements and are accordingly not reproduced here. Readers are cautioned that this estimate substantially overstates the resource in the high-grades compared to the resource estimate presented in Section 17.0; it is neither relevant nor reliable and has been superseded by the resource estimates in Section 17.0 of this report.

MDA estimated and reported the first independent 43-101-compliant resource for Nevada Sunrise (Ristorcelli and Christensen, 2008). This resource is presented in Table 6.2.

## Table 6.1 Summary of Historic Resource Estimates for Golden Arrow

| Company (Reference) | Deposit | Oxide/ Sulfide | Cutoff (oz Au/ton) | Tons Short tons | Grade (oz Au/ton) | Ounces of gold | Grade (oz Ag/ ton) | Ounces of silver |
|---|---|---|---|---|---|---|---|---|
| Homestake (Jennings, 1988) | **Gold Coin** | **Ox&Sulf** | **0.02** | **1,248,916** | **0.052** | **64,944** | **0.47** | **586,991** |
| | | | | | | | | |
| Westgold (Seedorff *et al.*, 1991) | Gold Coin | | 0.015 | 2,105,000 | 0.035 | 73,675 | Not calculated | |
| | Hidden Hill | | 0.015 | 3,457,000 | 0.033 | 114,081 | | |
| | **Total** | **Ox&Sulf** | **0.015** | **5,562,000** | **0.0338** | **187,756** | | |
| | | | | | | | | |
| Coeur d'Alene (Murray, 1994) | Hidden Hill | Ox | 0.01 | 2,149,800 | 0.031 | 67,285 | 0.64 | 1,365,566 |
| | Gold Coin | Ox | 0.01 | 1,857,744 | 0.035 | 65,518 | 0.39 | 725,989 |
| | Conf. Mtn. | Ox | 0.01 | 3,698,867 | 0.035 | 130,860 | 0.35 | 1,303,580 |
| | **Total Ox.** | **Ox** | **0.01** | **7,686,420** | **0.034** | **263,663** | **0.44** | **3,395,135** |
| | Hidden Hill | Sulf | 0.01 | 2,474,365 | 0.034 | 84,232 | 0.71 | 1,767,566 |
| | Gold Coin | Sulf | 0.01 | 524,725 | 0.059 | 31,163 | 0.71 | 374,947 |
| | Conf. Mtn. | Sulf | 0.01 | 1,671,600 | 0.059 | 98,344 | 0.43 | 725,716 |
| | **Total Sulf.** | **Sulf** | **0.01** | **4,670,690** | **0.046** | **213,739** | **0.61** | **2,868,618** |
| | **Total** | **Ox&Sulf** | **0.01** | **12,357,110** | **0.039** | **477,402** | **0.51** | **6,263,753** |
| | | | | | | | | |
| Kennecott (Ristorcelli, 1996) | Gold Coin | Ox&Sulf | 0.01 | 8,718,347 | 0.024 | 209,240 | 0.31 | 2,693,969 |
| | Hidden Hill | Ox&Sulf | 0.01 | 2,659,959 | 0.029 | 77,139 | 0.52 | 1,383,179 |
| | **Global** | **Ox&Sulf** | **0.01** | **11,378,305** | **0.025** | **286,379** | **0.36** | **4,077,148** |
| | **Global** | **Ox&Sulf** | **0.02** | **5,608,092** | **0.037** | **209,437** | **0.46** | **2,600,321** |
| | **Global** | **Ox&Sulf** | **0.05** | **346,576** | **0.157** | **54,429** | **1.01** | **349,348** |
| | **Global** | **Ox&Sulf** | **0.10** | **119,883** | **0.339** | **40,699** | **1.85** | **221,379** |
| | | | | | | | | |
| Tombstone Expl. (Murray, 1997) | Hidden Hill | Ox&Sulf | 0.01 | 2,585,625 | 0.03 | 77,569 | -- | -- |
| | GC/CM | Ox&Sulf | 0.01 | 4,963,438 | 0.03 | 148,903 | -- | -- |
| | **Total** | **Ox&Sulf** | **0.01** | **7,549,063** | **0.03** | **226,472** | **--** | **--** |
| | GC/CM | Ox&Sulf | 0.0058 | 6,610,188 | 0.024 | 158,645 | -- | -- |
| | GC/CM* | Ox&Sulf | | 6,610,188 | -- | -- | 0.31 | 2,049,158 |
| | | | | | | | | |

Explanations: HH is Hidden Hill, GC is Gold Coin, CM is Confidence Mountain; used when needed for formatting.
*Using a cutoff of 0.3 oz Au/t

# Table 6.2 Nevada Sunrise 2008 Resource Estimate

(From Ristorcelli, and Christensen, 2008)

| Cutoff oz AuEq/t | Tons | Grade oz AuEq/t | Grade oz Au/t | Ounces Gold | Grade oz Ag/t | Ounces Silver | Ounces Gold Eq. |
|---|---|---|---|---|---|---|---|
| **Golden Arrow Oxide Project-Total Indicated** | | | | | | | |
| 0.010 | 5,232,000 | 0.03 | 0.021 | 107,000 | 0.25 | 1,313,000 | 131,000 |
| **Golden Arrow Oxide Project-Total Inferred** | | | | | | | |
| 0.010 | 3,699,000 | 0.02 | 0.012 | 43,000 | 0.23 | 836,000 | 58,000 |
| **Golden Arrow Unoxidized Project-Total Indicated** | | | | | | | |
| 0.015 | 4,268,000 | 0.04 | 0.031 | 132,000 | 0.48 | 2,053,000 | 169,000 |
| **Golden Arrow Unoxidized Project-Total Inferred** | | | | | | | |
| 0.015 | 2,672,000 | 0.03 | 0.021 | 55,000 | 0.38 | 1,010,000 | 73,000 |
| **Golden Arrow Total Indicated** | | | | | | | |
| variable | 9,500,000 | 0.03 | 0.025 | 239,000 | 0.35 | 3,366,000 | 300,000 |
| **Golden Arrow Total Inferred** | | | | | | | |
| variable | 6,371,000 | 0.02 | 0.015 | 98,000 | 0.29 | 1,846,000 | 131,000 |

Note: silver to gold ratio is 55; variable cutoffs are 0.01 oz Au/t for oxide and 0.015 for unoxidized

Note: discrepencies due to rounding

# 7.0 GEOLOGIC SETTING

Christensen has reviewed all of the reports of historic exploration within the Golden Arrow district as well as numerous technical references relating to the regional geologic setting of the district. This review, combined with his long experience with Nevada geology and personal field investigations at Golden Arrow, has allowed for many new or modified observations and interpretations. Consequently, there are few references in this section unless specific information is presented from a specific source.

## 7.1 Regional Geology

The Golden Arrow mining district is situated along the northeastern margin of the Walker Lane structural zone and along the western structural margin of the Kawich volcanic caldera. There is clear evidence that both of these regional-scale geological features influenced the development of the structural setting for mineral deposits of the Golden Arrow district.

The Walker Lane is a geologic province stretching in a northwest-southeast direction along the Nevada-California border (Stewart, 1980), measuring about 450mi long by 60-190mi wide (700km long by 100-300km wide; Figure 7.1). It is a zone of complex faulting, including northwest-trending, right-lateral transcurrent faults, and igneous intrusions resulting from the inboard deformation of the North American continent by collision with the Pacific tectonic plate. The Walker Lane is a structural zone parallel to the San Andreas fault, along which there has been and continue to be tectonic motion and deformation. The faulting and igneous activity have controlled the formation of a host of mineral deposits of gold, silver and other metals.

In total, the Walker Lane has past production and current resources of more than 30 million ounces of gold and 400 million ounces of silver. Notable districts include the Comstock Lode, Paradise Peak, Rawhide, Aurora, Borealis, Round Mountain, Bullfrog, Tonopah and Goldfield districts. More recent discoveries include the Gemfield and Midway deposits.

The Golden Arrow mining district is located along the western margin of the Kawich Range (Figure 7.2) (Gardner, 1980; Best *et al*., 1995). The oldest rocks in the area are Paleozoic shale, carbonate, and quartzite that are exposed in the northern end of the Kawich Range and in the Ellendale district. However, most of the Kawich Range is underlain by Oligocene to Miocene ash-flow tuff sheets that unconformably overlie the Paleozoic sedimentary rocks. The Kawich Range contains the remains of a late Oligocene (23 Ma) volcanic caldera that was the source for most of the tuff exposed in the northern portion of the range. The center of the caldera is delimited by intracauldron tuffs and two piles of crystal-rich rhyodacite domes and lava flows, surrounded by younger ring fractures and rhyolite intrusive bodies (Honn, 2005). The caldera margins are poorly preserved because of extreme dissection along range-front faults, and are offset along a series of northwest-trending faults. Two to three compound ash-flow cooling units are exposed outside the caldera margins as thick sheets, particularly on the west flank of the range. Basin-fill sediments and alluvial fan deposits of Quaternary age are the youngest deposits in the region.

Large volumes of hydrothermal alteration are common along caldera-bounding faults of the Kawich volcanic center. Several mining districts are located along the margin of the Kawich caldera, including

Golden Arrow, Silverbow, Bellehelen, and Eden. Mineralization is commonly associated with rhyolite to andesite intrusive rocks.

**Figure 7.1 Walker Lane Structural Zone**
(Map provided by Nevada Sunrise, 2007)

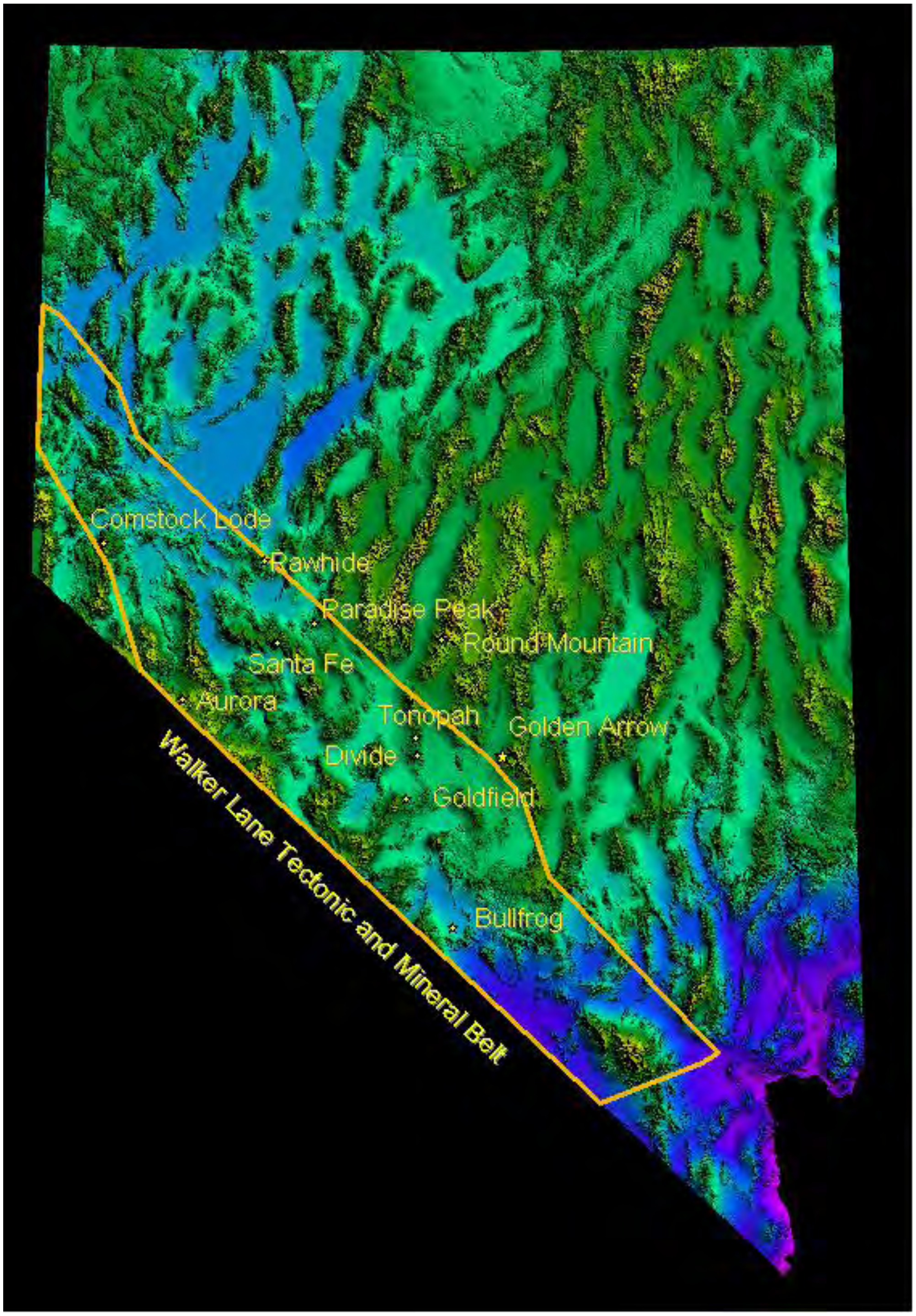
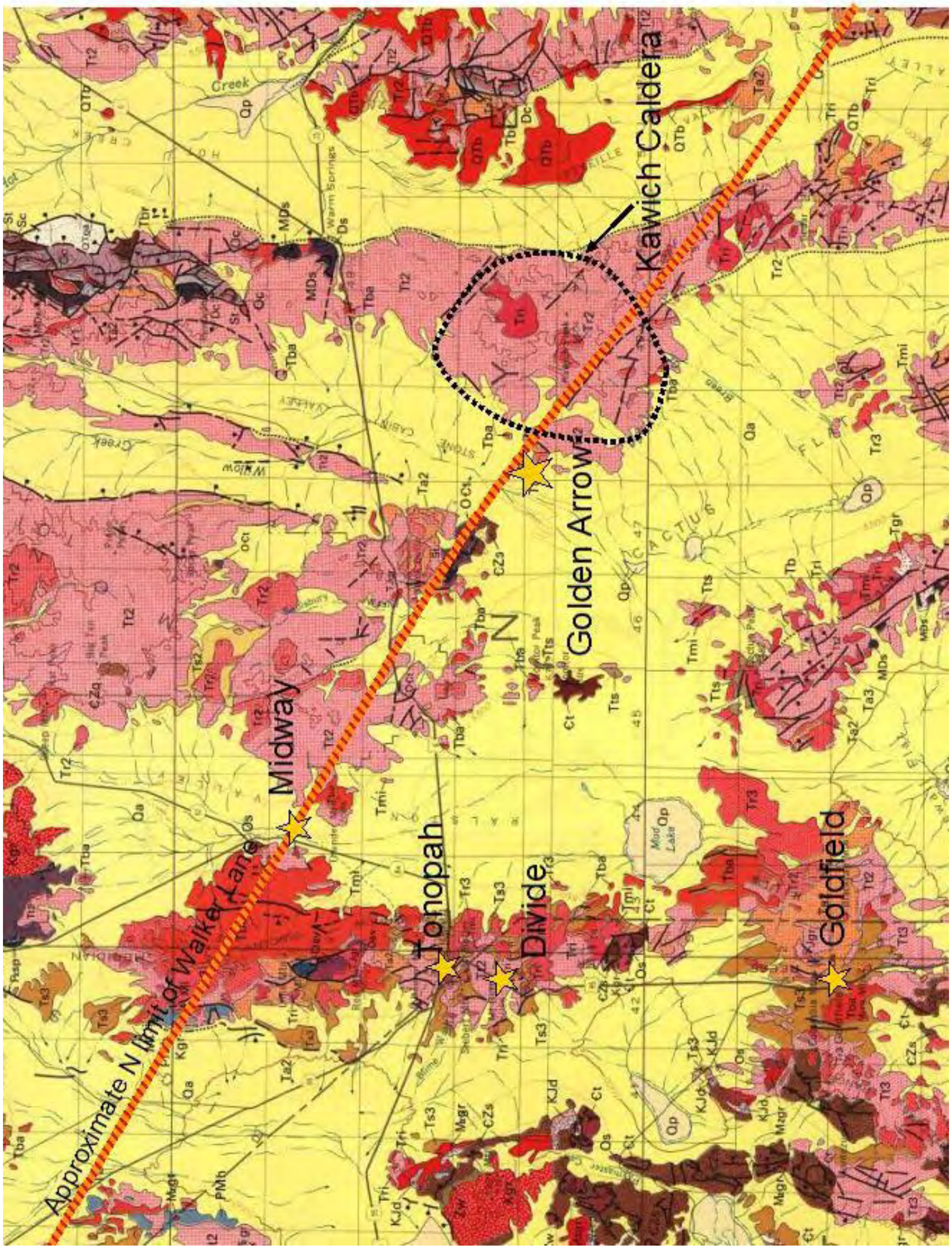


**Figure 7.2 Regional Geology of South-Central Nevada Showing the Location of the Golden Arrow Mining District**

(Geologic base map from Stewart and Carlson, 1978)



The Page fault within the Golden Arrow property is parallel to the principal Kawich caldera-bounding fault, with a consistent sense of displacement. The rhyolite of Confidence Mountain lies along the trace of the Page fault and is considered a late ring-fracture-localized rhyolite dome.

## 7.2 Regional Mineralization and Mining Districts

Silverbow is the closest gold exploration property, located approximately six miles (10km) southeast of Golden Arrow. The district was discovered at the same time as Golden Arrow, with intermittent production through 1941. As suggested by the name, silver production was about 100 times greater than that of gold based on ounce production. Gold production is estimated at between 1,000 and 10,000 ounces (Cornwall, 1972). Deposits occur in and near quartz veins in rhyolite tuffs, which are intensely altered by silicification and kaolinitization in the vicinity of the deposits. There are numerous claim groups between Golden Arrow and Silverbow, but there is currently no significant exploration activity.

The Midway project, located approximately 30 miles (50km) west-northwest of Golden Arrow is perhaps the most active and noteworthy nearby project. Midway is a low-sulfidation epithermal gold system. Gold occurs in near-vertical quartz-adularia veins hosted by Tertiary-age volcanic rock and sedimentary rock and the Ordovician-age Palmetto Formation. The deposit was hidden beneath up to 100ft (30m) of unconsolidated cover.

The Midway deposit contains more than 12 high-grade gold veins. The Midway vein has a weighted average grade of 4.387 oz Au/ton (150.411 g Au/t) over an average true width of 5.9ft (1.8m), and the Rochefort vein has a weighted average grade of 1.296 oz Au/ton (44.434 g Au/t) over an average true width of 4.0ft (1.2m). A 2005 resource estimate for the three zones reported an inferred resource of 5.526 million tons (5.013 million tonnes) grading 0.039 oz Au/ton (1.337 g Au/t) for a total of 215,500 ounces gold at a cut-off grade of 0.01 oz Au/ton (0.343 g Au/t). Midway plans to drive an underground decline for bulk sampling and later mine development (Midway Gold website, April 2009).

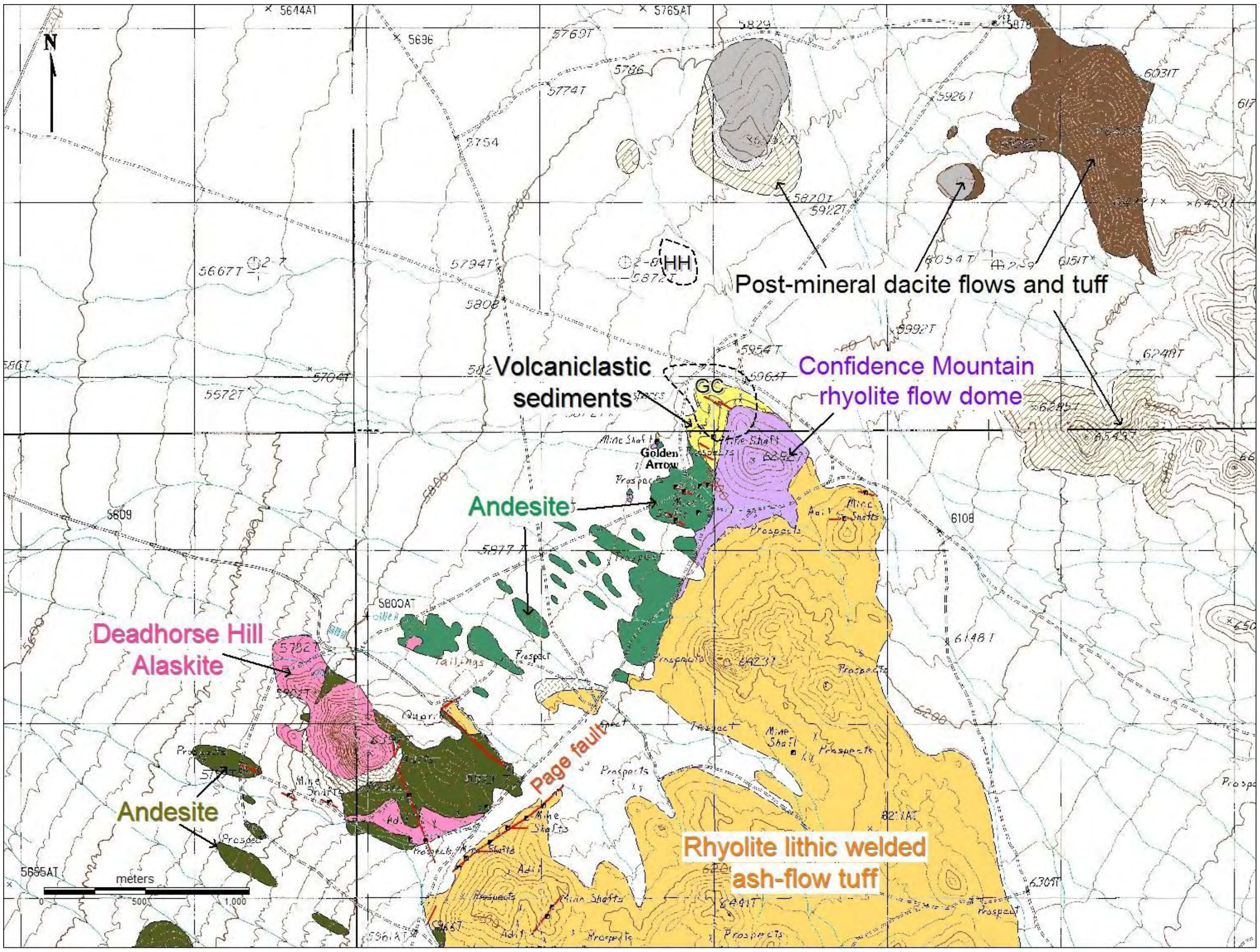
The Tonopah Divide gold and silver project currently being explored by Centerra (US) Inc. and Tonogold Resources is located approximately 35mi (58km) west of Golden Arrow, six miles (ten kilometers) south of Tonopah. The district was discovered in 1918, was the scene of a gold rush, and went bust within two decades. Like Golden Arrow, the district has seen a parade of exploration companies and small operators over the past 30 years, but with no real success reported. Gold and silver mineralization, both as high-grade veins and disseminated mineralization, is hosted within tuffaceous and andesitic volcanic rock and is spatially and genetically related to intrusive rhyolite domes. Centerra completed a 15-hole RC exploration drilling program in 2008. Gold and silver were encountered in all holes, with several intercepts considered significant (Tonogold website, March 2009).

## 7.3 Property Geology

The geology of the Golden Arrow property is defined by a variety of volcanic and intrusive rocks associated with the Kawich caldera and by structure formed during evolution of the caldera and later deformation within the Walker Lane structural corridor. The geology of the Golden Arrow property is illustrated in Figure 7.3. The Gold Coin mineralized zone lies on the northwestern edge of Confidence

Mountain, with most of it lying under shallow alluvial cover. The Hidden Hill zone lies north of Confidence Mountain, completely hidden by alluvium.

**Figure 7.3 Geology of the Golden Arrow Property**
(Map provided by Nevada Sunrise, 2007)




In a general sense, rocks of the Golden Arrow district can be subdivided into four groups (Seedorff *et al.*, 1991), from oldest to youngest:

- Pre-caldera intermediate andesitic to dacitic flows, flow breccias, and pyroclastic rocks with intercalated epiclastic sedimentary rocks;
- Rhyolitic ash-flow tuff and related rocks erupted from the Kawich caldera;
- Post-caldera pyroclastic rocks, lava, and shallow intrusions; and
- Alluvium.

### 7.3.1 Lithologies

The following descriptions of the most prominent lithologic units have been developed through surface mapping and logging of drill core and cuttings. They are discussed more or less from older to younger.

***Andesite.*** The oldest rocks on the property are Oligocene- to Miocene-age andesitic flows, volcanic breccia, pyroclastic rocks, and andesite-derived epiclastic sedimentary rocks. The andesite unit crops out to the south of Confidence Mountain from the Gold Bar and Desert shafts to Deadhorse Hill. Andesite has been intersected in drilling at depth at both the Gold Coin and Hidden Hill deposits, underlying felsic volcaniclastic rocks and rhyolite. The andesite is inferred to rest upon Paleozoic slate, limestone and quartzite, as exposed elsewhere in the Kawich Range, but these basement units are nowhere exposed on this property. Alteration of the andesite ranges from insignificant, to common regional background propylitic alteration, to extreme argillic alteration within the two deposits.

***Confidence Mountain rhyolite.*** Confidence Mountain is a rhyolite flow dome which intrudes and overlies the andesite. The rhyolite is a light-colored, flow-banded porphyritic rock with sanidine and quartz phenocrysts in a flow-banded aphanitic matrix. Outcrops of carapace breccia and autobreccia are common on Confidence Mountain. Quartz-phyric rhyolite dikes encountered in drill holes at depth are interpreted to be of the same unit.

***Volcaniclastic sedimentary rocks***. Closely associated with the Confidence Mountain rhyolite is a thick section of volcaniclastic sedimentary rocks. The volcaniclastic sedimentary rocks are of rhyolite parentage and vary from fine mudstone to coarse angular sedimentary breccias; the unit varies from well-sorted to unsorted. The presence of clear dipyramidal quartz grains, locally constituting more than half of the rock volume, is distinctive. The unit is typically well bedded, and sedimentary features such as cross-bedding and soft-sediment deformation are common. The unit is frequently densely cemented by chalcedonic silica.

The volcaniclastic sedimentary unit both underlies and laps over the rhyolite of Confidence Mountain. Lithic clasts in the sedimentary breccia are of Confidence Mountain rhyolite. In drilling, the unit is seen to occupy a deep trough or rift basin within the andesite basement extending in a northwest trend from beneath Confidence Mountain to Hidden Hill.

The volcaniclastic unit is interpreted as a maar deposit, deposited within a water-filled volcanic depression, with sediment derived from the adjacent exogenous Confidence Mountain rhyolite dome. The abundant, frequently stratabound, chalcedonic cement is evidence for hot-spring activity within the maar setting. In addition, the unit is cut by phreatic breccia, evidence of a dynamic environment of deposition.

***Latite dikes.*** A number of latite dikes or small intrusive bodies are encountered in drilling at both the Hidden Hill and Gold Coin zones. This is light-colored igneous rock with phenocrysts of biotite and sanidine in a flow-banded obsidian matrix. The unit intrudes both andesite and volcaniclastic sediments. Peperite breccia, commonly pyrite-rich, is common at intrusive contacts between latite and the volcaniclastic sediments, suggesting that the latite intruded wet maar sediment.

***Deadhorse alaskite***. Deadhorse Hill is comprised of a coarse-grained alaskite intrusion with coarse phenocrysts of K-feldspar, plagioclase, quartz and minor biotite. The unit occurs as the coarse intrusive neck of Deadhorse Hill as well as in several radiating dikes cross-cutting andesite. A tuff ring partially wraps the Deadhorse intrusive neck. This lithology has been variously called alaskite, rhyolite, and granite; Nevada Sunrise geologists consider the name "alaskite" to be the most appropriate field descriptive term.

***Rhyolite ash-flow tuff.*** The higher hills on the property, to the east of the Page fault, are underlain by variably welded rhyolite ash-flow tuffs. The Pahranagat Lakes tuff is a large-volume crystal-rich rhyolite welded-tuff sourced from the Kawich volcanic center. The welded tuff, or ignimbrite, contains crystals of sanidine, plagioclase, quartz, biotite, hornblende, and titanomagnetite; clasts of rhyolite as well as basement andesite and Paleozoic lithologies; and deformed pumice clasts. The unit is moderately to densely welded. The unit appears to lap over the andesite basement rock. The Pahranagat Lakes tuff has been dated at 22.639 ±0.009 Ma (Best *et al*., 1995). In the Golden Arrow district, the unit is considered to be pre-mineral.

***Dacite units.*** The small hills to the north and northeast of Confidence Mountain and the Hidden Hill deposit are capped by dark-colored, dense, unaltered dacite to andesite volcanic flows. These are underlain by a very thick section of unwelded pumice-lithic-crystal tuff, characterized by crystals of plagioclase, biotite and hornblende. The dacite unit is strongly magnetic; an extreme low observed in the aeromagnetic survey over the unit suggests that it has reverse remnant magnetism. The unit is nowhere hydrothermally altered, even where overlying the altered and mineralized volcaniclastic sedimentary unit, and is interpreted to be post-mineralization.

***Alluvium and latest Tertiary basalt cover.*** Much of the property is covered by unconsolidated alluvium, colluvium and eolian material. The alluvial material consists of clay to boulder-sized clasts of all volcanic lithologies within the nearby Kawich Range. In the broad flat area between Confidence Mountain and Deadhorse Hill, the alluvial cover is quite thin, as evidenced by windows of outcrop in most of the shallow arroyos. The Hidden Hill zone is covered by about 110ft (35m) of alluvium and is situated on the end of a narrow, east-northeast-trending paleoridge (Seedorff *et al.*, 1991). According to Seedorff *et al.* (1991), the alluvium gradually thickens westward toward the center of Stone Cabin Valley but only rarely exceeds 250ft (75m) in thickness in those parts of the Golden Arrow property that have been drilled. In addition, basaltic or dacitic, post-mineralization volcanic rocks overlie the older Tertiary rocks, particularly over the northern part of the property.

### 7.3.2 Structure

The regional structural framework for the Golden Arrow property is defined by the generally north-trending normal fractures associated with the western margin of the Kawich caldera and generally northwest-trending faults of the Walker Lane.

The most prominent structure in the surface geology is the Page fault, extending in a broad arc across the property from a northeastward to northward trend, terminating at the Confidence Mountain rhyolite flow dome. Numerous historic prospects and shafts exploited veins and mineralized breccias lenses along the Page fault zone (Figure 7.4). The fault frequently places older andesite to the west against younger rhyolite ash-flow tuffs to the east. All kinematic indicators suggest that this is a tensional normal fault, probably related to collapse of the Kawich caldera.

**Figure 7.4 Historic Workings Along the Page Fault**

Hudson (1989) interpreted the relative ages of the various structural features. He postulated that the oldest fault structure is probably the north-south fault hidden beneath alluvial cover on the east side of the property. This fault is interpreted to be an element of the ring-fracture system of the Kawich caldera. Next, northeast-trending faults, including the Page fault, and northwest-trending (330$^{o}$) faults were active prior to the mineralizing event. Later reactivation of the northwest-trending faults resulted in the southwestern sides being dropped down.

Murray (1997) devoted considerable attention to structural controls on mineralization. His studies show that the majority of the mineralized veins in the Gold Coin area strike 320$^{o}$ and dip variably from southwest to northeast. He interpreted this as evidence for the involvement of Walker Lane deformation in structural preparation for mineralization.

### 7.3.3 Alteration

Lithologies within the Golden Arrow district exhibit a variety of alteration styles. The later post-mineralization lithologies – the dacite flows and tuffs – are mainly fresh and unaltered. The welded rhyolite Pahranagat Lakes tuff and the alaskite of Deadhorse Hill similarly exhibit little alteration.

There remains a question as to whether these units were post-mineralization or simply are not altered as currently exposed. The basement andesite was everywhere affected by regional propylitic alteration (epidote±chlorite±albite±calcite).

The volcaniclastic sedimentary rocks exhibit variable to extreme alteration, as might be expected from deposition and alteration in an active maar setting. Intense chalcedonic silicification of hot-springs character is particularly striking in outcrops on the western flank of Confidence Mountain. In drill holes, fine-grained silicification is locally so intense as to create a rock described in logging as porcellanite – a dense, extremely hard aggregate of fine crystalline quartz. Yet elsewhere this same unit is altered to a bleached white clay (kaolinite?) residue.

Gold-quartz veins along the Page fault and surrounding Deadhorse Hill are characterized by crystalline quartz and adularia with very limited selvages of silicification and sericite. Gold mineralization within the Hidden Hill zone is typically associated with intense clay-pyrite alteration.

Supergene oxidation may extend to more than 600ft (200m) along fault and fracture zones, but more generally extends to depths of 100-200ft (30-60m) in the Hidden Hill and Gold Coin zones.

### 7.3.4 Geologic Summary

Acknowledging that there is great complexity in the details, the geology of the Golden Arrow property can be summarized as follows. Basement rocks in the district include metamorphic rocks – quartzite, slate, phyllite and marble – of Paleozoic age; these do not crop out anywhere in the district. Paleozoic basement metamorphic rocks are overlain by a thick and heterogeneous sequence of Tertiary volcanic rocks associated with the evolving Kawich Range volcanic center. The earliest volcanic basement consists of andesite flows, volcanic breccia, and epiclastic sedimentary rocks. The andesite basement is overlain by tremendous thicknesses of rhyolite (lithic-crystal-pumice) welded ash-flow tuff or ignimbrite representing the main stage of volcanic activity – eruption and caldera collapse. Intrusion and extrusion of rhyolite flow domes along the caldera margin fault zones closely followed eruption of the great ash-flow sheets. Hydrothermal alteration and mineralization were intimately involved with this episode of structural collapse and felsic intrusion. As volcanic activity waned, the system became once again more mafic, with eruption of post-mineral dacite to andesite tuffs and volcanic flows. Near-surface weathering and erosion have reduced the volcanic surface and covered much of the rock with colluvium and alluvium. Supergene alteration and oxidation of the mineral deposits continue to the present.

## 8.0 DEPOSIT TYPES

Unless specifically referenced, the information in this section is based on Christensen's observations and experience.

Gold deposits of the Golden Arrow mineral district historically have been classified as low-sulfidation epithermal deposits, based upon the style of mineralization observed in the high-grade gold-quartz-adularia veins in the historic underground mines (Ernst, 1990; Murray, 1997; Bonanza, 2001). More recent work, however, highlights at least two broad styles of hydrothermal alteration and mineralization within an evolving hydrothermal system (Figure 8.1).

There are two classes of epithermal deposits, which can be discriminated in terms of their geologic setting, alteration mineralogy, and formation fluid chemistry:

(1) Low-sulfidation epithermal deposits are spatially associated with magmas, where ore deposition generally occurs several miles (or kilometers) above the site of intrusion. Vein minerals precipitate from geothermal waters with near-neutral pH and reduced deep fluid that is essentially in equilibrium with the altered host rocks due to slow ascent in a rock-dominated hydrothermal system. The liquid is low-salinity and may be gas-rich with $CO_2$ and $H_2S$ the dominant gases. Where this liquid discharges at the surface, boiling neutral hot-springs deposit silica sinter. Alteration zones are of limited dimension and are dominated by minerals formed in neutral pH environments – quartz, adularia, carbonates and sericite. Steam-heated waters also occur in this environment, formed by condensation of vapor.

(2) High-sulfidation precious metal deposits form proximal to volcanic vents that focus the discharge of volcanic vapors to the surface. Their principal surface expressions are high-temperature fumaroles and related condensates of extremely acidic water. Fluid discharges that are grossly out of equilibrium with the surrounding rock are largely directed along structural conduits. Alteration zones can be extensive, and the alteration mineralogy is dominated by minerals formed in an acidic environment – quartz, alunite, kaolinite and pyrophyllite.

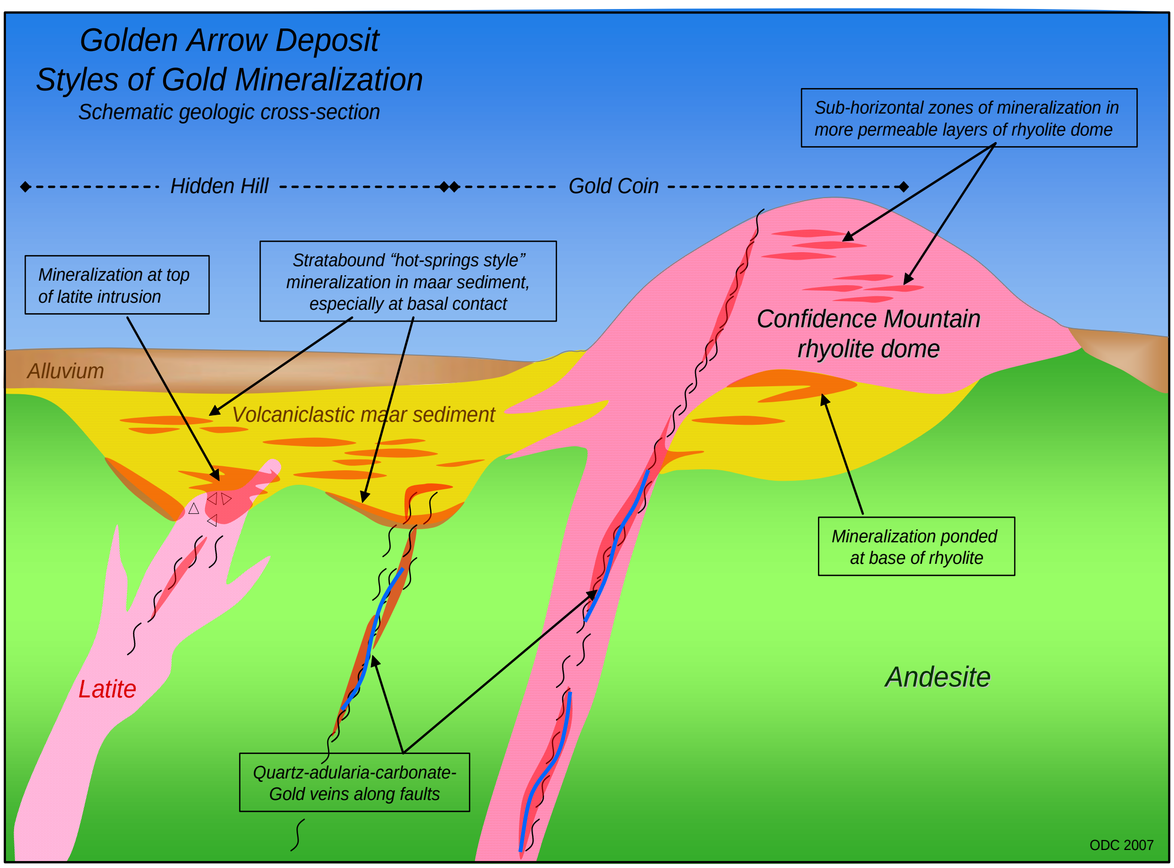
Gold-quartz veins exploited by numerous underground workings at Golden Arrow are hosted in both rhyolite and andesite lithologies. The veins fill brittle open fractures. Narrow zones of quartz ± adularia ± sericite ± carbonate alteration surround quartz ± carbonate ± adularia ± barite veins. The veins exhibit rhythmic banded textures, comb textures, and evidence of repeated brecciation and healing. Gold is confined to the veins and their immediate wallrock selvages. Ore grades of several ounces of gold per ton from hand-selected ore were reported from historic mining operations. The veins vary considerably in thickness both along strike and dip; thicker veins and greater gold values were reported to occur in tabular ore shoots. These veins are clearly of low-sulfidation character.

In contrast, more broadly disseminated and generally lower-grade gold mineralization in both the Hidden Hill and Gold Coin deposits exhibits a variety of mineralization styles. (1) In Hidden Hill, gold mineralization is disseminated in brecciated zones with intense clay-pyrite alteration surrounding intrusive latite dikes. (2) Also in Hidden Hill, gold is concentrated in nearly horizontal "hot-springs style" stratabound lenses within the volcaniclastic maar sediment, especially along the lower contact of the volcaniclastic sediment with underlying andesite. (3) In Gold Coin, this stratabound style of mineralization within the volcaniclastic sediment can be ponded beneath the overlying rhyolite flow-dome. (4) In Gold Coin, subhorizontal zones of gold enrichment occur within more permeable layers in the rhyolite flow dome. There is evidence in drill core that the hot-springs mineralization and alteration overprint earlier low-sulfidation gold mineralization.

The coincidence of these two styles of alteration and mineralization is similar to that at Buckskin Mountain, National District, Humboldt County, Nevada, as documented by Vikre (2007). There, high-grade gold-silver veins hosted within rhyolite are overlain by hot-springs sinter and intensely altered unconsolidated volcaniclastic deposits – a setting with striking similarities to Golden Arrow. The sinter and veins were deposited by sinter-vein hydrothermal fluid that evolved in response to volcanism and tectonism. Thermal quenching of the fluid caused deposition of banded multiphase bonanza precious metal-quartz veins. Then, acid-sulfate fluids of a second fluid regime derived from the oxidation of $H_2S$ and other exsolved volatiles produced near-surface zones of intense acid alteration and deposited pyrite and marcasite at depth.

The Golden Arrow deposit is best described as consisting of low-sulfidation epithermal quartz-adularia-precious metal veins overprinted by hot-springs style, high-sulfidation epithermal alteration and precious metal mineralization. Both styles of mineralization represent exploration targets for Nevada Sunrise.

**Figure 8.1 Golden Arrow Deposit Styles of Gold Mineralization**

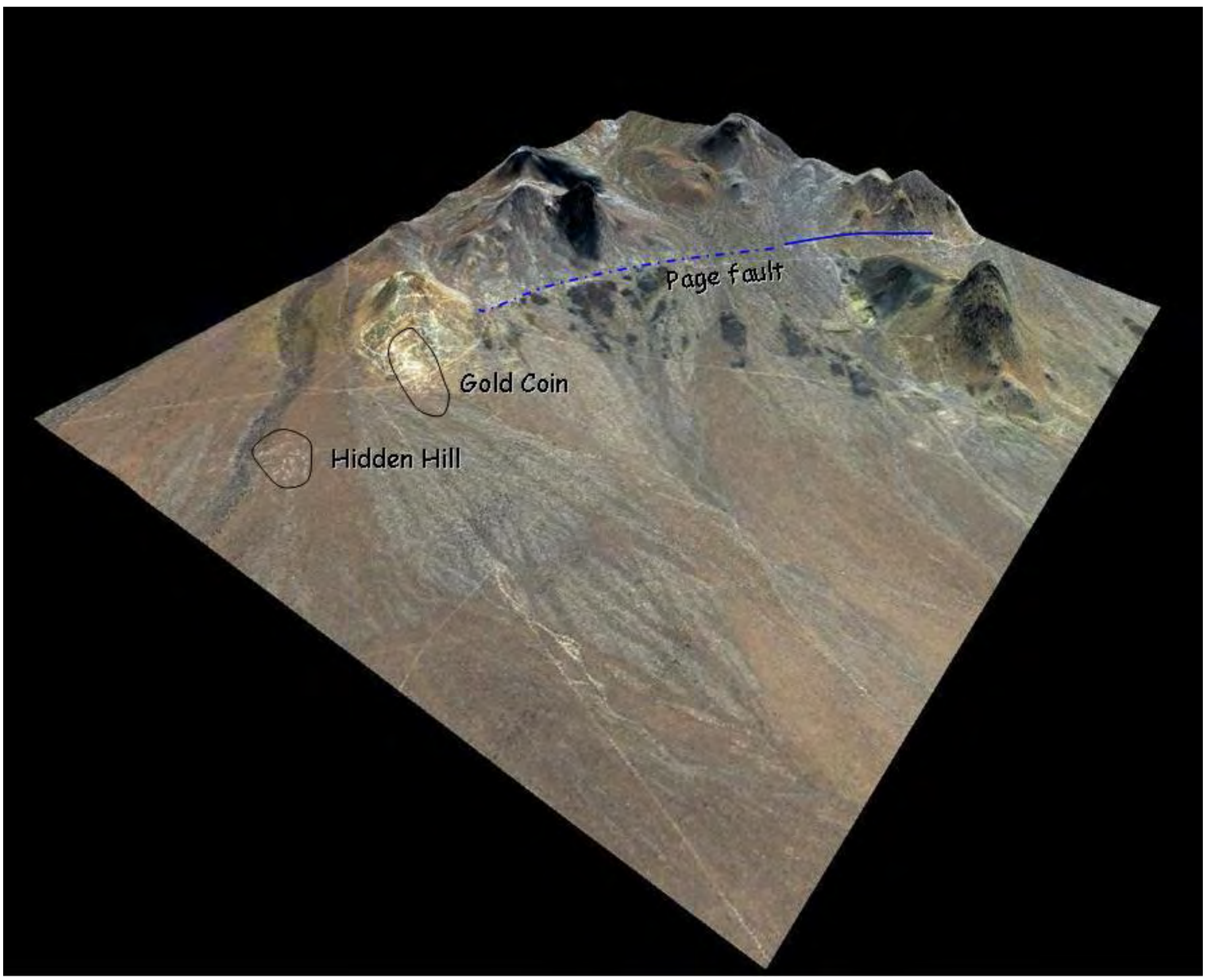


# 9.0 MINERALIZATION

Most of the data and information presented in this section is from direct observation and experience of Christensen unless otherwise directly referenced.

Mineralization at Golden Arrow occurs primarily in three areas. The Gold Coin zone crops out on and northwest of Confidence Mountain. Additional mineralization occurs on the northwest slope of Confidence Mountain in the Confidence Mountain zone, which is often combined with the Gold Coin zone for discussion in older reports. The Hidden Hill zone, entirely covered by Quaternary alluvium, is about 1,800ft (550m) north of the Gold Coin zone (Figure 9.1).

**Figure 9.1 View of Golden Arrow Area Looking Southeast Showing Location of Gold Coin and Hidden Hill Mineralized Zones**
(Provided by Nevada Sunrise, 2007)



The gold and silver mineralization at Golden Arrow exhibits characteristics of both low-sulfidation, high-grade, vein-style epithermal mineralization and disseminated, hot-springs style, high-sulfidation epithermal mineralization.

In the low-sulfidation style, precious metal concentrations occur within multi-episodic quartz + sulfide (± adularia ± carbonate ± sericite ± barite) veins, veinlets and stockwork zones localized in open faults and fractures. Alteration selvages are of limited intensity and dimension and include quartz ± adularia ± sericite. Host rocks include both rhyolite and andesite.

In the high-sulfidation style, precious metal concentrations are more broadly disseminated within porous lithologies including volcaniclastic sedimentary rocks, rhyolite and andesite. Zones of mineralization are frequently highly altered to quartz ± clay ± pyrite. Gold is broadly distributed in host volcaniclastic maar sedimentary rocks and in andesite, but is quite restricted to discrete brittle fracture zones in rhyolite. In the Hidden Hill zone, there is a distinct spatial association and an inferred genetic association between alteration, mineralization and latite dikes. The margins of the latite dikes are commonly peperite breccia, indicating intrusion into wet sediments, and are typically gold-mineralized. Pipes of hydrothermal breccia or tuffisite within both the Hidden Hill and Gold Coin zones are evidence of a very dynamic environment of formation closely associated with igneous activity (Figure 9.2).

Quartz is the most common silicate mineral in these deposits. Vein quartz occurs as milky, crystalline, chalcedonic and opaline varieties. Within the veins, quartz textures can be massive, banded, drusy, or sucrosic. Comb and drusy quartz textures are common in open fractures (Figure 9.3). The volcaniclastic maar sedimentary rocks contain laminated beds of chalcedonic quartz as well as thicknesses of stratabound chalcedonic cementation.

Pyrite is the most common sulfide mineral. Coarse pyrite occurs disseminated with the quartz veins and immediate vein selvages. In the Hidden Hill mineralization, zones of clay-pyrite alteration may contain more than 50% fine brassy pyrite.

