BiTel Knoll Mineralized Rock Geochemical Survey on CLY Group, Bunker Hill Mine area, Salmo Sheet NTS 082F03 W 1/2, Nelson Mining District B.C.

2005 Assessment Report

Claims worked on: CLY2, Bunker Hill C.G. Lot 2939 and Mormon Girl C.G. Lot 1949

Latitude 49° 03’ 36’’ Longitude 117° 23’ 15”

BGS 082F.004 (1:20,000 scale map)

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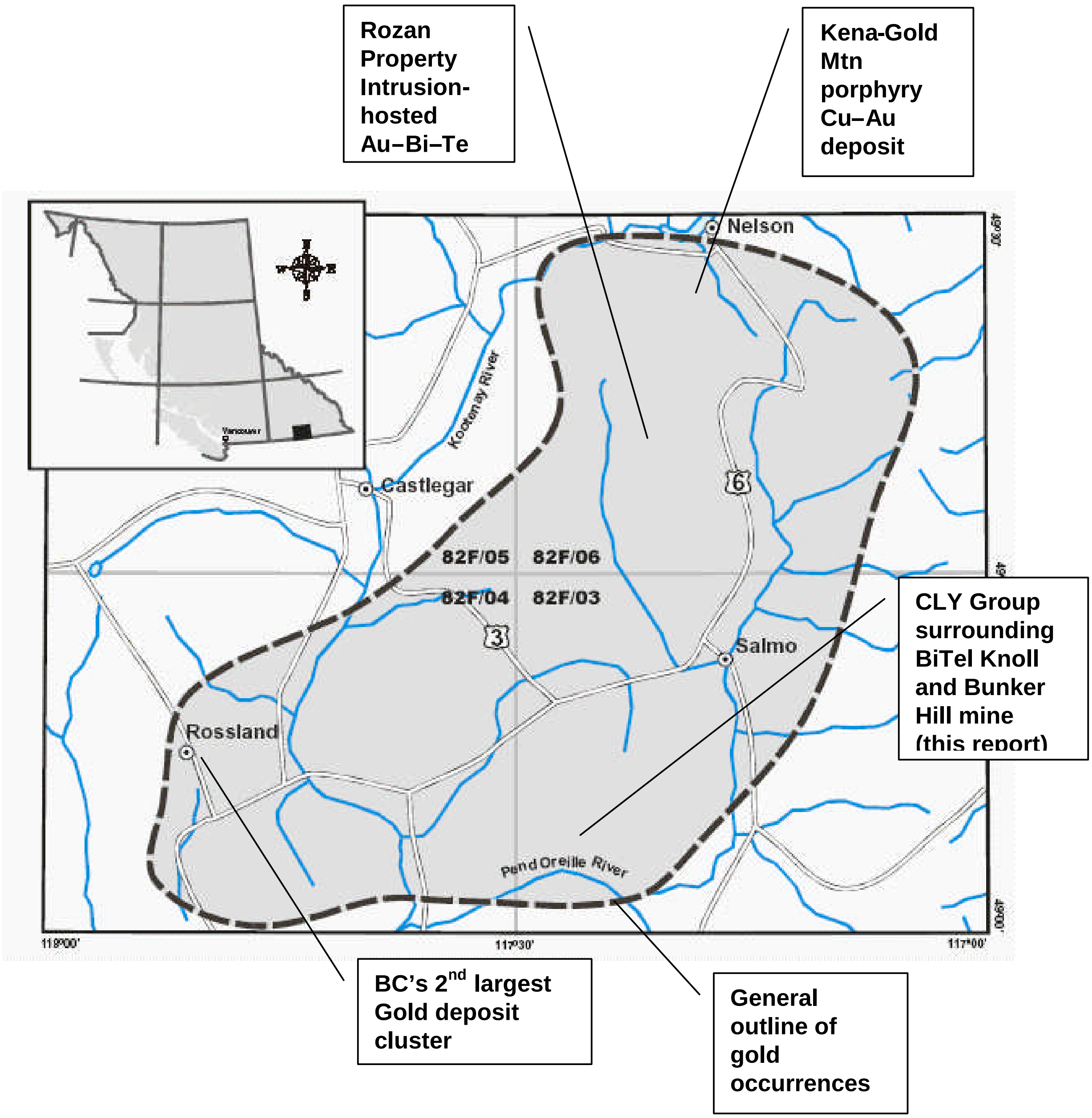

Fig. 1A CLY Gp Location in West Kootenays, South BC (fig. from Jackaman & Hoy 2004)

1 Introduction

1.1 Purpose of Mineralized rock Geochemical Survey

In July 2004 the writer decided to re-investigate several rock sample sites with significant gold assays (Kennedy 2003). These are near or at sites of small-scale historic production from two workings, the Blue Quartz Vein[1] and Moly Quartz Vein Trenches (Minister of Mines Annual Report 1933, 1936, Section 5 and fig. 2). This report's focus is the outcropping knob above and to the north, herein named BiTel Knoll. The purpose of rock sampling was to characterize BiTel Knoll veining as to mineral deposit type. The geochemical environment is specific and favourable for hosting economic gold deposits of a certain type: *intrusion-hosted and/or proximal* Intrusion–related gold mineralization, mid Cretaceous aged. With the limited sampling in 2004, the average grade of the several BiTel Knoll quartz veins is conservatively estimated at ~ 2 g/t Au.

These very low sulphide, gold > silver Au(Ag)–Bi–Te–W–Mo m-plus wide quartz veins *differ in character from silver > gold veins mined underground at the historic Bunker Hill Mine.* Georeferencing 2003 – 2004 exploration work, with the 1999 VLF-EM total field ground geophysical survey and soil geochem survey (Howard 2000), identifies substantial exploration targets (fig. 3).

1.2 Work Performed in 2004

Previous analysis of 'Kootenay Gold' grab samples described and located by Kennedy (2003) and (2004) did not include Te, Se, Hg and other elements on skarn and quartz vein samples from CLY Gp. Gold and silver were also not determined by fire assay [FA]. Samples were analyzed by Acme Analytical Laboratories Ltd. of Vancouver; some by Group 1D ICP-ES [Emission Spectrometry] for 30 elements, some by Group 1DX 36 element ICP-MS [Mass Spectrometry] analyses on ignited, aqua regia leached 0.5 g portions. Iron and tungsten values are only partial due to the refractory nature of the minerals, i.e. scheelite. ICP-MS on 15 g portions determined gold. Te and Hg were not analyzed, and not Se on 32 rocks (#A302012 in Appendix 2 of Kennedy 2003).

Hence Acme Analytical Laboratories retrieved and re-analyzed 37 stored 'rejects' of selected 2003 samples in 2004. The re-analysis was 37-element 'basic suite' Group 1F-MS Ultra trace ICP-MS on 15 or 30 g portions with Hg Te & Se. One-assay ton portions of 9 samples were analyzed for precious metals by Group 6 Precious Metals (Fire) Assays with nil Pt and Pd. Fire assays on 1 (29.2 g) or 2 assay ton portions confirm the ICP-MS gold values. Metallics Assay on about half-kilogram portions of 7 samples determined trace amounts of metallic gold & silver using a +150 mesh screen procedure (Appendix 4).

During two field trips from Sept. 11 - 15 [5 days in-field] and Sept 30 - Oct. 3 2004 [4 days] the writer and B. Doyle of Nelson, BC collected forty-eight [48] bulk channel and grab rock samples in nine days (17 man days). 31 samples are from BiTel Knoll, 4 from nearby trenches (fig. 2) and 13 from other sites on CLY 2 claim (sample locations are triangles on fig. 3). Howard worked alone on Sept. 30. Acme analyzed two sample lots, 23 in Oct. 2004 and 25 in March 2005. The latter shipment comprised 22 channel samples and 3 grab samples. One or two assay ton portions were fire assayed for Au & Ag and half-kilo amounts for the 'metallics' procedure fire assays. Some tests for Pd & Pt gave nil values.

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[1] **Named Quartz Veins and Workings are Capitalized**

On BiTel Knoll a chained N-S line with 10 m flags was established. This runs N and S of the line's origin, the aluminized tag marking 1999 grid station 3+75 E on line L5N. Mapping of BiTel Knoll and two trenches at 1:200 scale (fig. 2) comprises an area 110 X 120 m (1320 m^2 = 1.32 hectares or 3.26 acres). Fig. 2 also locates samples of angular float (one, 0515) and subcrop previously collected by C. Kennedy in 2003 (BH- series) and 2004 (BHCK- series). Two samples collected in 1999 from the Blue Quartz Vein Pit BH-047 and BH-050 (Howard 2000) are also on fig. 2. In Dec. 2004 four 1999 channel samples of Adit 1 Gallery Quartz Vein (Howard 2000) were re-analyzed by Acme Analytical's Group 1F-MS ultra trace ICP-MS to retain consistency in lab results.

Table 2 2004 Field Work Itemized

Area or Working	Chained Baseline, m	Hand Trenching, ha	Rock Samples[2]
Bitel Knoll Veining	**130**	**3.9052×10^{-4}**	**31**
(comprising Ella Veins n=6, Eloise Vein 11 & Clarissa Veins 14)			
Moly Quartz Vein Trench	*	*	**1**
Blue Quartz Vein Trench	*	*	**3**
Limpid Roadside Veining	*	*	**6**
Southernmost Lefevre Trench #1	*	*	**1**
Mineralized Qtz float along 9-3 Hydro Tower Access Rd		*	**2**
Quartz Vein just E of Timbered Shaft Vein		*	**1**
Others	*	*	**3**
Totals	**130**	**3.9052×10^{-4}**	**48**
Lefevre Workings##	*	*	**16##**
Adit 1 Gallery Quartz Vein#	*	*	**4#**

re-assay of 16 Kennedy (2003) samples
 # re-assay of four Adit 1 Gallery Quartz Vein channel samples collected in 1999 (in Howard 2000)

Geologic mapping BiTel Knoll area 1.32 hectares at 1:200

1.2.1 Field Procedure for Rock Sampling

Rock hammers with a carbide moil or chisels and sledges were used to collect bulk samples, generally > 1 kg. The general poor exposure limited sample sites. Shovels, an axe, mattock, hand brushes and a broom whisked with water removed some ground cover. Some vein subcrops were hand trenched, Eloise Vein North and Clarissa Main Veins and three shallow trenches over the two Ella veins (fig. 2) for 3.9052×10^{-4} ha = 3.9052 sq. m (1 ha = 10^{-2} sq. km = 10,000 sq. m). Concrete-nailed permanent metal ID tags and arctic flagging identify rock sample sites. Sample numbering on metal tags is not systematic, only identifying.

1.2.2 Laboratory Procedure

See Appendix 4 for methods and specifications for Group1-MS Ultratrace ICP-MS analysis and Group 6 Precious Metals (Fire) Assay by Acme Analytical Laboratories Ltd.

[2] Collected & analyzed

1.3 Location and Access

CLY Group prospect is located in the Nelson Mining Division BC, 16 km southwest of the town of Salmo and 6 km north of the international border (fig. 1A and inset on fig. 2). The National Topographic System designation is NTS 082F03 W ½, Salmo sheet. The BGS sheets are 082F.004 and 082F.003 (fig. 1B). The property's centre is latitude 49° 03' 36'' longitude 117° 23' 15" or UTM Zone 11 5,434,080 m N – 471,620 m E (a position just south of the Lefevre Skarn workings). Access from Salmo is by paved Highway 6 south to the US border crossing at Nelway, then westerly on the Pend d'Oreille River gravel road, then about northwesterly for 4 km on the Limpid Creek Forest Service Road maintained by the Ministry of Forests. Logging operations were active during the two 2004 site visits. Several disused B.C. Hydro roads provide further 4X4 access (fig. 3). The new found BiTel Knoll showings are just beyond the most northerly W-E grid line L 5N established in 1999 (Assessment Report by the writer, 2000).

1.4 Claims

CLY Group formerly consisted of 40 claim units in two modified grid claims CLY 1, CLY 2 (tenure #'s 370177, 370178) surrounding two Crown Granted claims Bunker Hill Lot 2939 and Mormon Girl Lot 1949 (Tables 1A & 1B in Appendix 5, fig. 3, 1889 Survey Sketch). The July 10 2005 claim conversion formed two claims, of 35 cell units each: CLY 1 New Tenure # 516587 and CLY 2 New Tenure # 516584.
Tenure Cell ID's are: **New Tenure # 516587 (formerly CLY 1):**

082F03D052C	**082F03D062C**	**082F03D072C**	**082F03D082C**	**082F03D054C**
082F03D064C	**082F03D074C**	**082F03D084C**	**082F03D054D**	**082F03D062B**
082F03D064D	**082F03D072B**	**082F03D074D**	**082F03D082B**	**082F03D084D**
082F03D064A	**082F03D074A**	**082F03D084A**	**082F03D064B**	**082F03D074B**
082F03D084B	**082F03D053D**	**082F03D063D**	**082F03D073D**	**082F03D083D**
082F03D053C	**082F03D063C**	**082F03D073C**	**082F03D083C**	**082F03D063A**
082F03D073A	**082F03D083A**	**082F03D063B**	**082F03D073B**	**082F03D083B**

New Tenure # 516584 (formerly CLY 2):

082F03C070A	**082F03C080A**	**082F03C090A**	**082F03C070B**	**082F03C080B**
082F03C090B	**082F03D052D**	**082F03D062D**	**082F03D072D**	**082F03D082D**
082F03D062A	**082F03D072A**	**082F03D082A**	**082F03D051C**	**082F03D061C**
082F03D071C	**082F03D081C**	**082F03D051D**	**082F03D061D**	**082F03D071D**
082F03D081D	**082F03D061B**	**082F03D071B**	**082F03D081B**	**082F03D061A**
082F03D071A	**082F03D081A**	**082F03C060C**	**082F03C070C**	**082F03C080C**
082F03C090C	**082F03C060D**	**082F03C070D**	**082F03C080D**	**082F03C090D**

This report retains the 'CLY Group' name. Collectively, MINFILE 082FSW002 names all mineralization 'Bunker Hill'. Claims are 100% owned by William R. Howard.

1.5 Physiography and Vegetation

The property is in the rounded, southern Bonnington Mountains, north of the Pend d'Oreille River valley. The Pend d'Oreille River is a reservoir for hydroelectric power production. Moderate to steep mountainous relief ranges from 600 to 1,700 meters above sea level. Forest cover is Douglas fir and lodge pole pine with some stands of mature cedar. Some areas are dense alder brush, bushy and near impassable. Poplar and birch stands are common along moist drainages.
Recently (autumn 2004) small areas were selectively logged. Glacial drift and superimposed fluvial and alluvial deposits cover most all. Rock exposure is scarce (less than 1%) excepting rocky knobs

(e.g. 20-40% about BiTel Knoll). Uncommon outcrops can be found near topographic highs, steep slopes, incised creek valleys, old road cuts & diggings and by new skid trails. Blasted road cuts along the Limpid Ck Forest Service Road provide the best exposures. A disadvantage to surface prospecting is "the dense evergreen forest with its deep mat of brush and fallen timber (Daly 1912)".

2 Exploration History

2.1 Pre-WWII Development

The Mormon Girl claim was located April 28 1897 by Willis M. Fowlkes and the Bunker Hill claim May 28 1897 by G. O. Mouk (spelling?) on outcropping veins. F.A. Wilkie, P.L.S. surveyed both in Dec. 1897. They became gazetted Crown Grants on June 18 1898 (Annual Report 1898 p. 1188, 1191). Thence gold-bearing quartz veins were developed and mined from three adits, now caved. By 1900 "several hundred feet of development work [occurred] … and a 10-stamp mill had been erected. Ten men are employed (AR 1901 p. 846)". "The operation of the old 10-stamp mill erected in 1900 is reported to have been of very short duration as the ore was not amenable to straight amalgamation, the gold values being chiefly associated with pyrite[3] (AR 1934 p. E24)". Bunker Hill Gold Mines, Limited operated the property from 1933 to 1935 and thereafter Waneta Gold Mines, Ltd. to 1941.

MINFILE data conflicts with the original Annual Report references; particularly, incorporating minor 1933 production from the Blue Quartz Vein Trench, the gold grade is correctly 0.300 oz/ton and silver grade 0.869 oz/ton (0.879 g/t Au and 24.5 g/t Ag). This production is not included in MINFILE.

Table 3: Gold and silver production 1933–1942, Bunker Hill Mine and Two Open Cuts, correcting MINFILE 082FSW002 data by referring to original Minister of Mines Annual Reports

Year	Tonnes	Tons	Ag (g)	Ag (oz.)	Au (g)	Au (oz.)	Fineness[4]
^1933a	▪ 55.12	50	4043.46	130	248.83	8	58
^^1933b	2.45	2.22	27.62	0.888	35.27	1.134	561
1934	+100.31	+91	1244.14	40	1772.90	57	588
1938	▪ 81.35	73.8	2426.07	78	155.52	5	60
*1939	▪ 49.60	45	*248.83	*8	248.83	8	500
1940	66.14	60	1119.73	36	590.97	19	345
1942	38.03	34.5	528.76	17	279.93	9	346
Totals	▪ 393.00	356.52	9638.61	309.888	3332.25	107.134	mean 204
			▪ 24.526 g/t	0.869 oz/ton	▪ 8.479 g/t	0.300 oz/ton	

^ Moly Quartz Vein Trench
^^ Blue Quartz Vein Trench, not included in the MINFILE production figures (English units converted to metric) for 1933
+ In 1934 182 tons was mined from Adit 2 but only about half, about 91 tons, was shipped to Trail

[3] rather gold-bearing Bi-Te minerals
[4] 'Total', 'Bulk' fineness considers the total gold & silver present in ore, as recovered in bullion. In high fineness ore most of the gold is present as metallic [native] gold, with little silver content in any accompanying sulphides (after Boyle 1979). In this case 'bulk' fineness approximates the 'true' fineness of the gold mineral occurrence. 'True' fineness of native gold is in parts per thousand (Au / (Au + Ag)) * 1000, metals in weight percent. Fineness varies from nil (pure silver) to 1000 (pure gold).

***MINFILE notes gram equivalent of 9 oz. Ag for 1939, but p. A85 of 1939 Annual Report states 8 oz. recovered**
▪ MINFILE lists incorrect conversions of these yearly production figures from English short tons to metric tonnes (1 ton = 1.1023 tonne). Hence the precious metal grades including the total is misstated.

Recorded production in these 6 years from 1933 to 1942 totals 3,332 grams gold = 3.33 kg from 309 tonnes at a grade of 8.479 g/t [107.1 oz. Au and 309.8 oz. silver from 356.5 tons = 0.30 oz/ton Au and 0.87 oz/ton Ag]. MINFILE states "In 6 years, between 1933 and 1942, a total of 340 tonnes of ore were mined from which 3,298 grams of gold and 9,642 grams of silver were recovered."

Fig. 4 Close-up of typical Bunker Hill Mine ore. Argentiferous base-metal minerals (galena, sulphosalts) are abundant in this piece; pyrite is common, auriferous bismuth tellurides may occur. From lower, roadside dump outside Adit 2 – unshipped, left from "roughly sorted" ore from Underhand Stope Vein mined in 1934.

Three underground diamond drill holes in Adit No. 3 in 1936 (Minister of Mines 1936) did not encounter significant veining. Detailed plans with underground workings and structures, and surface trenches plotted are in the 1936 and 1934 Annual Reports. *Mining of silver–rich, low fineness ore in 1940 and 1942 ended production.* Early work concentrated on continuing the underground development of the Bunker Hill Mine, not local property exploration. An ore petrography study of Waneta Gold Mines, Limited material found undetermined gold telluride and lead - bismuth minerals (Warren & Cummings 1937).

2.2 WWII Tungsten Discovery to 1988

H. Lefevre discovered tungsten ore – scheelite the mineral calcium tungstate $CaWO_4$ – in two old pits SE and uphill of the Bunker Hill adits on the Mormon Girl C.G. in 1942 (Hedley 1943). An early ultraviolet 'blacklight' likely identified scheelite by its fluorescence. M. S. Hedley examined and mapped the showing in 1943 after Jason Mines, Limited of Toronto trenched 700 feet in the winter (1943 Property File document). He noted NNE trending metasediments – argillites, limestone and quartz schists - dipping 65-90° SE toward granite.
H. Little mapped the Lefevre tungsten skarn workings for the report 'Tungsten Deposits of Canada', GSC Economic Geology Series No. 17 (1959). His pit & trench numbers are on fig. 3. The Bunker Hill Mine area was at the northern limit of 1959 mapping by the B.C. Department of Mines (Bulletin 41, Fyles & Hewlett 1959). Work then concentrated on the setting of lead – zinc deposits in the Reeves limestone of the 'Mine Belt'. In 1965 H. Little compiled Fyles & Hewlett's mapping with his own at 1:63,360 (colour GSC Map 1145A Geology, Salmo). The first modern exploration on Bunker Hill was by M. Harris for M. Kaufman (1984). He surveyed five 150 m-spaced W-E lines and collected soils at 30 m intervals. 102 were analyzed for gold & tungsten and 35 grab samples of rock. A 1:2000 scale geology sketch shows the Bunker Hill Sill and analytical results (Kaufman 1984). This lists gold and tungsten analyses of twelve undescribed rocks MH-84-11 to -23 from the Lefevre workings. Four ran over 900 ppb Au:

Sample	Au ppb	W ppm
MH-84-12	**1000**	**740**
MH-84-19	**1600**	**990**
MH-84-20	**940**	**1710**
MH-84-23	**1050**	**over 2000**

In 1988 Corona Corp. ran a single line of soils L24E to the SW, partly over the project area, passing the disused Bunker Hill Mine Rd (Gaunt 1990). Soils returned "no significant results" although a grab sample ran 0.942 oz. / ton gold "within 10 m of the soil line". This was from either the Moly Quartz Vein Trench or the Blue Quartz Vein Trench. There was no follow up work.

2.3 1995 structural – geologic mapping and thereafter

J. Einarsen in 1995 completed structural – geologic mapping at 1:50,000 mostly SW of Bunker Hill (unpub. University of Calgary Ph.D. thesis). He identified the Tillicum Ck Fault, a major crustal-scale fault. A mineral deposit model in 1996 emphasized the importance of oceanic rocks for hosting gold bearing quartz veins (Ash et al. 1996). In 1997 the writer found ultramafic rocks - serpentinites and pyroxenites - along and close to the Limpid Ck Forest Service Road and the 9-1 / 9-2 Hydro Tower Rd. This area was partly clear cut in 1999. Adit 1 of the former Bunker Hill Mine is 730 m SE. X-ray diffraction (Ball 1997) identified a common black, cryptocrystalline mineral in veinlets and breccia in felsic 'Culvert granite' subcrops along the Limpid Ck Forest Service Rd as schorl. This is common Fe^{++}–rich tourmaline, a boron and hydroxyl bearing [OH^-] aluminosilicate.

Mineral deposit studies in 1997 and 1998 researched similar mineralized environments (Newberry et al. 1997, Newberry 1998). B.C. GSB Bulletin 101 notes tungsten skarn on Bunker Hill (Ray & Webster 1997) though there is no mention that the authors visited the property.

Lefebure et al. (1999), Lefebure & Cathro (1999) and Cathro & Lefebure (2000) of the BC Geological Survey Branch classed the Bunker Hill quartz veins as Intrusion-related gold – tungsten – bismuth mineralization, based on literature searches. Compare the Rozan occurrence discussed by Cathro & Lefebure (2000) (Section 14.5).

2.4 Prospectors Assistance Programme work in 1999

Assessment Report 26,159 (Howard 2000) details work mostly funded by **a 1999 Prospectors Assistance Programme grant of $10,000.** 5.965 km of topofiled & flagged rectilinear grids were established including the main Bunker Hill – Lefevre grid of 7 W-E lines. This totals 3.42 line-km. The N-S baseline is on its W side. Over this grid 2.80 line-km of total field VLF-EM[5] data was obtained (Fraser-filtered contours on fig. 3). 87 soils were generally collected at 50 m intervals, 25 m for the last two [anomalous] lines L4+50N & L5N. The Adit 1 Gallery Quartz Vein was uncovered with hand tools and 4 channel samples chiseled. 3 grab samples from Adit 2 dump and 9 about the Lefevre Skarn workings were collected. Analytical results of 5 Moly Quartz Vein Trench and 2 Blue Quartz Vein Trench samples gave little encouragement to prospect near BiTel Knoll, even though both workings have historic production from small open cuts (Section 5). Prospecting in 1999 found five undocumented old workings: Yankee Open Cut, Yankee Clear Cut Trench, Kenneth Trench, Hand Steel Trench and Timbered Shaft. For the main Bunker Hill – Lefevre grid area (including the unsupported Leo 'anomaly' from 1988 Corona work) 96 soils from 94 sites were analyzed (Howard (2000). Gold was analyzed by fire assay / atomic absorption and 30 trace elements by ICP-Atomic Absorption by Loring Laboratories Ltd., Calgary AB. Loring analyzed all samples for the PAP work, repeating some very low Bi analyses to give higher values.

GSB papers by J. Logan (2001, 2002a, 2002b) affirmed the potential for an Intrusion-related gold system on CLY Gp. There was no work from 2000 to May 2003.

2.5 Exploration by Kootenay Gold Corp. 2003 to 2004

In spring 2003 Kootenay Gold Corp., a private Calgary company, optioned the property. Assessment work in 2003 and 2004 included geologic mapping by G. Ray over 9 days (Ray 2004 p. 8). This was mostly along roads and trails in an area approx. one sq. km centered about Bunker Hill[6]. The mapping is preliminary work in rugged mountainous terrain; it incompletely covered a larger area of 3.5 km^2 (op. cit. p. 8 and Maps 1 and 2). There is still good access from roads and numerous trails for fill-in (fig. 3). Ray did not collect rock samples for assay or geochem. C. & T. Kennedy prospected for 9 days each (Kennedy 2003). They found

"… a N-S trending, 1.5 km-long zone with anomalous gold values that stretches north and south of the Lefevre [W + Au Skarn] trenches. This zone … is still open to the S and N (Ray 2004)."

In June 2004 Kootenay Gold Corp. relinquished their option. The stated reason was the opinion that the Lefevre W + Au Skarn "is of limited size potential (J. McDonald, June 28 2004)". The Lefevre workings are sloughed and heavily drift covered. Still, "… the main potential seems to lie with gold in the quartz veins" (op. cit.). Several persons told the writer on different occasions in 2004 that the company experienced financial difficulties.
For correctness of the documentary record, this report includes several corrections to G. Ray's 2004 assessment report.

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[5] EM-16 Sabre instrument, model 27 (Howard 2000)
[6] less than one-tenth of the property

2.6 Organization of Report

- Section 3 overviews the Mineral Potential
- Section 4 overviews the district-scale structural setting. See Howard 2000 and Ray 2004 for background information re the local geology; this is not repeated herein.
- Sections 4.1. and 4.1.1 review the Cs Unit; Section 4.1.2 its two Structural Divisions
- Section 4.1.3 discusses an improbable correlation of the Cs Unit that contradicts thesis work by Einarsen (1995) and detailed mapping by the writer (2000).
- Sections under 4.2 describe detailed features of the intruding Bunker Hill Sill
- Section 4.2.6 considers the Bunker Hill Sill as an exploration target.
- Section 5 describes two old workings with minor past production just S of the Knoll.
- Section 6 details BiTel Knoll quartz veining and the four Named Veins (fig. 2).
- Section 6.7 compares the mean Eloise & Ella Main Vein orientation with others, grouping them in a vein set.
- Section 7.1.1 repeats description of the Adit 1 Gallery Quartz Vein (in Howard 2000); Section 7.1.2 compares recent Acme Analytical Laboratories Ltd. assays with 1999 values.
- Section 7.1.3 notes the extensional nature of the Adit 1 Gallery Quartz Vein and similarities to the Ella and Eloise Veins on BiTel Knoll.
- Section 7.2 characterizes mineral and element zoning on the property. The historic Bunker Hill veins differ from the Adit 1 Gallery Quartz Vein and BiTel Knoll Veining. Moderate sulphide content, base-metal mineral-bearing, silver > gold veins contrast with very low sulphide content, native gold + bismuth telluride-bearing, gold > silver veins
- Section 8 notes analytical geochemistry supports the existence of auriferous bismuth-telluride minerals in the Lefevre W + Au Skarn and Lefevre quartz-sulphide veins.
- Section 9 describes weakly mineralized Limpid Roadside Veining with trace Bi & Te.
- Section 10 notes auriferous quartz vein float occurs uphill of BiTel Knoll
- Section 11 describes showings with nil gold.
- Section 12 details construction of the grayscale grid illustrating coincident Bi and/or Te soil anomalies. These are in white shades on fig. 3, highlighting Domains 1-3 and Domain 5
- Section 13 integrates the 1999 VLF–EM ground geophysical survey on the main Bunker Hill – Lefevre grid with more recent work (fig. 3). This highlights buried targets, notably Domains 1-3 and Domain 5. The numbered Domains are groups of Fraser-filtered positive dip angle total field VLF–EM anomalies.
- Section 14 estimates the mean gold grade of all the BiTel Knoll veins as ~ 2 g/t. Caution is advised in relying on this estimate as the coefficient of variation is 1.6 or 160% of the mean ('relative standard deviation'). This is very high – the Au–Bi–Te mineralization is erratically distributed as dispersed clots. With only 39 rock samples from four poorly exposed veins actual grades of individual veins are not determined.
- Section 14.3 estimates Eloise Vein at approx. 2.5 – 2.3 g/t, the range of trimmed $mean_{5\text{-}10\%}$ values. This is only a fair estimate from 8 chip samples of varying widths. Practical matters limited sample collection in 2004; often samples were from small hand-dug trenches. Without further sampling from better exposures actual grades are indeterminate.
- Section 14.5 compares BiTel Knoll and CLY Gp geochem with the Rozan property, both with the same specific type of mineralization. Generally higher Bi and Te and greater vein density in places suggests a more promising mineralizing environment on CLY Gp.
- Section 14.6 notes grades, tonnages, mineralization, vein widths & vein density and associated elements in three developed intrusion-related gold deposits.
- Section 15 concludes with summary points

3 CLY Group Mineral Potential

3.1 Economic & General Assessment: little explored Intrusion–related gold system

In the region, the **Kena Gold Mountain Zone is a significant porphyry Au-Cu deposit near Nelson** (Logan et al. 2003). **CLY Group's setting well compares to mid Cretaceous aged, *intrusion-hosted / proximal,* Intrusion related or "plutonic-related" gold deposit systems in Alaska and Yukon** (McCoy et al. 1997, Ray 2004). A host of **varying styles (types) of mineralization may occur** (discussed in Lefebure & Cathro 1999, Thompson & Newberry 2000, Hart et al. 2002, Hart & Burke 2003, Rhys & Lewis 2004). These include extensional quartz vein / veinlet swarms (fig. 18 p. 56 photo of Fort Knox), shear veins, intrusive hydrothermal sulphidic breccias (Stephens & Weekes 2001), replacement bodies and skarn. Gold skarns related to 'epizonal' intrusions (Meinert 2000) are only parts of larger Intrusion–related gold systems, a more encompassing model.
Pogo, Fort Knox, Dublin Gulch, Scheelite Dome and Clear Ck are examples of explored Intrusion–related gold deposit systems (Table 18). Like on CLY Gp, all except Pogo have associated tungsten ± gold skarns, e.g. see Lennan (1983), Allegro (1987) or Brown et al. (2002).

Two sets of m-plus thick, subparallel Au–Bi–Te–Mo–W quartz veins occur on Bitel Knoll. Quartz-sulphide veins with similar orientations overprint the Lefevre W + Au Skarn (Howard 2000, Ray 2004). The Lefevre workings and the buried Domain 5 anomaly group (Section 13.2, Howard 2000) have geochemical signatures characteristic of gold skarns. Both are drill targets.

BiTel Knoll has higher densities of exposed veining, and ten times higher Bi and Te in rock compared to the Ridge zone on the Rozan property SW of Nelson (Section 14.5).

3.2 HCA Black Limestone beds, Favourable Hosts for Skarn or Replacement Mineralization

The Cs Unit (Little 1965, 1985) Harcourt Ck Assemblage (Einarsen 1995, Howard 2000) includes two argillaceous, black, carbonaceous limestone beds. These are favourable for bulk tonnage skarn or replacement mineralization. The rationale is that "Some gold skarns ... are developed in impure calcareous clastic sediments that were deposited along the fracture controlled edge of a back-arc or marginal basin. Such rifted basin margins are particularly favourable for gold skarns because controlling basement structures preferentially channel arc-related plutons into suitable carbonate-rich host rocks (Ray & Webster 1991)."

Applying this scenario to CLY Gp, the Bunker Hill sill-form leucocratic granite (the arc-related pluton) intrudes an undetermined structure in the lower part of the Harcourt Ck Assemblage comprised of the HCA Quartzite + Tuff unit and the (likely fault-repeated) HCA Limestone + Argillite unit (Howard 2000, fig 3). The latter unit includes argillites, argillaceous quartzites and the carbonaceous black limestone (now partly marble). It may be a marginal ocean basin remnant. The Lefevre W + Au Skarn is in the structural setting described above, hosted by a carbonaceous limestone bed[7] at the contact of the sill-form Bunker Hill leucogranite. This is a mid Cretaceous felsic intrusive (Logan 2002a, 2002b).

