# **Assessment Report**

on the

# NIAGARA PROPERTY

# **BOUNDARY DISTRICT**

## NTS 82E/1 and 82E/2

Lat: 49° 06' 12" N Long: 118° 28' 57" W (at approximate centre of property)

Greenwood Mining Division British Columbia, Canada

Prepared for:

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## 1.0 SUMMARY

The Niagara property is one of eight mineral properties owned by Kettle River Resources in the Greenwood area of southern B.C. The property is located 8 kilometres northwest of Grand Forks, B.C., on NTS 82E/1 and 82E/2, and covers an area of approximately 890 hectares. This report describes the results of a prospecting and rock sampling program completed on the claims during 2005.

The Niagara property is a grass-roots property which is underlain in large part by the Triassic Brooklyn Formation. The Brooklyn Formation is a favourable host rock for both copper-gold skarn mineralization and gold-bearing volcanogenic massive sulfide/oxide (Lamefoot-type) mineralization.

Prospecting during 2005 identified an area of copper staining and silicification in Brooklyn limestone, in the southeast corner of the property. A sample from this area returned elevated zinc, copper and arsenic (5742 ppm Zn, 1227 ppm Cu, 110 ppm As), but no significant precious metal values. Just north of Fisherman Creek, and about 400 metres west of the rail grade, an angular float boulder of silicified siltstone with sulfides contained 4418 ppm Zn. These occurrences support the idea of volcanogenic or skarn related mineralization within the Brooklyn rocks on the claims.

Much of the property is quite steep and unsuitable to traditionally ground exploration methods. Airborne time domain EM would be a good tool to test for massive sulfide zones, associated with either volcanogenic or skarn mineralization, within the Brooklyn rocks. This is recommended, in conjunction with surveys on other Kettle River Greenwood area properties.

In addition to the skarn and volcanogenic massive sulfide/oxide mineralization potential of the property, Eocene-aged epithermal gold mineralization is a viable exploration target. Work during 2005 identified widespread evidence of epithermal style veining and silicification. No elevated precious metal values have been returned to date from this style of mineralization on the property, however further prospecting is warranted to explore for this target. In particular, the northwestern part of the property, in the hangingwall of the Thimble Mountain Fault, should be prospected.

## 2.0 INTRODUCTION

This report describes the 2005 work program on the Niagara property. Large sections of the report, pertaining to general background information, are taken verbatim from an earlier report by the author (Caron, 2005).

## 2.1 **Property Location and Description**

The Niagara property is one of eight mineral properties owned by Kettle River Resources within the Greenwood area, namely the Phoenix, Phoenix tailings, Bluebell, Niagara, Rads, Tam O'Shanter, Haas Creek and Arcadia properties. Kettle River's holdings cover several past-producing mines, as well as many of the key mineral occurrences in the Greenwood Camp.

The Niagara property is situated approximately 8 kilometers northwest of Grand Forks, B.C. on NTS 082E/1 and 082E/2, as shown on Figure 1. It is centered at latitude 49° 6' 12" N and at longitude 118° 28' 57" W. The property is a grass-roots exploration property, covering an area of 888 hectares, which adjoins Kettle River's Bluebell property to the east.

The property is comprised of 2 MTO cell claims covering 42 map cells that are located on Mineral Tenure map sheets 082E.008 and 082E.018. The claims are shown on Figure 2 and summarized below in Table 1. Expiry dates shown below are after filing the work which this report describes. Note that a portion of the 2005 work on the Niagara property was filed onto adjoining claims also held by Kettle River Resources but not described in this report.

Tenure #	AREA (Ha)	EXPIRY DATE <sup>*</sup>
516683	803.63	2007/Sep/10
521743	84.58	2006/Nov/01

\*after filing this report

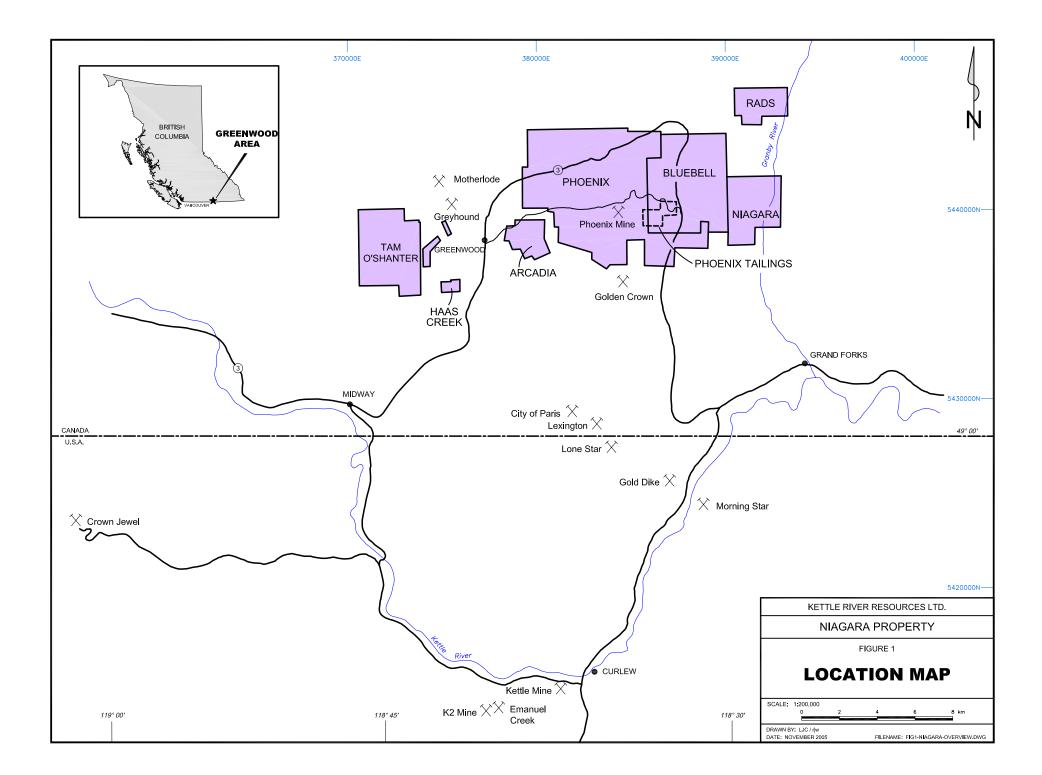
## Table 1 - Niagara Property Claim Information

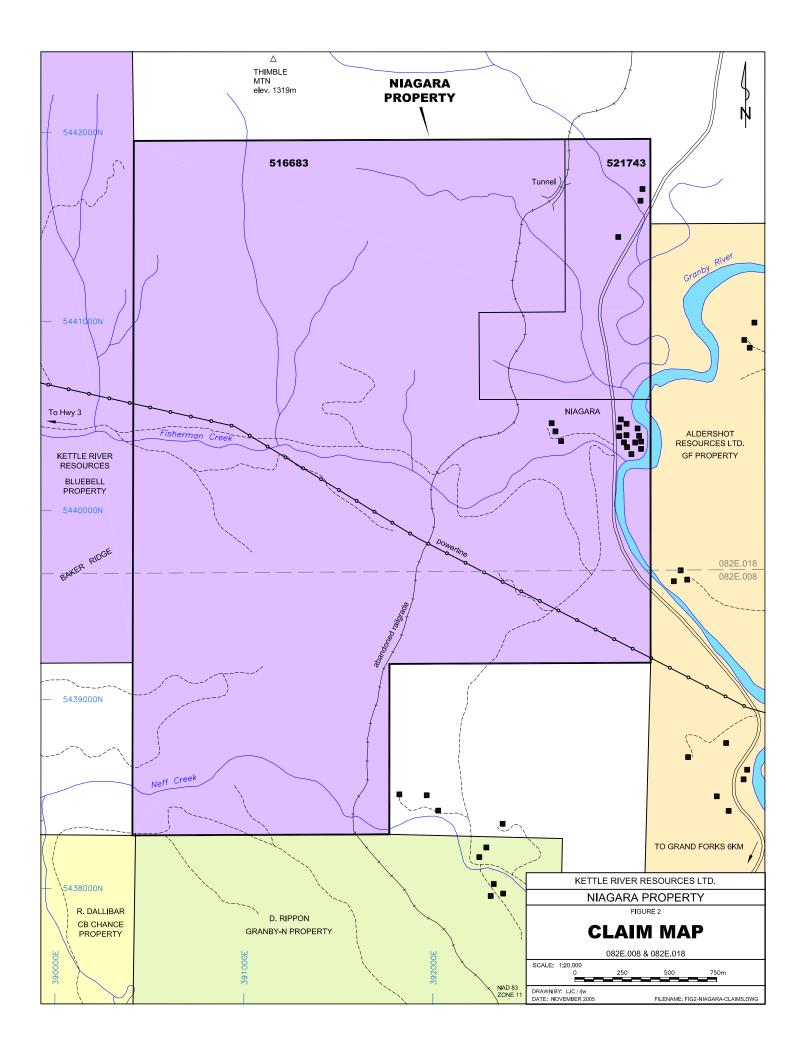
Kettle River acquired the property by staking in 1996 and, in July 2005, converted the Niagara legacy claim to the current MTO cell claim. An additional map cell claim was acquired in 2005, in the northern part of the property. The claims are 100% owned by Kettle River and not subject to any underlying agreements. Small areas in the extreme eastern portions of the property, in the Granby and lower Fisherman and Neff Creek valleys, are covered by ground with privately held surface title, as shown on Figure 3. These areas are rural residential areas, with numerous houses and small acreages. The rural community of Niagara is situated on the property, near the confluence of Fisherman Creek and the Granby River.

