93-126

David A. Downing 1993 Prospecting Report
for the

Top of the World Project

Lat. 64° 10' - 64° 20' N, Long. 140° 20' - 140° 50' W
(NTS 116C02)

Gladstone River Project

Lat.61° 00' - 61° 21' N, Long. 137° 50' - 138° 45' W
(NTS 115A SE)

Calder Summit Project

Lat. 63° 45' - 63° 55' N, Long. 139° 00' - 139° 15' W
(NTS 115O14)

Prepared for Cash Creek Resources Limited

Submitted To
Yukon Energy and Mines Branch
Yukon Economic Development
in fulfillment of the requirements of the
Yukon Mining Incentives Program
28 February 1994

Executive Summary

Three prospecting projects were undertaken during the field season of 1993.

Top of the World

Prospecting was conducted north of the Top of the World highway to the Fortymile River along Brown and Bruin Creeks (NTS 116C02). The target was VMS deposits and investigation of scattered multi-element anomalies previously located or known from personal communication.

A series of occurrences were located that individually appear distinct. They are however, all spatially on or just overlying thrust planes where carbonate rocks compose or are abundant in, the hanging wall. All occurrences have a similar geochemical signature with elevated levels of chromium, nickel, gold, silver, lead, zinc. There is an obvious metallic element zonation within this suite. Silver, lead, zinc, copper are more important away from the thrust and chromium, nickel, gold are more prominent along the thrust itself.

Three specific occurrences are worthy of further attention. a) An epithermal type occurrence on Brown Creek. b) A discontinuous alteration zone that extends from the ridge top between Brown and Bruin Creeks obliquely down the ridge to just above Bruin Creek. c) A series of parallel fracture zones with gold in quartz fragments in an altered, graphitic host on the Fortymile River.

Gladstone River

Three target areas in the Gladstone River area along the southeast margin of Kluane Lake (115A SE) were investigated. At the mouth of the Gladstone River and at the headwaters of Fourth of July Creek no positive results were obtained and no occurrences of note were located.

Initial prospecting along Inlet Creek late in the season was encouraging. As follow-up to a regional geochemical gold anomaly, the silt sampling and panning was conducted along the creek. Visible gold is found along the creek in the area of the anomaly and in increasing abundance upstream along the creek and in a dry pup coming in from the north. The creek in the upper reaches is running over glacial till.

The favorable indications along Inlet Creek point to a target modified from that originally proposed. The margins of the early Tertiary granitic stocks lying as outliers south of the main Ruby Range Batholith deserve investigation. These targets have not received the same level of exploration as the Batholith itself.

Calder Summit

At the headwaters of Little Blanche, Eldorado and Calder Creeks in the Klondike (115O15) a gold - diamond target was located. Three small elliptical pipes associated with a much larger magnetic anomaly were located. Of forty-six *indicator* minerals microprobed 1 kimberlitic garnet and 29 kimberlitic clinopyroxenes were identified. However petrographic and bulk geochemistry results indicate that the rock is a magmatic-facies, biotite-clinopyroxene minette and not kimberlite or lamproite as initially suspected. Minettes are known to produce mantle indicators from tapping high level magma chambers. Previous work in the Klondike had returned indicator minerals associated with kimberlite or similar deep mantle rocks. The discovery of the minette would explain the presence these indicators. Micro diamond analysis results have not yet been received.

In addition to the diamond potential, the same location was identified as a gold target. Silicified and altered rhyolite breccia adjacent to the *discovery outcrop* and subsequently discovered quartz feldspar porphyry dikes were erratically anomalous in gold. The multiple phase intrusion/extrusion of a volatile rich syenite stock is an excellent gold target.

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1.0 Introduction

A basic prospecting program was undertaken by David Downing for Cash Resources Ltd. during the summer of 1993. The program was financially assisted by the Yukon Territorial Government through the Grubstake Option of the Yukon Mining Incentives Program.

The program as originally proposed contained 3 prospecting areas. The Top of The World Project looking for VMS and epithermal deposits between the Top of the World Highway and the Fortymile River. The Gladstone River Project focused on Juneau type gold deposits along the southeast margin of Kluane Lake. The Cap Creek Project as proposed was not undertaken however, the Calder Creek Project in the Klondike was added to the agenda in mid-season. The Calder Creek Project examined an area from Quartz Creek north to the headwaters of Eldorado Creek between Calder Creek and King Solomon Dome. It looked for breccia pipes that contained diamond indicator minerals and had an apparent spatial relationship to some local gold occurrences. Project locations are indicated on the following page.

All of the projects were proposed on the basis of three criteria.

1) They all had the potential for the discovery of large deposits.

2) They all had a previous history of prospecting and research by the author that indicated something more than a theoretical potential.

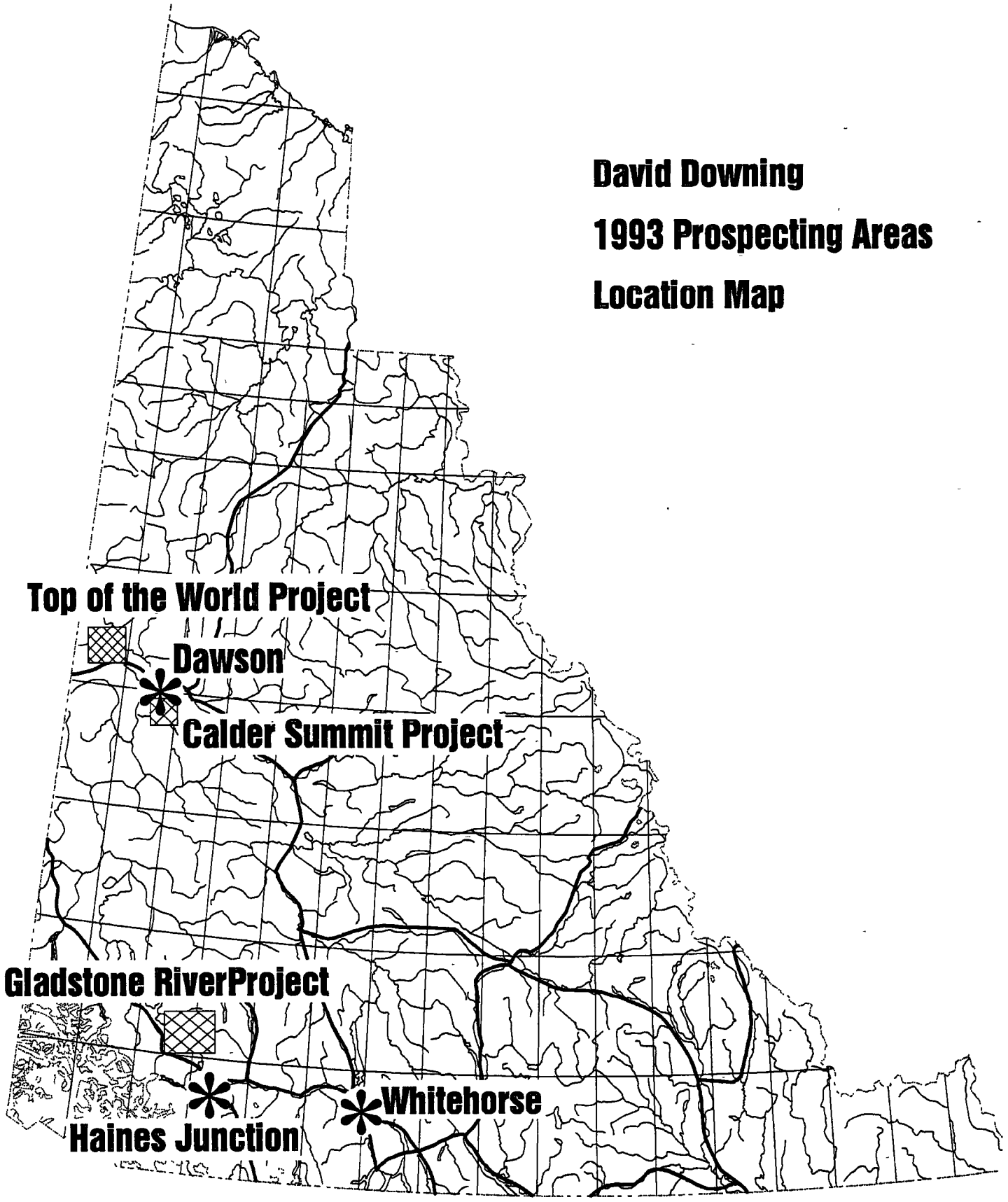
3) They all had road access, were close to a major highway and within less than an hours driving time of a major Yukon community.

This report is organized so that each project is written as a report within a report. Each section is essentially complete within its own section including results and recommendations. Only the Executive Summary and the Statement Of Expenses encompass the prospecting program as a whole. Analytical results for each prospecting area are included as separate appendices.

David Downing

1993 Prospecting Areas

Location Map



2.0 Top of The World Project

2.1 Background

2.1.1 Location and Access

The area is located on NTS 116C02. It is encompassed by 64° 10' - 64° 20' N latitude and 140° 20' - 140° 50' W longitude. It includes Brown Creek and Bruin Creek which run from the Top of the world Highway north to the Forty Mile River. The ridge Bruin and Brown Creek is 75km WNW of Dawson City, Yukon. The north draining creeks source on a east-west trending ridge and drains into the Fortymile River. The Top of the World highway runs along the ridge to the south and access trails have been constructed along the ridge to the east of Brown's Creek and down the various spurs to placer mining operations on the creek. The access trails are variously negotiable with a four wheel drive vehicle in good weather.

Access to the Fortymile River and the mouths of the creeks is via the Clinton Creek Road and the access trail into the Fortymile Placer operation. This trail is on the north side of the river and the Fortymile River must be waded to get to the mouths of Browns and Bruin Creeks. This is only possible at periods of low water. The use of a boat is strongly recommended.

The regional and local geology maps illustrate the location and access on the following pages.

2.1.2 History

The Fortymile district was know for its placer gold prior to the gold rush of 1898. The discovery claims that precipitated the gold rush were recorded at the Fortymile town site at the mouth of the Fortymile River. The creeks of the Fortymile and adjacent Sixtymile areas have been well prospected for placer gold using traditional panning methods for a hundred years. These creeks have been placer mined at various levels of activity until the present day. Browns Creek has one currently active placer operation 5 km downstream of the TAM claims.

One of the first lode discoveries in Yukon was made near Fortymile. Ogilvie on his first visit to the district in 1887 reported on a gold-silver prospect. The earliest records found are for claim 795 recorded by Isobella M. Healy in August 1896.

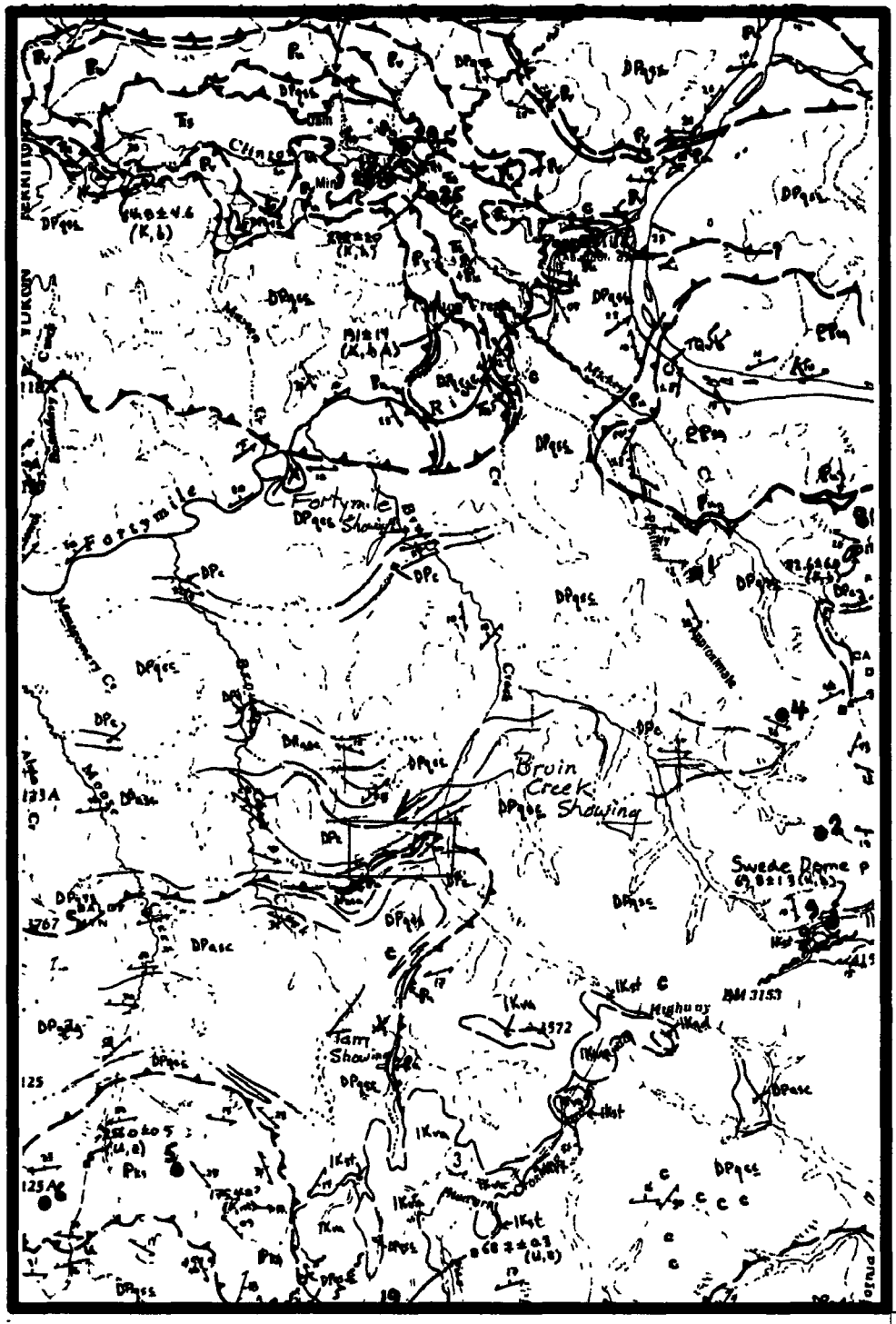
The source of asbestos noted in the area by the early placer miners was discovered in April 1957 by G. Walters and A. Anderson. The Clinton Creek Mine operated from October 1967 until August 1978 producing over 1 million tonnes of fibre. Detailed magnetic surveys were completed during this period that delineated magnetic bodies lying on the soles of thrust sheets that loop through the Fortymile area.

The TAM showing was located during prospecting in 1992.

2.2 Geology

2.2.1 Regional Geology

Dawson map area (NTS 116 B,C) southwest of the Tintina Fault Zone (Mortensen, 1988) is underlain mainly by greenschist to lower amphibolite facies metamorphic rocks of the Yukon-Tanana Terrane (Monger and Berg, 1987). these rocks can be divided into two main assemblages: 1) schists and gneisses derived from a variety of sedimentary and igneous protoliths and displaying a penetrative ductile deformation fabric; and 2) massive to brittlely sheared greenstone, diabase and serpentinized harzburgite. Assemblage 1 corresponds generally to rocks originally included in Green's (1972) units A, B and D (Nasina Series, Klondike Schist and Pelly Gneiss, respectively), but here has been further subdivided based on compositional, textures and limited isotopic age criteria. Assemblage 2 corresponds to Green's units C (greenstone = unit Pv and E (ultramafic rocks = unit Pu). The two assemblages are now imbricated along low-angle brittle faults that may include thrust faults and tectonic slides along original stratigraphic contacts. These faults are rarely well exposed (e.g. in Clinton Creek mine open pit and at



from NTS 116C2

from:
GSC Open File 1927

Scale 1:250 000
1 cm = 2500m

0 2.5 5 km

Resource Engineering

Regional Geology Map

David A. Downing, P. Eng.
17 August 1993

LEGEND

Late Tertiary or Quaternary

TQvb fresh, brown weathering olivine basalt

Early Tertiary

eTt felsic lapilli tuff and volcanic breccia

eTqfp tan to rusty weathering, unfoliated quartz-feldspar porphyry

eTdi brown weathering fine-grained diabase and plagioclase-phyric basalt

eTv mafic to intermediate volcanic rocks

PEst brown weathering conglomerate, argillite, minor tuffs

Late Cretaceous

lKva massive andesite flows, breccias and plugs

lKst quartz pebble conglomerate, sandstone, shale, minor tuffs

lKgd massive unfoliated hornblende-biotite granodiorite and quartz monzonite

lKqfp massive unfoliated quartz-feldspar porphyry

Triassic

Ts weakly deformed, thinly bedded argillite, sandstone, argillaceous limestone

middle and upper Paleozoic

Pv massive and sheared greenstone and diabase

Pu serpentinite, serpentinized harzburgite, carbonatized ultramafic rocks, talc-carbonate schist

Klondike Schist

- Pqm rusty weathering quartz-muscovite schist
- Psa quartz and/or feldspar augen-bearing quartz-muscovite (chlorite) schist
- Pks Klondike Schist undifferentiated (includes units Pqm, Psa, also chloritic schist and minor graphitic quartz-muscovite schist)

Nasina Series

- DPc marble
- DPsa quartz and/or feldspar augen-bearing quartz-muscovite schist
- DPmc dark green weathering chlorite (± biotite) schist, amphibolite and garnet amphibolite
- DPqss Nasina Series undifferentiated (mainly grey to black graphitic quartzite and quartz-muscovite (± biotite) schist; locally garnetiferous)

DMgdg massive to strongly foliated dioritic to granodioritic gneiss

Proterozoic(?) and Paleozoic

PPsg tan to pale green to medium brown weathering quartz-muscovite-chlorite schist, micaceous fine-grained quartzite, and banded quartz-feldspar-amphibole gneiss; includes locally abundant chlorite schist, metagabbro and marble

PPc marble

PPsa feldspar augen-bearing quartz-muscovite schist

——— lithological contact (defined, approximate, assumed)

thrust fault or slide (approximate, assumed)

steep fault (defined, approximate, assumed)

compositional layering in metamorphic rocks

bedding (upright, tops unknown)

u altered ultramafic rock occurrence

c stretched pebble conglomerate occurrence

q quartz-feldspar porphyry dyke (unit eTqfp)

m mafic dyke (unit eTdi)

p granitic pegmatite occurrence

● 31 mineral or coal occurrence (numbers correspond to Table 1)

• (K,R,U; b,m,h,a,w,z) isotopic age determination (K-Ar, Rb-Sr, U-Pb; biotite, muscovite, hornblende, actinolite, whole-rock, zircon)

several localities along Yukon River between Dawson and Fortymile), but they can commonly be traced as lithological contacts marked by the discontinuous occurrence of massive to sheared greenstone and/or serpentinite in felsenmeer and float.