The metallurgical deportment of gold is not well known. Fine visible gold can be seen occasionally in the quartz-adularia-gold veins; early miners recovered gold by gravity separation, suggesting that at least some if not much of the gold in the near-surface oxidized portions of these deposits occurs as the native metal.

Murray (1997) reported that silver occurs as argentite in quartz veins away from Confidence Mountain.

**Figure 9.2 Volcaniclastic Breccia Showing Dynamic Brecciation of the Maar Sediment**

**Figure 9.3 Bladed Epithermal Vein Quartz Texture**

Several deep holes were drilled in 1994 in the Confidence Mountain and Hidden Hill areas, and every fifth sample (*i.e.*, 25ft (8m) intervals) was analyzed for lead, zinc, copper, tellurium, bismuth, arsenic, and potassium. Only potassium values showed much variation; potassium was depleted in the quartz veins. The other elements were very low to below detection (Murray, 1994; 1997). The results of later lithogeochemical work by Tombstone indicated a strong correlation between gold, mercury, and molybdenum, which Murray (1997) interpreted to indicate a possible deep-seated molybdenum porphyry origin for the hydrothermal fluids.

Figure 9.4 is a schematic cross section of the Gold Coin mineralized zone, and Figure 9.5 is a schematic cross section of the mineralization at Hidden Hill.

**Figure 9.4 Schematic Cross Section of the Gold Coin Zone**
(From Nevada Sunrise, 2007)

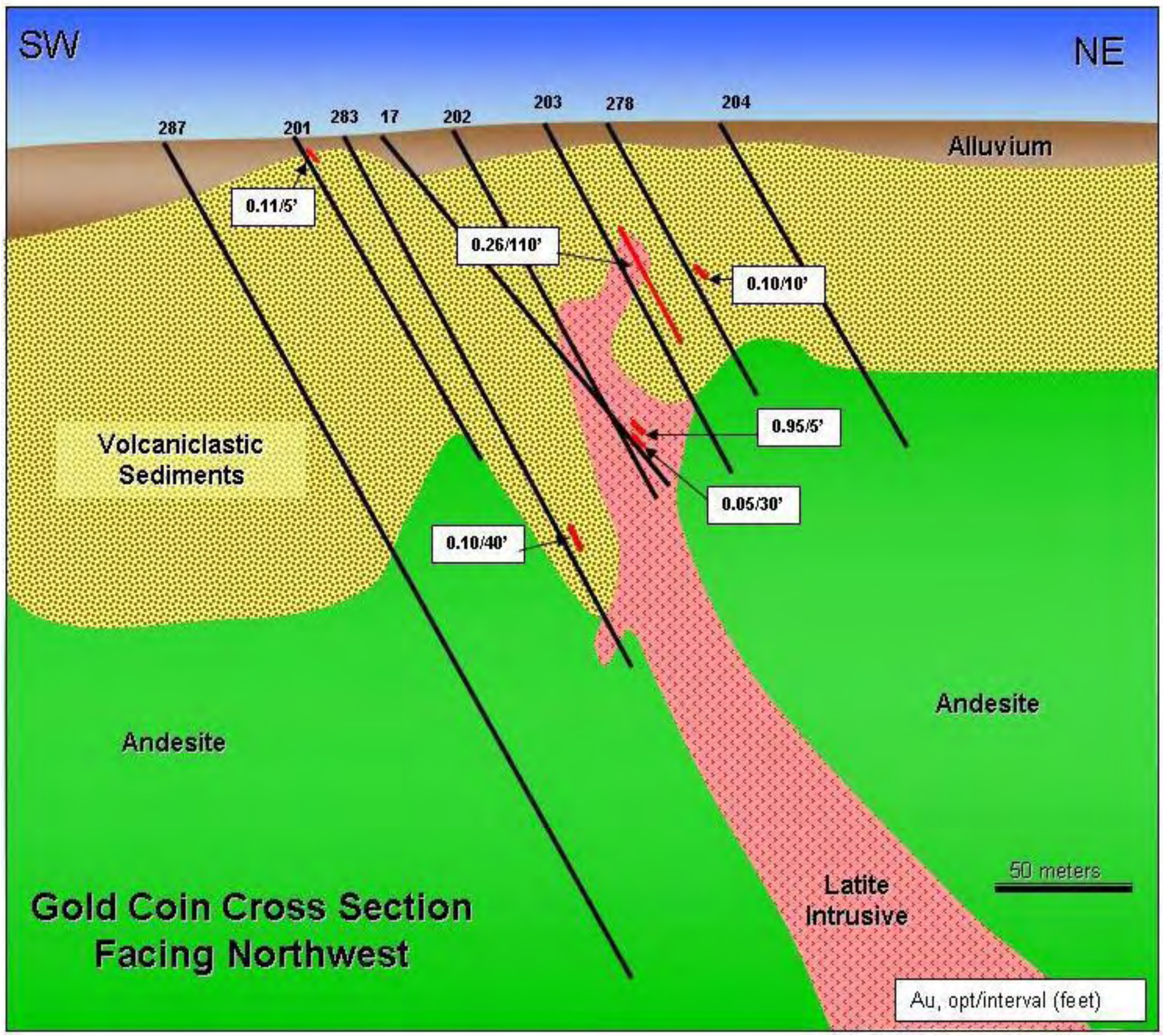
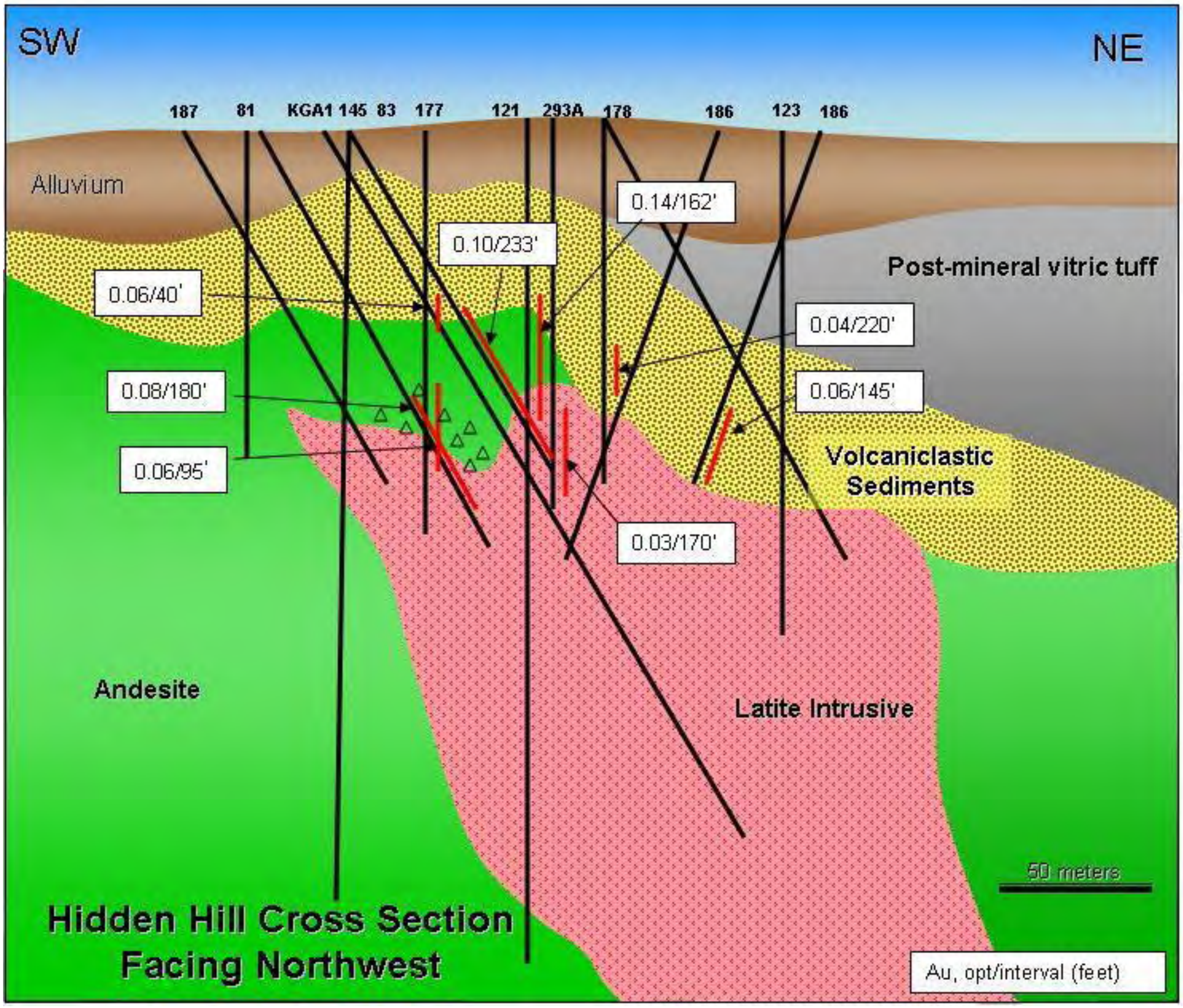


**Figure 9.5 Schematic Cross Section of the Hidden Hill Mineralized Zone**
(From Nevada Sunrise, 2007)



# 10.0 EXPLORATION

This section describes exploration conducted by Nevada Sunrise and Intor, which is the most recent exploration on the property except for a geophysical survey conducted recently by Animas, which is described at the end of 10.3.

Exploration activities conducted by Nevada Sunrise Gold Corp. prior to 2008 and release of the initial Technical Report on the property (Ristorcelli and Christensen, 2008) were limited to:

- compilation, review, and reinterpretation of existing exploration data;
- field geologic review and limited geologic mapping;
- location and re-surveying of many of the historic drill sites to verify and improve the precision of the drill-collar-location database;
- re-logging of all available drill core and chips and reinterpreting geological cross sections;
- acquisition and interpretation of new high-resolution satellite imagery and ASTER spectral data;
- compilation, remodeling and reinterpretation of the geophysical database;
- compilation and reinterpretation of the historic soil geochemical database; and
- completion of a soil geochemical orientation survey.

Nevada Sunrise had assembled a substantial archive of historic exploration results for the Golden Arrow prospect. The company has compiled the record within a GIS database.

Except where specifically stated otherwise, all work reported in this section of the report was funded by and done for Intor Resources which is the wholly owned Nevada subsidiary of Nevada Sunrise Gold Corp.

Since release of the initial Technical Report in 2008, Intor conducted the following activities to better define the mineral resource and advance the technical understanding of the property:

- completed a program of exploration drilling including both diamond core and reverse-circulation percussion drilling;
- completed a new outcrop geologic map of the property;
- completed a soil geochemical survey over a portion of the property;
- completed a revised mineral resource estimate, based on the results of the 2008 drilling; and
- initiated a program of metallurgical test work.

## 10.1 Geological Mapping

Nevada Sunrise geologists completed a new outcrop geological map of the Golden Arrow property in 2009. Mapping was done at a scale of 1:5000 on air-photo imagery of the property. The resulting map provides a base for interpretation of geochemical, geophysical and drilling information. A generalized geologic map is presented in Figure 7.3.

## 10.2 Geochemical Exploration

While nearly every geologist who has visited the Golden Arrow project has likely collected selected grab samples, systematic grid rock-chip sampling has not been conducted. The Nevada Sunrise archive contains rock geochemical data from Kennecott (29 samples), Newmont (43 samples), Tombstone (30 samples), and Nevada Sunrise LLC (27 samples). All of these were analyzed for multi-element suites. The samples are concentrated along the Page fault and in the vicinity of the Golden Arrow shaft. Not surprisingly, many of the highest values are reported for these two localities. It is noted there are also high-grade gold samples to the southeast of Confidence Mountain and east of Deadhorse Hill, areas that have received less exploration attention and little drilling.

Two extensive soil geochemical surveys have been completed on the property; one by Tombstone in 1997 (Jeanne, 1997) and one by William Henderson in 2003 for Pacific Ridge.

Tombstone collected samples at 100ft (30.5m) intervals along five north-south oriented lines extending approximately 13,000ft (4km) south from Confidence Mountain. The lines are spaced somewhat irregularly at an average of 1,640ft (500m) separation. The survey covered an area of 3.1mi$^2$ (8km$^2$). A total of 619 samples were analyzed by Chemex Laboratories for a suite of 33 elements.

Henderson collected a grid of samples over nearly all of the main Golden Arrow district, with samples collected at 264ft (79m) spacing along east-west lines spaced 528ft (158m), covering an area approximately 8.5mi$^2$ (22.0km$^2$). Samples were collected at 12 to 15in. (30 to 38cm) depth by hand scoop. Minerals Exploration Geochemistry in Carson City, Nevada, prepared a sieve-separated sample between 150 and 325 mesh. A total of 1,670 samples were analyzed by Activation Laboratories for a suite of 64 elements. The laboratory has acknowledged that there were problems with their sample preparation or analysis. The analytical data exhibit notable batch effects, which the laboratory has acknowledged were probably introduced during sample preparation. The geochemical results, however, exhibit coherent patterns of multi-element concentrations that are reasonable and consistent with the observed geology. The results do reveal useful patterns and information.

Factor analysis of both surveys by Nevada Sunrise (Intor) (Christensen, 2006c) defines three distinct geochemical associations:

(1) ***Zn, Cu, Fe, Ni, K, Mg, Co, Cr, Bi and Sn***. This factor distinguishes the dominant primary lithologies of andesite and basalt versus rhyolite and rhyolite volcaniclastic rocks.
(2) ***As, Sb, Hg, Mo, Pb, Ag, and Au.*** This factor association is characteristic of epithermal mineral systems known to exist on the Golden Arrow property.
(3) ***Ca, Mg, and Sr.*** This factor characterizes the association of elements formed by the presence of caliche in desert soil.

The distribution of gold and geochemical association #2 (described above) was reviewed by Jaacks (2007a) and reveals features not previously recognized, some of which present attractive exploration targets. Figure 10.1 illustrates the distribution of gold, and Figure 10.2 shows the distribution of mercury. There is a strong gold enrichment associated with known gold mineralization at Confidence Mountain. The anomaly also extends to the southeast into an area yet to be drilled. There is strong gold enrichment around the alaskite of Deadhorse Hill, another area never drill tested. There is a circular mid-level gold enrichment pattern to the northwest of Confidence Mountain, which more or less coincides with the known limits of the volcaniclastic sediment-filled maar basin. Finally, disruption of the geochemical patterns by interpreted northeast- and northwest-trending faults, particularly the Page fault, is evident.

There is a more diffuse circular anomaly evident in the mercury data, as highlighted by the yellow circle on Figure 10.2. The enrichment extends southeastward from Confidence Mountain over outcropping rhyolite welded tuff. It has been suggested that the tuff may represent a relatively impermeable lithology, in which mineralization developed in porous units at depth.

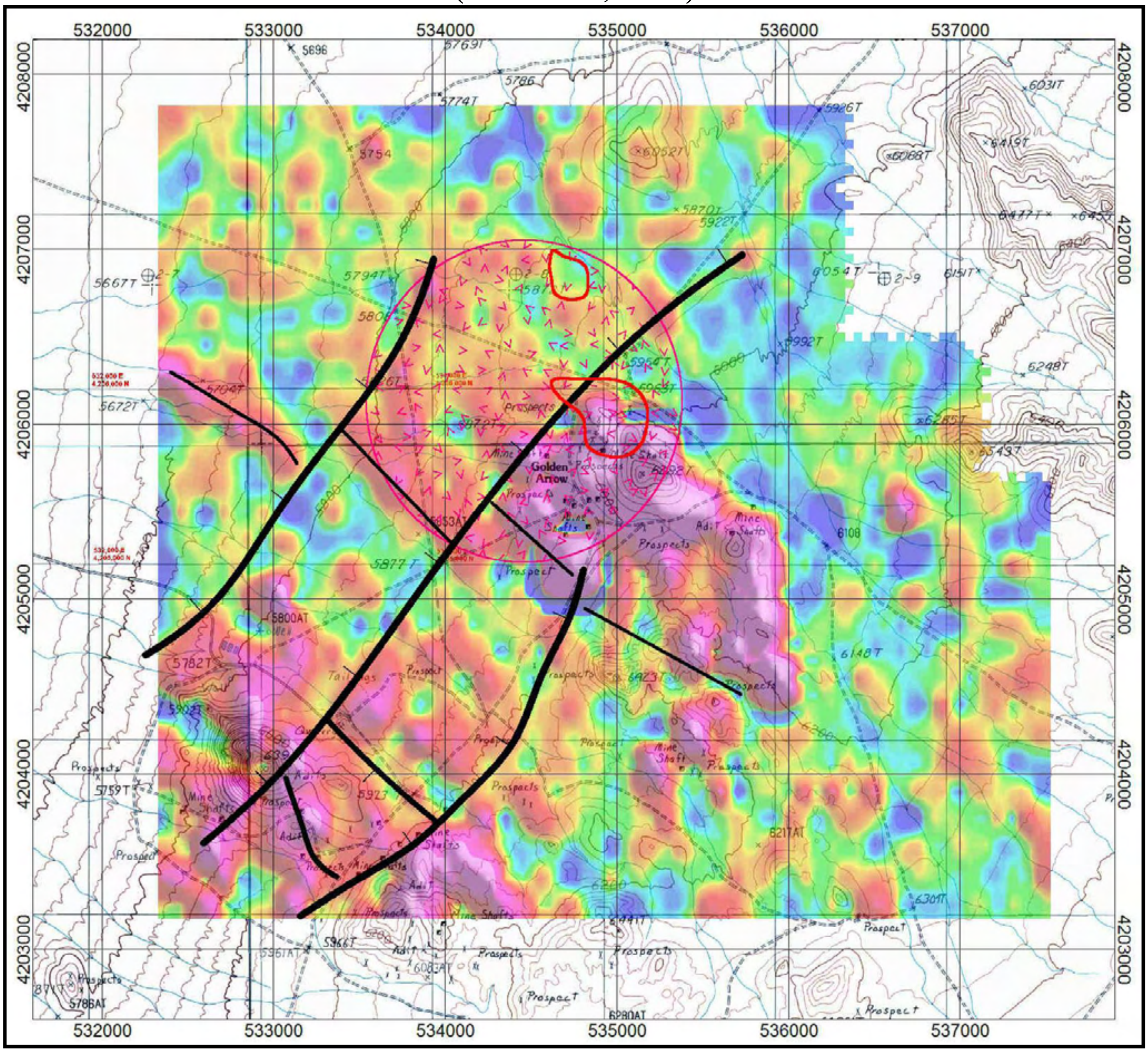
The Ag/Au ratio for Hidden Hill zone averages about 17, while this ratio for the Gold Coin zone is about 12.

Following the recommendation of Jaacks (2007b), Nevada Sunrise completed an orientation soil geochemical survey at Golden Arrow during 2007. Samples were collected on two grids: one extending over the Hidden Hill zone and the second crossing the Page fault in the vicinity of the Golden Arrow shaft. Samples were analyzed for multi-element geochemistry both by conventional *aqua regia* extraction and by enzyme-leach extraction. These samples were also analyzed for soil gas hydrocarbons. Multi-element geochemical results from this orientation yielded results similar to those from the 2003 soil geochemical survey discussed previously. No useful information could be derived from the soil gas hydrocarbon geochemistry.

Intor Resources contracted a soil geochemical survey over a portion of the Golden Arrow property during the 2008 exploration season. Soil geochemical samples were collected by the Blue Eagle Sampling Team of Helena Montana. Samples were collected at 50-meter intervals on east-west-oriented lines spaced at 100 meters. A total of 1012 samples were collected, covering an area of about 1.7 square miles (4.5 square kilometers). Sample locations were controlled by hand-held GPS units. At each site, a field-screened soil sample was collected from 10-12in. depth. ALS Chemex Laboratories in Sparks Nevada determined Au by *aqua regia* extraction from a 25-gram aliquot using graphite furnace AAS. A multi-element suite was determined by combination of ICP-MS and ICP-AES methods on a 5-gram aliquot.

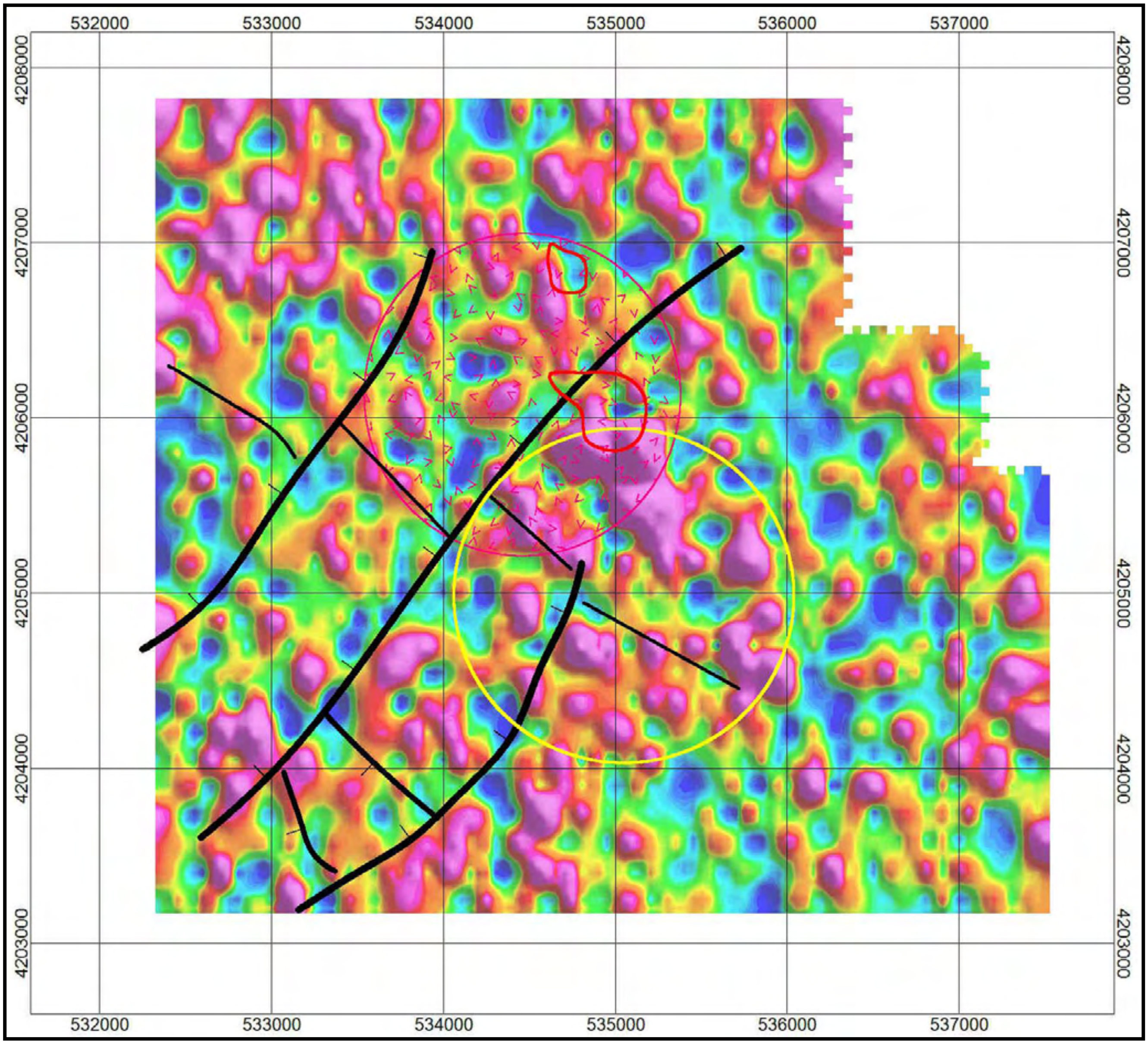
Statistical evaluation of the 2008 soil geochemical data defined a distinct suite of elements Au-Ag-As-Sb-Mo-Hg-Pb-Te that are correlated with each other. This is a typical “epithermal suite” of pathfinder elements for gold exploration. Element maps of soil geochemistry were prepared on a photo base outlining alluvial and soil domains. These maps demonstrated that the dominant control on soil trace-element geochemistry is the character of surficial material. Gold and pathfinder elements are most concentrated over outcropping and alluvial trails from the Confidence Mountain rhyolite dome. Areas highlighted by this survey for further exploration are an area immediately to the southeast of Confidence Mountain, which has had little exploration or drilling, and the alluvium-covered pediment extending westward from Confidence Mountain.

**Figure 10.1 Distribution of Gold in Soils at Golden Arrow**
(From Jaacks, 2007a)




Gold distribution is shown on a topographic base. Color shows contoured gold concentrations with higher gold values shown as warn red tones and lower values as cool blue tones. The bold red outlines are the locations of the Hidden Hill (northerly) and Gold Coin (southerly) mineralized zones. The patterned circle outlines a mid-level circular gold enrichment zone coincident with the maar sediments. Black lines are interpreted structures. Coordinates are in meters.

**Figure 10.2 Distribution of Mercury in Soils at Golden Arrow**
(From Jaacks, 2007a)



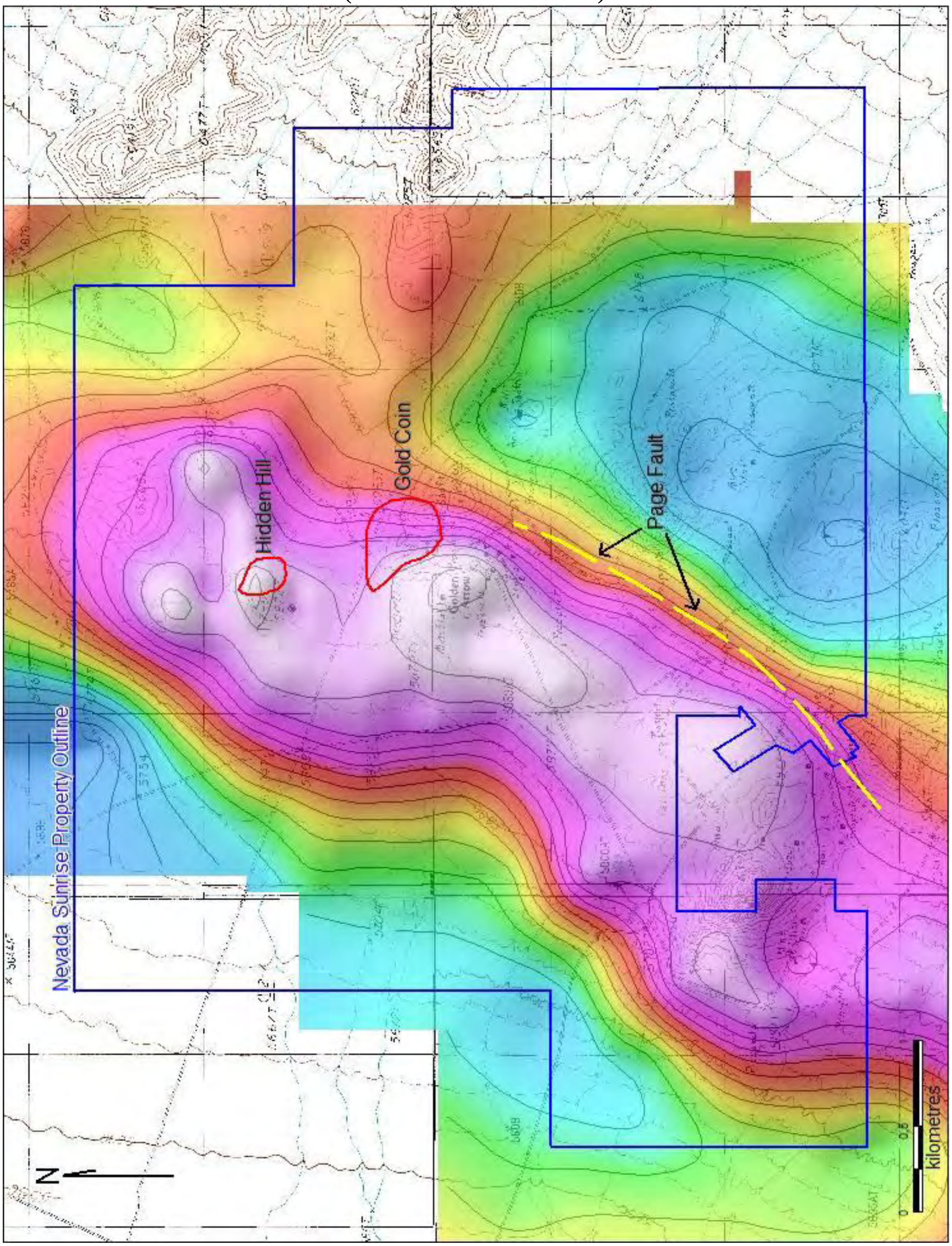

Mercury distribution is shown on a topographic base. Color shows contoured mercury concentrations with higher mercury values shown as warn red tones and lower values as cool blue tones. The bold red outlines are the locations of the Hidden Hill (northerly) and Gold Coin (southerly) mineralized zones. The yellow circle outlines an area of irregular mercury enrichment to the southeast of Confidence Mountain. The patterned circle outlines a mid-level circular gold enrichment zone coincident with the maar sediments. Black lines are interpreted structures. Coordinates are in meters.

## 10.3 Geophysical Testing

Although it has been acknowledged that geophysical surveys – magnetic and gravity data – led to the discovery of the Hidden Hill mineralization, and numerous geophysical surveys have been completed over the Golden Arrow property, surprising little effort has been made to critically integrate, interpret, and utilize the available geophysical information. Intor acquired numerous historical geophysical maps and was able to recover the original digital data files for geophysical work completed by Aerodat for Independence Mining in 1991. During 2007, these and other data from prior operators were reprocessed by Wave Geophysics of Evergreen Colorado, utilizing three-dimensional interpretation algorithms and imaging software only recently developed.

Several features in the geophysical data warrant note and are here illustrated. Gravity surveys detect differences in the mass of the underlying rock and are particularly useful for mapping (1) the depth of overburden cover, (2) faults that juxtapose rock units of different density, and (3) bedrock geologic units with distinct rock densities. Figure 10.3 is a Complete Bouguer Gravity image of the Golden Arrow property. The gravity data were collected by Kennecott in 1996 and were reprocessed by Wave Geophysics for Intor in 2007. The residual gravity data were computed by applying a 5km wavelength, high-pass filter to Complete Bouguer Anomaly data. The image is dominated by a distinct northeast-oriented elliptical anomaly measuring approximately 3.1mi by 1.2mi (5km by 2km). A portion of the eastern margin of this gravity high is coincident with the Page fault. Three-dimensional modeling of the gravity data suggests that the anomaly is caused by a deep intrusive body with several apophyses extending upward in the vicinity of Deadhorse Hill, Confidence Mountain, Hidden Hill and other locations. The northern portion of the gravity anomaly appears to be dropped down along a northwest fault passing directly through the Gold Coin zone.

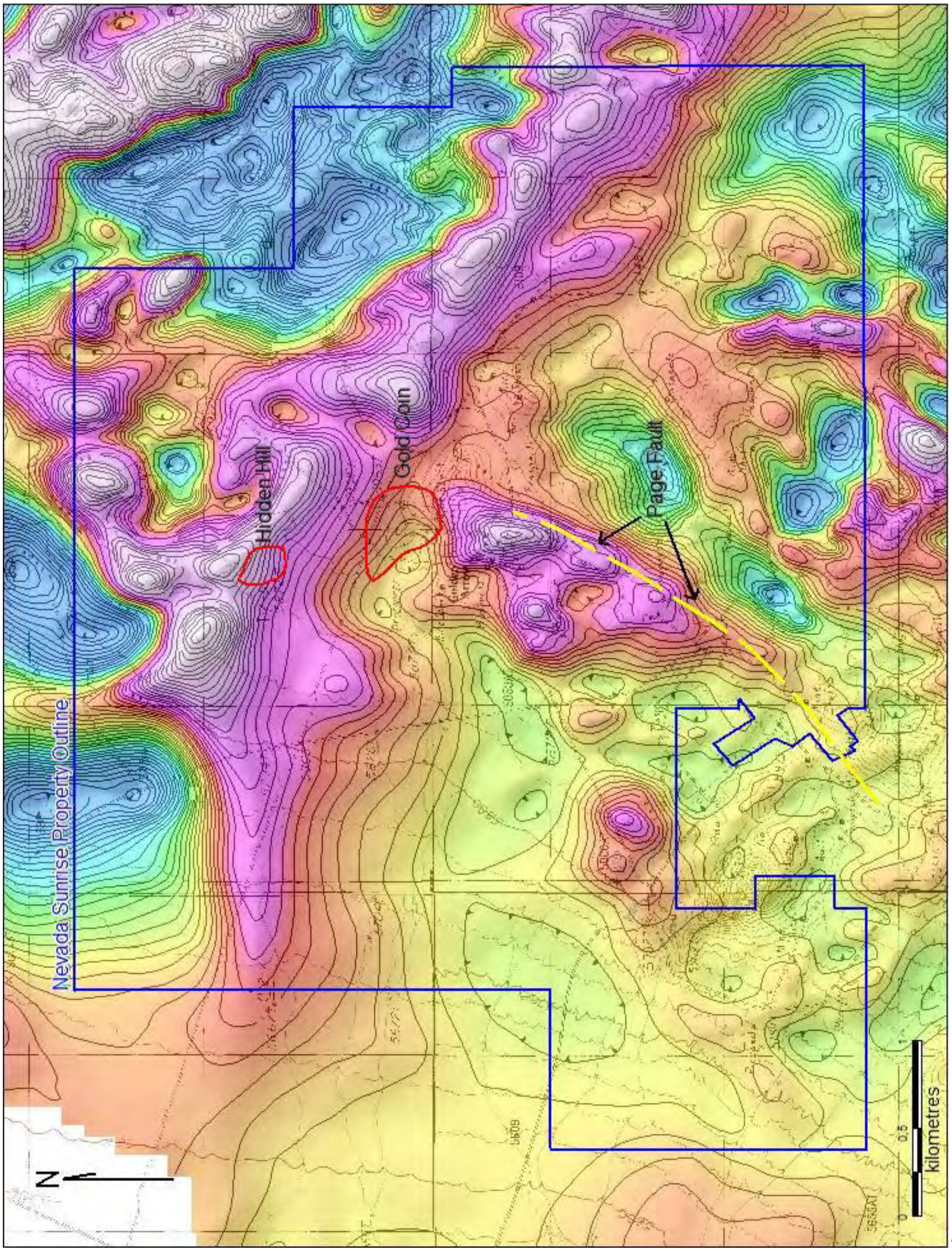
**Figure 10.3 Complete Bouguer Gravity Map of the Golden Arrow Property**
(Source described in text)



Magnetic surveys map the magnetic susceptibility of the underlying rock units and can be particularly valuable for mapping bedrock geology beneath cover. Nevada Sunrise was able to relocate the original digital data from the airborne magnetic and electromagnetic survey of the Golden Arrow district conducted by Aerodat Limited for Independence in 1991. Nevada Sunrise contracted Craig Beasley of Wave Geophysics of Evergreen, Colorado, to reprocess and reinterpret the data in 2007, using analytical modeling programs unavailable at the time of the survey. Figure 10.4 shows color-contoured airborne magnetics on the topographic base. This is reduced-to-the-pole aeromagnetics with 3.1mi (5km) high-pass filter processing. The property outline is shown in blue. The locations of the Hidden Hill and Gold Coin zones are shown in red, and the Page fault is shown in yellow.

The magnetic image of the Golden Arrow property exhibits a great variety of features at all scales. At the district scale (Figure 10.4), the Page fault is clearly evident as a break between magnetic andesite to the west and less magnetic rhyolite ash-flow tuff to the east. Just to the south of Confidence Mountain, there appears to be a north-trending splay extending from the main north-northeast-trending fault, which passes through the Desert shaft. Finally, there is a prominent magnetic high located immediately south of Confidence Mountain, perhaps another unmapped intrusive.

**Figure 10.4 Aeromagnetic Image of the Golden Arrow Property**
(Source described in text)



Gradient-array resistivity data over the Confidence Mountain area, collected by Practical Geophysics for Coeur in 1993, were digitized, gridded and imaged by Christensen for Nevada Sunrise in 2007. The new image paints a revealing image of the underlying geology and alteration (Figure 10.5). Confidence Mountain appears as a ring-shaped anomaly, with a less resistive core surrounded by a more resistive ring. The correspondence between the mapped resistivity and the grade-thickness drill-hole map for Gold Coin is striking. It is also notable that all of the mapped historic prospects and mines occur within the broad resistive ring. The data highlight untested exploration potential extending both westward and southeastward from Confidence Mountain.

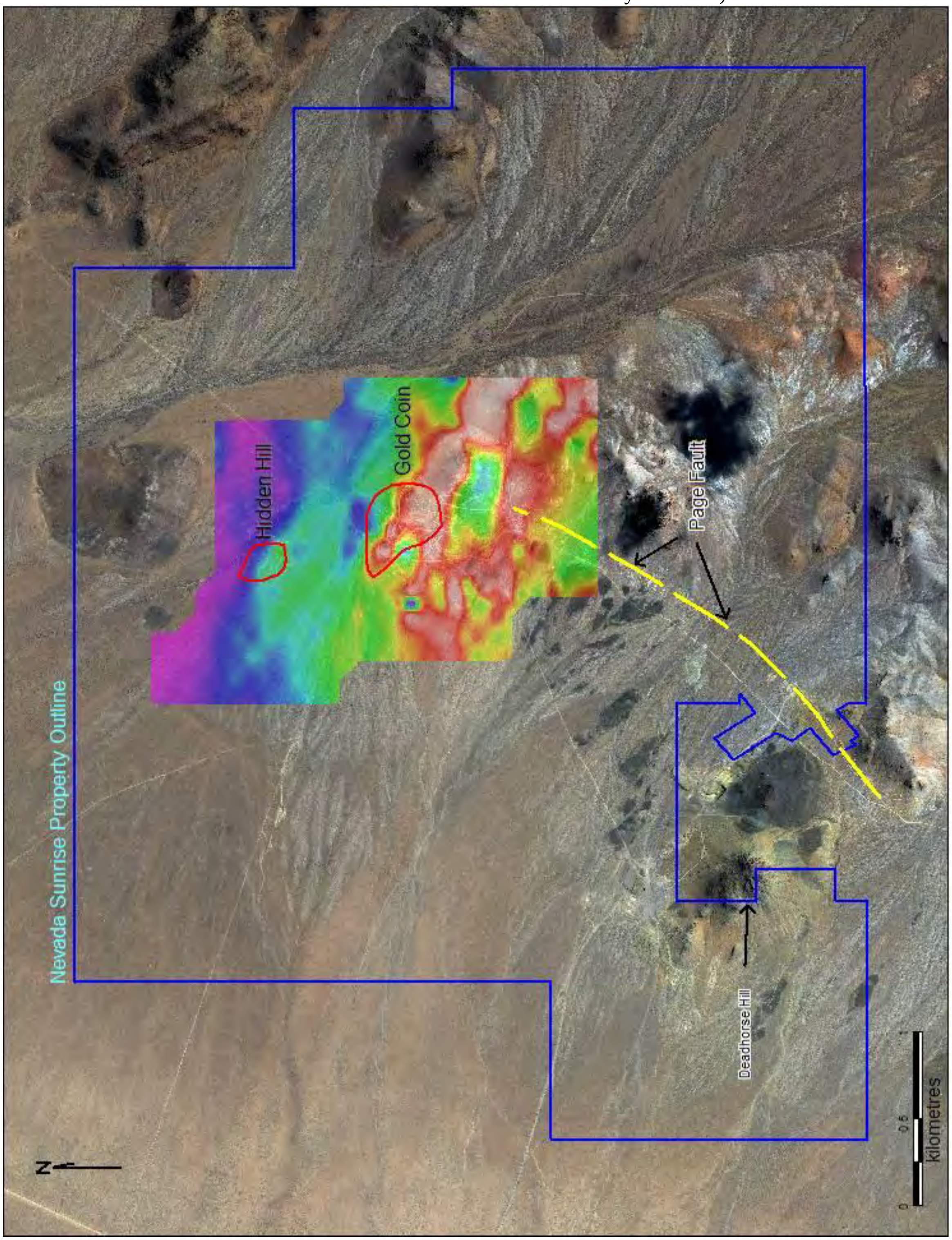
No additional geophysical fieldwork or interpretation was conducted by Nevada Sunrise during the 2008 exploration season.

In 2010, Animas contracted Zonge Geosciences of Sparks Nevada to complete a gradient array IP-resistivity survey over the Golden Arrow property. The survey consisted of 6 array blocks with approximately 64 line-kilometers of data acquisition. Survey data was acquired with transmitter bipoles of approximately 4,000m oriented parallel to survey lines; and 50m receiver dipoles and 50m spacings. Survey lines were spaced at 100 and 200m, oriented to cross anticipated geological fabric. The field survey was completed in May 2010; data reduction and interpretation have yet to be completed.

Animas has contracted with Durango Geophysical Operations to complete a Reconnaissance Induced Polarization (RIP) survey over the entire Golden Arrow property. This work is scheduled for June 2010.

## Figure 10.5 Gradient-Array Resistivity Map of the Gold Coin – Hidden Hill Area

(From Nevada Sunrise, 2007; Nevada Sunrise property outline is indicated in blue, and the locations of the Hidden Hill and Gold Coin mineralized centers are indicated by red ovals)



## 10.4 Geodetic Surveying

A major issue of concern at the Golden Arrow property since it was acquired by Nevada Sunrise has been the quality of the historical database of drill collar locations. Many of the earlier exploration programs used a local footage coordinate grid based on field control points.

Nevada Sunrise was able to locate a report by McDowell (1996) and another by Petray (1995), which confirmed that the control points used to establish the local grid at Golden Arrow were surveyed by qualified cadastral surveyors using professional equipment. Henderson (2006) relocated the field control points using professional standard GPS equipment with real-time differential correction to determine real-earth coordinates – reported as UTM coordinates, WGS84 datum, Zone 11.

Historic drill-hole collar locations were located with variable accuracy. Some companies had collar locations properly surveyed; others set drill sites by tape and compass and recorded planned, rather than actual, locations. Henderson (2006) was able to accurately survey the location of 84 drill collar locations in the field. Since most drill holes within any single program were reasonably well located with respect to each other, it was then possible to adjust the locations of all holes to a "best fit" location, using Blue Marble Geographic Calculator software. Back comparison of the adjusted locations of holes not located in 2006 to collar locations reported by Petray shows accuracy generally within three meters.

Plotting the collar locations on current and historic air photos shows good correspondence between collar location and evidence of drilling disturbance. The current Golden Arrow drill-hole collar location database is considered to be sufficiently accurate to be used for geological resource modeling, but Nevada Sunrise should endeavor to locate and accurately survey as many additional drill collars as possible.

## 10.5 Remote Sensing – Multi-spectral Satellite Image Analysis

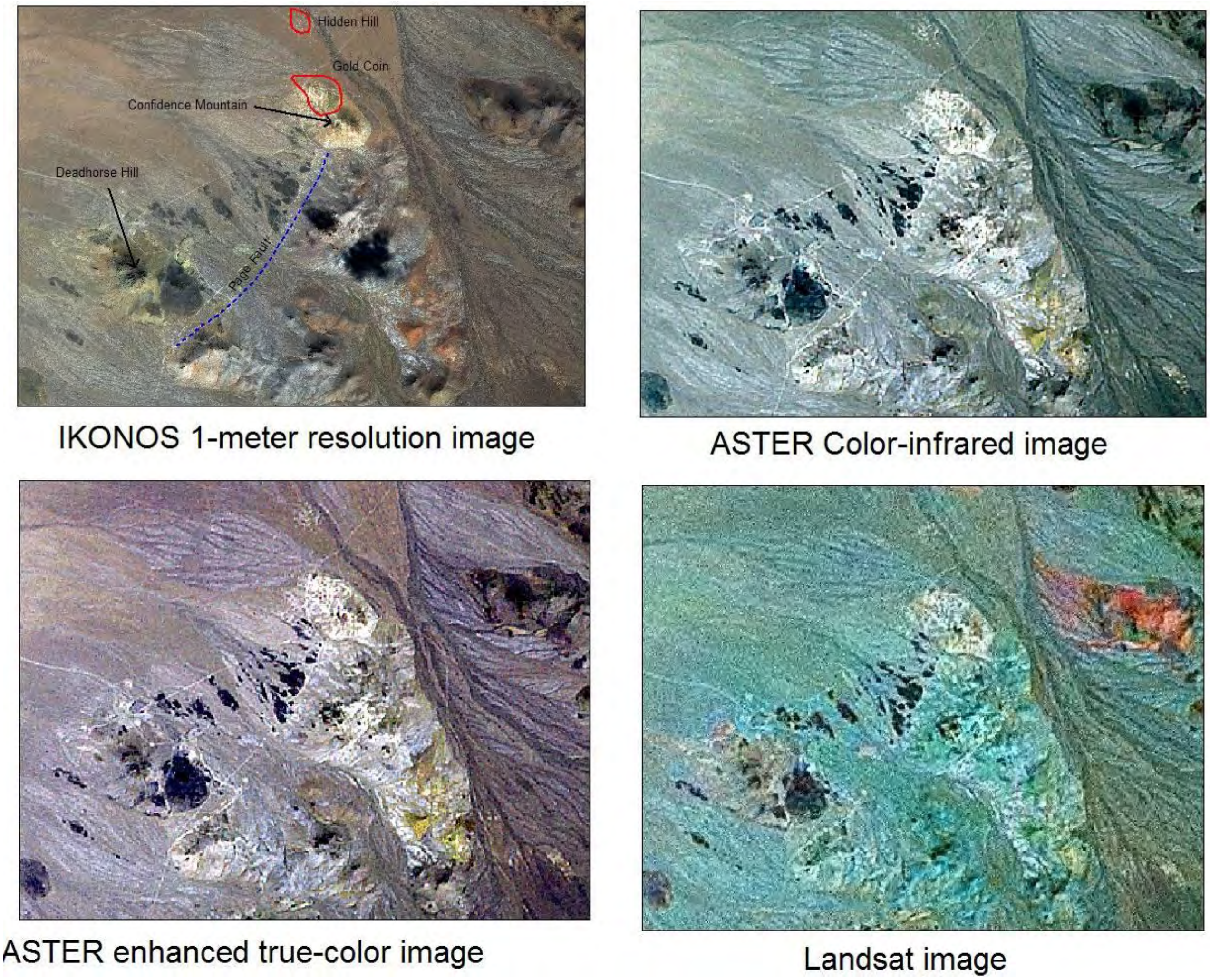
Nevada Sunrise (Intor) contracted with Perry Remote Sensing to acquire multi-spectral satellite imagery for the greater Golden Arrow project area and to prepare an interpretive alteration mineral distribution map (Perry, 2006). Digital ASTER data, including visible, near infrared, shortwave infrared, and thermal infrared bands were obtained from the U.S. Geological Survey EROS data center. Digital Landsat Thematic Mapper imagery was acquired from the archives of Perry Remote Sensing. IKONOS is a commercial satellite imaging system producing digital imagery with one-meter resolution. Imagery for Golden Arrow was custom collected for Nevada Sunrise (Intor) by GeoEye in 2006.

Multi-spectral satellite data have been shown to be useful for detecting subtle patterns of alteration mineralogy often not easily recognizable on the ground. Combining the complementary spectral data from Landsat and ASTER provides a useful approach to recognizing the spatial distribution of alteration suites. A suite of altered rocks from the Golden Arrow property was used as a spectral training set.

Nevada Sunrise received maps highlighting the distributions of a variety of clay, sulfate, and carbonate minerals within and surrounding the Golden Arrow property. These will guide future exploration. The high-resolution image has already proven its value as a base for detailed geologic mapping and for identifying the location of historic drill collars.

Figure 10.6 illustrates the different spectral characteristics of rock units and how data from the various remotely sensed images aid in mapping lithologies and alteration.