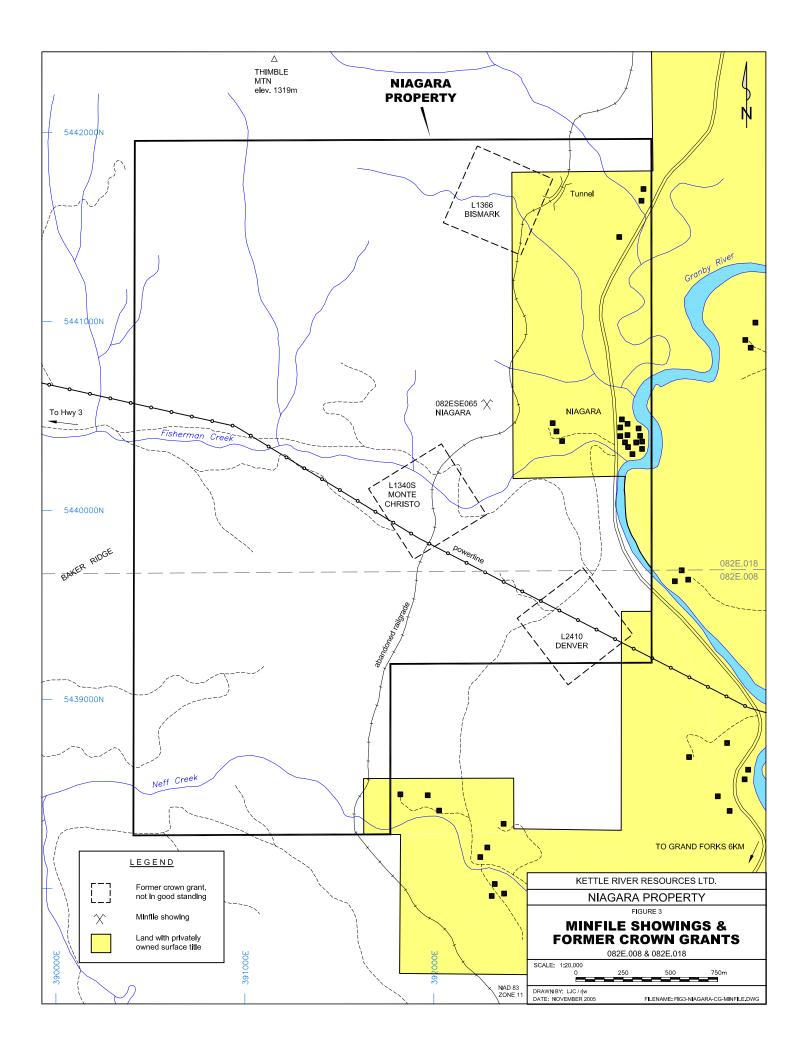
Limited services, including room, board and fuel, are available in the Greenwood (population < 1000). Grand Forks, with a population of about 8,000 in the city and immediate surrounding area, is a more major supply centre. Most services needed for exploration are available in Grand Forks, 8 kilometres southeast of the Niagara property. The closest full-service airports are located in Kelowna, Penticton or Castlegar.

## 2.2 Access, Climate, Local Resources, Infrastructure and Physiography

There is good road access to the southern part of the Niagara property. The paved Granby road follows the Granby River valley north from Grand Forks, and passes through the extreme eastern part of the claim block. The Old North Fork road from Niagara (maintained year-round) provides additional access, as do several four wheel drive powerline access roads, and an old road that climbs uphill to the rail grade near Fisherman Creek and then follows Fisherman Creek through to Highway 3 (joining the highway about 2 kilometres north of the Phoenix road turn-off). North of Fisherman Creek, the property is very steep with







no road access. The abandoned rail grade is accessible only by foot, bicycle, or by 4-wheeler or motorcycle and not by vehicle.

The property covers the south and eastern slopes of Thimble Mountain, the east facing slopes of Baker Ridge, as well as a portion of the Fisherman Creek and Neff Creek drainages. A high tension powerline passes through the centre of the property, in a generally east-west direction, while the abandoned CPR rail grade (now part of the Trans Canada Trail and a popular bicycling route) cuts the eastern part of the property from north to south.

Elevations range from about 530 metres in the Granby River valley at Niagara, to about 1300 metres, near the summit of Thimble Mountain in the northern part of the claim. The south and east facing slopes of Thimble Mountain are very steep, with abundant rock exposed and locally prominent cliffs. South of Fisherman Creek, the topography is more moderate and the percentage of rock exposed is lower than north of the creek. Water is available for drilling from Fisherman Creek or from Neff Creek, and seasonally from one or more of the smaller drainages on the property.

The climate is moderately dry, with hot summers and little rainfall. Snowfall is typically in the order of 1-2 metres. South slopes and areas at lower elevations are generally snow-free from early April to mid November, while the higher elevations are generally not free of snow until early May. Vegetation consists of moderate to open second growth mixed fir, pine and larch forest, with little undergrowth.

## 3.0 HISTORY

## 3.1 Regional Exploration History

In the Greenwood Camp, exploration dates back to the early 1880's. This first phase of exploration and development focused on high grade gold and silver veins, such as the Skylark, Providence, City of Paris and Jewel (Dentonia) Mines. The first ore shipped from the Boundary area was from the Skylark vein. The vein was discovered in 1892; ore from the vein was packed on horses and then hauled some 150 kilometres in wagons to Marcus, Washington, where it was shipped by rail to Everett. Exploration and development of the various veins in the camp continued intermittently through the early 1900's. Significant producers were the Jewel, with about 124,000 tonnes averaging 9.9 g/t Au produced, the Athelstan (33,000 tonnes @ 5.4 g/t Au), the Winnipeg (56,000 tonnes @ 7.2 g/t Au), and the Providence (10,500 tonnes @ 17.5 g/t Au, 4060 g/t Ag) (Church, 1986).

In 1890, copper skarn mineralization was discovered at Phoenix, about 5 kilometres east of Greenwood. The Granby Company was formed to work in the Phoenix area in 1896, and in 1900 the Granby Smelter in Grand Forks was completed to process ore from the Phoenix mine. Mining continued until 1919, when the Granby mine and smelter closed due to low copper prices, lower ore grades and a shortage of coking coal for the smelter furnaces. The discovery and development of copper skarn mineralization in the Deadwood Camp (Motherlode mine) just west of Greenwood was happening concurrently to the work at Phoenix, with ore processed in the British Columbia Copper Company smelter at Anaconda.

In 1894, mineralization was discovered at the Emma, in the Summit Camp north of Phoenix, during railroad construction. Over the next few years, crown grants had been issued over most of the main showings in the Summit Camp and considerable development work was done. The period from 1900 - 1920 marked the height of mining activity in the Summit Camp, with the B.C. Copper Company's B.C., Emma and Oro Denoro mines all in full operation. A total of about 450,000 tonnes was produced from these three mines during this period, with ore shipped by rail to the company's smelter at Anaconda (Greenwood) for processing. As with the Granby smelter in Grand Forks, the Greenwood smelter ceased operation in 1919 and the company's mines were shut down.

In 1909, the Greenwood-Phoenix Tramway Bore was started, an ambitious but ill-fated project to drive a cross-cut tunnel from Greenwood to a point underneath the Phoenix mine, a distance of about 3 kilometres. The objective of the project was to intersect a number of small veins that had been exposed on surface, and to test for mineralization at depth below the Phoenix deposit. The project was abandoned in 1913, after driving about 915 metres of tunnel without much success.

Small-scale production continued from a number of properties in the district following the closure of the Grand Forks and Greenwood smelters, and the coinciding shut-down of the mines in the Phoenix, Summit and Deadwood camp, and then, in 1956 the Granby Company re-evaluated the Phoenix property with the intent of open-pit mining. Open pit production at Phoenix began in 1959 at a rate of 900 tons per day, was increased to 2000 tons per day in 1961 and further increased to 3000 tons per day in 1972. Granby terminated mining operations at Phoenix in 1976, and later dismantled and moved the Phoenix mill. Total production at Phoenix during the period 1900 - 1976 is reported at 27 million tonnes at a grade of 0.9% Cu and 1.12 g/t Au, from a number of different ore bodies (Church, 1986). This amounts to over 1 million ounces of gold production from the Phoenix deposit.

Similarly, in 1956, Woodgreen Copper Mines renewed mining at the Motherlode mine near Deadwood. A 1000 ton per day mill was constructed to process ore mined via open pit methods, although production had dropped to 500 tons per day by 1959. Mining continued until 1962, at which point the mill was dismantled and removed. The total production from the Motherlode mine to 1962, including the early direct smelting

ore, is 4.2 million tonnes at a grade of 0.8% Cu and 1.3 g/t Au (Church, 1986).

Exploration in the camp was rekindled in the early 1980's with the discovery of the Sylvester K gold bearing massive sulfide zone north of the Phoenix (on Kettle River's Phoenix property). The Sylvester K is contained within a very characteristic, repeatable sequence of Brooklyn sediments and volcanics (the upper portion of the regionally mapped sharpstone unit), sitting just below massive Brooklyn limestone. Complex faulting offsets mineralization and has hampered exploration.

Skylark Resources was active in the area during the mid-late 1980's, on their wholly owned Skylark property (now Kettle River Resources' Arcadia property) and on the adjoining OB property, which they held in joint venture with Viscount Resources. Skylark discovered and explored the H and Serp Zones, straddling the boundary between the Skylark and OB properties. A 458 metre decline was completed on the H Zone, with drifting onto the Serp Zone. Production from the H Zone started in December 1987, at a rate of 90 tonnes per day. Ore was processed in the Robert's Mill at Boundary Falls and in the Dankoe Mill near Keremeos. Mining continued through to early 1989, with total production of 33,300 tonnes grading 353 g/t Ag and 2.7 g/t Au. Significant exploration work was also done on the Golden Crown and Lexington properties during the mid-late 1980's.

In the late 1980's and early 1990's, the camp was busy, with options by major companies on a number of properties in the Greenwood area (including Battle Mountain (Canada) Inc. on the Phoenix property, Canamax Resources on the Bluebell property, Minnova Inc. on the Tam O'Shanter property, and Teck and Orvana on the Eholt/Thimble Mountain property). Major exploration programs were completed on all of these properties, including several airborne surveys and considerable exploratory drilling.

Crown Resources and Echo Bay Mines discovered several gold-bearing volcanogenic massive sulfide/oxide deposit in the Belcher District, just south of the Canada-USA border, during the late 1980's and early 1990's. Recognizing the geological similarities between the Belcher District and the Greenwood area, Echo Bay Minerals Co. entered into a joint venture agreement with Kettle River Resources Ltd. in 1997, to explore certain claims in the Greenwood camp for this style of mineralization. A total of 2,500 metres of diamond drilling was done to test targets at the Emma, Sylvester K, R Bell and Bluebell showings, with little success.

