Technical Report on the Northumberland Project Nye County, Nevada, USA:

Resource Update 2008

Prepared by

Fronteer Development Group Inc.
(FRG: TSX, AMEX)

July 28, 2008

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1.0 EXECUTIVE SUMMARY

This technical report on the Northumberland project was prepared by Fronteer Development Group Inc. ("Fronteer") as an update to the independent technical report by Mineral Development Associates ("MDA"), dated November 1, 2007. The update describes a new Mineral Resource estimate that incorporates new drilling information collected after completion of the previous estimate, which is described in the MDA report. This report incorporates most of MDA's previous report, with the exception of Section 17, describing the updated Mineral Resource, and other updates where appropriate. The 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 Northumberland project is comprised of unpatented lode mining claims, patented mining claims, and fee lands owned by Nevada Western Gold LLC ("Nevada Western"), a wholly owned subsidiary of NewWest Gold Corp. USA ("NewWest"). Fronteer acquired 100% of NewWest, including the Northumberland project, on September 24, 2007.

The Northumberland Mineral Resources discussed in this technical report were estimated in April and May 2008 by Christopher Lee, Fronteer Chief Geoscientist, with the assistance of Jim Ashton, NewWest Senior Engineer. Mr. Lee and Mr. Ashton are qualified persons under Canadian Securities Administrators' National Instrument 43-101. Mr. Lee is an employee and shareholder of Fronteer. Mr. Ashton is also an employee of the company.

1.1 Introduction

The Northumberland project is located near the geographic center of Nevada in northern Nye County, approximately 300-road miles northwest of Las Vegas and 250-road miles east-southeast of Reno. The towns of Austin and Round Mountain are the nearest population centers to the project. Open-pit heap-leach mining activities were undertaken at the project from 1981 through 1990.

The Northumberland project is comprised of approximately 34,000 acres (13,760ha) of unpatented lode claims and 3,885 acres (1,572ha) of patented mining claims, patented millsite claims, and fee lands, all of which are owned or controlled by Nevada Western Gold LLC ("Nevada Western"), a wholly owned subsidiary of NewWest. The fee lands include two blocks, the Upper Site and Lower Site. The Upper Site is entirely surrounded by lands administered by the U.S. Forest Service and the Lower Site is surrounded by public lands administered by the Bureau of Land Management. All mining activities have taken place at the Upper Site, while some of the processing and other mining infrastructure from modern mining operations was located at the Lower Site. The unpatented claims are held in three discrete blocks, the largest of which surrounds the fee lands at the Upper Site. All of the Mineral Resources described this report lie within the fee lands owned by Nevada Western. Title to the property was verified in an independent title report by Erwin and Thompson LLP that was commissioned by NewWest, completed in June 2005, and supplemented most recently in July 2007.

A small portion of the Mineral Resources summarized below are subject to a 1% net smelter returns royalty.

1.2 Geology and Mineralization

The Northumberland mineralization occurs as stacked, sediment-hosted, finely disseminated, Carlin-type gold-silver deposits. Intrusive rocks also host significant mineralization. This deposit type and the overall geologic setting of the mineralization are quite similar to the Goldstrike deposit of the northern Carlin Trend. The gold-silver mineralization at Northumberland occurs in a cluster of eight more-or-less spatially distinct deposits that form an arcuate belt approximately 1.6 miles long in an east-west direction and 0.3 miles wide. The deposits are generally stratiform and follow three low-angle tectono-stratigraphic host horizons near the crest and within the west limb of the Northumberland anticline. The host horizons are structural discontinuities that include the intersection zone of the Prospect and Mormon thrusts and two bedding-plane faults. The overall geometry of the deposits and the higher-grade zones within the deposits appears to be locally influenced by east-trending high-angle structures in the area of the crest of the anticline.

Gold occurs as micron- to sub-micron-size particles that are intimately associated with sulfides. The gold is disseminated primarily within sedimentary units, although intrusive rocks host a significant portion of the mineralization. Silver occurs in a complex assemblage of copper-antimony sulfides and arsenic sulfosalts. The total sulfide content is less than five percent; pyrite, arsenopyrite, and marcasite are the most abundant species present. The mineralization is associated with both silicification and decalcification of carbonate hosts, and quartz-illite-pyrite alteration of igneous hosts.

1.3 Mining and Exploration History

The Northumberland property was in production under the operatorship of Northumberland Mining Company from 1939 to 1942, Cyprus Mining Company ("Cyprus") from 1981 to 1984, and Western States Minerals Corporation ("WSMC") from 1985 to 1990. The Northumberland Mining Company production details are not documented. Cyprus and WSMC mined over seven-million tons of ore from several open pits and produced over 230,000 ounces of gold and 485,000 ounces of silver by heap leaching of oxidized and partially oxidized ore that was either crushed or run-of-mine. Gold recoveries for crushed oxide ore and run-of-mine, partially oxidized ore from these operations has been estimated at approximately 75% and 50%, respectively.

Reconnaissance geologic mapping and soil geochemical sampling have been completed over most of the project, with detailed mapping undertaken in the area of the deposits. Various geophysical surveys cover significant portions of the property.

1.4 Drill-Hole and Assay Database

The Northumberland digital database used in the estimation of Mineral Resources includes 1,502 drill holes totaling 606,369.5 ft of drilling. These holes were drilled from 1968 through

2007 by Homestake Mining Company, Idaho Mining Corporation, Cyprus, WSMC, and Newmont by air-track, conventional rotary, reverse circulation, and diamond core methods. Entire series of older drill holes are not included in the database due to sample quality and assay reliability issues.

Although QA/QC programs were apparently not systematically implemented and documented prior to Newmont's 2004-2007 exploration work, check assay and twin-hole data from the Cyprus and WSMC drilling campaigns were compiled by MDA in 2006. An analysis of these data found no serious problems with the assay database, although additional check-assay data are needed. The twin-hole data suggests that down-hole contamination may be present locally. Several possible contaminated intervals were identified during the grade modeling of the deposits. These suspect assay intervals, as well as the contaminated volumes, were excluded from the resource estimation.

A number of assay pulps and/or rejects from mineralized WSMC drill intervals should be retrieved from storage and analyzed by an independent laboratory. All further drilling programs at Northumberland should continue the QA/QC procedures implemented by Newmont in 2004.

1.5 Metallurgical Testing

Metallurgical studies indicate that differences in the amenability of the Northumberland mineralization to direct cyanidation are primarily due to the degree of oxidation, as opposed to deposit-specific characteristics or crush size. Oxide material appears to be amenable to direct cyanidation by heap leaching, while sulfide mineralization requires oxidation prior to cyanidation. Sulfide mineralization is refractory due the close association of micron-size gold with sulfides and the local presence of preg-robbing carbonaceous material.

Diagnostic metallurgical testing completed to date indicates that gold and silver extractions from sulfide mineralization can be optimized by utilizing the N_2TEC flotation technology of Newmont with autoclaving of the concentrates. Extractions in excess of 90% for both gold and silver in the flotation concentrate were attained in the samples tested.

1.6 Mineral Resource Estimation

The Northumberland gold and silver resources were estimated in April and May 2008 by Fronteer Development Group personnel (Table 1.1). Resource cut-off grades were chosen to define material that might have a reasonable prospect of economic extraction under the following scenarios: open-pit mining and heap leaching of oxide mineralization [0.3 g/t Au (0.01 opt) cut-off]; open-pit mining and treatment of sulfide material [1.0 g/t Au (0.03 opt) cut-off]; and underground mining and processing of sulfide material [2.5 g/t Au (0.07 opt) cut-off]. No silver resources are classified as Measured due to the generalized nature of the estimation, and only silver lying within the modeled gold zones was tabulated. Silver resources are compiled from all modeled blocks that exceed the gold cut-offs; no silver cut-off is applied.

Table 1.1 - Northumberland Classified Resources July 2008, Fronteer Development Group

			MEASURED								
			Gold								Gold Equivalent*
Resource Type	Cut-off (g/t)	Cut-off (opt)	Tonnes	g/t	opt	oz					oz
Open Pit Oxide	0.3	0.01	12,888,000	1.19	0.035	492,000					492,000
Open Pit Sulfide	1.0	0.03	13,781,000	2.31	0.067	1,022,000					1,022,000
Underground	2.5	0.07									
TOTAL			**26,669,000**	**1.77**	**0.05**	**1,514,000**					**1,514,000**

			INDICATED								
			Gold				Silver				Gold Equivalent*
Resource Type	Cut-off (g/t)	Cut-off (opt)	Tonnes	g/t	opt	oz	Tonnes	g/t	opt	oz	oz
Open Pit Oxide	0.3	0.01	739,000	1.94	0.057	46,000	13,627,000	7.31	0.213	3,202,000	110,000
Open Pit Sulfide	1.0	0.03	8,794,000	2.35	0.069	665,000	22,575,000	8.01	0.234	5,815,000	781,000
Underground	2.5	0.07	316,000	3.35	0.098	34,000	316,000	4.43	0.129	45,000	35,000
TOTAL			**9,849,000**	**2.35**	**0.07**	**745,000**	**36,518,000**	**7.72**	**0.23**	**9,062,000**	**926,000**

			MEASURED & INDICATED								
			Gold				Silver				Gold Equivalent*
Resource Type	Cut-off (g/t)	Cut-off (opt)	Tonnes	g/t	opt	oz	Tonnes	g/t	opt	oz	oz
Open Pit Oxide	0.3	0.01	13,627,000	1.23	0.036	538,000	13,627,000	7.31	0.213	3,202,000	602,000
Open Pit Sulfide	1.0	0.03	22,575,000	2.32	0.068	1,687,000	22,575,000	8.01	0.234	5,815,000	1,803,000
Underground	2.5	0.07	316,000	3.35	0.098	34,000	316,000	4.43	0.129	45,000	35,000
TOTAL			**36,518,000**	**1.92**	**0.06**	**2,259,000**	**36,518,000**	**7.72**	**0.23**	**9,062,000**	**2,440,000**

			INFERRED								
			Gold				Silver				Gold Equivalent*
Resource Type	Cut-off (g/t)	Cut-off (opt)	Tonnes	g/t	opt	oz	Tonnes	g/t	opt	oz	oz
Open Pit Oxide	0.3	0.01	17,000	2.38	0.069	1,300	17,000	10.98	0.320	6,000	1,400
Open Pit Sulfide	1.0	0.03	1,335,000	2.59	0.075	111,000	1,335,000	7.69	0.224	330,000	118,000
Underground	2.5	0.07	5,574,000	3.70	0.108	664,000	5,574,000	5.95	0.174	1,067,000	685,000
TOTAL			**6,926,000**	**3.49**	**0.10**	**776,300**	**6,926,000**	**6.30**	**0.18**	**1,403,000**	**804,400**

**AuEq calculated at a Au:Ag ratio of 50:1*

1.7 Exploration Potential

The potential to find additional gold resources at Northumberland is considered to be excellent, both within the deposit area and in other portions of the large property holdings. The possibility of high-grade gold mineralization within structurally controlled zones in the core areas of the deposits warrants careful evaluation and drill testing. There is also potential to discover additional mineralization in the general area of the deposits in geologic settings similar to the known deposits.

There are a number of targets well beyond the limits of the Mineral Resources that are defined by soil and/or rock gold anomalies and favorable geology. Fronteer plans to drill test a number of targets within, and outside, the main resource area.

1.8 Conclusions and Recommendations

There is excellent exploration potential at Northumberland, both within the deposit area and in other areas of the large property holdings. Within the deposit area, gold-silver mineralization in each of the three tectono-stratigraphic horizons locally breaches the intervening rock units and merges with mineralization in the neighboring host horizon. These discordant zones are frequently cored by high-grade mineralization that is presumably structurally controlled and in many cases not properly defined by drilling. These high-grade core zones warrant further drill testing, as do the possible deeper extensions of the controlling structures. In addition, There are many open, untested ares within the shallower, more oxidized portions of the deposit that may allow expansion of the known deposits. Fronteer also plans to explore beyond the limits of the known deposits in an attempt to discover additional mineralization in similar geologic settings.

2.0 INTRODUCTION

This technical report on the Northumberland project was prepared by Fronteer Development Group Inc. ("Fronteer"), which is based in Vancouver, British Columbia and listed on the TSX and AMEX stock exchanges under the trading symbol "FRG". The report describes an updated Mineral Resource estimate for the Northumberland deposit that incorporates new drill hole data collected since the previous estimate, which is documented in the independent technical report by Mineral Development Associates ("MDA"), dated November 1, 2007. This report incorporates most of MDA's report, with the exception of Section 17, describing the updated Mineral Resource, and other updates where appropriate. The 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 Northumberland project is comprised of unpatented lode mining claims, patented mining claims, and fee lands owned by Nevada Western Gold LLC ("Nevada Western"), a wholly owned subsidiary of NewWest Gold Corp. USA ("NewWest"). Fronteer acquired 100% of NewWest, including the Northumberland project, on September 24, 2007.

The Northumberland Mineral Resources discussed in this technical report were estimated in April and May 2008 by Christopher Lee, Fronteer Chief Geoscientist, with the assistance of Jim Ashton, NewWest Senior Engineer, and Ross Sherlock, former Fronteer Chief Exploration Geologist. Mr. Lee's familiarity with the project has been gained primarily through discussions with George Lanier, NewWest Regional Geologist, and Jim Ashton, including desktop data analysis and interpretation over the past year, and during a site visit in July 2007. Mr. Ashton and Mr. Lanier have been actively involved in the Northumberland project for more than 10 years and, together, they personally conducted the previous Mineral Resource modeling and estimation under the guidance of MDA in January 2005. Mr. Lee and Mr. Ashton are the qualified persons for this report, and have the knowledge and capacity to do so under Canadian Securities Administrators' National Instrument 43-101.

The information in this report is current as of July 21, 2008 unless otherwise noted.

Currency, units of measure, and conversion factors used in this report include:

Linear Measure

1 inch	= 2.54 centimetres
1 foot	= 0.3048 metre
1 yard	= 0.9144 metre
1 mile	= 1.6 kilometres

Area Measure

1 acre		= 0.4047 hectares
1 square mile	= 640 acres	= 259 hectares

Capacity Measure (liquid)

1 US gallon	= 4 quarts	= 3.785 liter

Weight

1 short ton	= 2000 pounds	= 0.907 tonne
1 pound = 16 oz	= 0.454 kg	= 14.5833 troy ounces

Analytical Values	percent	grams per metric tonne	troy ounces per short ton
1%	1%	10,000	291.667
1 gm/tonne	0.0001%	1	0.0291667
1 oz troy/short ton	0.003429%	34.2857	1
10 ppb			0.00029
100 ppm			2.917

Density

g/cc = 32.0369 ÷ tonnage factor (ft^3/ton)

g/cc = 0.016018 x pounds/ft^3

Currency

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

Frequently used acronyms and abbreviations

AA	atomic absorption spectrometry
ac.	acre
ADR	adsorption-desorption-recovery
Ag	silver
American Assay	American Assay Laboratories
Au	gold
BLM	U.S. Department of the Interior, Bureau of Land Management
Boyles Brothers	Boyles Brothers Drilling Company
^{o}C	degrees Centigrade
cc	cubic centimetres
CIL	carbon-in-leach treatment
CIM	Canadian Institute of Mining, Metallurgical, and Petroleum
cm	centimetre
core	diamond drill core
CSAMT	controlled source audio-magneto-tellurics survey
CV	coefficient of variation
Cyprus	Cyprus Northumberland Mining Company or Cyprus Mines Corporation
deposit area	area including the Northumberland open pits and known gold deposits
Eklund	Eklund Drilling Company
Elsing	Elsing Drilling and Pump Co., Inc.
Fronteer	Fronteer Development Group
°F	degrees Fahrenheit
ft	foot or feet
g	grams
g/t	grams per metric ton (tonne)
g Ag/t	grams silver per metric ton
g Au/t	grams gold per metric ton
ha	hectare
Homestake	Homestake Mining Company
ICP-MS	inductively coupled plasma – mass spectrometry
Idaho Mining	Idaho Mining Corporation
in	inch
K-Ar	potassium-argon age dating method
Kerr McGee	Kerr McGee Mining Company
m	metre
Ma	million years

Frequently used acronyms and abbreviations, cont.

Nevada Western	Nevada Western Gold LLC
NewWest	NewWest Gold Corporation
Newmont	Newmont Mining Corporation
Northumberland	Northumberland project
NMC	Northumberland Mining Company
NSR	net smelter return
oz Ag/ton	troy ounces silver per short ton
oz Au/ton	troy ounces gold per short ton
PAH	Pincock, Allen & Holt, Inc.
RC	reverse circulation drilling
Rotary	conventional open-hole rotary drilling
Santa Fe	Santa Fe Pacific Gold Corporation
SG	specific gravity
TF	tonnage factor
ton	short ton
t	metric ton or tonne
Tonto	Tonto Drilling Services Inc.
USFS	U.S. Department of Agriculture, Forest Service
WSMC	Western States Minerals Corporation
WSRC	Western States Royalty Corporation

3.0 RELIANCE ON OTHER EXPERTS

A mineral status report of the Northumberland property prepared by Erwin and Thompson LLP (Erwin, 2005) documents royalty burdens and discusses the title status of the unpatented mining claims, fee lands, and patented mining claims as of April 2005. This report was updated with a fourth supplement, in July 2007 (Erwin 2007). Fronteer relies on the conclusions of Erwin and Thompson LLP (Erwin 2005, 2007) as to the title of, and royalties applicable to, the Northumberland properties.

Fronteer has not conducted any independent exploration on the Northumberland property and must rely on data and information provided by previous owners, NewWest, WSMC and other operators of the Northumberland project. However, based on thorough reviews by Fronteer and the independent consultants responsible for the previous Mineral Resource estimate and technical report, MDA, Fronteer believes that the data are general an accurate and reasonable representation of the project.

George Lanier, Regional Geologist for Fronteer, is a co-author of this technical report in recognition of his efforts in assisting in the preparation of Sections 7, 8, 9, and 16 of the report and his extensive contributions to the general understanding of the geology and mineralization at Northumberland.

4.0 PROPERTY DESCRIPTION AND LOCATION

4.1 Location

The Northumberland project is located in northern Nye County near the geographic center of Nevada at 38º 57' 29" N latitude and 116 º 50’ 44” W longitude (Figure 4.1). The project is approximately 300-road miles northwest of Las Vegas and 250-road miles east-southeast of Reno. The nearest population center to Northumberland is the Round Mountain area, which is located approximately 25 miles to the south. The central portion of the project lies in the center of the Toquima Range at Northumberland Pass.

4.2 Land Area

The Northumberland project is comprised of approximately 38,000 acres (15,380ha) of patented and unpatented mining claims and fee lands owned or controlled by NewWest (Figure 4.2). The fee lands include the Upper Site, which is entirely surrounded by Toyaibe National Forest lands administered by the U.S. Forest Service (“USFS”), and the Lower Site, which is surrounded by public lands administered by the Bureau of Land Management (“BLM”) (Figure 4.2). The Upper and Lower Site fee lands cover a total of 3,885 acres (1,572ha). All mining activities to date have occurred at the Upper Site, while some of the processing and other mining infrastructure from modern mining operations were located at the Lower Site (see Sections 6 and 10 for the mining and exploration history).

A mineral survey was conducted on the fee lands as part of the land exchange process discussed below. The unpatented mining claims in the general area of the Upper Site were surveyed by WSMC in the early 1990s; the remaining claims have not been surveyed.

4.3 Mining Claim Description

The Northumberland project includes 1,745 unpatented lode mining claims for a total of approximately 34,000 acres (13,760ha) (based on an assumption of 20 acres per claim that does not include 27 CAN claims staked to cover gaps in the other claims), and 3,885 acres (1,572ha) of patented mining claims, patented millsite claims, and fee lands. Some of the project lands are subject to net smelter return (“NSR”) royalties on production (Table 4.1). The unpatented claims, which are listed in Appendix A, lie in three discreet blocks, the largest of which surrounds the fee lands at the Upper Site (Figure 4.2). This block of claims includes one inlier claim block not controlled by Fronteer (shown as white in Figure 4.2). The 27 CAN claims were located in September 2006 to cover open fractions; the staking of these claims resulted in no additional area to the project relative to that reported in the 2006 technical report (Gustin et al., 2006).

Figure 4.1 Northumberland Location Map

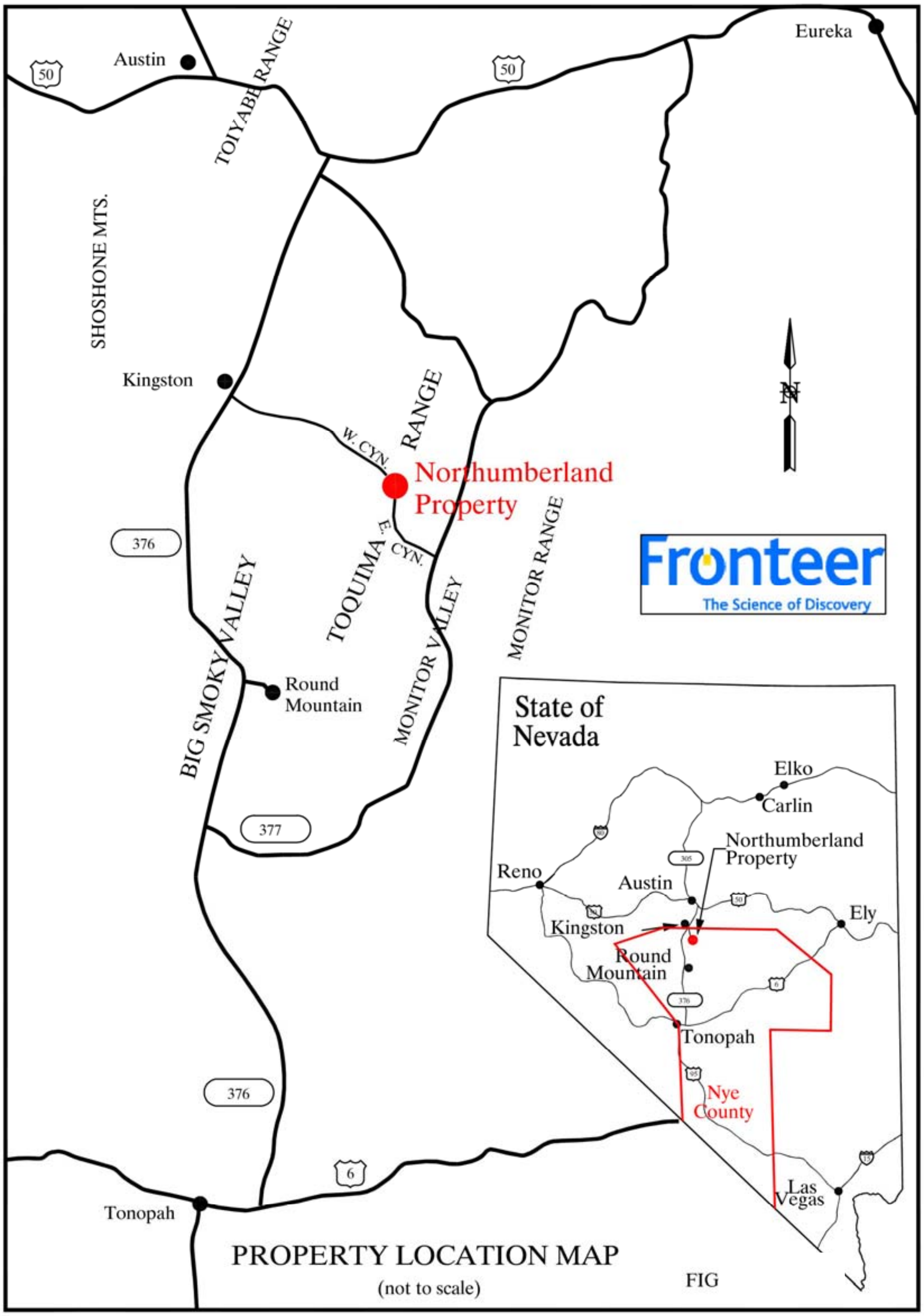


Figure 4.2 Northumberland Land Status Map

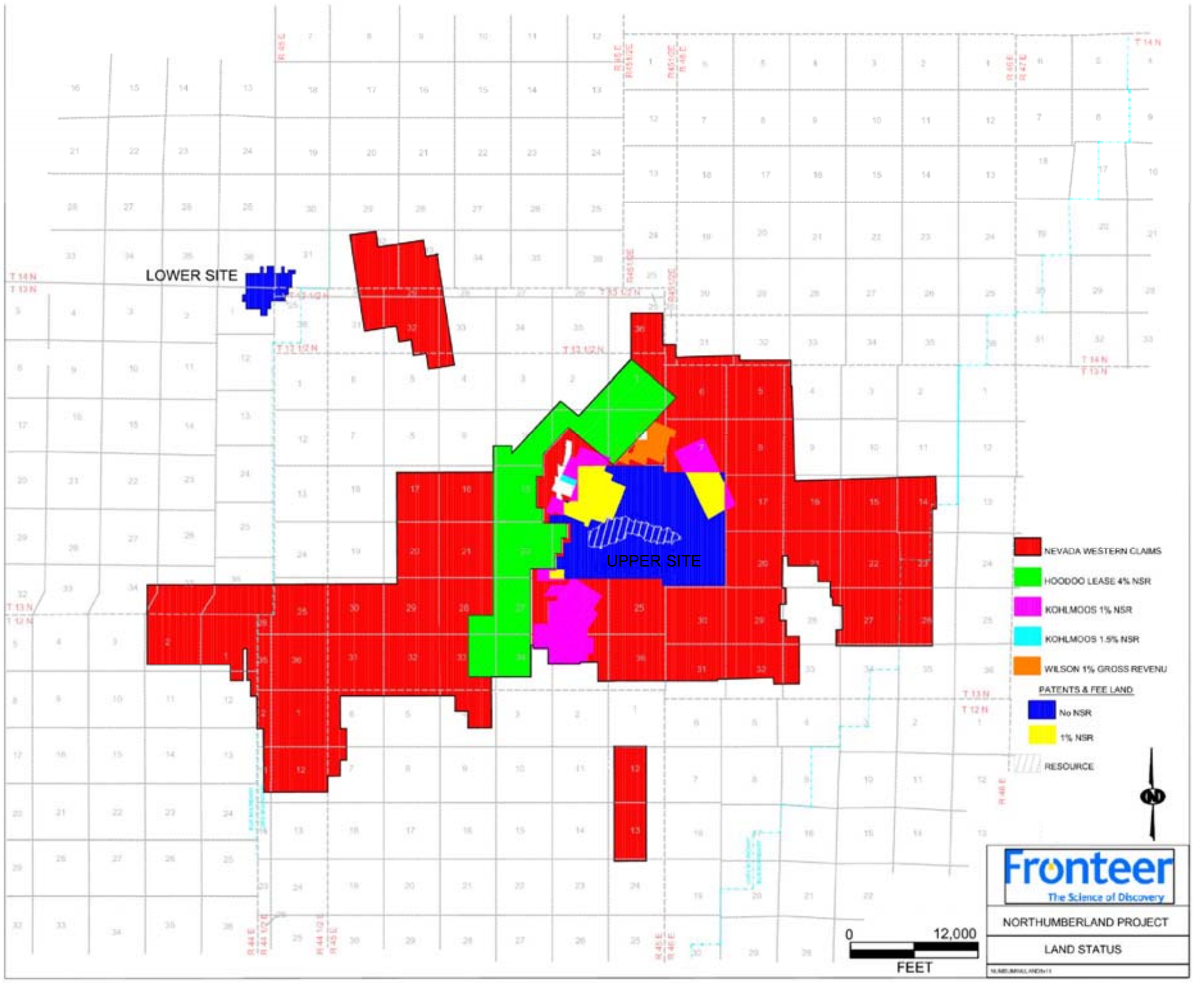


Table 4.1 Northumberland Land Holdings and Obligations

Property Type	Number	Approximate Area (acres)[1]	Approximate Area (hectares)	Annual Holding Costs[2]	Royalty Obligations
100%-Owned Unpatented Claims	1,194	24,040	9,730	$160,467	-
	15	300	120	$2,002.50	1% of gross revenue[3]
	73	1,320	535	$8,811.00	1% NSR
	1	20	8	$135.50	1.5% NSR
Claims staked by Newmont within Area of Interest[4]	253	4,520	1,830	$30,171.00	-
Leased Unpatented Claims (Sterling or “Hoodoo”)	209	4,180	1,690	$47, 901.50	4% NSR
Patented Claims	9	184.47	74.65	$10,200	-
Patented Millsite Claims	63	315.00	127.5		-
Fee Lands		3,385.53	1,370.12		1% NSR on some portions
Totals	*1,817 claims*	*approx. 34,879 acres*	*Approx. 15,477 hectares*	*$259,689*	

[1] Assumes each claim covers 20 acres (with the exception of the 27 CAN claims): actual acreage may vary.
[2] Includes $125 Federal claim-holding fees, $8.50 County filing fees, lease or advance royalty payments, and county taxes.
[3] Applies to gold and silver; a 1% NSR applies to other minerals.
[4] Not including the Thumb claims, which are listed as Leased Unpatented Claims.

4.4 Agreements and Encumbrances

The royalty burdens and status of the unpatented mining claims and private lands discussed in this section are based on a review of various legal documents provided by WSMC and NewWest, as well as a mineral status report on the Northumberland property effective June 2005 and supplemented in 2007 (Erwin, 2005, 2007).

The Northumberland property includes unpatented mining claims, patented mining claims, patented millsite claims, and fee lands, all of which are 100% owned by Nevada Western, as well as unpatented claims controlled by Nevada Western by means of a lease agreement with Sterling Gold Mining Corporation.

The lands 100% owned by Nevada Western were acquired by staking and through a series of purchases and agreements. These agreements include:

- the sale of various unpatented claims and assets to WSMC by Cyprus Northumberland Mining Company ("Cyprus") on July 1, 1985;
- the sale of 9 unpatented claims to WSMC by Kohlmoos and others on September 24, 1992 subject to a 1% NSR royalty retained by Kohlmoos;
- the sale of 15 claims to WSMC by Wilson Minerals on October 15, 1992 subject to a mineral production royalty equal to 1% of the gross revenues on gold and silver and a 1% NSR royalty on other minerals retained by Wilson Minerals (Erwin, 2005);
- the sale of 106 unpatented claims to WSMC by Kohlmoos on November 6, 1992 subject to a 1% NSR royalty retained by Kohlmoos;
- an interest in 176 claims assigned to WSMC and Gooding Corporation, a Colorado corporation that subsequently merged with WSMC (Erwin, 2005), by Arroyo Minerals, Inc. and Bankruptcy Trustee on March 28, 1994;
- a land exchange between WSMC and the USFS on April 1, 1997, in which 3,385.53 acres of USFS-administered public lands in the core of the Northumberland project area, including claims held by WSMC by means of the Cyprus and Kohlmoos agreements summarized above, were deeded to WSMC in exchange for 767.28 acres of privately owned fee acreage in Nye, White Pine and Lander Counties, Nevada; and
- the sale of the Kay No. 18 claim to Nevada Western by Kohlmoos on December 20, 2005 subject to a 1.5% NSR royalty retained by the original owners (the royalty will be reduced to 1% if the US government imposes a production royalty in the future).

The Sterling Gold Mining Corporation lease (the "Hoodoo" lease in Table 4.1 and Figure 4.2) was originally executed on June 12, 1991 and applied to 204 HD and ZIG unpatented mining claims. Erwin (2005) reported that the HD and ZIG claims were located in 1978. A Notice of Intent to Hold for these claims was filed with the BLM in December of 1979, but was not recorded in Nye County during the 1979 calendar year as is required under the provisions of the Federal Land Policy and Management Act. Instead, the Notice of Intent to Hold was recorded on January 17, 1980. Erwin (2005) recommended that the matter be investigated further and, if the situation as reported was found to be accurate, the claims should be relocated. In cooperation with Mr. Sterling, Newmont abandoned the HD and ZIG claims and staked 209 Thumb claims in their place in 2005. The lease will remain in effect so long as annual minimum advance royalty payments of $20,000 are paid. These payments apply towards a mineral production royalty equal to 4% of the net smelter returns from minerals produced from the claims.

Nevada Western entered into a joint venture with Newmont to further explore and, if warranted, develop the Northumberland project on December 19, 2003. Under the terms of the joint venture agreement, Newmont was to spend US$25 million within six years to earn a sixty percent interest in the project. From 2004 through 2007, Newmont spent approximately $8,700,000 exploring Northumberland. The JV agreement was terminated on June 1, 2008, and all interests in the property revert back to NewWest, including 253 claims staked by Newmont within the area of interest of the JV. As part of the termination agreement, Newmont granted NewWest a license, free of royalty and at no fee, to use Newmont's proprietary flotation process knowledge known as "N2TEC", for the processing of

Northumberland ores. In exchange, NewWest will grant Newmont the first right of refusal to process Northumberland ores, should NewWest elect not to build a refractory ore treatment plant of its own.

The Mineral Resources reported in Section 17 of this technical report lie within the fee lands and patented mining claims owned by Nevada Western (Figure 4.2). A very small portion of the resources is subject to the Kohlmoos 1% NSR royalty (Figure 4.2).

The Federal annual unpatented mining claim maintenance fees for the annual assessment year from September 1, 2006 to September 1, 2007 have been properly and timely paid on the Northumberland unpatented claims (Erwin, 2007). Erwin (2007) reports that the BLM mining claim records indicate that the Northumberland unpatented claims are active and in good standing through September 1, 2007. The maintenance fees for the Northumberland unpatented claims have been paid for the September 1, 2007 to September 1, 2008 assessment year.

4.5 Permits

All necessary permits are current at Northumberland, and the required reclamation bonding is in place. Current reclamation bonding with the Nevada Division of Environmental Protection, Bureau of Mining Regulation and Reclamation (BMRR) to cover disturbances at Northumberland currently stands at $2,100,854. This amount is comprised of two approved Nevada State Reclamation Permits. The mine site reclamation along with several exploration roads is covered under Permit #0028 ($1,544,454) and the Gooding Exploration is approved under Permit #0230 ($556,400). The Gooding Exploration Permit was transferred from Newmont to NewWest Gold USA Inc. (Fronteer) and approved by the BMRR in May 2008. The Gooding Exploration Permit allows for exploration activities on Northumberland fee lands with up to 200 acres of disturbance.

In 2005 the USFS approved four Plan of Operation permits submitted by Newmont to cover anticipated exploration of various targets in 2005 through 2007, including the Rim, Orocopter, Wilson, and Ziggurat targets. Newmont also obtained the Ziggurat and Orocopter Notices from the BLM for exploration activities planned for 2005 through 2007 (Newmont, 2006). NewWest is currently in the process of transferring the Orocopter, Wilson, and Rim Plan of Operation permits from Newmont. Associated with each of these Plan of Operation permits is a Nevada State Reclamation Permit. The USFS is the lead agency and holds the bond for each Plan. NewWest is currently waiting for approval from the USFS before initiating the transfer of the associated Reclamation Permits from the BMRR. The Ziggurat Plan of Operation and Notice were closed by Newmont after all reclamation work was completed. No exploration activities were done on the Orocopter Notice and therefore Newmont closed the permit.

4.6 Environmental Liabilities

There are ongoing environmental liabilities at Northumberland that are primarily related to the prior mining activities undertaken at both the Upper and Lower Sites. The most important of the environmental liabilities includes the closure of heaps and process ponds at the Upper Site, as well as sites with hydrocarbon-impacted soils at both the Upper and Lower Sites. Impacts to shallow ground water have been detected near ore-processing infrastructure related to WSMC's prior mining activities at the Upper Site, including an ore heap and a small pregnant solution pond, although no impacts to ground water have been detected to date in the deep aquifer or in shallow monitor wells situated down the hydraulic gradient.

Original total mining disturbance at the Upper Site was 285 acres; reclamation activities have reduced the disturbed acreage to approximately 126 acres. All mine-waste dumps at the Upper Site have been re-contoured where required and reseeded. Two underground storage-tank sites and the barren-pond generator sites have been excavated and are considered closed by the Nevada Department of Environmental Protection. A total of 4,500 cubic yards of petroleum-impacted soils have been removed from the Upper Site and stockpiled at the Lower Site. Reclamation issues currently being addressed at the Upper Site include the repair of solution ditches at heap No. 2X and heap No. 1 and the relining of the large overflow pregnant pond. All areas are being monitored both visually and through monitor wells, as are the three hydrocarbon-impacted sites.

Disturbance at the Lower Site originally totaled 94 acres; approximately 21 acres remain to be reclaimed. Completed work includes the re-contouring of old heaps and the reclamation of the six process ponds. One block building, a metal shop building, fencing, and some access roads remain to be reclaimed in the Lower Site, as well as approximately 4,500 cubic yards of hydrocarbon-impacted (diesel and motor oil) soils that are stockpiled on a closed heap.

In addition to the environmental liabilities attributable to past mining activities at Northumberland, there are lesser liabilities related to both prior and ongoing exploration activities, including drill access roads and drill sites.

5.0 ACCESS; CLIMATE; LOCAL RESOURCES; INFRASTRUCTURE; AND PHYSIOGRAPHY

5.1 Access

Northumberland can be accessed from State Highway 376 on the western margin of Big Smoky Valley by way of a well-maintained dirt road through West Northumberland Canyon. This dirt road intersects Highway 376 eighteen-road miles south of State Highway 50, and 85-road miles north of State Highway 6 (Figure 4.1).

5.2 Climate

The climate at the project site is typical of central Nevada's mid-latitude high-desert environment with warm dry summers and relatively cold windy winters. Average temperatures range from 74^{o} F in July to 30^{o} F in January. Precipitation is generally less than 12 inches per year with the bulk of it accumulating during winter storms and summer thunderstorms. Annual snowfall varies from year to year depending on the intensity and severity of individual storms. Vegetation ranges from sagebrush and grass at the Lower Site to juniper, pinion, and mountain cedar at the Upper Site.

5.3 Local Resources and Infrastructure

The town of Austin, located approximately 53-road miles to the northwest of Northumberland, and the Round Mountain area, located about 25-road miles to the south, are the nearest population centers to the project. The Round Mountain and Tonopah communities currently support mining operations at the Round Mountain gold mine.

A 230 kV transmission line that traverses Big Smoky Valley is the nearest power line to the project. It is situated at the eastern edge of the Lower Site, approximately 11 miles from the Upper Site. Power for the Cyprus and WSMC mining and processing activities at the upper site was provided by on-site generators. The private lands in the Upper and Lower Sites provide sufficient space for mining infrastructure required for extraction of the currently defined resources described in Section 17.

5.4 Physiography

The topography is moderately rugged with elevations across the property ranging from approximately 7,700ft to 9,165ft at Mount Gooding. The Cyprus and WSMC open pits in the Upper Site are at about 8,600ft. There is sufficient space in the area of the resources discussed in Section 17 to allow the construction of needed mining infrastructure.

6.0 HISTORY

6.1 Exploration and Mining History

Much of the following summary is taken from WSMC (1998).

The exploration and production history of Northumberland occurred during two periods. The first period began in 1866 when a prospector named Logan reportedly discovered silver mineralization in the Northumberland Mining district. Relatively minor amounts of silver were extracted from veins by underground mining methods during this time.

The second period of intermittent mining and exploration began in 1936 and continues to the present day. Significant low-grade gold mineralization was first discovered in 1936. The Northumberland Mining Company ("NMC") acquired the main properties of the district in 1938 and initiated production in 1939. NMC mined oxide ore from three small open pits that were located in what is now the east Main pit area. The ore was milled near the open pits and processed by cyanidation. Tailings were transported as slurry via a wooden flume one and one-half miles down East Northumberland Canyon to two tailing ponds. Operations stopped in 1942 when the federal government shut down gold mines by order L-208 as a result of World War II. In addition to its mining activities, NMC drilled 214 exploration and development churn holes between 1938 and 1942.

Gold exploration was the main activity at Northumberland between 1942 and 1975. Peter Joralemon drilled 47 conventional rotary ("rotary") holes between 1959 and 1963, Kerr McGee Mining Company ("Kerr McGee") drilled 27 rotary holes in 1963 and 1964, Homestake Mining Company ("Homestake") drilled 21 rotary holes in 1968; and Idaho Mining Corporation ("Idaho Mining") drilled 34 rotary holes between 1972 and 1974.

Cyprus Mines Corporation ("Cyprus") obtained the property in 1975 and drilled 53 rotary and core holes between 1975 and 1984 and 36 air-track holes in 1978. In addition to these holes, Cyprus drilled an unknown number of holes of unknown type with a "T83" prefix; the database includes 42 of these holes.

Cyprus succeeded in developing two distinct oxide gold deposits and began mining operations at the Upper Site in the Main and Chipmunk open pits in 1981. Mineralization from part of the Main deposit was mined in the Main pit, while the Chipmunk pit mined gold from the States deposit. The ore was crushed to -1/2 inch at facilities near the pits and hauled by truck to the Lower Site where heap-leach facilities were located. The pregnant solution produced from the heap was passed through activated-carbon columns, pressure stripped, and the gold and silver were recovered by electrowinning. Cyprus terminated heap-leaching operations in mid-1985.

Gold and silver production from Northumberland is summarized in Table 6.1.

Table 6.1 Northumberland Gold and Silver Production

(WSMC, 1998)

Company	Period	Tons	Gold (ounces)	Recovered Grade (oz Au/ton)	Silver (ounces)	Recovered grade (oz Ag/ton)
	Pre-1939	?	?	?	?	?
NMC	1939-1942	220,284	45,000	0.204	N/A	NA
Cyprus	1981-1984	2,153,016	92,000	0.043	103,900	0.048
WSMC	1985-1991	5,019,000	93,730	0.019	381,862	0.076
	Totals	*7,392,300*	*230,730*	*0.031*	*485,762*	*0.068*

6.2 WSMC and NewWest

WSMC acquired the Northumberland property from Cyprus in 1985. After turning the Cyprus heaps with a bulldozer, WSMC began to re-leach the heaps at the Lower Site shortly after acquiring the project. WSMC mined material from the two open pits developed by Cyprus from 1987 to 1990, with the primary ore production coming from the Chipmunk pit. Instead of hauling the crushed ore by truck to the Lower Site, as Cyprus had done, WSMC treated run-of-mine ore year-round on new heaps constructed at the Upper Site. WSMC ceased mining in 1990 and emphasis was then placed on exploration. Gold production from the WSMC heaps ended in 1991.

WSMC contracted Analytical Surveys, Inc. to conduct an aerial survey in 1990. This survey was used to create digital topography of the post-mining Northumberland surface.

Modeling of the known deposits allowed WSMC to understand the significance of the tectono-stratigraphic host horizons, project higher-grade mineralization within these horizons along lineaments, and test for mineralization in new areas. The significance of the South Ridge mineralization and high-grade core of the Chipmunk deposit was first recognized in 1990. The geometry of the high-grade cores of these deposits defined the east-striking lineaments. Deep holes drilled in Mormon Canyon approximately one-half mile west of the Chipmunk pit along the westward projection of these lineaments led to the discovery of the Zanzibar deposit in 1991. Further drilling in the southwestern portion of the Mormon Canyon target area resulted in the discovery of the high-grade Rockwell deposit in 1992. The northeast orientation of the Rockwell deposit and its potential to contain high grade (up to one oz Au/ton) was recognized in the 1997 drilling program. The presence of the Pad 4 deposit along the Chipmunk lineament was verified with a drill hole in the same year.

WSMC completed a land exchange with the USFS in 1997 that resulted in 3,386 acres (1,370ha) of USFS-administered public domain land becoming private fee land owned by WSMC. This fee land included the Upper Site and all of the gold deposits defined to date at Northumberland.

WSMC completed 679 RC and core holes for a total of approximately 310,000ft between 1985 and 1997. The geology of the entire project area was mapped and sampled on a reconnaissance scale. WSMC defined over 30 exploration targets outside of the deposit area based on the results from a trend analysis of satellite imagery, a CSAMT geophysical survey, two aeromagnetic surveys, over 6,600 rock chip samples, and 6,300 soil samples. Eight of these targets were drilled without encountering significant mineralization.

A number of metallurgical tests were completed by WSMC. The most significant of these are described in Section 16.

6.3 Newmont – Nevada Western Joint Venture

WSMC's interests in the Northumberland project were held by Nevada Western, a wholly owned subsidiary. Nevada Western entered into a joint venture with Newmont on the Northumberland project in December 2003. Through a series of transactions, Nevada Western became a wholly owned subsidiary of NewWest in 2005. Newmont, as operator of the joint venture, immediately began exploration work and completed soil geochemical sampling, geological mapping, geophysical surveys, metallurgical testing, and drilling. From 2004 through 2007, Newmont spent $8,700,000 exploring the Northumberland property.

Newmont collected a total of 1,512 B-horizon soil samples in 2003 on a 328 by 328ft grid that covered much of the fee lands in the deposit area. A total of 818 soil samples were taken in areas of Paleozoic carbonate units lying to the north of the deposit area that were deemed to be favorable but were lacking in geochemical data (Branham, Lauha, and Powell, 2004; Lauha and Powell, 2004a). Newmont also was able to retrieve and re-assay 1,950 of 2,200 assay pulps from WSMC soil samples collected on 600ft by 750ft grids on the outer portions of the Northumberland claims (Branham, Lauha, and Powell, 2004). The 250 soil sites for which the sample pulps could not be found were re-sampled and 568 soil samples were collected to fill various gaps in the property soil grid (Lauha and Powell, 2004a). An additional 200 soil samples were collected on the east side of the property (Lauha and Powell, 2004a; see Section 9.8). Multi-element geochemical analyses were completed on all of the geochemical samples. Based on a detailed analysis of the results of the soil sampling in and around the deposit area, Jackson (2004) stated, "the Northumberland system is characterized by strong enrichment of elements known to be associated with Carlin deposits on the Carlin Trend and it exhibits many of the element zonation relationships observed on the Trend. …The levels of metal enrichment indicate it [the Northumberland mineral system] is a powerful system with the potential to host high grade deposits."