**Figure 10.6 Remote Sensing Imagery of Golden Arrow**
(All images are at the same scale and of the same area.)




## 10.6 Drill-Hole Re-logging

Nevada Sunrise re-logged about 310 RC drill holes from Golden Arrow since 2006, which resulted in a re-interpretation of the geology and mineralization (Dixon, 2007). RC drill cuttings were all logged by binocular microscope, permitting identification of features not evident with the naked eye or loupe. While the evolving interpretation is more complex than previous concepts, the new model may expand exploration opportunities. This work resulted in identification of an intrusive latite that probably played a key role in the genesis of the mineralization at Hidden Hill. The latite appears to intrude andesite and andesitic lithic breccia and may have been the "heat engine" for at least one episode of mineralization (Dixon, 2007).

Hydrothermal breccias were commonly observed within the zones of mineralization. These breccias are observed, in core, to cross-cut all lithologies and, frequently, to be multiphase, that is the breccias contain fragments of earlier-formed breccia. Breccia clasts vary from angular and little displaced – jigsaw breccia – to highly rounded and milled tuffisite. The matrix is fine rock flour. Silicification and pyritization are common. These breccias are sufficiently distinct to be readily recognized in RC drill chips beneath the microscope.

In addition, as described in Section 9.0, there is evidence that both the Hidden Hill and Gold Coin mineralized zones are the result of both low-sulfidation and high-sulfidation systems (Dixon, 2007). Quartz-adularia, indicating a low-sulfidation system, is present in hole GA93-154 with abundant quartz-pyrite veining and minimal alteration of latite wall rocks. In contrast, GA93-151 exhibits almost total destructive alteration of wall rock to clay, a style of alteration more characteristic of a high-sulfidation system. Dixon (2007) concluded that "*Whereas much of the gold-silver mineralization seems to be vertically restricted to between 150 feet and 400 feet depths and probably is associated with a hot springs type system, a deep gold intercept in DH 93-151 suggests deeper and lateral exploration possibilities with quartz-adularia-gold system affinities.*"

## 10.7 Intor 2008 Drilling

Intor completed a program of exploration drilling in 2008 involving both RC and diamond core drilling, as summarized below in Table 10.1.

**Table 10.1 Summary of 2008 Exploration Drilling Program**

| ***2008 Intor drilling*** | Core holes | Core footage | RC holes | RC footage |
|---|---|---|---|---|
| Total completed | 5 | 3584 | 28 | 16,880 |
| *Gold Coin zone* | 3 | 1898 | 16 | 8,815 |
| *Hidden Hill zone* | 2 | 1686 | 6 | 3,810 |
| *Exploration* | 0 | 0 | 6 | 4,255 |

The proposed drill holes were about equally divided between holes for in-fill mineral resource confirmation, deposit extension and exploration. The program, however, was terminated early for company financial considerations. A piezometer for monitoring water levels within the Gold Coin zone was installed in one RC drill hole. This drilling program is discussed more extensively in Section 11.8.

# 11.0 DRILLING

## 11.1 Historic Drilling

Nevada Sunrise archives include exploration drill information collected by seven companies over the past two decades as summarized earlier in this report. Christensen (2006b) summarized the status of the drill database.

The holes are numbered GAXX-01 through GAXX304, where XX is the year drilled, plus eight holes drilled by Kennecott numbered KGA-001 through KGA-008. This is a total of 312 hole numbers. It turns out, however, that Tombstone pre-numbered drill sites, and holes 225, 226, 236, 237, 238, 239, 240, 242, 147, 256, 257, 258, 271, 272, 273, 274, and 275 (17 holes) were not drilled. Finally, four holes have twins, 26/26A, 29/29A, 288/288A, and 293/293A. There are a total of 291 holes in the database (Table 11.1 and Table 11.2). Figure 11.1 shows the location of these drill holes.

**Table 11.1 Drilling in the Golden Arrow Database**

| | | | |
|---|---|---|---|
| Total Number of Holes | 291 | Total footage | 148,101 feet |
| Total Number of core holes | 10 | Total footage | 6,606 feet |
| Total Number of RC holes | 281 | Total footage | 141,495 feet |

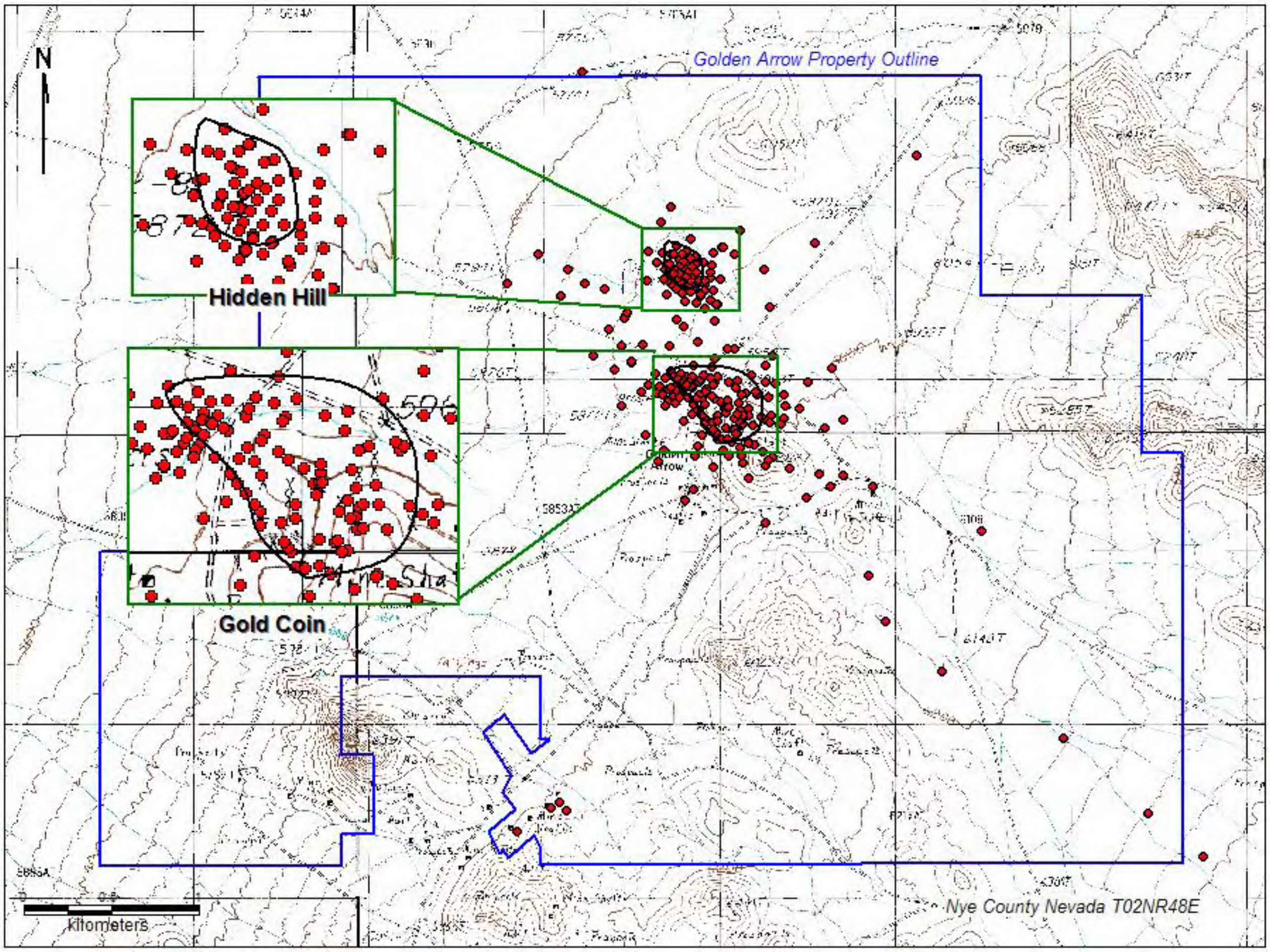
**Table 11.2 Drilling at Golden Arrow by Operator as Represented in Database**

| Company | Years | Holes | Type | Footage |
|---|---|---|---|---|
| Homestake | 1987-88 | 38 | RC | 16,580 |
| Westgold | 1989-90 | 87 | 81 RC; 6 core | 39,805 total, of which 3,598 was core |
| Independence | 1992 | 13 | RC | 6,795 |
| Coeur d'Alene | 1993-94 | 29 | 25 RC; 4 core | 20,160 total, of which 3,007 was core |
| Kennecott | 1996 | 8 | RC | 5,570 |
| Tombstone | 1997 | 86 | RC | 40,150 |
| Pacific Ridge | 2003-04 | 30 | RC | 19,041 |

Diamond drill core is available for all ten core holes, and rock chips are available for 233 of the RC drill holes. No material remains from Homestake holes 1-38. Chips are missing for holes 277-286 drilled by Pacific Ridge.

All diamond core was washed and re-logged by Nevada Sunrise consultant Richard Dixon (Dixon, 2007), with support from Odin Christensen. All of the reverse circulation drill chips were re-logged under a binocular scope by consultant Odin Christensen. It was observed that much of the core had never been washed, and many of the chip boxes had not been opened since the boxes were closed at the drill. The information gathered by this re-logging is contained within the lithologic database complied by Nevada Sunrise.

**Figure 11.1 Golden Arrow Historic Drill Hole Location Map**




Note black outline which defines the two resource areas.

It is estimated that more than 400 hammer, air-track, RC, and diamond drill holes exceeding 150,000ft (46,000m) have been drilled to explore for and evaluate gold-silver mineralization on the Golden Arrow property, including the 291 in the database. The vast majority of this drilling has been focused on discovering and delineating the Gold Coin and Hidden Hill mineralized zones.

Nevada Sunrise documentated a large part of this drilling, as summarized on Table 11.1 and Table 11.2. These tables are consistent with the database provided to MDA by Nevada Sunrise; however, because of some inconsistencies between the database and some of the reports reviewed by MDA and among the reports themselves, the numbers of holes and footages on these tables may not agree exactly with information in Section 6.1.

The objective of exploration programs over the years has varied. In the early years of the 20th century, miners sought only high-grade vein mineralization, which could be mined after limited capital investment and recovered by gravity or flotation methods. Later, during the 1980s and early 1990s, exploration was focused upon discovery of large-tonnage gold-silver mineralization suitable for large-scale production, preferably oxide ore amenable to cyanide recovery. The large exploration companies, in particular, sought very large deposits. As metal prices slid at the end of the century, Bonanza Explorations and Pacific Ridge Exploration again focused their exploration programs toward higher-grade, structurally controlled, vein-hosted gold-silver mineralization.

While most of the exploration drilling programs returned drill intercepts containing significant concentrations of gold and silver, none of the programs defined gold-silver mineralization of sufficient grade or tonnage to meet company objectives. The drill results demonstrate that precious-metal grades can be erratic within this mineral system, and that indeed both high-grade vein-hosted mineralization and more widespread disseminated mineralization are present within the Gold Coin and Hidden Hill deposit zones.

### 11.1.1 Homestake Mining Company

Homestake drilled 38 RC holes for a total of 16,580ft (5,054m). According to Jennings (1988), Drilling Services was the contractor for 20 of the first 21 Homestake holes drilled in 1987, with Tonto Drilling as the contractor for their other hole. The remaining 17 holes were drilled by Davis Brothers in 1988. All but two holes were drilled on a -50° angle. MDA has no information on the type of drill rig used by these contractors.

### 11.1.2 Western Gold Exploration and Mining Company

From 1989 to 1990, Westgold drilled 87 holes on the property for a total of 39,805ft (12,133m) (based on the database; Seedorff *et al.*, 1991, report 39,804ft). Six of the 87 holes were core, of which the deepest was drilled to 1,000ft (305m); core drilling totaled 3,598ft (1,097m).

According to Ernst (1990), Westgold used three different contractors for their 1989 RC drilling. Saga Exploration drilled the first five holes using a buggy-mounted Canterra 312 rig. Alwest Drilling, Inc. of Sparks, NV subcontracted Diversified Drilling of Round Mountain, NV to drill the next 11 holes using a Chicago Pneumatic 700 rig. Stevens Drilling of Hinckley, Utah, drilled the remaining 17 holes in 1989 and the first 11 holes in 1990 using a Schramm Rotadrill. MDA notes that the drill-collar database indicates that Saga drilled the first 27 holes in 1989 and that Stevens drilled the remaining 6 holes in 1989, but MDA could find no drill records to resolve this discrepancy.

For the remaining 37 of the 48 RC holes drilled in 1990, the drilling contractor was Stevens Drilling, who used a Schramm T660 rig. Holes were drilled with a 5½in. hammer bit. Water injection was needed to stabilize the alluvium (Seedorff *et al.*, 1991). Depth of the water table ranged from about 565 to 600ft (172 to 183m).

For their core drilling, done in 1990, Westgold used SDS Drilling Company of Sparks, Nevada, who used a Longyear 44 rig. Holes were drilled HQ size. Although there were few problems with holes 81 through 84, holes 121 and 122 had problems with lost circulation and caving alluvium; hole 122 had to be abandoned at a depth of 601ft (183m) when alluvium caved while the rods were pulled for a bit change (Seedorff *et al.*, 1991). Based on this experience, Seedorff *et al.* (1991) recommended that for future core drilling, four-inch casing be set to bedrock.

### 11.1.3 Independence Mining Company

MDA reviewed no reports on Independence's work. The drill collar database shows 13 RC holes for which the drilling contractor was Stevens Drilling. The drill collar database shows a total of 6,795ft (2,071m) drilled in 13 holes, which MDA has verified from lithologic logs. However, Murray (1997) reports 11 holes drilled by Independence for a total of 5,595ft (1,705m).

### 11.1.4 Coeur Explorations, Inc.

Coeur drilled at Golden Arrow from 1993 to 1994. MDA had no information on the drill contractor or type of drill used. As noted previously in Section 6.1, there is some inconsistency in the reported number of holes and footage of Coeur's drilling that MDA has been unable to resolve. According to Murray (1994, 1997), Coeur drilled 25 RC holes for about 17,050ft (5,197m) and four core holes totaling 3,007.5ft (917m), which is the same number of holes but slightly different footage than that in the drill-hole database and shown on Table 11.2. However, Murray (1997) also reported that Coeur drilled 21,352ft (6,508m) in three core and 28 RC holes.

### 11.1.5 Kennecott Exploration Company

MDA had no details on Kennecott's drilling program. Murray (1997) reported that they drilled eight exploration holes totaling 5,570ft (1,678m) in 1996. According to the database received by MDA, the eight holes were RC holes, drilled by Five O Drilling Company of Las Vegas, Nevada.

### 11.1.6 Tombstone Exploration Company, Ltd.

Tombstone drilled a total of 86 RC holes for 39,910ft (12,165m) in 1997; this drilling was predominantly designed to infill areas of known mineralization (Murray, 1997). MDA notes that in the drill collar database provided to them, Tombstone's total footage was shown as 40,150ft (12,238m), which is what is shown on Table 11.2. Tombstone believed their program showed that:

- the Hidden Hill zone is still open at depth to the northwest and to the north;
- the Gold Coin zone is closed to the northwest but is poorly defined between the main mineralization and Confidence zone to the southeast and is open at depth;
- the Confidence zone is open at depth, to the southeast, and along the northeast face of Confidence Mountain; and
- mineralization in hole GA90-78 zone is still open at depth and to the northwest and southeast.

After having drilled 23 holes, Tombstone contracted with Pincock, Allen and Holt to audit their procedures (Barker and Rozelle, 1997). Barker and Rozelle (1997) observed that "*Practices related to drilling standards, sampling standards and chip logging are excellent*." The drill contractor used for Tombstone's holes was Elsing Drilling Ltd. ("Elsing") of Twin Falls, ID.

### 11.1.7 Pacific Ridge Exploration Ltd.

According to Bowen (2004), Pacific Ridge drilled 29 RC holes totaling 18,721ft (5,706m) from July 2003 to January 2004; however, the database given to MDA by Nevada Sunrise had 30 holes totaling 19,041ft (5,804m). The holes were drilled in seven target areas with the majority of the holes testing strike and down-dip extensions of higher-grade mineralized intercepts identified in earlier drilling. Pacific Ridge's drilling found numerous high-grade intercepts in the Confidence Mountain area, including five feet averaging 2.36oz Au/ton (80.91 g Au/t) in drill hole GA04-301.

The first phase of this drilling included 10 holes totaling 5,120ft (1,561m) that were drilled in July and August, 2003. Nine of these holes were drilled in the Gold Coin zone, and one was drilled on the Grey Eagle mineralized structure. Harris Drilling Ltd. was the drill contractor for these holes.

The second phase of drilling from November 2003 to January 2004 included 19 holes for a total of 13,601ft (4,146m). Of these, 14 holes tested for higher-grade mineralization in the Gold Coin, Hidden Hill, and "186" zones, and five tested targets generated by Pacific Ridge's soil geochemical survey. The drill contractor for the second phase was Diversified Drilling Inc.

Although the intent was to drill dry, after two holes had to be abandoned due to drilling problems in clay-altered zones, the remaining holes were drilled with water injection. Chip logs were prepared as each drill hole progressed.

Table 11.3 lists selected drill intersections portraying the general tenor of the best zones of mineralization for all historical drilling for which Nevada Sunrise has records.

## 11.2 Intor Drilling

In 2008, Intor completed a program of resource definition and exploration drilling at the Golden Arrow property. The company drilled 33 holes – five core holes (3,584ft/1,092m) and 28 RC holes (16,880ft/5,145m), for a total of 20,464ft (62km) of drilling. The locations of the drill holes are illustrated on Figure 11.2. The drilling program ran from April 29 through August 21, 2008.

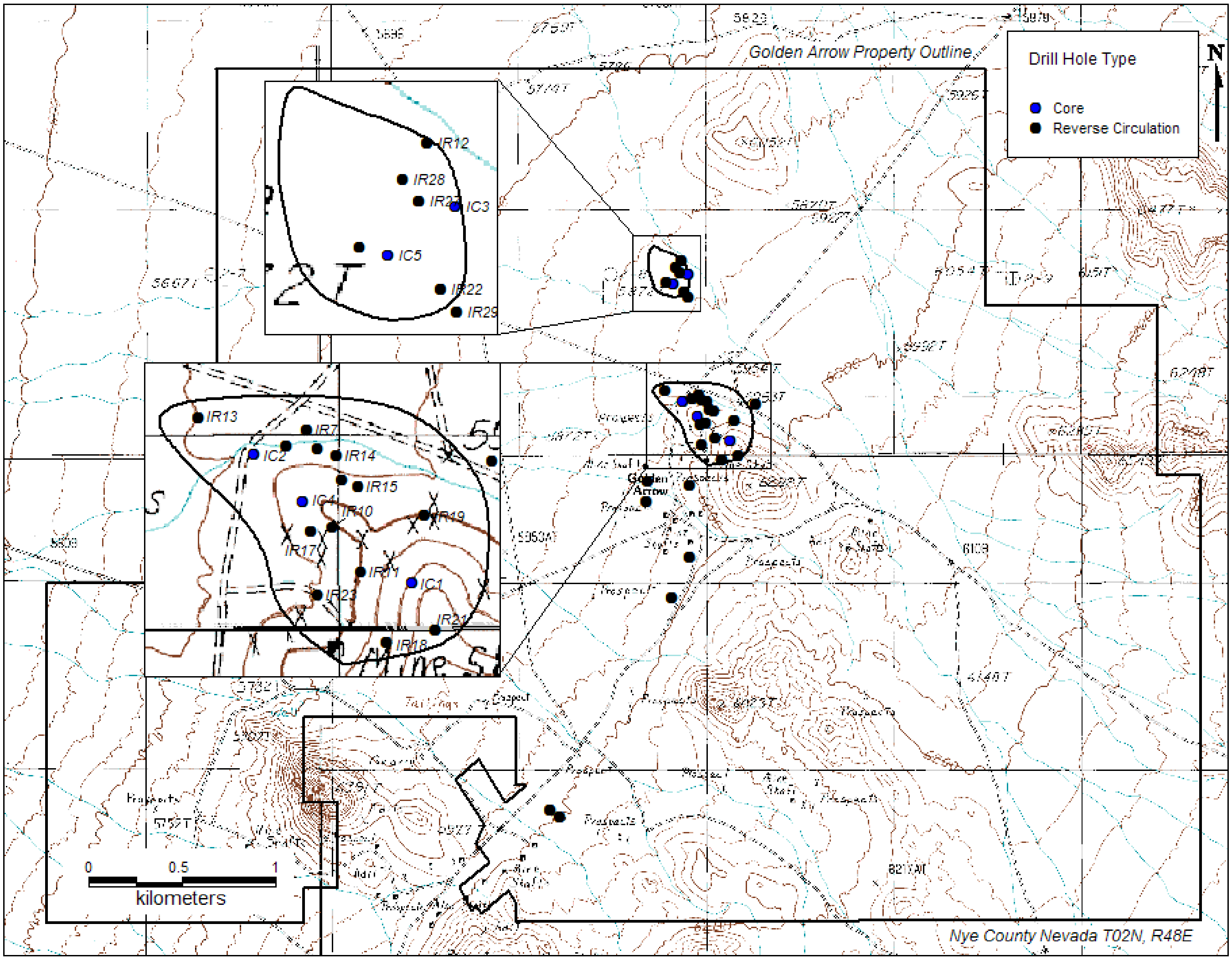
The RC drilling was performed by Drift Exploration Drilling of High Prairie, Alberta, using a track-mounted Drill Systems machine. Holes were drilled dry whenever possible; however most holes went wet, either because groundwater was encountered or because drilling conditions required. Several holes were terminated before reaching planned depth due to drilling difficulties or equipment limitations.

Diamond core drilling was performed by Ruen Drilling of Clark Fork, Idaho using a truck-mounted LF-100 core machine. Mud sumps were dug adjacent to all drill sites for fluid management. Water for drilling, purchased from a local ranch, came both from a nearby spring and from deep wells in Stone Cabin Valley.

Drill hole locations were staked in the field by the geologist using hand-held GPS units; drill rigs were positioned by Intor geologists using a Brunton compass. Sixteen holes were angle drill holes, and 17 were vertical holes. Depths were between 400 (120m) and 1000ft (300m). As-drilled hole locations were resurveyed using high-precision GPS with sub-meter accuracy.

Additional details regarding sampling, sample analysis and quality control are discussed in Sections 12.2 and 13.1.8 of this report.

**Figure 11.2 Golden Arrow Drill-Hole Location Map**




Intor constructed a piezometer in one drill hole within the Gold Coin mineral zone. Depth to water, originally 710ft (216m) below the collar, rose steadily over about a month to stabilize at 565ft (172m) below the collar.

All drill holes were abandoned in compliance with state regulations. Dry holes were capped with a 20-foot cement (6-meter) plug clearly marked with the drill-hole identification. Wet holes were grout injected and capped with a 20-foot (6-meter) cement plug with drill-hole identification. All drill sites were reclaimed and reseeded at conclusion of the program.

Table 11.4 lists selected drill intersections from the 2008 drilling program.

**Table 11.3 Selected Historical Drill Intersections**

(calculated and tabulated by Christensen; these do not necessarily represent true thicknesses)

| Higher-grade intercepts | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Hole_Id** | **From (ft)** | **To (ft)** | **Interval (ft)** | **oz Au/ton** | **oz Ag/ton** | **From (m)** | **To (m)** | **Interval (m)** | **g Au/t** | **g Ag/t** | **Location** | **Type** |
| 87-001 | 275 | 280 | 5 | 0.76 | 0.91 | 84 | 85 | 1.5 | 26.06 | 31.20 | Gold Coin | RC |
| 87-017 | 415 | 420 | 5 | 0.95 | 2.38 | 126 | 128 | 1.5 | 32.57 | 81.60 | Gold Coin | RC |
| 90-083 | 465 | 475 | 10 | 0.84 | 9.52 | 142 | 145 | 3.0 | 28.80 | 326.4 | Hidden Hill | DDH |
| 90-085 | 110 | 120 | 10 | 0.96 | 1.28 | 34 | 37 | 3.0 | 32.91 | 43.89 | Hidden Hill | RC |
| 90-121 | 278 | 307 | 29 | 0.44 | -- | 85 | 94 | 8.8 | 15.09 | NA | Hidden Hill | DDH |
| 94-159 | 160 | 165 | 5 | 2.94 | 0.11 | 49 | 50 | 1.5 | 100.8 | 3.77 | Gold Coin | RC |
| 94-166 | 385 | 395 | 10 | 1.08 | 1.1 | 117 | 120 | 3.0 | 37.03 | 37.71 | Gold Coin | RC |
| 94-172 | 40 | 55 | 15 | 0.36 | 2.3 | 12 | 17 | 4.6 | 12.34 | 78.86 | Gold Coin | RC |
| 96-003 | 525 | 540 | 15 | 0.47 | 2.82 | 160 | 165 | 4.6 | 16.11 | 96.69 | Gold Coin | RC |
| 97-203 | 220 | 250 | 30 | 0.87 | 1.2 | 67 | 76 | 9.1 | 29.83 | 41.14 | Gold Coin | RC |
| 03-288A | 585 | 605 | 20 | 0.31 | -- | 178 | 184 | 6.1 | 10.63 | NA | Gold Coin | RC |
| 04-301 | 545 | 550 | 5 | 2.28 | 3.21 | 166 | 168 | 1.5 | 78.17 | 110.06 | Gold Coin | RC |
| | | | | | | | | | | | | |
| Longer mineralized intercepts | | | | | | | | | | | | |
| **Hole_Id** | **From (ft)** | **To (ft)** | **Interval (ft)** | **Au, opt** | **Ag, opt** | **From (m)** | **To (m)** | **Interval (m)** | **g Au/t** | **g Ag/t** | **Location** | **Type** |
| 87-001 | 240 | 300 | 60 | 0.12 | 0.32 | 73 | 91 | 18.3 | 4.11 | 10.97 | Gold Coin | RC |
| 87-008 | 260 | 300 | 40 | 0.09 | 0.15 | 79 | 91 | 12.2 | 3.09 | 5.14 | Gold Coin | RC |
| 87-008 | 360 | 495 | 135 | 0.06 | 0.45 | 110 | 151 | 41.1 | 2.06 | 15.43 | Gold Coin | RC |
| 87-017 | 360 | 420 | 60 | 0.1 | 0.69 | 110 | 128 | 18.3 | 3.43 | 23.66 | Gold Coin | RC |
| 89-038 | 60 | 165 | 105 | 0.06 | 0.27 | 18 | 50 | 32.0 | 2.06 | 9.26 | Gold Coin | RC |
| 89-038 | 235 | 355 | 120 | 0.04 | 0.3 | 72 | 108 | 36.6 | 1.37 | 10.29 | Gold Coin | RC |
| 89-043 | 215 | 275 | 60 | 0.07 | 0.26 | 66 | 84 | 18.3 | 2.40 | 8.91 | Gold Coin | RC |
| 89-071 | 445 | 485 | 40 | 0.03 | -- | 136 | 148 | 12.2 | 1.03 | NA | Hidden Hill | RC |
| 90-078 | 335 | 365 | 30 | 0.09 | -- | 102 | 111 | 9.1 | 3.09 | NA | S of HH | RC |
| 90-081 | 392 | 572 | 180 | 0.08 | 1.54 | 119 | 174 | 54.9 | 2.74 | 52.80 | Hidden Hill | DDH |
| 90-083 | 272 | 505 | 233 | 0.1 | 2.55 | 83 | 154 | 71.0 | 3.43 | 87.43 | Hidden Hill | DDH |

# Table 11.3 Selected Historical Drill Intersections (continued)

| Hole_Id | From (ft) | To (ft) | Interval (ft) | oz Au/ton | oz Ag/ton | From (m) | To (m) | Interval (m) | g Au/t | g Ag/t | Location | Type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 90-085 | 110 | 490 | 380 | 0.06 | 0.8 | 34 | 149 | 115.8 | 2.06 | 27.43 | Hidden Hill | RC |
| 90-088 | 230 | 450 | 220 | 0.04 | 0.68 | 70 | 137 | 67.1 | 1.37 | 23.31 | Hidden Hill | RC |
| 90-102 | 420 | 500 | 80 | 0.04 | 0.6 | 128 | 152 | 24.4 | 1.37 | 20.57 | Hidden Hill | RC |
| 90-118 | 485 | 535 | 50 | 0.04 | -- | 148 | 163 | 15.2 | 1.37 | NA | Hidden Hill | RC |
| 90-121 | 209 | 371 | 162 | 0.14 | -- | 64 | 113 | 49.4 | 4.80 | NA | Hidden Hill | DDH |
| 94-172 | 30 | 80 | 50 | 0.16 | 1.31 | 9 | 24 | 15.2 | 5.49 | 44.91 | Gold Coin | RC |
| 96-001 | 270 | 435 | 165 | 0.05 | 0.39 | 82 | 133 | 50.3 | 1.71 | 13.37 | Hidden Hill | RC |
| 97-174 | 380 | 500 | 120 | 0.06 | 1.26 | 116 | 152 | 36.6 | 2.06 | 43.20 | Hidden Hill | RC |
| 97-175 | 220 | 315 | 95 | 0.06 | 0.21 | 67 | 96 | 29.0 | 2.06 | 7.20 | Hidden Hill | RC |
| 97-175 | 410 | 595 | 185 | 0.04 | 0.05 | 125 | 181 | 56.4 | 1.37 | 1.71 | Hidden Hill | RC |
| 97-177 | 195 | 235 | 40 | 0.06 | 0.56 | 59 | 72 | 12.2 | 2.06 | 19.20 | Hidden Hill | RC |
| 97-177 | 320 | 415 | 95 | 0.06 | 0.68 | 98 | 126 | 29.0 | 2.06 | 23.31 | Hidden Hill | RC |
| 97-179 | 345 | 465 | 120 | 0.05 | 1.45 | 105 | 142 | 36.6 | 1.71 | 49.71 | Hidden Hill | RC |
| 97-182 | 460 | 500 | 40 | 0.06 | 1.93 | 140 | 152 | 12.2 | 2.06 | 66.17 | Hidden Hill | RC |
| 97-186 | 380 | 525 | 145 | 0.06 | 0.97 | 116 | 160 | 44.2 | 2.06 | 33.26 | Hidden Hill | RC |
| 97-203 | 125 | 250 | 125 | 0.22 | 0.37 | 38 | 76 | 38.1 | 7.54 | 12.69 | Gold Coin | RC |
| 97-207 | 245 | 295 | 50 | 0.05 | 0.47 | 75 | 90 | 15.2 | 1.71 | 16.11 | Gold Coin | RC |
| 97-210 | 370 | 460 | 90 | 0.04 | 0.73 | 113 | 140 | 27.4 | 1.37 | 25.03 | Gold Coin | RC |
| 97-217 | 60 | 145 | 85 | 0.07 | 0.89 | 18 | 44 | 25.9 | 2.40 | 30.51 | Gold Coin | RC |
| 97-229 | 20 | 85 | 65 | 0.04 | 0.27 | 6 | 26 | 19.8 | 1.37 | 9.26 | Gold Coin | RC |
| 04-293A | 340 | 510 | 170 | 0.03 | 1.19 | 104 | 155 | 51.8 | 1.03 | 40.80 | Hidden Hill | RC |

**Table 11.4 Selected Drill Intersections from 2008 Intor Drilling**
(calculated and tabulated by Christensen; these do not necessarily represent true thicknesses)

| **Gold Coin Zone** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hole_Id | From (ft) | To (ft) | Interval (ft) | oz Au/ton | oz Ag/ton | From (m) | To (m) | Interval (m) | g Au/t | g Ag/t | Type |
| 08-305 | 250 | 305 | 55 | 0.059 | 0.619 | 76 | 93 | 16.8 | 2.023 | 21.223 | RC |
| 08-307 | 280 | 340 | 60 | 0.236 | 3.903 | 85 | 104 | 18.3 | 8.091 | 133.817 | RC |
| 08-309 | 5 | 45 | 40 | 0.032 | 0.341 | 2 | 14 | 12.2 | 1.097 | 11.691 | RC |
| 08-309 | 505 | 525 | 20 | 0.033 | 0.209 | 154 | 160 | 6.1 | 1.131 | 7.166 | RC |
| 08-311 | 108 | 170 | 62 | 0.089 | 1.011 | 33 | 52 | 18.9 | 3.051 | 34.663 | DDH |
| 08-311 | 268 | 312 | 44 | 0.107 | 1.337 | 82 | 95 | 13.4 | 3.669 | 45.840 | DDH |
| 08-311 | 402 | 439 | 37 | 0.164 | 1.072 | 123 | 134 | 11.3 | 5.623 | 36.754 | DDH |
| 08-315 | 256 | 331.5 | 75.5 | 0.037 | 1.149 | 78 | 101 | 23.0 | 1.269 | 39.394 | DDH |
| 08-318 | 560 | 580 | 20 | 0.034 | 2.172 | 171 | 177 | 6.1 | 1.166 | 74.469 | RC |
| 08-319 | 470 | 500 | 30 | 0.035 | 1.004 | 143 | 152 | 9.1 | 1.200 | 34.423 | RC |
| 08-319 | 520 | 545 | 25 | 0.032 | 0.404 | 158 | 166 | 7.6 | 1.097 | 13.851 | RC |
| 08-323 | 150 | 205 | 55 | 0.032 | 0.462 | 46 | 62 | 16.8 | 1.097 | 15.840 | RC |
| 08-323 | 330 | 430 | 100 | 0.083 | 0.939 | 101 | 131 | 30.5 | 2.846 | 32.194 | RC |
| | | | | | | | | | | | |
| **Hidden Hill Zone** | | | | | | | | | | | |
| Hole_Id | From (ft) | To (ft) | Interval (ft) | Au, opt | Ag, opt | From (m) | To (m) | Interval (m) | g Au/t | g Ag/t | Type |
| 08-313 | 178 | 199 | 21 | 0.057 | 0.307 | 54 | 61 | 6.4 | 1.954 | 10.526 | DDH |
| 08-313 | 504 | 559 | 55 | 0.09 | 2.582 | 154 | 170 | 16.8 | 3.086 | 88.526 | DDH |
| 08-314 | 267 | 321.5 | 54.5 | 0.037 | 0.431 | 81 | 98 | 16.6 | 1.269 | 14.777 | DDH |
| 08-314 | 341 | 456.7 | 115.7 | 0.037 | 0.962 | 104 | 139 | 35.3 | 1.269 | 32.983 | DDH |
| 08-314 | 505 | 591.9 | 86.9 | 0.089 | 0.787 | 154 | 180 | 26.5 | 3.051 | 26.983 | DDH |
| 08-332 | 325 | 385 | 60 | 0.054 | 1.675 | 99 | 117 | 18.3 | 1.851 | 57.429 | RC |
| 08-332 | 425 | 465 | 40 | 0.047 | 0.911 | 130 | 142 | 12.2 | 1.611 | 31.234 | RC |
| 08-333 | 325 | 405 | 80 | 0.063 | 0.561 | 99 | 123 | 24.4 | 2.160 | 19.234 | RC |
| 08-333 | 435 | 470 | 35 | 0.059 | 1.503 | 133 | 143 | 10.7 | 2.023 | 51.531 | RC |
| 08-334 | 425 | 450 | 25 | 0.053 | 0.211 | 130 | 137 | 7.6 | 1.817 | 7.234 | RC |
| 08-334 | 555 | 575 | 20 | 0.033 | 2.982 | 169 | 175 | 6.1 | 1.131 | 102.240 | RC |
| 08-336 | 315 | 375 | 60 | 0.108 | 3.466 | 96 | 114 | 18.3 | 3.703 | 118.834 | RC |
| 08-337 | 390 | 500 | 110 | 0.039 | 0.364 | 119 | 152 | 33.5 | 1.337 | 12.480 | RC |

# 12.0 SAMPLING METHOD AND APPROACH

## 12.1 Historic Sampling

MDA has no information on sampling methods used by Homestake, Independence, Coeur, or Kennecott.

The following information on Westgold's sampling procedures for their RC drilling is taken from Seedorff *et al.* (1991):

> *"Rotary drilling required water injection to maintain hole stability in alluvium. The amount of water injected was approximately 20-30 gallons per 5-foot sample. Below the water table, water flow increased to 200-300 gallons per sample. Discharge from the hole passed through a rotating wet-splitter and the sample split was collected in 12" x 18" poly bags or 10" x 17" Olefin bags. To minimize overflow of bags, the splitter was modified to collect smaller samples (after GA-90-85) and bag size was increased to 15" x 18" (after GA-90-120)."*

For their HQ core holes, Westgold used a five-foot (1.5-meter) core barrel for holes GA-90-81 through GA-90-84 and a ten-foot (three-meter) core barrel for holes GA-90-121 and GA-90-122 (Seedorff *et al.*, 1991). Core was split and sampled by drill run for the five-foot (1.5-meter) runs; for the ten-foot (three-meter) runs, the core was split into two five-foot (1.5-meter) samples.

During Tombstone's early drilling, the cyclone was connected to a rotary wet splitter. Overflow from the wet splitter was partially channeled to a sieve collector; coarse chips collected in the sieve were used to make chip-trays for logging. Samples were dried in the sun and then collected in security boxes at the end of the day; the boxes were not unlocked until a representative of the assayer arrived for pickup. After having drilled 23 holes, Tombstone contracted with Pincock, Allen and Holt to audit their procedures (Barker and Rozelle, 1997). Barker and Rozelle (1997) observed that "*Care of bagged samples and the security of those samples is excellent*" and that "*It is PAH's opinion that the drilling, sampling, organization of samples and chip trays, and security is of high quality and meets industry accepted practices and standards*."

According to Bowen (2004), Pacific Ridge collected samples continuously throughout their holes at five-foot (1.5-meter) intervals and collected both an assay and a field duplicate sample for each interval. Field duplicates were stored on an old drill access road near the summit of Confidence Mountain.

## 12.2 Geochemical Sampling by Nevada Sunrise

An orientation soil geochemical program was completed in 2007 over the Hidden Hill and Page fault sectors of the property. Soil samples were collected at a depth of approximately 20cm of moist soil. Samples were field sieved, placed in zip-lock plastic bags, and retained in an ice chest prior to shipping to Actlabs in Ancaster, Ontario for analysis.

A grid geochemical sampling program was completed in 2009 over a northern portion of the Intor Golden Arrow property. Samples were collected by the Blue Eagle Sampling Team of Helena Montana. Sample sites were located in the field by hand-held GPS units. Samples were collected at 50-meter intervals on east-west-oriented lines spaced at 100-meters. At each site, a hole was dug to approximately 10-12 inches (25-30 centimeters) depth, moist sample material collected, field-sieved with plastic screen to -3/8" (-0.953cm) and placed in a cloth bag. These bags were in turn secured in woven polypropylene rice bags and secured in the Intor field office in Tonopah. Samples were delivered to ALS Chemex in Sparks, Nevada, for analysis. Five blank and 12 standard samples were embedded within the sample sequence submitted for analysis; the results of these quality control samples verified the integrity of the analysis procedure.

## 12.3 2008 Drill Sampling

Reverse-circulation drill samples were collected by a member of the Drift Exploration Drilling crew, under the regular guidance and observation of Intor geologists. Dry discharge from the sampling cyclone passed through a three-tier Jones splitter. Wet discharge from the cyclone was cut with a rotating wet splitter. Sampling ports on the rotating splitter were opened or closed to permit collection of a proper sample volume. A single assay sample was bagged; most samples weighed 3-5 kilograms. A representative portion of the cyclone discard stream was caught in a strainer and placed in a 20-compartment plastic chip tray as a lithology sample.

Dry RC drill samples were collected in 12"x24" (30cmx60cm) 8-mil plastic sample bags, secured with plastic cable ties. Wet samples were collected in 12"x24" (30cmx60cm) polyspun fabric bags. Sample bags were pre-numbered by Intor geologists.

The Drift drill sampler collected a field duplicate assay sample each 100 feet (30 meters). For dry samples, the duplicate sample was collected from the final reject side of the tiered Jones splitter. For wet samples, the sample was collected from a "Y-splitter" on the reject discharge of the rotating wet splitter. The Intor geologist introduced a blank sample as the first and last sample in each drill hole.

Assay samples were laid out at the drill site to sun-dry for a few days as required, then combined in woven polypropylene rice bags, secured with cable ties, transported to an on-site central staging area, and placed in sample bins provided by American Assay. Arrangements were made with American Assay to pick up drill samples on site when 5-6 bins were full.

RC drill chip trays were stored in a secure facility in Tonopah during the period of the drilling program. They were transported to Colorado for logging lithology, oxidation and alteration utilizing a binocular microscope. They are currently in secure storage in Reno, Nevada.

Procedures for diamond drill core were different. The Ruen drill crew prepared core boxes at the drill, placed core and footage blocks in the boxes, and brought filled boxes to the on-site central staging area. Intor geologists daily photographed the core, logged the core for RQD, and logged the core for geology. Completed core boxes were transported daily to a locked storage facility in Tonopah.

At the conclusion of the program, Odin Christensen again reviewed the core and marked intervals for sampling. Intor contracted M2 Technical Services of Spokane to saw-split the core. M2 took custody of the core in Tonopah and transported it to Spokane for photo-documentation and sawing. One-half of the core was returned to the original core boxes; the second half was placed in plastic bags for analysis. M2 returned the core to Reno Nevada; the half-core was secured in an Intor warehouse, and the bagged core was delivered to McClelland Laboratories for analysis and metallurgical testing.

# 13.0 SAMPLE PREPARATION, ANALYSIS, AND SECURITY

MDA has little information on sample preparation or security used by the companies who have drilled at Golden Arrow except for Tombstone's drilling programs. Details on analysis of samples are described below.

## 13.1 Nevada Sunrise Geochemical Samples

Nevada Sunrise conducted no systematic rock-chip sampling on the Golden Arrow property. An orientation soil geochemical program was completed in 2007 over the Hidden Hill and Page fault sectors of the property. Soil samples submitted to Actlabs were sieved to -80 mesh. One sample split was extracted by *aqua regia* and analyzed for multi-element geochemistry by combined ICP-AES and ICP-MS (Actlabs procedure Ultratrace-1). A second sample split was extracted by enzyme leach and analyzed for multi-element geochemistry by combined ICP-AES and ICP-MS (Actlabs procedure 7 Enzyme). The third sample split was analyzed for soil gas hydrocarbons by gas chromatography/mass spectrometer ("GC/MS"). The samples remained under the supervision of Odin Christensen from collection until shipment by UPS to Actlabs.

Nevada Sunrise completed a soil geochemical sampling program in 2008 over a portion of the Golden Arrow property. Following collection, samples were retained in a secure storage facility in Tonopah, Nevada. Samples were transported to ALS Chemex Laboratories in Sparks, Nevada, by Odin Christensen. The dry soils were sieved to -180 micron (80 mesh) and the fine fraction used for analysis. Gold was extracted from a 25-gram aliquot with *aqua regia* and determined by graphite furnace atomic absorption. A suite of elements was determined using a combination of ICP-MS and ICP-AES methods on a 5-gram sample aliquot. The *aqua regia* digestion was selected to highlight mineral crusts and adsorbed elements and decrease the influence of primary soil silicate mineralogy. Standards and blanks were inserted with sample batches. The results of these standards were reviewed by the authors and found to be within expected ranges.

## 13.2 Historic Drilling

### 13.2.1 Homestake Mining Company

Homestake used Shasta for assaying. MDA has no further information on sample preparation and analysis for Homestake's program.

### 13.2.2 Western Gold Exploration and Mining Company

Westgold used American Assay Laboratories, Inc. ("American Assay") and Barringer Laboratories, Inc. ("Barringer") for assaying. For the 1989 drilling, American Assay analyzed for gold using two-assay-ton fire assay; holes GA89-37 through GA89-45 were also analyzed for silver using two-assay-ton fire assay (Ernst, 1990). Barringer ran check assays for gold in selected intervals using one-assay-ton fire assay. For the 1990 drilling, all drill samples were sent to American Assay for either one- or two-assay-ton fire assay with an atomic absorption ("AA") finish. For intervals with assays greater than 0.01 oz Au/ton, (0.34 g Au/t) pulps were then sent to Barringer for hot cyanide-extractable gold assay, and every fourth pulp was re-assayed by one-assay-ton fire assay with gravimetric finish (Seedorff *et al.*, 1991).

According to Seedorff *et al.* (1991), drill samples were analyzed for silver only where there was significant gold mineralization (≥10ft (3m) grading ≥0.01 oz Au/ton (0.34 g Au/t), and silver was analyzed by a wet chemical/AA method with a detection limit of 0.02 oz Ag/ton (0.69 g Au/t).

Westgold undertook limited duplicate-sample and check-assay programs for quality control (Seedorff *et al.*, 1991). For a 100ft (30m) mineralized interval in hole GA99-085, they used and compared the results from two different sampling methods – using the rotating wet splitter as described in Section 12.1 and collecting duplicate samples by catching 100% of the discharge from the outflow of the rotary splitter. It was noted that using the rotating wet splitter, there was excessive overflow of fines from the sample bags. Using the alternate method of catching the discharge from the outflow of the splitter, the 20-30 gallon (75-113 liter) sample of water and cuttings was split with a Gilson-type riffle splitter until the split fit into a 20in. (50cm) by 30in. (75cm) poly bag; although very labor intensive, this method resulted in minimal loss of fines. Assays from the alternate method of catching the discharge from the outflow of the splitter were 15% to 20% lower than assays of samples from the rotating wet splitter. According to Seedorff *et al.* (1991), "*This raised a concern that the "original" samples were being upgraded by loss of the clay fraction and concentration of the vein quartz. Due to this concern, the rotary splitter was modified to allow better adjustment of the sample size. For holes after GA-90-85, the size of the split was adjusted to eliminate or minimize overflow of bags*."

Although Westgold did not twin RC holes with core holes, RC hole GA90-118, drilled at -60°, was drilled within a few feet by vertical core hole GA90-122. The vertical core hole encountered a 147ft (45m) intercept that averaged 0.018 oz Au/ton (0.617 g Au/t), whereas the same mineralized intercept in the angled RC hole was 150ft (46m) averaging 0.026 oz Au/ton (0.891 g Au/t). According to Seedorff *et al.* (1991), "*The location and thickness of the mineralized intercept correlate quite well, but there is a significant variation in grade. The rotary hole is approximately 40% higher grade than the core hole. This discrepancy may be due to hole location or the angle at which the holes intersect the quartz veining, but the comparison does raise questions that must be answered prior to additional drilling.*"

Westgold compared fire assays of the same pulp for RC samples by American Assay and Barringer and found little scatter of the data. Coarse rejects from mineralized intervals in three of the core holes were sent to Barringer, who prepared and assayed new pulps; comparing the Barringer and American Assay assays, there was only moderate scatter of the data. According to Seedorff *et al.* (1991), "*Results of these comparisons suggest that there is no 'nugget' problem at Hidden Hill. The reported assay values are representative of the sample collected at the drill site. However, more test work is needed to confirm that the sample collected at the drill site is always representative of the mineralization being drilled."*

### 13.2.3 Independence Mining Company

MDA and Christensen have no information on the sample preparation or analysis used by Independence for their drill program.

### 13.2.4 Coeur Explorations, Inc.

Except for notations in the drill collar database that Coeur used Cone Geochemical Inc. for their assaying, MDA and Christensen have no information on sample preparation, analysis, or security.

### 13.2.5 Kennecott Exploration Company

Except for notations in the drill-collar database that Kennecott used Shasta for their assaying, Ristorcelli and Christensen have no information on sample preparation, analysis, or security.

### 13.2.6 Tombstone Exploration Company, Ltd.

Tombstone used Chemex Labs Inc. of Reno, NV, for all of their gold and silver assaying. Gold was analyzed by fire assay with an AA finish. According to Murray (1997), a series of standards produced by Smee and Associates of Vancouver, B.C. was inserted into the sample stream of most holes at about every 10$^{th}$ to 15$^{th}$ sample by Chemex. Checks of the standards indicated that there were no problems with the assays (Murray, 1997).

