MINE DEVELOPMENT ASSOCIATES
MINE ENGINEERING SERVICES

Updated Technical Report on the Lookout Mountain Project
Eureka County, Nevada, USA

Prepared for
TIMBERLINE RESOURCES CORP.

Report Date: April 11, 2013
Effective Date: March 1, 2013

Michael M. Gustin C.P.G.

775-856-5700

210 South Rock Blvd.
Reno, Nevada 89502
FAX: 775-856-6053

CONTENTS

775-856-5700

210 South Rock Blvd.
Reno, Nevada 89502
FAX: 775-856-6053

LIST OF TABLES

TABLE **PAGE**

LIST OF FIGURES

FIGURE **PAGE**

APPENDICES

1.0 SUMMARY

Mine Development Associates ("MDA") has prepared this updated technical report on the Lookout Mountain gold project, Eureka County, Nevada, USA at the request of Timberline Resources Corp. ("Timberline"). The purpose of this report is to provide a technical update on the Lookout Mountain project in support of an updated mineral resource estimate for the Lookout Mountain deposit. The mineral resource estimate for the South Adit deposit, first reported in the previous technical report (Gustin, 2012), was not updated but remains current. This report was 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. The Lookout Mountain project has been previously described in two technical reports prepared for Timberline by MDA (Gustin, 2011, 2012) and in two earlier technical reports prepared for Staccato Gold Resources Ltd. (Russell, 2005, 2007).

The Effective Date of this report is March 1, 2013.

1.1 Location and Ownership

Lookout Mountain is one of several projects located on what Timberline calls its South Eureka property, which covers an area of about 15,000 acres or over 23 square miles. The South Eureka property is located in the southern part of the Eureka mining district in Eureka County, central Nevada, about eight miles south of the town of Eureka. The Lookout Mountain claim block is one of six blocks that comprise Timberline's South Eureka property.

The Lookout Mountain project lies within the Lookout Mountain claim block, which consists of 378 contiguous unpatented lode mining claims situated in portions of Sections 2-4, 9, and 10, Township 17 North, Range 53 East, and Sections 8-10, 15-17, 20-22, 26-28, and 33-35, Township 18 North, Range 53 East, Mount Diablo Base and Meridian. The Lookout Mountain project claim group covers approximately 6,368 acres. BH Minerals USA Inc. ("BH Minerals"), a wholly owned subsidiary of Staccato Gold Resources, Ltd. ("Staccato"), has current leasehold title for the mineral rights to 373 of the 378 claims; Staccato was acquired by Timberline in 2010 and is now a wholly owned subsidiary of Timberline, as is BH Minerals. Timberline holds the remaining five claims, which were staked as internal fractional claims in September 2011.

The 373 BH Mineral claims are leased from Rocky Canyon Mining Company and include 371 RAT and SELRAT claims as well as the DAVE #1 and TREVOR #1 claims. The RAT and SELRAT claims are subject to a 1.5% Gross Value Royalty that is capped at $1,500,000. In addition, there is a 3.5% Gross Value Royalty that covers the RAT, SELRAT, DAVE #1, and TREVOR #1 claims. The Lookout

775-856-5700

210 South Rock Blvd.
Reno, Nevada 89502
FAX: 775-856-6053

Mountain and South Adit resources discussed herein are subject to both of these royalties. The five fractional claims staked by Timberline in 2011 are not subject to either royalty.

1.2 Exploration and Mining History

Replacement deposits of lead-silver-zinc-gold mineralization were discovered in the Eureka district, north of the Lookout Mountain property, in 1864 and produced substantial amounts of lead, silver, and gold, primarily from 1870 to 1890. Gold mineralization that contained no base metals and only minor, if any, silver was discovered at Windfall Canyon, about 3.5 miles northeast of Lookout Mountain, in 1904. The Windfall-type mineralization also differed from other mineralized bodies in the Eureka district in that it consisted of low-grade gold shoots with indistinct assay walls. After discovery of disseminated gold deposits in the region in the 1960s and renewed interest in the gold-only mineralization at Windfall, modern prospecting was initiated in the Lookout Mountain area in the 1960s.

Amselco Exploration Inc. ("Amselco") began the first major, and ultimately the largest, exploration program in the Lookout Mountain area in 1978. They conducted extensive geologic mapping and soil and rock geochemical sampling and drilled 309 conventional rotary, reverse circulation ("RC"), and core holes between 1978 and late 1985. Amselco discovered the mineralization that eventually became the Lookout Mountain open-pit mine at the northern end of Ratto Ridge and also discovered five other areas along Ratto Ridge that contain partially developed gold mineralization.

Amselco optioned the Lookout Mountain property to consultants Campbell Foss and Buchanan in July 1986, who entered into a joint venture that put Lookout Mountain into production in 1987, operated by Norse Windfall Mines Inc. ("Norse Windfall Mines"). Norse Windfall Mines mined 180,196 tons of mineralized rock averaging 0.12 oz Au/ton in 1987. The ore was agglomerated and leached to produce 17,700 ounces of gold at a recovery rate of 81%. Operations were halted in late 1988, and the property was returned to the original landowners.

The Lookout Mountain property was explored by EFL Gold Mine, Inc., Barrick Gold Exploration Inc., and Echo Bay Exploration, Inc. from 1990 to 1997. Staccato, through its wholly owned subsidiary BH Minerals, acquired the South Eureka district holdings, including the Lookout Mountain property, in April 2005. Staccato drilled 50 core and RC holes from 2005 to 2008.

Timberline acquired Staccato in June 2010 and thereby obtained the South Eureka property, including the Lookout Mountain project. Timberline has since drilled 150 core and RC holes at the Lookout Mountain project and has conducted geologic mapping, sampling, and metallurgical testing.

1.3 Geology and Mineralization

Central Nevada was a shelf environment throughout Paleozoic time, interrupted by the Late Devonian to Early Mississippian Antler Orogeny with east-directed compression and thrust faulting whose primary feature was the Roberts Mountains thrust, exposed just west of the Eureka district. During the Tertiary, several periods of igneous activity deposited a variety of volcanic and intrusive rocks throughout this region. Extensional tectonics dominated the Tertiary throughout Nevada. The South Eureka district lies on the southern end of the 100-mile-long, northwest-trending Battle Mountain-Eureka trend, also known as the Cortez trend, which hosts a large number of sediment-hosted gold deposits and base-metal replacement deposits.

The sedimentary rocks exposed in the South Eureka district are of Cambrian through Devonian age and are made up of limestone, dolomite, and minor amounts of shale and quartzite that were deposited in a shallow-water miogeosynclinal environment. They have been intruded by a Cretaceous pluton and several felsic dikes of Eocene age. The Oligocene Ratto Springs rhyodacite and Sierra Springs tuff overlie the Paleozoic rocks. Included within the Paleozoic section in the South Eureka district are the Ordovician Goodwin Formation of the Pogonip Group, which hosts gold mineralization at the nearby Archimedes deposit; the Cambrian Dunderberg Shale and Hamburg Dolomite, which host gold mineralization at the Lookout Mountain, Windfall, Paroni, and Rustler deposits on Timberline's South Eureka property; and the Devonian Bartine Limestone, which hosts gold mineralization at the Gold Bar mine to the northwest.

A pronounced north-trending high-angle fault zone, the Ratto Ridge fault system, has localized jasperoids and gold mineralization in sedimentary units along more than 2.5 miles of strike length at Lookout Mountain. This fault juxtaposes gently dipping Cambrian sedimentary rocks on the east against gently dipping Devonian sedimentary rocks on the west, an offset of perhaps 7,000 feet vertically along Ratto Ridge. The Ratto Ridge fault system is cut by a number of northeast- and east-trending, steeply south-dipping faults and also by less prominent northwest-trending, steeply south-dipping sets of faults.

There are breccias of multiple origins at Lookout Mountain as evidenced in the pit and drill core. Most appear to be collapse breccias, but there are also tectonic and probably depositional breccias, and these breccias host the bulk of the resources discussed in this report. Timberline believes these breccias, which are collectively referred to as Lookout Mountain breccia in this report, are predominantly developed within the Hamburg Dolomite.

The Lookout Mountain breccia has a northerly strike and moderate dip to the east. The breccia is quite wide at the surface and typically thins down dip. Jasperoid-rich zones are common in the upper portion of the breccia near its contact with the Dunderberg Shale, while the lower portion near the Secret Canyon Shale is characterized by a structural zone; both zones are frequently characterized by higher than average gold grades. The highest grades at Lookout Mountain appear to be controlled by favorable structural settings in both the breccia and overlying Dunderberg Shale. The Secret Canyon Shale, which immediately underlies much of the breccia, rarely hosts mineralization.

Gold mineralization at the Lookout Mountain project is Carlin-type disseminated sediment-hosted mineralization. Characteristic alteration of these deposits is decalcification, argillization, and intense silicification, which forms jasperoid. Gold is invariably accompanied by more or less silver and a halo of pathfinder elements commonly including arsenic, thallium, mercury, antimony, and barium. In addition to the previously mined Lookout Mountain deposit, other concentrations of gold mineralization on the Lookout Mountain property have been identified at South Adit, South Lookout Mountain, South Ratto Ridge, and Triple Junction.

At Lookout Mountain, and for 2.5 miles along Ratto Ridge, disseminated sediment-hosted gold mineralization has been found within the Lookout Mountain breccia, as well as the overlying Cambrian

Dunderberg Shale. Gold occurs in jasperoid that caps Ratto Ridge through to depths of 1,500 feet and is associated with strong surface arsenic, mercury, and antimony anomalies in soil and rock samples. Alteration is widespread, with decalcification and silicification being the most common types. Argillic alteration is also present, as is sanding of dolomites. Gold is associated with pyrite, realgar, quartz, and clay. The unoxidized mineralization at Lookout Mountain consists of disseminated arsenopyrite and arsenosiderite; assays ranging from 0.5 to over 1.0 oz Au/ton have been reported.

At South Adit, gold occurs in the same geological setting as the other occurrences along Ratto Ridge, *i.e.* at the Dunderberg-Hamburg contact associated with strong silicification/argillization and steeply dipping normal faults. The mineralized zone trends north and, like Triple Junction to the north, lies east of the crest of Ratto Ridge. At the top of the ridge above South Adit mineralization, a northwest-trending splay of the main north-trending structure appears. Mapping and drill-section interpretation suggest that a strong north-trending cross structure intersects the northwest-trending structure in this area. Large jasperoid bodies lie just above the South Adit mineralized zone with a strong east-northeast fault control.

1.4 Drilling and Sampling

The Lookout Mountain project has been drilled by Newmont, Amselco, Barrick, Echo Bay, Norse Windfall Mines, EFL, Staccato, and Timberline. The project database provided to MDA contains data from 684 holes, totaling 357,007 feet, including 62 core holes, 463 RC holes, and 159 rotary holes. Amselco's drilling program from 1978 through 1985 provided 45% of the holes in the current database. Timberline drilled a total of 150 holes from 2010 through 2012, of which 26 were core and 124 were RC.

The various operators prior to Staccato used commercial laboratories for the preparation and analysis of their drill samples that were well recognized and widely used in the minerals industry. In-house mine laboratories were also used for the 20 Norse Windfall Mines holes and some of the Amseclo holes, and many of these analyses utilized partial-gold extractions. Some of the Norse Windfall Mines gold data clearly understate grades in comparison to adjacent holes. MDA's reconstruction of the Amselco database effectively limits the impact of the in-house assays by replacing many of them with check analyses performed at commercial laboratories.

Staccato used ALS Minerals for their drill samples from the 2005 through 2007 programs and Inspectorate America Corp. ("Inspectorate") in 2008. Timberline used Inspectorate for all assaying of their primary drill samples.

1.5 Metallurgy

Bottle-roll and column-leach testing was conducted on Lookout Mountain mineralization by Hazen Research, Inc., Heinen Lindstrom Consultants, McClelland Laboratories, Inc. ("McClelland"), and Kappes, Cassiday and Associates ("KCA") from 1985 to 1997. Three sets of this early test work used composites of RC cuttings and drill core and yielded extractions ranging from 12% on unoxidized claystone to 94% on oxidized claystone. Two of the tests were completed on bulk samples taken from the Lookout Mountain open pit, with extractions ranging from 45% to 91%. Several samples of jasperoid from bottle-roll tests suggest silica encapsulation may affect gold extraction, and sulfide material showed very poor leaching capability.

Timberline initiated metallurgical testing by KCA in 2010. Four bulk samples, representing various mineralization types, were taken from the Lookout Mountain open pit. Bottle-roll leach testing of pulverized splits yielded extractions of 81% to 88% for the four samples, while extractions from coarse material ranged from 72% to 95%. Column-leach testing resulted in extractions of 74% to 91% for the four samples, with the lowest extraction coming from oxidized jasperoid breccia.

Bottle-roll tests on two sulfide core intervals, each crushed to 100% passing 5/8 inch and to 80% passing 200 mesh, yielded extractions ranging from 1% to 20%.

Bottle-roll tests on pulverized and crushed portions of composite samples of jasperoid/silicified breccias, brecciated jasperoid, and collapsed breccias/fault gouge from drill core yielded extractions ranging from 66% to 90%. Column-leach tests on the same three composites at different crush sizes produced extractions ranging from 53% to 84%.

Timberline drilled 12 core holes in 2012 specifically to provide additional samples for metallurgical testing. Samples were sent to KCA and McClelland to identify how much and which types of jasperoid may cause encapsulation problems; bottle-roll tests were conducted by both labs. Timberline concluded that the jasperoid material tested yielded poorer extractions at coarser sizes than those from smaller size fractions, indicating that some portion of the gold is encapsulated in silica and crushing of jasperoid material will likely be required. Determination of optimal crush size will require further testing.

1.6 Mineral Resource Estimate

The gold resources at the Lookout Mountain project, including the Lookout Mountain and South Adit deposits, were modeled and estimated by evaluating the drill data statistically, utilizing the geologic interpretations provided by Timberline to interpret mineral domains on cross sections spaced at 50- and 100-foot intervals, refining the mineral-domain interpretations on level plans spaced at 10-foot intervals, analyzing the modeled mineralization statistically to aid in the establishment of estimation parameters, and interpolating grades into a three-dimensional block model. All modeling of the Lookout Mountain project resources was performed using Gemcom Surpac® mining software.

The Lookout Mountain project resources are presented in Table 1.1.

Table 1.1 Lookout Mountain Project Gold Resources

Measured			Indicated			Measured & Indicated		
Tons	oz Au/ton	oz Au	Tons	oz Au/ton	oz Au	Tons	oz Au/ton	oz Au
3,043,000	0.035	106,000	25,897,000	0.016	402,000	28,940,000	0.018	508,000

Inferred		
Tons	oz Au/ton	oz Au
11,709,000	0.012	141,000

Note: Rounding may cause apparent discrepancies.

The Lookout Mountain project block-diluted mineral resources are tabulated using cutoff grades of 0.006 oz Au/ton for oxidized material and 0.030 oz Au/ton for unoxidized material. These cutoffs are chosen to capture mineralization that is potentially available to open-pit extraction and heap-leach processing. The higher cutoff applied to unoxidized material reflects probable lower heap-leach recoveries and/or more costly sulfide processing.

1.7 Conclusions and Recommendations

MDA has reviewed the project data and has visited the project site. MDA believes that the data provided to MDA by Timberline are generally an accurate and reasonable representation of the Lookout Mountain project.

The resources reported above are open along strike in both directions, as well as down dip. The possible extension of the Lookout Mountain deposit south through to the South Adit resource, located approximately 3,500 feet south of the southern limit of the modeled mineralization at Lookout Mountain, provides the best opportunity for near-term enhancement of project resources. In addition, there is excellent potential to add to the existing resources that lie west of the Ratto Canyon fault at the Lookout Mountain deposit.

MDA recommends a Phase I program of infill drilling, resource-expansions drilling, further metallurgical testing, full three-dimensional geological modeling, and the completion of a preliminary economic assessment (“PEA”) based on the current resources. The cost of this program is estimated to be about $3.275 million dollars.

If the PEA returns positive results, a Phase II program is recommended that is designed to prepare the project for a pre-feasibility study. The Phase II program includes hydrologic, environmental, and preliminary design studies, as well as continuations of the drilling program and metallurgical studies of Phase I. The cost of the proposed Phase II program is about $4.35 million (the Phase I and II estimated costs exclude all personnel, landholding, reclamation, reclamation bonding, permitting and related environmental costs).

2.0 INTRODUCTION

Mine Development Associates ("MDA") prepared this updated technical report on the Lookout Mountain gold project, located in Eureka County, Nevada, at the request of Timberline Resources Corp. ("Timberline"), a U.S.-based company listed on the TSX Venture Exchange and the NYSE Amex. The Lookout Mountain project is one of several projects included within what Timberline refers to as the South Eureka property. The focus of this report is on the Lookout Mountain and South Adit portions of the property, both of which are located on the Lookout Mountain claim block that constitutes the Lookout Mountain project.

This report has been prepared in compliance with the disclosure and reporting requirements set forth in the Canadian Securities Administrators' National Instrument 43-101, Companion Policy 43-101CP, and Form 43-101F1 ("NI 43-101"), as well as with the Canadian Institute of Mining, Metallurgy and Petroleum's "CIM Definition Standards - For Mineral Resources and Reserves, Definitions and Guidelines" ("CIM Standards") adopted by the CIM Council on December 2000 and modified in 2005 and 2010.

2.1 Project Scope and Terms of Reference

The purpose of this report is to provide a technical summary of the Lookout Mountain project in support of an updated mineral resource estimate for the Lookout Mountain deposit; the mineral resource estimate for the South Adit deposit, first reported in the previous technical report (Gustin, 2012), was not subject to new drilling, has not been updated herein, and remains current. The mineral resources were estimated and classified under the supervision of Michael M. Gustin, Senior Geologist for MDA. Mr. Gustin is a qualified person under NI 43-101 and has no affiliations with Timberline except that of independent consultant/client relationship. The mineral resources reported herein for the Lookout Mountain and South Adit deposits are estimated to the standards and requirements stipulated in NI 43-101.

The scope of this study included a review of pertinent technical reports and data provided to MDA by Timberline relative to the general setting, geology, project history, exploration activities and results, methodology, quality assurance, interpretations, drilling programs, and metallurgy. MDA has relied on the data and information provided by Timberline for the completion of this report, including the supporting data for the estimation of the mineral resources. MDA previously prepared two technical reports for Timberline on the Lookout Mountain project (Gustin, 2011, 2012). Two earlier technical reports were prepared for Staccato Gold Resources Ltd. by Russell (2005, 2007).

Mr. Gustin visited the Lookout Mountain project on January 6 and November 16, 2011 and April 10, 2013. These site visits included reviews of mineralized core and reverse-circulation drill chips, examination of drill-hole cross sections showing the geologic model, investigations of representative exposures in road cuts and outcrops, the inspection of sampling and logging procedures at active reverse-circulation drill sites, and confirmatory visits to almost every Timberline drill site at Lookout Moutain.

MDA has made such independent investigations as deemed necessary in the professional judgment of Mr. Gustin to be able to reasonably present the conclusions discussed herein.

The Effective Date of this updated technical report is March 1, 2013.

2.2 Definitions and frequently used acronyms and abbreviations

Measurements are generally reported in English units in this report. Where information was originally reported in metric units, conversions may have been made according to the formulas shown below; discrepancies may result in slight variations from the original data in some cases.

Frequently used acronyms, abbreviations, and unit conversions

AA	atomic absorption spectrometry
Ag	silver
Au	gold
BLM	United States Department of the Interior, Bureau of Land Management
CS-AMT	Controlled Source Audio-Frequency Magneto-Telluric geophysical survey
cm	centimeter; 1 cm = 0.3937 inch
°F	degrees Fahrenheit
ft	foot or feet; 1 ft = 0.3048 m
g/t	grams per tonne; 1 g Au/t = 1 ppm Au = 0.02917 oz/ton
ha	hectare; 1 ha = 2.471 acres
ICP	inductively coupled plasma
in.	inch or inches
IP	induced polarization geophysical survey
kg	kilogram; 1 kg = 2.205 pounds
km	kilometer; 1 km = 0.6214 mile
l	liter; 1 l = 1.057 US quarts
Ma	million years old
m	meter; 1 m = 3.2808 feet
mm	millimeter; 1 mm = 0.001 m = 0.003281 ft
oz	troy ounce; 12 troy oz = 1 troy pound; 1 oz Au/ton = 34.2857 g Au/t
ppm	parts per million
ppb	parts per billion
R	range
RC	reverse-circulation drilling method
SEM	scanning electron microscope
t, tonne	metric tonne = 1.1023 short tons
T	township

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

3.0 RELIANCE ON OTHER EXPERTS

The author is not an expert in legal matters, such as the assessment of the legal validity of mining claims, private lands, mineral rights, and property agreements in the United States. MDA did not conduct any investigations of the environmental or social-economic issues associated with the Lookout Mountain project, and the author is not an expert with respect to these issues.

MDA has relied on Timberline to provide full information concerning the legal status of Timberline Resources Corp. and related companies, as well as current legal title, material terms of all agreements, and material environmental and permitting information that pertain to the Lookout Mountain property. For the information summarized in Sections 4.2 (Land Area) and 4.3 (Agreements and Encumbrances), MDA has relied upon information provided by Timberline, including: (1) a document entitled *Lookout Mountain Title Review*, prepared by G.I.S. Land Services (2008) for Staccato Gold Resources, Ltd.; (2) an update of the G.I.S. Land Services report prepared for Timberline by the law firm of Harris & Thompson (Thompson, 2011); and (3) further updated land information.

MDA has relied upon information provided by Timberline and Enviroscientists Inc., an environmental consulting firm based in Reno, Nevada, for the information in Sections 4.4 (Environmental Permits and Licenses) and 4.5 (Environmental Liabilities).

Section 4.0 in its entirety is based on information provided by Timberline, and the author offers no professional opinions regarding the provided information.

4.0 PROPERTY DESCRIPTION AND LOCATION

The author is not an expert in land, legal, environmental, and permitting matters. Section 4.0 is based on information provided to the author by Timberline, including a 2008 title review prepared by G.I.S. Land Services for Staccato Gold Resources, Ltd. and a 2011 update to that title review that was prepared by the law firm of Harris & Thompson for Timberline (Thompson, 2011). The author presents this information to fulfill reporting requirements of NI 43-101 and expresses no opinion regarding the legal or environmental status of the Lookout Mountain project, the Lookout Mountain claim block, or the South Eureka property. Although not an expert in these matters, MDA is not aware of any significant factors or risks that may affect access, title, or the right or ability to perform work on the Lookout Mountain property.

4.1 Property Location

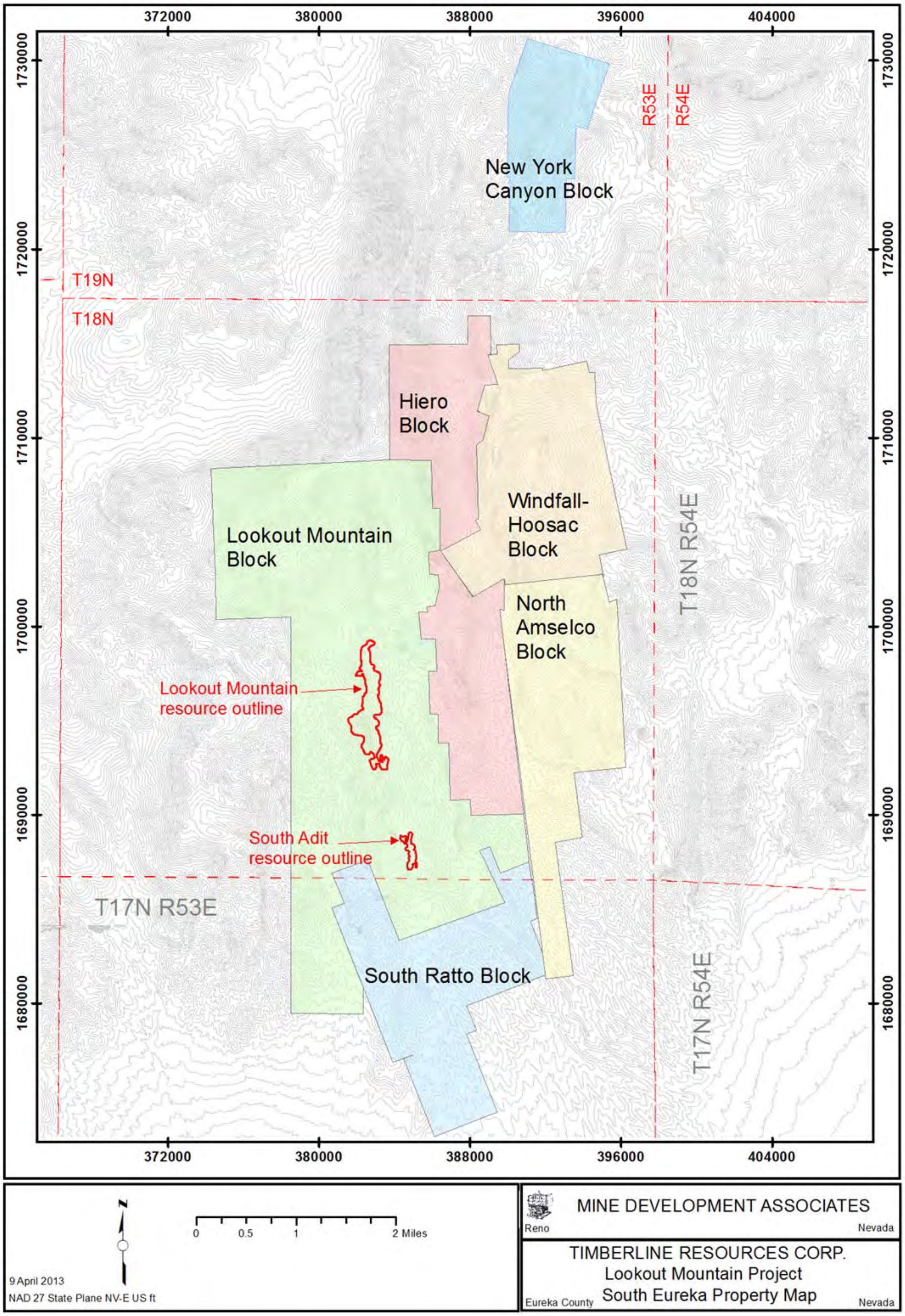
Lookout Mountain is one of several projects located on what Timberline calls its South Eureka property, which covers an area of about 15,000 acres or over 23 square miles. The South Eureka property lies within the Eureka mining district at the southeastern end of the Battle Mountain-Eureka (Cortez) mineralized trend of gold and base-metal deposits in north-central Nevada (Figure 4.1). The South Eureka property consists of six large claim blocks: the Lookout Mountain, Windfall-Hoosac, North Amselco, Hiero, South Ratto, and New York Canyon blocks (Figure 4.2). The focus of this report is on the Lookout Mountain claim group, which covers the Lookout Mountain project and is the largest of the six claim blocks (Figure 4.3). The Lookout Mountain project includes both the Lookout Mountain and South Adit deposits described in this report.

The Lookout Mountain project is located in the southern part of the Eureka mining district in Eureka County, Nevada, about eight miles south of the town of Eureka, the Eureka County seat. The property lies at the topographic junction of the south end of the Diamond Mountains with the east-central portion of the Fish Creek Range. The Lookout Mountain claim block covers Lookout Mountain and Ratto Ridge in the northern part of surveyed Township 17 North, Range 53 East and in much of unsurveyed Township 18 North, Range 53 East, Mount Diablo Base and Meridian. The approximate center of the Lookout Mountain property is located at 39° 24' 16"N, 115° 58' 56"W. The property is covered by the United States Geological Survey 7.5 minute Pinto Summit and Spring Valley Summit topographic quadrangle maps.

In this report, the Lookout Mountain resource area is split into two blocks, with the dividing line at 1696100N (the northing value in Nevada State Plane East, NAD27 coordinates, the coordinate system used for the project). The resource area lying north of this line is referred to as North Lookout Mountain, which includes the previously mined open pit. The South Lookout Mountain area, south of 1696100N, is generally less densely drilled and includes only Indicated and Inferred resources. The South Adit resource area is located about 3,500 feet to the southeast of the southern limits of the South Lookout Mountain resource area (Figure 4.3).

Figure 4.1 Location of the Lookout Mountain Project

Figure 4.2 South Eureka Property Map



4.2 Land Area

With the exception of the general description of ownership of unpatented mining claims in the U.S. and the information about surveying of the claims, the following information is summarized from the 2008 title review of the Lookout Mountain claims by G.I.S. Land Services (2008), as updated by the law firm of Harris & Thompson in 2011 (Thompson, 2011), and from updated information provided by Timberline (Timberline, written communication, April 2, 2012; Timberline, personal communication, February 22, 2013).

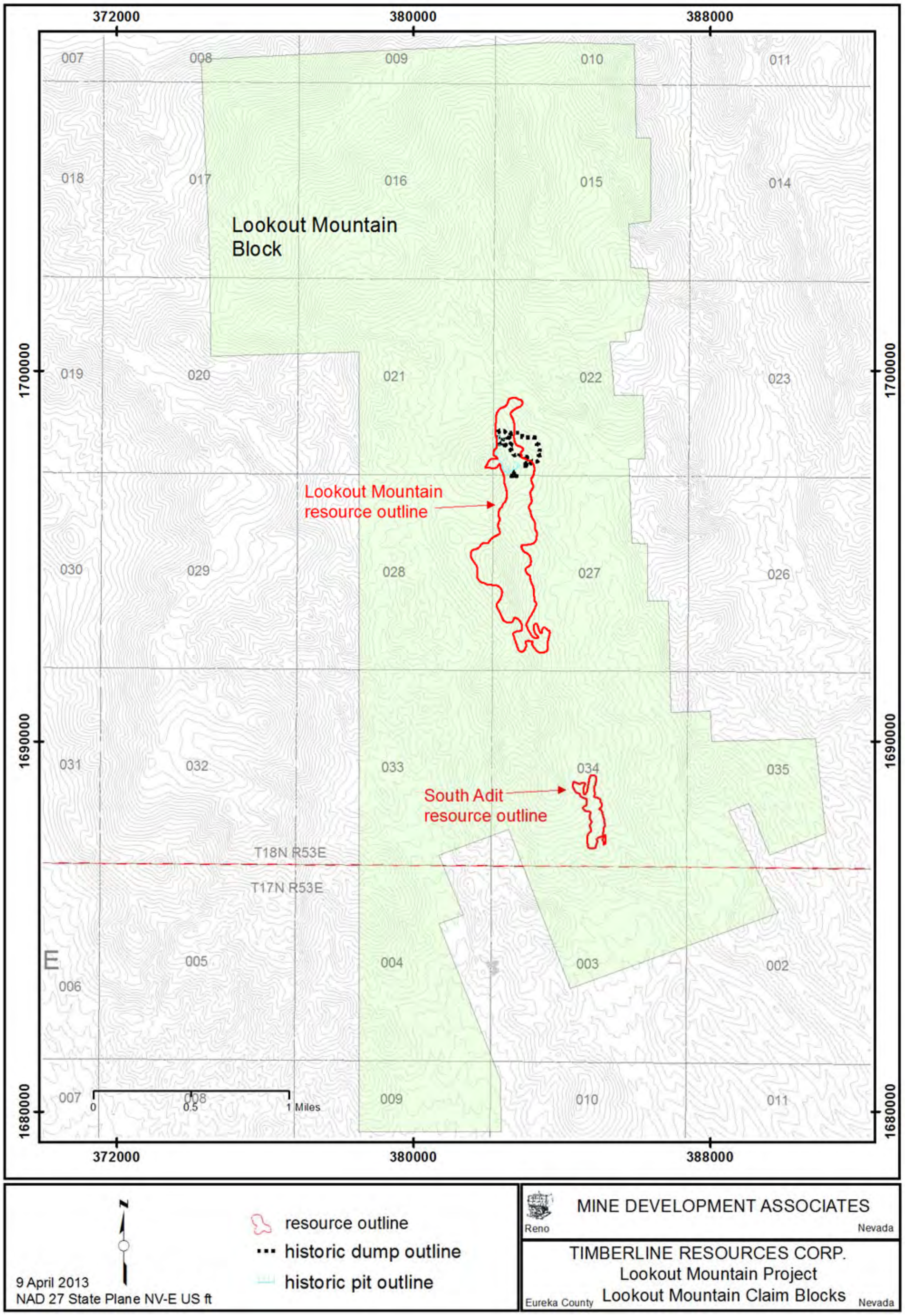
The Lookout Mountain claim group (Figure 4.3) consists of 378 contiguous unpatented lode mining claims situated in portions of Sections 2, 3, 4, 9, and 10, Township 17 North, Range 53 East and Sections 8, 9, 10, 15, 16, 17, 20, 21, 22, 26, 27, 28, and 33, 34, 35, Township 18 North, Range 53 East, Mount Diablo Base and Meridian. The claims total approximately 6,368 acres (approximately 2,577 hectares). Appendix A lists the 378 unpatented mining claims that make up the Lookout Mountain claim block. Timberline controls 373 of the 378 claims through a lease described in Section 4.3 and owns the remaining five internal fractional claims as described in Section 4.3.

Ownership of unpatented mining claims is in the name of the holder (locator), subject to the paramount title of the United States of America, under the administration of the U.S. Bureau of Land Management ("BLM"). Under the Mining Law of 1872, which governs the location of unpatented mining claims on federal lands, the locator has the right to explore, develop, and mine minerals on unpatented mining claims without payments of production royalties to the U.S. government, subject to the surface management regulation of the BLM. It should also be noted that in recent years there have been efforts in the U.S. Congress to change the 1872 Mining Law to include, among other items, a provision of production royalties to the U.S. government. Currently, annual claim maintenance fees are the only federal payments related to unpatented mining claims. Nevada BLM records of mining claims can be searched on-line at http://www.nv.blm.gov/LandRecords/.

Certificates of Location for each claim of the Lookout Mountain claim block were properly filed in Eureka County and the BLM. As of April 2012, MDA reviewed records that suggest the claims had been properly maintained, based on the Annual Notice of Intent to Hold documents filed in Eureka County and on the Annual Maintenance Fee documents filed with the BLM. Timberline reports that the annual fee of $140 per claim payable to the BLM, the annual filing fee of $10.50 per claim, and $4.00 for a Notice of Intent to Hold Mining Claims due to Eureka County were also paid for the 2012-2013 assessment year. The total of these costs for the 378 claims in 2012-2013 is $56,196.50.

MDA has not reviewed any documentation that indicates the claims have been surveyed, although Timberline believes that Amselco surveyed the claim block. There is no requirement to conduct a survey in order to hold the claims.

Figure 4.3 Lookout Mountain Claim Block Showing Resource Outlines



4.3 Agreements and Encumbrances

The 378 claims were located by various owners, and after a series of transactions, a total of 373 of the 378 claims (the RAT- and SELRAT- claim groups and the DAVE #1 and TREVOR #1 claims) were consolidated under the single ownership of Rocky Canyon Mining Company (G.I.S. Land Services, 2008). Through an Assignment of Lease executed April 14, 2008, Staccato Gold Resources, Ltd. ("Staccato") acquired leasehold title for the mineral rights of the claims from Century Gold LLC, who had previously leased the property from Rocky Canyon Mining Company (G.I.S. Land Services, 2008). As described in Section 4.3.2, Timberline acquired Staccato in 2010, and Staccato is now a wholly owned subsidiary of Timberline, as is BH Minerals. Section 6.1 describes the history of the property in more detail. In September 2011, Timberline staked an additional five internal fractional claims (TLRrat 1 through TLRrat 5) within the original 373 claims that comprise the property (Timberline, written communication, April 2, 2012).

4.3.1 Agreement between Staccato Gold Resources Ltd. and Rocky Canyon Mining Company

Staccato acquired Century Gold LLC, who had leased the Lookout Mountain claim block from Rocky Canyon Mining Company under a Mining Lease and Agreement dated August 22, 2003, and amended on June 1, 2008 (G.I.S. Land Services, 2008). The term of the lease is 20 years, commencing on June 1, 2008. Staccato must pay an annual advanced royalty payment of $72,000 in addition to the BLM and Eureka County fees described in Section 4.2. The royalties included in this agreement are described in Section 4.3.3.

Staccato assigned its interest in the lease and agreement to BH Minerals on September 22, 2008 (Thompson, 2011). Although Thompson (2011) states that the lease dated August 22, 2003 is extinguished, Timberline states that the lease between Rocky Canyon Mining Company and BH Minerals is still in force, as are its annual advanced royalty payments and royalty obligation.

Timberline reports that the five claims staked by Timberline in 2011 are not subject to this agreement.

4.3.2 Acquisition of Staccato Gold Resources Ltd. by Timberline Resources Corp.

According to press releases by Timberline dated March 23, June 1, and June 3, 2010, on June 2, 1010 Timberline acquired Staccato Gold Resources Ltd. ("Staccato") and Staccato's South Eureka property through a plan of arrangement whereby Timberline acquired all of the issued and outstanding common shares of Staccato by means of a share exchange. As a result of this arrangement, Staccato is now a wholly owned subsidiary of Timberline.

4.3.3 Royalties on the Lookout Mountain Claim Group

The Lookout Mountain claim group, excluding the five claims staked by Timberline in 2011, is subject to the following royalties as summarized from the 2008 title report (G.I.S. Land Services, 2008):

- 1.5% Gross Value Royalty payable to Geneve and Mary Bisoni on production from the Rat and Selrat claim groups (the Trevor and Dave claims are not included). This royalty is capped at $1,500,000.

- 3.5% Gross Value Royalty payable to Rocky Canyon Mining Company on production from the Rat and Selrat claim groups and the Dave and Trevor claims.

The updated title review by Harris & Thompson (Thompson, 2011) found no transfers of these royalties of record, so they remain vested as described above.

All of the Lookout Mountain and South Adit resources discussed herein are subject to both of the royalties listed above.

4.4 Environmental Permits and Licenses

A Notice allows for up to five acres of disturbance on public lands without having to go through a Plan of Operations and an associated environmental review process under the National Environmental Policy Act ("NEPA"). The Notice requires a map and description of the proposed activities and the placement of a reclamation bond, which for a Notice is almost always in the form of cash, with the BLM or the State of Nevada bond pool to cover the costs of reclamation should the operator default on their reclamation responsibility. The funds associated with the bond are returned to the company once reclamation is deemed complete by the BLM. Staccato held three Notices in the project area with a total of 12.62 acres of surface disturbance acknowledged. Staccato conducted surface exploration drill programs from 2005 to 2007 under one Notice authorized by the Bureau of Land Management (BLM) Mount Lewis Field Office, which covered the North Lookout Mountain and South Lookout Mountain areas, and two Notices for the 2008 program that covered the South Adit and Rocky Canyon areas. Staccato created 3.22 acres of disturbance under Notice NVN-085633, 4.68 acres under Notice NVN-085698, and 4.72 acres under Notice NVN-080923.

On November 1, 2007 the Notice NVN-080923 expired, triggering a one-year wait period before exploration activities could resume in the area covered by the Notice. However, Staccato was able to conduct reclamation activities (earthwork and reseeding) during 2007 and 2008. As of April 2011, the BLM had released the portion of the bond associated with the earthwork activities for the 4.64 acres of surface disturbance. As of April 2013, Timberline reports that the re-vegetation portion of the bond for 4.64 acres of surface disturbance has not been released. The remaining reclamation responsibility associated with the Notice (NVN-080923) has been rolled into the Lookout Mountain Exploration Project Plan of Operations (NVN-086574).

In March 2009, Staccato submitted the Lookout Mountain Exploration Project Plan of Operations to the BLM Mount Lewis Field Office. The BLM completed an environmental assessment ("EA") to meet their requirements under NEPA and approved the Plan of Operations (NVN-086574) in September 2010. This Plan of Operations authorized up to 266.4 acres of exploration-related surface disturbance within the project area. The exploration would occur in phases and each phase would be outlined in a work plan that would be submitted to the BLM prior to conducting work under that phase. A reclamation bond for this Plan of Operations was placed with the BLM in the amount of $240,586, which covers 30.53 acres of surface disturbance. The Nevada Division of Environmental Protection, Bureau of Mining Regulation and Reclamation ("BMRR") approved a Nevada Reclamation Permit (No. 0307) for the project in August 2010. Timberline has assumed the responsibility and liability for, and is currently operating under, the Plan of Operations (NVN-086574). Additional funding for the bond will be required for future exploration work under the Plan of Operations that is beyond the scope of the Phase 1 activities.

Exploration activities covered by the Plan of Operations consist of exploration drilling from existing disturbance and constructed drill sites that would be accessed by existing roads and new road construction, construction of trenches or bulk sampling, and the installation of up to three ground water monitoring wells. Project activities would continue to be conducted in phases. By April 15th of each year, Timberline is required to provide to both the BLM and NDEP a map showing existing disturbance, new disturbance created during the reporting year and, any reclamation completed. Timberline must also provide a plan map outlining the proposed drilling activities for the current-year exploration program. Timberline is allowed to utilize any approved disturbance created in prior-year work plans and to construct any disturbance that was authorized in prior-year work plans.

Timberline has decided to pursue baseline-studies in preparation for submission of a mine plan of operations to the BLM pending favorable pre-feasibility economic analyses. These studies, as part of the permitting process, include:

1. Threatened and endangered species and other biological surveys
2. Archeological surveys in areas not completed
3. Baseline hydrologic characterization work
4. Waste-rock acid generation/acid-base accounting ("WAG/ABA") waste-rock characterization
5. Facilities design
6. Pit slope stability studies.

Results from these studies are required, along with pre-feasibility-level work, to be submitted with a mine plan of operations to the BLM. Studies were initiated in late 2011 with the installation of monitor well BHMW-001. All studies are currently in progress.

4.5 Environmental Liabilities

The property was previously mined in the 1980s for gold. This mining operation resulted in the development of an open pit, a waste-rock dump, a haul road, and exploration drill roads. It appears that all processing of the ore occurred off site. A certain amount of reclamation has been completed on the mining-related surface disturbance; however, that reclamation is not consistent with the current reclamation standards. To date, Timberline has not been held responsible for re-contouring or reclaiming the existing open pit and waste dump at Lookout Mountain. It is reasonable to expect that as long as Timberline does not reactivate the disturbance associated with the waste-rock dump or the open pit, Timberline will continue to not be liable for any additional reclamation.

Under the Plan of Operations, Timberline assumes responsibility for approximately 12.62 acres of Notice-level disturbance created by Staccato from 2005 to 2008, and 8.5 acres of existing post-1981 disturbance created by prior exploration programs and utilized by Staccato. The disturbance acreage has been rolled into the Plan of Operations and bonded for under the Phase 1 exploration activities. Timberline reports that the current total disturbance they are liable for is 21.81 acres. In addition, there are approximately 8.5 acres of post-January 1, 1981 roads within the Project Area that Timberline will be required to close. This disturbance acreage has also been rolled into the Plan of Operations and accounted for under the current bond. Timberline will also be required to reclaim other post-January 1, 1981 existing roads within the project area that are utilized for project-related activities.

Since approval of the Plan of Operations through the FONSI letter (Finding of No Significant Impact) in 2010, Timberline has provided the State and the BLM with work plans for 2011 and 2012. Timberline added 25.6 acres of proposed disturbance in Work Plan 1 for 2011 and an additional 27.24 acres of proposed disturbance in work plan 2 for the 2012 program. A total of 83.36 acres have been approved and bonded ($494,901 total in State-wide bond) since 2010. Timberline has created a total of 15.65 acres of actual disturbance since 2010. Currently Timberline is deliberately overbonded such that future work can be completed by re-allocating already approved and bonded disturbance, through either work plans or letters describing the reallocation of disturbance.

5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE, AND PHYSIOGRAPHY

The following information is taken primarily from Russell (2005, 2007).

5.1 Access to Property

Access to the property is via U.S. Highway 50, which passes to the north and east of the Lookout Mountain property, and then through unpaved County roads maintained by Eureka County. The northern part of the Lookout Mountain claim group is accessed by the Windfall Canyon Road and its westward extension (the former haul road for the Lookout Mountain mine), which turns southwest off U.S. 50 approximately two miles south of Eureka. The southern part of the Lookout Mountain group is accessed by traveling approximately eight miles south of Eureka on U.S. 50 to South Gate, then approximately two miles south-southwest on the Fish Creek Valley road to a turnoff to the west and northwest on the Ratto Canyon Road.

Many dirt tracks within the property provide access to various localities at the project.

5.2 Climate

The Lookout Mountain area is characterized by the high-desert climate of the Great Basin. The climate is semi-arid with moderate winter snows and occasional thunderstorms that can include heavy rains from time to time during otherwise hot and dry summers. November snow commonly lingers until April in the higher elevations, and several feet of snow often accumulate on the property during the winter months. Access is not publically maintained off the paved roads during winter.

Temperatures range from as cold as -10ºF in winter to occasional days near 100ºF in summer. Summer temperatures usually consist of many consecutive days of over 90º F. Winter temperatures are usually in the 20º to 35ºF range. Precipitation amounts vary from year to year, averaging about 10.0 inches annually for the area.

At Eureka, located eight miles north of the property, the average temperature is 44°F, with an average high of 61.9°F and an average low of 26.7°F. Average annual precipitation is 10.1 inches.

Mining can be conducted year round, but heavy snows may impede exploration during the winter.

5.3 Physiography

The Lookout Mountain project is located in the Basin and Range physiographic province, characterized by generally north-trending fault-bounded ranges separated by alluvial valleys. The terrain on the property is rugged, with high ridges, steep canyons, and narrow valleys. Elevations range from 7,000 to 9,000 feet. Ridges show abundant bedrock exposures; slopes and valleys are typically covered by soil and alluvium. Sagebrush abounds in lower-elevation areas, while juniper and pinion cover the higher elevations. Grasses and shrubs grow on the highest ridge tops.

5.4 Local Resources and Infrastructure

The Lookout Mountain property is situated in central Nevada in an area with established mining infrastructure. Transmission power lines serve Eureka from the north. Essential services such as food and lodging are available in Eureka, including dockage for shipments of heavy equipment. Eureka's estimated 2010 population was 610 (U. S. Census). A small airport at Eureka is available for private air transport, and regularly scheduled air service is available in Elko, Nevada, about a two hours' drive north of the property. US Highway 50 that crosses Nevada in an east-west direction lies to the north and east of the property. The Union Pacific Railroad runs parallel to Interstate 80 about 85 miles north of the property.

Skilled miners and mining professionals are available at Eureka and 100 miles to the north at Carlin, Elko, and Spring Creek. Mining supplies and services are available at Carlin and Elko.

6.0 HISTORY

6.1 Exploration History

The following information is taken from Russell (2005, 2007), Morris (2007), Edmondo (2008a, 2008b), Shawe and Nolan (1989), and Emmons (1995, 1996), with additional references as cited.

Exploration in the Eureka area began around 1860, and the Eureka mining district was discovered in 1864. Production of lead-silver-zinc-gold mineralization from small bonanza mines dates from 1865. Early production from the district was from oxidized, gold-rich, manto-like replacement deposits in Paleozoic carbonate rocks near Cretaceous stocks. In addition to gold, the Eureka deposits produced substantial amounts of lead and silver. Several small lead-silver-gold mines were discovered in the South Eureka district (also known as the Secret Canyon district) about one mile east of Lookout Mountain/Ratto Ridge during this same time period. Incomplete production records prior to the 1950s suggest that production of gold, silver, copper, lead, and zinc from the Eureka district may have totaled $122 million (in 1962 dollars) (Nolan, 1962). About 1.65 million ounces of gold were produced from the Eureka district, mostly during the period from 1870 to 1890 (Shawe and Nolan, 1989).

Gold mineralization that contained no base metals and only minor, if any, silver was discovered in 1904 at Windfall Canyon, about 3.5 miles northeast of Lookout Mountain. The mineralization was largely oxidized and siliceous. The Windfall mine had early gold production from 1904 until 1908 and 1909 to 1912 (Vanderburg, 1938). Windfall's mineralization differs from the other mineralized bodies in the Eureka district in that the Windfall is characterized by low-grade gold shoots with indistinct assay walls, and gangue minerals as well as iron, lead, silver, and zinc are generally absent from the Windfall mineralization. Windfall's gold mineralization occurs in altered Hamburg dolomite. Individual mineralized shoots show both structural and stratigraphic control, localized by the intersection of northeast-striking fissures with the uppermost beds of the Hamburg dolomite (Nolan, 1962). Most of the old stopes terminated above the 200-foot level, and none extended below the 300-foot level (Nolan, 1962).

Disseminated gold deposits were discovered in the region in the 1960s, and there has been extensive exploration for, and development of, such deposits since then. Renewed interest in the gold-only mineralization at Windfall brought modern-day prospectors into the Lookout Mountain area in the 1960s.

Cordero Mining Co. (Sun Oil Company) drilled several core and rotary holes in the Pinnacle Peak and Lookout Mountain areas in the 1960s. The drilling was investigating mercury vapor anomalies, but no results are available (Jonson, 1991).

Newmont Mining Corp. ("Newmont") drilled five holes in the Prospect Peak/Rocky Canyon area to the north of Lookout Mountain in 1963 while exploring for porphyry molybdenum mineralization. A log with a database printout of assays for one core hole (#609) was among the data provided to MDA. Hole 609 was drilled to a depth of 1,525 feet and intersected 50 feet averaging 0.023 oz Au/ton from 450 to 500 feet in a silicified, pyritized fault zone (Jonson, 1991). That hole also intersected metasomatic alteration associated with granitic dikes that included magnetite, quartz, sericite, pyrite, molybdenite, fluorite, and calcite mineralization (Mako, 1993a).

The South Eureka property was idle from 1963 until 1974, when the Bisoni brothers staked 48 Rat-series claims on Ratto Ridge, based on anomalous gold, arsenic, antimony, and mercury results from rock-chip sampling. The original Bisoni Rat-series claims are part of the current property.

The largest exploration program was begun by Amselco Exploration Inc. ("Amselco") in 1978, after signing a lease with option to purchase agreement with the Bisoni brothers. Amselco subsequently staked 138 Selrat-series claims that adjoin the Rat claims and are also part of the current property. Amselco conducted extensive geologic mapping, soil and rock geochemical sampling (1,100 rock samples), and an initial 15-hole reverse circulation ("RC") drilling program, which tested gold mineralization identified by geochemical anomalies and jasperoid bodies developed along the north-trending Ratto Ridge fault, which forms the crest of Ratto Ridge. This drilling discovered significant sediment-hosted disseminated gold mineralization at depth. Amselco ultimately drilled 307 conventional rotary and RC holes and two core holes between 1978 and late 1985, which led to the discovery of mineralization that eventually became the Lookout Mountain open-pit mine at the northern end of Ratto Ridge. Amselco also discovered five other areas along Ratto Ridge which contain partially developed gold mineralization: South Lookout Mountain, Pinnacle Peak, Triple Junction, South Ratto Ridge, and South Adit. In the summer of 1985, Amselco discovered mineralization in Devonian rocks on the crest of Ratto Ridge, west of the known mineralization in Cambrian rocks.

Amselco optioned the Lookout Mountain property to consultants Campbell Foss and Buchanan ("CFB") in July 1986 (Cargill, 1988). CFB, through their company Viking Minerals, entered into a joint venture with two other private companies; the joint venture was called the Eureka Venture, Inc., which in turn owned a company called Norse Windfall Mines Inc. ("Norse Windfall Mines") (Cargill, 1988). Norse Windfall Mines was the operator of the South Eureka property, with day-to-day management of the operation by CFB on a contract basis. Also in 1986, Amselco was acquired by BP Minerals Company ("BP").

Norse Windfall Mines continued work at Lookout Mountain. They took 943 rock samples over the 2.5-mile length of Ratto Ridge, which identified at least nine areas of "strong mineralization" (Jonson, 1991). Norse Windfall Mines drilled 20 LM-series exploration holes in 1986 and put the Lookout Mountain mine into production in 1987. Norse Windfall Mines mined at Lookout Mountain in 1987 and 1988, hauling the ore 10 miles to leach pads at the Windfall mine. Cargill (1988) and Jonson (1991) reported that Norse Windfall Mines mined 180,196 tons of mineralized rock averaging 0.12 oz Au/ton in 1987. The ore was agglomerated and leached to produce 17,700 ounces of gold at a recovery rate of 81%. MDA has no information on production from 1988. Financial, management, logistical, and metallurgical problems halted operations, and the property was returned to the original landowners.

Jonson (1991) reported that in 1987, BP collected 39 rock samples, some of which were over the so-called Haul Road anomaly north of Lookout Mountain, and in 1988 collected 58 rock-chip samples from the extreme southern end of Ratto Ridge, from which no anomalous gold values were reported.

EFL Gold Mine, Inc. ("EFL") purchased the Rat- and Selrat-series claims from Bisoni and Amselco/BP in 1990 (Jonson, 1991). They took bulk samples from the floor of the Lookout Mountain pit that returned assays of 0.10 to 0.135 oz Au/ton. They also excavated three backhoe trenches in iron-stained volcanic tuff, but two samples from each of the three trenches were barren (Jonson, 1991). EFL drilled 11 RC holes in 1990 (EFL-1 through EFL-9, M1, M1-A), two of which, drilled 500 feet (152 meters) into the floor of the pit, intersected both oxide and sulfide gold mineralization below the pit floor (Jonson, 1991). The database used by MDA does not include the M1 and M1-A holes.