A 200-sample stream-sediment survey was conducted in the various drainages within the Northumberland caldera northwest of the Northumberland deposit area in 2004 (Lauha and Powell, 2004a). This survey was designed to examine a 100-square-mile area underlain by Tertiary volcanic rocks interpreted to include several altered diatreme breccia pipes. All anomalous results from the survey are considered by Newmont to reflect material eroded from the Northumberland deposit area (Branham, Lauha, and Powell, 2004; Newmont, 2005). Additional stream sediment sampling was undertaken in 2005 to infill and follow-up results obtained in the 2004 survey. At total of 27 bulk-leach extractable gold (BLEG) samples were taken (Newmont, 2006).

Detailed geologic mapping was completed over an area of about 10-square miles that included the fee ground and USFS lands south to the property boundary. New interpretative geologic cross sections of the deposit area were created. Preliminary mapping was also completed at specific target areas (Newmont, 2005; Newmont, 2006).

A total of 301 ten-foot channel samples were collected from 15 trenches excavated in the western portion of the Zanzibar area. These samples, as well as road-cut samples from the same area, were used to identify drill targets for potential drill testing.

Newmont conducted a reconnaissance gravity survey over much of the property. An infill gravity survey was also completed to attempt to define the eastern margin of the Northumberland caldera and improve the resolution around the Mount Gooding pluton (Newmont, 2005). A five-line CSAMT geophysical survey was completed over the Mount Gooding intrusion to assist in interpreting the shape of the pluton and its possible extension to the east (Lahua and Powell, 2004b; 2004d). Newmont completed an IP survey totaling 12.4 line miles in the Ziggurat target area and collected gravity data from 132 stations to infill existing data (Newmont, 2006). Newmont conducted a district-scale ground gravity survey in 2007 consisting of 658 new stations at 1640 ft centers, and a helicopter magnetic and radiometric survey totaling l709 ine miles with 328 ft line spacings and a nominal drape of 200 ft (Brock Bolin, oral communication).

Newmont defined drilling targets after compiling all available geological, geochemical, geophysical, and drilling data. A 26-hole RC drilling program, for a total of 32,595ft, was then completed in and around the deposit area in 2004, and an additional 20 RC holes totaling 22,200ft were drilled in 2005 (Lauha and Powell, 2004f; Newmont, 2006). The Zanzibar deposit and the southern edge of the Chipmunk deposit were the principle targets of the drilling, with additional holes testing the possible buried eastern extension of the Mount Gooding pluton, various targets in the area of the existing open pits, and the southern edge of the Mount Gooding pluton.

The 2006 holes were drilled with the goal of expanding the resource, establishing the orientation of the deeper high-grade mineralization discovered by Newmont hole NN-5, obtaining core samples for metallurgical and waste-rock characterization, and providing initial testing of the Ziggurat anomaly (Newmont, 2007). Five RC holes were completed at Ziggurat in 2006, all of which failed to return values in excess of 0.01 oz Au/ton. Newmont drilled 54 holes, for a total of 53,691 feet in 2006.

In 2007, Newmont completed 22 holes, for a total of 27,748 feet, in the main resource area. Newmont’s 2007 program tested for high-grade structural conduits to the Zanzibar deposit, as well as district targets in the Orocopter, Barite Pit, and South Mormon Canyon areas.

Five composites of RC samples were sent to Newmont’s metallurgical laboratory at the Lone Tree mine for testing in 2004. Three core samples of oxide material were sent to Newmont’s Carlin Metallurgical Laboratory in 2006 to determine gold amenability to cyanide leaching. Also in 2006, core from four holes drilled in the Zanzibar deposit was used to obtain sulfide material for roaster and autoclave amenability tests. There are no reported results from these sulfide samples. Further details on metallurgical tests are discussed in Section 16.

Newmont added three blocks of unpatented mining claims to the Northumberland property in 2004 and 2005. A gap in the southern boundary of the property position was covered with 43 claims, 126 claims were staked on the eastern side, and 57 claims were added in the Ziggurat target area on the western side of the property. Newmont also staked 27 claims to cover gaps in the claim block.

Newmont drilled 115 RC, core, and pre-collared core holes in 2005, 2006, and 2007, mostly in the general area of the resources. These holes were drilled to explore for both sulfide and oxide mineralization, obtain metallurgical and geotechnical samples, and verify RC drill results. Selected assay results for some of the 115 holes are highlighted in Table 6.2. Table 6.2 is derived from summary tables and a digital database provided to NewWest by Newmont.

Table 6.2 Northumberland JV Drill Summary: Selected Results

Drill Hole	TD (feet)	Zone (feet)	Imperial Units		Metric Units	
			Length (feet)	Grade (oz Au/ton)	Length (meters)	Grade (g Au/tonne)
Northumberland JV - 2005 Drilling Results						
NN-27(s)	650	525-570	45	0.145	13.72	4.97
NN-30 (s)	1400	860-985	125	0.113	38.10	3.87
NN-31 (s)	1400	870-935	65	0.134	19.81	4.59
NN-32 (s)	1370	770-855	85	0.198	25.91	6.79
NN-47 (s)	1460	835-850	15	0.203	4.57	6.96
		870-915	45	0.135	13.72	4.63
NN-48 (s)	1940	1190-1230	40	0.163	12.19	5.59
		1315-1360	45	0.138	13.72	4.73
NN-49 (s)	2050	1475-1505	30	0.101	9.14	3.46
		1585-1605	20	0.270	6.10	9.26

(s) = sulfide mineralization. Average values based on 0.050 oz Au/ton (1.71 g Au/tonne) cutoff.
(o) = oxide mineralization. Average values based on 0.010 oz Au/ton (0.34 g Au/tonne) cutoff.
Intervals may include internal values below cutoffs.

Table 6.2 Northumberland JV Drill Summary: Selected Results, cont.

Drill Hole	TD (feet)	Zone (feet)	Imperial Units		Metric Units	
			Length (feet)	Grade (oz Au/ton)	Length (meters)	Grade (g Au/tonne)
Northumberland JV - 2006 Drilling Results						
NN-45 (s)	2000	1480-1505	25	0.127	7.62	4.35
		1565-1655	90	0.118	27.43	4.05
NN-50 (s)	1550	1015-1065	50	0.142	15.24	4.87
NN-54 (s)	1820	1205-1225	20	0.152	6.10	5.21
		1250-1260	10	0.104	3.05	3.57
		1280-1305	25	0.124	7.62	4.25
		1700-1720	20	0.123	6.10	4.22
NN-55 (s)	1530	820-845	25	0.168	7.62	5.76
		850-860	10	0.104	3.05	3.57
NN-56 (s)	1530	770-1060	290	0.118	88.39	4.05
	(includes)	995-1010	15	0.236	4.57	8.09
NN-57 (s)	1150	750-900	150	0.130	45.72	4.46
		955-965	10	0.124	3.05	4.25
NN-58 (s)	680	520-575	55	0.151	16.76	5.18
		600-605	5	0.200	1.52	6.86
NN-59 (s)	580	440-535	95	0.170	28.96	5.83
	includes	440-490	50	0.242	15.24	8.30
NN-60 (o)	320	45-55	10	0.021	3.05	0.72
		160-220	60	0.089	18.29	3.05
		225-245	20	0.093	6.10	3.19
NN-61(o)	300	135-230	95	0.057	28.96	1.95
NN-62 (s)	850	505-570	65	0.186	19.81	6.38
		710-775	65	0.104	19.81	3.57
NN-63 (s)	1077	720-820	100	0.226	30.48	7.75
		835-875	40	0.104	12.19	3.57
		990-1015	25	0.437	7.62	14.98
NN-64 (s)	1228	785-865	80	0.215	24.38	7.37
	includes	800-830	30	0.306	9.14	10.49
		1170-1190	20	0.156	6.10	5.35
NN-66 (s)	950	740-790	50	0.223	15.24	7.65
	includes	765-785	20	0.401	6.10	13.75
NUN-71 (s)	1080	850-895	45	0.149	13.72	5.11
NUN-72 (s)	900	755-800	45	0.220	13.72	7.54
NUN-74 (o)	150	30-70	40	0.285	12.19	9.77
NUN-75 (s)	600	420-495	75	0.159	22.86	5.45
NUN82 (s)	1900	1680-1755	75	0.176	22.86	6.03
	includes	1725-1755	30	0.246	9.14	8.43
NUN83 (s)	1800	1615-1665	50	0.198	15.24	6.79
	includes	1650-1660	10	0.448	3.05	15.36
NUN-84 (s)	1795	1445-1455	10	0.116	3.05	3.98
		1545-1555	10	0.288	3.05	9.87
NN-85 (s)	1800	1415-1485	70	0.153	21.34	5.25
	includes	1455-1475	20	0.287	6.10	9.84
NUN-89 (s)	1400	1055-1100	45	0.136	13.72	4.66
		1110-1125	15	0.098	4.57	3.36
		1140-1180	40	0.129	12.19	4.42
NUN-92 (s)	1910	1805-1855	50	0.166	15.24	5.69
NUN-93 (s)	1365	890-930	40	0.139	12.19	4.77
NUN-94 (s)	1225	820-880	60	0.112	18.29	3.84
	includes	865-875	10	0.220	3.05	7.54
NN-102 (o)	150	20-55	35	0.108	10.67	3.70
NN-104 (o)	120	25-85	60	0.078	18.29	2.67
	includes	45-70	25	0.157	7.62	5.38
NN-105 (o)	100	40-55	15	0.157	4.57	5.38

Table 6.2 Northumberland JV Drill Summary: Selected Results, cont.

Drill Hole	TD (feet)	Zone (feet)	Imperial Units		Metric Units	
			Length (feet)	Grade (oz Au/ton)	Length (meters)	Grade (g Au/tonne)
Northumberland JV - 2007 Drilling Results						
NUN-88 (s)	1800	1020-1085	65	0.110	19.81	3.77
NUN-90 (s)	1800	1240-1265	25	0.133	7.62	4.56
NUN-95 (s)	1300	800-840	40	0.243	12.19	8.33
NUN-96 (s)	1216	725-765	40	0.247	12.19	8.47
NUN-97 (s)	1402	750-775	25	0.184	7.62	6.31
		795-805	10	0.180	3.05	6.17
NUN-98 (s)	1206	680-770	90	0.147	27.43	5.04
NUN-107 (o)	645	0-25	25	0.032	7.62	1.10
NUN-108 (o)	485	85-100	15	0.026	4.57	0.89
		110-180	70	0.045	21.34	1.54
NUN-109 (o)	400	10-25ft	15	0.061	4.57	2.09
		95-105	10	0.101	3.05	3.46
		145-160	15	0.022	4.57	0.75
NUN-110 (o)	445	195-330	135	0.038	41.15	1.30
NUN-113 (s)	2000	1915-1925	10	0.141	3.05	4.83
		1930-1935	5	0.097	1.52	3.33

Hole NN-5, drilled by Newmont in 2004, encountered two zones of mineralization, including 105 feet of 0.142 oz Au/ton within the Zanzibar deposit and 65 feet of 0.267 oz Au/ton immediately below the Zanzibar deposit. Two follow-up holes, NN56 and NN63, extended these mineralized zones. Hole N-56, located 65 feet east of NN-5, returned a 290-foot continuously mineralized zone grading 0.118 oz Au/ton that appears to be associated with both the Zanzibar Deposit and the lower zone discovered in hole NN-5. NN-63 and -64 were drilled to better define the deeper zone of mineralization encountered in both NN-5 and NN-56. NN-64 intercepted 80 feet of mineralization in the Zanzibar deposit with a grade of 0.215 oz Au/ton between 785 and 865 feet, which includes 30 feet of 0.306 oz Au/ton between 800 and 830 feet, but did not encounter the deeper zone. Hole NN-63 also intercepted the Zanzibar deposit (100 feet of 0.226 oz Au/ton between 720 and 820 feet) and encountered 25 feet of 0.437 oz Au/ton in the lower zone between 990 and 1015 feet. This deeper high-grade zone in NN-63 extended the mineralization in NN-56 approximately 60 feet to the south.

Hole NUN 113 was drilled 700 feet west of the northwestern-most hole in the Zanzibar deposit. NUN113 intersected a zone of mineralization that includes 10 feet of 0.141 oz Au/ton and five feet of 0.097 oz Au/ton between 1915 and 1935 ft. This hole may have intercepted an extension of the Zanzibar deposit, or may have encountered new sulfide mineralization.

Newmont drilled holes into oxide mineralization to obtain samples for metallurgical testing and to attempt to add oxide resources. NUN-110 was drilled to further test the oxide potential of the Pad 4 deposit. This hole intersected 135 feet of mineralization with a grade of 0.038 oz Au/ton between 195 and 330 feet.

7.0 GEOLOGIC SETTING

The following discussion is largely derived from an internal WSMC document (WSMC, 1998) that summarizes the geologic knowledge gained by the various governmental and company representatives that have studied the Northumberland project and its surrounding areas and from Kleinhampl and Ziony (1984). Additional observations of coauthor G. Lanier, Regional Geologist, Fronteer, are also included.

7.1 Regional Geology

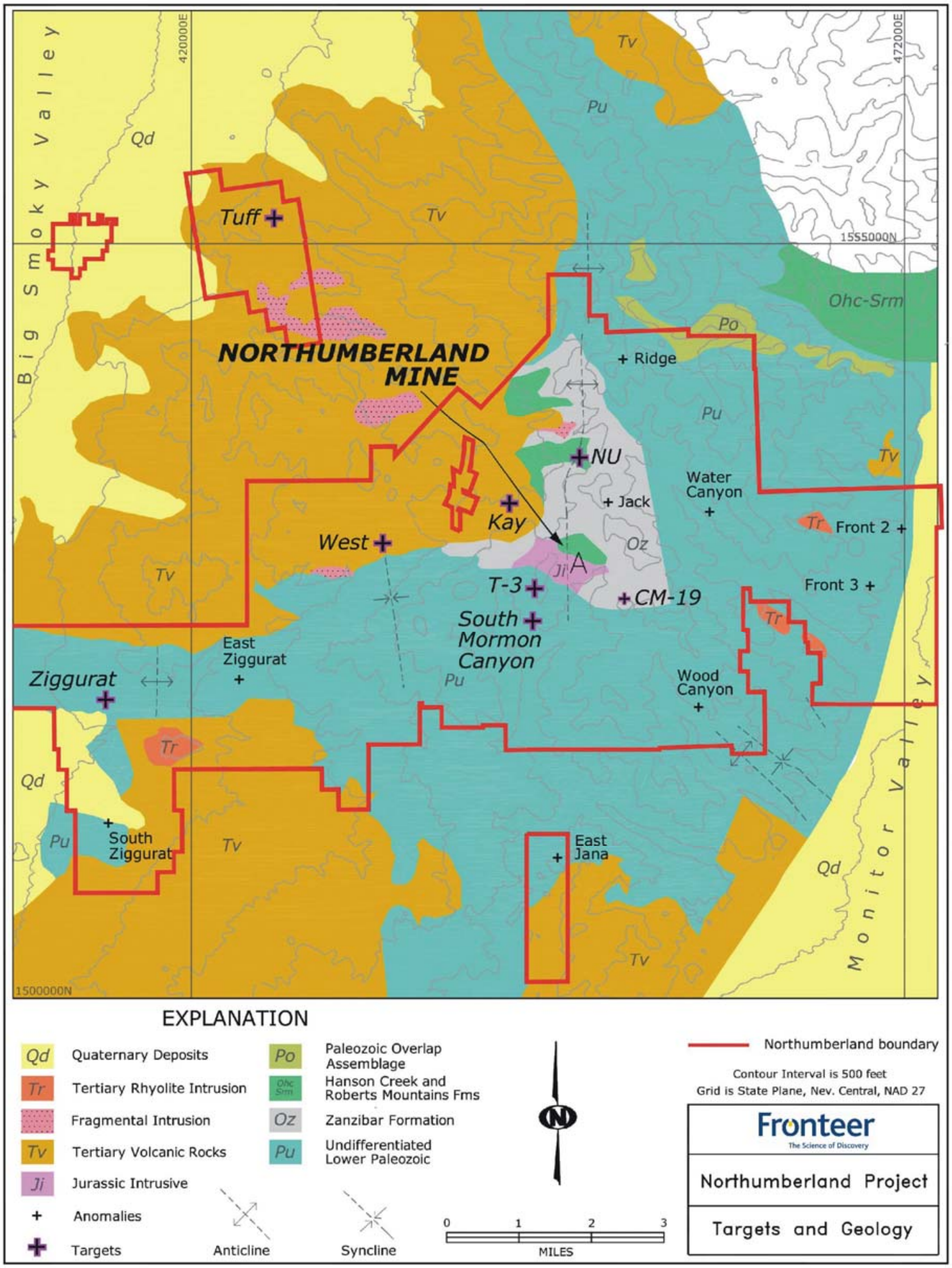
Northumberland is situated near the center of the Toquima Range, one of the north-trending ranges centrally located in the Great Basin portion of the Basin and Range Province. Northumberland lies along a north-northeast-trending alignment of large metal deposits in Nye County that includes Round Mountain, Manhattan, and Tonopah.

Paleozoic sedimentary rocks and Mesozoic plutons are exposed in an erosional window through Tertiary rhyolitic ash-flow tuff in the central portion of the Toquima Range (Figure 7.1). The window has been referred to as both the Ikes Canyon window and the Northumberland window (WSMC, 1998). The Paleozoic units include representatives of the autochthonous (units formed in their present location), parautochthonous (used here to represent units that formed at some intermediate distance from their present location that were transported by thrust faulting), allochthonous (used here to represent units formed a significant distance from their present location that were transported by thrust faulting), and overlap (sedimentary units derived from the erosion of the previously mentioned units) assemblages that characterize central Nevada. Ordovician to Devonian limestone, shale, and argillite total about 3,000ft in thickness and represent the autochthon in this region. Parautochthonous rocks include about the same thickness of the same units as the autochthon, but shaly limestone and shaly argillite that make up the Perkins Canyon Formation in the parautochthon correspond to a more basinward facies of the calcareous Pogonip Group of the autochthon (Kay and Crawford, 1964, cited in Kleinhampl and Ziony, 1984). Several thousand feet or more of argillite, chert, shale, and greenstone represent the allochthon in this part of the Toquima Range. Transported eastward from their original site of basinal deposition, some of these rocks may be correlatives of the Vinini Formation (McKee, 1972, cited in Kleinhampl and Ziony, 1984). The overlap assemblage in the Northumberland area consists of the Wildcat Peak Formation of Pennsylvanian age, which is made up of limy and clastic rocks. The Wildcat Peak Formation unconformably overlies the allochthon and locally the autochthon in the region.

A number of Jurassic plutons have been identified and dated in the Northumberland area. The largest in the district is named the Clipper Gap pluton and has been dated with K-Ar at 151 $\pm$ 3 Ma (Kleinhampl and Ziony, 1984).

Oligocene and Miocene tuffs, welded tuffs, and tuffaceous lacustrine sediments unconformably overlie the Paleozoic and Mesozoic units. According to Kleinhampl and Ziony (1984), these Tertiary rocks formed in part after the precious metal deposits were emplaced. A rhyolitic dome that is about 28 Ma cuts part of the Tertiary tuffs about five miles southwest of Northumberland. Tertiary megabreccias that may have been landslide and talus deposits (Kleinhampl and Ziony, 1984) are exposed west of the divide between East and West Northumberland canyons.

Figure 7.1 Regional Geology of Northumberland Area



Dioritic to felsitic dikes in the region cut the Jurassic plutons and Paleozoic units; some intermediate dikes cut Tertiary tuffs. These dikes have been variously assigned Cretaceous and Tertiary(?) ages. Some of the dikes are thought to be related to the hydrothermal event that produced the gold mineralization (Kleinhampl and Ziony, 1984).

Folding and thrust faulting, probably part of the Paleozoic Antler Orogeny, have complexly deformed the Paleozoic rocks in the Toquima Range. Paleozoic sedimentary and the Jurassic intrusive rocks have been folded and cut by high-angle normal, high-angle oblique-slip, and low-angle thrust and bedding-plane faults. Tertiary and younger rocks were subjected to block faulting, which produced moderate tilting of the bedded Tertiary units. In addition, there are prominent volcanic structures, such as the partially collapsed Northumberland Caldera, which lies on the western flank of the range (McKee, 1974 and 1976, cited in Kleinhampl and Ziony, 1984).

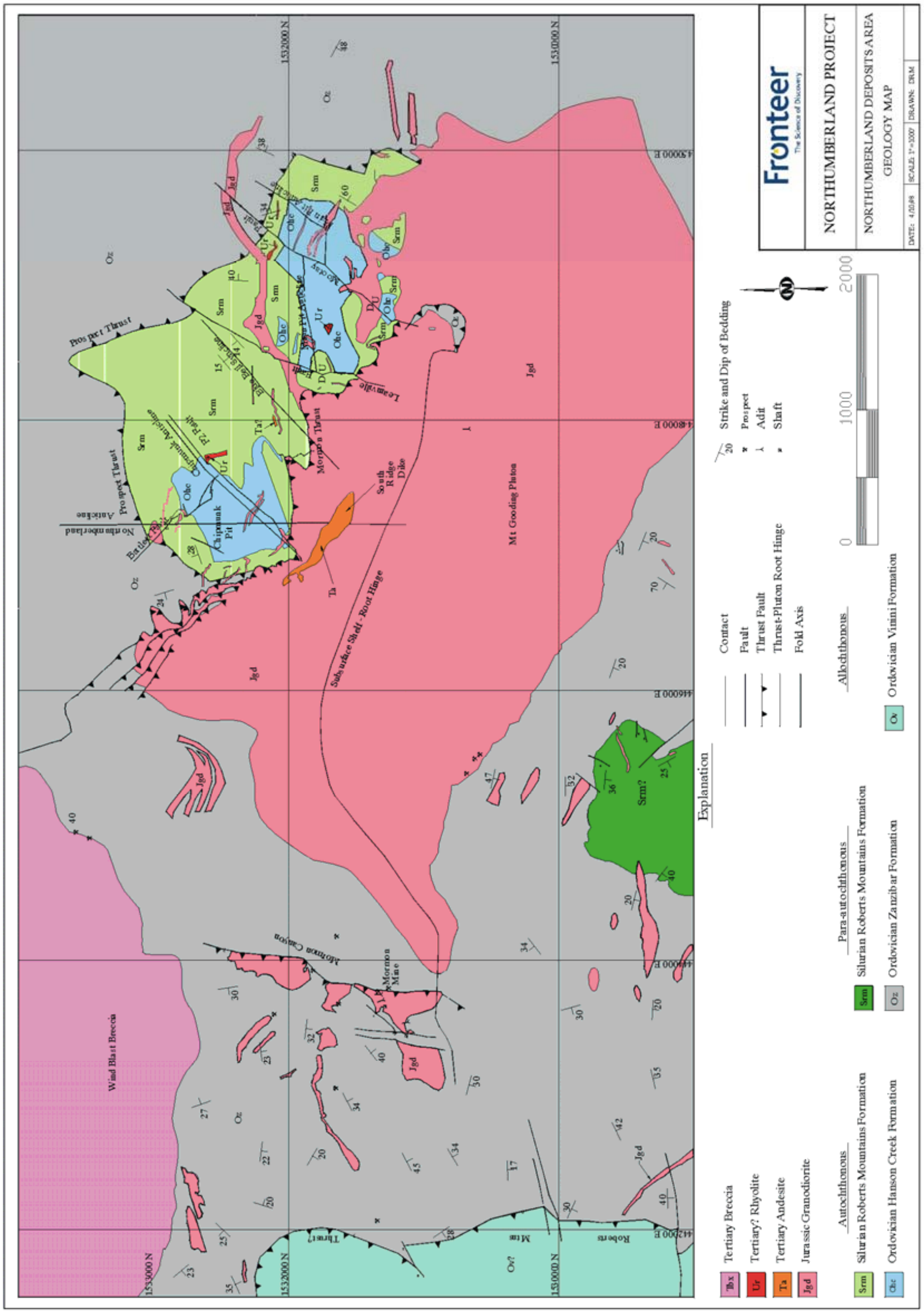
7.2 Local Geology

The area that includes the Northumberland open pits and surrounding gold deposits (the “deposit area”) is underlain by lower Paleozoic sedimentary and metasedimentary rocks exposed in an erosional window through Tertiary volcanic rocks (Figure 7.2). In general, the Paleozoic stratigraphic units occur within a folded low-angle shear zone. The units are structurally bound and internally sheared, and also exhibit rapid facies changes. In the Northumberland mine area, the Prospect thrust, thought to be of Antler age, placed parautochthonous Ordovician Zanzibar Formation over the autochthonous, transitional, Silurian Roberts Mountains Formation. The Zanzibar Formation, which consists of cherty limestone with distinctive alternating bands of chert and argillaceous limestone and siltstone at its base, is an off-shelf facies equivalent to part of the Pogonip Group carbonate rocks (Harris, 2003). The Roberts Mountains Formation includes limy shale with a cherty dolostone bed at its base. A carbonate assemblage of the Hanson Creek Formation with upper dolostone and lower limestone members underlies the Roberts Mountains Formation.

The Paleozoic rocks have been intruded by the Jurassic Mount Gooding pluton and related apophyses, dikes, and sills. The stock is a fine- to medium-grained equigranular granodiorite with locally porphyritic margins. The stock consists of two parts, a high-angle root below a low-angle sill-like shelf that extends up to 1,500ft north of the root. The bottom of the shelf is in fault contact with sedimentary rocks. The fault contact consists of up to 40ft of generally silicified breccia and is defined as the Mormon thrust. This configuration suggests that the top of the stock has been decapitated and shifted to the northwest or that the top of the stock is a laccolith with a faulted contact at its bottom. The stock, including the root and shelf, is locally strongly altered to quartz-illite on its northern side. This assemblage grades to propylitic alteration distal from the structural controls. An east-trending dike swarm cuts the Northumberland mine area. These dikes can be completely altered to illite but are thought to be related to the Jurassic intrusive event based on relict texture. The Mount Gooding stock has been dated by K-Ar methods to be 154 $\pm$ 3 Ma (Silberman and McKee, 1971).

The Mormon thrust of probable Jurassic age truncates the Prospect thrust as well as Jurassic igneous bodies. The contacts between the Roberts Mountains and Hanson Creek Formations as well as the limestone-dolostone members of the Hanson Creek Formation are locally bedding-plane faults. The two bedding-plane faults and the Prospect thrust near its intersection with the Mormon thrust are the main low-angle horizons that are known to have controlled mineralization at Northumberland.

Figure 7.2 Local Geology of Northumberland



The Paleozoic rocks and associated low-angle structures described above are folded along the broad, north-trending Northumberland anticline, which, south of the deposit area, appears to plunge to the south. Much smaller northeast- to east-trending anticlines and synclines are superimposed on the larger anticline near its crest.

Tertiary intrusive rocks are also present in the Northumberland mine area and consist of andesitic and rhyolitic dikes, sills, and small stocks. The South Ridge dike in the Northumberland mine area represents the oldest dated Tertiary intrusive event. The dike is andesitic in composition, has an aphanitic to porphyritic texture, intrudes granodiorite just south of the mineralized area, and has a late Eocene to early Oligocene $^{40}Ar/^{39}Ar$ age of 35.2 $\pm$ 0.2 Ma (Peters, 1996 and 1997). The South Ridge dike locally exhibits propylitic and argillic alteration and hosts low-level anomalous gold values. Quartz-phyric dikes and sills of rhyolitic composition are also exposed in the mine area. These rocks are too altered to date and classify but may be related to the Mount Ziggurat rhyolitic intrusive event, which has been K-Ar dated at 26.5 $\pm$ 0.7 Ma (Boden, 1992).

Stratigraphic units are less understood outside of the immediate Northumberland deposit area. The Roberts Mountains thrust has been inferred to be present on the western side of the district where it may have placed the Vinini Formation over the Zanzibar Formation. To the east, the Roberts Mountains thrust could be absent, and there is a normal sequence of sedimentary rocks ranging from the Ordovician Antelope Valley Formation at the base, to the Roberts Mountains Formation, to the early Mississippian Pinecone Formation of Coles (1988) at the top. If this interpretation is correct, the Pinecone Formation is an autochthonous siliciclastic unit. The Pinecone Formation is similar to the Slaven Chert and contains thick-bedded barite deposits. The Pennsylvanian Wildcat Peak Formation, part of the overlap assemblage, is locally exposed in the northeast portion of the project area. The formation rests unconformably on older Paleozoic units.

A thick sequence of the volcanic rocks is exposed west of the Northumberland Paleozoic window. Volcanic rocks also occur as erosional remnants that cap peaks on the eastern side of the range and, prior to mining, at the Northumberland mine site. The main volcanic pile is composed of thick, continuous, northwest-dipping sheets of rhyolitic crystal lithic ash-flow tuff, out-flow breccia, water-laid tuffaceous sediments and minor interbeds of vitrophyre. Volcanic rocks have been subdivided into the Northumberland Tuff, K-Ar dated at 33 $\pm$ 0.8 Ma (Zhafiqullah, 1992), the overlying Hoodoo Tuff with a K-Ar date of 30.4 Ma (McKee 1974), and the Moores Creek Tuff with a K-Ar date of 27.2 $\pm$ 0.6 Ma (Boden, 1992). The Moores Creek Tuff is exposed in the southernmost part of the project area and is temporally related to the Toquima volcanic complex at Round Mountain, Nevada. The volcanic complex at Northumberland includes discordant breccias that have been variously interpreted as diatremes, breccia pipes, talus, or landslide deposits. The breccia bodies typically have an east-west elongation with poorly defined and steeply dipping internal layering. The breccias are clast-supported and composed predominantly of fragments of Paleozoic basement rock with minor igneous fragments. The volcanic pile in the vicinity of Northumberland is considered by some to be part of the Northumberland Caldera (McKee, 1974). Tuffs exposed along the western range front have locally anomalous gold mineralization associated with faults.

8.0 DEPOSIT TYPE

The Northumberland mineralization occurs as stacked, sediment-hosted, finely disseminated, Carlin-type gold deposits. The mineralization is analogous in many ways to the Goldstrike (Betze\Post) deposit of the northern Carlin Trend in north-central Nevada (Leonardson and Rahn, 1996). Both are Carlin-type deposits that have a close spatial association with Jurassic-aged granodioritic stocks. The age of mineralization in both cases appears to be younger than the stocks, probably Eocene. Hydrothermal alteration and mineralization occur within and overprint contact metamorphic aureoles adjacent to the stocks. Host stratigraphic units are Ordovician to Silurian in age and include the Roberts Mountains Formation. There are inferred sill caps or traps above the deposits and there is a strong stratiform component to deposit geometries. Gold deposits are associated with the crests and limbs of anticlines, and both high- and low-angle structures are recognized as being important controls of the mineralization. Gold mineralization is micron-sized, disseminated, and associated with iron sulfides where not oxidized. Late hydrothermal barite is present at both Goldstrike and Northumberland.

The gold anomalies that occur in tuff to the west of the Paleozoic window at Northumberland are volcanic-hosted epithermal occurrences, similar in origin to the mineralization at Round Mountain, Nevada.

9.0 MINERALIZATION

The following discussion is derived primarily from the work of G. Lanier.

Gold and silver mineralization at Northumberland occurs in eight stratigraphically and more-or-less spatially distinct deposits that form an arcuate belt approximately 1.6 miles long in an east-west direction and 0.3 miles wide. The deposits are generally stratiform and follow three low-angle tectono-stratigraphic host horizons near the crest and within the west limb of the Northumberland anticline (Figures 9.1 and 9.2). The deposits can merge between horizons where the intervening rock layers are locally breached. From tectono-stratigraphic top to bottom, the mineralized horizons are referred to as the Prospect-Mormon thrust (upper), Basal Chert fault (middle), and Hanson Creek fault (lower) host horizons. As a generalization, the deposits that occur along the upper horizons are more dispersed laterally, while those at the lower horizon are more restricted perpendicular to stratigraphic layering.

The three host horizons are structural discontinuities that include the Prospect-Mormon thrust intersection zone and two bedding-plane faults. The Prospect-Mormon thrust horizon is a complex intersection between the two low-angle sub-parallel thrust faults that consists of a 20- to 40-ft thick shear zone. The shear zone consists of fault breccia with large sausage-shaped blocks of sedimentary and intrusive rocks bounded by internal shear planes. The Zanzibar deposit, the largest deposit at Northumberland, occurs along the Prospect-Mormon thrust horizon.

The Basal Chert and Hanson Creek fault horizons are bedding-plane faults. The former separates the lowermost Roberts Mountains Formation from the underlying Hanson Creek Formation. The basal chert unit of the Roberts Mountains Formation consists of interbedded chert and dolostone immediately above the Basal Chert fault and is often closely associated with gold mineralization. Deposits that are localized along this horizon include the States and Main deposits. The Hanson Creek fault separates the lower limestone member from the upper dolostone member of the Hanson Creek Formation. Deposits that generally follow or seem to originate from this fault horizon include Rockwell, Pad 4, Wedge-Shaped, Chipmunk, and South Ridge.

High-angle east-trending structures and dike swarms controlled the location and overall geometry of many of the Northumberland gold deposits. The distribution and internal high-grade zones of deposits associated with the Hanson Creek fault horizon define two east-trending deposit lineaments. The alignment of the east-oriented high-grade core within the Chipmunk deposit with the Pad 4 deposit defines the Chipmunk lineament, while the alignment of the South Ridge and Wedge-Shaped deposits defines the South Ridge lineament. The east-trending structural influence is also evident in the Basal Chert fault horizon where the States and Main deposits have geometric components that follow the two lineaments.

Northwest-trending structures had a local limiting effect on mineralization. The best example of this is the South Ridge dike and its projection. The dike establishes the western limit of the South Ridge deposit. The dike's northwest projection along a presumed structure establishes the eastern limit to most of the high-grade mineralization in the Zanzibar deposit.

Figure 9.1 Geologic Cross Sections Showing the Northumberland Gold Deposits

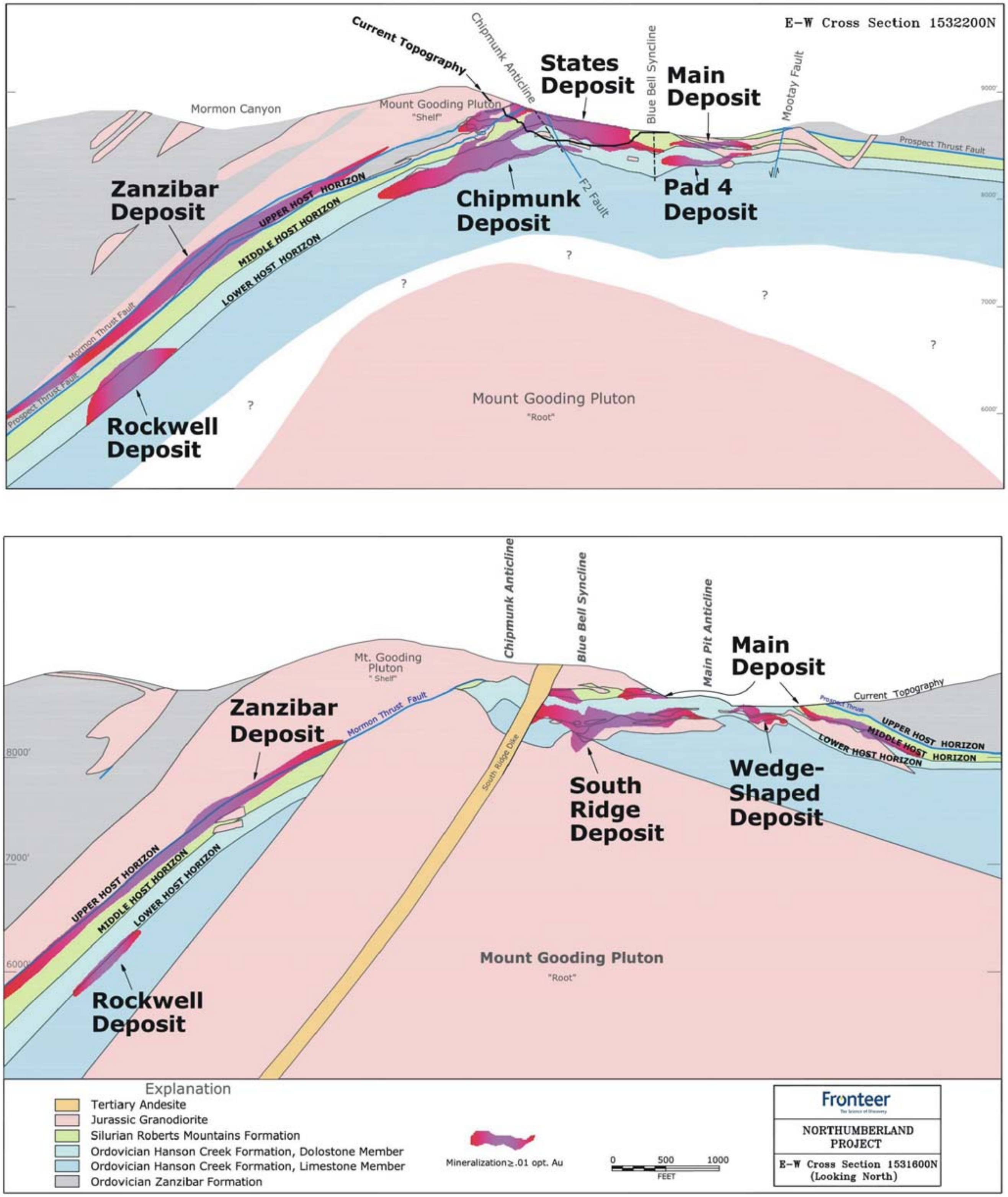


Figure 9.1 Geologic Cross Sections Showing the Northumberland Gold Deposits, continued

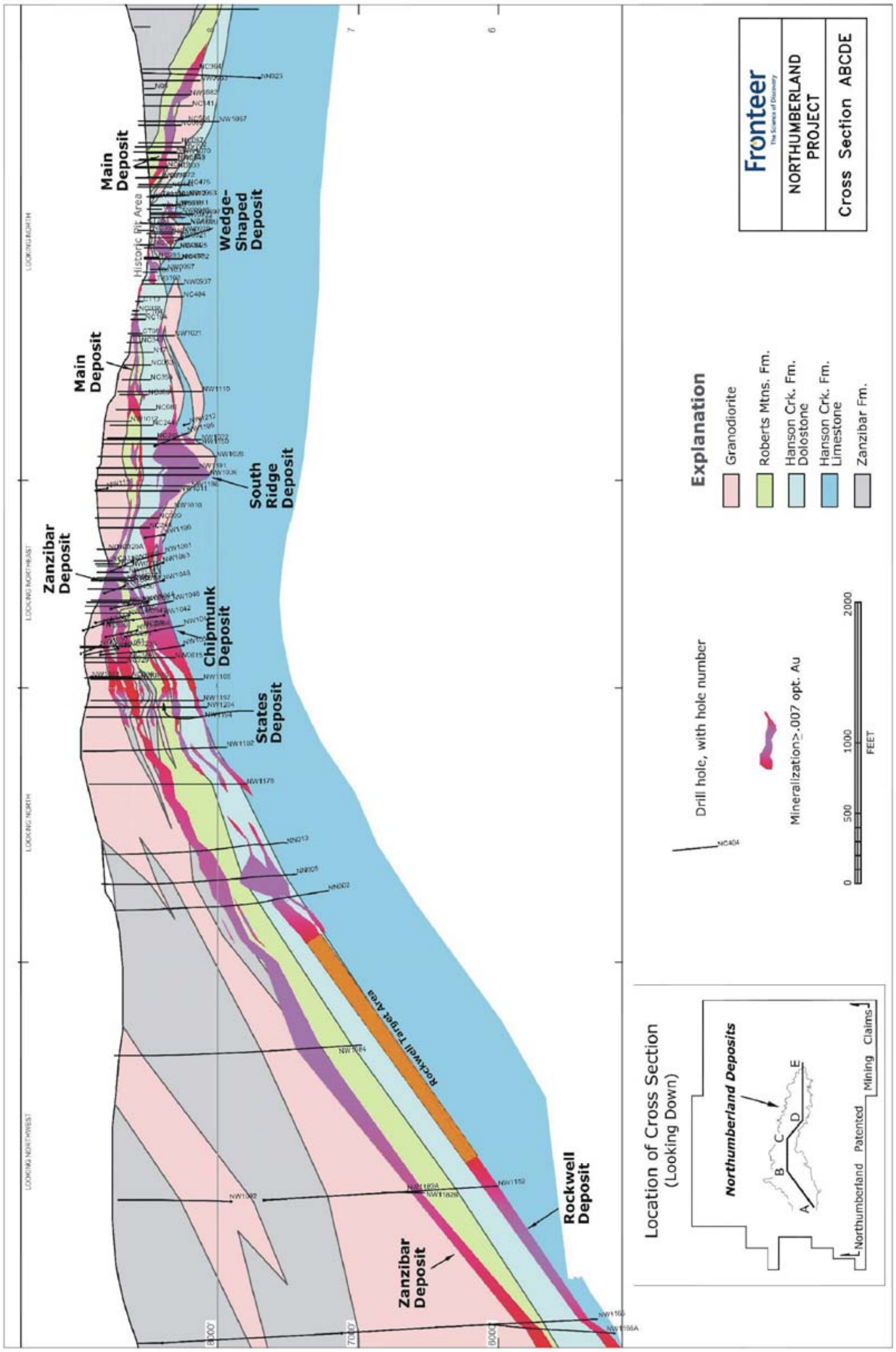
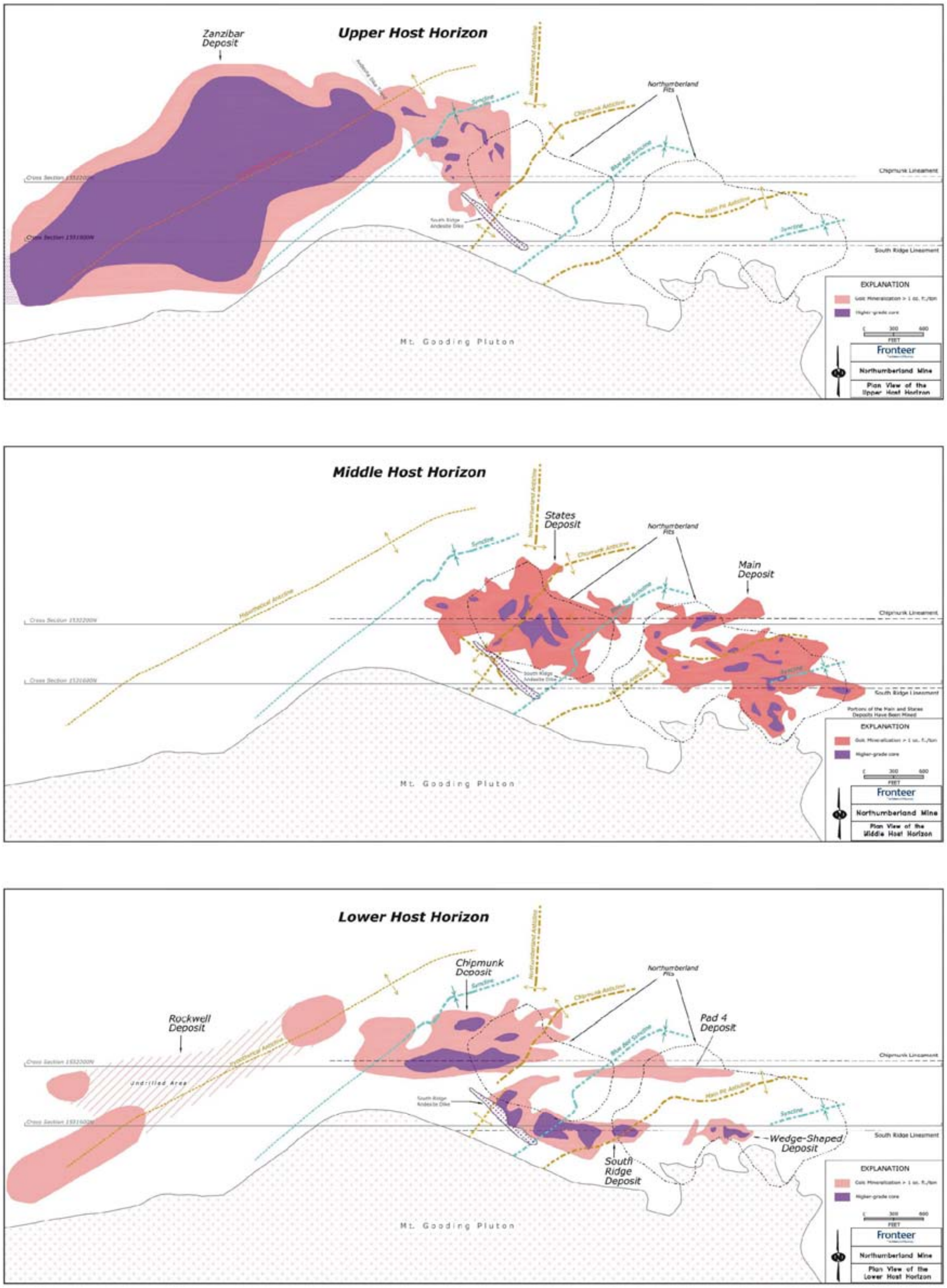


Figure 9.2 Plan Views of Northumberland Gold-Silver Host Horizons



Gold mineralization is also spatially associated with folds. The cluster of Northumberland deposits is situated in the crest and west limb of the north-trending Northumberland anticline. Much smaller northeast- to east-trending anticlines and synclines are superimposed on the larger anticline. Two of the smaller anticlines are well defined and spatially associated with deposits. The States deposit is associated with the Chipmunk anticline, while the Main Deposit is associated with the Main anticline.

Gold localization was also fundamentally influenced by the contact aureole of the Mount Gooding pluton. There is a narrow, poorly mineralized zone adjacent to the stock that corresponds to the highest-grade of contact metamorphism. This proximal zone is mainly decarbonized (primary organic carbon is removed) through the formation of garnet-diopside hornfels, although marble is present as well. Gold deposits are best developed in a more distal zone of the northern contact aureole of the Mount Gooding pluton that is strongly carbonized (carbon remobilized from the proximal zone is added), especially along structures; hornfels is present only locally.

Gold occurs as micron-sized particles in quartz veinlets and enclosed in goethite pseudomorphs after pyrite (Kuipers, 1991). In general, gold in unoxidized Northumberland mineralization is thought to be intimately associated with pyrite and arsenopyrite, which is typical for a Carlin-type system. The pyrite association is supported by the fact that gold is liberated upon natural and metallurgically induced oxidation. The total sulfide abundance is less than five percent, of which pyrite, arsenopyrite and marcasite are the most abundant species present. The gold is disseminated primarily within sedimentary rocks, although the Mount Gooding pluton and its associated intrusive rocks also host significant disseminated mineralization in all deposits.