In 2002, Gold City Industries Ltd. acquired the Golden Crown, Lexington and JD properties, three of the more advanced properties in the Greenwood area (together "The Greenwood Gold Project"). During 2003, 47 diamond drill holes were drilled on the Golden Crown property, 4 holes were drilled on the Lexington property and a trenching program was carried out on the JD property. In 2004, an agreement was reached with Merit Mining (formerly Jantri Resources) to acquire the Greenwood Gold project from Gold City. An additional 40 diamond drill holes were drilled on the Lexington project during 2004, and an updated 43-101 compliant Inferred Resource of 106,100 tonnes grading 6.6 g/t Au and 1.0% copper or 8.9 g/t Au equivalent, at a cut-off of 6 g/t Au equivalent was announced (MEM.V news release April 19, 2005). In addition, the company announced that conditional permitting was in place for a 200 tonne per day flotation mill near the Golden Crown property (MEM.V news release Jan 17, 2005). If construction of this mill proceeds, this will provide a custom-milling option for properties in the Greenwood area.

## **3.2** History of Exploration - Niagara Property

The Niagara property is a grass-roots exploration property with little previous exploration history. Figure 3 shows the outline of former crown granted mineral claims that are situated within the property. The only reference to work on these former crown grants, apart from the dates of crown granting (1900 to 1903) is a reference in the 1901 Minister of Mines Annual Report to 14 metres (46 feet) of "tunnelling and sinking" at the Niagara showing (Minfile 082ESE065). The 1901 Minister of Mines Annual Report also mentions that:

"The Mono, Queen of the Hills, Accident, Maine, Viola, Belle Plain, Deer Park and Utica (on Fisherman Creek), each have about 100 feet of work done on them in sinking, drifting and cross-cutting"

These claims were never crown granted and the location of them, and of the workings referenced, is unknown.

Only one assessment report has been filed on the area covered by the current Niagara property, a 1971 report documenting line cutting by Granby on the then AE and Spud claims.

Kettle River Resources staked the Niagara property in 1996, following a regional compilation program of geology and exploration results from the Greenwood area. The property was recognized as having a favourable structural and stratigraphic setting for gold (and/or copper) mineralization. Prior to the work program described in this report, Kettle River had not completed any exploration on the property.

In 2005, Kettle River Resources converted the legacy Niagara claims to the current MTO cell claims (and staked an additional MTO claim in the northern part of the property. A NI 43-101 compliant Technical Report was prepared by the author, for all of Kettle River's Greenwood area properties, including the Niagara (Caron, 2005). The general background information contained in this report is taken in large part from that source.

## 3.3 Summary of 2005 Work Program

A program of prospecting and rock sampling was completed on the Niagara property during the fall of 2005. Work was done from October 21 to November 1, 2005, by John Boutwell and Alfi Elden. The program was supervised by Linda Caron.

A total of 52 rock samples were collected and submitted to Eco Tech Labs in Kamloops for preparation and analysis for gold plus a 32 element ICP suite. Rock sample locations and results for select elements are shown on Figure 5. Sample descriptions are contained in Appendix 1 and complete analytical results are included in Appendix 2.

## 4.0 GEOLOGY & MINERALIZATION

## 4.1 Regional Geology and Deposit Types

The Niagara property is situated within the Boundary District, a highly mineralized area straddling the Canada-USA border, which includes the Republic, Belcher, Rossland and Greenwood Mining Camps. Total gold production from the Boundary District exceeds 7.5 million ounces (Schroeter et al, 1989; Höy and Dunne, 2001; Lasmanis, 1996). The majority of this production has been from the Republic and Rossland areas. At Republic, about 2.5 million ounces of gold, at an average grade of more than 17 g/t Au, has been produced from epithermal veins (Lasmanis, 1996). In the Rossland Camp, 2.8 million ounces of gold at an average grade of 16 g/t Au was mined from massive pyrrhotite-pyrite-chalcopyrite veins (Höy and Dunne, 2001). Recent exploration in the Boundary District resulted in the discovery of a number of new deposits, from which more than 1 million ounces of gold has been produced to date. At present, Kinross' Emanuel Creek (North) deposit is the only active metal mine in the district. Several other gold deposits, including the Buckhorn Mountain (Crown Jewel) deposit at Chesaw and the Golden Eagle deposit at Republic, remain undeveloped.

Numerous people have mapped portions of the Boundary District on a regional basis, including Höy and Dunne (1997), Fyles (1984, 1990), Little (1957, 1961, 1983), Church (1986), Parker and Calkins (1964), Muessig (1967), Monger (1967) and Cheney and Rasmussen (1996). While different formational names have been used within different parts of the district, the geological setting is similar.

The Boundary District is situated within Quesnellia, a terrane that accreted to North America during the mid-Jurassic. Proterozoic to Paleozoic North American basement rocks are exposed in the Kettle and Okanogan metamorphic core complexes. These core complexes were uplifted during the Eocene, and are separated from the younger overlying rocks by low-angle normal (detachment) faults. The distribution of these younger rocks is largely controlled by a series of faults, including both Jurassic thrust faults (related to the accretionary event), and Tertiary extensional and detachment faults.

The oldest of the accreted rocks in the district are late Paleozoic volcanics and sediments. In the southern and central parts of the district, these rocks are separated into the Knob Hill and overlying Attwood Groups. Rocks of the Knob Hill Group are of dominantly volcanic affinity, and consist mainly of chert, greenstone and related intrusives, and serpentinite. The serpentinite bodies of the Knob Hill Group represent parts of a disrupted ophiolite suite which have since been structurally emplaced along Jurassic thrust faults. Commonly, these serpentinite bodies have undergone Fe-carbonate alteration to listwanite, as a result of the thrusting event. Serpentinite is also commonly remobilised along later structures. Unconformably overlying the Knob Hill rocks are sediments and volcanics (largely argillite, siltstone, limestone and andesite) of the late Paleozoic Attwood Group.

The Paleozoic rocks are unconformably overlain by the Triassic Brooklyn Formation, represented largely by limestone, clastic sediments and pyroclastics. In the western part of the district, the Permo-Triassic rocks are undifferentiated and grouped together as the Anarchist Group.

Both the skarn deposits and the more recently recognized stratabound gold-bearing volcanogenic magnetitesulfide deposits in the district are hosted within the Triassic rocks. The Brooklyn Formation contains a distinctive angular chert pebble conglomerate, known locally as "sharpstone conglomerate". Stratiform VMS/O mineralization occurs, in a general sense, at the top of the sharpstone unit, and stratigraphically below massive Brooklyn limestone. The origin of the sharpstone has long been debated. Rayner (1995) states that submarine explosive activity, or alternately, faulting with rapid and substantial vertical movement to provide steep fault scarps, would be required to generate the angular chert clasts in the sharpstone. Volcanic rocks overlie the limestone and clastic sediments of the Brooklyn Formation and may be part of the Brooklyn Formation, or may belong to the younger Jurassic Rossland Group.

At least four separate intrusive events are known regionally to cut the older rocks, including the Jurassic aged alkalic intrusives (i.e. Lexington porphyry, Rossland monzonite, Sappho alkalic complex), Triassic microdiorite related to the Brooklyn greenstones, Cretaceous-Jurassic Nelson intrusives, and Eocene Coryell (and Scatter Creek) dykes and stocks.

In the Greenwood area, Fyles (1990) has shown that the pre-Tertiary rocks form a series of thrust slices, which lie above a basement high-grade metamorphic complex. A total of at least five thrust slices are recognized, all dipping gently to the north, and marked in many places by bodies of serpentine. There is a strong spatial association between Jurassic thrust faults and gold mineralization in the area.

Eocene sediments and volcanics unconformably overlie the older rocks. The oldest of the Tertiary rocks are conglomerate and arkosic and tuffaceous sediments of the Eocene Kettle River Formation. These sediments are overlain by andesitic to trachytic lavas of the Eocene Marron Formation, and locally by rhyolite flows and tuffs (such as in the Franklin Camp). The Marron volcanics are in turn unconformably overlain by lake bed sediments, lahars and volcanics of the Eocene Klondike Mountain Formation. The Klondike Mountain Formation is largely missing in the Greenwood area.

Three Tertiary fault sets are recognized, an early gently east dipping set, a second set of low-angle west dipping, listric normal (detachment-type) faults, and a late, steep dipping, north to northeast trending set of right or left lateral or west side down normal faults (Fyles, 1990). Epithermal gold mineralization, related to Eocene structural activity, has been an important source of gold in the Boundary District.

The Tertiary rocks are preserved in the upper plates of low-angle listric normal (detachment-type) faults related to the uplifted metamorphic core complexes, in a series of local, fault-bounded grabens (i.e. Republic graben, Toroda graben) (Cheney and Rasmussen, 1996; Fyles, 1990). In the Greenwood area, a series of these low-angle faults occur (from east to west, the main low-angle faults are the Granby River, Thimble Mountain, Snowshoe, Bodie Mountain, Deadwood Ridge, Windfall Creek, and Copper Camp faults). These faults have taken a section of the Brooklyn stratigraphy and sliced it into a series of discrete blocks, each separated by a low-angle fault. For example, the Phoenix section is rooted by the Snowshoe fault. Overlying these rocks were rocks now exposed about 6 kilometres to the west in the Deadwood Camp. The Deadwood segment was in turn overlain by rocks now situated to the west above the Copper Camp fault. The low angle Tertiary faults have displaced pre-Tertiary mineralization (i.e. the Deadwood camp represents the top of the Phoenix deposit), however current thinking attributes at least some of the gold in the deposits to the low angle Tertiary faults that underlie them. Many smaller low angle detachment-type faults are recognized on a property scale, and are often marked by Eocene sills which mask rocks the underlying fault plate.

Because the skarn and VMS/O deposits have a strong stratigraphic control, an understanding of both stratigraphy and structure is critical to exploration success. As summarized by Rayner (1995):

"Dr. Fyles' recent work on the extension tectonics of the district has fundamentally changed geological thinking in the Boundary Camp. Any attempt to look at the camp in a unified way with respect to concepts of zoning or a concentric distribution of deposits must deal with the fact that we are now looking at the laterally dismembered and subsequently eroded remnants of the original system."

Most of the historical production and previous exploration in the Boundary District has been directed at gold or copper-gold/silver mineralization and, as such, the following discussion is restricted to these styles

of mineralization. Occurrences of chrome, nickel, PGE's and lead-zinc mineralization are known within the district that are not discussed below. The important gold deposits within the Boundary District can be broadly classified into six deposit types, as summarized below (Peatfield, 1978; Church, 1986, 1997; Tschauder, 1989; Rasmussen, 1993, 2000).