Summit Minerals, Inc. acquired the property from EFL in December 1990 (G.I.S. Land Services, 2008; Jonson, 1991). Rocky Canyon Mining Company acquired the Lookout Mountain claim group from Summit Minerals, Inc. through an agreement in November 1991 (G.I.S. Land Services, 2008; Jonson, 1991).

Barrick Gold Exploration Inc. ("Barrick") leased the Lookout Mountain property from Rocky Canyon Mining Company in February 1992 (Mako, 1993a). Barrick completed geologic mapping, took more than 500 soil samples to expand and fill in Amselco's grid, and drilled in various places, primarily along Ratto Ridge and for about a mile north of the ridge. Drilling targeted favorable stratigraphy at depth near fault intersections (Mako, 1993a, 1993b). North American Exploration, Inc. conducted the soil sampling over the same two grids used for the ground magnetic survey described below. The soil samples were collected on 300-foot by 300-foot sample spacing, and samples were analyzed for 15 elements by ICP (inductively coupled plasma) analysis at the laboratory of MB Associates. Several anomalous areas were found east of Ratto Ridge, but the Magnetic Canyon area was found to be relatively non-anomalous.

Work by Barrick also included air and ground geophysics (Mako, 1993a). Aerodat, Ltd. surveyed 160 line-miles at a line spacing of 1/8 mile over the Lookout Mountain and surrounding area in March 1992. This air survey included magnetic, electromagnetic, apparent resistivity, VLF-EM, and radiometric surveys. Barrick felt that the magnetic data were the most useful and identified three significant anomalous areas: a circular positive anomaly in the Rocky Canyon area, a series of magnetic highs between the Lookout Mountain pit and Surprise Peak that extends about a mile south along Ratto Canyon; and a linear zone in the drainage west of Grays Canyon in the southwest part of the property. Geo-Western was contracted to survey three reconnaissance ground induced polarization ("IP")/resistivity lines in the Lookout Mountain pit area to determine if the high-grade sulfide mineralization below the pit could be detected by this method; at the time of Mako's (1993a) report, anomalies had been identified but not drill tested, and MDA has found no subsequent information. North American Exploration, Inc. was contracted to conduct ground magnetic surveys over two grids: one between Ratto Ridge and Ratto Canyon and the second covering the aeromagnetic anomalies and local jasperoid occurrences in Magnetic Canyon. Some of the magnetic highs are associated with areas mapped as being underlain by Paleozoic rocks, which suggests the presence of concealed intrusions. Most of the magnetic anomalies in Magnetic Canyon appeared to be associated with outcrops of Tertiary volcanic tuff.

A geochemical vectoring study was conducted by MagmaChem Exploration, Inc. (Mako, 1993a) for Barrick in an attempt to define hydrothermal fluid pathways and aid in the search for high-grade mineralization. The geochemical study was made along Ratto Ridge and included collection of approximately 800 rock and drill samples with multi-element ICP and graphite furnace analyses by MB Associates in California and ICP and neutron activation analysis by Activation Laboratories in Canada (Russell, 2005, 2007). This study showed that groups of elements common in sediment-hosted gold deposits in other areas were also statistically significant at Ratto Ridge. Mapping, together with results of the geochemistry, indicated that mineralization was apparently strongly controlled by east-northeast- and north-northwest- to northwest-trending cross structures near or at the point they intersect the north-trending Ratto Ridge fault and the Cambrian Dunderberg Shale and Hamburg Dolomite. This work identified 14 exploration targets in the Ratto Ridge area (Mako, 1993a).

Much of Barrick's work focused on the deeper potential in the Cambrian Dunderberg Shale east of the Ratto Ridge fault and on the potential of Devonian Nevada Group rocks, especially the Bartine Limestone, west of the fault. Outcrops of Bartine Limestone in the area show weak gold mineralization, strong alteration, and anomalous pathfinder element geochemistry. Barrick drilled a total of 40 RC holes in the Lookout Mountain property. Drilling of their geological and geochemical targets, as well as additional drilling in areas of known mineralization previously discovered by Amselco, encountered insufficient mineralization to meet Barrick's corporate objectives and led them to drop the project in June 1993.

Echo Bay Exploration, Inc. ("Echo Bay") leased the Lookout Mountain claim group in August 1993 from Rocky Canyon Mining Company (G.I.S. Land Services, 2008; Jonson, 1991). Of the 373 claims that comprised Echo Bay's property by 1998, 52 of the claims were owned by the Bisoni family of Eureka; 319 claims were owned by Rocky Canyon Mining Company; and two were staked by Echo Bay (Alta Gold Co., 1999). Echo Bay explored the Lookout Mountain area through December 1997, not only examining Ratto Ridge, but also acquiring additional ground to the north, south, and southwest. They conducted mapping, soil and rock-chip sampling, and scattered drilling in the area, exploring deep high-grade potential in the Cambrian Dunderberg Shale and Hamburg Dolomite and testing Devonian Nevada Group targets west of the Ratto Ridge fault. Their soil sampling in 1994 through 1996 covered the non-alluviated areas of nearly the entire claim block with a total of 2,343 soil samples collected and analyzed for gold, silver, arsenic, antimony, and mercury. Some samples were also analyzed for base metals. Echo Bay also collected about 150 surface rock-chip samples during 1994 and 1995. Numerous anomalies were identified through these geochemical sampling programs. They also undertook a CS-AMT (Controlled Source Audio-Frequency Magneto-Telluric) survey in the Ratto Canyon area in 1994. According to Emmons (1998), Echo Bay drilled 106 RC holes at Lookout Mountain from 1994 through 1997, for a total of 71,535 feet, although Timberline believes only 105 holes were drilled, which is the number of holes in the project database used by MDA. Most of Echo Bay's drilling took place just north of Lookout Mountain (Edmondo, 2008b). Their best intercepts were as follows (the true thickness of all intercepts is uncertain):

- 110 feet (33.5 meters) grading 0.043 oz Au/ton in the Dunderberg in EBR 27;
- 115 feet (35 meters) grading 0.043 oz Au/ton in the Nevada Group in EBR-9; and
- 90 feet (27.4 meters) grading 0.028 oz Au/ton in an offset of EBR-9.

Alta Gold Company ("Alta") subleased 227 of Echo Bay's 373 claims in December 1997, staked five additional claims, and began permitting a delineation-drilling program (Alta Gold Co., 1999). Alta conducted metallurgical test work on mineralized pit samples and drill cuttings from the Lookout Mountain open pit in 1997 as part of their due diligence study (Langhans, 1997). In 1999, Alta acquired the remaining 146 claims from Echo Bay that covered the Rocky Canyon area in the northern portion of the Lookout Mountain property (Wilson, 1999). Jennings and Schwarz (2005) indicated Alta had studied the dataset for Lookout Mountain from 1997 to 1999 but aborted their plans for permitting, exploration, and development of the Lookout Mountain mineralization. MDA has no information on any other exploration that Alta may have conducted on the property. Alta dropped the property in May 1999 (G.I.S. Land Services, 2008).

Century Gold LLC ("Century"), a privately held exploration firm, leased the Lookout Mountain claim block from Rocky Canyon Mining Co. in August 2003 (G.I.S. Land Services, 2008) along with four other claim blocks in the South Eureka district.

Staccato purchased Century's land holdings in the district, including Century's rights to the Lookout Mountain property, in April 2005 (G.I.S. Land Services, 2008; G. Edmondo, personal communication, 2011). A three-hole core drilling program was initiated in the Lookout Mountain pit on November 5, 2005, and 16 core holes were drilled in and immediately adjacent to the south end of the pit between February 5 and July 13, 2006. Staccato continued drilling through the spring of 2007. The drill programs were designed to confirm the existence of mineralization encountered in previous RC and conventional rotary drilling, to compare the results from core and rotary drilling, and to collect higher-quality geologic information through core drilling. Based on their drilling, Staccato recognized that the mineralization is hosted in collapse breccias formed by decalcification of the host rocks, and iron-rich dolomite, zebra dolomite, sooty pyrite, and other alteration types commonly associated with Carlin-type deposits were identified (Mathewson, 2006). Staccato drilled a total of 25 core holes (BH-series) from 2005 to 2007.

In 2008, after management changes, Staccato began a new exploration program designed to test gold mineralization outside of the Lookout Mountain pit area, and a technical program was initiated that was designed to bring the Lookout Mountain resource to pre-feasibility stage. Staccato drilled an additional seven core and 18 RC holes (BHSE-series) in the South Adit, Pinnacle Peak, Triple Junction, and Rocky Canyon areas during this phase. Another goal of the drilling was to develop a better structural and stratigraphic understanding of the numerous gold zones present along Ratto Ridge. The seven core holes were drilled primarily for stratigraphic purposes and covered the strike extent of Ratto Ridge.

In addition to drilling, Staccato extended soil sample grids by taking an additional 1,100 samples, completed a detailed ground magnetic survey to identify structural trends important to mineralization, and began surface geologic mapping. Staccato mapped surface exposures at 1:2,400 and 1:4,800 scales along Ratto Ridge. To generate consistency in identification of formations, Staccato initiated re-logging of old drill cuttings and core and began three-dimensional modeling efforts. This work was ongoing up to the merger with Timberline, and the results of this work were used to re-interpret geology, structure, and mineralization necessary for pre-feasibility work (Edmondo, 2010b).

Timberline acquired the South Eureka property, including the Lookout Mountain project, in June 2010 through its acquisition of Staccato (Timberline press releases dated March 23, June 1, and June 3, 2010). Timberline's exploration is described in Section 9.0.

6.2 Past Production

The first gold bar was poured at Lookout Mountain in January 1987 (Cargill, 1988). Norse Windfall Mines operated the heap-leach mine between 1987 and November 1988 (Jonson, 1991). Production from January through December 1987 totaled 180,196 tons averaging 0.12 oz Au/ton and yielded 17,700 ounces of gold; recovery was 81% (Cargill, 1988; Jonson, 1991). MDA has no information regarding the actual production between January and November 1988.

The ore was hauled 10 miles from the pit to the Windfall mine for crushing, agglomeration, and heap leaching. Recovery was expected to be 85 to 90%, but problems by the mining contractor resulted in the lower recovery (Jonson, 1991, citing an August 1988 report not available to MDA). The cutoff mining grade was 0.02 oz Au/ton due to the long haul to the agglomerator (Jonson, 1991). Mining reportedly was discontinued due to unspecified financial, management, logistical, and metallurgical problems, as well as a lawsuit (Russell, 2005; Alta Gold Co., 1999).

Production has also come from the nearby Windfall, Rustler, and Paroni open-pit mines elsewhere on Timberline's South Eureka property, as well as from the Archimedes mine discovered by Homestake Mining Company, which is about five miles north of the Lookout Mountain property and one mile northwest of the town of Eureka. Production from the Windfall, Rustler, and Paroni mines in the 1980s totaled about 2.8 million tons averaging 0.04 oz Au/ton (Russell, 2005).

6.3 Historic Mineral Resource and Reserve Estimates

All of the following estimates and their classifications pre-date NI 43-101 reporting requirements and are not known to be NI 43-101 compliant; they are presented here only as historical information. Terminology used by the authors of these reports, such as "reserves" and "resources," is shown in quotation marks and may not reflect the use of those terms as defined by NI 43-101. MDA has no information regarding how any of the historic estimates were categorized, and therefore can make no judgment as to the applicability of such categorizations to current NI 43-101 classification. MDA has not completed sufficient work to consider the historical estimates as current mineral resources or mineral reserves, Timberline is not treating the historical estimates as current mineral resources or mineral reserves, and these historic estimates should not be relied upon. MDA's current estimate of the Lookout Mountain and South Adit resources is described in Section 14.0.

Jonson (1991) tabulated pre-mining "reserves" of the original Lookout Mountain deposit, whose pre-mining dimensions were 1,100-feet long by 150-feet thick by 150-feet wide (Table 6.1); these "reserves" were based on 115 drill holes totaling 38,265ft. Schwarz (2005) noted that the Amselco estimates were "informal" and that the Independent Mining Consultant Inc.'s were more conservative, but that neither met the standards of NI 43-101. Asher (1986) estimated "reserves" and "global resources" for the Lookout Mountain deposit as part of Tenneco Minerals Company's ("Tenneco") review of the property as a submittal (Table 6.1). Asher described the deposit as being about 1,200-feet long and 300-feet wide, differing from Jonson's (1991) dimensions described above. Tenneco's estimate was based on 50-foot cross-sections provided to Tenneco by Amselco, a tonnage factor of 15 cubic feet per ton, and a pit slope of 45°. Asher reported that based on preliminary bottle-roll tests, refractory mineralization is encountered below 200 feet; of his total "global resource," 600,000 tons with a grade of 0.077 oz Au/ton are within 200 feet of the surface.

Table 6.1 Pre-mining "Reserves" of the Lookout Mountain Deposit
(Data from Cargill, 1988; Jonson, 1991; Asher, 1986; Hauntz, 1985)

Type (terminology as used by data sources)	Tons	Grade (oz Au/ton)	Cutoff (oz Au/ton)	Source
Amselco's original (no date given) "reserve"; oxide & sulfide	1,800,000	0.10	?	Cargill, 1988
"Geologic reserve"; oxide & sulfide	4,500,000	0.071	0.02	Amselco, 1985 (Jonson, 1991)
Preliminary mineral inventory; "geologic possible reserves"	1,900,000	0.10	0.02	Hauntz (1985) Amselco report
Preliminary mineral inventory; "geologic probable reserves"	1,500,000	0.10	0.02	Hauntz (1985) Amselco report
Preliminary mineral inventory; "geologic probable reserves"	1,200,000	0.12	0.03	Hauntz (1985) Amselco report
"Geologic reserve" oxide & sulfide	1,430,000	0.05	0.02	Independent Mining Consultants, Inc. for Norse Windfall Mines Nov., 1986 (Jonson, 1991)
"Global reserves"	2,135,923	0.082	0.02	Asher (1986) for Tenneco (total ounces 175,468)
Norse Windfall Mines 1986 "reserve"	446,246	0.12	?	Cargill, 1988
"Mineable" oxide	1,800,000	0.105	0.03	Amselco, 1985 Jonson (1991)
"Mineable" oxide	398,000	0.069	0.02	Independent Mining Consultants Inc., November, 1986 (Jonson, 1991)
"Drill-indicated oxide reserves"	599,667	0.077	0.02	Asher (1986) for Tenneco (total ounces 46,174)
"Mineable plus potentially mineable reserve" (oxide and sulfide)	1,720,876	0.090	0.02	Asher (1986) for Tenneco (total ounces 155,547)
-	430,000	0.070	-	1989 U.S. Borax report prepared during examination of the property (Jonson, 1991)

MDA notes that the tonnages and grades reported by Hauntz (1985) as listed above do not appear to match those reported as coming from Amselco in 1985 by Jonson (1991). In addition, Hauntz (1985) reported that Amselco had calculated a preliminary estimate that was "a less rigorous calculation of gold reserves" of about 1 million tons grading 0.03 to 0.04 oz Au/ton in the South Adit area.

By the autumn of 1986, after limited additional drilling on the Lookout Mountain property by Norse Windfall Mines, "reserves" of 446,246 tons with a grade of 0.12 oz Au/ton were established, and Lookout Mountain was brought into production (Cargill, 1988).

Table 6.2 describes additional estimates for the Lookout Mountain property, including Lookout Mountain and other mineralized areas on the property.

Table 6.2 Historic Resource and Reserve Estimates for the Lookout Mountain Property
(From Cargill, 1988; Jonson, 1991; Mako, 1993a; Retzlaff, 1998; Russell, 2005, 2007; Jennings and Schwarz, 2005)

Author	Year	Area	Designation (not NI 43-101 compliant)	Tons	Au oz/ton
Amselco (Mako, 1993a)	1979-1985	Property-wide	"Geologic Resource"	5,387,000	0.065
CFB (Cargill, 1988)	1988	Lookout Mtn	[1]"Reserve"-sulfide	1,400,000	0.12
			[1]"Remaining Reserve"-oxide	226,050	0.063
Alta	1999	Lookout Mtn	Sulfide "Resource"	1,300,000	0.1
Jonson	1991	Lookout Mtn	Sulfide	289,000	0.094
Alta Mining (Jones)	1997	Lookout Mtn	Block Model	2,086,154	0.028
Retzlaff	1998	Lookout Mtn Total 0.013 oz Au/ton cutoff	"Proven+Probable reserves"	2,080,196	0.0249
			"Possible reserves"	703,996	0.0215
		Lookout Mtn (local)	"Proven+Probable reserves"	747,367	0.0300
			"Possible reserves"	20,539	0.0272
		S Lookout Mtn	"Proven+Probable reserves"	1,196,765	0.0206
			"Possible reserves"	563,500	0.0191
		South Adit	"Proven+Probable reserves"	136,064	0.0350
			"Possible reserves"	119,957	0.0315
CFB (Cargill, 1988)	1988	South Adit	"Mineral Resource"	750,000	0.03(?)
Amselco (Jonson, 1991)	1985	South Adit	"Geologic Reserve"	887,000	0.032

[1]"Reserve" at the beginning of 1988; MDA has no information on amount subsequently mined in 1988.

It is important to note that Russell (2005, 2007) incorrectly attributed numerous "resources/reserves" to Neil Prenn of MDA in previous technical reports. These errors include Amselco's 1985 "geologic reserve" for South Adit shown on Table 6.2, as well as estimates for Pinnacle Peak, Haul Road, Triple Junction, and South Ratto Ridge.

6.4 Prior NI-43-101-Compliant Mineral Resource Estimates

Mineral resource estimates for Lookout Mountain were reported in technical reports by Russell (2005, 2007), and the reader is referred to those reports for details regarding those estimates. MDA reported an updated mineral resource estimate for Lookout Mountain in 2011 (Gustin, 2011), with a further update in 2012 (Gustin, 2012). Current mineral resources are discussed in Section 14.0 of this report.

7.0 GEOLOGIC SETTING AND MINERALIZATION

7.1 Geologic Setting

7.1.1 Regional Geology

The following information on the regional geology has been taken from Russell (2007), Nolan *et al*. (1956), Jennings and Schwarz (2005), and Cargill (1988), which in part summarize work by Roberts (1960) and Roberts *et al.* (1967).

Sedimentary rocks of Cambrian through Permian age are found in this region and were deposited in a shelf environment. Limestone, dolomite, quartzite, and shale make up the Paleozoic section. Ordovician units demonstrate two very different facies that have been juxtaposed by the Paleozoic Roberts Mountains thrust: autochthonous limestone, dolomite, and quartzite and allochthonous chert, quartzite, and graptolite-bearing shales originally deposited to the west but transported to their current position by eastward-moving thrust faulting.

There were several periods of Tertiary igneous activity in this part of Nevada. Andesitic to rhyolitic volcanic rocks and granitic intrusions were emplaced between 43 and 34 Ma, which may have coincided with deposition of most of the gold mineralization in the region. Rhyolitic and quartz latitic ash-flow tuffs were erupted from calderas between 34 and 17 Ma. From 17 to 15 Ma, basaltic andesite volcanism, dike emplacement, and related gold mineralization took place along the northwest-trending Northern Nevada Rift and parallel fractures, followed by peralkaline and rhyolitic volcanism in northernmost Nevada from 14 to 6 Ma.

The Paleozoic Antler Orogeny was characterized by east-directed compression and thrust faulting that transported siliceous and volcanic rocks from the west over shelf sequences in eastern Nevada along the Roberts Mountains thrust, which is exposed just west of the Eureka district. While the Roberts Mountain thrust does not cover the Lookout Mountain area, it exerted a major influence on the structural features of this area in the form of near-surface disturbances in front of the advancing thrust. In contrast, extensional tectonics dominated the Tertiary in northeastern Nevada, culminating in formation of the block-faulted Basin and Range physiographic province.

The South Eureka district lies on the southern end of the Battle Mountain-Eureka trend, also known as the Cortez trend, which hosts a large number of sediment-hosted gold deposits and base-metal replacement deposits. The trend extends about 100 miles from Battle Mountain on the northwest through the Lewis, Hilltop, and Cortez districts and the Tonkin Springs, Goldridge, and Goldbar mines, ending at the Eureka district on the southeast. The trend, which strikes N45°W, does not lie parallel to any topographic feature, known structure, or type of lithology.

7.1.2 Local Geology

The following information has been taken from Russell (2007), Shawe and Nolan (1989), Steininger *et al.* (1987), and Cargill (1988), which in part summarize the work of Nolan (Nolan *et al.*, 1956, Nolan, 1962) and Roberts *et al.* (1967).

The Eureka district lies at the northern end of the Fish Creek Range and is underlain by a miles-thick sequence of Cambrian through Devonian calcareous sedimentary rocks and Ordovician clastic rocks that were affected by the Late Devonian to Early Mississippian Antler Orogeny. Just west of the Eureka district, the Roberts Mountain thrust system carried dominantly clastic rocks from the west over dominantly carbonate rocks of the same age to the east during the Antler Orogeny. Post-orogenic coarse clastic units commonly referred to as the Overlap Sequence of Mississippian to Permian age, Lower Cretaceous freshwater sedimentary rocks and megabreccia, Tertiary volcanic rocks, and Mesozoic and Tertiary intrusions occur locally within the Eureka district. Rocks as young as Permian were deformed and cut by thrust faults, which themselves were deformed into a series of north-trending folds by compression that continued into Cretaceous time. Basin-range normal faults subsequently formed the present mountains and valleys.

The sedimentary rocks exposed in the South Eureka district are of Cambrian through Devonian age and are made up of limestone, dolomite, and minor amounts of shale and quartzite that were deposited in a shallow-water miogeosynclinal environment. These sedimentary units, which total 14,500 feet in thickness in the Eureka area, were autochthonous with respect to the Roberts Mountains thrust. They have been intruded by a Cretaceous(?) pluton, as well as felsic dikes thought to be of Eocene age. The Oligocene Ratto Springs rhyodacite and Sierra Springs tuff overlie the Paleozoic rocks. Figure 7.1 shows the stratigraphy of the South Eureka district.

The South Eureka district is underlain in part by the Ordovician Goodwin member of the Pogonip Group, the stratigraphic unit that hosts the nearby Archimedes gold deposit. Portions of the property are also underlain by the Cambrian Dunderberg Shale and Hamburg Dolomite, which host the Lookout Mountain, Windfall, Paroni, and Rustler gold deposits on Timberline's South Eureka property. The Devonian Bartine Limestone hosts gold mineralization at the Gold Bar mine to the northwest.

Figure 7.2 shows the geology of Timberline's South Eureka property and vicinity.

Figure 7.1 Stratigraphic Column of the South Eureka District

(From Russell, 2007; not to scale)

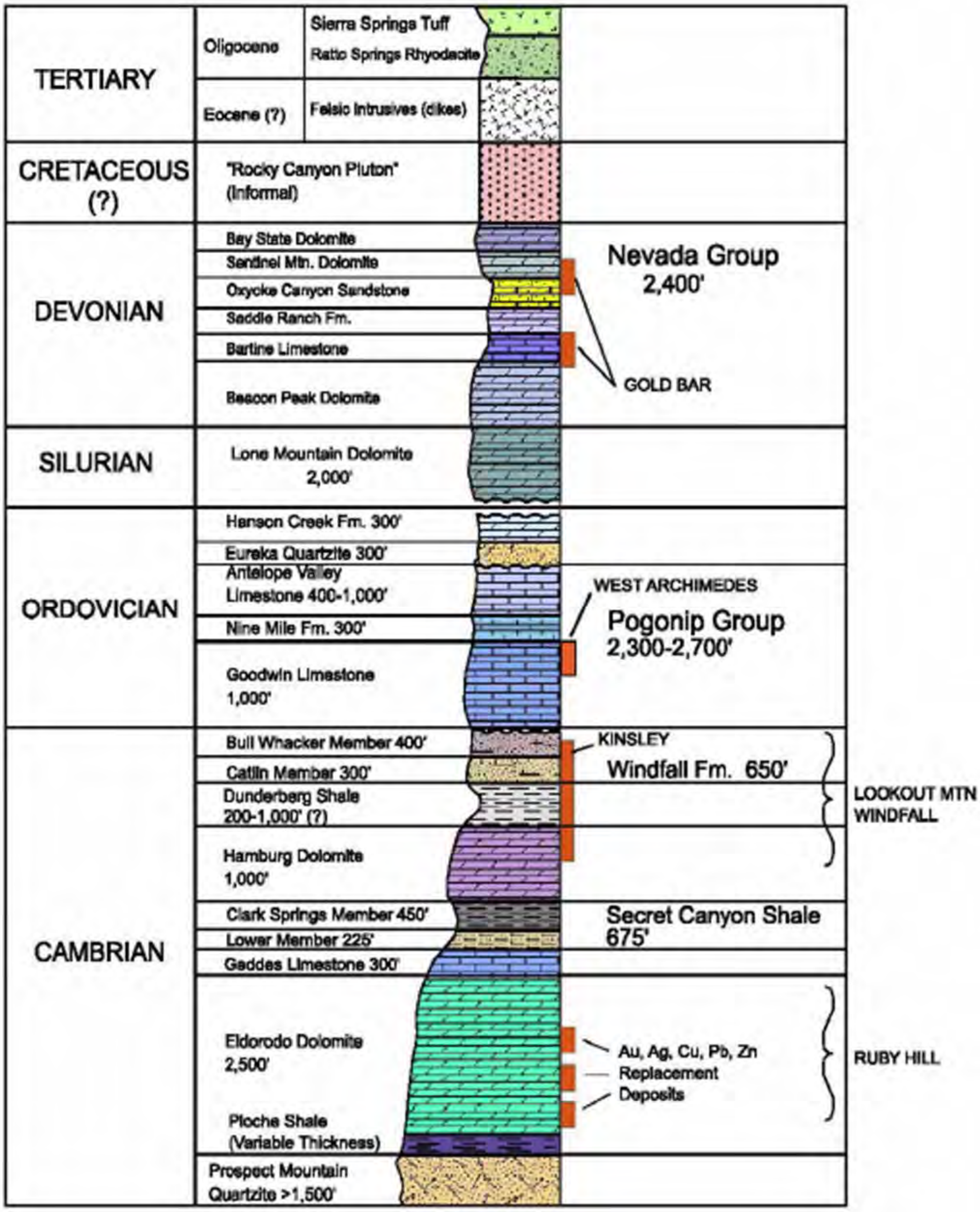
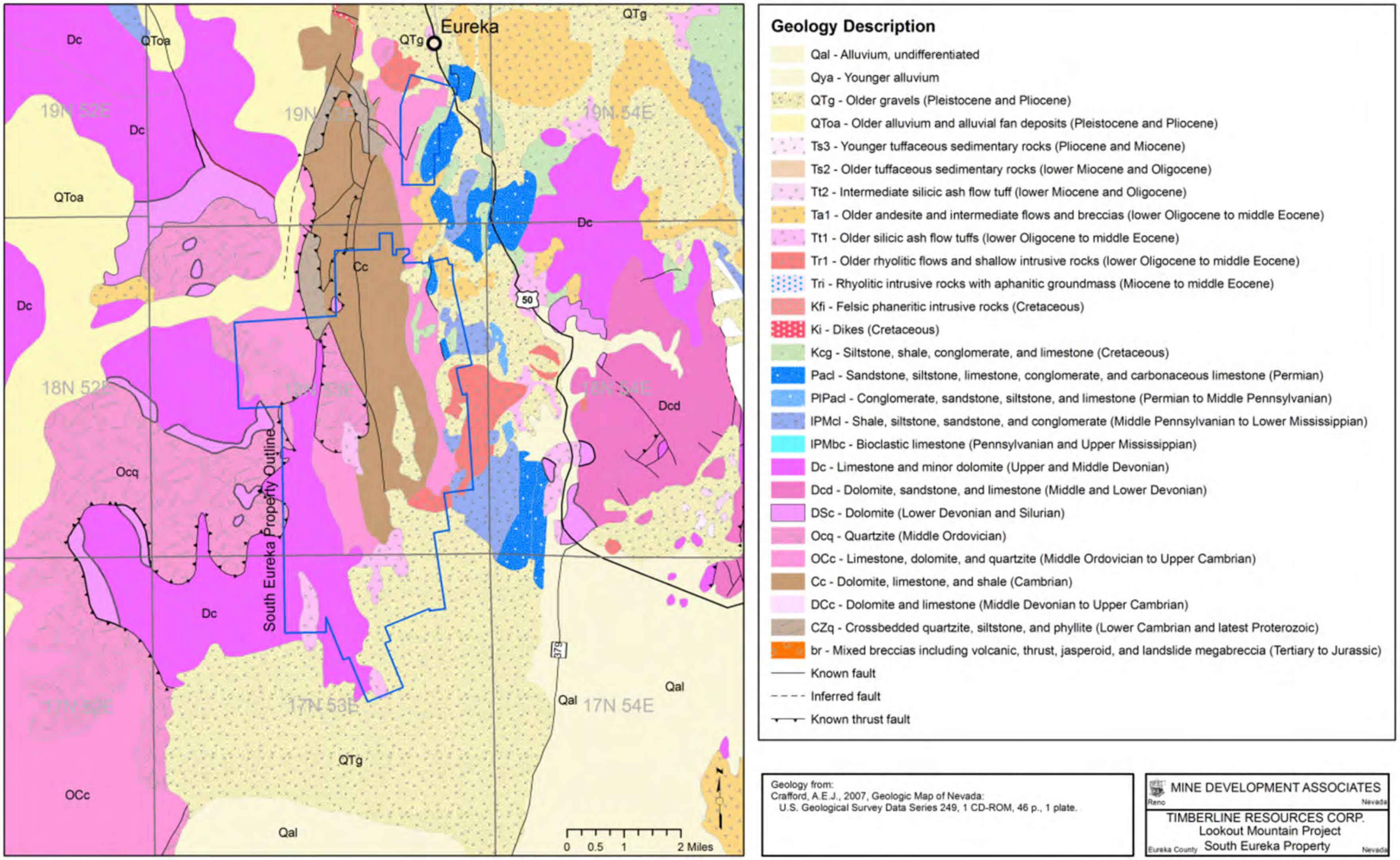


Figure 7.2 Geologic Map of the South Eureka Property and Vicinity



7.1.3 Project Geology

The following information on the geology of the Lookout Mountain project is taken from Russell (2007), Morris (2007), Steininger *et al.* (1987), Alta Gold Co. (1999), Cope (1992), and Cargill (1988), unless otherwise noted.

The Paleozoic section in the Lookout Mountain project area (Figure 7.3) is dominated by lower Paleozoic calcareous rocks that are complexly folded and faulted. The Cambrian rocks throughout the Eureka district are part of a Paleozoic thrust system that, at Lookout Mountain, places Cambrian rocks on top of Ordovician and Silurian rocks. Within the Cambrian sequence, internal thrusting and ramp faulting have created an imbricate set of lower-angle faults (Nolan, 1962), which cuts out most of the Cambrian Hamburg Dolomite beneath Lookout Mountain and Ratto Ridge (Edmondo, 2010a). Remnants of Hamburg Dolomite are found beneath the Dunderberg Shale within the core and along the east flank of an antiformal feature beneath Lookout Mountain and South Lookout Mountain. The Hamburg Dolomite along these zones has largely been dissolved, forming a collapse breccia controlled by the antiform and a north-trending, 60°E-dipping fault system interpreted as a ramp structure (Edmondo, 2010a).

Steininger *et al*. (1987) described several episodes of structural deformation in the Ratto Canyon region, noting that structural relationships at Ratto Canyon are obscured in places by widespread silicification of the Paleozoic rocks. They described an early period of east-trending compression that formed large north-trending folds. Ratto Ridge parallels the crest of one anticline, and Ratto Creek follows the trough of a syncline. A later, weaker episode of north-trending compression warped the north-south folds into one large anticline with an east-trending axial plane. At least two thrust faults have been mapped along Ratto Ridge, with a third thrust that may exist west of the South Adit area (Hauntz, 1985). Recently obtained conodont ages show that Cambrian rocks have been thrust over Ordovician and Silurian rocks at depth (Edmondo, 2010b, citing a 2009 Staccato internal company report). Three principal sets of normal faults have been identified, striking northeast, northwest, and east-west (Hauntz, 1985), and there are also strike-slip faults that appear to be tear faults associated with the thrusting.

A pronounced north-trending high-angle fault zone, the Ratto Ridge fault system (also referred to as the Ratto Canyon fault and the Lookout Mountain fault), has localized jasperoid development and gold mineralization in sedimentary units along more than 3.5 miles of strike length (Figure 7.3). This fault juxtaposes gently dipping Cambrian sedimentary rocks on the east against gently dipping Devonian sedimentary rocks on the west, an offset of perhaps 7,000 feet vertically along Ratto Ridge. The Ratto Ridge fault system is cut by a number of northeast- and east-trending, steeply south-dipping faults, and also by less prominent northwest-trending, steeply south-dipping sets of faults.

Favorable stratigraphic units, including the Cambrian Hamburg Dolomite and Dunderberg Shale among others less well explored, have focused up-dip gold deposition at fault/stratigraphic intersections. Other potential host rocks include the Ordovician Pogonip Group, the Devonian Bartine Limestone, and the Devonian Oxyoke Canyon Sandstone. Cambrian, Ordovician, and Devonian units are known to host gold deposits elsewhere in the region, such as at Archimedes in the northern part of the Eureka District, Gold Bar (40 miles to the northwest), and at Bald Mountain (80 miles to the northeast (Figure 7.1). Tertiary intermediate flows and tuffs with minor porphyry dikes and sills intrude and unconformably overly the Paleozoic section in the area and are part of the Eureka volcanic center.

The following descriptions of the stratigraphic units that are important in the definition of major structures and/or are hosts of significant gold mineralization are derived from a combination of the work of Nolan (1956) and several of the Timberline geologic staff.

The Cambrian Eldorado Dolomite is one of the main hosts for base-metal mineralization in the northern and southern parts of the Eureka district. At the Oswego mine, located about a mile east of Lookout Mountain, gold is hosted in a fault zone between the Eldorado Dolomite and the Secret Canyon Shale, with gold and associated alteration extending into the dolomite. Sanding, silicification, and recrystallization of the dolomite have been observed at the Oswego mine and in isolated areas within Ratto Canyon. The Eldorado Dolomite is a massive dark bluish black color in outcrop and is commonly streaky mottled and brecciated. Dark and light banding may possibly due to marbling. It is locally calcareous and finely laminated. A few non-crystalline limestone beds exist that are light grey and well bedded, with coarser grained and vuggy textures present locally where the unit is altered. Both the Eldorado and the Hamburg dolomites are characterized by rapid sanding, dissolution, and transport of less soluble material along open fractures, which can ultimately result in the formation of karst breccias and associated sediments. Both formations are hosts of higher-grade mineralization in the Eureka district. Typically the Eldorado Dolomite is darker, denser, and less sanded than the Hamburg Dolomite.

The Cambrian Geddes Limestone is a dark grey-black limestone, primarily massive with thin (3/8- to 3-inch) distinctively planar, regularly spaced ¼-inch micrite and wackestone beds separated by very thin shaly partings interbedded with dense, thicker (1- to 8-inch) beds of debris-filled wackestone and packstones. Lenticular black chert interbeds are present locally near the base. Calcite veining is common, weathering to reddish and yellow colors with a banded, flaggy appearance. It is present in deeper drill holes beneath known mineralization at Lookout Mountain. The Geddes Limestone is not known to host gold mineralization, but does host base-metal mineralization in Secret Canyon at the Geddes Bertrand mine.

The Cambrian Secret Canyon Shale includes a lower unit of argillaceous calcareous to non-calcareous shale and an upper bioturbated limestone. The lower Secret Canyon Shale Member is a calcareous shale- and argillite-dominant unit with lesser wackestone interbeds of variable thickness. The upper Clark Springs Member is a banded thin-bedded limestone that is rhythmically bedded with distinctive wavy bands of micrite and silty limestone. The limestones are composed of predominant quartz silty wackestones and packstones with beds from ¼- to ½-inch thick, separated by 1/8- to ¼-inch calcareous shale and argillite partings. This upper unit is structurally thinned along an overlying postulated thrust fault, averaging about 200 to 250 feet thick near Lookout Mountain. Both members are usually tightly folded by the aforementioned thrusts above and below the unit in the Lookout Mountain resource area. Very little mineralization has been found in the Secret Canyon Shale to date, as it seems to be the floor to known mineralization at Lookout Mountain.

The Cambrian Hamburg Dolomite is the principal host for gold mineralization at Lookout Mountain, as well as at the Windfall mine, north of Lookout Mountain. The Hamburg Dolomite is a dolomite with minor interbedded limestone that is difficult to distinguish from the Eldorado Dolomite. The unit is normally tan to light brown, quartz-silty, coarsely crystalline, saccharoidal, and porous. It is easily dissolved by meteoric waters or hydrothermal solutions, which have formed numerous karst breccias. Some limestone beds exist locally. Thickness varies widely, possibly partly from the tendency toward dissolution. The combination of original and secondary porosity (from sanding and karsting) results in this formation being a good host for mineralization. Sanding, silicification, and recrystallization are all common in the Hamburg Dolomite. The extensive jasperoid development along Ratto and Hamburg ridges is principally silicification of the Hamburg Dolomite.

The Cambrian Dunderberg Shale was considered by some to be the most economically significant unit at Ratto Canyon, according to Steininger *et al.* (1987). The Dunderberg consists predominantly of grey non-calcareous fissile shale with significant quantity (10 to 20%) of beds and boudins of highly fossiliferous limestones consisting of micrite and wackestone throughout the formation. A distinctive middle unit occurs locally and consists of 50 to100 feet of banded, tan, fossiliferous micrites and wackestones with thinner shale and calcareous shale partings. Nearer the Ratto Ridge structural zone, these limestones have been silicified and form thick jasperoid breccias. At Lookout Mountain, the formation has doubled in thickness, to about 600 feet, presumably resulting from thrust ramping.

The Windfall Formation consists of two members; the upper Bullwhacker member and the Lower Catlin Member. Both are limestones that have significant sand and silt, with intertidal subaqueous wave features. The Lower Catlin Member, approximately 250 feet thick in thickness, has a conformable transitional contact with the underlying Dunderberg Shale over a thickness of about 30 feet, with micritic limes, black laminated chert, and shale giving way to a nearer-surface depositional environment. The lowermost limestones are locally very rich in black and dark brown silty cherts. The lower unit consists of sandy and quartz-silty, fossiliferous, platy wackestones, packstones and grainstones, with interbedded calcareous sands and siltstones. Shaly partings are abundant in the lower half of the section. These sediments are thin bedded and laminated, with calcareous sands often containing fecal matter that has been altered to brown and green fine-grained micas. Coarse whole and partial fossils, rip-ups, sole markings, and wavy beds are common. The Upper Bullwhacker Member, which is approximately 400 feet thick, has a gradual conformable transition from the Catlin that is largely obscure in drilling. Nolan (1956) describes it as thin bedded, highly fossiliferous micrite and wackestone with ¼- to 1-inch thick sandy interbeds and platy, shaly, or silty partings.

Drilling by Echo Bay also identified thick sections of oxide mineralization (90 to 130 feet at grades of 0.020 to 0.047 oz Au/ton) in the Devonian Nevada Group (Alta Gold Co., 1999) and the Ordovician Pogonip Group at Rocky Canyon. Mapping by Barrick (Cope, 1992; Mako, 1993a) identified eight mappable Devonian and Silurian units within what Amselco had identified as the Devonian Nevada Group west of Ratto Ridge. Timberline's 2010 and 2011 mapping and drill-hole re-logging programs found sufficient issues with the identification of the different Devonian units mapped and logged by Barrick to indicate further study of the section is required. It is difficult to distinguish the Devonian section in the Eureka district, as many units are very similar in composition, texture, and paleoenvironment. Strong alteration, brecciation, and faulting along Ratto Ridge further serve to obscure lithologies and relationships. Timberline is still evaluating the Devonian stratigraphy on the west side of the Ratto Ridge fault zone.

Timberline's core holes BHSE 25C, 27C, and 45C at Rocky Canyon encountered unusual stratigraphy in the Pogonip Group that requires additional work before relationships with published stratigraphy in the district and elsewhere can be determined. The Pogonip Group contains three separate members. The lower Goodwin Member is transitional from the subaqueous Bullwhacker to shallower seas and resulting higher-energy intertidal and subaerial environments. Limestones of the Goodwin Member consist of quartz-silty grainstones, packstones, and fossiliferous wackestones with numerous fossil-hash beds, oncolites, and pisolites. Paleokarst sediments mark the base of the Goodwin Formation in New York Canyon, eight miles north of Lookout Mountain. Cherts have formed in various portions of the Goodwin Member and can be misleading marker horizons.

The Goodwin Member is overlain by 100 to 200 feet of laminated, silty, calcareous argillites that form a distinctive marker unit that is commonly sooty and rich in carbon and pyrite in the Rocky Canyon area. Overlying this distinctive unit is a zone of sheared dark grey to black calcareous silty argillites with soft-sediment deformation and strongly disarticulated boudins of 1-inch thick interbeds of light grey, micritic wackestone with a distinctive dark and light spotted pattern. Timberline staff has tentatively correlated this unit with the Ninemile Formation.

Above this unit are 200 to 300 feet of Antelope Valley fossiliferous quartz-silty wackestones and packstones with limy argillic partings. The top 50 to 75 feet of the Antelope Valley have been locally dolomitized in the Lookout Mountain area, possibly due to trapping of fluids below the overlying Eureka Quartzite. The uppermost Antelope Valley Formation near the contact with the Eureka Quartzite appears to be transitional, with at least 5 to 10 feet of quartz-sandy dolomite grading upward to the lower dolomitic quartz sands of the lower Eureka Quartzite. Timberline staff believes the units encountered in the three core holes represent the Antelope Valley Limestone and the Ninemile Formation.

The lowermost Eureka Quartzite can have up to 25 feet of dolomitic quartz sands above the Antelope Valley sandy dolomites. Above this lie 75 feet of pinkish, coarse quartz sands, with 10 to 15 % non-calcareous shale and fine trilobite fragments. Overlying the sands is massive, sheared, and brecciated white quartzite with cobbles and clasts of quartzite that show typical rounded and well-sorted quartz grains with a thin white clay matrix.

Differences between surface examination of the rocks exposed in the Lookout Mountain pit and drill results led to a controversy regarding which stratigraphic units host the gold mineralization at Lookout Mountain (Morris, 2007). Prior to 2006, the predominant host rocks were thought to be the middle Cambrian Dunderberg Shale. Mathewson (2006), based on core logging in 2006 and later mapping around the pit proposed that the host is the early Cambrian Secret Canyon Shale, about 1,000 feet or more down section from the Dunderberg. Results of paleontological study of rocks exposed in the pit indicate that those rocks are Dunderberg, but results from drill-hole samples were somewhat inconclusive (Morris, 2007). Both the Dunderberg and Secret Canyon shales are similar in composition and appearance, and they are products of similar depositional environments. Paleontological evidence is important in distinguishing them, especially when the units have been disrupted and altered.

Mathewson (2006) reinterpreted the stratigraphy of the Lookout Mountain pit area based on his detailed logging of the drill core. He noted that breccias, folds, and fault structures within the units appear to have generally thickened individual stratigraphic units. Reconstructive estimations have been applied to attempt to determine actual unit thicknesses. For example, collapse breccias may have thickened what is believed to be Secret Canyon Shale by perhaps as much as 20%. The uppermost portion of Geddes Limestone may, on the other hand, have been thinned by dissolution processes, *i.e.* limestone removal and cavitation. The middle Geddes Limestone is generally strongly folded, by drag-style and accommodation-style folds, and the thickness of this portion of the unit, at best, can only be estimated.

There are breccias of multiple origins in the Lookout Mountain pit and the Staccato drill core (Morris, 2007). Most appear to be collapse breccias, but there are also tectonic and probably depositional breccias. These are collectively referred to as the Lookout Mountain breccia in this report.

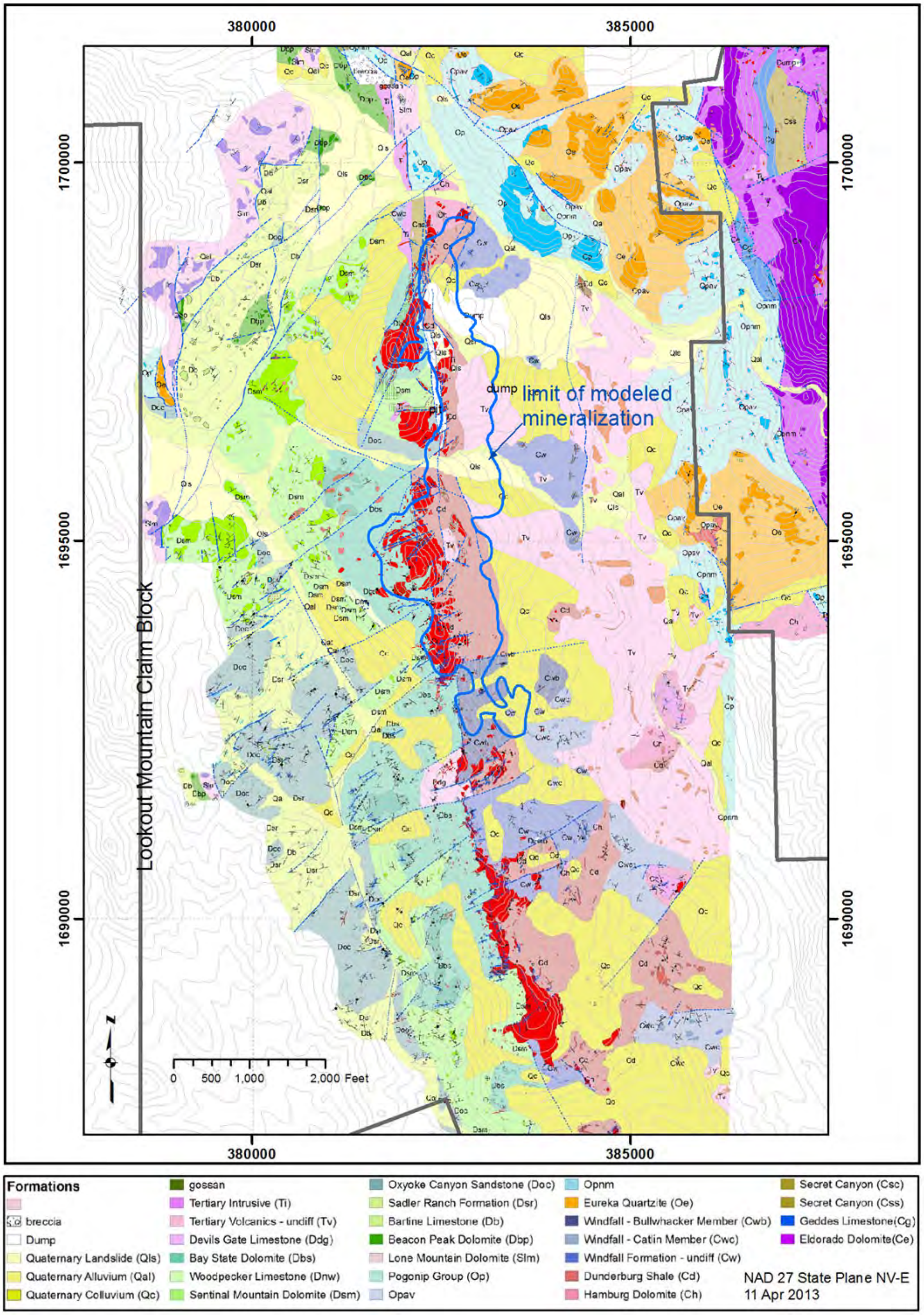
The prospective setting for significant gold deposits, whereby shale overlies limestone, is common in numerous Carlin-type gold deposit settings, and this setting is particularly conducive to the development of dissolution-induced collapse-breccia-hosted, high-grade gold deposits. Examples include Meikle, Gold Strike, Deep Star, portions of Gold Quarry, Rain, and perhaps Cortez Hills. At Lookout Mountain, high-grade gold mineralization is present almost exclusively within reduced (sulfidic) collapse breccia, hosted in what Mathewson (2006) interpreted to be the Secret Canyon Shale. Low-grade mineralization, mostly oxide, is broadly distributed in what he interpreted as the overlying Clark Spring limestone and shale and the underlying upper Geddes Limestone. The low-grade mineralization tends to occur spatially within oxidized and silicified and/or oxidized and dolomitized breccia zones.

The 2008 Staccato exploration group believed the determination of stratigraphic units, and therefore placement of the collapse breccias, remained open for interpretation, and that Mathewson's (2006) interpretation is somewhat controversial with respect to unit placement.

Based on additional surface mapping and sampling and on re-logging of over 400 drill holes in 2009 and 2010 (Edmondo, 2009, 2010c), Staccato and Timberline generated a new geological interpretation of Ratto Ridge. Figure 7.3 shows Timberline’s map of the Lookout Mountain claim block. As had previous workers, they identified the Ratto Ridge fault zone, separating Devonian and Cambrian rocks across Ratto Ridge, as the main control of alteration and mineralization along the ridge. West of the fault zone lies a gently north-dipping, relatively undisturbed sequence of Devonian dolomites, while on the east side of the fault are the Cambrian Dunderberg Shale, Windfall Formation, and Hamburg Dolomite. The trace of the Ratto Ridge fault zone is often indistinct due to alteration, colluvial cover, crosscutting faults, and jasperoid bodies. There are numerous intrusive bodies along the fault zone.

Based on drill-hole re-logging and conodont age determinations, the Cambrian section appears to have been thrust over the top of the Silurian Lone Mountain Dolomite and Eureka Quartzite. Hamburg Dolomite is present beneath both Lookout Mountain and South Lookout Mountain, occurring at the crest of an antiformal feature. This flat-lying pocket of Hamburg is present the length of Ratto Ridge, from Lookout Mountain to the south end of South Lookout Mountain. The dolomite shows significant solution and collapse textures throughout, indicating either karst formation, dissolution during mineralization, or both have taken place. In addition, an internal thrust in the Cambrian section has removed most of the Hamburg Dolomite from between the Secret Canyon and Dunderberg shales on the east flank of Lookout and South Lookout mountains and has created ramp structures which are important controls of mineralization.

Figure 7.3 Geologic Map of the Lookout Mountain Claim Block
(Mapping by Timberline, December 7, 2010)



According to Timberline's interpretation, most gold mineralization is hosted in a solution or karst breccia (Lookout Mountain breccia) formed in the overthrusted remnants of Hamburg Dolomite that lie in the footwall of ramp faults and at the apex of the antiformal feature sitting below the ridgeline of Ratto Ridge. Collapse-breccia sediment derived from the dissolution of multiple rock types, especially the Hamburg and other dolomites, and subsequent re-deposition of fine-grained sediment along fluid pathways is the primary host of low-grade mineralization (Edmondo, 2009). These collapse-breccia sediments are usually lithified but maintain high permeability and are easily altered and mineralized, often with 5 to 10% or more of sulfides. Drilling indicates there is very little mineralization in the Secret Canyon Shale, but the Dunderberg Shale hosts significant high-grade gold mineralization.

7.2 Mineralization

The following information is taken from Russell (2007), Morris (2007), Steininger *et al*. (1987), Alta Gold Co. (1999), Mako (1993a), Edmondo (2010a), and Cargill (1988) with other references as cited.

At Lookout Mountain, and for 2.5 miles in a north-northwesterly direction along Ratto Ridge, disseminated sediment-hosted gold mineralization has been found within the Cambrian Dunderberg Shale and in the Hamburg Dolomite. The Ordovician Pogonip Group outcrops immediately north and northeast of the Lookout Mountain resources (Figure 7.3) and is the host unit for the gold mineralization in this area at Rocky Canyon. This unit is also the host rock at the Archimedes gold deposit, which lies seven miles north of the Lookout Mountain pit. The stratigraphic section at Lookout Mountain is cut by the north-trending Ratto Ridge fault zone and by other northeast- and northwest-trending faults that also appear to control gold mineralization.

Alteration at the surface and in the subsurface is widespread, with decalcification and silicification being the most common types. This alteration is found for the entire length of Ratto Ridge and extends up to several thousand feet on either side of the main Ratto Ridge fault zone. Argillic alteration is also present, distinguished by the presence of abundant, multi-colored gumbo-like clays within the Dunderberg Shale. There appears to be a close spatial relationship between silicified zones and argillically altered zones (Hauntz, 1985). Dolomitization and formation of iron carbonates and iron-rich dolomite were identified in the Staccato drill holes but were not recognized in earlier drill programs. Sanding, in which calcareous matrix is removed, also occurs in dolomites in the area. Supergene oxidation is ubiquitous, but hypogene oxidation is only described at the Lookout Mountain deposit (Cargill, 1988). Formation of skarn is only known from the Newmont drill hole drilled on the Rocky Canyon magnetic anomaly (Cargill, 1988).