Honea (1992) examined mineralized specimens with a scanning electron microscope and found fine-grained gold particles occurring as silver-rich electrum (Au:Ag = 2.6:1) that range in size from 0.5 to 72 microns. The electrum is associated with a complex silver-bearing assemblage of copper-antimony sulfides, arsenic sulfosalts, and stibnite. Copper, lead, zinc and molybdenum sulfides, as well as gold and lead tellurides, are present in trace amounts.

The oxidation of sulfides extends variably to a depth of over 800ft below surface and is grossly layered with respect to topography and the mineralized horizons. The deeper layered oxidation is only locally pervasive; islands of unoxidized to partially oxidized sulfides are usually present within these deeper oxide zones.

The alteration at Northumberland is generally typical of Carlin-type deposits. Alteration of carbonate host rocks involves decarbonatization (some percentage of the carbonate minerals are removed, often resulting in a poorly consolidated rock; this process is also referred to as "sanding") followed by partial to locally complete silicification of the decarbonated rocks. Silicified rock is composed mainly of fibrous to anhedral replacement quartz that encloses organic carbon, sericite/illite, pyrite, and probably detrital quartz. Quartz veining accompanies the silicification, is locally abundant, and preserves up to five generations of fracturing and healing. Although significant gold mineralization can occur within both unsilicified sanded rock and silicified rock (jasperoid), jasperoid is the main gold host, especially in the upper horizons. Late-stage calcite and local barite veins overprint the silicification and decarbonatization. Northumberland is well known for its collection-quality barite specimens that are derived from the late-stage alteration.

Gold mineralization in igneous rocks is associated with two types of alteration, a typical quartz-illite/sericite-pyrite alteration and carbonation. The quartz-illite/sericite-pyrite alteration is common and occurs in the quartz-pyrite vein wall rocks. Adjacent to the main structural controls, the wall-rock alteration coalesces into pervasive zones of illite/sericite, which are locally accompanied by silicification. This alteration distally transitions to propylitically altered rock. The transition zone is characterized by the replacement of feldspars by illite/sericite and the replacement of biotite and hornblende with chlorite. Propylitic wall-rock alteration consists of chlorite-calcite-pyrite aggregates after mafic minerals and pyrite after magnetite.

Gold mineralization is also associated with an unusual occurrence of carbonated igneous rock. Dolomite is the main replacement mineral and can make up to 40% of the rock. While the general abundance and distribution of carbonated igneous rock are uncertain, it is known to be associated with high-grade gold mineralization in the Rockwell deposit and may also be present in the South Ridge and Wedge-Shaped deposits.

The eight gold deposits at Northumberland are briefly described below in the following stratigraphic order. The size dimensions of the deposits reported below are the horizontal distances of all gold mineralization enclosed within a grade-thickness contour of one ounce-ft per ton. Except where noted, thickness is the vertical thickness of gold mineralization greater than 0.007 oz Au/ton.

9.1 Zanzibar Deposit

The Zanzibar deposit (Figures 9.3 and 9.4) occurs in the Prospect-Mormon thrust horizon and is the largest known deposit at the project. The deposit is a tabular body of largely sulfide mineralization that is exposed in the high-wall of the Chipmunk pit and continues southwest for 4,700ft down the west-dipping limb of the Northumberland anticline to a drilled depth of 2,800ft. The mineralized zone is up to 140ft thick and is mainly hosted in silicified fault breccia of the Mormon thrust. Mineralization also extends above the breccia into broken and altered granodiorite, and below the fault into broken Roberts Mountains Formation.

The shallower, eastern portion of the deposit was drilled on a 100- by 200-ft grid in 1997 to evaluate the continuity of the higher-grade gold mineralization and the possibility of limited open pit mining. Grades up to about 0.2 oz Au/ton have good continuity within this area, while higher grades are less continuous. The western, deeper portion of the deposit is less densely drilled and the western limit of the deposit has not been established. The Zanzibar deposit is under active exploration by Newmont for high-grade zones.

9.2 States and Main Deposits

Most of the modern-day oxide gold production at Northumberland has come from the States and Main deposits. WSMC and Cyprus mined the States deposit from the Chipmunk pit. NMC, Cyprus, and WSMC mined high-grade pods of the Main deposit from a number of pits in the Main pit area. The mineralization that remains around the Chipmunk and Main pits includes both sulfide and oxide components.

Figure 9.3 Cross Section 445100E Showing the Modeled Zanzibar and Rockwell Deposits

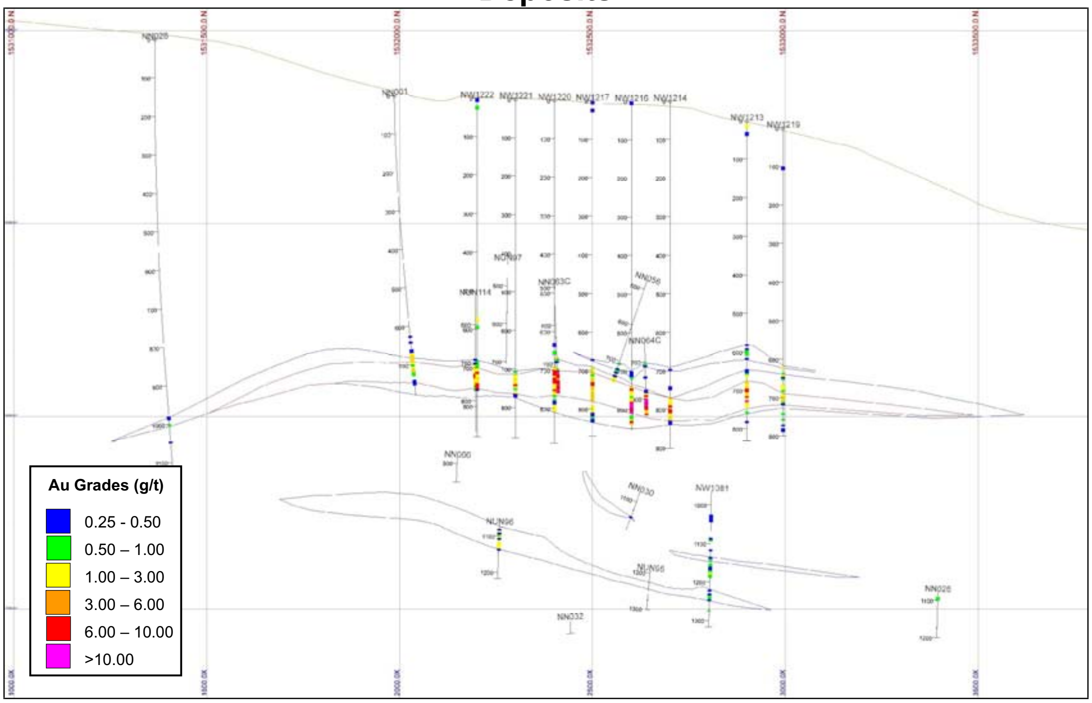
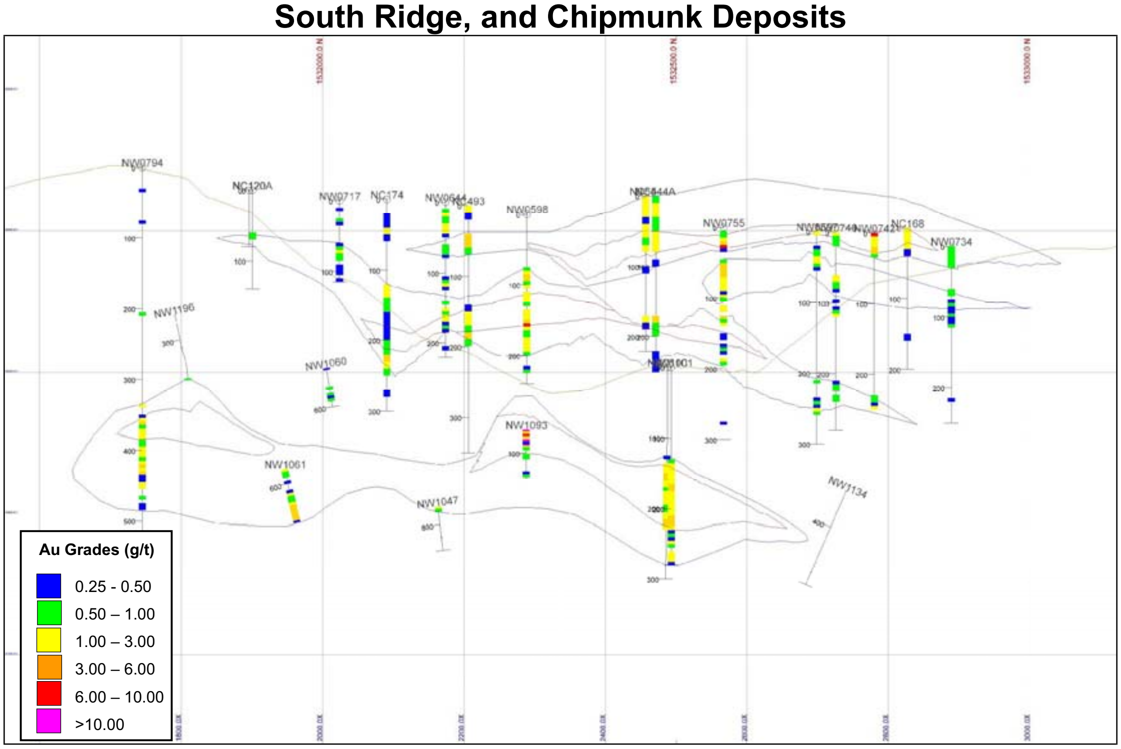


Figure 9.4 Cross Section 447100E Showing the Modeled Zanzibar, States, South Ridge, and Chipmunk Deposits



The States and Main deposits occur at the Basal Chert fault horizon where mineralization is mainly hosted in the 20-ft thick basal cherty bed of the Roberts Mountains Formation. In mineralized areas the bed is always silicified, with the silicification extending up to 100ft above the cherty bed. The dolostone in the basal chert unit of the Roberts Mountains Formation is generally sanded where the Hanson Creek dolostone underlies the States and Main deposits. A portion of the Main deposit is hosted in an argillized and unusually sulfidic granodiorite sill that is present below the basal chert unit. Coarsely crystalline barite mineralization is common in the States and Main deposits. The barite partially fills open fractures and cavities in jasperoid and is later than at least the bulk of the gold mineralization.

9.3 Chipmunk Deposit

The Chipmunk deposit is 2,000ft long in an east-west direction and 700ft wide. A high-grade core zone occurs along the Chipmunk lineament where the deposit is locally up to 170ft thick, contains grades up to one oz Au/ton, and merges vertically with the States deposit. The highest point of the deposit has been exposed in the bottom of the Chipmunk pit, while the eastern half of the deposit is present below the pit. The western half extends to the west beneath the pit high-wall where the top of the deposit is presently defined at 750ft below the surface at its deepest point.

The deposit occurs or appears to originate at the Hanson Creek fault horizon and is hosted by sanded and locally silicified dolostone, and by lesser-decalcified limestone and argillized igneous dikes. A significant portion of the deposit is oxidized.

9.4 Pad 4 Deposit

The Pad 4 deposit is incompletely defined with only enough drill-hole penetrations to establish that a deposit is present. Existing drilling suggests that the deposit is relatively low grade but has the potential to be primarily oxidized. The deposit occurs along the Hanson Creek fault horizon and is located east of the Chipmunk deposit along the Chipmunk lineament.

9.5 South Ridge Deposit

The South Ridge deposit is a sulfide body that occurs beneath South Ridge along the South Ridge lineament. The deposit is 1,800ft long in an east-west direction, and up to 400ft wide and 350ft thick. The top of the deposit is 500ft below South Ridge at its deepest point.

Gold mineralization in the South Ridge deposit is related to the Hanson Creek fault horizon. Most of the mineralization is hosted in dolostone and sanded dolostone; silicification is present but minor. The thick mineralized body contains internal near-horizontal lenses of higher-grade gold mineralization that approach 0.5 oz Au/ton. A lower-grade deeper portion of the deposit is hosted in altered granodiorite.

9.6 Wedge-Shaped Deposit

The Wedge-Shaped deposit is a small, partially oxidized body located 50ft below the Main pit between 8,200- and 8,400-ft elevations. The deposit is essentially a continuation of the South

Ridge deposit along the South Ridge lineament, but is distinguished by its unique geometry. While the other Northumberland deposits have a dominant low-angle stratiform component, the Wedge-Shaped deposit is for the most part internally and externally discordant to the stratigraphy. The deposit originates at the Hanson Creek fault horizon and ascends up through the dolostone member with an inclination of approximately 50 degrees to the south. The deposit is at least 800ft long and has a true thickness of up to 100ft.

Approximately half of the gold mineralization in the Wedge-Shaped deposit is hosted in altered igneous rock, 40 % is hosted in sanded dolostone, dolostone, and hornfels, and only 10% is hosted in jasperoid. The deposit is centered on a dark-gray aphanitic dike(?) that appears to be the control for mineralization. Internal higher-grade and lower-grade zones strike easterly.

9.7 Rockwell Deposit

The Rockwell Deposit is a deep extension of the Hanson Creek Fault Horizon that also hosts the Chipmunk, Pad 4, South Ridge and Wedge-Shaped deposits at shallower levels. The initial four discovery core holes drilled by WSMC encountered grades up to one oz Au/ton at the Hanson Creek fault horizon within a vertical depth range of 2,600 to 3,200ft. The discovery holes were drilled approximately one mile southwest of the Chipmunk pit to test a lineament. Other drilling that tested the deep horizon in the general area indicates that the deposit is at least 400ft wide in a northwest to southeast direction and lower-grade portions of the deposit could extend several thousand feet to the northeast. Newmont's RC hole NN-5 was drilled 2,100ft northeast of the initial drill holes and encountered 65ft with an average grade of 0.267 oz Au/ton within a 340ft thick zone of grades greater than 0.007 ounces per ton; the true thickness of this intercept is not known. Follow-up drilling by Newmont demonstrated that the high-grade mineralization intersected by NN-5 forms a pod that is discrete from the high-grade mineralized center defined by the WSMC discovery holes. Present drilling is consistent with the possibility that these pods are connected by continuous lower-grade mineralization.

The Rockwell deposit is hosted by sanded dolostone and decalcified limestone with local silicification at the initial discovery area with some of the highest grades occurring within dolomitized intrusive rock. The Rockwell deposit mineralization intersected in drill hole NN-5 occurs throughout the Hanson Creek dolostone and extends well up into the Roberts Mountains Formation where gold grades are highest.

9.8 Other Mineralization

There are numerous areas of gold mineralization at Northumberland, both within the general area of the defined deposits as well as in other portions of the large property. The areas are defined by soil and/or rock gold anomalies and favorable geology, only some of which have been tested by drilling. Fronteer plans to develop and test some of these targets in their upcoming drill program.

10.0 EXPLORATION BY ISSUER

Fronteer has not conducted any exploration on the Northumberland property prior to the Mineral Resource update described in Section 17 of this report. The Mineral Resource update is based entirely on the exploration work of previous operators, as discussed in Section 6.

On May 16, 2008, Fronteer began the first of a two-phase drill program at Northumberland, which will include approximately 20 drill holes for a combined 26,000 feet of RC and core drilling. Additional drilling in the second phase of the program will be based on the results of the first phase.

This two-phase program is designed with specific goals intended to provide for new discoveries and/or contribute significant increases in grade at known mineralized horizons. Phase I of the program will expend approximately $2.0M of the $3.6M 2008 budget. The targeting strategy was developed on the basis of a new Gemcom model and interpretation of the key structural-stratigraphic horizons. It focuses on testing the extents open-ended mineralized trends and expansion of large tonnage, high grade zones projected from grade thickness models. From the review of this data, specific targets were generated that fall into three categories; Development, Pit Exploration and Regional Exploration.

10.1 Development

The development portion of the program is designed to add additional near-surface, oxide material by providing new information on the Pad 4 Deposit that may tie the two existing pits together and stepping out on open ended mineralization peripheral to the model. A further goal of this program is to provide geotechnical information pertinent to mine design and feasibility. Eight core and RC holes have been sited for the initial phase of this program with further drilling contingent on information developed in Phase I.

10.2 Pit Exploration

The Pit Exploration portion of the program is a multi-faceted approach to identify new zones of mineralization within a conceptual open pit envelope. It will target the margins of the Mt. Gooding Stock and stacked favorable stratigraphy at depth below or proximal to, known resources. Several holes will test down plunge on the lower Rockwell Deposit to extend previous high grade intersections. Several holes will provide further information in poorly defined areas of the Rockwell Deposit while providing infill data in the overlying Zanzibar Deposit. Lastly, several aggressive step-out holes are designed to add additional resource ounces to the Zanzibar and Rockwell deposits. Six core holes with RC pre-collars are scheduled for Phase I of the program with follow up in Phase II based on outcome.

10.3 Regional Exploration

Two District targets will be further explored in the Phase I program, to identify new deposits, on the Northumberland property. Two holes are planned for the East Pluton to test for additional structural and stratigraphic mineralized horizons below the known systems. And a four to six hole fence will test for mineralization in the stratigraphy in contact with the Ziggurat rhyolite intrusion, which is in a similar geological environment to Northumberland.

11.0 DRILLING

The Northumberland database used in the Mineral Resource estimation reported in Section 17 contains information from 1,502 drill holes for a total of 606,369.5ft, including holes drilled by Newmont from 2004 - 2007 (Table 11.1). These include holes drilled by air-track, conventional open-hole rotary, RC, and core methods, as well as 42 holes of unknown type.

The database does not include the 214 churn holes drilled by Northumberland Mining Co., 47 rotary holes drilled by Joralemon, and 27 rotary holes drilled by Kerr McGee. These holes were removed from the database by WSMC due to suspect sample quality and suspect assays, including assays with a high detection limit (0.01 oz Au/ton). Eleven Homestake rotary holes are not in the database for unknown reasons. Cyprus holes NC079, NC080, NC255 through NC259, and NC289 are also not in the database due to missing data. WSMC holes T3-01 through T3-14 are in the database, but all assays are considered suspect and have been removed.

Table 11.1 Northumberland Resource Drill-Hole Database Summary

Company	Year	Air-track		Rotary		RC		Core		Total Drill Holes	Total Footage
		No.	Feet	No.	Feet	No.	Feet	No.	Feet		
Homestake	1968			11	2,045					11	2,045
Idaho Mining	1972-1974			34	5,229					34	5,229
Cyprus	1975-1983	41	2,766	553	139,398	(2)[1]	?[1]	27[1]	9,331[1]	663[2]	155,455[2]
WSMC	1985-1997					645[3]	270,732	34[3]	41,015.5	679	311,747.5
Newmont	2004-2007					95[4]	120,649.5	20[4]	11,243.5	115	131,893
TOTAL		41	2,766	598	146,672	740	391,381.5	81	61,590	1,502	606,369.5

[1] Two core holes pre-collared by RC, with unknown footage of RC; all footage is reported as core in table.
[2] Includes 42 holes of unknown type, for 3,960ft of the total footage.
[3] Includes 22 core holes pre-collared by RC, with 21,400ft of RC and 25,284ft of core.
[4] Includes 15 core holes pre-collared by RC, with 10,759ft of RC and 8,823.5ft of core.

11.1 Drill Data

Statistics of the drill-hole database used in the resource estimation described in Section 17 are given in Table 11.2. Summary statistics for the gold-assay data are summarized in Table 11.3 by drill type, and in Table 11.4 by company.

Table 11.2 Northumberland Resource Drill-Hole Database - Statistics

Item	Number	Footage	Avg. Footage
Drill Holes	1,502	606,369.5	403.7
Samples Assayed for Au by Fire Assay	87,908	563,314.5	6.4
Samples Assayed for Au by Cyanide Leach	21,266	121,620.3	5.7
Samples Assayed for Au by Cyanide Leach with no Fire Assay	2,404	12,620	5.2
Samples Assayed for Total Ag (Fire Assay or Acid Digestion)	63,049	439,136.3	7.0
Samples Assayed for Ag by Cyanide Leach	20,283	129,081	6.4
Samples Assayed for Ag by Cyanide Leach with no Total Ag	2,026	10,830	5.3

Item	Hole ID	Northing (ft)	Easting (ft)	Elevation (ft)	Depth (ft)
Minimum Northing of Collar	NW1142	1520695	415350	6575	2002
Maximum Northing of Collar	NW1164	1557510	422430	6350	390
Minimum Easting of Collar	NW1142	1520695	415350	6575	2002
Maximum Easting of Collar	NC533	1530617	452917	8918	210
Minimum Elevation of Collar	NW1164	1557510	422430	6350	390
Maximum Elevation of Collar	NW1127	1531075	445529	9160	75
Minimum Depth of Hole	NC105	1531971	450072	8622	10
Maximum Depth of Hole	NW1143	1531601	442552	8750	3426

Table 11.3 Northumberland Resource Drill-Hole Database – Sample Statistics by Drill Type

Drill Type	Samples		Au Grade (oz Au/ton)				
	Number	Avg. Length (ft)	Mean	Min	Max	Std. Dev.	CV
Air-track	515	5.3	0.018	0.001	0.520	0.046	2.579
Rotary	15,003	9.7	0.010	0.001	1.290	0.029	3.089
RC	65,703	5.6	0.009	0.000	1.200	0.030	3.253
Core	6,476	6.4	0.019	0.000	1.244	0.064	3.335
Unknown	211	18.4	0.026	0.001	0.300	0.066	2.514
Total	*87,908*	*6.4*	*0.010*	*0.000*	*1.290*	*0.034*	*3.365*

Table 11.4 Northumberland Resource Drill-Hole Database – Sample Statistics by Company

Company	Samples		Au Grade (oz Au/ton)				
	Number	Avg. Length (ft)	Mean	Min	Max	Std. Dev.	CV
Homestake	387	5.1	0.003	0.001	0.060	0.007	2.350
Idaho Mining	518	10.0	0.016	0.001	0.310	0.034	2.088
Cyprus	15,778	9.7	0.011	0.001	1.290	0.037	3.357
WSMC	45,126	6.1	0.011	0.000	1.200	0.034	2.978
Newmont	26,099	5.0	0.007	0.000	0.646	0.032	4.434
Total	*87,908*	*6.4*	*0.010*	*0.000*	*1.290*	*0.034*	*3.365*

The average grade of the Newmont drilling is low compared to the campaigns of most other operators. The 115 Newmont holes were drilled to depths of 100 to 2175ft and were assayed over their entire lengths, much of which was unmineralized. Many holes were drilled outside of the limits of the deposits and did not encounter significant mineralization. Fronteer has audited the Newmont holes drilled within the known deposit areas on cross sections and concludes that the Newmont results are consistent with those from previous operators.

Newmont drill-hole collars were surveyed using a Real Time Trimble GPS Navigation unit, model TSCI. WSMC hole collars were surveyed using a theodolite. Fronteer does not know if the other hole collars were surveyed.

The database includes down-hole survey data for 80 of the WSMC holes and all Newmont holes except for five shallow holes. The WSMC surveys were completed by Century Geophysics using a down-hole gyro instrument. The Newmont down-hole surveys were conducted using truck-mounted, wire-line, down-hole survey equipment. Constant dip angles are assumed for the remaining 1,306 holes in the database. This assumption is likely to introduce increasing location error with increasing depth of the drill holes, especially for angle holes. Of the holes lacking down-hole surveys, 135 are drilled to down-hole depths of 500ft or greater. All except two of these deep holes, however, were drilled vertically.

Of the 1502 holes in the database, 1420 were drilled at an angle of -80º or steeper. The overwhelming bulk of the Northumberland gold mineralization is grossly stratiform and broadly folded by the Northumberland anticline. Near-vertical drilling, therefore, will cut the mineralization at acceptable angles. The steepest dips to the mineralized bodies occur in the deep Zanzibar and Rockwell deposits, which have an average dip of about -45º. While near-vertical drill holes do not cut this mineralization orthogonally, the three-dimensional resource modeling of the drill-hole data described in Section 17 accurately reflects the true thicknesses of the mineralization.

11.2 Pre-WSMC Drilling

There are no records of the drill contractors, drill rigs, drilling equipment, etc. used in the Homestake, Idaho Mining, and Cyprus drilling campaigns.

11.3 WSMC Drilling

WSMC used a number of RC drilling contractors from 1985 to 1991. RC contractors known to Fronteer include Hackworth Drilling, Inc. of Elko, Nevada; Kelmine; Pioneer Drilling Company; Eklund Drilling Company of Carlin, Nevada ("Eklund"); and Elsing Drilling and Pump Co., Inc. of Twin Falls, Idaho ("Elsing"). In 1989 and 1990, Elsing used an Ingersoll-Rand TH60 with 5 ½- and 5 ¾-inch hammer bits. In 1990 and 1991, Hackworth used 5 1/2-inch hammer bits. Leroy Kay Drilling of Yerington, Nevada and Tonto Drilling Services Inc. of Salt Lake City, Utah ("Tonto") drilled core for WSMC in 1991. Elsing, Eklund, and Boyles Brothers Drilling Company of Sparks, Nevada ("Boyles Brothers", part of Layne Christensen Company) were used as RC contractors and Tonto as the core contractor in 1992 and 1993. Elsing used a 5 1/2-inch bit and Eklund used a VT-100 rig with 6-, 5 3/4-, and 5 7/8-inch bits. RC and core contractors used in 1997 were Boyles Brothers and Tonto, respectively. Boyles Brothers used a TH100A RC rig in 1992 and 1993, and the TH100A rig as well as an MPD-1500 rig in 1997. The types of rigs used by the other contractors are not known.

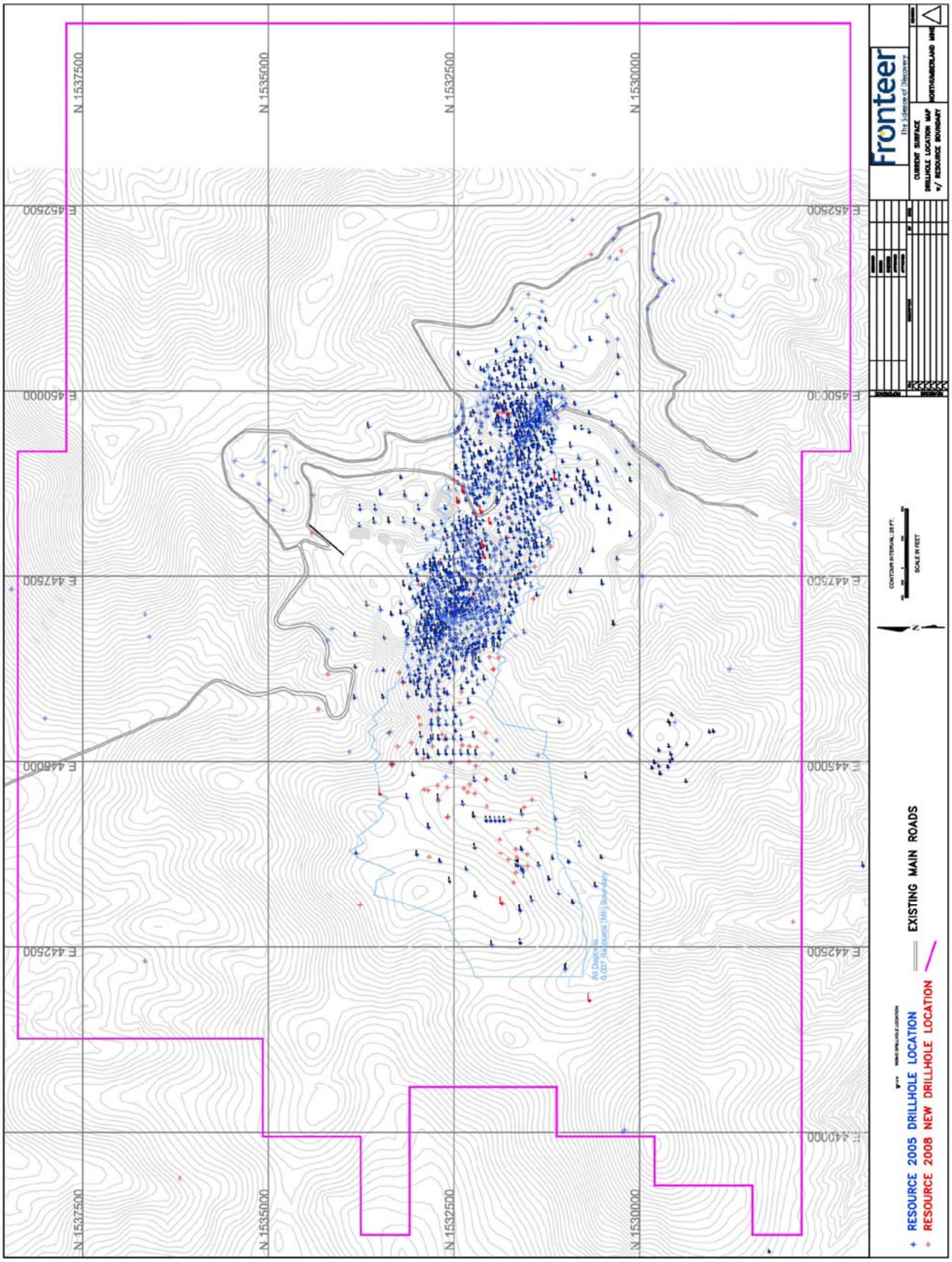
For all RC drilling, holes were started with hammer bits and were used to the end of holes unless ground conditions, such as broken rock or high-ground-water flow, required the use of a rock bit. Further details of the drilling procedures are not known.

11.4 Newmont Drilling

Newmont contracted Eklund for their 2004 through 2007 drilling campaigns. Eklund used an Ingersoll-Rand TH-75 drill rig with 5½- to 6-inch conventional-hammer and center-return tricone bits. The tricone bits were used when significant ground water was encountered in the drilling. Drilling additives and water were used to condition the hole and to maintain circulation in difficult rock conditions. Newmont contracted Layne Christensen Company for their 2006 and 2007 core and pre-collar core drilling programs. Holes were drilled using HQ-size bits. When required by ground conditions, holes were reduced using NQ-size bits.

Newmont drilled an additional 89 RC, core, and pre-collared core holes since the last resource estimate in 2005. These new holes have been included in the updated resource estimation discussed in Section 17, and were mostly drilled in the general area of the resources (Figure 11.1). These holes were drilled to explore for both sulfide and oxide mineralization, obtain metallurgical and geotechnical samples, and verify RC drill results. The results from this drilling are discussed in Section 6.

Figure 11.1 Drill-Hole Location Map



12.0 SAMPLING METHOD AND APPROACH

Fronteer has no information concerning the RC and rotary sampling methods or approaches by operators at Northumberland prior to WSMC in 1989 other than the sample lengths stored in the master digital database. Average drill sample lengths by company are given in Table 11.4.

Essentially all of the Homestake rotary samples were taken from five-ft intervals, while the Idaho Mining holes were sampled at 10-ft intervals. Cyprus air-track and rotary holes were sampled predominantly at five-ft and 10-ft intervals, respectively.

The drill holes in the Northumberland database are predominantly vertical, and sample intervals are usually in the range of five to ten feet. Fronteer believes the orientation and length of these samples are appropriate for the style of mineralization at Northumberland.

Individual drill-hole intercept grades and lengths are not given in this report; the resources described in Section 17 provide more meaningful data with regards to the scale and grade of the Northumberland mineralization.

12.1 Cyprus Core Sampling

WSMC was able to recover a significant amount of Cyprus core from a storage shed at Northumberland that had collapsed. The recovered core was then catalogued and stored in trailers at the site. The recovered Cyprus core is both NX- and NC-sized. The core was split with a mechanical splitter, with one-half of the core sent for assaying and one-half kept in the core boxes for future reference. Approximately 50% of the core footage was sampled at 10-ft intervals and the reminder was sampled at 5-ft intervals.

12.2 WSMC RC and Core Sampling

As part of an audit and verification of the Northumberland mineable reserves, Pincock, Allen & Holt, Inc. ("PAH") conducted a site visit in July 1989 and reviewed the drill sampling procedures. PAH (1989) reports that two approximately five-pound drill-sample splits were collected for each five-ft interval at the RC rig. One sample split was sent for assaying and the other split was stored at Northumberland for future reference.

Documentation of RC- and rotary-sampling methods beyond the PAH 1989 report is lacking. The following information on the 1989 to 1997 WSMC RC-drilling programs is derived from the personal knowledge of G. Lanier (pers. comm., 2005). A WSMC geologist was present while the rig was actively drilling. Cuttings collected during dry drilling were split with Jones-type tiered splitters supplied by the drilling contractor. Wet samples were split using the drillers' rotary splitters. Two identical splits, usually weighing at least five-pounds each, were collected at the rig and set on the ground at the drill site. According to the digital database, approximately one-half of the RC samples were collected at 10-ft intervals and the others were collected at five-ft intervals. The higher percentage of 10-ft intervals is related to drilling through known thick sections of unmineralized ground in Mormon Canyon. This determination was based on a modeled interpretation of mineralization prior to drilling specific holes. Five-foot intervals were used in all cases where there was a possibility of intersecting mineralization.

WSMC drill core, which was essentially all HQ-size, was sawed in half at the truck shop in the Upper Site. Approximately 55% of the core was sampled at 10-ft intervals, 27% at 5-ft intervals and less, and 18% between 5- and 10-ft intervals. A very small amount of the core was sampled at intervals greater than 10ft and less than 20ft. The core size was reduced from HQ to NQ in hole NW1165A due to ground conditions. NQ-size core was processed the same as the HQ-size.

12.3 Newmont RC and Core Sampling

The following details of the Newmont 2004 RC and Core sampling programs were provided by Eric Lauha, Newmont geologist (pers. comm., 2008). Water was injected by the drillers during the entire program, so that all samples were collected wet after passing through a rotary splitter. The sampler and/or driller adjusted the rotating splitter to optimize the filling of the 18-inch by 26-inch bags with the wet cuttings from each five-ft interval without overflow. The sample bags were labeled by hand, and a bar-code tag that identified the drill-hole number and footage interval was also attached to the bag. No rig duplicate samples were collected.

Occasional sample recovery problems due to lost circulation were experienced during the Newmont drilling program. The worst case was the lack of any sample recovery in hole NN-15 in the interval between 490 and 535ft, probably due to a broken structural zone and an associated solution cavity (Lauha, pers. comm., 2005). No significant gold was intersected immediately above and below this interval of no recovery. Other instances of loss of recovery were usually restricted to single 5-ft intervals.

Newmont drill core was all HQ-size. The core was sawed in half at Newmont's Maggie Creek Core Facility where Chemex would pick up the samples to be assayed. All of the core was sampled at 5-ft intervals. Standards were inserted into the sample stream as was done for the RC samples. Core recovery was generally very good as was the RQD.

12.4 Rotary and RC Sample Contamination

Newmont recognized indications of down-hole contamination in some holes that encountered difficult drilling conditions and where good circulation could not always be maintained (Lauha, pers. comm., 2005). The contamination was recognized by unusual mixtures of RC cuttings whereby lithologies previously encountered in the hole but not expected in the interval being drilled were seen. This type of contamination was sometimes seen at the end of drilling a 20-ft pipe length and the beginning of the next 20-ft section when drilling was paused and the hole was blown clean. The contaminating cuttings were derived from broken zones intersected higher in the drill holes.

No contamination is explicitly documented in the RC and rotary holes drilled prior to Newmont. However, several mineralized intervals suspected of being contaminated were excluded from the mineral envelopes created during the sectional grade modeling and therefore the resource estimation (see Section 17). These intervals were identified on the basis of gold values that extend to anomalous depths compared to nearby holes. As contamination is often difficult to recognize, it is likely that additional contaminated intervals remain in the database.

13.0 SAMPLE PREPARATION, ANALYSIS, AND SECURITY

13.1 Sample Handling, Security, and Preparation

Fronteer has no information on sample handling, security, or preparation for operators at Northumberland prior to WSMC's work in 1989.

American Assay Laboratories of Sparks, Nevada ("American Assay") analyzed the 1989 through 1997 drill samples of WSMC. American Assay obtained ISO 9002 registration in 2000. American Assay picked up the RC drill samples that were stored on the drill pads, as well as the core samples stored in the truck shop, and transported them either to their Elko, Nevada facility for sample preparation prior to transporting the sample pulps to their Sparks, Nevada laboratory for analysis, or directly to Sparks for both preparation and analysis. WSMC would occasionally transport the drill samples directly to the Sparks laboratory when a short turnaround time on the analyses was desired.

WSMC also stored duplicate RC samples at the drill sites. If the sample sent for analysis was mineralized (~0.01 oz Au/ton or greater) or within a mineralized interval, the rig duplicate was placed in a secured sample storage facility at one of two ranches owned by WSMC in the Battle Mountain area. The rig duplicates of unmineralized samples were discarded. The stored rig duplicates, along with assay pulps, assay rejects, and half-core, were recently moved to secured storage at the Lower Site at Northumberland.

The Newmont 2004 - 2007 RC samples were stored at the drill site and were periodically picked up by ALS Chemex ("Chemex") personnel. A Newmont geologist would typically arrange a pick-up with Chemex as soon as a drill hole was nearing termination, and a Chemex truck would often arrive when the drillers were abandoning the hole. Otherwise, the samples from the completed hole would be picked up by Chemex on the following day (Lauha, pers. comm., 2008).

13.2 Analytical Procedures

Many of the details of the analytical procedures used in the assaying of the drill-hole samples are not fully documented. As discussed in Section 11, all holes drilled by NMC, Joralemon, and Kerr McGee have been removed from the database due to suspect sample quality and assays, and will not be discussed further. Although gold and silver fire assays are included in the database for the Homestake drill holes and T83 series holes of Cyprus, neither the laboratory nor details of the analytical procedure are known. WSMC did not acquire the original assay certificates for holes drilled by Cyprus and earlier operators at the time WSMC took possession of Northumberland, although summary assay logs prepared by Whitney & Whitney, Inc. were obtained (Lanier, 1992a). Table 13.1 shows the extent of information known about the assay laboratories and analytical techniques used for the various series of drill holes through 1997.

Union Assay of Salt Lake City, Utah ("Union"); Skyline Laboratories of Denver, Colorado ("Skyline"); and Rocky Mountain Geochemical Corporation, of Sparks, Nevada ("Rocky Mountain") assayed Idaho mining drill samples.

Laboratories used to analyze the Cyprus drill samples include CMS of Salt Lake City, Utah; CRL of Salt Lake City; Hunter Mining Laboratory of Sparks, Nevada ("Hunter"); Monitor Geochemical Laboratory of Elko, Nevada ("Monitor"); Skyline; Union; Rocky Mountain; Western Testing Laboratories; Legend Laboratories of Reno, Nevada ("Legend"); and the Cyprus mine laboratory at Northumberland. Samples from holes NC01 through NC38 were analyzed by CMS using an MIBK technique whereby samples were roasted to 600º C to remove carbon, digested in aqua regia, and analyzed by atomic absorption ("AA"). Little is known of the analytical procedures used by the various laboratories. As discussed below, WSMC performed cyanide leach analyses on selected mineralized samples from some of the Cyprus holes at their laboratories in Elko and the Northumberland mine site.

Lanier (1992a) reported that the original gold and silver analyses for holes NC337 through NC553 (drilled by Cyprus during the period 1979-1983) were performed by Monitor by ½-assay-ton (15g charge) fire assay with gravimetric finish. Skyline was used for check assays and also analyzed by ½-assay-ton fire assay, although the finish is not known. Cyprus analyzed samples from many of these holes for silver by cyanide leach methods; gold was analyzed by cyanide leach in samples from NC337. Details of the cyanide leach procedures are not known. WSMC's Northumberland mine laboratory later ran check gold and silver analyses on NC341 and is believed to have used ½-assay-ton fire assaying. The WSMC lab also analyzed selected Cyprus samples by one-hour cold-cyanide leach with final gold and silver determination by AA.

Samples from WSMC holes T3-01 through T3-14, the CD88 series, and NW554 through NW799 were initially assayed at the WSMC Northumberland mine laboratory by cyanide soluble methods. Gold and silver were analyzed by one-hour 180º F shake-leach methods using a 10g charge in four-pound per ton cyanide solution with final determination by AA. Monitor also completed cyanide soluble assays of unknown type on some of the samples. Gold and silver cyanide leach values of samples from holes NW800 through NW958 were completed by WSMC, Barringer Laboratories, Inc. ("Barringer"), Universal Laboratories of Elko, Nevada ("Universal"), and Rocky Mountain. Samples from these WSMC holes that returned cyanide leach gold values of 0.010 oz Au/ton or greater were fire assayed, with gold and silver primarily determined by one-assay-ton (30g charge) fire assay with gravimetric finish at the WSMC laboratory (Lanier, 1992a).

The lack of comprehensive fire assay data precipitated the initiation of a program in mid-1989 to obtain complete gold and silver fire assays for all drill intervals. Available pulps or rejects from Cyprus and WSMC intervals lacking fire assay data were analyzed at the WSMC laboratory at Northumberland by fire assay with gravimetric determination of gold and silver values. Approximately 94% of the drill samples that were only analyzed by cyanide leach methods were fire assayed by the end of the program in 1990; neither pulps nor rejects for the remaining 6% could be located. The original cyanide soluble gold results commonly exceeded the new fire assay gold results, mainly for the NW700 series of holes drilled in 1987. Additional cyanide soluble gold assays were determined on these samples if the sample pulps could be located, and the original cyanide assays were replaced in the database with the new values. The original cyanide soluble results for those samples whose pulps could not be found were removed from the database.

Table 13.1 Laboratories and Assay Methods Employed Through 1997

Company	Drill Holes	Gold Analytical Technique and Laboratory					Silver Analytical Technique and Laboratory				
		FA/AA	FA/Grav	FA/?	Other	CN	FA/AA	FA/Grav	FA/?	AD/AA	CN
Idaho Mining	N01-16			Union					Union		
	N17-31			Skyline; Union					Skyline; Union		
	N32			Rocky Mountain						Rocky Mountain	
Homestake	NU01-21	?	?	?	?	?	?	?	?	?	?
Cyprus	NC001-038				CMS: Au assays by MIBK/AA	WSMC				CMS	
	NC039-081	CMS	CRL; Union			WSMC				CMS	
	NC082-220		Hunter	Union		WSMC	Hunter		Union		
	NC221-274A	Monitor		Union			Monitor		Union		
	NC275-298			Hunter; Skyline; Western; Legend		WSMC			Hunter; Skyline; Western		WSMC
	NC299-336		Skyline	Skyline; Monitor		WSMC	Skyline		Skyline; Monitor		WSMC
	NC337-536	Skyline	Monitor; WSMC	Monitor; Skyline		WSMC; Cyprus	Monitor	WSMC	Monitor; Skyline		Cyprus; WSMC
	NC537-553	?	Monitor	?	?	?	?	Monitor	?	?	?
	CT01-36A			Hunter; Monitor; Rocky Mountain					Hunter; Monitor; Rocky Mountain		
	T83 001-152	?	?	?	?	?	?	?	?	?	?
WSMC	NW554-799		WSMC	Monitor; Barringer		WSMC; Monitor		WSMC	Monitor; Barringer		WSMC; Monitor
	NW800-923		WSMC	Barringer; Rocky Mountain		Barringer; WSMC; Rocky Mountain		WSMC	Barringer	Barringer; Rocky Mountain	WSMC
	NW924-1222		American Assay	Universal; American Assay; Cone		Universal; American Assay; WSMC		American Assay	Cone	Universal; American Assay	WSMC
	T3 01-14		WSMC			WSMC		WSMC			WSMC
	T3 15-17			American Assay						American Assay	
	CNDM01-11			Barringer						Barringer	
	CD88 01-03		WSMC			WSMC		WSMC			WSMC

FA=fire assay AD=acid digestion CN=cyanide leach MIBK (see text)
AA=atomic absorption finish GRAV=gravimetric finish ?=unknown finish

Samples from holes NW946 through NW1222 were analyzed by American Assay by fire assay with AA finish. Samples returning values in excess of 3-ppm gold (0.088 oz Au/ton) were re-analyzed by fire assay with gravimetric finish. Cone Geochemical Inc. of Reno, Nevada ("Cone") performed some check analyses of selected samples from these holes by fire assaying with AA finish. Holes NW946 to NW1079 were analyzed by two-assay-ton (60g charge) fire assay; one-assay ton fire assaying was used on holes NW1080 through NW1222. The change to a charge weight of one-assay-ton was justified on the basis of 52 drill-hole samples assayed by both methods at American Assay. Silver was analyzed by an aqua regia partial digestion with an AA determination using a 0.3g charge. Samples that returned silver values in excess of 50 ppm were re-run using a 1g charge. Cyanide-soluble gold and silver were determined for mineralized intervals (greater than or equal to 0.01 oz Au/ton) using a 15-g, three-hour, cold-cyanide shake leach. The three-hour leach time was chosen after a statistical comparison between one-hour hot shake tests performed at the Northumberland laboratory and three-hour cold-shake tests performed at American Assay showed no significant differences.

All Samples from Newmont's 2004 - 2007 drill holes were sent to the Chemex preparation facility in Elko, Nevada except for drill holes NN037, NN039, NN042, and NN046 which were sent to American Assay Laboratory in Reno, Nevada. The sample cuttings were dried and all of the cuttings were passed through a preliminary jaw crusher and a secondary rotating jaw crusher. The crushed cuttings were passed through a riffle splitter several times to obtain a 250g subsample. The subsample was pulverized and a 100g split of the pulp was sent to the Chemex laboratory in Reno, Nevada or Vancouver, British Columbia for analysis. Chemex has ISO 9002 laboratory accreditation and ISO:9001:2000 for North America. Chemex analyzed the pulps by 30g fire assay with AA finish. The original pulp of any sample that returned a gold value greater than 10 ppm was re-assayed by 30g fire assay with gravimetric finish. The four drill holes that were sent to American Assay were prepared and analyzed in a manner similar to that used by Chemex.