## 1. Skarn Deposits

Both gold and copper-gold skarn deposits occur within the Boundary District. These deposits are related to Cretaceous-Jurassic intrusive activity into limestone and limey sediments generally belonging to the Triassic Brooklyn Formation. Important examples of this type of deposit include the undeveloped Buckhorn Mountain (Crown Jewel) deposit at Chesaw, Washington, the historic Phoenix deposit near Greenwood (part of Kettle River's Phoenix property), and the Motherlode deposit just west of Greenwood. Historic production from Phoenix is 27 million tonnes at 0.9% Cu and 1.12 g/t Au and from Motherlode is 4.2 million tonnes at 0.8% Cu and 1.3 g/t Au (Church, 1986).

Recent exploration in the district suggests that at least some of the metal in the "skarn" deposits (Phoenix, Motherlode) pre-date the skarn event. An iron (+/- copper, gold) rich volcanogenic massive sulfide/oxide horizon (the Lamefoot horizon, discussed below) occurs within the Brooklyn Formation. All of the major "skarn" deposits in the district occur at the same stratigraphic position within the Brooklyn Formation as the Lamefoot VMS/O horizon. The skarn alteration may simply be a redistribution of earlier syngenetic mineralization on this horizon, with perhaps some additional metals (particularly gold) introduced along structures cutting the horizon.

Exploration in the district has traditionally targeted copper (and more recently gold) skarn mineralization in Brooklyn limestone and sharpstone, and less commonly calcareous units in the Knob Hill and Attwood Groups. There has been little exploration for mafic volcanic hosted copper (plus gold) skarns (i.e. QR, Ingerbelle type).

## 2. Gold-bearing Volcanogenic Magnetite-Sulfide Deposits (Lamefoot-type)

Crown Resources and Echo Bay Minerals discovered a new style of mineralization within the Boundary District in the late 1980's, described as gold-bearing, magnetite-pyrrhotite-pyrite syngenetic volcanogenic mineralization (Rasmussen 1993, 2000). Mineralization is hosted within the Triassic Brooklyn Formation, but at least part of the gold is attributed to a late stage epigenetic (Jurassic or Tertiary) event. The gold bearing massive magnetite and sulfides at the Overlook, Lamefoot and Key deposits in Ferry County, Washington all occur at the same stratigraphic horizon, with a (stratigraphic) footwall of felsic volcaniclastics and a massive limestone hangingwall, and with auriferous quartz-sulfide and sulfide veinlets in the footwall of the deposits. Mineralization occurs near the top of the regional "sharpstone" conglomerate unit. The sharpstone is believed to have been derived by submarine explosive activity or by faulting with rapid vertical displacement. Rayner (1995) states that:

"either of these events ... are exactly what might be required to provide the channelways for exhalative fluids to reach the sea floor and create VMS deposits."

In the Greenwood Camp, many of the known showings that were previously termed "skarn" deposits are now felt to be volcanogenic in origin. They occur at the same stratigraphic position in the Brooklyn Formation as the Lamefoot, Overlook and Key deposits and have characteristics consistent with this style of deposit. The Sylvester K, Emma, Rathmullen and Cyclops (all on Kettle River's properties) are some examples. As discussed above, much of the metal in Phoenix and Motherlode "skarn" deposits is also now believed to pre-date the skarn event. Early exploration and development in the camp largely focussed on massive sulfide/oxide zones since this ore could be shipped directly to the smelters. Footwall stringer zones (known to occur at Lamefoot and at Sylvester K) were overlooked in the early years and are a good exploration target. In the Greenwood area, complex Tertiary faulting has dismembered and displaced the favourable VMS/O horizon. Low-angle faulting is common, with Eocene sills along many of these structures. Exploration is hampered by these sills, which mask the rocks in the underlying panel. An understanding of stratigraphy and structure is critical to exploration success.

#### 3. Mesothermal Quartz Veins with Gold (+Silver, Lead, Zinc)

Gold-silver mineralization occurs in mesothermal quartz veins related to Cretaceous-Jurassic Nelson intrusives. Polymetallic silver-lead-zinc veins with lesser gold are also included in this type. Veins may be hosted within the intrusives, or within adjacent country rock. Examples are the Jewel (Dentonia) and Providence veins, and the veins at Camp McKinney. At Camp McKinney, gold bearing quartz veins are hosted primarily by Permo-Triassic Anarchist Group greenstones, quartzite, chert and limestone. Past production at Camp McKinney was 124,452 tonnes at an average grade of 20.39 g/t Au (with minor lead, zinc and silver). This production was primarily from one east-west striking, near vertical quartz vein, averaging about 1 metre in width and mined over a strike length of about 750 metres (Caron, 2002b; Minfile 082ESE020).

#### 4. Epithermal Quartz Veins (and Gold along Eocene Structures)

The Republic district has produced over 2.5 million ounces of gold, at an average grade of better than 17 g/t Au from Eocene-aged low sulfidation epithermal veins (Lasmanis, 1996). The veins formed in a hot spring environment after deposition of the Sanpoil (Marron) volcanics, but before the deposition of the Oligocene Klondike Mountain Formation (Tschauder, 1986, 1989; Muessig, 1967). In the Republic area, the Klondike Mountain Formation has been eroded away in many places, exposing or removing the paleosurface, however a number of the Republic deposits are blind deposits beneath post mineral sediments of the Klondike Mountain Formation. Vein orientation is between about  $330^{\circ}$  and  $030^{\circ}$ ; dips are typically moderate to steep. The Republic veins commonly extend to depths of 200 - 250 metres, although some have reached depths of up to 500 metres. Ore is not continuous along the veins, but occurs in high grade shoots, ranging from 30 to 180 metres in strike length. Near the contact of the Sanpoil volcanics and the overlying Klondike Mountain Formation, the veins grade into stockwork zones. These stockworks are locally capped by silicified breccias with low grade gold and with locally disseminated pyrite which make potential bulk tonnage gold targets. Gold-sulfide mineralization is also associated with both high and low angle Tertiary faults. A number of new epithermal deposits have been discovered in recent years in the Republic and Curlew areas (i.e. Golden Eagle, Kettle, K2, Emanuel Creek, Emanuel North (Fifarek et al, 1996; Gelber, 2000, Kinross website)). The Emanuel Creek vein near Curlew is an impressive recent 'blind' vein discovery, under an average 350 metres of post-mineral cover, with grades up to 44.5 g/t Au over widths in excess of 30 metres (Kinross webcast, April 3, 2003). Kinross has recently completed mining the Emanuel Creek deposit and is currently mining the northern extension of the vein system (Emanuel North deposit).

The Bengal zone (and possibly the Wild Rose vein) on Kettle River's Tam O'Shanter property is an example of Eocene-aged epithermal veining associated with the eastern margin of the Toroda graben. The "Emma epithermal" quartz-breccia vein and (probably) silicified limestone with high grade gold values, at the Summit showing near the R. Bell mine, are other examples of epithermal systems. Low-sulfidation epithermal veining with good gold values is also known near Phoenix. Auriferous massive to semi-massive sulfide mineralization is also known along Eocene structures in the Greenwood area.

#### 5. Jurassic Alkalic Intrusives with Copper, Gold, Silver and/or PGE Mineralization

Jurassic aged alkalic intrusives host copper-gold and copper-silver-gold-PGE mineralization in several areas within the Boundary District. There is a strong spatial association between Jurassic structures (thrust faults) and Jurassic alkalic intrusives. A low-grade copper-gold porphyry system occurs at the Lone

Star - Lexington property, in a Jurassic quartz-feldspar porphyry intrusion (Seraphim et al, 1995). Massive to semi-massive chalcopyrite-magnetite-pyrite + PGE mineralization, with associated gold, occurs in Jurassic syenite and pyroxenite on the Sappho property near Midway (Caron, 2002a; Nixon, 2002; Nixon and Archibald, 2002), and at the Gold Dyke and Comstock mines near Danville (Tschauder, 1989).

At Rossland, parallel, en echelon, gold-bearing massive pyrrhotite-pyrite-chalcopyrite and quartz veins are related to the intrusion of the Rossland monzonite, a multi-phase Jurassic alkalic intrusive. At Rossland more than 20 veins are recognized in an area of about 1200 by 600 metres, from which over 5.5 million tonnes of ore grading 16 g/t Au was produced (Höy and Dunne, 2001). Gold bearing massive sulfide veins on the Golden Crown property near Phoenix and at the Wild Rose zone on the Wild Rose property adjacent to the Tam O'Shanter, have similarities to Rossland style veins (Caron, 1998, 1999).

## 6. Gold Mineralization Associated with Serpentinite

A number of gold deposits within the Boundary District are associated with massive sulfide and/or quartz/calcite veins within structurally emplaced serpentinite bodies along regional thrust faults. In the Greenwood area, mineralization is also known to occur along Eocene aged detachment faults, both within structurally emplaced serpentinite bodies and within more brittle rocks. Ore bodies associated with serpentinite have traditionally been small, but often very high grade. On the Lexington - Lonestar property, Merit Mining Corp. has recently announced a 43-101 compliant Inferred Resource of 106,100 tonnes grading 6.6 g/t Au and 1.0% Cu or 8.9 g/t Au equivalent, at a cut-off of 6 g/t Au equivalent, from a zone of massive sulfide mineralization at the contact of serpentinite and altered volcanics (MEM.V news release April 19, 2005). Mineralization on the Athelstan-Jackpot and Golden Crown properties southeast of Phoenix, the Serp Zone on the Snowshoe and Arcadia properties, the California mine near Republic, and the Morning Star mine near Danville are similarly associated with serpentinite (Caron, 1999, 2004; Tschauder, 1989).

## **Industrial Mineral Deposits**

Relatively little exploration has been done for industrial minerals in the Greenwood area. At present, there are 4 operating industrial mineral operations in the general area. Mighty White Dolomite operates a dolomite quarry near Rock Creek, and processes the dolomite for agricultural, landscaping and decorative purposes. Roxul (West) Inc. mines up to 50,000 tonnes of diorite annually from the Winner quarry, approximately 3 kilometres southeast of the Phoenix pit. The diorite is crushed and then trucked to Grand Forks where it is blended with other rock products and used in the manufacture of rock wool insulation at the company's Grand Forks plant. Roxul also produces syenite from the Cannon Creek quarry, 38 kilometres north of Grand Forks on the Granby road, for the same purpose. At Grand Forks, Pacific Abrasives & Supply Inc. is mining slag from the former Granby smelter. The slag is processed for a variety of applications, including sandblasting and roofing granules. Recent testing was done at a barite occurrence near Rock Creek, although this has not yet been placed into production.

## 4.2 Property Geology and Mineralization

The geology of the Niagara property, compiled from regional mapping by Fyles (1990) and Little (1983), is shown on Figure 4.