Mineralization has been discovered at the surface in jasperoid that caps Ratto Ridge downward to drilled depths of up to 1,500 feet vertically below the highest surface exposure. Gold is associated with pyrite, realgar, quartz, and clay (Alta Gold Co., 1999). Surface jasperoid bodies are associated with a trace-element geochemical signature consisting of arsenic, mercury, and antimony in both soil and rock chip samples. ICP geochemical analyses on drill samples (Mathewson, 2006; Edmondo, 2008a) demonstrate that gold mineralization in the Lookout Mountain area is rich in arsenic, with high-grade zones being particularly arsenic-rich. The high-grade zones are generally unoxidized, sulfidic, and, in addition to arsenic, consistently anomalous to very anomalous in thallium, antimony, and mercury. High-grade gold mineralization typically consists of 0.1 to 0.4 oz Au/ton, occasionally up to multiple ounces of gold per ton, and contains several thousand ppm arsenic up to values in the percent range. Several 10s of ppm to 100s of ppm mercury, several 10s of ppm antimony, and several 10s to 100 ppm thallium are also typical. Base metals are absent, and silver is generally below detection within these high-grade gold zones (Mathewson, 2006). Low-grade gold zones of 0.3 up to 2 to 3 ppm contain anomalous arsenic in the upper 100s of ppm to several 1,000 ppm, and are most commonly predominantly oxidized. Low 100s of ppm antimony, several 10s to 100s of ppm mercury, and up to 100 ppm thallium are also present. Lead is present in the 100 ppm range, and zinc is common in the multiple 100s to low 1,000s of ppm (Mathewson, 2006). Electron-microscope studies indicate that gold in the unoxidized zones is generally associated with quartz veinlets and arsenian pyrite. In the oxidized portions of the deposit, there appears to have been remobilization of the gold and re-deposition on iron-stained fractures (Steininger *et al.*, 1987).

Exploration groups have described the Lookout Mountain deposit in various ways, but all workers have described the mineralizing system as being strongly controlled by structures and favorable host rocks. Steininger *et al.* (1987), reporting on Amselco's discovery, described Lookout Mountain as a mineralized zone trending north-northwest and dipping 20 to 70 degrees to the north-northeast. Mineralization occurs in both jasperoid and in adjacent altered Dunderberg Shale, with the highest grades in altered shale adjacent to jasperoid. Gold occurs where the contact zone between the Dunderberg Shale and Hamburg Dolomite forms the hanging wall of the Ratto Ridge fault zone and where east- and northeast-trending faults provided ground preparation for mineralization. The thrust fault planes on Ratto Ridge probably formed a now-eroded cap to the system. There is a great variation in grade over short distances.

Asher (1986) described the mineralizing system as a structurally controlled jasperoid body with an easterly dip of 60 degrees, and with several low-angle zones controlled by bedding occurring as offshoots of the main structure. Cargill (1988) described the sulfide zone as consisting of disseminated arsenopyrite and arsenosiderite. The volume percent of sulfide material is reported to be a few tenths of a percent.

Alta (Alta Gold Co., 1999) reported that gold mineralization in drill holes occurs in two forms: in jasperoid and silicified zones within the Cambrian Dunderberg Shale and Hamburg Dolomite, and in nearly flat-lying, strongly oxidized zones in the Devonian Nevada Group. In the Dunderberg Shale, mineralization occurs in steeply dipping stratabound lenses, extending outward from a well-defined jasperoid feeder system. Drilling was not sufficient to determine the true nature of mineralization in the Devonian section.

Barrick distinguished five styles of gold mineralization (Mako, 1993a):

- Low-grade gold disseminated in silicified Dunderberg Shale with locally higher grades in and near faults;
- High-grade gold in carbonaceous Dunderberg Shale that appears to be stratabound, including the sulfide zone beneath the Lookout Mountain pit;
- Gold-bearing jasperoid in the Hamburg Dolomite;
- High-grade gold mineralization in thin, fault-controlled zones; and
- Gold mineralization in silicified Bartine Limestone.

The main feature controlling mineralization at Lookout Mountain was not recognized until 2006. Mathewson (2006) recognized that extensive zones of hydrothermal-related dissolution and associated brecciation, dolomitization, sideritization, and ankeritization within the Geddes Limestone (considered to be the Hamburg Dolomite and limestones of the Dunderberg Shale by Edmondo (2010a)) caused cavitation and collapse. This collapse propagated in an upward stoping process that did not stop until well into the overlying shale unit, creating large, almost flat-lying breccia bodies. This 'ground preparation' became highly conducive to the introduction of subsequent solutions, including the gold-bearing solutions.

Timberline and Staccato's conclusions derived from their drilling programs are similar to Mathewson's with regard to host-rock preparation. Timberline's results indicate that karst and/or solution/collapse breccia within the Hamburg Dolomite, at or beneath its upper contact zone with the Dunderberg Shale, is an important control on mineralization at Lookout Mountain along the entire length of Ratto Ridge and elsewhere on the South Eureka property, such as at the Windfall and Rustler pits (Edmondo, 2010b). Collapse breccia zones are characterized by a matrix of fine dolomite grains, silt, sand, and small grains of various rock types cementing clasts of jasperoid, dolomite, limestone, and shale. Rare depositional textures, such as bedding, graded beds, and cross bedding, indicate fluvial deposition for the fine silt and sandy fractions.

Large structural zones are important for the development of these zones, with cross structures and minor parallel structures to the main fault zones acting as important modifiers to the overall morphology. As discussed in Section 7.1.3, strong solution brecciation at Lookout Mountain has formed along a north-trending, 60° east-dipping structural zone that lies just east of the main fault separating Devonian from Cambrian stratigraphy at Lookout Mountain and Ratto Ridge. This fault forms the contact between the Dunderberg Shale and remnants of Hamburg Dolomite in the apex of an antiformal feature beneath Ratto Ridge, and has been interpreted as a ramp fault in the hanging wall of a basal thrust. The entire Hamburg section at Lookout Mountain displays strong karstic- and collapse-breccia textures. This section of Hamburg and the overlying Dunderberg shale host the majority of mineralization at Lookout Mountain, and the combined solution/karst/collapse/structural breccia unit is referred to herein as the Lookout Mountain breccia.

Strong silicification and gold mineralization are present within the Lookout Mountain breccia, occurring along structures and the contact between the collapse breccia and the Dunderberg Shale. The breccia is characterized by oxidized low- to moderate-grade gold mineralization, although unoxidized and mixed oxidized-unoxidized areas occur, especially at depth.

Strongly altered and mineralized northeast- and east-northeast-trending faults with moderate offset cut faults related to the main Ratto Ridge structural zone, with west-northwest-trending faults in the Lookout Mountain area potentially localizing higher-grade mineralization (>= 0.10 opt Au). These high grade-zones are typically irregularly shaped discontinuous pods that occur at and near the contact between the Dunderberg Shale and the Hamburg Dolomite. There are three zones presently identified by drilling: one at the surface at the Lookout Mountain pit, another about 200 feet in depth, and a third between 300 and 400 feet in depth. The highest-grade zones are typically hosted within unoxidized to partially oxidized stratabound breccia bodies enclosed in limestones within the lower Dunderberg Shale (such relationships are evident in the Windfall and Rustler pits as well (Edmondo, 2010a)).

Other breccia bodies are also present in the overlying Dunderberg Shale (or the Secret Canyon Shale of Mathewson (2006)) but are not oxidized and are mineralized with varying amounts of sulfides. These breccias also have a collapse-style character and contain locally abundant dolomite, siderite, or ankerite stringers. Potassium ferricyanide/Alizarin red staining of carbonates was routinely utilized to macroscopically determine the various carbonate mineralogies encountered in drilling (Mathewson, 2006). Within the dolomite, siderite, ankerite, and silica-mix breccias, tens of percent to massive amounts of brassy and sooty sulfides are locally present for up to tens of feet of thickness. The sulfide zones in the breccias, although they look impressive, tend to be only weakly to moderately mineralized with gold, typically from about 1 to 2 ppm (Mathewson, 2006).

The mineralization modeled by MDA at the Lookout Mountain deposit (see Section 14.0) forms a continuous body with a northerly strike length of about 6,900 feet, a maximum width of 1,650 feet (based on the surface projection of down-dip extents), and a vertical extent of 1,400 feet.

7.2.1 Lookout Mountain Deposit Paragenesis

The following is a summary of the paragenesis of the hydrothermal system and related mineralization taken from Mathewson (2006):

• *Onset of the hydrothermal event with dissolution by probable hydrothermal acidic solutions along multiple channel-ways developed within the upper Geddes Limestone. The overlying Secret Canyon Shale acted, at least in part, as an aquiclude to the essentially ascending probable sulfur-bearing hot solutions. These same solutions may also have been responsible for the transporting of magnesium and iron derived from the underlying units.*

• *Simultaneous, or certainly near simultaneous, dolomitization, sideritization and ankeritization of the upper Geddes Limestone occurred. The dolomitization process caused volume shrinkage that further increased permeability and permitted and enhanced additional carbonate dissolution. The limestone unit cavitated and collapsed under overlying lithostatic pressures. The collapsing process stoped well upward into the overlying Secret Canyon Shale and into Clark Spring limestone. The large volumes of open space in the breccias provided permeability and porosity for simultaneous to subsequent mineralization.*

• *Silicification of large portions of the breccia occurred with perhaps more simultaneous and, or repetitions of additional dissolution.*

• *Extensive sideritization (iron transformation of carbonate) and sulfidation by both sooty and brassy pyrite with perhaps slightly later introduction of pathfinder elements, including arsenic, followed.*

• *Gold-bearing solutions were introduced into and deposited within the breccias. High-grade gold zones developed in the zones of high concentrations of arsenical sooty-sulfides.*

• *Multiple pulses of mineralization occurred. Many of the breccias exhibit a multi- stage character suggestive of zones of repeated collapse and related development of new breccias. This likely provided for overlapped and enhanced zones of mineralization.*

• *The system appears to have undergone late-stage hypogene oxidation by introduction of oxygenated ground waters during the waning, cooling periods of the hydrothermal system. Oxygenating solutions penetrated throughout and very deep into the permeable portions of the system driven by the pressure gradients created by heat flow. Strong oxide to local massive gossanous material, comprised largely of hematite including specularite, is present in the deepest portions of the system penetrated by core to date.*

• *Local and limited extent, post-mineral supergene oxidation occurred as indicated by the presence of dominantly goethite in the shallow portions of the deposits. This oxidation probably occurred during the time of fairly recent uplift commensurate with associated weathering processes.*

7.2.2 South Adit

The initial discovery of gold mineralization by Amselco in the Ratto Canyon area was at South Adit, where gold occurs in the same geological setting as the other occurrences along Ratto Ridge, *i.e.* at the Dunderberg-Hamburg contact associated with strong silicification/argillization and steeply dipping normal faults. The mineralized zone trends north and, like Triple Junction to the north, lies east of the crest of Ratto Ridge. At the top of the ridge above South Adit mineralization, a northwest-trending splay of the main north-trending structure appears. Mapping and drill-section interpretation suggest that a strong north-trending cross structure intersects the northwest-trending structure in this area (Emondo, 2010c). Large jasperoid bodies lie just above the South Adit mineralized zone with a strong east-northeast fault control (Edmondo, 2009).

The first hole drilled on the property (RTR-1) hit mineralization in the South Adit area, but four later holes drilled around it were barren or encountered only very weak mineralization (Jonson, 1991). Better grades were later found farther to the north.

The mineralization modeled by MDA at the South Adit deposit has a north-south extent of almost 2,000 feet, a maximum width of about 700 feet (based on the surface projection of down-dip extents), and a vertical extent of 800 feet.

7.2.3 Other Gold Occurrences in Ratto Canyon and Vicinity

Surface gold anomalies, geology, and alteration features in the Devonian Nevada Group define multiple exploration targets on the property (Alta Gold Co., 1999). The following information on targets in the Nevada Group and other units is taken from Steininger *et al.* (1987) and Jonson (1991) (Figure 7.4).

7.2.3.1 North Lookout Mountain to Rocky Canyon

A mineralized zone containing over 0.01 oz Au/ton based on very widely spaced drill holes extends from the north end of the Lookout Mountain deposit to at least hole RCR-3 in Rocky Canyon. Scattered silicified/argillized/sanded outcrops mark this north-trending zone, which appears to be at least 600 feet wide just north of the Lookout Mountain deposit and perhaps 1,400 feet wide near RCR-3. The Haul Road anomaly lies in this zone and is about 3,500 feet northeast of the peak of Lookout Mountain; an outcrop of silty shale lies directly below massive Eureka quartzite and contains an 80-foot section averaging 0.03 oz Au/ton in rock chip samples (Jonson, 1991).

The Rocky Canyon area is underlain by a large magnetic anomaly believed to be caused by a Cretaceous intrusion. Newmont drilled a deep core hole in a search for molybdenum and intersected skarn and a granitic intrusion (Cargill, 1988). Hole 609 was drilled to a depth of 1,525 feet and intersected 50 feet averaging 0.023 oz Au/ton from 450 to 500 feet in a silicified, pyritized fault zone (Jonson, 1991). That hole also intersected metasomatic alteration associated with granitic dikes with magnetite, quartz, sericite, pyrite, molybdenite, fluorite, and calcite mineralization (Mako, 1993a).

Echo Bay drilled 75 holes in five targets in this area. Of these holes, 42 were drilled into the South Pogonip Anomaly, where 16 holes encountered "significant" gold mineralization (Alta Gold Co., 1999). Hole EBR-58-96 intersected 40 feet of 0.101 oz Au/ton, and EBR-77-97 intersected 45 feet of 0.131 oz Au/ton; MDA does not know if the intersected lengths represent true widths.

7.2.3.2 South Lookout Mountain

At the South Lookout Mountain prospect, first identified as a target in 1983, a thrust fault appears to separate silicified Devonian Nevada Group and/or Ordovician Eureka Quartzite in the upper plate from Dunderberg Shale and possible Hamburg Dolomite in the lower plate. The thrust fault is apparently cut by the Ratto Ridge fault, but jasperoid obscures the definition of structural relationships and lithologic contacts. Limited drilling by Amselco identified moderate gold-rich zones in jasperoid, presumably at and below the thrust contact. This target area is 2,500 feet long.

7.2.3.3 South Ratto Ridge

South Ratto Ridge has a structural setting similar to that of South Lookout Mountain, except that the Eureka Quartzite is absent at South Ratto Ridge. Gold mineralization is present and is stronger near the thrust contact in the jasperoids and sanded dolomites of the upper plate Devonian Nevada Group.

7.2.3.4 Pinnacle Peak

This area is about 1,000 feet south of the South Lookout Mountain area. It consists of three separate gold anomalies along a 1,500-foot strike length. Amselco drilled 20 RC holes in the general area, of which the six closest to the geochemical anomaly had intersections with assays of 0.03 oz Au/ton or better.

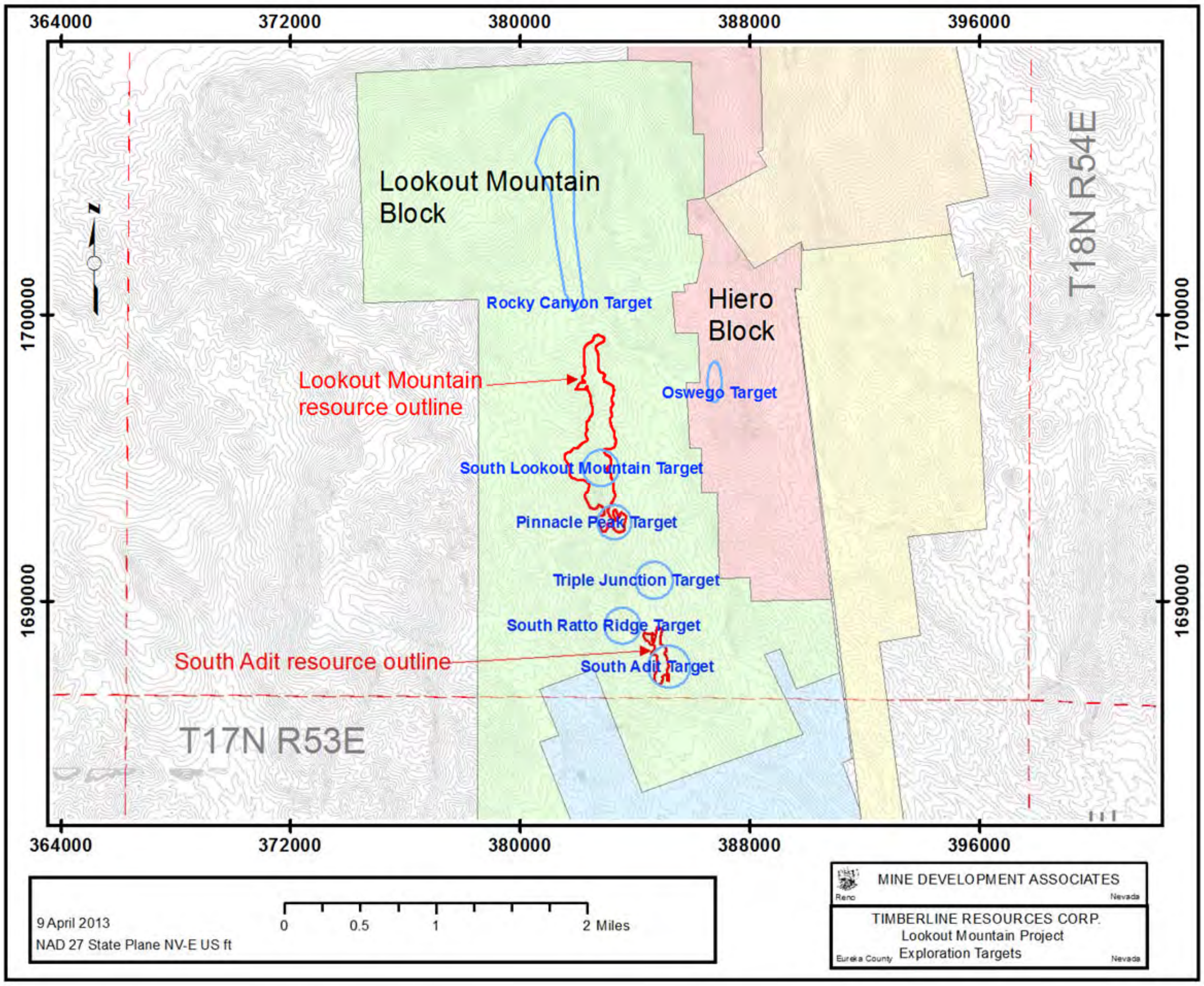
7.2.3.5 Triple Junction

Gold mineralization at Triple Junction is found at the contact of the Hamburg Dolomite and the Dunderberg Shale, associated with steeply dipping normal faults in the crest of a south-plunging anticline. Triple Junction was first identified as a target by Amselco rock geochemical sampling in 1983 and lies east of the north-trending Ratto Ridge in an area of sparse outcrop. Amselco drilled eight RC holes in the area, with intercepts of 0.04 to 0.085 oz Au/ton in three of them.

7.2.3.6 Oswego Mine

The Oswego mine occurs in a fault zone separating the Eldorado Dolomite from the Secret Canyon Shale. Although substantial gold mineralization was identified at the surface, drilling by Amselco is insufficient to assess potential in this area.

Figure 7.4 Exploration Targets



8.0 DEPOSIT TYPE

The following information is taken from Russell (2007) with additional information as cited.

The South Eureka district lies at the southernmost end of the Battle Mountain-Eureka trend of gold and base-metal deposits. Russell (2007) proposed that base-metal replacement mineralization in the area was deposited in Paleozoic and Mesozoic calcareous rocks during Mesozoic time, while gold was deposited during the Tertiary (Homestake geologists have demonstrated this at Archimedes). In contrast, Steininger *et al.* (1987) proposed that although there is little available information about district-wide metal zoning, the gold deposits at Windfall and Ratto Canyon may represent a peripheral halo surrounding the higher-temperature, gold-rich, lead-zinc-silver replacement deposits of the central part of the Eureka district.

More recently, many workers believe that gold in the South Eureka district occurs as Carlin-type, disseminated, sediment-hosted mineralization. Gold in these deposits is typically hosted by carbonaceous silty limestones and calcareous siltstones, but locally significant deposits occur in dolomite, shale, and quartzite.

Characteristic alteration of these deposits is decalcification, argillization, and intense silicification, which often forms jasperoid. Gold is invariably accompanied by more or less silver and a halo of pathfinder elements that commonly include arsenic, thallium, mercury, antimony, and barium (Mako, 1993a). Trace amounts of base metals are locally present in the gold systems, including lead, zinc, and copper. Typical minerals accompanying gold include pyrite, arsenopyrite, stibnite, realgar, orpiment, and their oxidation products. The gold mineralization was deposited in favorable Cambrian, Ordovician, and Devonian calcareous sedimentary units where they are intersected by major northwest-, northeast-, and north-trending faults and fractures that are commonly also mineralized.

Barrick's Archimedes property (also referred to as Ruby Hill) is located about 4.5 miles north of Timberline's South Eureka property and is an example of the exploration target. As of December 31, 2012, Archimedes had remaining Proven and Probable reserves of 326,000 ounces of gold and additional Measured plus Indicated resources of 3,463,000 contained ounces, as well as an Inferred resource of 220,000 contained ounces of gold (Barrick Gold Corporation annual report 2012). Archimedes is a sediment-hosted gold deposit in the form of a tabular body approximately 2,560 feet long and 260 feet wide that is hosted by the silicified, often decalcified, upper Goodwin Formation. Mineralization is controlled by a major north-striking fault and by the intersections of west-northwest- and north-northeast-striking faults. The mineralization is also lithologically controlled, with a higher-grade central core of jasperoid grading about 0.25 oz Au/ton within an outer zone of decalcified limestone grading about 0.024 oz Au/ton. Trace element geochemistry around Archimedes shows anomalous arsenic, mercury, and antimony, as is typical of this type of sediment-hosted gold deposits. The Lookout Mountain project has similar stratigraphy to Archimedes, specifically the presence of the Goodwin Formation, and has the same geochemical signature in and near known mineralization.

The Windfall mine, originally mined in 1904 with sporadic production until 1951, was rediscovered by Idaho Mining Corp. ("Idaho Mining") in 1967. Underground production prior to 1967 totaled about 65,000 tons grading 0.368 oz Au/ton, with the ore having been processed in a vat-leaching operation on site. The mine was reopened by Idaho Mining in 1975 and continued through at least 1984, producing

1,458,274 tons of ore and recovering 31,077 ounces of gold; run-of-mine ore was leached without crushing or agglomerating and with 80% recovery (Cargill, 1988). According to Pratt (2004), a total of 90,000 ounces of gold have been produced from the Windfall deposit. The Rustler deposit, an extension of the Windfall deposit located about 0.5 mile to the south was then put into production, producing 50,000 ounces (Pratt, 2004). Production of an additional 30,000 ounces of gold also came from the North Paroni and South Paroni pits. Mineralization in the Windfall deposits is primarily hosted by the uppermost part of the Middle and Late Cambrian Hamburg Dolomite, which in the vicinity of the deposit has been altered to sanded dolomite. The Windfall deposits are low grade, tabular, and have indistinct assay walls; they occur predominantly adjacent to the contact of the Hamburg Dolomite with the Dunderberg Shale or a Tertiary rhyodacite dike. Gold is accompanied by strongly anomalous antimony, arsenic, barium, mercury, and silver, but base metals are notably absent. During the 1970s, the Windfall ores were treated by heap leaching of run-of-mine ore without crushing, and recoveries were greater than 80% (W. L. Wilson, 1986). The Rustler deposit also occurs in the Hamburg Dolomite near the contact with both the Dunderberg Shale and the rhyodacite intrusion. Much of the Rustler mineralization occurred in zones that were thoroughly silicified, some of which were also brecciated (W. B. Wilson, 1986).

The previously mined Lookout Mountain deposit is one of several concentrations of gold mineralization identified within the Ratto Canyon area of the South Eureka district; significant concentrations of gold have also been identified at South Adit, South Lookout Mountain, South Ratto Ridge, and Triple Junction (Steininger *et al.*, 1987; Figure 4.2). Gold is also concentrated along north-trending faults at the Oswego mine and Hamburg Ridge to the east of these other prospects and Lookout Mountain. The mineralization in the Ratto Canyon area is similar geologically to mineralization at the Windfall mine to the north and to the Archimedes deposit still farther north within the Eureka district proper.

9.0 EXPLORATION

Timberline acquired the Lookout Mountain project in June 2010 through acquisition of Staccato. Staccato's exploration on the property is described in Section 6.1.

Timberline has carried out core and RC drilling (see Section 10.9 for details), detailed geologic mapping, channel sampling, bulk sampling within the historic Lookout Mountain pit for bench-scale metallurgical testing, and metallurgical testing on core samples to define the heap-leach characteristics and process parameters (Section 13.2).

Subsequent to the merger with Staccato, Timberline decided to bring the property forward with additional infill drilling and metallurgical work to determine if mineralization would be amenable to open-pit heap leach extraction. Timberline has also committed to continue Staccato's exploration program by building on the mapping and sampling programs to develop additional exploration targets. Timberline geologists completed mapping at the South Adit area and extended mapping into the Rocky Canyon area and Oswego mine area to the north and east of Lookout Mountain, respectively. During the mapping program, over 370 rock samples were taken to further define additional exploration targets.

After the Plan of Operations was approved by the BLM in late August 2010, Timberline embarked on an infill drill program to solidify the resources and provide further definition to the geologic model, particularly in the South Lookout Mountain area. Timberline completed 27,795 feet of RC drilling over an area defined by 1694000N to 1697750N, which is at the north end of the Lookout Mountain pit. The purpose of the 2010-2011 drilling program was to refine the geologic model and bring nominal drill spacing to 200-foot centers through North and South Lookout Mountain. In addition, Timberline drilled 14 RC and one core hole at the South Adit deposit.

Timberline also conducted a 7,000-foot core drilling program for metallurgical purposes. Five HQ core holes and two PQ core holes were completed for the program, and four bulk samples were taken from the pit for run-of-mine heap-leach testing. Channel samples were taken on the lowest benches in the pit to identify areas of mineralization for bulk sampling. Once areas of mineralization were identified, an excavator was used to clean and then sample the bench faces, with material placed into 55-gallon drums for shipment to Kappes, Cassiday & Associates ("KCA") for testing. Drill holes were logged and marked for sampling, then sent to KCA for processing. Further details of the metallurgical program are provided in Section 13.0.

Three of the 2011 RC holes were drilled for water monitoring purposes (BHMW-001, BHMW-001A, and BHMW-003), of which BHMW-001A was a re-drill of hole BHMW-001. BHMW-001A intersected water at 375 feet; casing was set, and the hole was established as the first water-monitoring well (identified as BHMW-001). BHMW-003 was dry.

Starting in late 2011 and continuing into 2012, Timberline initiated baseline-study programs in preparation for pre-feasibility work and submission of a mine Plan of Operations to the BLM; these studies included waste-rock characterization, geotechnical pit-slope stability (Golder Associates Inc., 2013), and preliminary facility design (NewFields, 2012). Additional metallurgical work was also undertaken.

Timberline's 2012 drill program consisted of 17 core holes and 31 RC holes. Of these, 24 RC and three core holes continued infill drilling of the Lookout Mountain deposit, with the core also used for metallurgical testing. An additional 12 HQ core holes were drilled specifically for metallurgical testing, with emphasis on the massive jasperoid-type of mineralization from North and South Lookout Mountain. Two core holes were drilled for geotechnical information (BHSE-157C, BHSE-160C), with this core also used for metallurgical testing. Seven RC holes (BHSE-146, BHSE-152, BHSE-154, BHSE-155, BHSE-156, BHSE-158, and BHSE-169) were drilled for hydrologic work, which resulted in establishment of three additional water-monitoring wells (BHSE-152 became water-monitoring well BHMW-002; BHSE-155 became water-monitoring well BHMW-007; and BHSE-156 became water-monitoring well BHMW-003); the other four holes were dry.

Schlumberger Water Services USA, Inc. completed a preliminary hydrogeologic characterization report in 2013 (Schlumberger Water Services USA, Inc., 2013).

10.0 DRILLING

10.1 Summary

The Lookout Mountain project has been drilled by Newmont, Amselco, Barrick, Echo Bay, Norse Windfall Mines, EFL, Staccato, and Timberline. Drilling on the project to date has consisted of 684 holes totaling 357,007 feet, based on the database provided to MDA (Table 10.1). The Lookout Mountain database includes assay data from conventional rotary, RC, and core drill holes. Figure 10.1 shows the location of drill holes used in the resource estimate.

Table 10.1 Lookout Mountain Mineral Resource Database Summary

Company	Period	Hole Numbers	Core		RC or Rotary		Total	
			No.	Feet	No.	Feet	No.	Feet
Newmont	1960s	NMT-609C	1	1,537			1	1,537
Amselco	1978-1979 1982-1985	RCR-, RTC-, RTR-	2	1,086	307	104,375	309	105,461
Norse Windfall Mines	1986	LM-			20	3,885	20	3,885
EFL	1990	EFL-			9	3,033	9	3,033
Barrick	1992-1993	BR-			40	33,282	40	33,282
Echo Bay	1994-1997	EBR-	3	671	102	70,769	105	71,440
Staccato	2005-2008	BH-, BHSE-	30	32,266	20	16,565	50	48,831
Timberline	2010-2011	BHSE-, BHMW-	9	5,827	93	57,510	102	63,337
Timberline	2012	BHSE-	17	9,206	31	16,995	48	26,201
TOTAL			*62*	50,593	*622*	*306,414*	*684*	*357,007*

Historic drilling was primarily conducted using reverse-circulation drilling systems with a down-hole hammer, although some of the early drilling was done by diamond core and conventional rotary with a down-hole hammer. Specific problems with drilling were discussed only in one unidentified report on the South Lookout Mountain area, where two of five drill holes were not completed because of lost circulation (Russell, 2007). Brecciated and vuggy rock is common on the Lookout Mountain claim group.

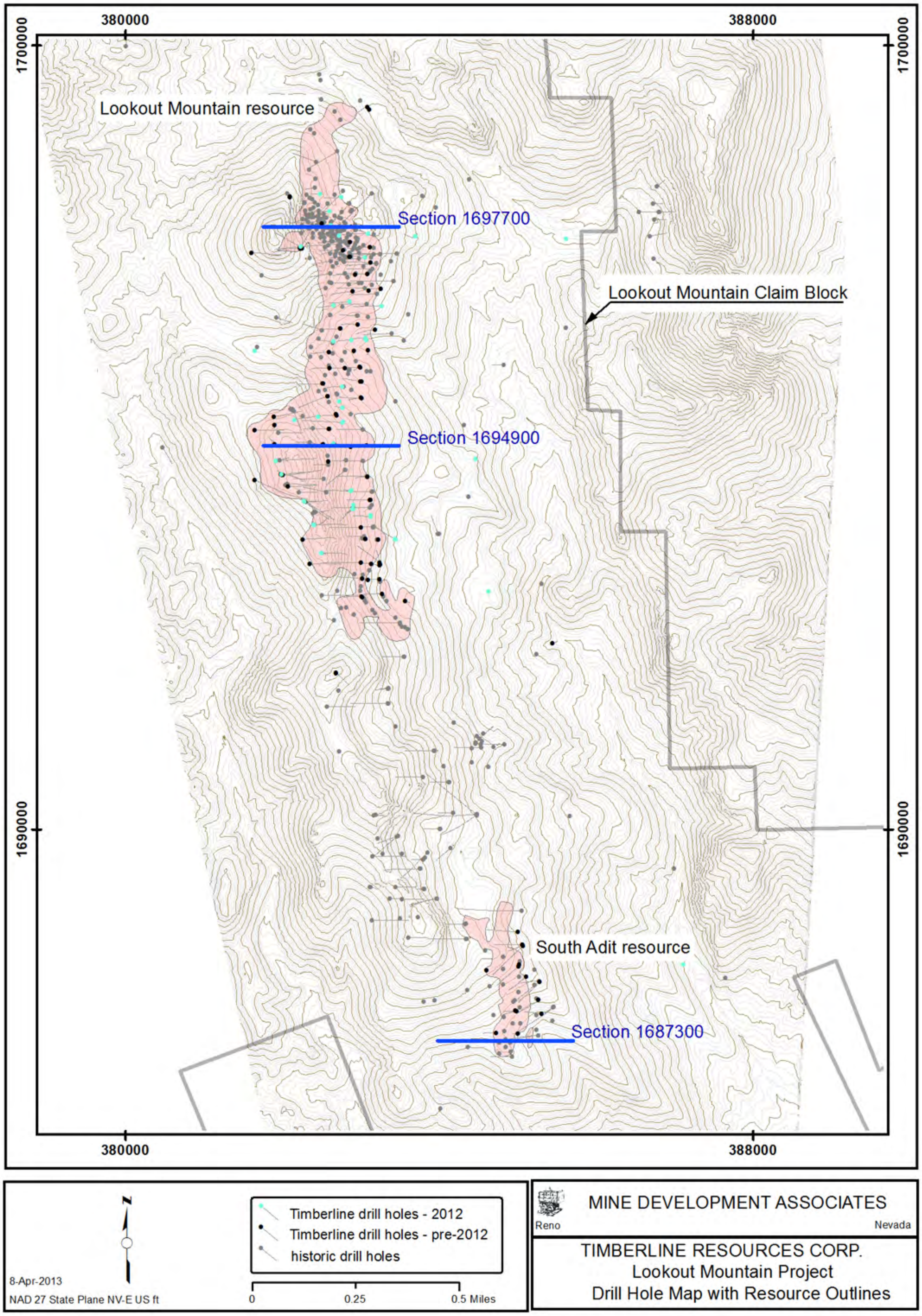
The majority of drill holes have vertical or subvertical orientations, which crosses the predominant mineralized zones at relatively high angles. A significant number of angle holes were also completed, which are approximately perpendicular to the mineralization. In either case, the drill data provided by the holes were appropriate for the modeling of the mineral resources.

MDA is unaware of any sampling or recovery factors that may materially impact the mineral resources discussed in Section 14.0. While RC down-hole contamination does present a sample integrity issue in some holes as discussed in Section 10.10, MDA believes the recognition and exclusion of the intervals of suspected contamination have adequately addressed the problem.

MDA has found very little information on the details of sampling programs by operators prior to Staccato. RC chips were logged by a number of company geologists. There is no evidence of serious recovery problems at Lookout Mountain. Sample weights, volumes, or estimated recoveries are rarely available in the historic documentation, with the exception that intervals of no recovery were locally common (Russell, 2007).

The predominant sample length for the drill intervals used directly in the resource estimation is 5 feet, with 10-foot intervals used in some holes and intervals less than 5 feet common in some of the core holes. These intervals are significantly less than the thickness of the bulk-tonnage style of mineralization at Lookout Mountain. MDA believes that the drill-sampling procedures provided samples that are sufficiently representative and of sufficient quality for use in the resource estimations discussed in Section 14.0.

Figure 10.1 Location Map of Lookout Mountain Drill Holes Utilized in Resource Estimation



10.2 Newmont Mining Corp.

The data for the Lookout Mountain project reviewed by MDA included a log and a database printout of assays from a single core hole drilled by Newmont (hole 609) in Rocky Canyon in the 1960s. A descriptive summary of this hole by Echo Bay indicates that it was drilled by Eklund Drilling Co., Inc. ("Eklund") using NX to BX core. The hole was sampled on 10-foot intervals.

10.3 Amselco Exploration Inc.

Amselco drilled a total of 309 RTR-, RCR-, and RTC-series holes at the Lookout Mountain project from 1978 through 1985. According to information reviewed by MDA, Amselco's drilling included 159 conventional rotary, 140 RC, two core drill holes, and eight holes presumed to be RC.

The two core holes were drilled by Boyles Brothers Drilling. The remaining RC and conventional rotary holes were drilled by Long Drilling, Eklund Drilling, Cooper & Sons, TW Enterprises, Becker Drilling, Young Drilling, Hackworth Drilling, Drilling Services, Layne, and Tonto Drilling. A tabulation compiled by Amselco shows the following types of rigs used by the various drillers:

Becker	CSR-1000	RC
Boyles	Longyear 44	core (NC-NX)
Cooper & Sons	Speedstar SS-15	conventional rotary
Eklund	Ingersol Rand TH-60	RC
Eklund	Ingersol Rand TH-100	RC
Hackworth	CP-700	RC
Long	CP-650	RC/conventional rotary
Long	CP-650?	conventional rotary
TW Enterprises	Schramm T-64	conventional rotary
Young	Gardner Denver	conventional rotary
Drilling Services	Ingersol Rand TH-100	RC
Drilling Services	Ingersol Rand Rotary	RC

Amselco's holes RCR-1 through 6 and RTR-1 through 200 were sampled on 5-foot lengths, whereas holes RTR-203 through 296 were sampled on 10-foot lengths with some 5-foot samples. Five-foot samples were collected and logged by the geologist at the drill rig but were apparently then combined into 10-foot samples for assay for the holes with 10-foot sample intervals (Jonson, 1991). Jonson (1991) notes that the change to 10-foot sample lengths occurred during the latter part of Amselco's drilling program, apparently in an effort to reduce assay costs. The two Amselco core holes were sampled on irregular intervals determined by the geology.

A total of 159 of the first 177 holes drilled by Amselco were drilled by the conventional rotary methods; the remaining 150 holes were either core (two holes) or reverse circulation. Rotary holes can be more susceptible to sample loss than RC holes, with or without loss of representativity. Down-hole contamination issues may also be exacerbated in rotary holes. The general issue of contamination is discussed in Section 10.10.

10.4 Norse Windfall Mines

Norse Windfall Mines drilled 20 LM-series RC holes at the Lookout Mountain project in 1986. Based on drill logs, the drilling contractor for these holes was Leroy Kay Drilling, using a Pollock Driltech D40K drill.

10.5 EFL

EFL drilled 11 holes in the Lookout Mountain project in August and September, 1990 (ELF-1 through EFL-9, M1, M1-A) for a total of 3,545 feet (Johns, 1990), although the M1 and M1-A holes are not in the database used by MDA. Drill records show that Brown Drilling of Kingman, Arizona was the drill contractor for all 11 holes, using a Chicago Pneumatic CP 650 RC drill with either 5.25- or 5.5-inch bits.

The nine EFL- RC holes were sampled on five-foot intervals. Both wet and dry samples were either channeled directly into a Gilson splitter from the cyclone or into a bucket before passing through a Gilson splitter (Johns, 1990). The sample was continually split until enough material remained to fill an 11 by 17-inch olefin drill bag. Johns (1990) noted that wet splitting was difficult due to the lack of a wet splitter and that samples were frequently heavily laden with clay, which made keeping a clean, evenly split sample very difficult. He further noted that due to the large volume of water and material produced in some holes, fine-grained rock was often washed away, leaving only the gravel portion to be sampled.

10.6 Barrick

Barrick drilled 40 BR-series RC holes at Lookout Mountain in 1992 and 1993. Lang Exploratory Drilling was the contractor for Barrick's 28 RC holes drilled in 1992 (Mako, 1993a). MDA has no information on the drill contractor for Barrick's 1993 drilling or on the type(s) of rig used.

The drill cuttings from Barrick's 1992 RC drilling were sampled at five-foot intervals.

Some of the 1992 drill sites in the vicinity of the Lookout Mountain pit were surveyed by Eric Pastorino. Barrick staff supervised the drilling and logged the drill cuttings (Mako, 1993a).

10.7 Echo Bay

Echo Bay drilled 106 EBR-series holes in the Lookout Mountain project from 1994 to 1997, according to Emmons (1998), although the database used by MDA has 105 Echo Bay holes. Three of the holes were core and the rest RC.

The contractor for the three core holes was Wink Drilling, who used a Hagby rig and drilled NQ core. There were various contractors for the RC drilling. Eklund Drilling and Drift Exploration Drilling ("Drift") used MPD-1000 rigs, while Eklund Drilling also used an MPD-1500. Lang Exploratory Drilling used a TD-25 track rig.

RC holes were sampled at five-foot intervals. The three Echo Bay core holes were sampled irregularly, but predominantly at five-foot intervals.

10.8 Staccato

Staccato drilled a total of 25 BH-series core holes in the Lookout Mountain property from 2005 through 2007. These were primarily HQ core holes, with a reduction to NQ-diameter (1.875 inch) core utilized to complete deeper holes. Boart-Longyear from Salt Lake City, Utah, the drill contractor for the holes drilled in 2005 and 2006, used a Longyear LS 244 rig. TonaTec Exploration ("TonaTec") completed the core drilling in 2007 using an LF90 drill rig.

In 2008, Staccato drilled an additional 25 BHSE-series holes, five of which were core and the remainder RC. TonaTec was the drill contractor for the core holes, again using an LF90 drill rig. Eklund Drilling was the contractor for the RC holes and used an MPD1500 track-mounted drill.

Sampling of the drill core generated by Staccato's 2005-2007 core drilling programs was under the supervision of Staccato personnel. The thickness of each sample in mineralized intervals was determined and marked by a geologist. The core was sawn by technicians under the supervision of the geologist, and the split core samples were delivered to the ALS Minerals ("ALS") sample preparation facility in Elko, Nevada; ALS Minerals was formerly known as ALS Chemex.

Staccato drilled both RC and core in 2008. Samples for RC drilling were taken on five-foot intervals, utilizing standard techniques for RC drilling. Samples were collected in buckets beneath a rotary splitter and placed into marked sample bags by the driller's helper. Samples were laid out on the drill site in sequence to dry, if necessary. Once the rig left site and samples were dried, they were then collected from the drill site by Inspectorate America Corp. ("Inspectorate") personnel and experienced geotechnical personnel working for Staccato and placed into an Inspectorate truck for shipment to the Inspectorate's lab in Sparks, Nevada.

Core drilling utilized a five-foot dual-tube core barrel for sampling with a maximum sample length of five feet. The length of individual core runs was based on driller's discretion and was determined by the presence of broken, caved, or other bad ground, which often led to smaller than five-foot drill-run intervals. After logging, individual samples were taken based on the down-hole depth from and to values of the drill runs. No sample was taken that crossed over drill-run depth values. This was to ensure that material from drill runs with poor recoveries was not mixed with material from runs with good or complete recovery. Samples were also taken within runs and were based on lithologic, alteration, or structural boundaries.

All core samples were marked with footages written on wooden blocks in red permanent marker and placed at the appropriate footage in the core box for samples that were taken within runs. A red border was placed on the block marking the drill run, with a mark placed on the core box where the depth block for the run was placed.

After photographing, core was then cut in half using a 14-inch ceramic saw at the company's office in Elko, Nevada. One half of the core was placed in a marked bag for sampling, and the other half placed back in the appropriate position in the core box for future needs. Samples were then picked up by Inspectorate personnel and delivered to the lab.

Sample bags for both core and RC samples were marked using the drill-hole ID and a three digit number starting with 001 and continuing in sequence to a number necessary to cover all assay intervals contained within the drill hole (*e.g.*, BHSE-015 001, BHSE-015 002 ... BHSE-015 235). This was done to allow for the insertion, in stream, of blank material and certified standards. For RC drilling, footages were correlated to bags via a sampler's log sheet and pre-numbered chip trays showing sample number, depth from, and depth to for each interval. For core drilling, footages were correlated to sample numbers via a sampler's record sheet. Depth from and depth to values for each sample number were filled out by the geologist logging the core hole and making sample breaks.

10.9 Timberline

Timberline began RC drilling at Lookout Mountain in September 2010 using a Schramm 660 track-mounted drill; New Frontier Drilling Co. ("New Frontier") was the drill contractor. A second RC rig, a Foremost MPD 1000, was added by New Frontier in October 2010. A third buggy-mounted RC rig was added to help finish drilling in January 2011, and O'Keefe Drilling Co. was the drill contractor. When RC drilling resumed later in 2011, New Frontier, Diversified Drilling LLC, and Boart Longyear were the drill contractors. Timberline also conducted a 7,000-foot core drilling program for metallurgical purposes. Core drilling began in the South Adit area in July 2010. Timberline Drilling, a division of Timberline Resources Corp., was the drill contractor for the core drilling, using a skid-mounted LF90 core drill. The three 2011 pilot water-monitoring holes (BHMW-001, -001A, and -003) were drilled by Boart Longyear, who then installed the water-monitoring well that became BHMW-001).

For Timberline's 2012 drilling, Timberline Drilling conducted the core drilling using a UDR 10 rig; a truck-mounted rig was used for a few holes. New Frontier conducted all the RC drilling in 2012 using the same rigs as they had previously. Boart Longyear installed the three water-monitoring wells drilled in 2012 (see discussion in Section 9.0), as well as the one installed in 2011.

Timberline drilled a total of 102 holes (BHSE- and BHMW- series) in 2010 and 2011, of which nine were core and 93 were RC. The three BHMW- holes (one was a re-drilled hole) were drilled to install water-monitoring wells, from which one well was actually installed. Timberline drilled an additional 17 core holes and 31 RC holes in 2012 (BHSE- series).

Timberline's 2010-2012 sampling methods were consistent with Staccato's methods from 2008, *i.e.* for RC drilling, samples were collected in a five-gallon bucket beneath the rotary splitter from the rig, then put into marked sample bags by the driller's helper. Samples were then laid out in order on the drill site to dry. Timberline geotechnical personnel then transferred samples to Timberline's logging facility in the town of Eureka to await pickup by Inspectorate lab personnel. Samples were shipped by Inspectorate to the lab in Sparks, Nevada, for processing.

Core holes drilled for metallurgical purposes in 2010 utilized a dual-tube five-foot core barrel with a maximum sample interval of five feet. The length of individual core runs was based on driller's discretion and was determined by the presence of broken, caved, or other bad ground, which often led to smaller than five-foot drill-run intervals. Once drilled, individual core runs were placed into core boxes with the from and to depths marked by wood or plastic blocks with the corresponding depths and recoveries written on the block in black permanent marker. Timberline personnel picked up full core boxes from the drill site and transported the core to the logging facility in the town of Eureka. Core was logged, and sample breaks, based on drill runs were broken out and marked with red permanent markers by Timberline geologists for sampling. Samples for core were completed based on down-hole runs, with lithologic, alteration, or structural breaks sampled from within runs.

After logging and photographing, the sections of core that were part of the mineralized zone were shipped to KCA in Reno, Nevada, for processing. Since whole core was to be used for metallurgical testing, only the core representing the mineralized interval, with an assumed un-mineralized buffer of 10 feet on either side, was sent. Remaining, non-mineralized core was split or sawed in half and sampled based on samples marked by Timberline geologists. Samples sent to KCA were processed individually. Processing sample intervals were stage crushed to minus 45 millimeters (-1.77 inches). The minus 45 millimeter crushed material was blended by conventional coning and quartering methods and two opposite quarters combined, coned three times, and then quartered again. This process continued until KCA obtained a portion weighing approximately 2 kilograms (0.91 pounds), which was then sent to Inspectorate for assay.

For the core holes drilled in 2012, the core was picked up on site by Timberline's geologic staff and taken to the logging shed, where geotechnical, lithologic, and alteration data were logged. Sample breaks were identified and marked with wood blocks, and footages with associated sample numbers were written on a sampler's record sheet before being shipped to KCA for metallurgical study. At KCA, whole core was used, with individual samples separated and crushed initially to a size of 1.75 inches. A minimum 500- to 1,000-gram split was sent to Inspectorate for analysis. For the three infill holes and the two geotechnical holes drilled in 2012, assay samples were taken as with the metallurgical holes, but the core was cut in half, with half-core samples sent to Inspectorate for sample preparation and assay.

As with Staccato's sampling, sample bags for both core and RC samples were marked using the drill-hole ID and a three-digit number starting with 001 and continuing in sequence to a number necessary to cover all assay intervals contained within the drill hole. (*e.g.*, BHSE-056 001, BHSE-056 002 ... BHSE-056 235). This was done to allow for the insertion, in stream, of blank material and certified standards. For RC drilling, footages were correlated to bags via a sampler's log sheet and pre-numbered chip trays showing sample number, depth from, and depth to for each interval. For core drilling, footages were correlated to sample numbers via a sampler's record sheet. Depth from and depth to values for each sample number were filled out by the geologist logging the core hole and making sample breaks.

All 2012 core holes were logged for basic geotechnical information. Two core holes (BHSE-157C, BHSE-160C) were drilled specifically to gain geotechnical information in Devonian carbonate rocks that would form the highwall to a potential open-pit. Both of these holes attempted to provide oriented core using an ACT3 digital orientation device, but the rock was generally too broken and altered to obtain quality readings.

10.10 Rotary and Reverse-Circulation Sample Contamination

Due to the nature of conventional rotary and RC drilling, the possibility of contamination of drill cuttings from intervals higher in the hole is a concern, especially when groundwater is encountered or fluids are added during drilling. Drill logs indicate that a number of holes intersected groundwater at Lookout Mountain, and water was sometimes injected by the drillers (this was always the case with the Timberline 2010 through 2012 RC drill holes).

Down-hole contamination can often be detected by careful inspection of the RC drill results in the context of the geology, by comparison with adjacent core holes, and by examining down-hole grade patterns.

MDA identified 14 RC holes (one Barrick, five Echo Bay, and eight Timberline) that clearly exhibit cyclic down-hole patterns in the gold assays of deeper portions of the holes. These patterns are detected by examining the gold results of each set of four samples derived by the drilling of the same 20-foot drill rod (or sets of two samples in the case of 10-foot rods). In a classic case, the first sample of a drill rod will have the highest grade, while the following three samples will gradually decrease in grade. This classic 'decay' pattern in grade is caused by the accumulation of mineralized material (derived from some level higher in the hole) at the bottom of the hole as the drilling pauses and a new drill rod is added to the drill string. When drilling resumes, the first sample has the greatest amount of contamination, and the successive samples are gradually 'cleaner' as the accumulated contamination is removed and the continuing contamination experienced during the drilling is overwhelmed by the material being drilled. This decay pattern is usually possible to detect only while drilling barren or very weakly mineralized rock. Even in cases where this cyclic gold contamination is of such low grade as to have minimal impact on resource estimation, its presence suggests that similar, and possibly more serious, contamination is occurring higher in the hole within mineralized zones, where the contamination is impossible to recognize.

The geologic context can also be used to detect contamination. The Secret Canyon Shale, which lies below the mineralized Lookout Mountain breccia, is only locally mineralized. Mineralized intersections within the Secret Canyon Shale that are not supported by adjacent holes must therefore be considered as possible candidates for contamination. Four such intercepts were identified, including one Barrick and three Timberline RC holes (one of the Timberline holes was also listed with those with cyclic patterns).

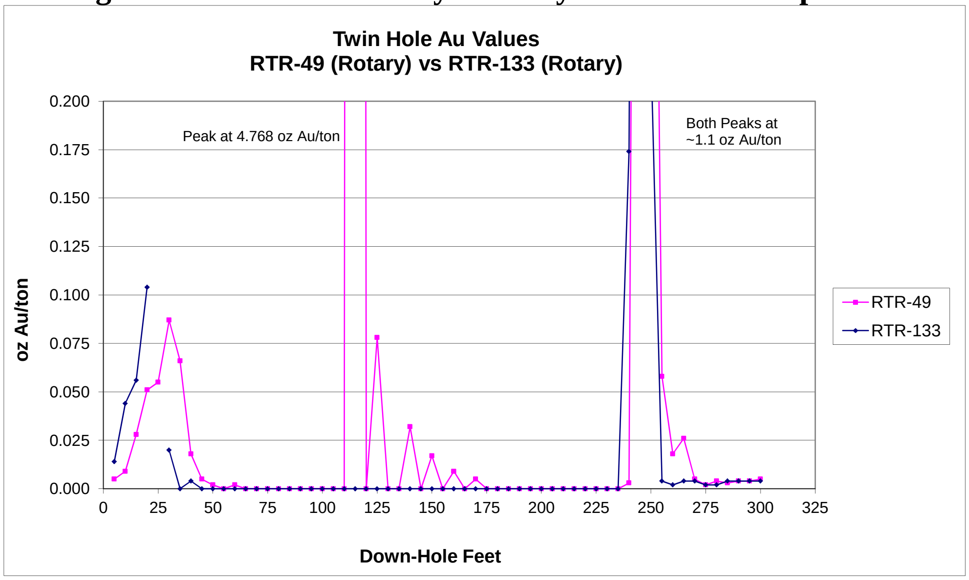
The mineralized zones in two Echo Bay RC holes, one Amselco RC hole, six Amselco rotary holes, and one Timberline RC hole appeared suspicious in comparison to surrounding holes, but these holes lacked clear cyclic patterns and the intercepts were within permissive geology. The logs of such holes were checked, and, in the case of the two Echo Bay RC holes and one Amselco rotary hole, notations of suspected or definitive contamination accompanied by high water flows were found.

All of the suspected contaminated intervals discussed above were excluded from the mineral domains used in the resource modeling. Even the purely suspicious intervals that lack supporting evidence noted in drill logs were deemed to be too anomalous for use in the modeling and therefore were also excluded. It is important to note that the excluded samples are typically low grade.