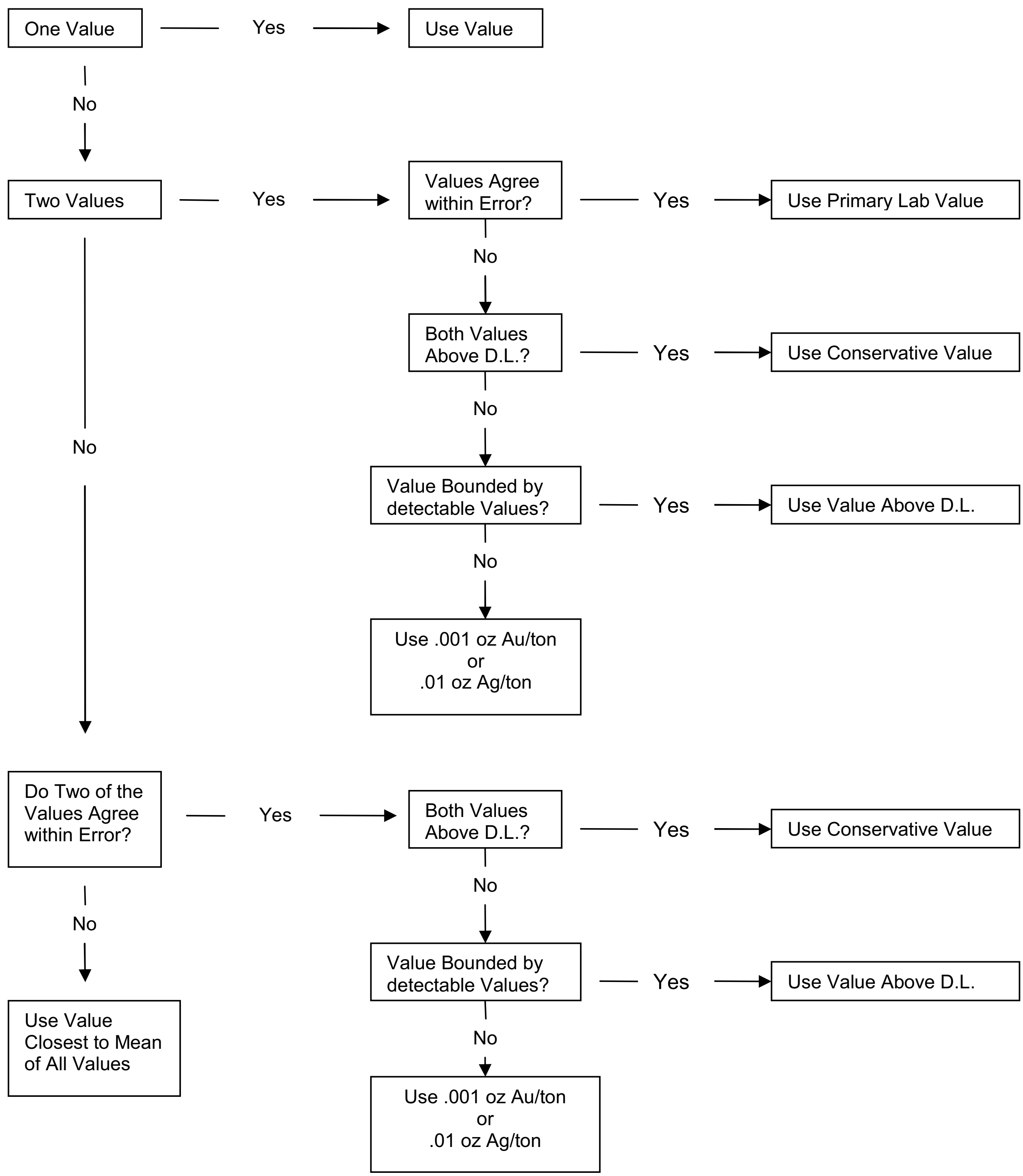
13.3 Soil Sample Analyses

The Newmont soil samples were sieved by Chemex and the 0.5- to 2.0-mm fraction was analyzed by fire assay with gold determination by inductively coupled plasma-mass spectrometry ("ICP-MS"). Trace elements were analyzed by aqua regia digestion with determination by ICP-MS and ICP-emission spectrometry. The analytical procedure used for the stream sediment samples is not known to Fronteer.

13.4 Drill-Hole Database

Due to multiple analytical gold and silver values for many of the drill-hole intervals, and averaging of values is statistically inappropriate, WSMC created a set of rules to govern the selection of a single assay value for use in the digital database for any given drill interval (Figure 13.1). These rules were followed closely and are unlikely to have introduced any material bias into the database.

Figure 13.1 Rules Governing Selection of Assay Value for Drill-Hole Database



D.L. = Detection Limit

14.0 DATA VERIFICATION

Documentation reviewed by Fronteer indicates that the drill-hole database was audited, corrected, and updated several times by WSMC. During the 2005 resource estimate, MDA audited the WSMC database using drill-hole log sheets, original assay certificates, copies of original assay certificates, and original down-hole survey data. As previously discussed, assay certificates are not available for the Cyprus holes, so typed sheets of assay results provided to WSMC at the time of the acquisition of the property from Cyprus were used to check these assay results. The collar coordinates for the Cyprus NC-series drill holes through NC314 that were selected for auditing had no survey data to compare with the database. These early holes were originally located on a local coordinate system and their collar locations were likely to have been verified by Northumberland personnel on the basis of Cyprus drill-hole plan maps (Lanier, pers. comm., 2004). Slightly more than five percent of the database was checked by MDA with only a few insignificant errors found and these were corrected.

Drill sample assays from several major mining companies are included in the database, including assays from all the Newmont holes, and these companies used multiple recognized assay laboratories. The assay data from these operators are consistent with the results generated by the WSMC drilling programs. Fronteer personnel are very familiar with the Northumberland project and have actively participated in every facet of exploration and related work and believe the data to be satisfactory and up to industry standards. During the 2005 resource estimate, MDA did conduct a site visit to Northumberland, which included an inspection of gold-silver mineralization exposed in the open pits, road cuts, surface trenches, and drill core.

14.1 Check Assaying

Systematic, consistently implemented data checks and validation procedures appear to be lacking in many of the drilling programs conducted at Northumberland. While this may be partially due to the inability of WSMC to obtain all of the data from previous operators, many QA/QC procedures were either not commonly followed or not completely documented at the time of the Homestake, Idaho Mining, Cyprus, and early WSMC exploration programs.

During the 2005 resource estimate, MDA compiled and analyzed gold check assay data for all Northumberland holes. In most cases, the documentation did not allow the distinction of check assays performed on pulps versus rejects. The WSMC checks of Cyprus NC-series holes are an exception, as these checks were predominantly performed on rejects (Lanier, pers. comm., 2005). In the discussion below, all check-assay data are considered to have been performed on ‘pulps/rejects’.

<u>Cyprus Drill Holes</u>. Figure 14.1 compares Monitor original assays versus Skyline check assays of samples from holes in the sequence NC348 through NC385. The means compare quite well and the data yield a high correlation coefficient (0.99).

WSMC check assays of samples from three of the holes compared above are compared with the original Monitor assays in Figure 14.2. These results do not compare well (correlation coefficient = 0.34), although the means are closer than might be expected from a visual inspection of the graph. Since the Monitor assays are the primary assays that are used in the assay database, and the Skyline check results verify the Monitor results, the poor WSMC check data are not considered to be a problem.

Figure 14.1 Check Assays of Pulps/Rejects: Monitor vs. Skyline

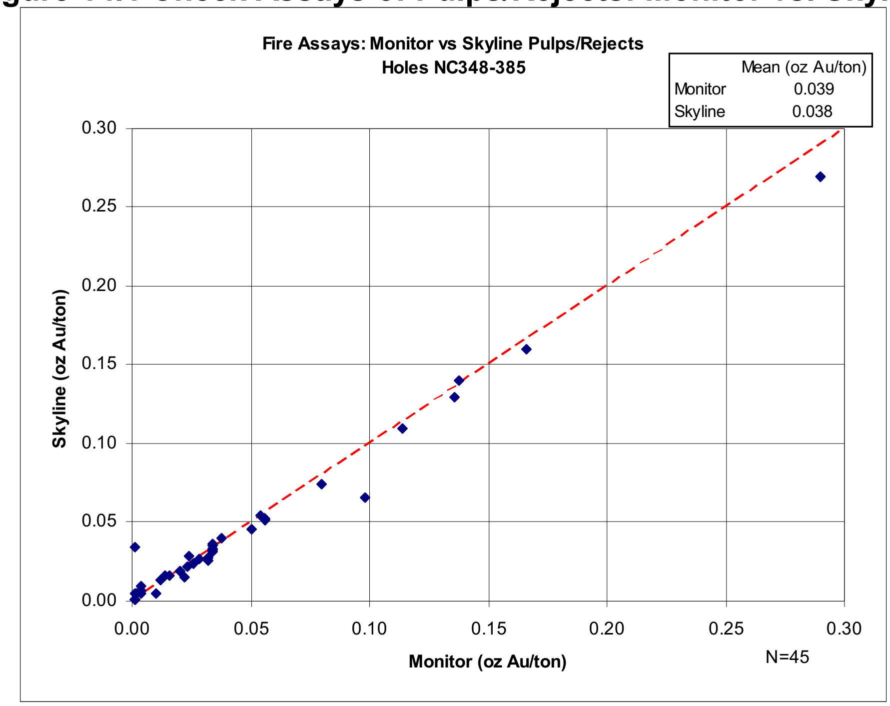
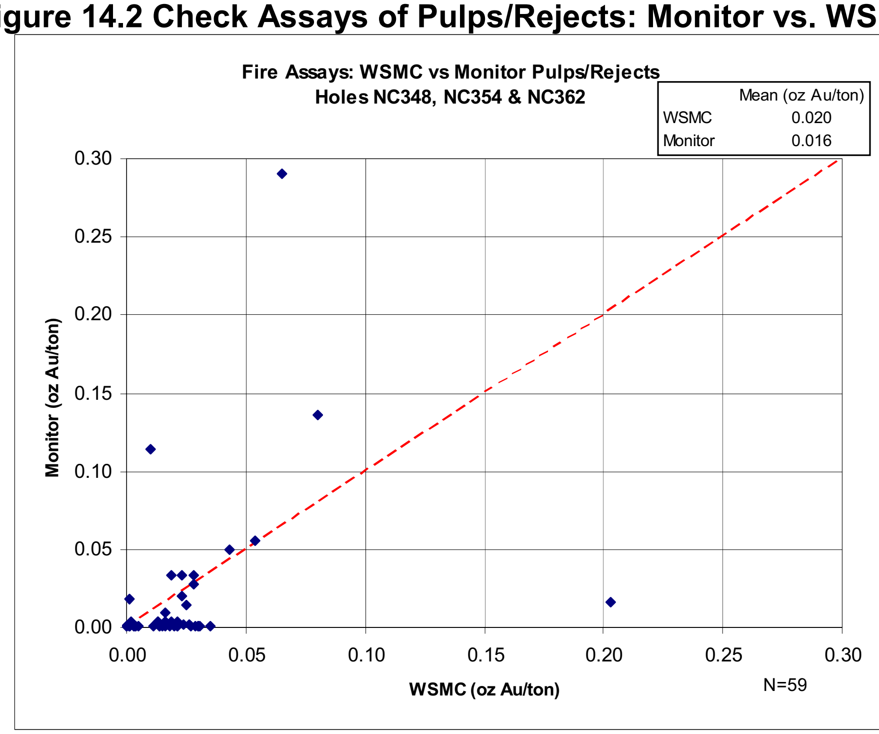


Figure 14.2 Check Assays of Pulps/Rejects: Monitor vs. WSMC



WSMC Drill Holes. American Assay original results are compared with Barringer check assays from holes NW959 and NW964 in Figure 14.3. The data compare very well, with a correlation coefficient of essentially 1.0.

Figure 14.3 Check Assays of Pulps/Rejects: American Assay vs. Barringer

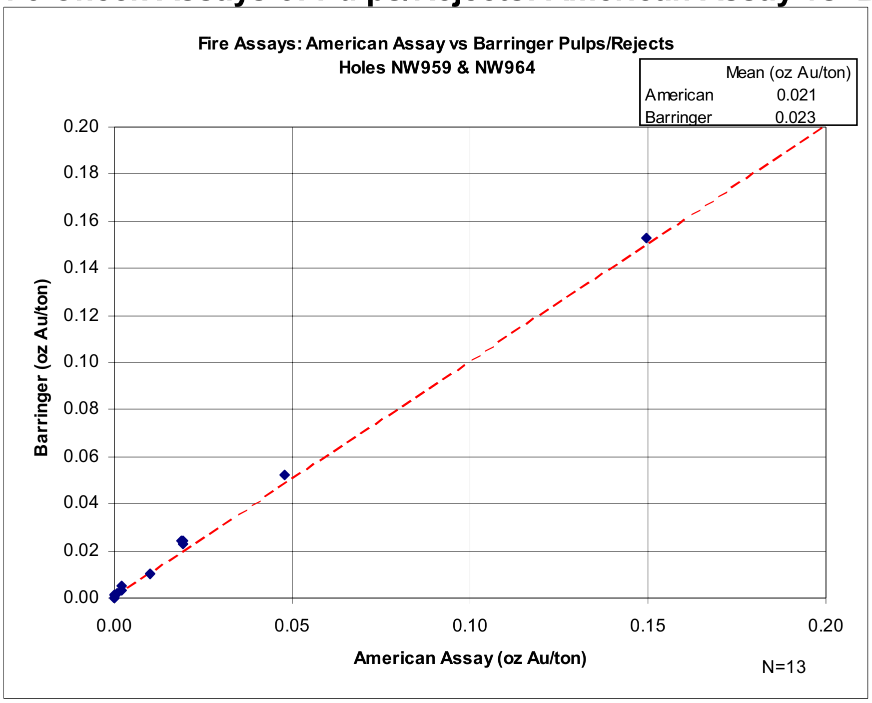


Figure 14.4 compares Barringer check assays with WSMC original assays from holes NW561 through NW964. The data compare reasonably well for samples where both assays grade up to about 0.05 oz Au/ton, while four samples with higher grades show considerable scatter. Thirty-three of the 40 assays values used in the database are from Barringer, including all the four higher-grade outlier samples.

WSMC assays from holes NW595 through NW959 are compared with Hunter check assays in Figure 14.5. The WSMC mean is 15% higher than the Hunter mean, and the data have a correlation coefficient of 0.82. Samples where both labs returned results less than about 0.05 oz Au/ton exhibit typical scatter for rig duplicate samples, while the remaining samples show a bias towards higher grades in the WSMC analyses.

Twenty Barringer sample results from hole NW887, all of which are used in the assay database, are compared with Rocky Mountain assays in Figure 14.6. The Rocky Mountain results are slightly, but systematically, higher than the Barringer assays.

Figure 14.4 Check Assays of Pulps/Rejects: WSMC vs. Barringer

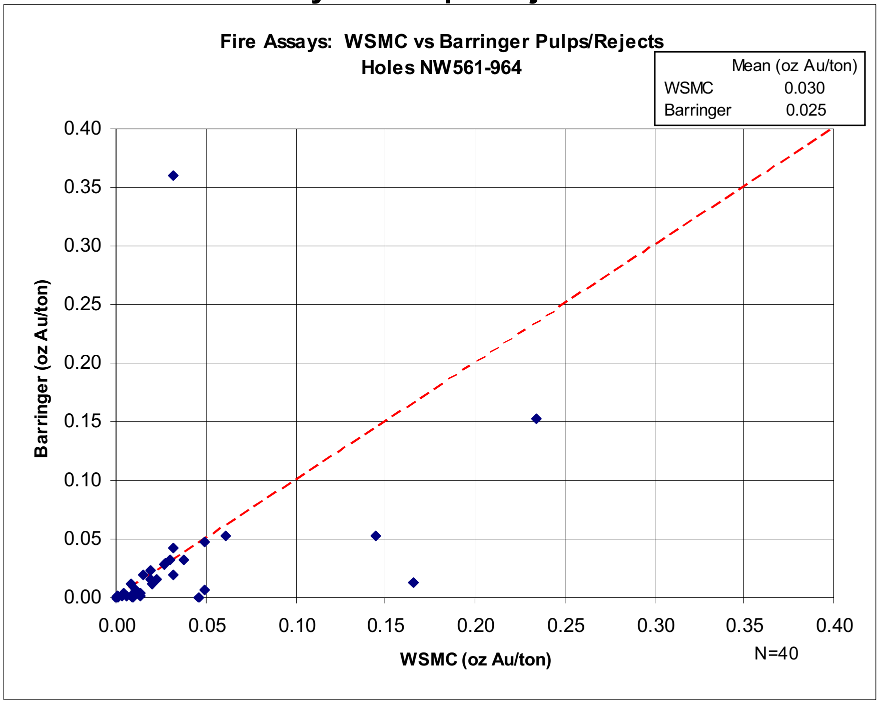


Figure 14.5 Check Assays of Pulps/Rejects: WSMC vs. Hunter

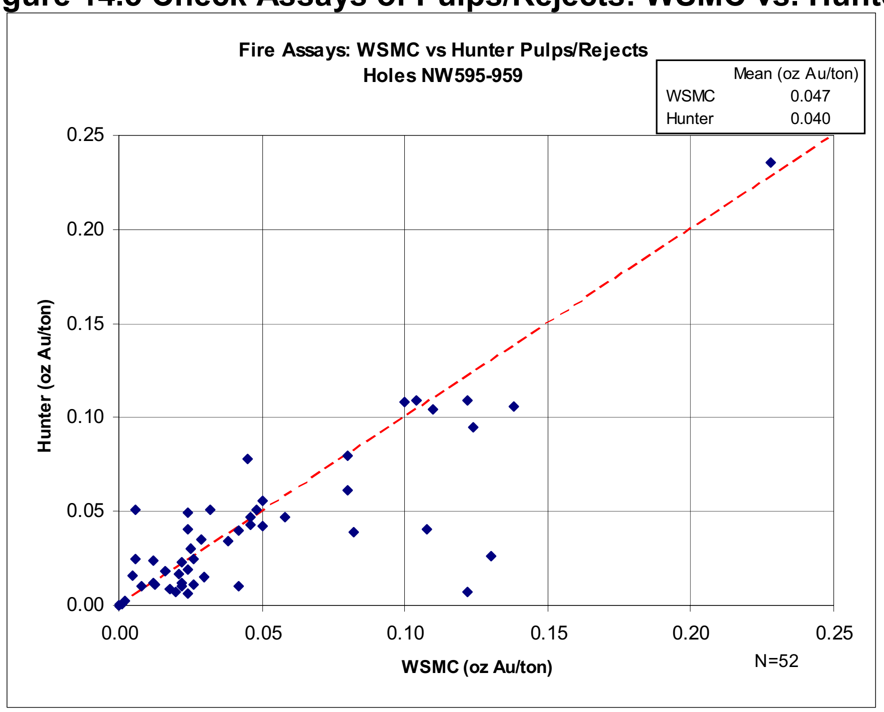


Figure 14.6 Check Assays of Pulps/Rejects: Barringer vs. Rocky Mountain

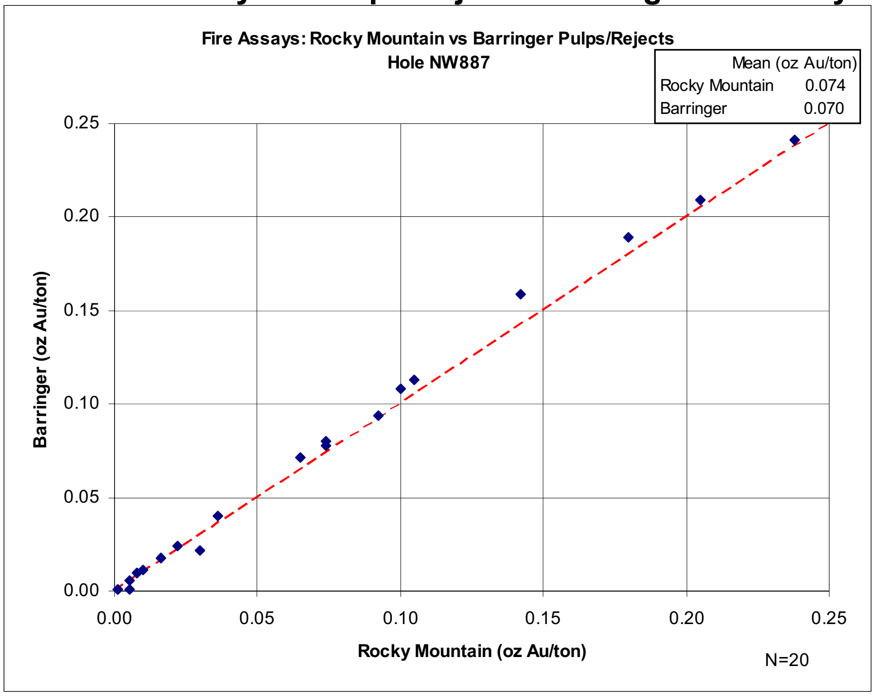
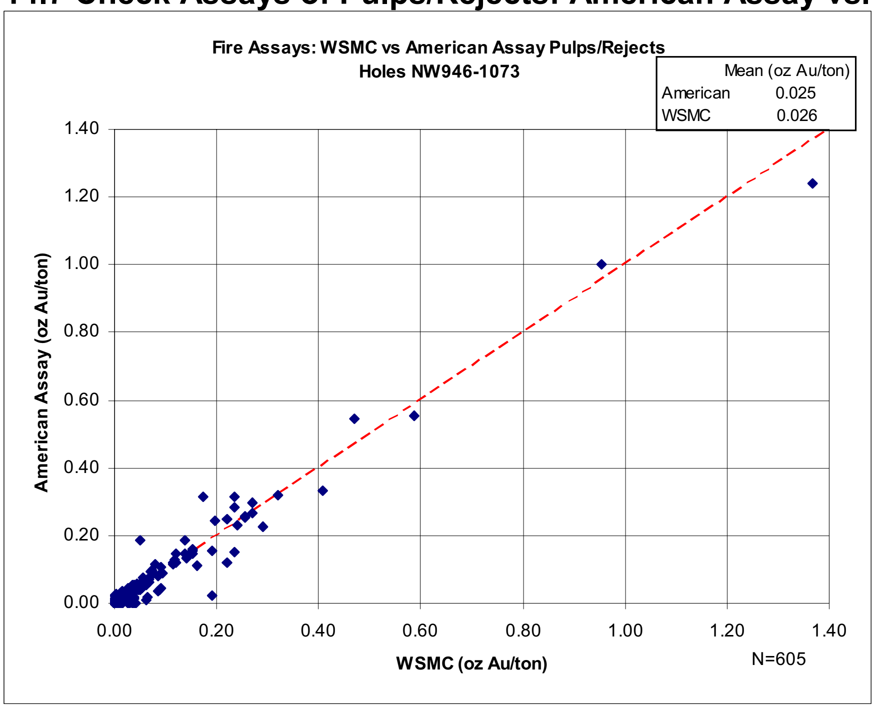


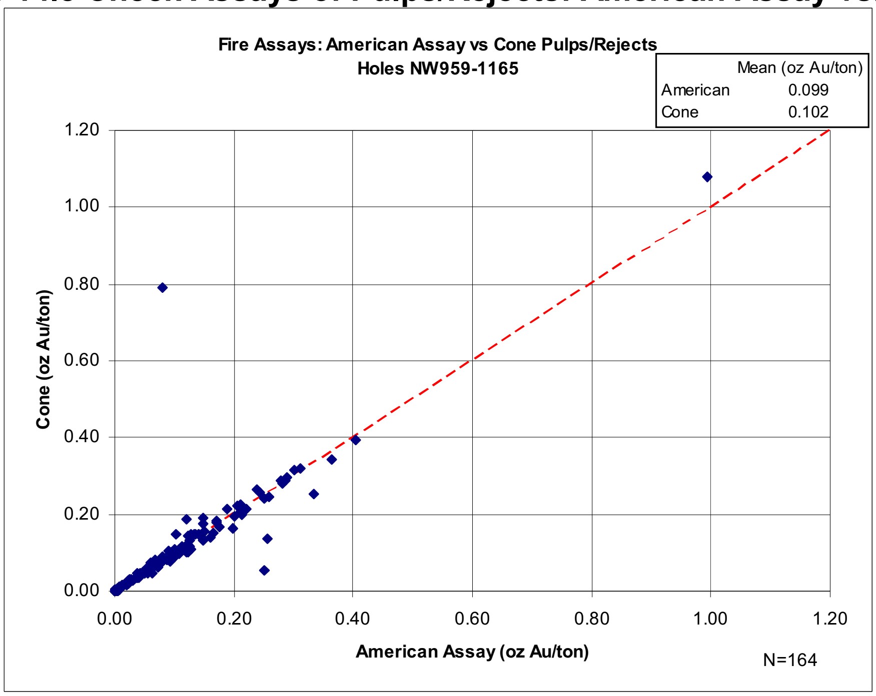
Figure 14.7 Check Assays of Pulps/Rejects: American Assay vs. WSMC



Original American Assay results compare well with WSMC check assays from holes NW946 through NW1073 (Figure 14.7). The WSMC mean grade is insignificantly higher than the American Assay mean, and the data have a correlation coefficient of 0.98.

Figure 14.8 compares original American Assay results with Cone Geochemical Inc. ("Cone") check assays for samples from holes NW959 through NW1165. With the exception of a few outliers, the data compare quite well.

Figure 14.8 Check Assays of Pulps/Rejects: American Assay vs. Cone



PAH (1989) compared the results of American Assay original analyses of 47 drill samples to American Assay check assays on rig duplicate samples (Table 14.1). The samples were of 1989 drill intervals with original assays exceeding 0.01 oz Au/ton; drill hole numbers and intervals were not provided, although holes drilled in 1989 include NW946 to NW958. Both the original and check analyses were by fire assay with AA finish. PAH noted that, "The similar means, and very high correlation coefficient show excellent precision."

Table 14.1 Comparison: American Assay Original vs. Duplicate

(adapted from PAH, 1989)

	American Assay (oz Au/ton)	American Assay (oz Au/ton)
Number	47	47
Mean	0.1580	0.1616
Standard Deviation	0.2517	0.2549
Correlation Coefficient	0.9952	

The results of 40 mineralized samples analyzed by WSMC in 1989 by fire assay with gravimetric finish were compared with American Assay fire assays with AA finish (Table 14.2; PAH, 1989). PAH concluded that there was good agreement between the two labs and that care was taken in the WSMC laboratory to ensure that analytical values were of high quality. It is not clear whether the duplicate samples analyzed by American Assay represent check assays on the same pulps or on pulps prepared on a different sample split; MDA believes the checks represent analyses of the original pulps.

Table 14.2 Drill Sample Assay Comparison: American Assay vs. WSMC

(adapted from PAH, 1989)

	American Assay (oz Au/ton)	WSMC (oz Au/ton)
Number	40	40
Mean	0.1524	0.1491
Standard Deviation	0.2667	0.2743
Correlation Coefficient	0.9902	

Finally, PAH conducted a statistical analysis of 217 drill samples with American Assay fire assay/AA values greater than 0.01 oz Au/ton versus WSMC cyanide leach assays of rig duplicate samples (Table 14.3). Fire assays are considered to represent the total gold content of the samples, while CN leach analyses represent the cyanide-soluble fraction of the samples. PAH (1989) believed that the correlation coefficient shows good correlation between the two analytical methods.

Table 14.3 Drill Sample Assay Comparison: American Assay Fire Assay vs. WSMC CN Leach

(adapted from PAH, 1989)

	American Assay Fire Assay (oz Au/ton)	WSMC CN Assay (oz Au/ton)	CN/Fire Assay
Number	217	217	
Mean	0.0496	0.0337	0.6794
Standard Deviation	0.0866	0.0573	
Correlation Coefficient	0.8993		

PAH (1989) concluded that, “Quality control is maintained at the [WSMC Northumberland mine and American Assay] labs by including internal standards and duplicate samples as a check on lab accuracy and precision.”

Newmont submitted assay standards at various grades routinely with the 2004 – 2007 drill-hole samples (Lauha, pers. comm., 2008). One standard was included for every 50th sample submitted. The standards at various grades are created by Newmont and distributed to the various drill programs. Personnel at the site then insert the standards into the sample sequence and try to place a standard with similar grade to the surrounding samples. Newmont has not provided the QA/QC for the standard samples nor have they provided a compilation of the standard assay data.

Duplicate samples from Newmont’s 2004 – 2007 drill programs were collected as a second split at the rig. Rig duplicates were collected at 100-ft intervals throughout most of the drilling program. The correlation between the original (AUOPT) and duplicate (AUDUP) samples is shown in Figure 14.9. The data compare quite well with a correlation coefficient of 0.946 and mean grade quite close. The poor precision of a few samples at the lower concentration is normal as precision improves with higher concentrations.

Figure 14.9 Scatter Plot of Newmont Rig Duplicates

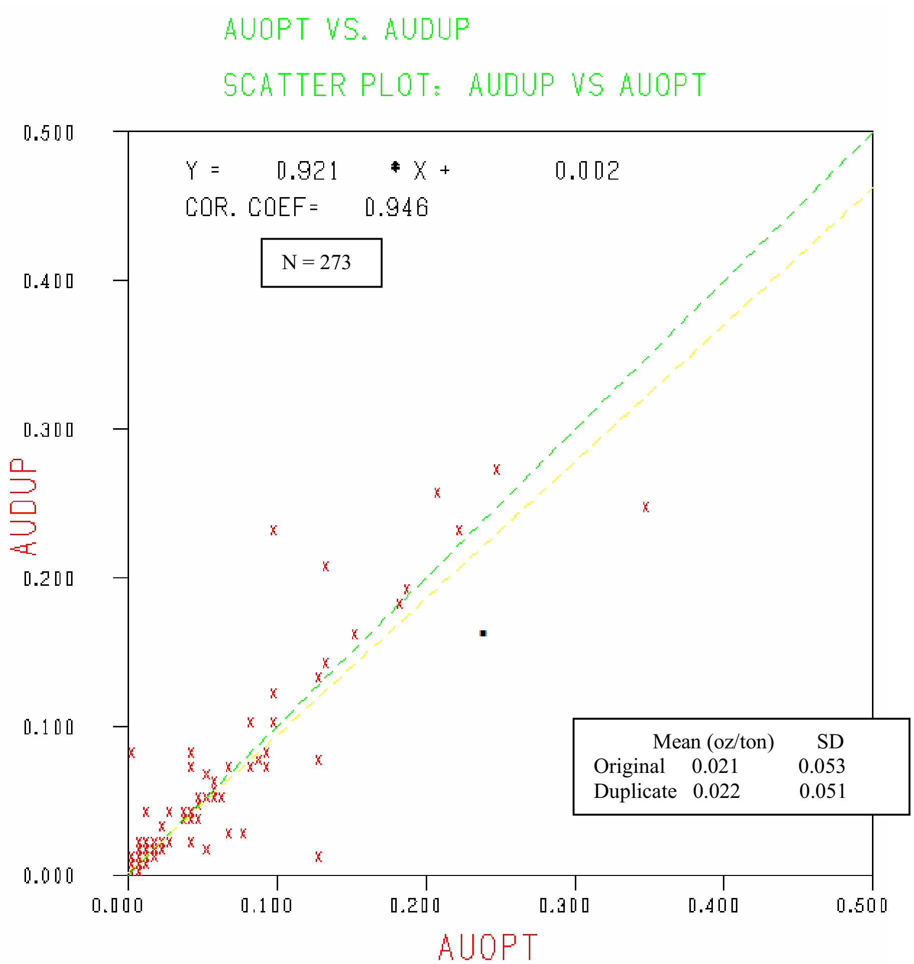
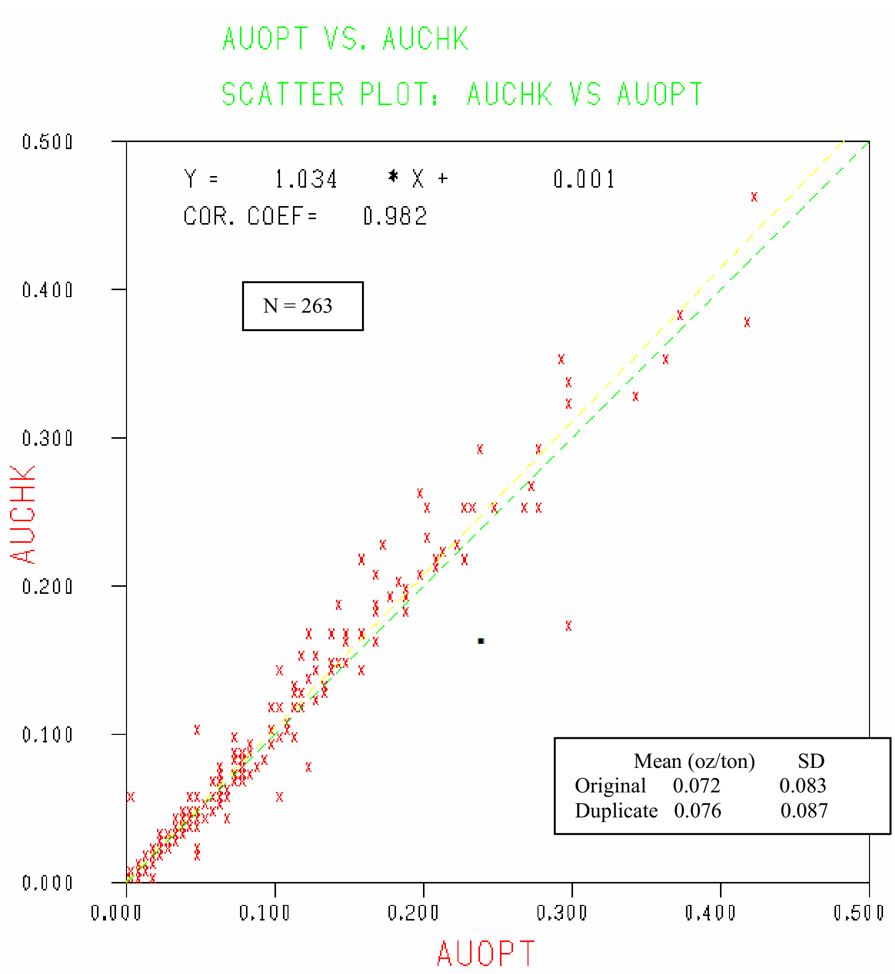


Figure 14.10 compares original Chemex results with American Assay check assays for samples drill during the 2004 – 2007 programs. With a correlation coefficient of 0.982 and comparable means the data compare quite well. The check assays have a slightly higher grade than the original samples used in the resource estimate.

Figure 14.10 Check Assays of Pulps: Chemex vs. American Assay



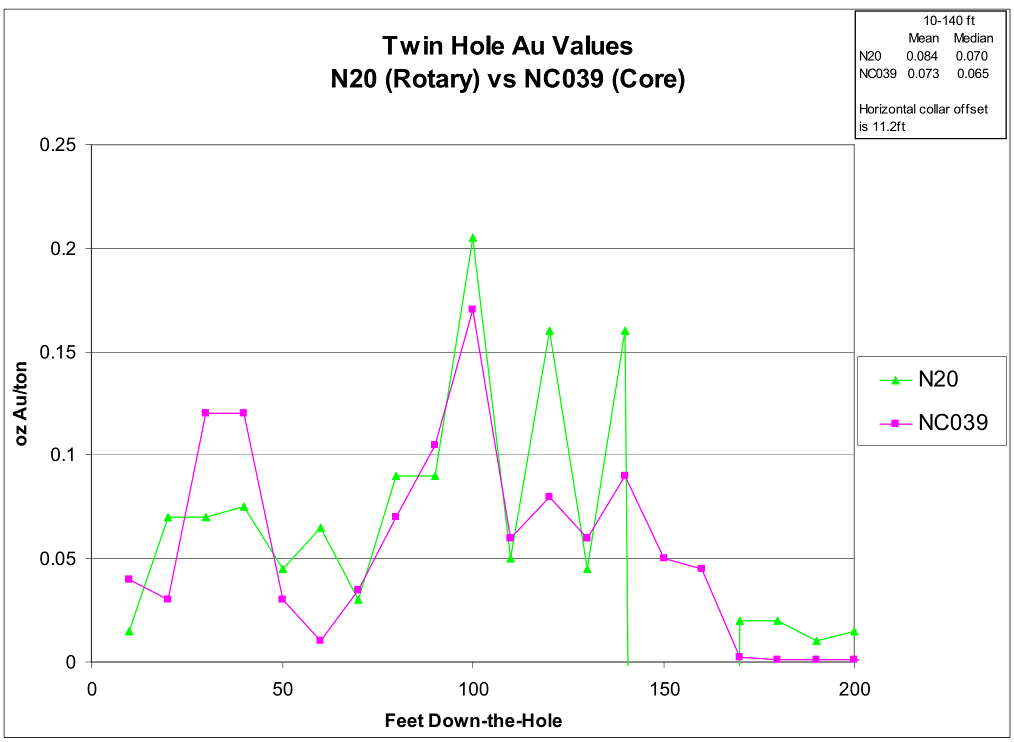
While the available check assays do not indicate serious problems with the assay database, more check data are needed before definitive conclusions can be made. Selected pulps and rejects from those that remain in WSMC storage should be re-assayed in order to augment the existing check-assay database. The early WSMC drilling data, in particular, warrant careful review and further verification by check assaying. All further drilling programs at Northumberland should continue to follow a sound QA/QC procedure similar to that implemented by Newmont.

14.2 Twin-Hole Comparisons

Core Twins. Whitney & Whitney, Inc. (1980) undertook a statistical analysis of 12 core/rotary twin pairs drilled by Cyprus and concluded that no significant bias existed in the rotary gold and silver assay results as compared to the core results.

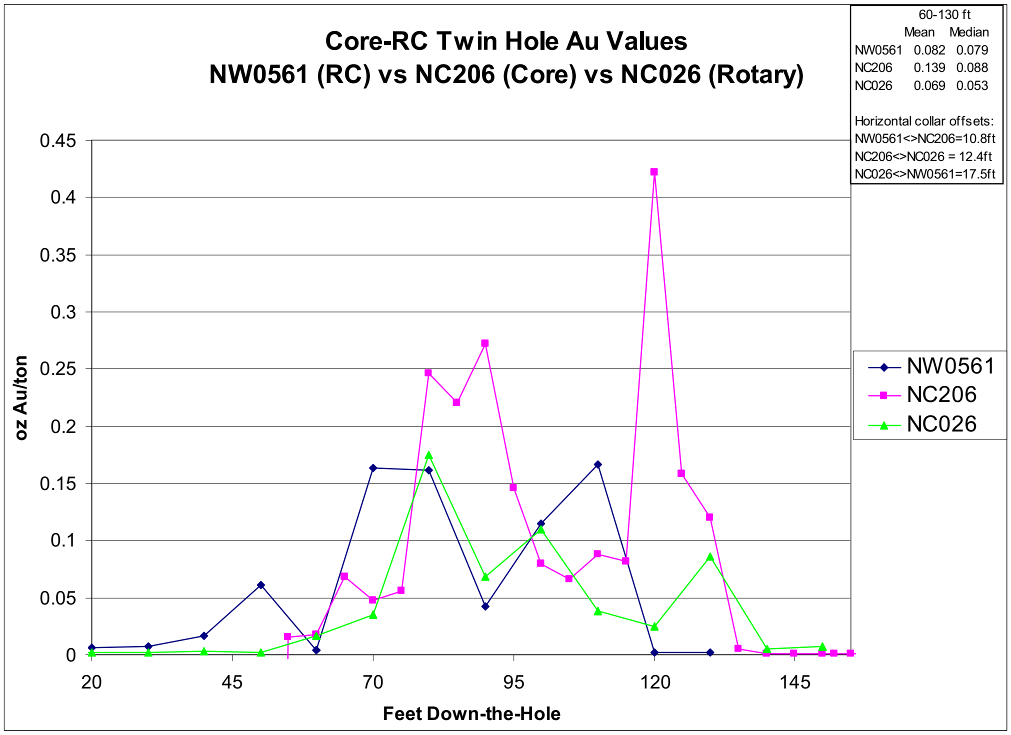
During the 2005 resource estimate, MDA compared five core/rotary twin pairs and one core/rotary/RC twin set (Figures 14.11 a-f). All of the core holes and all but one of the rotary holes in the twin sets were drilled by Cyprus. An Idaho Mining rotary hole and a WSMC RC hole are also included in the comparisons. The maximum distance between holes in any of the core twin sets is 17.5ft. The morphologies of the down-hole grade curves for each of the twin sets compare reasonably well, indicating that the twin holes sampled similar geology. The mean and median values of the mineralized core intervals are higher than the rotary twins in three cases and lower in the other three sets.