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[7] A single sample, along the Limpid Ck Forest Service Rd above the intersection with the old Bunker Hill Mine Rd, "collected over 14 m BH-305 ran < 5 ppb gold (self 2000)". It is not true that *several limestone samples* gave nil assays (Ray 2004 p. 14).

4 Regional Scale Structural Setting

CLY prospect covers a compressional fold and thrust belt, thereafter faulted. It is within the Omineca Belt of Quesnellia, Slide Mountain and Kootenay Terrane, the named tectonic divisions thought to occur from NW to SE on the property. Corresponding litho units are the Rossland Group Elise & Hall Formations (Höy & Andrew 1990), the Cs Unit (Little 1965, 1985) Charbonneau Ck and Harcourt Ck Assemblages, and the Lardeau Group Index Formation (Einarsen 1995). Description of regional stratigraphy, district scale structural assemblages and a structural-tectonic synthesis is in Einarsen (1995). The Cs Unit unconformably overlies the Cambrian Lardeau Group Index Formation (op. cit.). The contact is not known on the property. Thus, as also proposed for the HCA units, rocks become older to the SE.

Eocene age, extensional high angle NNE to NNW striking normal faults (op. cit.) offset and transect earlier folds and thrusts. North of CLY Gp Höy & Andrew (1990a, 1990b) detail the polyphase structure in the Mount Kelly - Hellroaring Creek Map Area (southward only to Swift Ck).

4.1 Uncertainly correlated, Poly-deformed rocks

Uncertainly correlated metasediments and metavolcanics host the mineralized showings on the central part of CLY Group. H. Little (1965, 1985) named these layered rocks the <u>C</u>arboniferous <u>s</u>ediments or the <u>Cs</u> Unit. Ages are now ascribed a longer range. “In the Bunker Hill area they strike mainly N to NNE and dip mostly E to ESE (Ray 2004)”. The Cs Unit is multiply deformed: “In addition to brittle faulting and shearing, the … [country] rocks have undergone greenschist facies metamorphism and were deformed by two episodes of pre-Cretaceous folding. The first (F1) ductile phase resulted in the property-wide S1 phyllitic and schistose planar fabrics that lie parallel to transposed bedding layers. The second, less intense F2 episode caused open to moderately tight folding of the S1 fabrics and layering (op. cit.)”.
“All units … have a well developed foliation and are strongly lineated, and no igneous textures are retained in metabasites [metavolcanics and metatuffs of the Cs Unit Harcourt Ck Assemblage] (Einarsen 1995)”.

West of CLY Group in the Rossland area NTS 082F04E Höy & Andrew (1991) describe the Cs Unit as “tan to black coloured argillite, silty argillite and minor siltstone, a massive light grey limestone, some massive dolomite and dolomitic siltstone ... locally silicified, sheared, brecciated and veined. Tight, minor folds occur locally, and crenulated phyllites indicate at least two periods of deformation”.

4.1.1 Cs Unit - Early designation

The first survey of the lower Pend d’Oreille River by R. A. Daly (1912 p. 275) found
“Dark greenish, or dark gray to black phyllite, alternating with blackish quartzite, the dominant rock on both banks of the Pend d’Oreille River ... [with] associated greenstone and altered basic breccias ...”

Fyles & Hewlett (1959) describe
“a thick, complexly deformed sequence of phyllite, argillite, quartzite, chert and limestone of uncertain age” near CLY Gp (p. 37). H. Little (1965) named this the Cs Unit, “a thick assemblage of black argillite and grey massive limestone with minor chert, greenstone, and phyllite”.

“The age ... is assumed to be Silurian (?), Lower and Middle Devonian, and Carboniferous (?) (Little 1985).” Triassic rocks may occur, as at comparable localities (Roback 1993, Roback & Walker 1995).

4.1.2 Two Structural Divisions of the Cs Unit: the Harcourt Ck & Charbonneau Ck Assemblages

J. Einarsen from district-scale structural-geologic mapping divides the Cs Unit into two structural divisions, the Harcourt Ck Assemblage [HCA] & Charbonneau Ck Assemblage [CCA] (1995). These structural divisions are fault-bounded lithologic assemblages. They are not stratigraphic formations. The Tillicum Ck Fault (fig. 3) separates the structurally higher CCA from the underlying HCA to the east and southeast. CCA exposures are unknown in the central area about Bunker Hill – BiTel Knoll. The HCA comprises Fyles & Hewlett's B3 Unit on Little's 1965 geology map. Einarsen in Fig. 13 (1995) describes a 'type section', rather a lithologic succession or assemblage, of the HCA in lower Harcourt Ck across the Pend d'Oreille River valley. The site is about 4 km SW of the Bunker Hill adits.
"The HCA is overturned, based on rare graded bedding, cross-beds and cleavage / bedding relationships observed south of Pend d'Oreille River, west of Seven Mile Dam (Einarsen 1995 p. 31)." Detailed mapping along the Bunker Hill Mine road (Howard 2000) suggests the HCA is also structurally inverted there.

4.1.3 Subdivision of the HCA

The HCA is subdivided into three recognizable lithologic assemblages or units (Howard 2000). These are only defined W of the Bunker Hill Sill. The units are thought to be internally fault-bounded and hence likely discontinuous along trend. On fig. 3 dashed lines mark the HCA units; names are italicized. Country rock underlying BiTel Knoll is argillaceous metaquartzite of the HCA Quartzite + Tuff unit, the structurally highest tripartite unit. It may be the oldest unit.

4.1.4 Improbable Correlation of the Cs Unit with the Laib Formation

The issue of correct stratigraphic correlation of the **Cs Unit** is contentious. This is not unexpected as the country rocks are **a dismembered structural sequence.** Notable are Kaslo Gp-like, Permian age? MORB metabasalts at two readily accessible sites: (1) at the intersection of the Limpid Ck Forest Service Rd & the Bunker Hill Mine Rd and downhill (2) along the Pend d'Oreille River Rd. Einarsen (1995) details the lithochemistry of this site. Significant, *not 'minor'* (Ray 2004 p. 15) **mafic volcanic rocks** occur in the HCA Metabasalt + Argillite unit on CLY Gp. **Together with ultramafics demarcating the Tillicum Ck Fault (Einarsen 1995), these are a slice of Slide Mtn terrane.** As at other localities, the Slide Mtn terrane structural assemblage here includes associated deep-water metavolcanics and metasediments of Silurian (?), Lower and Middle Devonian, and Carboniferous (?)" age (Little 1985). Triassic rocks may also occur as in northern Washington (Roback 1993, Roback & Walker 1995).

Contrary views consider rocks on the property as mostly all early Cambrian age Laib Formation. Höy & Dunne (1999) on Geoscience Map 1998-1, a compilation at 1:100,000 scale, map the east part of CLY Gp and the Bunker Hill / BiTel Knoll locale as Laib Formation 'lClb' (in purple): "phyllite, argillite, schist, micaceous quartzite; Reeves (Badshot) limestone member". The west part is mapped as Cs Unit (in blue grey) "argillite, silty argillite, siltstone; minor limestone". Höy & Dunne (2001) do not describe anywhere in their report metasediments and metavolcanics about Bunker Hill, rather their fig. 3-1 'Location and regional geology of the Katie property' sketches the 'Paleozoic Laib formation (?)' from near Salmo to the SW, north of Bunker Hill. Höy & Andrew (1990a, 1990b) only mapped to latitude 49° 05' focusing on the Rossland Group N of Swift Ck. CLY Group's latitude at the centre near the mine is 49° 03' 36''. In summary Höy & Andrew did not map Bunker Hill or the environs about Limpid Ck.

Ray (2004) noted "The precise age and grouping of the metasediments at Bunker Hill are uncertain but … they are considered to belong to the Cambrian-age Laib Formation as described by Little (1950), Fyles & Hewlett (1959) and Höy & Dunne (2001)".

However, Little's 1965 map 'Geology, Salmo British Columbia' GSC Map 1145A supercedes the preliminary (1950) map. This incorporates Fyles & Hewlett's 1959 mapping. They describe "a thick, complexly deformed sequence of phyllite, argillite, quartzite, chert and limestone of uncertain age" (1959, p. 37). Notably, "Rocks between McCormick and Harcourt Cks form a S and SE-ward dipping sequence [that] probably do not belong to the Laib Formation (op. cit., p. 67-68)." Little (1982) correlates the Cs Unit either with the Milford Gp in the northern Kootenay Arc or with the Attwood Formation about Greenwood.

Concluding, host rocks on CLY Gp are not simply the Cambrian age Laib Formation but rather Paleozoic to Triassic Cs Unit HCA and CCA assemblages. *Due to structural complexity*, little is known of the geology about Bunker Hill and BiTel Knoll - the nine days of trail & roadside mapping by Ray (2004) is preliminary work. This was restricted to an area about known showings, and hindered by springtime rainy weather in both 2003 and 2004 (op. cit., Ray p.c.). *Mapping of CLY Gp is incomplete even at district or regional scale.* More detailed structural-geologic mapping would advantage exploration. An uncorrelated and undated black, carbonaceous, argillaceous and partly sandy limestone bed of the HCA Limestone + Argillite unit hosts the Lefevre W + Au Skarn and overprinting auriferous quartz-sulphide veins (fig. 3).

4.2 Intruding Bunker Hill Sill

Above and to the E of the Bunker Hill adits a sill or dyke-like body of biotite leucogranite 160 to 400 m wide (Little 1965, Kaufman 1984) intrudes the HCA Quartzite + Tuff and HCA Limestone + Argillite units (see Location Map inset on fig. 2 and fig. 3). Possibly the HCA Metabasalt + Argillite unit is also intruded. The Bunker Hill Sill is considered an outlier of the Wallack Ck stock[8]. Its N-S extent is at least 2.5 km. Ray (2004) names it the Bunker Hill stock; as it is much smaller than the Wallack Ck stock (i.e. a 'plug'), Its continuation this report names it the Bunker Hill Sill after its elongate shape. The 'Clel plug' name (fig. 3) is used for its continuation N of the Limpid Ck Forest Service Rd as this part is more irregular in shape.

4.2.1 Age and Correlation

A regional-scale age-date compilation (Logan 2002a) places the Wallack Ck stock in the mid Cretaceous 115 – 90 Ma Bayonne magmatic suite. The Bayonne suite is generally calcalkaline biotite-hornblende granodiorite. The precise age of the Wallack Ck stock or the Bunker Hill Sill is unknown. Granite dykes mapped u/g in the Bunker Hill Mine (Minister of Mines 1934 p. E24, 1936 p. E18) are probably related. There is no evidence that these are "granitic stocks of the Middle to Late Jurassic Nelson batholith" as MINFILE 082FSW002 states.

4.2.2 Contact Metamorphism and present Level of Exposure

The Bunker Hill Sill leucogranite has contact metamorphosed HCA rocks. Biotite - bearing argillite and biotite schist occur 560 m along the disused Bunker Hill Mine Rd (Howard 2000). Andalusite knots occur in schist between Adits 1 & 2 (Daly 1912). On BiTel Knoll biotite - garnet hornfels formed from HCA Quartzite + Tuff Unit argillaceous metaquartzite near the contact. Ray (2004 Map 2) notes "minor biotite-pyroxene hornfels" about 150 N at UTM 5,434,550 m N – 471,595 m E.

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[8] Howard (2000) mistakenly refers to the Bunker Hill Sill as the Wallack Ck granitic pluton or granitoid.

Based on these mineral assemblages, an estimate of the maximum depth of emplacement of the Bunker Hill granitoid is about 2.5 Kbar. At 3.5 km / Kb this corresponds to a present level of exposure of less than ~ 8.7 km (Logan 2002a p. 239). A reasonable estimate is 5 – 8 km paleodepth exposed.

4.2.3 Intrusive contacts

M. Harris for Kaufman (1984) and Ray (2004) map the granitic contact of the Bunker Hill Sill as irregular and northerly trending about the Bunker Hill – Lefevre grid area. The contact is visible E of the Lefevre Skarn trenches and on BiTel Knoll E of Eloise Vein. In Lefevre Trench #10, 60 feet W of the contact, "the bedding in the quartzite strikes 004° and dips 83° SE (Little 1959)". A blasted roadcut along the Limpid Ck Forest Service Road at UTM 5,434,946 m N – 471,503 m E exposes the western contact. Here the contact "is sharp, trends N to NNE and dips steeply W 60 – 70°. The granite close to the contact is medium to coarse grained, sheared, chloritized and jarosite-stained, whereas the adjacent argillaceous and quartzitic country rocks to the W are biotite hornfelsed and cut by several thin granitic dikes. … At UTM 5,434,632 m N – 471,629 m E [approx. 220 m N of BiTel Knoll] the granite contact dips 60 – 70° E, sub parallel to the S1 schistosity in the adjoining hornfelsed impure quartzites (Ray 2004)". His Map 2 notes "thin bedded recrystallized quartzite schist" there.
Summarizing, northerly trending intrusive contacts dip steeply, variably 60 – 70° W or E.

4.2.4 Leucogranite Petrography and Tourmaline Alteration

On CLY, outcrops are mafic-poor, medium to very coarse crystalline biotite leuco-granitoids. Detailed description is lacking. Ray (2004) notes "sporadic sericite and hornblende" and trace disseminated pyrite and lesser pyrrhotite (!). Clots, veinlets and breccias of black schorl, common tourmaline (Ball 1997, Howard 2000) are commonplace in granitic rock along the Limpid Creek Forest Service Rd e.g. at UTM 5,434,776 m N – 470,910 m E. Here the 'Culvert granite' subcrop is feldspar porphyritic and dike-form. Limpid Roadside Veining has sparse tourmaline and the trenched Moly Quartz Vein is partly hydrothermal tourmaline + quartz breccia (fig. 2).

4.2.5 Shears in the Bunker Hill Sill

Commonly, granitoid outcrops appear undeformed but intense shearing occurs in places, e.g. in a poorly exposed subcrop left of the logging skid road in a N-S trending draw, part of the foot trail to BiTel Knoll from the side pull-over truck park (Location map inset on fig 2). Here granitic rock is highly altered and strongly sheared with pervasive propylitic (chloritic) and pink potassic (?) alteration. Several subparallel shear planes and limonite-filled vugs occur. Locale is 5,434,433 m N – 471,838 m E about 200m E of BiTel Knoll.
Ray (2004 and his Map 1) notes "the Bunker Hill stock [named Sill in this report] is cut locally by several shear zones and narrow faults, notably at UTM 5,434,959 m N – 471,548 m E [at Limpid Roadside Veining, just E of Section 1 HCA Limestone Detailed Structures (Howard 2000), and at 5,434,746 m N – 471,784 m E [along Limpid Creek Forest Service Road, named Yankee Corner in Howard 2000]. At the former locality, the 1 m thick chloritized shear zone trends SSE and dips 80° W[9] while at the latter [Yankee Corner site] closely-spaced fractures (10-30 cm apart) and thin shears strike NNE and dip 75° E. Mafic minerals adjacent to the granite margins or close to the shears are extensively chloritized and the rocks rust-stained". Photo 7 (op. cit.) shows many small shears in leucogranite.
Einarsen (1995 p. 110) found "the latest motion on the NE - trending … segment of the Waneta Fault ... was [strike slip] dextral displacement." This evidently deformed parts of the Bunker Hill Sill.

[9] Though on Ray's Map 1 this 'chloritic fault' dips 75 NE

4.2.6 Bunker Hill Sill leucogranite: an Exploration Target

It is unknown if on passing eastwards into the granite all the mineralized veins “quickly die out” (Ray 2004) or as former 1930’s developers may have assumed. Clarissa Main Vein and the Transverse Veins are unbounded to the E. Exposure and topographic relief of the host granitoids is much less than the adjacent contact metamorphosed and hornfelsed HCA. Granitic rocks are obviously altered and recessive a few meters E of the height of BiTel Knoll and below Clarissa Main Vein (photo, fig. 12). On the map scale the Bunker Hill Sill is topographically low (fig. 3). Auriferous quartz veins, e.g. Clarissa, and localized shearing with intense alteration making the granitic rocks softer show the Bunker Hill Sill is a target for Intrusion-related gold-quartz veining.

5 Sites with Minor Past Production

5.1 Blue Quartz Vein Trench

Minor past production is recorded from the Blue Quartz Vein about 60 m SW of the height of BiTel Knoll (fig. 2):

“A long trench has been made … on the ‘Blue Quartz’ Vein which strikes N 80 W [100° azimuth] with a dip of 42° south. This is reported to be from 6 to 14 inches wide, with schist walls. A shipment of 4,440 lbs [2.22 tons] sent to the Trail smelter from this working assayed 0.511 oz. / ton gold. No appreciable mineralization was present in the quartz, the analysis showing only 1.5% iron and no sulphur (Minister of Mines Annual Report 1933 p. A239)”.

Another record states

“The ‘Blue Quartz Vein’ in the open cut has a thickness of 3 to 8 inches and dips 45° to the south. The footwall is of light-coloured quartzite, while the hangingwall is somewhat argillaceous quartzite. There is a marked difference between the attitudes of the bedding planes in the two walls. It is reported that 2.2 tons (4,440 lb) of ore shipped in 1933, which averaged 0.51 oz. gold and 0.4 oz. silver / ton, came from this cut (Minister of Mines Annual Report 1936 p. E20).”

The Blue Quartz Vein was mined in 1933 by blasting and trenching the hangingwall and sloughing it downhill. The trench is 23.4 m long (fig. 2). The well-exposed footwall of the fault is oriented 119° 45° SW. Prominent half cm-sized corrugations – fault lineations – trend 222°, plunge 41°. Only small parts of the Blue Quartz Vein are left; the narrow trench is now mostly infilled. Some obscuring moss dates from 1933. The 1999 grid location is 3 +10 E on L5N. *The grayish ‘blue’ coloration of the quartz vein is due to a concentration of bismuthinite or native bismuth and Au–Bi–Te minerals.*

Fig. 5 Blue Quartz Vein Trench and hosting fault (see map fig. 2). View is about E [112°] along the trenched footwall of a fault oriented 119° 45° SW. Prominent fault lineations – mm scale corrugations – trend 222°, plunge 41°. Obscuring moss dates from 1933. Card has cm divisions at top. Flag at top centre marks sample 0414 with quartz + minor bismuthinite + visible gold. It ran 23 Te / 478 Bi / 2.1 As / 1.2 Ag and 8.65 Au by Fire Assay [ppm]. This part of the vein was not hand mined. Initial analysis of BH-21 collected nearby ran 36.3 Au [1.06 oz. / ton] 6.1 Ag >2,000 Bi and only 4 As [all ppm] (Kennedy 2003).

5.1.1 Geochem

Two 1999 rock samples from the Blue Quartz Vein Pit BH-047 & BH-050 (fig. 2) ran nil gold (Howard 2000):

No.	Au ppb	Bi ppm	Te ppm
BH-047	20	4	1
BH-050	10	75	20

Loring Labs only analyzed these three elements in 1999. Note anomalous Bi and Te for BH-050.

In 2004 BH-21 from Kennedy (2003)[10] was re-analyzed. Including three 2004 samples, analyses listed W to E are (all ppm):

[10] From the "Blue Vein", sample descriptions of Kennedy (2003)

Table 4 Blue Quartz Vein sample analyses

No.	Au by ICP-MS	Au by FA	Bi	Te	Ag by ICP-MS	Mo	Fineness	W	Pb	As	Sb
BH-20	0.011	—	15	—	7.8	3	N/A	2	4,963	44	<3
0535	1.381	1.33	73	5.19	0.264	239	834	2.8	5.2	0.8	0.6
BH-21	32.462	34.52	#1,962	93.4	▪5.281	3.9	867	2.2	80.5	5.1	2.3
0414	7.636	8.65	478	23	1.179	23	880	0.5	13	2.1	0.7
0512	0.046	0.03	4.5	0.4	0.102	26	!227	0.4	7	3.4	0.1

***Fineness calculated using Au determined by Fire Assay and Ag by ICP-MS**
— not analyzed
 # 0.19% Bi. Group 1D ICP-ES ran >2,000 Bi, the upper limit. **▪ 6 Ag by FA**
N/A fineness not calculated; precious metals assay extremely low
! low, though uncertain fineness as very low assays.

BH-20 (Kennedy 2003) is from the Pit with ‘rotted’ pyrite and galena. Initial Group 1D analyses did not give Te and Se values (not re-analyzed in 2004)
Blue Quartz Vein Trench samples, described W to E:
0535 is a mineralized selvage of the Blue Quartz Vein. Irregular closed fractures well fracture the milky white quartz. Aligned microvugs are uncommon. Light to medium blue-grey Bi minerals coat the fractures, coloring the quartz. A 2 cm thick vein selvage has 30-40% very dark bluish grey Bi minerals with a brilliant reflective luster. These are coarse grained, 0.3 - 1.0 mm sized. B. Doyle identified trace native gold. Foliation of the argillaceous metaquartzite wallrock, defined by shining dark gray mica and green actinolite (?), is partly replaced by quartz + Bi minerals. A metallics assay procedure found nil native gold.
BH-21 collected by Kennedy in 2003 is “a 6 inch wide vuggy quartz vein with pyrite, molybdenite *[no – actually Bi minerals are present]* oriented 125° 65° SW”. It ran 36.3 g/t Au [1.06 oz. / ton]. Re-analysis by Group 1F-MS ultra trace ICP-MS gave 32.5 g/t Au and 34.5 by fire assay.
0414 is a grab sample of medium brown fractured limonitic quartz. Closed 5 –15 cm spaced fractures are limonite-coated. A one cm band of very dark bluish-grey quartz, adjacent to a 2 cm band of dark yellow brown well-fractured quartz, has very common disseminated Bi minerals (bismuthinite?) and visible gold. A metallics assay gave nil mg gold but in total 8.65 ppm.
0512 is a grab sample of well-sheared and fractured rusty brown vein quartz. Near-perpendicular mm-sized fault slickenlines infer two movement directions. Quartz is coloured medium-dark grey blue by Bi minerals in very fine-sized pores. Trace pyrite occurs. Sub-mm to mm-sized Bi minerals display perfect platey cleavage and brilliant reflective luster.

The Blue Quartz Vein is unlike BiTel Knoll Veining only 30 m N. It is a 3 – 14” thick high-grade, skarn-like quartz selvage replacing metaquartzite along a fault oriented 119° 45° SW. Au–Bi–Te minerals + trace native gold occurs. Fineness is high (Table 4). Base metals, As and Sb are absent. The Pit mineralization differs; it is argentiferous galena + pyrite. The Pit’s host structure is not clear. Ray (2004) does not identify these workings.

5.2 Moly Quartz Vein Trench

The Moly Quartz Vein Trench is 70 m S of the height of BiTel Knoll (fig. 2). It is a blasted trench 39 m long. Of five 1999 rock samples (Howard 2000) BH-308 is highest in gold at 0.15 ppm; three others are not anomalous at 0.035 ppm. A +11° VLF-EM Fraser filtered dip angle anomaly at 3+62.5 m on line L4+50 is 23 m S of the W end of the Moly Trench (fig. 2, Drawing #19 in Howard 2000). This is part of Domain 3, a NNE-trending multi-station anomaly. It extends SSW to the Lefevre workings and beyond, off the main Bunker Hill – Lefevre grid (Section 13.1).

The Moly

“Quartz Vein is 40 inches wide striking about N 85° W [095° azimuth] dipping 35° N. The footwall country rock is granite ... Samples across 27 and 39 inches both assayed 0.40 oz. gold per ton (Minister of Mines 1933)”. “In the granite there is from 1 to 3 1/2 feet of quartz irregularly mineralized with molybdenite, pyrite and some fine black sulphide [sulphosalts?]. This quartz is reported to carry spotty gold values. Some 30 tons of rather low-grade material shipped in 1933 was reported to come principally from cut (Minister of Mines 1936).”

Auriferous vein sections 27 and 39 inches wide, both with 0.40 oz. / ton, have not been found. Ray (2004 Map 2) notes “a 40 m long quartz vein 0.2 to 1 m wide, contains gold, pyrite plus galena” but native gold was not found in 2004.
Calculated fineness of 1933 production of 8 oz. Au and 150 oz. Ag is 50, very low.

5.2.1 Geochem

Re-analysis of BH-23 to BH-25 from Kennedy (2003)[11] and two other samples (all ppm):

Table 5 Moly Quartz Vein sample analyses

No.	Au	Bi	Te	Ag	Mo	Pb	W	As	Sb
BH-23	0.26	25	0.9	2.05	260	136	3.3	44	1.1
BH-24	0.11	42	1.57	16.54	17	1,007	1.9	2	0.2
BH-25	0.06	4	0.55	1.37	143	33	3.5	229	0.5
BHCK-43	0.08	42	—	>100	373	> 10,000	2	27	>100
0540	*0.28	23	1.8	80.39	1,062	> 10,000	12.9	14	31

*** FA, ICP-MS is 0.24 Ag >> Au & fineness low, not calculated**

BH-23 is from a limonite coated shear striking 120°, presumably taken at the overhang above a water-filled pit.
BH-24 is a grab sample of limonite after pyrite, the vein striking 130° here.
BH-25 is also a grab sample of limonite after pyrite from the quartz vein, hosted by granite (descriptions from Kennedy 2003).
BHCK-43, an undescribed sample (Kennedy 2004), also has 820 Zn (ppm) and 0.75% Fe. Te and Se were not analyzed.
The single 2004 grab sample 0540 is quartz with about 5% galena (fig. 6). 2.5 and 2.0 cm wide bands of light blue-grey quartz enclose a central 3 cm thick layer of dark bluish grey quartz and cryptocrystalline limonite-strained quartz. On one side are clusters of coarse-sized (1 mm) galena crystals. Another piece has common limonite-coated vugs to 7 mm sized, and very coarse galena as 5x7x10 mm sized crystals. Very fine-grained molybdenite likely occurs; admixed with galena it could be visually mistaken for Bi minerals.

The Moly Quartz Vein with mean orientation 115° 36° NE is similar in attitude to Clarissa Main and Clarissa Transverse Veins (Section 6.6). The mineral assemblage differs: more than 1% coarse-grained galena with molybdenite (?) and likely fine-grained, undetermined silver- and antimony-bearing sulphosalts occur. This paragenesis would include the minor Bi present. ***Silver and base metal content is higher than all other known veins.***

[11] Not from the “Blue Vein” as in the sample descriptions of Kennedy (2003)

Fig. 6 Moly Quartz Vein sample 0540 described above

Similar in element content and mineralogy to the Moly Quartz Vein is Limpid Roadside Veining, though these quartz veins are weakly mineralized. Even though it crosses into the granite, **the Moly Quartz Vein does not have a *proximal* Au–Bi–Te mineral assemblage. Neither is it the Blue Quartz Vein continued:** dip senses, thicknesses and mineral assemblages (Section 5.1.1) differ, and **part of the Moly Quartz Vein is tourmaline + quartz breccia.** Tourmaline also occurs in Limpid Roadside Veining, at Clear Ck (Marsh et al. 1999, Stephens & Weekes 2001, Marsh et al. 2003) and at Dublin Gulch (Hitchens & Orssich 1995). It is also present in the Kena-Gold Mtn porphyry Cu–Au deposit (Logan et al. 2003). **“Tourmaline is common in [Intrusion-related gold systems] associated with smaller intrusions (McCoy et al. 1996)”.**

6 BiTel Knoll Veining

6.1 Location and previous references

The named BiTel Knoll Veins are on the SE slope of a brush-covered knob (square on Location Map, see inset top left on fig. 2, dash-lined on fig. 3). Old reports mention BiTel Knoll veining:

"Several other veins are indicated in trenching on the side-hill above the underground workings, one of which is in granite [since named the Moly Quartz Vein] (Minister of Mines 1934 p. E24)".
"Two hundred feet N [of Moly Quartz Vein Trench] is a large stripping showing poorly-mineralized quartz three feet thick, apparently developed along the bedding-planes of quartzite[12] (Minister of Mines 1936 p. E20)".

This refers to Eloise Vein South exposures. A surface cut, drawn on a map p. E19 (1936), is mostly in rusty metasediments. It is W of BiTel Knoll veining. The reported vein attitude 032° 45° SE (op. cit.) well compares with the mean Eloise & Ella Main Vein orientation 020° 45° SE (Section 6.7).

About 40 m S of BiTel Knoll is the main 1999 Bunker Hill – Lefevre grid. Seven 400 m-long W-E lines were established (Howard 2000). Station 3+75N on the northernmost line L5N is the origin of the 2004 N-S chained line at UTM coordinates 5,434,384 m N – 471,642 m E. Flags were placed 10 m apart (BiTel Knoll Map, fig. 2).

Ray (2004) refers to BiTel Knoll as the 'Blue Vein' area, comprising Clarissa Main Vein (photo 14 in Ray 2004), Clarissa Transverse Veins, the poorly exposed Ella veins and exposures of Eloise Vein South (op. cit., his photo 15). The Blue Quartz Vein Trench and Pit is not mapped.

6.2 Mineralogical Description

Collectively the mineralogy of the Eloise, Ella Main[13] and Clarissa Veins is quartz + minor bismuthinite (?) + trace native gold ± trace bismuth-gold tellurides (suspected from analyses) ± trace scheelite, molybdenite[14] (?) ± rare trace pyrite. Eloise and Clarissa Veins, one angular float boulder (VG symbols on fig. 2), and the Blue Quartz Vein have sparse specks of fine to coarse-grained native gold. **Particulate gold is always associated with irregular clots of bismuth mineral(s).**
***It is of interest that visible gold occurs, as in most Intrusion-related deposits the native gold particles are micron sized* (McCoy et al. 1997). The average is 111 µm at Fort Knox (Bakke 1995) and 155 µm, ranging from 4 – 1400 µm, at Dublin Gulch (Hitchens & Orssich 1995).

The bismuth-bearing mineral is **possibly bismuthinite Bi_2S_3** as its habit is bladed, elongated and somewhat striated. Bismuthinite occurs as 'prismatic, stout to slender or acicular crystals, vertically striated; usually massive, foliated or granular' (Roberts et al. 1990). The typical habit of native bismuth differs: 'indistinct crystals, usually massive, cleavable; granular; foliated'.

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12 rather oriented approx. along the foliation of the HCA argillaceous metaquartzite but clearly crosscutting
13 Ella Main Vein is only slightly auriferous to date
14 Some Mo may substitute for W in scheelite. Neither molybdenite nor scheelite has been visually identified. High W infers scheelite occurs.

Associated elements in the individual minerals are Bi + Au–Ag + Fe + Bi–Te–Au ± W ± Mo. *Base metals, Hg, Sb and As are near absent.* Sulphur content is very low, less than 0.07%. **Analytical ppm values of gold, bismuth and tellurium support the occurrence of unusual gold-bearing bismuth minerals or bismuth tellurides in the BiTel Knoll and Blue Quartz Veins , e.g. any of:**

- **maldonite** **Au_2Bi**
- **tetradymite** **Bi_2Te_2S**
- **tellurobismuthite** **Bi_2Te_3**

and possibly others.

Warren & Cummings (1937) note **undetermined gold telluride and "possibly galenobismutite"** $PbBi_2S_4$, in a microscopic study of Bunker Hill ore from the underhand Stope Vein in Adit 2. BiTel Knoll veining is superficially barren, milky white quartz and easily overlooked.

6.3 Vein Fractures

BiTel Knoll Veins typically have sub-planar, hairline-thick fractures spaced 5 to 20 mm apart. Up to three fracture sets occur, each variably developed. Fracture surfaces are coated rusty-red with limonite or uncommonly lemon yellow / light grey-green with secondary bismuth minerals, possibly bismutite[15]. Fractures are uncommon on proceeding to the E part of Clarissa Main Vein into the granite. Granite-hosted Clarissa Transverse Veins are weakly fractured.

The Adit 1 Gallery Quartz Vein has "closely spaced, steeply dipping fractures striking N-S subparallel to the phyllitic foliation in the nearby argillites; it is possible that this fracturing in the vein is related to the late shear movements seen in the nearby phyllites and argillaceous quartzites (Ray 2004)". Unknown is whether the hornfels or granite host is fractured and mineralized at BiTel Knoll or any other site.

Book-like fracturing occurs in parts of Eloise Vein (photo fig. 8). Some of the Eloise and Ella Main Vein fractures are fault surfaces: past northerly (or southerly?) movement is evident from mm-scale corrugations interpreted as fault striae. Compatible with this is the very planar slickenlined fault hosting the Blue Quartz Vein. BiTel Knoll vein lineations consistently trend ~ 190° with shallow plunge, about 20° (fig. 2).

The following sections detail individual veins.

[15] Bismuth oxy carbonate $Bi_2(CO_3)O_2$ a dull green earthy alteration product of native bismuth and bismuthinite

6.4 Eloise Vein

Eloise Vein is the best exposed. It outcrops intermittently for 35 m about N-S on the SE slope of Bitel Knoll (fig. 2). It is drift covered N and S. Exposed parts are named Eloise Vein North and Eloise Vein South.