There are eight sets of holes at Lookout Mountain that are sufficiently close to be considered twin holes. Some of these twin sets are useful for comparisons of the type of gold analyses and are discussed in Section 11.0. Other twin sets are more germane to considerations of sample quality and potential down-hole contamination; a few of the more revealing pairs are summarized below using graphical down-hole gold plots.

Figure 10.2 compares two Amselco rotary holes that are approximately five-feet apart.

Figure 10.2 Amselco Rotary - Rotary Twin-Hole Comparison



The mineralized zone in the upper portion of the hole is within colluvium/alluvium. Hole RTR-49 clearly intersected a mineralized zone in the middle of the hole that RTR-133 did not, while the lower mineralized zone was intersected by both holes. It is interesting to note that RTR-49 shows evidence of down-hole smearing in both of the hard-rock mineralized zones, while RTR-133 appears to be 'clean.' The smearing of the middle zone in RTR-49 is also characterized by a strong cyclic decay pattern in the gold values, with a periodicity of 10 feet. It is likely that RTR-49 intersected a thin high-grade structure that RTR-133 did not, and this high-grade zone contaminated down-hole intervals in a cyclic fashion. This mineralized zone was excluded from the resource modeling.

Figure 10.3 and Figure 10.4 compare an Amselco core-RC-rotary twin set, with the rotary and RC holes lying about 10 feet from the core hole. Over comparable intervals, the core hole is lower grade than the rotary hole and higher grade than the RC hole. It is difficult to draw conclusions from these relationships, other than the holes may be demonstrating natural grade variations. Note the lack of depth in the trough in both the RC and rotary holes (as compared to the core hole) that lies at a depth of about 50 feet. This is likely due to smearing of grade, which is typical of RC and rotary drill holes.

Figure 10.3 Amselco Core - Rotary Twin-Hole Comparison

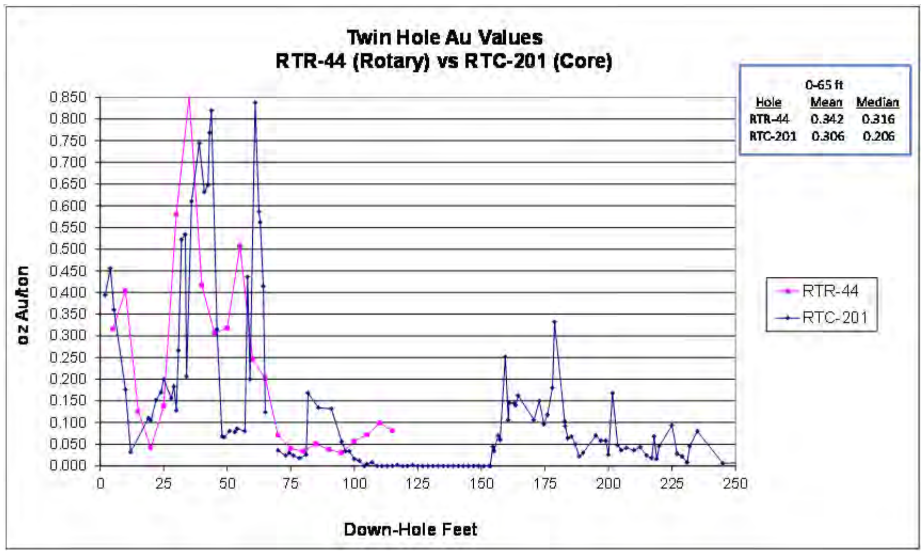
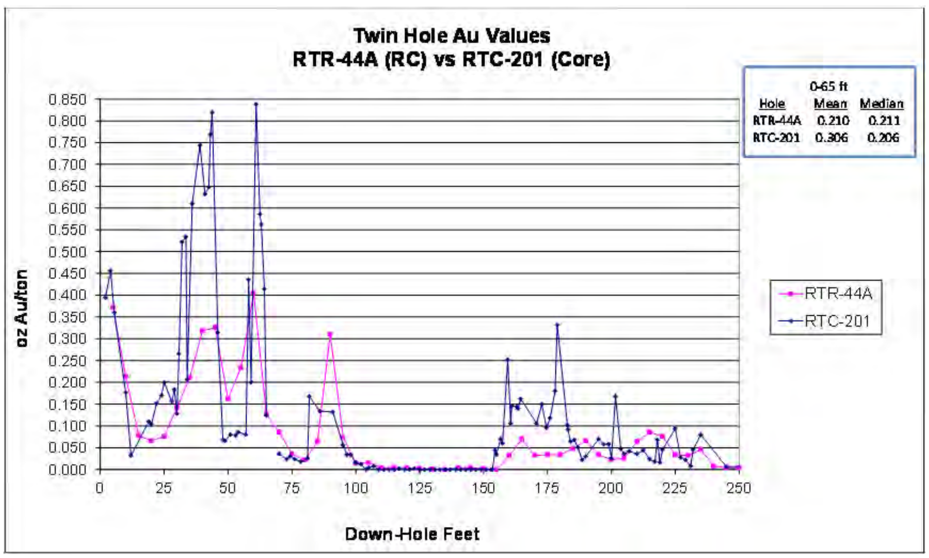


Figure 10.4 Amselco Core - RC Twin-Hole Comparison



An Amselco RC hole is compared to a Staccato 2007 core hole that is six-feet distant in Figure 10.5. Considering natural variability, the morphologies of the graphs compare well. The mean and median of the rotary hole (as displayed on the figure) are lower than the core hole over the interval 0 to 160 feet; loss of core hinders direct comparisons in deeper portions of the holes.

Figure 10.5 Staccato Core - Amselco RC Twin-Hole Comparison

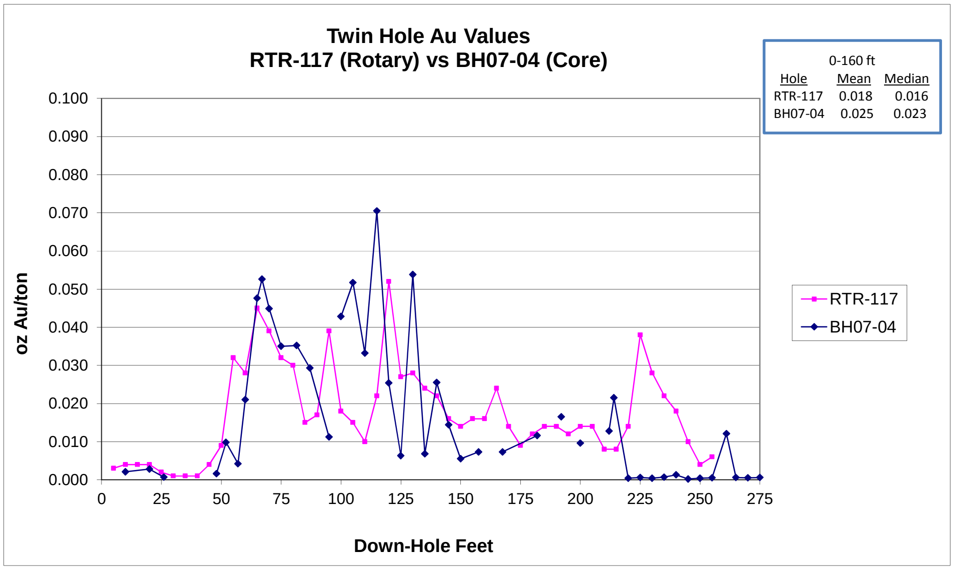
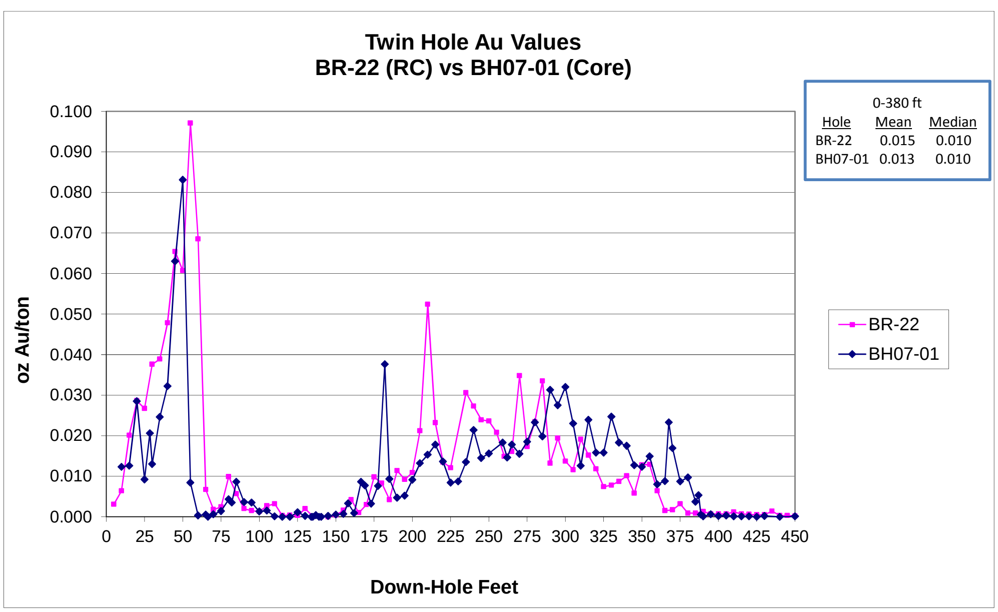


Figure 10.6 compares another Staccato core hole with a Barrick RC hole. The holes have a separation distance of 16 feet. The morphologies of the down-hole plots show excellent correspondence between the holes, and there is no evidence of down-hole contamination in the Barrick RC hole. The relatively close correspondence of the means and medians of the twin data reflect these relationships.

Figure 10.6 Staccato Core - Barrick RC Twin-Hole Comparison



The twin data support conclusions reached by MDA during the sectional modeling of the gold mineralization (see Section 14.2.5), *i.e.* there is local evidence of down-hole contamination of gold in the rotary and RC drill holes. In recognition of this, the mineral-domain modeling used in the resource estimation excluded the mineralized samples suspected of being contaminated. It should be noted, however, that the identification of suspect assays is interpretational; MDA believes it is possible that some relatively small amount of the excluded mineralization is 'real,' and it is likely that some mineralized samples included in the resource estimation are affected by contamination.

In light of these observations, RC drilling and sampling protocols need to be developed and implemented to minimize the injection of drilling fluids, decrease the likelihood for down-hole contamination, and increase sample representativity.

10.11 Collar Surveys, Down-Hole Surveys, and Project Coordinates

All Staccato 2005 through 2007 drill collars were surveyed by Carlin Trend Mining Services of Elko, Nevada using high-resolution GPS equipment. Down-hole surveys were performed on regular intervals for most of the Staccato core holes, including vertical holes. Most holes were surveyed within the first 100 feet, again at 500 feet, and then at or near the bottom of the hole (~1,000 feet). All holes showed a dip deviation of less than three degrees, except angle hole BH-06-16, which steepened from a 45 degree dip at the collar to 52 degrees at the bottom of the hole.

The Staccato 2008 and Timberline 2010 through 2012 drill-hole collar locations were surveyed by company geologists utilizing a Trimble AG132 sub-meter GPS system. The AG 132 unit utilizes Omnistar space-based differential correction services to achieve sub-meter (<1m) accuracy in the x and y directions. All drill-hole surveys were collected into handheld data collectors utilizing ArcPad software. Collection times for each point utilized 60-second averaging on spatial coordinate readings collected every second. Due to the inherent inaccuracy in elevation data for non-survey grade GPS units, elevation values from the GPS were not used in the project database. Timberline flew an aerial survey in July, 2010 that enables an engineering accuracy of ±5 feet on scribed topography. Drill-hole elevations were generated using the digital terrain model (DTM) data from the aerial survey. MDA 'pressed' the Staccato and Timberline drill holes to this topography, essentially assigning the "z" value of these holes in the project database on the basis of the digital topography.

Staccato staff initiated a program in 2008 to re-survey existing historic drill holes after finding a Barrick document, and then speaking with Allan Morris, that discusses errors in the detailed topographic base generated by Echo Bay Exploration. The errors were found when comparing the Echo Bay topographic base to the Pinto Summit and Spring Valley Summit 7.5' USGS topographic maps. Three different surveying methods were used to survey the historic holes. In 2009, historic holes were surveyed using the Trimble AG132 GPS with Omnistar differential correction, as described above. Prior to this, either a Trimble AG132 GPS with U.S. Coast Guard beacon differential correction, which provides variable accuracies depending on which beacon is captured by the unit, or handheld GPS units with approximately ±5-meter accuracy were used (Edmondo, personal communication, 2011). A total of 30 Amseclo, one Barrick, and two Echo Bay holes were found and surveyed using the Trimble unit with Omnistar differential correction, while 16 Amselco, six Barrick, and one Echo Bay hole were surveyed using the US Coast Guard beacon differential corrections. Handheld GPS units were used for four Amselco holes and one hole each for Echo Bay and EFL. Reclamation of drill access roads and drill sites precluded the surveying of the remainder of the historic holes.

The 2009 sub-meter GPS survey data from historic drill holes and survey points were compared to original coordinates reported in Amselco documents, and these data, in combination with the detailed topography, were used to determine translation/rotation parameters for correcting the discrepancies in the historic coordinates. The resultant first-order polynomial equation was used to transform the unsurveyed historic data into Nevada State Plane East, NAD27 coordinates that are used in the current project database.

International Directional Surveys ("IDS"), with an office in Elko, Nevada completed all down-hole surveys for the Staccato 2008 and Timberline 2010-2012 drill programs. IDS utilized a Surface Recording Gyro, which required an initial setup to establish true north for the gyro. A technician shoots an azimuth from a point on the surface to the gyro and then utilizes that direction in a computer program to calculate the azimuth. The survey tool has a built-in inclinometer to determine dip angle. All data are recorded digitally to a computer, processed, and presented to the client on site. There are no down-hole surveys for the following holes due to caving, loss of the hole, or stuck pipe: BHSE-127, -129, -129A, -136, and -160C.

11.0 SAMPLE PREPARATION, ANALYSES, AND SECURITY

The commercial analytical laboratories used by all operators that contributed data to the project drill-hole database, as well as the analytical procedures used by the laboratories to obtain the gold assays for Lookout Mountain, are, or were at the time, well recognized and widely used in the minerals industry. In-house mine laboratories were used for all of the Norse Windfall Mines and some of the Amselco holes, however, and many of these analyses appear to have used partial-gold extractions. The Norse Windfall Mines gold data clearly understate grades in at least some of the holes. MDA's reconstruction of the Amselco database effectively limits the impact of the in-house assays by replacing many of them with check analyses performed at commercial laboratories.

Records of drilling prior to that of Staccato have few details on sample preparation, QA/QC, or sample security. What information MDA has identified is reported below, along with details on analyses of samples taken from Russell (2007), unless otherwise cited. All of the historic operators were reputable, well-known mining/exploration companies, and there is ample evidence that these companies followed the accepted industry practices relating to sample-preparation and analytical techniques.

In consideration of this information, in addition to other data examined in accompanying sections of this report, MDA believes the Lookout Mountain analytical data are of sufficient quality for use in the resource estimation.

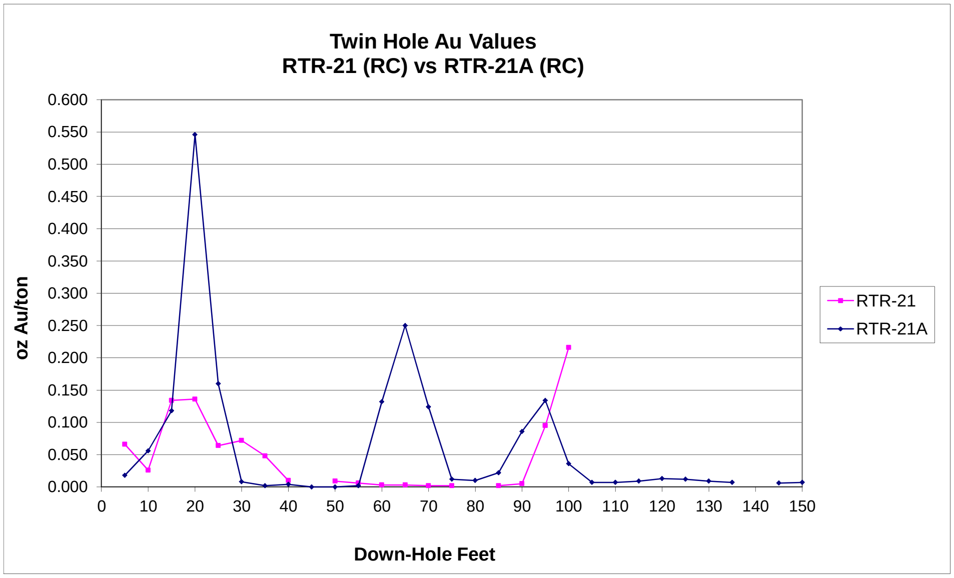
11.1 Amselco

Amselco used the following commercial assay laboratories for the analyses of their drill samples: Monitor Geochemical Laboratory Inc. ("Monitor"), Rocky Mountain Geochemical Corporation ("Rocky Mountain"), and Hunter Mining Laboratory, Inc. ("Hunter"). Amselco also used their in-house American Selco Laboratory in Sparks, Nevada. Records reviewed by MDA indicate that the samples sent to the commercial laboratories were analyzed by fire assay methods, but the finish was not often specified.

The in-house laboratory analyzed samples by fire assay using gravimetric or atomic absorption ("AA") finishes. Other in-house analyses are specified as "AA" in the documents examined. Based on other notations found in some cases, MDA believes many, and perhaps all, of these "AA" samples were analyzed by AA after either cyanide or aqua regia digestions. Since aqua regia will not fully digest sulfide minerals and silicates, and cyanide leach will only digest gold particles that are available to solution (and may not fully digest this gold if the particles are coarse), both of these are partial gold digestions. Fire assaying, by contrast, is considered to be total gold analysis. Some of the partial-digestion data are therefore expected to understate grades in comparison to those determined by fire assay methods.

Figure 11.1 compares two Amselco holes drilled 11 feet apart. The interval from 50 to 90 feet in RTR-21 was analyzed by the "AA" method at Amselco's in-house laboratory, while the remainder was analyzed by Rocky Mountain by fire assay. All of RTR-21A was analyzed by fire assay by Monitor. The interval analyzed by "AA" is anomalously low grade compared to the Monitor fire assays, which is probably the result of the partial digestions used by the in-house laboratory.

Figure 11.1 Amselco RC – RC Twin-Hole Comparison



11.2 Norse Windfall Mines

Norse Windfall Mines appear to have used an in-house laboratory for the assaying of their drill samples. According to handwritten laboratory certificates, the samples were analyzed by AA following cold cyanide shake-leach digestions.

The following graphs compare two Norse Windfall Mines RC holes that twin an Amselco RC hole (Figure 11.2) and an Amselco core hole (Figure 11.3). Both Amselco holes were analyzed by fire assay methods. The Norse Windfall Mines data are systematically lower than the fire assays from the Amselco holes. In the case of Figure 11.3, the divergence between the results increases with depth. These data are consistent with observations made by MDA during grade modeling, *i.e.* the Norse Windfall Mines holes are, in many cases, anomalously low-grade with respect to surrounding holes. These observations are explained by the partial digestions used in the analyses of the Norse Windfall Mines drill samples.

Figure 11.2 Norse Windfall Mines RC – Amselco RC Twin-Hole Comparison

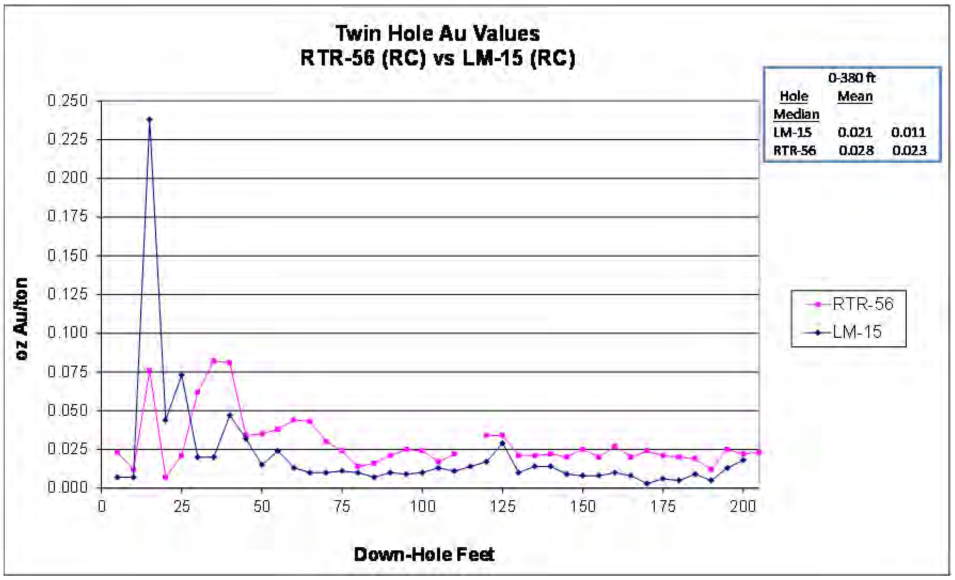
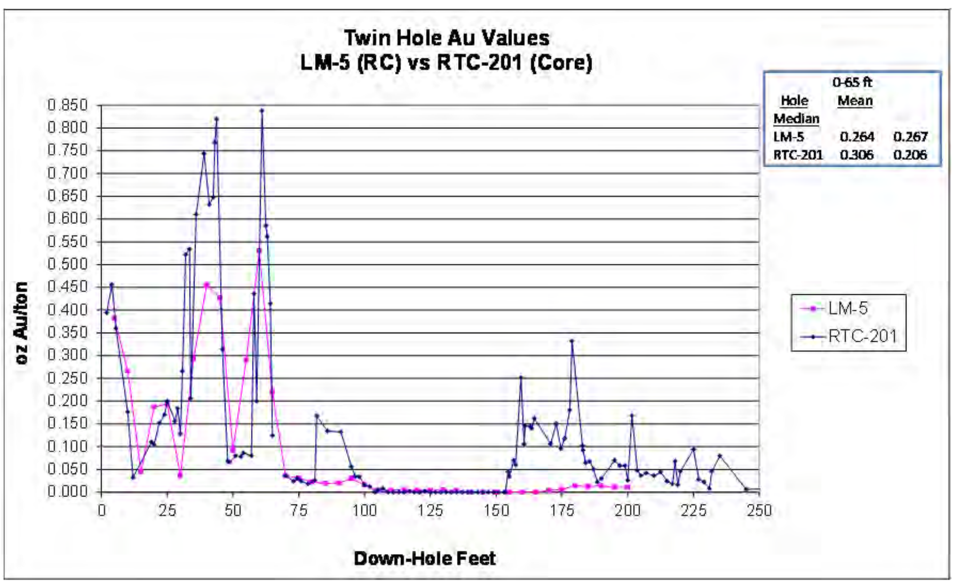


Figure 11.3 Norse Windfall Mines RC – Amselco Core Twin-Hole Comparison



11.3 EFL

EFL used American Assay Laboratory ("American Assay") for their analyses. American Assay performed gold cyanide solubility assays (their code CN15) as well as fire assays for gold (their code FA30), according to assay certificates that accompany the drill logs. The fire assay data were used in the resource modeling.

11.4 Barrick

Barrick used American Assay for the analytical work on their 40 holes. The samples were analyzed by fire assaying of 30-gram charges with either gravimetric or AA finishes. Select cuttings samples and composites of some of the geologically interesting intervals were analyzed by ICP for a 15-element suite by MB Associates (Mako, 1993a).

11.5 Echo Bay

Echo Bay used Cone Geochemical ("Cone") for the analytical work on their drill holes, with some check assays completed by Barringer Laboratories Inc. ("Barringer") and ALS. Records examined by MDA indicate that the samples were analyzed by fire assaying of 20- and 30-gram charges with an AA finish.

11.6 Staccato

ALS prepared and assayed the samples from Staccato's 2005 through 2007 drilling by fire assaying of 50-gram charges with either AA (method AA24) or gravimetric (method GRA22) finish.

The 2008 drill samples were prepared and analyzed by Inspectorate, who used fire assay with an AA finish. All samples exceeding 3 ppm (0.088 oz Au/ton) were re-analyzed by fire assay with a gravimetric finish. Fifty-element ICP geochemical analyses were performed for individual holes on pulp composites as outlined by Staccato staff. Composites were created by Inspectorate using standard techniques for blending splits from original assay pulps.

11.7 Timberline

Timberline used Inspectorate for assaying of their 2010-2012 drill samples. Samples were picked up by Inspectorate and taken to their laboratory in Sparks, Nevada, for sample preparation and analysis using standard 30-gram fire assays with AA finishes. Samples with gold values greater than 3 ppm were re-analyzed using a 30-gram fire assay with a gravimetric finish.

ALS completed check analyses on selected Inspectorate pulps as part of Timberline's quality assurance/quality control program. The pulps were analyzed by methods identical to those used by Inspectorate (all samples by ALS code Au-AA25; samples yielding results greater than 3 ppm by Au-GRA21).

11.8 Laboratory Accreditation

During the drilling that predated Staccato's involvement with the property, accreditation of laboratories was not common. MDA has no information on accreditation of those laboratories at that time. However, Monitor, Hunter, Rocky Mountain, American Assay, Cone, Barringer, ALS, and Inspectorate were all widely used laboratories in the mining industry.

Currently, ALS is registered to ISO 9001:2008, and a number of their facilities have received ISO 17025 accreditations for specific laboratory procedures, according to their website. Inspectorate is accredited to ISO 17025 standards, according to their website.

12.0 DATA VERIFICATION

In consideration of the Lookout Mountain data summarized below, as well as information provided elsewhere in this report, MDA believes the project data are acceptable for use in the resource estimation described in Section 14.0.

12.1 Database Audit

12.1.1 SRK Consulting Audit

SRK Consulting ("SRK") audited the drill-hole assay database in November 2009 using files provided by Staccato, including original and paper copies of assay certificates, drill-hole logs, various other original and copied documents, and digital assay certificates provided directly to SRK by ALS. The following discussion, presented in the order of which the holes were drilled, summarizes the results of this audit.

SRK used a database printout to audit the single Newmont hole in the database. No errors were found.

SRK audited a total of 61 of the 296 RTR-series, one of two RTC-series, and two of six RCR-series holes drilled by Amselco using copies of laboratory assay certificates, hand-written notes from an assay laboratory, a database printout, and handwritten assays on drill logs. A total of 43 errors were found in the database, including four errors in the reporting of less than detection limit values. The principal errors were found in holes in the series RTR-251 and RTR-272, where the lab reported gold in ounces per ton, but the database showed the results as ppm and then converted them to ounces per ton.

Four of Norse Windfall Mines' LM-series of 20 holes were audited. Since the assay certificates for these holes were handwritten on sheets with a header of "Windfall Venture," SRK considered the data to be suspect.

No errors were found in auditing two of the nine EFL-series holes drilled by EFL Gold Mine, Inc. ("EFL"). Ten of Barrick's 40 BR-series holes were audited, and two errors were identified.

After an initial audit of 18 of Echo Bay's EBR-series holes identified several significant data-entry errors, SRK completed an audit of 100% of the assays from the 105 holes in the database. A total of 45 errors were found and corrected. In addition, two samples from hole EBR-57-96 had assays that were not on any lab certificates and were therefore considered suspect (690-695 feet and 695-700 feet). Hole EBR-96-97 had assay results available that were not in the database, apparently because the driller had twisted off this hole and offset it with hole EBR-96A-97.

All of the assays from Staccato's BH- and BHSE-series holes were audited using digital certificates provided by ALS. Consistent errors in the identification of drill-sample interval 20 to 25 feet were found in 17 holes and corrected.

12.1.2 MDA Audit

MDA completed additional auditing of the project database as part of the 2011 resource study (note that MDA's resource database has more holes than reported by SRK for some of the historic companies discussed). The auditing was designed to complement the SRK audit, so much of the data checked by MDA had not been audited by SRK.

The collar coordinates of pre-Staccato holes were originally based on a project grid that was subsequently transformed into Nevada State Plane coordinates. Drill-hole collar coordinates, therefore, could not be checked against the historic documentation. Instead, locations of many of the historic holes were checked against rectified aerial photography to assure they are located on roads and drill pads. In some cases, original drill-hole maps were used to check relative positioning of the holes.

The azimuths, dips, and total depths of 55 holes were audited against copies of handwritten drill logs. No errors were noted. The azimuth and dips of the entire collar table were then checked for consistency with the survey table data for all holes lacking down-hole survey data, and no inconsistencies were found.

A total of 47 pre-Timberline holes have down-hole survey data in the project database, including 18 BH-series, 23 BHSE-series, and six RTR/RTC-series holes. No backup data were found to check the BH-series down-hole survey data. Four of the 23 BHSE-series holes were audited using printouts from International Directional Services ("IDS"). Of the 71 survey intervals audited in these holes, seven dip and 11 azimuth values were found to have discrepancies of ±0.1 degree. All of the errors occur in one hole, and none of the discrepancies are material. All six RTR/RTC-series holes with down-hole surveys were audited using a typed summary sheet of the survey data; no errors were found.

The audit of the historic assays began by checking 4,800 assay intervals from 54 holes ((3 BH-series, 6 BR-series, 11 EBR-series, 1 RTC-series, and 33 RTR-series holes). Initial work on the RTR- and RTC-series resulted in three findings that changed the auditing approach for these holes. First, the gold analyses are identified on various paper auditing materials as either "AA" or "FA", with the "AA" analyses found to represent analyses using cyanide shake-leach or aqua regia digestions, both of which are partial digestions and therefore quite different from fire assays ("FA"), which are assumed to be total gold analyses. However, the "AA" analyses were not differentiated in the project database, and in many cases were listed in the estimation field in the database when fire assay data were also available. Second, many values in the database for these holes represent inconsistent averaging of sets of assays, including the averaging of "AA" and "FA" analyses. Finally, a number of serious errors were identified. In light of these discoveries, MDA opted to complete a comprehensive re-compilation of all assay data from RTR- and RTC-series holes. The type of analysis was compiled into the database, as were all check-assay data. No "AA" analyses were carried into the database column for use in the resource estimation unless no other assay data were available. Averaging of multiple assays was also discontinued.

Exclusive of the Amselco holes, as well as Staccato and Timberline BHSE-series holes (discussed below), gold assays from 3,729 sample intervals were audited out of a total of 27,294 in the project database using the same auditing materials as used by SRK. Only one material input error was found and remedied. Eleven minor errors found in three Echo Bay holes were caused by the conversion of ppm values to oz/ton. Further conversions of ppb and ppm values to oz/ton led to very minor errors in six Barrick, one EFL, and four Echo Bay holes. Four instances in hole RCR-003 (Amselco) were found where <0.001 oz/ton values were in the database as 0.001 oz Au/ton. Finally, four additional intervals in RCR-003 with less than detection assays were entered in the database as "-99" and one interval that was not sampled was listed as 0.001.

The 2012 resource study incorporated 37 holes drilled at Lookout Mountain and 14 at South Adit that were not part of the previous resource database. Collar table data (x and y coordinates, hole azimuth and dip) were audited against the original handwritten tables compiled by Timberline geologists that surveyed the drill-hole collars; one discrepancy was found in the angle of a hole. No down-hole survey data were collected for eight of the 51 new holes, six of which were terminated prematurely due to drilling problems. The down-hole data provided by Timberline for the 43 new holes that were surveyed were checked against original digital data provided to MDA by IDS; no errors were found.

Essentially a complete audit of the Staccato drill-hole assay data for holes drilled in 2005 through 2008 was achieved in an automated fashion using a computer script that compared the database values to those from digital assay certificates provided to MDA directly by Inspectorate. Some significant errors were discovered and resolved, including nine from a single hole (BHSE-003 of Staccato).

Data from 48 new holes drilled in 2012 were added to the database for the current resource study. MDA used digital assay certificates for these holes that were received directly from Inspectorate to update the assay table, while original IDS down-hole survey files were used to update the survey table. The northings and eastings of the drill-hole collars were updated using digital files exported from the GPS instrument used by Timberline; the elevations of these drill-collar surveys are not sufficiently precise for use in the database, so the collars were 'pressed' to the project digital topographic surface.

The assay table for all Timberline 2010 through 2012 holes was constructed by MDA using original assay certificates received directly from Inspectorate.

12.2 Quality Control/Quality Assurance Data Relevant to Historic Drill Results

12.2.1 Amselco Drill Data

Amselco drill holes contribute 35% of the assays used directly in the resource estimation discussed in Section 14.0. The drill-hole records in possession of Timberline indicate that Amselco regularly inserted control samples (standards) into the drill-sample stream for assaying. The expected values of the standards are not known, and therefore the analyses of these standard analyses have not been compiled. It is not known if further Quality Control/Quality Assurance ("QA/QC") procedures were implemented by Amselco.

Staccato completed check assaying of drill cuttings from Amselco RC holes in 1990. A discussion of the results of these checks follows, as well as summaries of the results of duplicate assays compiled into the project database by MDA during the database audit and some Alta check assay data.

<u>Staccato Preparation Duplicates</u>. Preparation duplicates, also referred to as duplicate pulps, are new pulps prepared from splits of the original coarse rejects created during the first crushing and splitting

stage of the primary drill samples. Duplicate-pulp data provide information about the sub-sampling variance introduced during this stage of sample preparation.

Rocky Canyon Mining Company provided Staccato with vials of coarse-reject material from Amselco's drill samples. The vials were judged by Staccato to hold up to approximately 500 grams of material. Staccato filled plastic chip logging trays with a portion of the samples and sent the remainder to ALS for analysis. These samples can be considered as unconventional preparation duplicates, since: (1) the samples were analyzed by a different laboratory (ALS) than the original samples (Monitor); (2) the duplicate samples were analyzed years after completion of the drilling program; (3) the sub-sampling of the original coarse rejects to create the vial samples may not have been done by the original laboratory; and (4) an additional splitting stage was undertaken by Staccato when the chip trays were filled, which involves sub-sampling variance that is additional to 'conventional' preparation duplicates. ALS analyzed the duplicates by fire assay with an AA finish, while the original samples were analyzed by Monitor by either fire assay or fire assay of one-assay-ton charges (no finishes specified).

Figure 12.1 is a relative-difference graph that shows the difference, plotted on the y-axis, of each ALS assay relative to its paired original Monitor fire assay. The relative difference is the greater value of the original and duplicate assay pair compared to (divided by) the lesser value. The x-axis of the graph plots the means of the paired data. The red line shows the moving average of the relative differences of the pairs and provides a visual guide of trends in the data. A total of 827 assay pairs from 32 Amselco drill holes are shown on the plot, which excludes both 23 pairs where both analyses are below detection and 37 outlier pairs. The exclusion of the outlier pairs assists in visually evaluating the data.

While there are many pairs exhibiting high variability, no bias is apparent (a bias would be evidenced by the moving-average line tending to be more on one side or the other of the blue 0% relative difference line).

Figure 12.1 ALS Preparation Duplicates Relative to Original Monitor Assays – Staccato

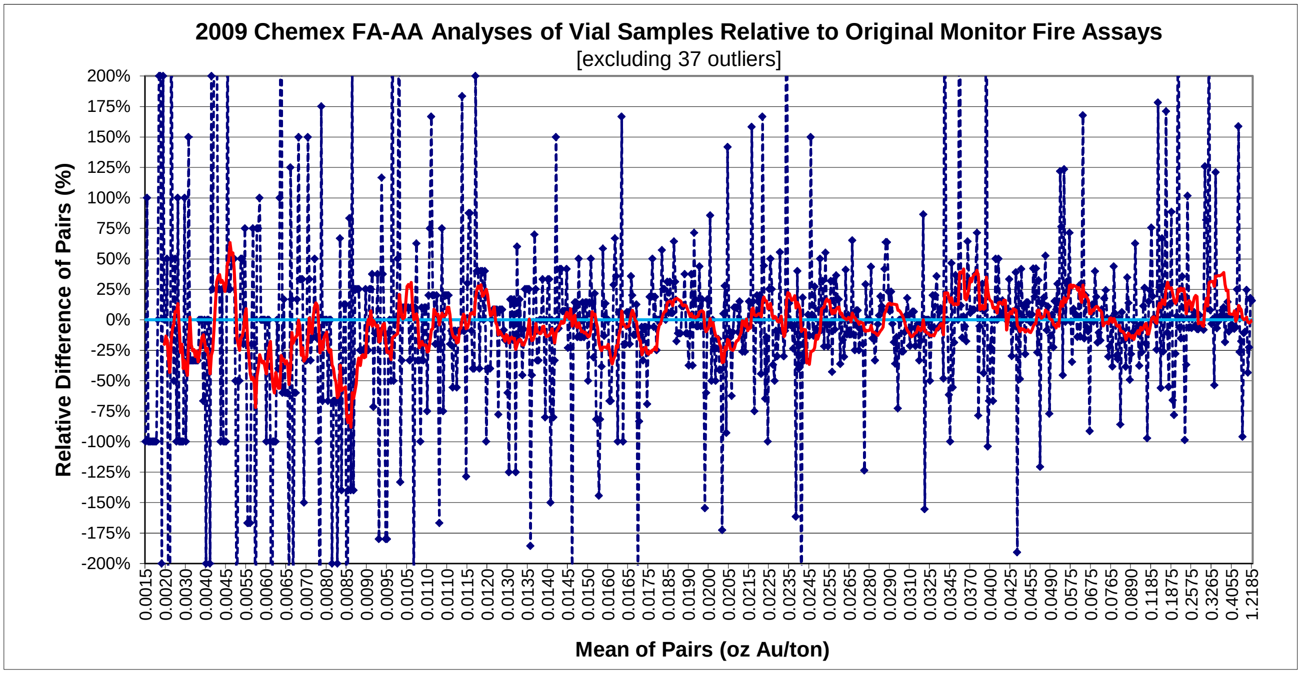


Figure 12.2 shows the absolute values of the relative differences of the same paired data. This plot helps to evaluate the variability (precision) of the data at various grade ranges. The graph demonstrates the gradually diminishing variability of the paired data up to a mean grade of the pairs of about 0.012 oz Au/ton, following which the variability fluctuates between about 25 and 50%.

Figure 12.2 Absolute Value of Relative Differences of ALS *vs.* Monitor - Staccato

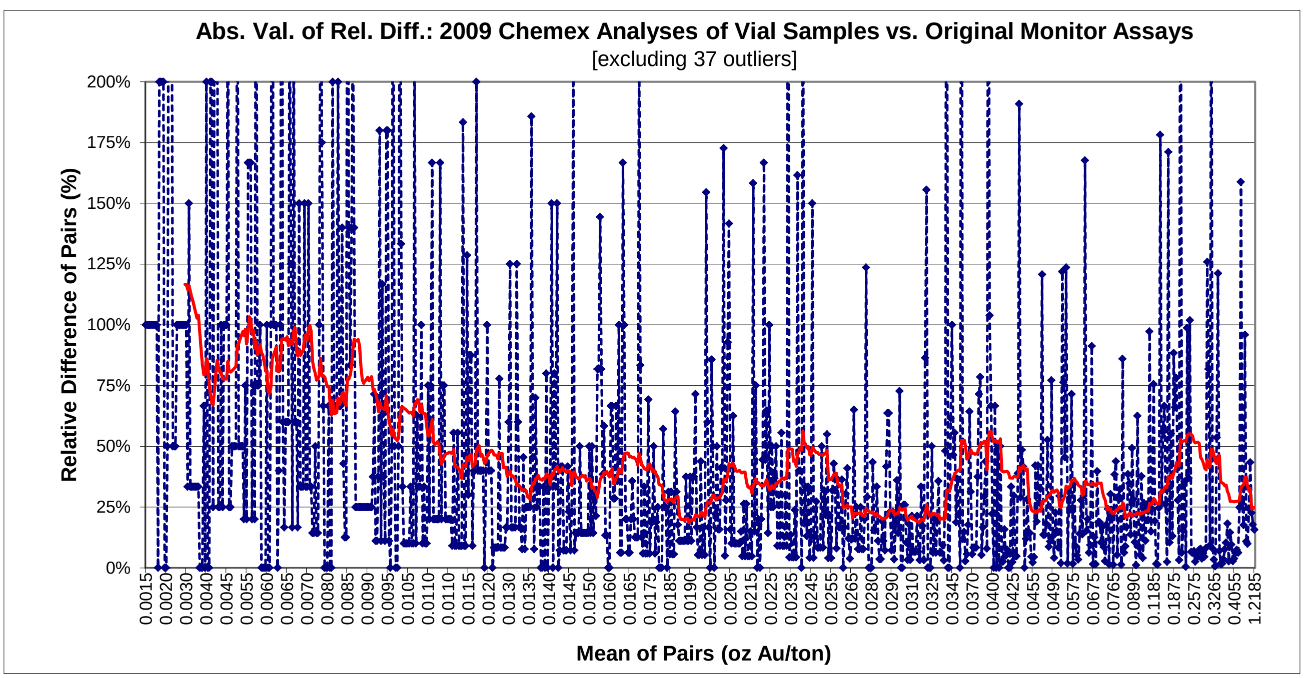


Table 12.1 summarizes the descriptive statistics of the data, excluding the 37 outlier pairs, at various cutoffs of the means of the pairs. The means of the analyses of the preparation duplicates generally compare well with those of the original assays at all cutoffs. If the 37 outlier pairs are included, the means of the preparation-duplicate analyses vary from 1% higher to 1% lower than the original assay means at the same cutoffs.

The average variability at grades in excess of about 0.01 oz Au/ton, as indicated by both Figure 12.2 and the mean of the absolute value of the relative differences shown in Table 12.1, is about 35%. This level of precision is not unusually high for preparation duplicates considering it incorporates additional analytical and sub-sampling variability, as discussed above.

Table 12.1 Descriptive Statistics of ALS Pulp Duplicates and Original Monitor Assays

All Pairs	Mean	Original	Duplicate	Diff.	Rel. Diff.	A.V. Rel. Diff.
Count	827	827	827		827	827
Mean	0.051	0.051	0.052	2%	-4%	47%
Median	0.020	0.020	0.019			
Std. Dev.	0.105	0.105	0.108			
CV	2.044	2.064	2.084			
Min.	0.001	0.001	0.001	0%	-400%	0%
Max.	1.219	1.130	1.307	16%	400%	400%

Mean ≥0.005	Mean	Original	Duplicate	Diff.	Rel. Diff.	A.V. Rel. Diff.
Count	762	762	762		762	762
Mean	0.056	0.055	0.056	2%	-4%	42%
Median	0.022	0.022	0.021			
Std. Dev.	0.109	0.109	0.112			
CV	1.954	1.974	1.992			
Min.	0.005	0.002	0.002	0%	-400%	0%
Max.	1.219	1.130	1.307	16%	400%	400%

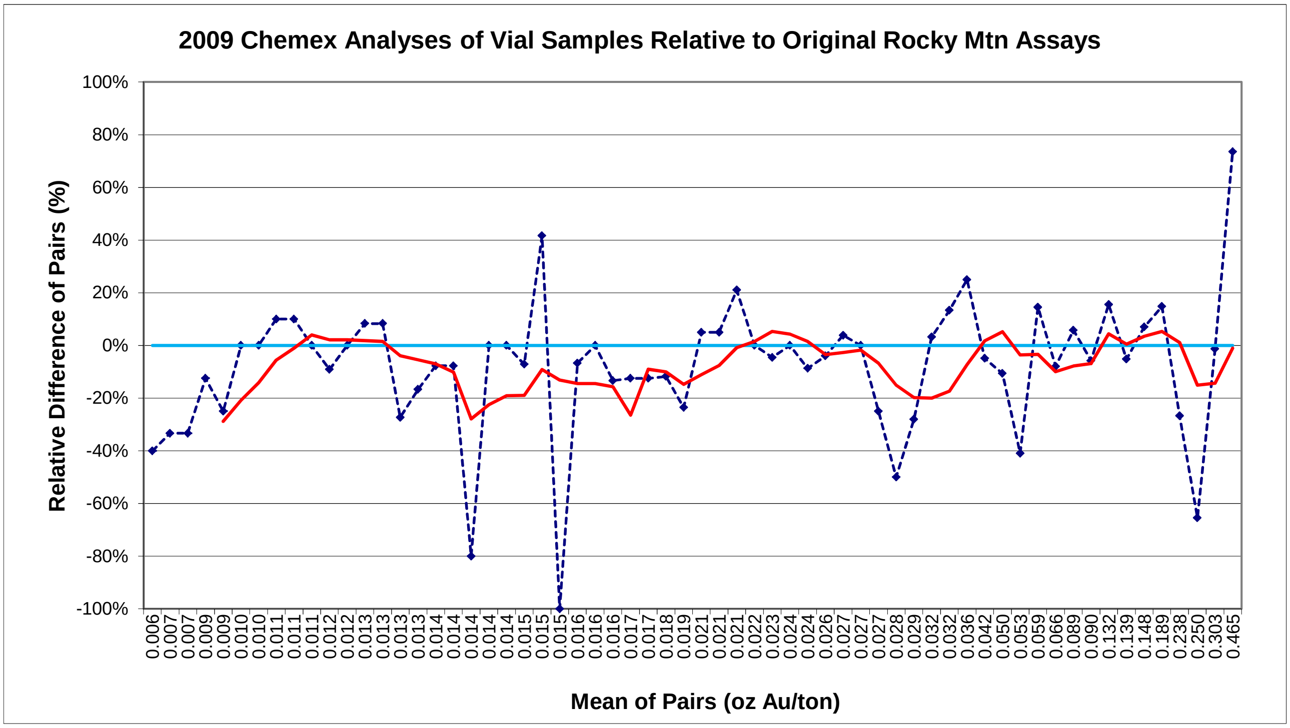
Mean ≥0.010	Mean	Original	Duplicate	Diff.	Rel. Diff.	A.V. Rel. Diff.
Count	644	644	644		644	644
Mean	0.064	0.064	0.065	2%	1%	36%
Median	0.025	0.026	0.025			
Std. Dev.	0.116	0.116	0.119			
CV	1.800	1.823	1.833			
Min.	0.010	0.004	0.005	25%	-280%	0%
Max.	1.219	1.130	1.307	16%	400%	400%

Mean ≥0.100	Mean	Original	Duplicate	Diff.	Rel. Diff.	A.V. Rel. Diff.
Count	85	85	85		85	85
Mean	0.303	0.298	0.309	4%	12%	38%
Median	0.284	0.266	0.283			
Std. Dev.	0.185	0.193	0.194			
CV	0.611	0.647	0.628			
Min.	0.101	0.073	0.072	-1%	-99%	0%
Max.	1.219	1.130	1.307	16%	330%	330%

CV = coefficient of variation = (Std. Dev./Mean); A.V. = absolute value

Similar preparation-duplicate data are available for 62 vial samples from two Amselco drill holes that were originally analyzed by Rocky Mountain. While the mean of the preparation duplicates is 1% higher than the original Rocky Mountain fire assays, Figure 12.3 indicates the preparation-duplicate analyses tend to be lower grade, especially at mean grades of the pairs less than about 0.03 oz A/ton, with higher-grade pairs masking this effect and overwhelming the statistics. For example, if the highest-grade pair is removed, the mean of the preparation duplicates becomes 7% *lower* than the mean of the original analyses. In consideration of the limited dataset, MDA does not believe there is a significant issue.

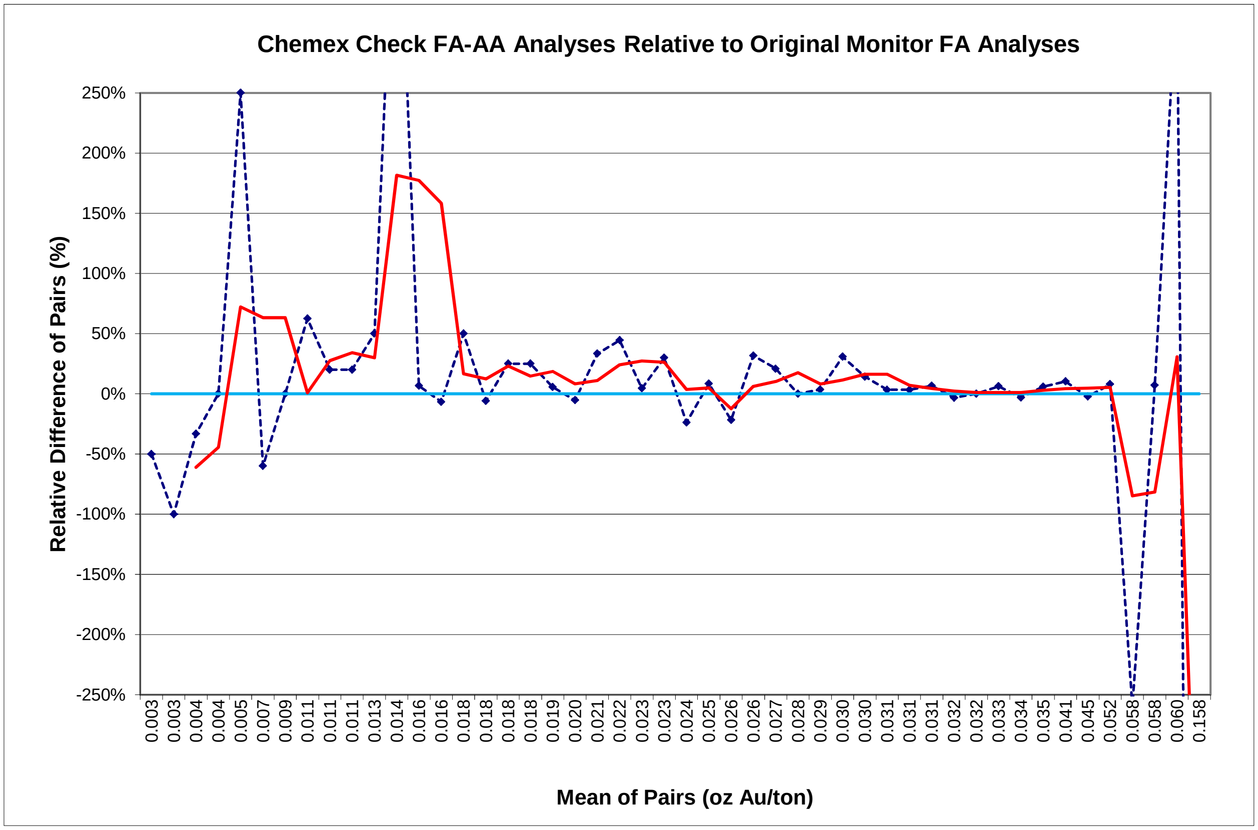
Figure 12.3 ALS Preparation Duplicates Relative to Original Rocky Mountain Assays



A total of 32 of preparation duplicates were also prepared from the Amselco coarse-reject vial samples that were originally analyzed by Amselco's in-house laboratory by AA methods (aqua regia or cyanide shake-leach digestions). The mean of the ALS fire assays of the preparation duplicates is 24% higher than the Amselco mean, although this reduces to 11% higher if the highest-grade pair is excluded. The dataset is not sufficient to allow for definitive conclusions, but it is nonetheless surprising that the fire assays yield lower results than the AA analyses.

<u>*Alta Preparation Duplicates*</u>. Alta sent 48 samples from four Amselco drill holes to ALS for fire assay analyses. The ALS laboratory certificate indicates the samples were crushed and pulverized, so they presumably represent preparation duplicates. The ALS results are compared to the original Amselco analyses, which were fire assayed by Monitor, in Figure 12.4.

Figure 12.4 ALS Preparation Duplicates Relative to Original Monitor Assays – Alta



The graph shows high variability in the data up to about 0.014 oz Au/ton and again above about 0.05 oz Au/ton, although there are not many pairs in the higher-grade range. While the mean of the check assays is 13% lower than the originals, removal of the four highest-grade pairs, which include three outlier results, results in the mean of the checks changing to 11% *higher* than the original analyses. The moving-average line indicates that the check assays do indeed tend to be higher grade than the original analyses at mean grades of the pairs of less than about 0.031 oz Au/ton.