After having completed 23 RC holes, Tombstone contracted with Pincock, Allen and Holt for a data audit that included checking 37 random samples from holes TGA97-193 and TGA97-194, which were prepped and analyzed by Bondar Clegg (Intertek Testing Services) (Barker and Rozelle, 1997). Barker and Rozelle (1997) indicated there was "reasonable consistency between Chemex Labs and Bondar Clegg." Overall Barker and Rozelle (1997) noted that "*Observed assay procedures are of high quality*."

### 13.2.7 Pacific Ridge Exploration Ltd.

According to Bowen (2004), Pacific Ridge sent their samples to American Assay Labs in Sparks, NV, for analysis of gold and silver.

## 13.3 Nevada Sunrise 2008 Drilling

Nevada Sunrise used American Assay Laboratories of Sparks, Nevada, for preparation and analysis of samples from RC drilling and ALS Chemex Laboratories of Sparks, Nevada for preparation and analysis of diamond core samples.

RC drill samples were field-dried and remained on-site under the supervision of geologists working for Intor until sample bins were picked up and transported by American Assay.

Drill cuttings were dried and crushed to -1.7 mm (10 mesh). A 350-gram split was retained and pulverized to -106 microns (150 mesh). Gold was determined on a 30g sub-sample by fire assay with atomic absorption finish. When gold concentrations exceeded 10 g Au/t, the analysis was repeated on a second 30g sample by fire assay with gravimetric finish. Silver was determined using a 2-acid (HCl + $HNO_3$) extraction with atomic absorption finish. When silver concentrations exceeded 100 g Au/t, the analysis was repeated on a second 30g sample by fire assay with gravimetric finish.

American Assay grouped samples into analytical lots of 50 samples. Included with each sample lot were two Rock Labs standards, one blank, and four duplicate samples from within the lot. Field duplicates and blanks were included by Intor with the RC sample lots, as previously described. The results of this quality control are discussed in 14.2.

The drill core was handled and analyzed differently. The core was saw-split by M2 Technical Services ("M2") and half-core bagged for analysis, as described in Section 12.3. M2 delivered the half-core to McClelland Laboratories of Sparks, Nevada. Intor retained McClelland Laboratories to complete initial sample preparation in order that samples would be properly handled for subsequent metallurgical testing.

Core samples were jaw-crushed to -1.25 in (-3.18cm). The crushed rock was split to quarters; three-quarters were retained for metallurgical testing. The one-quarter split was crushed to 100% -3/8-in. (-0.953cm) and half-split; one half was retained by McClelland Laboratories and the second half was delivered to ALS Chemex.

Chemex split off 250 grams and pulverized this to +85% -75 microns (200 mesh). Gold was determined on a 30g sample by fire assay with ICP finish. For samples with gold concentration greater than 10 g Au/t, a second determination was made by 30g fire assay with gravimetric finish. For samples with gold concentration greater than 20 g Au/t, a third determination was made by metallic screen fire assay using a 1000g sample. All samples with gold concentrations greater than 200 ppb had a cyanide-soluble gold determination. Silver was determined by HF-HNO3-HClO4 digestion with HCl leach and AA finish. For samples with silver concentration greater than 100 g Au/t, a second determination was made by 30g fire assay with gravimetric finish.

All core samples were also analyzed with a 49-element suite using a four-acid "near-total" digestion and combined ICP-AES and ICP-MS determination.

At the conclusion of the drill program, Nevada Sunrise submitted 339 American Assay pulps to ALS Chemex for inter-lab comparison. These samples were prepared using the American Assay procedures and analyzed by the Chemex procedures.

Analytical results from both American Assay Laboratories and ALS Chemex were transmitted electronically to Nevada Sunrise, McClelland Laboratories, and MDA.

# 14.0 DATA VERIFICATION

## 14.1 Historic Drilling

Nevada Sunrise took considerable effort to assure the integrity of the historic drill-hole database. The company maintains a secure database with dedicated database technician in the Auburn, California, office. This database has been made available to Animas, as have all drilling-related data.

An issue of concern was the accuracy of the drill collar location data, since many of the older drill hole collar locations were recorded in a local grid, for which there was no primary documentation. As discussed earlier in this report, Nevada Sunrise was able to secure field notes from land surveyors who had worked at Golden Arrow and then to locate survey monuments in the field to relocate known grid locations. Also, many drill collar locations from across the project area were located, and accurate UTM positions determined. Then, using cadastral software, other collar locations could be approximated. The great majority of collar locations are known to within three meters of their true position.

As discussed previously, all available drill core and cuttings were re-logged by two individuals, using binocular microscopes, to assure consistency. Many of the logged lithologies were changed substantially from earlier compilations. Nevada Sunrise has both digital summaries and original paper logs for all of the core and cuttings relogging.

Nevada Sunrise has copies of original assay reports for approximately half (53%) of the historic drilling. Remaining assays within the Nevada Sunrise database appear to have been taken from handwritten assay data on lithology logs and compiled from final reports (not original assay certificates) from American Assay and Environmental Laboratories. Spot comparisons of drill-hole assays appearing in the assay compilation were made against these original assay sheets. It is believed that the compiled assay results are correct.

In 1996, Steven Ristorcelli completed a Decay study for Kennecott Exploration Company to identify the existence of down-hole contamination in percussion drill holes. This work identified a number of RC holes that have evidence of possible down-hole contamination, a common problem with this type of drill sampling when drilling was done wet. Furthermore, he also found that core drilling encountered higher-grade mineralized material for longer intercepts than paired interpreted-to-be-uncontaminated reverse-circulation drilling. He concluded that there was some question about drill sample integrity.

In 1997, Barker and Rozelle prepared a report for Tombstone Exploration documenting an exploration data audit by Pincock, Allen & Holt. The data audit included a review of drilling and sampling procedures, sample handling, assaying methods, and sample verification. The audit reported that (1) practices related to drilling standards, sampling standards and chip logging were excellent; (2) the practice of having a geologist at the drill at all times should be encouraged; (3) care of bagged samples and the security of those samples were excellent; (4) observed assay procedures were of high-quality; (5) the check of 37 random samples indicated reasonable consistency between Chemex Laboratories and Bondar Clegg; and (6) a random check of the higher-grade portion of the raw assay database indicated that some form of clipping (high-grade outlier grade reduction or capping) would be required for mineral resource estimation.

Bowen (2004) completed a final report for Pacific Ridge in which data acquisition procedures were discussed, but this report is not consistent with the form required for NI 43-101 project documentation.

It is evident from past data verification work that some of the pre-1997 reverse circulation drill results may be questionable and that current industry-standard quality control and quality assurance procedures were not reported. However, the companies and individuals who completed this work are known to the authors, and critical reading of the exploration reports available reveals no suggestion that less than prudent practices were followed.

Nevada Sunrise has tons of reverse circulation drill rejects, duplicates, and assay pulps from historic drilling programs in storage. These are available for check analysis programs, but unfortunately, there is no inventory of the samples.

MDA has taken no new samples of historic data and has not undertaken any re-assaying or other direct verification of results by prior operators; MDA believes that the multiple well-known previous operators and the historic mining in the area are sufficient evidence to verify the existence of mineralization.

MDA audited the database from existing assay certificates which comprised 53% of the entire database. The digital drill-hole database received from Nevada Sunrise had an error percentage deemed too high for use in resource estimation (with respect to Au) when compared to existing assay certificates. As a consequence, MDA edited the database by checking all available Au data against original assay certificates, handwritten assay data on lithologic logs, and final assay reports and correcting existing errors. Overall, the database was considered very "clean" with the exception of one set of data where the check assays were mis-entered. The database is acceptable for use in classified resource estimation.

During the compilation of historic information for this report, MDA noted discrepancies in the number of drill holes and total footages of various drilling campaigns, both within and between historic reports and between the reports and the database received from Nevada Sunrise. Both historically reported and new database totals of number of holes and total footage drilled are described in Section 11.1.

## 14.2 2008 Intor Drilling

MDA received all assay data directly from the laboratory and constructed an independent database. Using this and the received survey data from Nevada Sunrise, the 2008-drilling database was constructed. Nevada Sunrise performed quality assurance and quality control ("QA/QC") for their 2008 program, and MDA received the data and performed an evaluation of said data. MDA finds that their QA/QC work adequately demonstrates the usability of the data for resource estimation.

### 14.2.1 Field Duplicates

Intor took 123 duplicate samples in the field at the RC rig. Curiously the duplicate samples returned, on average, 10% higher gold grades. The silver grades in the duplicate samples were 2% higher grade. These results are for all duplicate samples (Table 14.1), but the relationship holds even for those 40 samples over 100ppb Au (not shown). There is no significant change over different grade ranges.

**Table 14.1 Field Duplicate Statistics**

| Field Duplicates – Gold | Average (ppb Au) | Original (ppb Au) | Diff % | Duplicate (ppb Au) | Rel Diff % | AV Rel Diff % |
|---|---|---|---|---|---|---|
| Count | 123 | 123 | | 123 | | |
| Mean | 320 | 305 | 10% | 335 | 7% | 106% |
| Std. Dev. | 1624 | 1476 | 20% | 1777 | 306% | 287% |
| CV | 5.08 | 4.84 | | 5.31 | | |
| Minimum | 2 | 2 | 0% | 2 | | |
| Maximum | 17598 | 15798 | 23% | 19398 | | |
| **Field Duplicates – Silver** | **Average (ppm Ag)** | **Original (ppm Ag)** | **Diff %** | **Duplicate (ppm Ag)** | **Rel Diff %** | **AV Rel Diff %** |
| Count | 123 | 123 | | 123 | | |
| Mean | 6 | 6 | 2% | 6 | -11% | 38% |
| Std. Dev. | 14 | 14 | 1% | 14 | 81% | 72% |
| CV | 2.32 | 2.35 | | 2.34 | | |
| Minimum | 0 | 0 | 0% | 0 | | |
| Maximum | 123 | 127 | -6% | 119 | | |

## 14.2.2 Internal Duplicates

American Assay ran four duplicate determinations within each lot of 50 samples. Intor obtained all the original laboratory duplicate sample data. As expected, the comparisons were good (Table 14.2).

**Table 14.2 Lab Internal Duplicate Statistics**

| Laboratory Duplicates – Gold | Average (ppb Au) | Original (ppb Au) | Diff % | Duplicate (ppb Au) | Rel Diff % | AV Rel Diff % |
|---|---|---|---|---|---|---|
| Count | 326 | 326 | | 326 | | |
| Mean | 193 | 195 | -2% | 191 | -2% | 34% |
| Std. Dev. | 503 | 509 | -2% | 499 | 83% | 75% |
| CV | 2.61 | 2.61 | | 2.61 | | |
| Minimum | 2 | 2 | 0% | 2 | | |
| Maximum | 3892 | 3995 | -4% | 3829 | | |
| **Laboratory Duplicates – Silver** | **Average (ppm Ag)** | **Original (ppm Ag)** | **Diff %** | **Duplicate (ppm Ag)** | **Rel Diff %** | **AV Rel Diff %** |
| Count | 326 | 326 | | 326 | | |
| Mean | 6 | 6 | 0% | 6 | -5% | 23% |
| Std. Dev. | 18 | 18 | 0% | 18 | 97% | 94% |
| CV | 3.14 | 3.13 | | 3.16 | | |
| Minimum | 0 | 0 | 0% | 0 | | |
| Maximum | 198 | 197 | 1% | 198 | | |

## 14.2.3 Pulp Duplicates

Intor sent out 339 pulps prepared by American Assay to a second lab for analysis. The second lab was ALS Chemex in Reno, Nevada. Clearly the check laboratory returned significantly higher grades for the entire data set and for the data set whose paired samples were equal to or exceeded 100ppb Au (Table

14.3). Interestingly, the absolute value of the relative difference in grades shows a moderately high difference ranging between 25% and 50% and averaging 39%. This is high for duplicate assays on the same pulp but not unexpected for a volcanic-hosted epithermal precious metal deposit.

The external checks on duplicate pulps for silver returned lower values by 5% and 6% for all samples (Table 14.4) and for those samples whose mean of the pairs were greater than 5 g Au/t. It is noteworthy that the lower bias in the second lab is more pronounced in the original lab in the higher grades.

### Table 14.3 Pulp Duplicate Assay Statistics - Gold

| | **External Check Assays – Gold** | | | | | |
|---|---|---|---|---|---|---|
| | **Average (ppb Au)** | **Original (ppb Au)** | **Diff %** | **Duplicate (ppb Au)** | **Rel Diff %** | **AV Rel Diff %** |
| Count | 339 | 339 | | 339 | | |
| Mean | 216 | 197 | 19% | 234 | -7% | 82% |
| Std. Dev. | 686 | 607 | 29% | 786 | 252% | 239% |
| CV | 3.18 | 3.08 | | 3.36 | | |
| Minimum | 2 | 2 | 0% | 2 | | |
| Maximum | 8460 | 7280 | 32% | 9640 | | |
| | **External Check Assays – Gold Above Cutoff Grade (100 ppb Au)** | | | | | |
| | **Average (ppb Au)** | **Original (ppb Au)** | **Diff %** | **Duplicate (ppb Au)** | **Rel Diff %** | **AV Rel Diff %** |
| Count | 125 | 125 | | 125 | | |
| Mean | 543 | 495 | 19% | 591 | 11% | 39% |
| Std. Dev. | 1054 | 928 | 31% | 1215 | 101% | 94% |
| CV | 1.94 | 1.88 | | 2.06 | | |
| Minimum | 100 | 61 | -20% | 49 | | |
| Maximum | 8460 | 7280 | 32% | 9640 | | |

### Table 14.4 Pulp Duplicate Assay Statistics – Silver

| | **External Check Assays – Silver** | | | | | |
|---|---|---|---|---|---|---|
| | **Average (ppm Ag)** | **Original (ppm Ag)** | **Diff %** | **Duplicate (ppm Ag)** | **Rel Diff %** | **AV Rel Diff %** |
| Count | 339 | 339 | | 339 | | |
| Mean | 4 | 4 | -5% | 4 | 4% | 40% |
| Std. Dev. | 8 | 9 | -8% | 8 | 97% | 89% |
| CV | 2.04 | 2.08 | | 2.02 | | |
| Minimum | 0 | 0 | 0% | 0 | | |
| Maximum | 74 | 79 | -14% | 68 | | |
| | **External Check Assays – Silver Above Cutoff Grade (5 ppm Ag)** | | | | | |
| | **Average (ppm Ag)** | **Original (ppm Ag)** | **Diff %** | **Duplicate (ppm Ag)** | **Rel Diff %** | **AV Rel Diff %** |
| Count | 86 | 86 | | 86 | | |
| Mean | 14 | 14 | -6% | 13 | -17% | 45% |
| Std. Dev. | 12 | 13 | -9% | 12 | 137% | 130% |
| CV | 0.90 | 0.92 | | 0.90 | | |
| Minimum | 5 | 2 | -50% | 1 | | |
| Maximum | 74 | 79 | -14% | 68 | | |

### 14.2.4 Blanks

Intor inserted field blanks made up of commercial sand into the sample sequence. Clearly there was a bit of contamination early in the program as elevated gold (Figure 14.1) and silver (Figure 14.2) were found in the blanks. While this suggests evidence of poor laboratory sampling/sub-sampling practices, the amount of contamination is not so high to render the results unusable.

**Figure 14.1 Graphical Display of Gold Grades in Blank Samples**

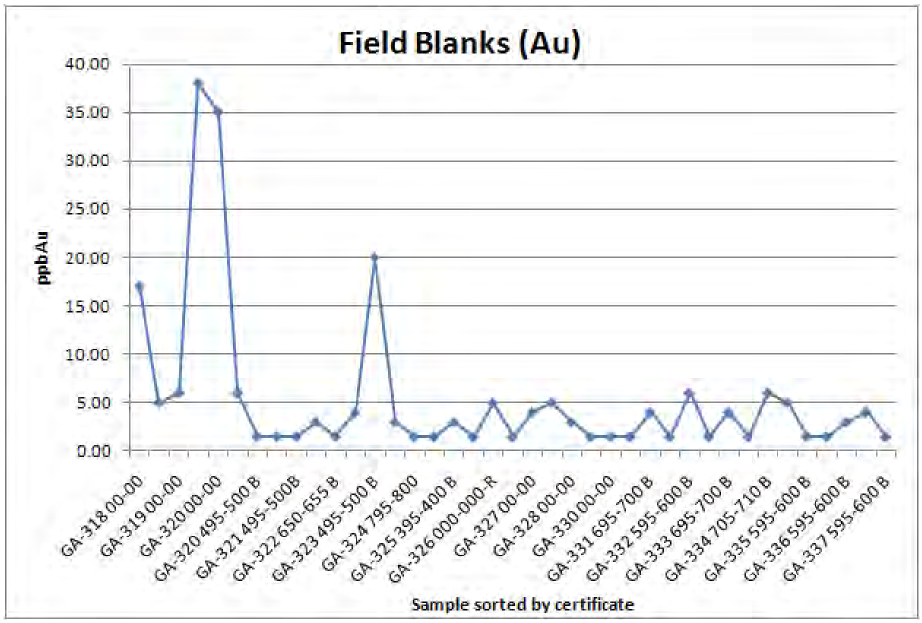
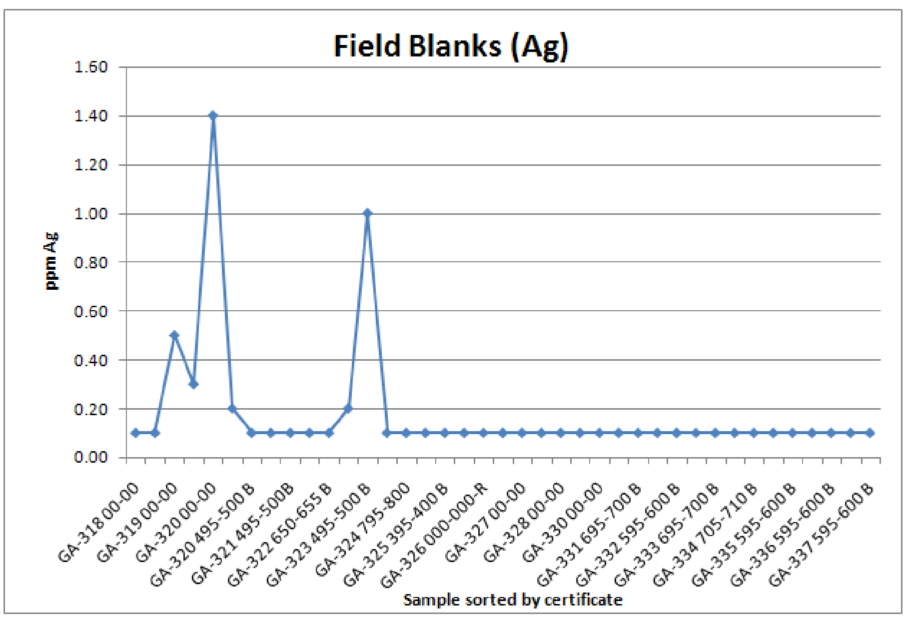



**Figure 14.2 Graphical Display of Silver Grades in Blank Samples**



### 14.2.5 Standards

Intor inserted two different gold standards into the RC drill sample sequence with American Assay. While there was an academically interesting minor high-bias in the lab's grades compared to the first standard (Figure 14.3) and a minor downward drift over time in grades on the second standard (Figure 14.4), analytical accuracy is demonstrated to be sufficiently accurate to allow for the use of these data in resource estimation. There were no certified averages for silver for these two standards, but a graphical display showed the values to fall within a well-defined range, with little to no drift.

**Figure 14.3 Graphical Display of the Gold Standard OXA45**

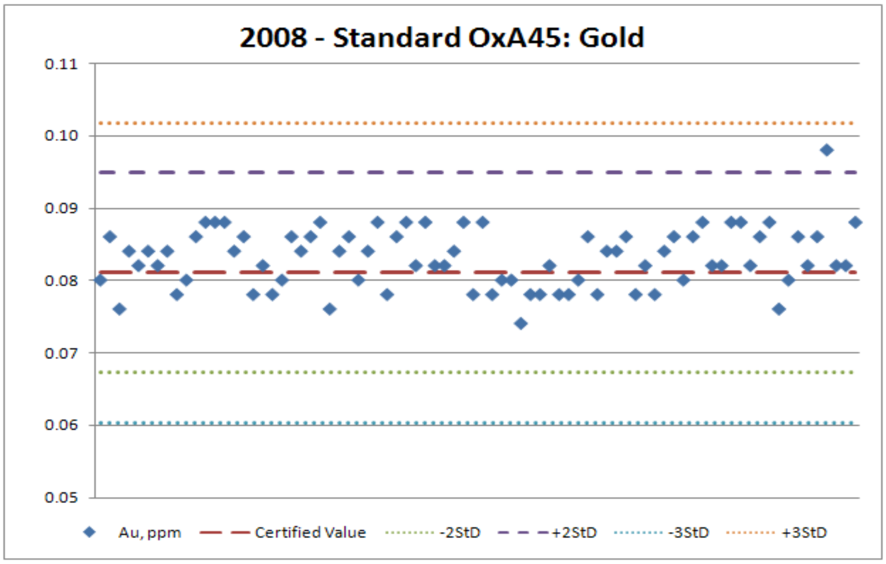
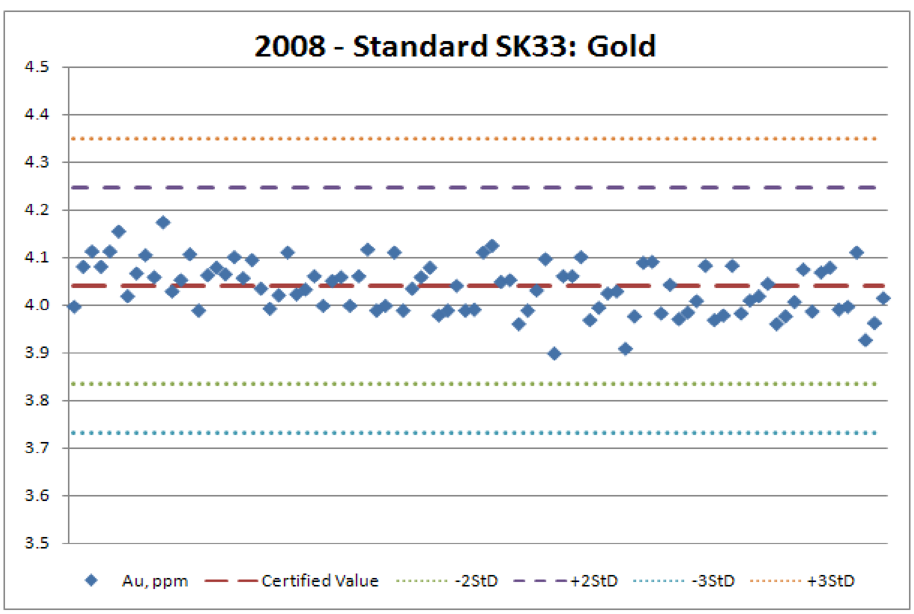



**Figure 14.4 Graphical Display of the Gold Standard SK33**



### 14.2.6 MDA Check Samples of 2008 Core Drilling

MDA independently selected and obtained seven core samples from the 2008 drilling. Those core samples were sawn and assayed by American Assay Labs in Sparks, Nevada. The results, while highly but not unexpectedly variable, and in spite of being generally lower grade, can and do support the existence of mineralization at Golden Arrow (Table 14.5).

**Table 14.5 MDA Check Samples on 2008 Drilling**

| | From (ft) | To (ft) | Original (oz Au/t) | Diff | Check (oz Au/t) | Original (oz Ag/t) | Diff | Check (oz Ag/t) |
|---|---|---|---|---|---|---|---|---|
| GA08-311 | 165.50 | 170.00 | 0.069 | 83% | 0.127 | 0.41 | -26% | 0.30 |
| GA08-312 | 106.50 | 111.00 | 0.008 | 214% | 0.025 | 0.03 | 500% | 0.18 |
| GA08-312 | 611.00 | 616.00 | 0.042 | -66% | 0.014 | 3.44 | -77% | 0.79 |
| GA08-313 | 142.50 | 148.00 | 0.035 | -23% | 0.027 | 1.02 | 22% | 1.25 |
| GA08-314 | 285.00 | 289.00 | 0.228 | -45% | 0.125 | 0.50 | -50% | 0.25 |
| GA08-314 | 577.50 | 582.90 | 0.004 | -59% | 0.002 | 0.12 | 125% | 0.26 |
| GA08-315 | 274.00 | 278.20 | 0.008 | -81% | 0.002 | 0.20 | 41% | 0.29 |
| **Average** | | | **0.056** | **-18%** | **0.046** | **0.82** | **-42%** | **0.47** |

### 14.2.7 2008 QA/QC Program Conclusions

While the second lab assaying the same pulps returned grades materially higher than those from the original lab, which were used in the database and estimation, the standards showed the original lab to be correct. In either case, the grades used in the database are the lower of the two sets, which in this instance are deemed to be more correct.

It is also interesting to note the high variability of duplicate grades received on pulps. While this phenomenon may not be particularly critical for estimating a global resource because there was not bias noted in that test, this will present problems during production if the issue is not addressed in advance.

And finally and inexplicably, the bias between the original field sample and the field duplicate in RC drilling inserts some, albeit minor, uncertainty and curiosity. Any risk caused by this phenomenon is mollified by the fact that the data entered in the database is the primary, and on average, lower grade value.

## 15.0 ADJACENT PROPERTIES

There are no adjacent properties of consequence or that could have any implications about mineralization or potential mineralization on Golden Arrow.

# 16.0 MINERAL PROCESSING AND METALLURGICAL TESTING

## 16.1 Introduction

This section on mineral processing and metallurgical testing was prepared by Mr. McPartland, a Qualified Professional certified by the Mining and Metallurgical Society of America, and an independent consultant with McClelland Laboratories in Reno, Nevada.

A total of four known metallurgical studies have been conducted on samples from Golden Arrow and were reviewed for this report. Kennecott completed scoping-level metallurgical testing by analyzing a large suite of core and cutting samples for gold and silver, both by fire assay and cyanide-extraction atomic absorption. Dawson Metallurgical Laboratories, Inc. and METCON Research Inc. conducted preliminary bottle roll cyanidation testing programs, in 1987 and 1994, respectively. McClelland Laboratories recently completed a more detailed metallurgical testing program initiated in 2008, which included bottle roll cyanidation testing, column leach cyanidation testing, milling/cyanidation, milling/flotation and milling/gravity concentration testing on a total of 26 drill core composites.

Overall, metallurgical testing indicates significant potential for heap leaching of the Hidden Hill and Gold Coin oxide materials. Simulated heap leach recoveries obtained from the sulfide material are significantly lower than from the oxides. This is based primarily on results from column leach cyanidation testing conducted at McClelland Laboratories and supported by results from bottle roll testing conducted at both METCON Research and McClelland Laboratories.

A limited amount of testing indicates that the material is sensitive to grind size, and milling/cyanidation treatment can be expected to significantly improve gold and silver recoveries, compared to those obtained by heap leaching. A limited amount of gravity concentration testing showed that the higher-grade oxide material contains significant quantities of "free-milling" particulate gold, and that these high-grade oxide materials generally responded well to processing using conventional milling/gravity concentration methods. A limited amount of flotation testing showed that select high-grade sulfide materials responded moderately well to upgrading by conventional milling/bulk sulfide flotation treatment methods. The gravity and flotation concentration testing conducted was very limited in scope. Economic trade-off studies, based in part on significant additional metallurgical testing, would be required to evaluate the potential for heap leaching, milling/cyanidation, milling/gravity concentration or milling/flotation treatment of the Golden Arrow mineralized material.

## 16.2 Dawson (1987)

Dawson Metallurgical Laboratories, Inc. conducted preliminary bottle-roll, cyanide-leach tests on seven drill-hole composite samples in 1987 for Homestake (Thompson, 1987; Jennings, 1988, citing a report of W. R. Stanley dated September 1987, which MDA, Christensen and McPartland have not seen). A summary of results from those tests are provided in Table 16.1.

Bottle roll test gold recovery obtained from nominal 75µm (200 mesh) feed in 48 hours of leaching ranged from 71.7% to 93.7% for oxide material (five samples), was 60.1% for mixed oxide/sulfide material (one sample) and was 47.5% for sulfide material (one sample). It was noted that significant pyrite was detected only in the sulfide sample and speculated that encapsulation of gold in sulfides might help to explain the lower gold recovery obtained from that material. Silver extraction ranged from 48.4% to 83.1% in the oxide material, was 48.0% for the mixed material and was 71.4% for the sulfide material. Cyanide consumption averaged 0.3 kg NaCN/mt of feed for the oxide material and was 1.2 and 2.8 kg NaCN/mt of feed for the mixed and sulfide material, respectively. Cyanide concentration used for these bottle roll tests was relatively high (5.0 g NaCN/L solution), which likely contributed to the high consumption observed with the sulfide material. Lime consumption ranged from 0.7 to 2.9 kg/mt of feed for the oxide and mixed oxide/sulfide material and was 4.8 kg/mt of feed for the sulfide material.

**Table 16.1 Summary Results, Milling/Cyanidation (Bottle Roll) Tests, Golden Arrow Drill-Hole Composite Samples, Nominal 75µm Feeds, Dawson Metallurgical**

| Sample | Drill Hole | Interval | Sample Type | Au Rec. % | Calc'd. Head gAu/mt | Ag Rec. % | Calc'd. Head gAg/mt | Reagents Required kg/mt ore NaCN Cons. | Reagents Required kg/mt ore Lime Added |
|---|---|---|---|---|---|---|---|---|---|
| 6943AL | GA1 | 160-185' | Oxide | 77.6 | 0.93 | N/A | N/A | <0.05 | 1.1 |
| 6944AL | GA1 | 255-275' | Oxide | 89.7 | 1.99 | N/A | N/A | 0.65 | 2.9 |
| 6945AL | GA1 | 275-295' | Oxide | 93.7 | 3.84 | 48.4 | 27 | 0.55 | 0.7 |
| 6946AL | GA2 | 55-70' | Oxide | 71.7 | 0.72 | 83.1 | 31 | 0.05 | 1.9 |
| 6947AL | GA2 | 125-140' | Oxide | 91.8 | 1.68 | 61.6 | 5 | 0.25 | 2.4 |
| 6948AL | GA6 | 120-155' | Mixed | 60.1 | 1.37 | 48.0 | 21 | 1.15 | 2.9 |
| 6949AL | GA6 | 250-285' | Sulfide | 47.5 | 0.86 | 71.4 | 11 | 2.75 | 4.8 |

## 16.3 METCON (1994)

METCON Research Inc. completed a suite of 13 bottle roll tests for various materials at different grinds and retention times for five drill-hole composite samples from Coeur in 1994 (Ortega, 1994; Wilder, 1994). A letter from Steven Murray (consulting geologist) dated Sept. 13, 1994 describes these samples. Drill hole GA-121C was described as being a core hole from the Hidden Hill area, while GA-166 was described as being a reverse circulation drill hole from the greater Gold Coin area. Summary results from the bottle roll tests are presented in Table 16.2. As noted in Table 16.2, there were some minor discrepancies between sample descriptions noted in the METCON report and noted in the Steven Murray letter.

Gold recovery obtained in 72 hours of leaching at a -1.7mm (10 mesh) feed size ranged from 77.6% to 86.5% for oxide material (two samples), was 86.4% for mixed oxide/sulfide material (one sample) and ranged from 55.3% to 72.0% for sulfide material (two samples). Fine grinding to 80%-75µm (200 mesh) in size improved gold recovery from the high-grade oxide material (1 sample) and high grade sulfide material (1 sample) by approximately 10%. Roasting of the high-grade sulfide material resulted in a small increase in gold extraction (from 82.3% to 84.9%) and a 35% decrease in silver extraction, compared to that of the sample not roasted. It should be noted that the high-grade sulfide sample evaluated for roasting was not particularly refractory to conventional cyanidation treatment, which limited the usefulness of the roasting test. Cyanide consumption did not exceed 0.50 kg NaCN/mt feed for any of the direct cyanidation tests. Lime requirements for direct cyanidation ranged from 1.2 to 2.7 kg/mt feed. Ortega (1994) noted that "*The reagent consumptions are considered preliminary and actual reagent consumptions obtained under actual leaching conditions may vary*."

**Table 16.2 Summary Results,Agitated Cyanidation (Bottle Roll) Tests, Golden Arrow Drill Hole Composite Samples, METCON Research**

| Drill Hole[1] | Interval | Sample Type | Feed Size | Leach Time, hours | Au Rec. % | Calc'd. Head gAu/mt | Ag Rec. % | Calc'd. Head gAg/mt | Reagents Required kg/mt feed NaCN Cons. | Reagents Required kg/mt feed Lime Added |
|---|---|---|---|---|---|---|---|---|---|---|
| GA-121C | 253-382[2] | Oxide | -1.7mm | 24 | 74.5 | 6.45 | 32.2 | 30 | 0.33 | 1.2 |
| GA-121C | 253-382[2] | Oxide | -1.7mm | 72 | 86.5 | 6.07 | 39.1 | 28 | 0.40 | 1.3 |
| GA-121C | 253-382[2] | Oxide | 80%-75µm | 48 | 96.0 | 6.79 | 59.3 | 34 | 0.40 | 1.5 |
| GA-166 | 125-180[3] | Oxide | -1.7mm | 24 | 69.5 | 0.89 | 52.4 | 13 | 0.41 | 1.4 |
| GA-166 | 125-180[3] | Oxide | -1.7mm | 72 | 77.6 | 0.93 | 60.9 | 12 | 0.31 | 1.5 |
| GA-166 | 225-280[4] | Mixed[6] | -1.7mm | 24 | 65.9 | 0.58 | 66.3 | 21 | 0.43 | 2.4 |
| GA-166 | 225-280[4] | Mixed[6] | -1.7mm | 72 | 86.4 | 0.51 | 67.8 | 23 | 0.47 | 2.7 |
| GA-166 | 325-410[5] | Sulfide | -1.7mm | 24 | 43.7 | 2.91 | 56.6 | 6 | 0.43 | 2.0 |
| GA-166 | 325-410[5] | Sulfide | -1.7mm | 72 | 72.0 | 1.47 | 77.3 | 6 | 0.46 | 2.0 |
| GA-166 | 325-410[5] | Sulfide | 80%-75µm | 48 | 82.3 | 1.92 | 61.4 | 6 | 0.19 | 2.5 |
| GA-166 | 325-410[5] | Sulfide | 80%-75µm[7] | 48 | 84.9 | 1.82 | 26.6 | 6 | 0.54 | 5.6 |
| GA-121C | 382-463 | Sulfide | -1.7mm | 24 | 34.4 | 0.62 | 42.5 | 8 | 0.25 | 1.8 |
| GA-121C | 382-463 | Sulfide | -1.7mm | 72 | 55.3 | 0.45 | 63.2 | 6 | 0.30 | 2.0 |

1) Steven R. Murray (Consulting Geologist) letter to Glen Atwood & Al Wilder, dated Sept. 13, 1997.
2) Steven R. Murry letter refers to interval as 253-302; 366-382.
3) Steven R. Murry letter refers to interval as 125-150.
4) Steven R. Murry letter refers to interval as 225-250.
5) Steven R. Murry letter refers to interval as 325-400.
6) Steven R. Murry letter refers to interval as being oxide material.
7) Milled sample was roasted before cyanidation.

## 16.4 Discussion of Historic Testwork

During their tenure on the property, Kennecott completed scoping-level metallurgical testing by analyzing a large suite of core samples for gold and silver, both by fire assay and cyanide-extraction atomic absorption. Christensen (2006a) evaluated Kennecott's data. A total of 447 mineralized drill samples had a mean average grade of 0.040 oz Au/ton (1.4 g Au/t) and 0.492 oz Ag/ton (16.6 g Ag/t). The mean AuCN/AuFA ratio was 0.815, and the mean AgCN/AgFA ratio was 0.769. A linear regression of AuCN to AuFA yields a line with a slope of 0.70, suggesting that higher-grade samples have a somewhat lower cyanide recovery. The average Ag/Au ratio in samples was 12:1. There is a suggestion that gold recovery decreases slightly with depth and that there is a secondary enrichment of silver at a depth of about 400ft (122m) (Christensen, 2006a).

B. M. Clem and the Golden American Joint Venture reportedly conducted column-leach tests of waste-dump samples during their work on the property from 1981 to 1984, but documentation is not available.

## 16.5 McClelland Laboratories

Nevada Sunrise engaged McClelland Laboratories of Sparks Nevada, to complete a suite of metallurgical tests on drill core from the 2008 drilling at Golden Arrow. That testing program has recently been completed (final report pending). The testing was designed to determine amenability to heap leach cyanidation, milling/cyanidation, gravity concentration and bulk sulfide flotation treatment, and to obtain information concerning variability of the samples. Testing is also being conducted to characterize mineralized material and waste for environmental planning. The test program includes a complete multi-element chemical analysis of all drill core material, bottle-roll cyanide recovery testing, cyanide column-leach recovery testing, gravity-recoverable gold tests, bulk sulfide flotation tests, meteroric water mobility testing, and acid-base accounting.

Amenability/variability testing has been completed by McClelland Laboratories on 20 drill core composite samples from five drill holes (McPartland, 2009). Bottle-roll tests were run on each composite at an 80%-1.7mm feed size to obtain information concerning heap leach amenability and to evaluate ore variability. On four higher-grade composites, testing also included a milling/cyanidation test at 75µm, a gravity concentration test at 150µm, and bulk sulfide flotation testing at 75µm. Gravity concentration tests were also conducted on three other drill core interval samples. Summary (average) results from the cyanidation bottle roll tests are presented in Table 16.3. Summary results from the process selection testing conducted on four high-grade composites are presented in Table 16.4.

Cyanidation test results generally show that the oxide samples were amenable to cyanidation treatment at the -1.7 mm feed size. Average gold and silver recoveries from oxide samples were 68.5% and 29.7%, respectively, in 96hrs of leaching. Sulfide samples were, as expected, less amenable to cyanidation treatment, with average gold and silver recoveries of 43.1% and 40.0%, respectively. Cyanide consumptions were low, and lime requirements were moderate for all of the -1.7mm bottle roll tests.

Milling/cyanidation tests were conducted for four higher-grade composites, including two oxide composites (#2 and #4) and two sulfide composites (#15 and #19). All four samples (oxide and sulfide type material) were amenable to milling/cyanidation treatment at an 80%-75µm (200 mesh) feed size. Gold recoveries ranged from 81.0% to 89.4% in 72 hours of leaching. Corresponding silver recoveries ranged from 53.1% to 77.6%. Gold recovery rates were slow for oxide samples, suggesting the need for a longer leach cycle. Reagent requirements were low to moderate, and incrementally higher than for the corresponding -1.7mm tests.

**Table 16.3 Average Results, Agitated Cyanidation (Bottle Roll) Tests, Golden Arrow Drill-Hole Composite Samples, McClelland Laboratories, Inc.**

| Sample Type | No. of Samples | Feed Size | Leach Time, hours | Au Rec. % | Calc'd. Head gAu/mt | Ag Rec. % | Calc'd. Head gAg/mt | Reagents Required kg/mt feed NaCN Cons. | Reagents Required kg/mt feed Lime Added |
|---|---|---|---|---|---|---|---|---|---|
| All | 23 | 80%-1.7mm | 96 | 57.5 | 1.69 | 34.2 | 28.8 | 0.20 | 2.7 |
| Oxide | 13 | 80%-1.7mm | 96 | 68.5 | 1.56 | 29.7 | 19.4 | 0.12 | 2.1 |
| Sulfide | 10 | 80%-1.7mm | 96 | 43.1 | 1.55 | 40.0 | 40.9 | 0.28 | 3.4 |
| HG | 4 | 80%-1.7mm | 96 | 53.7 | 3.62 | 48.4 | 52.9 | 0.14 | 2.2 |
| HG | 4 | 80%-75µm | 96 | 86.0 | 3.84 | 70.2 | 53.1 | 0.25 | 3.7 |

**Table 16.4 Summary Results, Process Selection Tests, Golden Arrow Drill-Hole Composite Samples, McClelland Laboratories, Inc.**

| Comp. | Drill Hole | Interval | Test Type | Feed Size | Weight to Cl. Conc., % of total | Cl. Conc. Grade gAu/mt | Cl. Conc. Grade gAg/mt | Head Grade gAu/mt | Head Grade gAg/mt | Recovery[1] % Au | Recovery[1] % Ag |
|---|---|---|---|---|---|---|---|---|---|---|---|
| #2 | GA-311 | 108-174' | Gravity | 80%-150µm | 0.25 | 1255 | 5100 | 4.63 | 33.8 | 69.1 | 39.1 |
| #2 | GA-311 | 108-174' | Flotation | 80%-75µm | 3.18 | 30.60 | 431 | 1.61 | 25.0 | 80.3 | 65.7 |
| #2 | GA-311 | 108-174' | Cyanidation | 80%-1.7mm | N/A | N/A | N/A | 4.75 | 34.5 | 50.7 | 54.5 |
| #2 | GA-311 | 108-174' | Cyanidation | 80%-75µm | N/A | N/A | N/A | 5.86 | 37.1 | 84.8 | 77.6 |
| #4 | GA-311 | 272-312' | Gravity | 80%-150µm | 0.45 | 408 | 1665 | 3.24 | 45.1 | 59.4 | 59.4 |
| #4 | GA-311 | 272-312' | Flotation | 80%-75µm | 16.12 | 7.63 | 148 | 3.11 | 42.7 | 47.0 | 65.7 |
| #4 | GA-311 | 272-312' | Cyanidation | 80%-1.7mm | N/A | N/A | N/A | 2.93 | 45.5 | 62.5 | 54.5 |
| #4 | GA-311 | 272-312' | Cyanidation | 80%-75µm | N/A | N/A | N/A | 3.30 | 49.8 | 89.4 | 77.3 |
| #15 | GA-313 | 504-559' | Gravity | 80%-150µm | 0.34 | 194.5 | 1520 | 2.04 | 91.2 | 66.9 | 26.6 |
| #15 | GA-313 | 504-559' | Flotation | 80%-75µm | 7.95 | 17.15 | 832 | 1.98 | 88.3 | 70.6 | 78.1 |
| #15 | GA-313 | 504-559' | Cyanidation | 80%-1.7mm | N/A | N/A | N/A | 1.84 | 95.0 | 48.5 | 31.9 |
| #15 | GA-313 | 504-559' | Cyanidation | 80%-75µm | N/A | N/A | N/A | 2.41 | 88.9 | 81.0 | 53.1 |
| #19 | GA-314 | 500-555' | Gravity | 80%-150µm | 0.33 | 348 | 1380 | 4.08 | 34.5 | 39.1 | 19.1 |
| #19 | GA-314 | 500-555' | Flotation | 80%-75µm | 3.19 | 106.50 | 691 | 4.11 | 31.6 | 90.0 | 85.8 |
| #19 | GA-314 | 500-555' | Cyanidation | 80%-1.7mm | N/A | N/A | N/A | 4.38 | 36.4 | 53.2 | 52.5 |
| #19 | GA-314 | 500-555' | Cyanidation | 80%-75µm | N/A | N/A | N/A | 4.37 | 36.5 | 88.6 | 72.6 |

1) Reported recoveries for gravity concentration and flotation concentrate testing are values reporting to the rougher concentrate.
These recoveries do not include any discount for values lost during subsequent processing of the concentrate products for metals recovery.

A total of 7 samples (including the four high-grade composites shown in Table 16.4) were presented to McClelland Laboratories for gravity concentration testing, with calculated head grades between 0.98 and 44.63 g Au/t. Gravity gold recovery (to cleaner concentrate) for the five oxide samples was highly variable between 4.7% and 67.8%; gravity gold recovery for the two sulfide samples was 28.2% and 32.4%. There is a suggestion that gravity gold recovery correlates with sample grade; higher-grade samples had higher gold recovery, generally. Microscopic examination of the gravity cleaner concentrates revealed the presence of particulate gold values in concentrates produced from all but the lowest grade oxide samples. No free gold was observed in concentrates produced from the sulfide samples.

Flotation tests on four higher-grade composite samples returned recoveries of 80.3% and 47.0% for oxide composites and 70.6% and 90.0% for sulfide composites. Silver recoveries were 65.7% for the oxide composites and 78.1% and 85.8% for the sulfide composites. Weight reporting to the flotation rougher concentrate was equivalent to between 8.2% and 17.4% of the feed weight.

The gravity concentration and flotation concentration recoveries discussed in this report do not include any discount for losses of precious metals that may occur during subsequent processing of the concentrate products for recovery of gold and silver. Additional metallurgical testing would be required to quantify those gold and silver losses.

Column percolation leach tests were recently completed at McClelland Laboratories on three drill-core "master" composite samples, comprised of the same drill core intervals as used for the amenability/variability testing described in the preceding paragraphs. The composites were described as Hidden Hill oxide master composite, Gold Coin oxide master composite and sulfide zone master composite. The tests were conducted to determine gold and silver recovery, recovery rate and reagent requirements under simulated heap-leaching conditions. Tests on the Hidden Hill oxide and sulfide zone master composites were each conducted at nominal (55% to 66% passing) 32mm and 80%-9.5mm feed sizes to determine crush size sensitivity of the ore. Summary results from the column leach tests, with comparative bottle roll test results on the same samples are presented in Table 16.5.

**Table 16.5 Summary Results, Cyanidation Tests, Golden Arrow Drill-Hole Master Composite Samples, McClelland Laboratories, Inc.**

| Master Comp. | Test Type | Feed Size | Leach Time, days | Au Rec. % | Calc'd. Head gAu/mt | Ag Rec. % | Calc'd. Head gAg/mt | Reagents Required kg/mt feed NaCN Cons. | Reagents Required kg/mt feed Lime Added |
|---|---|---|---|---|---|---|---|---|---|
| Hidden Hill Oxide (#21) | Column | 55%-32mm | 163 | 59.3 | 1.35 | 35.3 | 17.0 | 2.33 | 1.8 |
| Hidden Hill Oxide (#21) | Column | 80%-9.5mm | 163 | 54.9 | 2.64 | 45.5 | 25.7 | 2.78 | 1.8 |
| Hidden Hill Oxide (#21) | BRT | 80%-1.7mm | 4 | 59.1 | 5.28 | 56.9 | 23.9 | <0.07 | 2.2 |
| Golden Coin Oxide (#22) | Column | 80%-9.5mm | 163 | 77.6 | 1.83 | 13.0 | 23.0 | 2.73 | 1.6 |
| Golden Coin Oxide (#22) | BRT | 80%-1.7mm | 4 | 73.1 | 1.56 | 19.4 | 23.2 | <0.07 | 2.0 |
| Sulfide Zone Master (#23) | Column | 66%-32mm | 163 | 44.8 | 1.45 | 43.2 | 31.7 | 2.14 | 3.0 |
| Sulfide Zone Master (#23) | Column | 80%-9.5mm | 163 | 55.4 | 1.48 | 50.1 | 36.1 | 2.55 | 3.0 |
| Sulfide Zone Master (#23) | BRT | 80%-1.7mm | 4 | 65.4 | 1.62 | 49.0 | 39.2 | 0.29 | 3.8 |

Gold recoveries obtained from the Hidden Hill oxide master composite were 59.3% (32mm) and 54.9% (9.5mm). Gold recovery obtained from the Gold Coin oxide master composite at the 9.5mm feed size was 77.6%. Gold recoveries obtained from the sulfide zone master composite were 44.8% (32mm) and 55.4% (9.5mm) feed sizes.