A limited amount of fossil and isotopic age data is available for rocks of Assemblages 1 and 2 in the study area. These data are summarized in Mortensen (1988). Together they indicate that the ductility deformed metamorphic rocks of Assemblage 1 are largely of middle and late Paleozoic age. Orthogneiss of unit DMgdg from a locality 22 km south of the study area (Fiftymile Batholith) has yielded a Late Devonian early Mississippian U-Pb zircon age (Mortensen, 1986), Metaporphyry within Klondike schist units Pks and Psa) in the northern Sixtymile District and northern Klondike district have been dated at mid-Permian (U-Pb zircon ages), as has a sample of quartz augen schist (unit DPsa) within Nasina Series metasediments on the southwestern side of Cassiar Dome. Ductile deformation occurred between mid-Permian and latest Triassic time; however hornblende, biotite and muscovite from the metamorphic rocks yield K-Ar cooling ages as young as Late Jurassic. Greenstone and altered ultramafic rocks In the study area have not been directly dated. A Middle or Upper Triassic conodont age has been obtained from weakly deformed sediments of unit Trs that are associated with the greenstone and ultramafic rocks in the Clinton Creek open pit (Abbott, 1983).

Several phases of undeformed intrusive rocks occur in the area. Granodioritic to quartz monzonitic plutons (unit lKgd) probably represent the intrusive equivalents of the andesitic volcanics (unit lKva) which underlie much of the Sixtymile District. One such pluton (Swede Dome pluton) has yielded a U-Pb zircon age of 69.8 + 1.3 Ma, and a quartz-feldspar porphyry plug (unit lKqfp) cutting the volcanics along Sixtymile Road has yielded a U-Pb Zircon age of 68.7 + 0.3 Ma. The volcanics and interbedded clastic sediments (unit lKst) are tentatively correlated on compositional and age grounds with the Carmacks Group in the Dawson Range farther to the south, and with similar strata on Indian River and lower Sixtymile River. Narrow undeformed granitic pegmatites crosscut amphibolite facies orthogenesis (unit DMgdg) along Sixtymile River and lower Miller Creek. Muscovite from one of the pegmatite bodies yields a K-Ar age of 180 Ma. A bimodal suite of mafic and quartz-feldspar porphyry dikes and small plugs (units eTdi and eTqfp) occur sporadically in a band within 10-20 km of the Tintina Fault Zone. Samples of unit eTqfp in northern Klondike District, lower Yukon River, and northeast of Cassiar Dome have yielded Eocene K-Ar, U-Pb and Rb-Sr ages. Along the Yukon River, 24 km downstream from Dawson, the quartz feldspar porphyry dikes cross-cut inter layered immature clastic sediments and mafic flows that are probably related to fossiliferous Paleocene-Eocene siltstones, sandstones and conglomerates that occupy the Tintina Fault Zone itself (unit PEst).

At least four distinct phases of deformation are recognized in the metamorphic rocks in the study area; however, scarcity of outcrop precludes a detailed structural analysis. The penetrative ductile deformation fabrics present in Assemblage 1 rock units are not observed in Assemblage 2, indicating that this early tectonism pre-dated thrust faulting. At least one, and commonly two or more crenulation cleavages are present in both assemblages. Minor folds related to these cleavages locally appear to deform the thrust surfaces. Late, low-amplitude warping and small-scale steep faulting has affected all of the rock units in the area. Little evidence for large-scale normal or strike-slip fault structures in the study area (with the exception of Tintina Fault Zone) has been found either during field mapping or by aerial photograph and satellite imagery analysis. Some of the late folds and small-scale, northeast trending steep faults appear to be localized along the Tintina Fault Zone and may be genetically related to it.

2.2.2 Economic Geology

A great variety of styles of mineralization occur within the study area, including stratiform, porphyry, and skarn base metal occurrences, and precious metal-bearing mesothermal occurrences, and asbestos deposits in serpentinite. also present are numerous lignite occurrences in Eocene sediments along the Tintina Fault Zone and in sediments of unit lKst in the Sixtymile District, as well as portions of the Klondike, Sixtymile and Fortymile placer gold districts. The large number and variety of known mineral occurrences, together with the relatively limited mineral exploration activity that the area has attracted

and the presence of extensive placer gold deposits for which no lode sources have yet been discovered, all underscore the substantial remaining mineral potential of the area.

2.2.3 Local Geology

The geology of the prospecting area is dominated by Nasina Series quartzite and schist with minor marble. The outcrop is limited to exposures in road cuts and in ribs of resistant quartzite that run almost directly up and down the ridge hillside. The geology as mapped is displayed on the following two maps. The locations for the TAM showing and the Bruin Creek showing are indicated on the regional geology map. The legend corresponds with that of the regional geology.

The quartzite illustrated to the south of Browns Creek is found only in felsenmeer.

Evidence for the thrust fault is inferred from an exposed contact to the north of the map, local topography, and the presence of serpentinized harzburgite float and felsenmeer. It is readily apparent that the quartzite unit lies just above the thrust plane. There may be marble between the quartzite and thrust plane. Along the ridge top to the north where the thrust is exposed, marble forms the hanging wall of the thrust.

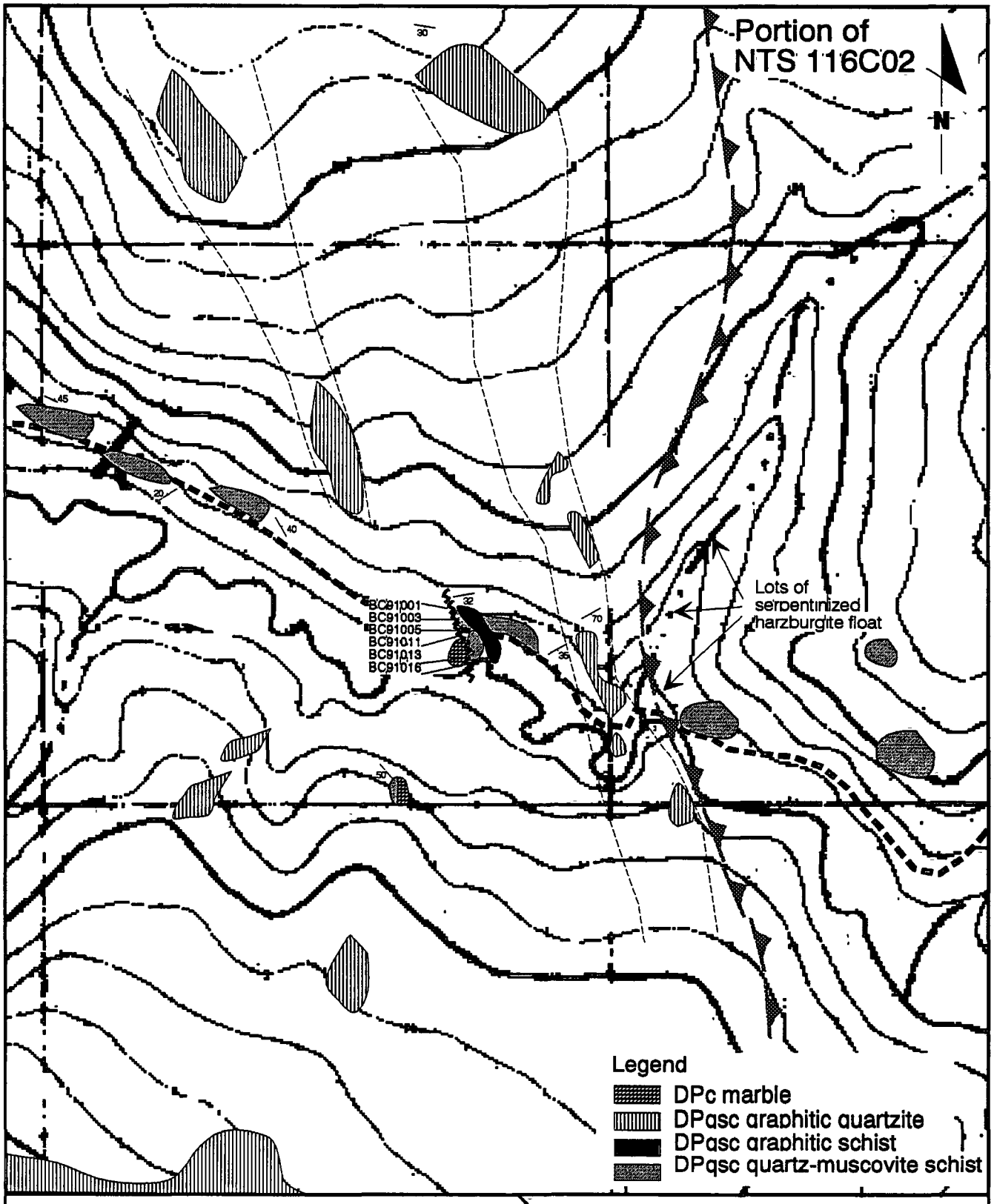
It is not obvious from the outcrop as illustrated whether the Nasina Series stratigraphy is folded to form the two quartzite ribs or whether it is faulted to repeat the stratigraphy.

What is obvious is that at the center of the TAM occurrence, where the road cut and a cut formed by a bend in the creek provides a large exposure, a near vertical shear zone has considerable limonite and clay alteration. Associated with the limonite and clay alteration are areas of brecciation and silicification. Assays of this material run as high as 2 gm/t gold and 48 gm/t silver.

The shear zone had six 1m chip samples collected at an equal spacing down the exposure. The sample numbers are recorded on the property geology map. The assay results are included in Appendix A.

The Bruin Creek area map, documents the sampling done where the thrust is exposed in the road cuts put in to reach the placer operation. Hydrothermal alteration, shearing and a pyrite halo are erratically located above the thrust. The thrust itself is clearly evident where dominated by an abundance of black, strongly magnetic rock and serpentinite. In spite of erratic highs, no strike length of any significance could be put together. Outcrop is sparse and the possibility remains for a mineral deposit, however straight prospecting is probably not the best tool for further work.

At the Fortymile location indicated on the regional geology map, gold and gold with quartz could be panned out of graphitic shear zones. The near vertical shears are sub parallel with a northwest trend and lie immediately below a thrust plane exposed to the immediate north. The shears are filled with graphitic clay. The surrounding graphitic schist is penetratively shattered and has a 15 cm pyritic halo. The gold may be panned from the outer margins of the pyritic halo. No gold could be panned from the clay gouge. Chip and grab samples did not run gold be were anomalous in nickel, chromium and tellurium.



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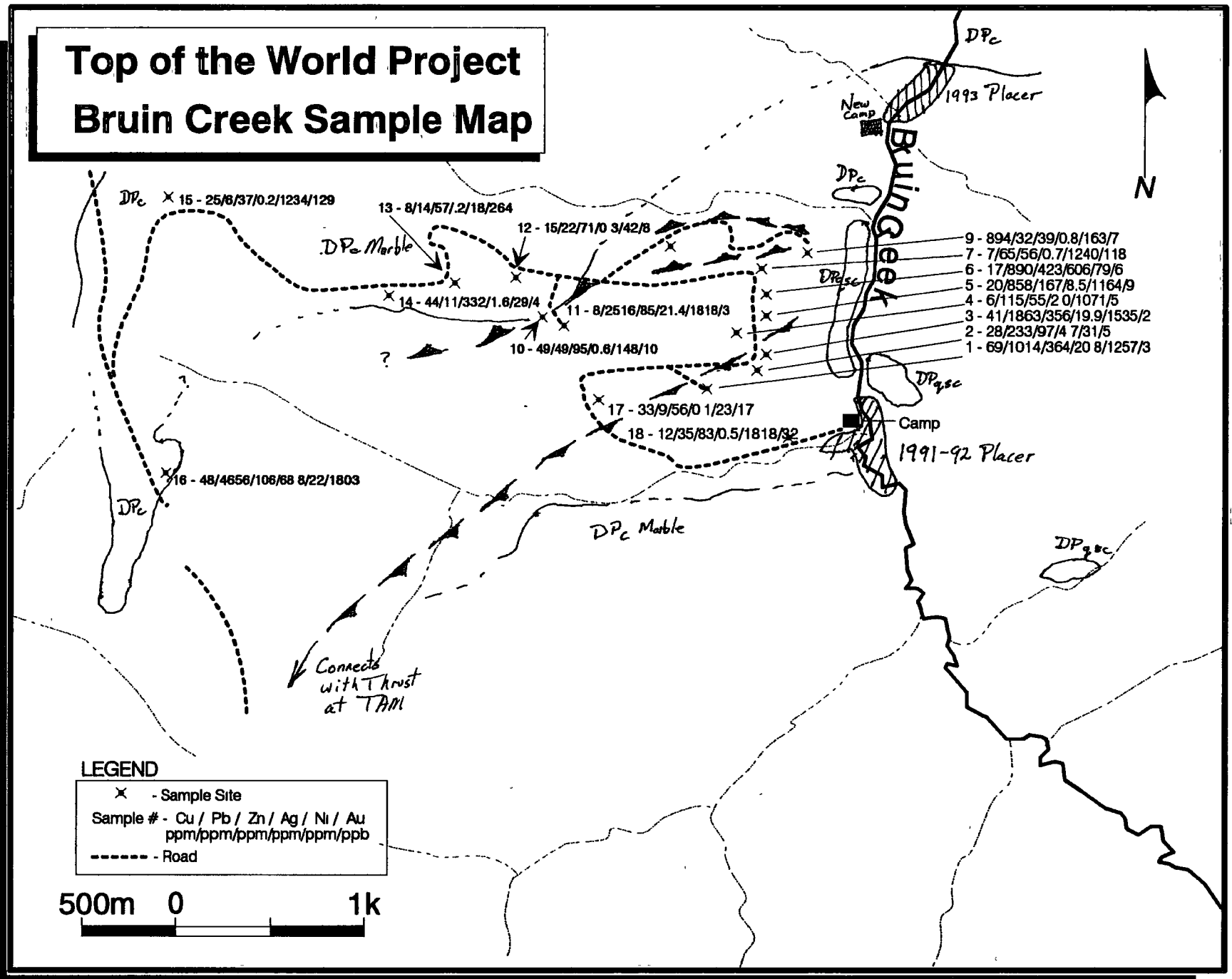
TAM Showing Geology Map

David A. Downing, P. Eng.

17 August 1993

Top of the World Project
Bruin Creek Sample Map



from NTS 116C2

2.3 Geochemical Survey

A limited 50 sample geochemical survey was conducted to test the feasibility of using geochemical surveying to further trace the mineralized shear zones.

A sample grid was put in place on the TAM occurrence. The baseline had stations run every 25m. Five lines of 400m were run at 100m intervals centered on the baseline.

Samples were collected every 50m except for the center portion of lines 11N & 12N where samples were collected every 25m.

B horizon soils were collected from the dry south facing slope. The samples were placed in standard brown kraft paper envelopes.

Northern Analytical Laboratories of Whitehorse, Yukon performed the geochemical analysis. The dried samples were sieved to -80 mesh and dissolved in aqua regia. Atomic adsorption analysis was completed for copper, nickel and lead.

The results were plotted on 1:5 000 scale grid maps. Due to the limited number of samples statistical analysis was abandoned for the purposes of selecting anomalous results. The results were contoured using roughly logarithmic contour intervals.

The soil sample grid and contoured results are included as the following four pages.