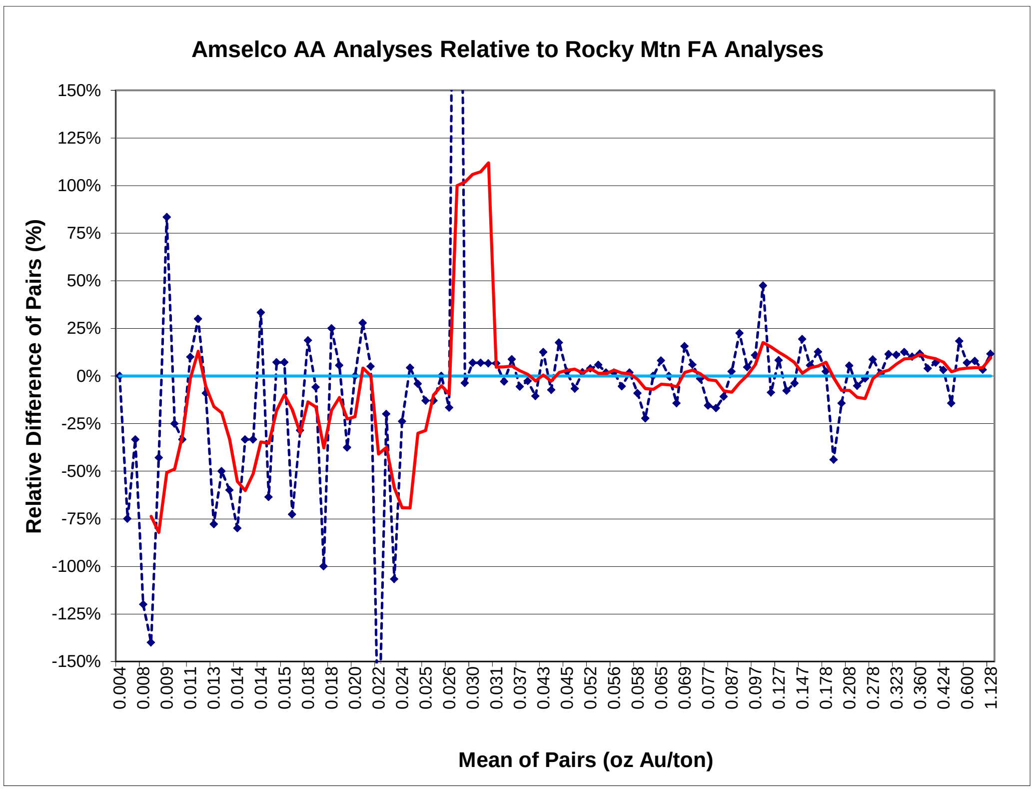
Check Assays of Uncertain Type. Alta also performed fire assays on 29 samples from three Amselco holes, none of which were included in the Alta samples discussed immediately above. The type of material used for the check assaying is not known. The fire-assay check samples are believed to have been analyzed at Alta's in-house laboratory by fire assay, while one of the original fire analyses was completed by Rocky Mountain and the remainder by Monitor. The dataset is too limited to be conclusive, but the Alta checks are systematically higher than the original analyses, and the mean of the Alta check analyses is 13% higher than the mean of the original analyses.

During the compilation of Amselco drill-hole data into the resource database, MDA included analyses from multiple laboratories when available. The resulting paired assay data are evaluated in the following paragraphs.

MDA found 20 samples from a single Amselco hole that were analyzed by both Rocky Mountain and Monitor using fire assay methods. Excluding two pairs that returned less than the detection limits for both labs, the Rocky Mountain analyses are 7% lower than Monitor, with the relative difference graph indicating that the difference is systematic at mean grades of the pairs greater than about 0.02 oz Au/ton. The number of pairs is not sufficient to derive meaningful conclusions, however.

A total of 120 pairs from nine holes were also compiled whereby Amselco AA analyses (thought to be aqua regia or cyanide shake-leach digestions) and Rocky Mountain fire assays were performed on the same samples. Figure 12.5 compares these data, excluding four pairs in which both analyses are less than the detection limit and four additional pairs that are extreme outliers. High variability is evident up to 0.025 to 0.030 oz Au/ton. While high variability is expected due to the lack of analytical precision at low gold concentrations, the variability evidenced in this case extends into meaningful grade ranges. The means of the AA analyses range from 3% higher for the entire dataset to 5% higher at mean grades of the pairs of greater than 0.05 oz Au/ton. While these differences are entirely caused by the pairs with means greater than 0.2 oz Au/ton, they are nonetheless surprising, because the AA analyses are thought to have been partial gold analyses.

Figure 12.5 Amselco AA Analyses Relative to Rocky Mountain Fire Assays

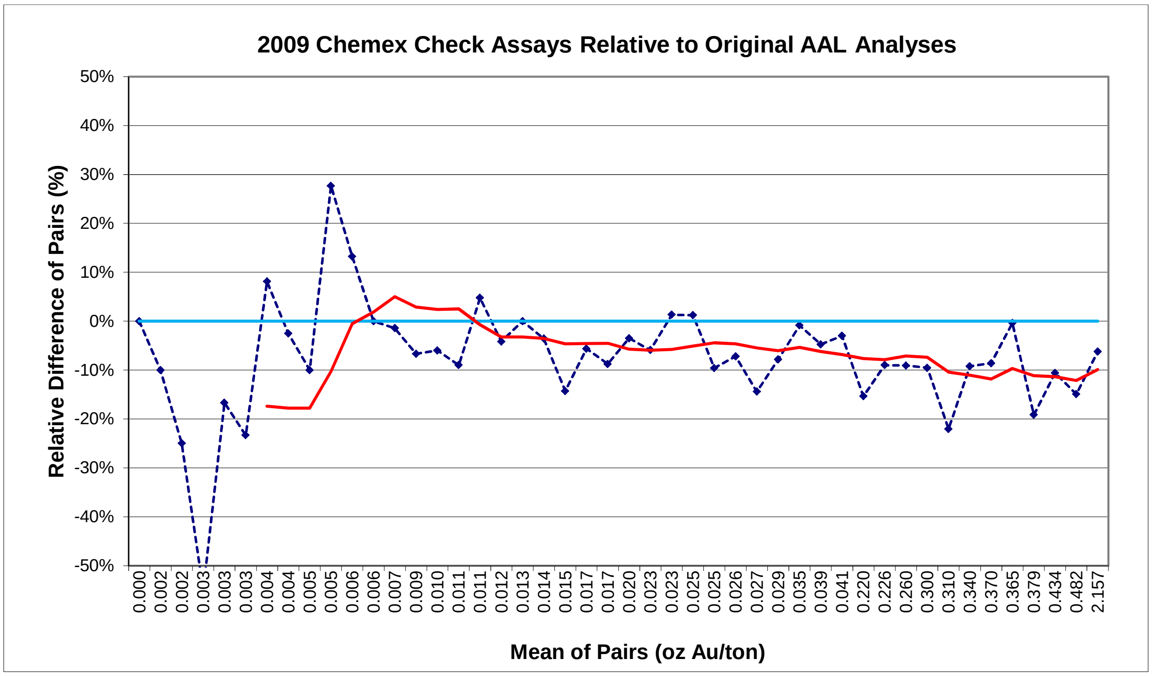


A subset of the samples plotted on Figure 12.5 was also analyzed by Rocky Mountain using what Amselco referred to as "bulk fire" assays. The "bulk fire" analyses tend to be slightly lower than the fire assays, with the possible exception of the highest mean grades of the pairs. Excluding a single high-grade outlier pair, the mean of the "bulk fire" analyses is 1% lower than the mean of the fire assays.

12.2.2 Barrick Drill Data

Pulp Checks. Staccato sent 46 original pulps from two Barrick holes to ALS for check assays. The pulps were originally prepared by American Assay and analyzed by fire assaying of 30-gram charges; some of the higher-grade results were re-fired using gravimetric methods. ALS analyzed the samples by fire assay with AA finishes, with results exceeding 0.3 oz Au/ton re-analyzed by fire assay-gravimetric methods. The ALS checks are compared to the original American Assay analyses in Figure 12.6.

Figure 12.6 ALS Pulp Checks Relative to Original American Assay Analyses



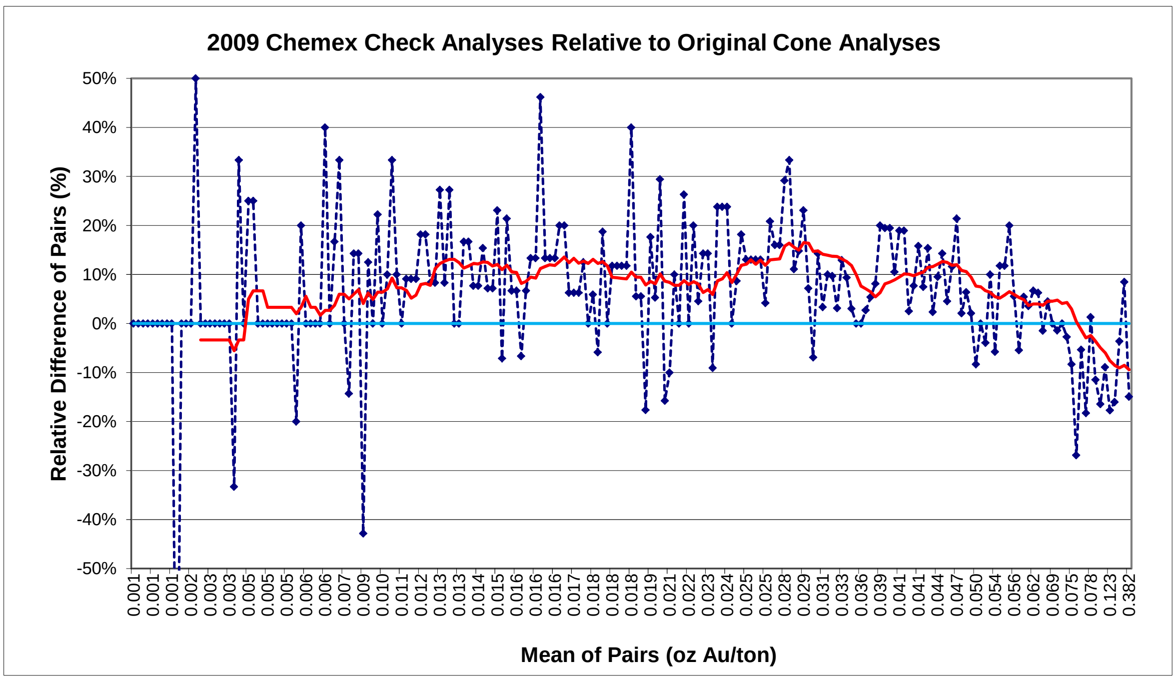
The check assays are systematically lower than the original analyses at mean grades of about 0.01 oz Au/ton and higher, and the divergence increases with increasing grades. The mean of the checks is 12% lower than the original assays. The dataset is unrepresentatively high grade with respect to the Lookout Mountain mineralization (the checks and originals average 0.132 and 0.149 oz Au/ton, respectively). It is common for re-analyses of the highest grade portion of a population to return lower results, which could explain the progressive divergence of the results as grades increase, but it is unlikely that this phenomena accounts for the systematically lower results of the check analyses overall.

12.2.3 Echo Bay Drill Data

Pulp Checks. Staccato sent 209 original pulps from 17 Echo Bay holes to ALS along with the Barrick pulps discussed above. The original Echo Bay analyses were done by Cone. Available documentation indicates that the Cone analyses were fire assays of 20- and 30-gram charges with AA finishes.

Although the mean of the ALS check analyses is only 3% higher than the mean of the original Cone assays, Figure 12.7 demonstrates that this relatively close agreement is a function of the pairs in excess of about 0.07 oz Au/ton. The relative difference plot clearly indicates that the ALS checks are systematically higher (~10%) in the grade range of about 0.005 to 0.07 oz Au/ton. Variability is unusually high for pulp-check data.

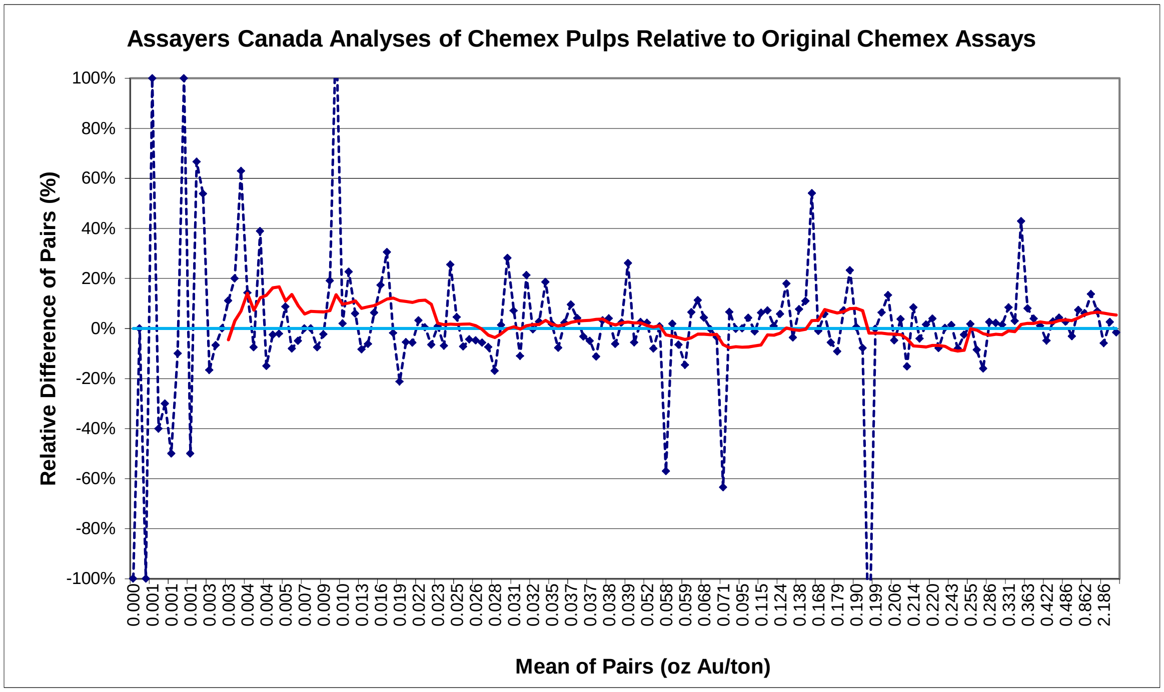
Figure 12.7 ALS Pulp Checks Relative to Original Cone Analyses



12.2.4 Staccato Drill Data

Pulp Checks. Staccato submitted 178 ALS pulps from 10 holes of the Staccato 2005 through 2007 drilling programs to Assayers Canada (now SGS) for check assaying (no holes from the Staccato 2008 drilling program are located at Lookout Mountain). The original ALS pulps were analyzed by fire assaying of 50-gram charges with AA finishes, with over-limit results re-assayed gravimetrically. MDA is not certain of the type of analysis used by Assayers Canada. The relative differences of the paired data are shown in Figure 12.8, excluding 12 extreme outlier pairs and 10 pairs whereby both the check and original assays returned less than detection limits.

Figure 12.8 Assayers Canada Pulp Checks Relative to Original ALS Analyses



The check assays compare well, with a mean that is 1% higher than the mean of the original ALS analyses at cutoffs of the mean of the pairs of 0, 0.005, 0.050, and 0.100 oz Au/ton. Including the outlier pairs, the checks are 2% higher. The precision of the data is above a grade of 0.005 oz Au/ton averages 10%, which is normal for re-assaying of pulps. No bias is evident.

12.2.5 Timberline Drill Data - 2010 and 2011 Programs

Timberline's QA/QC program includes the insertion of certified reference materials (standards), uncertified 'standards', preparation blanks, and field duplicates into the drill-sample stream. Preparation duplicates were also analyzed by the primary laboratory (Inspectorate), and a number of Inspectorate pulps were sent to ALS for pulp-check analyses.

Timberline completed two drill programs, one in late 2010 to early 2011, referred to as the 2010-2011 program, and the other in mid- to late-2011, referred to as the 2011 drilling program.

Certified Standards. Standards are used to monitor the analytical accuracy and precision of the assay laboratory during the time the drill samples were analyzed. In the case of normally distributed data (note that most assay populations from metal deposits are positively skewed), approximately 95% of the standard analyses should lie within two standard-deviations of the certified (expected) value, while only about 0.3% of the analyses should lie outside of three standard deviations. As it is statistically unlikely that two consecutive samples would lie outside of the two standard-deviation limits, such samples are considered failures unless further investigation proves otherwise. All samples outside of the three standard-deviation limits are also deemed to be failures. Failures should trigger laboratory notification of potential problems and a re-run of all samples included with the failed standard result.

Timberline used fourteen certified reference standards acquired from Rocklabs of Aukland, New Zealand (Table 12.2). These standards have certified gold values that range from 0.002 to 0.25 oz Au/ton, which well represents the Lookout Mountain gold-grade distribution.

Table 12.2 Timberline Certified Standards

Standard	Source	Certified Value (ppm Au)	Standard Deviation	Drill Program
SL34	Rocklabs	5.893	0.14	2010 - 2011
SN38	Rocklabs	8.573	0.158	2010 - 2011
OxA71	Rocklabs	0.0849	0.0056	2010 - 2011
OxE74	Rocklabs	0.615	0.017	2010 - 2011
HiSilK2	Rocklabs	3.474	0.087	2010 - 2011
OxD87	Rocklabs	0.417	0.013	2011
OxG83	Rocklabs	1.002	0.027	2011
OxG84	Rocklabs	0.922	0.033	2011
OxH66	Rocklabs	1.285	0.032	2011
OxJ68	Rocklabs	2.342	0.064	2011
OxN33	Rocklabs	7.378	0.208	2011
SE58	Rocklabs	0.607	0.019	2011
SG40	Rocklabs	0.976	0.022	2011
SN50	Rocklabs	8.685	0.18	2011

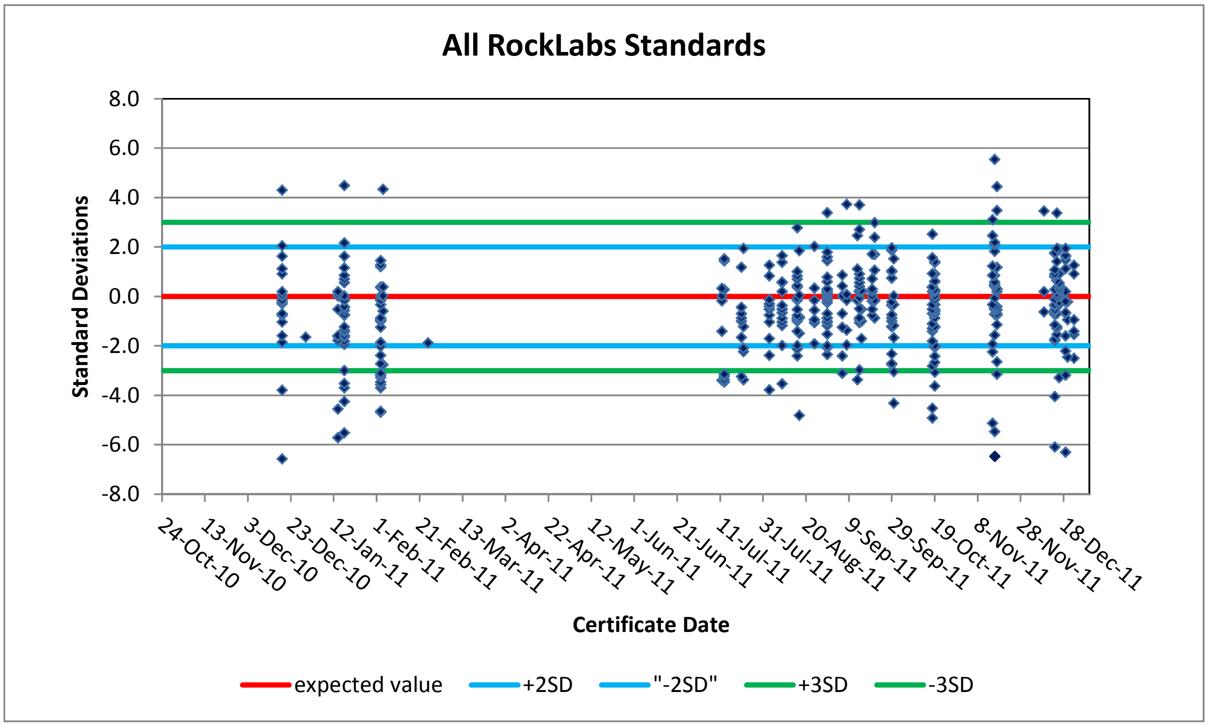
The standards were assigned sample numbers in-sequence with their accompanying drill samples and were inserted at a nominal rate of one standard for every 20 drill samples. MDA compiled 436 analyses of these standards.

The Inspectorate analyses of the standards resulted in a total of 53 three-standard-deviation failures, or about one in every eight standard analyses. Fifteen of the failures are from one standard (HiSilk2; all low-side failures) and 42 are low-side failures (*i.e.*, 42 standard analyses are more than three standard deviations lower than the expected value). A low bias is evident in many of the Inspectorate analyses relative to the expected values. If the standard deviations of the standards were adjusted to fit with expected values suggested by the Inspectorate analyses, the failure rate would significantly decrease. No relationship between standard expected values and degree (or absence) of bias is evident.

The complete dataset for the 14 standards is shown in Figure 12.9 (three outlier analyses are outside of the plot limits), which plots the Inspectorate standard analyses in terms of their differences from the expected values, expressed in normalized standard deviation units. As an example, a value of "-1.3" on the graph indicates the Inspectorate assay is 1.3 standard-deviation units lower than the expected value of the reference standard. The data are ordered by the date of the assay certificates on the x-axis. The normalized expected value of the standards is represented by the red line, and the ± two and ± three normalized standard-deviation limits of the standards are shown as blue and green lines, respectively. The slight low bias in the standard analyses is evident.

Excluding the three outlier results, the Inspectorate analyses of the standards have an average difference from the expected values of about -0.5 standard-deviation units.

Figure 12.9 Normalized Results of Inspectorate Analyses of All 2010 and 2011 Certified Standards

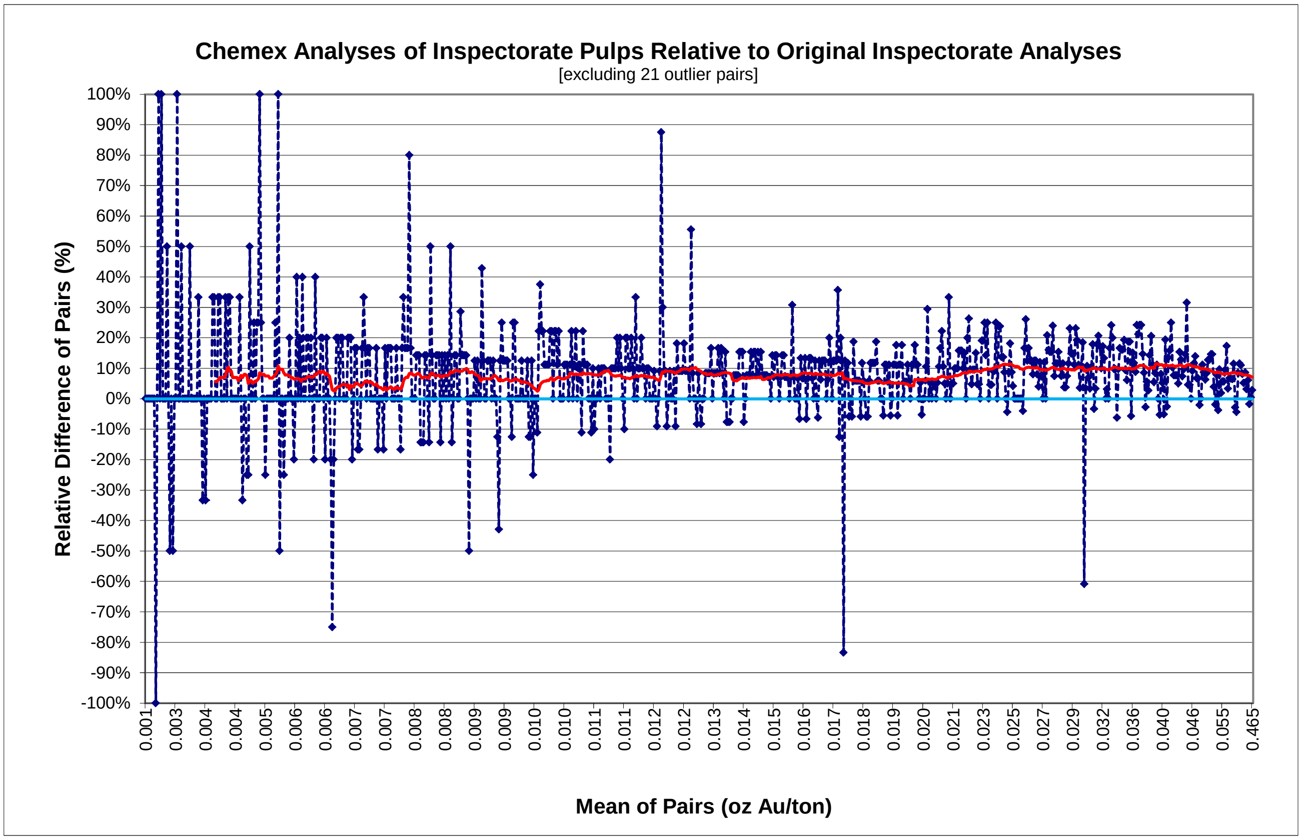


<u>*Uncertified Reference Materials*</u>. In addition to the certified Rocklabs standards, four uncertified 'standards' were used from late October 2010 through early February 2011. Each of these reference materials was analyzed 10 times by ALS and one time by Assayers Canada, and these analyses were used to assign expected and standard-deviation values.

At a minimum, a proper certification process includes round-robin analyses by a number of commercial laboratories to establish well-founded statistical values, which is not the case for the four 'standards.' Other than to note that the Inspectorate analyses were systematically lower than the 'expected values,' these 'standards' are not discussed further.

<u>*Pulp Checks*</u>. Timberline sent Inspectorate's pulps from most samples from mineralized intervals intersected in the 2010-2011 drill program to ALS for check assaying. These 811 pulp checks serve as an additional tool to evaluate analytical accuracy. Figure 12.10 compares the check assays to the original Inspectorate analyses, excluding 21 outlier pairs (only six of which have means of the pairs that exceed 0.001 oz Au/ton) and 12 additional pairs whereby the original and check assays both returned less than detection limits.

Figure 12.10 ALS 2010-2011 Pulp Checks Relative to Original Inspectorate Analyses



The plot demonstrates that the ALS check assays are systematically higher than the original Inspectorate analyses over the entire grade range of the data, which represent the Lookout Mountain grade population very well. The mean of the check assays is 7% higher than the mean of the original analyses for all data and cutoffs up to 0.01 oz Au/ton, and the mean of the absolute values of the relative differences is 10%.

Timberline sent an additional 1,352 Inspectorate pulps from the 2011 drill program to ALS for check assaying. While similar relationships are evident, the mean of the ALS analyses is only 3% higher at cutoffs up to 0.01 oz Au/ton, and the mean of the absolute value of the relative differences is 10% (all data) to 3% (0.01 oz Au/ton cutoff).

Timberline included 23 certified Rocklabs standards with the 2010-2011 Inspectorate pulps sent to ALS for check assaying. Unfortunately, only two of the standard pulps had sufficient material to assay. The ALS analyses of these standard pulps were both higher than the expected values by 0.7 and 0.9 standard-deviation units. No standard pulps were submitted with the drill-sample pulps from the 2011 drill program.

<u>*Preparation Blanks*</u>. Preparation blanks are coarse samples of barren material that are used to detect possible laboratory contamination, which is most common during sample-preparation stages. In order for analyses of blanks to be meaningful, therefore, they must be sufficiently coarse to require the same crushing stages as the drill samples. It is also important for blanks to be placed into the sample stream

immediately after mineralized samples (which would be the source of most cross-contamination issues). Blank results that are greater than five times the detection limit (25 ppb Au based on the 5 ppb detection limit of the Inspectorate analyses) are typically considered failures that require further investigation and possible re-assay of associated drill samples. Dimension stone sold in 50-pound sacks available from garden/hardware stores was used as the coarse blank material.

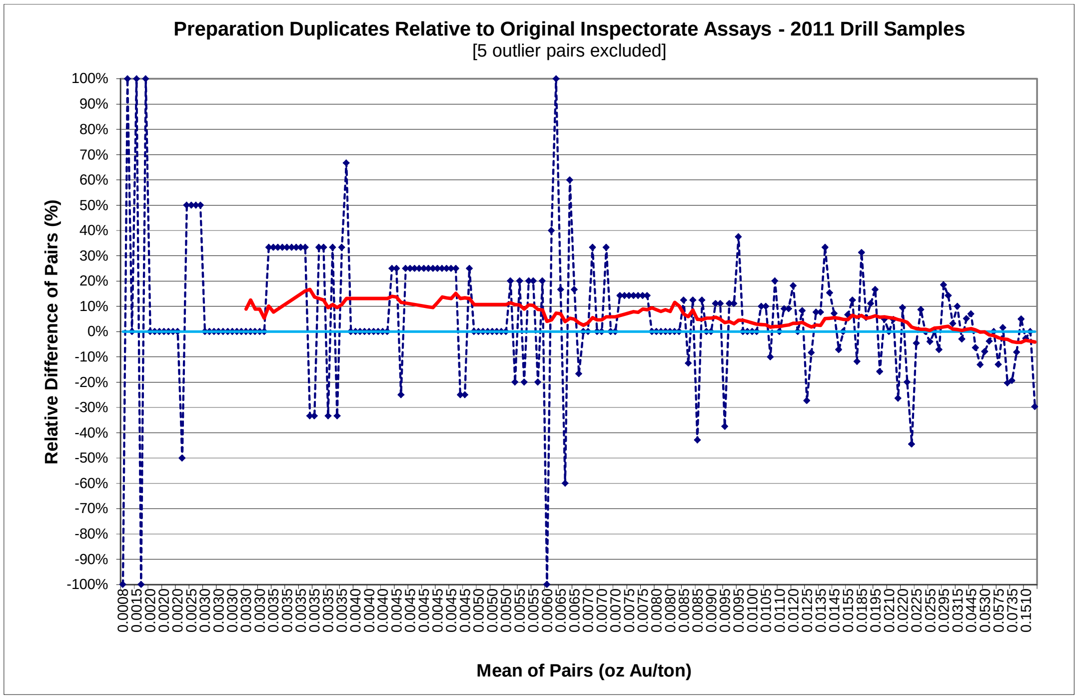
Four of the 345 blank analyses examined by MDA from the 2010-2011 drill program exceed the 25 ppb (0.0007 oz Au/ton) threshold, with a maximum value of 71 ppb (0.002 opt). None of these "failures" have previous samples with significant gold values (two less than detection limits, 0.003, and 0.008 oz Au/ton). A total of 324 of the Inspectorate analyses of blanks returned less than detection limits. While these results suggest that cross contamination was not a problem, 254 of the samples analyzed previous to the coarse blanks returned values less than 0.005 oz Au/ton, and only 47 of the previous samples returned values in excess of 0.01 oz/ton, so the opportunity for cross contamination of the blank samples was limited.

Of the 377 blank analyses from the 2011 drilling program, only four exceed the 25 ppb Au threshold. Only one of these ‘failures’ was preceded by a sample assaying greater than 0.005 oz Au/ton (0.057 oz Au/ton), and the highest blank analysis is 0.004 oz Au/ton. Only 21 of the drill samples analyzed immediately before a blank sample have values in excess of 0.01 oz Au/ton, and one (5%) of these blanks was a failure.

Preparation Duplicates. Timberline instructed Inspectorate to prepare duplicate pulps from the coarse rejects of 175 drill samples from the 2010-2011 drilling program. Excluding two outlier pairs, the means of the preparation duplicates match those of the original analyses at cutoffs of the mean of the pairs of 0, 0.005, and 0.010 oz Au/ton, and no bias is evident in the data.

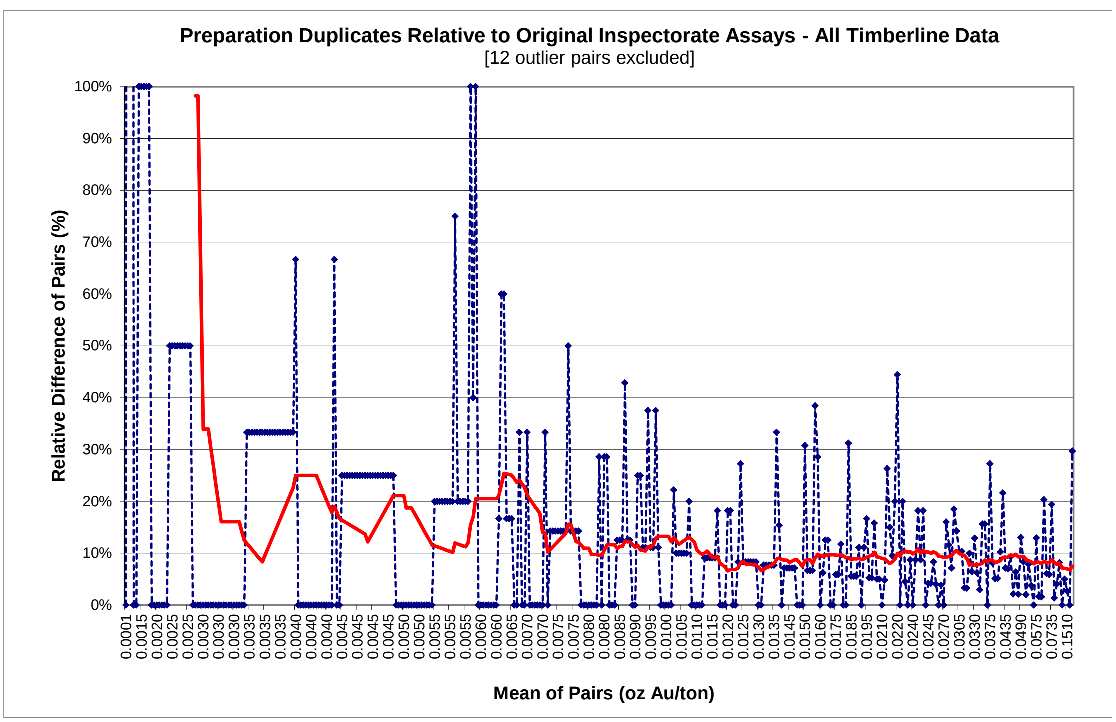
Inspectorate analyses of duplicate and original pulps from the 2011 drilling program, excluding five outlier pairs, are compared in Figure 12.11. In this case, a consistent high bias is evident at grades up to about 0.04 oz Au/ton, whereby the analyses of the preparation duplicates are higher than the original pulps. The means of the preparation-duplicate analyses are 4% to 7% higher than the means of the assays of the original pulps at cutoffs of 0.00 to 0.01 oz Au/ton, respectively.

Figure 12.11 2011 Preparation Duplicates Relative to Original Analyses



The absolute values of the relative differences between the preparation duplicates and original assays from both the 2010-2011 and 2011 drilling programs are plotted in Figure 12.12.

Figure 12.12 Absolute Value of Relative Differences of Preparation Duplicates *vs.* Original Assays

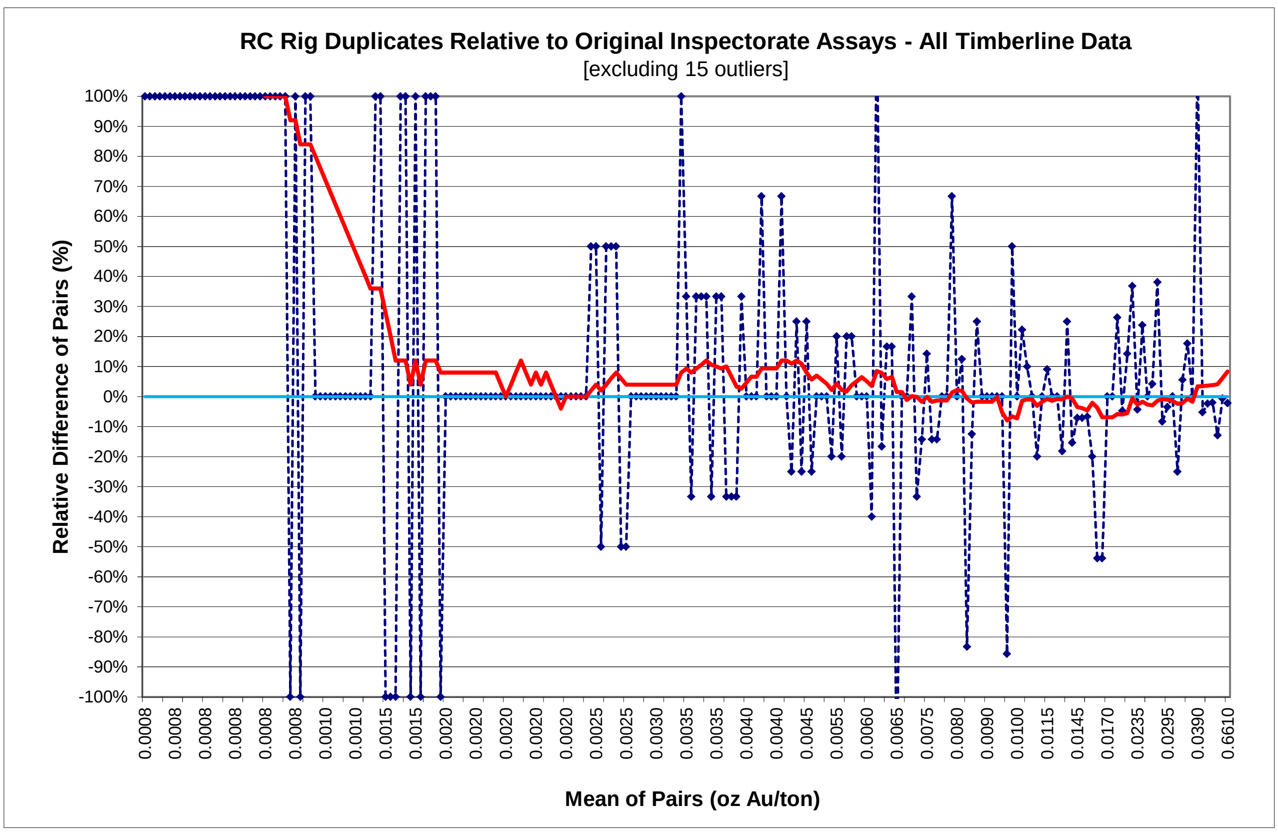


The absolute value of the relative differences can be used as a measure of the variability introduced by the sub-sampling of the coarse rejects if the analytical variance is known and removed. The mean of the absolute values of the relative differences is 19% for all data (excluding the 12 outlier pairs) and decreases to 8 to 9% for means of the pairs in excess of 0.01 oz Au/ton.

Rig Duplicates. Rig or field duplicates are secondary splits of drill samples. In the case of core drilling, field duplicates are obtained by re-splitting the core remaining after the primary samples have been taken. RC field duplicates are splits of the cuttings collected at the drill rig at the same time as the primary samples. Field duplicates are mainly used to assess inherent geologic variability and sampling variance.

Timberline collected RC rig-duplicate samples at a nominal rate of one duplicate for every 20 samples; no rig duplicates were collected from core holes. Out of the 511 rig duplicate / original pairs from the 2010-2011 and 2011 drill programs, there are only 232 pairs in which both the duplicate and original Inspectorate assays exceed detection limits. These 232 pairs, excluding 15 outlier pairs, are compared in Figure 12.13. Only four of the excluded outlier pairs have mean grades in excess of 0.004 oz Au/ton.

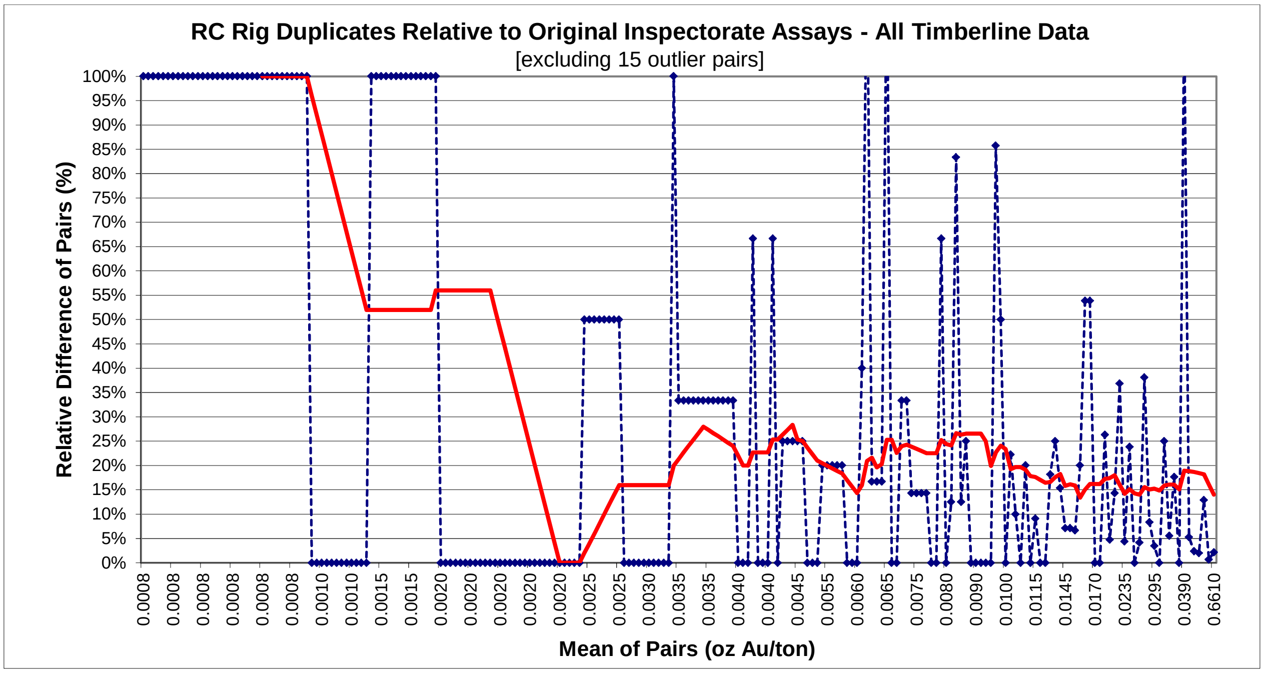
Figure 12.13 Rig Duplicates Relative to Original Analyses



A high bias is evidence by the graph at mean grades of the pairs up to about 0.006 oz Au/ton, although the means of the rig duplicates and original splits are identical at cutoffs of 0.00, 0.005, and 0.01 oz Au/ton. There are insufficient pairs at higher grades to allow for statistically significant conclusions.

A plot of the absolute values of the relative differences between the rig duplicates and the original analyses is shown in Figure 12.14. Variability at grades higher than about 0.004 oz Au/ton gradually declines from about 25% to 15% (seen at mean grades of the pairs in excess of about 0.015 oz Au/ton). This variability incorporates all variability downstream of the exiting of the drill cuttings into the primary splitter at the drill rig, including the sampling variance experienced during sample reduction at the drill site, as well as variability due to sub-sampling during all stages of laboratory sample preparation and analytical variability.

Figure 12.14 Absolute Value of Relative Differences of Rig Duplicates *vs.* Original Assays



12.2.6 Timberline Drill Data - 2012 Program

Timberline's 2012 drilling program incorporated a QA/QC program similar to those discussed in Section 12.2.5.

<u>*Certified Standards*</u>. Fourteen certified Rocklabs standards were used in the 2012 drilling program, including 11 of those listed on Table 12.2 (OxA71, HiSilK2, OxG83, OxD87, OxH66, OxG84, OxJ68, OxN33, SN50, SE58, and SG40). Details of the three new standards are presented in Table 12.3.

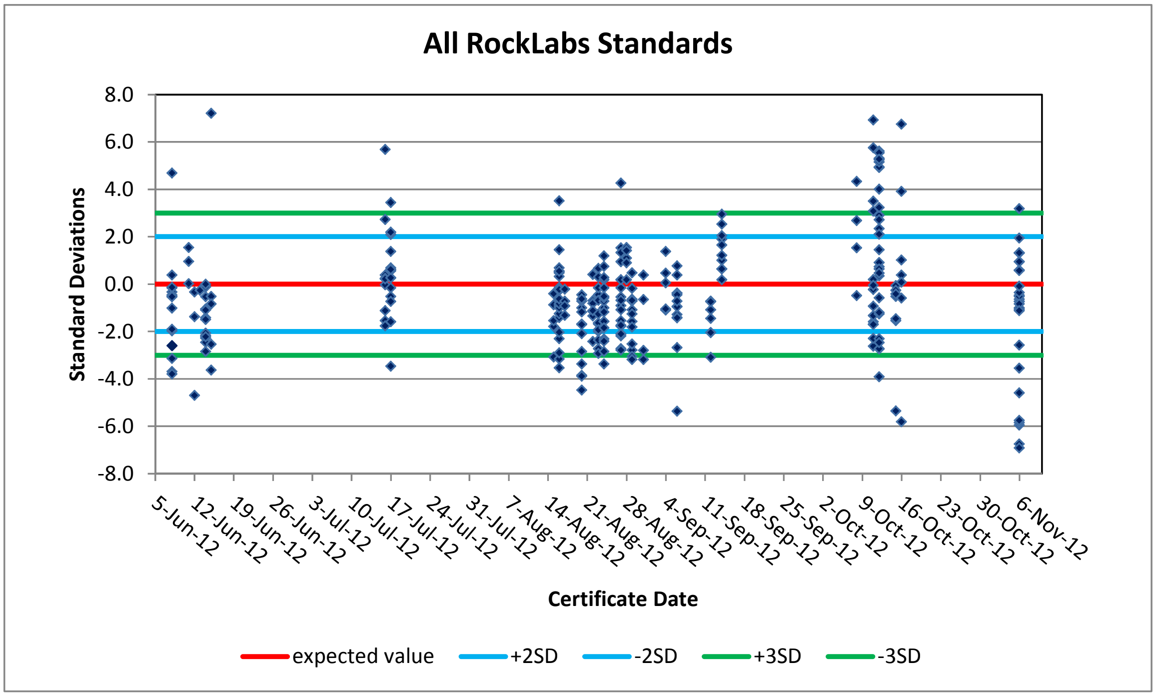
Table 12.3 Timberline Certified Standards

Standard	Source	Certified Value (ppm Au)	Standard Deviation	Drill Program
OxC102	Rocklabs	0.207	0.011	2012
OxF100	Rocklabs	0.804	0.019	2012
OxG99	Rocklabs	0.932	0.020	2012

The Inspectorate analyses of the standards used in the 2012 program are generally similar to those of the standards inserted into the 2010 and 2011 drill-sample streams. While the 'failure' rate is fairly high, most of the 'failures' are caused by an overall low bias in the Inspectorate analyses relative to the certified values of the standards that is evident up until the Fall of 2012 (Figure 12.15). If bias-related 'failures' are disregarded, there are more failures on the high side (Inspectorate analysis is higher than the expected value). While bias in the Fall analyses is not definitive, although there may be a high bias in mid-September through October, the precision of the assays is particularly poor in this period.

Excluding the two probable cases of mis-identified standards, the Inspectorate analyses of the standards have an average difference from the expected values of about -0.5 standard-deviation units, with a value of -0.8 for analyses on certificates dated up to mid-September.

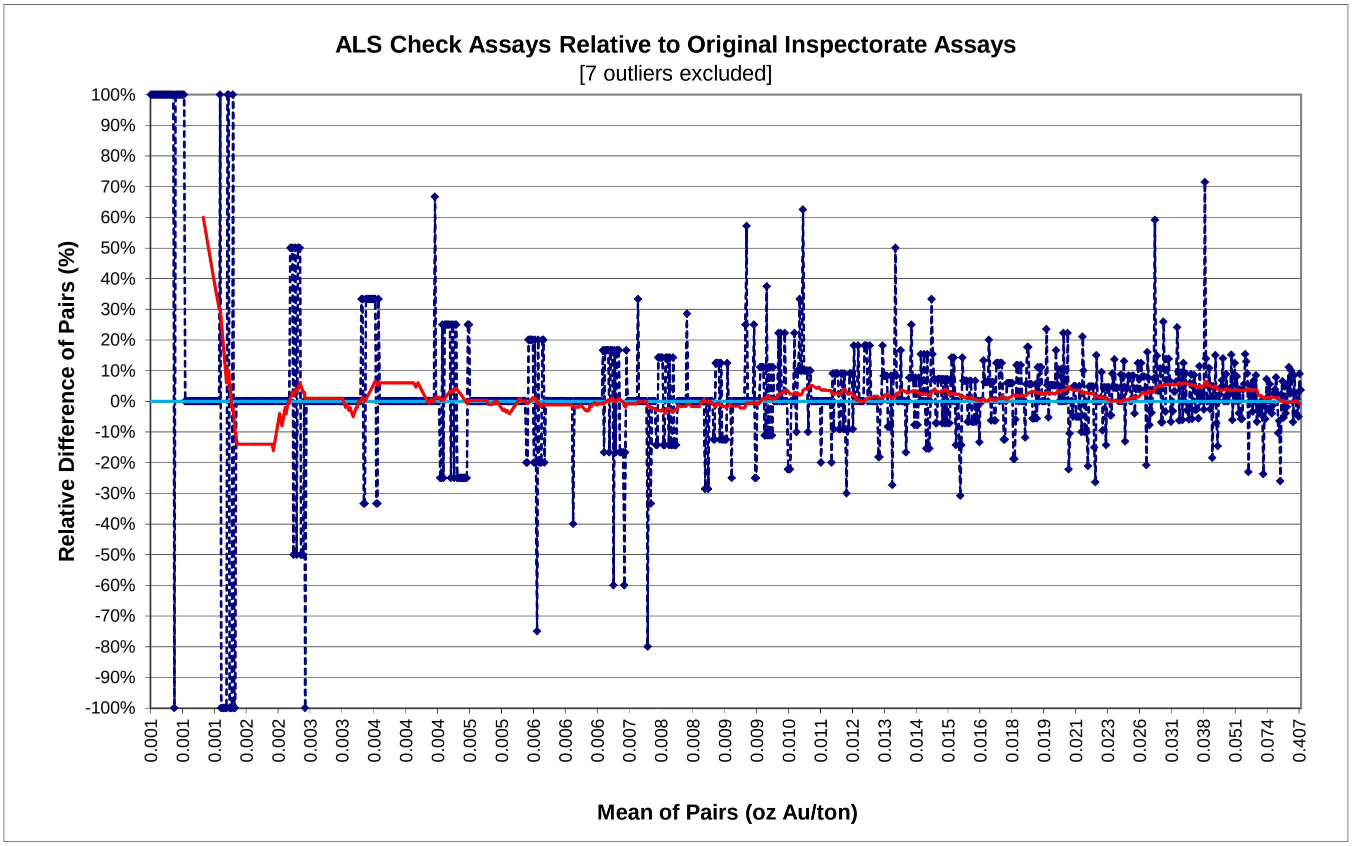
Figure 12.15 Normalized Results of Inspectorate Analyses of All 2012 Certified Standards



<u>Pulp Checks</u>. MDA compiled a total of 1,116 ALS check analyses of Inspectorate's original assay pulps from the 2012 drilling program. Figure 12.16 compares these ALS fire assays to the original Inspecotorate fire assays after 27 pairs where the original and check assays both returned less than detection limits and seven outlier pairs are removed. A clear high bias in the ALS check assays is evident at grades of about 0.010 oz Au/ton and higher. The means of the check analyses are 2% higher than the original Inspectorate assays at cutoffs of 0.000, 0.005, 0.010, and 0.050 oz Au/ton. The mean of the absolute value of the relative differences is 11% for all data and 8% at a 0.010 oz Au/ton cutoff.

These results of the 2012 check-assaying program are consistent with Inspectorate analyses of the 2012 certified standards, as well as with the results of the 2011 check-assaying program.

Figure 12.16 ALS 2012 Pulp Checks Relative to Original Inspectorate Analyses



<u>*Preparation Blanks*</u>. None of the 354 Inspectorate analyses of the 2012 preparation blanks constituted a 'failure'; the highest value returned is 0.001 oz Au/ton. Only 46 of the samples immediately preceeding the blanks assayed over 0.01 oz Au/ton.

<u>*Preparation Duplicates*</u>. A total of 227 preparation duplicates were analyzed by Inspectorate in 2012; less than detection limits were returned from both the original and duplicate-pulp assays of 67 of these samples. Half of the preparation duplicate / original pairs have means of the pairs greater than or equal to 0.005 oz Au/ton. The means of the assays of the preparation duplicates are 2% lower than those of the orginal samples for all samples and at cutoffs of 0.005 and 0.010 oz Au/ton (there are insufficient samples at higher cutoffs for meaningful stastistics).

The mean of the absolute values of the relative differences between the preparation duplicates and original assays is 16% at a cutoff of 0.005 oz Au/ton, but drops to 8% if two outlier pairs within this dataset are removed.

<u>*Rig Duplicates*</u>. A total of 146 RC field duplicates were collected and analyzed in 2012; only 58 of these have assays of the field duplicate and/or original split that exceed the detection limits. The mean of the assays of the 58 field duplicates is 4% lower than those of the original samples, although the data are somewhat limit. The mean of the absolute values of the relative differences between the rig duplicates and the original analyses is 16% at a cutoff of 0.005 oz Au/ton.

12.2.7 Discussion of QA/QC Results

Amselco drill holes comprise half of the holes that contribute assay data directly used in the estimation of resource grades at both Lookout Mountain and South Adit. Staccato's analyses of preparation duplicates provide the best check-assay dataset available for the Amselco analytical data, and these duplicates compare very well with the original Amselco analyses. Other QA/QC datasets available for the Amselco holes are generally of insufficient size for statistically meaningful conclusions to be drawn.