Figure 14.11 Down-Hole Gold Grade Plots of Core-Rotary and Core-RC Twin Sets

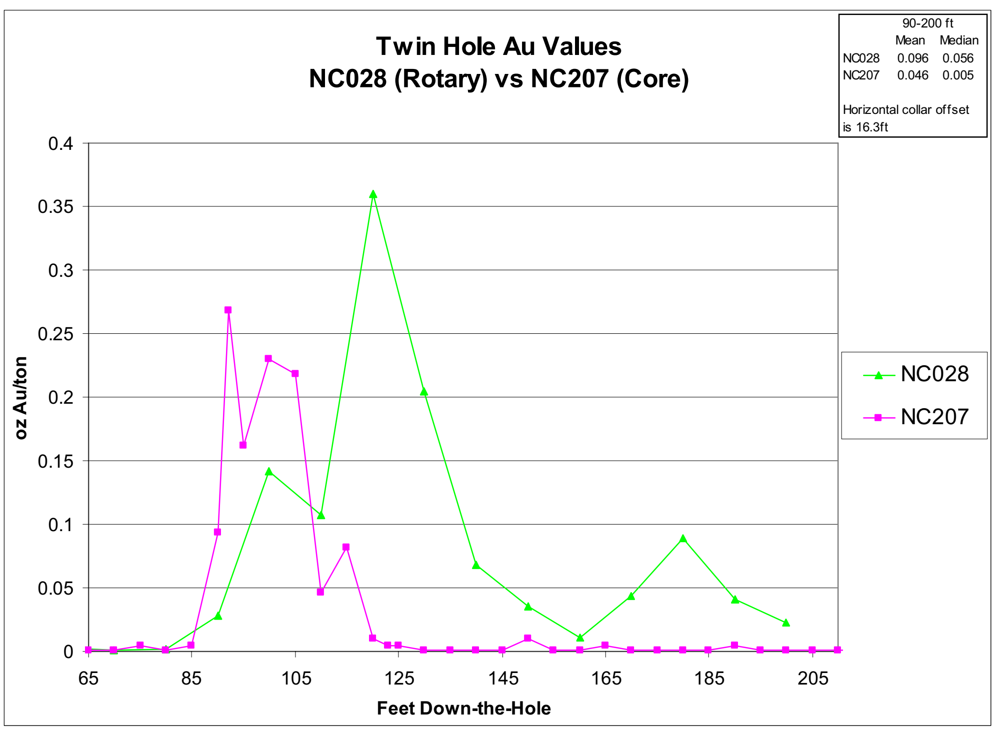


(a)

Figure 14.11 Down-Hole Gold Grade Plots of Core-Rotary and Core-RC Twin Sets (continued)

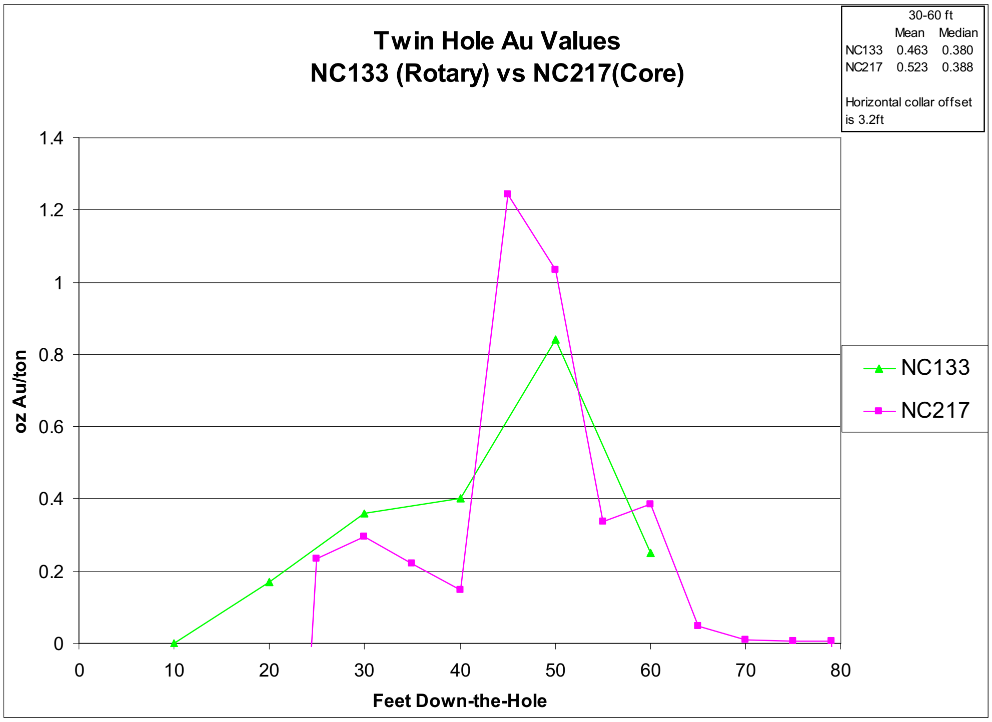


(b)

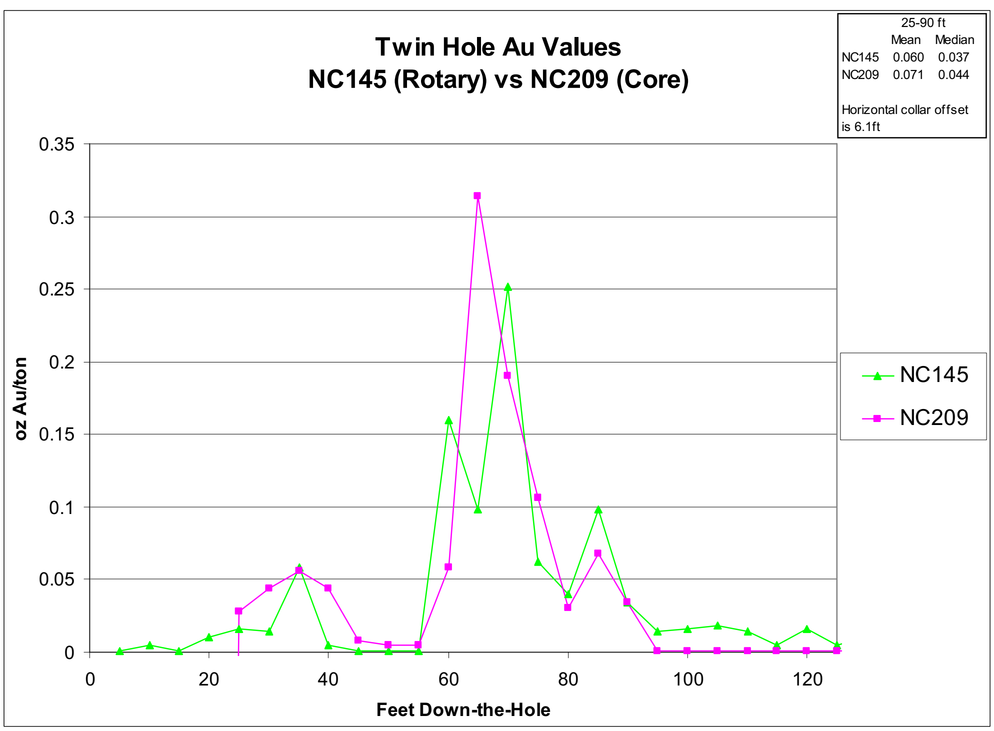


(c)

Figure 14.11 Down-Hole Gold Grade Plots of Core-Rotary and Core-RC Twin Sets (continued)

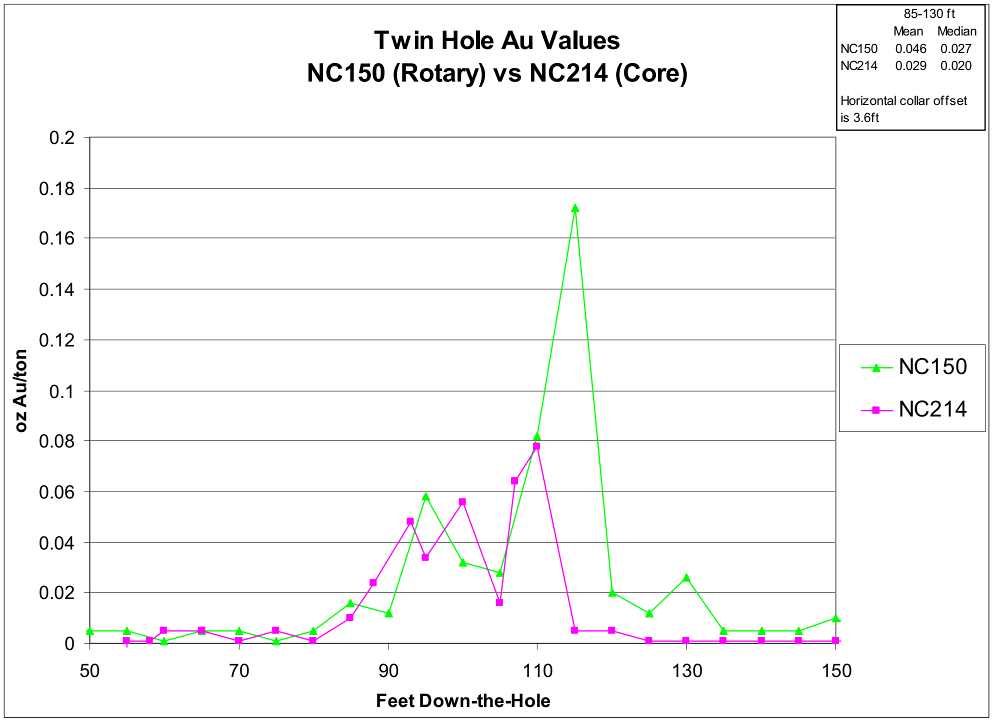


(d)



(e)

Figure 14.11 Down-Hole Gold Grade Plots of Core-Rotary and Core-RC Twin Sets (continued)



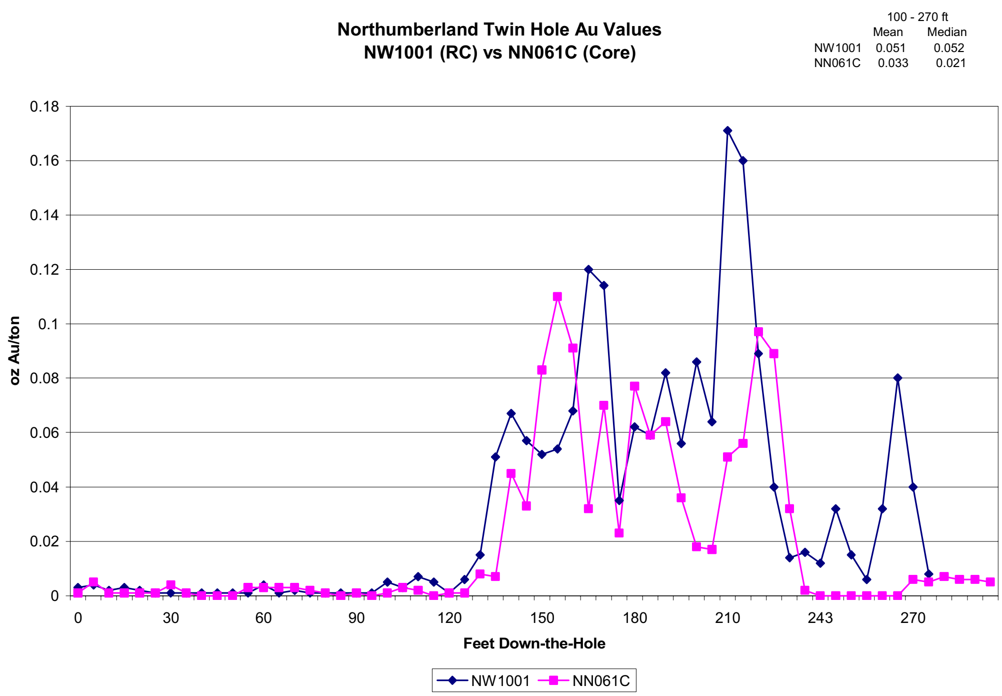
(f)

One of the main concerns with rotary and RC drilling is the potential for down-hole contamination. Contamination is possibly indicated by the gradual tailing off of values in rotary hole NC145 below the high-grade peak, which is in contrast to the abrupt loss of gold values in the core hole (Figure 14.11e). A certain amount of down-hole contamination is also evidenced in Figure 14.11e and f, where the baseline RC gold values down-hole of the mineralized intercepts are higher than the core baseline values.

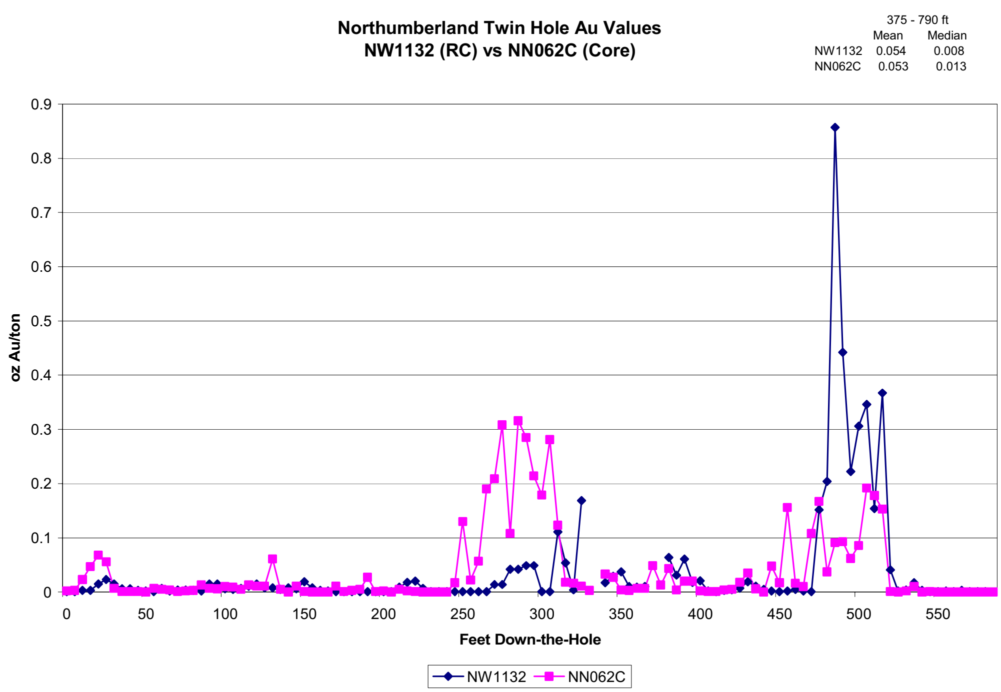
The grade differences in the core/rotary and core/RC twin pairs are not systematic, but appear to be primarily related to the magnitude of the higher-grade spikes. MDA believes that the limited data provided by these twin holes do not indicate a grade bias between core and RC/rotary drilling methods at Northumberland.

Fronteer compared three RC/Core twin pairs for the Newmont drilling (Figures 14.12 a-c). Two of the RC holes were drilled by WSMC while all the other holes were drilled by Newmont. The distances between the three pairs is (NW1001-NN061C) 6 feet, (NW1132-NN062C) 10 feet, and (NN005-NN057) 14.2 feet. The morphologies of the down-hole grade curves for each of the twin pairs compare quite well, indicating that the twin holes sampled similar geology. The mean values of the mineralized RC intervals are higher than the RC twins in all cases. The median values for the RC holes were higher in two instances and lower in the third. Down-hole contamination is not apparent in Figures 14.12 b or c. Figure 14.12a could indicate contamination at the bottom of NW1001. Fronteer believes that the data provided by the Newmont twin holes show good correlation and concur with MDA's assessment that a grade bias between core and RC drilling methods is not indicated at Northumberland .

Figure 14.12 Down-Hole Gold Grade Plots of Core-RC Twin Pairs

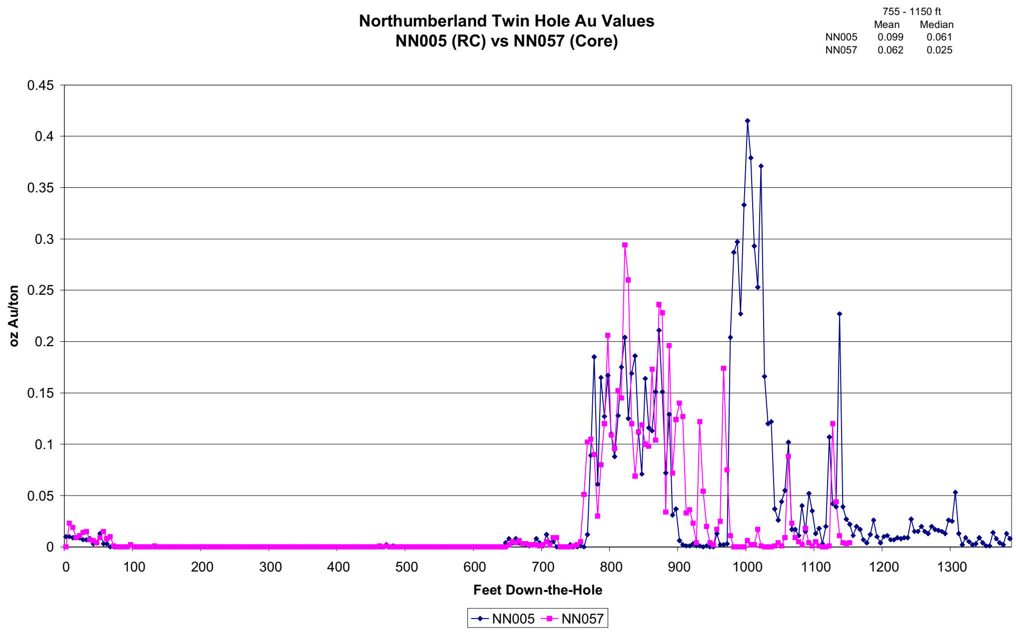


(a)



(b)

Figure 14.12 Down-Hole Gold Grade Plots of Core-RC Twin Pairs (continued)



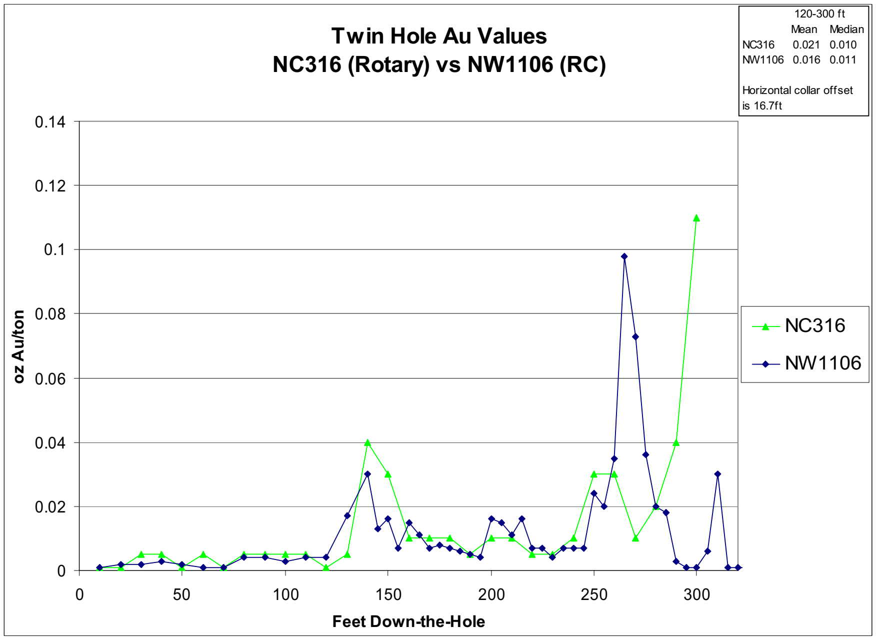
(c)

RC Twins. Down-hole grade plots of RC/rotary and RC/RC twin pairs are shown in Figure 14.13 a-d. The grade curves have been shifted in some cases to account for elevation differences and to facilitate visual comparisons.

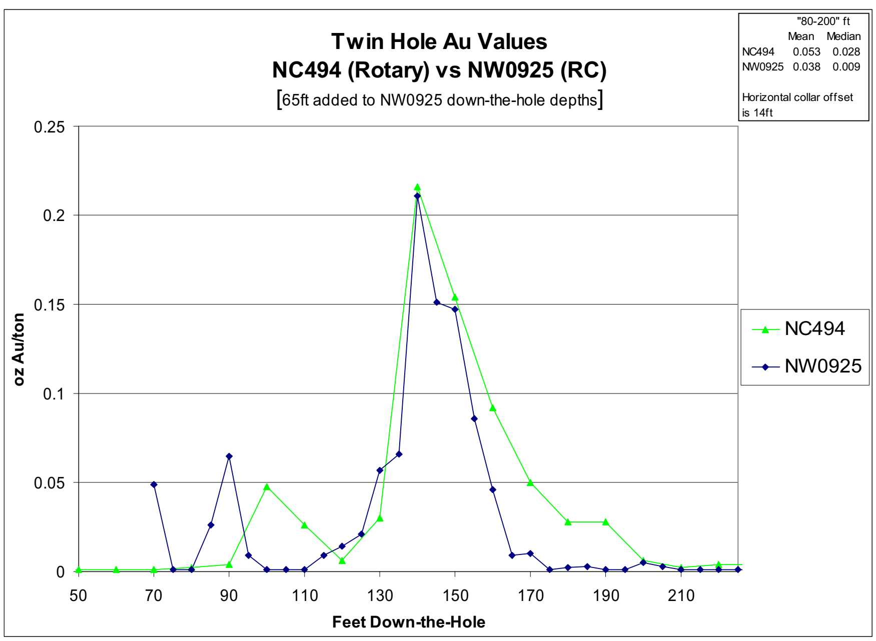
The morphologies of the grade plots compare well for each twin pair with the exception of NW621/NW904, which only has a gross correspondence of the curves. The results from rotary hole NC316 compare well with RC hole NW1106 (Figure 14.13a). The rotary/RC comparison in Figure 14.13b suggests that the rotary hole may have experienced down-hole smearing of values below higher-grade spikes, however. Grade differences in the RC/RC twin pair in Figure 14.13c may be due to sampling slightly different geology.

The RC twin data are insufficient to allow for meaningful conclusions. There are suggestions of at least local down-hole contamination of gold values, consistent with observations discussed in Section 12.4. It is noteworthy that the more recent RC holes demonstrate less contamination than the older holes, a relationship that implies ever-increasing vigilance with respect to drilling hygiene on the part of the operators.

Figure 14.13 Down-Hole Gold Grade Plots of RC-Rotary and RC-RC Twin Sets

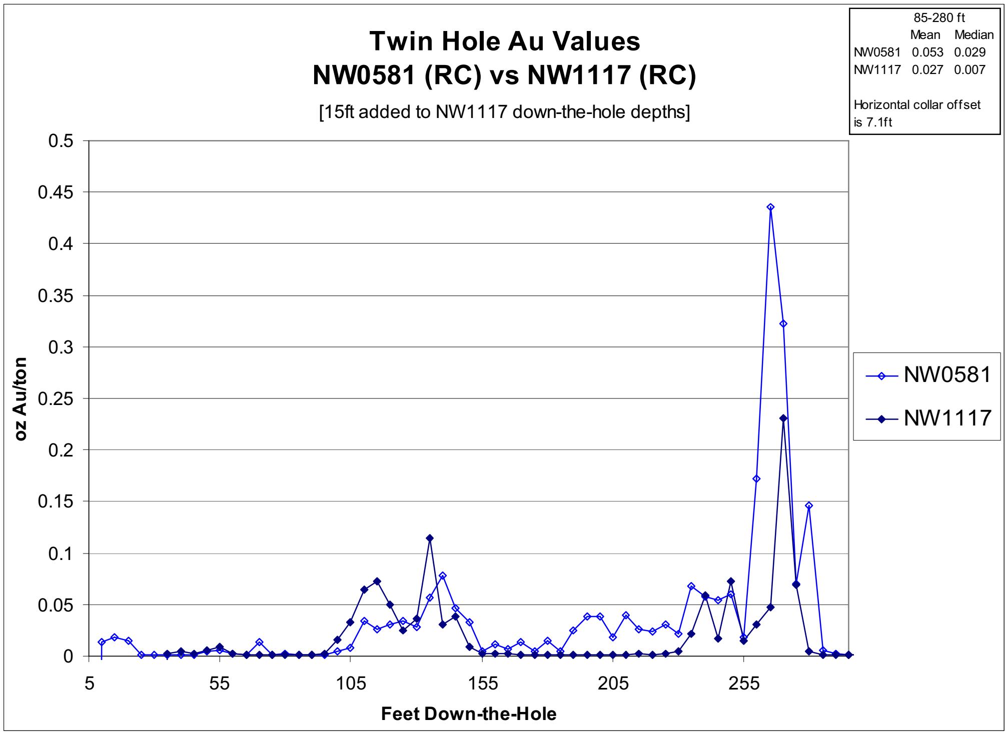


(a)

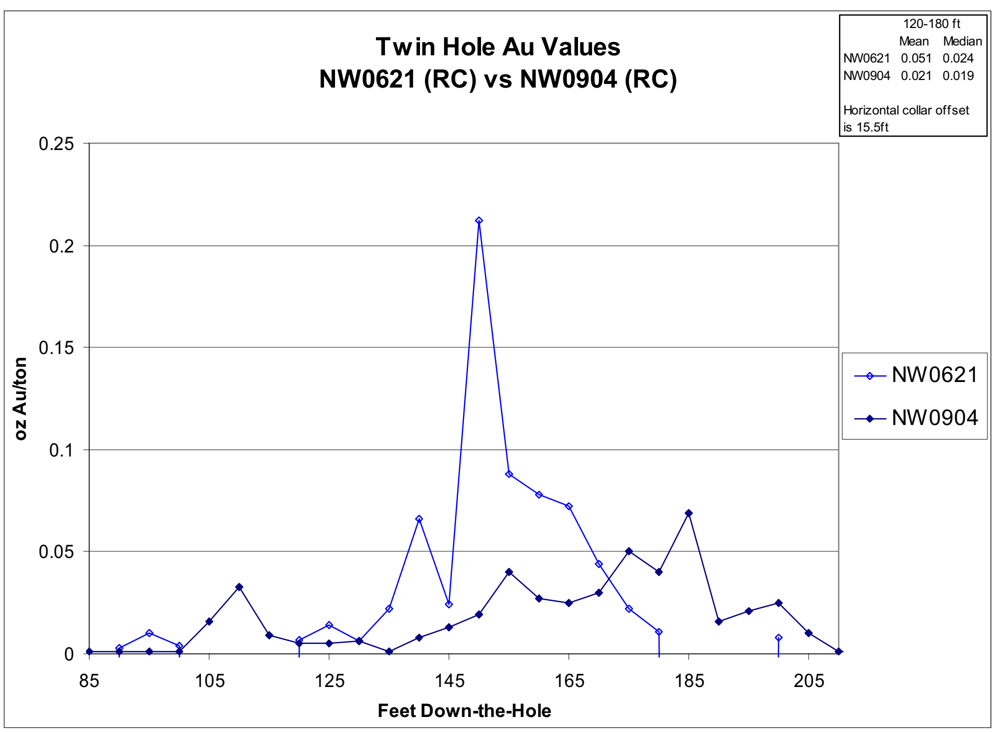


(b)

Figure 14.13 Down-Hole Gold Grade Plots of RC-Rotary and RC-RC Twin Sets (continued)



(c)



(d)

14.3 Assays Removed From Database

As discussed in Section 11, entire series of older drill holes have been removed from the database due to sample quality and assay reliability issues. Other assays have been removed during the mineral domain modeling discussed in Section 17 due to suspected down-hole contamination (see Section 12.4).

15.0 ADJACENT PROPERTIES

No properties adjacent to Northumberland are discussed in this report. Northumberland is a property of merit on its own and needs no additional support from properties.

16.0 MINERAL PROCESSING AND METALLURGICAL TESTING

Historic gold production by Cyprus and WSMC from over seven million tons of ore utilized heap leaching of sized and run-of-mine oxide and semi-refractory ore. Gold recovery for oxide ore has been estimated at approximately 75% (Fiddler, 2003). Although a significant tonnage of the resources reported in Section 17 are categorized as oxide, the bulk of the resources are unoxidized (refractory) to partially oxidized (semi-refractory) and necessitate oxidation prior to cyanidation. Diagnostic metallurgical testing to date indicates that the best extraction of gold and silver from sulfide material can be achieved utilizing N_2TEC flotation technology of Newmont, which yielded recoveries in excess of 92% for both gold and silver in the mineralized material tested.

Due to the historic nature of much of the metallurgical data, Fronteer cannot definitively comment on the representivity of the samples used in each of the tests summarized below. Fronteer believes, however, that the test results can reasonably be used in the choice of the minimum cutoff grades applied to the resources discussed in Section 17.

16.1 Gold Recoveries from Mining Operations at Northumberland

Oxide ore, mainly from the Main and States deposits, was processed using cyanide leaching from 1939 to 1942 by the NMC, followed in 1981 to 1985 by Cyprus, and then in 1986 through 1990 by WSMC. NMC operated an all-sliming cyanide plant with a capacity of approximately 200 tons per day (Wark, 1943). Cyprus crushed ore to minus-½ inch at the Upper Site and hauled the crushed ore by truck to the Lower Site, which included heaps and an adsorption-desorption-recovery ("ADR") plant. The pregnant solution produced from the heaps was passed through activated-carbon columns, pressure stripped, and dore was produced from the solution by electrowinning. WSMC used essentially the same process, except heaps of run-of mine ore and the ADR plant were located at the Upper Site, which greatly reduced the hauling distance. Otherwise, WSMC's operations were essentially a continuation of the operations of Cyprus.

Prior to a production decision, Cyprus completed a test heap-leach program in 1978 (Kappes, 1979). The program consisted of mining and leaching mineralized material on two heaps; one heap was composed of 1,440 tons of crushed material from the Main deposit and the other consisted of 2,200 tons of ripped material from what is now referred to as the States deposit. The field tests indicated that gold recovery from crushed States deposit ore might be 75% to 80% with 90 days of leaching, and 61% with 80 days of leaching for Main deposit ore.

Actual gold recoveries from the commercial mining operations of Cyprus and WSMC were estimated by Fiddler (2003) using the average grade of the leached heaps as determined by a 2003 heap drilling program, the ounces produced and sold, and the tons delivered to the heaps based on production records. Ore mined by Cyprus from both the States and Main deposits went to the heap at the Lower Site. Estimated actual gold recovery for this heap is 75%, which is comparable to the test-heap predicted recoveries. Ore mined by WSMC was run-of-mine and was leached at the mine site in four separate heaps. Estimated actual gold recovery for these heaps is 50%. This lower recovery may be more related to an increase in partially oxidized material encountered below the oxide ore mined by Cyprus than to the difference in Cyprus' sized ore verses WSMC's run-of-mine ore.

Low gold recoveries caused the cessation of mining in 1990. This, along with the discovery of significant sulfide resources at about the same time, resulted in the initiation of preliminary geometallurgical studies and diagnostic metallurgical testing needed to establish a process to treat the semi-refractory and the newly discovered sulfide mineralization. A significant tonnage of oxide material remains in all deposits except Zanzibar, South Ridge, and Rockwell. This remaining oxide mineralization is expected to behave similarly to the historically processed oxide ore.

16.2 Geo-Metallurgical Studies

Drill-sample lithologies, percent of oxidation, percent of sulfide, carbon content (0-3 scale), and percent of clay from drill logs were compared to the corresponding cyanide-soluble/fire-assay gold ratios in order to obtain a geologic framework from which to understand the metallurgical characteristics of the Northumberland mineralization (Lanier, 1990). The ratio is considered an indicator of the amenability of the mineralized material to direct cyanidation (leachability). The analysis of the Wedge-Shaped deposit, which was studied in its entirety, and contains mineralization representative of all oxidation stages present at Northumberland, showed that oxidation and lithology are the two variables that have the largest effect on leachability. As a generalization, samples with more complete oxidation have higher ratios. The effect of lithology is demonstrated by unique population distributions for intrusive and sedimentary rocks. The study also showed that there is no apparent relationship between grade and leachability, and that there is not an association between visible carbon and low cyanide-soluble/fire-assay gold ratios.

16.3 Metallurgical Testing

A number of metallurgical tests have been conducted on mineralized sulfide samples and mixed sulfide/oxide samples, some of the more important of which are summarized below. A detailed presentation of all testing completed to date is beyond the scope of this report. Metallurgical testing completed to date indicates that the N_2TEC flotation technology is the most promising method to achieve a viable processing option for the sulfide mineralization at Northumberland.

Dawson Metallurgical Laboratories ("Dawson"; 1990). Dawson performed non-optimized, pre-oxidation diagnostic testing on 11 gold-bearing drill-hole samples from 11 RC holes (Thompson, 1990). The samples were selected to represent refractory and semi-refractory material from the Zanzibar (NW1027 and NW1029), South Ridge (NW1007 and NW1009), States (NW953, NW1009, and NW1025), and Chipmunk (NW959, NW1001, and NW1005) deposits. Each composite sample was stage crushed to 20 mesh using a parallel-rolls crusher in closed circuit with a vibrating screen. Head grades were established for fire-assay Au and Ag, cyanide-soluble Au and Ag, total and sulfide sulfur, and total and organic carbon. Specific tests included whole-sample cyanidation; gravity concentration followed by bulk sulfide flotation with flotation tailings cyanidation; alkaline pre-oxidation with Na_2CO_3, NaOCl, and air followed by cyanidation; pre-acidification with H_2SO_4 followed by cyanidation; and pre-acidification followed by acid autoclaving with cyanidation of the autoclaved solids.

Average indicated extractions from these tests are as follows: whole-sample cyanidation - 40.7%, pre-acidification followed by cyanidation - 44.3%, gravity concentration followed by bulk sulfide flotation with tailing cyanidation - 46.9%, alkaline chlorination pre-oxidation followed by cyanidation - 68.0%, and pre-acidification followed by acid autoclaving followed by cyanidation - 81.0%. High cyanide consumption of up to 33 lbs/ton of material tested was observed during cyanidation of the alkaline chlorination pre-oxidized samples. High acid requirements were calculated for most of the samples tested in the acid autoclaving followed by cyanidation samples. Results indicated that the refractory nature of the material is mainly due to sulfide association. Gold extraction by cyanidation increased significantly after sulfides were oxidized by acid autoclaving in all but one sample, whose poor extraction was attributed to carbonaceous material that was not oxidized by acid autoclaving.

Western States Minerals Corporation (1991). WSMC (Kuipers, 1991) developed and directed a metallurgical study to analyze mineralogy, elemental content, response to diagnostic leaching, cyanidation amenability, and physical beneficiation by flotation and other methods. Microscopy of mineralized samples was conducted by Russ Honea; Resource Development Inc. and International Process Research Inc., both of Denver, Colorado, conducted metallurgical tests. The study used seven composited samples from 37 RC holes and 420 five-ft assay intervals chosen to represent the Main (composite M), South Ridge (S), Chipmunk (A, B, and I), and Zanzibar (Z and ND) deposits. The ND composite was derived from a deeper portion of the Zanzibar deposit than the Z composite. Samples were reduced to six mesh in a gyratory crusher and thoroughly blended into the composites.

The test procedure entailed "cyanidation leaching of a sample, ground to 80% -200 mesh to remove and recover non-refractory gold naturally existing in a 'free milling' state. Following this the sample is subjected to a hydrochloric acid leach, which should decompose oxides and hydroxides (i.e., hematite, goethite, etc.), the sulfide pyrrhotite, and carbonates such as dolomite and calcite. Following this acid leach the sample is again cyanidation leached to remove and recover any gold that is 'free' due to the decomposition of related materials. The procedure is repeated with nitric acid leach to decompose any remaining sulfides such as pyrite and arsenopyrite, followed by cyanidation, after which the sample is roasted to destroy any organic carbonaceous mineralization, again followed by cyanidation. Finally the sample is screened, and the various size fractions assayed to determine the distribution of the remaining encapsulated gold and gold associated minerals which did not yield to the decomposition and leaching processes" (Kuiper, 1991).

The main conclusions of the study were as follows (Kuiper, 1991):

- Gold occurs as micron- to sub-micron-size particles of metallic gold intimately associated with sulfides, occasionally in association with oxidized sulfide minerals, and rarely as free particles.
- The occurrence of gold is highly consistent throughout the deposits. Differences in cyanide leachability are mostly due to the degree of oxidation and silicification. 10% to 20% of the gold was not recoverable in the South Ridge, Zanzibar, and Chipmunk intrusion-hosted mineralization tested due to apparent silica encapsulation.

- The organic carbonaceous material is only slightly preg-robbing (absorbs gold preferentially over the cyanide solutions) within the areas of higher-grade mineralization. The organic carbonaceous material does not contain gold of higher grade than the rock itself and can be fairly efficiently removed by flotation, if desired.
- Flotation tests indicated that the gold-bearing mineralization can be effectively concentrated by flotation methods.
- The South Ridge and Zanzibar deposits are highly refractory and require complete pre-oxidation of sulfide and carbonaceous components to yield economic process recoveries. Roasting is probably the most applicable pre-oxidation process to follow pre-concentration by flotation.
- The Main deposit, along with unoxidized ores and some intrusive rocks from portions of the Chipmunk deposit, exhibit semi-refractory characteristics. Tests showed that an appreciable quantity of the gold (40-70%) is amenable to cyanidation without pre-oxidation. The remainder of the gold is associated with sulfides that require pre-oxidation.
- Oxidized rock from the Chipmunk deposit exhibits no significant refractory characteristics and is likely amenable to cyanidation by heap leaching.
- A generalized sequential milling and processing flow sheet could begin with the cyanidation of easily recoverable oxides, progressing to the treatment of semi-refractory material, and eventually to highly refractory material.
- All of the deposits contain elevated concentrations of arsenic (255-3000 ppm), and the Zanzibar deposit also contains elevated antimony (55 and 2100 ppm).

Kappes, Cassiday & Associates (“KCA”; 1993). Osmanson (1993) of Kappes, Cassidy & Associates of Sparks, Nevada ran 12 flotation tests on two composite samples of sulfide material, one from the Zanzibar deposit (the Z composite discussed above) and the other from the Chipmunk deposit (A composite, above), to optimize grind size, flotation pH, and collector type and dosage. A total of 12 tests were performed using products ranging from 44% +100 mesh to 100% -100 mesh (92.5% -325 mesh). Two variations were also tested that examined neutral to acid pH flotation, and one test examined pre-oxidation and carbon-in-leach (“CIL”) treatment.

The flotation tests concentrated from 28% to 62% of the gold. In search of an alternative treatment method, the flotation tests were then followed by what KCA referred to as a “double-ox pre-oxidation test”. This test program consisted of a caustic dosage of 30 pounds per ton of sample at 80º C with a continuous air sparge for a period of 62 hours, followed by carbon-in-leach (“CIL”) cyanidation. Oxidation of the sulfides appeared complete, but the dominance of a graphite froth led to the belief that CIL would fail due to preg robbing. All preg-robbing analyses failed to confirm this, however. Omanson (1993) concluded that the carbon does not possess preg-robbing potential.

Dawson Metallurgical Laboratories (“Dawson”; 1996-1997). Dawson conducted a series of diagnostic tests in 1996 and 1997. The initial testing was conducted on a split-core sample from the Zanzibar deposit and compared the effect on cyanide leaching of crushing the mineralized material using High Pressure Grinding Rolls (“HPGR”) with that of crushing the mineralized material using a simulated Vertical Shaft Impact Crusher (“VSI”) (Allen, 1996a).

In addition, a cursory test was performed to investigate whether recovery could be improved by oxidation of the sulfides using a neutral pH autoclave test procedure. This latter test was conducted because the use of acid autoclaving may not be practical due to high acid consumptions. Test results indicated that only slightly improved gold extraction was obtained after crushing the sample using the HPGR crusher (56% extraction) compared with conventional crushing to minus ¼ inch or VSI crushing to minus 6 mesh (52% extraction). More fines were produced in the HPGR crush (32 weight-percent) than in the simulated VSI crush (17 weight-percent) in the minus 100-mesh fraction with gold upgraded slightly in this fraction. Results of an unoptimized neutral autoclaving test followed by CIL cyanide leaching yielded about 82% gold extraction.

Dawson then compared autoclave pretreatment followed by CIL cyanidation (Allen, 1996b). A direct CIL cyanide leach test on refractory material from the Zanzibar deposit extracted less than 2% of the gold and oxidized 8% of the sulfide sulfur. This test was followed by neutral autoclave tests on two different grind sizes, 80% minus 145 microns, and 80% minus 58 microns. Gold extraction after cyanidation was 36% and 41%, with 29% and 32% of the sulfide sulfur oxidized for coarsely and finely ground samples, respectively. These tests were followed by acid autoclave of the fine grind material, which produced 88% extraction with 98% of the sulfide sulfur being oxidized; net acid consumption was 350 lb/ton. These results indicate that gold extraction is proportional to the degree of sulfide oxidation and is not significantly related to grind-size (Allen, 1996b).

Finally, Dawson evaluated the effect of grind size on flotation response, with and without pre-float acid addition (Thompson, 1996). The purpose of the acid was to help liberate sulfides from the carbonate gangue. The Zanzibar deposit sample was ground to achieve a fineness of 80% minus 132 microns, 80% minus 63 microns, and 80% minus 58 microns. Standard bulk-sulfide flotation procedures were used. Flotation at the lower grind fineness recovered about 55% of the gold into a combined rougher concentrate. Three stages of collector addition and flotation were used. The concentrate contained about 15% of the sample weight and assayed 0.533 oz Au/ton and only 5.5% sulfide sulfur. When the fineness was increased to the next step, gold recovery increased to nearly 61% from a 0.151 oz Au/ton back-calculated head grade. Further increasing the grind fineness did not result in any significant improvement in either gold or sulfide-sulfur recovery. Results from a bulk sulfide flotation test on a sample ground to 80% minus 63 microns with acid conditioning indicated that with 20 or 50 lb/ton sulfuric acid there was no increase in gold recovery from the sample after three stages of rougher flotation. A slight increase in recovery to about 67% occurred when a fourth stage of rougher flotation was added to the test with 50 lb/ton sulfuric acid. These flotation tests resulted in relatively low sulfide and gold recoveries, and low concentrate grades. Dawson concluded that the low recovery is mainly due to the very fine sulfide-grain structure and to the fact that the sulfide is well disseminated throughout the gangue.

Roasting the Zanzibar sample ground to 80% minus 145 microns resulted in the oxidation of over 98% of the sulfide. About 61% of the gold was extracted from this roasted sample by CIL. Although roasting oxidized about the same percentage of the sulfide as the acid autoclave test described above, gold leach extraction was higher in the acid autoclave test.

Geobiotics, Inc. ("Geobiotics"; 1996). Preliminary bio-oxidation tests on samples from the Zanzibar deposit were conducted by Geobiotics, Inc. (Rollin, 1996). The work indicated that the samples contained about 20 weight-percent carbonate and were therefore high acid consumers. Geobiotics concluded that an overall gold recovery of about 90% could be achieved with moderate operating cost in a process where the needed acid would be produced by bio-oxidation of the sample material when blended with a high-sulfide material.

The bio-oxidation test results are considered by WSMC, MDA and Fronteer to be inconclusive.

Hazen Research, Inc. (1996). Tests using Newmont's proprietary N_2TEC flotation technology were conducted on two refractory samples from the Zanzibar deposit by Hazen Research, Inc. (Oberg, 1996). The N_2TEC flotation technology was originally developed by Santa Fe Pacific Gold Corporation, who was subsequently acquired by Newmont. The two test samples consisted of drill-sample composites from holes drilled in the Zanzibar deposit. Sample #1 was a composite of 46 intervals from holes NW1029, NW1080, NW1081, NW1082A, NW1085, and NW1114. Sample #2 was a composite of 16 intervals of Roberts Mountains Formation and two intervals of intrusive rock from core hole NW1086A. Each sample weighed approximately three kilograms.

Bench-scale rougher concentrates extracted 92.9% and 92.0% of the gold and 98.5% and 96.3% of the silver in the two samples (Table 16.1). Following cyanidation, the flotation tails provided an additional 2 to 3% extraction of the gold. Organic carbon concentrations of 0.99% and 0.34% were obtained, which was considered to be a significant additional refractory component of the two samples. Using conventional flotation with comparable operating conditions, gold extraction was only 77.0% (Oberg, 1996).

Table 16.1 Summary of N_2TEC Flotation Testing on Northumberland Samples

(From Hanson, 1996)

Type	Calc. Head (oz Au/ton)	Residue (oz Au/ton)	Combined Concentrate (weight %)	Gold Recovery (%)	Silver Recovery (%)	Total Sulfur Recovery (%)
Sample #1	0.126	0.013	33.5%	92.9%	98.5%	91.5%
Sample #2	0.145	0.015	22.7%	92.0%	96.3%	94.3%

Note: Test work performed by Hazen Research, Inc. using proprietary technology of Newmont

The test results were considered promising, with experience in pilot plant operations with similar feed types indicating that the rougher concentrate weight might be reduced with only a minor loss of gold recovery (Hanson, 1996). Preliminary indications are that a 200-mesh grind is sufficient to liberate the submicron-size gold particles.

Newmont (2004). Composite samples of coarse rejects from four mineralized intervals in three Newmont 2004 RC holes drilled in the Zanzibar deposit and one RC composite from 2004 RC holes in the Main deposit were submitted to the metallurgical laboratory at Newmont's Lone Tree mine for flotation testing (Lauha and Powell, 2004c; 2004e). Direct cyanide leaching, roasting, and autoclaving were performed on a composite of all of the samples, and flotation tests were conducted on the individual intervals (Lauha and Powell, 2004c). Newmont stated that "typical roaster recoveries were around 60%, with flotation recovery near 70%, but autoclave recovery achieved over 80% recovery" and concluded that "due to the high organic carbon and the preg-robbing characteristics of some Northumberland ores, roasting initially appeared to be the process of choice based on head assays and preg-rob tests. However, the autoclave followed by cyanide leach achieved the highest recovery. These results are validated by test work performed in the early 1990s. Typical roaster recoveries were around 60%, with flotation recovery near 70%, but autoclave recovery achieved over 80% recovery. The overall best recovery was achieved by using the N_2TEC process at the Denver lab in 1996. Gold recovery was 92.4% average. This technology was not exactly duplicated at Lone Tree; however, further testing of Northumberland mineralization may be necessary to determine if the recovery can be improved to match the 1996 work" (House, 2004).

Newmont (2006-2007). Composite samples of oxide mineralization from 2006 core holes NN-60, NN-61, and NN-74 were studied by Newmont's Carlin Metallurgical Laboratory to determine the amenability of the gold to cyanide leaching (Eyzaguirre, 2007). The study included head assays, screen-fraction analysis at -1 inch, -10 mesh, and -200 mesh, standard cyanidation bottle-roll tests without charcoal addition at the three different size fractions, and column cyanide-leach tests performed on each composite of -1 inch agglomerated sample. Eyzaguirre's conclusions of the study are summarized as follows:

- The size fraction analysis showed homogeneous distribution of gold contents throughout all size fractions of the composites.
- Low values of mercury and relatively high values of arsenic should be considered when identifying final design of a flow sheet for the deposit.
- The Northumberland samples responded well to the fine-grind standard bottle-roll test procedure. The percent measured gold extractions for the three samples ranged from 78% to 85%.
- Drill hole NN-74 did not perform well in the -1 inch column and bottle roll tests. This is attributed to silicification of that sample. However, in view of the increased recoveries obtained in the bottle roll tests at finer grinds, and considering this is the highest-grade sample, milling of the material should be evaluated.
- Average reagent additions required to achieve gold extractions from the oxide samples are within acceptable limits.
- There are very small indications of preg-robbing effects in the three drill-hole samples.
- NCV values are all within positive ranges and indicate no signs of potential acid generation.
- Overall, and based on the samples studied, the oxide zone of the Northumberland deposit would qualify as a good heap-leach candidate.

17.0 MINERAL RESOURCE ESTIMATE

The Mineral Resource Estimate for the Northumberland deposit has been updated to include new drilling information that post-dates the previous independent estimate by MDA (Gustin et al., 2006). The new drilling information includes 89 new drill holes (69 RC, 20 Core), drilled by Newmont under the Northumberland JV, mostly within the extents of the 2006 resource area.

Mineral resource estimation reported for Northumberland follows the guidelines of Canadian National Instrument 43-101. The modeling and estimate of gold and silver resources were done by Fronteer personnel under the guidance of Christopher Lee, Fronteer Chief Geoscientist and Jim Ashton, Fronteer Senior Engineer, both of whom are considered Qualified Persons by the definitions and criteria set forth in NI 43-101.

17.1 Drill Hole Data

Cyprus compiled a digital database of the Northumberland drill data in 1984. This database was acquired by WSMC in 1985 as part of the acquisition of the property. WSMC, NewWest and Newmont subsequently and continually updated and refined the database. The database used in the estimation of gold and silver Mineral Resources at Northumberland, which was completed in May 2008, contains assay and geological information for 1,502 drill holes, including the 89 new Newmont holes drilled from 2005 through 2007. Digital topography of the post-mining surface was used in the modeling with all waste dumps and heaps uniquely identified.

17.2 Deposit Geology Pertinent to Mineral Resource Estimation

Gold and silver mineralization at Northumberland occurs in a cluster of eight generally stratiform deposits that follow three low-angle tectono-stratigraphic host horizons: the Hanson Creek fault, Basal Chert and Prospect-Mormon thrust horizons (see Section 7 for details beyond those summarized here). These horizons define the crest and west limb of the Northumberland anticline. The Rockwell, Pad 4, Wedge-Shaped, Chipmunk, and South Ridge deposits occur along the Hanson Creek fault horizon. The Rockwell deposit is spatially distinct and lies within the west limb of the anticline, while the other Hanson Creek horizon deposits lie along the crest of the anticline and partially merge with each other. The Basal Chert fault horizon hosts the States and Main deposits, which lie in the crest of the anticline and also merge near their extremities. The Zanzibar deposit occurs along the Prospect-Mormon thrust horizon near the crest and within the west limb of the anticline. Mineralization in each of the tectono-stratigraphic horizons locally breaches the intervening rock units and merges with mineralization in the neighboring host horizon. The overall geometry of the deposits and the higher-grade zones within the deposits appear to be influenced by east-trending high-angle structures in the area of the crest of the Northumberland anticline. The deposits are relatively laterally extensive and vertically restricted.

Small folds with northeast- to east-trending axial planes are superimposed on the Northumberland anticline. Two such anticlinal-synclinal sets cause significant variations in the orientations of the host horizons near the crest of the larger anticline. An attempt was made to simplify this corrugated layer-cake geometry to aid in the estimation process (Table 17.1); however, the degree of minor folding in the deposit is such that an impractical amount of sub-domaining would be required to adequately represent the deposit. For this reason, the current estimate used an 'Unwrinkling' process in Gemcom software (described below), which transforms the deposit into a flat plane to facilitate seamless interpolation across fold hinges. Each deposit was grouped into one of three 'Resource Layers', corresponding to their stratigraphic position within the deposit, for the unwrinkling transformation (Table 17.1).

Table 17.1 Simplified Orientations of Geological Domains

Deposit	Domain	Code	Dip	Dip Direction	Stratigraphic Horizon	Resource Layer
Chipmunk	CHP	100	0	0	Hanson Creek Fault	Layer 3
	CHP_DIP	101	-20	160		
Main	MAN	200	0	0	Basal Chert	Layer 2
	MAN_DIP	201	-20	90		
Pad 4	PD4	300	0	0	Hanson Creek Fault	Layer 3
Rockwell	RKW	400	-15	270	Hanson Creek Fault	Layer 3
	RKW_DIP	401	-50	285		
States	STA	500	0	0	Basal Chert	Layer 2
	STA_DIP	501	-20	305		
Zanzibar	ZAN	600	0	0	Prospect-Mormon Thrust	Layer 1
	ZAN_DIP	601	-30	250		
	ZAN_DIP2	602	-45	255		

Interpretation of the sectional geology was completed and updated with the new drilling. The geology focused on defining the stratigraphic units, the intrusive rocks and the structural/stratigraphic contacts between the stratigraphic units. The geological interpretation was prepared by hand on paper sections and then digitized, and imported into Gemcom as polygons. These polygons are located in the database under the GeopolyA workspace and the Litholog layer group. These polygons were used as a general guide for the grade modeling described below.