The results for copper, lead and nickel all show a central axis of values elevated above a lower surrounding background. Copper and nickel both returned higher values in the northeast corner.

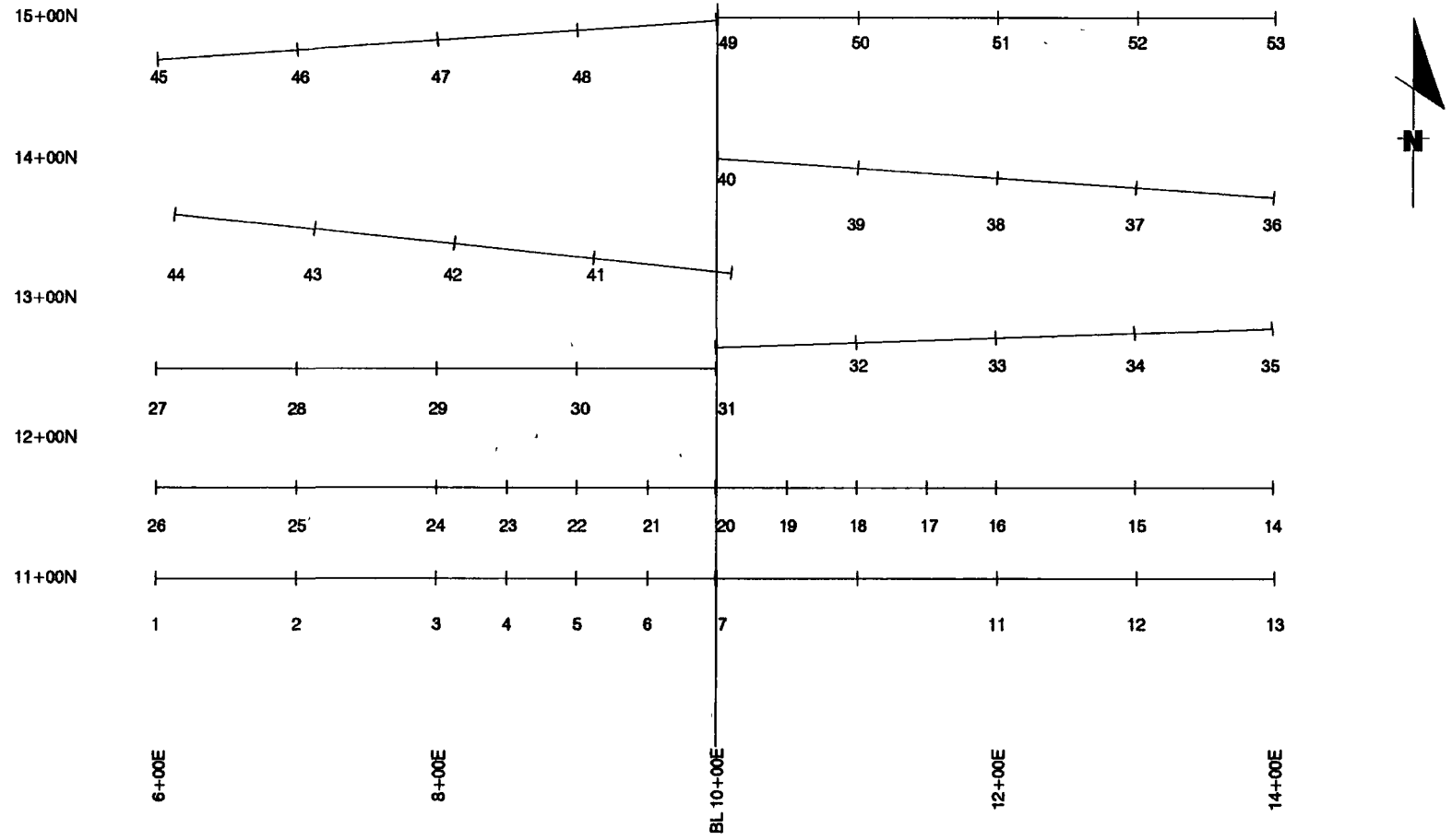
The assay certificate is included in Appendix A.

2.4 Conclusions and Recommendations

A series of occurrences were located that individually appear distinct. They are however, all spatially on or just overlying thrust planes where carbonate rocks compose or are abundant in, the hanging wall. All occurrences have a similar geochemical signature with elevated levels of chromium, nickel, gold, silver, lead, zinc. There is an obvious element zonation within this suite. Silver, lead, zinc, copper are more important away from the thrust and chromium, nickel, gold are more prominent along the thrust itself.

Three specific occurrences are worthy of further attention. a) An epithermal type occurrence on Brown Creek. b) A discontinuous alteration zone that extends from the ridge top between Brown and Bruin Creeks obliquely down the ridge to just above Bruin Creek. c) A series of parallel fracture zones with gold in quartz fragments in an altered, graphitic host on the Fortymile River.

Three occurrences of interest have been located within a relatively limited area. Further prospecting can be expected to have limited value without the aid of more advanced geoscientific tools such as geochemical and geophysical surveys. Further work should concentrate on the thrust planes. It is doubtful that it is only coincidence that the one placer operation on Bruin Creek and the two on Brown Creek occur where the thrust sheet crosses these creeks.



Legend

Flagged Line
25 Sample Value (ppm)
Geochemical Contour

Scale 1:5 000
1 cm = 50m

0 100 200

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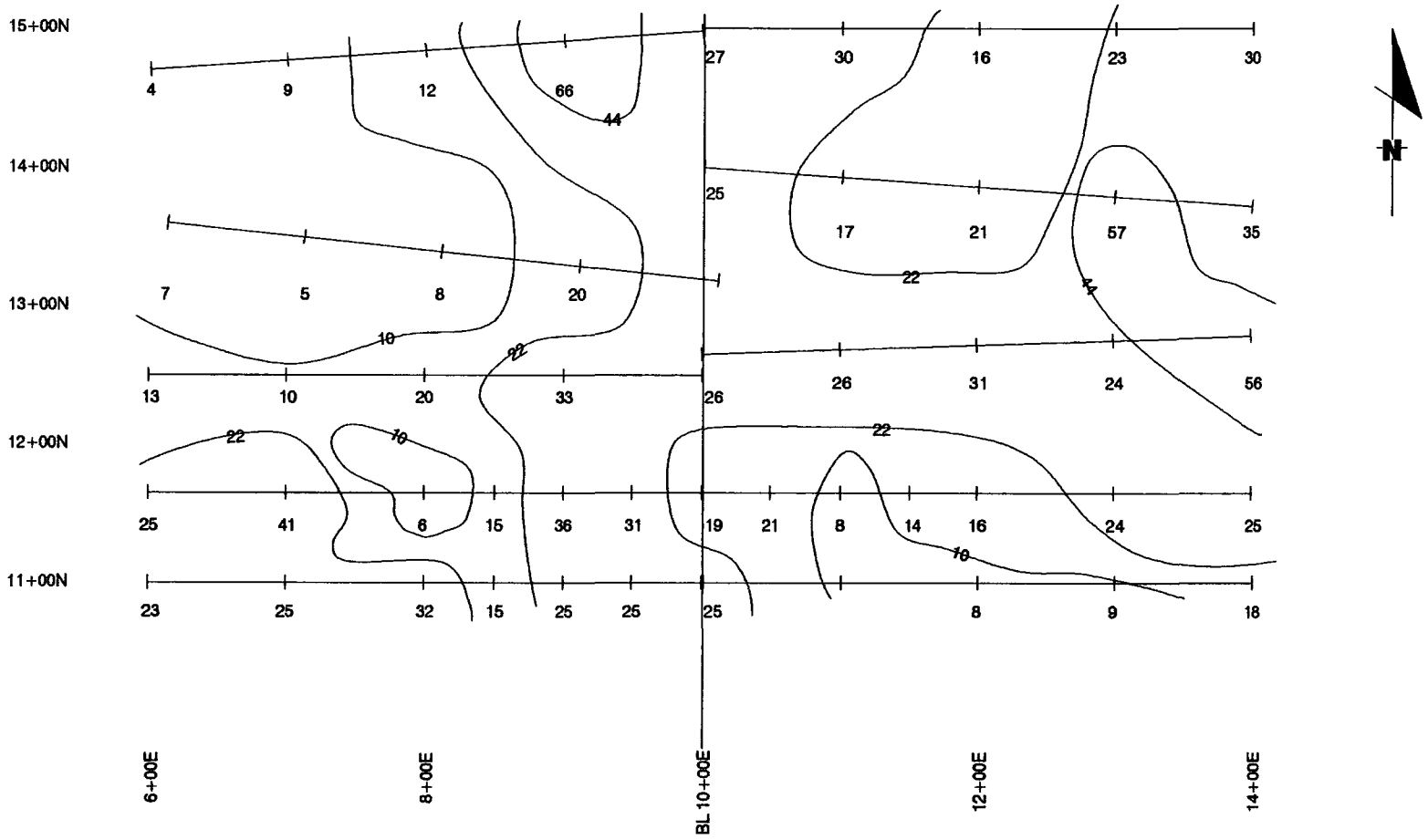
TAM Showing Soil Sample Locations

David A. Downing, P. Eng. | 10 August 1993



Legend

Flagged Line
25 Sample Value (ppm)
Geochemical Contour

Scale 1:5 000
1 cm = 50m

0 100 200

Resource Engineering

TAM Showing Copper in Soils

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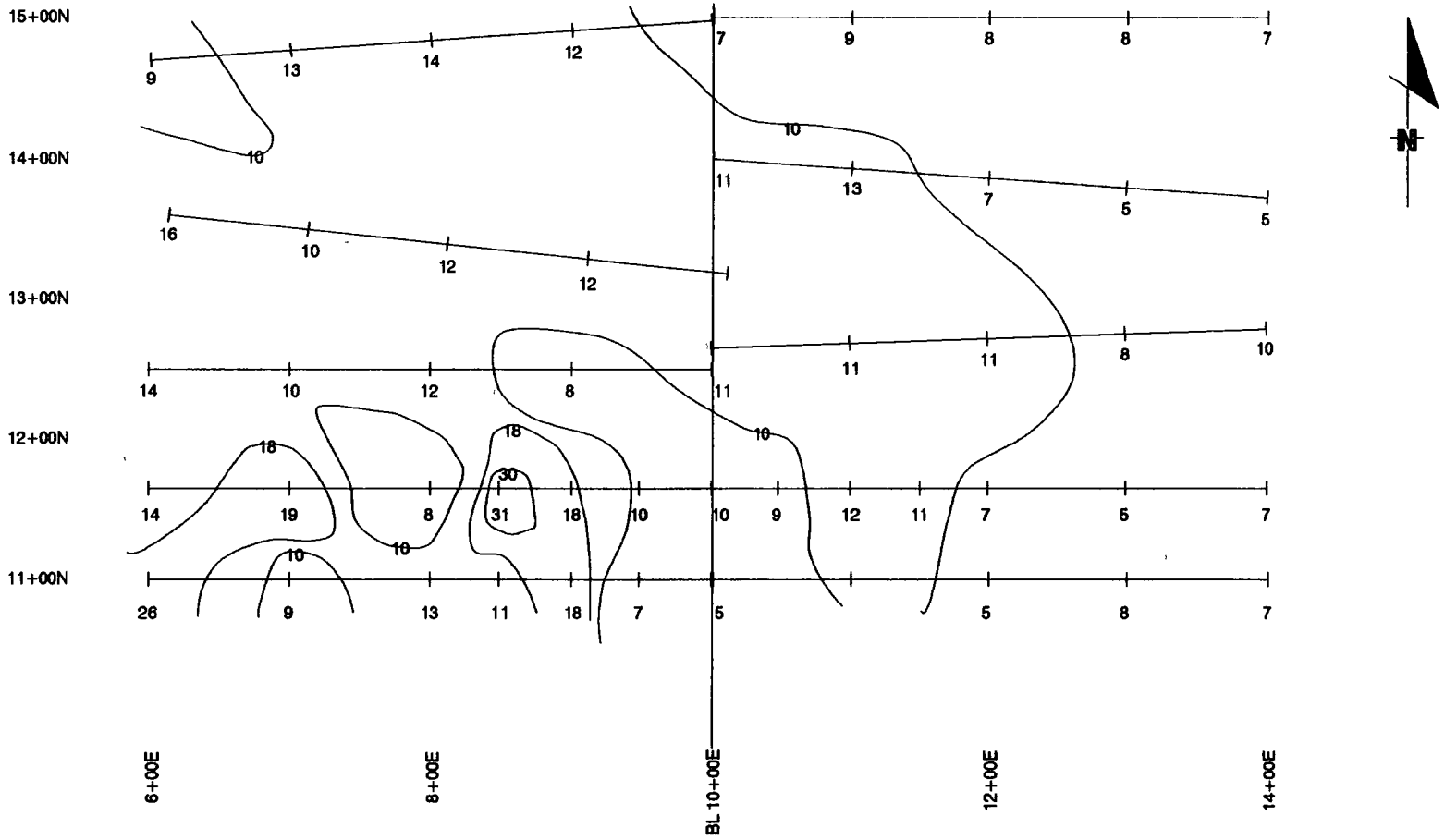

Legend

- Flagged Line
- 25 Sample Value (ppm)
- Geochemical Contour

Scale 1:5 000
1 cm = 50m

0 100 200

Resource Engineering

TAM Showing Lead in Soils

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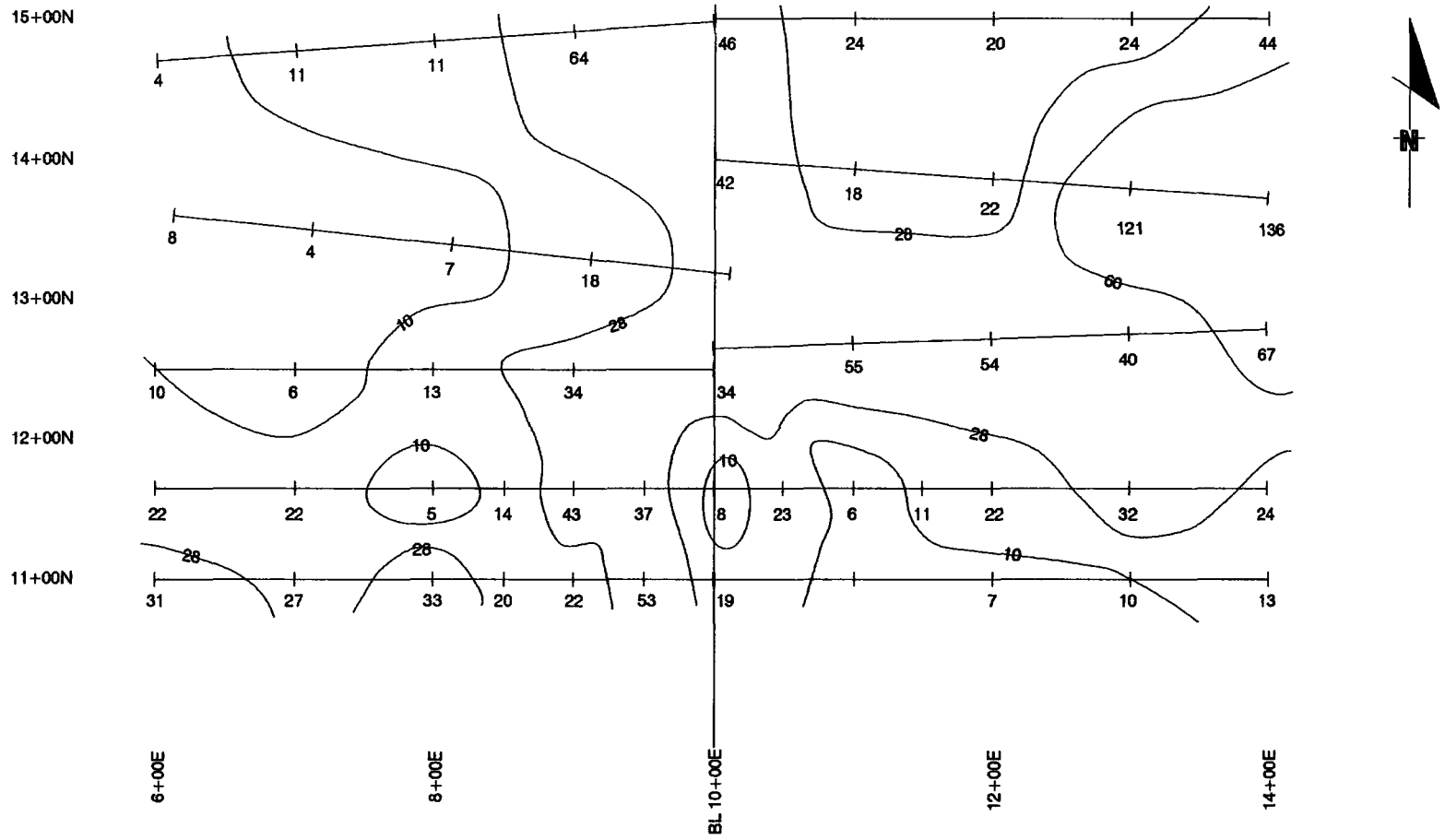


Legend

Flagged Line
25 Sample Value (ppm)
Geochemical Contour

Scale 1:5 000
1 cm = 50m

0 100 200

Resource Engineering

TAM Showing Nickel in Soils

David A. Downing, P. Eng. | 10 August 1993

4.0 Calder Summit Project

4.1 Introduction

Three partners with joint ownership of the QUAD claims located on Calder Summit contacted me in August to help identify a rock they had found they thought might be diamond bearing. After viewing the rock I was invited to visit the claims and view the rock in-situ. At that time the partnership stated that they had no intention of staking further claims on their own and released me to undertake any exploration I should wish to conduct. The partners did request that they be given an option to bid on any trenching or road work that arose out of my exploration efforts. They also requested that they be given the option of participating in any subsequent staking.