Pulp checks undertaken by Staccato using pulps from Barrick's drill samples yielded results that are systematically lower than the original analyses. There are no additional data available to support either the original or check analyses. Barrick drilled 5% of the holes that contribute assays to the resource estimations at both Lookout Mountain and South Adit. Similar pulp checks were undertaken using original Echo Bay drill samples, which make up 7% of the resource holes at Lookout Mountain; Echo Bay did not drill at South Adit. In this case, the duplicates are systematically higher than the original analyses. Again, in the absence of corroborative data, no definitive conclusions can be made. The checks of both the Barrick and Echo Bay pulps were assayed by ALS.

Staccato data provide a further 21% of the resource holes at Lookout Mountain and 10% at South Adit. Pulp checks completed by Staccato are consistent with the original analyses.

Standards inserted into Timberline's drill-sample stream returned results from Inspectorate that are generally slightly lower than the certified values. The original analyses are also systematically lower than pulp checks undertaken by ALS. These datasets suggest that the original 2010 to early 2011 Inspectorate analyses may understate gold grades, perhaps by as much as about 7%; this potential understatement drops to about 3% in subsequent programs. Timberline drill holes comprise about 30% of the drill holes used in the resource grade estimation at Lookout Mountain and 36% of the holes at South Adit.

There is no QA/QC information for the Newmont, Norse Windfall Mines, or EFL drill samples. Norse Windfall Mines holes comprise about 6% of the resource drill holes at Lookout Mountain, while the EFL holes contribute less than 1%; neither company drilled at South Adit. The EFL assay data at least partially are comprised of cyanide shake-leach analyses, and many of the holes are clearly lower in grade than surrounding holes from other drill campaigns. No Newmont holes contribute assay data to the Lookout Mountain or South Adit resource estimations.

The Timberline QA/QC data are by far the most comprehensive and allow for an examination of precision at various stages. The lack of duplicate analyses on the same pulp by the original analytical laboratory (Inspectorate) does not allow for an estimate of the analytical precision of the assays, but the variability is typically low (usually less than 10%). The preparation duplicates, which incorporate the analytical precision and variablitity due to subsampling of the coarse rejects, indicate a relatively low variability (less than about 10%) in the laboratory sub-sampling stages. The rig duplicate data, which incorporate the analytical, laboratory sub-sampling, and field sub-sampling variances, suggest a total variability of about 20%. This means that about 10% of the variability (the rig-duplicate variability less the duplicate-pulp variability) can be attributed to the sampling variances in the field (sub-sampling at the RC rig).

Timberline should continue to attempt to maximize the quantity of preparation and rig duplicates at grades that are representative of the mineralized population distribution. Significantly more blanks that immediately follow mineralized samples are also needed. Core duplicates need to be added to the field-duplicate dataset in future drilling programs that are not using the core for metallurgical testing. Finally, results of the QA/QC program need to be monitored as the results are received, and all failures identified should be acted upon as soon as possible.

12.3 Independent Sampling

MDA did not collect and assay samples from the Lookout Mountain project. Mineralization from open-pit exposures, core, and RC cuttings was inspected, as well as numerous altered exposures. MDA has reviewed reports written for a number of different mining companies, including reports that document the open-pit mining and production, and visited the project site. In MDA's opinion, independent sampling for the purposes of confirming the Lookout Mountain mineralization beyond that described below is not needed.

As part of work related to the 2005 technical report for Staccato, Russell (2005) supervised the sampling of vials containing coarse rejects from Amselco drill holes. Table 12.4 summarizes the results from this check assaying, with some changes to the original assays to reflect MDA's compilation of the Amselco drill data. The check assays are derived from splits of the cuttings contained in 16 vials from eight Lookout Mountain RC holes. The cuttings were split from 40-dram plastic vials stored in badly weathered NX core boxes, placed into plastic baggies, and submitted to ALS in Reno, Nevada for analysis. Many vials contained only a few grams of material, so selecting a small portion of that for re-assay could further decrease representativity. Russell believed that it was not surprising that the cuttings did not check well with the historic assays. The discrepancies are not systematic, and the check assays demonstrate gold grades that are consistent with the Lookout Mountain mineralization.

Table 12.4 Check Analyses of Amselco Chips

(adapted from Russell, 2005)

Drill Hole	Interval (feet)	Original Assay (oz Au/ton)	Original Composited Assay (oz Au/ton)	Check Assay (oz Au/ton
RTR-48	335-340	0.142	0.117	0.123
	340-345	0.092		
	380-385	0.305	0.323	0.535
	385-390	0.34		
RTR-134	415-420	0.126	0.178	0.254
	420-425	0.23		
	425-430	0.356	0.354	0.468
	430-435	0.352		
RTR-182	25-30	0.11	0.097	0.067
	30-35	0.084		
	35-40	0.076	.074	0.038
	40-45	0.072		
RTR-183	0-5	0.05	0.043	0.038
	5-10	0.035		
	145-150	0.112	0.166	0.061
	150-155	0.22		
RTR-191	440-445	0.262	0.442	0.823
	445-450	0.622		
	450-455	0.36	0.46	0.482
	455-460	0.55		
RTR-208[1]	465-470	0.031	0.031	0.022
	475-485	0.054	0.054	0.048
RTR-210[1]	340-350	0.032	0.032	0.040
	350-360	0.024	0.024	0.024
	375-385	0.035	0.035	0.034
RTR-259	270-280	0.033	0.033	0.038

13.0 MINERAL PROCESSING AND METALLURGICAL TESTING

13.1 Metallurgical Testing by Previous Operators

Bottle-roll and column-leach testing was conducted on mineralized samples from Lookout Mountain by Hazen Research, Inc. ("Hazen"), Heinen Lindstrom Consultants ("Heinen Lindstrom"), McClelland Laboratories, Inc. ("McClelland"), and Kappes, Cassiday and Associates ("KCA") from 1985 to 1997 (Table 13.1).

Two tests were completed on bulk samples taken from the Lookout Mountain pit. The test completed by McClelland utilized five samples taken by hand and stored in five-gallon buckets. These samples are hand plotted on 1:24000-scale U.S. Geological Survey topography created prior to mining, which indicates the samples were taken from the Lookout Mountain open pit. The KCA bulk sample was also taken from an unspecified location in the pit.

Table 13.1 Summary of Historic Metallurgical Testing

Date	Metallurgists	Company	Sample Type	Tests
07/10/1985	Hazen	Amselco	composites of cuttings from 6 RC holes	bottle roll
04/23/1986	Hazen	Amselco	2 composites of drill core	4" column leach
05/28/1986	Heinen Lindstrom	Tenneco	10 composites of drill-hole cuttings	bottle roll
04/08/1987	KCA	Norse Windfall Mines	1-ton bulk sample	3 column leach crush tests
11/04/1997	McClelland	Alta	bulk samples	bottle roll

Hazen conducted preliminary cyanide leach bottle-roll testing on six composites of RC cuttings from Lookout Mountain for Amselco in 1985 (Gathje, 1985). There were two samples each of three rock types (Klessig, 1985): unoxidized claystone, oxidized claystone, and jasperoid. Each sample was tested twice, once without grinding and once after grinding to approximately -200 mesh. The leaching conditions were 30% solids, pH 10.5 to 11 maintained with hydrated lime, and a cyanide concentration maintained at 1 g NaCN/l. The leach liquors were sampled at 4, 8, 24, and 48 hours and assayed for gold and cyanide. Gold dissolutions varied considerably from sample to sample, ranging from about 10% to about 90%, but did not vary significantly by grind size (Gathje, 1985) (Table 13.2; Figure 13.1). Dissolution rates were rapid, and generally there were no experimentally significant differences in the gold dissolutions at four hours compared to 48 hours. Cyanide consumptions were high, ranging from 1.7 to 4.5 lbs NaCN/ton, and they increased significantly as the leach times increased.

Table 13.2 Results of 1985 Bottle-Roll Testing by Hazen Research, Inc.
(Results from Gathje, 1985; descriptions and depths from Klessig, 1985a, 1985b)

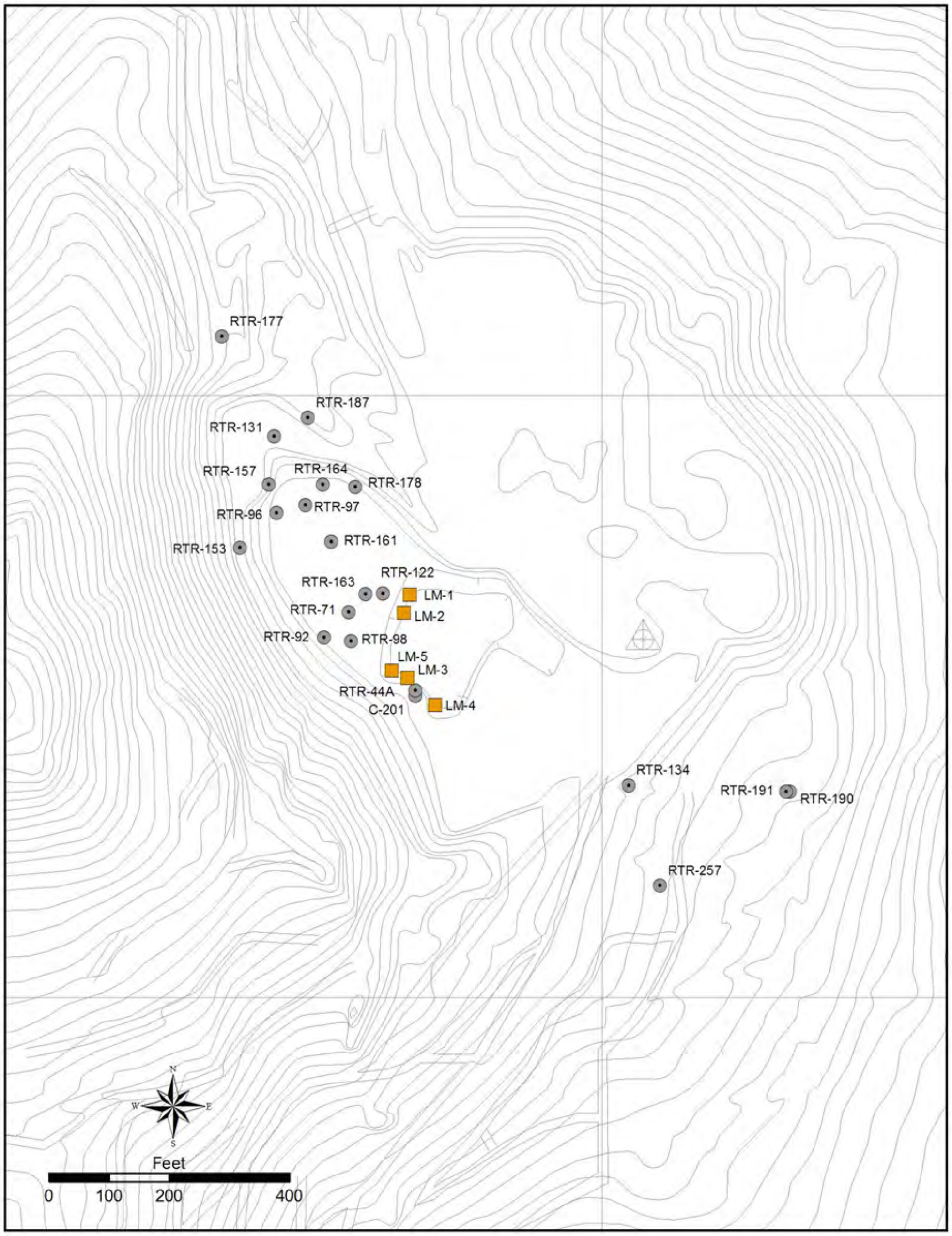
Composite	Description	Assay Grade (oz Au/ton)	% Extraction (no grind)	% Extraction (grind)	Depth Below Surface
85-1-OAC	oxidized claystone from RC holes RTR-92, 131, 161, 163, 177, and 187	0.048	81.4	78.5	<=80 ft
85-2-OHC	oxidized claystone from RC holes RTR-44A, 71, 98, and 153	0.408	91.3	90.4	<= 55 feet
85-3-RAC	unoxidized claystone from holes RTR- 161, 163, and 257	0.047	28.6	27.3	Mixed, 1/2 < 70 and 1/2 >340 ft
85-4-RHC	unoxidized claystone from RC holes RTR-134, 190, and 191	0.362	10.6	12.1	>430 and < 480 ft
85-5-AGJ	jasperoid from holes RTR-92, 96, 97, 157, 164, and 178	0.034	48.9	62.7	< 150 ft
85-6-HGJ	jasperoid from holes RTR-71, 98, and 122	0.284	80.2	89.7	< 45 ft

Hazen conducted subsequent column-leach tests on two core-composites from a single Lookout Mountain drill hole for Amselco in 1986 (Gathje, 1986; Figure 13.1). Each composite was stage crushed to minus ½ inch, and splits of about 14 kilograms were leached in 4-inch-diameter columns using a solution feed of 1 g NaCN/1 applied at the rate of 0.005 gpm/ft^2. Four-kilogram splits of the minus ½-inch material for each sample were screened, and the fractions were fire assayed for gold and silver. Preliminary results before actual tailings assays were available are shown in Table 13.3.

Table 13.3 Preliminary Results of 1986 Column-Leach Test Work by Hazen Research, Inc.
(Results from Gathje, 1986; sample descriptions and depths from table from Staccato)

Composite (hole ID and footage)	Description	Assay Grade oz Au/ton	% Extraction	Depth Below Surface
RTC-201 0-95	oxidized claystone	0.243	82.3	<100 feet depth
RTC-201 160-225	oxidized claystone	0.087	93.7	>150 < 250 feet depth

Figure 13.1 Location of Metallurgical Samples from Hazen and McClelland Test Work
(From Edmondo, 2008a)



Heinen-Lindstrom Consultants conducted bottle-roll cyanidation tests in 1986 for Tenneco on 10 composite samples of nominal 1/4–inch RC drill cuttings from Amselco holes drilled at Lookout Mountain (McClelland, 1986; Asher, 1986). Composite 6 (Table 13.4) was not collected from a mineralized zone. A wide variation in recovery and reagent requirements was observed between some of the samples. Gold extractions ranged from 33% to 81% (Table 13.4). Cyanide consumptions were low for eight of the 10 composites, ranging from 0.2 to 0.9 pounds NaCN/ton. One of the composites with high-cyanide consumption had no gold (composite 6), while the second (composite 3) also experienced high-lime consumption and contained large quantities of sulfide minerals, which explains the poor gold recovery. Lime requirements were low for nine of the composites at 2.0 pounds CaO/ton. The leach-rate profiles for most of the composites indicated the presence of sulfide minerals or the presence of free-milling visible gold (McClelland, 1986). The leaching conditions were 40% solids, pH of about 11 maintained with lime, and a cyanide concentration maintained at 2.0 pounds NaCN/ton. Leaching was carried out for 72 hours. For samples tested that lie above 200 feet below the surface, extractions were 60 to 80%; below 200 feet, the samples tested were refractory, and the deep high-grade mineralization at the southwestern end of the deposit did not leach well (Asher, 1986).

Table 13.4 Results of 1986 Bottle-Roll Test Work by Heinen-Lindstrom Consultants
(Results from McClelland, 1986; Asher, 1986)

Composite	Hole ID	From-To (feet)	Head Assay (oz Au/ton)	Calculated Head (oz Au/ton)	% Extraction (72 hours)
1	RTR-056	15-40	0.069	0.080	75.0%
2	RTR-056	150-180	0.025	0.032	75.0%
3	RTR-181	260-280	0.145	0.142	33.8%
4	RTR-071	5-45	0.262	0.329	80.8%
5	RTR-179	105-185	0.021	0.024	62.5%
6	RTR-189	290-365	No value	No value	No value
7	RTR-138	310-425	0.096	0.033	33.3%
8	RTR-097	80-110	0.030	0.031	38.7%
9	RTR-097	135-160	0.096	0.098	61.2%
10	RTR-097	160-275	0.027	0.029	75.9%

KCA conducted three column-leach and one bottle-roll test on a bulk sample submitted by Norse Windfall Mines in 1986 from Lookout Mountain (Dix, 1987) (Table 13.5). The sample consisted of four 55-gallon drums with a combined weight of about one ton. Edmondo (2008a) indicated that the bulk sample was taken from an unknown location within the pit. Gold recovery in the three column tests was rapid, with 93% of the recoverable gold leached in the first seven days. All three column tests were run on agglomerated samples.

Table 13.5 1987 KCA Test Work on Lookout Mountain Samples
(derived from Dix (1987), with sample type information from a table from Staccato)

Description	Sample Type	Tests	Assay Grade oz Au/ton	% Extraction
nominal 3" particle size	9:1 claystone:silica	column leach	0.301	91.01%
nominal 1.5" particle size	9:1 claystone:silica	column leach	0.298	89.82%
nominal 0.5" particle size	9:1 claystone:silica	column leach	0.286	90.30%

In addition, KCA completed a single agitated cyanide bottle-roll test on a pulverized (minus 100 mesh) portion of the bulk sample that had a calculated head grade of 0.318 oz Au/ton. The test achieved an extraction of 90.57%.

McClelland Laboratories, Inc. ("McClelland") conducted bottle-roll cyanidation test work on five bulk exploration samples from the Lookout Mountain pit for Alta in 1997 (Langhans, 1997) (Table 13.6; Figure 13.1). Alta collected bucket samples of exposed gold mineralization and drill cuttings from within the current pit for the test work. The samples reportedly represented the predominant rock and mineralization types as logged in the drilling by various companies (Russell, 2007). One of the samples, LM-4, contained what was considered to be an insignificant quantity of gold and was not subject to metallurgical testing. Leach conditions were 40% solids, adjustment of pH of the pulps to 10.8 to 11.2 by addition of lime, and cyanide addition equivalent to 2.0 pounds NaCN per ton of solution. Leaching continued for 96 hours. Both of the higher-grade samples were readily amenable to cyanidation treatment at the P_{80}10M feed size, with gold recoveries of 86% and 91% in 96 hours of leaching. The gold recovery rate was rapid for all samples, with extraction substantially complete within 24 hours of leaching. Cyanide and lime consumptions were extremely high for sample LM-1 at 6.72 and 52.5 lbs/ton of material, respectively. Cyanide consumption was low for the other three samples; lime requirements were moderate for sample LM-3 and low for the other two samples.

Table 13.6 Results of 1997 Bottle-Roll Test Work by McClelland Laboratories, Inc.
(Results from Langhans, 1997; sample descriptions from table from Staccato)

Composite	Description	Assay Grade (oz Au/ton)	% Extraction
LM-1	unoxidized claystone with realgar	0.322	85.80%
LM-2	oxidized silicified claystone	0.035	45.50%
LM-3	oxidized silicified claystone	0.576	91.30%
LM-4	Not Run	0.012	Not Run
LM-5	oxidized jasperoid	0.040	61.50%

Lightner (2007) summarized the historic metallurgy and suggested that there is potential for a run-of-mine heap-leach operation at Lookout Mountain, but some materials may be problematic. Several samples of jasperoid from bottle-roll tests suggest silica encapsulation may affect gold extraction, and sulfide material showed very poor leaching capability. Lightner recommended a metallurgical program to include the following:

- Thorough testing of sulfide mineralization using several process variations to determine the potential for commercial development;
- Establishment of a better understanding of oxide, sulfide, and mixed or transition material types, as well as quantification of various lithologies within oxide material; and
- Considerable additional metallurgical testing after appropriate geological modeling of both lithology and oxidation is completed.

Finally, microprobe analyses of several Amselco mineralized samples in 1984-85 indicated that gold exists in solid solution with arsenic in pyrite and as native gold in jasperoid up to 15 microns in size (Russell, 2007, as corrected by G. Edmondo, 2011, personal communication).

13.2 Metallurgical Testing for Timberline Resources Ltd.

Timberline put a test program in place in 2010 to better define the metallurgical characteristics of mineralization at the Lookout Mountain project. The program used drill core and bulk samples to assess the potential for a run-of-mine heap-leach processing scenario. Four bulk samples were taken from the historic open pit, and six core holes were drilled of both PQ and HQ core sizes (an additional metallurgical core hole drilled at Rocky Canyon failed to intersect significant mineralization). Each sample and composite underwent column and bottle-roll testing, as well as screen-size fraction analyses, with a focus on examining crush sizes that are as coarse as possible from the bulk, PQ, and HQ material. In addition, samples of sulfide material from both the core and bulk samples were tested to assess leaching characteristics and to evaluate pressure-oxidation extraction technologies for this material type. KCA performed the metallurgical testing, which is summarized in Sections 13.2.1 and 13.2.2.

Timberline drilled 12 HQ3 core holes in 2012 specifically to obtain representative samples of mineralized jasperoid for metallurgical testing. The samples were sent to KCA to identify how much and which types of jasperoid may cause encapsulation problems, based on poor extractions from 2010 column testing on jasperoid from drill-core samples. Questions about KCA's results led to re-analysis by both McClelland and KCA. This work is summarized in Section 13.2.3.

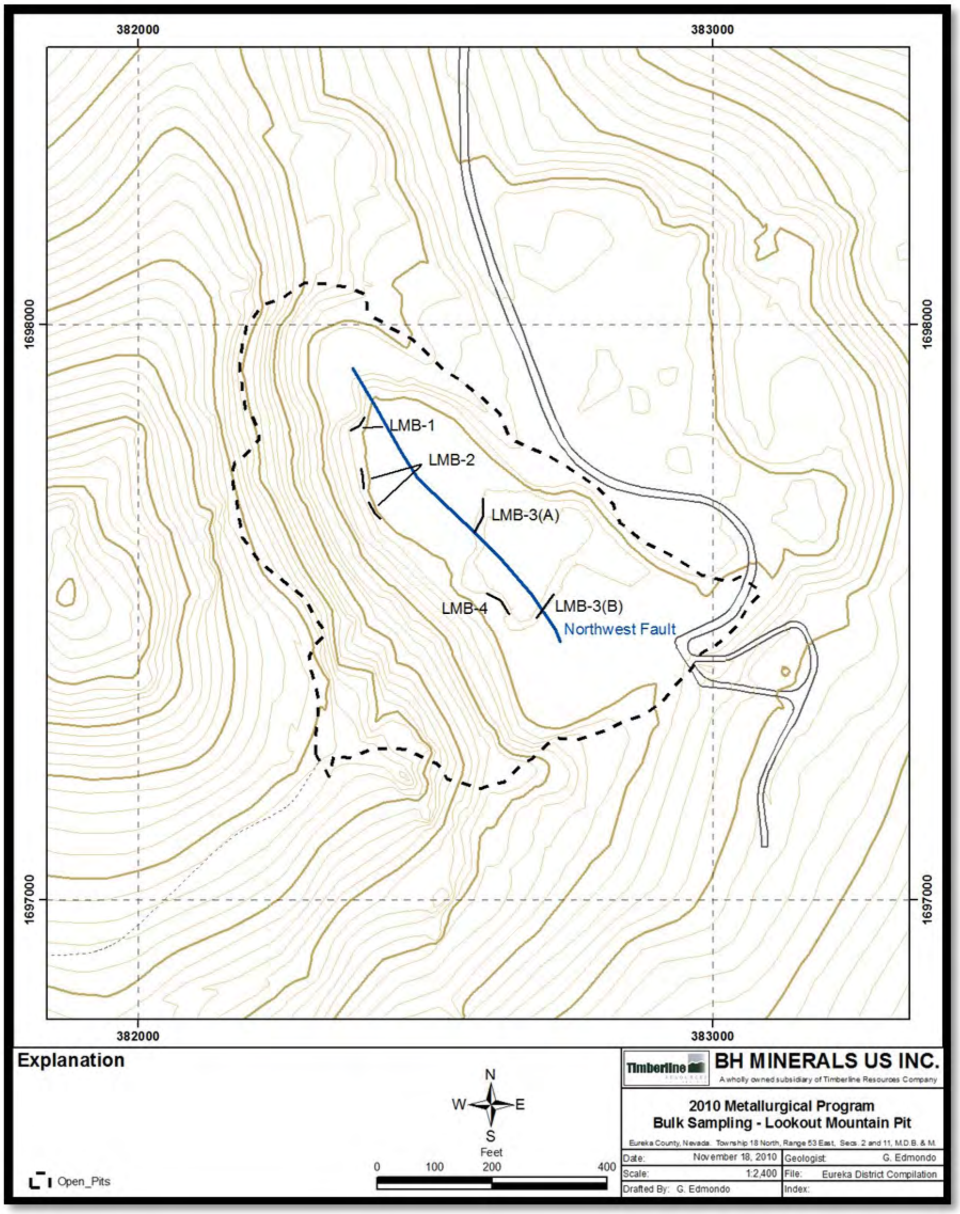
13.2.1 2010-2011 Bulk Samples

Four bulk samples, representing various mineralization types, were taken in the lower two benches of the Lookout Mountain pit (Table 13.7 and Figure 13.2). Locations were chosen based on channel sampling that was completed to locate gold mineralization specifically for the bulk tests. Each bulk sample consisted of two to three 55-gallon drums of material. The samples were collected from the mine bench face using an excavator with a reversed bucket after the faces had been cleaned. Samples LMB-1, LMB-2, and LMB-4 are located in the footwall of a northeast-dipping fault zone found in the pit that separates dolomite, collapse breccia, and jasperoid breccia in the footwall from argillized Dunderberg Shale in the hanging wall. Samples LMB-1 and LMB-2 consist of oxidized collapse breccia, with LMB-1 containing significant jasperoid clasts and breccia material from an east-trending fault/fracture set. LMB-2 contains largely collapse-breccia material with fault gouge and jasperoid, while LMB-4 consists entirely of oxidized jasperoid breccia. Sample LMB-3 consists of argillized Dunderberg Shale with high-grade sulfide mineralization and weak oxidation along open fracture sets and bounding faults that occur along the hanging wall of the northwest-trending fault. Drill core from the Timberline and prior programs indicates these are the dominant mineralized types present in the Lookout Mountain gold system.

Table 13.7 Bulk Sample Descriptions
(Provided by Timberline)

ID	Avg. Head Assay (oz Au/ton)	Type	Lithologic Type
LMB-1	0.018	Oxide	Mix of collapse breccia, jasperoid breccia, and decalcified dolomite
LMB-2	0.032	Oxide	Decalcified dolomite collapse breccia with jasperoid
LMB-3	0.361	Sulfide	Argillized shale with sulfide (LMB-3A with realgar)
LMB-4	0.079	Oxide	Jasperoid breccia

Figure 13.2 Bulk Sample Locations in the Lookout Mountain Pit



Results from testing of the bulk samples were received from KCA (Kappes, Cassiday & Associates, 2011a, 2011b), including head assays, analyses for deleterious elements (*e.g.*, copper, carbon, and mercury), screen analyses by size fraction, bottle-roll tests, agglomeration tests, and column-leach tests. The screen-size analyses suggest a significant proportion of gold is in the finer-size fractions for samples LMB-1 through 3, with the opposite relationship for sample LMB-4. The results of the bottle roll, agglomeration, and column tests are summarized below.

Bottle-Roll Leach Tests. Cyanide bottle-roll tests were completed on pulverized (p80 200 mesh) splits from each of the four bulk samples. All leach tests were run for a period of 96 hours. Table 13.8 summarizes the results of the bottle-roll test work.

Table 13.8 Bottle-Roll Results from 2010-2011 Bulk Sample Testing
(From Kappes, Cassiday & Associates, 2011a, 2011b)

ID	Calc. Head (oz Au/ton)	Extracted (% Au)	Leaching Days	NaCN Consumption (lbs/ton)	$Ca(OH)_2$ (lbs/ton)
LMB1	0.0135	81%	4	0.38	4.0
LMB2	0.0323	86%	4	0.14	4.0
LMB3	0.3331	84%	4	11.2	42.0
LMB4	0.0708	88%	4	0.45	4.0

In addition, bottle-roll tests were completed on a crushed (p80 10 mesh) portion of the four samples. Table 13.9 summarizes the results of this testing on the coarse material.

Table 13.9 Coarse Bottle-Roll Results from Bulk Sample Testing
(From Kappes, Cassiday & Associates, 2011b)

ID	Calc. Head (oz Au/ton)	Extracted (% Au)	Leaching Days	NaCN Consumption (lbs/ton)	$Ca(OH)_2$ (lbs/ton)
LMB1	0.0188	83%	4	0.23	2.0
LMB2	0.0339	81%	4	0.22	2.0
LMB3	0.3141	95%	4	9.91	38.0
LMB4	0.0774	72%	4	0.08	1.5

Agglomeration Tests. Agglomeration tests were conducted using 2-kilogram portions from samples of the LMB-2, LMB-3, and LMB-4 material that were crushed and sorted to 100% passing 1 inch (2.54 cm). Each sample was tested using 0 (no added cement or solution), 5, 10, and 15 pounds of cement per short ton. The percolation tests were conducted in small columns at a range of cement levels with no compressive load applied. The purpose of the percolation tests was to examine the permeability of the material under various cement agglomeration levels.

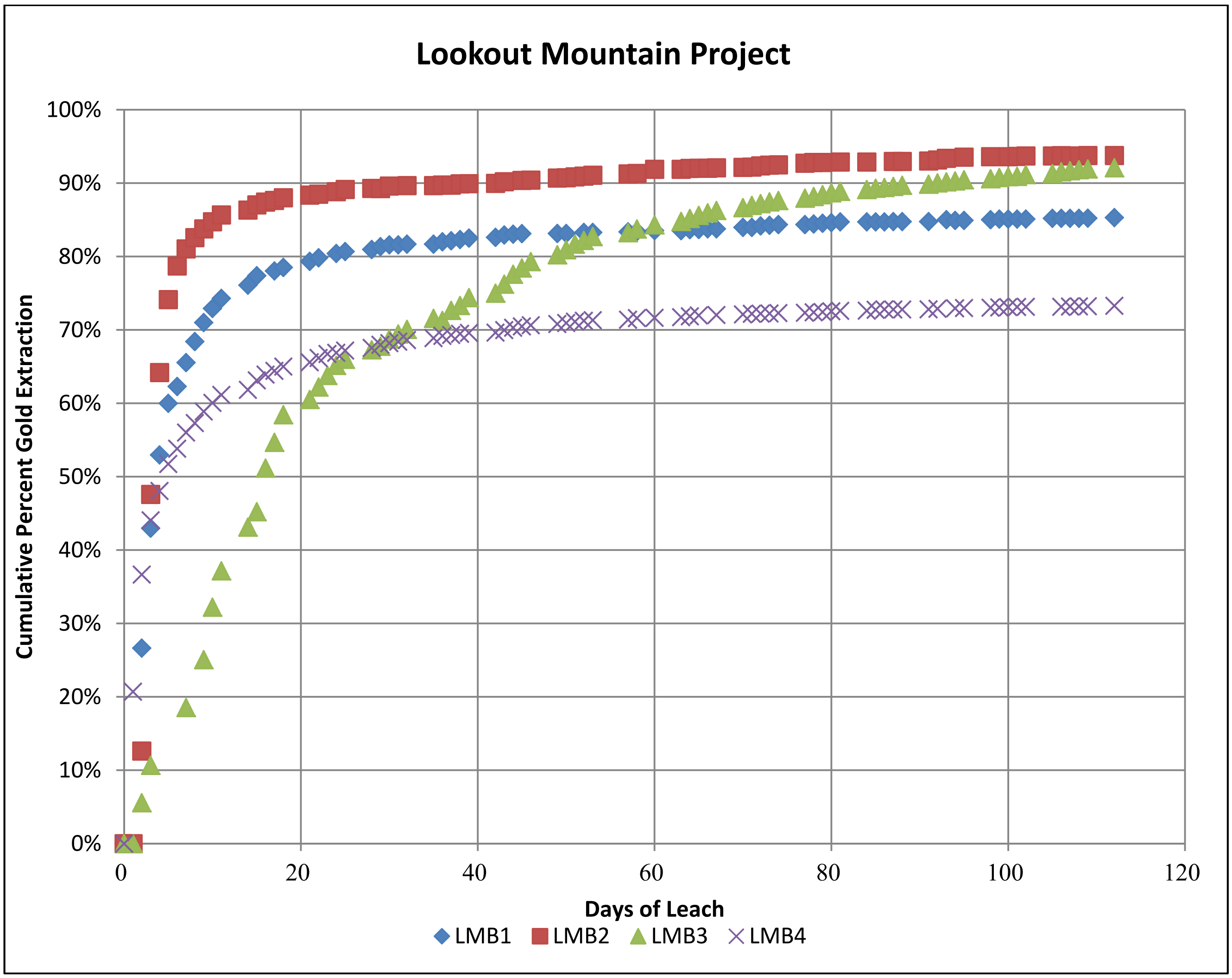
These tests indicated that no agglomeration with cement was required for the LMB-2 and LMB-4 material. Agglomeration with upwards of 10 pounds of cement per short ton was required to maintain permeability of the LMB-3 material in the small column tests; therefore, this material was agglomerated prior to column-leach testing.

Column-Leach Tests. Each bulk sample was placed into a separate column without crushing in order to simulate a run-of-mine heap-leach scenario. Column diameters were 17.5 inches for samples LMB-1 and 2, and 14.5 inches for samples LMB-3 and 4. The differences in column diameters were due to the amount of material available, with the controlling factor being the height of the columns. Testing occurred over 112 days, with the majority of gold extracted within 20 days or less. Table 13.10 and Figure 13.3 summarize the results of the column test work.

Table 13.10 Column-Leach Results from 2010-2011 Bulk Sample Testing
(From Kappes, Cassiday & Associates, 2011b)

ID	Crush Size (inches)	Calc. Head Assay (oz Au/ton)	Extracted (% Au)	Leaching Days	NaCN Consumption (lbs/ton)	$Ca(OH)_2$ Addition (lbs/ton)	Cement Addition (lbs/ton)
LMB1	As-Rec'd	0.0198	79%	112	0.63	4.02	0.00
LMB2	As-Rec'd	0.0360	76%	112	0.62	4.02	0.00
LMB3	As-Rec'd	0.3470	91%	112	6.52	34.30	9.49
LMB4	As-Rec'd	0.0821	74%	112	0.57	4.07	0.00

Figure 13.3 Cumulative Gold Extractions from Column Testing of Bulk Samples
(From Kappes, Cassiday & Associates, 2011a)



KCA Discussion. An overall summary of the metallurgical test work on the four bulk samples is shown on Table 13.11. The highly reactive LMB-3 material continued to show a moderately low pH through most of the column leach phase, but gold extraction after 112 days was high (91% based upon a calculated head grade of 0.3470 oz Au/ton). Additional test work is required to confirm the high sodium cyanide consumption of the LMB-3-type material and to determine if this sodium cyanide consumption could be minimized.

Table 13.11 Summary of Testing on Bulk Samples
(From Kappes, Cassiday & Associates, 2011b)

Sample Description	Test Type	Crush/Grind Size Inches/mesh	Calculated Head Oz Au/ton	Extracted Oz Au/ton	Tail Assays Oz Au/ton	Extracted % Au	Days of Leach	Consumption NaCN lbs/ton	Addition Hydrated Lime lbs/ton	Addition Cement lbs/ton
LMB 1	Column	As-rec'd (p80 2.10 inches)	0.0198	0.0156	0.0042	79%	112	0.63	4.02	0.00
LMB 1	Bottle	P80 10	0.0188	0.0157	0.0031	83%	4	0.23	2.0	0.00
LMB 1	Bottle	P80 200	0.0135	0.0110	0.0025	81%	4	0.38	4.0	0.00
LMB 2	Column	As-rec'd (p80 2.10 inches)	0.0360	0.0272	0.0088	76%	112	0.61	4.02	0.00
LMB 2	Bottle	P80 10	0.0339	0.0276	0.0064	81%	4	0.22	2.0	0.00
LMB 2	Bottle	P80 200	0.0323	0.0276	0.0047	86%	4	0.14	4.0	0.00
LMB 3	Column	As-rec'd (p80 2.10 inches)	0.3470	0.3160	0.0310	91%	112	6.52	34.30	9.49
LMB 3	Bottle	P80 10	0.3141	0.2983	0.0158	95%	4	9.91	38.0	0.00
LMB 3	Bottle	P80 200	0.3331	0.2791	0.0540	84%	4	11.2	42.0	0.00
LMB 4	Column	As-rec'd (p80 2.10 inches)	0.0821	0.0609	0.0212	74%	112	0.57	4.07	0.00
LMB 4	Bottle	P80 10	0.0774	0.0558	0.0216	72%	4	0.08	1.5	0.00
LMB 4	Bottle	P80 200	0.0708	0.0622	0.0087	88%	4	0.45	4.0	0.00

13.2.2 2010-2011 Core Samples

Five core holes from the area of the Lookout Mountain open pit and one each from South Lookout Mountain and South Adit were drilled for metallurgical purposes. Bottle-roll, agglomeration, and column-leach tests on the core samples were completed by KCA (Kappes, Cassiday & Associates, 2011c). A total of 144 core intervals were delivered to KCA, from which two intervals were selected for coarse and fine bottle-roll leach testing. Selected crushed intervals were then composited into three samples representing jasperoid/silicified breccias, brecciated jasperoid, and collapsed breccias/fault gouge for bottle-roll, agglomeration, and column-leach testing.

Bottle-Roll Test on Sulfide Core Intervals. Cyanide bottle-roll leach tests were run for 120 hours on two sulfide core intervals, with each interval separated into two samples, one crushed to p100 5/8 inch and the other crushed to p80 200 mesh. Results are summarized in Table 13.12.

Table 13.12 Results of Bottle-Roll Testing on Sulfide Core Intervals
(From Kappes, Cassiday & Associates, 2011c)

Sample Description	Target Crush Size	Calculated Head Oz Au/ton	Au Extracted %	Calculated Head Oz Ag/ton	Ag Extracted %	Consumption NaCN lbs/ton	Addiition $Ca(OH)_2$ lbs/ton
BHSE-029C-094	5/8 inch	0.5590	15%	0.02	12%	6.41	9.50
BHSE-029C-094	pulverized	0.5747	20%	0.02	7%	10.16	24.00
BHSE-029C-108	5/8 inch	0.2776	1%	0.02	11%	1.80	5.00
BHSE-029C-108	pulverized	0.3059	3%	0.01	23%	5.86	7.00

<u>Bottle-Roll Test on Core Composites.</u> Cyanide bottle-roll tests were conducted on pulverized (p80 200 mesh) and crushed (p100 10 mesh) portions of the three composite samples. All tests were run for 96 hours. Results are summarized in Table 13.13.

Table 13.13 Results of Bottle-Roll Testing on Composite Core Samples
(From Kappes, Cassiday & Associates, 2011c)

Sample Description	Est. p80 Size, mesh Tyler	Calculated Head Oz Au/ton	Au Extracted %	Calculated Head Oz Ag/ton	Ag Extracted %	Consumption NaCN lbs/ton	Addiition $Ca(OH)_2$ lbs/ton
Jasperoid/silicified breccia	200	0.0279	82%	0.02	38%	0.59	2.00
Jasperoid/silicified breccia	10	0.0284	66%	0.04	43%	0.13	2.00
Brecciated jasperoid	200	0.0172	85%	0.03	54%	0.44	2.00
Brecciated jasperoid	10	0.0184	73%	0.04	45%	0.13	2.00
Collapsed breccia/fault gouge	200	0.0261	90%	0.05	12%	0.55	6.00
Collapsed breccia/fault gouge	10	0.0227	84%	0.05	10%	0.35	4.00

<u>Agglomeration Tests</u>. Agglomeration tests were conducted using 2-kilogram portions from each sample. Each sample was tested using 0 (no added cement or solution) and 5 pounds of Portland Type II cement per short ton. The percolation tests were conducted in small columns at a range of cement levels with no compressive load applied. The purpose of the percolation tests was to examine the permeability of the material under various cement agglomeration levels.

KCA noted that this type of agglomeration test work is very preliminary but does provide an indication of whether agglomeration may be required for processing the Lookout Mountain material with cement requirements for a single-lift heap having an overall height of not more than 20 feet. A table summarizing the results assign a "Pass" to each of the tested materials, but do not discuss the results of the testwork further.

Column-Leach Tests. A column-leach test was performed on each of the three core composites at different crush sizes (p100 1 ¾ inches and p100 ¾ inches). The material was leached for 69 days. Results are summarized in Table 13.14.

Table 13.14 Results of Column-Leach Testing on Composite Core Samples
(From Kappes, Cassiday & Associates, 2011c)

Sample Description	Est. p100 Size, inches	Calculated Head Oz Au/ton	Au Extracted %	Calculated Head Oz Ag/ton	Ag Extracted %	Consumption NaCN lbs/ton	Addiition $Ca(OH)_2$ lbs/ton
Jasperoid/silicified breccia	1 3/4	0.0264	59%	0.02	56%	1.04	2.01
Jasperoid/silicified breccia	3/4	0.0285	62%	0.02	52%	1.70	2.01
Brecciated jasperoid	1 3/4	0.0172	53%	0.02	56%	0.84	2.02
Brecciated jasperoid	3/4	0.0177	61%	0.02	52%	1.12	2.02
Collapsed breccia/fault gouge	1 3/4	0.0296	77%	0.02	40%	1.61	3.16
Collapsed breccia/fault gouge	3/4	0.0265	84%	0.02	44%	2.50	3.18

13.2.3 2012 Core Samples

Unless otherwise indicated, this information is derived from a summary by Timberline.

Timberline drilled 12 HQ3 core holes in 2012 specifically for the purposes of the ongoing metallurgical study, including BHSE-126C, -128C, -130C, -134C, -140C, -145C, -147C, -148C, -149C, -150C, -151C, and -153C. They were drilled in the area of the existing open pit at North Lookout and at various locations at South Lookout Mountain. A total of 2,018 samples were sent to KCA in 2012 (KCA, 2013). This testing was planned to identify how much and which types of jasperoid may cause encapsulation problems, with the intent of further investigating the poor extractions in the 2010 column testing of jasperoid samples from drill core.

Timberline logged lithology, formation, and alteration, and defined assay-sample breaks before sending the whole core to KCA for sample preparation. Samples were crushed to 100% passing 1.75 inches; a one-kilogram was split of the crushed material from each sample interval was pulverized to 80% passing 200 mesh and sent to Inspectorate for gold analysis (KCA, 2013). Composites were generated for each hole for bottle-roll testing. The testing program was to consist of crush-size recovery analysis using bottle rolls followed by column testing.

The bottle-roll leach tests were completed at top sizes of p100 - 1.75 inches (100% passing 1.75 inches), p100 - 0.75 inches, p100 - 0.5 inches, and p100 – 0.066 inch (10-mesh Tyler). The crushing process as described by KCA was as follows:

1. Where possible, a 10-kilogram composite sample using the intervals that were designated was utilized;
2. After development of the composites, a 4,000-gram split of the initial material was taken for the bottle roll at 1.75 inches;

3. The remainder was stage crushed to p100 0.75 inches, and a 2,000-gram portion was split out for a bottle-roll leach test;
4. The remainder was stage crushed to p100 0.5 inches, and a 2,000-gram portion was split out for a bottle-roll leach test;
5. The remainder was stage crushed to p100 10-mesh Tyler, and a 1,000-gram portion was split out for a bottle-roll leach test; and
6. KCA stored the reject 10 mesh Tyler material.

Bottle-roll results from KCA on jasperoid mineralization, even on 10-mesh-size material, were uniformly low, significantly lower than previous bottle-roll extractions of coarse reject material from nearby RC holes. As a check on these results, eight samples covering a range of head-grade assays were sent to McClelland with a split of some these samples sent for re-analysis by KCA. The samples were tested by McClelland and originally by KCA at two size fractions – 1.75 inch and 10 mesh (0.066 inch). Comparison of the results from McClelland's check and KCA's original and re-assays are shown in Table 13.15.

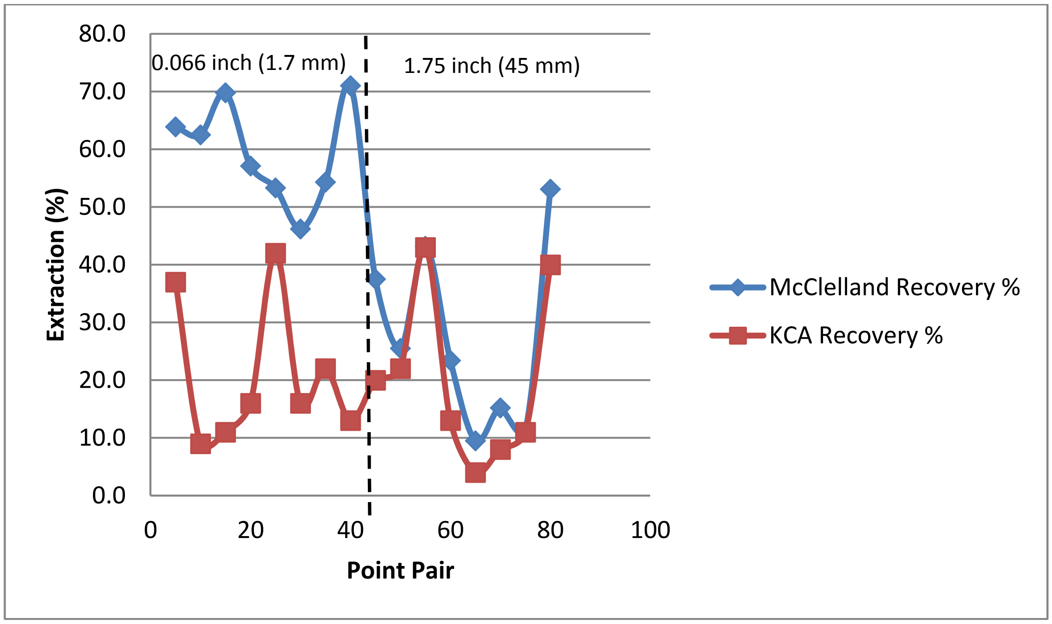
Table 13.15 Comparison of Bottle-Roll Results from McClelland and KCA
(From Timberline; 2012 testing)

McC Number	KCA Number	Hole/Composite	Size Fraction (inch)	McClelland Check Recovery %	KCA Original Recovery %	KCA Re-run Recovery %	KCA Re-run Recovery %
CY-09	66304 D	BHSE-126C/4	0.066	63.9	37	66	67
CY-10	66305 D	BHSE-126C/5	0.066	62.5	9	59	62
CY-11	66309 D	BHSE-128C/3	0.066	69.8	11*	64	
CY-12	66326 D	BHSE-140C/3	0.066	57.1	16	53	
CY-13	66330 D	BHSE-140C/7	0.066	53.3	42	48	
CY-14	66337 D	BHSE-145C/6	0.066	46.2	16	53	
CY-15	66338 D	BHSE-145C/7	0.066	54.3	22	56	
CY-16	66353C	BHSE-149C/3	0.066	63.0	34		
CY-17	66355 D	BHSE-149C/5	0.066	71.0	13		
CY-1	66304 A	BHSE-126C/4	1.75	37.5	20**		
CY-2	66305 A	BHSE-126C/5	1.75	25.5	22		
CY-3	66309 A	BHSE-128C/3	1.75	43.2	43		
CY-4	66326 A	BHSE-140C/3	1.75	23.4	13		
CY-5	66330 A	BHSE-140C/7	1.75	9.5	4		
CY-6	66337 A	BHSE-145C/6	1.75	15.2	8		
CY-7	66338 A	BHSE-145C/7	1.75	11.2	11		
CY-8	66355 A	BHSE-149C/5	1.75	53.1	40		

* KCA's original preliminary report indicated 11%; KCA now reports the final value as 49%.
** KCA's original preliminary report indicated 20%; KCA now reports the final value as 38%.

Figure 13.4 compares McClelland's check results to KCA's original results.

Figure 13.4 McClelland Re-Aanalyses vs. Original KCA Bottle-Roll Results
(modified from Timberline; 2012 testing)



McClelland's results are systematically higher than the original KCA results for samples crushed to 10 mesh; the mean of the KCA extractions is less than half of the mean of the McClelland extractions. For samples crushed to 1.75 inches, however, the results of the two labs are close. KCA's re-analyses of 10-mesh samples are also close to the results of McClelland.

From these data, Timberline concludes that (1) the original KCA results of the 10-mesh material are flawed; (2) McClelland's results showing poorer recovery at coarser sizes compared to smaller size fractions suggests some portion of the gold is encapsulated in silica; and (3) crushing of jasperoid material will likely be required. These conclusions are consistent with results obtained from the 2010 testing.

Because of questions about KCA's initial bottle-roll results, the planned column testing was not completed. Further testing will be required to determine the degree of crushing required.

13.3 Recovery during Previous Mining

Norse Windfall Mines mined about 180,000 tons of mostly oxide gold mineralization reportedly grading 0.12 oz Au/ton during 1987 (Cargill, 1988; Jonson, 1991). They hauled the mineralized rock 10 miles (16 kilometers) from the Lookout Mountain pit to cyanide heap-leach pads at the Windfall mine, where they achieved an estimated 81% recovery from the agglomerated pit material.

13.4 Discussion of Metallurgical Results

Although the authors are not experts with respect to metallurgy, the metallurgical test data have been reviewed, and MDA believes the information is sufficient for the purpose for which it used in this report, which is to support the cutoff grade used to define the resources reported in Section 14.0.

MDA believes the samples on which the Lookout Mountain project metallurgical test work has been performed are representative of the resources in terms of both grade and areal distribution. The Amselco samples are understandably clustered in the area of the existing open pit at North Lookout Mountain. Timberline has tested a number of samples from this area as well, but has also tested a significant number of samples from various areas at South Lookout Mountain.

14.0 MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES

14.1 Introduction

The mineral resource estimation for the Lookout Mountain project, which includes the Lookout Mountain and South Adit deposits, follows the guidelines of Canadian National Instrument 43-101 ("NI 43-101"). The updated modeling and estimate of the mineral resources at the Lookout Mountain deposit, which were completed in December 2012 through February 2013, were done under the supervision of Michael M. Gustin, a qualified person with respect to mineral resource estimations under NI 43-101; no new drilling was undertaken at South Adit, and these resources remain unchanged. Mr. Gustin is independent of Timberline by the definitions and criteria set forth in NI 43-101; there is no affiliation between Mr. Gustin and Timberline except that of an independent consultant/client relationship. No mineral reserves were estimated for the Lookout Mountain project.

Although MDA is not an expert with respect to any of the following aspects, MDA is not aware of any unusual environmental, permitting, legal, title, taxation, socio-economic, marketing, or political factors that may materially affect the Lookout Mountain mineral resources as of the date of this report.

The mineral resources presented in this report for the Lookout Mountain project conform to the definitions adopted by the Canadian Institute of Mining, Metallurgy and Petroleum ("CIM") in December 2000 and modified in 2005 and 2010, and meet the criteria of those definitions, where:

> *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.*
>
> *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.*
>
> *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.

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.

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.

14.2 Resource Modeling

14.2.1 Data

Models were created for estimating the gold resources at Lookout Mountain and South Adit from data generated by Amselco, Barrick, Echo Bay, Norse Windfall Mines, EFL, Staccato, and Timberline, including information derived from rotary, RC, and core drill holes. These data, as well as digital topography of the project area, were provided to MDA by Timberline and incorporated into a digital database in State Plane coordinates expressed in US Survey feet, Nevada East zone, using the NAD27 datum. All modeling of the Lookout Mountain project resources was performed using Gemcom Surpac® mining software.

14.2.2 Deposit Geology Pertinent to Resource Modeling

The modeled gold mineralization at the Lookout Mountain deposit is primarily hosted by the Lookout Mountain breccia, which has a northerly strike and moderate dip to the east. The breccia is quite wide at the surface and typically thins down dip, which creates a wedge shape in cross section that tilts in a westerly direction. Jasperoid-rich zones are common in the upper portion of the breccia near its contact with the Dunderberg Shale, while the lower portion near the Secret Canyon Shale is often marked by a clear structural zone; both zones are frequently characterized by higher than average gold grades. The highest-grade zones at Lookout Mountain appear to be controlled by favorable structural settings in both the breccia and overlying Dunderberg Shale. The Secret Canyon Shale, which immediately underlies much of the breccia, rarely hosts mineralization.

Gold mineralization at South Adit is similar to that at Lookout Mountain in several respects. Gold occurs at or near the Dunderberg-Hamburg contact and is associated with strong silicification, argillization, and a series of steeply to moderately dipping normal faults that form a westerly tilted and downward-pinching wedge of prospective ground.

14.2.3 Modeling of Geology

Timberline provided MDA with a set of cross sections that define the various stratigraphic units across the full extents of the Lookout Mountain resource model area, as well as the Lookout Mountain breccia and various structures. These interpretations were derived from careful study of the drill data, including extensive re-logging of drill chips from the pre-Timberline holes. The sectional interpretations were digitized and used as the base for the mineral domain modeling (discussed below). Each successive drilling program has led to only minor modifications of the geologic interpretations at North Lookout Mountain and the northern portion of South Lookout Mountain, which has progressively increased MDA's confidence in the resource modeling in these areas.