Gold head grades were erratic, particularly for the Hidden Hill oxide master composite, indicating the presence of free milling, particulate gold values. This observation is supported by gravity concentration testing conducted on other composites from the project (discussed in preceding paragraphs). Abnormally high assay variability was encountered during assaying of the Hidden Hill oxide master composite column-leached residues, indicating that some of the contained particulate gold may not have been completely recovered during leaching. The indicated feed size sensitivity for the Hidden Hill oxide master composite was believed to result from assay variability, and gold recoveries obtained from that composite at the two feed sizes were considered to be essentially the same. Gold recovery rates were fairly slow, again in particular for the Hidden Hill oxide master composite, and gold extraction was progressing at a slow rate from all of the feeds when leaching was terminated after about 165 days. Longer leaching cycles would improve gold recoveries, and very long commercial heap leach cycles may be required to maximize gold recovery from material represented by these composites.

Calculated head grades for the samples subjected to column testing ranged from 0.039 to 0.077 oz Au/ton, which is significantly higher than the Golden Arrow resources discussed elsewhere in this report. Further metallurgical testing will be required to determine the effects of gold grade on heap leach recoveries.

Comparison between column leach test results and short-term bottle roll test results from the same composites tested at McClelland Laboratories indicate that bottle roll test gold recoveries (4 day leach cycle at 1.7mm feed size) fairly accurately predicted (± 5%) long-term column leach test gold recoveries from the oxide material at a coarser (9.5mm) feed size. Bottle roll test gold recovery from the sulfide material (1.7mm feed size) was 10% higher than obtained during column testing at the 9.5mm feed size. This comparison supports the use of 1.7mm bottle roll test gold recoveries to help in developing a heap leach recovery model for the oxide material, but indicates that the sulfide material is more sensitive to feed size and will require more caution when considering fine feed size bottle roll test data.

Column test silver recoveries from the Hidden Hill oxide master composite and the sulfide master composite at both feed sizes evaluated ranged from 35.3% to 50.1%. Silver recovery from the Gold Coin oxide master composite was 13.0%

Column test cyanide consumptions were high, and ranged from 2.1 to 2.8 kg NaCN/mt feed. The high cyanide consumptions are believed to result in part from the unusually long (163 day) column leach cycles employed. Bottle test cyanide consumptions (1.7mm feed size) for the same composites were low (0.3 kgNaCN/mt feed for the sulfide zone master composite and <0.07 kgNaCN/mt feed for the oxide composites). The 1.6 to 3.0 kg lime/mt feed added before leaching was sufficient for maintaining protective alkalinity during leaching. Moderately higher initial lime additions for material represented by the sulfide zone master composite may be effective in decreasing cyanide consumption.

Load/permeability ("Load vs Hydraulic Conductivity") tests were conducted by AMEC Earth and Environmental, Inc. on the two McClelland Laboratories oxide material composite column leached residues (9.5mm feed size) to determine permeability under simulated heap stack height compressive loadings. Results from those two tests showed that hydraulic conductivity was greater than $6.0 \times 10^{-2}$ cm/sec at simulated heap stack heights of as high as 100ft. These hydraulic conductivities are considered to be within normally accepted limits for conventional mult-lift heap leaching (up to a 100ft simulated heap stack height).

Evaluation of coarser crushing or ROM heap leaching is recommended for the ores represented by the Hidden Hill and Gold Coin oxide master composites. Evaluation of finer crushing, including possibly HPGR (high pressure grinding roll) grinding is recommended for the ore represented by the sulfide zone ore type, if sufficient ore of this type exists to warrant the expected higher capital and operating costs associated with finer crushing. Further heap leach ore variability testing will also be required.

Available column test results support the preliminary heap leach recovery estimate made by Wilder (1984) 65% (75% to 55% range suggested) for -1/2" feed for the oxide type material. The single column test on sulfide type material (55% Au recovery at 3/8" feed size) indicates that commercial heap leach recovery from the sulfide type material may be somewhat lower.

## 17.0 MINERAL RESOURCE ESTIMATE

The resource reported herein is an update (Ristorcelli and Christensen, 2009) to the first independent reported 43-101-compliant estimate completed for Nevada Sunrise in 2008 (Ristorcelli and Christensen, 2008). No further information on the resource estimate has been added for the current report.

### 17.1 Database

The Golden Arrow database was modified with drill data from the Golden Arrow 2008 exploration program. Those data were audited and then used in modeling. Auditing the database and general database discussion were described in Section 14.0 Data Verification of this report. There are a total of 28,864 gold assays and 24,297 silver assays in the entire Golden Arrow database. Cyanide soluble gold assays are few, amounting to 921 for gold and 261 for silver. The average drill spacing at Gold Coin is 130ft (39m), and at Hidden Hill it is 100ft (30m). Details of the database are given in Table 17.1.

**Table 17.1 Descriptive Statistics of the Golden Arrow Database**

| All Data | | | | AuCap | 1.5 | | AgCap | 13.0 |
|---|---|---|---|---|---|---|---|---|
| | Valid N | Median | Mean | Std.Dev. | CV | Minimum | Maximum | Units |
| Au | 28,864 | 0.002 | 0.007 | 0.042 | 5.914 | 0.000 | 3.770 | oz/t |
| Au Capped | 26,397 | 0.002 | 0.008 | 0.035 | 4.625 | 0.000 | 1.500 | oz/t |
| Ag | 24,297 | 0.03 | 0.14 | 0.49 | 3.49 | 0.00 | 17.85 | oz/t |
| Ag Capped | 22,650 | 0.03 | 0.15 | 0.44 | 2.99 | 0.00 | 13.00 | oz/t |
| Au CN | 921 | 0.01 | 0.03 | 0.06 | 2.35 | 0.00 | 1.17 | oz/t |
| Ag CN | 261 | 0.17 | 0.39 | 0.97 | 2.50 | 0.01 | 14.60 | oz/t |

Note: The differences in number of uncapped and capped grades is that the uncapped is for the entire database and capped is for the database samples lying within the limits of the model.

### 17.2 Modeling

The geologic sections were updated with the new drill data, and in so doing, it became clear that the lithologic model needed no fundamental changes for either Gold Coin or Hidden Hill (Figure 17.1, Figure 17.2, Figure 17.3, and Figure 17.4; all of which are derived from the pre-2009 database). Nevertheless, the lithologic model was modified to reflect the changes imparted by the 2008 drilling. Using the geology as a guide along with the color-coded assays representing natural distributions, mineral domains were modified using the new drill data. As with the lithology but even more so, the new post-2008-model drilling verified the 2008 model in that the domains needed few changes and none fundamental.

Essentially two styles of gold mineralization were modeled: a disseminated or permeability controlled flooding type of mineralization and a more structurally controlled style of mineralization in each of Gold Coin and Hidden Hill. Confidence is high in the sub-horizontal flooding type of mineralization but less so in the steeper-dipping zones, especially at Hidden Hill. This steeper-dipping mineralization is not without precedent as the historic mining took place on moderately dipping mineralized structures. Consequently, MDA allowed for Measured resources only in the sub-horizontal flooding type of mineralization.

**Figure 17.1 Quantile Plot of Gold Grades at Gold Coin**

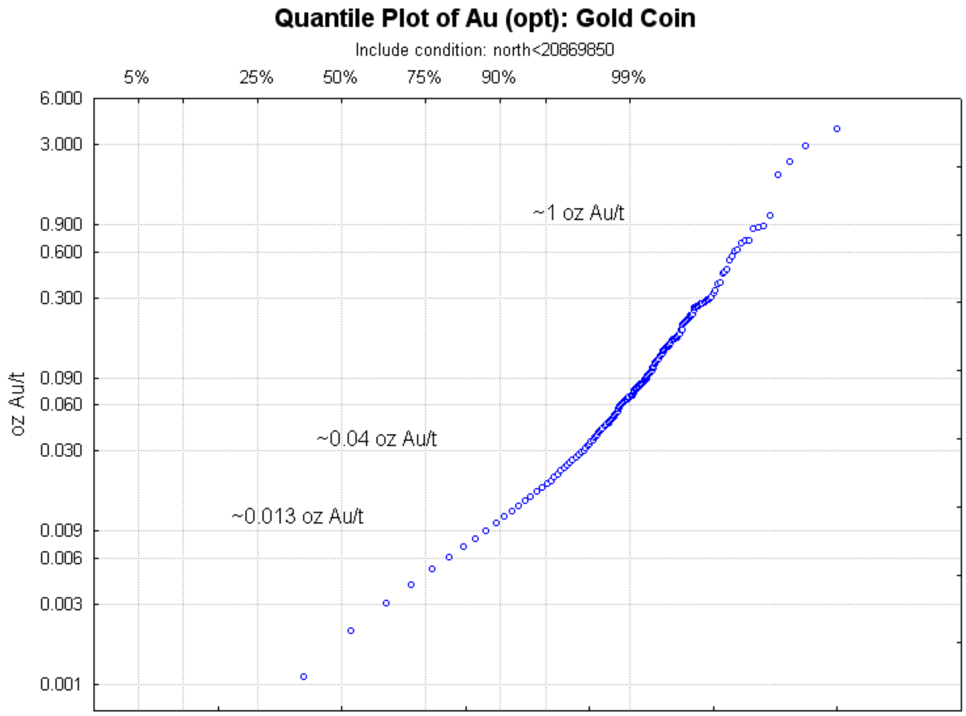
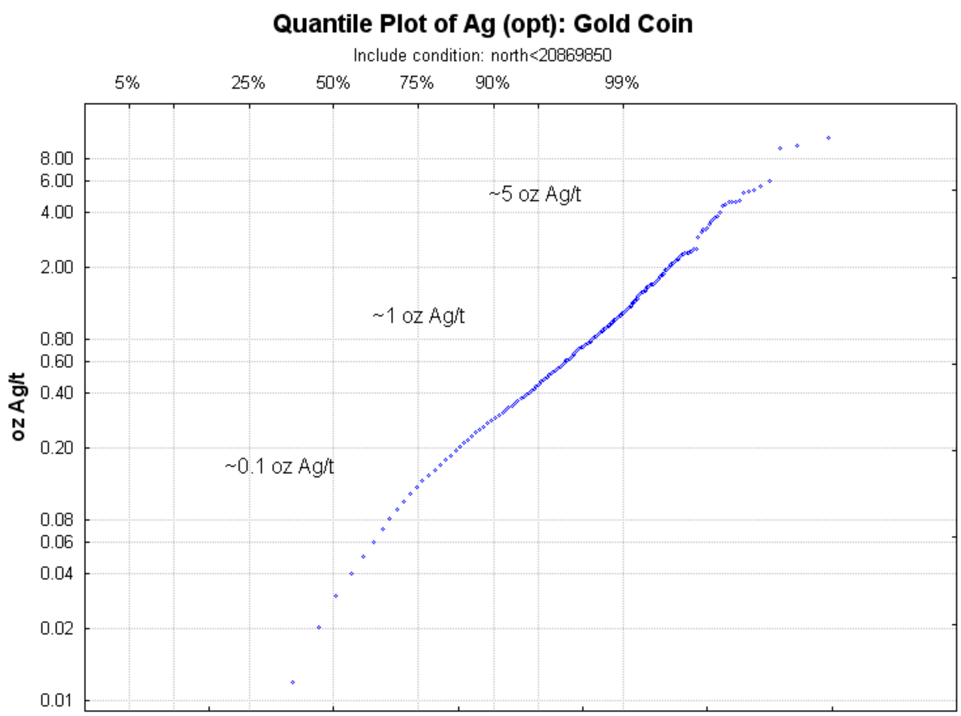
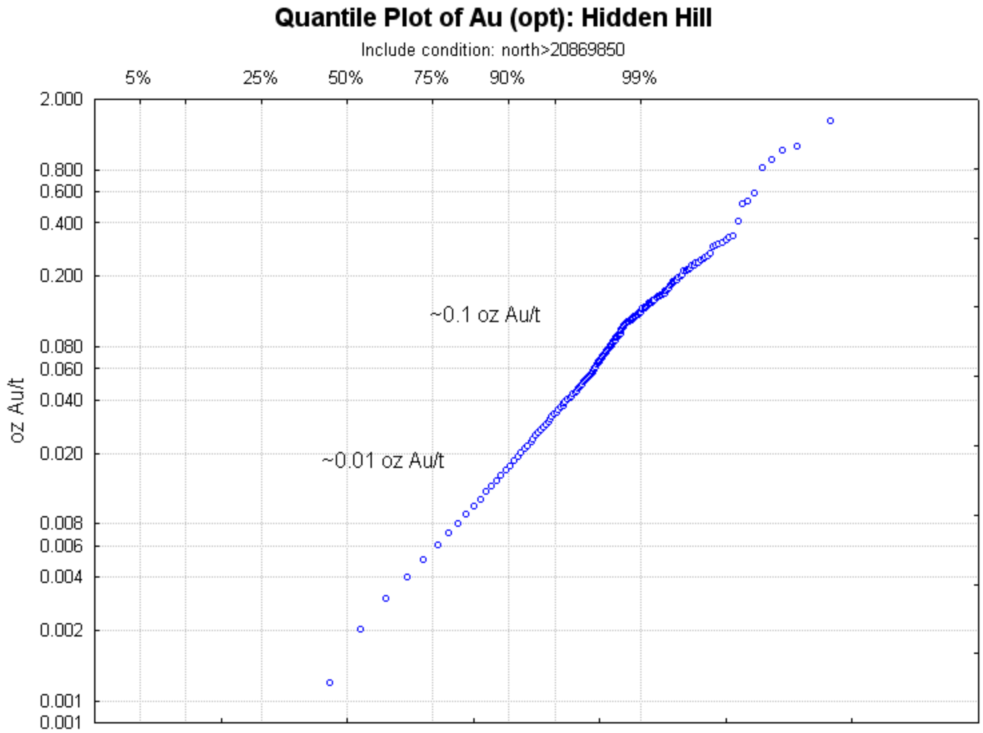


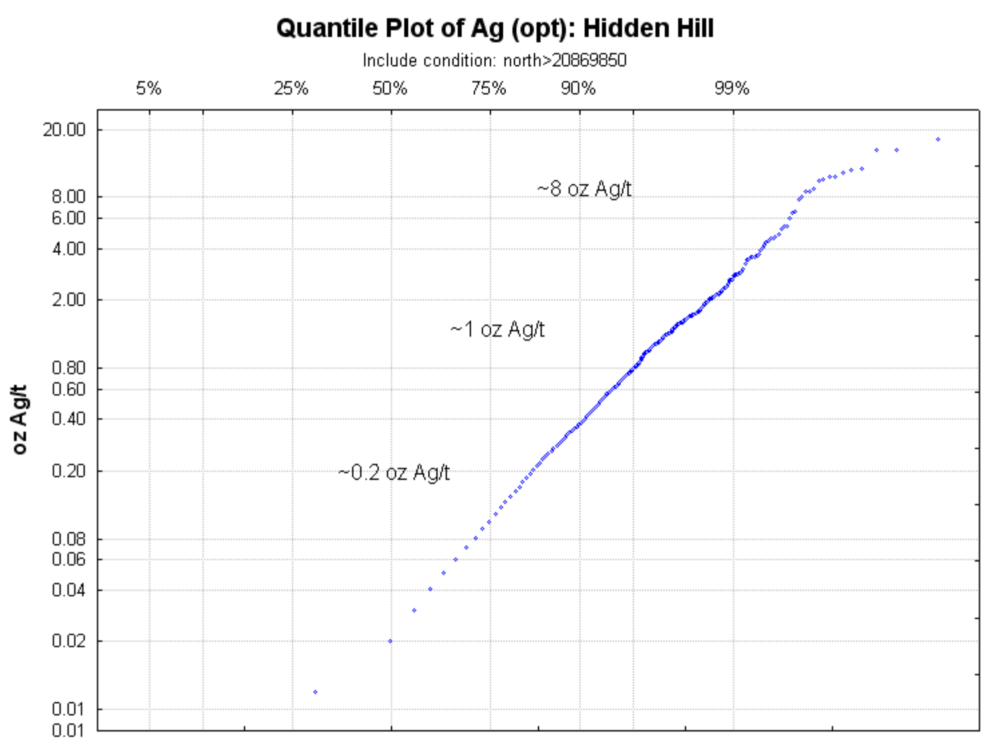

**Figure 17.2 Quantile Plot of Silver Grades at Gold Coin**



## Figure 17.3 Quantile Plot of Gold Grades at Hidden Hill




## Figure 17.4 Quantile Plot of Silver Grades at Hidden Hill



The horizontal to sub-horizontal disseminated mineralization lies mostly within the volcaniclastic rocks near the top of the andesite and sub-parallel to that contact. These sub-horizontal deposits can dip up to $10^{o}$ and seem to occur over or near depressions in the top of the andesite. The orientation of the steeper-dipping mineralized bodies strikes northwest at about azimuth ~$300^{o}$ and dips southwest at about $50^{o}$. Descriptive statistics of the gold data used in mineral domain modeling are given Table 17.2 and Table 17.3.

Silver domain modeling was done in a similar fashion and with similar results, namely two dominant orientations, sub-horizontal and moderately dipping. However, silver also has an overprint of supergene enrichment, which complicates the modeling. Relatively large bodies of silver mineralization lie sub-parallel to the oxide/unoxidized interface. Statistics of the silver data set are given in Table 17.2 and Table 17.3.

The original interpretation was made on irregularly spaced (average about 125ft (38m) spacing) sections looking north-northwest. These sections' geology and mineral domains were digitized, loaded into MineSight® mining software, and cleaned. Attempts were made to build three-dimensional solids of both silver and gold zones, but these solids were found to be too complicated for efficient and accurate modeling. As a consequence, the non-orthogonal sections were sliced to east-west-oriented sections spaced 20ft (6m) apart along block centers. The mineral domains were re-interpreted on these sections, which were used to code samples and the block model. Solids were made for the andesite and unoxidized material. A surface was made at the bottom of the alluvium. Figure 17.5, Figure 17.6, Figure 17.7, and Figure 17.8 show typical gold and silver models for Gold Coin and Hidden Hill, respectively. Statistics (Table 17.2 and Table 17.3) and quantile plots of the metals were completed by domain. Capping levels were chosen based on quantile plots of the zone-grade distributions, coefficients of variation, and a review of the locations of samples. Each zone has a different capping level.

## Table 17.2 Descriptive Statistics of the Gold Coin Database Used for Resource Estimation

| **Gold Coin** | **Zone** | **Low grade Au** | | **AuCap** | **0.12** | | | |
|---|---|---|---|---|---|---|---|---|
| | **Valid N** | **Median** | **Mean** | **Std.Dev.** | **CV** | **Minimum** | **Maximum** | **Units** |
| Au | 1,982 | 0.012 | 0.015 | 0.013 | 0.831 | 0.000 | 0.127 | oz/t |
| Difference | | | 0% | | | | | |
| Au Capped | 1,982 | 0.012 | 0.015 | 0.012 | 0.828 | 0.000 | 0.120 | oz/t |
| Ag | 1,970 | 0.20 | 0.30 | 0.39 | 1.30 | 0.00 | 9.01 | oz/t |
| Ag Capped | 1,970 | 0.20 | 0.29 | 0.32 | 1.10 | 0.00 | 2.92 | oz/t |
| AuCN | 114 | 0.01 | 0.01 | 0.01 | 0.68 | 0.00 | 0.07 | oz/t |
| AgCN | - | 0.00 | 0.00 | 0.00 | NA | 0.00 | 0.00 | oz/t |

| **Gold Coin** | **Zone** | **High grade Au** | | **AuCap** | **1.5** | | | |
|---|---|---|---|---|---|---|---|---|
| | **Valid N** | **Median** | **Mean** | **Std.Dev.** | **CV** | **Minimum** | **Maximum** | **Units** |
| Au | 278 | 0.079 | 0.172 | 0.326 | 1.895 | 0.003 | 3.770 | oz/t |
| Difference | | | -7% | | | | | |
| Au Capped | 278 | 0.079 | 0.160 | 0.228 | 1.427 | 0.003 | 1.500 | oz/t |
| Ag | 274 | 0.61 | 1.20 | 1.87 | 1.56 | 0.00 | 17.85 | oz/t |
| Ag Capped | 274 | 0.61 | 1.09 | 1.34 | 1.23 | 0.00 | 7.00 | oz/t |
| AuCN | 28 | 0.06 | 0.09 | 0.09 | 1.00 | 0.01 | 0.31 | oz/t |
| AgCN | - | 0.00 | 0.00 | 0.00 | NA | 0.00 | 0.00 | oz/t |

| **Gold Coin** | **Zone** | **Low grade Ag** | | | | | **AgCap** | **2.5** |
|---|---|---|---|---|---|---|---|---|
| | **Valid N** | **Median** | **Mean** | **Std.Dev.** | **CV** | **Minimum** | **Maximum** | **Units** |
| Au | 4,883 | 0.006 | 0.014 | 0.076 | 5.466 | 0.000 | 3.770 | oz/t |
| Au Capped | 4,883 | 0.006 | 0.013 | 0.050 | 3.802 | 0.000 | 1.500 | oz/t |
| Ag | 4,855 | 0.21 | 0.29 | 0.35 | 1.18 | 0.00 | 9.01 | oz/t |
| Difference | | | -2% | | | | | |
| Ag Capped | 4,855 | 0.21 | 0.29 | 0.28 | 0.95 | 0.00 | 2.50 | oz/t |
| AuCN | 192 | 0.01 | 0.02 | 0.03 | 1.98 | 0.00 | 0.31 | oz/t |
| AgCN | - | 0.00 | 0.00 | 0.00 | NA | 0.00 | 0.00 | oz/t |

| **Gold Coin** | **Zone** | **High grade Ag** | | | | | **AgCap** | **7.0** |
|---|---|---|---|---|---|---|---|---|
| | **Valid N** | **Median** | **Mean** | **Std.Dev.** | **CV** | **Minimum** | **Maximum** | **Units** |
| Au | 178 | 0.039 | 0.112 | 0.187 | 1.668 | 0.001 | 1.022 | oz/t |
| Au Capped | 178 | 0.039 | 0.112 | 0.187 | 1.669 | 0.001 | 1.022 | oz/t |
| Ag | 176 | 1.35 | 1.93 | 2.17 | 1.12 | 0.00 | 17.85 | oz/t |
| Difference | | | -7% | | | | | |
| Ag Capped | 176 | 1.35 | 1.80 | 1.56 | 0.87 | 0.00 | 7.00 | oz/t |
| AuCN | 14 | 0.05 | 0.09 | 0.10 | 1.12 | 0.00 | 0.30 | oz/t |
| AgCN | - | 0.00 | 0.00 | 0.00 | NA | 0.00 | 0.00 | oz/t |

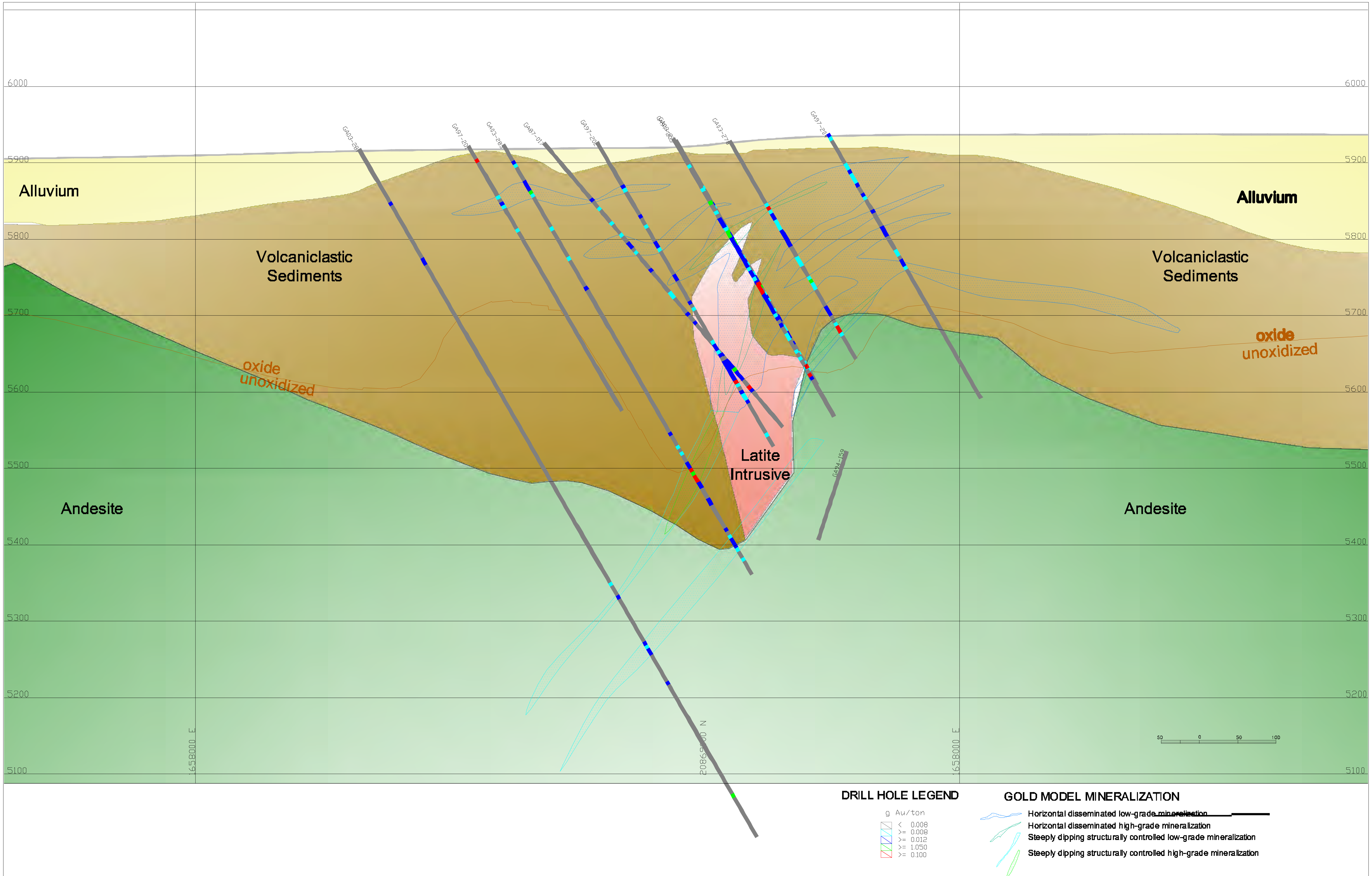
# Table 17.3 Descriptive Statistics of the Hidden Hill Database Used for Resource Estimation

| Hidden Hill | Zone | Low grade Au | | AuCap | None | | | |
|---|---|---|---|---|---|---|---|---|
| | **Valid N** | **Median** | **Mean** | **Std.Dev.** | **CV** | **Minimum** | **Maximum** | **Units** |
| Au | 1,455 | 0.015 | 0.021 | 0.024 | 1.117 | 0.000 | 0.451 | oz/t |
| Difference | | | 0% | | | | | |
| Au Capped | 1,455 | 0.015 | 0.021 | 0.024 | 1.117 | 0.000 | 0.451 | oz/t |
| Ag | 1,081 | 0.25 | 0.51 | 0.91 | 1.80 | 0.01 | 15.00 | oz/t |
| Ag Capped | 1,081 | 0.25 | 0.49 | 0.77 | 1.59 | 0.01 | 11.00 | oz/t |
| AuCN | 431 | 0.01 | 0.02 | 0.02 | 1.18 | 0.00 | 0.24 | oz/t |
| AgCN | 191 | 0.18 | 0.35 | 0.39 | 1.13 | 0.01 | 2.45 | oz/t |

| Hidden Hill | Zone | High grade Au | | AuCap | 0.9 | | | |
|---|---|---|---|---|---|---|---|---|
| | **Valid N** | **Median** | **Mean** | **Std.Dev.** | **CV** | **Minimum** | **Maximum** | **Units** |
| Au | 228 | 0.114 | 0.149 | 0.172 | 1.158 | 0.008 | 1.490 | oz/t |
| Difference | | | -3% | | | | | |
| Au Capped | 228 | 0.114 | 0.144 | 0.143 | 0.991 | 0.008 | 0.900 | oz/t |
| Ag | 189 | 1.05 | 2.03 | 2.84 | 1.40 | 0.03 | 17.44 | oz/t |
| Ag Capped | 189 | 1.05 | 1.94 | 2.56 | 1.31 | 0.03 | 13.00 | oz/t |
| AuCN | 81 | 0.07 | 0.12 | 0.16 | 1.41 | 0.00 | 1.17 | oz/t |
| AgCN | 23 | 0.45 | 1.23 | 2.91 | 2.36 | 0.03 | 14.60 | oz/t |

| Hidden Hill | Zone | Low grade Ag | | | | | AgCap | 4.0 |
|---|---|---|---|---|---|---|---|---|
| | **Valid N** | **Median** | **Mean** | **Std.Dev.** | **CV** | **Minimum** | **Maximum** | **Units** |
| Au | 1,326 | 0.010 | 0.023 | 0.052 | 2.203 | 0.000 | 1.020 | oz/t |
| Au Capped | 1,326 | 0.010 | 0.023 | 0.051 | 2.160 | 0.000 | 0.900 | oz/t |
| Ag | 1,101 | 0.28 | 0.41 | 0.62 | 1.51 | 0.01 | 14.94 | oz/t |
| Difference | | | -3% | | | | | |
| Ag Capped | 1,101 | 0.28 | 0.40 | 0.43 | 1.09 | 0.01 | 4.00 | oz/t |
| AuCN | 309 | 0.02 | 0.03 | 0.04 | 1.33 | 0.00 | 0.25 | oz/t |
| AgCN | 141 | 0.24 | 0.42 | 1.23 | 2.90 | 0.01 | 14.60 | oz/t |

| Hidden Hill | Zone | High grade Ag | | | | | AgCap | 13.0 |
|---|---|---|---|---|---|---|---|---|
| | **Valid N** | **Median** | **Mean** | **Std.Dev.** | **CV** | **Minimum** | **Maximum** | **Units** |
| Au | 293 | 0.036 | 0.078 | 0.141 | 1.808 | 0.000 | 1.490 | oz/t |
| Au Capped | 293 | 0.036 | 0.074 | 0.112 | 1.505 | 0.000 | 0.900 | oz/t |
| Ag | 267 | 1.49 | 2.17 | 2.35 | 1.08 | 0.04 | 17.44 | oz/t |
| Difference | | | -1% | | | | | |
| Ag Capped | 267 | 1.49 | 2.16 | 2.26 | 1.05 | 0.04 | 13.00 | oz/t |
| AuCN | 68 | 0.04 | 0.10 | 0.18 | 1.93 | 0.00 | 1.17 | oz/t |
| AgCN | 21 | 1.17 | 1.21 | 0.50 | 0.41 | 0.07 | 2.45 | oz/t |

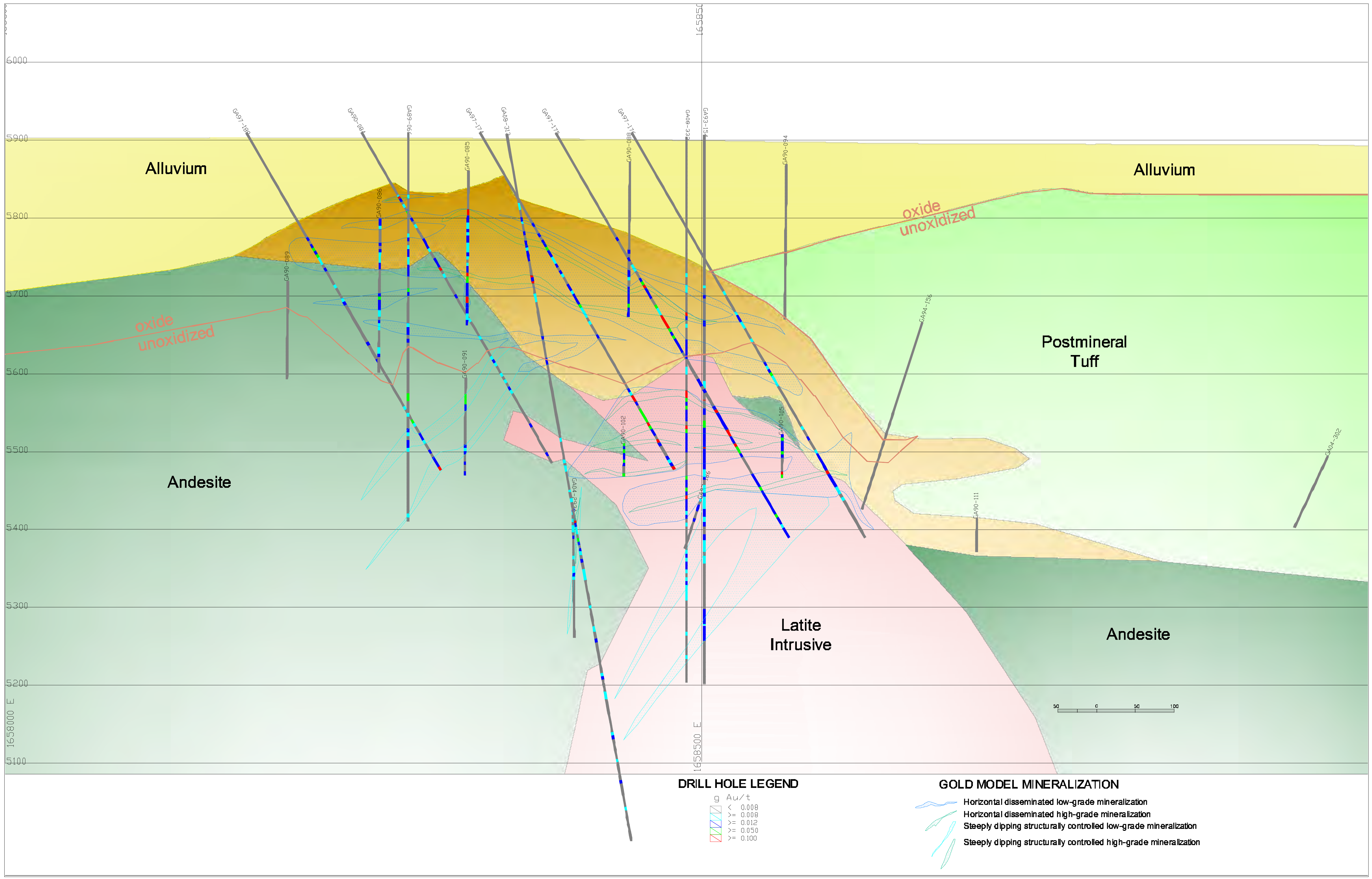



NEVADA SUNRISE GOLD CORP.
Golden Arrow Project
Gold Model Gold Coin Section 2860

MINE DEVELOPMENT ASSOCIATES
Reno Nevada

DATE APR-10-09
DRAWN BY C.WALKER
CHECKED BY MDA
SCALE As Shown

FIGURE NO.
17.5

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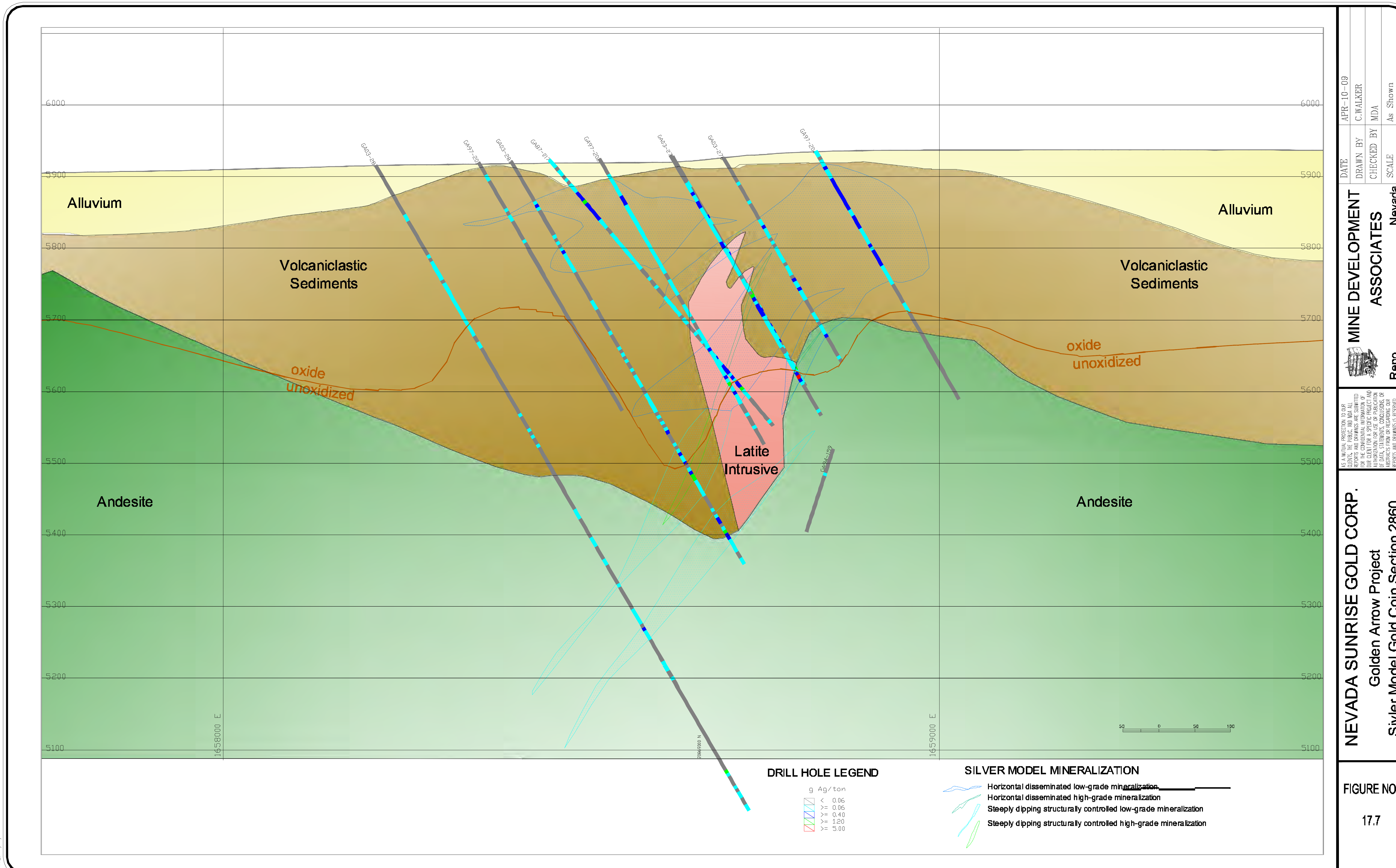
| DATE | MAR-20-09 |
| DRAWN BY | CWALKER |
| CHECKED BY | SRISTORCELLI |
| SCALE | As Shown |

MINE DEVELOPMENT ASSOCIATES
Reno Nevada



NEVADA SUNRISE GOLD CORP.
Golden Arrow Project
Gold Model Hidden Hills Section 4025

FIGURE NO.
17.6

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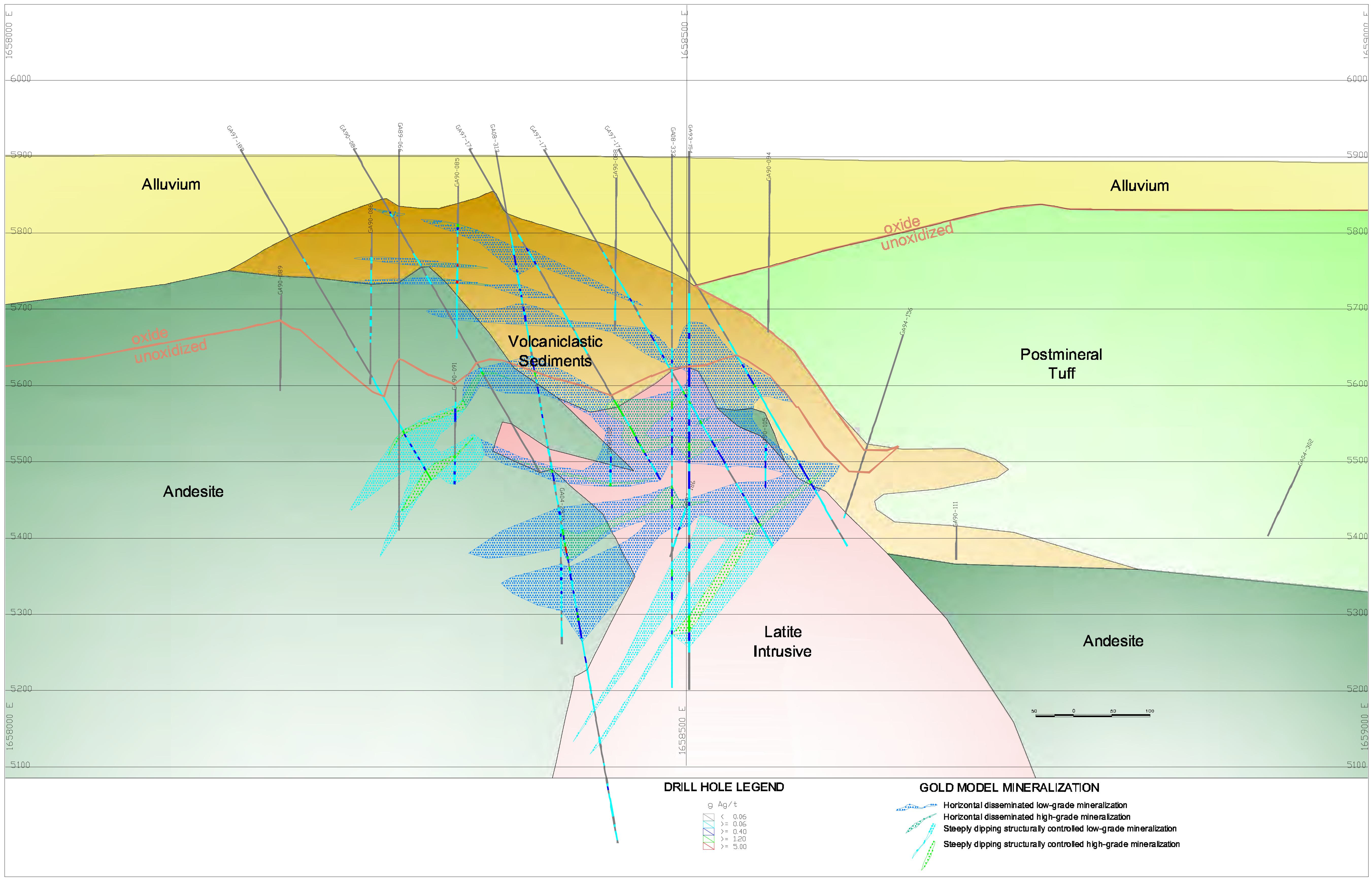


DATE MAR-20-09
DRAWN BY CWALKER
CHECKED BY SRISTORCELLI
SCALE As Shown

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Reno Nevada

NEVADA SUNRISE GOLD CORP.
Golden Arrow Project
Silver Model Hidden Hills Section 4025

FIGURE NO.
17.8

## 17.3 Density

A suite of surface lithologic samples that represents the type lithologies on the property was collected in 2006, and specific gravity determinations were completed on them by the co-author (Christensen, 2006e). These determinations are considered dry specific gravity determinations. The average of all determinations was 2.38, with a range of 1.68 to 2.76. Christensen also made density determinations on 104 samples of core from 52 separate intervals. Clay-altered lithologies are the least dense; latite, particularly latite with quartz veining and pyrite, is the most dense. In addition, MDA selected 16 samples from the Gold Coin deposit area for density testing. These samples were taken from core storage in Reno and sent to McClelland Laboratories Labs of Reno, Nevada.

The Golden Arrow down-hole sample specific gravity database now consists of 84 samples. All samples were taken from core. Descriptive statistics of samples from Golden Arrow from 2008 are described in Table 17.4 and for the entire database including the 2009 samples are given in Table 17.5. It is noteworthy that differences between rock types are minimal, but differences are apparently significant between oxidized and unoxidized rocks. Clearly the oxidation has a greater effect on rock density than rock type. Consequently, the oxide surface was used to differentiate between varying density rocks.

**Table 17.4 Descriptive Statistics of the Historic Density Samples**

| Oxide State | Rock | Mean ($g/cm^3$) | No. of Samples |
|---|---|---|---|
| **By rock type** | | | |
| | QA | 2.29 | 1 |
| | TVC | 2.13 | 10 |
| | TR | 2.21 | 4 |
| | TA | 2.21 | 28 |
| | TLD | 2.28 | 24 |
| | TPT | 2.33 | 1 |
| All Groups | | 2.23 | 68 |
| **By oxidation state** | | | |
| Ox | | 2.15 | 22 |
| Unox | | 2.26 | 46 |
| All Groups | | 2.23 | 68 |
| **By rock type and oxidation state** | | | |
| Ox | QA | 2.29 | 1 |
| Ox | TA | 2.14 | 11 |
| Ox | TLD | 2.03 | 2 |
| Ox | TVC | 2.17 | 8 |
| Unox | TA | 2.25 | 17 |
| Unox | TLD | 2.30 | 22 |
| Unox | TPT | 2.33 | 1 |
| Unox | TR | 2.21 | 4 |
| All Groups | | 2.23 | 68 |

* 3 is oxidized; 1 is unoxidized

**Table 17.5 Descriptive Statistics of the Historic and 2009 Density Samples**

Combined Analysis - 2008 and 2009 data

| Oxide State | Rock | Mean (g/cm3) | No. of Samples |
|---|---|---|---|
| **By Rock Type** | | | |
| | QA | 2.29 | 1 |
| | TVC | 2.18 | 17 |
| | TR | 2.33 | 7 |
| | TA | 2.19 | 32 |
| | TLD | 2.28 | 25 |
| | TPT | 2.33 | 1 |
| | BXH | 2.30 | 1 |
| | TRD | 2.29 | 2 |
| | **Total** | **2.23** | **86** |
| **By Oxidation State** | | | |
| Ox | | 2.19 | 31 |
| Unox | | 2.26 | 55 |
| | **Total** | **2.23** | **86** |
| **By Rock Type and Oxidation State** | | | |
| Ox | QA | 2.29 | 1 |
| Ox | TA | 2.13 | 12 |
| Ox | TLD | 2.03 | 2 |
| Ox | TVC | 2.19 | 12 |
| Ox | TR | 2.49 | 3 |
| Ox | TRD | 2.10 | 1 |
| | **Total Ox** | **2.19** | **31** |
| Unox | TA | 2.24 | 20 |
| Unox | TLD | 2.31 | 23 |
| Unox | TPT | 2.33 | 1 |
| Unox | TR | 2.21 | 4 |
| Unox | TVC | 2.25 | 3 |
| Unox | BXH | 2.30 | 1 |
| Unox | TRD | 2.48 | 1 |
| | Total Unox | 2.27 | 53 |
| | **Total - All** | **2.24** | **84** |

MDA assigned a density of 2.25 g/cm$^3$ for unoxidized bedrock and 2.15 g/cm$^3$ for oxidized bedrock in the 2008 model and, since there were no compelling data to change these, the assigned values were kept the same in the 2009 model. For alluvium, MDA used a density of 1.6 g/cm$^3$.

## 17.4 Oxidation and Cyanide Recoveries

As a consequence of modeling the visual oxidation state, cyanide ("CN") recoveries for gold and silver were able to be evaluated in the context of visual oxidation state. There is a difference in cyanide recoveries in the oxidized material as compared to the unoxidized material (Table 17.6). It is noted that this does not reflect expected recoveries in a commercial mining operation but rather demonstrates a difference in cyanide recoverability relative to the oxidation state.

**Table 17.6 Cyanide Recoveries by Visual Oxidation State**

| | AuCn/Au | Valid N | AgCn/Ag | Valid N |
|---|---|---|---|---|
| **Unoxidized** | 64% | 299 | 72% | 90 |
| **Oxidized** | 80% | 281 | 86% | 110 |
| **All** | 72% | 580 | 80% | 200 |

The Golden Arrow oxidation data logged by Nevada Sunrise consultants came from two different sources. The demarcation between Oxide and Reduced (also referred to as unoxidized) was based upon oxidation or potential for oxidation of pyrite. Oxide material is characterized by the presence of ferric iron oxides (*i.e.*, limonite, goethite, jarosite) and absence of pyrite. Reduced material lacks ferric iron oxide and may or may not contain pyrite. For most holes the demarcation between Oxide and Reduced or unoxidized material is quite distinct and occurs over five or ten feet. Rock which contains both pyrite and iron oxide was logged as unoxidized.