17.3 Grade Modeling

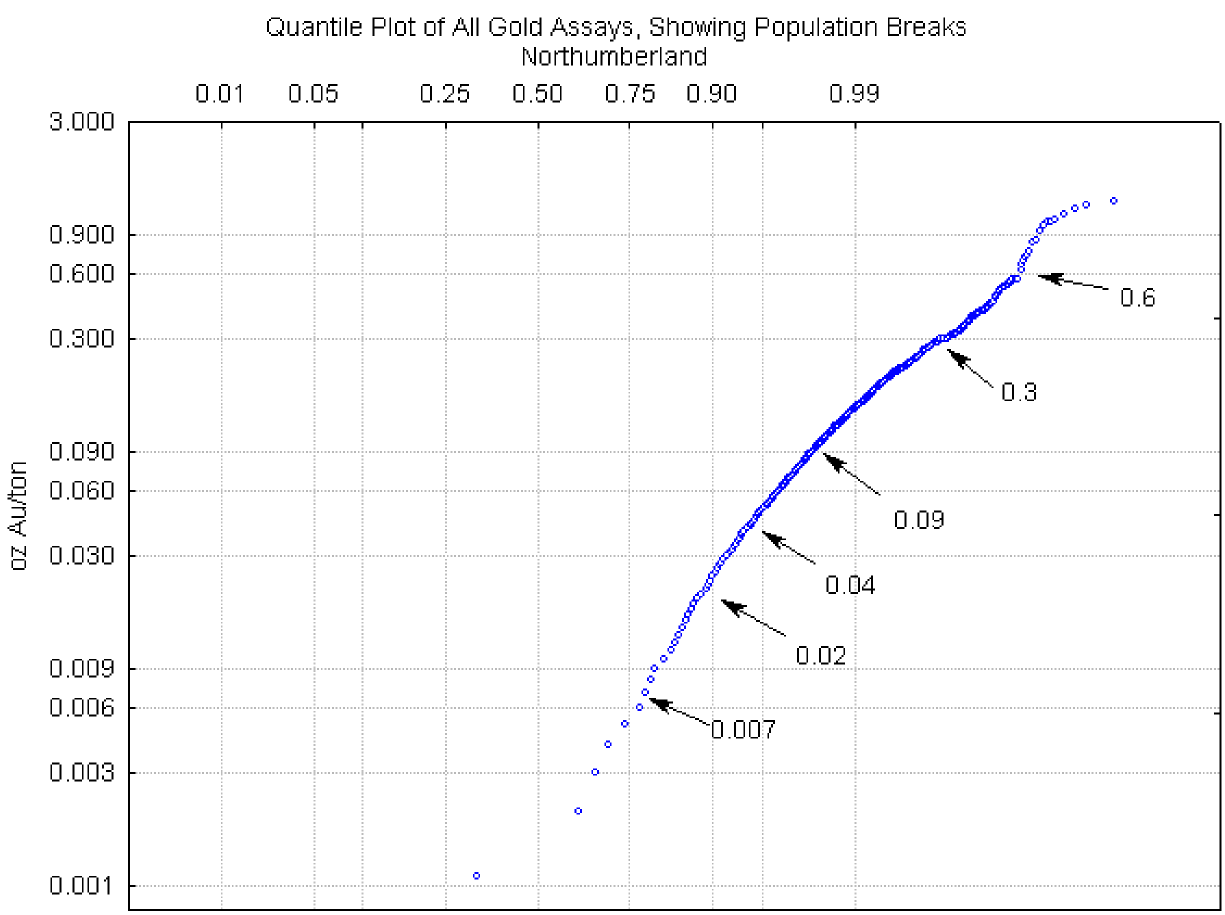
The gold grade distributions for the drill-hole assays were examined collectively and by deposit groupings (*e.g.*, Zanzibar and Rockwell; Chipmunk, South Ridge, Pad 4, and Wedge-shaped; etc.) in order to identify grade population characteristics. The entire Northumberland database was found not to be significantly different from the deposit groupings examined, and the distribution of all of the assays was therefore used to determine natural population breaks (Figure 17.1).

The gold distribution curve is for the most part curvilinear, with distinct breaks at about 0.3 and 0.6 oz Au/ton. More subtle breaks are discernable at about 0.007, 0.02, 0.04, and 0.09 oz Au/ton. To be consistent with the previous MDA 2006 estimate, grade envelopes were created at a 0.007 opt composite and at a 0.040 opt composite, as a subset of the 0.007 grade envelope.

Grade envelopes were constructed by Ross Sherlock, under the supervision of Christopher Lee. Two sets of envelopes were created: a coarse "*grade envelope*" (0.007 opt) and a higher grade internal "*grade subset*" (0.04 opt). The grade envelope was constructed on sections using a composite grade of 0.007 opt (0.24 g/t) gold and allowing 10 feet (3.05 m) of internal dilution. The grade envelopes were constructed following the general trend of the stratigraphy and centered over structural/ stratigraphic intervals. The composite intervals were used only as a guide, incorporating intervals of lower or null grade if it allowed for continuity of the zones and the geology was consistent. Grade envelopes were only constructed if the zones could be identified with confidence over more than 4 sections with more than two drill holes per section.

The higher grade subsets were constructed internal to the grade envelopes. These solids were constructed if a higher grade portion of the grade envelope could be identified with confidence over at least 3 sections with at least two drill holes per section. The higher grade subsets were constructed around a 0.04 opt (1.37 g/t) gold composite allowing for 5 feet (1.53 m) of internal dilution. Lower or null grade intervals were not incorporated into the grade subset solids.

Figure 17.1 Quantile Plot of Northumberland Au Sample Data



In general, the zones follow the stratigraphy and the polygons as previously interpreted by Gustin et al., (2006). The main difference in this model and the previous 2006 resource estimate is that this model created a 3D wire frame of the grade envelopes with strong continuity between sections. These wireframes represent geologic interpretations of the mineralized bodies, with strong sectional continuity, whereas the previous 2006 resource was a grade contour without strong sectional continuity. The greater continuity in the current model was achieved by smoothing the grade shapes, relative to previous interpretation, and interpolating between sections on the basis of geological continuity. As such, there is much greater geological confidence in the shape and extent of the mineralized domains in 3D space. Table 17.2 outlines the various parameters of the solids created, including file names and workspaces within the database.

Grade envelopes were constructed on north south sections spaced at 100 feet for Rockwell and Zanzibar and 50 feet for the remaining deposits. As there has been historic mining a number of drill hole collars are located in space where the deposits have been previously mined out. The geologic interpretation, including the grade envelopes were interpreted above the existing topography. This will allow for the resource estimate to be extended into previously mined material and allowing reconciliation between the resource estimate and the production statistics.

The nomenclature of the Northumberland deposit is driven to some extent by historical useage. In this iteration of the resource model the same names were used whenever possible. However, local continuity between the different deposit areas makes some of the boundaries fairly arbitrary and the current wireframe solids locally cross historic boundaries. For example, Zanzibar – States and Main deposits are, in places, located at the same structural-stratigraphic interval and the naming of the solid, in this model, may not correspond exactly to previous work. Wherever possible the names correspond, however there may be some discrepancies when compared with previous models. This has no impact on the distribution or volume of mineralized material.

Silver exhibits a strong spatial association with gold, with most of the known silver mineralization occurring within or adjacent to the gold mineralized horizons described above. Outside of these gold envelopes, silver occurs in two modes. Discrete zones of higher grade (+100g/t Ag), which have an unknown geometry and controls on mineralization. Outside of the discrete higher grade zones are long intervals of low grade (< 20 g/t Ag). The controls and geometry of this mineralization is also unknown, and despite their strong spatial correlation within the gold domains, gold and silver do not show any direct statistical correlation (Figure 17.3). Since the controls on both styles of mineralization are unknown, the silver mineralization was not explicitly modeled. Silver occurring outside these gold envelopes is considered to be volumetrically negligible.

Table 17.2 Grade Envelopes Used in Resource Estimation

Solid Name	Type	Structural / Stratigraphic Interval	Gemcom Model, GradeSolid Triangulation Workspace Solid name			Easting Max	Easting Min	Volume (cubic feet)	Gemcom Model Polyline/ Grade Workspace 3-D Ring Name TAG	Tie Line Name	Comments
Chipmunk A	Grade Envelope	Hanson Creek Dolostone-Limestone transition	CHP A	Envelope	27-Feb	446400	445,600	21,080,234	CHP A	CHP A Tie	
Chipmunk B	Grade Envelope	Hanson Creek Dolostone-Limestone transition	CHP B W	Envelope	27-Feb	447650	445600	114,188,829.00	CHP B	CHP B Tie	Solid divided into an east and west set, due to rapid changes in width
Chipmunk B east	Grade Envelope	Hanson Creek Dolostone-Limestone transition	CHP B E	Envelope	27-Feb	449650	447700	41,963,635	CHP B E	CHP B E tie	Solid divided into an east and west set, due to rapid changes in width
Chipmunk C	Grade Envelope	Hanson Creek Dolostone-Limestone transition	CHP C	Envelope	27-Feb	449650	445600	27,349,057	CHP C	CHP C tie	
Main	Grade Envelope	Hanson Creek - Roberts Mountain Contact	Man A	Envelope	7-Mar	450700	448050	68,386,300	Man 1	Man 1 tie	
PD4	Grade Envelope	Hanson Creek Dolostone-Limestone transition	PD4	Envelope	8-Mar	449350	447700	13,168,340	PD4	PD4 Tie	not very well contrained by drilling
PD4 B	Grade Envelope	Hanson Creek Dolostone-Limestone transition	PD4 B	Envelope	8-Mar	449350	448800	1,059,735	PD4 B	PD4 B Tie	not very well contrained by drilling
Rockwell A	Grade Envelope	Hanson Creek Dolostone-Limestone transition	RKW A	Envelope	25-Feb	443300	442100	56,093,901	RKW A	RKW A Tie	
Rockwell B	Grade Envelope	Hanson Creek Dolostone-Limestone transition	RKW B	Envelope	25-Feb	444300	443700	11,498,798	RKW B	RKW B Tie	
Rockwell C	Grade Envelope	Hanson Creek Dolostone-Limestone transition	RKW C	Envelope	25-Feb	445100	444800	4,821,799	RKW C	RKW C Tie	
Rockwell D	Grade Envelope	Hanson Creek Dolostone-Limestone transition	RKW D	Envelope	25-Feb	445600	445100	20,399,476	RKW D	RKW D Tie	
Rockwell E	Grade Envelope	Hanson Creek Dolostone-Limestone transition	RKW E	Envelope	25-Feb	445500	445050	5,366,910	RKW E	RKW E Tie	
States 1	Grade Envelope	Hanson Creek - Roberts Mountain Contact	STA 1	Envelope	7-Mar	449700	446500	140,100,654	STA 1 & STA 1E	STA 1 Tie & STA 1E Tie	two sets of 3D rings, east and west, ctreated one solid
States 2	Grade Envelope	Hanson Creek - Roberts Mountain Contact	STA 2	Envelope	8-Mar	448200	447800	5,975,583	STA 2	STA 2 Tie	
States 3	Grade Envelope	Hanson Creek - Roberts Mountain Contact	STA 3	Envelope	8-Mar	448100	447800	1,415,856	STA 3	STA 3 Tie	
Zanzibar 1	Grade Envelope	Hanson Creek - Roberts Mountain Contact	Z1	Envelope	7-Mar	447200	442100	806,389,950	Z1	Z1 Tie	largest solid
Zanzibar FW	Grade Envelope	Hanson Creek - Roberts Mountain Contact	Z1FW	Envelope	5-Mar	447300	446700	8,167,510	Z1FW	Z1FW Tie	small lens in FW of Z1
Zanzibar FW A	Grade Envelope	Hanson Creek - Roberts Mountain Contact	Z1FW A	Envelope	4-Mar	443400	443100	1,539,563	Z1FW A	Z1FW A Tie	small lens in FW of Z1
Zanzibar FW B	Grade Envelope	Hanson Creek - Roberts Mountain Contact	Z1FW B	Envelope	4-Mar	443400	443100	176,273	Z1FW B	Z1FW B Tie	small lens in FW of Z1
Zanzibar FW C	Grade Envelope	Hanson Creek - Roberts Mountain Contact	Z1FW C	Envelope	4-Mar	443400	443100	763,719	Z1FW C	Z1FW C Tie	small lens in FW of Z1
Zanzibar FW D1	Grade Envelope	Hanson Creek - Roberts Mountain Contact	Z1FW D1	Envelope	4-Mar	443350	443250	1,143,100			small lens in FW of Z1, formed by extruding a polygon, no 3DR or tie lines
Zanzibar FW E	Grade Envelope	Hanson Creek - Roberts Mountain Contact	Z1FW E	Envelope	4-Mar	444400	443700	7,346,241	Z1FW E	Z1FW E Tie	small lens in FW of Z1
Zanzibar 2A	Grade Envelope	Hanson Creek - Roberts Mountain Contact	Z2 A	Envelope	5-Mar	442400	442100	2,232,021	Z2 A	Z2 A Tie	HW of Z1
Zanzibar 2B	Grade Envelope	Hanson Creek - Roberts Mountain Contact	Z2 B	Envelope	5-Mar	442700	442300	2,107,486	Z2 B	Z2 B Tie	HW of Z1
Zanzibar 2C	Grade Envelope	Hanson Creek - Roberts Mountain Contact	Z2 C	Envelope	4-Mar	445300	443400	71,801,829	Z2 C	Z2 C Tie	HW of Z1
Zanzibar 2D	Grade Envelope	Hanson Creek - Roberts Mountain Contact	Z2 D	Envelope	5-Mar	445950	445500	1,442,584	Z2 D	Z2 D Tie	HW of Z1
Zanzibar 2E	Grade Envelope	Hanson Creek - Roberts Mountain Contact	Z2 E	Envelope	5-Mar	446250	445600	10,824,509	Z2 E	Z2 E Tie	HW of Z1
Zanzibar 2F	Grade Envelope	Hanson Creek - Roberts Mountain Contact	Z2 F	Envelope	5-Mar	446350	445800	3,039,720	Z2 F	Z2 F Tie	HW of Z1
Zanzibar 2G	Grade Envelope	Hanson Creek - Roberts Mountain Contact	Z2 G	Envelope	5-Mar	446900	446150	23,915,298	Z2 G	Z2 G Tie	HW of Z1
Zanzibar 2H	Grade Envelope	Hanson Creek - Roberts Mountain Contact	Z2 H	Envelope	4-Mar	446950	446650	4,872,925	Z2 H	Z2 H Tie	HW of Z1
Zanzibar I	Grade Envelope	Hanson Creek - Roberts Mountain Contact	Z2 I	Envelope	5-Mar	446850	446650	2,170,416	Z2 I	Z2 I Tie	HW of Z1
Chipmunk B A	Grade Subset	subset of Chipmunk B	CHP B A	G SUB	clipped	446100	445900	424,779	CHP B A GS	CHP B A GS	subset of CHP B Envelope & clipped
Chipmunk B B	Grade Subset	subset of Chipmunk B	CHP B B	G SUB	clipped	447250	446250	22,466,872	CHP B B GS	CHP B B GS	subset of CHP B Envelope & clipped
Chipmunk B C	Grade Subset	subset of Chipmunk B	CHP B C	G SUB	clipped	446350	446250	403,117	CHP B C GS	CHP B C GS	subset of CHP B Envelope & clipped
Chipmunk B D	Grade Subset	subset of Chipmunk B	CHP B D	G SUB	clipped	449650	447000	20,962,769	CHP B D GS	CHP B D GS	subset of CHP B Envelope & clipped
Chipmunk B E	Grade Subset	subset of Chipmunk B	CHP B E	G SUB	clipped	447300	447000	1,719,329	CHP B E GS	CHP B E GS	subset of CHP B Envelope & clipped
Chipmunk B F	Grade Subset	subset of Chipmunk B	CHP B F	G SUB	clipped	447350	447200	350,857	CHP B F GS	CHP B F GS	subset of CHP B Envelope & clipped
Chipmunk C 1	Grade Subset	subset of Chipmunk C	CHP C 1	G SUB	clipped	446200	445950	195,134	CHP C GS 1	CHP C GS 1	subset of CHP C Envelope & clipped
Chipmunk C 2	Grade Subset	subset of Chipmunk C	CHP C 2	G SUB	clipped	446850	446250	3,556,876	CHP C GS 2	CHP C GS 2	subset of CHP C Envelope & clipped
Main 1	Grade Subset	subset of Main	Man 1	G SUB	clipped	450700	448100	22,660,397	Man GS A	Man-GS A	subset of Main
Main 1B	Grade Subset	subset of Main	Man 1B	G SUB	clipped	449300	448550	3,375,956	Man GS B	Man GS B	subset of Main
Rockwell A 1	Grade Subset	subset of Rockwell A	RKW A 1	G SUB	clipped	443100	442200	5,797,001	RKW A GS 1	RKW A GS 1	subset of RKW A
Rockwell A 2	Grade Subset	subset of Rockwell A	RKW A 2	G SUB	clipped	443100	442200	3,261,852	RKW A GS 2	RKW A GS 2	subset of RKW A
Rockwell A 3	Grade Subset	subset of Rockwell A	RKW A 3	G SUB	clipped	442800	442500	408,222	RKW A GS 3	RKW A GS 3	subset of RKW A
States 1	Grade Subset	subset of States 1	Sta 1	G SUB	clipped	449700	446500	33,934,039	STA 1 GS	STA 1 GS	subset of States 1
Zanzibar 1 A	Grade Subset	subset of Zanzibar 1	Z1 A	G SUB	clipped	442100	447150	207,444,389	Z! A GS	Z1 A GS	subset of Z1
Zanzibar 1 B	Grade Subset	subset of Zanzibar 1	Z1 B	G SUB	clipped	444400	443800	21,477,115	Z! B GS	Z1 GS B	subset of Z1
Zanzibar 1 C	Grade Subset	subset of Zanbzibar 1	Z1 C	G SUB	clipped	446450	445900	2,400,147	Z! C GS	Z1 GS C	subset of Z1

Figure 17.2 Section 445200E illustrating the relationships between stratigraphy, thrust faults (dashed lines) and grade envelopes.

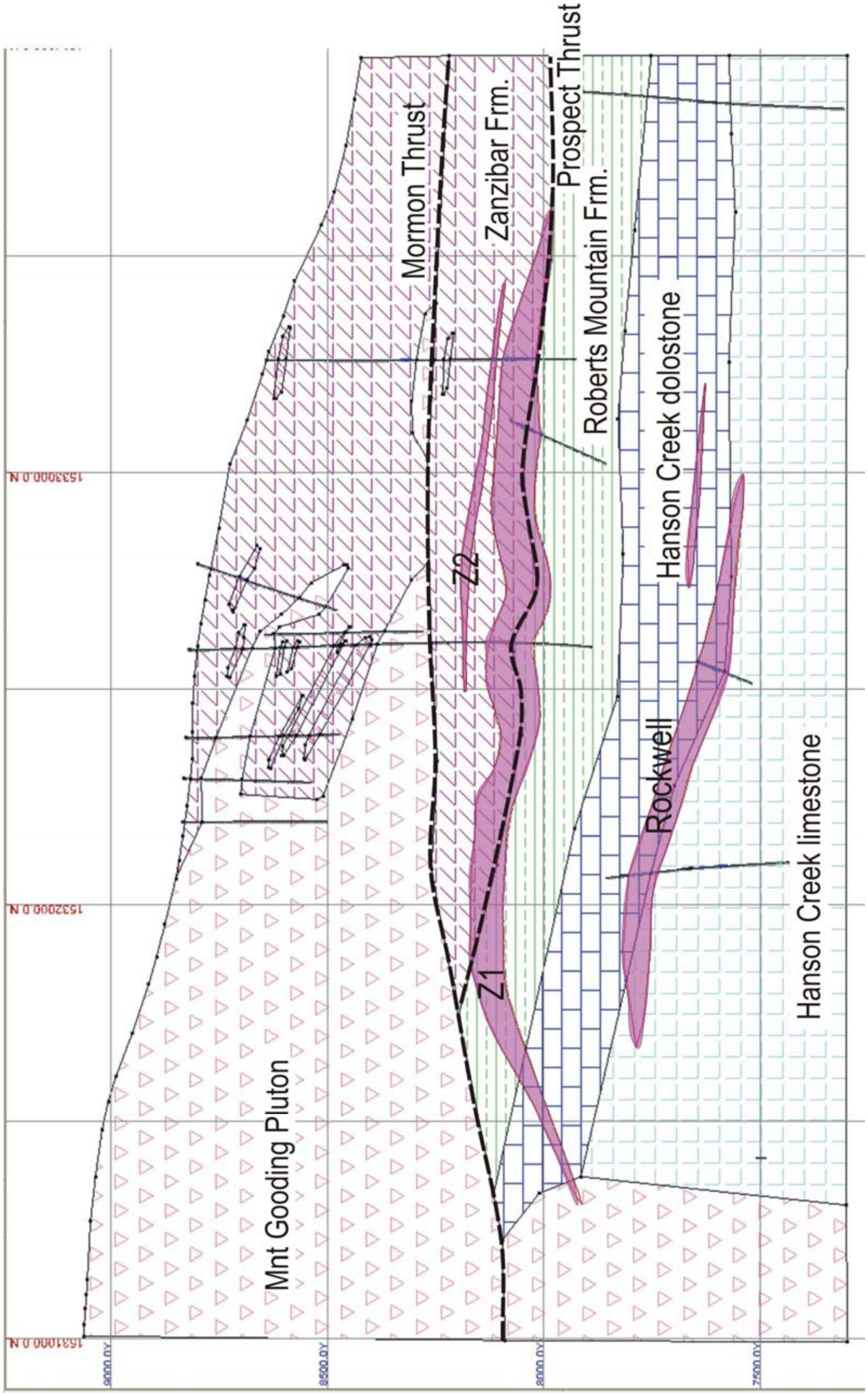
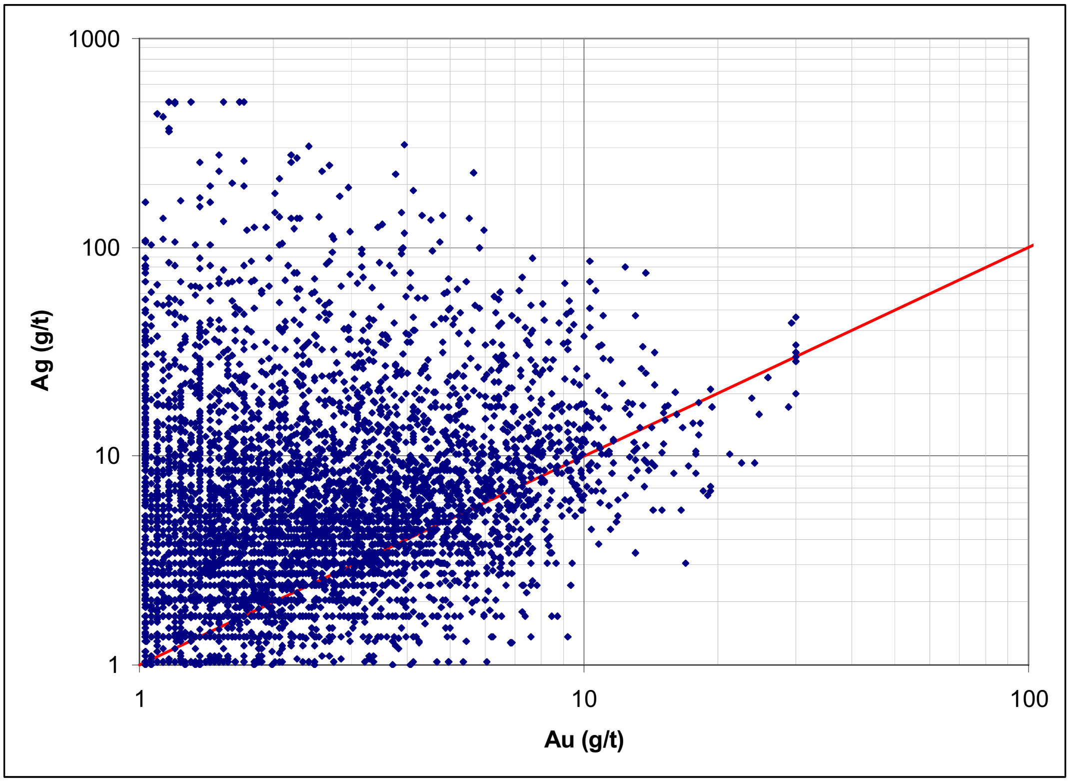


Figure 17.3 Scattergram Showing Lack of Correlation Between Gold and Silver



17.4 Assay Data

The Northumberland database contains assay data from five different operators and four different drill types. These data have been compared here by drill type and operator to assess their compatibility and suitability for resource estimation. Assaying for silver was inconsistent among the different operators, so these comparisons only consider the gold assay data.

Three operators used Rotary drilling: Cyprus, Homestake and Idaho Mining. Assay results from Idaho Mining and Cyprus compare well; however, the Homestake assays are significantly lower (Figure 17.4). The differences between the three data populations are particularly evident in Q-Q plots (Figure 17.5). Idaho Mining assays tend to be slightly higher than the Cyprus assays over most of their grade ranges; however, the lower grade Homestake data are clearly not compatible with the others. Homestake Rotary drill hole data are therefore considered unreliable and were not used for the purpose of resource estimation. There are only 11 Homestake drill holes and 29 assays above 0 g/t Au, so their omission will not have a significant impact on the resource estimate.

Figure 17.4 Box & Whisker Plots Comparing Rotary Drilling by Operator

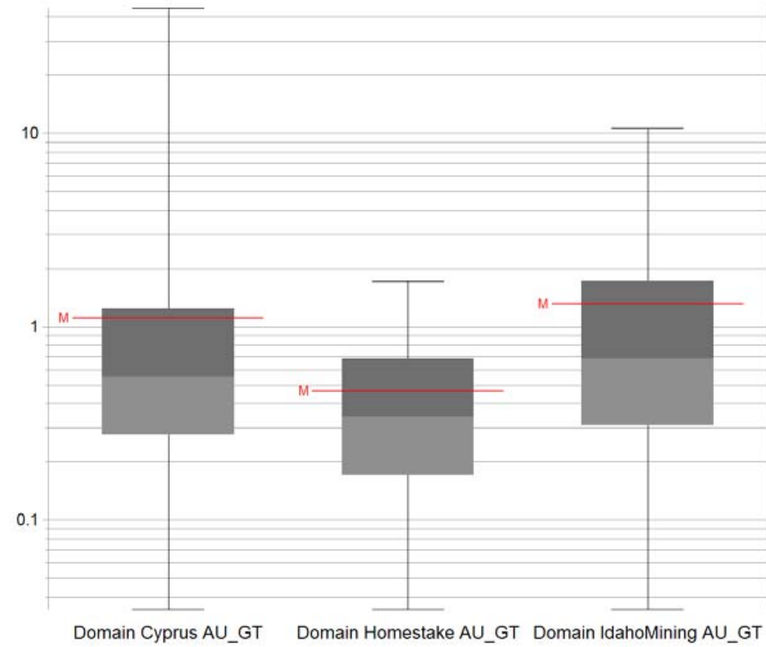
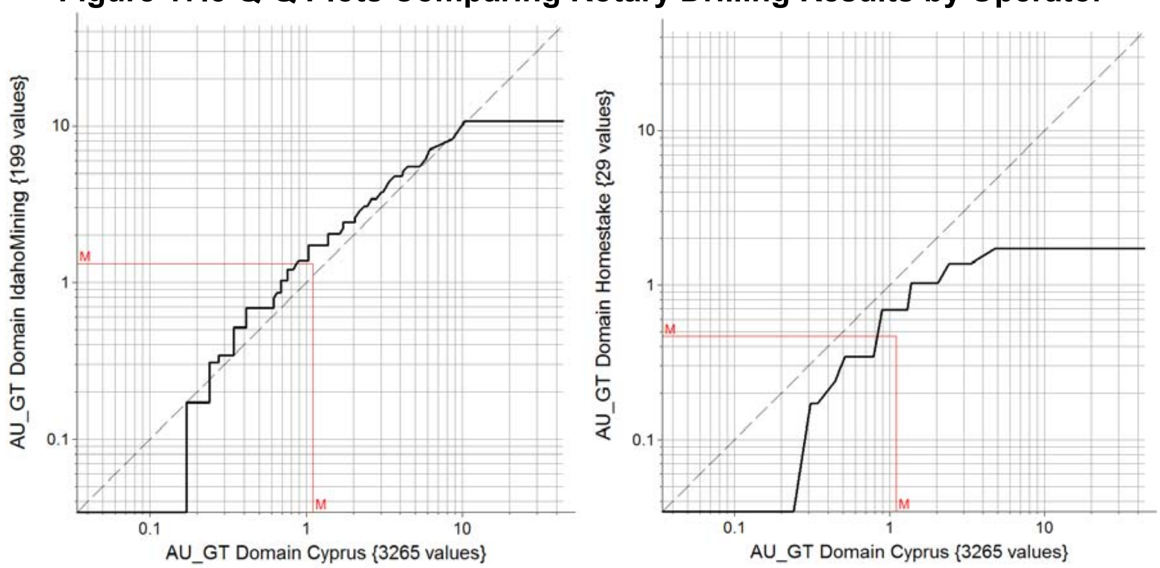


Figure 17.5 Q-Q Plots Comparing Rotary Drilling Results by Operator



Three operators used RC drilling: Cyprus, Newmont and WSMC. The Newmont data tends to be slightly higher than the others, particularly in the grade range of interest, but much of the Northumberland drilling focused on the higher grade Zanzibar deposit to the west of the shallower WSMC drilling. Considering this difference the Newmont data compare well with the WSMC data (Figure 17.6 and Figure 17.7). On the other hand, Cyprus RC drill hole data are significantly lower than both the Newmont and WSMC data. Cyprus used RC drilling only to drill 2 pre-collars for core holes. Since their data don't agree well with others in the grade range of interest, and account for a negligible amount of data, the Cyrpus RC holes were also rejected from the resource estimation database.

Figure 17.6 Box & Whisker Plots Comparing RC Drilling By Operator

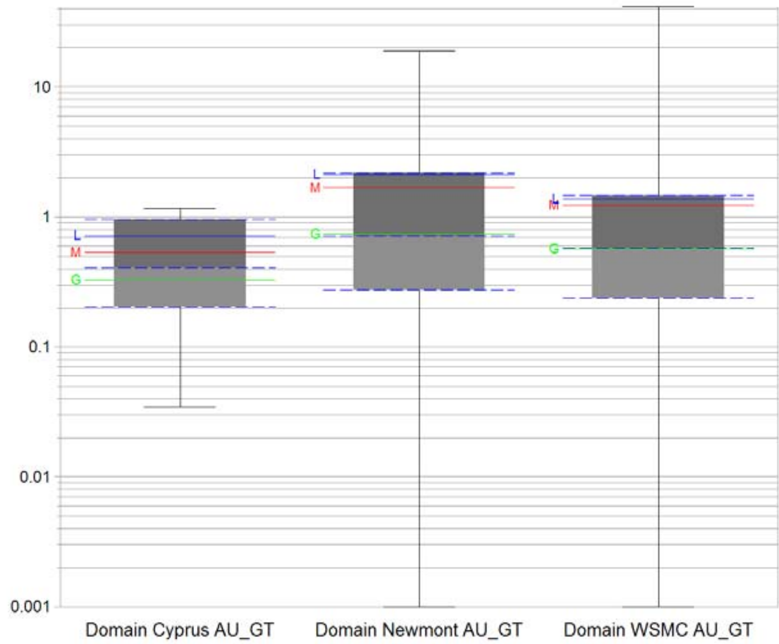
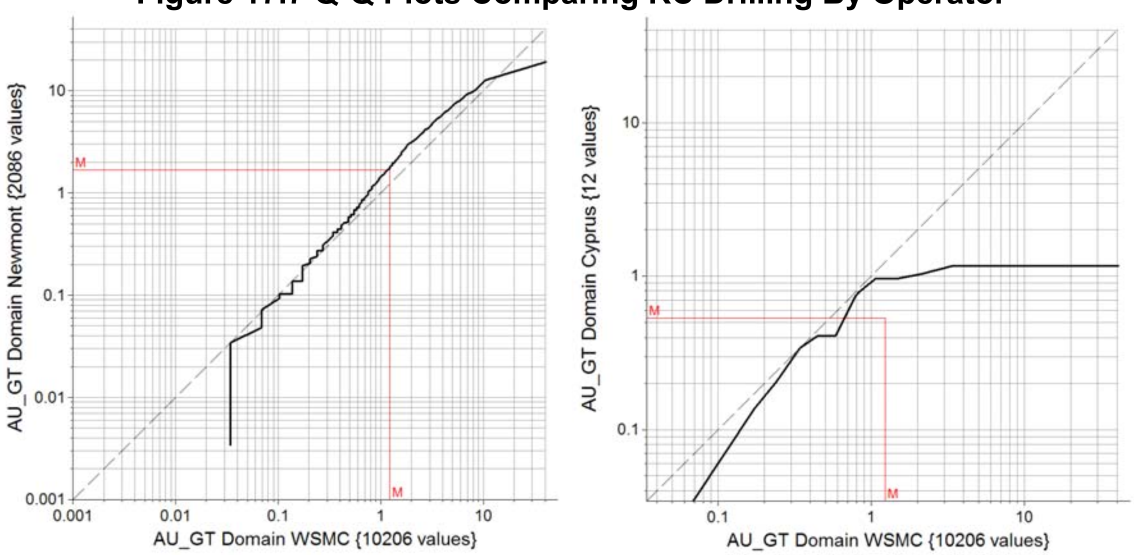


Figure 17.7 Q-Q Plots Comparing RC Drilling By Operator



The same three operators also drilled between 20 and 34 core holes. All of the assays from core compare well between all operators (Figure 17.8). The Newmont data are slightly higher grade than WSMC and Cyprus data, in the grades range of interest (Figure 17.9), which is due to their focus on different areas of the deposit.

Figure 17.8 Box & Whisker Plot Comparing Core Drilling By Operator

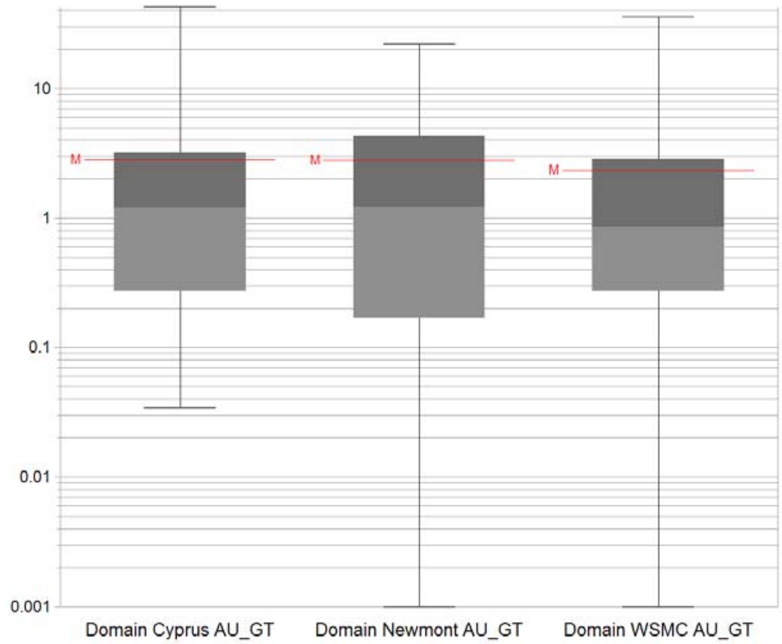
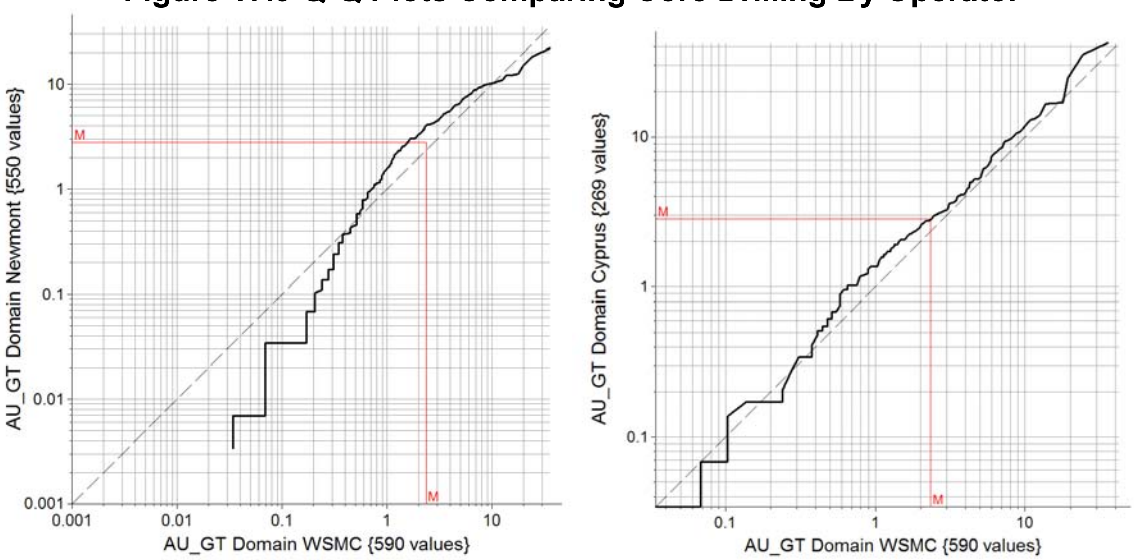
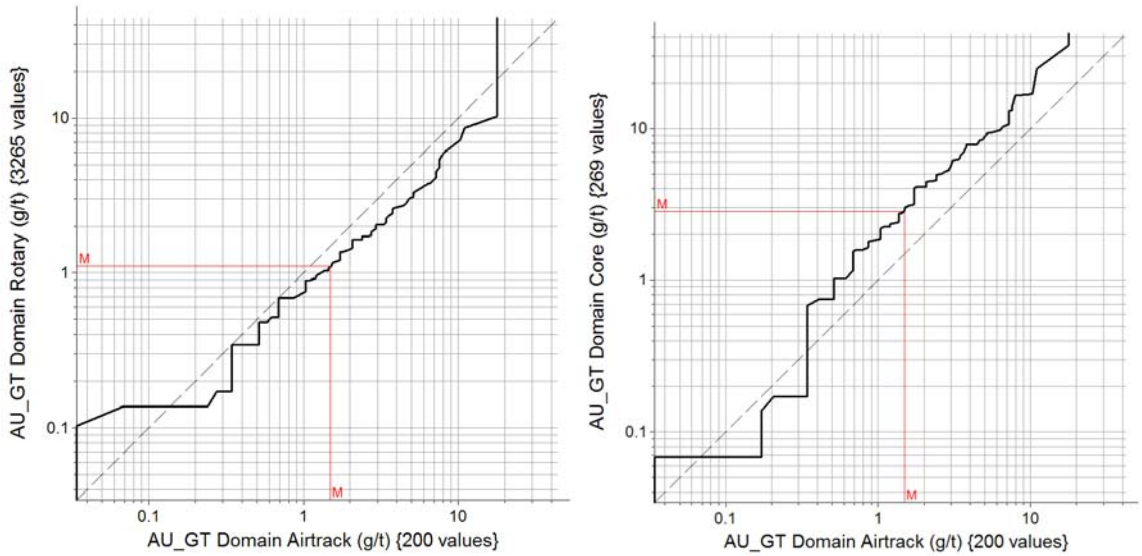


Figure 17.9 Q-Q Plots Comparing Core Drilling By Operator



Cyprus also conducted a small amount of Airtrack drilling. The resulting data compare well with Rotary drill holes, although slightly higher grade; whereas, Airtrack drilling is significantly lower grade than core hole data (Figure 17.10). Considering that core assay data tends to be generally higher grade than other drill types, and Rotary drilling tends be generally lower grade, the Airtrack drilling appears to be in line with the median assay data population and will be used regardless of the minor discrepancies.

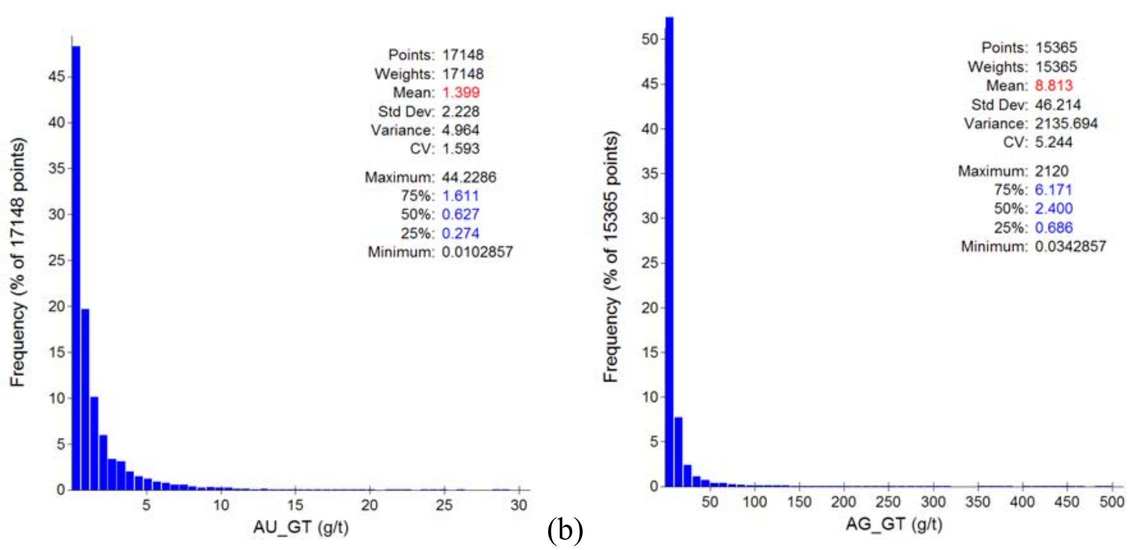
Figure 17.10 Q-Q Plots Comparing Drill Types by Cyprus



17.4.1 Model Data

A total of 17,148 gold assays and 15,365 silver assays were captured within the 3D interpreted grade envelopes (Figure 17.11). These data are largely dominated by RC drilling and data collected by WSMC. The higher grades in the Newmont data (Table 17.4) reflect drilling in the western Zanzibar and Rockwell areas, and assays from core remain consistently higher on average (Table 17.3).

Figure 17.11 Histograms Showing (a) Gold and (b) Silver Assays Captured Within Modeled Grade Envelopes



(a) (b)

Table 17.3 Descriptive Statistics and Box Plots Showing Assay Data By Drill Type

	Unknown	AirTrack	Rotary	RC	Core
Samples	31	200	3,464	12,090	1,363
Mean	2.95	1.48	1.12	1.33	2.71
Std Dev	8.19	2.27	1.92	1.93	3.99
Variance	67.01	5.15	3.68	3.71	15.92
CV	2.77	1.53	1.72	1.45	1.47
Max	34.11	17.83	44.23	41.14	42.65
Median	0.31	0.69	0.55	0.62	1.11
Min	0.03	0.03	0.03	0.01	0.01

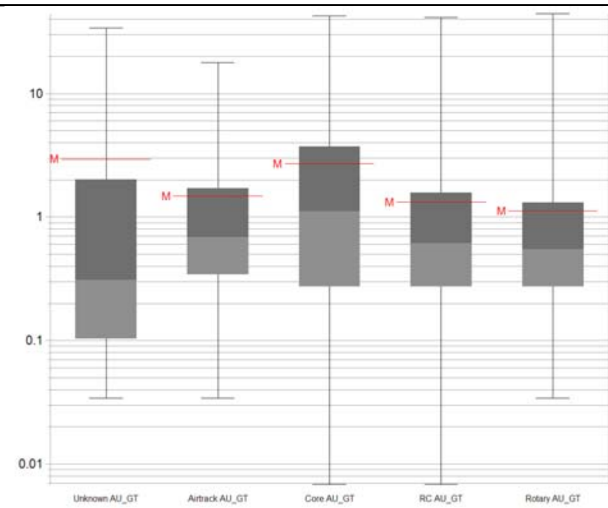
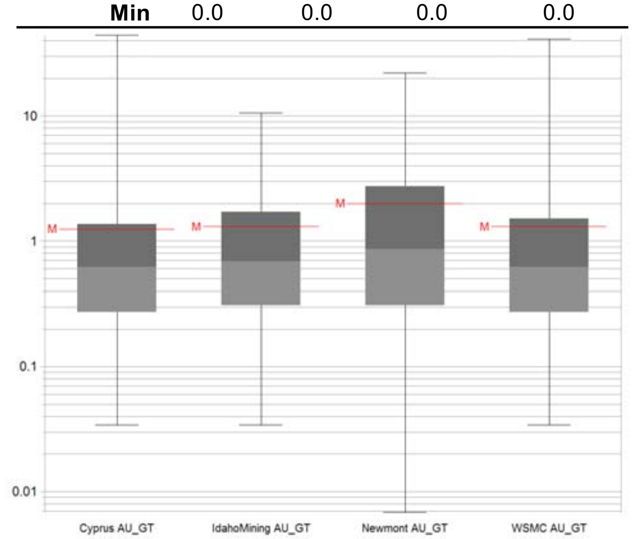


Table 17.4 Descriptive Statistics and Box Plots Showing Assay Data By Operator

	Idaho	Cyprus	WSMC	Newmont
Samples	199	3,746	10,692	2,511
Mean	1.3	1.2	1.3	2.0
Std Dev	1.6	2.3	2.1	2.7
Variance	2.7	5.4	4.2	7.1
CV	1.2	1.9	1.6	1.3
Max	10.6	44.2	41.1	22.1
Median	0.7	0.6	0.6	0.9
Min	0.0	0.0	0.0	0.0



Summary statistics for each deposit and grade domain are shown in Table 17.5 and Table 17.6. Mean gold values for each of the domains show the differences between the high and low grade domains, supporting the consistency in the model interpretation of the gold values. A similar pattern can be seen in the silver data for some domains, albeit more subtle and less consistent. The Main, States and Zanzibar deposits have moderately higher silver grades than the rest of the deposits.