MDA created a solid of the Lookout Mountain mine dumps using existing topography and pre-mine topography digitized from an historic topographic map of the mine area.

Geologic cross sections of the South Adit area were also provided and similarly were used as the base to MDA's subsequent modeling of the gold mineralization.

14.2.4 Oxidation Modeling

Timberline provided MDA with a set of Lookout Mountain and South Adit cross sections with interpretations of the boundaries between oxidized and unoxidized rocks derived from the drill-hole logging codes. MDA made a number of modifications to these sections, primarily by respecting cyanide shake-leach data.

The revised set of oxide sections were then used as controls to create intermediary sections at 20-foot intervals using Gemcom Surpac's morphing routine. The 20-foot spacing was chosen to match the length of the model blocks. The morphing algorithm allows the user to explicitly correlate the geometry of a polygon on one control section with that of an associated polygon on an adjacent control section through the use of guide lines.

14.2.5 Gold Modeling

The mineral resources at Lookout Mountain and South Adit were modeled and estimated by:

- evaluating the drill data statistically;
- utilizing the geologic interpretations provided by Timberline to interpret mineral domains on cross sections spaced at 50- and 100-foot intervals at Lookout Mountain and 100-foot intervals at South Adit;
- rectifying the mineral-domain interpretations on level plans spaced at 10-foot intervals at Lookout Mountain and 20-foot intervals at South Adit;

- analyzing the modeled mineralization geostatistically to aid in the establishment of estimation parameters; and

- interpolating grades into three-dimensional block models.

All modeling of the Lookout Mountain project resources was performed using Gemcom Surpac® mining software.

Timberline provided MDA with a set of cross sections that interpreted the limits of the gold mineralization and, in portions of the Lookout Mountain deposit, higher-grade mineralization within the low-grade envelopes.

Mineral Domains. MDA modeled the Lookout Mountain and South Adit gold mineralization by interpreting mineral-domain polygons on north-looking cross sections that span the extents of the resource study areas. A mineral domain encompasses a volume of ground that ideally is characterized by a single, natural, grade population of a metal that occurs within a specific geologic environment.

In order to define the mineral domains at Lookout Mountain and South Adit, the natural gold populations were first identified on quantile graphs that plot the gold-grade distribution of the drill-hole assays. This analysis led to the identification of five separate populations, not all of which show sufficient continuity to model effectively. Ultimately, MDA modeled low-grade (~0.003 to ~0.015 oz Au/ton), medium-grade (~0.015 to ~0.080 oz Au/ton), and high-grade (>~0.080 oz Au/ton) populations, assigned to gold domains 100, 200, and 300, respectively. Ideally, each of these populations can be correlated with specific geologic characteristics that are captured in the project data to aid in the definition of the mineral domains.

In addition to these mineral domains, alluvial/colluvial material that was shed from areas of outcropping mineralization at Lookout Mountain was modeled where the alluvium consistently contains gold (domain 10).

The mineral domains modeled by MDA at Lookout Mountain occur predominantly within the Lookout Mountain breccia, with exceptions including mineralization in the Dunderberg Shale in the hanging wall of the breccia, minor mineralization in Secret Canyon limestone immediately below the breccia, and the gold occurring in alluvium. As discussed above, South Adit mineralization appears to have similar structural and lithologic controls.

MDA was not always able to correlate the three mineral domains with specific geologic characteristics that are consistently captured in the project datasets. This is primarily due to the preponderance of RC holes, the chips from which are not of sufficient size to characterize specific textures within the Lookout Mountain breccia. However, the high density of drilling at North Lookout Mountain, which includes most of the core holes drilled in the resource area, ultimately led to the high-quality geologic modeling by Timberline, which in turn significantly increases the confidence of the modeling in this area.

Higher-grade mineralization (domain 300) is most extensive at North Lookout Mountain. In cross-sectional view, the high-grade zones in this area are characterized by a central cylindrical core of mineralization that has thin extensions emanating outwards that are slightly oblique to the upper contact of the Lookout Mountain breccia. These high-grade zones transgress the breccia – Dunderberg Shale contact, occurring in both units. The axes of the cylindrical core zones significantly exceed their cross-sectional extents, creating cigar-shaped zones that plunge at shallow angles to the south-southeast. One of the core zones occurs near the present-day surface and is largely mined out, while the other lies about 400 to 500 feet down dip of the upper contact of the breccia (Figure 14.1). The thin extension from the upper high-grade pod extends downwards along a shear within the Dunderberg Shale, sub-parallel to the upper breccia contact.

Mid-grade mineralization (domain 200) at North Lookout Mountain occurs primarily in two continuous zones: one immediately below and along the upper contact of the breccia and the other immediately above the lower contact. Both of these zones periodically branch off to form related sub-parallel zones of lesser continuity. Based on limited core data, the upper mid-grade zone is characterized by jasperoid-dominant breccia, while the lower domain 200 mineralization is associated with a well-defined structural zone that has likely experienced post-mineral movement. Domain 200 mineralization at South Lookout Mountain and South Adit is believed to be controlled by structures of various orientations, some of which include the southern extensions of the two main zones of domain 200 mineralization at North Lookout Mountain.

Domain 100 low-grade mineralization encompasses the extents of the mineralized system in the resource areas, which in many areas at Lookout Mountain more-or-less outline the extents of the Lookout Mountain breccia.

Vertical north-looking cross sections spanning a north-south distance of 6,700 feet were used for the initial modeling of the Lookout Mountain mineral domains. Sections spaced at 50-foot intervals were used for the 850-foot-long section of dense drilling at North Lookout Mountain, while the remainder of the modeling utilized 100-foot sections. A total of 20 100-foot spaced sections were utilized for the South Adit modeling. The drill-hole traces, topographic profile, and Timberline geologic and gold interpretations were plotted on the sections, with gold assays (colored by the grade-domain population ranges) and pertinent alteration codes plotted along the drill-hole traces. Mineral-domain envelopes were interpreted on the sections using available and reasonably assumed geologic criteria to encompass gold values that more-or-less correspond to each of the defined grade populations. With few exceptions, the mineral domains only model zones with demonstrable continuity. At North Lookout Mountain, the mineral domains were modeled through to the pre-mine surface using all available drill data, so that assay data that have been 'mined out' were also modeled and used in the grade interpolations described below.

Representative cross sections showing gold mineral-domain interpretations in North and South Lookout Mountain are shown in Figure 14.1 and Figure 14.2, respectively, while Figure 14.3 shows the South Adit interpretation.

The cross sectional mineral-domain envelopes were digitized, pressed three-dimensionally to the drill holes, and then sliced at 10-foot vertical intervals. The resultant slices were used to refine the mineral domains on a set of 10-foot level plans.

Assay Coding, Capping, and Compositing. Drill-hole gold assays were coded to the mineral domains using the cross-sectional mineral-domain envelopes. Descriptive statistics of the coded assays are provided in Table 14.1 and Table 14.2 for Lookout Mountain and South Adit, respectively.

Table 14.1 Descriptive Statistics of Lookout Mountain Coded Gold Assays

Domain	Assays	Count	Mean (oz Au/ton)	Median (oz Au/ton)	Std. Dev.	CV	Min. (oz Au/ton)	Max. (oz Au/ton)
100	Au	7998	0.007	0.006	0.005	0.756	0.000	0.070
	Au Cap	7998	0.007	0.006	0.005	0.756	0.000	0.070
200	Au	3374	0.030	0.024	0.025	0.826	0.000	0.570
	Au Cap	3374	0.030	0.024	0.021	0.706	0.000	0.200
300	Au	585	0.256	0.184	0.297	1.161	0.001	4.066
	Au Cap	585	0.256	0.184	0.297	1.161	0.001	4.066
10	Au	609	0.012	0.005	0.027	2.275	0.000	0.363
	Au Cap	609	0.011	0.005	0.016	1.545	0.000	0.100
All	*Au*	*12566*	*0.024*	*0.008*	*0.079*	*3.360*	*0.000*	*4.066*
	Au Cap	*12566*	*0.024*	*0.008*	*0.079*	*3.363*	*0.000*	*4.066*

Table 14.2 Descriptive Statistics of South Adit Coded Gold Assays

Domain	Assays	Count	Mean (oz Au/ton)	Median (oz Au/ton)	Std. Dev.	CV	Min. (oz Au/ton)	Max. (oz Au/ton)
100	Au	370	0.007	0.006	0.004	0.605	0.000	0.025
	Au Cap	370	0.007	0.006	0.004	0.605	0.000	0.025
200	Au	209	0.031	0.026	0.017	0.546	0.008	0.123
	Au Cap	209	0.031	0.026	0.017	0.546	0.008	0.123
300	Au	4	0.092	0.090	0.012	0.134	0.080	0.108
	Au Cap	4	0.092	0.090	0.012	0.134	0.080	0.108
All	*Au*	*583*	*0.016*	*0.010*	*0.017*	*1.061*	*0.000*	*0.123*
	Au Cap	*583*	*0.016*	*0.010*	*0.017*	*1.061*	*0.000*	*0.123*

Figure 14.1 North Lookout Mountain Cross Section 1697700 Showing Gold Mineral Domains

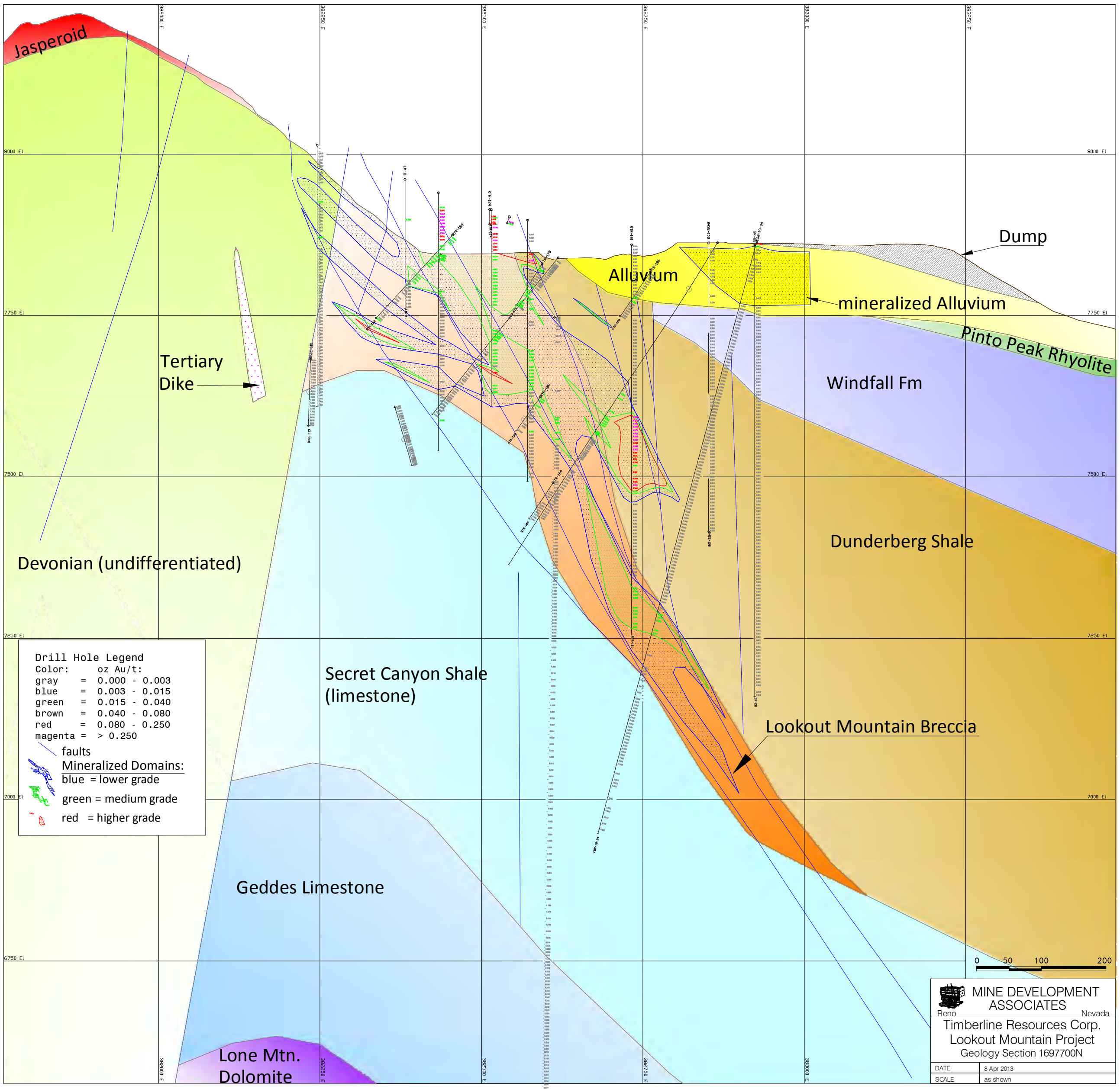


Figure 14.2 South Lookout Mountain Cross Section 1694900 Showing Gold Mineral Domains

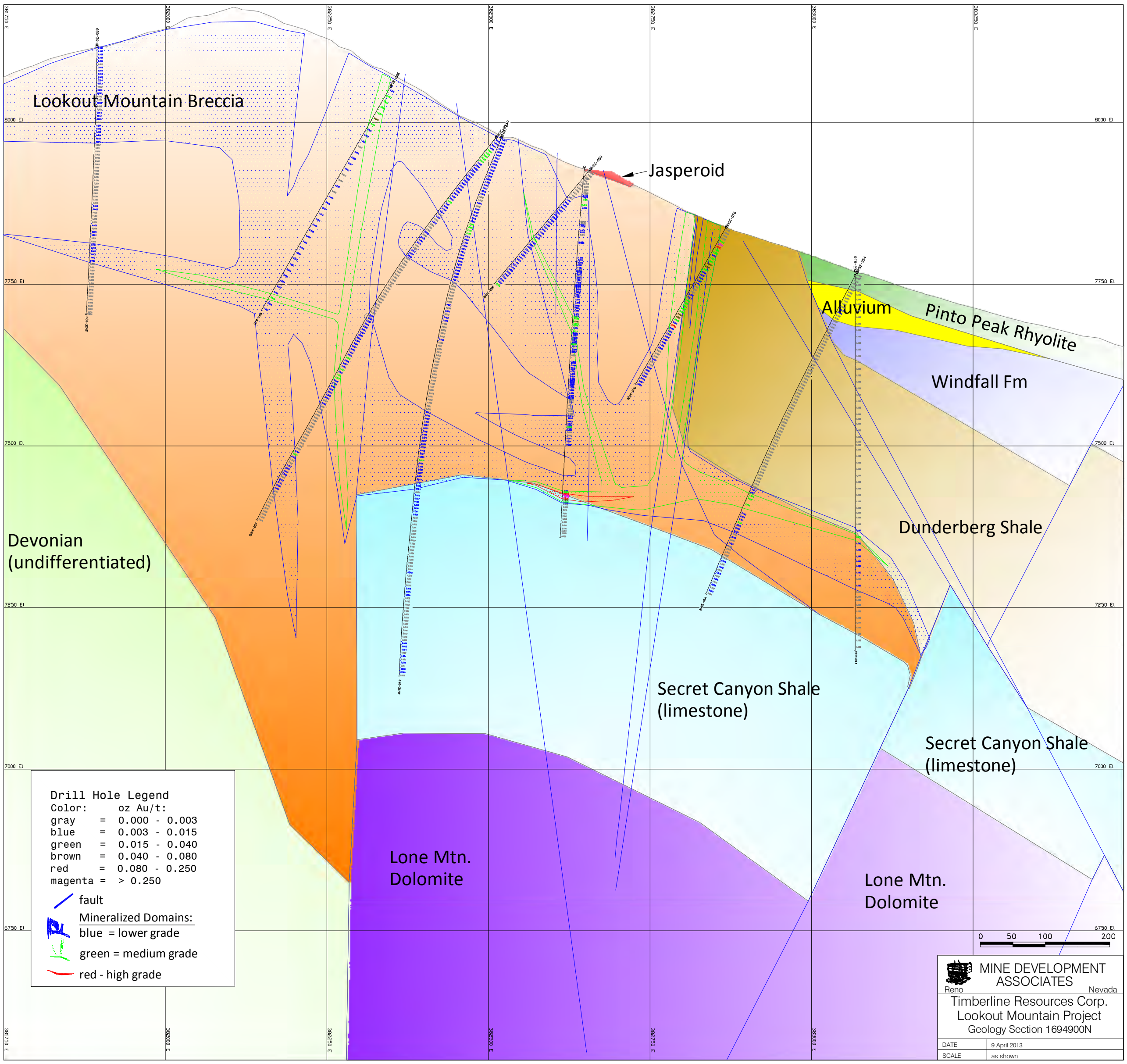
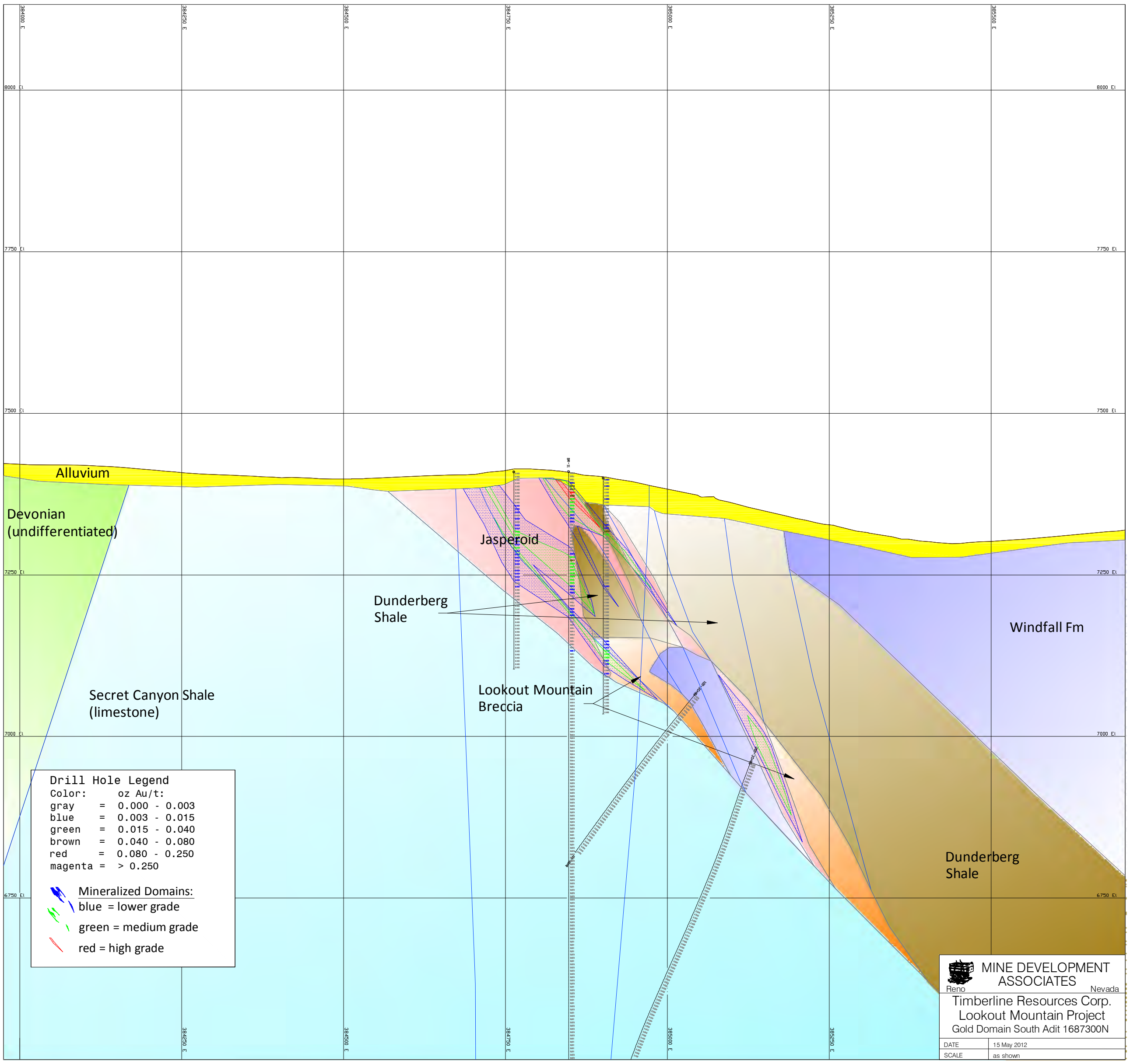


Figure 14.3 South Adit Cross Section 1687300 Showing Gold Mineral Domains



The process of determining assay caps (Table 14.3) included inspection of quantile plots of the coded assays by domain to determine if multiple populations exist, as well as to identify possible high-grade outliers that might be appropriate for capping. Descriptive statistics of the coded assays by domain and visual reviews of the spatial relationships of the possible outliers and their potential impacts during grade interpolation were also considered.

Table 14.3 Gold Assay Caps by Mineral Domain

	LOOKOUT MOUNTAIN		SOUTH ADIT	
Domain	oz Au/ton	Number Capped (% of samples)	oz Au/ton	Number Capped (% of samples)
100	no cap		no cap	
200	0.200	8 (<1%)	no cap	
300	no cap		no cap	
10	0.100	10 (2%)	n/a	

In addition to the assay capping, search restrictions were applied on the higher-grade portions of domains 100, 300, and 10 (alluvium) during Lookout Mountain grade interpolations, as well as on domain 200 at South Adit (search restrictions discussed further below).

The capped assays were composited at 10-foot down-hole intervals respecting the mineral domains. Descriptive statistics of Lookout Mountain and South Adit composites are shown in Table 14.4 and Table 14.5, respectively.

Table 14.4 Descriptive Statistics of Lookout Mountain Gold Composites

Domain	Count	Mean (oz Au/ton)	Median (oz Au/ton)	Std. Dev.	CV	Min. (oz Au/ton)	Max. (oz Au/ton)
100	4338	0.007	0.006	0.005	0.650	0.000	0.050
200	1834	0.030	0.025	0.018	0.607	0.000	0.148
300	299	0.256	0.204	0.221	0.863	0.020	2.249
10	357	0.011	0.005	0.015	1.407	0.000	0.100
All	*6828*	*0.023*	*0.009*	*0.067*	*2.877*	*0.000*	*2.249*

Table 14.5 Descriptive Statistics of South Adit Gold Composites

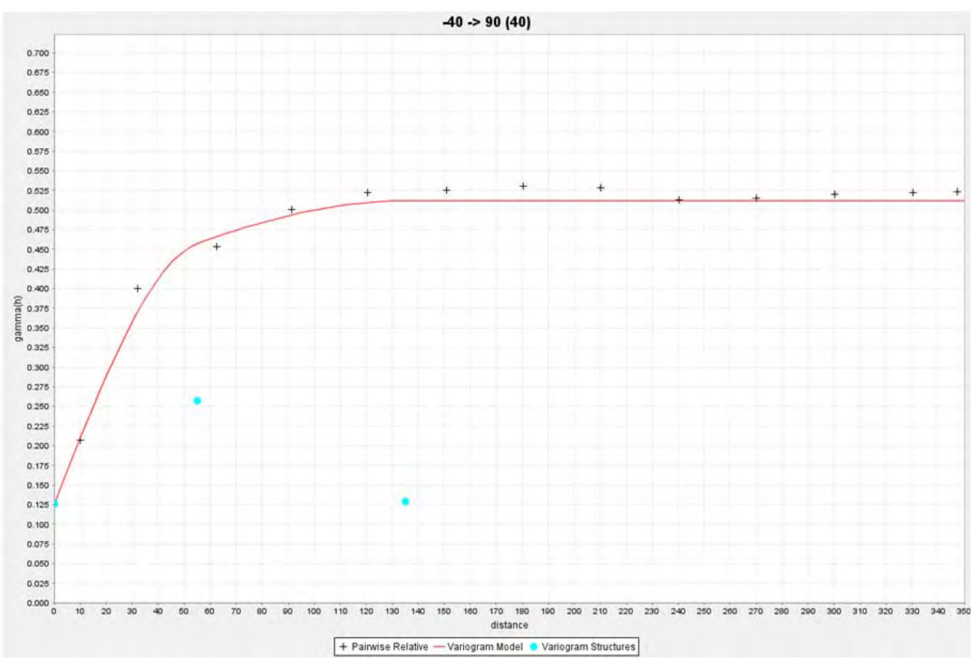
Domain	Count	Mean (oz Au/ton)	Median (oz Au/ton)	Std. Dev.	CV	Min. (oz Au/ton)	Max. (oz Au/ton)
100	225	0.007	0.006	0.003	0.506	0.000	0.019
200	118	0.031	0.027	0.014	0.459	0.013	0.084
300	2	0.092	0.092	0.003	0.028	0.089	0.095
All	*345*	*0.016*	*0.010*	*0.016*	*0.996*	*0.000*	*0.095*

Block Model Coding. The level-plan mineral-domain polygons were used to code three-dimensional block models comprised of 20 foot (wide) x 20 foot (long) x 20 foot (high) blocks; two of the 10-foot spaced level plans were used to code each 20-foot model bench. In order for the block models to better reflect the irregularly shaped limits of the various gold domains, as well as to explicitly model dilution, the percentage volume of each mineral domain within each block is stored (the "partial percentages"). At Lookout Mountain, the stored block percentage is the average derived from two 10-foot levels within each 20-foot block, while one level plan is used to code each South Adit block.

Each block is assigned a tonnage factor, as listed in Table 14.8. The percentage of each block that lies below the topographic surface is stored for use in the calculation of block tonnages. The 20-foot spaced oxide envelopes (see Section 14.2.4) were used to code the blocks on a partial percentage basis model row-by-model row. If 50% or more of a block is thereby coded, the block is considered as oxidized for the purposes of the application of the resource cutoffs (described below).

Grade Interpolation. A variographic study was performed using the Lookout Mountain gold composites from each mineral domain, collectively and separately, at various azimuths, dips, and lags. The study was complicated by the fact that the mineralization occurs in multiple orientations at South Lookout Mountain. Acceptable structures modeled on variograms were obtained from composites from domain 300, as well as domain 100 and 200 together (Figure 14.4). Maximum ranges of 120 to 135 feet were obtained in both the horizontal direction at an azimuth of 000° and at an orientation of -40° at an azimuth of 090°, which are geologically reasonable orientations for the global strike and dip of the mineralization, respectively. At South Adit, reliable variograms in the strike direction could not be generated due to insufficient data; the longest range defined in the dip direction is 60 feet. Parameters obtained from the variography study were used in an ordinary-krige interpolation and also provided information relevant to both the estimation parameters used in an inverse-distance interpolation and resource classification.

Figure 14.4 Variogram of Lookout Mountain Domain 100 and 200 Composites in Dip Direction



As discussed above, core zones of mineral-domain 300 mineralization at North Lookout Mountain plunge to the southeast. This contrasts with the north-striking, moderately east-dipping mineralization that characterizes the remainder of North Lookout Mountain and some of the South Lookout Mountain mineralization, which is characterized by two additional orientations. The presence of multiple mineral orientations necessitated the use of multiple search ellipses for the Lookout Mountain model.

Multiple populations were captured in both the high-grade and alluvial domains at Lookout Mountain and the mid-grade domain at South Adit. In order to control the higher-grade populations in each of these domains, restrictions on the search distances of the higher-grade population were implemented.

Hard-rock grades were interpolated using inverse distance to the third power, ordinary krige, and nearest-neighbor methods; colluvial/alluvial resources Lookout Mountain were estimated using inverse distance to the second power. The mineral resources reported herein were estimated by inverse-distance interpolation, as this technique was judged to provide results superior to those obtained by ordinary kriging. The nearest-neighbor estimation was also completed as a check on the other interpolations.

The parameters applied to the gold-grade estimations at Lookout Mountain are summarized in Table 14.6.

The maximum number of composites allowed for the estimation of a block was decreased from 18 to 10 in the low-grade domain (domain 100) in order to limit the influence of some erratically distributed higher-grade samples within the domain. Estimation parameters used at South Adit are listed in Table 14.7.

The major and semi-major axes of the search ellipses approximate the average strike and dip directions of the gold mineralization in each estimation domain. The first-pass search distances take into consideration the results of both the variography and drill-hole spacing. The second passes were designed to estimate grade into all blocks coded to the mineral domains that were not estimated in the first passes.

The estimation passes were performed independently for each of the mineral domains, so that only composites coded to a particular domain were used to estimate grade into blocks coded by that domain. The estimated grades were coupled with the partial percentages of the mineral domains and unmodeled waste stored in the blocks to enable the calculation of a single weight-averaged block-diluted grade for each block.

Table 14.6 Summary of Lookout Mountain Estimation Parameters

Search Ellipse Orientations

Estimation Domain	Major Bearing	Plunge	Tilt
North Lookout Mountain Au domain 300	330°	20°	-40°
North & South Lookout Mountain subvertical structures	0°	0°	80°
North & South Lookout Mountain moderately steeply dipping structures	0°	0°	-60°
North & South Lookout Mountain subhorizontal mineralization & alluvium	0°	0°	-10°

Au Domains 200 & 300

Estimation Pass	Search Ranges (ft)			Composite Constraints		
	Major	S-Major	Minor	Min	Max	Max/hole
1	150	150	75	2	18	3
2	350	350	350	1	18	3
Au Domain 100						
1	150	150	75	2	10	3
2	350	350	350	1	10	3

Search Restrictions

Domain	Grade Threshold (oz Au/ton)	Search Restriction (ft)	Estimation Pass
Au 100	>0.010	125	1
Au 300	>0.15	85	1 & 2
Au 10	>0.009	100	1 & 2
Au 10	>0.040	50	1 & 2

Ordinary Krige Parameters

Model	Domain	Nugget	First Structure				Second Structure			
		C_0	C_1	Ranges (ft)			C_2	Ranges (ft)		
SPH-Normal	10, 100, 200	0.151	0.250	50	50	35	0.120	120	120	105
SPH-Normal	300	0.100	0.146	60	60	30	0.037	80	60	30

[1] krige interpolation used as a check against the reported inverse-distance interpolation

Table 14.7 Summary of South Adit Estimation Parameters

Search Ellipse Orientations

Estimation Domain	Major Bearing	Plunge	Tilt
South Adit Au domains 100, 200 & 300	0°	0°	-60°

Au Domains 100, 200, 300

Estimation Pass	Search Ranges (ft)			Composite Constraints		
	Major	S-Major	Minor	Min	Max	Max/hole
1	200	200	100	2	18	3
2	400	400	400	1	18	3

Search Restrictions

Domain	Grade Threshold (oz Au/ton)	Search Restriction (ft)	Estimation Pass
Au 200	>0.035	100	1

Ordinary Krige Parameters

Model	Domain	Nugget	First Structure				Second Structure			
		C_0	C_1	Ranges (ft)			C_2	Ranges (ft)		
SPH-Normal	100,200,300	0.176	0.228	40	40	28	0.098	60	60	40

[1] krige interpolation used as a check against the reported inverse-distance interpolation

14.2.6 Density Modeling

MDA was provided with a total of 214 specific-gravity determinations from the resource area. These data were derived from dry bulk specific-gravity determinations completed on core samples by the water immersion method using samples coated with wax, including 12 determinations by Thurston Testing Laboratory and 202 from KCA. There are 167 determinations on samples that lie within mineral domains modeled at Lookout Mountain. Descriptive statistics of these density data, converted into tonnage factors ("TF"), are summarized in Table 14.8.

Table 14.8 Density Data

Domain	Mean	Median	Min	Max	Count	Model TF
100	13.6	13.1	12.3	16.4	19	
200	13.4	13.3	10.8	18.4	21	
300	13.0	13.0	12.5	13.7	7	
100, 200, 300	13.4	13.1	10.8	18.4	47	13.5
unmineralized	13.1	12.7	11.2	17.8	167	13.0

MDA does not believe that the differences between the tonnage factors from samples within the low-, medium-, and high-grade mineral domains are statistically significant; therefore, a single tonnage factor (13.5 ft^3/ton) is applied to all modeled mineralization. This tonnage factor is slightly higher than the mean and median values due to *in situ* open spaces present within the Lookout Mountain breccia that cannot be captured in samples of drill core and therefore cannot be accounted for in the specific-gravity determinations. A tonnage factor of 20 was assigned to the partial percentage of a block coded to alluvium, and this value was weight-averaged with the bedrock tonnage factor to obtain the full-block density.

All unmineralized units are assigned a tonnage factor of 13.0 ft^3/ton in the Lookout Mountain model. There are a number of different formations and lithologies present in the model area, so this average number has spatial inaccuracies. This simplified modeling of the density of the host rocks will warrant evaluation if economic studies are planned.

Only two density determinations are available from mineralization modeled at South Adit, which yielded tonnage factors of 14.0 and 13.6. The same tonnage factors used at Lookout Mountain were applied to the South Adit model.

14.2.7 Lookout Mountain Project Mineral Resources

Total Lookout Mountain project block-diluted mineral resources, including both the Lookout Mountain and South Adit deposits, are listed in Table 14.9 using cutoff grades of 0.006 oz Au/ton for oxidized material and 0.030 oz Au/ton for unoxidized material. These cutoffs are chosen to capture mineralization that is potentially available to open-pit extraction and heap-leach processing. The higher cutoff applied to unoxidized material reflects probable lower heap-leach recoveries and/or more costly sulfide processing.

Table 14.9 Lookout Mountain Project Gold Resources

Measured			Indicated			Measured & Indicated		
Tons	oz Au/ton	oz Au	Tons	oz Au/ton	oz Au	Tons	oz Au/ton	oz Au
3,043,000	0.035	106,000	25,897,000	0.016	402,000	28,940,000	0.018	508,000

Inferred		
Tons	oz Au/ton	oz Au
11,709,000	0.012	141,000

Note: Rounding may cause apparent discrepancies.

The Lookout Mountain resources are classified on the basis of the number and distance of composites used in the interpolation of a block, as well as the number of holes that contributed composites and the geographic location of the blocks within the model area (Table 14.10).

Table 14.10 Lookout Mountain Classification Parameters

Class	Min. No. of Comps	Additional Constraints
Measured	3	Minimum of 2 holes, excluding rotary holes, within an average distance of 45ft from block for all blocks lying between 1695270N and 1698700N
Indicated	3	Minimum of 2 holes within an average distance of 110ft from block
Inferred	Blocks coded as > 50% alluvium and all other estimated blocks	

Measured resources are restricted to lie within the densely drilled portion of North Lookout Mountain and the northernmost portion of South Lookout Mountain, where the geology is very well constrained. Composites from rotary holes are not used by the minimum criteria that apply to the definition of Measured resources. Indicated resources are defined using composites from all holes; spatial restrictions for the Indicated classification have been removed due to enhanced geologic understanding of the entire Lookout Mountain deposit area. All estimated blocks that are not classified as Measured or Indicated, or that are coded as alluvium, are assigned to the Inferred category.

Classification parameters used to classify the South Adit resources are listed in Table 14.11.

Table 14.11 South Adit Classification Parameters

Class	Min. No. of Comps	Additional Constraints
Indicated	2	Minimum of 2 holes within an average distance of 60ft from block
Inferred	All other estimated blocks	

The Indicated criteria at South Adit are more restrictive than those used at Lookout Mountain, which again is a reflection of the confidence in the underlying geologic modeling; there are no Measured resources at South Adit.

The modeled mineralization is tabulated at additional cutoffs for the Lookout Mountain (Table 14.12) and South Adit (Table 14.13) deposits in order to provide grade-distribution information, as well as to provide sensitivities of the resources to economic conditions or mining scenarios other than those envisioned by the reportable cutoffs.

Table 14.12 Lookout Mountain Deposit Mineralization at Various Cutoffs

Oxidized Material

Cutoff	Measured			Indicated			Measured & Indicated		
(oz Au/ton)	Tons	oz Au/ton	oz Au	Tons	oz Au/ton	oz Au	Tons	oz Au/ton	oz Au
0.003	3,209,000	0.018	58,000	37,528,000	0.010	394,000	40,737,000	0.011	452,000
0.006	***2,635,000***	***0.021***	***56,000***	***24,740,000***	***0.014***	***342,000***	***27,375,000***	***0.015***	***398,000***
0.008	2,278,000	0.024	54,000	17,921,000	0.017	298,000	20,199,000	0.018	352,000
0.010	1,933,000	0.026	51,000	13,156,000	0.020	258,000	15,089,000	0.021	309,000
0.015	1,344,000	0.033	44,000	7,397,000	0.026	191,000	8,741,000	0.027	235,000
0.030	367,000	0.064	24,000	1,749,000	0.044	76,000	2,116,000	0.047	100,000
0.050	125,000	0.119	15,000	290,000	0.080	23,000	415,000	0.092	38,000
0.100	51,000	0.194	10,000	52,000	0.165	9,000	103,000	0.179	19,000

Cutoff	Inferred		
(oz Au/ton)	Tons	oz Au/ton	oz Au
0.003	16,763,000	0.008	136,000
0.006	***8,608,000***	***0.012***	***104,000***
0.008	5,580,000	0.015	84,000
0.010	3,799,000	0.018	69,000
0.015	1,970,000	0.025	48,000
0.030	428,000	0.041	18,000
0.050	51,000	0.076	4,000
0.100	2,000	0.488	1,000

Unoxidized Material

Cutoff	Measured			Indicated			Measured & Indicated		
(oz Au/ton)	Tons	oz Au/ton	oz Au	Tons	oz Au/ton	oz Au	Tons	oz Au/ton	oz Au
0.003	1,325,000	0.047	62,000	3,321,000	0.024	79,000	4,646,000	0.031	141,000
0.006	1,137,000	0.054	61,000	2,418,000	0.031	75,000	3,555,000	0.038	136,000
0.008	1,037,000	0.058	61,000	2,037,000	0.036	73,000	3,074,000	0.043	134,000
0.010	946,000	0.063	60,000	1,734,000	0.041	70,000	2,680,000	0.049	130,000
0.015	767,000	0.075	58,000	1,287,000	0.051	65,000	2,054,000	0.060	123,000
0.030	***408,000***	***0.123***	***50,000***	***627,000***	***0.082***	***51,000***	***1,035,000***	***0.098***	***101,000***
0.050	273,000	0.165	45,000	273,000	0.138	38,000	546,000	0.152	83,000
0.100	171,000	0.219	38,000	133,000	0.212	28,000	304,000	0.216	66,000

Cutoff	Inferred		
(oz Au/ton)	Tons	oz Au/ton	oz Au
0.003	1,012,000	0.009	9,000
0.006	542,000	0.013	7,000
0.008	380,000	0.016	6,000
0.010	285,000	0.019	5,000
0.015	160,000	0.024	4,000
0.030	***36,000***	***0.037***	***1,000***
0.050	-	-	-
0.100	-	-	-

Note: Rounding may cause apparent discrepancies.

Table 14.13 South Adit Deposit Mineralization at Various Cutoffs

Oxidized Material

Cutoff (oz Au/ton)	**Indicated Tons**	**oz Au/ton**	**oz Au**
0.003	681,000	0.014	10,000
0.006	***530,000***	***0.017***	***9,000***
0.008	447,000	0.019	9,000
0.010	383,000	0.021	8,000
0.015	252,000	0.026	7,000
0.030	81,000	0.038	3,000
0.050	-	-	-
0.100	-	-	-

Cutoff (oz Au/ton)	**Inferred Tons**	**oz Au/ton**	**oz Au**
0.003	5,202,000	0.008	44,000
0.006	***3,065,000***	***0.012***	***36,000***
0.008	2,178,000	0.014	30,000
0.010	1,522,000	0.016	24,000
0.015	657,000	0.022	14,000
0.030	95,000	0.038	4,000
0.050	11,000	0.054	1,000
0.100	-	-	-

Note: Rounding may cause apparent discrepancies.
all South Adit mineralization is oxidized

Figure 14.5, Figure 14.6, and Figure 14.7 show cross sections of the block models that correspond to the mineral-domain cross sections in Figure 14.1, Figure 14.2, and Figure 14.3, respectively.

14.2.8 Model Checks

Volumes derived from the sectional mineral-domain modeling were compared to both the level-plan and coded block-model volumes to assure close agreement, and all block-model coding was checked visually on the computer. Nearest-neighbor and ordinary-krige estimates of the modeled resources were undertaken as a check on the inverse-distance resource results. Grade-distribution plots of assays and composites versus the nearest neighbor, krige, and inverse-distance block grades were also evaluated as a check on the estimations. Finally, the inverse-distance grades were visually compared to the drill-hole assay data to assure that reasonable results were obtained.

The pre-mining deposit at Lookout Mountain was modeled and estimated, after which the mined-out material was removed to allow for reporting of the present-day resources. This allows for a comparison of the resource model with the recorded production. At a cutoff of 0.020 oz Au/ton, which was the reported cutoff grade employed at the mine (Jonson, 1991), the mined-out Measured, Indicated, and Inferred oxide material totals 323,000 tons grading 0.091 oz Au/ton (29,500 ounces). Production data for 1987 indicate that Norse Windfall Mines mined 180,200 tons grading 0.12 oz Au/ton at North Lookout Mountain, for a total of almost 22,000 ounces (Section 6.1). The lack of data for 1988, the second and last year of production, limits the usefulness of the comparison.

Figure 14.5 North Lookout Mountain Cross Section 1697700N Showing Block Model Gold Grades

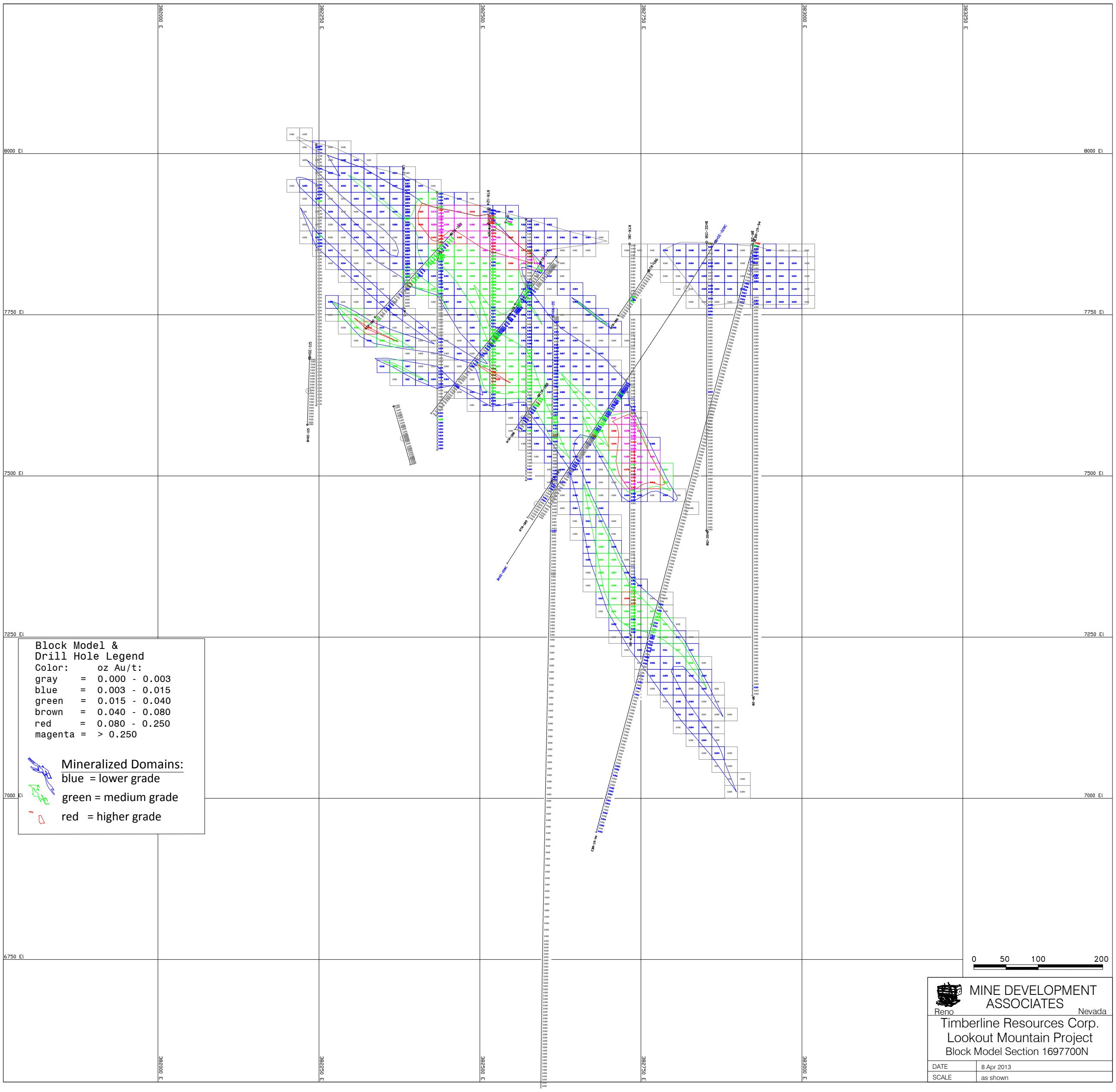


Figure 14.6 South Lookout Mountain Cross Section 1694900N Showing Block Model Gold Grades

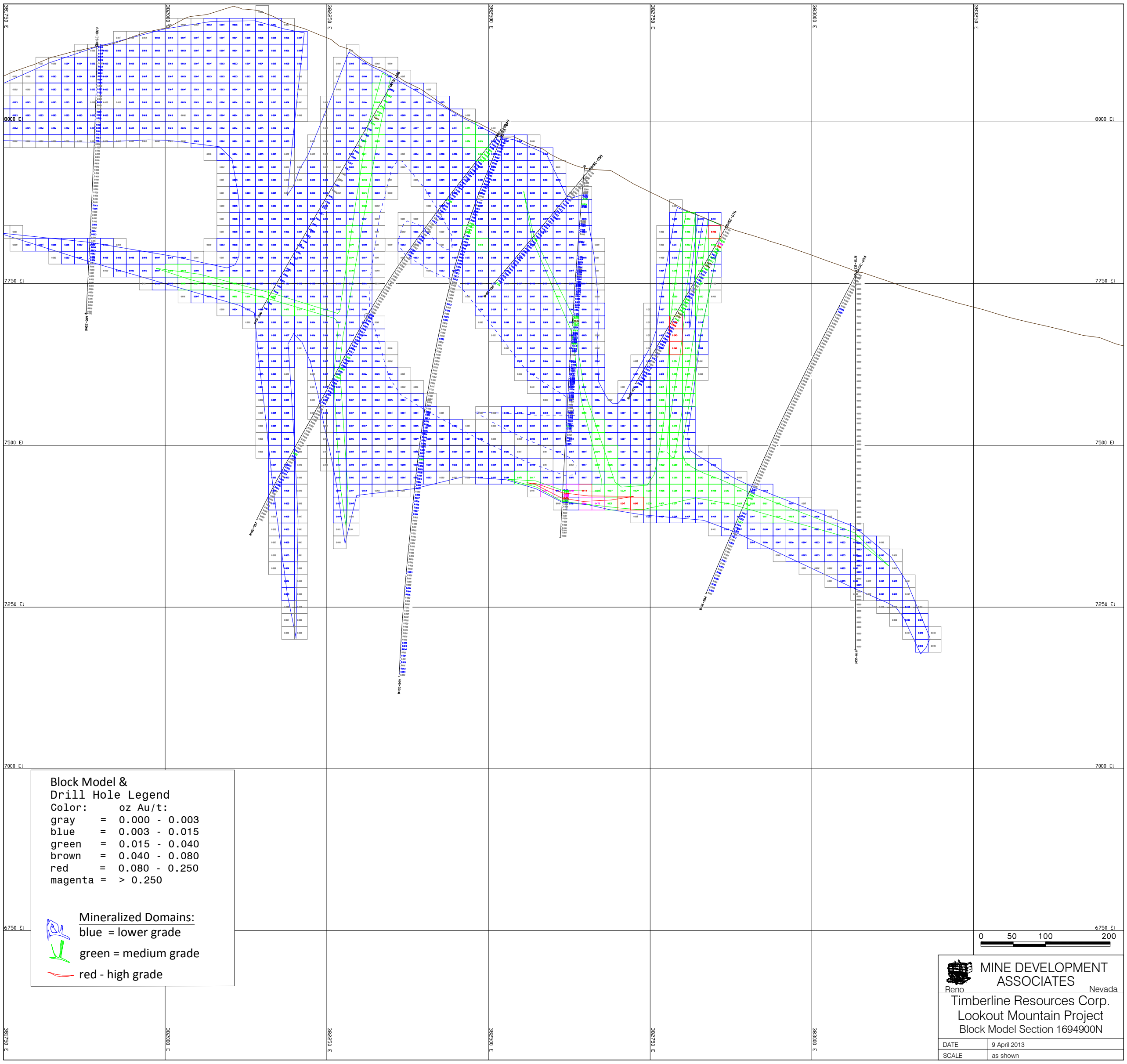
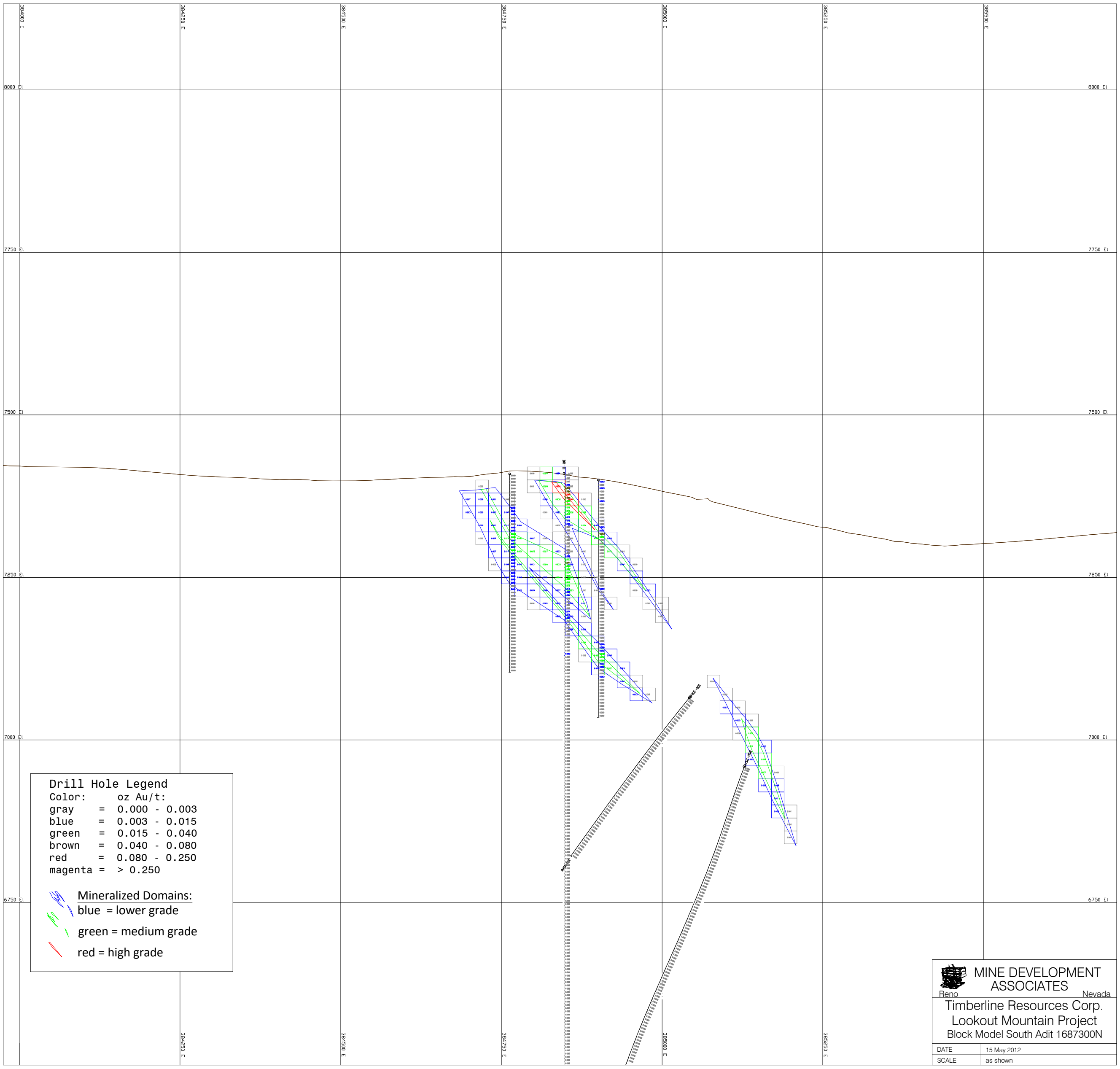


Figure 14.7 South Adit Cross Section 1687300N Showing Block Model Gold Grades



14.2.9 Comments on the Resource Modeling

Mineralized alluvium was modeled and estimated at the Lookout Mountain deposit, with blocks coded as including more than 50% alluvium classified as Inferred. A total of 176,000 tons of alluvium grading 0.011 oz Au/ton (2,000 ounces) are included in the resources at the reportable oxide cutoff of 0.006 oz Au/ton.