4.2 Background

4.2.1 Location and Access

The QUAD claim group is located in the Dawson Mining District of the Yukon - NTS Sheet 115-0-14 at Latitude 63°50'N and Longitude 139°10'W. The claims are situated approximately 25 km south-east of Dawson City on the Bonanza Creek and Eldorado Creek roads to "Calder Summit."

The QUAD claim group consists of 47 fractions and Quartz Mining claims. The claim group is located at the head of Eldorado Creek, adjacent to Calder and Little Blanche creeks. The area is referred to as Calder Summit with the drainage system north into Eldorado Creek and south into Quartz Creek to the Indian River.

Prospecting was undertaken in the area north of Quartz Creek to the Calder Summit (Kennecott held all the claims north of this point) and east of the Calder Creek valley to King Solomon Dome. Prospecting was brought to a premature halt with the arrival of snow.

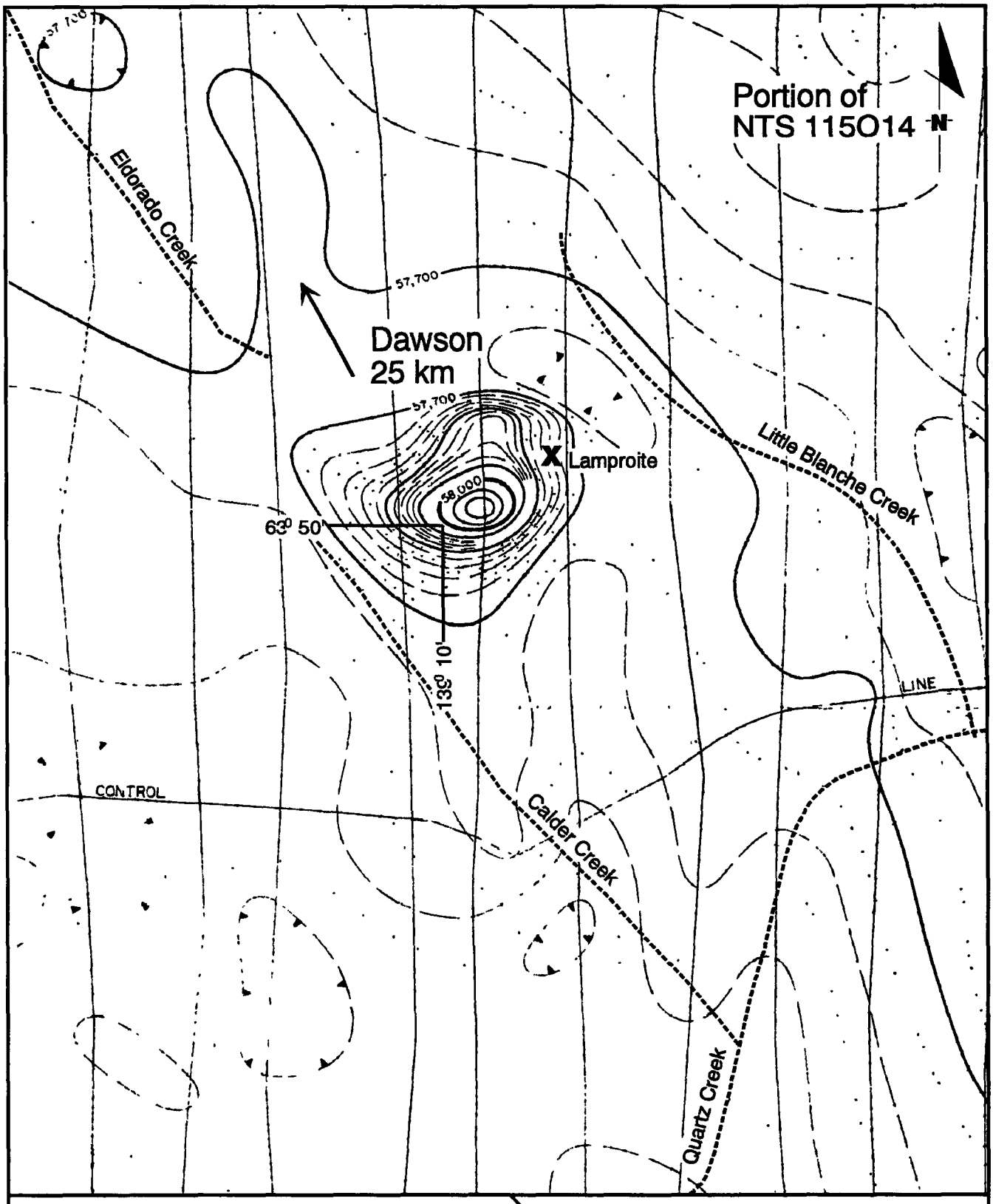
4.2.2 History

Hardrock claims at the headwaters of Calder Creek are documented to have changed hands for $250,000 at the time of the gold rush. No obvious explanation has lent itself to the exchange of such an exorbitant sum. The area of these claims is presently held by Mr. Robert Truswell of Dawson.

The Calder Summit property was previously staked in July 1972 to cover an isolated magnetic high anomaly. The JEN 1 -64 claims group was staked by R.G.Hilker Ltd. for Conwest Exploration Co.Ltd.-Toronto. The property was acquired during a regional exploration program in the Klondike area. Exploration was designed to identify possible areas where Tertiary age intrusives occur within the Klondike Schist. The younger intrusives were exploration targeted as potential gold bearing source rock and in-situ deposits. A geochemical survey was conducted on the JEN claim group and several tractor trenches excavated to check for bedrock. The property was permitted to lapse in 1976 due to a lack of further warranted exploration funding.

Results of the geochemical survey indicate that the geochemical response to bedrock mineralization may be suppressed because of either the effects of permafrost or a thick overburden area.

The partners currently holding the ground staked it to cover the possible extension of a shear zone that was projected to extend southwards from Kennecott's holdings to the north along Eldorado Creek.



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Calder Summit Magnetic Map

Scale
1 " = 1 mile
0 1 2 mi

David A. Downing, P. Eng.
28 August 1993

4.3 Magnetic Anomaly

An isolated magnetic anomaly is adjacent to and partially overlapping Calder Summit. The Calder magnetic anomaly is contained on the Grand Forks, Yukon Territory sheet 115-0-14 Geophysics Paper 4309, Scale 1 :63,360. The magnetic anomaly is plotted on the previous page. The distinct dipole or isolated magnet anomaly varies between 57,700-58,500 gammas and is typical of that associated with pipe like bodies.

4.4 Geology

Regional geology of the Ogilvie map sheet was mapped by H. S. Bostock from 1935 to 1937 and published as G.S.C. Map 711A. The Calder Summit area lie entirely within Bostock's map unit B, the Klondike Schist of Precambrian or later age. They are described as chiefly sericitic, with some chlorite and abundant quartz commonly segregated into corrugated lenses. Also present is feldspathic quartz-mica schist to augen gneiss. Some phases of this unit have a sheared granitic texture, often porphyritic.

Although refined in detail by the more recent work of Debicki and Mortensen the basic framework described by Bostock still serves at the Calder Summit for the metamorphic rocks. The detail that may be added at a 1:50,000 scale is the intrusion of, what is mapped as a small andesite stock (unit 11d), on the southwest side of Calder Summit. The 1:50,000 scale geology of the summit is found on the following page.

Three elliptical breccia pipes were discovered this fall. They are each 8 - 15 m by 3 - 5 m on their long and short axis respectively. They are slightly positive features when exposed surrounded by a recessive yellow alteration halo. The halo is about 1 m wide. The pipes appear to be vertical with steep sides. Rare fragments of the hosting rock and very rare fragments of eclogite are found as clasts in the breccia.

To the immediate northeast of the pipes, which intrude feldspathic quartz-mica schist is a silicified ryholitic breccia. This breccia is cut by quartz feldspar porphyry dikes.

The "pipes" and environs are illustrated as an expanded window on the 1:50,000 scale geology map.

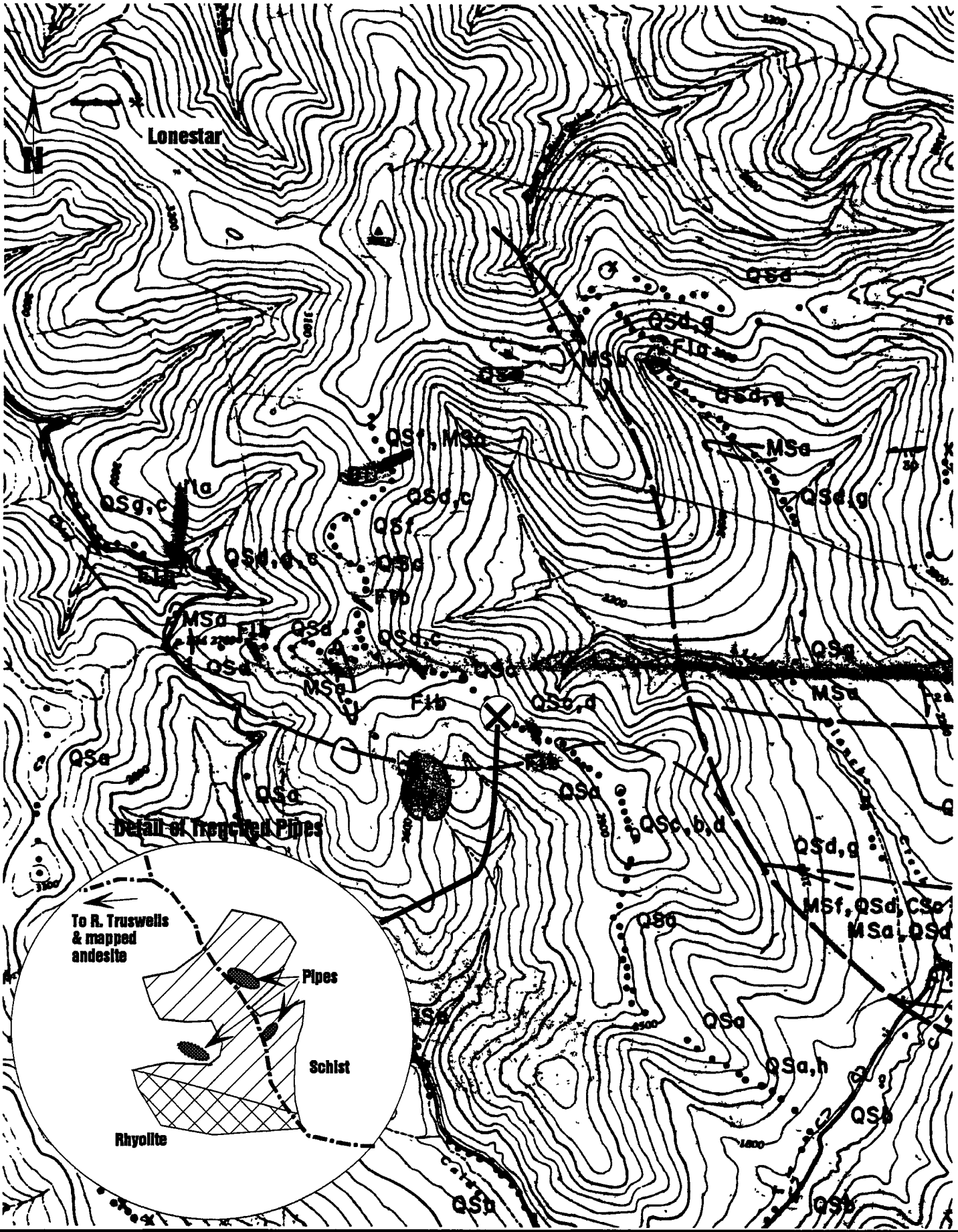
4.5 Sampling and Analytical Results

Samples collected as indicated on the geology map were sent to a variety of laboratories for analytical work. Not all have been received at this date. Those included in Appendix C include whole rock ICP analysis, diamond indicator analysis by heavy liquid separation and gold assay analysis by Loring Laboratories Ltd.; Thin section analysis by Alex W. Knox; Heavy mineral and crushed sample analysis by Canamera Geological Ltd.; whole rock ICP, hand sample description, and electron microprobe analysis by Kennecott; and petrography and electron microprobe analysis of heavy minerals by Monopros Limited.

In summary petrographic and bulk geochemistry analysis of the diatremes indicates that the rock is a magmatic-facies, biotite-clinopyroxene minette and not kimberlite or lamproite as initially suspected. Minettes are known to produce mantle indicators from tapping high level magma chambers. Previous work in the Klondike had returned indicator minerals associated with kimberlite or similar deep mantle rocks. The discovery of the minette would explain the presence these indicators. Of forty-six indicator minerals microprobed by Monopros Ltd., 1 kimberlitic garnet and 29 kimberlitic clinopyroxenes were identified. Micro diamond analysis results have not yet been received.

A complete description of the samples and analytical techniques are included in Appendix C.

In addition to the diamond potential, the same location was identified as a gold target. Silicified and altered rhyolite breccia adjacent to the *discovery outcrop* and subsequently discovered quartz feldspar



Legend

QSa - feldspar-quartz schist
FIb - quartz feldspar porphyry
MSa - chlorite - quartz schist
IIa - andesite

Scale

0 500 1000 2000m

1:50,000

David Downing
Calder Summit
Geology Map
September 1993

porphyry dikes were erratically anomalous in gold. The multiple phase intrusion/extrusion of a volatile rich syenite stock is an excellent gold target.

4.6 Conclusions and Recommendations

Classification of the Calder summit intrusive dike rock samples as "minette", and not lamproite or kimberlite indicates the diamond potential of these rocks is probably very low. No diamonds have been recovered to date from any minette bulk sampled. Low potential for diamond bearing minettes however, does not preclude the occurrence of diamond bearing lamproite or kimberlite in the Proterozoic or later age Klondike Plateau terrane. The Calder Summit intrusive dikes are indicative of offshoots from a possible syenite stock that is possibly indicated by the magnetic anomaly. The syenite and dikes are ideal deposition type of rocks for gold mineralization and deposits.

Examination of other noted occurrences of dark andesite or mafic rocks should be conducted throughout the Klondike. For the Calder Summit area basic prospecting of heavy mineral sampling and walking the hills looking for outcrop and float is justified.

The QUAD claims deserve a magnetometer survey to locate further "pipes".

4.7 References

Debicki, R.L. and Baldwin, G., 1984: Bedrock geology and mineralization of the Klondike areas (east), 115O09,10,11,14,15,16 and 116B02, Exploration and Geological Services Division Yukon; Indian and Northern Affairs Canada, Open File 1:50,000 scale map with marginal notes.

Geological Survey of Canada, 1966: Geophysical paper 4309; 1:63,000 scale total magnetic field map.

Mortensen, J.K. 1988: Geology of southwestern Dawson Map area, Yukon Territory; in Current Research, Part E, Geological Survey of Canada, Paper 88-1E, p.73-38.

Mortensen, J.K. 1988: Geology of southwestern Dawson Map area, Yukon; Geological Survey of Canada Open File 1927, 1:250,000 scale map with marginal notes.