Fig. 7 Eloise Vein South. View to N in light rain taken at origin of the N-S baseline (fig. 2), along the 0º topofiled (then chained), red flagged baseline. The resistant 1.7 meter thick vein is in hornfelsed HCA argillaceous metaquartzite. It dips moderately SE. Note the vein is curviplanar, the axis of the 'hollow' on the right plunges moderately E. Vein continues as subcropping Eloise Vein North beneath the distant fog-shrouded tree in the photo's top left.

Fig. 8 B. Doyle further uphill on resistant Eloise Vein South. View to NNE. A 30 cm chip sample 0517, with W-E oriented 'pages-of-a-book' fracturing above left knee, ran 2.76 g/t Au by fire assay. Several sub-mm sized, very fine-grained native gold specks were observed on collecting the sample, all near limonitized patches.

Fig. 9 Angular boulder of float, meters downhill of Eloise Vein North. Two coarse-grained and three fine-grained gold flecks occur just below 'I' of Inches word on cm scale card. Quartz is uncommonly coloured bluish by bismuth minerals (but shadows to the right give a bluish cast). Metal tag marks grab sample 0515 with 47 Te / 723 Bi / 75 Pb / 1.3 As / 1.8 Ag and 8.7 Au (all ppm). Hg is only 8 ppb. Sets of limonite-coated fractures evidently control mineralization.

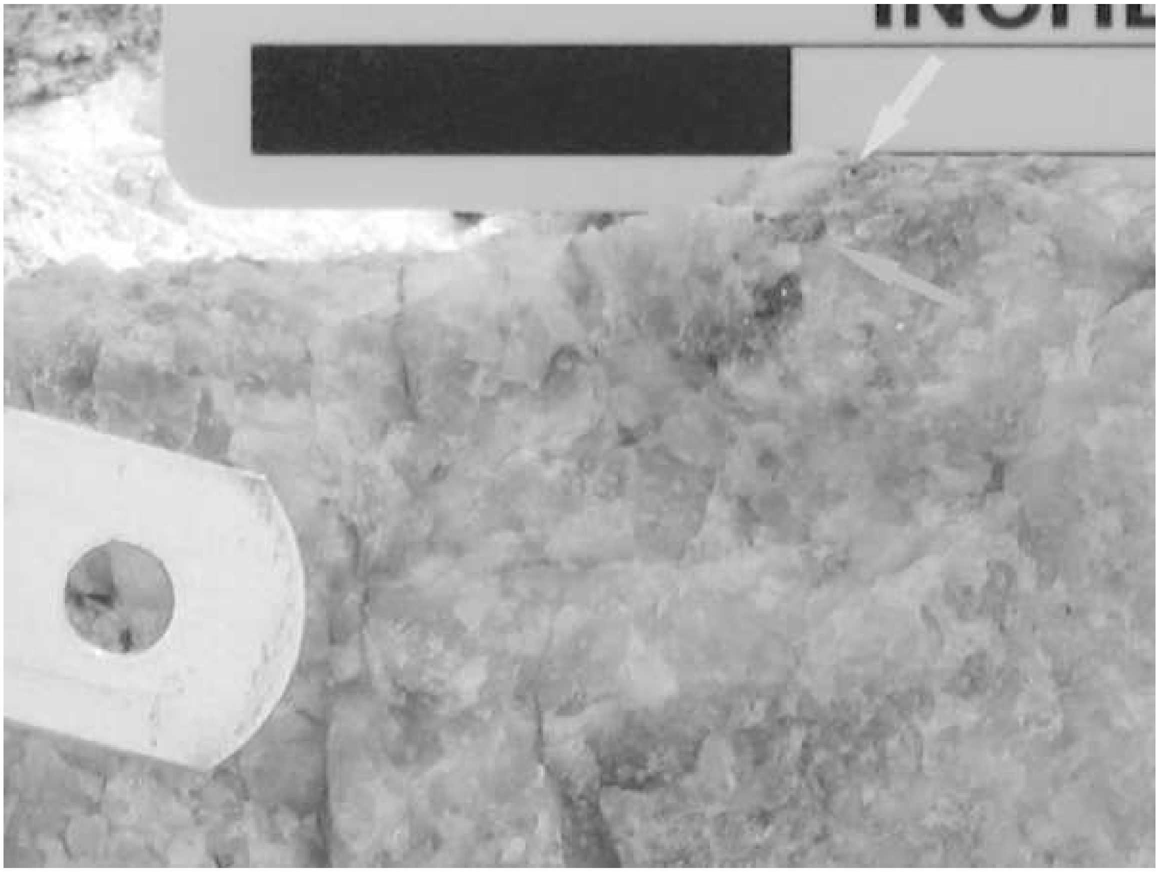

Fig. 10 Close-up of previous photo, site of grab sample 0515 of angular float from Eloise Vein North. Top arrow marks a coarse gold grain. Bottom arrow marks a clot of coarse sized bismuth minerals with several flecks of fine-grained gold. The bismuth mineral is likely bismuthinite. Both may be decomposition products from sulfidation of early maldonite. Quartz has a v light grey cast in the photo – card is actually white and tag steel-grey. Limonite-coated fractures trend about the same as the Bi + Au clot.

Two **orientation** measurements of Eloise Vein are 016° 52° SE (autumn 2004 fieldwork) and 015° 43° SE (Ray 2004). The average of these is **016° 47° SE**. Eloise Vein South is curviplanar with a 'hollow' linear axis on the E (upper) side plunging moderately east (fig. 7 above). This resistant, 1.7 meter thick vein is hosted by hornfelsed HCA Quartzite + Tuff unit (Howard 2000) argillaceous metaquartzite. Fractured milky white quartz has uncommon medium blue–grey bismuth minerals and sparse native gold. Scheelite was not found but anomalous Mo and W analytical values (to 30 Mo and 37 ppm W in 0441) strongly infers its presence. Ray (2004) has another photo #15.

6.4.1 Geochem

Listed from S to N (fig. 2):

Table 6 Eloise Vein sample analyses

Sample	Au by ICP-MS	Au by FA	Bi	Te	Ag by ICP-MS	Mo	*Fineness	W	As
Eloise Vein South									
0517	2.76	▪2.76	208	13.6	0.68	15.0	803	5.3	0.8
BH-22	27.45	29.90	‡1,946	>100	^4.42	30.2	856	2	3.4
0514	1.16	1.27	60.3	3.2	0.78	21.4	620	1.3	0.5
0428	0.10	0.15	9.0	0.5	0.04	7.7	!777	1.1	0.7
0441	7.97	8.17	564	33.0	1.43	30.1	851	37.1	0.8
BHCK-24	5.89	–	416	–	0.8	11	880	3	< 2
0429	1.03	1.07	65.3	3.5	0.21	8.8	835	22.5	0.7
BHCK-25 (granitic dyke)	0.016	–	1.0	–	0.15	22	N/A	< 2	19
Eloise Vein North									
0424	10.29	▪9.94	476	55.8	1.52	8.6	868	0.8	2.4
0437	10.89	9.57	563	49	1.39	2.0	873	8.5	2.9
0438	0.025	0.05	3.7	0.3	0.02	1.4	!685	1.6	0.9
0412	23.10	27.03	1,601	95.4	4.2	13.2	867	0.3	2.2
0404	0.009	0.020	2.4	0.1	0.02	1.7	N/A	7.7	0.8
0409	0.24	0.36	21.9	1.49	0.19	12.8	!656	33.8	1.6
BHCK-29	12.43	–	644	–	1.6	9	886	< 2	< 2

***Fineness calculated using Au determined by Fire Assay and Ag by ICP-MS (ICP-ES for BH-22)**
– not determined
N/A fineness not calculated; precious metals assay extremely low.
! moderate, though uncertain fineness as very low assays.
^ ICP-ES analyses
▪ metallic screen assay
‡ 0.19% Bi

Described from S to N (fig. 2):
From Eloise Vein South:

0517 is a 30 cm chip sample of quartz, half milky white, compact and massive, half light to dark grey blue. 1 – 2 cm spaced limonite-coated fractures are common. Uncommonly fracture surfaces have light straw yellow-tan coatings - secondary Bi minerals? Rare microvugs adjacent to cryptocrystalline light blue-grey quartz are partly infilled by very dark grey Bi (?) minerals. Several sub-mm sized, very fine-grained native gold specks occur, all near limonitized patches. A metallics assay on 495 g gave nil mg metallic gold, in total 2.76 ppm.
BH-22 collected by C. Kennedy in 2003 has “pyrite, limonite and a silver [coloured Bi] mineral”. Initial Group 1D analysis ran 29.9 g/t Au [0.87 oz. per ton] / 4.9 Ag and > 2,000 ppm Bi. As content is trace at 5, W bkgd at 2 ppm. Te and Se were not analyzed then.
0514 is a grab sample of well-fractured quartz taken 2 m uphill of 0517. At least 3 sets of fractures are well developed, generally spaced 1-1.5 cm apart, some occurring 0.2 cm apart. One fracture set has very common sub-mm sized vugs along quartz-healed surfaces. Dark red-brown limonite coats most all the fractures. Quartz is mostly light blue-grey, partly medium blue-grey, coloured by trace bismuthoids.

0428 is a 32 cm chip taken 2 m N of 0514. White quartz has some limonite along fractures oriented 079° 42-58° NE.
0441 a 0.3 m chip sample at the site of BHCK-24 of limonite-stained quartz, has about 0.5% Bi minerals.
BHCK-24 is an undescribed grab sample of subcrop (Kennedy 2004). Te and Se were not analyzed.
0429 is a 0.78 chip sample of white quartz with limonite-coated fractures taken close to the BHCK-24 site.
BHCK-25 is a grab sample of an altered granitic dyke to the E (Kennedy 2004). Te and Se were not analyzed.

From Eloise Vein North:

0424 a grab sample of rusty, well fractured quartz taken 0.2 m downslope of 0412. White and rusty quartz has very common limonite-coated fractures; the dominant set is spaced 5 – 10 mm apart. Minor vugs are 1- 3 mm in size. Uncommon clots of dark grey blue bismuthoid minerals colour the quartz. Very fine sized grains of visible gold are set amongst weathered Bi minerals, rare traces of a straw yellow-green mineral. A metallics assay on 485 g gave nil mg gold, in total 9.94 ppm.
0437 a 1.0 m chip sample collected along strike is fractured rusty with trace bismuth minerals.
0438 is a continuation of 0437 for 1.5 m with no Bi minerals observed is not anomalous.
0412 is a 41 cm chip sample of moderately fractured quartz with minor Bi minerals. At least 3 crosscutting fracture sets are present. The closest-spaced is 3-5 mm apart. Another set for a 3 cm length has mm-thick seams of dark grey-blue very fine to coarse (one mm-sized) Bi minerals, about 0.3% to 0.5% of the sample. Accompanying are many grains of coarse-grained visible gold. Rare microvugs are infilled by metallic-luster Bi minerals with trace whitish green secondary Bi minerals. 0412 ran 1.0 Se (high). A metallics assay on 500 g gave 1.18 mg gold, the weighted total for the sample 27.03 ppm.
0404 is a 0.96 m chip sample of fractured and rusty quartz with scarce mm-sized vugs and trace Bi minerals (?) It is not anomalous except for 7.7 ppm W.
BHCK-28 a neighbouring grab sample of subcrop (Kennedy 2004) ran 0.04 Au / 9 Bi and < 0.3 Ag (nil) / < 2 As (nil) / 3 Mo / 4 W with Te and Se not analyzed.
0409 is a 1.1 m chip sample across the quartz vein (60%) and sediments (40%), taken from a half-m deep trench 2 m S of BHCK-29 and 4.3 m N of 0438. Quartz is rusty and fractured with trace Bi minerals. It is definitely anomalous in gold and pathfinder elements.
BHCK-29 is a piece of a large angular boulder (Kennedy 2004) not far off the vein. Te and Se were not analyzed.

Eloise Vein is highly anomalous in Au–Bi–Te–Mo–W. As is near absent. Remarkably, if gold is present, bulk fineness is consistently high. Leaving out 5 samples < 0.03 g/t Au, the mean of 10 is **834 fine. From 8 channel samples (of varying widths), a conservative estimate of mean gold grade is 2.5 – 2.3 g/t.** This is determined by trimming the log-normal sample distribution (Section 14). **Variation is extreme at a coefficient of variation 1.5 or 150% of the mean.**
The site is easily accessible. Uncovering by mechanical trenching would enable further sampling.

6.5 Ella Veins

Two subparallel veins subcrop downslope and SW of Eloise Vein South. They are the least exposed of the four named veins. In hand dug trenches they are 1.5 and 1.9 m *plus* in true thickness. Ten cm-spaced limonite-coated fractures are common. Ray (2004) on Map 2 notes “two 15 cm thick quartz veins” 10’s of meters SW of Eloise Vein; these were not found. Ella Main Vein orientation averages 024° 43° SE.

Fig. 11 Ella Main Vein poorly exposed. 1.9 m plus in true thickness. Grab sample 0426 site is just below the pack.

Table 7 Ella Veins sample analyses

Sample	Au by ICP-MS	Au by FA	Bi	Te	Ag by ICP-MS	Mo	*Fineness	W	As
0426	3.477	3.44	184	12.4	0.612	13.5	849	10.4	1.0
0443	0.031	0.05	7.1	0.3	0.709	7.4	N/A	5.7	1.1
0442	0.019	0.04	2.9	0.2	0.003	1.2	–	0.3	1.1
0436	0.004	< 0.01	0.3	0.02	0.002	5.2	–	0.1	0.8
*0427	0.079	0.11	13.9	0.86	0.840	4.7	116	4.9	1.0
0435	0.004	< 0.01	1.1	0.06	0.008	2.8	–	6.9	0.7

***Fineness calculated using Au determined by Fire Assay and Ag by ICP-MS**
– not determined
N/A fineness not calculated; precious metals assay extremely low.
***0427 is anomalous for Ag Bi W and uncertainly Au. High silver gives a very low fineness.**

Ella Main Vein samples:

0426 is a grab sample of weakly fractured, massive white quartz. Closed 15-20 mm-spaced fractures are poorly developed. Limonite content is minor. Two 5 mm sized aggregates of dark grey blue Bi minerals occur with microvugs along one slightly open fracture. Minor black Mn (?) staining and a trace of pale yellow-green secondary Bi minerals occur. 0426 is definitely auriferous and anomalous in trace elements.
Three chip samples collected in Oct. were background:
0443 is a 1.1 m chip sample of ‘glassy’ white quartz, moderately fractured. Limonite-coated fractures are oriented 019° 38-42° SE. Mn staining is trace, no sulphides were found. Bi Mo and W are anomalous but not Te or precious metals.
0442 adjacent to 0443 is a 0.8 m chip sample of the same vein with trace blue quartz and no visible sulphides. No elements are anomalous.
0436 is a 2.3 m chip sample collected about 10 m downslope of 0427. Quartz is white to bluish grey with few limonite-coated fractures and no visible sulphides. It is not anomalous.

Ella Offset Vein 16 m WNW is very poorly exposed (fig. 2):

0427 is an 82 cm width of very fractured white to smoky quartz. 5-20 mm-spaced fractures are very common, occurring in 3 or more sets; some are limonite-coated. Scarce 1 to 5 mm-sized vugs are present. One quartz piece has a 30 cm band of dark grey blue cryptocrystalline quartz - possibly Bi minerals? Ag Bi W are anomalous and uncertainly Au. High silver gives a very low fineness.
0435 is a 1.5 m long chip sample one m S of 0427. It is massive white and blue-grey quartz with a trace of a black unidentified mineral, possibly tourmaline. Limonite-stained fractures are few. It is not anomalous.

Uncovering and more sampling of these thick, poorly exposed veins is suggested.

6.6 Clarissa Veins

Clarissa Veins cross the intrusive contact (fig. 2): to the E is leucogranite, to the W hornfelsed, argillaceous metaquartzite. They consist of **the 1 m plus thick Clarissa Main Vein and at least four cm-sized extensional veins named Clarissa Transverse Veins.** Exposure is less than that of Eloise Vein. Clarissa Main Vein is oriented 112° 48° NE. At the E exposure in the granitic host are the Clarissa Transverse Veins, several cm-sized **subparallel 'sheeted' quartz veins.** They range from 2 to 15 cm thick, averaging about 4 cm, and are subparallel to the m-thick Main Vein. Limonite-coated fractures are uncommon. The mean of four orientation measurements of these is 108° 59° NE. At Clarissa Transverse Veins site the hosting Bunker Hill Sill granite is salmon coloured, by alteration of the feldspars. Possibly this is potassic alteration. On casual glance, white quartz is barren with scarce rust.

Fig. 12 Clarissa Main Vein, E end, view to N. Orientation is 112 48 NE (fig. 2). Limonite-coated vein fractures are rare in Clarissa Main Vein, and on with a casual glance it appears barren. Meters away B. Doyle found trace bismuthinite (?) & three small specks of native gold in grab sample 0423. This ran 0.47 ppm Au (only Fire Assay analysis). Below the cm-card are sub cm-sized quartz veinlets in salmon coloured, (potassic?) altered granitoid of Bunker Hill Sill. Veinlets are subparallel or 'sheeted'. Alteration and sheeted veins are typical of intrusion-hosted deposits.

6.6.1 Clarissa Main Vein

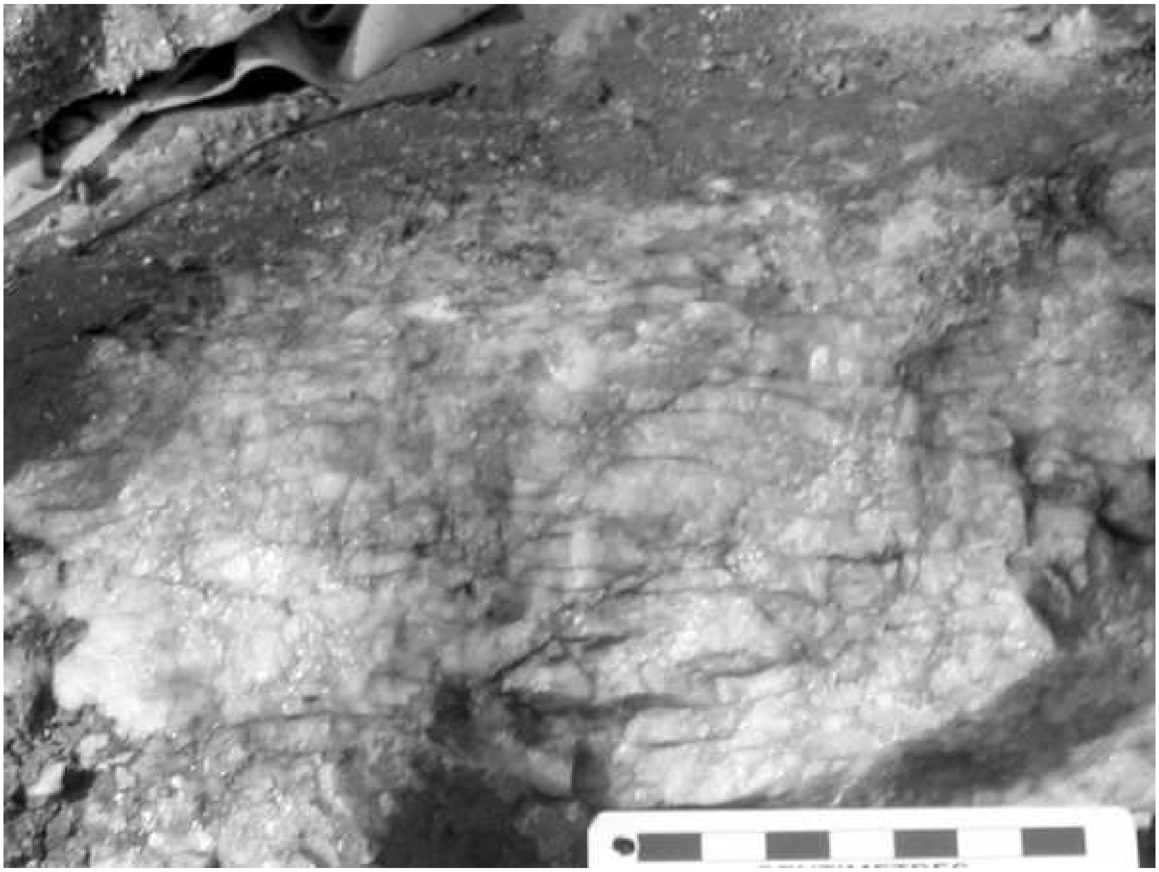

Fig. 13 Close-up of Clarissa Main Vein sample 0406, view to 020° with cm scale card. Sample is one of ten 1.0 m chip samples taken by B. Doyle in Oct. 2004 from W to E *along* the 112° vein trend. 0406 ran 1.3 Te / 19.7 Bi / 0.05 (nil) Ag and 0.3 Au [ppm]. The sample adjacent 0407 ran 14 Te / 217 Bi / 30.2 Ag and 3.24 Au. Prominent set of 5 to 10 mm-spaced limonite coated fractures is oriented 065 71 NW. Another crosscutting set, spaced 20 to 30 mm apart, is oriented more northerly and near vertical at 013 88 SE.

Considered from W to E:

BHCK-26 a grab sample of subcrop collected by Kennedy in 2004 ran 0.11 Au / 7 Bi / 6 Mo low 3 W and nil < 0.3 Ag and < 2 As, with Te and Se not analyzed.
0413 a grab sample is not anomalous in gold or trace elements.
Site BHCK-26 may be part of Eloise Vein North. The relationship of these intersecting veins was not observed. Two orientation measurements at site 0423 are 127° 56° NE and 093° 42° NE; the average is 112° 48° NE.

In Oct. after hand trenching B. Doyle took **ten, 1.0 m chip samples *along* the 112° trend** of Clarissa Main Vein from W to E. These may not represent the total bulk of the vein as contacts on both sides are well buried. Hence some vein portions were systematically under-sampled.

Table 8 Geochem of ten 1.0 m chip samples *along* the 112° trend of Clarissa Main Vein, listed W to E

Sample	Au by ICP-MS	Au by FA	Bi	Te	Ag by ICP-MS	Mo	Pb	*Fineness	W
0403	0.026	0.05	3.5	0.18	0.020	2	2	!714	>100
0405	0.012	0.03	2.4	0.10	0.202	10	7	!129	2.8
0406	0.168	0.30	19.7	1.29	0.049	9	3.5	860	29.4
0407	3.008	3.24	217.1	13.8	30.19	13	186	^97	8.5
0408	0.014	0.03	2.3	0.17	0.186	3	4.7	!139	30.7
0430	3.048	3.02	200.7	12.5	0.787	2	16.6	793	26.3
0431	0.048	0.04	4.5	0.27	0.765	6	4.4	?348	6.7
0432	0.012	0.02	2.4	0.14	0.256	5	8.5	!72	0.9
0433	0.061	0.12	18.1	0.72	8.458	9	42.7	^14	7.0
0434	0.010	0.04	3.3	0.15	1.033	2	23.9	!37	0.2

***Fineness calculated using Au determined by Fire Assay and Ag by ICP-MS**
– not determined
! Very low fineness - uncertain as Au near the anomalous threshold (background).
^ Very low fineness as high Ag + Pb (argentiferous galena present?)
? atypical

0405 has sparse Bi minerals, trace molybdenite (?) and yellow scheelite (?).
0430 is white quartz, with limonite-coated fractures. Two specks of visible gold occur with Bi minerals.
0431 is the same. Some sericite and rusty vugs occur. Pyrite occurs in cross-cutting veinlets of an unidentified dark mineral.
0432 are white quartz, rusty along fractures, with no visible sulphides.
0433 is the same with less fractures and trace medium-grained Bi minerals in one clot. A trace of black Mn staining occurs.
0434 is massive, little-fractured white quartz, with more black Mn staining. No sulphides are visible.
BHCK-27 collected by Kennedy in 2004 ran 8.47 Au / 517 Bi / 1.2 Ag / 3 As / 4 Mo with Te and Se not analyzed.

Concluding, **Clarissa Main Vein is sporadically enriched in gold, maximum approx. 3 ppm, with anomalous Ag–Bi–Te–W–Pb and trace Mo.** As is background. **Any argentiferous galena or lead sulphosalts occurring with the Au–Bi–Te minerals lowers the bulk fineness.** Two values with only trace Pb–Ag content are 860 and 793 fine.

6.6.2 Clarissa Transverse Veins

Fig. 14 Clarissa Transverse Veins oriented approx. 108° 59° NE, view to WNW about on strike. Site is one meter NE of previous photo. Cm-card stands on 10 cm thick quartz vein. Subparallel veins from left to right are 10, 2 (difficult to see) and 15 cm thick. Scarce limonite-coated fractures darken the latter. Average vein thickness is approx. 4 cm. Vein density over two meters is approx. 45% (self) or 60% (B. Doyle). Veins are 'sheeted'; more occur to photo's left, unsampled.

Table 9 Clarissa Transverse Veins sample analyses

Sample	Au by ICP-MS	Au by FA	Bi	Te	Ag by ICP-MS	Mo	Pb	*Fineness	W
BH-27	0.101	—	10.2	0.47	0.645	19.6	25	^135	>100
0422	—	0.65	—	—	—	—	—	—	—
0423	—	0.47	—	—	—	—	—	—	—
0515	9.042	8.7	723	47.3	1.851	8.0	75	825	5.3

***Fineness calculated using Au determined by Fire Assay and Ag by ICP-MS**
^ Very low fineness as high Ag, low Au

BH-27 a grab sample (Kennedy 2003) has scheelite as W > 200 ppm. Initial Au by ICP-MS on 15 g ran 0.147 ppm. Te and Se were not then analyzed. Re-analysis gave Au 0.101 ppm and > 100 W.
0422 a 60 cm chip sample of Clarissa Transverse Veins with trace pyrite + trace bismuthoids + very minor limonite + secondary bismuth minerals Quartz is white, massive and compact with only trace porosity. Part has 3-5 mm spaced tight fractures with a red secondary mineral- hematite? A slight trace of a lime green-coloured secondary mineral coats some of the quartz. It was analyzed only for gold by fire assay - 0.65 ppm.
0423 a grab sample of the easternmost exposure 2 m S of 0422 is massive, uniformly white, unfractured non-porous quartz, apparently barren. A slight trace of black Mn (?) staining occurs. B. Doyle noted trace Bi minerals & three small specks of native gold. 0423 was also only fire assayed for gold to give 0.47 ppm Au.
0515 is a sample of angular float from a boulder. The sample is possibly from Eloise Vein. Quartz is mostly white and well fractured with very common limonite-coated fractures. The many crosscutting sets give a brecciated appearance About 10% of the quartz is coloured medium to dark grey blue by micro- to cryptocrystalline Bi minerals (?). B. Doyle identified visible gold. Straw yellow-green secondary Bi minerals are common. The 825 fineness is typical of Eloise Vein. Se is 0.6 ppm (moderate).

Concluding, limited sampling shows **Clarissa Transverse Veins are anomalous in Ag–Bi–Te–W–Pb and trace Mo gold with indeterminate pathfinder elements.** Again, fineness is very low or very high.

6.7 Mean Eloise & Ella Main Vein Orientation

The mean of 5 measurements of Eloise & Ella Main Vein contacts is **020° 45° SE:**

Table 10 Five Measurements of Eloise & Ella Vein Contacts

Strike	Dip	Sense	Site	Recorder	Date	Note
016	52	SE	Eloise 0514	W Howard	Oct 2 04	lower, western contact
015	43	SE	Eloise	G Ray	June 04	strike and exact locale uncertain
027	50	SE	Ella Main Vein 0426	W Howard	Sept 14 04	approx.
025	34	SE	Ella Main Vein 0426	W Howard	Oct 3 04	very good, site re-measured
020	45	SE	Ella Main Veining	W Howard	Oct 3 04	very good, site re-measured

These two veins trend NNE and dip moderately SE at 40°. They are included in a vein set with Bunker Hill Mine underground veins + Ella veins + Eloise + Timbered Shaft + one Lefevre vein + one Four Tribs Ck (BH-48, Kennedy 2003) quartz vein. The **mean of 10 orientations,** including reliable measurements underground at the Bunker Hill Mine in the 1930's (Minister of Mines 1936), is **039° 40° SE.**

7 Adit 1 Gallery Quartz Vein – 2004 Re-analysis

7.1 Location

The site is in front of the uppermost caved adit of the Bunker Hill Mine, about 220 m SW of BiTel Knoll (see Location Map, inset top left on fig. 2). Detailed description and a map is in the year 2000 Assessment Report; following in this Report is a brief excerpted summary. There was no 2004 visit.

7.1.1 Description & Orientation

The Adit 1 Gallery[16] Quartz Vein is a tabular, meter-plus sized fissure-infilling vein in competent, contact metamorphosed siliceous argillite and argillaceous quartzite of the HCA Quartzite + Tuff unit (Howard 2000). The site is *not* "The lower adit … {the No.2 or 'gallery adit' of Howard, 2000} (Ray 2004)".

UTM co-ordinates are 5,434,280 m N – 471,490 m E. The vein can be discontinuously traced along **strike ~ 46 m NE.** Wallrock contacts are sharp. There are **multiple infilling phases** of quartz, *at least three generations.* The 031° 46° SE orientation, measured in 1999 in a hand-dug trench about 3 m south of the SE (right) wall at the start of Adit 1 Gallery, well compares to **a vein set** Bunker Hill Mine underground + Ella veins + Eloise + Timbered Shaft with mean attitude 039° 40° SE (Section 6.7).

"Three measured widths are 1.35, 1.2 and 1.0 m. The last two widths are from the northernmost exposure at 4+38 N and 2+09 E where, combined, the Adit 1 Gallery Quartz Vein is over 2.2 m wide[17] (Howard 2000)."

7.1.2 Adit 1 Gallery Quartz Vein – Re-analysis of Four 1999 channel samples

Table 11 Four Re-analyses of Bunker Hill Mine Adit 1 Gallery Quartz Vein channel samples, comparing 1999 Loring Labs Analyses

Sample	Width m	Description	Au FA by L	Au ▪FA by A	Bi L	Bi A	Te L	Te A	Ag A	Mo A
BH-045	0.9	< 2% triangular pyrite, dk gy Bi-Te minerals?	3.20	2.92	330	451.10	12	9.42	1.164	65.11
BH-022	0.73	Same, also N side	4.325	3.90	93	117.05	6	3.13	1.228	35.55
BH-046	1.93 along strike	Milky quartz & less than ¼% opaque ore minerals	5.075	4.24	53	56.83	4	2.79	1.706	30.90
BH-041	0.60 along strike	Same, also S side	15.840	10.87	353	342.24	27	18.09	1.704	13.36

All values are ppm. L = Loring Labs 1999 A = Acme Analytical Labs 2004
▪FA by A – Fire Assay on 2 assay ton portion by Acme Analytical.

Values are near equal; Acme has slightly lower gold by fire assay. Gold tenor ranges from 2.9 – 10.9 g/t (about one-tenth to one-third of an ounce). Acme has lower Te and higher Bi values than Loring. Higher Bi is consistent with eleven re-analyses by Loring of 1999 soil samples for Bi.

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16 the level adit entrance
17 the vein does not "elsewhere reach 3 m in width" (Ray 2004 p. 19).

For these, Loring corrected original values of 'less than the detection limit' to Bi values to a maximum 6 ppm (Howard 2000). Acme's 2004 ICP Mass Spectrometry analyses for Te and Bi are more accurate than Loring's 1999 ICP Atomic Absorption Spectrometry. Note silver in the Adit 1 Gallery Quartz Vein is uniformly low; Mo content is significant (and defining?) at a mean of 36. Maximum Cu is 142 for BH-046 and max. Pb is 12 for BH-041. W reaches 5.6 for BH-046, definitely anomalous, and As 13.4 for BH-045 (all ppm).

Table 12 Bulk Fineness of Adit 1 Gallery Quartz Vein channel samples

Sample	*Bulk Fineness
BH-045	715
BH-022	761
BH-046	713
BH-041	864

***Fineness calculated using Au determined by Fire Assay and Ag by ICP-MS**

The mean fineness is 763, lower than Eloise Vein's 834 (mean of 10). The Adit 1 Gallery Quartz Vein is ***proximal to intermediate*** **multi-phase Au(Ag)–Bi–Te–Mo(–W) mineralization.** W content is lower than in the BiTel Knoll and Lefevre quartz-sulphide veins.

7.2 Extensional nature of Adit 1 Gallery and BiTel Quartz Veins and their Relationship

Neither the Adit 1 Gallery nor the BiTel Quartz Veins have textures typical of 'mesothermal-style' gold - quartz veins. They are extensional (tensional) in character; pervasive shearing commonplace in typical Archaen fault-fill veins (Robert & Poulsen 2001) is absent. Foliated shear lenses of spalled wallrock, altered and enveloped by ductilely strained quartz, are uncommon. 'Mesothermal-style' or fault-fill shear veins are also termed greenstone gold, Archean lode gold, shear-hosted lode gold or 'orogenic' gold (Robert 1996, Ash & Alldrick 1996, Robert & Poulsen 2001). Fault-fill shear veins form at greater depths, under higher mean compressive stresses than extensional veins. In these tectonic settings extensional veins are generally of minor economic importance (Robert & Poulsen 2001). This writer conjectures that fracturing and some shearing (Section 6.3) of the named Quartz Veins on BiTel Knoll, and likely others on CLY Gp, happened considerably after their formation.