A notable characteristic of both the gold and the silver assay data is the remarkable consistency in grade across the full range of the deposit, both in low and high grade domains. This strength of continuity is further supported by the variography, described below and promotes a high degree of geological confidence to grade interpolation and extrapolation.

Table 17.5 Descriptive Statistics and Box Plots of Gold Assays by Domain

	Chipmunk		Main		Pad 4	Rockwell		States		Zanzibar	
	LG (100)	HG (110)	LG (200)	HG (210)	LG (300)	LG (400)	HG (410)	LG (500)	HG (510)	LG (600)	HG (610)
Samples	2,996	608	990	675	115	361	22	3,079	956	5,554	1,792
Mean	1.0	3.0	0.8	3.1	0.7	1.3	5.4	0.7	2.6	0.8	3.7
Std Dev	1.5	3.5	1.8	3.6	0.8	2.2	10.5	0.9	3.0	1.1	3.2
Variance	2.1	12.2	3.1	13.3	0.6	5.0	110.7	0.8	8.7	1.1	10.3
CV	1.4	1.2	2.2	1.2	1.0	1.8	1.9	1.3	1.1	1.4	0.9
Max	19.3	41.1	38.7	44.2	5.4	14.2	34.1	10.3	42.7	13.5	35.8
Median	0.5	2.2	0.3	2.0	0.5	0.5	1.1	0.4	1.8	0.4	2.8
Min	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

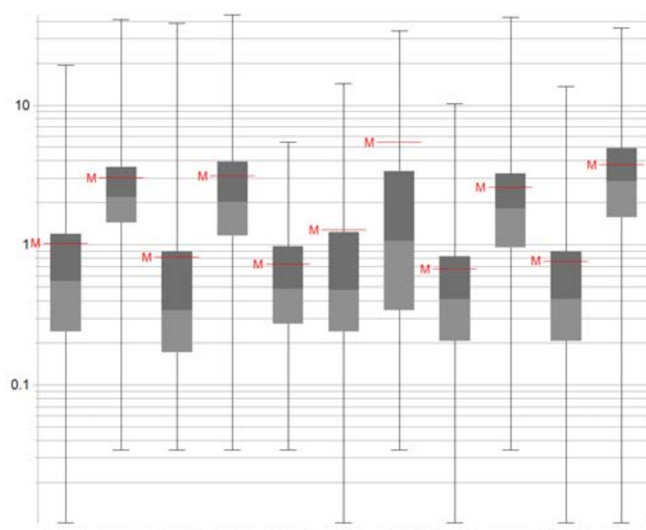
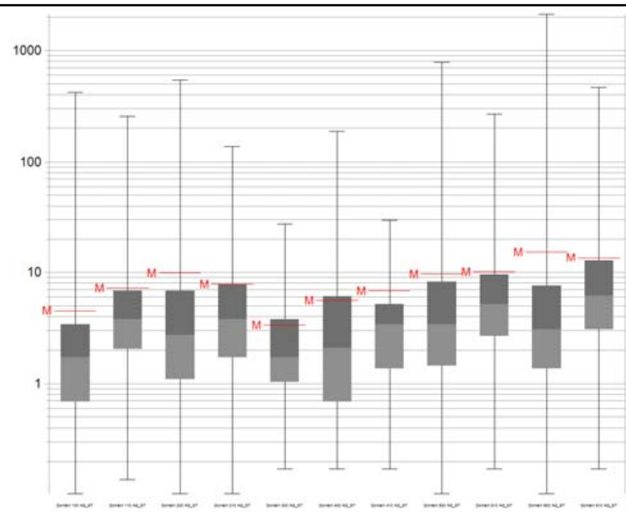


Table 17.6 Descriptive Statistics and Box Plots of Silver Assays by Domain

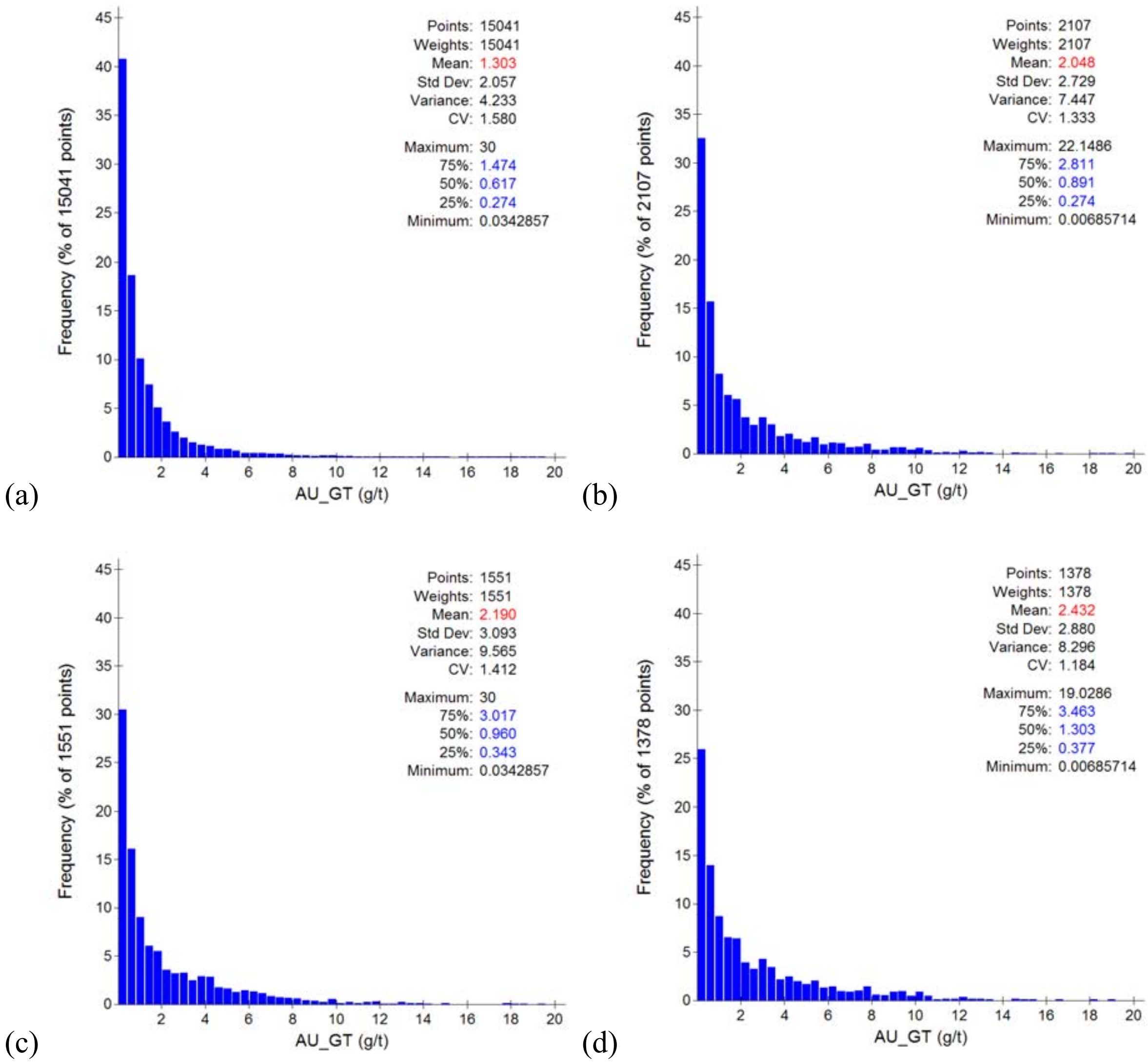
	Chipmunk		Main		Pad 4	Rockwell		States		Zanzibar	
	LG (100)	HG (110)	LG (200)	HG (210)	LG (300)	LG (400)	HG (410)	LG (500)	HG (510)	LG (600)	HG (610)
Samples	2,910	574	963	656	115	269	22	3,039	942	4,873	1,442
Mean	3.8	6.7	7.3	6.7	2.3	4.8	5.6	7.4	8.7	12.0	12.5
Std Dev	15.5	17.9	31.4	13.4	4.2	13.4	9.1	29.5	18.8	73.9	27.1
Variance	239.1	320.6	985.2	179.6	17.5	178.8	82.8	873.1	353.5	5468.5	733.6
CV	4.0	2.7	4.3	2.0	1.8	2.8	1.6	4.0	2.2	6.1	2.2
Max	422.1	255.8	541.7	137.1	27.4	187.0	29.8	784.8	266.4	2120.0	463.2
Median	1.4	3.8	1.7	3.4	1.0	1.5	2.4	2.1	4.1	2.1	5.3
Min	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



17.4.2 Comparison of Old vs New

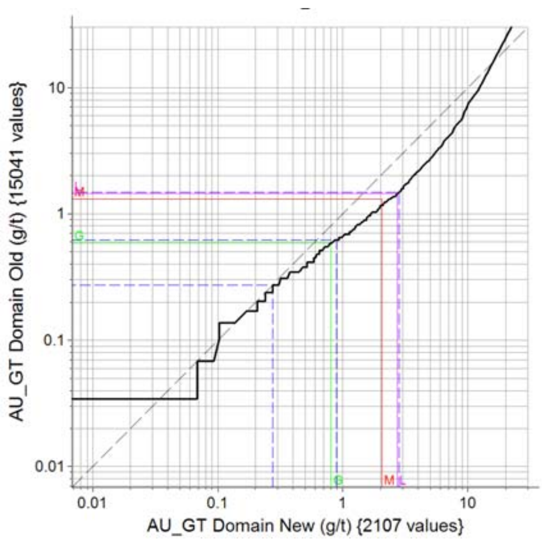
The interpreted mineralized domains in the current model captured 2,107 assays from 77 of the new holes (18 core, 59 RC) drilled by Newmont between 2005 and 2007. The mean grade of the new assays is considerably higher than the mean grade of the pre-existing data (Figure 17.12(a) and (b), and Figure 17.13(a)). The bulk of the post-2006 MDA resource drilling targeted the deeper Zanzibar and Rockwell deposits in the west. The differences are far less marked when old and new data are compared west of 445500 ft Easting only (Figure 17.12(c) and (d), and Figure 17.13(b)), demonstrating that the two datasets are comparable by location.

Figure 17.12 (a) Old and (b) New Assay Data Collected Pre- and Post-2006 MDA Mineral Resource Estimate, respectively. (c) and (d) are old and new, west of 445500 ft E.

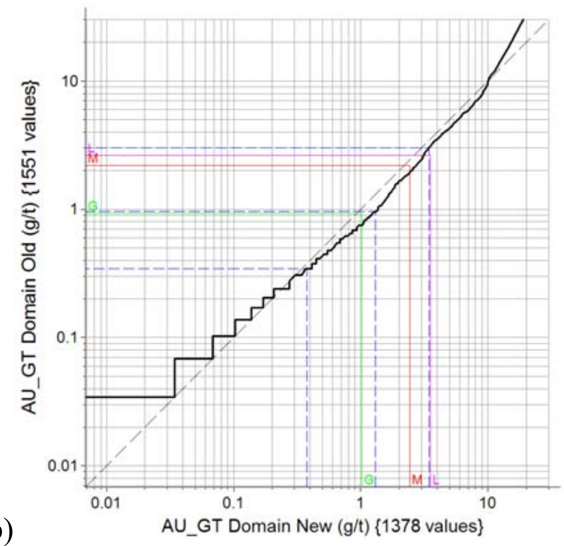


The new 2005-2007 Newmont drilling further confirms earlier observations that the deeper western portions of the deposit in the Zanzibar and Rockwell areas are distinctly higher grade than the shallower eastern portions, and demonstrate the strong continuity of grade throughout the deposit.

Figure 17.13 Q-Q Plots Showing Comparisons of Old vs New Data Across the Entire Deposit (a) and only west of 445500ft E (b).



(a)



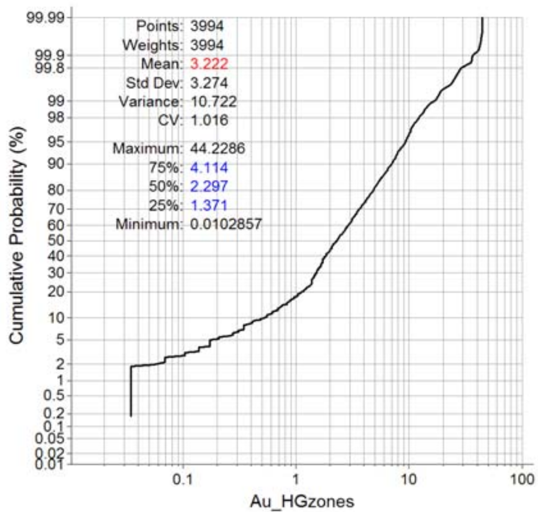
(b)

17.4.3 Grade Capping

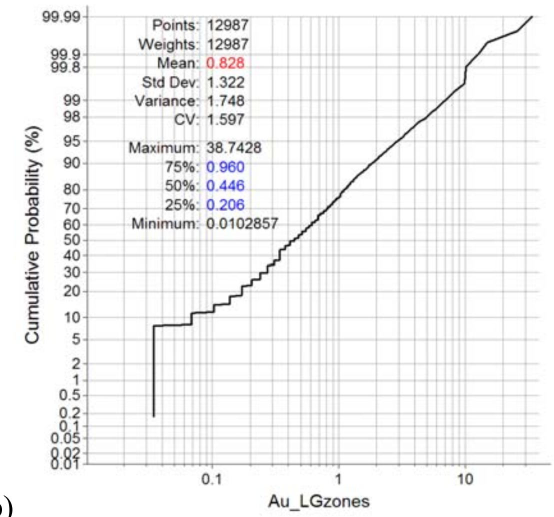
The continuity of gold and silver mineralization at Northumberland has been shown to be very strong across the entire deposit, with a slight, gradual increase towards the deeper western portions. Very few outliers are expected in this environment and are unlikely to have a significant impact on the grade estimates. Nevertheless, it is prudent to cap the very highest grades in order to prevent unrealistic additions of metal and improve local estimates in areas where they do exist. Capping should be applied separately to the high and low grade domains. On log probability plots, the grade distributions for gold show subtle changes in slope around 30 g/t Au in the high grade domains and 15 g/t Au in low grade domains (Figure 17.14). These inflections were chosen as the highest allowable grades for each grade population, resulting in 8 assays being capped in the high grade domains and 3 assays being capped in the low grade domains.

Since silver mineralization does not correlate directly with gold, the high and low grade gold domains do not represent reliable subsets of the silver grade distribution. Silver was therefore treated as a single grade domain for the purposes of grade capping. Figure 17.15 shows a subtle change in slope in the silver grade distribution around 500 g/t Ag. This was chosen as the appropriate capping grade for silver, resulting in 21 silver assays being capped.

Figure 17.14 Log Probability Curves of Gold in High and Low Grade Domains

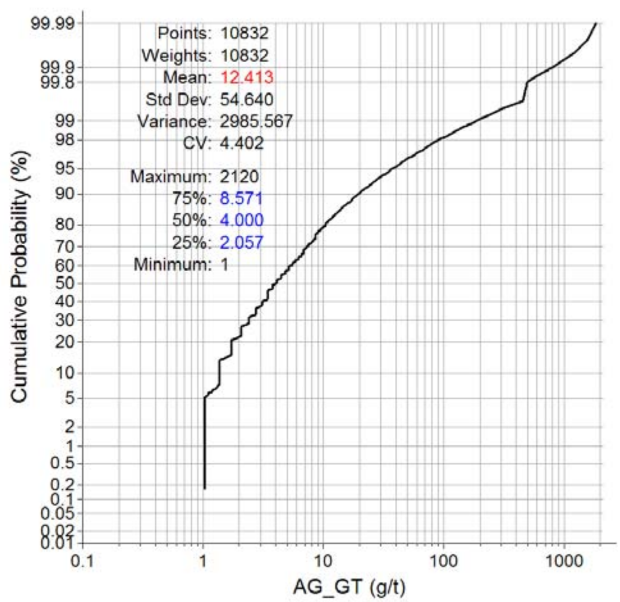


(a)



(b)

Figure 17.15 Log Probability Curve for Silver Grades



Capping resulted in a negligible change in the mean gold grade, and moderate change in the mean silver grade (Table 17.7).

Table 17.7 Descriptive Statistics for Raw and Capped Gold and Silver Grades

	Au	Au capped	% diff	Ag	Ag capped	%diff
Mean	1.40	1.39	-0.38%	8.6	7.9	-7.98%
Median	0.62	0.62		2.1	2.1	
Standard Deviation	2.23	2.15		45.6	29.7	
Sample Variance	4.96	4.64		2078.3	884.7	
Minimum	0.01	0.01		0.0	0.0	
Maximum	44.23	30.00		2120.0	500.0	
Number Capped	0	11		0	21	
Count	17,148	17,148		15,805	15,805	

17.4.4 Composites

The capped drill-hole assays were composited down-hole at 10-ft intervals and coded by mineral domain and deposit. Due to typically abrupt changes in grade across each of the mineral domain envelopes, only assays from a particular mineral domain were used to create composites coded to that domain, and composites were cut to match domain boundaries.

A total of 11,435 composites were generated within the mineralized domains. Of these, 3,252 composites (28%) are less than 10 feet in length and 1,579 (14%) are less than 5 feet long. In order to restrict undue weighting of smaller samples on the edges of the domain boundaries, the resource estimate was conducted using only those composites greater than 5 ft in length ("GT5"). In the case of gold, the mean grade of the final dataset (Au Comps GT5) is effectively equivalent to that of the raw uncapped, uncomposited database, with only -0.5% difference (Table 17.9). In the case of silver, the removal of the shorter composites mitigates the losses introduced by capping and compositing (Table 17.9), with a -10% difference from the original raw data.

Table 17.8 Summary Statistics for Gold Composites

	Au	Au capped	% diff	Au Comps	% diff	Au Comps GT5	% diff
Mean	1.40	1.39	-0.38%	1.34	-4.43%	1.39	-0.48%
Median	0.62	0.62		0.68		0.69	
Standard Deviation	2.23	2.15		1.90		1.95	
Sample Variance	4.96	4.64		3.61		3.82	
Minimum	0.01	0.01		0		0	
Maximum	44.23	30.00		30.00		30.00	
Number Capped	0	11		11.00		11.00	
Count	17,148	17,148		11,435		9,856	

Table 17.9 Summary Statistics for Silver Composites

	Ag	Ag capped	%diff	Ag Comps	%diff	Ag Comps GT5	%diff
Mean	8.6	7.9	-7.98%	7.5	-14.42%	7.7	-10.58%
Median	2.1	2.1		2.1		2.2	
Standard Deviation	45.6	29.7		25.1		25.4	
Sample Variance	2078.3	884.7		628.7		645.4	
Minimum	0.0	0.0		0.0		0.0	
Maximum	2120.0	500.0		500.0		500.0	
Number Capped	0	21		21.0		21.0	
Count	15,805	15,805		11,435		9,856	

All composites were coded according to whether they reside in the high (0.04 opt) or low (0.007 opt) grade domains within their respective deposit areas (Zanzibar, Rockwell, Chipmunk, States, Main and Pad 4), and also assigned to their respective stratigraphic layer (c.f. Table 17.1). These stratigraphic layers form the basic deposit shapes that were used to 'Unwrinkle' the deposit. Figure 17.16 and Figure 17.17 show the grade distributions within each stratigraphic layer for the high and low grade domains, respectively.

Figure 17.16 Histograms of capped composites (>0.1 g/t Au) in High Grade Domains: (a) Layers 1, (b) Layer 2, and (c) Layer 3

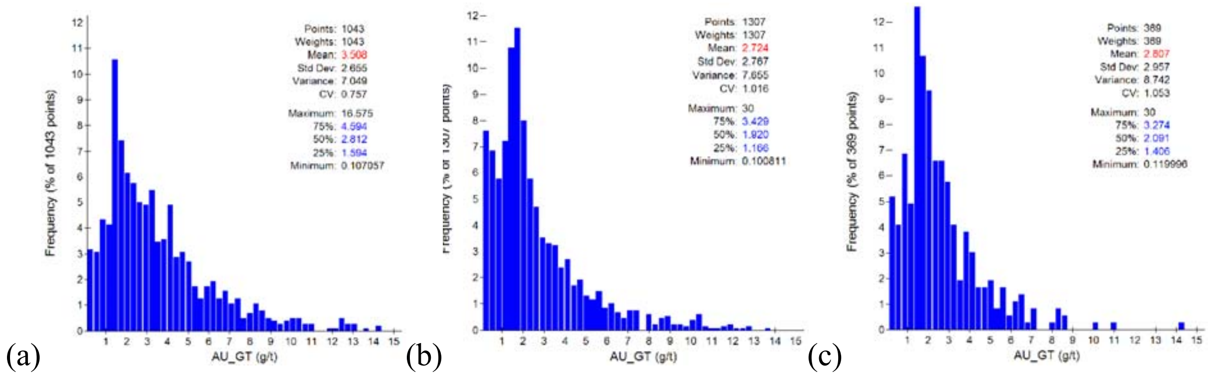
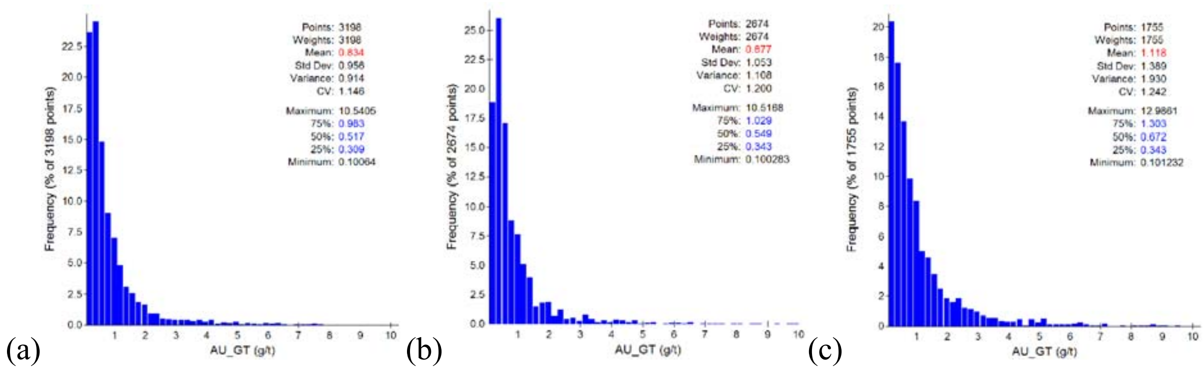


Figure 17.17 Histograms of capped composites (>0.1 g/t Au) in Low Grade Domains: (a) Layers 1, (b) Layer 2, and (c) Layer 3



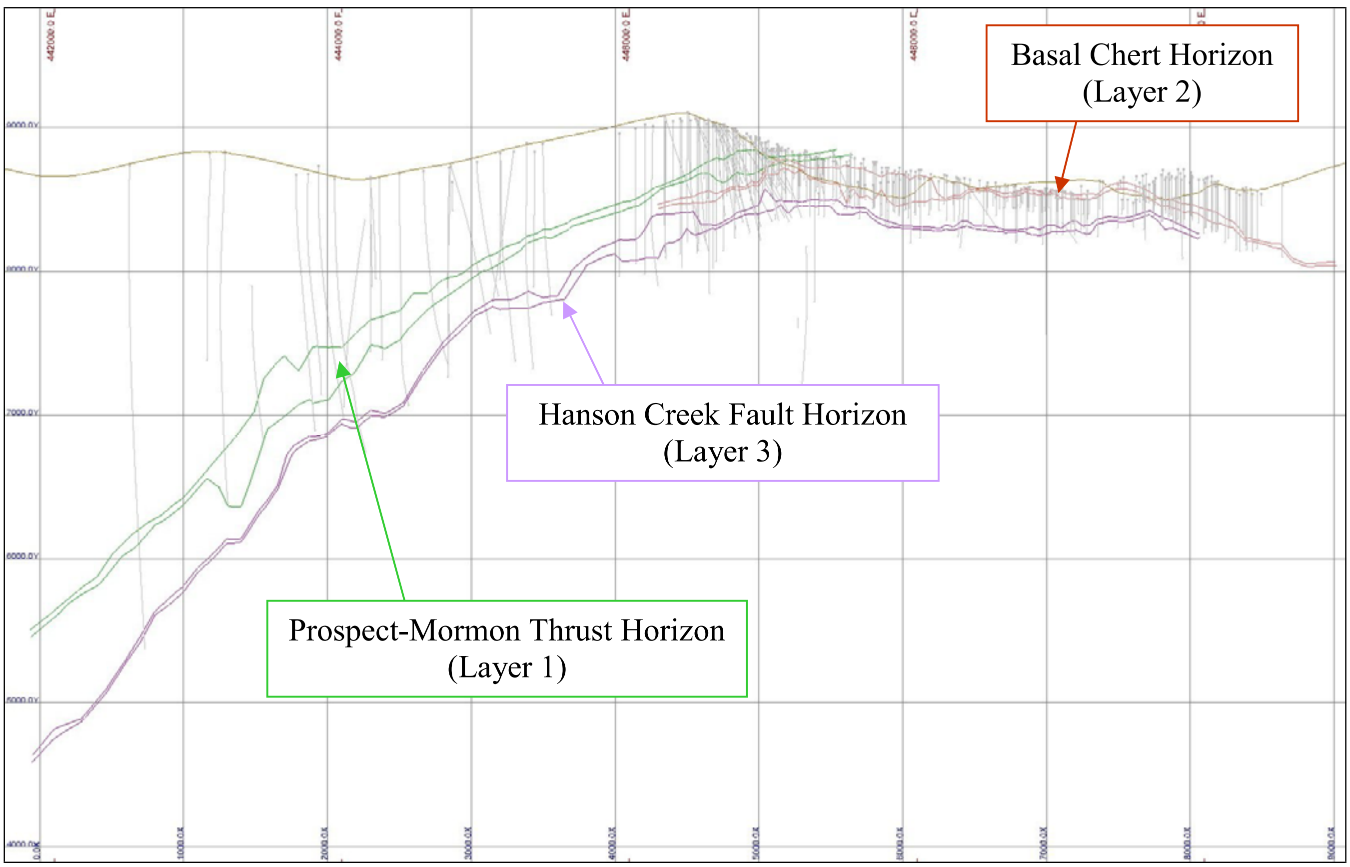
17.5 Unwrinkling

The broad anticlinal structure followed by the Northumberland mineralization is fairly simple at the scale of the deposit; however, there are numerous associated minor folds and cross-folds that transect this main structure. The amplitude of these minor folds locally exceeds the thickness of the mineralized layers, meaning that a local search in any direction may not capture nearby data if it occurs on the opposing limb of a fold. Using conventional techniques of grade interpolation, this short range variability would have to be modeled at an impractically small scale to provide adequate control on the interpolation directions. The Gemcom “Unwrinkle” tool is designed to address exactly this kind of deposit configuration.

“Unwrinkling” is a process whereby the composite data captured within a particular zone are transformed into a flat plane, allowing seamless and continuous grade interpolation across the flattened fold hinges. The transformation is controlled by the shape of the upper and lower surfaces that define the mineralized domain in real space, and the position of each composite relative to these surfaces and each other is preserved. Grades can then be smoothly interpolated across fold hinges within a new flat block model in the unwrinkled space. The interpolated block grades can then be back-transformed, by inverting the original forward transformation, and used to update the block model in real space.

Three independent layers were created to capture the principal stratigraphically-controlled mineralized horizons at Northumberland. These are: the Prospect-Mormon Thrust Horizon (Layer 1), the Basal Chert Horizon (Layer 2), and the Hanson Creek Fault Horizon (Layer 3) (Figure 17.18). Each layer, including their contained high and low grade domains, was transformed into a flat layer of uniform 100 feet thickness.

Figure 17.18 East-West Long Section Showing Distribution of Stratigraphic Layers



17.6 Variography

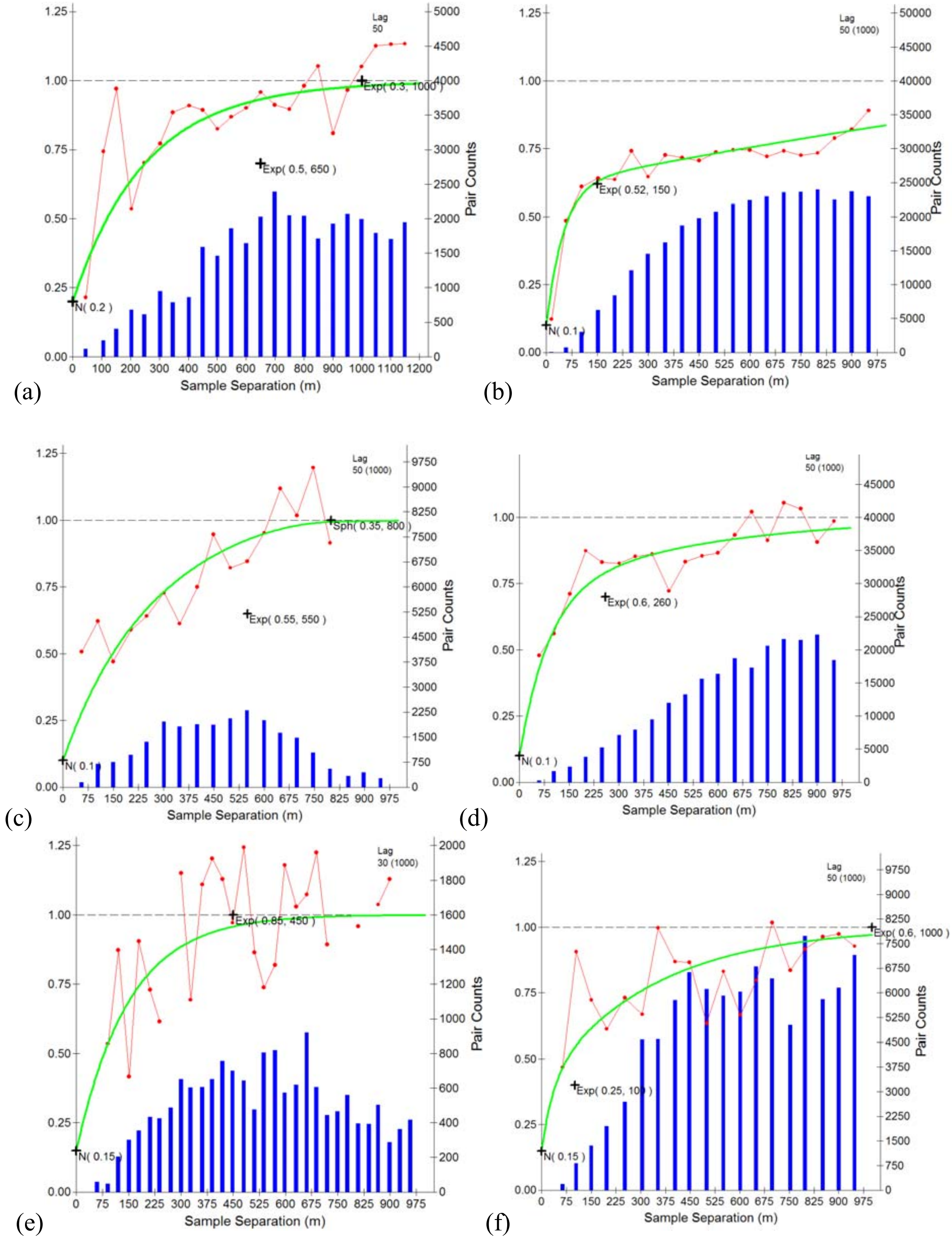
Variography was performed on gold composites from the high and low grade domains within each of the mineralized layers independently, at varying lags, azimuths, and dips. Well-developed structures with strong continuity over long ranges were defined in traditional semi-variograms using log-transformed data in layers 1 and 3, and non-transformed data in layer 2. Table 17.10 provides the details of the variogram models, and the semi-variograms for each of the principal directions of continuity are shown in Figure 17.19. Such strong continuity and long ranges would not have been identifiable in real space, and illustrate the benefit of using the unwrinkling transformation.

No variography was conducted on the silver data, because the data selection was based entirely on the modeled gold distribution and may not comprise a viable geostatistical population.

Table 17.10 Traditional Semi-Variogram Models for Mineralized Domains

		L1_HG			L1_LG			L2_HG			L2_LG			L3_HG		L3_LG		
Structure		C_0	C_1	C_2	C_0	C_1	C_2	C_0	C_1	C_2	C_0	C_1	C_2	C_0	C_1	C_0	C_1	C_2
Type		Nugget	Exp	Exp	Nugget	Exp	Sph	Nugget	Exp	Sph	Nugget	Exp	Exp	Nugget	Exp	Nugget	Exp	Exp
Sill		0.2	0.5	0.3	0.1	0.52	0.38	0.1	0.55	0.35	0.1	0.6	0.3	0.15	0.85	0.15	0.25	0.6
Orientation	rotX		0	0		0	0		0	0		0	0		0		0	0
	rotY		0	0		0	0		0	0		0	0		0		0	0
	rotZ		-10	-10		-20	-20		80	80		-5	-5		0		-15	-15
Dimensions	rangeX		650	1000		150	2500		550	800		260	1500		450		100	1000
	rangeY		500	650		150	800		225	550		230	900		250		200	300
	rangeZ		50	65		55	150		60	65		55	100		100		90	100

Figure 17.19 Traditional Semi-Variograms for the Principal Directions of Continuity in Each of the High and Low Grade Domains: (a) L1_HG, (b) L1_LG, (c) L2_HG, (d) L2_LG, (e) L3_HG, (f) L3_LG



17.7 Block Model

A 3D block model was created using Gemcom software to capture all of the relevant data for resource estimation. Block codes were assigned for each grade envelope in each deposit along with the percentage of each domain falling within the block. Each block was assigned a gold and silver grade, a density, oxidation indicator, and an extraction ratio, according to the estimation process and modeling described below. Block model dimensions are given in Table 17.11.

A separate unwrinkled block model was created for each layer at an arbitrary elevation below the actual deposit to capture the grade estimates. The unwrinkled block model dimensions were chosen to mimic the original block model in the X and Y directions, but with half the vertical thickness to account for the reduced uniform thickness of 100 ft. The unwrinkled block dimensions are: 25 feet in the X direction, 40 feet in the Y direction and 10 feet in the Z direction.

Table 17.11 Block Model Dimensions in Real Space

Origin	minX	441,012.5
	minY	1,530,020
	maxZ	9,150
Rotation		0
Block Size	Column (ft)	25
	Row (ft)	40
	Level (ft)	20
Dimensions	# Columns	400
	# Rows	115
	# Levels	248
Total	# Blocks	11,408,000

17.7.1 Grade Estimation

Gold grades were estimated using Ordinary Kriging in a single pass for each of the unwrinkled block model layers. Each block was assigned a high grade value and a low grade value using only those composites coded from each respective domain. The estimation parameters for the samples used in the grade estimates are given in Table 17.12. These parameters were derived from the variography for each separate domain and represent approximately 90% of the full range defined by each respective variogram model.

Table 17.12 Estimation Parameters for Northumberland Grade Estimation

		L1_HG	L1_LG	L2_HG	L2_LG	L3_HG	L3_LG
Orientation	Zrot	-10	-20	80	-5	0	-15
	Xrot	0	0	0	0	0	0
	Zrot	0	0	0	0	0	0
Dimensions	rangeX	800	1750	650	1000	450	850
	rangeY	550	550	400	600	250	275
	rangeZ	50	100	50	70	100	90
Samples	Min	4	4	4	4	4	4
	Max	16	16	16	16	16	16
	perDH	4	4	4	4	4	4

Silver grades were estimated in a single pass by Inverse Distance Squared weighting in the unwrinkled block models, using the same search parameters as those used for gold.

All grade estimates in the unwrinkled block models were back-transformed into real space and used to update the real space block model. A single back-transformed grade value was used to populate each block with a nearest neighbour interpolation.

17.7.2 Density and Oxidation Modeling

Specific gravity ("SG") measurements of mineralized Northumberland material were made by WSMC using the immersion method and the Marcy direct-reading pulp-density scale. For the immersion method, selected samples of core were cleaned with a brush and sprayed with a thin lacquer (Krylon) to prevent the samples from absorbing water during the test (Lanier, 1992b). Hip chain string was used to suspend the samples, which were weighed suspended in air and in tap water. Bulk specific gravity was then calculated using the following equation:

$$SG = A / (A - B)$$

where: A = weight in air; and B = weight in water

A comparison was made of 30 Marcy measurements with determinations on the same samples using the immersion method. The Marcy and immersion method measurements averaged 2.59 and 2.61, respectively (Lanier, 1997). In addition to the WSMC data, Core Laboratories, Inc. of Dallas, Texas determined the SG of 19 samples for Cyprus.

A total of 295 SG, or tonnage factor ("TF"), measurements collected from mineralized Northumberland samples were used to determine densities. The SG results vary principally by lithology and oxidation. Since a lithologic model of Northumberland has not been created, average TF's were estimated for each deposit based on the percentage of each lithology in the deposit. Lithologic codes of all samples assigned to gold domains were used to estimate the relative amounts of mineralized dolostone, limestone, siltstone/silty limestone, jasperoid, hornfels, and intrusions in each deposit (Table 17.13). The average TF values for each of the lithologies were then weight-averaged to determine the 'unfactored' TF for each deposit. These values were increased by a 2% factor in oxidized rocks and 1% in unoxidized rocks in order to account for unmeasured void spaces, such as open fractures (Table 17.14).

Table 17.13 Tonnage Factors by Lithology

Deposit	Dolostone		Limestone		Ls-Siltstone		Jasperoid		Intrusions		Hornfels		Totals[1]
	No	TF	No	TF	No	TF	No	TF	No	TF	No	TF	
Zanzibar	12	11.95	6	12.42	28	12.29	51	12.38	43	12.20	3	11.94	143
Rockwell	7	12.76	7	12.09			1	11.69	2	12.00	4	12.00	21
Chipmunk	25	12.37	4	12.97	3	13.69	6	12.61	47	12.21			85
States-Main			8	14.90			8	12.76					16
S Ridge	9	12.97	16	13.13					2	15.48	3	13.18	30
Totals	*53*	*12.42*	*41*	*13.12*	*31*	*12.42*	*66*	*12.44*	*94*	*12.26*	*10*	*12.31*	*295*

[1] Table does not include two measurements of calc-silicate rocks

Table 17.14 Tonnage Factors by Deposit

Deposit	Oxidized TF	Unoxidized TF
Zanzibar	12.53	12.41
Rockwell	12.76	12.63
Chipmunk	12.78	12.65
States	12.95	12.82
Main	12.95	12.82
Wedge Shaped	12.80	12.68
Pad 4	13.10	12.97
South Ridge	12.78	12.66

In order to assign the tonnage factors to the blocks, an oxidation model was estimated using the oxidized ("2"), mixed ("1"), and unoxidized ("0") codes in the drill sample database. Oxidation trends within the deposits mimic the stratigraphy. Drill hole geologic codes were therefore contoured to create a digital surface representing the base of the Roberts Mountains Formation. The relative vertical distance of the blocks to the Roberts Mountains surface were calculated and stored in the block model. The block model was then used to code the relative vertical distance to the 10-ft oxidation composites. These procedures normalize true elevations of the composites and blocks to the Roberts Mountains surface, effectively flattening the undulating stratigraphy for the purposes of the oxidation estimation.

The oxide code was interpolated using the inverse-distance-cubed method that recognized the relative distances stored in the composites as the elevation values. Each geologic area was interpolated separately with unique search parameters. The search ellipses were highly anisotropic, with relatively long axes in the horizontal directions and short minor axes in the vertical direction in order to honor the stratigraphic control. The lengths of the major and semi-major axes of the search ellipses ranged from 550ft in geologic area 1 to 440ft in areas 4 and 5, while the minor axes used ranges of 35ft to 50ft. A minor amount of blocks were not estimated in the Zanzibar deposit. These blocks were set to zero (unoxidized).

The oxide codes were interpolated to assign blocks oxidation codes to the first decimal place. All blocks greater than or equal to 1.5 were assigned oxidized tonnage factors, while the remaining blocks were assigned unoxidized tonnage factors.

17.7.3 Metallurgical Modeling

Portions of the Northumberland gold-silver mineralization are amenable to direct cyanidation, while other portions require metallurgical treatment that includes oxidation prior to cyanidation (see Section 16). Due to the significant difference in costs involved in the recovery of gold and silver from these two styles of mineralization, unique grade cutoffs are necessary for the purposes of resource reporting. A generalized metallurgical model was therefore developed to define both the mineralization that is amenable to direct cyanidation and the mineralization that requires oxidation prior to cyanidation. These types of mineralization were identified on the basis of gold cyanide extraction ratios, which are defined as the ratios of cyanide leach assays to original fire assays expressed in percent. The metallurgical modeling, therefore, has been completed solely for the purposes of tabulating the Mineral Resources at appropriate cutoffs. Additional work, including the possible development of a new metallurgical model, would need to be completed prior to taking these resources to reserves.

Variography performed on gold cyanide extraction ratio data indicated maximum ranges of about 700 to 800ft in both global and directional variograms, with most of the relationship between samples accounted for at a range of 550ft.

Cyanide extraction ratios were estimated by the inverse-distance-cubed ("ID^3") method using the parameters in Table 17.15. Relative elevations of the 10-ft composites to the Roberts Mountains surface were used in a similar fashion as the oxidation estimation described above. Cyanide extraction ratios derived from gold assays of less than 0.005 oz Au/ton were not used in the composites, as these low assay values can lead to spuriously high cyanide extractions and otherwise rather meaningless ratios. Only cyanide extraction ratios within the mineral domains were composited.

Approximately 90% of the blocks were estimated by the inverse-distance interpolation. The equation of a best-fit line derived from the relationship between cyanide extraction ratios and logged oxidation code was applied to the interpolated oxidation codes to calculate the cyanide extraction ratios for the unestimated blocks. The data used to derive the best-fit line were constrained to samples that: (1) have a minimum fire assay value of 0.01 oz Au/ton; (2) lie within the gold mineral domains; and (3) have a maximum extraction ratio of 115%.

Table 17.15 Summary of Northumberland Cyanide Extraction Estimation Parameters

Areas 1 through 5	
Composites: Min / Max / Max per hole	1 / 5 / 3
Composite Length-weighting	Yes
Estimation method	ID^3
Search Distances (ft)	550 / 550 / 50
Search Directions: Azimuth / Dip / Tilt	0º / 0º / 0º

The minimum fire assay limit is imposed in order to remove many of the spurious extraction ratios well in excess of 100% and otherwise meaningless ratios, which are common at grades of less than 0.01 oz Au/ton. Only data lying within the mineral domains were used in the estimation. While the best-fit line reflects the expected positive relationship between increasing oxidation and increasing extraction values, the correlation is not strong (correlation coefficient = 0.49). This is partially due to the subjectivity associated with various loggers assigning codes of 1, 2, and 3 in the description of oxidation state. The interpolated extraction ratios were capped at 100%.

17.8 Block Model Validation

A nearest-neighbor and an ID2 estimate of the deposit was undertaken as a check on the kriged grade model. At no cutoff grade, the tons and grade of all estimated blocks in the two models are essentially identical. Grade distribution plots (Figure 17.20), Q-Q plots (Figure 17.21), and swath plots (Figure 17.22) of the nearest neighbor, ID2 and kriged block grades were also evaluated. In addition, local block grade estimates were visually evaluated in comparison to neighbouring composite grades. The results showed good agreement in the statistical and spatial grade distributions of each interpolation method.