For the first 38 holes, no cuttings remain. The values of reduced and oxidized were taken from compilations of Tombstone work, which were summarized from the Homestake logs. Similarly, for holes 277-286, no cuttings are available. Calls on the location of the oxide/sulfide boundary were extracted from the logs of Pacific Ridge.

This scheme worked well for the pre-mineral bedrock units, but was inconsistently applied to post-mineral units. For example, alluvial cover consists of a mixture of unaltered and unoxidized volcanic cobbles to boulders in a matrix of oxidized more fine-grained material. Alluvial material was always classified as oxide.

There was inconsistency in logging material interpreted to be post-mineral volcanic cover of andesite of the Knoll, tuff of the Knoll, and basalt. These units are everywhere unaltered either by hydrothermal alteration or supergene weathering. They contain no ferric iron oxides, but these units occasionally contain minor disseminated pyrite as an accessory volcanic mineral component, not of hydrothermal origin. For consistency with the simple criteria stated above, however, all of the material logged as andesite or tuff of the Knoll was classified as unoxidized.

## 17.5 Compositing

Once the samples were capped, they were composited into 10ft (3m) down-hole composites. Compositing was done down-hole honoring the domains. Table 17.7 and Table 17.8 present the descriptive statistics of the composite database used for gold and silver domains, respectively. Quantile plots of the zones are presented in Appendix C.

# Table 17.7 Descriptive Statistics by Gold Domain - Composites

**Hidden Hill** **Low grade Au**

| | Valid N | Median | Mean | Std.Dev. | CV | Minimum | Maximum | Units |
|---|---|---|---|---|---|---|---|---|
| **AuOPT** | **844** | **0.016** | **0.022** | **0.021** | **0.971** | **0.000** | **0.368** | **oz/t** |
| **AuOPT_Capped** | **844** | **0.016** | **0.022** | **0.021** | **0.971** | **0.000** | **0.368** | **oz/t** |
| AgOPT | 629 | 0.27 | 0.51 | 0.76 | 1.49 | 0.01 | 7.91 | oz/t |
| AgOPT_Capped | 629 | 0.27 | 0.51 | 0.76 | 1.49 | 0.01 | 7.91 | oz/t |

**Hidden Hill** **High grade Au**

| | Valid N | Median | Mean | Std.Dev. | CV | Minimum | Maximum | Units |
|---|---|---|---|---|---|---|---|---|
| **AuOPT** | **154** | **0.115** | **0.149** | **0.142** | **0.952** | **0.011** | **1.280** | **oz/t** |
| **AuOPT_Capped** | **154** | **0.115** | **0.144** | **0.118** | **0.820** | **0.011** | **0.900** | **oz/t** |
| AgOPT | 127 | 1.06 | 2.03 | 2.69 | 1.32 | 0.07 | 14.94 | oz/t |
| AgOPT_Capped | 127 | 1.06 | 2.03 | 2.69 | 1.32 | 0.07 | 14.94 | oz/t |

**Gold Coin** **Low grade Au**

| | Valid N | Median | Mean | Std.Dev. | CV | Minimum | Maximum | Units |
|---|---|---|---|---|---|---|---|---|
| **AuOPT** | **1,116** | **0.013** | **0.015** | **0.010** | **0.655** | **0.000** | **0.079** | **oz/t** |
| **AuOPT_Capped** | **1,116** | **0.013** | **0.015** | **0.010** | **0.653** | **0.000** | **0.078** | **oz/t** |
| AgOPT | 1,108 | 0.21 | 0.30 | 0.33 | 1.10 | 0.00 | 5.51 | oz/t |
| AgOPT_Capped | 1,108 | 0.21 | 0.30 | 0.33 | 1.10 | 0.00 | 5.51 | oz/t |

**Gold Coin** **High grade Au**

| | Valid N | Median | Mean | Std.Dev. | CV | Minimum | Maximum | Units |
|---|---|---|---|---|---|---|---|---|
| **AuOPT** | **187** | **0.086** | **0.172** | **0.279** | **1.623** | **0.003** | **2.396** | **oz/t** |
| **AuOPT_Capped** | **187** | **0.086** | **0.160** | **0.198** | **1.239** | **0.003** | **1.500** | **oz/t** |
| AgOPT | 185 | 0.67 | 1.21 | 1.72 | 1.42 | 0.00 | 13.79 | oz/t |
| AgOPT_Capped | 185 | 0.67 | 1.21 | 1.72 | 1.42 | 0.00 | 13.79 | oz/t |

**Outside All Mzd Zones**

| | Valid N | Median | Mean | Std.Dev. | CV | Minimum | Maximum | Units |
|---|---|---|---|---|---|---|---|---|
| **AuOPT** | **11,641** | **0.002** | **0.003** | **0.005** | **1.610** | **0.000** | **0.091** | **oz/t** |
| **AuOPT_Capped** | **11,641** | **0.002** | **0.003** | **0.005** | **1.569** | **0.000** | **0.091** | **oz/t** |
| AgOPT | 9,875 | 0.03 | 0.08 | 0.20 | 2.34 | 0.00 | 8.61 | oz/t |
| AgOPT_Capped | 9,875 | 0.03 | 0.08 | 0.20 | 2.34 | 0.00 | 8.61 | oz/t |

## Table 17.8 Descriptive Statistics by Silver Domain - Composites

**Hidden Hill — Low grade Ag**

| | Valid N | Median | Mean | Std.Dev. | CV | Minimum | Maximum | Units |
|---|---|---|---|---|---|---|---|---|
| AuOPT | 757 | 0.011 | 0.022 | 0.036 | 1.592 | 0.000 | 0.848 | oz/t |
| AuOPT_Capped | 757 | 0.011 | 0.022 | 0.036 | 1.592 | 0.000 | 0.801 | oz/t |
| **AgOPT** | **631** | **0.31** | **0.41** | **0.48** | **1.17** | **0.01** | **7.78** | **oz/t** |
| **AgOPT_Capped** | **631** | **0.31** | **0.40** | **0.36** | **0.91** | **0.01** | **3.12** | **oz/t** |

**Hidden Hill — High grade Ag**

| | Valid N | Median | Mean | Std.Dev. | CV | Minimum | Maximum | Units |
|---|---|---|---|---|---|---|---|---|
| AuOPT | 183 | 0.041 | 0.080 | 0.136 | 1.693 | 0.001 | 1.490 | oz/t |
| AuOPT_Capped | 183 | 0.041 | 0.077 | 0.105 | 1.377 | 0.001 | 0.900 | oz/t |
| **AgOPT** | **165** | **1.48** | **2.18** | **2.12** | **0.98** | **0.05** | **13.13** | **oz/t** |
| **AgOPT_Capped** | **165** | **1.48** | **2.16** | **2.04** | **0.95** | **0.05** | **11.00** | **oz/t** |

**Gold Coin — Low grade Ag**

| | Valid N | Median | Mean | Std.Dev. | CV | Minimum | Maximum | Units |
|---|---|---|---|---|---|---|---|---|
| AuOPT | 2,549 | 0.007 | 0.014 | 0.050 | 3.615 | 0.000 | 1.892 | oz/t |
| AuOPT_Capped | 2,549 | 0.007 | 0.013 | 0.037 | 2.822 | 0.000 | 0.884 | oz/t |
| **AgOPT** | **2,535** | **0.23** | **0.30** | **0.29** | **0.98** | **0.00** | **5.51** | **oz/t** |
| **AgOPT_Capped** | **2,535** | **0.23** | **0.29** | **0.24** | **0.81** | **0.00** | **2.50** | **oz/t** |

**Gold Coin — High grade Ag**

| | Valid N | Median | Mean | Std.Dev. | CV | Minimum | Maximum | Units |
|---|---|---|---|---|---|---|---|---|
| AuOPT | 117 | 0.042 | 0.113 | 0.170 | 1.510 | 0.002 | 1.022 | oz/t |
| AuOPT_Capped | 117 | 0.042 | 0.113 | 0.170 | 1.511 | 0.002 | 1.022 | oz/t |
| **AgOPT** | **117** | **1.44** | **1.94** | **2.01** | **1.04** | **0.08** | **13.79** | **oz/t** |
| **AgOPT_Capped** | **117** | **1.44** | **1.80** | **1.44** | **0.80** | **0.08** | **7.00** | **oz/t** |

**Outside Mzd Zones**

| | Valid N | Median | Mean | Std.Dev. | CV | Minimum | Maximum | Units |
|---|---|---|---|---|---|---|---|---|
| AuOPT | 10,247 | 0.001 | 0.003 | 0.008 | 2.516 | 0.000 | 0.412 | oz/t |
| AuOPT_Capped | 10,247 | 0.001 | 0.003 | 0.008 | 2.513 | 0.000 | 0.412 | oz/t |
| **AgOPT** | **8,434** | **0.01** | **0.04** | **0.17** | **4.26** | **0.00** | **15.00** | **oz/t** |
| **AgOPT_Capped** | **8,434** | **0.01** | **0.04** | **0.06** | **1.69** | **0.00** | **1.00** | **oz/t** |

## 17.6 Estimation

Following compositing and the previously described statistical analyses of those composites, correlograms were constructed in multiple directions on various combinations of mineral zones and for each deposit independently.

At Gold Coin, some poorly defined anisotropy of gold mineralization was noted with the long dimension in the northwest direction at about 2:1 compared to the northeast direction. The nugget was almost the entire sill. As a consequence, inverse distance cubed modeling was chosen for grade estimation. At Hidden Hill, good gold correlograms were constructed, but the modeled nuggets were very high at ~70%

of the sill. Again, some poorly developed anisotropy was noted, but it was less strong when compared to Gold Coin. Silver grades produced good correlograms structures with ranges generally between 80 (24m) and 150ft (46m).

The estimation criteria were, in part, defined by these correlograms and, in part, attempting to honor understood geologic controls and distributions. Those estimation parameters are given in Appendix D for both Gold Coin and Hidden Hill. In all cases, length weighting was used on composites during estimation.

Inverse distance estimation was chosen as the base case, while an estimate was also made by nearest neighbor. A long pass was used to fill in all blocks in the zones for Inferred, and a shorter pass over-wrote the long pass for the Indicated material. A Kriged estimate was not done as the gold correlograms were not sufficiently well developed for Gold Coin.

## 17.7 Resource

MDA classified the resource in order of increasing geological and quantitative confidence, into Inferred, Indicated and Measured categories to be in compliance with Canadian National Instrument 43-101 and the "CIM Standards on Mineral Resources and Reserves, Definitions and Guidelines", issued in 2000 and modified with adoption of the "CIM Definition Standards - For Mineral Resources and Mineral Reserves" in 2005. CIM mineral resource definitions are given below:

**Mineral Resource**

*Mineral Resources are sub-divided, in order of increasing geological confidence, into Inferred, Indicated and Measured categories. An Inferred Mineral Resource has a lower level of confidence than that applied to an Indicated Mineral Resource. An Indicated Mineral Resource has a higher level of confidence than an Inferred Mineral Resource but has a lower level of confidence than a Measured Mineral Resource.*

A Mineral Resource is a concentration or occurrence of diamonds, natural solid inorganic material, or natural solid fossilized organic material including base and precious metals, coal, and industrial minerals in or on the Earth's crust in such form and quantity and of such a grade or quality that it has reasonable prospects for economic extraction. The location, quantity, grade, geological characteristics and continuity of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge.

*The term Mineral Resource covers mineralization and natural material of intrinsic economic interest which has been identified and estimated through exploration and sampling and within which Mineral Reserves may subsequently be defined by the consideration and application of technical, economic, legal, environmental, socio-economic and governmental factors. The phrase 'reasonable prospects for economic extraction' implies a judgment by the Qualified Person in respect of the technical and economic factors likely to influence the prospect of economic extraction. A Mineral Resource is an inventory of mineralization that under realistically assumed and justifiable technical and economic conditions might become economically extractable. These assumptions must be presented explicitly in both public and technical reports.*

**Inferred Mineral Resource**

An 'Inferred Mineral Resource' is that part of a Mineral Resource for which quantity and grade or quality can be estimated on the basis of geological evidence and limited sampling and reasonably assumed, but not verified, geological and grade continuity. The estimate is based on limited information and sampling gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes.

*Due to the uncertainty that may be attached to Inferred Mineral Resources, it cannot be assumed that all or any part of an Inferred Mineral Resource will be upgraded to an Indicated or Measured Mineral Resource as a result of continued exploration. Confidence in the estimate is insufficient to allow the meaningful application of technical and economic parameters or to enable an evaluation of economic viability worthy of public disclosure. Inferred Mineral Resources must be excluded from estimates forming the basis of feasibility or other economic studies.*

**Indicated Mineral Resource**

An 'Indicated Mineral Resource' is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics can be estimated with a level of confidence sufficient to allow the appropriate application of technical and economic parameters, to support mine planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough for geological and grade continuity to be reasonably assumed.

*Mineralization may be classified as an Indicated Mineral Resource by the Qualified Person when the nature, quality, quantity and distribution of data are such as to allow confident interpretation of the geological framework and to reasonably assume the continuity of mineralization. The Qualified Person must recognize the importance of the Indicated Mineral Resource category to the advancement of the feasibility of the project. An Indicated Mineral Resource estimate is of sufficient quality to support a Preliminary Feasibility Study which can serve as the basis for major development decisions.*

**Measured Mineral Resource**

A 'Measured Mineral Resource' is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are so well established that they can be estimated with confidence sufficient to allow the appropriate application of technical and economic parameters, to support production planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough to confirm both geological and grade continuity.

*Mineralization or other natural material of economic interest may be classified as a Measured Mineral Resource by the Qualified Person when the nature, quality, quantity and distribution of data are such that the tonnage and grade of the mineralization can be estimated to within close limits and that variation from the estimate would not significantly affect potential economic viability. This category requires a high level of confidence in, and understanding of, the geology and controls of the mineral deposit.*

MDA is reporting the resources at cutoffs that are reasonable for deposits of this nature and mining conditions of this type considering economic conditions because of the requirement that the resource exists "in such form and quantity and of such a grade or quality that it has reasonable prospects for economic extraction". Presently, MDA believes that all exploitation at Golden Arrow would be by open pit methods. Considering cyanide-extraction recoveries described in Section 16.0, MDA believes that the resource reporting cutoff for heap leachable open pit material would be approximately 0.01 oz Au/ton (0.34 g Au/t) for oxidized material and 0.015 oz Au/ton (0.514 g Au/t) for unoxidized material.

In this 2009 resource update and for the first time, there are Measured resources at Golden Arrow. The reason there are Measured resources in this estimate as opposed to previous estimates is because of the successful demonstration of the model's ability to predict mineralization. MDA compared the 2008 domains with the 2008 post-model drilling results and found that only minor changes to the gold and silver zones were needed. In addition, the effect on the total resource from the infill drilling changed little. These demonstrations of reliability of the model compensate for the lack of sample integrity work; the reader should be aware that MDA has excluded from Measured and Indicated those intervals deemed potentially contaminated. MDA has also eliminated the steeply dipping mineralization from Measured because of the lower level of confidence in those zones. The limited quality control and check assaying on historic data, especially on the silver, is compensated for by the numerous drilling campaigns and operators whose individual biases and errors could very well be self-correcting.

MDA classified the Golden Arrow resources by a combination of distance to the nearest sample, number of samples, the confidence in certain drill geologic interpretations, particular domains and areas inside the mineral domains. The criteria for resource classification are given in Table 17.9.

## Table 17.9 Classification Criteria

| | |
|---|---|
| **Measured** | |
| **Indicated - sub-horizontal disseminated mineralization** | |
| No. of samples / distance | >=1 / <=10ft inside zones for Au |
| or | |
| No. of samples / distance | >=4 / <=25ft inside zones for Au |
| **Indicated – structurally controlled steeply dipping mineralization** | |
| None | |
| **Indicated - sub-horizontal disseminated mineralization** | |
| No. of samples / distance | >=1 / <=50ft inside zones for Au |
| or | |
| No. of samples / distance | >=2 / <=100ft inside zones for Au |
| or | |
| No. of samples / distance | >=2 / <=30ft inside zones for Ag |
| **Indicated – structurally controlled steeply dipping mineralization** | |
| No. of samples / distance | >=1 / <=25ft inside zones for Au |
| or | |
| No. of samples / distance | >=2 / <=20ft inside zones for Ag |
| **Outside Mineralized Zones – Indicated** | |
| None | |
| **Outside Mineralized Zones – Inferred** | |
| No. of samples / distance | >=1 / <25ft inside zones for Au |
| or | |
| No. of samples / distance | >=1 / <25ft inside zones for Ag |

Table 17.10 and Table 17.11 present the Measured and Indicated Golden Arrow resource by oxide type individually. Table 17.12 presents the total combined Measured and Indicated Golden Arrow resource by oxide type. Table 17.13 presents the total Inferred Golden Arrow resource.

Gold equivalent was calculated based on average silver and gold metal prices to arrive at a ratio of 55 to 1, respectively. Gold equivalent calculations reflect gross metal content and have not been adjusted for metallurgical recoveries or relative processing and smelting costs. The gold equivalent grades were used only for establishing cutoff grades. Tabulating the material in this manner produces a more accurate presentation of the spatial association of gold and silver, while at the same time giving full credit to both elements.

Figure 17.9 through Figure 17.12 present the same cross sections as earlier in the report but with block model grades included. The model blocks are 20ft (6m) north by 20ft (6m) east by 10ft (3m) deep. The 10ft (3m) dimensions were chosen as a possible, though somewhat small, size for open pit mining of this small, dominantly horizontal deposit.

# Table 17.10 Total Gold and Silver Resources for Golden Arrow: Measured

| Measured | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cutoff | Un-Oxidized | | | | | | Oxidized | | | | | | Total | | | | | |
| | | AuEq | Au | | Ag | | | AuEq | Au | | Ag | | | AuEq | Au | | Ag | |
| oz AuEq/t | Tons | oz/t | oz/t | Ozs | oz/t | Ozs | Tons | oz/t | oz/t | Ozs | oz/t | Ozs | Tons | oz/t | oz/t | Ozs | oz/t | Ozs |
| 0.005 | 1,021,000 | 0.037 | 0.027 | 27,900 | 0.54 | 551,000 | 1,304,000 | 0.026 | 0.021 | 27,800 | 0.24 | 308,000 | 2,325,000 | 0.031 | 0.024 | 55,700 | 0.37 | 859,000 |
| 0.010 | 933,000 | 0.040 | 0.029 | 27,400 | 0.58 | 542,000 | 1,099,000 | 0.029 | 0.024 | 26,600 | 0.27 | 291,000 | 2,032,000 | 0.034 | 0.027 | 54,000 | 0.41 | 833,000 |
| ***Variable*** | ***751,000*** | ***0.047*** | ***0.034*** | ***25,800*** | ***0.67*** | ***505,000*** | ***1,099,000*** | ***0.029*** | ***0.024*** | ***26,600*** | ***0.26*** | ***291,000*** | ***1,850,000*** | ***0.036*** | ***0.028*** | ***52,400*** | ***0.43*** | ***796,000*** |
| 0.015 | 751,000 | 0.047 | 0.034 | 25,800 | 0.67 | 505,000 | 757,000 | 0.037 | 0.031 | 23,300 | 0.32 | 243,000 | 1,508,000 | 0.042 | 0.033 | 49,100 | 0.50 | 748,000 |
| 0.020 | 576,000 | 0.056 | 0.041 | 23,800 | 0.79 | 454,000 | 449,000 | 0.050 | 0.043 | 19,300 | 0.39 | 177,000 | 1,025,000 | 0.053 | 0.042 | 43,100 | 0.62 | 631,000 |
| 0.025 | 449,000 | 0.065 | 0.049 | 21,900 | 0.91 | 407,000 | 293,000 | 0.065 | 0.057 | 16,700 | 0.45 | 131,000 | 742,000 | 0.065 | 0.052 | 38,600 | 0.73 | 538,000 |
| 0.030 | 354,000 | 0.076 | 0.057 | 20,100 | 1.04 | 367,000 | 216,000 | 0.079 | 0.070 | 15,100 | 0.49 | 106,000 | 570,000 | 0.077 | 0.062 | 35,200 | 0.83 | 473,000 |
| 0.040 | 246,000 | 0.094 | 0.071 | 17,600 | 1.24 | 305,000 | 146,000 | 0.100 | 0.091 | 13,200 | 0.54 | 79,000 | 392,000 | 0.096 | 0.079 | 30,800 | 0.98 | 384,000 |
| 0.050 | 191,000 | 0.108 | 0.083 | 15,900 | 1.39 | 264,000 | 103,000 | 0.124 | 0.113 | 11,600 | 0.61 | 63,000 | 294,000 | 0.114 | 0.094 | 27,500 | 1.11 | 327,000 |
| 0.060 | 146,000 | 0.125 | 0.098 | 14,300 | 1.49 | 218,000 | 84,000 | 0.139 | 0.128 | 10,700 | 0.65 | 55,000 | 230,000 | 0.130 | 0.109 | 25,000 | 1.19 | 273,000 |
| 0.070 | 118,000 | 0.139 | 0.111 | 13,000 | 1.58 | 185,000 | 68,000 | 0.157 | 0.145 | 9,800 | 0.70 | 47,000 | 186,000 | 0.145 | 0.123 | 22,800 | 1.25 | 232,000 |
| 0.080 | 96,000 | 0.155 | 0.123 | 11,900 | 1.70 | 163,000 | 54,000 | 0.178 | 0.166 | 8,900 | 0.75 | 40,000 | 150,000 | 0.163 | 0.139 | 20,800 | 1.35 | 203,000 |
| 0.090 | 76,000 | 0.173 | 0.139 | 10,600 | 1.85 | 141,000 | 44,000 | 0.201 | 0.185 | 8,200 | 0.80 | 35,000 | 120,000 | 0.183 | 0.157 | 18,800 | 1.47 | 176,000 |
| 0.100 | 65,000 | 0.187 | 0.149 | 9,800 | 1.96 | 128,000 | 38,000 | 0.218 | 0.202 | 7,700 | 0.85 | 32,000 | 103,000 | 0.198 | 0.170 | 17,500 | 1.55 | 160,000 |
| 0.150 | 31,000 | 0.258 | 0.212 | 6,500 | 2.68 | 82,000 | 20,000 | 0.302 | 0.291 | 5,700 | 0.94 | 18,000 | 51,000 | 0.275 | 0.239 | 12,200 | 1.96 | 100,000 |
| 0.200 | 18,000 | 0.326 | 0.264 | 4,800 | 3.27 | 59,000 | 13,000 | 0.380 | 0.353 | 4,700 | 0.98 | 13,000 | 31,000 | 0.349 | 0.306 | 9,500 | 2.32 | 72,000 |
| 0.250 | 11,000 | 0.386 | 0.339 | 3,700 | 2.75 | 30,000 | 9,000 | 0.442 | 0.419 | 3,800 | 1.09 | 10,000 | 20,000 | 0.412 | 0.375 | 7,500 | 2.00 | 40,000 |
| 0.300 | 7,000 | 0.470 | 0.408 | 3,000 | 2.13 | 16,000 | 7,000 | 0.490 | 0.469 | 3,300 | 1.01 | 7,000 | 14,000 | 0.480 | 0.450 | 6,300 | 1.64 | 23,000 |
| 0.350 | 6,000 | 0.450 | 0.445 | 2,500 | 1.88 | 11,000 | 5,000 | 0.518 | 0.554 | 2,500 | 1.04 | 5,000 | 11,000 | 0.481 | 0.455 | 5,000 | 1.45 | 16,000 |
| 0.400 | 5,000 | 0.476 | 0.461 | 2,200 | 2.10 | 10,000 | 4,000 | 0.568 | 0.596 | 2,200 | 1.04 | 4,000 | 9,000 | 0.517 | 0.489 | 4,400 | 1.56 | 14,000 |

* reported cutoff varies by oxidation state (0.01 oz Au/t for oxide and 0.015 oz Au/t for unoxidized material

# Table 17.11 Total Gold and Silver Resources for Golden Arrow: Indicated

| Indicated | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Cutoff** | **Un-Oxidized** | | | | | | **Oxidized** | | | | | | **Total** | | | | | |
| | | **AuEq** | **Au** | | **Ag** | | | **AuEq** | **Au** | | **Ag** | | | **AuEq** | **Au** | | **Ag** | |
| **oz AuEq/t** | **Tons** | **oz/t** | **oz/t** | **Ozs** | **oz/t** | **Ozs** | **Tons** | **oz/t** | **oz/t** | **Ozs** | **oz/t** | **Ozs** | **Tons** | **oz/t** | **oz/t** | **Ozs** | **oz/t** | **Ozs** |
| 0.005 | 8,991,000 | 0.024 | 0.019 | 169,000 | 0.30 | 2,679,000 | 7,399,000 | 0.019 | 0.015 | 112,500 | 0.19 | 1,435,000 | 16,390,000 | 0.022 | 0.017 | 281,500 | 0.25 | 4,114,000 |
| 0.010 | 6,790,000 | 0.030 | 0.023 | 158,200 | 0.35 | 2,383,000 | 5,637,000 | 0.022 | 0.018 | 102,600 | 0.22 | 1,263,000 | 12,427,000 | 0.026 | 0.021 | 260,800 | 0.29 | 3,646,000 |
| ***Variable*** | ***4,685,000*** | ***0.038*** | ***0.030*** | ***141,500*** | ***0.42*** | ***1,949,000*** | ***5,637,000*** | ***0.022*** | ***0.018*** | ***102,600*** | ***0.22*** | ***1,263,000*** | ***10,322,000*** | ***0.029*** | ***0.024*** | ***244,100*** | ***0.31*** | ***3,212,000*** |
| 0.015 | 4,685,000 | 0.038 | 0.030 | 141,500 | 0.42 | 1,949,000 | 3,428,000 | 0.029 | 0.024 | 82,600 | 0.26 | 905,000 | 8,113,000 | 0.034 | 0.028 | 224,100 | 0.35 | 2,854,000 |
| 0.020 | 3,198,000 | 0.047 | 0.039 | 123,400 | 0.49 | 1,554,000 | 1,809,000 | 0.040 | 0.034 | 61,700 | 0.31 | 564,000 | 5,007,000 | 0.045 | 0.037 | 185,100 | 0.42 | 2,118,000 |
| 0.025 | 2,298,000 | 0.058 | 0.048 | 109,200 | 0.55 | 1,266,000 | 1,073,000 | 0.052 | 0.046 | 49,300 | 0.35 | 372,000 | 3,371,000 | 0.056 | 0.047 | 158,500 | 0.49 | 1,638,000 |
| 0.030 | 1,739,000 | 0.067 | 0.056 | 97,700 | 0.61 | 1,066,000 | 738,000 | 0.064 | 0.057 | 41,900 | 0.38 | 281,000 | 2,477,000 | 0.066 | 0.056 | 139,600 | 0.54 | 1,347,000 |
| 0.040 | 1,102,000 | 0.087 | 0.074 | 81,600 | 0.70 | 774,000 | 442,000 | 0.084 | 0.076 | 33,700 | 0.42 | 187,000 | 1,544,000 | 0.086 | 0.075 | 115,300 | 0.62 | 961,000 |
| 0.050 | 772,000 | 0.105 | 0.092 | 70,700 | 0.74 | 567,000 | 307,000 | 0.102 | 0.094 | 28,700 | 0.45 | 138,000 | 1,079,000 | 0.104 | 0.092 | 99,400 | 0.65 | 705,000 |
| 0.060 | 568,000 | 0.123 | 0.109 | 62,100 | 0.76 | 432,000 | 227,000 | 0.118 | 0.110 | 24,900 | 0.48 | 109,000 | 795,000 | 0.122 | 0.109 | 87,000 | 0.68 | 541,000 |
| 0.070 | 451,000 | 0.139 | 0.125 | 56,200 | 0.77 | 349,000 | 177,000 | 0.134 | 0.124 | 22,000 | 0.51 | 90,000 | 628,000 | 0.137 | 0.125 | 78,200 | 0.70 | 439,000 |
| 0.080 | 362,000 | 0.154 | 0.140 | 50,700 | 0.79 | 287,000 | 140,000 | 0.149 | 0.139 | 19,500 | 0.53 | 75,000 | 502,000 | 0.153 | 0.140 | 70,200 | 0.72 | 362,000 |
| 0.090 | 300,000 | 0.169 | 0.155 | 46,300 | 0.79 | 236,000 | 111,000 | 0.166 | 0.156 | 17,300 | 0.56 | 62,000 | 411,000 | 0.168 | 0.155 | 63,600 | 0.73 | 298,000 |
| 0.100 | 247,000 | 0.185 | 0.170 | 42,100 | 0.81 | 199,000 | 85,000 | 0.188 | 0.178 | 15,100 | 0.56 | 47,000 | 332,000 | 0.186 | 0.172 | 57,200 | 0.74 | 246,000 |
| 0.150 | 126,000 | 0.248 | 0.233 | 29,200 | 0.84 | 105,000 | 34,000 | 0.295 | 0.283 | 9,600 | 0.63 | 21,000 | 160,000 | 0.258 | 0.243 | 38,800 | 0.79 | 126,000 |
| 0.200 | 70,000 | 0.310 | 0.295 | 20,600 | 0.80 | 55,000 | 18,000 | 0.401 | 0.388 | 7,100 | 0.71 | 13,000 | 88,000 | 0.328 | 0.315 | 27,700 | 0.77 | 68,000 |
| 0.250 | 48,000 | 0.350 | 0.336 | 16,100 | 0.78 | 38,000 | 13,000 | 0.476 | 0.462 | 5,900 | 0.74 | 10,000 | 61,000 | 0.377 | 0.361 | 22,000 | 0.79 | 48,000 |
| 0.300 | 34,000 | 0.380 | 0.363 | 12,400 | 0.93 | 32,000 | 10,000 | 0.522 | 0.508 | 5,300 | 0.73 | 8,000 | 44,000 | 0.412 | 0.402 | 17,700 | 0.91 | 40,000 |
| 0.350 | 21,000 | 0.418 | 0.394 | 8,100 | 1.31 | 27,000 | 8,000 | 0.582 | 0.569 | 4,600 | 0.73 | 6,000 | 29,000 | 0.463 | 0.438 | 12,700 | 1.14 | 33,000 |
| 0.400 | 14,000 | 0.443 | 0.415 | 5,700 | 1.53 | 21,000 | 7,000 | 0.624 | 0.611 | 4,100 | 0.70 | 5,000 | 21,000 | 0.503 | 0.467 | 9,800 | 1.24 | 26,000 |

* reported cutoff varies by oxidation state (0.01 oz Au/t for oxide and 0.015 oz Au/t for unoxidized material

# Table 17.12 Total Gold and Silver Resources for Golden Arrow: Measured and Indicated

| Measured and Indicated | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Cutoff** | **Un-Oxidized** | | | | | | **Oxidized** | | | | | | **Total** | | | | | |
| | | **AuEq** | **Au** | | **Ag** | | | **AuEq** | **Au** | | **Ag** | | | **AuEq** | **Au** | | **Ag** | |
| **oz AuEq/t** | **Tons** | **oz/t** | **oz/t** | **Ozs** | **oz/t** | **Ozs** | **Tons** | **oz/t** | **oz/t** | **Ozs** | **oz/t** | **Ozs** | **Tons** | **oz/t** | **oz/t** | **Ozs** | **oz/t** | **Ozs** |
| 0.005 | 10,012,000 | 0.026 | 0.020 | 196,900 | 0.32 | 3,230,000 | 8,703,000 | 0.020 | 0.016 | 140,300 | 0.20 | 1,743,000 | 18,715,000 | 0.023 | 0.018 | 337,200 | 0.27 | 4,973,000 |
| 0.010 | 7,723,000 | 0.031 | 0.024 | 185,600 | 0.38 | 2,925,000 | 6,736,000 | 0.023 | 0.019 | 129,200 | 0.23 | 1,554,000 | 14,459,000 | 0.027 | 0.022 | 314,800 | 0.31 | 4,479,000 |
| ***Variable*** | ***5,436,000*** | ***0.039*** | ***0.031*** | ***167,300*** | ***0.45*** | ***2,454,000*** | ***6,736,000*** | ***0.023*** | ***0.019*** | ***129,200*** | ***0.23*** | ***1,554,000*** | ***12,172,000*** | ***0.030*** | ***0.024*** | ***296,500*** | ***0.33*** | ***4,008,000*** |
| 0.015 | 5,436,000 | 0.039 | 0.031 | 167,300 | 0.45 | 2,454,000 | 4,185,000 | 0.030 | 0.025 | 105,900 | 0.27 | 1,148,000 | 9,621,000 | 0.035 | 0.028 | 273,200 | 0.37 | 3,602,000 |
| 0.020 | 3,774,000 | 0.049 | 0.039 | 147,200 | 0.53 | 2,008,000 | 2,258,000 | 0.042 | 0.036 | 81,000 | 0.33 | 741,000 | 6,032,000 | 0.046 | 0.038 | 228,200 | 0.46 | 2,749,000 |
| 0.025 | 2,747,000 | 0.059 | 0.048 | 131,100 | 0.61 | 1,673,000 | 1,366,000 | 0.055 | 0.048 | 66,000 | 0.37 | 503,000 | 4,113,000 | 0.058 | 0.048 | 197,100 | 0.53 | 2,176,000 |
| 0.030 | 2,093,000 | 0.069 | 0.056 | 117,800 | 0.68 | 1,433,000 | 954,000 | 0.067 | 0.060 | 57,000 | 0.41 | 387,000 | 3,047,000 | 0.068 | 0.057 | 174,800 | 0.60 | 1,820,000 |
| 0.040 | 1,348,000 | 0.088 | 0.074 | 99,200 | 0.80 | 1,079,000 | 588,000 | 0.088 | 0.080 | 46,900 | 0.45 | 266,000 | 1,936,000 | 0.088 | 0.075 | 146,100 | 0.69 | 1,345,000 |
| 0.050 | 963,000 | 0.106 | 0.090 | 86,600 | 0.86 | 831,000 | 410,000 | 0.107 | 0.098 | 40,300 | 0.49 | 201,000 | 1,373,000 | 0.106 | 0.092 | 126,900 | 0.75 | 1,032,000 |
| 0.060 | 714,000 | 0.124 | 0.107 | 76,400 | 0.91 | 650,000 | 311,000 | 0.124 | 0.114 | 35,600 | 0.53 | 164,000 | 1,025,000 | 0.124 | 0.109 | 112,000 | 0.79 | 814,000 |
| 0.070 | 569,000 | 0.139 | 0.122 | 69,200 | 0.94 | 534,000 | 245,000 | 0.140 | 0.130 | 31,800 | 0.56 | 137,000 | 814,000 | 0.139 | 0.124 | 101,000 | 0.82 | 671,000 |
| 0.080 | 458,000 | 0.155 | 0.137 | 62,600 | 0.98 | 450,000 | 194,000 | 0.157 | 0.146 | 28,400 | 0.59 | 115,000 | 652,000 | 0.155 | 0.140 | 91,000 | 0.87 | 565,000 |
| 0.090 | 376,000 | 0.170 | 0.151 | 56,900 | 1.00 | 377,000 | 155,000 | 0.176 | 0.165 | 25,500 | 0.63 | 97,000 | 531,000 | 0.171 | 0.155 | 82,400 | 0.89 | 474,000 |
| 0.100 | 312,000 | 0.185 | 0.166 | 51,900 | 1.05 | 327,000 | 123,000 | 0.197 | 0.185 | 22,800 | 0.64 | 79,000 | 435,000 | 0.189 | 0.172 | 74,700 | 0.93 | 406,000 |
| 0.150 | 157,000 | 0.249 | 0.227 | 35,700 | 1.19 | 187,000 | 54,000 | 0.296 | 0.283 | 15,300 | 0.72 | 39,000 | 211,000 | 0.261 | 0.242 | 51,000 | 1.07 | 226,000 |
| 0.200 | 88,000 | 0.312 | 0.289 | 25,400 | 1.30 | 114,000 | 31,000 | 0.396 | 0.381 | 11,800 | 0.84 | 26,000 | 119,000 | 0.334 | 0.313 | 37,200 | 1.18 | 140,000 |
| 0.250 | 59,000 | 0.357 | 0.336 | 19,800 | 1.15 | 68,000 | 22,000 | 0.457 | 0.441 | 9,700 | 0.91 | 20,000 | 81,000 | 0.384 | 0.364 | 29,500 | 1.09 | 88,000 |
| 0.300 | 41,000 | 0.397 | 0.376 | 15,400 | 1.17 | 48,000 | 17,000 | 0.522 | 0.506 | 8,600 | 0.88 | 15,000 | 58,000 | 0.434 | 0.414 | 24,000 | 1.09 | 63,000 |
| 0.350 | 27,000 | 0.418 | 0.393 | 10,600 | 1.41 | 38,000 | 13,000 | 0.562 | 0.546 | 7,100 | 0.85 | 11,000 | 40,000 | 0.465 | 0.443 | 17,700 | 1.23 | 49,000 |
| 0.400 | 19,000 | 0.445 | 0.416 | 7,900 | 1.63 | 31,000 | 11,000 | 0.587 | 0.573 | 6,300 | 0.82 | 9,000 | 30,000 | 0.497 | 0.473 | 14,200 | 1.33 | 40,000 |

* reported cutoff varies by oxidation state (0.01 oz Au/t for oxide and 0.015 oz Au/t for unoxidized material

# Table 17.13 Total Gold and Silver Resources for Golden Arrow: Inferred

| Inferred | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Cutoff** | **Un-Oxidized** | | | | | | **Oxidized** | | | | | | **Total** | | | | | |
| | | **AuEq** | **Au** | | **Ag** | | | **AuEq** | **Au** | | **Ag** | | | **AuEq** | **Au** | | **Ag** | |
| **oz AuEq/t** | **Tons** | **oz/t** | **oz/t** | **Ozs** | **oz/t** | **Ozs** | **Tons** | **oz/t** | **oz/t** | **Ozs** | **oz/t** | **Ozs** | **Tons** | **oz/t** | **oz/t** | **Ozs** | **oz/t** | **Ozs** |
| 0.005 | 11,958,000 | 0.011 | 0.006 | 76,500 | 0.25 | 2,942,000 | 5,427,000 | 0.009 | 0.006 | 33,100 | 0.18 | 982,000 | 17,385,000 | 0.010 | 0.006 | 109,600 | 0.23 | 3,924,000 |
| 0.010 | 4,819,000 | 0.017 | 0.011 | 50,600 | 0.35 | 1,677,000 | 2,040,000 | 0.013 | 0.009 | 17,700 | 0.25 | 510,000 | 6,859,000 | 0.016 | 0.010 | 68,300 | 0.32 | 2,187,000 |
| ***Variable*** | ***1,750,000*** | ***0.026*** | ***0.019*** | ***32,700*** | ***0.42*** | ***739,000*** | ***2,040,000*** | ***0.013*** | ***0.009*** | ***17,700*** | ***0.25*** | ***510,000*** | ***3,790,000*** | ***0.019*** | ***0.013*** | ***50,400*** | ***0.33*** | ***1,249,000*** |
| 0.015 | 1,750,000 | 0.026 | 0.019 | 32,700 | 0.42 | 739,000 | 406,000 | 0.021 | 0.016 | 6,700 | 0.25 | 100,000 | 2,156,000 | 0.025 | 0.018 | 39,400 | 0.39 | 839,000 |
| 0.020 | 850,000 | 0.037 | 0.029 | 24,300 | 0.45 | 385,000 | 141,000 | 0.029 | 0.025 | 3,500 | 0.25 | 35,000 | 991,000 | 0.036 | 0.028 | 27,800 | 0.42 | 420,000 |
| 0.025 | 511,000 | 0.047 | 0.039 | 19,900 | 0.45 | 228,000 | 85,000 | 0.034 | 0.030 | 2,500 | 0.26 | 22,000 | 596,000 | 0.045 | 0.038 | 22,400 | 0.42 | 250,000 |
| 0.030 | 337,000 | 0.057 | 0.049 | 16,600 | 0.45 | 150,000 | 49,000 | 0.040 | 0.034 | 1,700 | 0.32 | 15,000 | 386,000 | 0.055 | 0.047 | 18,300 | 0.43 | 165,000 |
| 0.040 | 176,000 | 0.079 | 0.071 | 12,500 | 0.46 | 81,000 | 16,000 | 0.053 | 0.049 | 800 | 0.21 | 3,000 | 192,000 | 0.077 | 0.069 | 13,300 | 0.44 | 84,000 |
| 0.050 | 108,000 | 0.102 | 0.093 | 10,100 | 0.44 | 48,000 | 8,000 | 0.065 | 0.060 | 500 | 0.18 | 1,000 | 116,000 | 0.099 | 0.091 | 10,600 | 0.42 | 49,000 |
| 0.060 | 77,000 | 0.120 | 0.112 | 8,600 | 0.45 | 34,000 | 3,000 | 0.067 | 0.077 | 200 | 0.16 | - | 80,000 | 0.118 | 0.110 | 8,800 | 0.43 | 34,000 |
| 0.070 | 59,000 | 0.136 | 0.130 | 7,600 | 0.40 | 24,000 | 2,000 | 0.100 | 0.088 | 200 | 0.14 | - | 61,000 | 0.135 | 0.128 | 7,800 | 0.39 | 24,000 |
| 0.080 | 48,000 | 0.151 | 0.145 | 6,900 | 0.38 | 18,000 | 1,000 | 0.100 | 0.096 | 100 | 0.16 | - | 49,000 | 0.150 | 0.143 | 7,000 | 0.37 | 18,000 |
| 0.090 | 37,000 | 0.171 | 0.166 | 6,100 | 0.35 | 13,000 | 1,000 | 0.100 | 0.103 | 100 | 0.17 | - | 38,000 | 0.169 | 0.163 | 6,200 | 0.34 | 13,000 |
| 0.100 | 32,000 | 0.183 | 0.180 | 5,700 | 0.24 | 8,000 | 1,000 | 0.100 | 0.111 | 100 | 0.15 | - | 33,000 | 0.180 | 0.176 | 5,800 | 0.24 | 8,000 |
| 0.150 | 19,000 | 0.226 | 0.219 | 4,200 | 0.26 | 5,000 | - | - | - | - | - | - | 19,000 | 0.226 | 0.221 | 4,200 | 0.26 | 5,000 |
| 0.200 | 10,000 | 0.275 | 0.266 | 2,700 | 0.27 | 3,000 | - | - | - | - | - | - | 10,000 | 0.275 | 0.270 | 2,700 | 0.30 | 3,000 |
| 0.250 | 6,000 | 0.303 | 0.301 | 1,800 | 0.24 | 1,000 | - | - | - | - | - | - | 6,000 | 0.303 | 0.300 | 1,800 | 0.17 | 1,000 |
| 0.300 | 3,000 | 0.340 | 0.340 | 1,000 | 0.31 | 1,000 | - | - | - | - | - | - | 3,000 | 0.340 | 0.333 | 1,000 | 0.33 | 1,000 |
| 0.350 | 1,000 | 0.400 | 0.376 | 400 | 0.36 | - | - | - | - | - | - | - | 1,000 | 0.400 | 0.400 | 400 | - | - |
| 0.400 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

* reported cutoff varies by oxidation state (0.01 oz Au/t for oxide and 0.015 oz Au/t for unoxidized material

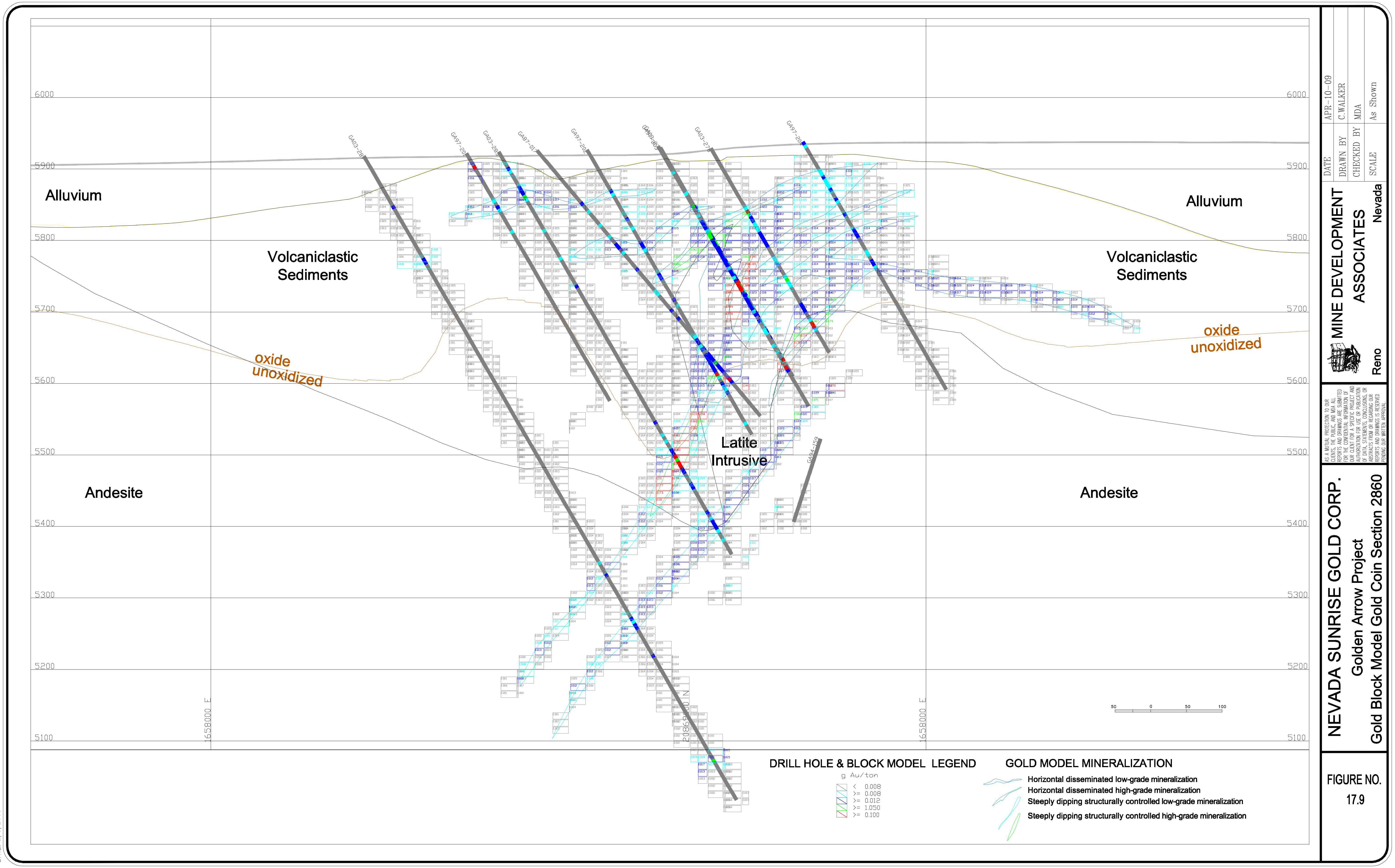


FIGURE NO. 17.9

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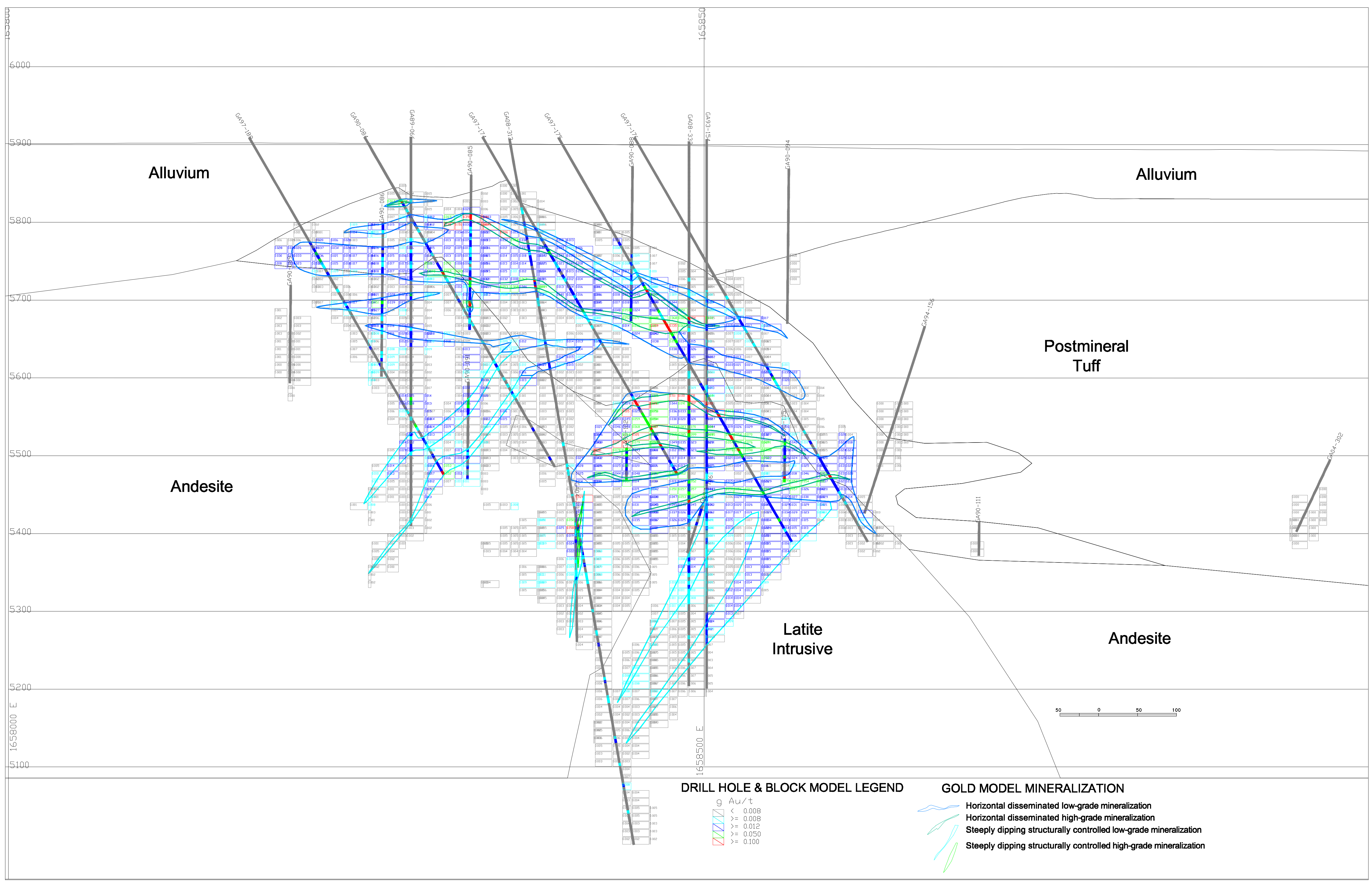
DATE: 2/8/2008