Similar trace element geochemistry and structural orientation show that the Adit 1 Gallery Quartz Vein and BiTel Knoll veins are part of a larger system. A former interpretation (Howard 2000) simply considered the Adit 1 Gallery Quartz Vein to represent veins mined underground at Bunker Hill. Receptive structures (extensional faults / fractures / fissures) channeled fluids and formed multi-phase Au(Ag)–Bi–Te–Mo(–W) quartz veins at least 185 m away from the exposed W intrusive contact of the Bunker Hill Sill, possibly to within 400 m (Ray 2004).

7.3 Spatial Zoning of Minerals and Elements: Bunker Hill underground production compared to Adit 1 Gallery - BiTel Knoll Quartz Veins

Vein pieces from dumps below Adits 1 & 2 generally have more sulphides. Silver-bearing galena is admixed with pyrite and trace pyrrhotite. The mineral and element association differs from the BiTel Knoll veins: Bunker Hill veins are collectively "Proximal to intermediate placed [considered *intermediate to distal* in this report] gold-bearing quartz + pyrite ± pyrrhotite ± arsenopyrite ± sphalerite ± galena … sporadically enhanced in Ag, Bi, As, Te and possibly Se" (Ray 2004 p. 25). **This report refines and extends the mineral and element zoning scheme on CLY Gp by classifying more occurrences.**

The four named BiTel Knoll quartz veins comprise *proximal to intrusion-hosted* very low sulphide, gold > silver, milky white quartz veins with bismuthinite + trace native gold + bismuth-gold tellurides + rare trace pyrite ± scheelite ± molybdenite (?). These differ from the *intermediate to distal* moderate sulphide content, silver (gold), base metal sulphide-bearing quartz veins mined underground at Bunker Hill. The two types of veins have different sulphides in varying abundances. A supposition is that zoning is genetically related to the Bunker Hill Sill leucogranite. The last production from Bunker Hill was silver–rich, low fineness ore (345 in 1940 and 346 in 1942). **The placement scheme is:**

- **Moly and Timbered Shaft Quartz Veins and Limpid Roadside Veining *distal***
- **Bunker Hill veins mined underground *intermediate to distal***
- **Adit 1 Gallery Quartz Vein *intermediate to proximal***
- **Lefevre Skarn and quartz-sulphide veins *proximal***
- **BiTel Knoll Quartz Veins *intrusion-hosted to proximal***

In the Bunker Hill mine area both *proximal* and *intermediate- to distal-placed* veins occur – consider that the same hosting fissure may have been re-infilled.

8 Lefevre Skarn – 2004 Re-analysis

Significant Bi, Te and Se (Table 13) are found in ICP-MS re-analysis by Acme Analytical Labs in 2004 of 16 vein and skarn grab samples collected by Kennedy (2003) from the Lefevre workings - trenches and pits (Location Map, inset on fig. 2). Formerly Te or Se was not determined (op. cit.).

Howard (2000) and Ray (2004) describe the site, though “very poor weather and light conditions” hindered recent examination (Ray 2004 p. 22). “In the southernmost pit (# 5 of Hedley (1943) or Trench #3 of Little (1959), see fig. 3) the **garnet-pyroxene-scheelite skarn** is largely **overprinted by abundant and widespread quartz-sulphide mineralization.** The latter includes thin veins of white to gray quartz as well as pods and veins of massive pyrite with lesser pyrrhotite and minor arsenopyrite (op. cit. p. 22)”. H. Little (1959) recognized scheelite in the Lefevre quartz-sulphide veins.

Kennedy’s 2003 samples gave Au in skarn to 11.9 g/t (sample LS-09). Re-analysis by fire assay gave 8.8 g/t (Table 13). Lefevre Au(Ag)–Bi–Te–Mo–W–As quartz-sulphide veins crosscutting the Lefevre Skarn grade to 14 ppm gold (Kennedy 2003). These are *proximal* with gold > silver. “Mineralization in the trenches is also enhanced in Ag (maximum 62 ppm, LS-09), Co (max 422 ppm, As (> 1%), Bi (max 1,447 ppm, LS-12) and W (>200 ppm) (Ray 2004 p. 21)”.

Table 13 Samples from the Lefevre Skarn workings re-analyzed including Te and Se

Sample	Description	Au 1 g by ICP	Au FA	As	Bi	Te	Se	Ag	Mo	W
LS-01	QV in skarn	3.706	3.39	44.9	116.8	3.1	1.4	1.038	6.5	>100
LS-02	QV in skarn	5.804	*8.84	132.6	637.5	20.0	1.2	1.110	11.4	>100
LS-03	QV in skarn	0.248	—	6.8	11.7	0.3	0.6	0.201	3.8	>100
LS-04	skarn	0.190	—	4.8	21.1	0.4	0.4	0.126	19.0	>100
LS-05	breccia	0.338	—	▪2,712.9	15.7	0.4	1.1	5.960	1.2	39.5
LS-07	skarn	0.926	—	10.7	67.6	0.9	0.8	0.346	3.0	>100
LS-08	skarn	0.691	0.81	2.5	60.1	0.9	0.8	0.381	10.0	>100
LS-09	skarn float	13.313	*8.8	8.13%	772.2	25.6	7.4	61.392	4.2	>100
LS-10	QV in skarn	5.848	*6.43	246.9	516.8	18.2	2.8	1.686	0.7	>100
LS-11	QV in skarn	5.978	*6.13	8.19%	503.9	17.1	5.9	1.787	41.8	>100
LS-12	QV in skarn	13.504	*14.17	343.5	^1,299.2	40.2	4.2	2.966	1.9	96.7
LS-13	skarn	1.692	1.86	13.5	96.1	2.2	3.0	0.933	129.8	>100
LS-14	skarn	1.029	1.04	12.7	81.5	1.9	3.2	0.684	58.5	>100
LS-15	skarn	1.482	1.35	2.9	105.1	2.6	3.1	0.831	92.4	>100
LS-16	skarn	0.086	—	9.9	5.6	0.2	1.8	0.258	10.1	7.6
LS-17	skarn	1.151	0.70	2.0	71.7	2.0	4.2	1.028	35.3	>100

FA – Fire Assay on 2 assay-ton portion
— not analyzed
***metallic screen assay procedure on approx. 500 g**
▪2.7% arsenic. LS-09 and LS-11 analyses are % As.
The only sample with significant Sb is LS-09 with 29.64 ppm.
^ LS-12 has 0.13 % bismuth.

8.1 Trace Native gold in Metallics assays

Re-analysis of 5 of these samples for metallics gives the highest value, 0.77 mg of metallic gold, in LS-02. This is a "quartz vein within garnet skarn, 0.5 m wide (Kennedy 2003)". Total gold is 8.84 g/t. Metallics FA for LS-09 (skarn float with massive arsenopyrite, pyrite, quartz, pyrite, pyrrhotite) and LS-12 (vein) gave 0.16 and 0.11 mg. The total gold content of 8.80 and 14.17 g/t respectively is not mostly particulate native gold, it is in very fine-grained auriferous bismuth telluride minerals.
By Group 1D ICP (Kennedy 2003):
LS-09 has 13.313 Au (by FA) / 25.6 Te / 772 Bi / 29.6 Sb / > 10,000 As / 351 Pb / 61.4 Ag / 355 Co / 7.4 Se and 10.5% Fe. As is 8.8%.
LS-12 has 13.504 ppm Au (by FA) / 40.2 Te / 1,299 Bi / 1.6 Sb / 343 As / 6.8 Pb / 3.0 Ag / 40 Co / 4.2 Se and 10.5% Fe.

8.2 Correction to Ray (2004)

A correction to the statement "Many samples are enhanced in Au, with values up to 36,274 ppb (Ray 2004 p. 6)" is necessary. *This value is from BH-21 collected from the Blue Quartz Vein (site on fig. 2), not the Lefevre Skarn.* BH-21 is "a 125° striking quartz vein with pyrite, molybdenite, vuggy, dipping 65° SW, 6 inches wide (Kennedy 2003 Appendix 1)". Skarn LS-09 is highest in Au at 13.3 g/t (Table 13 above). It is not from a trench or working, but *float 20 m NW of the northernmost trench, Trench #13*. "Skarn argillitic schist (Ray 2004)" mapped further N at UTM 5,434,300 m N – 471,605 m E in a covered area in Bunker Hill Trib infers the Lefevre Skarn continues northward under drift. This buried 'Lefevre Extension' may lengthen the mineralized area to 200 m N-S from 100 m N-S. The width is about 30 m W-E.

8.3 Sphalerite skarn sample 0421

In 2004 fieldwork one grab sample was collected, sphalerite skarn 0421 from the S wall of the southernmost Lefevre Trench #1 at UTM 5,434,078 m N – 471,615 m E. 0421 has abundant massive very coarse grained (2-3 mm sized) disseminated very dark brown sphalerite with recrystallized quartz and medium brown plagioclase (or partly scheelite?). Outer weathered surfaces are coloured medium red brown by limonite. 0421 ran 0.007 (nil) Au / 272 Cd / > 10,000 Zn / 0.22 Ag / 1.14% Fe / 58.7 W (anomalous) (all ppm).

8.4 Auriferous Bi–Te Minerals in the Lefevre Skarn and Lefevre Quartz-sulphide Veins

In the 1937 paper by H.V. Warren & J. M. Cummings 'The Relationship Between Gold and Metallic Minerals in British Columbia' fig. 4 of a quartz vein from Waneta Mines, Limited workings at Bunker Hill shows

"Pyrite veined by quartz, an unidentified bismuth - lead mineral, probably galenobismutite, $PbBi_2S_4$ and a gold telluride. Gold is present as a telluride which, in close association with an unidentified bismuth mineral, veins pyrite. Gold - bearing telluride has been introduced during a late period of mineralization ... in fractured portions of an old period of mineralization."

The material is likely from the Underhand Stope Vein in Adit 2 mined in 1934. A similar mineral association in the Lefevre workings is inferred by 2004 re-analysis: geochem infers **an unusual Au–Bi–Te–W–As mineralogy** like that described in this report for the BiTel Knoll Veins but different in higher base metal mineral content. **The Lefevre Skarn and crosscutting Lefevre quartz-sulphide veins likely have gold-bearing bismuth-telluride minerals and trace Ag–Au selenides associated with pyrite + pyrrhotite + arsenopyrite + scheelite ± trace chalcopyrite, sphalerite, galena + molybdenite.** Antimony-bearing minerals are absent. Somewhat comparable is "…younger quartz-bearing Au–Bi–Te–Se–As mineralization spatially associated with the Emerald-Tungsten W skarns {Ray and Webster, 1997} (Ray 2004)".

8.5 Comparable Tungsten and Gold Skarns in Alaska

In the Fairbanks district of Alaska *proximal* tungsten and gold-bearing tungsten skarns occur on the periphery of Fort Knox-type plutonic-related granitoid-hosted gold deposits (Allegro 1987, Newberry et al. 1997, Newberry 1998, Thompson & Newberry 2000, Hart et al. 2002).
There, tungsten + gold skarns formed "mainly from middle Cretaceous magmatic-generated hydrothermal systems" (McCoy et al. 1997 p. 194). "Alaskan W skarns ... show variable enrichments in F, Zn, Cu, Sn and Ag and severe depletions in Ni and Co. *Gold-rich skarns are typically rich in As, Te, and Bi and low in Mo and Ag* (Newberry et al. 1997 p. 375)." This well describes element budgets in the Lefevre workings. **Concluding, the mineralogy and geochemistry of the Lefevre Skarn and overprinting Lefevre quartz-sulphide veins is that of a *proximal* tungsten + gold skarn system[18].**

At the Gil tungsten + gold skarn (10.7 million tons at 1.3 g/t), Jensen et al. (2003) note reduced, Fe-rich lithologies are favorable hosts for this *distal placed* deposit. "Brittle, cross-cutting quartz, calcite, white mica veins" mineralize calcareous amphibole schists.

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[18] The writer has field experience with tungsten skarns in Yukon: the Marn (near Dawson city) and Ray Gulch (at Dublin Gulch, see Lennan 1983, Hitchens & Orssich 1995).

9 Limpid Roadside Veining

On Sept. 11 2004 C. Kennedy, B. Doyle & self re-sampled quartz veining **in Bunker Hill granite** in blasted roadcuts along the S side of Limpid Creek Forest Service Rd. The site is just E of the northerly trending intrusive contact, 650 m N of BiTel Knoll near UTM 5,434,959 m N – 471,548 m E (inset Location Map on fig. 2 or fig. 3). It is very convenient for sampling. The site is **meters E of the intrusive contact.** Ray (2004 Map 1 and p. 16) notes a “2 m thick dyke of black, biotite-rich lamprophyre that trends N and dips 42° E” and a SSE trending chloritic fault plane cutting the granite. Downhill is an unmapped “area with skarn potential (op. cit. Map 1)”.
At least four quartz veins occur. They are rusty with limonite after pyrite and other trace sulphides. The 117° 72° SW orientation near parallels the road; uphill veins are drift covered. Two previous channel samples BH-10 and BH-11 (Kennedy 2003) are **gold anomalous** at 0.594 and 0.096 ppm:

Fig. 15 C. Kennedy (foreground) & B. Doyle examining Limpid Roadside Veining in a roadcut along the Limpid Ck Forest Service Road (fig. 3). Quartz veins are intrusion-hosted in the Bunker Hill Sill. Vein orientation 117° 72° SW near parallels the road. Year 2003 samples BH10 & BH11 are anomalous at 594 & 96 ppb gold. In Sept. 2004 0417 0418 & 0419 were sampled. 0417 has anomalous Au 0.13 / Ag 1.3 / Mo 490 / Pb 375 / As 98, all ppm. Bi and Te are background. Some vein fractures are tourmaline-coated. The site is 650 m N of BiTel Knoll veins along the same W contact of the Bunker Hill Sill.

Table 14 Limpid Roadside Veining Quartz samples including two previous samples

Sample	Au by ICP-MS	Au by FA	Bi	Te	Ag by ICP-MS	Mo	Pb	*Fineness	W
BH-10	0.594	—	9	—	8.4	158	2,182	66	6
BH-11	0.096	—	5	—	3.6	671	498	26	18
0415	—	0.05	—	—	—	—	—	—	—
0416	0.042	0.04	10.2	0.5	2.544	58	64	N/A	6.7
0417	0.103	0.13	1.4	0.2	1.325	490.8	375.8	89	3.9
0418	0.005	—	1.3	0.1	0.799	111.1	221.3	N/A	0.5
0419	0.013	< 0.01	0.6	0.1	0.652	111.6	342.4	N/A	7.3
0516	—	0.02+	—	—	< 2+	—	—	—	—

***Fineness calculated using Au determined by Fire Assay and Ag by ICP-MS.**
N/A fineness not calculated; precious metals assay extremely low.
— not determined
+ metallic screen method

BH-10 is a 10-inch vein with a limonite rich margin.
BH-11 is a similar subparallel 10 inch vein with “limonite and a pyrite-rich margin” in ‘skarned’ altered granite. For both, Te and Se were not analyzed by Acme Analytical’s Group 1D ICP procedure.
In Sept. 2004 six samples, 0415 to 0419 inclusive & 0516, were collected to further characterize the showing:
0415 is a grab sample of rusty, well-fractured quartz with common limonite and trace black Mn staining. It was only fire assayed.
0416 is a 60 cm chip sample of off white moderately fractured quartz. Yellow brown limonite coats 0.5 – 3 cm-spaced fractures, some coated black with dendritic Mn stain. As is 15 ppm, Bi moderately anomalous and Te background.
0417 is a grab sample of rusty, well-fractured quartz. At least three sets of 5-10 mm spaced fractures are coated with minor pyrite and minor unidentified medium grey-blue sulphides with good metallic luster. Sulphide content is < 1%. Some vein fractures are tourmaline-coated. Mn staining and muscovite (sericite) occur along the granite contact. Au at 0.103 is definitely anomalous, though Bi and Te Se are background.
0418 is a grab sample of massive, compact and non-porous white quartz. Poorly developed 5 mm-spaced fractures have trace pyrite and tourmaline (?) and an unidentified steel grey mineral. Some fractures are limonite-coated. Analysis ran nil Au and background Bi, Te, Se and W yet with anomalous Mo Pb As (5.5 ppm) and Ag.
0419 is a grab sample of quartz with common tourmaline on fracture surfaces taken beside BH-10. Trace pyrite and fine-grained arsenopyrite (?) occur with slight Mn staining. Very light grey-blue flinty microcrystalline quartz has common 3-10 mm spaced fractures, often coated medium grey with cryptocrystalline tourmaline. One fracture set is dominant. One selvage is kaolinite-altered granitoid, with trace sericite. Minor red brown limonite occurs along some fractures. 0419 is not anomalous with nil Au and background Bi and Te Se yet with anomalous W Mo Pb As (11.7 ppm) and Ag.
0516 is massive and compact very light - light grey blue quartz. Secondary limonite and fracturing is absent. Tourmaline ‘slips’ and trace pyrite occur. 0516 was only fire assayed, and was not anomalous.

Summarizing, **Limpid Roadside Veining is weakly mineralized with minor pyrite, trace argentiferous galena and possibly molybdenite.** It is geochemically anomalous in trace elements that characterize Intrusion–related gold systems, namely (in abundance order) Pb, Mo, W, As, Ag and Au but not Bi[19] and Te, 'defining' elements. **It well compares to a faintly mineralized version of the Moly Quartz Vein: both are *intrusion-hosted* with tourmaline though not Au–Bi–Te mineralized.** Limpid Roadside Veining is at a favoured location close to the W intrusive contact. Projecting the HCA Limestone + Argillite unit black Limestone bed along trend, downhill to Clel Ck, is an "area with skarn potential (Ray 2004 Map 1)", unmapped.

10 Float along Covered Skid Trail

A small boulder of rusty, multiphase quartz BH-30, "float with gray sulfide, milky quartz, some limonite and pyrite" (Kennedy 2003), occurs 20 m up the covered skid trail at UTM 5,434,537 m N – 472,042 m E at its intersection with the Limpid Ck Forest Service Rd. It is gold anomalous at 2.16 Au / 365 Bi / 24.1 Ag / 140 Mo / 347 Pb (op. cit.). ICP-MS re-analysis in 2004 gave 1.95 Au / 299 Bi / 16.3 Te / 18.87 Ag / 3.4 W / 147 Mo / 343 Pb / 1.5 As / (ppm).
The unknown source is presumably uphill, and local. It was not re-sampled.

11 Showings with nil gold

11.1 Mineralized Qtz float along 9-3 Hydro Tower Access Rd

Small boulders of vuggy, multiphase quartz veins with limonite from weathered sulphides occur along the (upper) 9-3 Hydro Tower Access Rd at UTM 5,434,070 m N – 471,790 m E (0440) and about 90 m south (0439).
These are uphill and north of BH-62 "pyrite-rich quartz / quartzite float" at UTM 5,433,692 m N – 471,983 m E (Kennedy 2003) that ran 1.49 Au / 138 Bi / 1.3 Ag / 192 W / 43 Mo / 8 Pb / <0.5 As and 7.57% Fe. Te and Se were not analyzed. ICP-MS re-analysis gave 1.45 Au / 110 Bi / 3 Te / 1.2 Ag / > 100 W / 41 Mo / 8 Pb / 0.4 As (ppm) and 7.53% Fe. Float BH-62 was not re-found.
To the N along the 9-3 Hydro Tower Access Rd grab samples 0439 and 0440 of angular rusty quartz float with mm to cm-sized vugs and inclusions of black argillite were not anomalous in gold at 5.7 and 4.0 ppb by ICP nor indicator elements.

11.2 Timbered Shaft Quartz Vein

Howard (2000) describes this; it was not examined in 2004. It is included for comparison with other 2004 showings. Of two samples from Kennedy (2003) BH-28 and BH-29, BH-29 is argentiferous galena with >9999 (> 10,000 ppm or > 1%) Pb. It has 3 Mo, 34 Cu, 439 Zn, 53 Bi, 26.3 Ag (ppm) and 2.5% Fe. Mineralization is "quartzite breccia with galena and pyrite"; it is not gold-anomalous at 0.026 ppm. The Timbered Shaft Quartz Vein assemblage of argentiferous galena and pyrite is similar to the Moly Quartz Vein and Limpid Roadside Veining.

11.3 Vein near Timbered Shaft

A well-exposed foliation-parallel quartz vein occurs a few meters E of the Timbered Shaft at the contact of resistant medium argillaceous quartzite and recessive black very schistose argillite. At ground level the quartzite is banded red-brown and dark yellow. The site is not far from a skid trail at UTM 5,434,340 m N – 472,070 m E. A 12 cm channel sample 0401 is not anomalous at 3.4 ppb Au by ICP.

[19] Excepting 10.2 ppm Bi for 0416

11.4 Blow-down Quartz Vein

0410 is from a large outcrop of white quartz veining ~ 5 m wide by 1.5 m long below a blown down tree at UTM 5,434,006 m N – 471,756 m E ± 30m. Ray (2004) maps a limestone xenolith [not found] in granite nearby (fig. 3). Trace limonite occurs in rare fractures. There were no ICP analyses. One vein is 21 cm thick, the lower contact oriented 124° 65° NE, the upper contact with sericitized granite 135° 72° NE. It ran nil Au at < 0.01 g/t & < 2 g/t Ag by FA; there was no ICP analyses.

11.5 Granite hosted Quartz vein NNW of 9-3 Hydro Tower

Two grab samples 0411 and 0420 are of bull quartz from quartz veining in granite 125 m NNW of the 9-3 Hydro Tower Access Rd at UTM 5,433,863 m N – 471,924 m E (fig. 3). A small ridge 1.5 m high has veins oriented 012 68 SE and 165 74 SW. Quartz is white, unfractured, generally compact and 'sugary'. Mm-sized euhedral quartz crystals in common 3 mm-sized vugs are abundant. No sulphides occur, but a trace light green mineral (fluorite?) was noted. Quartz is white to clear, granular or 'sugary' and very compact, in veins to 16 cm thick. Both samples are not anomalous at 0411 0.01 g/t Au & 0420 < 0.01 g/t, and both < 2 g/t Ag. There were no ICP analyses.

12 Method used to Illustrate Bi and/or Te soil anomalies, partly coincident

High bismuth and tellurium occur with gold in the BiTel Knoll veins. To enable ready visualization of both Bi-and-Te-in-soil anomalies nearby a weighted sum procedure is used to recalculate analytical values of soils from the Bunker Hill – Lefevre grid (results in Howard 2000). A grayscale grid displays these on fig. 3. Contours of Fraser-filtered positive dip angles from the VLF-EM total field survey (Howard 2000) overlie this. Bi and Te are *specific* pathfinder elements for gold mineralization (Boyle 1979), especially in the Intrusion-related environment.

12.1 Calculation of Bi+Te weighted sums

A weighted sum index formula detailed in Garrett et al. (1980) is used. A linear combination of Bi and Te, each equally weighted (0.5 in the index), forms the indices. The weighted sum values are **'robust'** as estimates of the means and standard deviations are trimmed values, less influenced by anomalous outliers (the extreme values of practical interest). Consider the Bi-Te weighted sum as an empirical index of buried gold potential in the area of the Bunker Hill – Lefevre grid.
Trimmed $_{5\%}$ robust estimates of the parameters used in the index are determined from normal probability plots (Hintze NCSS 2000).

Data is trimmed from both ends of the distribution, after filtering out low, less-than-threshold values [both elements] or high values [Bi]. Martinez–Iglewicz statistical tests[20] (1981) of a normal distribution of the filtered and trimmed data are satisfied for both elements.

[20] This test is based on the median and a robust estimator of dispersion (Hintze NCSS 2000).

Element	Filter, only values considered with	Trimmed $_{5\%}$ Mean	Trimmed $_{5\%}$ Standard Deviation	No. of values considered by the 5% trimming	Original no. of soil values after filtering
Bi	**>0.5, <15 ppm**	**5.92**	**2.37**	**26.1**	**29**
Te	**>9 ppm**	**11.7**	**1.30**	**33.3**	**37**

Table 15 Filtered and Trimmed $_{5\%}$ robust estimates of the mean and standard deviation of the distribution of Bi- and Te-in-soil values

The formula is

$$\mathbf{Wtd_{Bi+Te-in-soil} = 0.5*((Bi_{in\text{-}soil} - 5.92)/2.37) + 0.5*((Te_{in\text{-}soil} - 11.7)/1.30)}$$

Values are normalized[21] 'z-scores' as the element means are subtracted from the analytical values and divided by the element's standard deviation. The $\text{Wtd}_{\text{Bi+Te–in–soil}}$ sum index values or scores are also robust as robust estimates of means and standard deviations are used. Note as the initial distribution is not a normal (i.e. Gaussian) distribution, it remains non-normal, that is skewed by variably high anomalous values.

12.2 Construction of the grayscale grid (fig. 3) illustrating Bi and/or Te anomalies

To map the index values, they are inverse distance weighted by a search ellipse of major axis 80 m and minor axis 30 m oriented at 22° (MapInfo V 4.2–Discover V 3.0 software options). A grayscale grid interpolates the values at 2 m pixel intervals for fig. 3. Whiter areas well outline anomalous Bi and/or Te soils coincident with Domain 5.

13 Integration with VLF–EM Total Field Geophysical Anomaly Groups [Domains]

To advantage continuing exploration efforts, the 1999 VLF–EM ground geophysical survey of the main Bunker Hill – Lefevre grid (Howard 2000 Drawing #19 and p. 15, 25 therein) is reinterpreted in light of more recent work, e.g. Ray's mapping (2004) for Kootenay Gold, and the grayscale grid interpolating the $\text{Wtd}_{\text{Bi+Te–in–soil}}$ weighted sum indices (fig. 3).

13.1 Domains 1–3, East Anomaly Group

The mean 020° strike of Eloise Vein & Ella Main Vein closely corresponds with the NNE trend of a group of VLF–EM Fraser-filtered positive dip angle anomalies named Domains 1–3. **High Fraser-filtered dip angles in the positive teens surround single-digit anomalies.** The dashed white lines on fig. 3 outline five anomaly trends. **The mean of the five linear trends is 26°** with a low standard deviation 1.3°. Domains 1–3 form "a moderate, NNE trending, disjointed group on the E and S parts of the grid ... stronger sections of the S group (Domain 1) appear to be spatially associated with the Lefevre Skarn trenches near L 2+50 N and 3+10 E (Wehrle 1999)".
Domain 1 has a high of +13° just W of Lefevre Trench 7 at UTM 5,434,138 m N – 471,600 m E). It continues SW of the Lefevre workings.

[21] Or standardized with the mean of the z scores, the standard scores, 0 and the standard deviation 1. Z scores are multiples of the standard deviation of the distribution, indicating distance from the mean in standard units.

To the NNE Domain 3 straddles the mapped intrusive contact; it is broader than Domain 1. It coincides with a northeasterly inflection of the intrusive contact (Ray 2004). The N high is 23 m S of the W end of the Moly Quartz Vein Trench, at 3+62.5 m on line L4+50 (UTM 5,434,338 m N – 471,670 m E), a +11° value. Domain 3 is a 180 m-long covered area between the Lefevre Skarn and the Moly Trench. It is prospective and open-ended. It is apparently the source of highly anomalous Bi + Te in soils found slightly downhill to the W (grayscale grid, fig. 3).

Domain 2 is an open, double-station +15° anomaly at the grid's SE corner. It coincides with the S part of the Lefevre Skarn (fig. 3).

Domains 1–3 together form a 250 m (plus) long SSW–NNE trending anomaly, about 50 m wide, open on to the S, E and NE (fig. 3 and Drawing # 19 & Fig. 5 after p. 14[22] in Howard 2000). Additional VLF–EM geophysics may identify BiTel Knoll veining to the NE. Magnetic pyrrhotite present in the skarn suggests a ground magnetometer survey would be very effective (Pratico 1999). Clearly, it may be propitious to resurvey.

13.2 Domains 4 & 5, West Anomaly Group with similar NNE trends

Domains 4 & 5 are prominent anomaly groups, again covered (fig. 3), W of the Bunker Hill – Lefevre grid, W and N of Adit 1. Domain 5 is a target for buried, *intermediate to distal*, auriferous replacement or skarn mineralization (Howard 2000). Maximum positive dip angles are 18° on L4+50N and 20° on L5+00N. It is open to the N. Au Ag Bi Te As Sb Pb Zn Cd Co Fe Mn and Ti are geochemically anomalous in soils. Pb & Ag and Bi & Te enrichment with background Mo and W give an element signature that differs from the contact-related *proximal* Lefevre W + Au skarn. Domain 5 is further from the intrusive contact – i.e. *intermediate to distal-placed*. "Pyroxene-dominant gold skarns ... tend to be sulphide rich [thus possible VLF-EM conductors] … distal to the pluton (Ray 1996)" and recessive. The *distal-placed* Gil gold skarn (Jensen et al. 2003) may be an analog.

Three neighbouring, anomalous Te-in-soil values on L5N, the last north grid line, highlight Domain 5's prospectivity: 1+25E 14 ppm, 1+50E 12 ppm and 1+75E 16 ppm (Howard 2000). Bi values are anomalous at respectively 3.7, 5 and 4.5 ppm. The weighted sum $Wtd_{Bi+Te-in-soil}$ index values (Section 12) are high and anomalous. An interpolated grayscale grid highlights these soils in white shades on fig. 3. Te and Bi are *specific* indicator elements for Intrusion-related Au mineralization.

The Domain 4 anomaly axis is surprisingly ~ 45 m W and downhill of Adit 1 (fig. 3). A 022° 61° SE fault just above the caved Adit 1 tunnel (Howard 2000 Map 1) is along trend. The survey indicates NNE faulting or shearing in HCA country rock the length of the grid. Later easterly faulting may disjoint or dismember originally continuous anomalies. N of Adit 1 are old sloughed trenches:

"It is considered possible that strong quartz exposures, about 100 feet to the N of and above No. 1 adit[23], may have some relation to the main vein system (Minister of Mines 1934 p. E24)".

Combined VLF–EM–Mag geophysical surveys may outline other buried structures, possible controls of Intrusion-related Au–Bi–Te mineralization.

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[22] 12.5 m interpolated Fraser-filtered data points are incorrectly offset in this hand drawn fig. on line L 4+50 N
[23] Veins in these sloughed trenches are now covered; hand trenching warranted.

14 Gold Grade Estimation

14.1 Sampling is preliminary

A broad, general estimate of the gold grade tenor of the BiTel Knoll veins is 1 – 10 g/t Au; precise mean grades of individual veins are unknown. The usual problems estimating grades of individual veins by hand sampling apply. The sample set is small due to the restricted exposure. The population of n=39 samples from Eloise, Ella and Clarissa veining is about the limit for numerical analysis; sampling is preliminary work. Eloise Vein is more auriferous than Clarissa veining at ~ 2.4 g/t. Of 39 BiTel Knoll samples, 26 are channel samples and 13 are grab samples. The latter include two mineralized, angular boulders and a granitic dyke (fig. 2). However, Au–Bi–Te values to tens and hundreds of ppm confirm the especial exploration environment of an Intrusion-related gold system. Unusual gold-bearing bismuth tellurides occur[24]. These are rare, worldwide.

14.2 Normal probability plot of logarithm of gold grades and robust estimates of mean, standard deviation and coefficient of variation

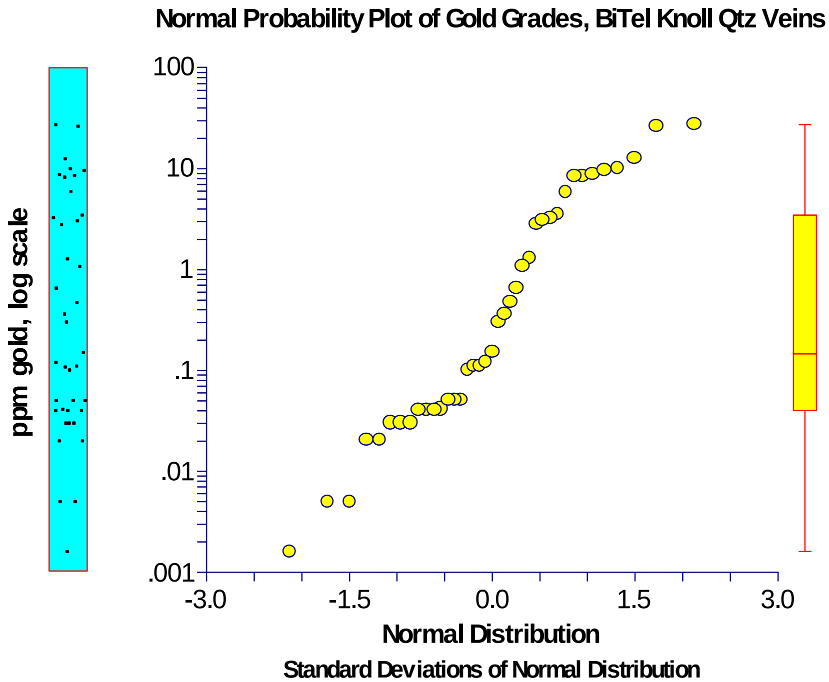

Fig. 16 Normal probability plot of log gold grade of all BiTel Knoll qtz vein samples, n=39

The three lower values are from Ella vein and the granite dyke. Note three slopes are apparent. Log transformation of the values does not form a normal distribution: the Anderson-Darling test rejects normality at a probability level of 0.019 (Hintze NCSS 2000 software). The simple arithmetic mean is 3.44 g/t Au, the standard deviation near double at 6.47 g/t. Trimming values from each side of the distribution allows for robust estimates of the mean and standard deviation:

[24] Warren & Cummings 1937 describe gold telluride in a microscopic study of ore from the Bunker Hill Mine.