Figure 17.20 Histograms Showing Grade Distributions for Nearest-Neighbour, ID2 and Ordinary Kriging Estimates

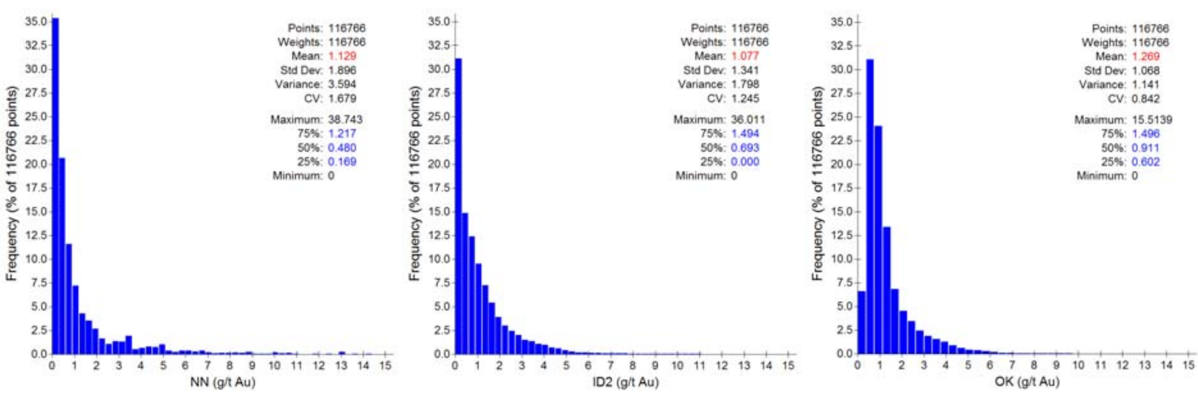


Figure 17.21 Q-Q Plots Comparing Grade Estimates for Each Interpolation Above a Cut-Off Grade 0.3 g/t Au

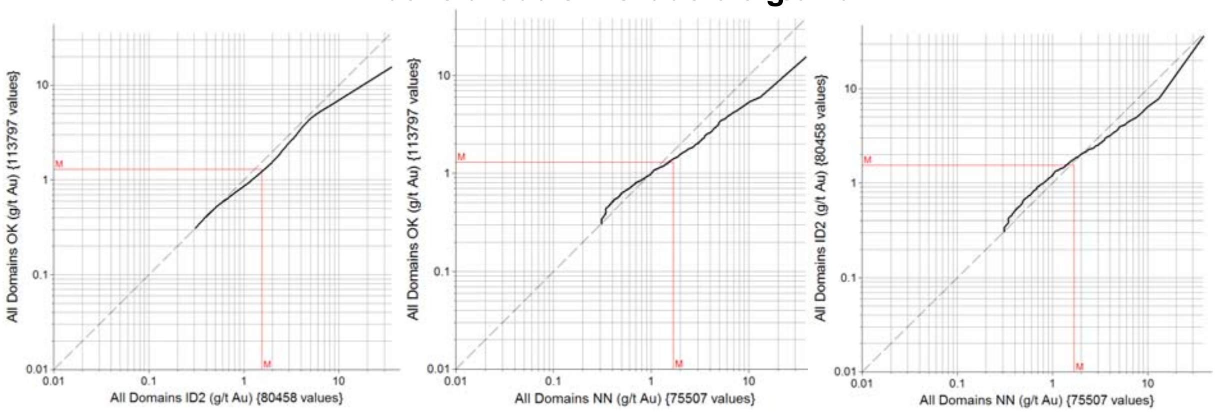
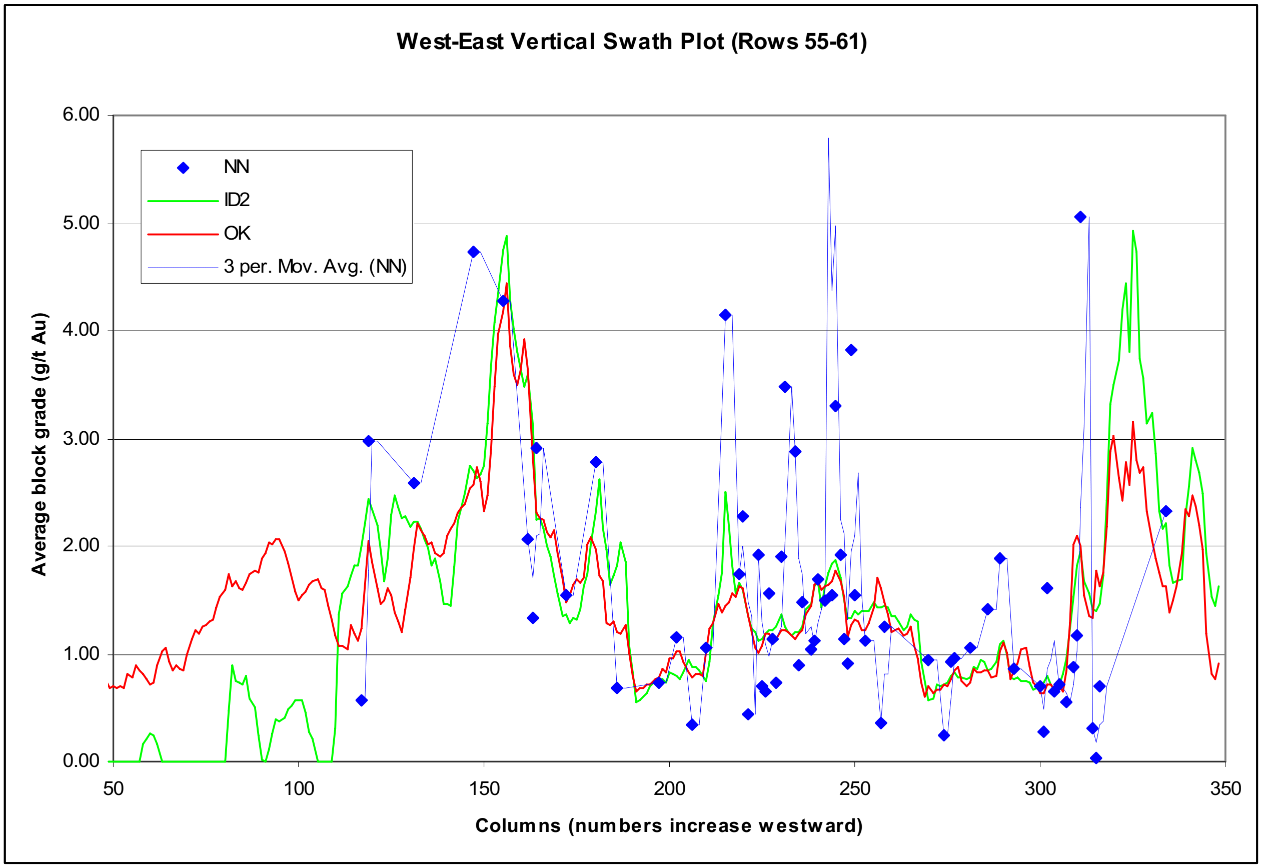


Figure 17.22 Vertical east-west swath plot comparing nearest neighbour (NN), inverse distance squared (ID2), and ordinary kriging (OK) estimates along a 240 foot wide swath across the center of the deposit



Various views of the Northumberland block model are shown in Figure 17.23, Figure 17.24, and Figure 17.25. Cross-section 445100E (Figure 17.25) shows the strong stratigraphic controls in part of the Zanzibar (Layer 1) and Rockwell (Layer 3) deposits. Note the thrusted cap of the Mount Gooding pluton along Layer 1).

Figure 17.23 Plan View of the Northumberland Block Model Grades (Blue=0.25-0.50, Green=0.5-1.0, Yellow=1.0-3.0, Orange=3.0-6.0, Red>6.0)

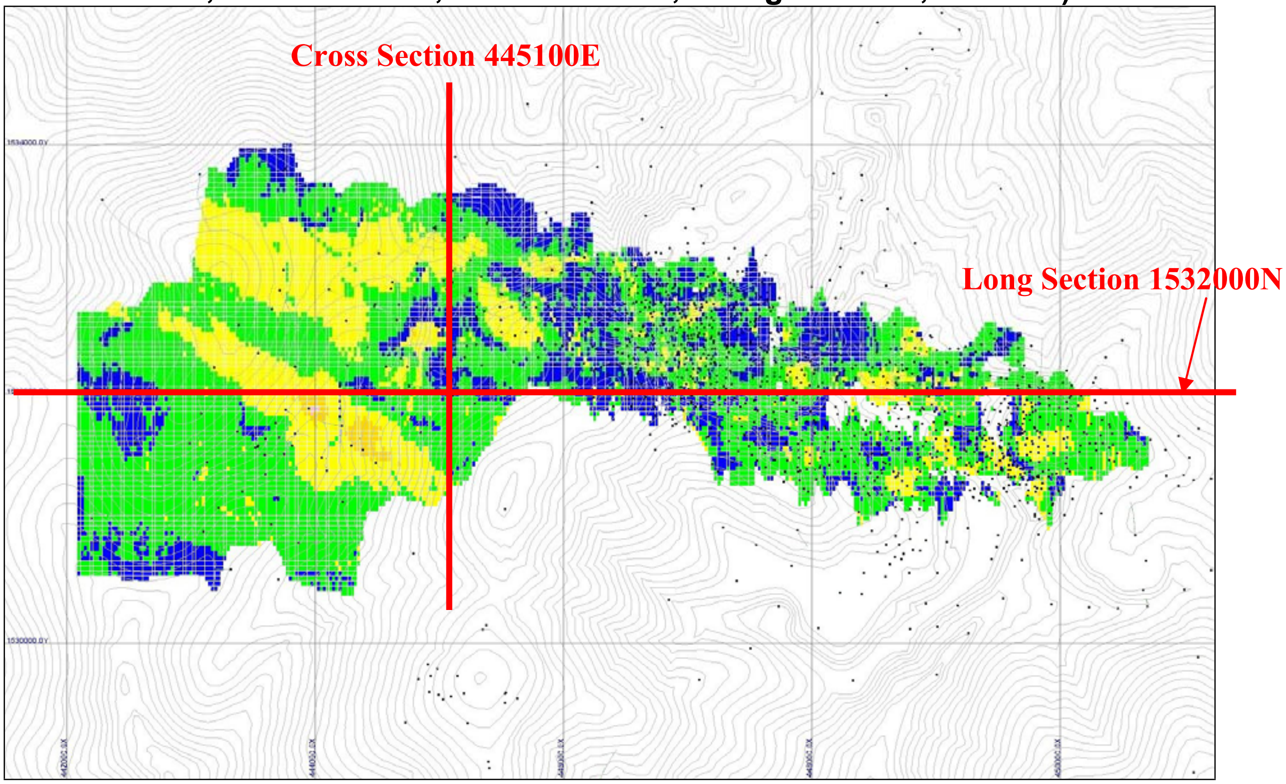


Figure 17.24 Long Section 1532000N Showing Block Grades (colours as in Figure 17.23)

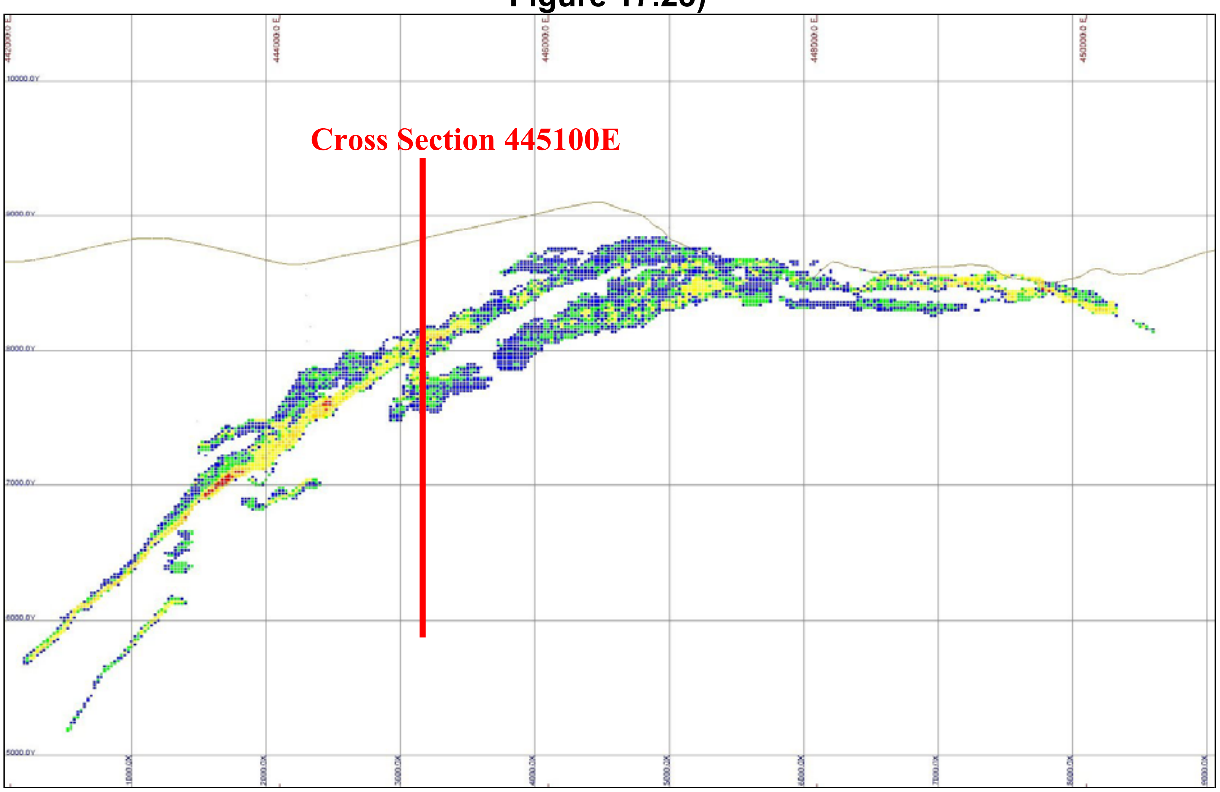
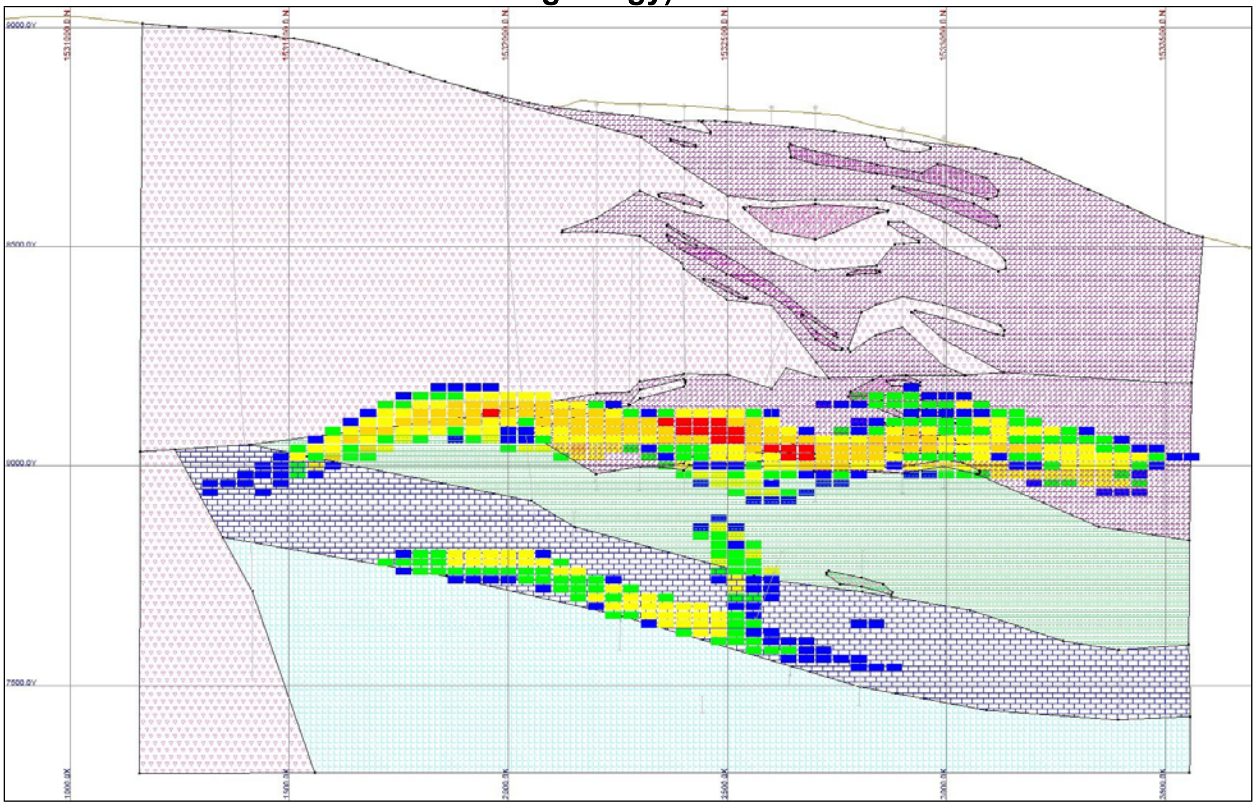


Figure 17.25 Cross-Section 445100E Showing Zanzibar and Rockwell Block Grades and Geology (grade colours as in Figure 17.23; c.f. Figure 17.2 for geology)



17.9 Resource Classification

The Mineral Resources stated in this report for the Northumberland project conform to the definitions and categories set out in the Canadian Institute of Mining, Metallurgy and Petroleum ("CIM") Definition Standards on Mineral Resources and Mineral Reserves adopted by the CIM Council on August 20, 2000 and the revisions adopted on December 11, 2005.

Gold resources were classified on the basis of: (i) geological confidence, (ii) the average distance of the model blocks to composite samples used in the estimate, and (ii) the minimum number of composites used to estimate the block grades (Table 17.16). The average distances are those measured in the unwrinkled block model, and correspond to approximately ¼ the variogram range for Measured, ½ the range for Indicated and the full range for inferred. In all cases the classified blocks lie at least partially within a defined mineral zone. In cases where a block was coded to both high and low grade domains, the classification parameters for the highest tonnage domain in the block were used.

No silver resources are classified as Measured due to the lack of time spent studying the geology of its occurrence, the high silver CV's, and the generalized nature of the estimation. Silver was not modeled independently of the gold, so that only silver lying within the limits of the modeled gold zones was estimated. Significant additional silver lies outside of the gold zones and therefore was not estimated. This is far from an optimum method of estimating silver grades and tons, but it does serve to provide some insight into the magnitude of the silver mineralization associated directly with the gold. There is a good possibility that when estimated properly, the grades and tons will change.

Table 17.16 Northumberland Block Classification Parameters

Domain	MEASURED		INDICATED		INFERRED	
	AvgDist	MinSam	AvgDist	MinSam	AvgDist	MinSam
L1_HG	200	5	400	5	800	1
L1_LG	425	5	850	5	1750	1
L2_HG	150	5	300	5	650	1
L2_LG	250	5	500	5	1000	1
L3_HG	100	5	200	5	450	1
L3_LG	200	5	400	5	850	1

The gold resources are tabulated using three gold-grade cutoffs that are applied to the block model on the basis of reasonably expected mining methods, metallurgical characteristics, and comparisons with similar mining operations in Nevada. A cutoff grade of 0.3 g/t Au (0.01 opt) is applied to blocks that can reasonably be considered to be available for potential open-pit extraction and heap-leach processing; all blocks above an elevation of 7,500 ft with a cyanide extraction ratio of 50% or higher are deemed to be potentially mineable by open-pit methods and oxidized sufficiently to be amenable to heap leaching. The 7,500-ft elevation limits blocks potentially available to open-pit mining. This elevation is supported by internal scoping-level economic studies undertaken by Jim Ashton, Senior Engineer, Fronteer. The 0.01 cutoff grade for oxide material is derived from comparable open-pit heap-leach operations in Nevada.

Two cutoff grades are used for sulfide material, which will likely require oxidation prior to cyanide leaching. The sulfide material is identified by cyanide extraction ratios less than 50%. Sulfide blocks that lie above 7,500ft can reasonably be considered available for potential open-pit extraction and are compiled using a cutoff grade of 1.0 g/t Au (0.03 opt). This cutoff was chosen with consideration given to the Fronteer internal economic analyses mentioned above. Blocks lying below 7,500ft will likely require more costly underground mining methods and are compiled using a cutoff grade of 2.5 g/t Au (0.07 opt).

The gold grades for each block represent the weighted average of the grades estimated for each of the mineral domains included in the block; they are not diluted to full blocks but rather to the mineralized zone only. Similarly, the tons of a block are derived from that portion of the block below surface topography and within the gold mineral domains.

The silver resources are compiled from all gold resource blocks based on the gold cutoff grades discussed above; no silver cutoff is applied.

The Measured, Indicated, and Inferred gold and silver resources are summarized in Table 17.17. The gold resources at additional cutoffs are listed in Table 17.18 and Table 17.19.

Table 17.17 Northumberland Classified Resources July 2008, Fronteer Development Group

			MEASURED								
			Gold								Gold Equivalent*
Resource Type	**Cut-off (g/t)**	**Cut-off (opt)**	**Tonnes**	**g/t**	**opt**	**oz**					**oz**
Open Pit Oxide	0.3	0.01	12,888,000	1.19	0.035	492,000					492,000
Open Pit Sulfide	1.0	0.03	13,781,000	2.31	0.067	1,022,000					1,022,000
Underground	2.5	0.07									
TOTAL			**26,669,000**	**1.77**	**0.05**	**1,514,000**					**1,514,000**

			INDICATED								
			Gold				Silver				Gold Equivalent*
Resource Type	**Cut-off (g/t)**	**Cut-off (opt)**	**Tonnes**	**g/t**	**opt**	**oz**	**Tonnes**	**g/t**	**opt**	**oz**	**oz**
Open Pit Oxide	0.3	0.01	739,000	1.94	0.057	46,000	13,627,000	7.31	0.213	3,202,000	110,000
Open Pit Sulfide	1.0	0.03	8,794,000	2.35	0.069	665,000	22,575,000	8.01	0.234	5,815,000	781,000
Underground	2.5	0.07	316,000	3.35	0.098	34,000	316,000	4.43	0.129	45,000	35,000
TOTAL			**9,849,000**	**2.35**	**0.07**	**745,000**	**36,518,000**	**7.72**	**0.23**	**9,062,000**	**926,000**

			MEASURED & INDICATED								
			Gold				Silver				Gold Equivalent*
Resource Type	**Cut-off (g/t)**	**Cut-off (opt)**	**Tonnes**	**g/t**	**opt**	**oz**	**Tonnes**	**g/t**	**opt**	**oz**	**oz**
Open Pit Oxide	0.3	0.01	13,627,000	1.23	0.036	538,000	13,627,000	7.31	0.213	3,202,000	602,000
Open Pit Sulfide	1.0	0.03	22,575,000	2.32	0.068	1,687,000	22,575,000	8.01	0.234	5,815,000	1,803,000
Underground	2.5	0.07	316,000	3.35	0.098	34,000	316,000	4.43	0.129	45,000	35,000
TOTAL			**36,518,000**	**1.92**	**0.06**	**2,259,000**	**36,518,000**	**7.72**	**0.23**	**9,062,000**	**2,440,000**

			INFERRED								
			Gold				Silver				Gold Equivalent*
Resource Type	**Cut-off (g/t)**	**Cut-off (opt)**	**Tonnes**	**g/t**	**opt**	**oz**	**Tonnes**	**g/t**	**opt**	**oz**	**oz**
Open Pit Oxide	0.3	0.01	17,000	2.38	0.069	1,300	17,000	10.98	0.320	6,000	1,400
Open Pit Sulfide	1.0	0.03	1,335,000	2.59	0.075	111,000	1,335,000	7.69	0.224	330,000	118,000
Underground	2.5	0.07	5,574,000	3.70	0.108	664,000	5,574,000	5.95	0.174	1,067,000	685,000
TOTAL			**6,926,000**	**3.49**	**0.10**	**776,300**	**6,926,000**	**6.30**	**0.18**	**1,403,000**	**804,400**

**AuEq calculated at a Au:Ag ratio of 50:1*

Table 17.18 Northumberland Gold Resources by Cutoff Grade

MEASURED																
Cut-off	Oxide - >2286 m				Sulfide - >2286 m				Sulfide - <2286 m				TOTAL			
(g/t Au)	Tonnes	Grade (g/t)	Grade (opt)	Ounces (Au)	Tonnes	Grade (g/t)	Grade (opt)	Ounces (Au)	Tonnes	Grade (g/t)	Grade (opt)	Ounces (Au)	Tonnes	Grade (g/t)	Grade (opt)	Ounces (Au)
0.30	**12,888,000**	**1.19**	**0.03**	**492,000**	27,513,000	1.47	0.04	1,299,000					40,401,000	1.53	0.04	1,792,000
0.50	10,584,000	1.36	0.04	462,000	23,318,000	1.66	0.05	1,245,000					33,902,000	1.73	0.05	1,707,000
1.00	5,124,000	2.05	0.06	337,000	**13,781,000**	**2.31**	**0.07**	**1,022,000**					18,905,000	2.46	0.07	1,358,000
1.50	2,980,000	2.63	0.08	252,000	8,581,000	2.96	0.09	817,000					11,561,000	3.16	0.09	1,069,000
2.00	1,823,000	3.21	0.09	188,000	5,762,000	3.57	0.10	661,000					7,585,000	3.83	0.11	849,000
2.50	1,163,000	3.77	0.11	141,000	4,258,000	4.04	0.12	553,000					5,421,000	4.38	0.13	694,000
3.00	729,000	4.39	0.13	103,000	3,356,000	4.39	0.13	474,000					4,086,000	4.84	0.14	577,000
3.50	492,000	4.93	0.14	78,000	2,581,000	4.74	0.14	393,000					3,073,000	5.25	0.15	471,000
4.00	314,000	5.65	0.16	57,000	1,933,000	5.07	0.15	315,000					2,247,000	5.67	0.17	372,000
4.50	206,000	6.34	0.18	42,000	1,274,000	5.49	0.16	225,000					1,480,000	6.19	0.18	267,000
5.00	165,000	6.79	0.20	36,000	847,000	5.84	0.17	159,000					1,012,000	6.63	0.19	196,000

INDICATED																
Cut-off	Oxide - >2286 m				Sulfide - >2286 m				Sulfide - <2286 m				TOTAL			
(g/t Au)	Tonnes	Grade (g/t)	Grade (opt)	Ounces (Au)	Tonnes	Grade (g/t)	Grade (opt)	Ounces (Au)	Tonnes	Grade (g/t)	Grade (opt)	Ounces (Au)	Tonnes	Grade (g/t)	Grade (opt)	Ounces (Au)
0.30	**739,000**	**1.94**	**0.06**	**46,000**	12,761,000	1.83	0.05	752,000	2,861,000	1.72	0.05	158,000	16,361,000	1.82	0.05	956,000
0.50	650,000	2.15	0.06	45,000	11,810,000	1.95	0.06	739,000	2,835,000	1.72	0.05	157,000	15,295,000	1.91	0.06	941,000
1.00	546,000	2.45	0.07	43,000	**8,794,000**	**2.35**	**0.07**	**665,000**	2,357,000	1.91	0.06	145,000	11,696,000	2.27	0.07	853,000
1.50	442,000	2.74	0.08	39,000	6,071,000	2.85	0.08	557,000	1,617,000	2.21	0.06	115,000	8,130,000	2.72	0.08	711,000
2.00	294,000	3.17	0.09	30,000	4,624,000	3.20	0.09	476,000	848,000	2.64	0.08	72,000	5,766,000	3.12	0.09	579,000
2.50	183,000	3.74	0.11	22,000	3,441,000	3.53	0.10	391,000	**316,000**	**3.35**	**0.10**	**34,000**	3,940,000	3.53	0.10	447,000
3.00	113,000	4.40	0.13	16,000	2,386,000	3.88	0.11	298,000	161,000	4.06	0.12	21,000	2,660,000	3.92	0.11	335,000
3.50	75,000	4.98	0.15	12,000	1,483,000	4.28	0.12	204,000	99,000	4.40	0.13	14,000	1,657,000	4.34	0.13	231,000
4.00	51,000	5.49	0.16	9,000	830,000	4.72	0.14	126,000	56,000	5.00	0.15	9,000	936,000	4.78	0.14	144,000
4.50	37,000	5.88	0.17	7,000	416,000	5.16	0.15	69,000	36,000	5.18	0.15	6,000	489,000	5.28	0.15	83,000
5.00	27,000	6.91	0.20	6,000	207,000	5.71	0.17	38,000	25,000	6.22	0.18	5,000	260,000	5.74	0.17	48,000

INFERRED																
Cut-off	Oxide - >2286 m				Sulfide - >2286 m				Sulfide - <2286 m				TOTAL			
(g/t Au)	Tonnes	Grade (g/t)	Grade (opt)	Ounces (Au)	Tonnes	Grade (g/t)	Grade (opt)	Ounces (Au)	Tonnes	Grade (g/t)	Grade (opt)	Ounces (Au)	Tonnes	Grade (g/t)	Grade (opt)	Ounces (Au)
0.30	**17,000**	**2.38**	**0.07**	**1,300**	1,827,000	2.08	0.06	122,000	35,916,000	1.45	0.04	1,673,000	37,760,000	1.48	0.04	1,797,000
0.50	16,000	2.53	0.07	1,300	1,752,000	2.15	0.06	121,000	33,077,000	1.54	0.04	1,635,000	34,846,000	1.57	0.05	1,757,000
1.00	16,000	2.53	0.07	1,300	**1,335,000**	**2.59**	**0.08**	**111,000**	18,681,000	2.14	0.06	1,288,000	20,033,000	2.17	0.06	1,400,000
1.50	13,000	2.87	0.08	1,200	1,173,000	2.76	0.08	104,000	10,530,000	2.87	0.08	972,000	11,716,000	2.86	0.08	1,078,000
2.00	8,000	3.11	0.09	800	934,000	3.03	0.09	91,000	7,635,000	3.31	0.10	812,000	8,577,000	3.28	0.10	904,000
2.50	5,000	3.73	0.11	600	600,000	3.47	0.10	67,000	**5,574,000**	**3.70**	**0.11**	**664,000**	6,179,000	3.68	0.11	731,000
3.00	3,000	5.18	0.15	500	342,000	4.00	0.12	44,000	3,915,000	4.11	0.12	518,000	4,260,000	4.11	0.12	563,000
3.50	1,300	7.18	0.21	300	198,000	4.56	0.13	29,000	2,747,000	4.49	0.13	397,000	2,947,000	4.50	0.13	426,000
4.00	1,300	7.18	0.21	300	129,000	5.06	0.15	21,000	1,665,000	4.99	0.15	267,000	1,795,000	4.99	0.15	288,000
4.50	1,300	7.18	0.21	300	84,000	5.55	0.16	15,000	997,000	5.52	0.16	177,000	1,082,000	5.52	0.16	192,000
5.00	1,300	7.18	0.21	300	58,000	5.90	0.17	11,000	597,000	6.04	0.18	116,000	657,000	6.01	0.18	127,000

Table 17.19 Northumberland Silver Resources by Cutoff Grade

	INDICATED															
Cut-off	Oxide - >2286 m				Sulfide - >2286 m				Sulfide - <2286 m				TOTAL			
(g/t Au)	Tonnes	Grade (g/t)	Grade (opt)	Ounces (Ag)	Tonnes	Grade (g/t)	Grade (opt)	Ounces (Ag)	Tonnes	Grade (g/t)	Grade (opt)	Ounces (Ag)	Tonnes	Grade (g/t)	Grade (opt)	Ounces (Ag)
0.30	13,626,000	7.31	0.21	3,202,000	40,275,000	7.13	0.21	9,239,000	2,861,000	4.11	0.12	378,000	56,761,000	7.02	0.20	12,820,000
0.50	11,234,000	7.12	0.21	2,573,000	35,128,000	7.24	0.21	8,179,000	2,835,000	4.14	0.12	377,000	49,197,000	7.04	0.21	11,129,000
1.00	5,670,000	6.98	0.20	1,272,000	22,575,000	8.01	0.23	5,814,000	2,357,000	4.24	0.12	321,000	30,601,000	7.53	0.22	7,407,000
1.50	3,423,000	6.62	0.19	729,000	14,652,000	9.21	0.27	4,339,000	1,617,000	4.04	0.12	210,000	19,691,000	8.34	0.24	5,278,000
2.00	2,117,000	6.68	0.19	455,000	10,386,000	10.31	0.30	3,444,000	848,000	4.22	0.12	115,000	13,351,000	9.35	0.27	4,014,000
2.50	1,346,000	6.95	0.20	301,000	7,698,000	11.39	0.33	2,819,000	316,000	4.43	0.13	45,000	9,360,000	10.52	0.31	3,165,000
3.00	843,000	7.27	0.21	197,000	5,742,000	12.35	0.36	2,280,000	161,000	4.83	0.14	25,000	6,746,000	11.53	0.34	2,501,000
3.50	567,000	7.68	0.22	140,000	4,065,000	13.58	0.40	1,775,000	99,000	5.34	0.16	17,000	4,730,000	12.70	0.37	1,932,000
4.00	364,000	8.46	0.25	99,000	2,763,000	14.84	0.43	1,318,000	56,000	6.11	0.18	11,000	3,183,000	13.95	0.41	1,428,000
4.50	243,000	9.47	0.28	74,000	1,690,000	15.86	0.46	862,000	36,000	6.91	0.20	8,000	1,969,000	14.89	0.43	943,000
5.00	192,000	9.88	0.29	61,000	1,054,000	16.35	0.48	554,000	25,000	7.46	0.22	6,000	1,272,000	15.18	0.44	621,000

	INFERRED															
Cut-off	Oxide - >2286 m				Sulfide - >2286 m				Sulfide - <2286 m				TOTAL			
(g/t Au)	Tonnes	Grade (g/t)	Grade (opt)	Ounces (Ag)	Tonnes	Grade (g/t)	Grade (opt)	Ounces (Ag)	Tonnes	Grade (g/t)	Grade (opt)	Ounces (Ag)	Tonnes	Grade (g/t)	Grade (opt)	Ounces (Ag)
0.30	17,000	10.98	0.32	6,000	1,827,000	6.57	0.19	386,000	35,916,000	10.90	0.32	12,590,000	37,760,000	10.69	0.31	12,982,000
0.50	16,000	11.66	0.34	6,000	1,752,000	6.76	0.20	381,000	33,077,000	11.40	0.33	12,128,000	34,846,000	11.17	0.33	12,516,000
1.00	16,000	11.66	0.34	6,000	1,335,000	7.69	0.22	330,000	18,681,000	9.58	0.28	5,754,000	20,033,000	9.45	0.28	6,090,000
1.50	13,000	11.96	0.35	5,000	1,173,000	8.03	0.23	303,000	10,530,000	8.84	0.26	2,992,000	11,716,000	8.76	0.26	3,299,000
2.00	8,000	11.66	0.34	3,000	934,000	8.56	0.25	257,000	7,635,000	6.53	0.19	1,604,000	8,577,000	6.76	0.20	1,864,000
2.50	5,000	12.44	0.36	2,000	600,000	8.71	0.25	168,000	5,574,000	5.95	0.17	1,067,000	6,179,000	6.23	0.18	1,237,000
3.00	3,000	10.37	0.30	1,000	342,000	8.73	0.25	96,000	3,915,000	5.93	0.17	746,000	4,260,000	6.15	0.18	843,000
3.50	1,000	31.10	0.91	1,000	198,000	8.32	0.24	53,000	2,747,000	6.06	0.18	535,000	2,947,000	6.22	0.18	589,000
4.00	1,000	31.10	0.91	1,000	129,000	8.68	0.25	36,000	1,665,000	6.05	0.18	324,000	1,795,000	6.24	0.18	360,000
4.50	1,000	31.10	0.91	1,000	84,000	8.89	0.26	24,000	997,000	6.05	0.18	194,000	1,082,000	6.29	0.18	219,000
5.00	1,000	31.10	0.91	1,000	58,000	9.12	0.27	17,000	597,000	5.78	0.17	111,000	657,000	6.11	0.18	129,000

17.10 Other Mineralization

In addition to the resources reported in Table 17.17, there are approximately 80 million tons grading 1.5 g/t Au (0.04 opt) at a cut-off of 0.3 g/t Au (0.01opt) were estimated in the model but excluded from the resources. This additional gold mineralization is not currently considered to have reasonable prospects for economic extraction. The portion of this material that lies above 7,500 feet warrants re-evaluation, if silver mineralization is properly modeled, which may lead to added value, or if positive changes are realized in such factors as commodity prices, operating-cost efficiencies, or metallurgical advances.

In addition to the other gold mineralization described above, a significant amount of silver lies outside of the gold mineral domains and therefore was not estimated.

17.11 Recommended Improvements for Subsequent Modeling

The silver mineralization needs to be modeled independently of the gold in order to upgrade silver resources into the Measured and Indicated categories. Modeling procedures similar to those described above for gold should be used. In order to accomplish this, a better understanding of the geology of the silver mineralization needs to be obtained and the silver assay database needs to be verified.

Consideration should be given to improving the three-dimensional model of metallurgical parameters, such as oxidation and cyanide extraction ratios. The generalized oxidation and metallurgical models in this study were created for the purpose of applying appropriate specific gravity factors and gold-grade cut-off values for resource reporting, respectively. A more robust metallurgical model would be needed for feasibility-type studies.

18.0 MINERAL RESERVE ESTIMATE

No reserves are estimated in this report.

19.0 OTHER RELEVANT DATA AND INFORMATION

Fronteer is not aware of additional information that is material to this technical report.

20.0 INTERPRETATIONS AND CONCLUSIONS

The Northumberland mineralization occurs as stacked, primarily sediment-hosted, finely disseminated, Carlin-type gold-silver deposits that, taken as a whole, are similar to the Goldstrike deposit of the northern Carlin Trend. The gold-silver mineralization at Northumberland occurs in a cluster of eight more-or-less spatially distinct deposits that form an arcuate belt approximately 1.6 miles long in an east-west direction and 0.3 miles wide. The deposits are generally stratiform and follow three low-angle tectono-stratigraphic host horizons near the crest and within the west limb of the Northumberland anticline. The deposits locally merge between horizons where the intervening rock units are breached. From stratigraphic top to bottom, the mineralized horizons are referred to as the Prospect-Mormon thrust (upper), Basal Chert fault (middle), and Hanson Creek fault (lower) host horizons. The three horizons are structural discontinuities that include the Prospect-Mormon thrust intersection zone and two bedding-plane faults. The overall geometry of the deposits and the higher-grade zones within the deposits appear to be influenced by east-trending high-angle structures in the area of the crest of the anticline.

Gold occurs as micron- to sub-micron-size particles that are intimately associated with sulfides, occasionally in association with oxidized sulfide minerals, and rarely as free particles. The gold is disseminated primarily within sedimentary units, although the Mount Gooding pluton and its associated intrusive rocks host disseminated mineralization in all of the deposits. Silver occurs in a complex assemblage of copper-antimony sulfides and arsenic sulfosalts. The total sulfide content is less than five percent; pyrite, arsenopyrite, and marcasite are the most abundant species present. The mineralization is associated with both silicification and decalcification of carbonate hosts, and quartz-illite-pyrite alteration of igneous hosts.

Cyprus and WSMC mined over seven-million tons of ore from several open pits and produced over 230,000 ounces of gold and 485,000 ounces of silver by heap leaching of sized and run-of-mine oxidized and partially oxidized ore. Gold recoveries for crushed oxide ore and run-of-mine, partially oxidized ore from these operations have been estimated at approximately 75% and 50%, respectively.

Metallurgical studies indicated that differences in the amenability of the Northumberland mineralization to direct cyanidation are primarily due to the degree of oxidation, as opposed to deposit-specific characteristics or crush size. Oxide material appears to be amenable to direct cyanidation, while sulfide mineralization requires oxidation prior to cyanidation. Silica encapsulation may be a local factor, but does not appear to be a major impediment to gold recovery. Sulfide mineralization is refractory due the close association of micron-size gold with sulfides and the local presence of preg-robbing organic-rich/carbonaceous material.

Diagnostic metallurgical testing to date indicates gold and silver extractions from sulfide mineralization can be optimized by utilizing the N_2TEC flotation technology of Newmont with autoclaving of the concentrates. Extractions in excess of 90% for both gold and silver in the flotation concentrate were attained in the samples tested.

Gold and silver resources at Northumberland were estimated from information provided by a database that includes 1,502 holes for a total of 606,369.5 ft of drilling. These holes were drilled from 1968 through 2007 by conventional rotary, reverse circulation, and core methods; a small amount of air-track data is also included. Entire series of older drill holes have been removed from the database due to sample quality and assay reliability issues. Although QA/QC programs were not systematically implemented and documented prior to Newmont's 2004-2007 exploration work, check assay and twin hole data were compiled by MDA in 2006. An analysis of these data found no serious problems with the assay database, although additional check assay data are needed. The twin-hole data suggest the possibility of local down-hole contamination. Several possible contaminated intervals were identified during the grade modeling of the deposits, and the suspect assay intervals, as well as the contaminated volumes, were excluded from the resource estimation.

There is excellent exploration potential at Northumberland, both within the deposit area and in other areas of the large property holdings. Within the deposit area, gold-silver mineralization in each of the three tectono-stratigraphic horizons locally breaches the intervening rock units and merges with mineralization in the neighboring host horizon. These discordant zones are frequently cored by high-grade mineralization that is presumably structurally controlled and in many cases not properly defined by drilling. These high-grade core zones warrant further drill testing, as do the possible deeper extensions of the controlling structures. In addition, Fronteer plans to explore beyond the limits of the known deposits in an attempt to discover additional mineralization in similar geologic settings.

There are a number of targets beyond the limits of the deposit area that are defined by soil and/or rock gold anomalies, only some of which have been tested by drilling. Fronteer plans to evaluate and test more of these anomalies in the future.

21.0 RECOMMENDATIONS

Additional check assay data are needed at Northumberland. A number of assay pulps and/or rejects from mineralized WSMC drill intervals should be retrieved from storage and analyzed by an independent laboratory. A set of existing pulps and/or rejects from mineralized WSMC drill intervals should be analyzed by an independent laboratory.

21.1 2008 Recommendations

A preliminary economic assessment and scoping study (Economic Study) using the updated Northumberland resource has been initiated. This work is intended as a management planning tool to guide and accelerate pre-feasibility investigations and future mine-development by defining mining, metallurgical, environmental and infrastructure options; developing an optimum operating scenario; and obtaining an early estimate of economic viability of the project. The Economic Study will be 43-101 compliant and completed under the supervision of an independent engineering group, SRK Consulting. This phase of the proposed work program is budgeted at US$250,000.

A two phase drill program has been developed by Fronteer to test new ideas and targets within and around the known deposit (see Section 10 for details). A summary of the proposed work is summarized here:

Phase I

- Define high-grade targets at the deposit complex.
- Employing the geophysical data newly acquired by Newmont, define district drill targets.
- Conduct a biostratgraphic study of sedimentary and metasedimentary rocks in the Northumberland window to define potential district host horizons using an academic institution to collect and identify fossils.

Phase II

- Drill 16,000m (21 holes~52,500 ft) of precollared core (6,400m RC & 9,600m core) to test high-grade targets in the Zanzibar and Rockwell deposits.
- Drill 4,570m (10 holes~15,000 ft) of RC holes to test district targets.

The proposed budget for this work program is:

Phase I		
2 Geologist (4 months @ $10,000/mo.)	$	80,000
Biostratigraphy	$	50,000
Holding Costs	$	212,600
Reclamation	$	500,000
Phase I Subtotal	**$**	**842,600**
Phase II		
3 Geologist (8 months @ $10,000/mo.)	$	240,000
Drilling: Core: 3,735m @ $325/m	$	1,210,000
Precollar RC: 6,400m @ $100/m	$	640,000
RC: 4,570m @ $82/m	$	375,000
Field Support	$	100,000
Assays: 6,000 samples @ $20/sample	$	120,000
Metallurgy	$	90,000
Phase II Subtotal:	**$**	**2,775,000**
GRAND TOTAL:	**$**	**3,617,600**

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23.0 DATE AND SIGNATURE PAGE

Effective Date of report:	July 28, 2008
Completion Date of report:	July 28, 2008

	July 28, 2008
"Christopher Lee"	Date Signed
Christopher Lee, P. Geo.	

	July 28, 2008
"Jim Ashton"	Date Signed
Jim Ashton, P. Eng.	

24.0 CERTIFICATE OF AUTHORS

I, **Christopher Lee**, P. Geo., do hereby certify that:

1) I am a geologist residing at 303-141 Water Street, Vancouver, BC, V6B 1A7, and employed by Fronteer Development Group Inc as Chief Geoscientist.

2) I am a graduate of the University of Waterloo, with an Honours B.Sc. Co-op in Geology, 1991, and I obtained a M.Sc. in Geology from the Memorial University of Newfoundland in 1994. I have practiced my profession continuously since 1991;

3) I am a Professional Geoscientist registered in good standing with the Association of Professional Engineers and Geoscientists of British Columbia (#29049);

4) I have read the definition of "qualified person" set out in National Instrument 43-101 ("NI432-101") and certify that by reason of my education, affiliation with professional associations (as deemed in NI43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

5) I am responsible for the preparation of this report entitled "*Technical Report on the Northumberland Project, Nye County, Nevada, USA: Resource Update 2008"* and dated July 28, 2008 (the "Technical Report") relating to the Northumberland project, with the exception of Sections 11, 12, 13 and 14. I have visited the Northumberland project in July 2007, following all exploration activity described herein, and am very familiar with the database having conducted detailed review, analysis and preparation of the Mineral Resource Estimate.

6) As of July 28, 2008, and to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading and I have read the disclosure being filed and it fairly and accurately represents the information in the Technical Report that supports the disclosure.

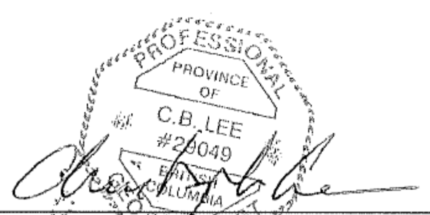
7) I am not aware of any material fact or material change with respect to the subject matter of the Technical Report that is not reflected in the Technical Report, the omission to disclose which make the Technical Report misleading.

8) I am not independent of the issuer applying all the tests in Section 1.5 of National Instrument 43-101 and acknowledge that I hold securities of the Fronteer Development Group inc. in the form of shares and stock option agreements.

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

10) I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Dated this 25th day of July 2008, in Vancouver, B.C.



Christopher Lee, M.Sc., P.Geo.
Chief Geoscientist
Fronteer Development Group Inc.

I, James W. Ashton, do hereby certify that:

1. I am currently employed as Senior Project Engineer by:

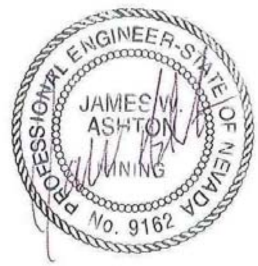
   NewWest Gold USA, Inc.
   230 South Rock Blvd. Suite 30
   Reno, Nevada 89502.

2. I graduated with a Bachelor of Science degree in Mining Engineering from the University of Nevada, Reno in 1984. I have practiced my profession continuously since 1984.
3. I am a Registered Professional Engineer (#9162) in the State of Nevada and a Registered member of the Society of Mining Engineers.
4. I have performed worked on the property intermittently since 1997 and have relevant experience having led or participated in both engineering and geological studies supporting all facets of operating and development projects.
5. I have read the definition of "Qualified Person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "Qualified Person" for the purposes of NI 43-101.
6. I am responsible for assisting in the preparation and specifically for Sections 11, 12, 13, and 14 of the technical report titled "*Technical Report on the Northumberland Project, Nye County, Nevada, USA: Resource Update 2008"* and dated July 28, 2008 (the "Technical Report") relating to the Northumberland project. I have visited the Northumberland project numerous times.
7. As of July 25th, 2008 and to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading and I have read the disclosure being filed and it fairly and accurately represents the information in the Technical Report that supports the disclosure.
8. I am not aware of any material fact or material change with respect to the subject matter of the Technical Report that is not reflected in the Technical Report, the omission to disclose which makes the Technical Report misleading.
9. I am not independent of the issuer applying the tests in Section 1.5 of National Instrument 43-101 and acknowledge that I hold securities of the Fronteer Development Group in the form of stock options.
10. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.
11. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Dated this 25th day of July 2008.

"James W. Ashton"

Signature of Qualified Person



James W. Ashton