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|---|---|
| DATE | MAR-20-09 |
| DRAWN BY | CWALKER |
| CHECKED BY | SRISTORCELLI |
| SCALE | As Shown |

MINE DEVELOPMENT ASSOCIATES
Reno Nevada

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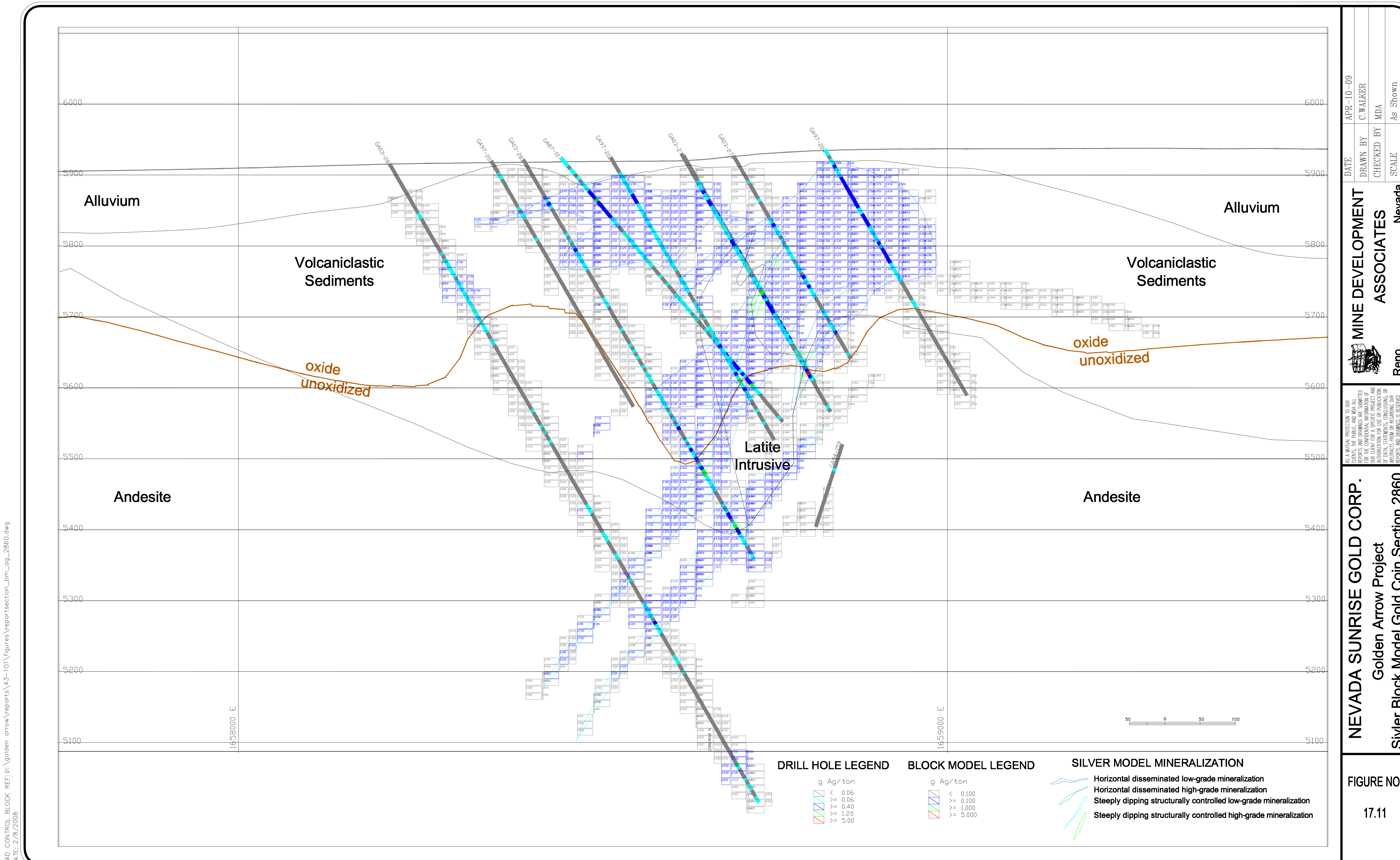
NEVADA SUNRISE GOLD CORP.
Golden Arrow Project
Gold Block Model Hidden Hills Section 4025

FIGURE NO.
17.10


6000
5900
5800
5700
5600
5500
5400
5300
5200
5100
Alluvium
Volcaniclastic Sediments
Andesite
Latite Intrusive
oxide
unoxidized
1658000 E
1659000 E
50 0 50 100
DRILL HOLE LEGEND
g Ag/ton
< 0.06
>= 0.06
>= 0.40
>= 1.20
>= 5.00
BLOCK MODEL LEGEND
g Ag/ton
< 0.100
>= 0.100
>= 1.000
>= 5.000
SILVER MODEL MINERALIZATION
Horizontal disseminated low-grade mineralization
Horizontal disseminated high-grade mineralization
Steeply dipping structurally controlled low-grade mineralization
Steeply dipping structurally controlled high-grade mineralization
DATE APR-10-09
DRAWN BY C.WALKER
CHECKED BY MDA
SCALE As Shown
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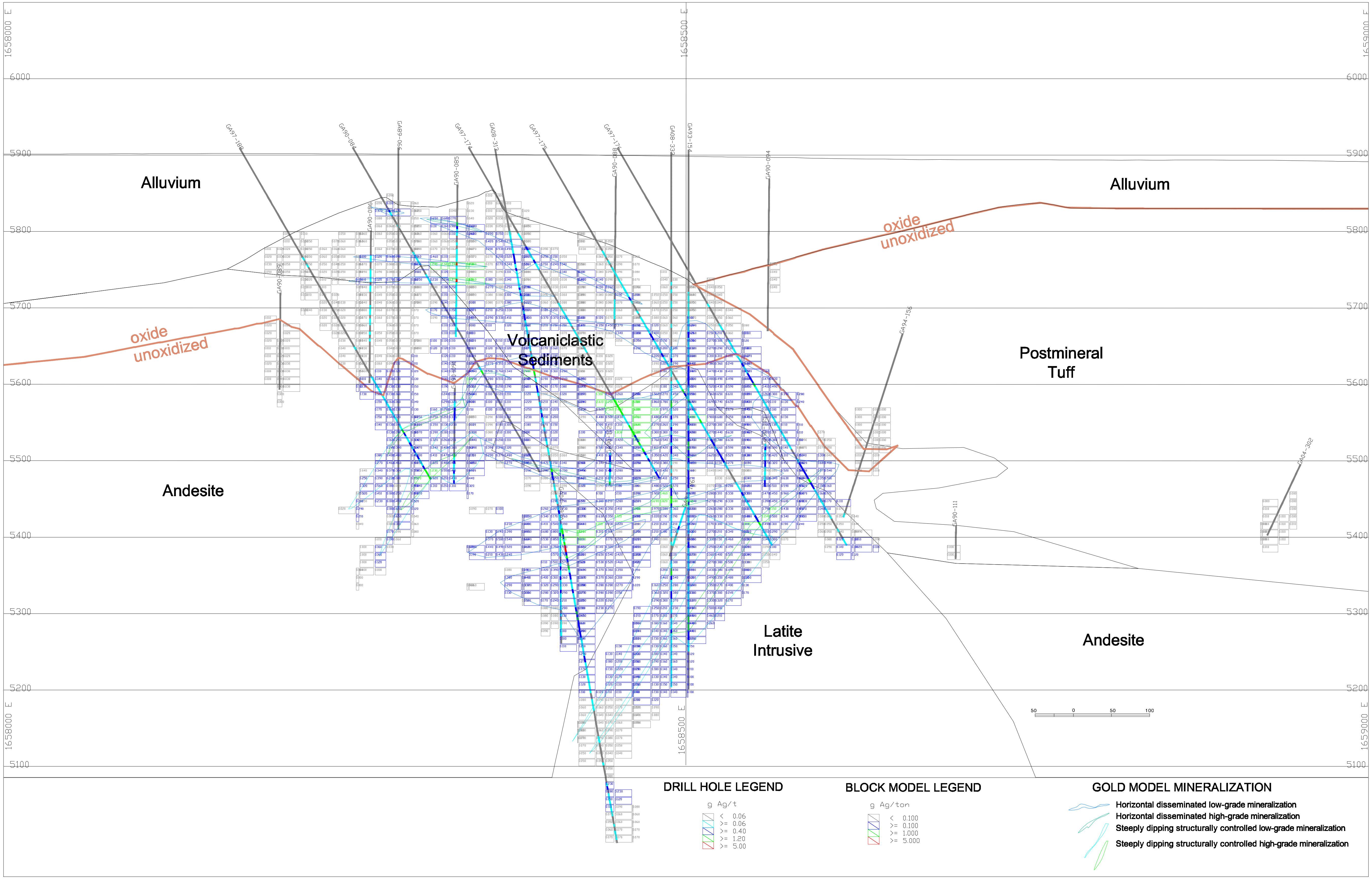
NEVADA SUNRISE GOLD CORP.
Golden Arrow Project
Sivler Block Model Gold Coin Section 2860
FIGURE NO.
17.11

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| CHECKED BY | SBRISTORCELLI |
| SCALE | As Shown |

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## NEVADA SUNRISE GOLD CORP.
Golden Arrow Project
Silver Model Block Hidden Hills Section 4025

FIGURE NO.
17.12

## 17.8 Resource Validation and Checking

In 2008, MDA made volume checks and comparisons of estimation-method results checks on the estimate during and after the estimation process, and assay-composite-model checks. The check on section to cross sectional volumes yielded acceptable results as did the comparison back to total mineralized volumes in the block model. A check was made on comparing a nearest neighbor to the inverse distance model as well as a comparison of bench composite grades to the coincident block model grade. MDA felt that the results of these checks were reasonable and so used the same estimation procedures, algorithms and parameters.

## 17.9 Discussion, Qualifications, Recommendations and Upside

The 2009 updated NI 43-101-compliant resource estimate for Golden Arrow represents a significant increase in knowledge and understanding of the deposits, which formed the basis for a logical program for exploration. The model and resource were demonstrated by that infill drilling to be reliable and predictable.

Like all estimates, there are weak points, none of which are serious flaws but all of which reduce some confidence. While the overwhelming relationship of geologic features to mineralization is for the most part strong, the certainty of the steeper dipping mineralization at Gold Coin is not high, but there are sufficient holes that line up suggesting a steepening of the mineralization and some supporting geology. At Hidden Hill, confidence is lower for these more steeply dipping zones.

Some sample integrity work and QA/QC evaluations to assess sample quality of the RC drill holes and the core holes, which entails inexpensive data gathering, compilation and analysis of core recovery, RQD, RC sample weights, and wet drilling, for example, are needed prior to feasibility work, if the project progresses that far. However, the limited quality control and check assaying on historic data, especially on the silver, is compensated by the fact that there have been multiple companies working on the project, all obtaining similar results.

More effort should be put into added precision of the material-type definition, in particular a more clear density model. This would require more sample measurements and more detailed geology, especially alteration, but only if supported by the geology.

While most dilution has been built into the model, there is likely some additional minor dilution that would occur during mining. The dilution in this reported resource is using 10ft (3m) block. If mining were to take place on 20ft (6m) benches, dilution would certainly be greater. Bench-heights studies could assess the impact of dilution based on varying heights.

## 18.0 OTHER RELEVANT DATA AND INFORMATION

To the authors' knowledge, there is no information or data outside of that presented in this report and contained within the referenced documents relevant to making this report complete, understandable, and not misleading.

## 19.0 INTERPRETATIONS AND CONCLUSIONS

The Golden Arrow mining district is located at the intersection of the northeastern margin of the northwest-trending Walker Lane structural zone and the western structural margin of the Kawich volcanic center. The property is underlain by Oligocene to Miocene andesite to rhyolite extrusive volcanic rocks and is intruded by a caldera-margin rhyolite dome and an unusual alaskite body. Historic mining exploited high-grade quartz-adularia-gold veins hosted within the north-northeast-striking Page fault and also veins within an array of northwest-striking faults near Confidence Mountain. The two known centers of more broadly disseminated gold-silver mineralization – Hidden Hill and Gold Coin – are intimately associated with the Confidence Mountain rhyolite flow dome and its detrital apron. Numerous prospect pits and anomalous geochemistry are spatially associated with the Deadhorse Hill alaskite body. Younger rhyolite ash-flow tuffs, dacite and andesite flows, and glassy tuffs locally cover the host-rock units.

The property has been explored by a number of capable mineral exploration companies over the past two decades, during which time a substantial and valuable archive of geological, geophysical, geochemical and drilling data has been acquired. The historical exploration archive represents an exceptional asset upon which to base future exploration. Animas and Nevada Sunrise should continue to acquire, compile, integrate, interpret and apply the already-available technical data as effectively as possible. This data is providing exceptional insights into the geologic understanding of the area as well as defining additional exploration targets and potential, all previously unknown.

Epithermal precious metal mineralization presents two styles of occurrence and alteration. Low-sulfidation epithermal quartz-adularia-gold veins, with limited alteration selvages of silica ± adularia ± carbonate ± sericite, occupy open fault and fracture zones. These are the high-grade gold veins exploited early in the last century. Vein textures are those typical of low-sulfidation bonanza veins: multiphase banded quartz-sulfide veins and open-space-filling cocks-comb quartz. This earlier style of mineralization is overprinted by high-sulfidation, hot-springs style, laminated-chalcedony flooding of porous volcaniclastic sedimentary rocks, disseminated clay-pyrite-gold mineralization, and intense pervasive acidic alteration. Both the Gold Coin and Hidden Hill deposit areas were strongly affected by the later high-sulfidation alteration style, which may obscure earlier low-sulfidation veins.

The district has been intensively explored during the past 30 years. Exploration has included geological mapping, rock and soil geochemistry, numerous varied geophysical surveys, and drilling. Animas and Intor have records, and most drill cuttings or core, for 291 historic drill holes totaling 148,101ft (45,141m). This historic work is augmented by the additional 33 holes totaling 20,464ft (6,237m) of drilling completed in 2008 by Intor. This work has discovered and generally defined two mineralized centers, the Gold Coin and Hidden Hill zones. Historic estimates of mineral resources vary considerably, depending upon the date and method of calculation. However, this report presents an updated NI 43-101-compliant resource estimate at Golden Arrow, which supersedes all previous estimates.

Animas should continue to compile all available historic exploration information into a GIS (Geographical Information System) database for integrated review and interpretation. This review includes remodeling of the digital geophysical data, using advanced three-dimensional inverse numerical modeling programs that were not available at the time the data were originally collected. Preliminary modeling suggests the presence of a large buried felsic intrusive body at depth. The southeastern margin of this mass is coincident with the mineralized Page fault, and both the Hidden Hill and Gold Coin deposits are located above interpreted upward intrusive apophyses from this body.

Soil geochemistry outlines a zone of gold and pathfinder elements enrichment over and surrounding the Confidence Mountain rhyolite flow dome, and another zone surrounding the Deadhorse Hill alaskite. These zones of anomalous soil geochemistry have not been adequately tested by drilling.

Despite the amount of exploration work completed, most drilling has been focused upon the two known centers of mineralization. The Golden Arrow district continues to have potential to contain additional undiscovered mineralization. There are a number of possible reasons for this, including past low metal prices, failure of most companies to consolidate the district land position, and over-focus on the two known deposits. Animas believes there is excellent potential for the discovery of additional centers of gold-silver mineralization on the property.

A number of exploration target areas are currently receiving technical evaluation (Figure 19.1):

(1) The Confidence Mountain rhyolite flow dome is situated at the intersection of the north-northeast-striking Page fault and a major northwest-trending structural zone evident in several geophysical surveys (Figure 10.4). Geologic evidence suggests a genetic and spatial association between the rhyolite dome and gold mineralization. The Gold Coin deposit extends northwestward from the rhyolite dome along the structural zone. There has been very little exploration across the dome to the southeast beneath post-mineralization cover. Geophysical resistivity trends, gold and pathfinder-element enrichments in soil, and potassium alteration evident in airborne radiometric data all suggest exploration potential to the southeast of Confidence Mountain.

(2) Historic gold production was realized from bonanza quartz-adularia-gold veins within the Page fault zone. The Page fault extends approximately two kilometers southwestward from Confidence Mountain to a cluster of historic shafts, including the Golden Arrow shaft. For most of this distance, the fault is concealed by post-mineralization ignimbrite and colluvial cover – cover too thick for the old-time prospectors to explore through. Both gravity and magnetic geophysical data clearly map this fault at depth. Precious metal mineralization within low-sulfidation veins is commonly restricted to within a confined depth interval; precious metals were deposited only within that depth interval at which boiling occurred within the hydrothermal system. Veins barren at one elevation may be tremendously rich at depth; the ability to rapidly drill-test veins at depth gives today's explorer an advantage over the pick-and-shovel prospector.

(3) High-grade veins were historically exploited within the northern block of patented claims along a swarm of west-northwest-trending veins, including those mined from the Desert and Gold Bar shafts. These veins have received little modern exploration, principally because many of the exploring companies did not control these patented claims. Precision drill targeting of these bonanza veins can be improved with high-resolution ground geophysical surveys such as induced polarization or resistivity.

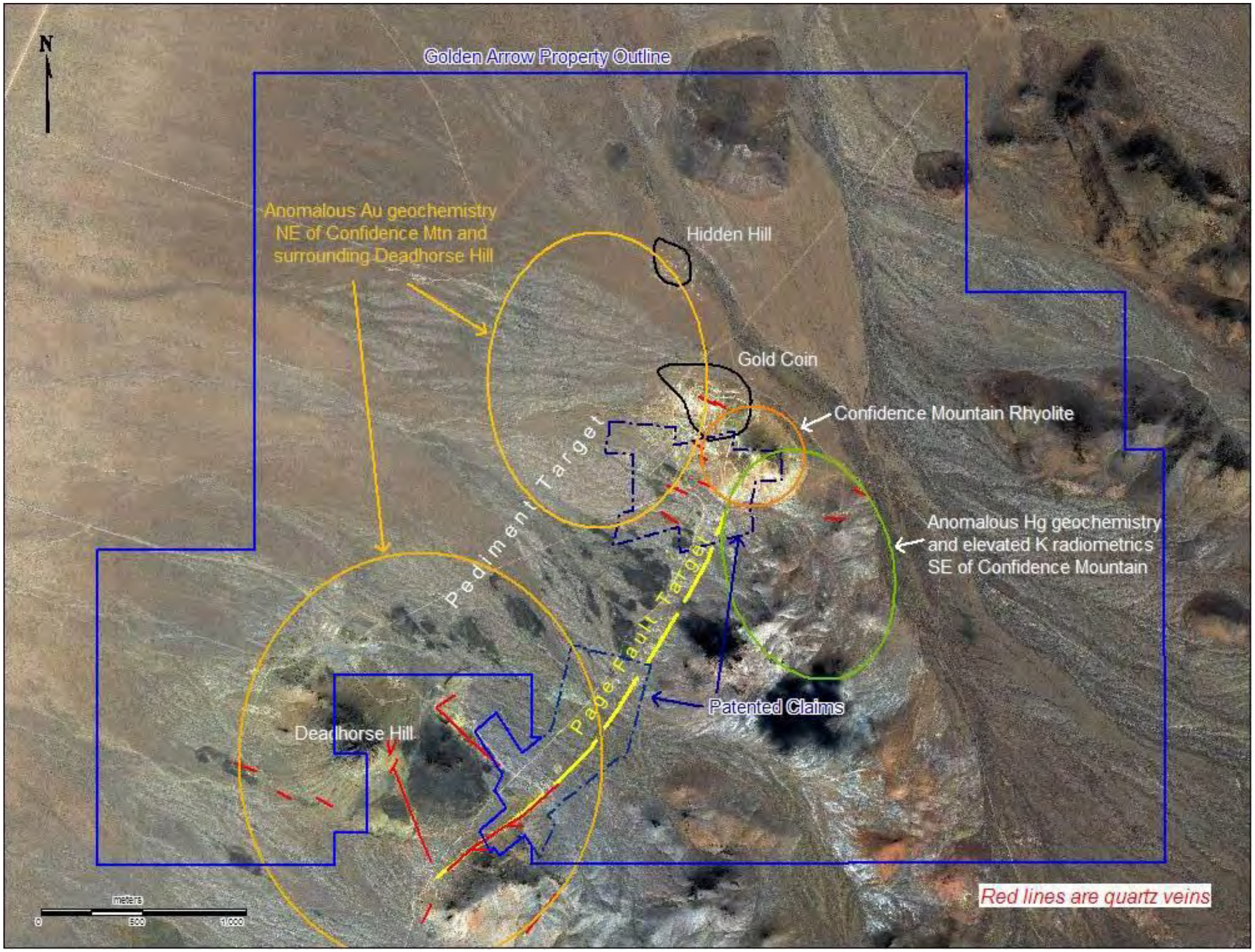
(4) The pediment area to the west of the Page fault between Confidence Mountain and Deadhorse Hill deserves exploration attention. Core logging has demonstrated that some of the highest gold grades in the two known deposits are hosted in andesite; the pediment to the west of the Page fault is underlain by andesite. Geophysical data suggest that the mineralized Page fault traces the margin of a buried intrusive body and that the Gold Coin and Hidden Hill deposits are situated above upward apophyses of this same body. The western margins of the interpreted intrusion, as well as several other interpreted apophyses, lie hidden beneath the pediment cover. The alluvial cover was sufficiently deep to hide veins and alteration from the eyes of early prospectors; modern geophysical and geochemical tools can highlight targets for exploration drilling.

(5) The alaskite mass of Deadhorse Hill, while itself little altered or mineralized, is surrounded by an aureole of anomalous geochemistry. Much of this zone is covered by post-mineralization andesite or colluvium. To date, there has been no drilling within this target area.

All of these exploration targets will require better definition, which shall come from the continuing review of the technical database augmented by additional geologic, geochemical and particularly geophysical work.

Some preliminary economic modeling in 2009 suggests the then-current economic production profile for Golden Arrow, under assumptions then being utilized by industry for financings and feasibilities, was economic on an operational basis but would not pay back capital. Golden Arrow required a sustained price of over US$900/oz Au to become economic as a stand-alone project.

**Figure 19.1 Golden Arrow Project Exploration Targets under Technical Review**
(Provided by Nevada Sunrise, 2007; explanation in the text)



## 20.0 RECOMMENDATIONS

The Golden Arrow gold-silver property represents a property of merit that warrants continued exploration. Historic exploration programs by other companies discovered and defined the dimensions by drilling of the Hidden Hill and Gold Coin deposits. Drilling by Intor in 2008 substantially confirmed the geological model for the deposits and solidified the confidence of the mineral resource. MDA and Christensen recommend that Animas undertake a systematic exploration program to discover additional centers of mineralization within the Golden Arrow property.

The Golden Arrow property has been explored by a number of capable mineral exploration companies over the past three decades, during which time a substantial and valuable archive of geological, geophysical, geochemical and drilling data has been acquired, yet these data have only recently been used comprehensively. The historical exploration archive represents an exceptional asset upon which Animas can base future exploration. Animas should continue to compile, integrate, interpret and apply the already-available technical data as effectively as possible.

Much of the historic exploration information lacks documentation of methodology and quality control. Animas must ensure that future exploration information is properly acquired and documented, as was done in the Intor 2008 exploration program.

While previous exploration has demonstrated that soil geochemistry can be an effective guide for detection of concealed gold mineralization, the conventional multi-element soil geochemical survey completed in 2008 did not provide definitive exploration guidance. Potentially more definitive information might be realized from soil-gas geochemistry or Mobile Metal Ion (MMI) soil geochemistry. Orientation surveys of these techniques should be considered.

Geophysical surveys have a unique capability to map three-dimensional geometry of subsurface geology and alteration. Three-dimensional inverse modeling of the historic gravity and magnetic data has proven useful for defining the three-dimensional subsurface geologic framework at Golden Arrow. Targeting very thin quartz-adularia-gold veins along the Page fault system, however, will require the detailed lateral and depth imaging that only electrical geophysical methods can provide. The physical properties that most distinguish these veins, or the silicification and disseminated sulfide characteristic of the Hidden Hill and Gold Coin mineralized zones, are electrical resistivity and chargeability. Ristorcelli and Christensen recommend that Animas conduct the appropriate electrical geophysical surveys at the Golden Arrow property to precisely define exploration targets prior to additional exploration drilling. These surveys can be completed within a period of months at a cost of approximately $80,000. As the interpreted results are received, these should be integrated and interpreted within the existing technical database to define drill targets.

The mineral resource model reported in this document is sufficiently robust, and the distribution of gold and silver within the Hidden Hill and Gold Coin zones sufficiently well delineated, for the company to proceed with preliminary economic assessment of the property. Preliminary economic modeling in 2009 suggested that, using the then-current economics and assumptions for production, Golden Arrow was economic on an operational basis but would not pay back capital. Golden Arrow required a sustained price of over US$900/oz Au to become economic as a stand-alone project. Discovery of one or more additional centers of mineralization at equal or better grade will not only enhance the value of the property but likely make it more economically robust. At this time, exploration for additional mineralized zones is of greater importance than refined definition of the two known zones.

Advancing mineral deposit discoveries through development to production requires considerable time to complete numerous studies and planning activities. If it appears that the defined gold and silver mineralization at Golden Arrow has a reasonable chance of becoming economic and if demonstrated to be so by an economic evaluation, Animas should initiate those early and long-term studies which will be required to demonstrate feasibility, such as environmental baseline monitoring, hydrologic studies, geotechnical studies, and additional metallurgical testing. Prior to embarking on major engineering and related studies, however, some additional infill drilling will be required to acquire material for refined engineering, environmental and metallurgical characterization.

Animas should, therefore, continue a systematic, staged exploration program. This would include execution of appropriate geophysical and geochemical surveys to define exploration targets, to be followed by staged exploration drilling, with each drill stage incorporating the data and interpretations from previous exploration. The exploration drilling program will have two primary objectives. The first objective will be to test for high-grade quartz-adularia-gold vein mineralization along the Page fault or its northwest splay faults. For this, diamond core drilling will be preferred. An appropriate first-stage diamond core drilling program will be on the order of 4000ft, with approximately $320,000 total cost. The second objective will be to test a number of new target areas for centers of mineralization similar to those at Gold Coin and Hidden Hill. This program should use lower-cost RC drilling to maximize the number of targets tested. An appropriate first-stage drilling program to test new target areas will be on the order of 16,000ft, with approximately $480,000 total cost.

Golden Arrow is a property of merit and justifies significant additional work. Specifically, the authors recommend that Animas undertake:

- Further exploration data compilation (~$40,000);
- Relocate and resurvey historical drill collars (~$10,000)
- Secure hazardous historic mine openings (~$30,000)
- Electrical geophysical surveys ((~$80,000);
- Exploration drilling guided by geophysical data and new interpretations (~$800,000);
- Metallurgical studies (~$50,000); and
- Preliminary economic assessments and, if positive, site characterization and background studies (~$80,000).

Including a contingency of $110,000, it is estimated that the first phase of the program would cost approximately US$1.2 million for those tasks defined above. Follow-up programs could be several times larger than this if the first tasks are successful.

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## 22.0 DATE AND SIGNATURE PAGE

Effective Date of report: June 9, 2010

The data on which the contained resource estimates are based was current as of the Effective Date.

Completion Date of report: June 9, 2010

***"Steve Ristorcelli"*** June 9, 2010

______________________________ Date Signed:

Steven Ristorcelli, C. P. G.

***"Odin Christensen"*** June 9, 2010

___________________________ Date Signed:

Odin Christensen, C. P. G.

***"Jack McPartland"*** June 9, 2010

___________________________ Date Signed:

Jack McPartland, Q. P.

## 23.0 AUTHORS' CERTIFICATES

**STEVEN RISTORCELLI, C. P. G.**

I, Steven Ristorcelli, C. P. G., do hereby certify that:

1. I am currently employed as Principal Geologist by: Mine Development Associates, Inc., 210 South Rock Blvd., Reno, Nevada 89502.

2. I graduated with a Bachelor of Science degree in Geology from Colorado State University in 1977 and a Master of Science degree in Geology from the University of New Mexico in 1980.

3. I am a Registered Professional Geologist in the states of California (#3964) and Wyoming (#153) and a Certified Professional Geologist (#10257) with the American Institute of Professional Geologists.

4. I have worked as a geologist continuously for 33 years since graduation from undergraduate university.

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 of "qualified person" for the purposes of NI 43-101.

6. I am one of the authors of the report entitled *Updated Technical Report on Golden Arrow Project, Nye County, Nevada, U.S.A.* dated June 9, 2010 (the "Technical Report") prepared for Animas Resources Ltd. I take co-responsibility for Sections 1.0, 2.0, 3.0, 5.0, 6.0, 11.0, 12.0, 13.0, 14.0, 18.0, 19.0, 20.0, and 21.0 and full responsibility for Section 17.0 of the Technical Report. I take co-responsibility for 4.0, which was written and compiled by other experts and for which I am not an expert.

7. I have had prior involvement with the property and project having visited it and having worked on prior resource estimates. The latest site visit was for one day on November 12, 2007.

8. To the best of my knowledge, information and belief, this technical report contains all the scientific and technical information that is required to be disclosed to make this technical report not misleading.

9. I am independent of Animas Resources Ltd. and all their subsidiaries as defined in Section 1.4 of NI43-101 and in Section 3.5 of the Companion Policy to NI43-101.

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

11. The Technical Report contains information relating to mineral titles, permitting, environmental issues, regulatory matters and legal agreements. I am not a legal, environmental or regulatory professional, and do not offer a professional opinion regarding these issues.

12. A copy of this report is submitted as a computer readable file in Adobe Acrobat© PDF© format. The requirements of electronic filing necessitate submitting the report as an unlocked, editable file. I accept no responsibility for any changes made to the file after it leaves my control.

Dated this 9th day of June, 2010.

***"Steven Ristorcelli"***

Signature of Qualified Person
Steven Ristorcelli

**ODIN CHRISTENSEN, PHD, CPG.**

I, Odin D. Christensen, PhD., do hereby certify that:

1. I am a self-employed consulting minerals geologist residing at 5261 Road 46, Mancos Colorado 81328 USA

2. I graduated from the University of Minnesota, Duluth, with a Bachelor of Science Degree in Geology in 1970, and from Stanford University with a Doctor of Philosophy (PhD.) Degree in Geology in 1975.

3. I have been employed as a professional geologist for 34 years since graduation, including 28 years in metallic minerals exploration and mining.

4. I am a member of the American Institute of Professional Geologists (AIPG) and am a Certified Professional Geologist (CPG) #8676. I am also a Fellow of the Society of Economic Geologists (SEG), a Fellow of the Geological Society of America (GSA), and a Registered Member of the Society for Mining, Metallurgy and Exploration (SME).

5. I have read the requirements of a Qualified Person set forth in National Instrument 43-101 and certify that by reason of my education, professional experience and affiliation with the American Institute of Professional Geologists as a Certified Professional Geologist, I fulfill the requirements for a Qualified Person for the purposes of NI 43-101.

6. I am co-author of this report titled *Updated Technical Report on Golden Arrow Project, Nye County, Nevada, U.S.A.* dated June 9, 2010. My work as co-author is based upon my personal knowledge of the property and critical review of historical technical information.

7. I have personally visited and completed geologic investigations at the Golden Arrow property multiple times during the period 2006-2009. The most recent visit was April 8, 2010 for two days. I take co-responsibility for Sections 1.0, 2.0, 3.0, 5.0, 6.0, 11.0, 12.0, 13.0, 14.0, 18.0, 19.0, 20.0, and 21.0 and full responsibility for 7.0, 8.0, 9.0, 10.0 and 15.0 of the Technical Report. I take co-responsibility for 4.0, which was written and compiled by other experts and for which I am not an expert.

8. To the best of my knowledge, information and belief, this technical report contains all the scientific and technical information that is required to be disclosed to make this technical report not misleading.

9. I am independent of Animas Resources Ltd., as defined in Section 1.4 of NI 43-101 and in Section 3.5 of the Companion Policy to NI 43-101.

10. I have read National Instrument 43-101 and Form 43-101F1, and this technical report has been prepared in compliance with that instrument and form.

Dated June 9, 2010.

***"Odin D. Christensen"***

Odin D. Christensen

**CERTIFICATE of AUTHOR - Jack S. McPartland**

I, Jack McPartland, do hereby certify that:

1. I am currently employed as Metallurgist/Vice President Operations, McClelland Laboratories, Inc., 1016 Greg Street, Sparks, NV 89431, U.S.A.
2. I graduated with an MS, Metallurgical Engineering (1989) and BS, Chemical Engineering (1986), University of Nevada, Reno.
3. I am a member of SME and TMS, and certified as a Qualified Professional (QP) Member of MMSA, with special expertise in Metallurgy/Processing.
4. I have worked as a metallurgist continuously for a total of 22 years since my graduation from University.
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 am one of the authors of the report entitled *Updated Technical Report on Golden Arrow Project, Nye County, Nevada, U.S.A.* dated June 9, 2010 (the "Technical Report") prepared for Animas Resources Ltd. I take full responsibility for Sections 1.5 and 16.0 of the Technical Report.
7. I have had prior involvement with the property having reviewed portions of an earlier technical report and managed metallurgical testing on samples from the project. I have never visited the property.
8. I am not aware of any material fact or material change with respect to the subject matter of the Technical Report that is not reflected in the Technical Report, the omission to disclose which makes the Technical Report misleading.
9. I am independent of the issuer applying all of the tests in section 1.5 of National Instrument 43-101.
10. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.
11. The Technical Report contains information related to mineral titles, permitting environmental issues, regulatory matters and legal agreements. I am not a legal, environmental or regulatory professional, and do not offer a professional opinion regarding those issues.
12. A copy of this report is submitted as a computer readable file in Adobe Acrobat© PDF© format. The requirements of electronic filing necessitate submitting the report as an unlocked, editable file. I accept no responsibility for any changes made to the file after it leaves my control.

Dated this 9th of June, 2010

___ ***"Jack S. McPartland"***____________

(Signed and sealed)
Jack S. McPartland
McClelland Laboratories, Inc.
1016 Greg Street
Sparks, NV 89431
USA
Telephone: 775-356-1300
Fax 775-356-8917

# APPENDIX A

## Conversion factors for common units of measurement

<u>Length</u>
miles x 1.6093 = kilometers
kilometers x 0.621 = miles
feet x 0.3048 = meters
meters x 3.281 = feet

<u>Area</u>
Square mile x 2.59 = square kilometer
Square kilometer x .3861 = square mile
Hectares x 2.471 = acres
Acres x 0.4047 = hectares
Square mile x 640 = acres
Square kilometer x 100 = hectares
Placer claim = 40 acres

<u>Volume</u>
Cubic yards x 0.765 = cubic meters
Cubic meter x 1.308 = cubic yards
Cubic yards x 27 = cubic feet

<u>Weight</u>
Pounds x 0.453 = kilograms
Kilograms x 2.2046 = pounds
1 short ton = 2000 pounds
1 long ton = 2240 pounds
1 metric ton = 1000 kilograms = 1.1 short tons

**<u>Troy weight</u>** <u>for precious metals</u>
1 troy ounce = 31.1035 grams
12 troy ounces = 1 troy pound
1 ounce avoirdupois = 28.350 grams

# APPENDIX B

Golden Arrow Property, Assessment of Site Conditions, by Mr. Joseph Martini of Enviroscientists, Inc., dated December 10, 2007

Appendix B is the text of Joseph Martini's December 10, 2007 environmental report on Golden Arrow (Martini, 2007) along with Appendix A of his report but not Appendix B or Appendix C.

His Appendix B consisted of results of a search by Environmental Data Resources, Inc. ("EDR") of environmental records that had the potential to provide environmental information on Golden Arrow. The conclusion of the search by EDR was that "The target property was not listed in any of the databases searched by EDR." Because the search of databases yielded no material information about environmental issues and because the full appendix was 56 pages long, Martini's (2007) Appendix B is not included here.

Martini's (2007) Appendix C consisted of 27 photographs of historical disturbances and structures taken on the Golden Arrow property by Martini in late 2007, two of which are included as Figure 4.3 and Figure 4.4 of the present report by MDA. Appendix C has not been included here.

Enviroscientists, Inc.

4600 Kietzke Lane, Suite C129
Reno, Nevada 89502
(775) 826-8822 • fax: (775) 826-8857

**MEMORANDUM**

**TO:** Mr. Steve Ristorcelli

**FROM:** Mr. Joseph D. Martini

**CC:** Dr. Odie Christiansen

**DATE:** December 10, 2007

**SUBJECT:** Golden Arrow Property; Assessment of Site Conditions

---

Intor Resources Corporation (IRC) has retained Enviroscientists, Inc. (Enviroscientists) to assist Mine Development Associates (MDA) in the assessment of site conditions (Assessment) at the Golden Arrow property located in Nye County, Nevada (Property). This Assessment will be included as part of a National Instrument 43-101 report being prepared by MDA for the Property.

## Introduction

The Property consists of 309 unpatented lode mining claims and 17 patented lode mining claims on 6,304 acres. The Property is located approximately 35 miles southeast of the town of Tonopah, Nevada. The Property is best accessed from the town of Tonopah by traveling east on state route 6, for approximately 35 miles, then south on Stone Cabin Valley road for approximately ten miles. The Property can be accessed by several points along Stone Cabin Road by traveling east. The Property lies at an average elevation of approximately 5,850 feet above mean sea level (amsl) and is located in Sections 15 through 23, and 26 through 35, Township 2 North, Range 48 East (T2N, R48E), Mount Diablo Base and Meridian.

This Assessment consisted of a site visit conducted on a November 12, 2007, November 20,2007 telephone conversations with Mr. Conrad Hinshaw of the Bureau of Land Management (BLM), Tonopah Field Station and Ms. Rhonda Clevenger of the Nevada Division of Environmental Protection (NDEP), a November 28, 2007 telephone conversation with Mr. Steven Dondero of the BLM, Elko Field Office, and a November 29, 2007 telephone conversation with Tracy Kipke of the Nevada Department of Wildlife (NDOW). In addition, data concerning the Property was obtained from the Nevada Bureau of Mines and Geology, Bulletin 77, Geology and Mineral Deposits of Southern Nye County, Nevada (NBMG 1972) and Environmental Data Resources Inc. (EDR).

## General History

Mining and exploration activities occurred at the Property throughout the late 1800s and early 1900s (NBMG 1972). Significant exploration and some production had been completed by 1915. Mining activity occurred again in the late 1930s through the 1940s. Historic mining activities were localized in the central portion of the Property known as Golden Arrow on Sunrise 25 through Sunrise 28, Sunrise 108, Sunrise 109, Sunrise 128 and Sunrise 130 claims (Section s7, T2N, R48E), and in the southern portion of the Property on the Sunrise 115 through Sunrise 127 claims (Sections 33 and 34, T2N, R48E).

During 1980, SSHK, Inc. with Einar C. Erickson as the consulting geologist, was conducting mining operations at a small open in pit in Section 32, T2N, R48E, and had constructed a small heap facility and three solution ponds to process the ore in Sections 29 and 32, T2N, R48E. The heap leach operations also included a monitoring well, a small processing building, a small open pit mine, and a waste rock dump. With the exception of the open pit and a portion of the waste rock dump, all components are located on the Property.

In January 1981, the BLM, Tonopah Field Station was notified of SSHK Inc.'s intention to conduct a small heap leach operation in Sections 29 and 32, T2N, R48E. According to the Notice, which is included as Attachment A, the heap leach facility was constructed by spreading a 12 inch layer of clay/silt over compacted earth. The clay/silt layer was then compacted, sprayed with a water repellent polyelectrolyte solution, and overlain with a six inch layer of crushed gravel. Ore was stacked to a maximum height of 12 feet. The notice described SSHK, Inc.'s intention to begin processing ore in a closed cycle leach system with the use of sodium cyanide solution and zinc powder precipitation process. Average cyanide concentration in the solution was expected to be approximately five pounds per ton.

The base of the leach facility was completed; however, only a small portion of the facility was loaded with ore. The ore that was placed on the facility was run of mine and likely originated from the small open pit as well as from several of the historic ore and waste stockpiles located throughout the Property. Solution was applied to the leach facility via rainbird style sprinklers, and solution was collected in an open ditch and delivered to the three lined ponds.

On September 19, 1982, the NDEP conducted a site visit of the heap leach facility in response to a report of wildlife mortalities. According to the December 1, 1982 report, which is included as Attachment A, no moribund animals were discovered; however, the facility was abandoned and had not been completely reclaimed. NDEP requested in the report that the liners from the ponds be removed to allow free drainage of meteoric waters, and the removal of several drums and containers of caustic soda and other chemicals.

Discussions with the BLM, NDEP, and NDOW produced no further information on the heap leach operation; however, it should be noted that the personnel from NDEP and NDOW that were identified in the correspondences described above no longer worked at the agencies. Mr. Steve Dondero of the BLM who was provided a courtesy copy of the NDEP site visit report, had no recollection of the any issues related to the operation. In addition, a search of available local, state, federal, and tribal environmental records on the Property was conducted by EDR The search was negative. The EDR reports are included as Attachment B

Small exploration operations have occurred on the Property from the early 1990s through present. Table 1 outlines the Notices on the property that have been submitted to the BLM since 1990 and their status.

**Table 1: Post-1990 Notice-level Activity**

| Company | Sections (T2N, R48E) | Case Number | Status |
|---|---|---|---|
| Vector Associates, Inc | 22, 23, 26, and 27 | NVN 072561 | Closed |
| Homestake Mining Company | 21, 22, 28, and 29 | NVN 072630 | Closed |
| Young Drilling and Neighbors | Section 28 | NVN 072907 | Closed |
| Western Gold Exploration | 21, 26 - 28, 34, and 35 | NVN 072986 | Closed |
| Merlin Mining Company | 32 and 33 | NVN 073016 | Closed |
| | 28, 29, 32, and 33 | NVN 073094 | Closed |
| Freeport McMoRan Gold Company | 16 - 19, and 20 | NVN 073049 | Closed |
| Silver Viking Corporation | 32 | NVN 073360 | Expired |
| Kennecott Exploration | 15 | NVN 073555 | Closed |
| Tombstone Exploration | 21 | NVN 073609 | Closed |
| Pacific Ridge Exploration, LTD | 21, 22, 27, and 28 | NVN 077082 | Expired |
| Doe | 16 - 21 and 29- 31 | NVN 077880 | Authorized |
| | 19 | NVN 082752 | Pending |

**Site Visit**

On November 12, 2007, a site visit was conducted by Mr. Joseph D. Martini of Enviroscientists, Dr. Christiansen of IRC, and yourself. Weather conditions were warm, dry, with light winds, and few clouds. Numerous photographs were taken during the site visit and are included in this Assessment in Attachment C.

Observed site conditions included an abandoned heap leach facility, three small unlined solution ponds, a waste rock dump, several shafts, stopes, trenches, waste stockpiles, ore stockpiles, historic debris, partial structures, and exploration and access roads.

The SSHK mining operation includes a heap leach facility, three solution ponds, and waste rock dump. The base of the heap leach facility looks as if it were completed. Plastic liner is visible in several locations around the facility. At certain locations two layers of the plastic are visible. In general the visible plastic material is ripped and brittle. The plastic is covered with a thin layer of crushed material, and a layer of medium size smooth cobble. Several stockpiles of the crushed material and cobble were identified around the facility. Approximately 50 percent of the facility is loaded with ore to approximately ten feet high. Ore appeared to be run of mine and had a wide range of sizes. Several shallow irrigation trenches approximately two inches deep and eight inches wide have been dug along the length of the surface of the ore. No piping was found on or around the facility. The only indication of a working operation was one rainbird style sprinkler found on the surface of the ore. No sulfide ore was identified on the surface of the heap.

Three small solution ponds are located to the west of the heap. A shallow open trench which appears to be designed to gravity feed the solution from the heap leach facility to the closest pond was identified. No visible connection between the closest pond and the other two was identified. There was a small amount of liquid in the bottom the pond closest to the heap leach facility. Livestock tracks were visible in and around the pond to the level of liquid. No moribund wildlife was found. There was no visual evidence that the ponds remained lined; however, because the area receives very little precipitation and there was standing water in the pond, it is possible that the liners remain.

The Golden Arrow section of the Property (Section 27, T2N, R48E)contains numerous open shafts, trenches waste and ore stockpiles, standing structures, and historic debris. There are several shafts surrounded by overburden and waste rock. The shafts are generally open and several are in very good condition having intact timber and ladders. All shafts have been enclosed with three strand barbed wire. One large stope is located in the center of the Golden Arrow portion of Property. Near the stope, several structures and numerous debris piles litter the landscape. Several small waste rock and ore stockpiles are located near the shafts throughout the property. The majority of the stockpiles looked as if material had been removed from their center. A few small trenches were also located in the area. There was no evidence of sulfidic material in the waste and ore stockpiles. In addition, there was no evidence of runoff from the stockpiles. Exploration roads have been constructed throughout the area.