Percent Trimming (each side)	Trimmed Mean 'x'	Trimmed Standard deviation 's'	No. of values considered	Coefficient of Variation s / x
nil	3.44	6.47	39	1.88
5	2.34	3.75	35.1	1.60
10	1.90	3.05	31.2	1.61
15	1.52	2.50	27.3	1.65

Table 16 Bitel Knoll quartz vein gold grades - trimming the data set allows for 'robust' estimates of parameters of the distribution of gold grades

Clearly minor trimming of the data stabilizes parameter[25] estimates. Trimming ignores both high-grade grab samples and chip samples without mineralized clots (i.e. exposed part of Ella vein). **The trimmed mean$_{5\text{-}10\%}$ values 2.34 – 1.90 g/t is a good estimate of the range of gold tenor. Note with trimming the standard deviation lessens and stabilizes at about 3 g/t.** The coefficient of variation defined as

$$C = s / x$$

markedly stabilizes at approx. 1.6 with successive trimming. As robust estimates of the parameters are used this is a 'robust' **coefficient of variation. This 'relative standard deviation' is very high at 160%.**
"The coefficient of variation is a parameter that, in the early stages of an exploration programme, is very suitable for providing **a quick indication of the variability of the sample data and the grades of the proposed exploitation,** for example by comparing C with known values derived from other deposits… According to Champigny & Armstrong (1989), isolated high-grade values have a marked effect if C exceeds 1.5 (Wellmer 1998 p. 23-24)".

The coefficient of variation of various gold-quartz vein deposits in Western Australia ranges from 0.8 – 1.6 (op. cit. Appendix Table 1). In the BiTel Knoll veins clots of Au–Bi–Te minerals give statistical outliers (i.e. extreme values) that significantly increase gold grades. **This is an example of the 'nugget effect' (Dominy et al. 2000) though with clots of micron-sized to very fine grained gold.**

[25] parameter – the statistic, e.g. mean, standard deviation or coefficient of variation

14.3 Limited data on 8 Eloise Vein Chip Samples

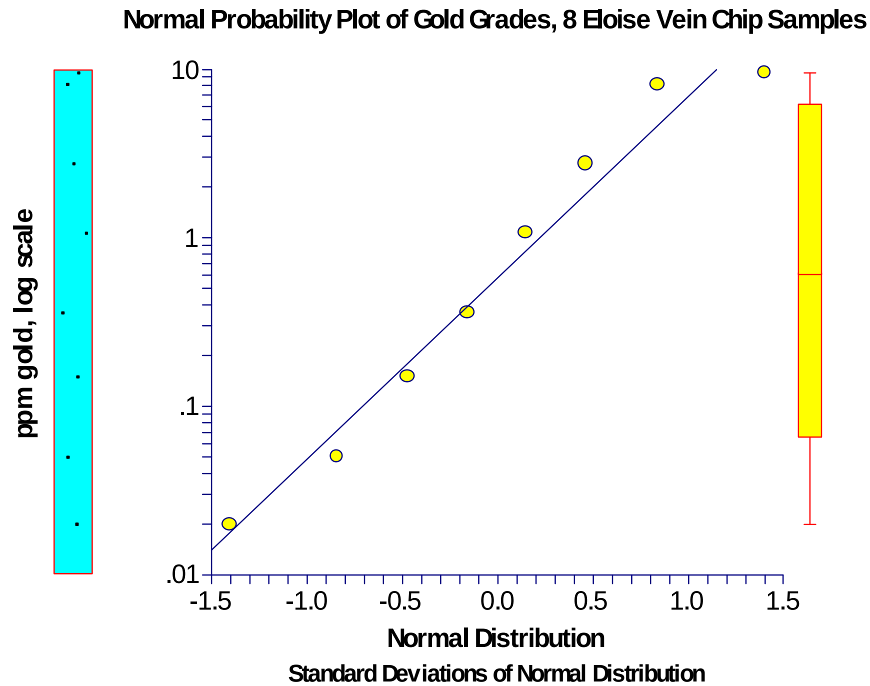

Fig. 17 Normal probability plot of log gold grade of Eloise Vein chip samples, n=8

The very limited data set of 8 Eloise Vein chip samples forms a log-normal distribution with no outliers – the line is nearly straight. Samples range from 0.30 m to 1.5 m thick. The mean is stable at ~ 2 g/t Au with successive trimming:

Percent Trimming (each side)	Trimmed Mean 'x'	Trimmed Standard deviation 's'	No. of values considered	Coefficient of Variation s / x
nil	2.77	3.89	8	1.40
5	2.54	3.68	7.2	1.45
10	2.26	3.37	6.4	1.49
15	1.95	2.99	5.6	1.53

Table 17 Eloise Vein chip sample gold grades - trimming the data set shows the 'robust' estimates of parameters of the distribution of gold grades are nearly the same

With minimal sampling, the trimmed mean$_{5\text{-}10\%}$ values **2.5 – 2.3 g/t is a fair estimate of the range of Eloise Vein gold tenor.** A 'robust' estimate of the coefficient of variation of Eloise Vein gold grades is high at 1.5. Compare all 39 BiTel Knoll chip and grab samples with 8 Eloise Vein chip samples:

Vein	No.	Mean	Trimmed Mean $_{5\%}$	Trimmed Mean $_{10\%}$	Trimmed Mean $_{15\%}$	Standard Deviation	Standard Deviation$_{10\%}$	Coefficient of Variation$_{10\%}$
All veins, grab & chip samples	39	3.44	2.34	1.90	1.52	6.47	3.05	1.61
Eloise chips	8	2.77	2.54	2.26	1.95	3.89	3.37	1.49

Table 18 Eloise Vein chip samples vs. all BiTel Knoll vein samples - 'robust' estimates of parameters of the distribution of gold grades are near equal

Parameter estimates are stable with successive trimming, as expected more so for the set of Eloise Vein chip samples. One inference is that 2004 grab samples are not overly selective of exceptional mineralization. Another is that the mean gold grade *of all the veins* is approx. 2 g/t, the trimmed$_{10\%}$ mean of *either distribution.* The trimmed$_{10\%}$ coefficient of variation C is nearly the same for the single Eloise Vein or all the BiTel Knoll veins considered together, very high at 1.5 – 1.6 or 150 – 160% of the mean grade.

14.4 Limited data on Adit 1 Gallery and Blue Quartz Veins

Comparing limited data on other occurrences, the **mean grade of four Adit 1 Gallery Quartz Vein channel samples** is more than double the BiTel Knoll veins at **5.48 g/t Au.** The range is 2.9 – 10.9 g/t. The structural orientation of the Adit 1 Gallery Quartz Vein and its similar element content show this multi-phase extensional vein is part of the BiTel Knoll vein system rather than a silver-enriched, moderate sulphide-content Bunker Hill vein with Ag > Au.

Three grab samples of the fault-hosted Blue Quartz Vein ran 3 – 10 g/t Au. This is of course lower than the grade of 14.4 g/t from 2.45 tonnes high-graded (hand-sorted) in 1933.

14.5 Comparison with the Ridge showing, Rozan property near Nelson

This is the nearest similar *intrusion-hosted* showing the writer is aware of. The Rozan property (082FSW179) is 10 km S-SW of Nelson (see Figure 1A). Diorite to granodiorite intrusives (Grunenberg 2001), mapped as the Nelson batholith, intrude Rossland Group rocks. **"Low grade stockwork gold bearing quartz veins and higher grade bonanza type veins"** occur (op. cit.).

"Chip sampling in trench #2, located just west of the road along the Ridge zone … returned **0.93 g/t over 17 m, including a section with 2.37 g/t Au over 4.5 m** [unpublished report by Yukon Revenue Ltd., Eric Denny, personal communication, 1999]. **The sheeted auriferous quartz veinlets of the Ridge Zone on the Rozan property look identical to low grade mineralization at the Fort Knox mine in Alaska and Dublin Gulch** property in the Yukon. The intrusive host, lack of alteration selvages, low sulphide contents and anomalous Bi, Mo and Te values are consistent with these types of plutonic-related gold deposits (Cathro and Lefebure 2000)". The mineralization age is unknown.

Emgold Mining Corp. drilled two BQ2 diamond drill holes totaling 304.19 m and chip sampled areas of veining in 2000 (Grunenberg 2001).

Compare high values of rock chip samples with BiTel Knoll veining geochem:

Sample		Mo	Cu	Pb	Zn	Ag	As	Bi	W	Au ppm
by Phelps Dodge (Cathro and Lefebure 2000):										
PD-55131	Ridge Zone Te 11.3	1.9	18.1	8.7	10.3	1.4	1.9	14.2	40	3.100
PD-55132	Ridge Zone Te 1.5	204	29.5	16.9	3.4	2.5	4.5	4.2	9	0.253
by Emgold (Grunenberg 2001):										
00-ROZ-02	aplite dyke, pyrite 20 cm chip	2	16	17	12	1.3	<2	39	18	2.93
00-ROZ-06	quartz-sulphide vein, 40 cm	17	36	1,339	380	195.6	5	1,070	75	4.60
00-ROZ-11	aplitic vein, 10 cm with py, quartz	12	10	81	7	7.8	<2	180	139	0.41
00-ROZ-12	shaft on quartz-sulphide vein 60 cm chip	8	3	9	2	1.5	<2	16	474	12.73
00-ROZ-13	dk grey quartz vein in granodiorite 2 cm chip	2	120	184	463	6.2	<2	8	56	0.46

Table 19 Rozan Property, Geochem of rock chip samples with two Te values

Highest Bi in 00-ROZ-06 is associated with high Pb–Zn–Ag–Mo). Au is 4.6 g/t but Ag is much greater at 195.6 g/t. 00-ROZ–11 is similar with enhanced Pb and Ag > Au. These element contents infer ***distal*** **geochem** like the Moly Quartz Vein, possibly late mineralization.
Samples with ***intrusion-hosted or proximal*** **geochem** are 00-ROZ-12 with the highest Au 12.73, Bi at 16 and significant W 474 (all ppm) and *trace base metals.* 00-ROZ-02 is similar. The first Phelps Dodge Ridge Zone chip sample is alike with 3.1 g/t Au and enhanced Te 11.3 ppm (Cathro and Lefebure 2000). In core the maximum Bi is 4 ppm with 0.34 g/t Au in hole RMM-00-01 from 11.08 - 13.30 m (Grunenberg 2001 Appendix III). “The density of veining indicated by drilling is not of an abundance indicative of potential economic significance at the low grades”.

Geochem of **Rozan quartz vein and aplite samples** indicates *proximal or intrusion-hosted* mineralization like the actual setting of the occurrences. Rozan rock samples have **enhanced bismuth and tellurium but the *auriferous BiTel Knoll veins have Bi and Te about ten times abundant.*** For example, a 0.41 m chip of Eloise Vein has 27.03 Au / 1,601 Bi / 95.4 Te (ppm, sample 0412, fig. 2). Higher Bi and Te concentrations suggest a more promising environment for Au associated mineralization on CLY Gp. **Vein density is also greater at BiTel Knoll** than at Rozan – and possibly in the buried areas to the S, N and E (fig. 2).
In addition to “good exploration potential for the discovery of a small, high grade, vein-hosted gold deposit” (Ray 2004) on CLY Gp, a large, bulk tonnage, low to moderate grade deposit may be present.

14.6 Ore-grades with vein density possibly sufficient for a deposit

Concluding, erratic and dispersed concentrations of Au–Bi–Te minerals in the Bitel Knoll quartz veins and chip sampling limited by exposure make precise estimates of mean gold grades for the veins difficult. **For all the veins collectively and Eloise Vein individually, a preliminary estimate of the mean is approx. 2 g/t Au.** This is obtained by successively trimming sample distributions (trimming both the high and low ends). **The simple arithmetic mean of all BiTel Knoll vein samples is 3.44 g/t Au. The estimated 'trimmed' gold grade ~ 2 g/t is about double that of bulk-tonnage ore grades for this deposit type: an *intrusion-hosted* and/or *proximal,* Intrusion-related deposit in the form of multiple thin, sheeted, low-sulphide quartz veins along fractured & faulted zones in granitic rock (specifically like Fort Knox or the Eagle Zone at Dublin Gulch).**

Deposit	Grade, g/t Au†	Tonnage, Mt	Resource, M. oz. Au	Mineralogy	Vein Widths & Density	Elements Associated
Fort Knox	0.93	169	5.4	< 0.1 – 0.3% sulphides: gold, maldonite, bismuthinite, Bi tellurides, arsenopyrite, pyrite, molybdenite, scheelite (McCoy et al. 1997)	Milky white stockwork qtz veins 0.5 to 7 cms thick (Bakke 1995). Ave. 15 per m. M-wide veins occur	Au Bi Te Mo W (As Sb)
Dublin Gulch Eagle Zone	1.19	99	4.1	< 5% of vein: pyrrhotite, pyrite, scheelite, arsenopyrite, sphalerite, bismuthinite, gold, galena, molybdenite, Pb-Bi-Sb sulphosalts	Veins 0.5 – 10 cm, ave. 2– 3 cm thick. <1 to > 20 per m, ave. 5 per m (Maloof et al. 2001). M-wide veins occur	Au Bi Te Mo W As Pb Zn Sb
Clear Ck (Marsh et al. 2003).	Saddle Zone 24 m of 2.1 g/t	?	?	1–2% combined: arsenopyrite and pyrite, lesser pyrrhotite, trace scheelite, molybdenite, galena, chalcopyrite and bismuthinite	Veins typically 0.5–2 cm thick, locally to 12 cm. Vein density as high as 10 per 5 m, but 3–5 veins per 5 m is typical (Marsh et al. 2003).	(1) As Au Bi ± Sb Te (2) Ag Bi Pb ± As Au

Table 20 Features of Fort Knox and Dublin Gulch, *intrusion-hosted* Au–Bi–Te deposits, with mineralogy, vein widths & density and elements associated

† Pre-mining resource, figures from Hart et al. 2002

Vein density, expressed as cm of veining per m of rock [or equivalently, m of veining per 100 m of rock], is unknown about BiTel Knoll. **It is very high near the contact zone as veins average 1.5 – 1.9 m thick and high for the Clarissa Transverse Veins (45%).** In targeting a bulk tonnage deposit, vein density is an important factor influencing 'global' grades and the total resource. "Throughout the Tombstone Plutonic Suite, the economic potential of sheeted vein deposits primarily reflects the product of vein density and aperture [i.e., opening width or vein thickness] (Lang et al. 2001)".

Fig. 18 Fort Knox mine, side wall of open pit with a high areal density of sheeted gold-bearing quartz veins. A few are differently oriented. Photo courtesy T. Baker, with permission

Two directions of auriferous veining at BiTel Knoll, and a third, fault-related nearby at the Blue Quartz Vein, encourage further evaluation.
Large-diameter core drilling and bulk sampling by mechanical means may be necessary for a full evaluation. The coefficient of variation of gold grades is extreme at 1.5 – 1.6 or 150–160%.

15 Conclusions

Geochem analyses of 2004 rock samples highlight BiTel Knoll & environs (maps, figs. 2 & 3) as **a bulk tonnage, moderate grade gold ore target. The estimate of approx. 2 g/t mean gold grade of veining approaches ore-grade for the specific type of deposit. The coefficient of variation is very high at 1.6 or 160%, as dispersed clots of Au–Bi–Te minerals in the veins significantly influence the gold grades.** The granitic intrusive contact on BiTel Knoll is well-veined with large Au–Bi–Te–Mo–W quartz veins to 1.9 m (plus) wide. Subparallel veins occur in at least two sets. Host rocks are extremely hard, hornfelsed HCA Quartzite + Tuff unit argillaceous metaquartzites and more recessive (hence altered?) Bunker Hill Sill felsic granitoids. Quartz veins crosscut granitic rock but the contact and the granites are mostly covered. BiTel Knoll is better exposed. It is a geographic feature due to resistant, hornfelsed metasedimentary bedrock. Just south is minor historic production from two small blasted trenches in a covered area. This is lower in elevation and mostly sloughed (fig. 2, Section 5). Apparently, 1930's developers considered BiTel Knoll veining barren; sulphide content is considerably less than in quartz pieces from adit dumps. **More veins likely occur in the covered areas below and N-S along the Knoll. Other vein arrays likely occur along both contacts of the NNE trending Bunker Hill Sill. Vein density appears sufficient for development of a bulk tonnage deposit (point 20 below, fig. 14).**

(1) Country Rocks
Four large, named quartz veins Ella Main, Ella Offset, Eloise and Clarissa occur on BiTel Knoll. They are located at the W contact[26] of the Bunker Hill Sill. This is an outlier of the Wallack Ck stock, a mid Cretaceous 115 – 90 Ma Bayonne suite (Logan 2002a, 2002b) leucocratic granitoid. The favoured host is structurally competent, hornfelsed argillaceous metaquartzite of the lowermost Quartzite + Tuff unit (Howard 2000), a tripartite division of the Harcourt Ck Assemblage [HCA]. The HCA is a structural division (Einarsen 1995) of the upper Paleozoic to Triassic (?) Cs Unit (Little 1965, 1985). The Laib Formation designation for the layered rocks (Ray 2004) is incorrect, considering field mapping by Fyles & Hewlett (1959), Little (1965) and Einarsen (1995).

(2) Spatial Placement
BiTel Knoll mineralization is *intrusion-hosted to proximal*, part of an Intrusion-Related system (McCoy et al. 1997, Newberry et al. 1997, Lefebure & Cathro 1999, Thompson & Newberry 2000, Logan 2002a, 2002b, Section 3.1). Like more explored occurrences, veining developed "*in apexes of middle Cretaceous reduced plutons (here the ca. 115-90 Ma Bayonne suite Bunker Hill Sill) and in spatially associated sedimentary and metamorphic rocks. Gold is typically present in and around the tops of intrusions* (McCoy et al. 1997)."

(3) Poor Exposure
Vein terminations were not seen; along strike all veins are buried (fig. 2). Ella Main Vein is an exception. It appears to be fault-terminated on its N end, but may continue in en-echelon fashion, displaced NW as Ella Offset Vein.

[26] "Because of the brittle nature of ore-hosting structures, competency contrasts between hosting lithologies control the geometry of plutonic-related deposits (McCoy et al 1997)."

(4) Veins are Extensional
BiTel Knoll veins and the Adit 1 Gallery Quartz Vein have characteristics typical of extensional (tensional) Intrusion-related veins (Thompson & Newberry 2000). They are not fault-fill shear or 'mesothermal' veins after the criteria of Robert & Poulsen (2001), Section 7.2. These extensional veins are tabular, infilling fissures in very competent 'brittle' host rocks. Wallrock contacts are sharp. Vein quartz is dense and nonporous with rare mm-sized vugs. Ella Main Vein is at least 1.9 meter thick. It includes a large piece of spalled wallrock as a 'horse'. Original textures of the BiTel Knoll veins are somewhat obscured by common overprinting structures, mm-sized striations and cm-sized corrugations. Frequent 5 to 20 mm-spaced fractures occur in subparallel sets.

(5) Rare Mineral Assemblage
Observed mineralogy of the very low sulphide content, gold > silver BiTel Knoll veins and the Adit 1 Gallery Quartz Vein is quartz + minor bismuthinite + trace native gold + rare trace pyrite ± scheelite ± molybdenite(?) (Section 6.2). Ore mineral content is ~ 0.2 - 0.5 %. A bismuthinite + bismuth telluride + native gold mineral paragenesis is suggested as (1) specks of fine to coarse-grained native gold are always associated with clots of an undetermined bismuth mineral and (2) higher gold samples have correspondingly higher bismuth and tellurium contents. A host of rare minerals including auriferous bismuth tellurides may occur in trace though economic amounts including gold tellurides and "possibly galenobismutite" (Warren & Cummings 1937).

(6) Specific geochemical pathfinders present – Bismuth & Tellurium
BiTel Knoll and the Adit 1 Gallery Quartz Veins are geochemically anomalous in bismuth, tellurium, silver, molybdenum and tungsten with significant gold. Bi and Te are *specific* pathfinders, indicative of gold mineralization worldwide (Boyle 1979).

(7) Re-assay of Adit 1 Gallery Quartz Vein samples
Four 1999 channel samples of the Adit 1 Gallery Quartz Vein, re-assayed by Acme Analytical, gave precious metal values near equal to Loring Labs 1999 results at 2.9 – 10.9 g/t (Section 7.1.2). Acme has lower Te and higher Bi values than Loring. Acme's 2004 ICP Mass Spectrometry analyses for Te and Bi are more accurate than Loring's 1999 ICP Atomic Absorption Spectrometry. The Adit 1 Gallery Quartz Vein is *proximal to intermediate*, multi-phase Au(Ag)–Bi–Te–Mo– W mineralization. BiTel Knoll and Lefevre quartz-sulphide veins have more W, as befits their *more proximal* placement.

(8) Ella, Eloise and Adit 1 Gallery Quartz Veins parts of a lager vein set
The partly exposed Adit 1 Gallery Quartz Vein (Section 7.1.3 and Howard 2000) is similar in trace element geochemistry, character and structural orientation as Ella Main and Eloise Veins. It is 185 m SW in a more covered area. Adit 1 Gallery Quartz Vein is included with Ella veining and Eloise Vein in a vein set with mean orientation 039° 40° SE [n=10 measurements]. Formerly, and mistakenly, Adit 1 Gallery Quartz Vein was considered representative of veins mined underground at Bunker Hill (Howard 2000). All are part of a large system, typified by their geochemistry.

(9) Anomalous Te and Bi, defining trace elements also in gold skarns
Elements concentrated, especially Te and Bi, in the BiTel Knoll veins are also characteristic of reduced W + Au skarns (Newberry et al. 1996) in Intrusion-related gold environments (McCoy et al. 1996, Thompson & Newberry 2000). The Lefevre W + Au Skarn is an example (Section 8.4).

(10) Historic mining of argentiferous veins
Veins mined underground at Bunker Hill and the trenched Moly Quartz Vein are silver enriched with a low fineness (Section 2.1). *Mining of silver–rich, 345 fine ore in 1940 and 346 in 1942 ended Bunker Hill Mine production.* These slightly auriferous, base metal mineral-bearing veins may be "… products of a late, lower temperature paragenetic stage (McCoy et al. 1996)" as in more researched Alaskan deposits.

(11) Historic development just S of BiTel Knoll
Minor past production from the Moly Quartz Vein Trench in metasediments and granite ("30 tons of rather low-grade material shipped in 1933 (Minister of Mines 1936)" and Blue Quartz Vein Trench in metasediments ("2.2 tons of ore shipped in 1933 averaged 0.511 oz. gold / ton, 0.4 oz. silver / ton (op. cit.)") shows potential for additional occurrences about BiTel Knoll.

(12) Spatial zoning of mineral assemblages identified
This report extends the mineral and element zoning on the property suggested by Ray (2004). It differentiates very low sulphide, gold > silver bismuth telluride-bearing veins from moderate sulphide content, silver (gold) base metal sulphide-bearing quartz veins with Ag > Au (Section 7.3). Different sulphides are present, in varying abundances.
Mineral assemblages are deemed spatially and genetically related to the Bunker Hill Sill leucogranite. In this scheme the BiTel Knoll veins are *intrusion-hosted or proximal placed*, the Adit 1 Gallery Quartz Vein with Au(Ag)–Bi–Te–Mo(–W) *proximal to intermediate*. These have very low sulphide content with Au > Ag. Historic underground production at Bunker Hill from moderate sulphide content, base metal mineral-bearing Ag > Au quartz veins is considered *intermediate to distal.* Geochemical zoning is a useful exploration guide.

(13) Lefevre workings a target
The Lefevre W + Au Skarn is 260 m SSW along the same intrusive contact as BiTel Knoll veining. Limpid Roadside Veining is 650 m N. The Lefevre Skarn[27] is very competent and overprinted by Au–Bi–Te–Mo–W–As quartz-sulphide veins. Lefevre is a reduced, pyrrhotite-rich pyroxene (actinolite?) – garnet – scheelite tungsten + gold skarn (Section 8). Sphalerite, arsenopyrite and molybdenite are minor; geochemical analyses infer auriferous bismuth telluride (and selenide?) minerals occur. Evidently S–Te minerals host most of the gold in the skarn and quartz veins. Metallic gold occurs in trace amounts. Metallics fire assay of 887 g of skarn float LS-09 with massive arsenopyrite, quartz, pyrite and pyrrhotite (Kennedy 2003) gave 0.16 mg metallic gold for a total assay of 8.80 g/t. 407 g of quartz vein LS-02 gave 0.77 mg metallic gold for a total assay of 8.84 g/t. Further detailed examination of the Lefevre workings is warranted.

(14) Former VLF-EM ground survey outlines some hosting structures - Domains 1–3
All quartz veins are sulphide-poor, and likely non conductive. However the 1999 total field VLF–EM survey (Howard 2000) combined with 2004 mapping allows identification of hosting structures. One example is 'Domains 1–3', likely a NNE trending fault or shear zone (Section 13.1). This approximately coincides with the mineralized, N-trending, W intrusive contact of the Bunker Hill Sill mapped by Ray (2004) (see Drawing #19 and discussion p. 15 & 26 in Howard 2000, Ray 2004, Section 12.1).
Domains 1–3 is a 250 (plus) m long, SSW-NNE anomaly group about 50 m wide of positive Fraser-filtered dip angles. To the S Domain 1 extends SW of the Lefevre W + Au Skarn workings. It is broad, overlying the intrusive contact zone.

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[27] Rather than argillaceous metaquartzites and minor grey marble of the HCA Quartzite + Tuff Unit (Howard 2000), Lefevre is now considered hosted by the structurally repeated HCA Limestone + Argillite Unit, including some black, argillaceous and carbonaceous limestone (Ray 2004) contact metamorphosed to white calc-silicate marble.

To the NNE it is just S of the Moly Quartz Vein Trench. Domain 3, open-ended to the E, may indicate veining: the mean trend of 26° is about the same as the mean strike of Eloise and Ella veins on BiTel Knoll 020°. Domains 1–3 is open to the S, E and NE (fig. 3).

(15) Domain 5 - *intermediate to distal* replacement or skarn gold mineralization?
Domain 5 (Section 13.2) remains a prime exploration target for buried, Au–Bi–Te bearing *intermediate to distal-placed* replacement or skarn mineralization (Howard 2000) like the Gil deposit (Jensen et al. 2003). Au Ag Bi Te As Sb Pb Zn Cd Co Fe Mn and Ti are geochemically anomalous in several soils. This geochemistry differs from trace elements in the *proximal-placed* Lefevre W + Au Skarn and the overprinting Lefevre Au(Ag)–Bi–Te–Mo–W–As quartz-sulphide veins. Domain 5's locale away from the intrusive contact and anomalous Pb Ag Bi & Te in soils with background Mo & W infers underlying *intermediate to distal* gold mineralization. Bi and Te in soils from a coincident, multistation anomaly (fig. 3) open ended to the N.

(16) Utility of geophysics
Combined VLF–EM–Mag ground geophysical surveys may outline other buried structures that control mineralization.

(17) Caution interpreting low element-in-soil values
The 1999 soil survey did not indicate BiTel Knoll veining. Two soils taken 50 m apart on the northernmost W-E line L5N, at the NE corner of Bunker Hill – Lefevre main grid, *were not anomalous* (fig. 2). These were collected downslope of Ella Main and Eloise veins. Also not outlined is the NE strike extension of Adit 1 Gallery Quartz Vein (Howard 2000, diagrammatic on the inset on fig. 2). Concluding, 50 m-spaced soils do not point out known meter-plus wide veins. Encouragingly other soils on the 1999 grid have coincident anomalies in pathfinders Bi, Te, Au and other elements. Buried sources are prime exploration targets.

(18) Utility of Weighted Sum Index of Bi and/or Te in soils
Calculation of 'robust' values of an equally weighted linear combination of bismuth and/or tellurium in soils (Section 12) highlights Domain 5 and Domains 1-3. Index values are high, possibly indicating subsurface rock anomalous in bismuth and/or tellurium, *specific* indicator elements for gold in the Intrusion-related environment.

(19) Limpid Roadside Veining
Limpid Roadside Veining is weakly mineralized with minor pyrite, trace argentiferous galena, trace tourmaline and likely molybdenite. It is geochemically anomalous in trace elements that characterize Intrusion–related gold systems, namely (in order) Mo, Pb, As, Ag and Au but *not Bi and Te, 'defining' elements.* Limpid Roadside Veins are like faintly mineralized Moly Quartz Veins: both are *intrusion-hosted* with tourmaline, though not Au–Bi–Te mineralized.

(20) Expanded area of interest with new targets for an economic deposit
The 2004 BiTel Knoll Mineralized Rock Geochemical Survey expands the area of exploration interest to a minimum area 200 m W-E and 400 m N-S over the west intrusive contact of the Bunker Hill Sill. New targets are very low sulphide, gold > silver, bismuth telluride-bearing quartz vein systems, for example the BiTel Knoll – Adit 1 Gallery Quartz Vein system. These m-plus wide extensional veins may mineralize significant volumes of rock (fig. 18) as on surface the vein density is high, e.g. for the sheeted cm-wide Clarissa Transverse Veins ~ 45% over a two meter width (fig. 14). Lay the Fort Knox open pit photo fig. 18 on its side and cover it with soil and forest, and it well compares to BiTel Knoll.

(21) Caution in determining mean gold grades
39 quartz vein samples from the four poorly exposed BiTel Knoll veins include 26 channel samples and 13 grab samples. The latter include two mineralized angular boulders and a barren granitic dyke (fig. 2). This is a small population for determining mean gold grades by statistical analysis. Even with log transformation, values are not normally distributed (Section 14). Because of the from of occurrence of the auriferous minerals in clots, the actual 'bulk' mean grade of individual veins is indeterminate without more comprehensive sampling.

(22) Conservative estimate of grade and troubling high coefficient of variation
Dispersed, erratic concentrations or 'clots' of Au–Bi–Te minerals in the Bitel Knoll quartz veins also make precise estimates of the gold grades difficult. The mean grade of all the veins is approx. 2 g/t gold, a conservative value estimated from the range of the trimmed $mean_{5-10\%}$ values 2.34 – 1.90 g/t (Section 14). The standard deviation is very high at 3.0 g/t, even with 20% of the data trimmed (10% from each side of the distribution). The coefficient of variation C is stable at 1.6 or 160% on successively trimming the data by 10 to 30 % (Section 14). C is a unitless measure of 'relative standard deviation'. This value is also the maximum C of various gold-quartz veins in Western Australia (tabled by Wellmer 1998). Without further sampling the actual grade of these one to two meter-thick veins is unknown.

(23) Eloise Vein grade estimate
Eloise Vein gold grade is approx. 2.5 – 2.3 g/t, the range of the trimmed $mean_{5-10\%}$ values (Section 14.3). This is only a 'fair' estimate from 8 chip samples of varying widths. Practical matters limited sample collection; samples vary in widths, some are from small hand-dug trenches. The coefficient of variation is near identical to that of all the BiTel Knoll veins, very high at 1.5 or 150%.

(24) Limited data on Adit 1 Gallery Quartz Vein
The mean of four re-analyses of Adit 1 Gallery Quartz Vein channel samples is higher at 5.48 g/t Au. The range is 2.9 – 10.9 g/t for this small data set.

(25) Comparison with the Rozan property, other *intrusion-hosted* mineralization in the region
Rozan is south of Nelson, also granitoid hosted. BiTel Knoll quartz veins have about ten times more Bi and Te than gold-bearing quartz veins and aplite veins / dykes on the Rozan property (Section 14.5). Both have *intrusion-hosted*, Intrusion-related Au(Ag)–Bi–Te–W–Mo low-sulphide mineralization. Vein density at BiTel Knoll is greater than in the area drilled in 2000 on Rozan by Emgold Mining Corp. (Grunenberg 2001). Two directions of auriferous veining at BiTel Knoll, and a third, fault-related nearby at the Blue Quartz Vein, also encourage further evaluation

(26) Mineralized country rock?
If brittlely veined, metaquartzite or granitic country rock about BiTel Knoll could also be auriferous. Both were not sampled nor examined in detail. Amount of replaceable carbonate mineral content in the metaquartzite and amount and nature of alteration minerals in the leucogranite (e.g. below Clarissa Main Vein, fig. 12) is unknown.