5.0 SUMMARY OF EXPENSES

Invoice Date	Project	Amount
26-Jul	Top of the world	3321.44
06-Aug	Top of the world	737.5
06-Aug	Gladstone River	1100.01
31-Aug	Gladstone River	3000
16-Sep	Gladstone River	1479.27
26-Feb.	Gladstone River	2231.16
26-Feb.	Calder Summit	4332.45
	Total	16201.83

Copies of invoices are attached

Grubstake Expense Sheet
Prospector: D.A. Downing Date: 26-Jul-93
Project: Top of The World (Browns Creek)

Date	Item	Rate ($/day)	Days	Amount ($)
15-Jul	Truck Rental (deposit)		6	900.00
16-Jul	Silva Ranger Compass			58.85
16-Jul	First Aid Kit			24.70
16-Jul	Gas (Stewart Crossing)			45.00
16-Jul	Nails			2.45
16-Jul	100 Soil Sample Bags			21.4
20-Jul	Gas (Dawson)			56.12
21-Jul	Truck Rental (balance)			21.29
21-Jul	Gas (Whitehorse)			52.08
23-Jul	Geology Map			5.35
16/21-Jul	D. Downing (labor)	150.00	6	900.00
16/21-Jul	Zeke Aasman (labor)	100.00	6	600.00
16/21-Jul	Daily Living Expense (YTG Rate)	52.85	12	634.20
			Total	3 321.44

Grubstake Expense Sheet
Prospector: D.A. Downing
Project: Top of The World (Browns Creek)

Date: 6-Aug-93

Date	Item	Rate ($/day)	Days	Amount ($)
5-Aug-93	Assays (WO#13985)			621.94
5-Aug-93	Assays (WO#13567)			115.56
			Total	737.50

Grubstake Expense Sheet
Prospector: D.A. Downing
Project: Gladstone River

Date: 6-Aug-93

Date	Item	Rate ($/day)	Days	Amount ($)
30-Jul	Topo Maps			26.32
30-Jul	Gas (Haines Jnct.)			12.50
2-Aug	Gas (Whitehorse)			47.84
2-Aug	Truck Rental		3	404.80
31/2-Aug	D. Downing (labor)	150.00	3	450.00
	Daily Living Expense (YTG Rate)	52.85	3	158.55
			Total	1 100.01

* assay costs for soils/silts and rock samples to follow

31 August 1993

Cash Resources Ltd.
Box 4127
Whitehorse, Yukon
Y1A 3S9

RESOURCE ENGINEERING
rr1 site 18 comp 23
whitehorse yukon
y1a 4z6
phone 403 633 3782
fax 403 668 7533

INVOICE: 930806

PROJECT: Gladstone (Yukon Mining Incentives Grubstake)

DESCRIPTION:

Spot panchromatic image data for prospecting area.

AMOUNT DUE:

Full SPOT scene on CD-ROM		$ 3 000.00
	Subtotal	$ 3 000.00
GST (N/A, rebate of expenses)		0.00
	Total	**$ 3 000.00**

GST REGISTRATION # R130279813

Respectfully,

David A. Downing, P. Eng.

Grubstake Expense Sheet
Prospector: D.A. Downing
Project: Gladstone River

Date: 16-Sep-93

Date	Item	Rate ($/day)	Days	Amount ($)
9-Sep	Gas (Haines Jnct.)			54.82
13-Sep	Gas (Whitehorse)			54.71
9-Sep	Truck Rental		3	453.27
3-Sep	Glacial map			4.28
8-Sep	Blackline print of surficial map			3.64
9-12 Sept.	A. Aasman (labor)	100.00	3	300.00
	D. Downing (labor)	150.00	3	450.00
	Daily Living Expense (YTG Rate)	52.85	3	158.55
			Total	1 479.27

* assay costs for soils/silts and rock samples to follow

Grubstake Expense Sheet
Prospector: D. A. Downing Date: 26 Feb. 1994
Project: Gladstone River (Inlet Creek)

Date	Item	Rate ($/day)	Days	Amount ($)
18 Sept.	Gas (Haines Jnct.)			49.92
23 Sept.	Gas (Whitehorse)			57.60
18/23 Sept.	Truck Rental		6	906.54
18/23 Sept.	D. Downing (labour)	150.00	6	900.00
	Daily Living Expense (YTG Rate)	52.85	6	317.10
			Total	2231.16

Grubstake Expense Sheet
Prospector: D. A. Downing Date: 26 Feb. 1994
Project: Calder Summit

Date	Item	Rate ($/day)	Days	Amount ($)
15 Sept.	Gas (Stewart Crossing)			56.12
17 Sept.	Gas (Whitehorse)			52.00
17 Sept.	Gas (Dawson)			48.78
15/17 Sept.	Truck Rental		3	412.80
25/30 Sept.	Truck Rental		6	918.75
8/10 Oct.	Truck Rental		3	409.80
	D. Downing (labour)	150.00	12	1800.00
	Daily Living Expense (YTG Rate)	52.85	12	634.20
			Total	4332.45

Appendix A
Top of The World Project
Analysis and Assays

Northern Analytical Laboratories ltd.

05-Aug-93date | Assay Certificate | Page1

Resource Engineering | WO 13985

Sample	Au ppb	Cu ppm	Pb ppm	Ni ppm
72904A	8			
72905A	7			
72906A	18			
72907A	43			
72908A	24			
72909A	424			
72911A	12			
72912A	10			
72913A	9			
72914A	5			
72915A	7			
72918A	8			
BC 01		23	26	31
BC 02		25	9	27
BC 03		32	13	33
BC 04		15	11	20
BC 05		25	18	22
BC 06		25	7	53
BC 07		25	5	19
BC 11		8	5	7
BC 12		9	8	10
BC 13		18	7	13
BC 14		25	7	24
BC 15		24	5	32
BC 16		16	7	22
BC 17		14	11	11
BC 18		8	12	6
BC 19		21	9	23
BC 20		19	10	8
BC 21		31	10	37
BC 22		36	18	43
BC 23		15	31	14
BC 24		6	8	5
BC 25		41	19	22
BC 26		25	14	22
BC 27		13	14	10
BC 28		10	10	6
BC 29		20	12	13
BC 30		33	8	34
BC 31		26	11	34
BC 32		26	11	55
BC 33		31	11	54

Certified by

105 Copper Road, Whitehorse, YT, Y1A 2Z7 Ph: (403) 668-4968 Fax: (403) 668-4890

Northern Analytical Laboratories ltd.

Resource Engineering WO 13985

Sample	Au ppb	Cu ppm	Pb ppm	Ni ppm
BC 34		24	8	40
BC 35		56	10	67
BC 36		35	5	136
BC 37		57	5	121
BC 38		21	7	22
BC 39		17	13	18
BC 40		25	11	42
BC 41		20	12	18
BC 42		8	12	7
BC 43		5	10	4
BC 44		7	16	8
BC 45		4	9	4
BC 46		9	13	11
BC 47		12	14	11
BC 48		66	12	64
BC 49		27	7	46
BC 50		30	9	24
BC 51		16	8	20
BC 52		23	8	24
BC 53		30	7	44
BC101		42	5	68

Certified by

105 Copper Road, Whitehorse, YT, Y1A 2Z7 Ph: (403) 668-4968 Fax: (403) 668-4890

INTERNATIONAL PLASMA LABORATORY LTD

2036 Columbia Street
Vancouver, B C
Canada V5Y 3E1
Phone (604) 879-7878
Fax (604) 879-7898

CERTIFICATE OF ANALYSIS
iPL 93H0607

TAM

Client: Northern Analytical Laboratories iPL: 93H0607 Out: Aug 11, 1993 Page 1 of 1 Section 1 of 1
Project: WO=13985 12 Pulp In: Aug 06, 1993 Certified BC Assayer: David Chiu

Sample Name		Ag ppm	Cu ppm	Pb ppm	Zn ppm	As ppm	Sb ppm	Hg ppm	Mo ppm	Tl ppm	Bi ppm	Cd ppm	Co ppm	Ni ppm	Ba ppm	W ppm	Cr ppm	V ppm	Mn ppm	La ppm	Sr ppm	Zr ppm	Sc ppm	Ti %	Al %	Ca %	Fe %	Mg %	K %	Na %	P %
72904	P	<	12	<	38	16	<	<	3	<	<	2.8	13	11	466	<	18	99	4914	5	686	<	10	0.01	1.09	22.63	3.03	1.09	0.03	0.02	0.02
72905	P	<	13	5	53	80	12	<	5	<	2	0.2	7	29	49	<	138	8	129	<	7	1	1	<	0.18	0.06	1.74	0.01	0.07	0.02	0.02
72906	P	0.1	262	53	514	42	<	<	21	<	<	<	16	344	276	<	113	300	310	11	106	5	18	<	0.71	0.14	25.58	0.01	0.04	0.02	0.79
72907	P	0.2	15	10	142	<	<	<	3	<	<	<	32	22	214	<	40	126	1358	17	41	1	20	<	1.70	3.76	8.00	2.47	0.02	0.02	0.28
72908	P	0.6	19	7	190	25	25	<	12	<	<	<	7	62	184	21	60	56	426	2	11	2	6	<	0.22	0.04	11.33	0.03	0.06	0.02	0.09
72909	P	0.1	18	7	44	21	34	3	3	<	<	<	70	0.1%	227	<	1671	37	493	<	12	<	6	<	0.84	0.21	3.47	14%	<	0.02	<
72911	P	0.3	67	13	83	7	<	<	4	<	<	<	21	63	253	<	61	32	1040	13	32	2	8	<	0.66	4.46	4.46	0.29	0.10	0.02	0.04
72912	P	0.2	49	12	67	<	<	<	2	<	<	0.3	7	40	72	<	40	18	527	9	31	2	8	<	0.44	3.83	3.31	0.48	0.04	0.02	0.03
72913	P	0.1	25	6	19	<	<	<	1	<	<	<	2	9	137	<	42	22	110	20	20	3	2	0.01	0.86	0.17	1.51	0.48	0.22	0.03	0.02
72914	P	2.2	121	10	854	7	<	<	45	<	<	1.3	4	85	210	<	93	308	35	9	26	3	1	<	0.32	0.23	6.47	0.06	0.10	0.02	0.13
72915	P	0.2	14	5	24	<	11	<	3	<	<	<	73	0.1%	37	<	609	16	566	<	1	<	4	<	0.24	0.17	3.16	15%	<	0.02	<
72918	P	0.2	3	3	28	<	6	<	3	<	<	0.4	67	0.1%	625	<	311	7	503	<	78	1	3	<	0.20	3.27	2.84	16%	<	0.02	<
Min Limit		0.1	1	2	1	5	5	3	1	10	2	0.1	1	1	2	5	1	2	1	2	1	1	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Max Reported*		99.9	20000	20000	20000	9999	9999	9999	9999	999	999	99.9	999	999	9999	999	9999	999	9999	9999	9999	999	99	1.00	99.99	99.99	99.99	9.99	9.99	5.00	5.00
Method		ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP	ICP

--=No Test ins=Insufficient Sample S=Soil R=Rock C=Core L=Silt P=Pulp U=Undefined m=Estimate/1000 %=Estimate % Max=No Estimate

3.0 Gladstone River Project

3.1 Background

3.1.1 Location and Access

The prospecting area of this project lies to the north of the Alaska Highway to the Gladstone River and east of Kluane Lake to Forth of July Creek and the Jarvis River. It is bounded by lines of latitude 61° 00' - 61° 21' N and longitude 137° 50' - 138° 45' W.

Access to the area is from the Alaska Highway 30 km northwest of Haines Junction. A good access trail runs parallel to the lake, 52 km north to the Gladstone River. From Cultus Bay on this road, a branch runs east to Forth of July Creek bisecting the area along an east west axis. There is a good 1000m airstrip at Forth of July Creek.

Location and access are indicated on the regional geology map.

3.2.2 History

In the southwest corner of the area lies Silver City, notable as a mining rush community typical of frontier development in the early 1900's.

Forth of July Creek has a long history of placer mining and many artifacts and cabins may still be seen today. At its peak a community of close to 1000 people existed near the headwaters of the creek.

A major dredging operation was run on the Gladstone River during the mid 1950's. The dredge worked the north side of the river upstream from the mouth about 3 km. At that time the government built the access road to assist with the mining development. Some upgrading of the road by a placer operator took place in 1991.

Currently two floater dredges are working the north side of the Gladstone River near the mouth. They are each processing about 80 m^3 an hour. Only test work has been undertaken at Fourth of July for the last 3 years.

3.3 Geology

A large area on the northeast side of the Denali Fault Zone in southwestern Yukon is underlain by metamorphic rocks. These rocks have been correlated with the Nisling Assemblage, a continental margin assemblage thought to be of early Paleozoic age or older, and in part with the Kluane Schist. Recent work is suggesting that the rocks in this area represent a distinct assemblage now termed the Aishihik assemblage and the Kluane assemblage. The Kluane assemblage is the focus of this project. The geology of the prospecting area at 1:250,000 scale is shown on the following page.

Supracrustal rocks southwest of the Ruby Range Batholith have been subdivided into three main units: the Aishihik assemblage, the Kluane assemblage, and the Dezadeash Formation. The Aishihik assemblage consists of biotite mucovite psammite and pelite that are commonly migmatitic and garnet and/or sillimaite-bearing, micaceous quartzite, amphibolite, marble, calc-silicate, and minor granitic orthogneiss. It is lithologically equivalent to the biotite schist and marble units in Aishihik map-area and the Nisling assemblage. The Kluane assemblage comprises mainly graphitic biotite schist with abundant andesine porphyroblasts, as well as minor muscovite-chlorite schist. The biotite schist units are locally garnet and staurlite bearing. The Kluane assemblage includes the hornfelsed schist or Kluane Schist unit as well as rocks included in the Yukon Group. The Dezadeash formation to the southeast consists of weakly metamorphosed argillite, greywacke, conglomerate and minor volcanic rocks. It contains macrofossils of Late Jurassic and Early Cretaceous age.

2.5 References

ABOTT, J.G. 1983: Origin of the Clinton Creek asbestos deposit; in Yukon Exploration and Geology 1982, Indian and Northern Affairs Canada, Whitehorse, p. 18 - 25

DEBICKI, R.L. (compiler) 1983a. Yukon Mineral Industry 1941 to 1959. Indian and Northern Affairs Canada, 136 p.

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D.I.A.N.D. 1987: Dawson map-area (NTS 116B,C); in Yukon exploration and Geology 1985 - 86, Indian and Northern Affairs Canada, Whitehorse, p. 388 - 399.

GREEN, l.h. 1972: Geology of Nash Creek, Larsen Creek and Dawson map-areas, Yukon Territory; Geological Survey of Canada, Memoir 364, 157 p.

MORTENSON, J.K. 1986: U-Pb ages of granite orthogneiss in the Yukon-Tanana terrane in west-central Yukon; in Current Research, Part B, Geological Survey of Canada, Paper 86-1B, p. 141- 146.

3.0 Gladstone River Project

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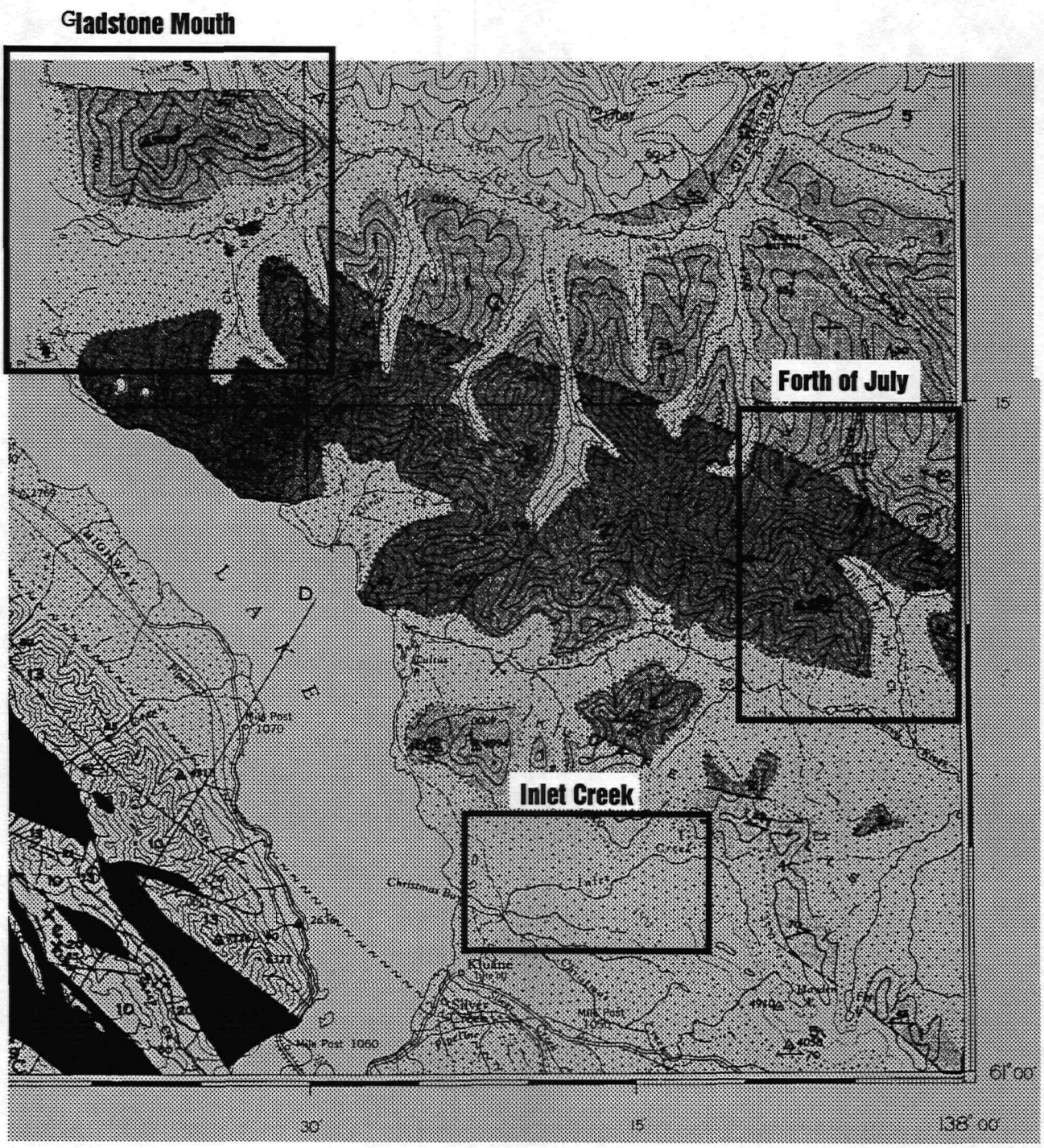


Legend

1 - Quartz biotite schist

2 - Quartz sericite schist

0 5 10 15
kilometers

RESOURCE ENGINEERING

GLADSTONE PROJECT

Kluane Geology (1:250,000)
from GSC Map 1012A, 17-1973

The Ruby Range Batholith is an elongate body of mainly biotite - hornblende granodiorite that intrudes both the Kluane and Aishihik assemblages. The batholith appears to have intruded in a sill like fashion, roughly parallel to compositional layering and schistosity in the enclosing schists and gneisses.