A total of 839 sample intervals lie within the modeled mineral domains at the Lookout Mountain deposit and are known or suspected to have been analyzed by cyanide shake-leach or aqua regia / AA methods only; no fire-assay data are available for these intervals. This represents 7% of the coded assays used in the resource estimation of Lookout Mountain; there are no cyanide-only assays at South Adit. Since both of these analytical techniques are partial-gold analyses, the inclusion of these data could result in some under-estimation of the resources. An estimate that excluded these analyses yielded only about 1,000 fewer ounces of gold at the reporting cutoffs than the actual resource estimate reported above. The actual impact is likely to exceed this, however, since artificially lower analyses can lead to samples being modeled into lower-grade domains than otherwise might be the case, *i.e.* the partial-gold analyses could lead to lower *volumes* of higher-grade domains, an impact that can only be partly examined by a re-estimation that excludes the analyses.

As discussed in Section 10.10, there is strong evidence of local down-hole contamination in the reverse-circulation drill data. The mineral-domain modeling used in the resource estimation at least partially mitigates this problem through the exclusion of mineralized intervals suspected of being contaminated. It should be noted, however, that the identification of suspect intervals is interpretational; MDA believes it is possible that some relatively small amount of the excluded mineralization is not actually contaminated, while some mineralized samples included in the resource estimation may be affected by contamination.

Subsequent resource modeling could be improved by the incorporation of geologic criteria into the project database that assist in the definition of the various mineral domains, especially the mid- and higher-grade domains. Oxidation modeling can also be improved by standardizing the codes in the database, which are derived from the work of many different geologists from the various drill campaigns. The oxidation codes should consistently reflect the oxidation state of the rock, not the oxidation state of sulfide minerals only (*i.e.*, rocks that never had sulfide minerals can be logged as oxidized). Significantly more cyanide-leach analyses would also aid the oxidation modeling.

15.0 ADJACENT PROPERTIES

Timberline's South Eureka property includes other claim groups in addition to the Lookout Mountain group (see Figure 4.2). In addition to Lookout Mountain, mining has taken place at the Paroni mine, Rustler mine, and Windfall mine (see Section 6.0).

16.0 OTHER RELEVANT DATA AND INFORMATION

MDA is not aware of any other data or information relevant to the mineral resource estimate described in this report.

17.0 INTERPRETATION AND CONCLUSIONS

MDA reviewed the project data, including the Lookout Mountain drill-hole database, and visited the project site. MDA believes that the data provided by Timberline, as well as the geological interpretations Timberline has derived from the data, are generally an accurate and reasonable representation of the Lookout Mountain project.

The modeled gold mineralization at the Lookout Mountain resource extends for almost 7,000 feet in length and is primarily hosted by the Lookout Mountain breccia, which strikes in a northerly direction and dips moderately to the east. The breccia is quite wide at the surface and typically thins down dip, which creates a wedge shape in cross sectional view that tilts to the west. Gold mineralization at South Adit is generally similar to that at Lookout Mountain. Gold occurs at or near the Dunderberg-Hamburg contact and is associated with strong silicification, argillization, and a series of steeply to moderately dipping normal faults that form a westerly tilted and downward-pinching mineralized wedge. Gold mineralization at the Lookout Mountain project is of the disseminated sediment-hosted type.

The primary controls on the Lookout Mountain mineralization are the north-trending, high-angle Ratto Ridge fault system, which has localized jasperoids and gold mineralization in sedimentary units along more than 2.5 miles of strike length, and the Lookout Mountain breccia. The mineral domains modeled by MDA occur predominantly within the Lookout Mountain breccia, with exceptions including mineralization in the Dunderberg Shale in the hanging wall of the breccia, which is often high grade, minor mineralization in Secret Canyon limestone immediately below the breccia, and the gold occurring in colluvium/alluvium. Critical controls to the mineralization at South Audit have yet to be definitively established.

About 180,000 tons of mostly oxide gold mineralization reportedly grading 0.12 oz Au/ton were mined from the Lookout Mountain open pit during 1987. The ore was hauled 10 miles to cyanide heap-leach pads at the Windfall mine, where an estimated 81% recovery was achieved from the agglomerated ore. Metallurgical testing completed by Timberline and previous operators suggests that the oxidized gold mineralization remaining at Lookout Mountain and South Adit is amenable to extraction by cyanidation via heap leaching, although projected recoveries are variable for some materials and require further test work.

Timberline provided MDA with a project database consisting of information derived from 62 core holes and 622 RC and rotary holes completed by Newmont, Amselco, Norse Windfall Mines, EFL, Barrick, Echo Bay, Staccato, and Timberline. MDA audited the database and completed a comprehensive re-compilation of all assay data from Amselco's RTR- and RTC-series holes. In-house mine laboratories were used for the 20 Norse Windfall Mines holes and some of the Amseclo holes, and many of these analyses utilized partial-gold extractions. Some of the Norse Windfall Mines gold data clearly understate grades in comparison to adjacent holes. MDA's reconstruction of the Amselco database effectively limits the impact of the in-house assays by replacing many of them with check analyses performed at commercial laboratories. MDA believes the Lookout Mountain analytical data are of sufficient quality for use in the resource estimation.

The mineral resources reported herein were estimated using this database.

While QA/QC data collected at the time of most of the historic drill programs are not available, this is partially compensated by critical check assaying of historic drill chips. Timberline instituted the first modern QA/QC program at Lookout Mountain, which has not identified any serious issues. While there is strong evidence of local down-hole contamination, the issue is at least partially mitigated by the removal of suspect intervals from the resource modeling.

The Lookout Mountain project gold resources, which include both the Lookout Mountain and South Adit deposits, are tabulated using cutoff grades of 0.006 oz Au/ton for oxidized material and 0.030 oz Au/ton for unoxidized material. These cutoffs are chosen to capture mineralization that is potentially available to open-pit extraction, with the lower cutoff applied to oxidized material that can reasonably be assumed to be amenable to heap-leach processing, while the higher cutoff is applied to unoxidized material and reflects probable lower heap-leach recoveries and/or more costly sulfide processing. Measured and Indicated resources total 28,940,000 tons averaging 0.018 oz Au/ton (508,000 ounces), with an additional 11,709,000 tons averaging 0.012 oz Au/ton (141,000 ounces) assigned to the Inferred category.

The potential to expand the existing resource base at the Lookout Mountain project is summarized in the Section 18.0 discussion of Phase I work recommendations.

18.0 RECOMMENDATIONS

The Lookout Mountain project has advanced to the stage where economic studies are warranted, as reflected in the Phase I recommendations discussed below. With positive results, significant expenditures should be invested in various studies that would support a pre-feasibility study (Phase II).

The Phase I program should begin with a preliminary economic assessment based on the current resource modeling; other Phase I work could initiate concurrently.

Project resources remain open in all directions. Drill holes have intersected mineralized zones along the strike of the resources both to the north (Rocky Canyon) and to the south, with the 3,500-foot strike extent between the southern limit of the Lookout Mountain deposit and the northern limit of the South Adit deposit affording the best opportunity for resource expansion in the near term. Significant exploration expenditures that include surface sampling, channel sampling in areas of difficult access, and approximately 15,000 feet of drilling are warranted.

Irrespective of the results of the exploration drilling, the existing resource base also justifies further investment. Approximately 10,000 feet of infill RC and core drilling within the project resources is recommended, with the goal of converting current Inferred resources to higher categories. Ongoing metallurgical testing programs should also continue under the guidance of metallurgical experts; this program will require about 10,000 feet of additional core drilling to provide the necessary materials for testing. The program should include additional bottle-roll and column testing of various particle sizes, further crush-size fraction testing, SEM and other mineralogic characterizations, material-type volumetrics, and density measurements.

During the Phase I program, three-dimensionally accurate modeling of the geology needs to be undertaken, including all lithogic and alteration/geochemical interpretations, as well as the complex structural interpretations. This work will support all future economic studies, where waste-rock modeling has increased importance (only sectional-type geologic modeling has been completed to date). This work will entail finalizing all geologic modeling on cross sections and then rectifying the interpretations three-dimensionally to the drill data, which would likely be accomplished on a comprehensive set of level plans.

Estimated costs of the Phase I work program are summarized on Table 18.1.

Table 18.1 Recommended Phase I Lookout Mountain Work Program

Item[1]	Estimated Cost
Drilling (~35,000 feet) - Includes exploration, infill, and metallurgical RC and core drilling	$ 2,300,000
Drill Access - construction and upgrading	135,000
Surface Geochemical Sampling	150,000
Drill and Surface Sample Assaying – includes QA/QC samples	200,000
Metallurgical Testing	250,000
Geologic Modeling	175,000
Preliminary Economic Assessment	65,000
Total	*$ 3,275,000*

[1]All landholding, personnel, environmental (reclamation, reclamation bonding, permitting, etc. costs), and travel costs not included

If the results of the Lookout Mountain project Phase I program are favorable, *i.e.* the preliminary economic assessment yeilds positive results, a Phase II program that prepares the project for a pre-feasibility study should be initiated. A pre-feasibility and its accompanying baseline environmental studies are required for the submission of a mine Plan of Operation to the BLM. The following Phase II work is recommended to achieve these goals:

- Additional drilling, including: continuation of the infill (5,000 feet of core and RC), exploration (15,000 feet of RC and core), and metallurgical (5,000 feet of core) drill programs initiated in Phase I; condemnation drilling (10,000 feet of RC) to define potential sites for waste rock, leach pad, and mine facilities; and drilling to support hydrologic studies (10,000 feet of rotary/RC);
- Continuation of the Phase I metallurgical work;
- Geotechnical program, including pit-slope work, shear and compression tests, and stability analyses; the work would include four to eight oriented core holes that would double as metallurgical holes;
- Completion of environmental baseline studies required for a mine Plan of Operation, including biological (threatened and endangered species, migratory birds, critical habitat, sage grouse, etc.) and cultural surveys.
- Detailed hydrologic studies, including modeling, preparation of a hydrogeochemical characterization report, and the completion of water monitoring and production wells; and
- Preliminary facilities design, including soil geotechnical studies, determination of utility pathway locations and needs, and determination of the location, size, and type of crusher.

Estimated costs of the Phase II work program are summarized on Table 18.2.

Table 18.2 Recommended Phase II Lookout Mountain Work Program

Item[1]	**Estimated Cost**
Drilling (~45,000 feet). Includes exploration, hydrologic, condemnation, infill, and metallurgical RC and core drilling	$ 3,000,000
Drill Access - construction and upgrading	75,000
Drill-Sample Assaying – includes QA/QC samples	225,000
Metallurgical Testing	250,000
Hydrologic Studies	300,000
Environmental Baseline Studies	350,000
Preliminary Facilities Design-Related Work	150,000
Total	*$ 4,350,000*

[1]All landholding, personnel, environmental (reclamation, reclamation bonding, permitting, etc.), and travel costs not included

19.0 REFERENCES

Alta Gold Co., 1999, *Lookout Mountain property; a disseminated gold system along the Battle Mountain-Eureka trend*: Internal company report, 9 p. plus figures.

Asher, R., 1986 (May 2), *Ratto Canyon submittal, Eureka County, Nevada*: Internal Memorandum of Tenneco Minerals Company, 7 p. plus attachments.

Barrick Gold Corporation, 2010, *A new era in gold*: Annual report for 2009 of Barrick Gold Corporation, 170 p.

Campbell, Foss and Buchanan, Inc., 1986 (April 30), *Amselco Ratto Canyon project; overview of data and property examination*: Report prepared for Norse Petroleum (U.S.) Inc., 5 p. plus attachments.

Cargill, C., 1988 (July 30), *Report on the Eureka property of Norse-Windfall Mines Inc.*: Report prepared by Cargill Geological Consultants Limited for Moneta Porcupine Mines Inc., 29 p.

Cope, E. L., 1992 (June 15), *Geologic evaluation of the area west of Ratto Ridge, Ratto project, Eureka County, Nevada*: Report prepared for Barrick Gold Exploration, 5 p. plus attachments.

Creel, L., 2006 (December 3), *Lookout Mountain resource estimation*: Report prepared by Creel Consulting for Staccato Gold Resources Ltd., 2 p.

Creel, L., 2007 (January 3), *Lookout Mountain resource estimation*: Report prepared by Creel Consulting for Staccato Gold Resources Ltd., 2 p.

Dix, R. B., 1987 (April 8), *Ratto property bulk sample cyanide leach tests; final report*: Report prepared by Kappes, Cassiday & Associates for Norse Windfall Mines Inc., 21 p.

Edmondo, G., 2007, *Property evaluation report on properties controlled by Staccato Gold Resources Ltd.*: Report prepared by MinGIS for Metallica Resources Inc., 5p.

Edmondo, G., 2008a, *Property evaluation report on properties controlled by Staccato Gold Resources Ltd.; Follow up report on short term recommendations*: Report prepared by MinGIS for Metallica Resources Inc., 11p.

Edmondo, G., 2008b, *Summary of exploration activities at Lookout Mountain and vicinity*: Internal report for Staccato Gold Resources Ltd., 2 p.

Edmondo, G., 2009, *Lookout Mountain report of 2009 activities and work program for Rocky Canyon Mining Company*: Report prepared by Staccato Gold Resources Ltd. and BH Minerals US Inc. for Rocky Canyon Mining Company, 14 p.

Edmondo, G., 2010a, *A summary of mineralization in terms of metallurgical type and grade characterization*: Internal report for BH Minerals USA Inc., 5 p.

Edmondo, G., 2010b, *Eureka district exploration update, Eureka County, Nevada*, in *2010 Fall Field Trip Guidebook*: Geological Society of Nevada Special Publication no. 51, p. 406-407.

Edmondo, G., 2010c, *Lookout Mountain report of 2010 activities and work program for Rocky Canyon Mining Company*: Report prepared by Timberline Resources Corp. and BH Minerals US Inc. for Rocky Canyon Mining Company, 14 p.

Emmons, D. L., 1995 (August 23), *1995 Ratto Canyon annual report*: Report prepared by Echo Bay Exploration Inc. for Rocky Canyon Mining, 2 p. plus attachments.

Emmons, D. L., 1996 (September 4), *1996 Ratto Canyon annual report*: Report prepared by Echo Bay Exploration Inc. for Rocky Canyon Mining, 1 p. plus attachments.

Emmons, D. L., 1998 (January 2), *1997 Ratto Canyon annual report*: Report prepared by Echo Bay Exploration Inc. for Rocky Canyon Mining, 1 p. plus attachments.

Gathje, J. C., 1985 (August 21), *HRI Project 6172, Cyanidation of gold ore samples*: Letter from Hazen Research, Inc. to Amselco Exploration Inc., 3 p.

Gathje, J. C., 1986 (April 21), *HRI Project 6319, Column leach tests, interim report*: Letter from Hazen Research, Inc. to Amselco Minerals Inc., 4 p.

G.I.S. Land Services, 2008 (November 26), *Lookout Mountain title review, 373 lode claims, Eureka County, Nevada, executive summary, Report 2008-15-LM,* Report prepared for Staccato Gold Resources, Ltd., 56 p.

Golder Associates Inc., 2013 (February), *Lookout Mountain project scoping-level pit slope evaluation, Eureka, Nevada*: Report prepared for Timberline Resources, 43 p. plus appendices.

Gustin, M. M., 2011 (May 2), *Technical report on the Lookout Mountain project, Eureka County, Nevada, USA*: Report prepared by Mine Development Associates for Timberline Resources Corp., 124 p.

Gustin, M. M., 2012 (May 31), *Updated technical report on the Lookout Mountain project, Eureka County, Nevada, USA*: Report prepared by Mine Development Associates for Timberline Resources Corp., 129 p.

Hauntz, C. E., 1985 (January 30), *Amselco Exploration Inc. Great Basin precious metals project; Ratto Canyon report*: Internal report of Amselco Exploration Inc., 75 p. plus appendices.

Jennings, D., and Schwarz, F., 2005 (March 10), *Technical report on the South Eureka district property, Eureka County, Nevada*: Draft of report prepared for Staccato Gold Resources Ltd., 38 p. (incomplete draft).

Johns, K. M., 1990, *EFL Gold Exploration drill program, August 27 – September 8, 1990*: Internal report for EFL Gold Exploration, 4 p.

Jonson, D. C., 1991 (May 6), *Exploration potential for gold deposits in the Ratto Canyon area, Eureka County, Nevada: an analysis of Amselco Minerals, Norse Windfall, BP Minerals /Kennecott, and EFL Gold Mines data 1978-1990*: Report prepared for Summit Minerals Co., 40 p.

Kappes, Cassiday & Associates, 2011a (February 18), *Lookout Mountain project bulk samples, report of metallurgical test work, February 2011*: Report prepared for Timberline Resources Corp., 34 p.

Kappes, Cassiday & Associates, 2011b (May), *Lookout Mountain project bulk samples, report of metallurgical test work, May 2011*: Report prepared for Staccato Gold Resources Ltd./BH Minerals US Inc., 94 p. plus appendices.

Kappes, Cassiday & Associates, 2011c (June), *Lookout Mountain project core composite samples, report of metallurgical test work, June 2011*: Report prepared for Staccato Gold Resources Ltd./BH Minerals US Inc., 104 p. plus appendices.

Kappes, Cassiday & Associates, 2013 (February), *Lookout Mountain project report of metallurgical test work February 2013*: Report prepared for Staccato Gold Resources Ltd./BH Minerals US Inc., 59 p. plus appendices.

Klessig, P., 1985a (July 10), Letter describing the samples sent for preliminary metallurgical test work: Letter from Amselco Exploration Inc. to Hazen Research Inc., 2 p.

Klessig, P., 1985b (July 12), *Samples for metallurgical testing*: Internal Amselco Exploration Inc. memorandum, 3 p.

Langenheim, R. L., Jr., and Larson, E. R., 1973, *Correlation of Great Basin stratigraphic units*: Nevada Bureau of Mines and Geology Bulletin 72, 42 p.

Langhans, J. W., Jr., 1997 (November 4), *Report on bottle roll cyanidation testwork – Lookout Mountain exploration samples, MLI job no. 2460*: Report prepared by McClelland Laboratories, Inc. for Alta Gold Company, 7 p. plus appendices.

Lightner, F., 2007 (December 13), *Staccato Gold – metallurgy Lookout Mountain property*: Internal report for Staccato Gold Resources Ltd., 3 p.

Mako, D. A., 1993a (February 19), *Ratto project, Eureka County, Nevada; 1992 exploration summary*: Internal Barrick Gold Exploration Inc. report, 26 p.

Mako, D. A., 1993b, *Ratto project, Eureka County, Nevada; exploration summary for 1993*: Internal Barrick Gold Exploration report, 10 p.

Mathewson, D. C., 2006, *Lookout Mountain gold deposit, Eureka mining district, Battle Mountain – Eureka gold trend, Nevada*: Geological Society of Nevada field trip paper, 13 p.

McClelland, G. E., 1986 (May 15), *Report on preliminary cyanidation of 10 drill cuttings composites, HLC job no. 1156*: Report prepared by Heinen-Lindstrom Consultants for Tenneco Minerals, 8 p.

Morris, A. J., 2007 (September 28), *South Eureka project, Eureka County, Nevada, September 2005 to August 2007 exploration activities update*: Report prepared for BH Minerals USA Inc., 11 p.

NewFields, 2012 (October 29), *HLP and RSA facilities alternative analysis*: Report prepared for Timberline Resources, 5 p. plus figures.

Nolan, T. B., 1962, *The Eureka mining district, Nevada*: U.S. Geological Survey Professional Paper 406, 78 p.

Nolan, T. B., Merriam, C. W., and Williams, J. S., 1956, *The stratigraphic section in the vicinity of Eureka, Nev.*: U. S. Geological Survey Professional Paper 276, 77 p.

Pratt, C. L., 2004, *Geology and mineralization at the Windfall & Rustler mines, Eureka district, Eureka County, Nevada*: Internal compilation report of Century Gold, LLC, 4 p.

Prenn, N. B., 2005 (May 5), Letter describing the resource estimate for the Lookout Mountain property: Letter to Staccato Gold Resources Ltd. from Mine Development Associates, 5 p.

Retzlaff, F., 1998 (revised January 19), *Lookout Mt reserve calculations*: Report prepared for Alta Gold Co., 3 p. plus attachments.

Roberts, R. J., 1960, *Alignment of mining districts in north-central Nevada*: U. S. Geol. Survey Prof. Paper 400-B, Art. 9.

Roberts, R. J., Montgomery, K. M., and Lehner, R. E., 1967, *Geology and mineral resources of Eureka County, Nevada*: Nevada Bureau of Mines and Geology Bulletin 64, 152 p.

Russell, R. H., 2005 (May 10), *Technical report for the South Eureka district property, Eureka County, Nevada, USA*: Technical report prepared for Staccato Gold Resources Ltd., 65 p. plus appendices.

Russell, R. H., 2007 (January 15), *Technical report and gold resource estimate for the South Eureka district property, Eureka County, Nevada, USA*: Technical report prepared for Staccato Gold Resources Ltd., 76 p. plus appendices.

Schlumberger Water Services USA, Inc., 2013 (March), *Timberline Resources Corporation Lookout Mountain project preliminary hydrogeologic characterization report*: Report prepared for Timberline Resources Corporation.

Schwarz, F., 2005 (February 20), *Proposed drilling, southern Eureka district project*: Report prepared for Staccato Gold Resources Ltd., 9 p.

Shawe, D. R., and Nolan, T. B., 1989, *Gold in the Eureka mining district, Nevada*: U. S. Geological Survey Bulletin 1857-C, p. C27-C37.

SRK Consulting, 2009 (November 13), *Access database review*: Report prepared for BH Minerals USA Inc./Staccato Gold Resources, 6 p.

Steininger, R. C., Klessig, P. J., and Young, T. H., 1987, *Geology of the Ratto Canyon gold deposits, Eureka County, Nevada*, in Johnson, J. I., (ed.), Bulk Mineable Precious Metal Deposits of the Western United States, Guidebook for Field Trips, p. 293-304.

Thompson, R. K., 2011 (February 23), *South Eureka project update, Lookout Mountain title review, Eureka County, Nevada*: Title review prepared by Harris & Thompson, An association of attorneys, for Timberline Resources, 8 p. plus appendices.

Vanderburg, W. O., 1938, *Reconnaissance of mining districts in Eureka County, Nev.*: U.S. Bureau of Mines Information Circular 7022, 66 p.

Wilson, B., 1999 (September 17), *Rocky Canyon*: Internal Alta Gold Co. memo, 1 p.

Wilson, W. B., 1986, *Geology of the Rustler gold deposit,* in Sediment-hosted precious metal deposits of northern Nevada: Nevada Bureau of Mines and Geology Report 40, p. 83.

Wilson, W. L., 1986, *Geology of the Eureka-Windfall gold deposit*, in Sediment-hosted precious metal deposits of northern Nevada: Nevada Bureau of Mines and Geology Report 40, p. 81-82.

Yeomans, B. W., and Norby, C., 2006, *Check assays on drilling – Lookout Mountain pit area, South Eureka project, NV*: Report prepared for Staccato Gold Resources Ltd., 3 p.

20.0 DATE AND SIGNATURE PAGE

Effective Date of report: March 1, 2013

Completion Date of report: April 11, 2013

"Michael M. Gustin"

Michael M. Gustin, C.P.G.

April 11, 2013

Date Signed

21.0 CERTIFICATE OF AUTHORS

MICHAEL M. GUSTIN, C.P.G.

I, Michael M. Gustin, C.P.G., do hereby certify that I am currently employed as Senior Geologist by Mine Development Associates, Inc., 210 South Rock Blvd., Reno, Nevada 89502 and:

1. I graduated with a Bachelor of Science degree in Geology from Northeastern University in 1979 and a Doctor of Philosophy degree in Economic Geology from the University of Arizona in 1990. I have worked as a geologist in the mining industry for more than 25 years. I am a Licensed Professional Geologist in the state of Utah (#5541396-2250), a Licensed Geologist in the state of Washington (# 2297), a Registered Member of the Society of Mining Engineers, and a Certified Professional Geologist of the American Institute of Professional Geologists.
2. 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. I am independent of Timberline Resources Corp., and all of its subsidiaries, as defined in Section 1.5 of NI 43-101 and in Section 1.5 of the Companion Policy to NI 43-101.
3. I visited the Lookout Mountain project site most recently on April 10, 2013.
4. I am responsible for this report titled, "***Updated Technical Report on the Lookout Mountain Project, Eureka County, Nevada USA***", dated April 11, 2013 (the "Technical Report"), subject to my reliance on other experts identified in Section 3.0.
5. I have had no prior involvement with the property or project that is the subject of the Technical Report, other than work related to previous technical reports, cited herein, that I authored.
6. As of the date of the certificate, 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.
7. I have read NI 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.
8. 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.
9. 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 11th day of April, 2013.

"Michael M. Gustin"

Michael M. Gustin

APPENDIX A

Lookout Mountain Project Mining Claims

(From Thompson, 2011, with updated information from Timberline, written communication, 2012)

Count	Claim	BLM: NMC	Eureka County Book	Page	Claimant
1	RAT NO.1	113195	49	184	Maynard E. & Lester A. Bisoni
2	RAT NO. 2	113196	49	185	Maynard E. & Lester A. Bisoni
3	RAT NO. 3	113197	49	186	Maynard E. & Lester A. Bisoni
4	RAT NO. 4	113198	49	187	Maynard E. & Lester A. Bisoni
5	RAT NO. 5	113199	49	188	Maynard E. & Lester A. Bisoni
6	RAT NO. 6	113200	49	189	Maynard E. & Lester A. Bisoni
7	RAT NO. 7	113201	49	190	Maynard E. & Lester A. Bisoni
8	RAT NO. 8	113202	49	191	Maynard E. & Lester A. Bisoni
9	DAVE #1	735946	294	477	Rocky Canyon Mng` Co
10	RAT NO. 9	113203	49	192	Maynard E. & Lester A. Bisoni
11	RAT NO. 10	113204	49	193	Maynard E. & Lester A. Bisoni
12	RAT NO. 11	113205	49	194	Maynard E. & Lester A. Bisoni
13	RAT NO. 12	113206	49	195	Maynard E. & Lester A. Bisoni
14	RAT NO. 13	113207	49	196	Maynard E. & Lester A. Bisoni
15	RAT NO. 14	113208	49	197	Maynard E. & Lester A. Bisoni
16	RAT NO. 15	113209	49	198	Maynard E. & Lester A. Bisoni
17	RAT NO. 16	113210	49	199	Maynard E. & Lester A. Bisoni
18	RAT NO 17	588522	208	183	Mary M. & Geneve Bisoni
19	RAT NO 17A	588526	208	191	Mary M. & Geneve Bisoni
20	RAT NO 18	588523	208	185	Mary M. & Geneve Bisoni
21	RAT NO 18A	588528	208	194	Mary M. & Geneve Bisoni
22	RAT NO 19	588524	208	187	Mary M. & Geneve Bisoni
23	RAT NO. 20	113214	49	203	Maynard E. & Lester A. Bisoni
24	RAT NO. 21	113215	49	204	Maynard E. & Lester A. Bisoni
25	RAT NO. 22	113216	49	205	Maynard E. & Lester A. Bisoni
26	RAT NO. 23	113217	49	206	Maynard E. & Lester A. Bisoni
27	RAT NO. 24	113218	49	207	Maynard E. & Lester A. Bisoni
28	RAT NO. 25	113219	49	208	Maynard E. & Lester A. Bisoni
29	RAT NO. 26	113220	49	209	Maynard E. & Lester A. Bisoni
30	RAT NO. 27	113221	49	210	Maynard E. & Lester A. Bisoni
31	RAT NO. 30	26569	65	115	Maynard E. & Lester A. Bisoni
32	RAT NO. 31	26570	65	116	Maynard E. & Lester A. Bisoni
33	RAT NO 32	588525	208	189	Mary M. & Geneve Bisoni
34	RAT NO 32A	588527	208	191	Mary M. & Geneve Bisoni
35	RAT NO. 33	26572	65	192	Maynard E. & Lester A. Bisoni
36	RAT NO. 38	26573	65	117	Maynard E. & Lester A. Bisoni
37	RAT NO. 39	26574	65	118	Maynard E. & Lester A. Bisoni
38	RAT NO. 40	26575	65	119	Maynard E. & Lester A. Bisoni
39	RAT NO. 41	26576	65	120	Maynard E. & Lester A. Bisoni
40	RAT NO. 42	26577	65	121	Maynard E. & Lester A. Bisoni
41	RAT NO. 43	26578	65	122	Maynard E. & Lester A. Bisoni
42	RAT NO. 44	26579	65	123	Maynard E. & Lester A. Bisoni
43	RAT NO. 45	26580	65	124	Maynard E. & Lester A. Bisoni
44	RAT NO. 46	26581	65	125	Maynard E. & Lester A. Bisoni

Count	Claim	BLM: NMC	Eureka County Book	Page	Claimant
45	RAT NO. 47	26582	65	126	Maynard E. & Lester A. Bisoni
46	RAT NO. 48	26583	65	127	Maynard E. & Lester A. Bisoni
47	RAT NO. 50	26584	65	128	Maynard E. & Lester A. Bisoni
48	RAT NO. 51	26585	65	129	Maynard E. & Lester A. Bisoni
49	RAT NO. 52	26586	65	130	Maynard E. & Lester A. Bisoni
50	RAT NO. 53	26587	65	131	Maynard E. & Lester A. Bisoni
51	RAT NO. 54	26588	65	132	Maynard E. & Lester A. Bisoni
52	RAT NO. 55	26589	65	133	Maynard E. & Lester A. Bisoni
53	RAT NO. 56	26590	65	134	Maynard E. & Lester A. Bisoni
54	SELRAT # 1	70755	70	478	Amselco Expl Inc
55	SELRAT # 2	70756	70	479	Amselco Minerals Inc
56	SELRAT # 3	70757	70	480	Amselco Expl Inc
57	SELRAT # 4	70758	70	481	Amselco Minerals Inc
58	SELRAT # 5	70759	70	482	Amselco Expl Inc
59	SELRAT # 6	70760	70	483	Amselco Minerals Inc
60	SELRAT # 7	70761	70	484	Amselco Expl Inc
61	SELRAT # 8	70762	70	485	Amselco Minerals Inc
62	SELRAT # 9	70763	70	486	Amselco Minerals Inc
63	SELRAT # 10	70764	70	487	Amselco Minerals Inc
64	SELRAT # 11	70765	70	488	Amselco Minerals Inc
65	SELRAT # 12	70766	70	489	Amselco Minerals Inc
66	SELRAT # 13	70767	70	490	Amselco Minerals Inc
67	SELRAT # 14	261574	107	499	Amselco Minerals Inc
68	SELRAT # 15	70769	70	492	Amselco Minerals Inc
69	SELRAT # 16	70770	70	493	Amselco Minerals Inc
70	SELRAT # 17	70771	70	494	Amselco Minerals Inc
71	SELRAT # 18	70772	70	495	Amselco Minerals Inc
72	SELRAT # 19	70773	70	496	Amselco Minerals Inc
73	SELRAT # 20	70774	70	497	Amselco Minerals Inc
74	SELRAT # 21	70775	70	498	Amselco Minerals Inc
75	SELRAT # 22	70776	70	499	Amselco Minerals Inc
76	SELRAT # 23	70777	70	500	Amselco Minerals Inc
77	SELRAT # 24	70778	70	501	Amselco Minerals Inc
78	SELRAT # 25	70779	70	507	Amselco Minerals Inc
79	SELRAT # 26	70780	70	508	Amselco Minerals Inc
80	SELRAT # 27	70781	70	509	Amselco Minerals Inc
81	SELRAT # 28	70782	70	510	Amselco Minerals Inc
82	SELRAT # 29	70783	70	511	Amselco Minerals Inc
83	SELRAT # 30	70784	70	512	Amselco Minerals Inc
84	SELRAT # 31	70785	70	513	Amselco Minerals Inc
85	SELRAT # 32	70786	70	514	Amselco Minerals Inc
86	SELRAT # 33	70787	70	515	Amselco Minerals Inc
87	SELRAT # 34	70788	70	516	Amselco Minerals Inc
88	SELRAT # 35	70789	70	517	Amselco Minerals Inc

Count	Claim	BLM: NMC	Eureka County Book	Page	Claimant
89	SELRAT # 36	70790	70	518	Amselco Minerals Inc
90	SELRAT # 37	70791	70	519	Amselco Minerals Inc
91	SELRAT # 38	70792	70	520	Amselco Minerals Inc
92	SELRAT # 39	70793	70	521	Amselco Minerals Inc
93	SELRAT # 40	70794	70	522	Amselco Minerals Inc
94	SELRAT # 41	70795	70	523	Amselco Minerals Inc
95	SELRAT # 42	70796	70	524	Amselco Expl Inc
96	SELRAT # 43	70797	70	525	Amselco Minerals Inc
97	SELRAT # 44	70798	70	526	Amselco Expl Inc
98	SELRAT # 45	70799	70	527	Amselco Minerals Inc
99	SELRAT # 46	70800	70	528	Amselco Expl Inc
100	SELRAT # 47	70801	70	529	Amselco Expl Inc
101	SELRAT # 48	70802	70	530	Amselco Minerals Inc
102	SELRAT # 49	70803	70	531	Amselco Expl Inc
103	SELRAT # 50	70804	70	532	Amselco Minerals Inc
104	SELRAT # 51	70805	70	533	Amselco Minerals Inc
105	SELRAT # 52	70806	70	534	Amselco Minerals Inc
106	SELRAT # 53	70807	70	535	Amselco Minerals Inc
107	SELRAT # 54	70808	70	536	Amselco Minerals Inc
108	SELRAT # 55	70809	70	502	Amselco Minerals Inc
109	SELRAT # 56	70810	70	203	Amselco Minerals Inc
110	SELRAT # 57	70811	70	504	Amselco Minerals Inc
111	SELRAT # 58	70812	70	405	Amselco Minerals Inc
112	SELRAT # 59	70813	70	406	Amselco Minerals Inc
113	SELRAT # 60	104570	74	539	Amselco Expl Inc
114	SELRAT # 61	104571	74	540	Amselco Expl Inc
115	SELRAT # 62	104572	74	541	Amselco Expl Inc
116	SELRAT # 63	104573	74	542	Amselco Expl Inc
117	SELRAT # 64	104574	74	543	Amselco Expl Inc
118	SELRAT # 65	104575	74	544	Amselco Expl Inc
119	SELRAT # 66	104576	74	545	Amselco Expl Inc
120	SELRAT # 67	104577	74	546	Amselco Expl Inc
121	SELRAT # 68	104578	74	547	Amselco Expl Inc
122	SELRAT # 69	104579	74	548	Amselco Expl Inc
123	SELRAT # 70	104580	74	549	Amselco Expl Inc
124	SELRAT # 71	104581	74	550	Amselco Expl Inc
125	SELRAT # 72	104582	74	551	Amselco Expl Inc
126	SELRAT # 73	104583	74	552	Amselco Expl Inc
127	SELRAT # 74	104584	74	553	Amselco Expl Inc
128	SELRAT # 75	104585	74	554	Amselco Expl Inc
129	SELRAT # 76	104586	74	555	Amselco Expl Inc
130	SELRAT # 77	104587	74	556	Amselco Expl Inc
131	SELRAT # 78	104588	74	557	Amselco Expl Inc
132	SELRAT # 79	104589	74	558	Amselco Expl Inc

Count	Claim	BLM: NMC	Eureka County Book	Page	Claimant
133	SELRAT # 80	104590	74	559	Amselco Expl Inc
134	SELRAT # 81	104591	74	560	Amselco Expl Inc
135	SELRAT # 82	104592	74	561	Amselco Expl Inc
136	SELRAT # 83	104593	74	562	Amselco Expl Inc
137	SELRAT # 84	104594	74	563	Amselco Expl Inc
138	SELRAT # 85	104595	74	564	Amselco Expl Inc
139	SELRAT # 86	104596	74	565	Amselco Expl Inc
140	SELRAT # 87	104597	74	66	Amselco Expl Inc
141	SELRAT # 88	104598	74	567	Amselco Expl Inc
142	SELRAT # 89	104599	74	568	Amselco Expl Inc
143	SELRAT # 90	104600	74	569	Amselco Expl Inc
144	SELRAT # 91	104601	74	570	Amselco Expl Inc
145	SELRAT # 92	104602	74	571	Amselco Expl Inc
146	SELRAT # 93	104603	74	572	Amselco Expl Inc
147	SELRAT # 94	104604	74	573	Amselco Expl Inc
148	SELRAT # 95	104605	74	574	Amselco Expl Inc
149	SELRAT # 96	104606	74	575	Amselco Expl Inc
150	SELRAT # 97	104607	74	576	Amselco Expl Inc
151	SELRAT # 98	104608	74	577	Amselco Expl Inc
152	SELRAT # 99	104609	74	578	Amselco Expl Inc
153	SELRAT # 100	104610	74	579	Amselco Expl Inc
154	SELRAT # 101	104611	74	580	Amselco Expl Inc
155	SELRAT # 102	104612	74	581	Amselco Expl Inc
156	SELRAT # 103	104613	74	582	Amselco Expl Inc
157	SELRAT # 104	104614	74	583	Amselco Expl Inc
158	SELRAT # 105	104615	74	584	Amselco Expl Inc
159	SELRAT # 106	104616	74	585	Amselco Expl Inc
160	SELRAT # 107	104617	74	586	Amselco Expl Inc
161	SELRAT # 108	104618	74	587	Amselco Expl Inc
162	SELRAT # 109	104619	74	588	Amselco Expl Inc
163	SELRAT # 110	104620	74	589	Amselco Expl Inc
164	SELRAT # 111	104621	74	590	Amselco Expl Inc
165	SELRAT # 112	104622	74	591	Amselco Expl Inc
166	SELRAT # 113	104623	74	592	Amselco Expl Inc
167	SELRAT # 114	104624	74	593	Amselco Expl Inc
168	SELRAT # 115	104625	74	594	Amselco Expl Inc
169	SELRAT # 116	104626	74	595	Amselco Expl Inc
170	SELRAT # 117	104627	74	596	Amselco Expl Inc
171	SELRAT # 118	104628	74	597	Amselco Expl Inc
172	SELRAT # 119	104629	74	598	Amselco Expl Inc
173	SELRAT # 120	104630	74	599	Amselco Expl Inc
174	SELRAT # 121	104631	74	600	Amselco Expl Inc
175	SELRAT # 122	104632	74	601	Amselco Expl Inc
176	SELRAT # 123	104633	74	602	Amselco Expl Inc

Count	Claim	BLM: NMC	Eureka County Book	Page	Claimant
177	SELRAT # 124	104634	74	603	Amselco Expl Inc
178	SELRAT # 125	104635	74	604	Amselco Expl Inc
179	SELRAT # 126	104636	74	605	Amselco Expl Inc
180	SELRAT # 127	104637	74	606	Amselco Expl Inc
181	SELRAT # 128	104638	74	607	Amselco Expl Inc
182	SELRAT # 129	104639	74	608	Amselco Expl Inc
183	SELRAT # 130	104640	74	609	Amselco Expl Inc
184	SELRAT # 131	104641	74	610	Amselco Expl Inc
185	SELRAT # 132	104642	74	611	Amselco Expl Inc
186	SELRAT # 133	104643	74	612	Amselco Expl Inc
187	SELRAT # 134	104644	74	613	Amselco Expl Inc
188	SELRAT # 135	104645	74	614	Amselco Expl Inc
189	SELRAT # 136	104646	74	615	Amselco Expl Inc
190	SELRAT # 137	104647	74	616	Amselco Expl Inc
191	SELRAT # 138	104648	74	617	Amselco Expl Inc
192	SELRAT # 139	203222	95	527	Amselco Expl Inc
193	SELRAT # 139A	141787	79	164	Amselco Expl Inc
194	SELRAT # 140	141788	79	165	Amselco Expl Inc
195	SELRAT # 141	141789	79	166	Amselco Expl Inc
196	SELRAT # 142	141790	79	167	Amselco Expl Inc
197	SELRAT # 143	141791	79	168	Amselco Expl Inc
198	SELRAT # 144	141792	79	169	Amselco Expl Inc
199	SELRAT # 145	141793	79	170	Amselco Expl Inc
200	SELRAT # 146	141794	79	171	Amselco Expl Inc
201	SELRAT # 147	141795	79	172	Amselco Expl Inc
202	SELRAT # 148	141796	79	173	Amselco Expl Inc
203	SELRAT # 149	141797	79	174	Amselco Expl Inc
204	SELRAT # 150	141798	79	175	Amselco Expl Inc
205	SELRAT # 151	141799	79	176	Amselco Expl Inc
206	SELRAT # 152	141800	79	177	Amselco Expl Inc
207	SELRAT # 153	141801	79	178	Amselco Expl Inc
208	SELRAT # 154	141802	79	179	Amselco Expl Inc
209	SELRAT # 155	141803	79	180	Amselco Expl Inc
210	SELRAT # 156	141804	79	181	Amselco Expl Inc
211	SELRAT # 157	141805	79	182	Amselco Expl Inc
212	SELRAT # 158	141806	79	183	Amselco Expl Inc
213	SELRAT # 159	141807	79	184	Amselco Expl Inc
214	SELRAT # 160	141808	79	185	Amselco Expl Inc
215	SELRAT # 161	141809	79	186	Amselco Expl Inc
216	SELRAT # 162	141810	79	187	Amselco Expl Inc
217	SELRAT # 163	141811	79	188	Amselco Expl Inc
218	SELRAT # 164	141812	79	189	Amselco Expl Inc
219	SELRAT # 165	141813	79	190	Amselco Expl Inc
220	SELRAT # 166	141814	79	191	Amselco Expl Inc

Count	Claim	BLM: NMC	Eureka County Book	Page	Claimant
221	SELRAT # 167	141815	79	192	Amselco Expl Inc
222	SELRAT # 168	141816	79	193	Amselco Expl Inc
223	SELRAT # 169	141817	79	194	Amselco Expl Inc
224	SELRAT # 170	141818	79	195	Amselco Expl Inc
225	SELRAT # 171	141819	79	196	Amselco Expl Inc
226	SELRAT # 172	141820	79	197	Amselco Expl Inc
227	SELRAT # 173	141821	79	198	Amselco Expl Inc
228	SELRAT # 174	141822	79	199	Amselco Expl Inc
229	SELRAT # 175	141823	79	200	Amselco Expl Inc
230	SELRAT # 176	141824	79	201	Amselco Expl Inc
231	SELRAT # 177	141825	79	202	Amselco Expl Inc
232	SELRAT # 178	141826	79	203	Amselco Expl Inc
233	SELRAT # 179	141827	79	204	Amselco Expl Inc
234	SELRAT # 180	141828	79	205	Amselco Expl Inc
235	SELRAT # 181	141829	79	206	Amselco Expl Inc
236	SELRAT # 182	141830	79	207	Amselco Expl Inc
237	SELRAT # 183	141831	79	208	Amselco Expl Inc
238	SELRAT # 184	141832	79	209	Amselco Expl Inc
239	SELRAT # 185	141833	79	210	Amselco Expl Inc
240	SELRAT # 186	141834	79	211	Amselco Expl Inc
241	SELRAT # 187	141835	79	212	Amselco Expl Inc
242	SELRAT # 188	141836	79	213	Amselco Expl Inc
243	SELRAT # 189	261467	107	500	Amselco Expl Inc
244	SELRAT # 190	261468	107	501	Amselco Expl Inc
245	SELRAT # 191	261469	107	502	Amselco Expl Inc
246	SELRAT # 192	261470	107	503	Amselco Expl Inc
247	SELRAT # 193	261471	107	504	Amselco Expl Inc
248	SELRAT # 194	261472	107	505	Amselco Expl Inc
249	SELRAT # 195	261473	107	506	Amselco Expl Inc
250	SELRAT # 196	261474	107	507	Amselco Expl Inc
251	SELRAT # 197	261475	107	508	Amselco Expl Inc
252	SELRAT # 198	261476	107	509	Amselco Expl Inc
253	SELRAT # 199	261477	107	510	Amselco Expl Inc
254	SELRAT # 200	261478	107	511	Amselco Expl Inc
255	SELRAT # 201	261479	107	512	Amselco Expl Inc
256	SELRAT # 202	261480	107	513	Amselco Expl Inc
257	SELRAT # 203	261481	107	514	Amselco Expl Inc
258	SELRAT # 204	261482	107	515	Amselco Expl Inc
259	SELRAT # 205	261483	107	516	Amselco Expl Inc
260	SELRAT # 206	261484	107	517	Amselco Expl Inc
261	SELRAT # 207	261485	107	518	Amselco Expl Inc
262	SELRAT # 208	261486	107	519	Amselco Expl Inc
263	SELRAT # 209	261487	107	520	Amselco Expl Inc
264	SELRAT # 210	261488	107	521	Amselco Expl Inc

Count	Claim	BLM: NMC	Eureka County Book	Page	Claimant
265	SELRAT # 211	261489	107	522	Amselco Expl Inc
266	SELRAT # 212	261490	107	523	Amselco Expl Inc
267	SELRAT # 213	261491	107	524	Amselco Expl Inc
268	SELRAT # 214	261492	107	525	Amselco Expl Inc
269	SELRAT # 215	261493	107	526	Amselco Expl Inc
270	SELRAT # 216	261494	107	527	Amselco Expl Inc
271	SELRAT # 217	261495	107	528	Amselco Expl Inc
272	SELRAT # 218	261496	107	529	Amselco Expl Inc
273	SELRAT # 219	261497	107	530	Amselco Expl Inc
274	SELRAT # 220	261498	107	531	Amselco Expl Inc
275	SELRAT # 221	261499	107	532	Amselco Expl Inc
276	SELRAT # 222	261500	107	533	Amselco Expl Inc
277	SELRAT # 223	261501	107	534	Amselco Expl Inc
278	SELRAT # 224	261502	107	535	Amselco Expl Inc
279	SELRAT # 225	261503	107	536	Amselco Expl Inc
280	SELRAT # 226	261504	107	537	Amselco Expl Inc
281	SELRAT # 227	261505	107	538	Amselco Expl Inc
282	SELRAT # 228	261506	107	539	Amselco Expl Inc
283	SELRAT # 229	261507	107	540	Amselco Expl Inc
284	SELRAT # 230	261508	107	541	Amselco Expl Inc
285	SELRAT # 231	261509	107	542	Amselco Expl Inc
286	SELRAT # 232	261510	107	543	Amselco Expl Inc
287	SELRAT # 233	261511	107	544	Amselco Expl Inc
288	SELRAT # 234	261512	107	545	Amselco Expl Inc
289	SELRAT # 236	261513	107	546	Amselco Expl Inc
290	SELRAT # 237	261514	107	547	Amselco Expl Inc
291	SELRAT # 238	261515	107	548	Amselco Expl Inc
292	SELRAT # 239	261516	107	549	Amselco Expl Inc
293	SELRAT # 240	261517	107	550	Amselco Expl Inc
294	SELRAT # 241	261518	107	551	Amselco Expl Inc
295	SELRAT # 246	261519	107	552	Amselco Expl Inc
296	SELRAT # 247	261520	107	553	Amselco Expl Inc
297	SELRAT # 248	261521	107	554	Amselco Expl Inc
298	SELRAT # 249	261522	107	555	Amselco Expl Inc
299	SELRAT # 250	261523	107	556	Amselco Expl Inc
300	SELRAT # 251	261524	107	557	Amselco Expl Inc
301	SELRAT # 255	261525	107	558	Amselco Expl Inc
302	SELRAT # 256	261526	107	559	Amselco Expl Inc
303	SELRAT # 257	261527	107	560	Amselco Expl Inc
304	SELRAT # 258	261528	107	561	Amselco Expl Inc
305	SELRAT # 259	261529	107	562	Amselco Expl Inc
306	SELRAT # 260	261530	107	563	Amselco Expl Inc
307	SELRAT # 261	261531	107	564	Amselco Expl Inc
308	SELRAT # 262	261532	107	565	Amselco Expl Inc

Count	Claim	BLM: NMC	Eureka County Book	Page	Claimant
309	SELRAT # 263	261533	107	566	Amselco Expl Inc
310	SELRAT # 264	261534	107	567	Amselco Expl Inc
311	SELRAT # 265	261535	107	568	Amselco Expl Inc
312	SELRAT # 266	261536	107	569	Amselco Expl Inc
313	SELRAT # 267	261579	107	570	Amselco Expl Inc
314	SELRAT # 268	261537	107	571	Amselco Expl Inc
315	SELRAT # 269	261538	107	572	Amselco Expl Inc
316	SELRAT # 270	261539	107	573	Amselco Expl Inc
317	SELRAT # 271	261540	107	574	Amselco Expl Inc
318	SELRAT # 272	261541	107	575	Amselco Expl Inc
319	SELRAT # 273	261542	107	576	Amselco Expl Inc
320	SELRAT # 274	261543	107	577	Amselco Expl Inc
321	SELRAT # 283	261544	107	578	Amselco Expl Inc
322	SELRAT # 284	261545	107	579	Amselco Expl Inc
323	SELRAT # 285	261546	107	580	Amselco Expl Inc
324	SELRAT # 286	261547	107	581	Amselco Expl Inc
325	SELRAT # 351	261548	107	582	Amselco Expl Inc
326	SELRAT # 359	261549	107	583	Amselco Expl Inc
327	SELRAT # 368	261550	107	584	Amselco Expl Inc
328	SELRAT # 374	261551	107	585	Amselco Expl Inc
329	SELRAT # 375	261552	107	586	Amselco Expl Inc
330	SELRAT # 376	261553	107	587	Amselco Expl Inc
331	SELRAT # 377	261554	107	588	Amselco Expl Inc
332	SELRAT # 378	261555	107	589	Amselco Expl Inc
333	SELRAT # 379	261556	107	590	Amselco Expl Inc
334	SELRAT # 380	261557	107	591	Amselco Expl Inc
335	SELRAT # 381	261558	107	592	Amselco Expl Inc
336	SELRAT # 382	261559	107	593	Amselco Expl Inc
337	SELRAT # 383	261560	107	594	Amselco Expl Inc
338	SELRAT # 384	261561	107	595	Amselco Expl Inc
339	SELRAT # 385	261562	107	596	Amselco Expl Inc
340	SELRAT # 386	261563	107	597	Amselco Expl Inc
341	SELRAT # 387	261564	107	598	Amselco Expl Inc
342	SELRAT # 388	261565	107	599	Amselco Expl Inc
343	SELRAT # 389	261566	107	600	Amselco Expl Inc
344	SELRAT # 390	261567	107	601	Amselco Expl Inc
345	SELRAT # 391	261568	107	602	Amselco Expl Inc
346	SELRAT # 392	261569	107	603	Amselco Expl Inc
347	SELRAT # 393	261570	107	604	Amselco Expl Inc
348	SELRAT # 394	261571	107	605	Amselco Expl Inc
349	SELRAT # 395	261572	107	606	Amselco Expl Inc
350	SELRAT # 396	261573	107	607	Amselco Expl Inc
351	SELRAT # 397	265000	110	138	Amselco Expl Inc
352	SELRAT # 398	265001	110	139	Amselco Expl Inc

Count	Claim	BLM: NMC	Eureka County Book	Page	Claimant
353	SELRAT # 399	265002	110	140	Amselco Expl Inc
354	SELRAT # 400	265003	110	141	Amselco Expl Inc
355	SELRAT # 401	265004	110	142	Amselco Expl Inc
356	SELRAT # 402	265005	110	143	Amselco Expl Inc
357	SELRAT # 403	265006	110	144	Amselco Expl Inc
358	SELRAT # 404	265007	110	145	Amselco Expl Inc
359	SELRAT # 405	290890	118	163	Amselco Expl Inc
360	SELRAT # 406	290598	118	2	Amselco Expl Inc
361	SELRAT # 407	290891	118	164	Amselco Expl Inc
362	SELRAT # 408	290892	118	165	Amselco Expl Inc
363	SELRAT # 409	290893	118	166	Amselco Expl Inc
364	SELRAT # 410	290894	118	167	Amselco Expl Inc
365	SELRAT # 411	290895	118	168	Amselco Expl Inc
366	SELRAT # 412	290896	118	169	Amselco Expl Inc
367	SELRAT # 413	290897	118	170	Amselco Expl Inc
368	SELRAT # 414	290898	118	171	Amselco Expl Inc
369	SELRAT # 415	290899	118	172	Amselco Expl Inc
370	SELRAT # 416	290900	118	173	Amselco Expl Inc
371	SELRAT # 417	290901	118	174	Amselco Expl Inc
372	SELRAT # 418	292486	118	285	Amselco Expl Inc
373	TREVOR #1	735947	294	478	Rocky Canyon Mng Co
374	TLRrat 1	1056560	525	185	Timberline Resources Corp
375	TLRrat 2	1056561	525	186	Timberline Resources Corp
376	TLRrat 3	1056562	525	187	Timberline Resources Corp
377	TLRrat 4	1056563	525	188	Timberline Resources Corp
378	TLRrat 5	1056564	525	189	Timberline Resources Corp