The property covers a complexly faulted package of Triassic Brooklyn rocks, which are unconformably overlain to the west by Eocene sediments and volcanics. The eastern part of the property, in the Granby River valley, has thick alluvial cover with no bedrock exposed. Elsewhere, rock exposure is moderate to very good.

The low-angle west to northwest-dipping Thimble Mountain fault forms a distinct geological break trending from northeast to southwest across the Niagara property. The Thimble Mountain fault is an Eocene-aged, detachment-type fault that forms the eastern edge of a graben-like feature centred on Thimble Mountain. Eocene volcanics and sediments occur west of the Thimble Mountain fault. Fyles (1990) notes that a slide breccia, containing blocks of pre-Tertiary and Tertiary rocks, occurs above the Thimble Mountain fault, indicating that the fault was a growth fault on which movement was taking place during deposition of the Eocene rocks. A broad serpentinite zone marks the footwall of the Thimble Mountain fault.

The Thimble Mountain fault cuts and offsets an earlier east-west trending, low-angle north dipping Jurassicaged thrust fault, believed to be regionally correlative with the Lind Creek fault. The Lind Creek fault is significant in that much of the gold mineralization in the Greenwood area is spatially related to the fault. The majority of the past gold production in the Greenwood area has been from mineralization in the upper plate of the Lind Creek thrust.

Rocks of the Brooklyn Formation are exposed in footwall of the Thimble Mountain fault. South of the Lind Creek fault, a thick section of black siltstone (unit Trba) is exposed in Fisherman Creek (above the rail grade) and on the east facing slope of Baker Ridge, south of Fisherman Creek. The siltstone is underlain by chert pebble and limestone cobble conglomerate. Bedding strikes east to northeast, with low angle north-northwest dips, and the section is upright and northwest facing. Fyles (1990) describes a transition zone between the conglomerate and siltstone, where massive black siltstone contains lenses of dark grey chert breccia.

North of the Lind Creek fault, the Brooklyn stratigraphy is east-facing, striking generally north-south with moderate to steep east-dips. Sharpstone conglomerate is overlain to the east by Brooklyn limestone, which is in turn overlain by greenstone.

The Niagara property is a grass-roots exploration property. Apart from a mention of minor pyrite and chalcopyrite in limestone along the CPR rail grade just north of Fisherman Creek (noted by Reinsbakken, 1970), there were no known zones of mineralization on the property, prior to the 2005 work program. Several new zones of mineralization, and old prospect pits and shafts were found during the 2005 program. Apart from several samples returning elevated values of copper or zinc, however, there were no significant results from rock samples collected.

In the western part of the property, a 4 to 5 meter deep shaft was discovered in a forested area south of the powerline. Quartz-carbonate stockwork veinlets occur within altered Brooklyn greenstone and serpentinite. There were no significant results from samples collected from this zone.

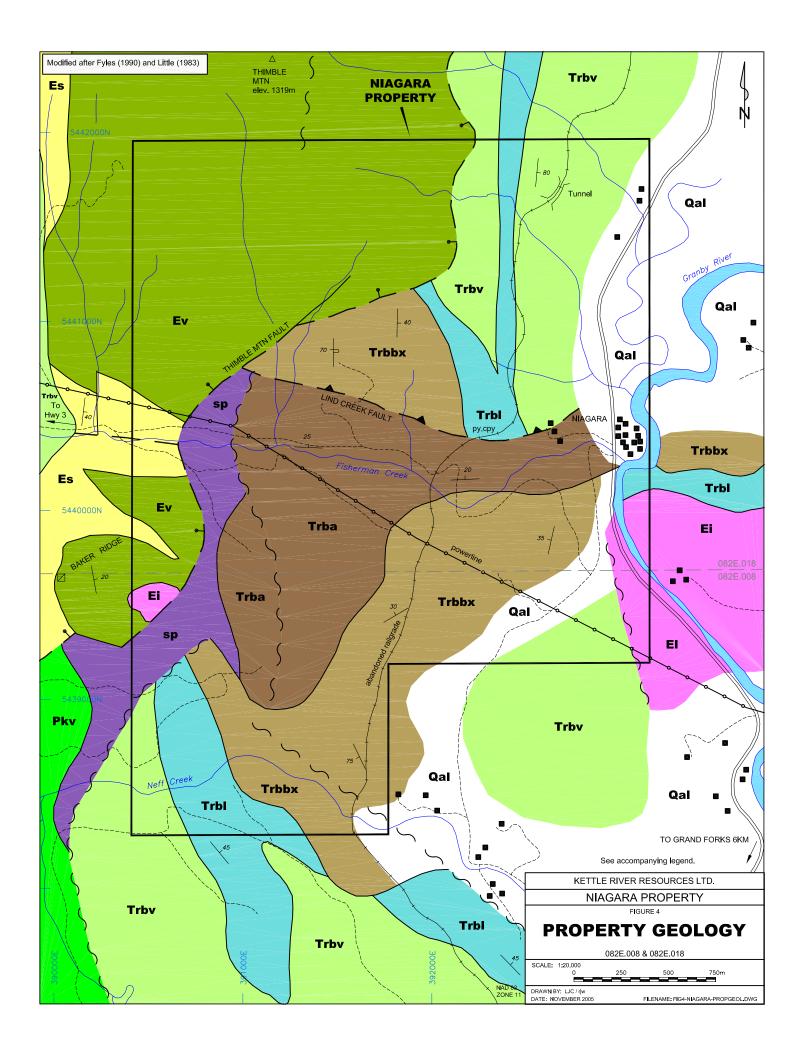
On Baker Ridge (west of the property boundary) a 3 meter deep shaft has been dug on bleached, pyritic tuff of the Eocene Kettle River Formation. Again, there were no significant values from this zone.

Black siltstone with disseminated pyrite, and with quartz stringers containing pyrite and chalcopyrite, occurs on the dump of a tunnel, situated just below the rail grade, near the junction with the Fisherman Creek road. A select sample from the tunnel dump returned 2216 ppm Cu, 1162 ppm Zn, 150 ppb Au and 12.2 ppm Ag. Mineralization is quite restricted, however, and the tunnel appears to be related to railroad construction, and not to mining activity.

Significant epithermal quartz (+/- carbonate) veining was discovered in float and in outcrop, for a considerable distance along the rail grade (and the steep hillside above the rail grade). Drusy quartz stringers and stockworks, pervasive silicification and discrete quartz-carbonate veins (to 1 meter in width), all hosted within various Brooklyn lithologies (limestone, conglomerate, volcanic breccia) were

noted, however there were no significant precious metal values in samples collected from this style of mineralization. Several old workings were discovered on the steep east facing hillside north of Fisherman Creek and above the rail grade. A small adit and shallow shaft test a 1 meter wide quartz vein which contains minor chalcopyrite. A sample of vein material contained 4407 ppm Cu, but without significant gold or silver.

In the southeast corner of the property, north of the powerline and east of the Old North Fork road, copper staining in Brooklyn limestone was observed in outcrop. Silicification and milky white quartz was also noted. A sample from this area returned elevated zinc, copper and arsenic (5742 ppm Zn, 1227 ppm Cu, 110 ppm As), but no significant precious metal values.



# GEOLOGICAL LEGEND



Drill hole

۲ - Open stope

## 5.0 ROCK SAMPLING

Detailed prospecting was completed over the Niagara property by John Boutwell and Alfi Elden during October, 2005. A total of 52 rock samples were collected during the course of prospecting and geological mapping. Descriptions for all rock samples are contained in Appendix 1 and sample locations are shown on Figure 5.

All samples were shipped to Eco Tech Labs in Kamloops for preparation and analysis for Au plus a multielement ICP suite. Details of the analytical procedure are contained in Appendix 3 of this report. Complete analytical results are included in Appendix 2 and results for select elements are included on Figure 5, and below in Table 2.

Several old prospect pits and shafts, and new areas of mineralization, were discovered on the property during the 2005 program. Apart from several samples returning elevated values of copper or zinc, however, there were no significant results from rock samples collected.

Black siltstone with disseminated pyrite, and with quartz stringers containing pyrite and chalcopyrite, occurs on the dump of a tunnel, situated just below the rail grade, near the junction with the Fisherman Creek road. A select sample (NI-02) from the tunnel dump returned 2216 ppm Cu, 1162 ppm Zn, 150 ppb Au and 12.2 ppm Ag. Mineralization is quite restricted, and the tunnel appears to be related to railroad construction, and not to mining activity.

Significant epithermal quartz (+/- carbonate) veining was discovered in float and in outcrop, for a considerable distance along the rail grade (and the steep hillside above the rail grade), however there were no significant precious metal values in samples collected from this style of mineralization. A sample of vein material (NI-10) from a 1-meter wide quartz vein in this area (explored by a small adit and shallow shaft) did contained 4407 ppm Cu.

In the southeast corner of the property, north of the powerline and east of the Old North Fork road, copper staining in Brooklyn limestone was observed in outcrop. Silicification and milky white quartz was also noted. A sample (NI-17) from this area returned elevated zinc, copper and arsenic (5742 ppm Zn, 1227 ppm Cu, 110 ppm As), but no significant precious metal values.

Just north of Fisherman Creek, and about 400 metres west of the rail grade, an angular float boulder of silicified siltstone with sulfides (sample NI-31) contained 4418 ppm Zn.