3.4 Prospecting Results

The area was selected for prospecting due to the occurrence of placer deposits along the contact of the Ruby Range Batholith and the Kluane Schist. The area was glaciated and it would appear that these placers have accumulated within the last 10,000 years. Regional geochemical results included some anomalies however, use of these results had previously attracted exploration within the batholith itself or along its margin to the east at Killermun Lake. In these areas arsenic anomalies had lead to the discovery of veins and stockworks containing arsenopyrite.

Three initial target areas were selected for evaluation within the larger defined target. The first two, at the mouth of the Gladstone River and at the headwaters of Fourth of July Creek, both had substantial placer deposits, were on the batholith schist contact and had road access. The third target was a gold geochemical anomaly on Inlet Creek from a regional stream silt sampling program.

Silt samples and prospecting in the first two area failed to locate any mineralization or anomalies of interest. The sample results are plotted on page 20.

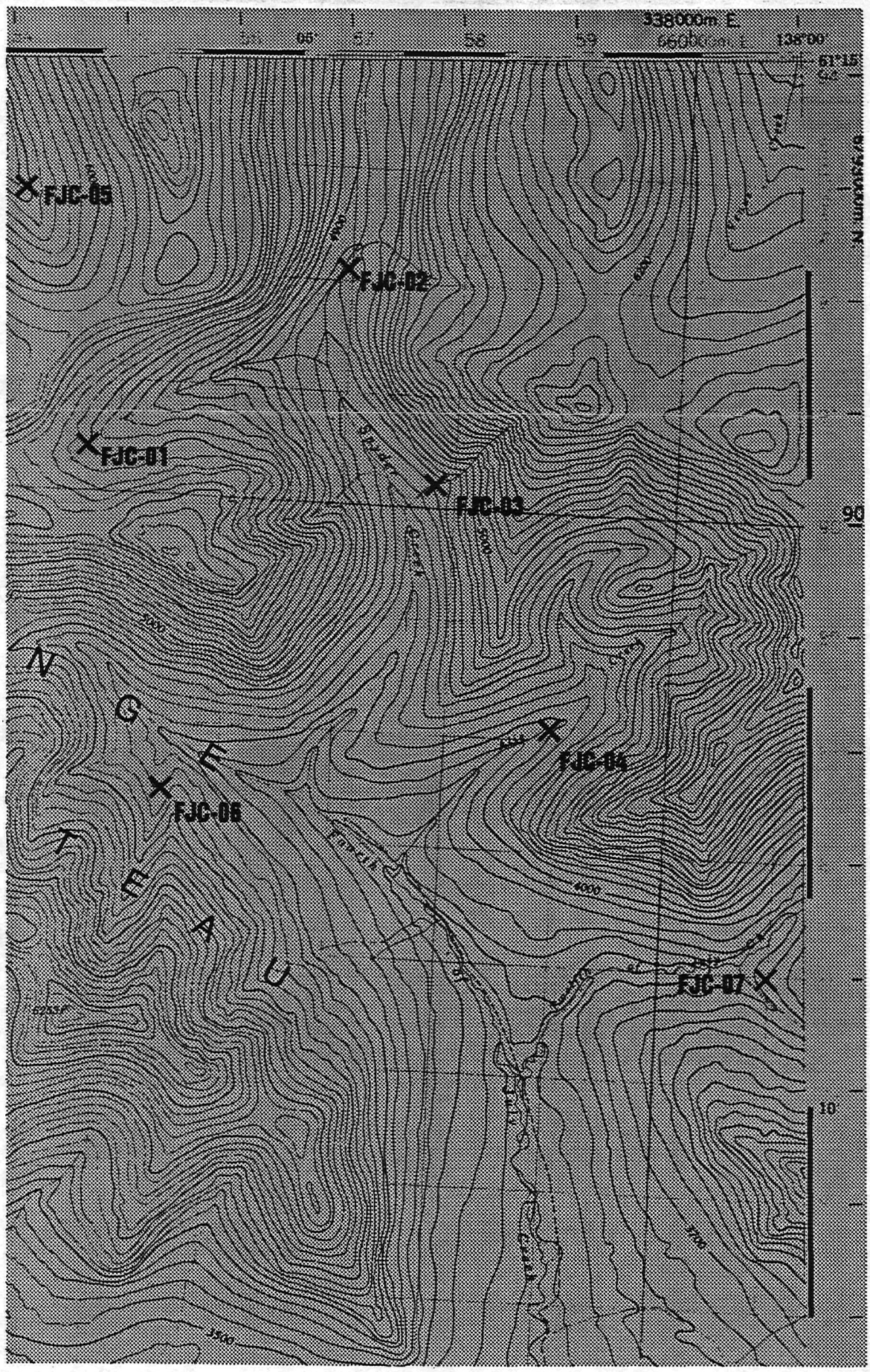
Tom Churchill, owner of Churchill Placers on Forth of July Creek told of a galena find in the cirque above his camp. The cirque is also marked on the sample map.

Inlet Creek was panned every 500 m from the mouth upstream for 8 km. Results of this panning are shown on page 21. In the area of the high gold value from the regional survey, samples were panned every 100m. There was consistently 2- 4 *flyspecks* per pan. Undoubtedly the regional anomaly was due to a single piece of gold in the sample. Nonetheless, the consistent presence of gold over a substantial area sitting on a bed of glacial till is worthy of note.

3.5 Conclusions and Recommendations

There is no obvious mineral showings along the schist batholith contact zone where it crosses the Gladstone River or to the immediate north of the headwaters of Fourth of July Creek. This is only a small portion of the exposed length of this contact and with lots of outcrop in the area more basic prospecting is recommended.

The favorable indications along Inlet Creek point to a target modified from that originally proposed. The margins of the early Tertiary granitic stocks lying as outliers south of the main Ruby Range Batholith deserve investigation. These targets have not received the same focus as the Batholith itself.



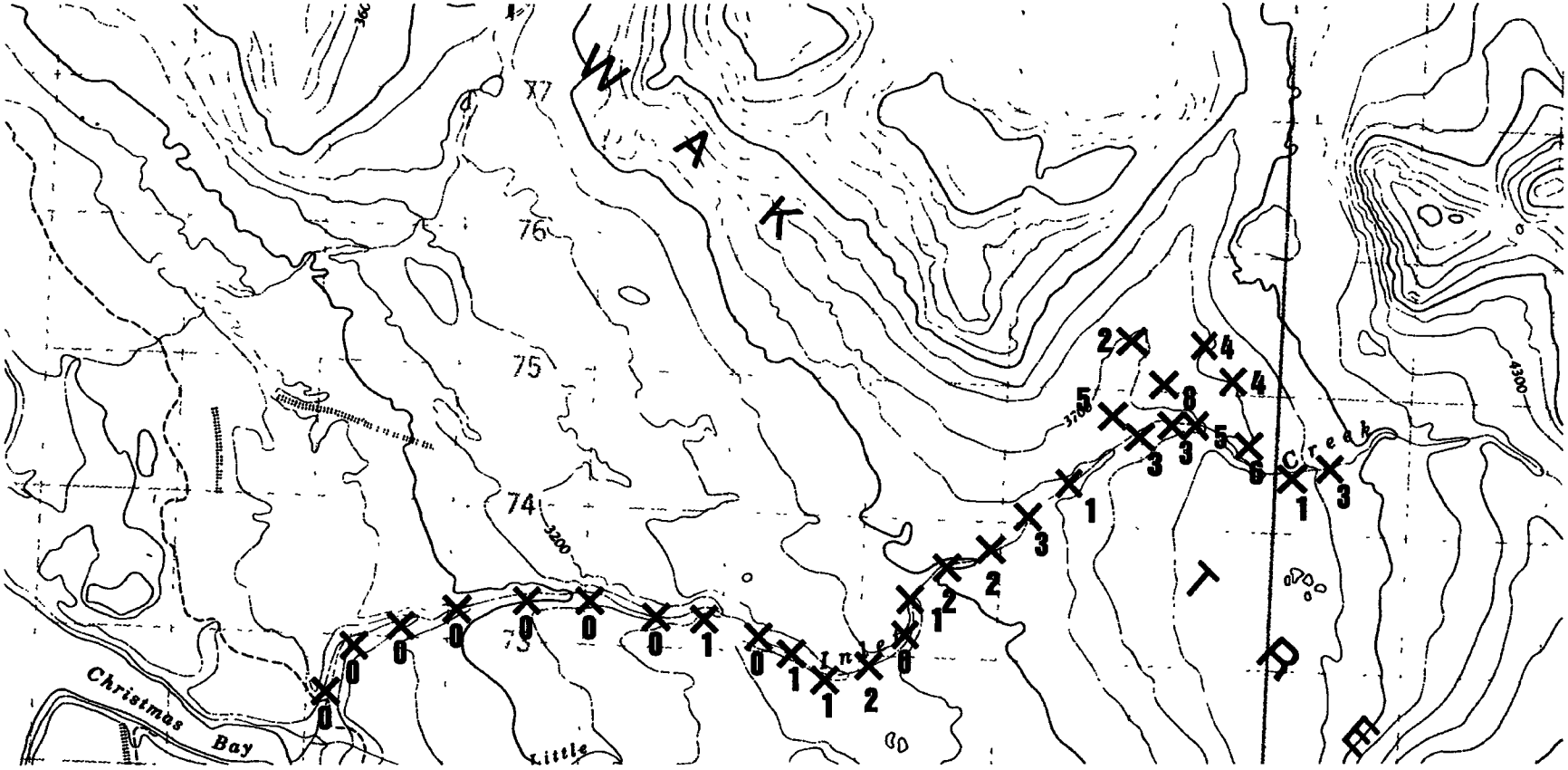
Legend

FJC-07 ✕ - Sample site & number

Scale

0 500 1000 2000m

David Downing
Forth of July Creek
Sample Sites
September 1993



Legend	Scale		David Downing Inlet Creek Panning Results September 1993
7 X - Colors per pan and location	0 500 1000 2000m 1:50,000		

3.6 References

Erdemr, P., 1990: Studies of the Kluane and Nisling assemblages in Kluane and Dezadeash map areas, Yukon; in Current Research, Part E; Geological Survey of Canada, Paper 90-1E, p. 107-111.

Mortensen, J.K. and Erdmer, P., 1992: U-Pb, ^{40}Ar-^{39}Ar, and K-Ar ages for metamorphism of the Kluane and Aishihik assemblages in southwestern Yukon Territory; in Radiogenic Age and Isotopic Studies, Report 6; Geological Survey of Canada, Paper 92-2, p.135-140.

Muller, J.E., 1967: Kluane Lake map-area (115, 115F E1/2); Geological Survey of Canada, Memoir 340, 137 p.

Tempelmen-Kluit, D.J., 1974: Reconnaissance geology of Aishihik Lake, Snag and part of Stewart River map areas, west-central Yukon; Geological Survey of Canada, Paper 73-41, 97 p.

Appendix B
Gladstone River Project
Analysis and Assays

99999 92:10:08 ggs 1W

XU	AG	AL	AS	AU	BA	BE	BI	CA	CD	CO	CR	CU	FE	K	LA	MG	MN	MO	NA	NI	P	PB	SB	SR	TI	V	W	ZN
540	0.05	0.90	14	1	78	0.7	4	1.67	0.05	14	50	44	7.37	0.07	11	0.41	1741	2	0.02	73	0.33	3	2.5	38	0.005	70	2.5	157
540	0.1	0.60	2.5	1	113	0.6	3	2.50	0.05	17	60	51	6.90	0.07	7	0.98	1119	3	0.03	70	0.29	4	2.5	89	0.005	62	2.5	163
540	0.05	0.87	2.5	0.5	81	0.4	1	3.68	0.05	21	58	16	5.60	0.05	6	1.27	1602	3	0.005	105	0.23	2	5	57	0.005	57	2.5	181
540	0.05	0.03	2.5	0.5	0.5	0.05	1	0.08	0.05	0.5	298	1	0.62	0.005	0.5	0.03	79	7	0.005	12	0.005	5	2.5	0.5	0.005	0.5	2.5	6
540	0.7	0.36	58	3	285	1.2	1	0.84	0.05	24	104	37	12.20	0.03	0.5	0.06	343	4	0.005	193	0.1	3	32	15	0.005	12	2.5	184
540	0.1	1.10	2.5	0.5	39	0.3	7	0.80	1.3	25	83	39	5.93	0.03	6	0.10	1488	2	0.005	108	0.32	21	21	19	0.005	50	2.5	234
540	0.05	0.14	2.5	0.5	27	0.05	1	0.23	0.05	0.5	267	5	1.55	0.02	0.5	0.03	101	6	0.005	44	0.07	6	7	0.5	0.005	0.5	2.5	28
540	0.5	0.20	222	2	965	1.4	1	0.22	0.05	34	161	47	11.10	0.01	0.5	0.06	922	7	0.005	343	0.18	3	24	22	0.005	18	2.5	191
540	4.3	0.25	359	235	153	2.5	1	0.20	0.05	39	216	73	17.07	0.01	0.5	0.06	637	8	0.005	343	0.21	24	94	10	0.005	27	2.5	139
540	4.3	0.25	357	260	145	2.5	1	0.21	0.05	39	216	74	17.18	0.01	0.5	0.06	635	7	0.005	347	0.21	25	93	10	0.005	27	2.5	140
540	0.05	0.26	26	1	116	1.1	1	6.32	1.6	10	174	32	2.29	0.06	17	1.01	735	7	0.01	66	0.05	2	17	49	0.005	32	2.5	79
540	0.2	0.54	49	2	212	1.3	1	11.61	0.4	40	835	25	3.89	0.04	12	5.62	1084	6	0.01	546	0.01	4	4	359	0.005	46	2.5	82
540	0.1	0.32	112	1	172	1.0	1	12.99	0.2	18	382	14	2.92	0.03	10	5.26	932	5	0.01	151	0.02	5	63	325	0.005	38	2.5	37
540	0.1	0.27	52	5	63	1.2	1	16.16	4.6	9	107	14	2.85	0.04	17	2.84	869	5	0.02	142	0.82	3	46	144	0.005	34	2.5	74
540	0.05	0.76	8	0.5	42	0.7	3	1.85	0.05	8	196	17	1.23	0.04	18	1.11	233	8	0.005	73	0.03	7	7	35	0.005	27	2.5	29
540	0.3	1.06	2.5	5	263	1.2	1	1.74	0.05	5	63	24	5.11	0.17	15	0.30	256	0.5	0.005	44	0.36	2	2.5	60	0.005	67	2.5	56
540	0.1	0.70	17	1	44	1.2	1	9.70	0.05	49	614	62	4.61	0.04	6	1.28	910	0.5	0.005	562	0.05	5	7	26	0.005	69	2.5	75

Appendix C
Calder Summit Project
Analysis and Assays

THE PETROGRAPHY OF ROCK SPECIMENS FROM THE LITTLE BLANCHE CREEK AREA, YUKON TERRITORY

M. Field

SUMMARY:

In handspecimen, the rock has a brownish colour and a distinct porphyritic texture. In thin section, the rock consists of phenocrysts of K-feldspar, green clinopyroxene and biotite set in a matrix dominated by fine-grained K-feldspar. Occasional quartz-rich metasediment xenoliths are also present. Accessory minerals present are opaque spinels (magnetite) and apatite. The clinopyroxene phenocrysts commonly occur as glomeroporphyritic clusters, suggesting that the magma may have sampled a high level magma chamber.

CONCLUSION:

The rock is classified as magmatic-facies, biotite-clinopyroxene minette. It should be considered to have low diamond potential. Since some minettes are known to produce mantle indicator minerals, the Little Blanche Creek occurrence may be responsible for some low interest indicators in the area.

KIMBERLITIC HEAVY MINERALS RECOVERED FROM THE LITTLE BLANCHE CREEK SAMPLES

A total of 46 grains were optically selected as possibly kimberlitic by the A.A.R.L. sorters after acid digestion of a representative aliquot of the sample. The following table gives a classification of the grains after probing:

3	non-kimberlitic ilmenites
1	kimberlitic garnet
8	non-kimberlitic chromites
29	kimberlitic clinopyroxenes
5	other non-kimberlitic minerals

The microprobe data can be found as an annexure.