(27) Bunker Hill Sill a prime target
Clarissa Main and Clarissa Transverse Veins, multiple auriferous quartz veins partly in the Bunker Hill Sill leucogranite, show the felsic intrusive itself is an exploration target for an *intrusion-hosted*, mid Cretaceous, Intrusion-related low-sulphide gold deposit (Section 4.2.6). In addition to "good exploration potential for the discovery of a small, high grade, vein-hosted gold deposit" (Ray 2004), 2004 work on CLY Gp suggests a large, bulk tonnage, low to moderate grade deposit may be present.

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Kennedy, C. June 2004 Rock Geochemistry Program on CLY Property (only map & analyses available, not filed)

McDonald, J. June 28 2004 Letter to W. Howard, 1 p.

Ray, G. P.Geo., P. Eng. Sept. 25 2004 Assessment Report on the Geology & Mineral Potential of the CLY 1 & 2 Claims (including the Bunker Hill & Mormon Girl Crown Grants), southeastern BC, Canada (NTS 082F03) for Kootenay Gold Corp.
AR 27,513 Includes Map 1 Geology of part of the Bunker Hill Claims 1:5,000 scale & Map 2 Geology of part of the Bunker Hill Claims 1:2,000 scale
http://www.em.gov.bc.ca/cf/aris/search/search.cfm?mode=repsum&rep_no=27513

Acme Analytical Labs Nov. 2004 ‘ultra trace’ ICP-MS & fire assay re-analysis of selected 2003 rocks collected by Kootenay Gold and analysis of BiTel Knoll rocks collected Sept. and Oct 2004 Field Trip (see Appendix)

Acme Analytical Labs Dec. 2004 ‘ultra trace’ ICP-MS & fire assay re-analysis of four Bunker Hill Adit 1 Gallery Vein channel samples collected in 1999 (Appendix)

Bunker Hill BC MINFILE 082FSW002

Rozan BC MINFILE 082FSW179

[END REFERENCES]

Appendix No. 1 Acme Analytical Laboratories Ltd. Assay & geochem certificates:

Includes
Re-analyses of 33 selected grad samples of Kennedy (2003),
Oct. 2004 analyses,
Re-analyses of 4 Bunker Hill Adit 1 Gallery Quartz Vein channel samples of Howard (2000) and
March 2005 analyses

ACME ANALYTICAL LABORATORIES LTD. 852 E. HASTINGS ST. VANCOUVER BC V6A 1R6 PHONE(604)253-3158 FAX(604)253-1716
(ISO 9002 Accredited Co.)

GEOCHEMICAL ANALYSIS CERTIFICATE

Howard, Bill [redacted] File # A404012R
[redacted] Submitted by: Tom Kennedy

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppb	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppb	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %
SI	.01	.47	.28	1.4	7	<.1	.1	2	.03	<.1	<.1	1.0	<.1	1.7	<.01	.03	<.02	<2	.00
[redacted]																			
BM-22	30.22	2.99	17.93	4.0	4417	3.0	.6	108	.77	3.4	2.2	27444.7	3.1	2.0	<.01	1.23	1945.72	4	.12
LS-9	4.19	103.40	351.16	11.7	61392	17.0	355.4	302	10.53	>10000	2.0	13313.4	5.7	22.8	.28	29.64	772.17	7	.06
LS-10	.71	235.92	6.97	3.3	1686	37.6	24.3	190	5.54	246.9	<.1	5840.2	.1	1.9	.03	1.20	516.76	<2	.07
LS-11	41.79	4.76	6.43	24.9	1787	33.9	471.4	2801	9.79	>10000	4.3	5978.6	11.9	26.3	.02	19.10	583.90	16	1.06
LS-12	1.92	240.77	6.83	3.6	2966	40.2	40.6	227	10.54	343.6	.2	13503.7	.3	1.3	.01	1.60	1299.15	<2	.05
STANDARD DS6	12.97	147.40	25.59	140.5	294	24.9	12.1	768	3.05	19.0	6.1	42.0	2.7	46.3	6.69	3.03	6.04	59	.76

SAMPLE#	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Sc ppm	Tl ppm	S %	Hg ppb	Se ppm	Te ppm	Ga ppm	Sample gm
SI	<.001	<.5	<.5	.01	2.5	<.001	<1	.01	.364	<.01	<.1	<.1	<.02	.03	<5	<.1	<.02	<.1	30
[redacted]																			
BM-22	.059	8.6	5.7	.10	7.7	.008	1	.21	.010	.05	.5	1.0	.04	.03	<5	1.7	>100	1.3	30
LS-9	.032	18.2	6.3	.06	16.0	.003	4	.36	.020	.09	>100	1.2	.08	2.04	274	7.4	25.61	2.8	30
LS-10	.006	.5	1.9	.01	.9	.001	<1	.02	.005	.01	>100	.1	.02	5.14	69	2.8	18.20	.2	30
LS-11	.045	29.1	34.4	.49	18.8	.018	6	1.13	.023	.30	>100	2.8	.23	3.62	147	5.9	17.12	9.3	30
LS-12	.001	1.2	4.3	.01	.7	.001	<1	.03	.005	.01	96.7	.1	.04	6.21	27	4.2	10.22	.3	30
STANDARD DS6	.095	12.2	186.6	.63	139.4	.090	17	2.03	.035	.14	5.0	3.3	1.05	.03	174	5.1	.88	6.5	30

GROUP 1F30 - 30.00 GM SAMPLE LEACHED WITH 180 ML 2-2-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR, DILUTED TO 600 ML, ANALYSED BY ICP/ES & MS.
(>) CONCENTRATION EXCEEDS UPPER LIMITS. SOME MINERALS MAY BE PARTIALLY ATTACKED. REFRACTORY AND GRAPHITIC SAMPLES CAN LIMIT AU SOLUBILITY.
- SAMPLE TYPE: ROCK REJ.

Data___ FA _____ DATE RECEIVED: OCT 28 2004 DATE REPORT MAILED:......Nov 17/04.......

BRITISH COLUMBIA CERTIFIED ASSAYER
Clarence Leong

ACME ANALYTICAL LABORATORIES LTD. 852 E. HASTINGS ST. VANCOUVER BC V6A 1R6 PHONE(604)253-3158 FAX(604)253-1716
(ISO 9002 Accredited Co.)

ASSAY CERTIFICATE

Howard, Bill [redacted] File # A404017R
Submitted by: [illegible]

SAMPLE#	S.Wt gm	NAu mg	-Au gm/mt	TotAu gm/mt
SI	<1	<.01	<.01	<.01
BH-22	481	<.01	26.18	26.18
LS-9	887	.16	8.62	8.80
LS-10	629	<.01	6.43	6.43
LS-11	723	<.01	6.13	6.13
LS-12	662	.11	14.00	14.17
STANDARD FA-10R	<1	<.01	.50	.50

-AU : -150 AU BY FIRE ASSAY FROM 2 A.T. SAMPLE. DUPAU: AU DUPLICATED FROM -150 MESH. NAU - NATIVE GOLD, TOTAL SAMPLE FIRE ASSAY.
- SAMPLE TYPE: ROCK REJ.

Data ✓ FA Yim DATE RECEIVED: OCT 28 2004 DATE REPORT MAILED: Nov 17/04

BRITISH COLUMBIA CERTIFIED ASSAYER
C.L.
Clarence Leong

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(ISO 9002 Accredited Co.)

ASSAY CERTIFICATE

[redacted] File # A302012R
Submitted by: Tom Kennedy

SAMPLE#	S.Wt gm	NAg mg	-Ag gm/mt	TotAg gm/mt
SI	<1	<.06	<2	<2
[redacted]				
BH-22	481	.07	4	4
LS-9	887	<.06	66	66
LS-10	629	<.06	<2	<2
LS-11	723	<.06	2	2
LS-12	662	.37	4	4
STANDARD GC-2a	<1	<.06	1042	1042

-AG : -150 AG BY FIRE ASSAY FROM 2 A.T. SAMPLE. DUPAG: AG DUPLICATED FROM -150 MESH. NAG - NATIVE SILVER, TOTAL SAMPLE FIRE ASSAY.
ASSAY RECOMMENDED FOR ROCK AND CORE SAMPLES IF CU PB ZN AS > 1%, AG > 30 PPM & AU > 1000 PPB
- SAMPLE TYPE: ROCK REJ.

Data___ FA [signature] DATE RECEIVED: OCT 28 2004 DATE REPORT MAILED: Nov 17/04

BRITISH COLUMBIA CERTIFIED ASSAYER
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(ISO 9002 Accredited Co.)

ASSAY CERTIFICATE

Howard, Bill File # A302012B
215 Silver Mead Cres. NW, Calgary AB T3B 3W4 Submitted by: Tom Kennedy

SAMPLE#	As %
LS-9	8.13
LS-11	8.19
STANDARD R-2a	.23

GROUP 7AR - 1.000 GM SAMPLE, AQUA - REGIA (HCL-HNO3-H2O) DIGESTION TO 100 ML, ANALYSED BY ICP-ES.
- SAMPLE TYPE: ROCK PULP

Data___ FA ____ DATE RECEIVED: NOV 30 2004 DATE REPORT MAILED: May 25/05

BRITISH COLUMBIA CERTIFIED ASSAYER
Clarence Leong

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(ISO 9002 Accredited Co.)

ASSAY CERTIFICATE

[redacted] File # A308012R
Submitted by: Tom Kennedy

SAMPLE#	S.Wt gm	NPt mg	-Pt gm/mt	TotPt gm/mt
SI	<1	<.01	<.01	<.01
[redacted]				
BH-22	481	<.01	<.01	<.01
LS-9	887	<.01	<.01	<.01
LS-10	629	<.01	.01	.01
LS-11	723	<.01	<.01	<.01
LS-12	662	<.01	.01	.01
STANDARD FA-10R	<1	.01	.47	.47

-PT : -150 PT BY FIRE ASSAY FROM 2 A.T. SAMPLE. DUPPT: PT DUPLICATED FROM -150 MESH. NPT - NATIVE PT, TOTAL SAMPLE FIRE ASSAY.
- SAMPLE TYPE: ROCK REJ.

Data___ FA ___ DATE RECEIVED: OCT 28 2004 DATE REPORT MAILED: Nov 17/04

BRITISH COLUMBIA CERTIFIED ASSAYER
Clarence Leong

ACME ANALYTICAL LABORATORIES LTD. 852 E. HASTINGS ST. VANCOUVER BC V6A 1R6 PHONE(604)253-3158 FAX(604)253-1716
(ISO 9002 Accredited Co.)

ASSAY CERTIFICATE

Howard, Bill [redacted] File # A102012R
Submitted by: [illegible]

SAMPLE#	S.Wt gm	NPd mg	-Pd gm/mt	TotPd gm/mt
SI	<1	<.01	<.01	<.01
[redacted]				
BH-22	481	<.01	<.01	<.01
LS-9	887	<.01	<.01	<.01
LS-10	629	<.01	<.01	<.01
LS-11	723	<.01	<.01	<.01
LS-12	662	<.01	<.01	<.01
STANDARD FA-10R	<1	.01	.48	.48

-PD : -150 PD BY FIRE ASSAY FROM 2 A.T. SAMPLE. DUPPD: PD DUPLICATED FROM -150 MESH. NPD - NATIVE PD, TOTAL SAMPLE FIRE ASSAY.
- SAMPLE TYPE: ROCK REJ.

Data ___ FA [signature] DATE RECEIVED: OCT 28 2004 DATE REPORT MAILED: Nov 17/04

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C.L.
Clarence Leong

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GEOCHEMICAL ANALYSIS CERTIFICATE

Howard, Bill File # A302012R2

215 Silver Mead Cres. NW, Calgary AB T3B 3W4 Submitted by: Tom Kennedy

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppb	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppb	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm
BH-21	3.87	8.46	80.47	15.3	5281	7.3	1.3	146	1.33	5.1	2.0	32462.2	7.3	3.7	.04	2.35	1961.60	8
BH-30	147.15	4.03	343.13	7.1	18872	2.5	.4	31	.36	1.5	1.2	1949.9	1.2	1.5	.01	1.16	299.29	<2
LS-8	9.95	101.75	4.47	61.5	381	26.2	10.8	4066	6.95	2.5	4.8	691.2	16.1	61.6	.06	.25	60.05	34
LS-13	129.75	154.78	3.23	28.4	933	10.0	10.2	3230	16.51	13.5	2.1	1692.0	7.5	19.2	<.01	.14	96.07	33
LS-14	58.48	253.37	2.74	45.5	684	30.5	32.2	3902	12.08	12.7	4.6	1029.1	12.5	15.5	.02	.20	81.48	42
LS-15	92.39	227.97	3.74	34.9	831	32.7	35.0	3904	13.09	2.9	3.9	1481.5	9.2	18.0	<.01	.20	105.10	30
LS-17	35.26	254.56	8.00	21.5	1028	55.3	48.9	4413	9.18	2.0	9.5	1150.7	5.9	13.7	.08	.25	71.71	35
STANDARD DS5	12.38	143.33	25.79	139.5	286	24.4	11.7	787	3.00	18.1	6.1	42.0	2.7	46.4	5.69	3.86	6.15	60

SAMPLE#	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Sc ppm	Tl ppm	S %	Hg ppb	Se ppm	Te ppm	Ga ppm	Sample gm
BH-21	.04	.023	14.4	15.9	.19	36.5	.027	1	.59	.024	.30	2.2	.9	.20	.10	22	2.1	93.40	2.1	15
BH-30	.03	.015	1.3	6.4	.01	2.6	<.001	1	.04	.007	.02	3.3	.1	<.02	.03	16	.1	16.31	.2	15
LS-8	1.07	.064	38.0	61.3	1.40	65.6	.152	<1	2.84	.125	1.19	>100	5.5	.94	2.30	17	.8	.87	19.9	15
LS-13	.43	.063	17.7	41.2	.68	47.8	.126	<1	1.35	.048	.99	>100	3.5	.79	3.16	29	3.0	2.22	14.6	15
LS-14	.84	.065	36.9	47.9	1.03	35.3	.119	<1	1.88	.059	1.09	>100	6.5	.79	6.72	14	3.2	1.86	16.9	15
LS-15	.62	.041	31.2	38.8	.75	27.7	.105	<1	1.65	.071	.77	>100	4.3	.59	7.18	<5	3.1	2.58	13.6	15
LS-17	.97	.151	11.7	17.6	.33	22.0	.049	<1	1.09	.037	.41	>100	2.7	.39	8.31	11	4.2	1.99	10.8	15
STANDARD DS5	.77	.095	12.6	182.3	.68	136.9	.093	18	2.13	.035	.14	4.8	3.3	1.03	.02	177	5.2	.87	6.6	15

GROUP 1F15 - 15.00 GM SAMPLE LEACHED WITH 90 ML 2-2-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR, DILUTED TO 300 ML, ANALYSED BY ICP/ES & MS.
(>) CONCENTRATION EXCEEDS UPPER LIMITS. SOME MINERALS MAY BE PARTIALLY ATTACKED. REFRACTORY AND GRAPHITIC SAMPLES CAN LIMIT AU SOLUBILITY.
- SAMPLE TYPE: ROCK PULP

Data___ FA ____ DATE RECEIVED: OCT 28 2004 DATE REPORT MAILED: May 25/05

ACME ANALYTICAL LABORATORIES LTD. 852 E. HASTINGS ST. VANCOUVER BC V6A 1R6 PHONE(6 53-3158 FAX(604)253-1716
(ISO 9002 Accredited Co.)

ASSAY CERTIFICATE

Howard, Bill File # A302012R2

215 Silver Mead Cres. NW, Calgary AB T3B 3W4 Submitted by: Tom Kennedy

SAMPLE#	Ag** gm/mt	Au** gm/mt	Pt** gm/mt	Pd** gm/mt
BH-21	6	34.52	<.01	<.01
BH-30	22	2.31	<.01	.01
LS-8	<2	.81	<.01	<.01
LS-13	<2	1.86	<.01	<.01
LS-14	<2	1.04	<.01	.01
LS-15	<2	1.35	.01	.01
LS-17	2	.70	<.01	.01
STANDARD GC-2a/FA-10R	1031	.49	.48	.48

GROUP 6 - PRECIOUS METALS BY FIRE ASSAY FROM 2 A.T. SAMPLE, ANALYSIS BY ICP-ES.
- SAMPLE TYPE: ROCK PULP

Data___ FA ____ DATE RECEIVED: OCT 28 2004 DATE REPORT MAILED: May 25/05

BRITISH COLUMBIA CERTIFIED ASSAYER
C.L.
Clarence Leong

ACME ANALYTICAL LABORATORIES LTD. 852 E. HASTINGS ST. OUVER BC V6A 1R6 PHONE(604)2 3-3158 FAX(604)253-1716
(ISO 9002 Accredited Co.)

GEOCHEMICAL ANALYSIS CERTIFICATE

Howard, Bill File # A302012R5

215 Silver Mead Cres. NW, Calgary AB T3B 3W4 Submitted by: Tom Kennedy

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppb	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppb	Th ppm	Sr ppm	Cd ppm	Sb ppm
LS-1	6.50	81.23	5.55	14.3	1038	11.5	7.7	2982	2.69	44.9	2.2	3706.2	4.5	7.6	.10	.62
STANDARD	12.80	146.44	24.47	139.1	275	24.0	11.8	784	3.09	17.4	6.1	39.5	3.0	45.4	5.68	3.98

SAMPLE#	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Sc ppm	Tl ppm	S %	Hg ppb	Se ppm	Te ppm	Ga ppm
LS-1	116.80	10	.56	.081	14.6	13.4	.24	8.5	.028	1	.59	.022	.14	>100	1.3	.12	1.40	14	1.4	3.08	4.3
STANDARD	6.22	58	.76	.095	13.2	184.9	.70	132.9	.090	16	2.02	.035	.14	4.7	3.5	1.01	.01	188	4.7	.87	6.6

Standard is STANDARD DS5.

GROUP 1F1 - 1.00 GM SAMPLE LEACHED WITH 6 ML 2-2-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR, DILUTED TO 20 ML, ANALYSED BY ICP/ES & MS.
(>) CONCENTRATION EXCEEDS UPPER LIMITS. SOME MINERALS MAY BE PARTIALLY ATTACKED. REFRACTORY AND GRAPHITIC SAMPLES CAN LIMIT AU SOLUBILITY.
- SAMPLE TYPE: ROCK PULP

Data ___ **FA** ____ **DATE RECEIVED:** OCT 28 2004 **DATE REPORT MAILED:** May 25/05

BRITISH COLUMBIA CERTIFIED ASSAYER
C.L.
Clarence Leong

ACME ANALYTICAL LABORATORIES LTD. 852 E. HASTINGS ST. VANCOUVER BC V6A 1R6 PHONE(604)25[illegible]58 FAX(604)253-1716
(ISO 9002 Accredited Co.)

ASSAY CERTIFICATE

Howard, Bill File # A302012R5

215 Silver Mead Cres. NW, Calgary AB T3B 3W4 Submitted by: Tom Kennedy

SAMPLE#	Ag** gm/mt	Au** gm/mt	Pt** gm/mt	Pd** gm/mt
LS-1	<2	3.39	<.01	<.01
STANDARD GC-2a/FA-10R	1081	.50	.48	.47

GROUP 6 - PRECIOUS METALS BY FIRE ASSAY FROM 2 A.T. SAMPLE, ANALYSIS BY ICP-ES.
- SAMPLE TYPE: ROCK PULP

Data___ FA ____ DATE RECEIVED: OCT 28 2004 DATE REPORT MAILED: May 25/05

BRITISH COLUMBIA CERTIFIED ASSAYER
C.L.
Clarence Leong

ACME ANALYTICAL LABORATORIES LTD. 852 E. HASTINGS ST. VANCOUVER BC V6A 1R6 PHONE(604)253-3158 FAX(604)253-1716
(ISO 9002 Accredited Co.)

GEOCHEMICAL ANALYSIS CERTIFICATE

Howard, Bill File # A302012R6

215 Silver Mead Cres. NW, Calgary AB T3B 3W4 Submitted by: Tom Kennedy

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppb	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppb	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm
SI	<.01	.31	.29	.7	33	<.1	<.1	3	.04	1.9	<.1	4.3	<.1	1.8	.02	.03	.02	<2
LS-2	11.37	44.96	9.63	2.3	1110	3.2	2.1	144	3.05	132.6	.1	5803.6	1.1	1.2	<.01	3.23	637.46	2
STANDARD DS5	13.13	147.06	25.70	141.1	283	24.8	12.5	793	3.09	19.1	6.3	43.9	2.8	48.0	5.71	3.84	6.37	62

SAMPLE#	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Sc ppm	Tl ppm	S %	Hg ppb	Se ppm	Te ppm	Ga ppm	Sample gm
SI	.10	<.001	<.5	<.5	<.01	2.4	<.001	1	<.01	.452	<.01	<.1	.1	<.02	.04	8	<.1	<.02	<.1	15
LS-2	.01	.011	3.7	4.9	.01	5.3	.002	3	.08	.008	.05	>100	.2	.03	.23	66	1.2	19.99	.7	15
STANDARD DS5	.77	.095	12.4	184.8	.67	142.8	.101	18	2.11	.034	.14	5.0	3.4	1.06	.03	173	5.0	.88	7.0	15

GROUP 1F15 - 15.00 GM SAMPLE LEACHED WITH 90 ML 2-2-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR, DILUTED TO 300 ML, ANALYSED BY ICP/ES & MS.
(>) CONCENTRATION EXCEEDS UPPER LIMITS. SOME MINERALS MAY BE PARTIALLY ATTACKED. REFRACTORY AND GRAPHITIC SAMPLES CAN LIMIT AU SOLUBILITY.
- SAMPLE TYPE: ROCK REJ.

Data___ FA ____ DATE RECEIVED: OCT 28 2004 DATE REPORT MAILED: May 25/05

BRITISH COLUMBIA CERTIFIED ASSAYER
Clarence Leong

ACME ANALYTICAL LABORATORIES LTD. 852 E. HASTINGS ST. VANCOUVER BC V6A 1R6 PHONE(604)253-3158 FAX(604)253-1716
(ISO 9002 Accredited Co.)

ASSAY CERTIFICATE

Howard, Bill File # A302012R6
215 Silver Mead Cres. NW, Calgary AB T3B 3W4 Submitted by: Tom Kennedy

SAMPLE#	S.Wt gm	NAu mg	-Au gm/mt	TotAu gm/mt
SI	<1	<.01	.01	.01
LS-2	407	.77	6.95	8.84
STANDARD FA-10R	<1	.10	.50	.50

-AU : -150 AU BY FIRE ASSAY FROM 1 A.T. SAMPLE. DUPAU: AU DUPLICATED FROM -150 MESH. NAU - NATIVE GOLD, TOTAL SAMPLE FIRE ASSAY.
- SAMPLE TYPE: ROCK REJ.

Data___ FA ____ DATE RECEIVED: OCT 28 2004 DATE REPORT MAILED: May 25/05

BRITISH COLUMBIA CERTIFIED ASSAYER
C. L.
Clarence Leong

ACME ANALYTICAL LABORATORIES LTD. 852 E. HASTINGS ST. VANCOUVER BC V6A 1R6 PHONE(604)253-3158 FAX(604)253-1716
(ISO 9002 Accredited Co.)

ASSAY CERTIFICATE

Howard, Bill File # A302012R6
215 Silver Mead Cres. NW, Calgary AB T3B 3W4 Submitted by: Tom Kennedy

SAMPLE#	S.Wt gm	NAg mg	-Ag gm/mt	TotAg gm/mt
SI	<1	<.06	2	2
LS-2	407	<.06	<2	<2
STANDARD GC-2a	<1	<.06	1042	1042

-AG : -150 AG BY FIRE ASSAY FROM 1 A.T. SAMPLE. DUPAG: AG DUPLICATED FROM -150 MESH. NAG - NATIVE SILVER, TOTAL SAMPLE FIRE ASSAY.
ASSAY RECOMMENDED FOR ROCK AND CORE SAMPLES IF CU PB ZN AS > 1%, AG > 30 PPM & AU > 1000 PPB
- SAMPLE TYPE: ROCK REJ.

Data___ FA ____ DATE RECEIVED: OCT 28 2004 DATE REPORT MAILED: May 30/05

BRITISH COLUMBIA CERTIFIED ASSAYER
C.L.
Clarence Leong

REVISED COPY

ACME ANALYTICAL LABORATORIES LTD. 852 E. HASTINGS ST. VANCOUVER BC V6A 1R6 PHONE(604)-3158 FAX(604)253-1716
(ISO 9002 Accredited Co.)

ASSAY CERTIFICATE

Howard, Bill File # A302012R6
215 Silver Mead Cres. NW, Calgary AB T3B 3W4 Submitted by: Tom Kennedy

SAMPLE#	S.Wt gm	NPd mg	-Pd gm/mt	TotPd gm/mt
SI	<1	<.01	<.01	<.01
LS-2	407	<.01	.01	.01
STANDARD FA-10R	<1	<.01	.48	.48

-PD : -150 PD BY FIRE ASSAY FROM 1 A.T. SAMPLE. DUPPD: PD DUPLICATED FROM -150 MESH. NPD - NATIVE PD, TOTAL SAMPLE FIRE ASSAY.
- SAMPLE TYPE: ROCK REJ.

Data___ FA ____ DATE RECEIVED: OCT 28 2004 DATE REPORT MAILED: May 25/05

BRITISH COLUMBIA CERTIFIED ASSAYER
Clarence Leong

ACME ANALYTICAL LABORATORIES LTD. 852 E. HASTINGS ST. VANCOUVER BC V6A 1R6 PHONE(604)253-3158 FAX(604)253-1716
(ISO 9002 Accredited Co.)

ASSAY CERTIFICATE

Howard, Bill File # A302012R6
215 Silver Mead Cres. NW, Calgary AB T3B 3W4 Submitted by: Tom Kennedy

SAMPLE#	S.Wt gm	NPt mg	-Pt gm/mt	TotPt gm/mt
SI	<1	<.01	.01	.01
LS-2	407	<.01	.01	.01
STANDARD FA-10R	<1	<.01	.47	.47

-PT : -150 PT BY FIRE ASSAY FROM 1 A.T. SAMPLE. DUPPT: PT DUPLICATED FROM -150 MESH. NPT - NATIVE PT, TOTAL SAMPLE FIRE ASSAY.
- SAMPLE TYPE: ROCK REJ.

Data___ FA ____ DATE RECEIVED: OCT 28 2004 DATE REPORT MAILED: May 25/05

BRITISH COLUMBIA CERTIFIED ASSAYER
Clarence Leong

ACME ANALYTICAL LABORATORIES LTD. 852 E. HASTINGS ST. VANCOUVER BC V6A 1R6 PHONE(604)253-3158 FAX(604)253-1716
(ISO 9002 Accredited Co.)

GEOCHEMICAL ANALYSIS CERTIFICATE

Howard, Bill File # A302012R4

215 Silver Mead Cres. NW, Calgary AB T3B 3W4 Submitted by: Tom Kennedy

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppb	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppb	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm
LS-7	2.98	95.54	4.09	61.4	346	19.5	7.7	8139	5.64	10.7	3.4	925.5	12.1	34.1	.28	.27	67.64	26
STANDARD DS5	12.56	146.00	26.08	141.4	282	24.7	11.7	783	2.99	18.0	6.0	40.7	2.8	46.3	5.68	4.13	6.00	60

SAMPLE#	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Sc ppm	Tl ppm	S %	Hg ppb	Se ppm	Te ppm	Ga ppm	Sample gm
LS-7	2.14	.052	23.0	36.2	.65	18.7	.100	1	2.16	.068	.45	>100	3.8	.37	1.40	<5	.8	.90	14.5	15
STANDARD DS5	.77	.095	12.3	186.2	.68	134.2	.092	17	2.10	.034	.14	5.0	3.3	1.03	.01	182	5.1	.88	6.5	15

GROUP 1F15 - 15.00 GM SAMPLE LEACHED WITH 90 ML 2-2-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR, DILUTED TO 300 ML, ANALYSED BY ICP/ES & MS.
(>) CONCENTRATION EXCEEDS UPPER LIMITS. SOME MINERALS MAY BE PARTIALLY ATTACKED. REFRACTORY AND GRAPHITIC SAMPLES CAN LIMIT AU SOLUBILITY.
- SAMPLE TYPE: ROCK PULP

Data___ FA ____ DATE RECEIVED: OCT 28 2004 DATE REPORT MAILED: May 25/05

BRITISH COLUMBIA CERTIFIED ASSAYER
C.L.
Clarence Leong

ACME ANALYTICAL LABORATORIES LTD. 852 E. HASTINGS ST. VANCOUVER BC V6A 1R6 PHONE(604)2[illegible]-3158 FAX(604)253-1716
(ISO 9002 Accredited Co.)

GEOCHEMICAL ANALYSIS CERTIFICATE

Howard, Bill File # A302012R3
215 Silver Mead Cres. NW, Calgary AB T3B 3W4 Submitted by: Tom Kennedy

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppb	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppb	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Sc ppm	Tl ppm	S %	Hg ppb	Se ppm	Te ppm	Ga ppm
[redacted]																																					
BH-23	259.70	116.48	136.05	184.2	2047	46.6	29.3	418	7.26	50.4	22.3	258.8	4.5	16.0	.05	1.14	24.92	36	.02	.127	23.4	38.6	.16	73.7	.011	2	.94	.022	.17	3.3	2.3	.15	.13	38	2.7	.90	2.0
BH-24	17.02	38.86	1006.74	52.5	16544	7.9	2.6	67	2.57	2.3	1.0	105.5	5.1	6.9	.21	.22	41.83	11	.02	.019	11.7	14.5	.11	31.6	.012	1	.40	.030	.15	1.9	.9	.11	.25	11	3.5	1.57	1.6
BH-25	142.54	25.83	33.00	72.6	1369	4.5	2.1	76	3.35	227.8	9.7	58.1	7.7	23.5	.01	.46	3.63	2	.03	.096	8.7	6.4	.02	54.2	.002	<1	.39	.066	.13	3.5	.7	.04	.11	5	.2	.55	2.4
BH-26	1773.53	2.95	1686.87	3.4	4492	2.2	1.2	23	1.84	159.4	5.2	94.6	1.5	2.4	.02	2.58	5.90	<2	<.01	.024	.7	5.7	.01	25.7	.001	17	.25	.012	.20	10.2	.3	.06	1.30	15	.4	.29	1.4
BH-27	19.55	3.97	24.90	2.0	645	2.5	.3	34	.49	5.5	.8	100.5	4.0	1.8	<.01	.15	10.22	<2	.03	.020	16.8	6.9	.01	10.3	.001	3	.10	.014	.06	>100	.3	.02	<.01	26	<.1	.47	.5
LS-3	3.79	195.33	1.10	1.2	201	3.0	.8	66	.83	6.8	<.1	248.0	.1	.8	<.01	.26	11.66	<2	.01	.001	.9	8.0	<.01	1.3	.001	1	.01	.005	.01	>100	<.1	<.02	.23	24	.6	.25	.1
LS-4	18.97	46.95	4.07	96.6	126	18.2	7.9	5056	4.00	4.8	4.1	190.2	14.7	91.2	.48	.38	21.08	23	3.47	.061	32.2	34.1	.67	46.9	.091	1	2.06	.090	.35	>100	3.6	.27	.54	42	.4	.44	10.0
LS-5	1.22	45.29	243.25	23.1	5960	29.2	79.2	415	5.42	2712.9	.9	338.2	8.0	4.3	.04	1.72	15.65	3	.06	.028	9.0	7.1	.10	11.3	.004	29	.41	.008	.06	39.5	1.0	.05	3.03	12	1.1	.42	1.7
LS-16	10.10	97.49	5.07	24.7	258	8.3	3.1	576	4.19	9.9	.9	85.5	6.0	19.7	<.01	.13	5.64	18	.08	.025	5.5	25.5	.42	20.7	.024	<1	1.01	.038	.22	7.6	2.0	.14	.30	19	1.8	.21	6.4
RE LS-16	10.16	96.85	4.96	24.3	238	8.2	3.0	589	4.27	8.0	.8	94.2	6.1	20.1	.01	.11	5.51	18	.08	.026	5.6	25.7	.43	20.7	.025	<1	1.03	.037	.22	7.3	2.1	.14	.24	19	1.8	.18	6.5
STANDARD DS5	12.80	146.44	25.69	139.1	289	24.0	11.8	784	3.09	17.4	6.1	39.5	3.0	45.4	5.68	3.98	6.22	58	.76	.095	13.2	184.9	.70	132.9	.090	16	2.02	.035	.14	4.7	3.5	1.01	.01	188	4.7	.87	6.6

GROUP 1F1 - 1.00 GM SAMPLE LEACHED WITH 6 ML 2-2-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR, DILUTED TO 20 ML, ANALYSED BY ICP/ES & MS.
(>) CONCENTRATION EXCEEDS UPPER LIMITS. SOME MINERALS MAY BE PARTIALLY ATTACKED. REFRACTORY AND GRAPHITIC SAMPLES CAN LIMIT AU SOLUBILITY.
- SAMPLE TYPE: ROCK PULP Samples beginning 'RE' are Reruns and 'RRE' are Reject Reruns.