	Au(ppb)	Ag (ppm)	As (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)
NI-01	10	0.4	5	52	18	87
NI-02	150	12.2	150	2216	48	1162
NI-03	10	0.2	15	6	4	9
NI-04	15	< 0.2	<5	3	10	28
NI-05	10	0.8	<5	461	14	98
NI-06	10	0.4	<5	52	18	54
NI-07	35	0.4	15	16	8	15
NI-08	5	0.2	10	6	4	6
NI-09	5	< 0.2	15	7	8	32
NI-10	5	5.2	<5	4407	346	903
NI-11	10	1.8	5	538	14	164
NI-12	5	0.2	5	20	6	39
NI-13	10	0.4	15	52	42	107
NI-14	10	0.3	15	9	10	64
NI-15	15	< 0.2	15	77	18	89
NI-16	5	< 0.2	<5	132	4	53
NI-17	5	2.1	110	1227	12	5742
NI-18	10	< 0.2	<5	11	6	49
NI-19	<5	0.2	25	42	28	25
NI-20	10	2.0	<5	342	6	105
NI-21	40	0.5	<5	351	6	81
NI-22	20	0.3	15	5	8	15
NI-23	45	< 0.2	95	7	10	21
NI-24	5	0.2	<5	7	8	25
NI-25	5	0.4	10	36	50	42
NI-26	20	0.2	<5	4	6	30
NI-27	5	0.3	10	49	12	37
NI-28	5	< 0.2	15	2	4	5
NI-29	5	0.4	5	24	10	21
NI-30	5	0.2	20	20	44	<1
NI-31	20	0.9	45	92	50	4418
NI-32	10	0.2	10	12	6	49
NI-33	10	0.4	10	6	14	30
NI-34	5	< 0.2	<5	22	42	47
NI-35	5	0.2	<5	5	14	19
NI-36	5	< 0.2	<5	4	20	48
NI-37	65	0.2	40	16	6	19
NI-38	10	< 0.2	<5	2	12	26
NI-39	10	< 0.2	<5	3	<2	3
NI-40	55	0.2	70	21	20	61
NI-41	15	< 0.2	<5	<1	10	24
NI-42	10	0.2	10	15	32	16
NI-43	10	< 0.2	<5	15	12	34
NI-45	10	0.3	<5	26	22	41
NI-46	10	0.2	<5	6	6	33
NI-47	5	0.3	<5	50	24	36
NI-48	10	< 0.2	<5	20	8	15
NI-49	5	0.9	<5	201	6	58
NI-50	10	0.2	<5	21	6	22
NI-51	10	0.4	15	30	6	24
NI-52	5	0.2	<5	4	34	25

Table 2 -	2005 Rock	Sample	Results
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## 6.0 CONCLUSIONS & RECOMMENDATIONS

The Niagara property is a grass-roots property which is underlain in large part by the Triassic Brooklyn Formation. The Brooklyn Formation is a favourable host rock for both copper-gold skarn mineralization and gold-bearing volcanogenic massive sulfide/oxide (Lamefoot-type) mineralization.

Prospecting during 2005 identified an area of copper staining and silicification in Brooklyn limestone, in the southeast corner of the property. A sample from this area returned elevated zinc, copper and arsenic (5742 ppm Zn, 1227 ppm Cu, 110 ppm As), but no significant precious metal values. Just north of Fisherman Creek, and about 400 metres west of the rail grade, an angular float boulder of silicified siltstone with sulfides contained 4418 ppm Zn. These occurrences support the possibility of volcanogenic or skarn related mineralization within the Brooklyn rocks on the claims.

Much of the property is quite steep and unsuitable to traditionally ground exploration methods. Airborne time domain EM would be a good tool to test for massive sulfide zones, associated with either volcanogenic or skarn mineralization, within the Brooklyn rocks. This is recommended, in conjunction with surveys on other Kettle River Greenwood area properties.

In addition to the skarn and volcanogenic massive sulfide/oxide mineralization potential of the property, Eocene-aged epithermal gold mineralization is a viable exploration target. Work during 2005 identified widespread evidence of epithermal style veining and silicification. No elevated precious metal values have been returned to date from this style of mineralization on the property, however further prospecting is warranted to explore for this target. In particular, the northwestern part of the property, in the hangingwall of the Thimble Mountain Fault, should be prospected.

## 7.0 STATEMENT OF QUALIFICATIONS

I, Linda J. Caron, certify that:

- 1. I am an independent consulting geologist residing at 717 75<sup>th</sup> Ave (Box 2493), Grand Forks, B.C., V0H 1H0
- 2. I obtained a B.A.Sc. in Geological Engineering (Honours) in the Mineral Exploration Option, from the University of British Columbia (1985) and graduated with a M.Sc. in Geology and Geophysics from the University of Calgary (1988).
- 3. I have practised my profession since 1987 and have worked in the mineral exploration industry since 1980. Since 1989, I have done extensive geological work in Southern B.C. and particularly in the Greenwood Grand Forks area, both as an employee of various exploration companies and as an independent consultant.
- 4. I am a member in good standing with the Association of Professional Engineers and Geoscientists of B.C. with professional engineer status.
- 5. I have no direct or indirect interest in the Niagara property, or in the securities of Kettle River Resources Ltd., nor do I expect to receive any.
- 6. I am a Qualified Person and independent of Kettle River Resources Ltd., as defined by National Instrument 43-101. I have read National Instrument 43-101 and Form 43-101F1, and have prepared this report in compliance with these documents. As of the date of signing, I am not aware of any material facts related to this property, which are not reflected in this report.
- 7. I supervised the work program described in this report.

Linda Caron, M.Sc., P. Eng.

Date of signing

# 8.0 COST STATEMENT

## Labour

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Linda Caron, Geologist supervision, report preparation		
3.5 days @ \$481.50/day	\$	1,685.25
John Boutwell, Prospector prospecting	Ŧ	_,
8 days @ \$300/day	\$	2,400.00
Afreda Elden, Prospector prospecting		,
8 days @ \$200/day	\$	1,600.00
	\$	5,685.25
	+	-,
Analytical Costs		
Eco Tech Labs, Kamloops 52 rock samples	\$	1,150.11
Analysis for $Au + 32$ element ICP	Ŷ	1,100111
Expenses		
Fuel	\$	62.00
4 wheeler rental 2 days @ \$50/day	\$	100.00
Vehicle rental 9 days @ \$75/day	\$	675.00
Misc. field supplies & shipping costs (Deakin, Greyhound, etc)	\$	60.62
	پ \$	
Wildrock Resources - drafting & map copying for report		91.00
Report copying & binding	<u>\$</u>	36.00
	\$	1,024.62

Total: \$ 7,859.99

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# **APPENDIX 1**

Rock Sample Descriptions

Sample #	ocations are N Loca		Description								
	Easting	Northing									
NI-01	392266		Float - chert or silicified limestone? north of rail grade ~ 20 m. Minor pyrite. Sampled by AE, $21/10/05$ .								
NI -02	392075	5440075	From adit?/tunnel below rail grade on Fisherman Creek. Very black siltstone with diss py + qtz stringers with py, cpy. Sampled by JB, 21/10/05.								
NI -03	392150	5440804	10 m long trench, trends N-S in volcanics. Calcite (+ qtz) in hematite- limonite rich zone, with minor sulfide specks. Vuggy with cc lined cavities. Sampled by AE, 21/10/05.								
NI -04	392185	5440305	Limestone outcrop on rail grade, with quartz-calcite stockwork veinlets. Sampled by JB, 21/10/05.								
NI -05	392247	5441043	~ 2 m shaft on qtz-cc vein about 20 m NE of adit (NI-10). Cu stain in sidewall of vertical vein in greenstone. Sampled by AE, 21/10/05.								
NI -06	392185	5440305	Same location as NI-04. Partially silicified massive limestone. Sampled by JB, 21/10/05.								
NI -07	392484	5441706	Vein in outcrop, ~ 0.5 m wide. Qtz-carb vein with oxidized pyrite, limonite staining, trends 023/10?? Poss fluorite. Sampled by AE, 22/10/05.								
NI -08	392179	5440779	Epithermal looking veining, extremely limonitic agglomerate, mostly calcite, minor silica. From very old trench. Sampled by JB, 21/10/05.								
NI -09	392373	5441725	Float rock. Sulfide (pyrite) in conglomerate. Silicified matrix, weak reaction to acid. Sampled by AE, 22/10/05.								
NI -10	392239	5441014	1 m wide NW striking, vertically dipping quartz vein with blebs of cpy. Old small adit here. Vein is hosted in agglomerate. Sampled by JB, 21/10/05.								
NI -11	392527	5441674	~ 2 cm wide veinlet of qtz-cc in calcareous pale green rock. Minor Cu stain. Sampled by AE, $22/10/05$ .								
NI -12	392344	5440459	Float train of epithermal looking drusy quartz in Brooklyn volcanics. Sampled by JB, 21/10/05.								
NI -13	392375	5441775	Float rock ~ 40-50 m N of NI-09. Minor py in silicified portion of rock, weak fizz, vuggy, hematite staining. Sampled by AE, 22/10/05.								
NI -14	392344	5440459	Same location as NI-12. Whitish drusy quartz in pale green volcanic. Sampled by JB, 21/10/05.								
NI -15	390803	5439177	Silica veinlet in siltstone or argillite. Float. Vuggy, hematitic. Sampled by AE, 23/10/05.								
NI -16	392500	5441742	Qtz-carb vein, 2% euhedral py. Sampled by JB, 22/10/05.								
NI -17	392868	5439354	Minor Cu stain in crystalline limestone outcrop. Sampled by AE, 24/10/05.								
NI -18	392326	5441733	Slightly drusy qtz-cc flooding volcaniclastic host. Angular float. Sampled by JB, 22/10/05.								
NI -19	392868	5439354	Same location as NI-17. Float with very minor sulfides in silicified rock. Sampled by AE, 24/10/05.								
NI -20	392438	5441854	Silicified epidote rich skarn, float. Sampled by JB, 22/10/05.								
NI -21	390785		Very hard float rock, brown-red weathering, gypsum? on some fractures. No reaction to acid. Sampled by AE, 25/10/05.								
NI -22	392476	5441527	Drusy qtz float. Rock is composed of 85% silica, 15% calcite, very vuggy, mostly drusy qtz, creamy-reddish brown. Sampled by JB, 22/10/05.								
NI -23	~390785	~5439765	Float, ~ 20-25 m south of NI-21. Some cc, some silica, diss py in hem stained areas of rock. Sampled by AE, 25/10/05.								
NI -24	392470	5441530	Float - protolith unidentifiable. 90% silica, 10% calcite. Sampled by JB, 22/10/05.								
NI -25	392134	540011	N side of Fisherman Creek, float of drusy qtz-cc stockwork breccia in fine grained black siltstone, minor py, limonite staining. Sampled by AE, 25/10/05.								
NI -26	392455	5441531	Float near NI-24. Less intensely silicified than NI-24. Drusy qtz stockwork veinlets in coarse limestone conglomerate. Sampled by JB, 22/10/05.								