ELEMENTS DATA FILE : LITTLE BLANCHE (OLD) TABLE 1 PAGE 1

SAMPLE NAME	SIO2	TIO2	AL2O3	FE2O3	FEO	MGO	MNO	CAO	TOTAL
LITTLE BLANCHE (OLD)/J-29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LITTLE BLANCHE (OLD)/J-30	0.00	0.00	0.00	0.00	0.00	1.06	0.00	0.00	0.00
LITTLE BLANCHE (OLD)/J-31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	42.40	0.05	18.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible] BLANCHE [illegible]

[illegible] NAME	SIO2	TIO2	AL2O3	[illegible]	FEO	MGO	MNO	CAO	TOTAL
1 [illegible] BLANCHE [illegible]/1-4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2 [illegible] BLANCHE [illegible]/1-5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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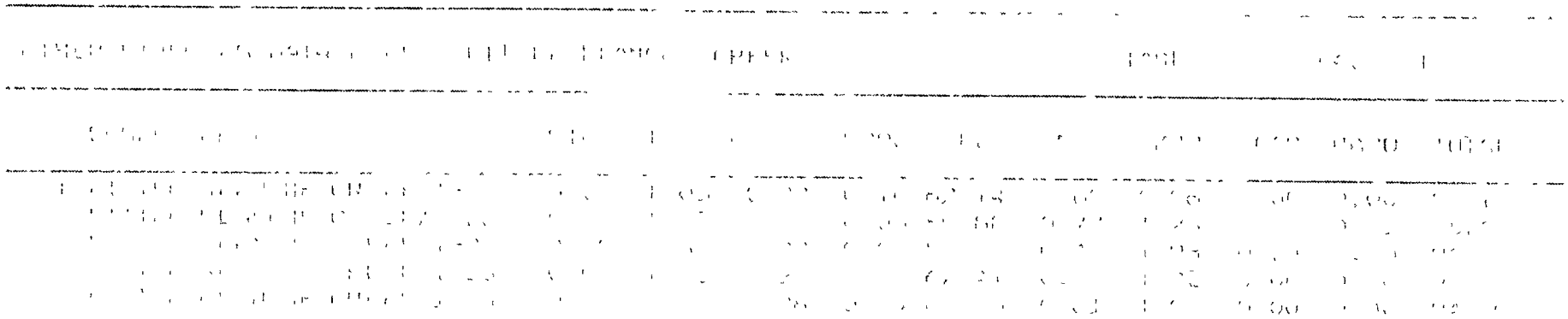
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
6 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
8 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]



CALDER SUMMIT

LORING LABORATORIES LTD.

DIAMOND EXPLORATION SERVICES

1. Whole Rock ICP Analysis - 30 Elements
2. Whole Rock ICP Analysis - 8 Elements
3. Diamond Indicator Mineral by Heavy Liquid Separation
   Certificate of Analysis - December 21, 1993
4. Certificate of Assay - Sample #71226,
   Gold Assay Analysis - December 22, 1993
   Whole Rock ICP Analysis 30 Elements

PROCESSING and SEM ANALYSIS OF SAMPLES

Laboratory Sample Processing:

The alluvial test samples were processed by Loring Laboratories Ltd, Calgary, AB, David Ko, managing director of diamond sample processing services. The samples were dried, heavy liquid separation by tetrabromoethane 2.9 g/cc, magnetics removed, middlings examined by binocular microscope, heavy liquid separation by methylene iodine 3.3 g/cc, Franz magnetic separator, non-magnetic paramagnetic, examination by binocular microscope and indicator mineral picking. The indicator minerals are then mounted on the flat surface of cylindrical plug.

Analytical Methodology:

The indicator mineral grains to be analysed are mounted on the flat end surface of a cylindrical epoxy plug that has a 100 squares grid layout. The grid identification system consists of the top ten squares designated as letters A-J and the left ten rows are numbers 1-10. The upper left corner of the grid or A-1 remains blank with no mineral grain and therefore identifies the orientation of the plug. Each mineral grain on the grid is located for scanning electron microscope (SEM) identification, eg. H-9, B-7, J-4, etc. The plug grid contains 99 cells and indicator minerals from two or three samples can be mounted on the same plug, but organized into separate rows for sample and grain identification purposes.

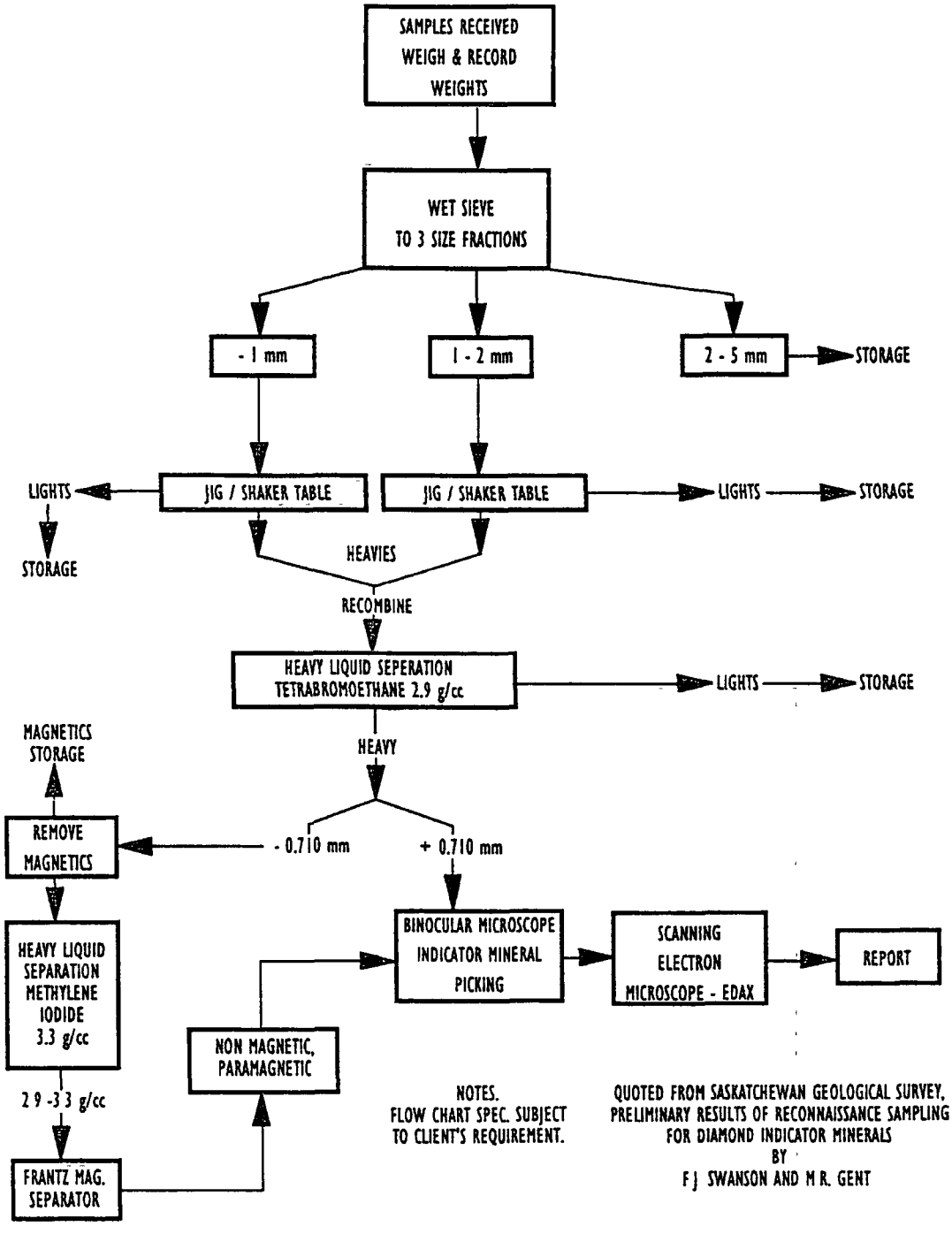
The grains are mounted and organized into groups or cells of such size that all grains in a cell may be viewed at once in the SEM at a magnification of 24x. The surface of the epoxy plug, containing the grains, is ground and polished to produce a smooth plane cutting through all the mineral grains. The polished plug surface is carbon coated to a reproducible thickness. The mounted indicator mineral grains on the plug are then prepared for analysis by the scanning electron microscope.

ARL-SEMQ Scanning Electron Microscope

The University of Calgary ARL-SEMQ Scanning Electron Microscope is equipped with a Bence-Albee computer program for data reduction and background correction. The mineral grain plug is placed in the SEM and manipulated so that an individual cell comes into full view when the SEM is set at a 24x magnification. The SEM x-ray spectras are obtained for selected grains and the ensuing spectra passes through the data reduction program, that produces the oxide composition of the analysed mineral grain. The C.F. Mineral Research Lab SEM is calibrated for analysis of eleven oxide elements: Na-Si-Al-Fe-Mg-K-

DIAMOND EXPLORATION SERVICES

SAMPLE PROCESSING FLOW CHART



NOTES.
FLOW CHART SPEC. SUBJECT TO CLIENT'S REQUIREMENT.

QUOTED FROM SASKATCHEWAN GEOLOGICAL SURVEY, PRELIMINARY RESULTS OF RECONNAISSANCE SAMPLING FOR DIAMOND INDICATOR MINERALS
BY
F J SWANSON AND M R. GENT

Ca-Mn-Cr-Ti-Zr (possibly use Nb). The University of Calgary SEM is calibrated for analysis of nine oxide elements: Si-Ti-Al-Fe-Mg-Ca-Na-Cr-F.

Microprobe Operating Conditions

The University of Calgary ARL-SEMQ Scanning Electron Microscope was operated to probe mineral grains mounted on the surface of an epoxy plug. The weight % of the eleven elements were corrected by Bence-Albee reduction.

- Beam Current = 0.15 μ Amps
- EMC = 300 μ Amps
- Voltage = 15.0 KV
- Spot Size = 1 μn ±
- Counting Time = 20 seconds

SEM Oxide Composition Correlation:

The oxide compositions of the SEM analysis of mineral grains are computer printed, and the data is then correlated with indicator mineral standards. The oxide composition of a mineral grain is compared with a standard and then named, eg, Cr-Ti chromite, K-Ti tourmaline, Mn-ilmenite or garnet group G3, G1, G5, G9 or G11.

WHOLE ROCK ICP ANALYSIS

Loring Laboratories Ltd. PROJECT 3397 File # 93-3619R

SAMPLE#	SiO2 %	Al2O3 %	Fe2O3 %	MgO %	CaO %	Na2O %	K2O %	TiO2 %	P2O5 %	MnO %	Cr2O3 %	Ba ppm	Sr ppm	Zr ppm	Y ppm	Nb ppm	Sc ppm	LOI %	SUM %
71227	56.07	14.20	6.02	2.49	6.36	3.46	6.07	.69	.81	.10	<.002	4026	894	251	29	24	12	2.6	99.70
71229	56.20	14.00	6.17	2.75	6.46	3.27	6.08	.69	.78	.11	<.002	3743	947	254	29	24	13	2.5	99.80
RE 71229	57.13	14.13	6.30	2.70	5.54	3.33	5.74	.69	.70	.11	<.002	3913	914	257	29	25	13	2.5	99.69

.200 GRAM SAMPLES ARE FUSED WITH 1.2 GRAM OF LIBO2 AND ARE DISSOLVED IN 100 MLS 5% HNO3. Ba IS SUM AS BaSO4 AND OTHER METALS ARE SUM AS OXIDES.
- SAMPLE TYPE: PULP Samples beginning 'RE' are duplicate samples.

GEOCHEMICAL ANALYSIS CERTIFICATE

Loring Laboratories Ltd. PROJECT 36267 File # 93-3619

629 Beaverdam Road N.E., Calgary AB T2K 4W7

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	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
71226	3	138	16	62	.4	26	18	1203	5.55	<2	<5	<2	24	138	<.2	<2	<2	84	.95	.229	60	62	.36	1133	.05	3	1.00	.04	.17	<1
71227	2	43	27	68	.3	20	12	600	4.19	3	<5	<2	20	94	.5	<2	<2	88	1.20	.142	38	79	1.16	612	.21	<2	.95	.10	.29	<1
71228	2	54	35	54	.3	19	12	545	4.20	2	<5	<2	19	95	.5	2	<2	89	1.37	.143	35	55	1.27	569	.20	2	.99	.09	.28	<1
71229	3	51	42	98	.5	20	13	605	4.13	<2	<5	<2	19	112	.6	<2	<2	87	1.63	.146	38	55	1.56	824	.25	2	1.01	.08	.41	<1
71230	2	66	31	84	.3	20	13	674	4.23	2	<5	<2	20	98	.7	<2	<2	88	1.43	.136	40	62	1.30	711	.25	2	.94	.11	.35	1
RE 71230	2	64	29	84	.3	20	13	675	4.22	2	<5	<2	20	99	.5	<2	<2	88	1.43	.136	40	62	1.31	719	.25	2	.95	.11	.35	<1
STANDARD C	19	63	39	130	6.8	67	31	1095	4.00	42	23	7	37	53	18.4	14	19	58	.52	.081	39	61	.94	201	.09	33	1.89	.06	.15	10

ICP - .500 GRAM SAMPLE IS DIGESTED WITH 3ML 3-1-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER.
THIS LEACH IS PARTIAL FOR MN FE SR CA P LA CR MG BA TI B W AND LIMITED FOR NA K AND AL.
- SAMPLE TYPE: PULP Samples beginning 'RE' are duplicate samples.

629 Beaverdam Rd. N.E.
Calgary, Alberta T2K 4W7

LORING LABORATORIES LTD.

Tel: (403) 274-2777
Fax: (403) 275-0541

Date: December 21,1993

Subject: Sample Results

File: 36267

1. Introduction

Enclosed are the results of the processing of samples 71227 to 71230. It should be noted that no grains were selected from samples 71228 and 71229.

The data sheets enclosed represent the adjusted microprobe data as received from the technician. On the tables and charts attached to this report, the oxides are presented in weight percent of the composition of the mineral and -- indicates that the oxide was not analyzed in the mineral (see Microprobe Data table)

The minerals selected have been identified using the EDS. The minerals believed to contain oxides useful in indicators minerals were analyzed by electron microprobe.

Care must be taken in interpreting this data. Although some of these minerals may be found in kimberlite or lamproite, they may also be present in other rocks.

Following are a few notes on the mineral grains picked from your samples.

2. Garnet

The garnets have been categorized according to Dawson and Stephens' (1975) classification. All six of the grains selected for probing rank as G5. (see Garnet Classification tables).

None of the garnets plot in the Eclogitic Field from Fipke (1989).
(see Eclogite Garnet Indicators chart).

629 Beaverdam Rd. N.E.
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LORING LABORATORIES LTD.

CERTIFICATE OF ANALYSIS

SAMPLE ID	ORIGINAL WEIGHT (Kg)	MIDDLINGS 2.9 - 3.3 SG MAGN. (Gm)	MIDDLINGS 2.9 - 3.3 SG NON-MAG. (Gm)	HEAVIES >3.3 SG MAGN. (Gm)	HEAVIES >3.3 SG NON-MAG. +28 Mesh (Gm)	HEAVIES >3.3 SG P.M. -28 Mesh (Gm)	HEAVIES >3.3 SG W.P.M. -28 Mesh (Gm)	HEAVIES >3.3 SG NON-MAG. -28 Mesh (Gm)
71227	21.2	4.60	9.98	10.60	0.15	3.37	1.74	0.49
71228	10.6	0.57	0.83	1.36	0.01	0.22	0.15	0.10
71229	15.4	2.35	7.44	2.78	0.05	2.42	1.25	0.15
71230	18.1	3.13	5.99	6.06	0.05	2.20	1.71	0.25

NOTE : P.M. = PARAMAGNETIC W.P.M. = WEAK PARAMAGNETIC

I HEREBY CERTIFY that the above results are those analyses made by me upon the herein described samples....

ASSAYER

3. Pyroxene

The two pyroxenes that were probed have been graded according to Stephen and Dawson's (1977) classification on the accompanying table, both rank as CP-2 (diopside). (see Pyroxene Classification table).

Seven other grains were identified as pyroxenes but were not probed due to low chrome content.

Neither of the pyroxenes plot in the chrome pyroxene indicator mineral region (Fipke, 1989) (see Clinopyroxene chart).

4. References

Dawson J.B. and W.E. Stephens
1975: Statistical Classification of Garnets from Kimberlite and Associated Xenoliths. Journal of Geology, vol. 83, p. 589-607.

Fipke, C. E. (ed.)
1989: The development of advanced technology to distinguish between diamondiferous and barren diatremes. Geol. Surv. of Canada, Open File Report 2124.

Gurney, J. J.
1985: A correlation between garnets and diamonds in Kimberlites; in J.E. Glover and P.G. Harris (eds.), Kimberlite Occurrence and Origin: A basis for conceptual models in exploration, Geol. Dept. and Univ. Exten., Univ. W. Aust., Publ. No. 8, 143-166.