Data___ FA ____ DATE RECEIVED: OCT 28 2004 DATE REPORT MAILED: May 25/05

BRITISH COLUMBIA CERTIFIED ASSAYER
Clarence Leong

ACME ANALYTICAL LABORATORIES LTD. 852 E. HASTINGS ST. VANCOUVER BC V6A 1R6 PHONE(604)253-3158 FAX(604)253-1716
(ISO 9002 Accredited Co.)

GEOCHEMICAL ANALYSIS CERTIFICATE

Howard, Bill File # A407542
215 Silver Head Cres. NW, Calgary AB T3B 3W4

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppb	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppb	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %
SI	.13	1.96	.22	.7	3	4.1	.1	3	.06	.1	<.1	1.0	<.1	1.7	.01	.02	<.02	<2	.11
BH-022	35.55	50.92	2.79	9.8	1228	8.1	7.2	30	3.09	11.8	.5	3851.7	.1	.7	.03	.37	117.05	2	.01
BH-041	13.36	12.15	12.22	5.6	1704	1.9	.8	36	.82	7.9	.3	7765.1	.4	1.1	.03	.49	342.24	2	.01
BH-045	65.11	141.86	5.03	14.5	1164	12.8	9.9	53	3.78	13.4	2.0	3399.7	.4	1.6	.11	.42	451.10	6	.01
BH-046	30.90	7.39	80.18	6.5	1706	1.8	.8	38	.72	5.0	.7	4449.9	.4	.8	.03	.18	56.83	2	.01
STANDARD DS6/AU-1	11.70	126.88	30.24	142.9	280	25.5	10.9	712	2.90	20.9	7.0	47.0	3.2	39.6	6.03	3.54	5.17	58	.85

SAMPLE#	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Sc ppm	Tl ppm	S %	Hg ppb	Se ppm	Te ppm	Ga ppm	Au** gm/mt	Sample gm
SI	<.001	<.5	5.2	<.01	2.0	<.001	<1	.01	.569	<.01	<.1	.1	<.02	.05	<5	<.1	<.02	<.1	<.01	15
BH-022	.010	<.5	3.5	.01	2.8	.001	1	.02	.007	.01	.4	.3	<.02	.30	<5	1.1	3.13	.1	3.90	15
BH-041	.010	2.3	2.8	.01	9.8	.001	<1	.05	.003	.02	3.9	.2	<.02	.09	<5	.6	18.09	.3	10.87	15
BH-045	.038	1.5	10.1	.01	7.1	.002	1	.08	.003	.01	1.1	.5	<.02	.16	<5	1.0	9.42	.4	2.92	15
BH-046	.008	1.8	2.9	.01	4.9	.001	<1	.04	.004	.01	5.6	.2	<.02	.02	8	.2	2.79	.1	4.24	15
STANDARD DS6/AU-1	.080	14.7	185.1	.58	169.5	.084	17	1.88	.073	.15	3.3	3.2	1.74	.06	239	4.5	2.37	6.0	3.31	15

GROUP 1F15 - 15.00 GM SAMPLE LEACHED WITH 90 ML 2-2-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR, DILUTED TO 300 ML, ANALYSED BY ICP/ES & MS.
(>) CONCENTRATION EXCEEDS UPPER LIMITS. SOME MINERALS MAY BE PARTIALLY ATTACKED. REFRACTORY AND GRAPHITIC SAMPLES CAN LIMIT AU SOLUBILITY.
AU** BY FIRE ASSAY FROM 2 A.T. SAMPLE.
- SAMPLE TYPE: ROCK CHIP P150

Data ~~ℓ~~ **FA** ____ **DATE RECEIVED:** DEC 8 2004 **DATE REPORT MAILED:** Dec 30/04

BRITISH COLUMBIA CERTIFIED ASSAYER
C. L
Clarence Leong

ACME ANALYTICAL LABORATORIES LTD. 852 E. HASTINGS ST. VANCOUVER BC V6A 1R6 PHONE(604)253-3158 FAX(604)253-1716
(ISO 9002 Accredited Co.)

GEOCHEMICAL ANALYSIS CERTIFICATE

Howard, Bill File # A406783

215 Silver Head Cres. NW, Calgary AB T3B 3W4

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppb	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppb	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm
SI	.21	.40	.58	.6	2	.1	<.1	1	.03	.1	<.1	.2	<.1	1.3	<.01	<.02	.03
0514	21.41	3.70	13.69	150.2	777	2.7	.7	97	.81	.5	1.2	1154.6	2.7	2.5	1.63	.09	60.32
0515	8.04	5.10	75.17	4.8	1851	6.1	.3	49	.53	1.3	1.2	9041.6	.2	.8	.01	.76	723.44
STANDARD DS6	11.65	125.68	28.87	148.0	288	24.1	10.9	728	2.91	22.9	6.8	45.0	3.1	38.6	6.21	3.53	5.16

SAMPLE#	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Sc ppm	Tl ppm	S %	Hg ppb	Se ppm	Te ppm	Ga ppm	Sample gm
SI	<2	.06	<.001	<.5	<.5	<.01	1.6	<.001	<1	<.01	.245	<.01	<.1	.1	<.02	.03	<5	<.1	<.02	<.1	15
0514	6	.04	.015	7.8	10.0	.09	14.4	.011	<1	.33	.020	.08	1.3	1.4	.06	.04	<5	.1	3.20	1.6	15
0515	<2	.02	.011	.6	20.3	<.01	1.2	<.001	<1	.02	.003	<.01	5.3	.3	<.02	.02	8	.6	47.29	.1	15
STANDARD DS6	58	.86	.081	14.8	180.4	.59	173.1	.081	20	1.82	.073	.15	3.4	3.5	1.83	.04	243	4.5	2.38	6.2	15

GROUP 1F15 - 15.00 GM SAMPLE LEACHED WITH 90 ML 2-2-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR, DILUTED TO 300 ML, ANALYSED BY ICP/ES & MS.
(>) CONCENTRATION EXCEEDS UPPER LIMITS. SOME MINERALS MAY BE PARTIALLY ATTACKED. REFRACTORY AND GRAPHITIC SAMPLES CAN LIMIT AU SOLUBILITY.
- SAMPLE TYPE: ROCK R150 60C

Data f FA ____ DATE RECEIVED: OCT 28 2004 DATE REPORT MAILED: Nov 24/04

BRITISH COLUMBIA CERTIFIED ASSAYER
C.L.
Clarence Leong

ACME ANALYTICAL LABORATORIES LTD. 852 E. HASTINGS ST. VANCOUVER BC V6A 1R6 PHONE(604)253-3158 FAX(604)253-1716
(ISO 9002 Accredited Co.)

ASSAY CERTIFICATE

Howard, Bill File # A406783
215 Silver Mead Cres. NW, Calgary AB T3B 3W4

SAMPLE#	Ag** gm/mt	Au** gm/mt
SI	<2	<.01
0514	<2	1.27
0515	2	8.70
STANDARD R-2a/AU-1	154	3.40

GROUP 6 - PRECIOUS METALS BY FIRE ASSAY FROM 2 A.T. SAMPLE, ANALYSIS BY ICP-ES.
- SAMPLE TYPE: ROCK R150 60C

Data ____ FA ____ DATE RECEIVED: OCT 28 2004 DATE REPORT MAILED: Nov 24/04

BRITISH COLUMBIA CERTIFIED ASSAYER
C. Leong
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ACME ANALYTICAL LABORATORIES LTD. 852 E. HASTINGS ST. VANCOUVER BC V6A 1R6 PHONE(604)253-3158 FAX(604)253-1716
(ISO 9002 Accredited Co.)

ASSAY CERTIFICATE

Howard, Bill File # A406784
215 Silver Mead Cres. NW, Calgary AB T3B 3W4

SAMPLE#	Ag** gm/mt	Au** gm/mt
SI	<2	<.01
0410	<2	.02
0411	<2	.01
0415	<2	.05
0420	<2	<.01
0422	13	.65
0423	6	.47
0516	<2	.02
STANDARD R-2a/AU-1	156	3.33

GROUP 6 - PRECIOUS METALS BY FIRE ASSAY FROM 1 A.T. SAMPLE, ANALYSIS BY ICP-ES.
- SAMPLE TYPE: ROCK R150 60C

Data f FA ____ DATE RECEIVED: OCT 28 2004 DATE REPORT MAILED: Nov 18/04

BRITISH COLUMBIA CERTIFIED ASSAYER
Clarence Leong

ACME ANALYTICAL LABORATORIES LTD. 852 E. HASTINGS ST. VANCOUVER BC V6A 1R6 PHONE(604)253-3158 FAX(604)253-1716
(ISO 9002 Accredited Co.)

GEOCHEMICAL ANALYSIS CERTIFICATE

Howard, Bill File # A406785

215 Silver Mead Cres. NW, Calgary AB T3B 3W4

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppb	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppb	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %
SI	.16	.55	.96	<.1	4	.2	<.1	<1	.04	<.1	<.1	<.2	<.1	1.7	<.01	<.02	<.02	<2	.10
0426	13.49	13.02	5.12	6.8	612	8.1	3.1	508	1.31	1.0	2.4	3477.2	1.9	1.4	<.01	.47	183.90	3	.04
0427	4.74	3.68	5.05	2.1	840	5.6	.4	92	.57	1.0	.4	79.0	.4	1.2	<.01	.06	13.93	2	.03
STANDARD DS5/R-2a/AU-1	12.25	146.39	23.53	138.2	290	24.0	11.3	797	2.99	17.4	5.6	39.6	2.6	47.1	5.28	3.68	4.93	58	.72

SAMPLE#	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Sc ppm	Tl ppm	S %	Hg ppb	Se ppm	Te ppm	Ga ppm	Ag** gm/mt	Au** gm/mt
SI	<.001	<.5	.6	<.01	2.6	<.001	<1	.01	.421	<.01	<.1	<.1	<.02	<.01	<5	<.1	<.02	<.1	<2	.01
0426	.039	5.6	19.5	.11	12.3	.001	<1	.29	.022	.06	10.4	.8	.05	.01	5	.4	12.36	1.9	<2	3.44
0427	.023	2.1	16.4	.02	4.2	.001	<1	.06	.007	.02	4.9	.2	<.02	<.01	<5	.2	.86	.4	<2	.11
STANDARD DS5/R-2a/AU-1	.094	12.1	176.5	.68	136.1	.090	17	2.01	.035	.13	4.7	3.3	1.08	.04	173	4.9	.85	6.2	157	3.37

GROUP 1F1 - 1.00 GM SAMPLE LEACHED WITH 6 ML 2-2-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR, DILUTED TO 20 ML, ANALYSED BY ICP/ES & MS.
(>) CONCENTRATION EXCEEDS UPPER LIMITS. SOME MINERALS MAY BE PARTIALLY ATTACKED. REFRACTORY AND GRAPHITIC SAMPLES CAN LIMIT AU SOLUBILITY.
AG** & AU** BY FIRE ASSAY FROM 2 A.T. SAMPLE.
- SAMPLE TYPE: ROCK R150 60C

Data C FA ____ DATE RECEIVED: OCT 28 2004 DATE REPORT MAILED: Nov 27/04

BRITISH COLUMBIA CERTIFIED ASSAYER
Clarence Leong

ACME ANALYTICAL LABORATORIES LTD. 852 E. HASTINGS ST. VANCOUVER BC V6A 1R6 PHONE(604)253-3158 FAX(604)253-1716
(ISO 9002 Accredited Co.)

GEOCHEMICAL ANALYSIS CERTIFICATE

Howard, Bill File # A406786

215 Silver Mead Cres. NW, Calgary AB T3B 3W4

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppb	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppb	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm
0418	111.09	2.84	221.34	24.0	799	1.6	.4	65	.47	5.5	.2	5.0	.3	<.5	<.01	.09	1.30
STANDARD DS5	12.25	146.39	23.53	138.2	290	24.0	11.3	797	2.99	17.4	5.6	39.6	2.6	47.1	5.28	3.68	4.93

SAMPLE#	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Sc ppm	Tl ppm	S %	Hg ppb	Se ppm	Te ppm	Ga ppm
0418	6	<.01	.001	<.5	4.4	.02	2.6	<.001	1	.03	.001	<.01	.5	.1	<.02	.02	<5	.2	.08	.3
STANDARD DS5	58	.72	.094	12.1	176.5	.68	136.1	.090	17	2.01	.035	.13	4.7	3.3	1.08	.04	173	4.9	.85	6.2

GROUP 1F1 - 1.00 GM SAMPLE LEACHED WITH 6 ML 2-2-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR, DILUTED TO 20 ML, ANALYSED BY ICP/ES & MS.
(>) CONCENTRATION EXCEEDS UPPER LIMITS. SOME MINERALS MAY BE PARTIALLY ATTACKED. REFRACTORY AND GRAPHITIC SAMPLES CAN LIMIT AU SOLUBILITY.
- SAMPLE TYPE: ROCK R150 60C

Data ✓ FA ____ DATE RECEIVED: OCT 28 2004 DATE REPORT MAILED: Nov 26/04

BRITISH COLUMBIA CERTIFIED ASSAYER
Clarence Leong

ACME ANALYTICAL LABORATORIES LTD. 852 E. HASTINGS ST. VANCOUVER BC V6A 1R6 PHONE(604)253-3158 FAX(604)253-1716
(ISO 9002 Accredited Co.)

GEOCHEMICAL ANALYSIS CERTIFICATE

Howard, Bill File # A406782
215 Silver Mead Cres. NW, Calgary AB T3B 3W4

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppb	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppb	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm
SI	.01	.43	.20	.6	<2	.1	<.1	4	.02	<.1	<.1	.7	<.1	1.6	<.01	.03	.06	<2
0412	13.22	4.64	84.13	10.4	4155	1.5	.5	130	.78	2.2	1.8	23094.9	.8	1.0	.09	3.24	1601.44	2
0414	23.46	2.87	12.99	16.9	1179	6.3	1.3	318	1.76	2.1	1.7	7636.3	6.5	11.4	.02	.72	477.93	21
0424	8.62	6.54	15.35	5.4	1515	2.2	.6	115	1.11	2.4	.9	10291.0	1.0	1.2	.03	.22	475.75	3
0512	25.95	17.06	6.96	31.0	102	14.9	4.0	513	2.94	3.4	12.2	46.0	15.0	10.1	.02	.14	4.51	29
0517	14.99	2.43	5.45	5.3	676	3.1	.6	139	.89	.8	1.9	2756.2	2.1	1.9	<.01	.26	208.06	5
0535	239.07	5.34	5.21	12.2	264	8.1	1.3	289	1.09	.8	4.5	1381.4	4.7	5.4	<.01	.64	72.96	8
STANDARD DS5	12.26	143.19	25.69	139.0	278	23.5	11.8	797	3.02	17.5	6.1	42.0	2.8	46.7	5.36	3.74	5.89	62

SAMPLE#	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Sc ppm	Tl ppm	S %	Hg ppb	Se ppm	Te ppm	Ga ppm	Sample gm
SI	.07	<.001	<.5	.6	<.01	2.2	<.001	<1	.01	.324	<.01	<.1	.1	<.02	.03	<5	<.1	<.02	<.1	15
0412	.05	.023	2.6	3.8	.03	4.4	.001	<1	.07	.005	.01	.3	.4	<.02	.01	<5	1.0	95.42	.6	15
0414	.15	.064	13.0	30.1	.25	42.7	.055	2	.72	.052	.38	.5	3.8	.29	<.01	<5	.5	23.18	3.2	15
0424	.01	.008	4.6	4.8	.02	4.8	.002	<1	.07	.004	.01	.8	.5	<.02	<.01	<5	.2	55.83	.7	15
0512	.15	.082	39.4	40.3	.77	51.5	.028	1	1.51	.066	.33	.4	4.8	.16	.07	5	.4	.41	7.9	15
0517	.10	.055	6.3	7.8	.10	6.0	.004	<1	.25	.015	.05	5.3	1.0	.03	<.01	<5	.4	13.60	1.4	15
0535	.12	.059	14.2	11.3	.16	25.5	.023	3	.48	.031	.18	2.8	1.4	.12	.04	<5	.3	5.19	1.8	15
STANDARD DS5	.77	.095	12.3	176.2	.69	138.2	.097	18	2.03	.031	.14	4.8	3.4	1.01	.02	170	4.8	.82	6.5	15

GROUP 1F15 - 15.00 GM SAMPLE LEACHED WITH 90 ML 2-2-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR, DILUTED TO 300 ML, ANALYSED BY ICP/ES & MS.
(>) CONCENTRATION EXCEEDS UPPER LIMITS. SOME MINERALS MAY BE PARTIALLY ATTACKED. REFRACTORY AND GRAPHITIC SAMPLES CAN LIMIT AU SOLUBILITY.
- SAMPLE TYPE: ROCK M150 60C

Data f FA ____ DATE RECEIVED: OCT 28 2004 DATE REPORT MAILED: Nov 30/04

BRITISH COLUMBIA CERTIFIED ASSAYER
C. L.
Clarence Leong

ACME ANALYTICAL LABORATORIES LTD. 852 E. HASTINGS ST. VANCOUVER BC V6A 1R6 PHONE(604)253-3158 FAX(604)253-1716
(ISO 9002 Accredited Co.)

ASSAY CERTIFICATE

Howard, Bill File # A406782
215 Silver Mead Cres. NW, Calgary AB T3B 3W4

SAMPLE#	S.Wt gm	NAu mg	-Au gm/mt	TotAu gm/mt
SI	<1	<.01	<.01	<.01
0412	500	1.18	24.67	27.03
0414	490	<.01	8.65	8.65
0424	485	<.01	9.94	9.94
0512	505	<.01	.03	.03
0517	495	<.01	2.76	2.76
0535	515	<.01	1.33	1.33
STANDARD AU-1	<1	<.01	3.41	3.41

-AU : -150 AU BY FIRE ASSAY FROM 1 A.T. SAMPLE. DUPAU: AU DUPLICATED FROM -150 MESH. NAU - NATIVE GOLD, TOTAL SAMPLE FIRE ASSAY.
- SAMPLE TYPE: ROCK M150 60C

Data___ FA ✓ DATE RECEIVED: OCT 28 2004 DATE REPORT MAILED: Nov 30/04

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ASSAY CERTIFICATE

Howard, Bill File # A406782
215 Silver Mead Cres. NW, Calgary AB T3B 3W4

SAMPLE#	S.Wt gm	NAg mg	-Ag gm/mt	TotAg gm/mt
SI	<1	<.06	<2	<2
0412	500	.36	5	5
0414	490	<.06	2	2
0424	485	.07	2	2
0512	505	<.06	<2	<2
0517	495	<.06	<2	<2
0535	515	<.06	<2	<2
STANDARD GC-2a	<1	<.06	157	157

-AG : -150 AG BY FIRE ASSAY FROM 1 A.T. SAMPLE. DUPAG: AG DUPLICATED FROM -150 MESH. NAG - NATIVE SILVER, TOTAL SAMPLE FIRE ASSAY.
- SAMPLE TYPE: ROCK M150 60C

Data___ FA ✓ DATE RECEIVED: OCT 28 2004 DATE REPORT MAILED: Nov 30/04

BRITISH COLUMBIA CERTIFIED ASSAYER
C.L.
Clarence Leong

ACME ANALYTICAL LABORATORIES LTD. 852 E. HASTINGS ST. VANCOUVER BC V6A 1R6 PHONE(604)253-3158 FAX(604)253-1716
(ISO 9002 Accredited Co.)

GEOCHEMICAL ANALYSIS CERTIFICATE

Newmont Mining Corporation File # A500554

1700 Lincoln St., Denver CO 80203U.S.A. Submitted by: Patrick Highsmith

SAMPLE#	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	U	Au	Th	Sr	Cd	Sb	Bi
	ppm	ppm	ppm	ppm	ppb	ppm	ppm	ppm	%	ppm	ppm	ppb	ppm	ppm	ppm	ppm	ppm
0401	3.36	16.75	37.75	12.7	138	4.8	1.1	190	1.47	.6	.6	3.4	5.7	7.3	.03	.10	.46
0403	2.27	2.90	2.08	2.5	20	1.4	.3	39	.38	.4	.3	25.5	.5	2.0	<.01	.09	3.51
0404	1.74	4.33	2.10	19.5	24	5.9	.9	517	1.28	.8	2.3	8.9	4.0	6.9	.02	.07	2.40
0405	9.77	3.19	7.00	5.6	202	2.1	.4	56	.79	1.3	.8	12.1	2.7	3.1	.02	.08	2.44
0406	8.65	2.78	3.55	4.4	49	4.4	.5	112	.68	1.2	1.9	168.0	3.6	5.6	.02	.10	19.71
0407	13.46	3.79	186.20	6.8	30191	2.2	.5	53	.89	4.5	1.3	3008.2	2.7	2.6	.03	.43	217.18
0408	2.82	3.01	4.76	59.8	186	10.0	2.0	882	3.07	1.6	4.0	13.9	13.4	7.8	.03	.10	2.31
RE 0408	2.76	2.65	4.69	55.9	174	9.0	1.9	904	3.14	1.6	3.8	14.0	12.5	6.2	.03	.09	2.20
0409	12.79	6.74	3.77	23.3	189	5.7	1.4	530	2.20	1.6	3.7	240.7	11.5	9.4	.02	.11	21.89
0413	2.23	2.32	1.36	4.5	13	3.9	.4	73	.53	.5	.5	27.6	1.2	1.6	.02	.05	1.58
0428	7.73	4.07	1.45	6.3	43	3.1	.6	77	.51	.7	1.0	102.0	1.3	1.4	<.01	.08	9.04
0429	8.79	2.60	2.00	3.8	212	4.2	.3	63	.47	.7	.6	1032.4	.9	1.5	<.01	.09	65.34
0430	2.25	2.96	16.60	3.6	787	2.0	.4	30	.49	1.0	.9	3047.8	2.2	1.2	.01	.60	208.68
0431	5.50	3.12	4.38	8.0	765	4.1	.4	49	.92	6.2	1.0	48.0	2.2	2.3	.03	.15	4.51
0432	5.36	3.38	8.47	11.2	256	1.8	.4	44	.61	5.5	.6	11.7	1.7	.9	.03	.14	2.42
0433	8.95	2.29	42.71	4.1	8458	3.5	.5	49	.30	1.3	.3	60.9	.8	.7	<.01	.06	18.12
0434	2.43	3.08	23.86	3.9	1033	2.0	1.2	172	.31	1.3	.2	9.9	1.1	1.0	.03	.06	3.31
0435	2.76	4.39	1.73	3.7	85	4.5	.5	62	.68	.7	.2	4.1	.4	2.6	.01	.06	1.06
0436	5.27	3.54	7.69	10.8	78	2.4	.5	59	.53	.8	.5	4.0	.5	1.3	.02	.07	.32
0437	2.06	3.64	5.08	2.5	1389	4.1	.4	41	.52	2.9	1.4	10886.9	.3	.7	.01	.38	562.74
0438	1.45	3.73	1.00	5.3	23	2.1	.5	85	.77	.9	.5	25.4	.9	1.1	.03	.07	3.69
0439	.94	12.49	41.94	19.2	60	5.4	.9	90	1.51	1.7	.3	5.7	4.7	3.2	.01	.19	1.75
0440	.42	5.89	2.18	6.0	16	2.7	2.0	49	.55	1.0	.2	4.8	.7	3.2	.01	.06	.19
0441	30.09	2.92	4.84	15.2	1431	3.8	.3	34	.36	.8	.8	7969.1	1.4	1.4	<.01	.30	564.31
0442	1.17	3.60	3.08	6.9	28	4.1	.6	143	.59	.9	1.1	19.3	1.1	4.2	.02	.06	2.89
0443	7.44	3.14	13.95	13.5	709	5.8	.9	690	.83	1.1	3.7	31.4	2.3	2.5	.05	.09	7.13
STANDARD DS6	11.56	129.73	30.13	148.4	282	25.5	10.7	715	2.88	21.0	6.7	50.8	3.1	38.3	6.17	3.35	4.92

SAMPLE#	V	Ca	P	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Sc	Tl	S	Hg	Se	Te	Ga
	ppm	%	%	ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppm	ppm	%	ppb	ppm	ppm	ppm
0401	3	.03	.037	6.9	24.6	.16	12.8	.002	1	.37	.050	.01	3.5	1.3	<.02	.02	<5	.5	.06	.7
0403	<2	.03	.015	1.7	23.8	.02	18.3	.004	1	.09	.016	.04	>100	.3	.02	.02	35	<.1	.18	.5
0404	10	.37	.193	10.5	47.5	.30	29.9	.036	1	.65	.025	.25	7.7	3.0	.19	.04	5	.1	.11	5.0
0405	3	.11	.063	6.8	28.7	.05	26.5	.007	1	.20	.017	.09	2.8	.9	.05	.01	<5	.1	.10	1.2
0406	2	.40	.230	11.4	37.4	.04	16.8	.011	1	.17	.014	.08	29.4	.9	.05	.02	<5	.2	1.29	1.0
0407	2	.05	.035	8.3	27.7	.05	12.4	.008	1	.15	.010	.07	8.5	.7	.05	.03	<5	.3	13.82	.9
0408	30	.14	.057	22.4	65.9	.87	155.4	.183	1	1.72	.059	1.27	30.7	11.8	.92	<.01	<5	.2	.17	13.7
RE 0408	31	.14	.052	21.1	63.8	.89	140.4	.172	1	1.74	.050	1.19	31.3	10.8	.90	<.01	<5	.1	.14	12.9
0409	16	.81	.385	25.8	37.6	.34	47.5	.047	1	.98	.035	.39	33.8	5.1	.28	.01	8	.3	1.49	6.6
0413	2	.05	.029	2.5	35.8	.06	13.7	.008	<1	.18	.010	.06	6.4	.7	.05	.01	<5	<.1	.10	1.0
0428	3	.08	.047	2.9	28.3	.07	10.0	.014	1	.17	.009	.08	1.1	.9	.07	<.01	<5	<.1	.53	1.1
0429	2	.11	.064	2.9	33.5	.04	6.1	.006	<1	.12	.007	.04	22.5	.5	.04	<.01	<5	<.1	3.52	.8
0430	<2	.01	.006	7.8	25.4	.02	5.7	.002	<1	.09	.009	.03	26.3	.3	.02	.01	<5	.1	12.50	.4
0431	2	.01	.013	6.1	33.3	.02	16.3	.001	2	.16	.014	.06	6.7	.4	.02	.01	<5	.1	.27	.6
0432	<2	.01	.009	4.6	24.5	.02	12.3	.001	2	.16	.010	.07	.9	.3	.04	<.01	<5	.1	.14	.6
0433	<2	<.01	.002	.9	35.7	.01	7.3	.001	1	.08	.010	.04	7.0	.1	<.02	<.01	<5	<.1	.72	.3
0434	<2	.01	.003	2.6	25.4	.01	15.2	.001	1	.12	.013	.05	.2	.2	.02	<.01	<5	<.1	.15	.4
0435	2	.03	.026	1.7	38.2	.03	7.6	.004	<1	.09	.006	.02	6.9	.3	.02	.01	<5	.2	.06	.4
0436	<2	.08	.043	1.8	24.6	.02	4.9	.001	<1	.09	.007	.02	.1	.3	<.02	.01	<5	<.1	.02	.4
0437	<2	.01	.006	.6	33.5	.01	3.1	.001	<1	.06	.002	.01	8.5	.2	<.02	.02	<5	.2	48.91	.3
0438	2	.03	.018	2.6	26.1	.05	7.5	.006	<1	.14	.007	.04	1.6	.7	.03	.02	<5	<.1	.33	.8
0439	5	.02	.018	12.8	33.4	.21	6.5	.001	<1	.41	.026	.03	4.5	.9	<.02	.02	<5	.3	.19	1.2
0440	2	.01	.008	2.2	23.9	.06	3.7	.001	<1	.13	.016	.01	<.1	.5	<.02	<.01	<5	.1	<.02	.4
0441	<2	.06	.033	6.8	30.6	.01	6.1	.002	<1	.10	.006	.02	37.1	.3	<.02	.02	<5	.2	32.96	.4
0442	3	.23	.106	4.5	29.6	.08	6.3	.002	<1	.21	.008	.04	.3	1.0	.02	<.01	<5	<.1	.18	1.1
0443	5	.06	.034	5.3	38.5	.12	12.6	.002	1	.34	.018	.04	5.7	1.0	.03	.01	<5	.1	.34	2.0
STANDARD DS6	58	.88	.075	15.0	183.4	.59	172.2	.076	18	1.94	.074	.16	3.4	3.2	1.75	.02	237	4.3	2.34	6.0

GROUP 1F1 - 1.00 GM SAMPLE LEACHED WITH 6 ML 2-2-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR, DILUTED TO 20 ML, ANALYSED BY ICP/ES & MS.
(>) CONCENTRATION EXCEEDS UPPER LIMITS. SOME MINERALS MAY BE PARTIALLY ATTACKED. REFRACTORY AND GRAPHITIC SAMPLES CAN LIMIT AU SOLUBILITY.
- SAMPLE TYPE: Rock R150 Samples beginning 'RE' are Reruns and 'RRE' are Reject Reruns.

Data FA ____ DATE RECEIVED: FEB 11 2005 DATE REPORT MAILED: Mar. 1 / 2005

BRITISH COLUMBIA CERTIFIED ASSAYER
Jacky Wang

ACME ANALYTICAL LABORATORIES LTD. 852 E. HASTINGS ST. VANCOUVER BC V6A 1R6 PHONE(604)253-3158 FAX(604)253-1716
(ISO 9002 Accredited Co.)

ASSAY CERTIFICATE

Newmont Mining Corporation File # A500584
1700 Lincoln St., Denver CO 80203 U.S.A. Submitted by: Patrick Highsmith

SAMPLE#	Ag** gm/mt	Au** gm/mt
0401	<2	<.01
0403	<2	.05
0404	<2	.02
0405	<2	.03
0406	<2	.30
0407	31	3.24
0408	<2	.03
RE 0408	<2	.03
0409	<2	.36
0413	<2	.03
0428	<2	.15
0429	<2	1.07
0430	<2	3.02
0431	<2	.04
0432	<2	.02
0433	7	.12
0434	<2	.04
0435	<2	<.01
0436	<2	<.01
0437	<2	9.57
0438	<2	.05
0439	<2	.01
0440	<2	<.01
0441	<2	8.17
0442	<2	.04
0443	<2	.05
STANDARD R-2a/AU-1	157	3.33

GROUP 6 - PRECIOUS METALS BY FIRE ASSAY FROM 2 A.T. SAMPLE, ANALYSIS BY ICP-ES.
- SAMPLE TYPE: Rock R150
Samples beginning 'RE' are Reruns and 'RRE' are Reject Reruns.