NI -27	391614	5440248	Small old prospect pit in Fisherman Creek, in cherty black siltstone.
	202504		Bleached. Sampled by JB, 26/10/05.
NI -28	392786	5439317	Sampled by JB, 24/10/05.
NI -29	391612	5440246	Light grey-white outcrop, hard to tell if this is chert or later introduced silica. Sampled by JB, 26/10/05.
NI -30	392861	5439361	Limestone outcrop - banded horizontal, silicification + milky white qtz with poss galena. Sampled by JB, 24/10/05.
NI -31	391588	5440273	Angular boulder on "flood plain" of Fisherman Creek. Silica flooding of siltstone unit. Pyrite, pyrrhotite, cpy, sphal?. Sampled by AE, 26/10/05.
NI -32	391929	5440545	Several pieces qtz-carb angular float in roadcut. Sampled by JB, 24/10/05.
NI -33	391551		Crystal packed vugs + dense crystalline silica in altered siltstone? Float on road above Fisherman Creek. Sampled by AE, 26/10/05.
NI -34	389978	5439799	Old shaft (~ 3 m deep) on Baker Ridge in Eocene. Bleached pyritic tuff. Sampled by JB, 25/10/05.
NI -35	391892	5439402	1 m wide qtz-carb vein system, drusy qtz-cc veins, varying in intensity across outcrop. Sampled by JB, 27/10/05.
NI -36	390770	5439798	Old vertical shaft (~4-5 m deep) dug on qtz-cc stockwork in serp & volcs. Sampled by JB, 25/10/05.
NI -37	391903	5439526	10 mm silica veins in angular float (poss tuff). Visible sulfides in tuff matrix. Sampled by AE, $27/10/05$ .
NI -38	390786	5439762	~ 50 m S of NI-36. Outcrop of stockwork/bx veining in serpentinite (and serpent gst). Sampled by JB, 25/10/05.
NI -39	391687	5439055	
NI -40	390808	5440115	Float. Strong amber coloured drusy qtz veins and veinlets in either serp? or fine grained black siltstone? Sampled by JB, 25/10/05.
NI -41	392205	5440307	Subcrop. Gar-ep skarn with qtz-cc veinlets, pale pale green colour. Sampled by AE, 27/10/05.
NI -42	391328	5440315	20 cm (?) wide, drusy qtz stingers in volcanics, outcrop. Veinlets trend 360/90. Sampled by JB, 26/10/05.
NI -43	392205	5440307	Same location as NI-41. Garnet-ep skarn with magnetite, chlorite. Sampled by AE, 27/10/05.
NI -44			No GPS reading. Sampled by JB, 26/10/05.
NI -45	392205	5440307	Same location as NI-41, -43. Garnet-ep-magnetite skarn. Sampled by AE, 27/10/05.
NI -46	392195	5440308	Epidote-chlorite-garnet-silica skarn in roadcut. Sampled by JB, 27/10/05.
NI -47	392390	5440354	Probable outcrop. Skarny appearance, red-brown staining; pyrite, pyrrhotite, + poss cpy as sporadic pockets in matrix. Massive gossan on rail grade ~ 20 m N of GPS reading. Sampled by AE, 27/10/05.
NI -48	392195	5440308	Same location as NI-46. Rock has some raised silica veining only visible on surface. Very representative of entire area. Sampled by JB, 27/10/05.
NI -49	392450	5441300	Drusy epithermal qtz float in talus. Very minor cpy. Sampled by JB, 27/10/05.
NI -50	392195	5440308	
NI -51	392445	5441275	
NI -52	392519	5440988	Epithermal style qtz in place, just above rail grade, several stringers over 2 m width. Sampled by AE, 27/10/05.

# **APPENDIX 2**

Analytical Results

21-Nov-05

ECO TECH LABORATORY LTD. 10041 Dallas Drive KAMLOOPS, B.C. V2C 6T4 ICP CERTIFICATE OF ANALYSIS AK 2005-1475

Phone: 250-573-5700 Fax : 250-573-4557

Values in ppm unless otherwise reported

KETTLE RIVER RESOURCES LTD. Box 130 Greenwood, BC V0H 1J0

No. of samples received: 98

Et #.	Tag #	Au(ppb)	Ag	Al %	As	Ва	Bi	Ca %	Cd	Co	Cr	Cu	Fe %	La	Mg %	Mn	Mo Na%	Ni	Р	Pb	Sb	Sn	Sr	Ti %	U	v	w	Y	Zn
48	NF01	10	0.4	2.26	5	20	10	2.65	<1	21	27	52	0.75	<10	0.12	136	1 0.22	23	1260	18	5	<20	299	0.10	<10	35	<10	8	87
49	NF02	150	12.2	0.46	150	25	10	1.74	10	48	119	2216	3.26	<10	0.15	279	9 0.02	192	270	48	10	<20	28	0.02	<10	63	<10	71	162
50	NF03	10	0.2	0.20	15	25	20	9.79	<1	3	45	6	4.23	<10	3.97	1803	<1 <0.01	8	650	4	<5	<20	566	<0.01	<10	24	<10	9	9
51	NF04	15	<0.2	0.74	<5	<5	5	>10	<1	2	31	3	0.40	<10	0.06	517	<1 0.01	1	380	10	<5	<20	120	0.04	<10	33	<10	5	28
52	NF05	10	0.8	0.16	<5	25	5	>10	<1	2	37	461	0.47	<10	0.17	1297	<1 <0.01	33	70	14	<5	<20	350	<0.01	<10	6	<10	4	98
53	NF06	10	0.4	0.32	<5	25	10	5.47	<1	3	63	52		<10	0.09	317	1 0.02	6	490	18	<5	<20	60	0.07	<10	27	<10	5	54
54	NF07	35	0.4	0.11	15	35	10	6.39	<1	4	69	16	0.86		0.06	350	8 <0.01	5	460	8	<5	<20	185	<0.01			<10	5	15
55	NF08	5	0.2	0.12	10	20	20	8.59	<1	3	54	6	3.00	<10	2.50	1279	2 <0.01	8	800	4	<5	<20	301	<0.01	<10	16	<10	5	6
56	NF09	5	<0.2	1.00	15	100	15	5.80	<1	18	58	7	3.05	<10	0.82	671	<1 0.02	21	970	8	<5	<20	152	0.10	<10	57	<10	6	32
57	NF10	5	5.2	0.28	<5	25	<5	0.16	<1		167	4407	1.14		0.23	145	1 0.02		130		<5	<20	19	<0.01			<10		903
58	NF11	10	1.8	1.79	5	60	20	3.11	<1		74	538	3.32		1.71		<1 0.02		1500	14	5	<20	167	0.11					164
59	NF12	5	0.2	0.53	5	15	10	0.67	<1		122	20	1.05		0.50	232	<1 <0.01		470	6	<5	<20	16	<0.01		25		4	39
60	NF13	10	0.4	1.09	15	80	20	3.16	2	27		52	3.78		0.92		<1 0.04		420	42	<5	<20	81	0.13		64		7	
61	NF14	10	0.3	0.91	15	15	10	0.39	<1	8	127	9	1.90	<10	0.93	269	1 <0.01	30	490	10	<5	<20	10	<0.01	<10	39	<10	3	64
62	NF15	15	<0.2	2.55	15	50	30	0.36	<1	61	196	77	8.17	20	1.43	569	<1 0.02	159	1410	18	10	<20	21	0.06	<10	90	<10	8	89
63	NF16	5	<0.2	0.44	<5	25	10	>10	<1	4	28	132	1.34	<10	0.41	901	<1 <0.01	10	520	4	<5	<20	335	<0.01	<10	17	<10	8	53
64	NF17	5	2.1	0.98	110	35	15	9.70	38	18	58	1227	2.84	<10	0.16	902	4 0.01	86	1140	12	15	<20	175	0.05	<10	14	<10	95	742
65	NF18	10	<0.2	0.54	<5	20	10	1.23	<1	5	109	11	1.17	<10	0.53	482	<1 0.02	7	560	6	<5	<20	49	0.05	<10	35	<10	7	49
66	NF19	<5	0.2	3.79	25	80	15	6.81	<1	18	50	42	1.99	<10	0.21	231	3 0.13	19	1650	28	10	<20	308	0.09	<10	27		7	25
67	NF20	10	2.0	0.78	<5	30	10	1.67	<1	10		342	1.09		0.72	460	2 0.02		410	6	<5	<20	99	0.13		36			105
68	NF21	40	0.5	0.89	<5	40	15	0.91	<1	57	58	351		<10	0.37	195	<1 0.15	71	240	6	<5	<20	24	0.13	<10	26	<10	6	81
69	NF22	20	0.3	0.17	15	25	5	6.44	<1	3		5	0.96		0.15	619	10 <0.01	4		8	<5	<20	158	<0.01			<10		15
70	NF23	45	<0.2	1.37	95	20	15	2.77	2	5	87	7	2.72	<10	1.34	873	<1 <0.01	10	120	10	<5	<20	35	<0.01	<10	15	<10	8	21
71	NF24	5	0.2	0.20	<5	40	10	0.29	<1	4	122	7	1.03	<10	0.10	224	1 <0.01	7	550	8	<5	<20	8	<0.01	<del>~</del> 10	12	<10	3	25
72	NF25	5	0.2	0.20	10	30	10	2.09	<1		113	36	2.20		0.75	567	45 < 0.01	46	290	50	_0 5	<20	67	<0.01				8	42
72	NF26	20	0.4	0.34	<5	85	<5	2.03	<1		104	4		<10	0.33	292	3 <0.01		210	6	<5	<20	31	<0.01				3	30
73	NF20 NF27	20 5	0.2	1.35	10	25	<5	0.83		15	58		1.23		0.33	292	1 0.02	31	230	12	<5 5	<20	44	0.03		11		8	30 37
74 75	NF27	5	0.3 <0.2	0.03	15	25 10	<5 <5	0.83 9.76	<1 <1	15		49 2	0.50		0.78		<1 <0.02	4	230 90	4	-5 -5	<20 <20	44 460	<0.03		3		o 7	5
75	INF20	5	<0.2	0.05	15	10	<5	9.70	<1	1	43	2	0.50	<10	0.08	1903	<1 <0.01	4	90	4	<5	<20	400	<0.01	<10	5	<10	'	5
76	NF29	5	0.4	0.85	5	30	<5	0.73	<1	5	85	24	0.79	<10	0.33	212	2 0.02	16	390	10	<5	<20	32	0.05	<10	17	<10	4	21
77	NF 30	5	0.2	4.09	20	50	<5	4.19	<1	7	153	20	0.91	<10	0.62	169	494 0.34	9	1300	44	15	<20	327	0.09	<10	26	<10	7	<1
78	NF31	20	0.9	1.50	45	30	<5	1.84	53	9	102	92	1.86	<10	0.85	368	4 0.04	31	250	50	10	<20	38	0.05	<10	50	<10	44	418
79	NF32	10	0.2	0.50	10	50	5	7.55	<1	6	76	12	1.70	<10	0.49	694	3 <0.01	23	490	6	<5	<20	204	<0.01	<10	14	<10	7	49
80	NF33	10	0.4	0.43	10	20	10	0.09	<1	5	136	6	1.34	<10	0.22	139	1 <0.01	17	260	14	5	<20	5	<0.01	<10	10	<10	2	30