The Gold Coin area to the north of Golden Arrow was described as an area of interest by Dr. Christiansen of IRC. The area contained several intact structures, ore and waste stockpiles, and exploration roads. A large exploration road was constructed into the face of the hill in the Gold Coin area. Several incidences of unreclaimed drill cutting piles were encountered along the road.

The second area of interest identified by IRC was west of Gold Coin in Sections 22 and 27, T2N, R48E in an expansive flat area. This area has been the target of several recent exploration projects. With the exception of drill roads, surface disturbance associated with overland travel, and small piles of drill cuttings, no items of interest were identified.

A third area of interest located in the southern portion of the Property in and around the Sunrise 115 through Sunrise 127 claims (Sections 33 and 34, T2N, R48E). Much like the Golden Arrow portion of the Property, there are numerous open shafts, trenches waste and ore stockpiles, standing structures, and historic debris throughout the area. Shaft entrances are generally intact or slightly deteriorated. Almost all shafts are protected by three strand barbed wire. There was no evidence of sulfidic material in the waste and ore stockpiles or runoff from the stockpiles.

**Summary of Observation and Issues**

Based on the observation during the site visit, and except as discussed below, the Property does not have any fatal flaws with regard to identified environmental liability. Wastes generated from, and structures associated with historic mining and exploration activities will affect any future actions that require compliance with the National Environmental Policy Act (NEPA), or the National Historic Preservation Act. In addition, the existence of the heap leach facility in Sections 29 and 32, T2N, R48E, poses a potential and currently unqualified liability. The quantity of processing that occurred at this facility (i.e., quantity and concentration of solution,) and the housekeeping at the operations (i.e., spill and leaks) are unknown. There are no records of spills or leaks and no orders of non-compliance on file with the regulatory agencies; however, this does not mean that contamination of soils or groundwater from either heap leach solution or other processing chemicals did not occur. Enviroscientists recommends a detailed analytical survey of the soils and ground water in the vicinity of the heap leach operation be completed by IRC prior to any future actions in the immediate area of the heap leach..

Should you have any questions or require additional information, please do not hesitate to call our Reno, Nevada office at (775) 826-8822.

January 26, 1981
Gold Creek Corp.
301 So. 11th St. Suite 200
Las vegas, Nevada 89101

District Manager
Bureau of Land Management
Box 194
Battle Mountain, Nevada 89820

Subject: Notice of Processing activity: GOLDEN ARROW

Location of activity: T 2N, R 48E, SW ¼ of the SE ¼ of section 29.

Approximate dates of operation: throughout the year

Operator :

SSHK, Inc.
301 So. 11th St.
Las Vegas , Nevada89101
Golden Arrow Mining

Claimant and name of claim:

| | |
|---|---|
| James Marusek<br>5330 Driftwood<br>Oxnard, Ca. | GoldenArrow #26<br>#19516 |
| Leroy C. Taylor<br>450 South 400 East<br>Bountiful, Utah | Golden Arrow# 27<br>#19517 |
| Roy C. Taylor<br>1141 Oakridge Lane<br>Bountiful , Utah | Golden Arrow# 28<br>#19518 |
| Houston Minerals<br>13806 Porshire<br>Houston, Tx. | Golden Arrow #29<br># 19519 |

Existing operations:

The leach pads are graded and compacted earth with a slope of about 6% toward the solution collection area at the end closest to the precipitation plant. A 12" layer of clay/silt is spread over the compacted earth, and isitself, compacted before being sprayed with a water- repellent polyelectrolyte solution designed to seal the underlayer. A 6" layer of gravel and small cobbles is carefully spread on the sealed clay coating to enhance drainage of leach solutions.The ore is then loaded on the pads to a depth of 6 to 12 feet.

During construction, an 18" berm of compacted earth and compacted and treated clay is prepared around the leach pad to confine the leach solutions to the pad area. At the lowest edge of this raised berm, an open trench drain is similarly prepared, but is lined with rubber sheeting membrane. This drain leads to the first of three solution ponds.

Existing roads: (see maps)

Existing workings: (see maps)

Proposed operations:

1. Closed cycle heap leach of gold and silver oxide ores.
2. No mechanical equipment is used other than pumps, filter tanks, and other process equipment associated with the leaching operation. Pickup trucks are used in servicing the facility. Delivery of supplies is by semi-trucks. Ore is hauled from the mine by 30 ton dump trucks. Occasionally the ore on the leach pad is agitated by ripping with a bulldozer.
3. No concentration, flotation, extraction, or separate process is used except a caustic soda -sodium cyanide heap leach process with a zinc box or zinc powder/filter precipitation of noble metals. The precipitated noble metals are removed from the site for further processing.
4. The chemicals used in the process are:
Sodium cyanide, in a concentration up to 5.0 pounds/ton solution.
Sodium hydroxide, sufficient to maintain a solution pH of 8 to 11.
Zinc shavings or powder, sufficient to precipitate the noble metals.
Diatomaceous earth, cellulose, and grainular carbon used in conjunction with filtrationof solutions and final clean-up of solutions by carbon-adsorption of precious metals.
5. Sodium hypochlorite is on site to effect rapid oxidation of the cyanide ion in solution, should that become necessary. Small amounts of lead acetate are used to activate the zinc shavings. Minor amounts of analytical reagents are on hand for use in testing and analysis of process solutions and lab work.

Cat or Blade work: Occasional ripping of existing leach pad.

Surface disturbance: An additional leach pad 200' by 300' may be constructed sometime in 1981. If so, you will be notified and given the exact data.

Drilling and blasting work:

NONE

Reclamation Plan:

"Reclamation of all areas disturbed will be completed to the standard described in S 3809.1.3(d) of title 43 CFR and that reasonable measures will be taken to prevent unnecessary or undue degradation of federal lands during operation".

STATE OF NEVADA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
CAPITOL COMPLEX
CARSON CITY, NEVADA 89710
TELEPHONE (702) 885-4670

RECEIVED
BUREAU OF LAND MANAGEMENT
TONOPAH RESOURCE AREA OFFICE

December 1, 1982

Mr. Einar Erickson
Golden Arrow Mine
2245 North Decatur Boulevard
Suite D
Las Vegas, Nevada 89108

Re: Closure and Abandonment

Greetings:

In response to a report of animal mortality and possible wildlife kills, an inspection of the mill site of the Golden Arrow Mine (T2N, R48E, S32) was done by the Division of Environmental Protection on 19 September 1982. It appears that this cyanide heap leach mill is abandoned and closure is incomplete. No moribund or dead animals were found in the immediate vicinity of the unfenced impoundments. However, there remains two hazards to domestic stock and wildlife which must be mitigated.

First, remove and dispose the liners from the three impoundments, then breach the banks. These impoundments must be rendered incapable of ponding or storing water.

Second, remove and dispose all drums and containers. There are more than several drums of caustic soda which are easily accessible and subject to possible release to the environment.

You are directed to report, in writing, the resolution of these hazardous situations in a timely manner. If you are not responsible for post-closure amelioration of environmental hazards, please inform me of the names and addresses of those you feel this obligation is incumbent upon.

Respectfully,

Harry van Drielen (de)

Harry van Drielen
Environmental Management Specialist II

de

cc: William Molini
Department of Wildlife
Steve Dondero
Bureau of Land Management, Tonopah

PHONE 870-6771
PHONE 384-0264

EINAR C. ERICKSON
CONSULTING GEOLOGIST

709 CLINE STREET
LAS VEGAS, NEVADA 89128

Dec 14, 1982

Mr. Harry van Drielen
Environmental Management Specialist II
Department of Conservation and Natural Resources
Division of Environmental Protection
Capitol Complex
Carson City, Nevada 89710

Re: GOLDEN ARROW PROJECT

Dear Mr. van Drielen:

I am in receipt of your December 1, 1982 letter in regards to the Golden Arrow Mine (T2N, R48E, S32) and the inspection in regard to reported animal mortality and possible wildlife kills, and that upon inspection no moribund or dead animals were found.

The Project Golden Arrow, was sub-leased through Metals Development Corporation who has unitized the district to GOLDEN ARROW MINES, INC a division of THE SSHK, INC. group, who also operated the Treasure Hill project you are familiar with. They removed mobilfe equipment in December of 1980, and some of their leaching equipment during 1981, vandels have removed most of everything else it appears from an overflight I recently made. On a separate sheet of paper I have enclosed the address of the President of Golden Arrow Mines, Inc. Mr. Robert Spitler, who is also President of SSHK, INC. if you would be so kind as to direct a duplicate letter to him of the demands you have made I would very grateful. It is their responsibility to take care of the project.

I would be most grateful if you would then notify me of their reply and response. If they have made closure and abandonment of their rights to the ground, then upon your notification of such to me, I will immediately take necessary steps to re-assert the rights of Metal Development, Corp to the properties, finalize notices of termination, and other legal requirements, so proper accomodation of the letter mailed to me can be made.

I was a consultant geologist to the SSHK, INC. group until they ceased to pay for my services in February 1981. Metals Development Corp has hired me also as a consultant to assist in such matters. It is the ultimate objective of the project to develop a full scale cyanide facility on the project to accomodate proven reserves. But as I am not reponsible for the post-closure of the hazards, I have provided you the names of those who are, but expect they will not perform, but as you realize for legal purposes this has to be ascertained.

Respectfully,

Einar C. Erickson

cc. William Molini
Steve Dondero
B. Leavitt Att.

March 2, 1989

MAR 2 1989

N67-81-002N
N67-81-009N
NV-060-N01-2
NV-060-N01-9
3809
(NV065.30)

CERTIFIED MAIL P-581 731 327
Return Receipt Requested

## DECISION

| | | |
|---|---|---|
| SHUK, Inc. | : | |
| Robert Spitler | : | 43 CFR 3809 |
| 131 East Court Street | : | Surface Management |
| Bowling Green, OH 43402 | : | |

## NOTICE OF NONCOMPLIANCE

This decision finds your mining project at Golden Arrow project, Nye County, Nevada, in noncompliance with the surface management regulations. The specific sections of the regulations that you have failed to comply with include:

1. Failure to reclaim your operation after abandonment. 43 CFR 3809.1-3(d)(3).

2. You have caused undue and unnecessary degradation of public lands. 43 CFR 3809.0-5(k).

3. Failure to backfill cyanide ponds as specified in State cyanide permit. Failure to properly dispose of cyanide drums and sodium hydroxide drums.

To correct these deficiencies you need to provide a reclamation plan within 30 days that addresses the following items. All trash generated during operation needs to be cleaned up. The leach pads need to be recontoured. The ponds need to be filled according to State of Nevada standards. All cyanide drums, sample buckets, and all other containers and piping need to be disposed of in an approved manner. The ore crushing pad needs to be regraded. The mine pit needs to be made safe.

Your actions will be monitored by this office, and the office of the special investigator. Because cyanide was in use, your actions will also be monitored by the State of Nevada. Failure to comply with the terms of this decision will affect your future operations on Federal lands.

You have the right to appeal to the Nevada State Director, Bureau of Land Management, in accordance with 43 CFR 3809.4. If you exercise this right, your appeal, accompanied by a statement of reasons and any arguments you wish to present, which would justify reversal or modification of the decision, must be filed in writing at this office within 30 days after the date of this decision. This decision will remain in effect during appeal unless a written request for a stay is granted.

Please contact Victor Ross or Robert Fisk at 482-6214 to work out the details of your reclamation plan.

/s/ ROGER OYLER

Theodore J. Angle
for the District Manager

Enclosure: 3809 Regulations

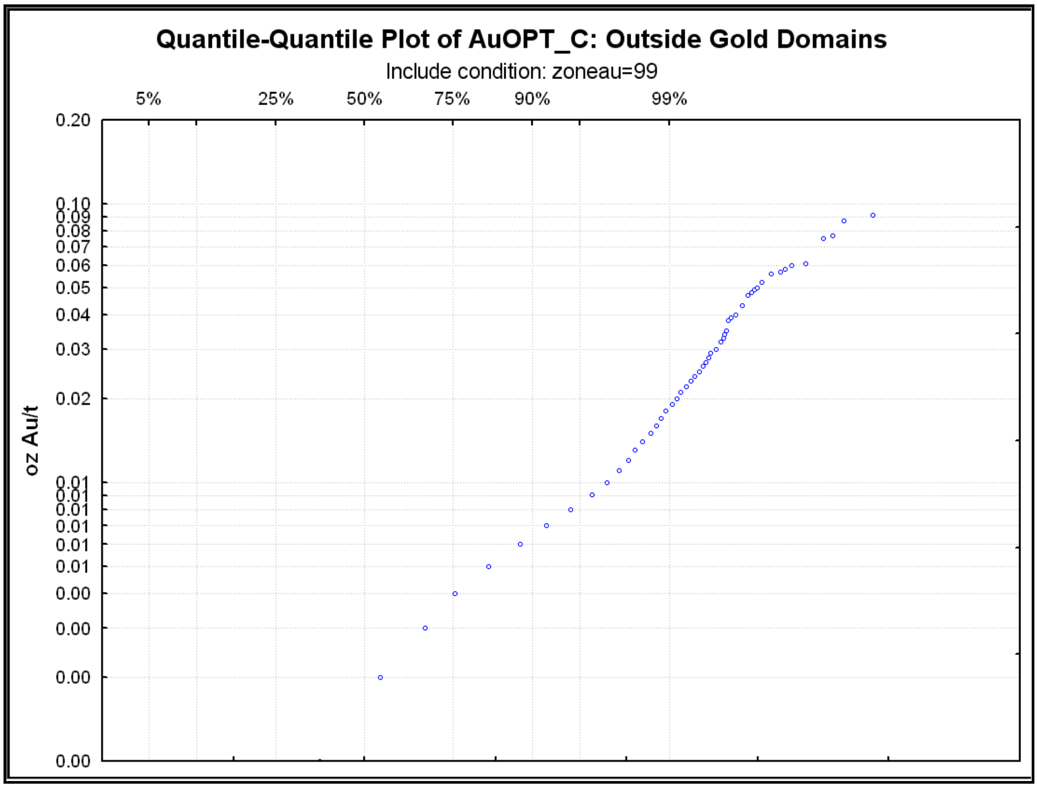
cc: Harry van Drielen

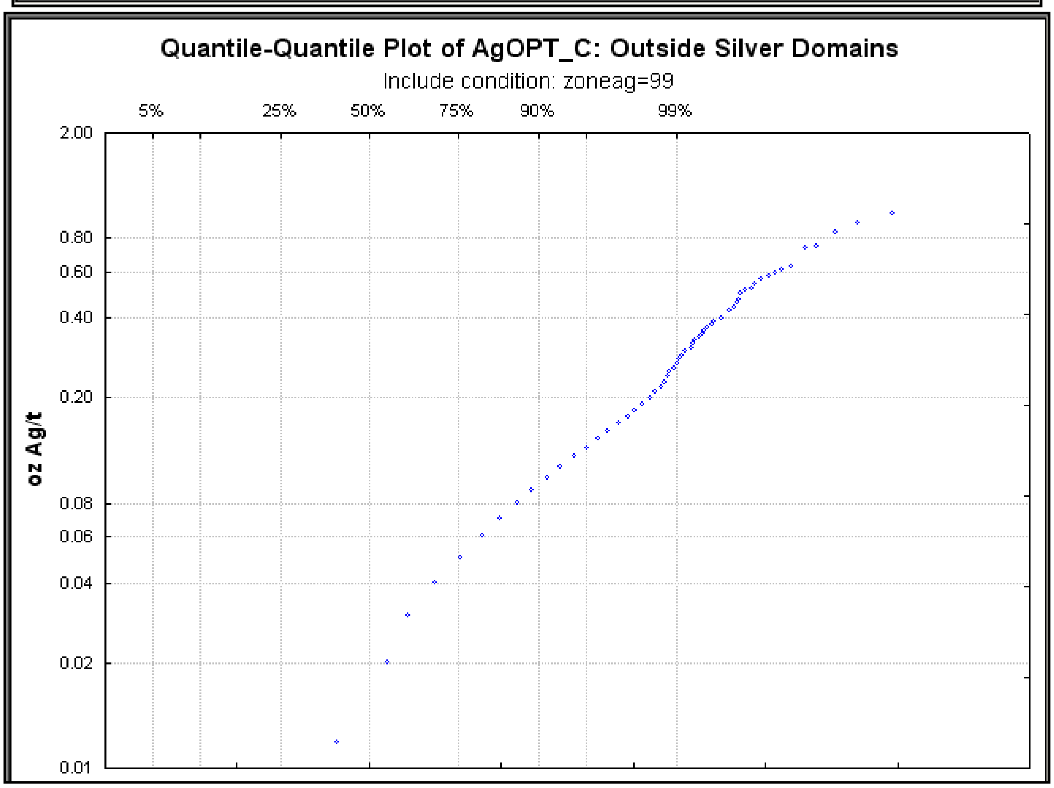
ROSS:jm:2/28/89:261M:PS-6

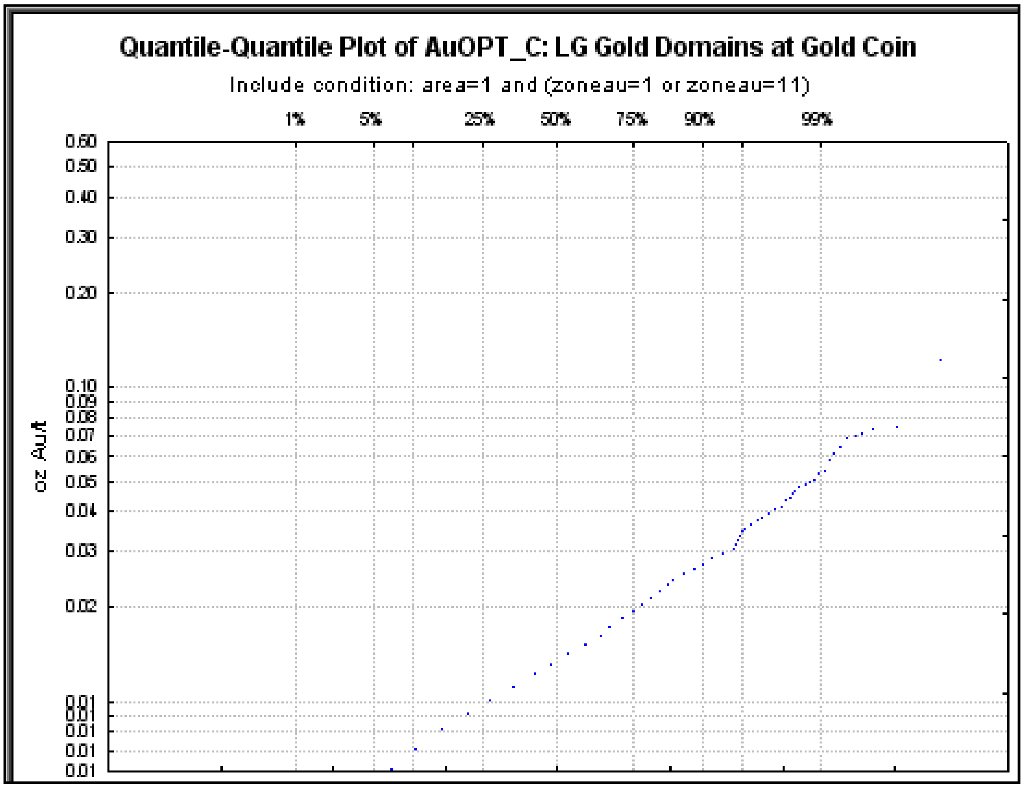
# APPENDIX C

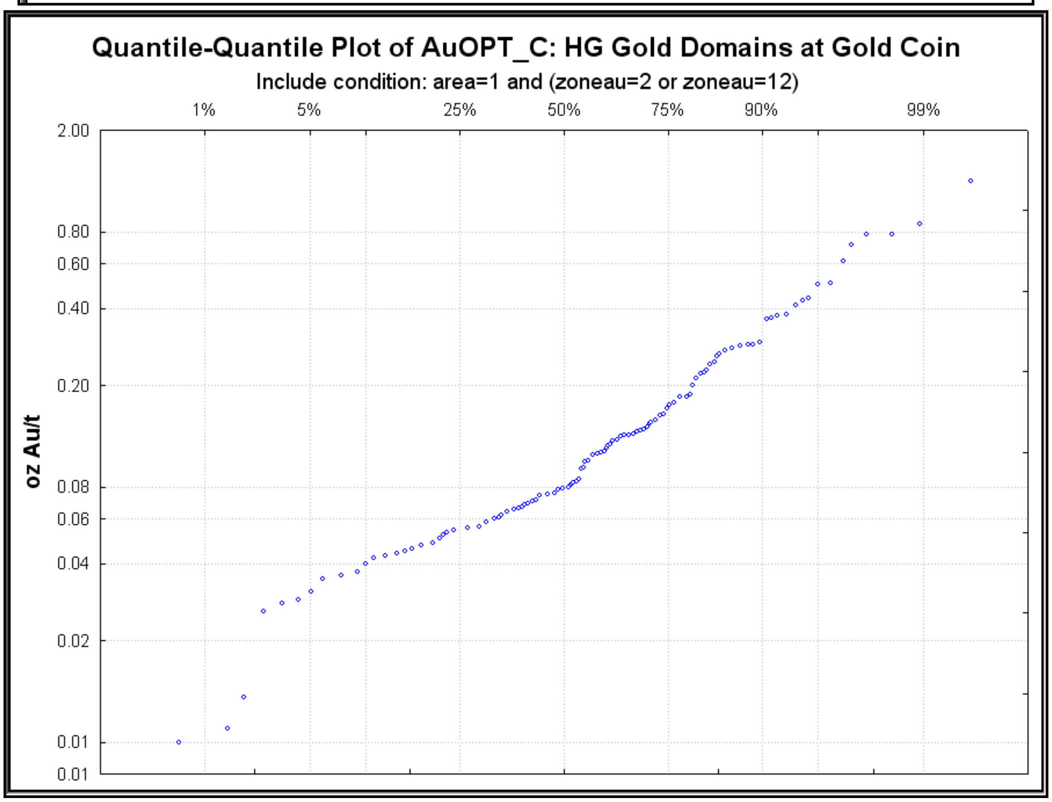
## Quantile Plots of Gold and Silver Grades by Domain

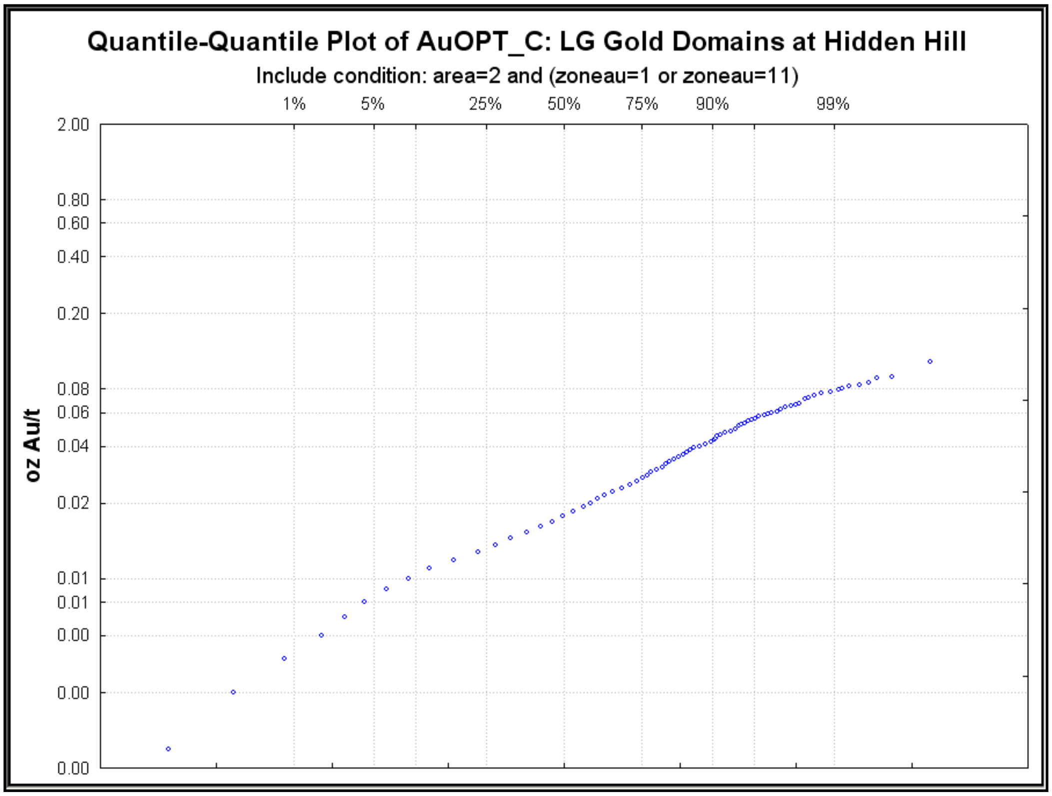
(from 2008 database)

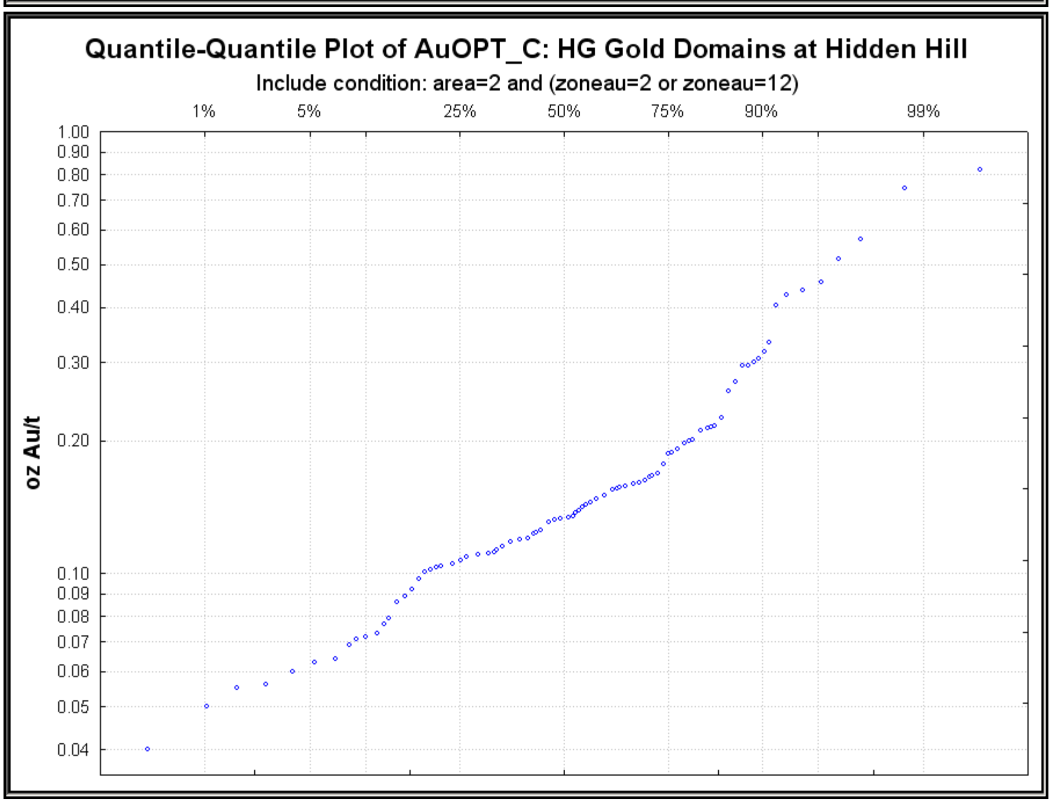

Quantile-Quantile Plot of AuOPT_C: Outside Gold Domains
Include condition: zoneau=99
5%
25%
50%
75%
90%
99%
0.20
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
oz Au/t

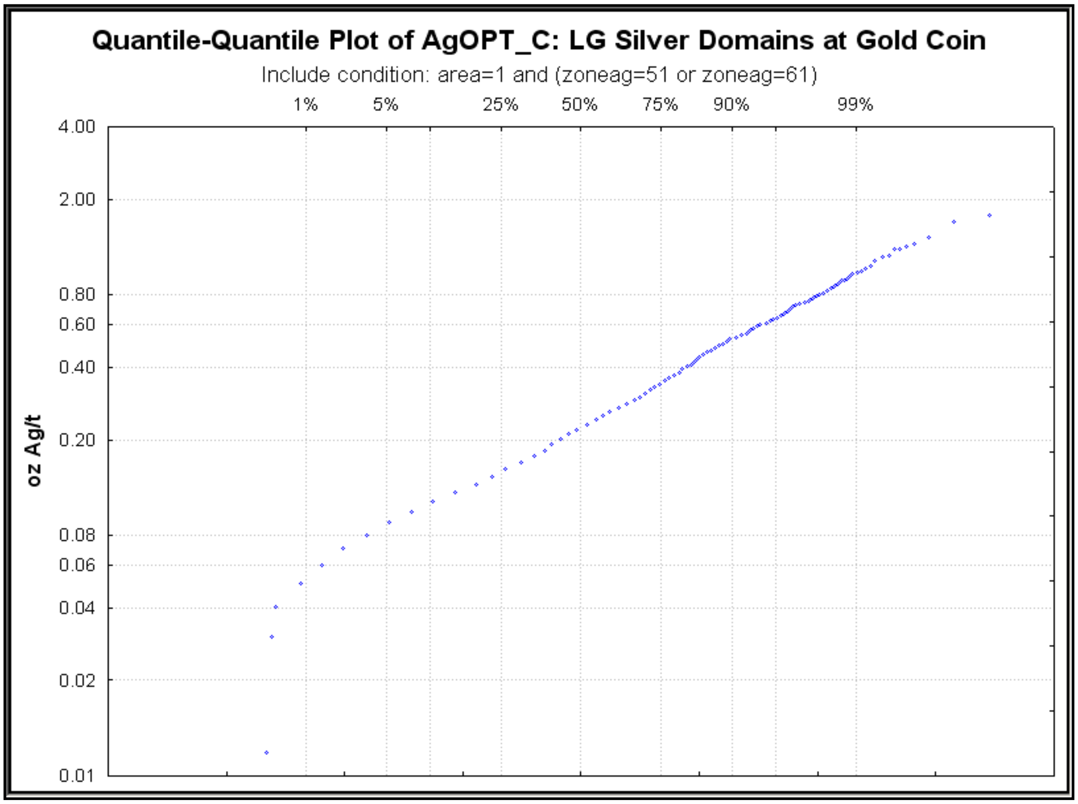

Quantile-Quantile Plot of AgOPT_C: Outside Silver Domains
Include condition: zoneag=99
5%
25%
50%
75%
90%
99%
2.00
0.80
0.60
0.40
0.20
0.08
0.06
0.04
0.02
0.01
oz Ag/t

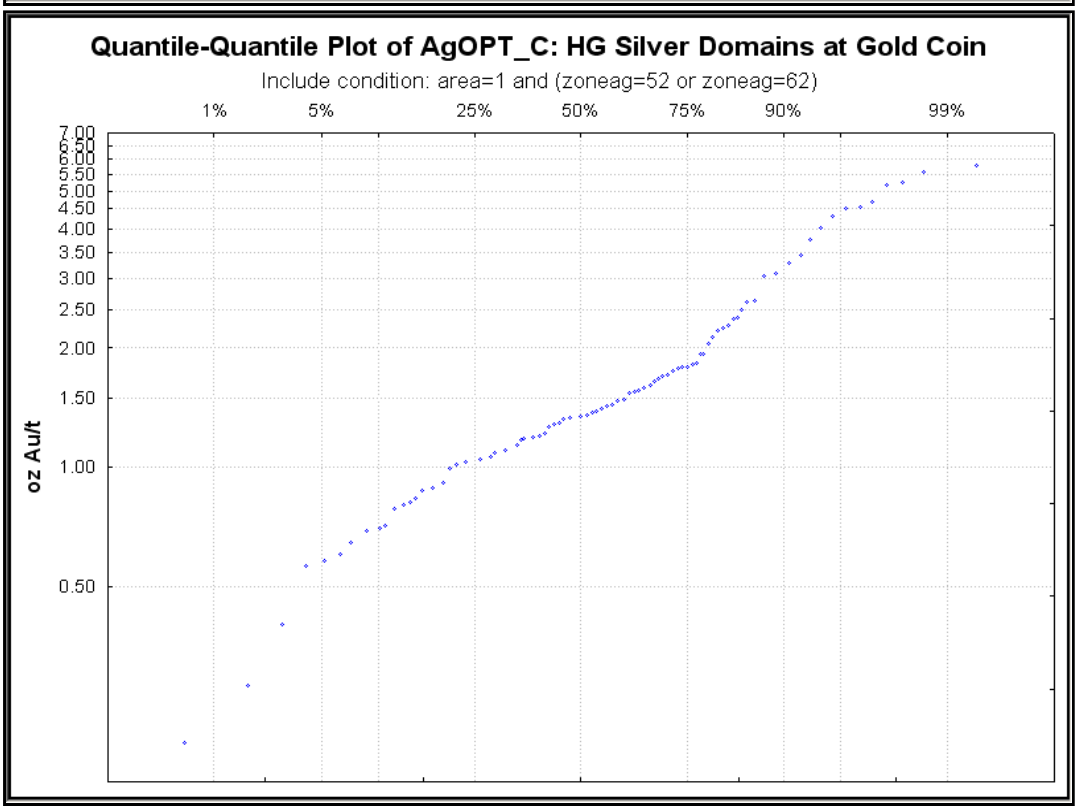

Quantile-Quantile Plot of AuOPT_C: LG Gold Domains at Gold Coin
Include condition: area=1 and (zoneau=1 or zoneau=11)
1%
5%
25%
50%
75%
90%
99%
oz Au/t
0.60
0.50
0.40
0.30
0.20
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01

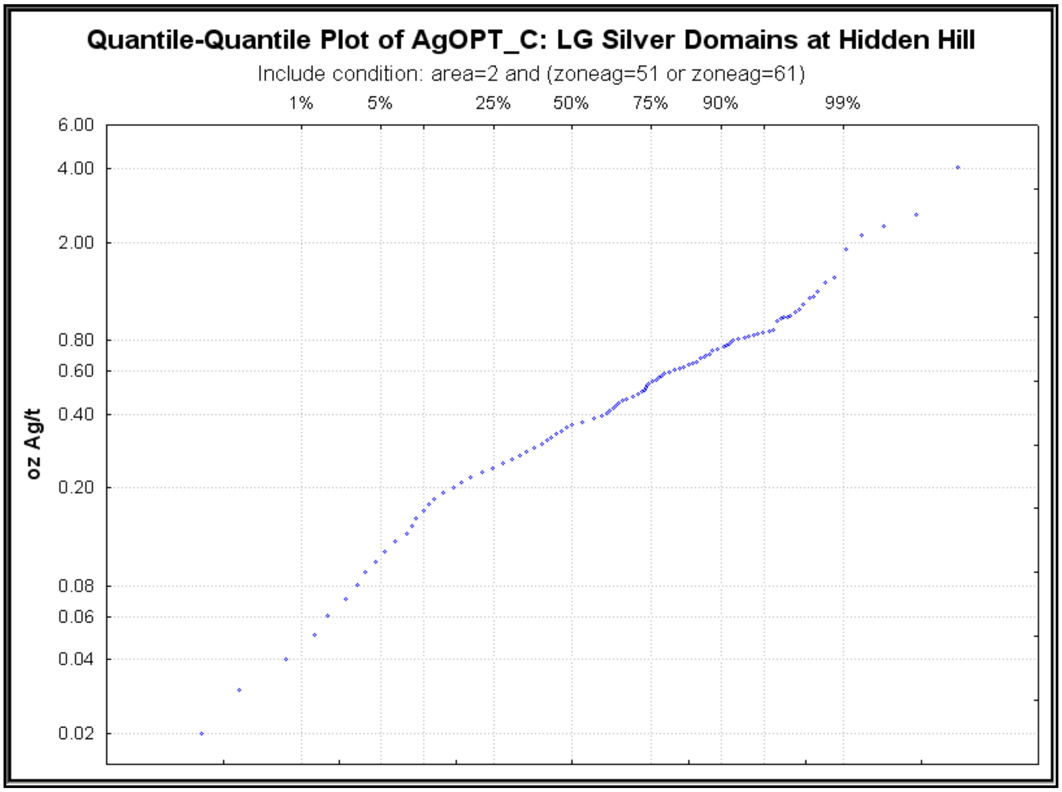

Quantile-Quantile Plot of AuOPT_C: HG Gold Domains at Gold Coin
Include condition: area=1 and (zoneau=2 or zoneau=12)
1%
5%
25%
50%
75%
90%
99%
oz Au/t
2.00
0.80
0.60
0.40
0.20
0.08
0.06
0.04
0.02
0.01
0.01

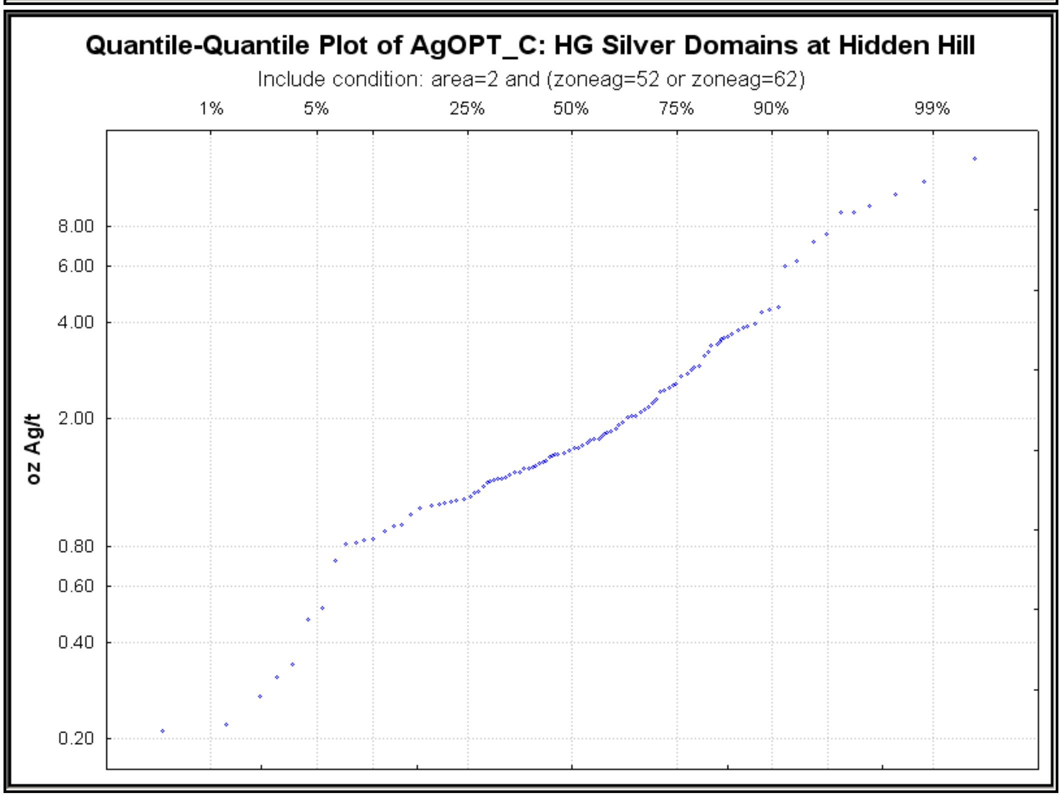

Quantile-Quantile Plot of AuOPT_C: LG Gold Domains at Hidden Hill
Include condition: area=2 and (zoneau=1 or zoneau=11)
1%
5%
25%
50%
75%
90%
99%
2.00
0.80
0.60
0.40
0.20
0.08
0.06
0.04
0.02
0.01
0.01
0.00
0.00
0.00
oz Au/t


Quantile-Quantile Plot of AuOPT_C: HG Gold Domains at Hidden Hill
Include condition: area=2 and (zoneau=2 or zoneau=12)
1%
5%
25%
50%
75%
90%
99%
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.09
0.08
0.07
0.06
0.05
0.04
oz Au/t


Quantile-Quantile Plot of AgOPT_C: LG Silver Domains at Gold Coin
Include condition: area=1 and (zoneag=51 or zoneag=61)
1%
5%
25%
50%
75%
90%
99%
oz Ag/t
4.00
2.00
0.80
0.60
0.40
0.20
0.08
0.06
0.04
0.02
0.01


Quantile-Quantile Plot of AgOPT_C: HG Silver Domains at Gold Coin
Include condition: area=1 and (zoneag=52 or zoneag=62)
1%
5%
25%
50%
75%
90%
99%
oz Au/t
7.00
6.50
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50


Quantile-Quantile Plot of AgOPT_C: LG Silver Domains at Hidden Hill
Include condition: area=2 and (zoneag=51 or zoneag=61)
1%
5%
25%
50%
75%
90%
99%
oz Ag/t
6.00
4.00
2.00
0.80
0.60
0.40
0.20
0.08
0.06
0.04
0.02


Quantile-Quantile Plot of AgOPT_C: HG Silver Domains at Hidden Hill
Include condition: area=2 and (zoneag=52 or zoneag=62)
1%
5%
25%
50%
75%
90%
99%
oz Ag/t
8.00
6.00
4.00
2.00
0.80
0.60
0.40
0.20

# APPENDIX D

## Gold and Silver Estimation Parameters

## Estimation Parameters for Gold at Gold Coin: Sub-horizontal disseminated mineralization

| **Description** | **Parameter** |
|---|---|
| **Low-grade disseminated sub-horizontal (1) Gold – Pass 1** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $300^o$ / $0^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 500 / 500 / 200 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | None |
| **Low-grade disseminated sub-horizontal (1) Gold – Pass 2** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $300^o$ / $0^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 150 / 150 / 75 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | 0.03 / 100 |
| **High-grade disseminated sub-horizontal (2) Gold – Pass 1** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $300^o$ / $0^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 250 / 250 / 100 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | None |
| **High -grade disseminated sub-horizontal (2) Gold – Pass 2** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $300^o$ / $0^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 150 / 150 / 75 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | 0.08 / 100 |

## Estimation Parameters for Gold at Gold Coin: Structurally controlled steeply dipping mineralization

| **Description** | **Parameter** |
|---|---|
| **Low-grade structurally controlled steeply dipping (11) Gold – Pass 1** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $30^o$ / $50^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 500 / 500 / 200 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | None |
| **Low-grade structurally controlled steeply dipping (11) Gold – Pass 2** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $30^o$ / $50^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 150 / 150 / 75 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | 0.03 / 100 |
| **High-grade structurally controlled steeply dipping (12) Gold – Pass 1** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $30^o$ / $50^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 250 / 250 / 125 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | None |
| **High -grade structurally controlled steeply dipping (12) Gold – Pass 2** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $30^o$ / $50^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 150 / 150 / 75 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | 0.08 / 80 |

## Estimation Parameters for Silver at Gold Coin: Sub-horizontal disseminated mineralization

| **Description** | **Parameter** |
|---|---|
| **Low-grade disseminated sub-horizontal (1) Silver - Pass 1** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $300^o$ / $0^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 500 / 500 / 200 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | None |
| **Low-grade disseminated sub-horizontal (1) Silver – Pass 2** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $300^o$ / $0^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 150 / 150 / 75 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | None |
| **High-grade disseminated sub-horizontal (2) Silver – Pass 1** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $300^o$ / $0^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 250 / 250 / 100 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | 2.0 / 150 |
| **High -grade disseminated sub-horizontal (2) Silver – Pass 2** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $300^o$ / $0^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 150 / 150 / 75 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | 2.0 / 100 |

## Estimation Parameters for Silver at Gold Coin: Structurally controlled steeply dipping mineralization

| **Description** | **Parameter** |
|---|---|
| **Low-grade structurally controlled steeply dipping (11) Silver – Pass 1** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $30^o$ / $50^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 400 / 400 / 100 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | None |
| **Low-grade structurally controlled steeply dipping (11) Silver – Pass 2** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $30^o$ / $50^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 150 / 150 / 75 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | None |
| **High-grade structurally controlled steeply dipping (12) Silver – Pass 1** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $30^o$ / $50^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 250 / 250 / 125 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | 2.0 / 150 |
| **High -grade structurally controlled steeply dipping (12) Silver – Pass 2** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $30^o$ / $50^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 150 / 150 / 80 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | 2.0/ 70 |

## Estimation Parameters for Gold at Hidden Hill: Sub-horizontal disseminated mineralization

| **Description** | **Parameter** |
|---|---|
| **Low-grade disseminated sub-horizontal (1) Gold – Pass 1** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $300^o$ / $0^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 400 / 400 / 200 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | None |
| **Low-grade disseminated sub-horizontal (1) Gold – Pass 2** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $300^o$ / $0^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 150 / 150 / 75 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | None |
| **High-grade disseminated sub-horizontal (2) Gold – Pass 1** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $300^o$ / $0^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 200 / 200 / 100 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | None |
| **High -grade disseminated sub-horizontal (2) Gold – Pass 2** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $300^o$ / $0^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 150 / 150 / 75 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | None |

## Estimation Parameters for Gold at Hidden Hill: Structurally controlled steeply dipping mineralization

| Description | Parameter |
|---|---|
| **Low-grade structurally controlled steeply dipping (11) Gold – Pass 1** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $60^o$ / $55^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 400 / 400 / 200 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | None |
| **Low-grade structurally controlled steeply dipping (11) Gold – Pass 2** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $60^o$ / $55^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 150 / 150 / 75 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | None |
| **High-grade structurally controlled steeply dipping (12) Gold – Pass 1** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $60^o$ / $55^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 200 / 200 / 100 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | None |
| **High -grade structurally controlled steeply dipping (12) Gold – Pass 2** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $60^o$ / $55^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 150 / 150 / 75 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | None |

## Estimation Parameters for Silver at Hidden Hill: Sub-horizontal disseminated mineralization

| Description | Parameter |
|---|---|
| **Low-grade disseminated sub-horizontal (1) Gold – Pass 1** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $300^o$ / $0^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 400 / 400 / 200 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | None |
| **Low-grade disseminated sub-horizontal (1) Gold – Pass 2** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $300^o$ / $0^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 150 / 150 / 75 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | None |
| **High-grade disseminated sub-horizontal (2) Gold – Pass 1** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $300^o$ / $0^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 200 / 200 / 100 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | 2.0 /100 |
| **High -grade disseminated sub-horizontal (2) Gold – Pass 2** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $300^o$ / $0^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 150 / 150 / 75 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | 2.0 /80 |

## Estimation Parameters for Silver at Hidden Hill: Structurally controlled steeply dipping mineralization

| **Description** | **Parameter** |
|---|---|
| **Low-grade structurally controlled steeply dipping (11) Gold – Pass 1** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $60^o$ / $55^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 400 / 400 / 200 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | None |
| **Low-grade structurally controlled steeply dipping (11) Gold – Pass 2** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $60^o$ / $55^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 150 / 150 / 75 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | None |
| **High-grade structurally controlled steeply dipping (12) Gold – Pass 1** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $60^o$ / $55^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 200 / 200 / 100 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | 2.0 /100 |
| **High -grade structurally controlled steeply dipping (12) Gold – Pass 2** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $60^o$ / $55^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 150 / 150 / 75 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | 2.0 /100 |

## Estimation Parameters for Gold and Silver outside the defined mineral gold domains

| Description | Parameter |
|---|---|
| **Outside Mineralized Zones (99) Gold – One pass only** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $300^o$ / $0^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 100 / 100 / 50 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | 0.01 / 30 |

## Estimation Parameters for Silver outside the defined mineral silver domains

| Description | Parameter |
|---|---|
| **Outside Mineralized Zones (99) Silver – One pass only** | |
| Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |
| Rotation/Dip/Tilt (variogram and searches) | $300^o$ / $0^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 100 / 100 / 50 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in oz Au/t and distance in ft) | 0.1 / 30 |