Data NL FA ____ DATE RECEIVED: FEB 11 2005 DATE REPORT MAILED: Mar. 1 /2005

BRITISH COLUMBIA CERTIFIED ASSAYER Jacky Wang

Appendix 2 Summary of Expenditures

July 27 – Dec. 31 2004

Accommodation

10/5/04	SELKIRK MOTEL	FRUITVALE 2nd trip	-155.25
10/8/04	SELKIRK MOTEL	FRUITVALE 2nd trip	-51.75
10/8/04	SELKIRK MOTEL	FRUITVALE 2nd trip	-51.75

		TOTAL Accommodation	-258.75

Kilometerage 1990 Toyota Corolla, both trips

TOTAL Kilometerage	-196.31

Equipment - Small

8/18/04	MOUNTAIN EQUIPMENT COOP		-42.80
8/24/04	BUTLER SURVEY SUPPLIES	notebooks	-16.21
8/25/04	CDN TIRE STORE #00299	various	-60.12
8/27/04	BUTLER SURVEY SUPPLIES	field book	-29.26
9/7/04	MOUNTAIN EQUIPMENT COOP		-27.36
9/8/04	RIBTOR SALES	various	-64.16
9/8/04	CDN TIRE STORE	tote & batteries	-29.18
9/9/04	CDN TIRE STORE	file & batteries	-24.90
9/10/04	REVY HOME CENTRE #287	pails for rocks	-52.93
10/18/04	Eco-Tech Labs Kamloops	plastic ore bags	-11.45
10/22/04	RONA HOME & GARDEN #62870	rock pails	-17.11

		TOTAL Equipment – Small	-375.48

Lab Fees

12/9/04 Acme Analytical Labs #A406781 to A406786	-924.21

TOTAL Lab Fees	-924.21

Labour

09/17/04 B. Howard in transit 1st trip Sept. 10 & 16. 2 days @ 400/day	-800.00
09/1704 B. Howard 1st trip Sept. 11 to 15 5 days @ 450/day	-2,250.00
09/21/04 B. Doyle 1st trip Sept. 11 to 15 5 days in-field	-1,250.00
10/6/04 B. Doyle 2nd trip Sept. 30 to Oct. 3 3 days in-field	-900.00
10/07/04 B. Howard in transit 2nd trip Sept. 29 & Oct. 4. 2 days @ 400/day	-800.00
10/07/04 B. Howard 2nd trip Sept. 30 to Oct. 3 4 days @ 450/day	-1,800.00

TOTAL Labour	-7,800.00

Office copying

7/27/04 Mail Boxes Etc.		-1.09
7/27/04 MBEtc	copy Ray 2004 report	-22.96
9/17/04 CHQ#00332-2500028198		-6.01
9/27/04 Mail Boxes Etc.		-6.93
11/22/04 MBEtc		-27.03

	TOTAL Office copying	-64.02

Courier

10/29/04 GREYHOUND LINES	rx to Vancouver	-44.77
11/20/04 Calgary Public Library	charge for Allegro thesis on Alaskan W skarns	-15.00
11/22/04 MBEtc		-46.90
12/09/04 GREYHOUND LINES	1999 rx for re-assay	-22.22

	TOTAL Courier	-128.89

Post

8/20/04 CANADA Post		-7.81

	TOTAL Post	-7.81

Printing

11/17/04 PETRO-TECH PRINTING LTD.		-30.44
11/22/04 PETRO-TECH PRINTING LTD.		-32.37
11/30/04 PETRO-TECH PRINTING LTD.		-34.24

	TOTAL Printing	-97.05

Office Supplies

8/26/04 STAPLES #48	sundry for report	-28.43
10/12/04 STAPLES/BUSINESS DEPOT	for Report	-58.85

	TOTAL Office Supplies	-87.28

Truck Rental

10/4/04 JJH ENTERPRISES, TRAIL		-74.85

	TOTAL Truck Rental	-74.85

Site Meals & Groceries

9/7/04	MOUNTAIN EQUIPMENT COOP		-23.66
9/9/04	Superstore	1st trip	-89.57
9/9/04	Co-op	1st trip	-13.02
9/12/04	Subway Salmo		-11.11
9/14/04	Subway Salmo	1st trip	-10.57
9/15/04	Arbys Cranbrook		-4.28
9/24/04	Superstore	2nd trip	-85.06
9/29/04	Arbys Cranbrook		-6.46
9/30/04	Subway Salmo		-6.62
10/1/04	Subway Salmo	2nd trip	-6.62
10/2/04	Subway Salmo	2nd trip	-6.62
10/3/04	Subway Salmo	(B. Doyle pd) 2nd trip	-17.72

		TOTAL Site Meals & Groceries	-281.31

Telephone Long Distance

9/14/04	TELUS LD	from Salmo	-2.59
9/16/04	TELUS LD	from Salmo	-8.24
10/12/04	Telus Mobility		-5.65

		TOTAL Telephone Long Distance	-16.48

TOTAL EXPENDITURES for 2004 -10,312.44

Jan. 1 – June 24 2005

Courier

02/10/05	GREYHOUND LINES	rocks to Acme Analytical Labs Vancouver	-65.58
02/11/05	GREYHOUND LINES	rocks to Acme Analytical Labs Vancouver	-61.29

		TOTAL Courier	-126.87

Lab Fees

01/28/05	Acme Analytical Labs	#A407542		-187.89
05/18/05	Acme Analytical Labs	#A302012R2		-292.80
05/18/05	Acme Analytical Labs	#A302012R3		-170.94
05/18/05	Acme Analytical Labs	#A302012R4		-42.00
05/18/05	Acme Analytical Labs	#A302012R5		-63.40
05/18/05	Acme Analytical Labs	#A302012R6		-86.14
05/18/05	Acme Analytical Labs	#A302012B		-39.59
04/01/05	Acme Analytical Labs	#A500554	- US$ 1,009.66	-1,226.43
Converted at 1 US$ = CDN$ 1.2147				

			TOTAL Lab Fees	-2,109.19

Office–Report & Map Preparation

06/01/05 W. Howard BiTel Knoll Report 5 1/3 days @ 300/day	-1,600.00
06/01/05 W. Howard drafting 2 Maps 4 days @ 300/day	-1,200.00

TOTAL Office–Report & Map Preparation	-2,800.00

Office– Report Copying

01/21/05 MAILBOXES ETC	interim report	-186.16

	TOTAL Office – Report Copying	-186.16

Office – Printing Figs. (Maps)

01/18/05 PETRO-TECH PRINTING LTD.	-31.89
01/20/05 PETRO-TECH PRINTING LTD. interim report	-53.07
05/19/05 PETRO-TECH PRINTING LTD.	-49.22
06/10/05 PETRO-TECH PRINTING LTD.	-49.70
06/14/05 PETRO-TECH PRINTING LTD.	-96.17

TOTAL Office – Printing Figs. (Maps) - 280.05

TOTAL EXPENDITURES for 2005	**-5,502.27**
COMBINED 2004 and 2005 EXPENDITURES	**-15,814.71**

Appendix 3

Wm. R. Howard - Statement of Qualifications

Wm. R. Howard graduated in 1978 from the University of Alberta with a B.Sc., honours with distinction in Geology. He was awarded a 1999 Prospectors Assistance Program grant for the Bunker Hill project (Howard, 2000). He has attended numerous conferences, field trips and courses on mineral exploration including the 1999 Kamloops Exploration Group [KEG] Short Course on Intrusion-related Gold in Kamloops B.C. and the Cordilleran Exploration Round-up Jan. 24 – 25 2004 Short Course ‘Gold Vein Deposits: Turning Geology into Discovery’ by D. Rhys & P. Lewis. He worked at Dublin Gulch in 1980 about the Ray Gulch tungsten skarn before the discovery of the Eagle Zone gold deposit.
Howard has been involved in prospecting in the Canadian Cordillera since 1976 and the Nelson Mining Division since 1988.

Bruce Doyle - Statement of Qualifications

Bruce Doyle of Nelson B.C. is a reasonably successful and active prospector in the Nelson Mining Division and southeast B.C. He regularly attends the Kamloops Exploration Group and Roundup annual meetings and is active in the Chamber of Mines. He is the discoverer of the Silver Lynx massive sulphide prospect W of Nelson and a past recipient of Prospectors Assistance Program grants. He owns the ‘Amazing Grace’ gold property E of Castlegar BC, currently under option.

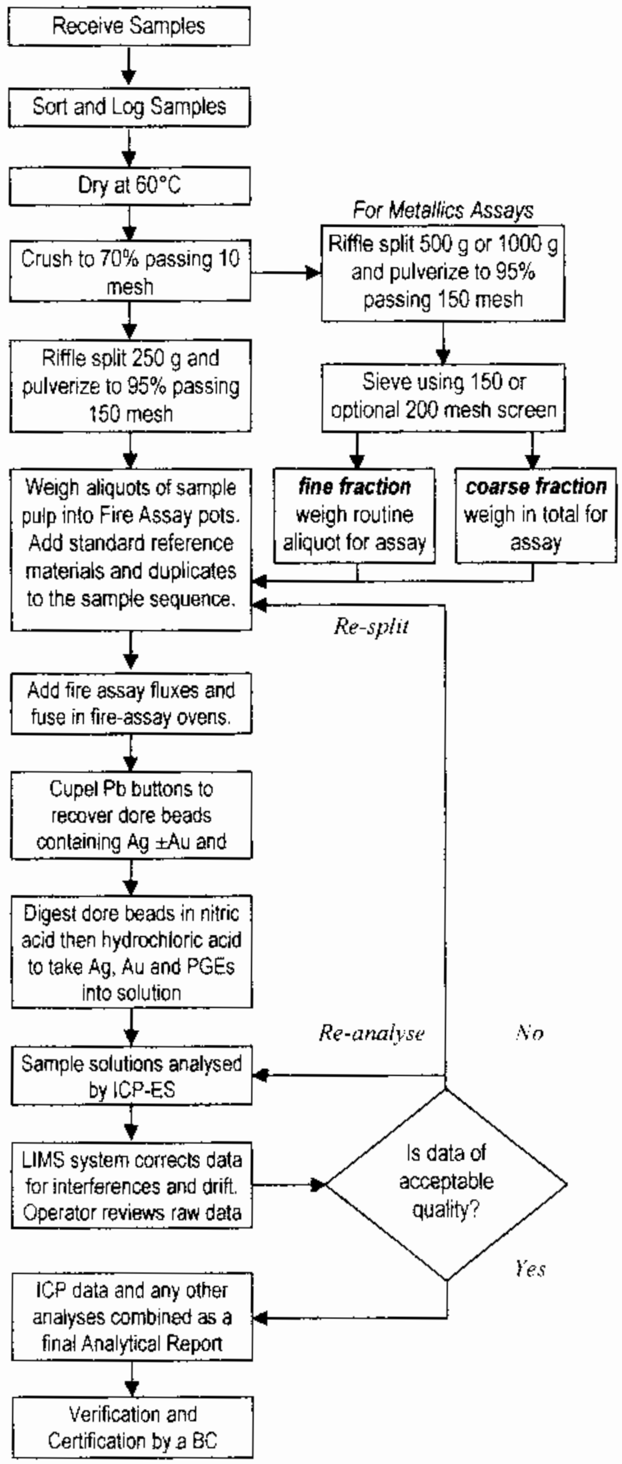
Appendix No. 4 Acme Analytical Laboratories Ltd. Methods and Specification for Group1-MS Ultratrace ICP-MS and Group 6 Precious Metals (Fire) Assay

ACME ANALYTICAL LABORATORIES LTD.

ISO 9001:2000
FM 63007
Vancouver 2003

METHODS AND SPECIFICATIONS FOR ANALYTICAL PACKAGE
GROUP 6 – PRECIOUS METALS ASSAY

Analytical Process



Comments

Sample Preparation

Rock and drill core are jaw crushed to 70% passing 10 mesh (2 mm), a 250 g riffle split is then pulverized to 95% passing 150 mesh (100 µm) in a mild-steel ring-and-puck mill. One assay ton aliquots (29.2 g) are weighed into fire assay crucibles. Option for 2 assay-ton aliquots is available on request. Smaller aliquots of ¼ or ½ assay ton may be required with difficult ore matrices.

Metallics Assay: A 500 g reject split (or optional 1000 g) is pulverized to 95% passing 150 mesh. Screening the pulp gives a fine and coarse fraction (containing any coarse gold) for assaying.

Sample Digestion

The sample aliquot is custom blended with fire assay fluxes, PbO litharge and a Ag inquart. Firing the charge at 1050°C liberates Au ± PGEs that report to the molten Pb-metal phase. After cooling the Pb button is recovered placed in a cupel and fired at 950°C to render a Ag ± Au ± PGEs dore bead. The bead is weighed and parted (i.e. leached in 1 mL of hot HNO_3) to dissolve Ag leaving a Au sponge. Adding 10 mL of HCl dissolves the Au ± PGE sponge. A Rh fire assay requires inquarting with Au.

Sample Analysis

Solutions are analysed for Ag, Au, Pt, Pd and Rh on a Jarrel-Ash Atomcomp model 975 ICP emission spectrometer. Au in excess of 30 g/t forms a large sponge that can be weighed (gravimetric finish). Ag in excess of 300 g/t is reported from the fire assay solution otherwise a separate split is digested in aqua regia and analysed by ICP-ES.

Metallics Assay: The coarse fraction is assayed in total. An aliquot of the fine fraction is assayed. Results report the total Au in the coarse fraction, the fine-fraction Au concentration and a weighted average Au concentration for the entire sample.

Quality Control and Data Verification

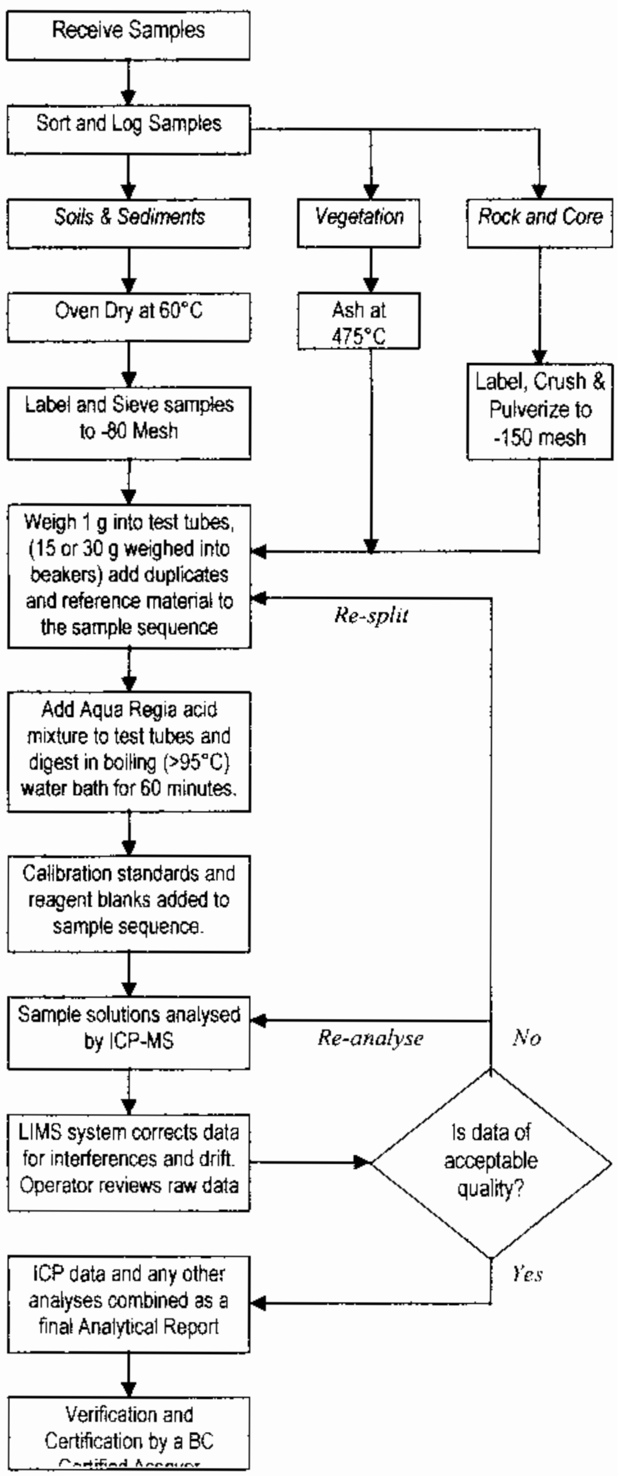
An Analytical Batch (1 page) comprises 34 samples. QA/QC protocol incorporates a sample-prep blank (SI or G-1) as the first sample carried through all stages of preparation to analysis, a pulp duplicate to monitor analytical precision, a -10 mesh rejects duplicate to monitor sub-sampling variation (drill core only), two reagent blanks to measure background and aliquots of in-house Standard Reference Materials like STD AU-1, AG-2 or FA-10R to monitor accuracy.

Raw and final data undergo a final verification by a British Columbia Certified Assayer who signs the Analytical Report before it is released to the client. Chief Assayer is Clarence Leong, other certified assayers are Leo Arciaga, Ken Kwok, Marcus Lau, Dean Toye and Jacky Wang.

852 East Hastings Street • Vancouver • British Columbia • CANADA • V6A 1R6
Telephone: (604) 253-3158 • Facsimile: (604) 253-1716 • Toll Free: 1-800-990-ACME (2263) • e-mail: info@acmelab.com

METHODS AND SPECIFICATIONS FOR ANALYTICAL PACKAGE
GROUP 1F-MS – ULTRATRACE ICP-MS ANALYSIS • AQUA REGIA

Analytical Process



Comments

Sample Preparation

All samples are dried at 60°C. Soil and sediment are sieved to -80 mesh (-177 μm). Moss-mats are disaggregated then sieved to yield -80 mesh sediment. Vegetation is pulverized or ashed (475°C). Rock and drill core is jaw crushed to 70% passing 10 mesh (2 mm), a 250 g riffle split is then pulverized to 95% passing 150 mesh (100 μm) in a mild-steel ring-and-puck mill. Pulp splits of 1 g are weighed into test tubes, 15 and 30 g splits are weighed into beakers.

Sample Digestion

A modified Aqua Regia solution of equal parts concentrated ACS grade HCl and HNO_3 and de-mineralised H_2O is added to each sample (6 mL/g) to leach in a hot-water bath (~95°C) for one hour. After cooling the solution is made up to a final volume with 5% HCl. Sample weight to solution volume ratio is 1 g per 20 mL.

Sample Analysis

Solutions aspirated into a Perkin Elmer Elan 6000 ICP mass spectrometer are analysed for the Basic package comprising 37 elements: Au, Ag, Al, As, B, Ba, Bi, Ca, Cd, Co, Cr, Cu, Fe, Ga, Hg, K, La, Mg, Mn, Mo, Na, Ni, P, Pb, S, Sb, Sc, Se, Sr, Te, Th, Ti, Tl, U, V, W and Zn. The Full package adds the 14 following elements: Be, Ce, Cs, Ge, Hg, In, Li, Nb, Rb, Re, Sn, Ta, Ta, Y and Zr. A PGE add-on package includes Pd and Pt. Larger sample splits are recommended for better analytical precision on elements subject to nugget effects (eg. Au, Pt).

Quality Control and Data Verification

An Analytical Batch (1 page) comprises 34 samples. QA/QC protocol incorporates a sample-prep blank (SI or G-1) carried through all stages of preparation and analysis as the first sample, a pulp duplicate to monitor analytical precision, a -10 mesh rejects duplicate to monitor sub-sampling variation (drill core only), two reagent blanks to measure background and aliquots of in-house Standard Reference Materials like STD DS5 to monitor accuracy.

Raw and final data undergo a final verification by a British Columbia Certified Assayer who signs the Analytical Report before it is released to the client. Chief Assayer is Clarence Leong, other certified assayers are Leo Arciaga, Ken Kwok, Marcus Lau, Dean Toye and Jacky Wang.

Document: Method and Specifications for Group 1F-MS.doc	Date: Jan 17, 2004	Prepared By: J. Gravel

Appendix No. 5 Tables 1A & 1B (old) Claim Tenure details

Table 1A: Details on the tenure of the (old) CLY Group claims in Nelson Mining District British Columbia Canada

Tenure number	Claim name	BCGS Map number	Work recorded	Area* (units)
370177	CLY 1	082F.003 082F.004	Good Standing to 2007.06.30	20
370178	CLY 2	082F.004	Good Standing to 2008.06.30	20

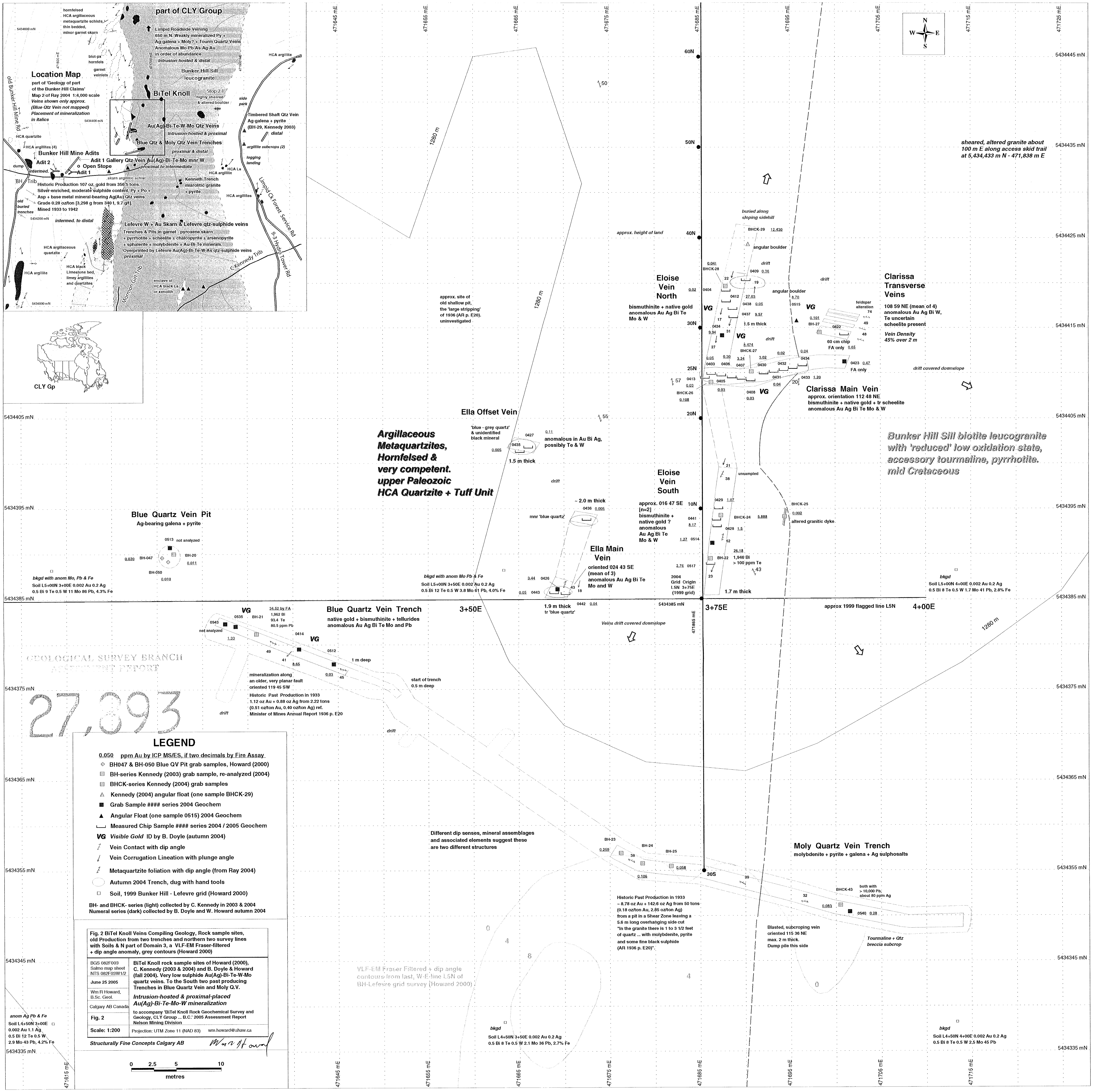
[Table 1A continues]

Tenure number	Claim name	Tag number	Area* (sq km)	NTS map	Mining Division
370177	CLY 1	232582	5.0	082F03W	12 Nelson
370178	CLY 2	232578	5.0	082F03W	12 Nelson

***surround the 2 Crown Grants, so slightly less area**

Table 1B: Details of CLY Group Crown Grants

Lot name	Lot No.	area (hectares)	NTS map	BCGS map	Land district	
Bunker Hill	2939	12.08	082F03W	082F.004	Kootenay	Crown Grant
Mormon Girl	1949	17.65	082F03W	082F.004	Kootenay	Crown Grant



part of CLY Group
Location Map
part of 'Geology of part of the Bunker Hill Claims' Map 2 of Ray 2004 1:4,000 scale
Veins shown only approx. (Blue Qtz Vein not mapped)
Placement of mineralization in italics
Limpid Roadside Veining
Bunker Hill Sill leucogranite
BiTel Knoll
Au(Ag)-Bi-Te-W-Mo Qtz Veins
Blue Qtz & Moly Qtz Vein Trenches
Bunker Hill Mine Adits
Adit 1 Gallery Qtz-Vein Au(Ag)-Bi-Te-Mo mnr W
Open Stope
Adit 1
Adit 2
Timbered Shaft Qtz Vein
Kenneth Trench
Historic Production 107 oz. gold from 356.5 tons.
Lefevre W + Au Skarn & Lefevre qtz-sulphide veins
Limpid Ck Forest Service Rd
9-3 Hydro Tower Rd
C. Kennedy Trib
Mormon Girl Trib
old Bunker Hill Mine Rd
CLY Gp
60N
50N
40N
30N
25N
20N
10N
30S
3+50E
3+75E
4+00E
1280 m
Eloise Vein North
bismuthinite + native gold
anomalous Au Ag Bi Te Mo & W
Clarissa Transverse Veins
108 59 NE (mean of 4)
anomalous Au Ag Bi W, Te uncertain
scheelite present
Vein Density 45% over 2 m
Clarissa Main Vein
approx. orientation 112 48 NE
bismuthinite + native gold + tr scheelite
anomalous Au Ag Bi Te Mo & W
sheared, altered granite about 100 m E along access skid trail at 5,434,433 m N - 471,838 m E
Bunker Hill Sill biotite leucogranite with 'reduced' low oxidation state, accessory tourmaline, pyrrhotite. mid Cretaceous
Argillaceous Metaquartzites, Hornfelsed & very competent. upper Paleozoic HCA Quartzite + Tuff Unit
Ella Offset Vein
anomalous in Au Bi Ag, possibly Te & W
Eloise Vein South
approx. 016 47 SE [n=2]
bismuthinite + native gold ? anomalous Au Ag Bi Te Mo & W
Ella Main Vein
oriented 024 43 SE (mean of 3)
anomalous Au Ag Bi Te Mo and W
Blue Quartz Vein Pit
Ag-bearing galena + pyrite
Blue Quartz Vein Trench
native gold + bismuthinite + tellurides
anomalous Au Ag Bi Te Mo and Pb
mineralization along an older, very planar-fault oriented 119 45 SW
Historic Past Production in 1933
1.12 oz Au + 0.88 oz Ag from 2.22 tons (0.51 oz/ton Au, 0.40 oz/ton Ag) ref. Minister of Mines Annual Report 1936 p. E20
Moly Quartz Vein Trench
molybdenite + pyrite + galena + Ag sulphosalts
Different dip senses, mineral assemblages and associated elements suggest these are two different structures
Historic Past Production in 1933
~ 8.78 oz Au + 142.6 oz Ag from 50 tons (0.18 oz/ton Au, 2.85 oz/ton Ag) from a pit in a Shear Zone leaving a 5.6 m long overhanging side cut
"In the granite there is 1 to 3 1/2 feet of quartz ... with molybdenite, pyrite and some fine black sulphide (AR 1936 p. E20)".
Blasted, subcroping vein oriented 115 36 NE max. 2 m thick. Dump pile this side
Tourmaline + Qtz breccia subcrop
VLF-EM Fraser Filtered + dip angle contours from last, W-E line L5N of BH-Lefevre grid survey (Howard 2000)
GEOLOGICAL SURVEY BRANCH ASSESSMENT REPORT
27,893
LEGEND
0.050 ppm Au by ICP MS/ES, if two decimals by Fire Assay
BH047 & BH-050 Blue QV Pit grab samples, Howard (2000)
BH-series Kennedy (2003) grab sample, re-analyzed (2004)
BHCK-series Kennedy (2004) grab samples
Kennedy (2004) angular float (one sample BHCK-29)
Grab Sample #### series 2004 Geochem
Angular Float (one sample 0515) 2004 Geochem
Measured Chip Sample #### series 2004 / 2005 Geochem
VG Visible Gold ID by B. Doyle (autumn 2004)
Vein Contact with dip angle
Vein Corrugation Lineation with plunge angle
Metaquartzite foliation with dip angle (from Ray 2004)
Autumn 2004 Trench, dug with hand tools
Soil, 1999 Bunker Hill - Lefevre grid (Howard 2000)
BH- and BHCK- series (light) collected by C. Kennedy in 2003 & 2004
Numeral series (dark) collected by B. Doyle and W. Howard autumn 2004
Fig. 2 BiTel Knoll Veins Compiling Geology, Rock sample sites, old Production from two trenches and northern two survey lines with Soils & N part of Domain 3, a VLF-EM Fraser-filtered + dip angle anomaly, grey contours (Howard 2000)
BGS 082F003 Salmo map sheet NTS 082F03W1/2
BiTel Knoll rock sample sites of Howard (2000), C. Kennedy (2003 & 2004) and B. Doyle & Howard (fall 2004). Very low sulphide Au(Ag)-Bi-Te-W-Mo quartz veins. To the South two past producing Trenches in Blue Quartz Vein and Moly Q.V.
June 25 2005
Wm R Howard, B.Sc. Geol.
Intrusion-hosted & proximal-placed Au(Ag)-Bi-Te-Mo-W mineralization
Calgary AB Canada
Fig. 2
to accompany 'BiTel Knoll Rock Geochemical Survey and Geology, CLY Group ... B.C.' 2005 Assessment Report Nelson Mining Division
Scale: 1:200
Projection: UTM Zone 11 (NAD 83)
wm.howard@shaw.ca
Structurally Fine Concepts Calgary AB
0 2.5 5 10
metres

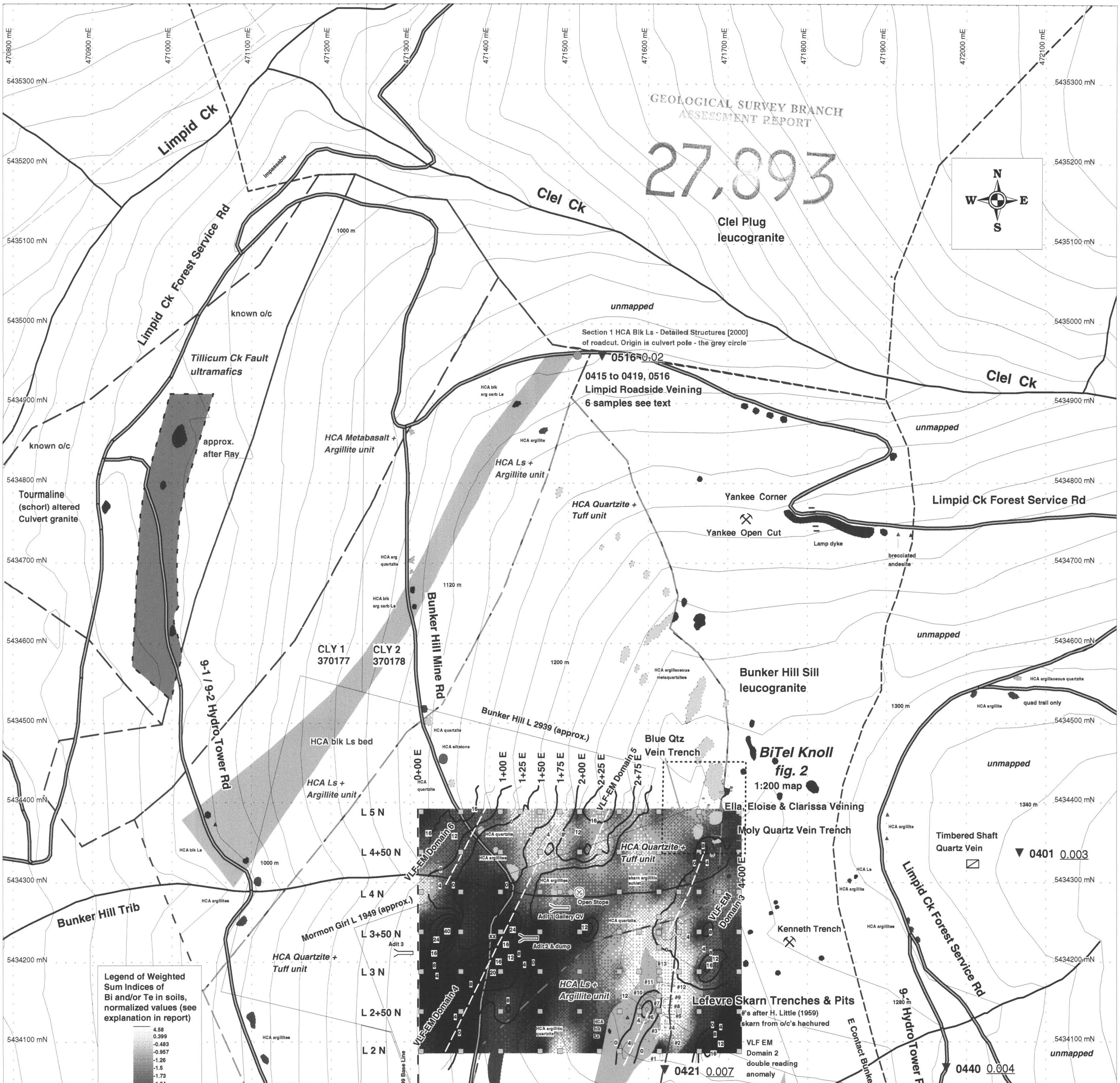


Fig. 3
Compilation of VLF-EM + dip angle Anomaly Groups, Bi / Te in soils, HCA units (Howard 2000), Preliminary geology (Ray 2004), 2004 Rock samples and showings about BiTel Knoll (E of map centre)

BGS 082F003 Salmo map sheet NTS 082F03W1/2	VLF-EM Fraser-filtered + dip angles are contoured at +2 unit intervals. Numbered Domains are anomaly groups. Dashed white lines are Domain trends [n=5]. Greyscale grid of Bi and/or Te index values in 25 or 50 m-spaced soils (2000), 2 m pixels. Geology from Ray (2004). Dashed lines demarcate Harcourt Ck Assemblage (Einarsen 1995) units (Howard 2000), names in italics. Inset is BiTel Knoll site fig. 2 map. Triangles labelled 0### with ppb Au are 2004 rock sample sites. Named showings from Howard (2000). Some geographic names are informal. Contour interval is 20 m.
Sept. 12 2005	
Wm R Howard, B.Sc. Geol.	
Calgary AB Canada	
Fig. 3	to accompany 'BiTel Knoll Mineralized Rock Geochemical Survey on CLY Group 2005 Assessment Report
	Projection: UTM Zone 11 (NAD 83) wm.howard@shaw.ca