ECO TECH LABORATORY LTD.		ICP CERTIFICATE OF ANALYSIS AK 2005-1475								KETTLE RIVER RESOURCES LTD.																			
Et #.	Tag #	Au(ppb)	Ag	AI %	As	Ва	Bi	Ca %	Cd	Co	Cr	Cu	Fe %	La	Mg %	Mn	Mo Na%	Ni	Р	Pb	Sb	Sn	Sr	Ti %	U	v	w	Y	Zn
81	NF34	5	<0.2	0.73	<5	45	<5	0.81	<1	5	48	22	3.94	90	0.54	150	10 0.07	33	3530	42	<5	<20	199	<0.01	<10	30	<10	10	47
82	NF 35	5	0.2	0.51	<5	50	10	0.92	<1	6	142	5	1.67	<10	0.38	426	1 <0.01	18	270	14	<5	<20	18	<0.01	<10	19	<10	5	19
83	NF36	5	<0.2	3.10	<5	10	20	2.26	<1	15	93	4	5.61	<10	3.45	861	2 <0.01	40	190	20	10	<20	57	<0.01	<10	127	<10	8	48
84	N⊦37	65	0.2	0.76	40	20	10	1.20	<1	7	90	16	1.70	<10	0.35	325	<1 0.07	3	380	6	<5	<20	27	0.08	<10	19	<10	7	19
85	NF38	10	<0.2	1.89	<5	35	15	1.47	<1	9	123	2	2.83	<10	2.36	910	2 <0.01	43	180	12	5	<20	45	0.02	<10	70	<10	9	26
86	NF39	10	<0.2	0.09	<5	15	5	0.70	<1	2	123	3	0.37	<10	0.08	156	<1 <0.01	4	60	<2	<5	<20	12	<0.01	<10	1	<10	1	3
87	NF40	55	0.2	1.32	70	75	15	0.05	1	5	95	21	3.94	10	0.74	245	4 < 0.01	13	420	20	<5	<20	11	<0.01	<10	21	<10	2	61
88	NF41	15	<0.2	1.59	<5	<5	15	6.80	<1	11	77	<1	1.95	<10	1.60	570	<1 0.01	30	490	10	5	<20	140	0.10	<10	33	<10	7	24
89	NF42	10	0.2	0.43	10	25	5	0.05	<1	3	113	15	1.34	<10	0.19	106	2 <0.01	13	370	32	<5	<20	5	<0.01	<10	10	<10	2	16
90	NF43	10	<0.2	1.59	<5	<5	20	8.36	<1	12	52	15	3.84	<10	1.67	525	<1 0.02	32	520	12	5	<20	279	0.07	<10	31	<10	9	34
91	NF45	10	0.3	0.94	<5	10	20	1.87	<1	25	133	26	4.38	<10	0.78	338	1 0.01	75	600	22	5	<20	88	0.13	<10	37	<10	6	41
92	NI-46	10	0.2	0.51	<5	<5	5	6.74	<1	7	53	6	1.00		0.14	422	<1 <0.01	8	260	6	<5	<20	81	0.05		13	<10	3	33
93	NF 47	5	0.3	2.88	<5	20	10	2.36	<1	12	37	50	1.69		0.20	147	1 0.39	4	800	24	10	<20	304	0.11		39	<10	6	36
94	NF 48	10	<0.2	0.62	<5	5	5	>10	<1	2	22	20	0.61	<10	0.09	309	<1 0.01	3	460	8	<5	<20	661	0.05			<10	4	15
95	NF 49	5	0.9	0.35	<5	25	5	0.45	<1	5	122	201	1.14	<10	0.20	143	<1 <0.01	16	40	6	5	<20	14	<0.01	<10	15	<10	2	58
96	NF 50	10	0.2	0.50	<5	10	10	9.76	<1	4	29	21	1.24		0.22	479	<1 0.02		420	6	<5	<20	308	0.07			<10	6	22
97	NF21	10	0.4	0.36	15	70	10	4.84	<1	7	98	30	1.80	<10	0.31	408	3 <0.01		350	6	5	<20	82	0.01	<10	18	<10	6	24
98	NF 52	5	0.2	0.54	<5	20	10	0.12	<1	6	128	4	1.76	<10	0.37	806	3 0.02	12	240	34	<5	<20	5	<0.01	<10	15	<10	2	25
QC DATA	<u>.</u>																												
Repeat:																													
54	NF07	40	0.4	0.11	15	35	10	6.48	<1	4	68	16	0.86	<10	0.06	345	8 <0.01	6	490	10	<5	<20	184	<0.01	<10	5	<10	5	15
71	NF24	5	0.2	0.19	<5	40	5	0.28	<1	3	119	7	0.96	<10	0.09	211	1 <0.01	6	500	8	<5	<20	8	<0.01	<10	11	<10	2	23
80	NF33	10	0.4	0.43	10	20	10	0.09	<1	4	134	6	1.31	<10	0.21	138	1 <0.01	17	260	14	5	<20	5	<0.01	<10	9	<10	2	30
89	NI-42	10	0.2	0.44	10	25	10	0.06	<1	3	115	15	1.35	<10	0.19	105	2 <0.01	13	350	32	<5	<20	5	<0.01	<10	10	<10	2	17
Resplit:																													
71	NF24	10	0.2	0.18	<5	40	5	0.26	<1	3	131	8	0.93	<10	0.09	210	4 <0.01	6	510	8	<5	<20	7	<0.01	<10	10	<10	2	23
Standard																													
GEO'05			1.5	1.52	50	125	50	1.49	1	19	60	86	3.34		0.87	606	<1 0.03		630	20	<5	<20	53	0.10	<10	68	<10	10	73
GEO'05			1.5	1.49	55	130	55	1.56	1	19	62	86	3.55	<10	0.90	657	<1 0.02	29	710	24	<5	<20	54	0.09	<10	69	<10	10	74
GEO'05			1.5	1.41	50	125	50	1.56	1	19	58	84	3.49	<10	0.87	676	<1 0.02	28	670	22	<5	<20	54	0.09	<10	67	<10	10	72
OXF41		1805																											

ECO TECH LABORATORY LTD. Jutta Jealouse B.C. Certified Assayer

JJ/kk XLS/05

df/n1475

# **APPENDIX 3**

Analytical Procedures

#### Eco-Tech Labs Analytical Procedure

#### SAMPLE PREPARATION

Samples are catalogued and dried. Soils are prepared by sieving through an 80 mesh screen to obtain a minus 80 mesh fraction. Samples unable to produce adequate minus 80 mesh material are screened at a coarser fraction. These samples are flagged with the relevant mesh. Rock samples are 2 stage crushed to minus 10 mesh and a 250 gram subsample is pulverized on a ring mill pulverizer to -140 mesh. The subsample is rolled, homogenized and bagged in a prenumbered bag.

#### GEOCHEMICAL GOLD ANALYSIS

The sample is weighed to 30 grams and fused along with proper fluxing materials. The bead is digested in aqua regia and analyzed on an atomic absorption instrument. Over-range values for rocks are re-analyzed using gold assay methods.

Appropriate reference materials accompany the samples through the process allowing for quality control assessment. Results are entered and printed along with quality control data (repeats and standards). The data is faxed and/or mailed to the client.

#### **Quality Control Standards and Certified Standards**

Approximately 50 CanMet Certified reference material, WCM Minerals reference ores and Inhouse Standards are currently in use in our laboratory. Each batch of samples analysed will contain one standard of similar composition to monitor the analysis. If the result of the reference material falls within the accepted limits the results of the samples will be accepted. In case the results of the reference material falls outside the accepted limits the results of the samples are suspect and the analysis will be repeated.

#### GOLD ASSAY

A 30 g sample size is fire assayed using appropriate fluxes. The resultant dore bead is parted and then digested with aqua regia and then analyzed on a Perkin Elmer AA instrument.

Appropriate standards and repeat sample (Quality Control Components) accompany the samples on the data sheet.

#### BASE METAL ASSAYS (Ag,Cu,Pb,Zn)

Samples are catalogued and dried. Rock samples are 2 stage crushed followed by pulverizing a 250 gram subsample. The subsample is rolled and homogenized and bagged in a pre-numbered bag.

A suitable sample weight is digested with aqua regia. The sample is allowed to cool, bulked up to a suitable volume and analysed by an atomic absorption instrument, to .01 % detection limit.

Appropriate certified reference materials accompany the samples through the process providing accurate quality control. Result data is entered along with standards and repeat values and are faxed and/or mailed to the client.

## MULTI ELEMENT ICP ANALYSIS

A 0.5 gram sample is digested with 3ml of a 3:1:2 (HCl:HN03:H20) which contains beryllium which acts as an internal standard for 90 minutes in a water bath at 95°C. The sample is then diluted to 10ml with water. The sample is analyzed on a Jarrell Ash ICP unit.

Results are collated by computer and are printed along with accompanying quality control data (repeats and standards). Results are printed on a laser printer and are faxed and/or mailed to the client.

	Detection Limi	t	Detection Limit					
	Low	Upper	Low	Upper				
Ag	0.2ppm	30.0ppm	Fe	0.01%	10.00%			
Al	0.01%	10.0%	La	10ppm	10,000ppm			
As	5ppm	10,000ppm	Mg	0.01%	10.00%			
Ba	5ppm	10,000ppm	Mn	1ppm	10,000ppm			
Bi	5ppm	10,000ppm	Mo	1ppm	10,000ppm			
Ca	0.01%	10,00%	Na	0.01%	10.00%			
Cd	1ppm	10,000ppm	Ni	1ppm	10,000ppm			
Co	1ppm	10,000ppm	Р	10ppm	10,000ppm			
Cr	1ppm	10,000ppm	Pb	2ppm	10,000ppm			
Cu	1ppm	10,000ppm	Sb	5ppm	10,000ppm			
Sn	20ppm	10,000ppm						
Sr	1ppm	10,000ppm						
Ti	0.01%	10.00%						
U	10ppm	10,000ppm						
V	1ppm	10,000ppm						
Y	1ppm	10,000ppm						
Zn	1ppm	10,000ppm						