Stephens W.E. and J.B. Dawson
1977: Statistical Comparison Between Pyroxenes from Kimberlites and their Associated Xenoliths. Journal of Geology, vol. 85, p. 433-449.

Loring Laboratories Ltd.

629 Beaverdam Road N.E.,
Calgary Alberta T2K 4W7
Tel: 274-2777 Fax: 275-0541

File No. : 36267
Client: Tron Duik
Microprobe Data

	Location			Data in wt %									
Sample#	P#	C#	R#	SiO2	TiO2	Al2O3	Cr2O	FeO	MnO	MgO	CaO	Na2O	Total	Mineral
71227	66	B	1	37.86	0.04	21.84	0.01	28.84	0.39	8.62	0.97	0.03	98.60	Garnet
71227	66	C	1	37.51	0.03	21.66	0.00	33.86	0.70	5.10	1.51	0.01	100.38	Garnet
71227	66	D	1	36.99	0.00	21.32	0.00	34.36	1.29	4.47	0.64	0.00	99.07	Garnet
71227	66	E	1	38.13	0.00	22.17	0.02	31.25	0.32	7.57	1.06	0.01	100.53	Garnet
71227	66	F	1	53.17	0.17	1.86	0.26	4.23	0 11	16.95	23.75	0.31	100.81	Pyroxe
71230	66	A	2	38.93	0.00	22.45	0.02	27.66	0.23	10.18	1.11	0.02	100.60	Garnet
71230	66	B	2	37.89	0.00	22.13	0.02	31.59	0.31	7.22	1.07	0.00	100.23	Garnet
71230	66	F	2	54.14	0.15	1.91	0.39	4.89	0.20	16.81	21.38	0.82	100.69	Pyroxe

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Calgary Alberta T2K 4W7
Tel: 274-2777 Fax: 275-0541

File #36267
Client: Tron Duik

Garnet Classification (after Dawson and Stephens, 1975)

Location				Data in wt %						Garnets Classification											
Sample	P#	C	R#	TiO2	Cr2O3	FeO	MgO	CaO	Na2O	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12
71227	66	B	1	0.04	0.01	28.84	8.62	0.97	0.03	..	..	..	..	5	..	..	..	..	..	..	..
71227	66	C	1	0.03	0.00	33.86	5.10	1.51	0.01	..	.	..	..	5	..	..	..	..	..	..	..
71227	66	D	1	0.00	0.00	34.36	4.47	0.64	0.00	..	..	..	..	5	..	..	..	..	..	..	..
71227	66	E	1	0.00	0.02	31.25	7.57	1.06	0.01	..	..	.	..	5	..	..	..	..	..	..	..
71230	66	A	2	0.00	0.02	27.66	10.18	1.11	0.02	..	..	..	..	5	..	..	..	..	..	..	.
71230	66	B	2	0.00	0.02	31.59	7.22	1.07	0.00	..	..	..	..	5	..	..	..	..	..	..	..
				Total Garnets					6	0	0	0	0	6	0	0	0	0	0	0	0
										G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12

Loring Laboratories Ltd.

629 Beaverdam Road N.E.,
Calgary Alberta T2K 4W7
Tel: 274-2777 Fax: 275-0541

File #36267
Client: Tron Duik

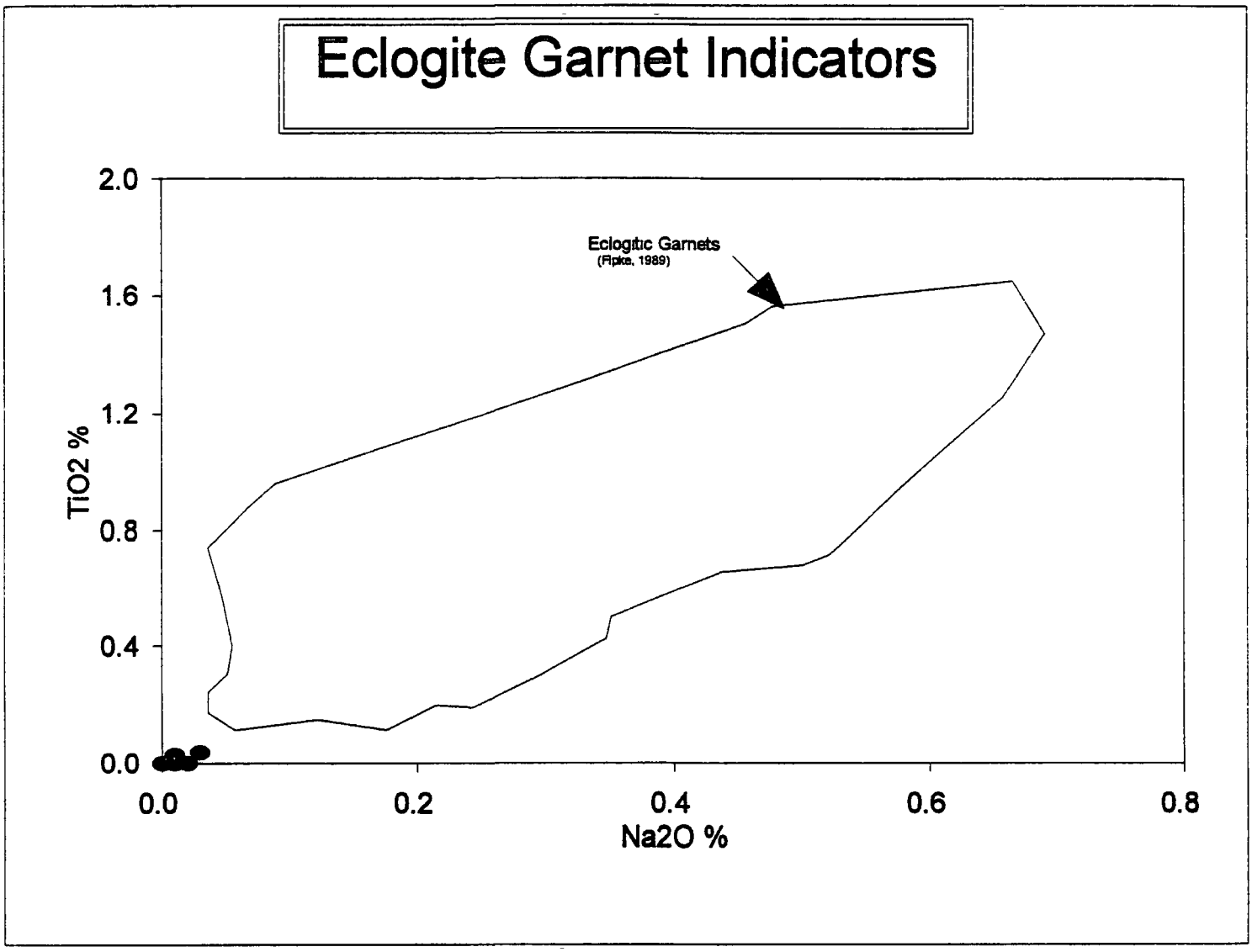
Mg - Almandine Garnets

Garnet Classification (after Dawson and Stephens, 1975)

Location				Data in wt %						Garnets Classification											
Sample	P#	C	R#	TiO2	Cr2O3	FeO	MgO	CaO	Na2O	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12
71227	66	B	1	0.04	0.01	28.84	8.62	0.97	0.03	..	..	..	..	5	..	..	..	..	..	.	..
71230	66	A	2	0.00	0.02	27.66	10.18	1.11	0 02	..	..	..	..	5	..	..	..	..	..	..	..
										—	—	—	—	—	—	—	—	—	—	—	—
			Total Garnets						2	0	0	0	0	2	0	0	0	0	0	0	0
										G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12

Loring Laboratories Ltd.
629 Beaverdam Road N.E.,
Calgary Alberta T2K 4W7
Tel: 274-2777 Fax: 275-0541

File #36267
Client Tron Duik



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Pyroxene Classification (after Stephens and Dawson, 1977)

	Location			Data in wt %							ORTHOPYROXENE	CLINOPYROXENE
Sampl	P#	C	R#	TiO2	Al2O	Cr2O	FeO	MgO	CaO	Na2O	Classification	
71227	66	F	1	0.17	1.86	0.26	4.23	16.95	23.75	0.31		2
71230	66	F	2	0.15	1.91	0.39	4.89	16.81	21.38	0.82		2

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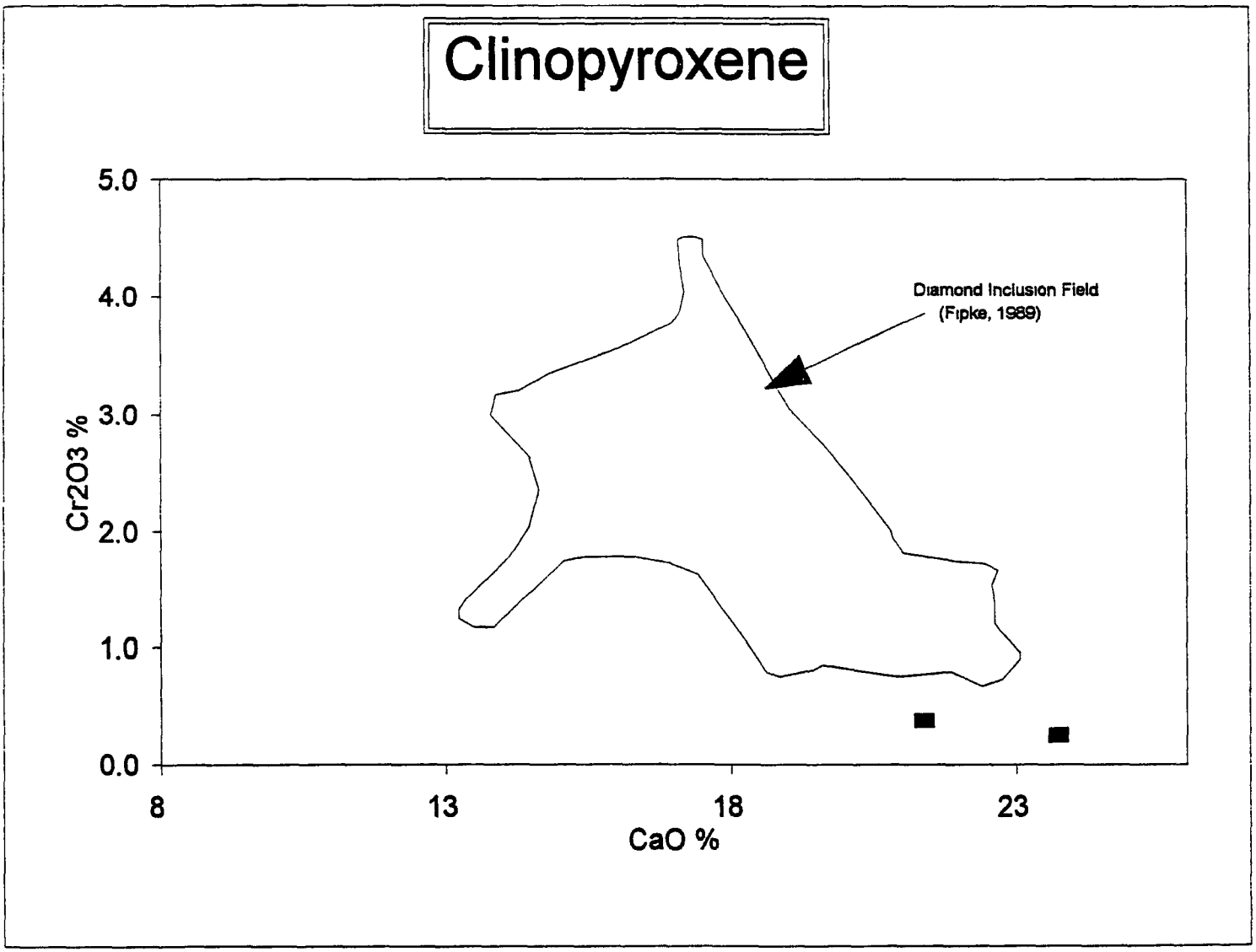
File #36267
Client: Tron Duik



Certificate of Assay
LORING LABORATORIES LTD.

SAMPLE NO.	OZ./TON GOLD
"Assay Analysis"	
71226	.003

I Hereby Certify that the above results are those assays made by me upon the herein described samples....

Rejects retained one month.
Pulps retained one month
unless specific arrangements
are made in advance.

Assayer

CALDER SUMMIT

ALEX W. KNOX, M.Sc, P.GEOL. - Rock Identification Samples #71227 and #71229, Calder Summit, Wayne Hawkes et al QUAD Claims Group Property, Dawson City, Yukon, NTS Sheet 115-0-14. Alex W. Knox-Memo and Rock Descriptions received January 22, 1994.

thin section.

Comparing the whole rock analyses with a typical syenite shows a good correlation except for SiO_2, Al_2O_3, CaO and LOI. The lower SiO_2 and Al_2O_3 value in the samples reflect the higher mafic mineral content in these rocks and the high CaO and LOI values are due to the high carbonate content.

Interpretation

The mineralogy of these two rock samples and the whole rock chemistry are consistent with these rocks being porphyritic syenites. The dominance of mafic mineral phenocrysts puts them in the lamprophyre group specifically minettes (biotite lamprophyres) if they are dyke rocks, or trachytes if they are extrusive.

Thin Section Description

Sample 71227

Phenocrysts (20%)

Phlogopite-biotite	60%
Altered pyroxene (diopside?)	30%
Alkali feldspar	10%

The phlogopite-biotite phenocrysts range from 0.3-2 mm long, are euhedral and essentially unaltered. From their pleochroic colours, the composition is probably somewhere between phlogopite and biotite.

The altered pyroxene phenocrysts range from 0.1 to 0.25 mm. In this sample the pyroxenes are almost completely altered to chlorite-mica-carbonate. This alteration is most intense in the cores of the grains.

The alkali feldspar phenocrysts are euhedral, generally 5-10 mm long (with a few smaller ones) and are untwinned or show simple twinning. Carbonate minerals occur within the feldspar crystals, alon fractures and cleavage planes.

Groundmass (80%)

Feldspar	50%
Carbonate minerals	20%
Opaque minerals	20%
Phlogopite-biotite	10%

The groundmass consists of a felted intergrowth of lath-shaped feldspar, whose elongation defines a moderately developed trachytic texture. In this feldspathic are studded small equant opaque minerals, small shreads of phlogopite-biotite and patches of anhedral carbonate (calcite?). There is possibly some interstitial quartz.

Sample 71229

Phenocrysts (25%)

Phlogopite-biotite	50%
Altered pyroxene (diopside?)	25%
Alkali feldspar	15%
Opaque minerals	10%

The phlogopite-biotite phenocrysts are fresh, subhedral, and 0.8-0.05 mm long.

The pyrixene phenocrysts ar euhedral to subhedral, equant, 1.0-0.1 mm in diameter, and are largely altered to mica-chlorite, best developed in the cores of the grains. The alteration of

the pyroxenes in noticablly less intense tha in sample 71227. In less altered crystal remanents of strong crysytal zoning are present.

The alkali feldspar is fresh and euhedral.

In addition to the phenocrysts this sample contains several included rock fragments, the largest of which is 1x2 cm.

Groundmass (75%)

Alkali feldspar		70%
Opaque minerals	15%	
Phlogopite-biotite	10%	
Carbonate minerals	5%	

The groundmass of this sample is similar to that in sample 71227, except that in this sample the groundmass is finer grained, the grain size is patchy and the trachytic texture is much less well developed. There is much less obvious carbonate in the groundmass compared to sample 71227. The carbonate in this sample is present as small dots between the feldspar laths.

ANALTICAL COMPARISON				
Element (%)	71227	71229	Typical Lamprolite	Typical Syenite
SiO2	56.07	56.20		60.19
Al2O3	14.20	14.00	3-4.5	16.28
FeO	6.02	6.17		6.02
MgO	2.49	2.75	19-27	2.49
CaO	6.36	6.46		4.30
Na2O	3.46	3.27		3.98
K2O	6.07	6.08	3.5-5.5	4.49
TiO2	0.69	0.69		0.67
P2O5	0.81	0.78		0.28
MnO	0.10	0.11		0.14
LOI	2.60	2.50		1.16
Ba (ppm)	4056	3743		
Sr (ppm)	894	947		
Zr (ppm)	251	254		
Y (ppm)	29	29		
Nb (ppm)	24	24		
Sc (ppm)	12	13		
Cr (ppm)	-50	-50	300-1700	
La/cond.	115.2	115.2	500-1100	

At your request I have studied the rock samples and analytical data provided in order to characterize the samples and decide on a classification for them.

Method

Two rock samples were provided for study, labelled 71227 and 71229. These samples were examined both megascopically and in thin section. As well, the whole rock major element analyses provided were studied to confirm the observations.

Results

Thin section examination showed that the two rocks are very similar, differing only in the matrix grain size and to a lesser extent the alteration of some of the phenocrysts.

Sample 71227

This rock consists of phenocrysts of phlogopite-biotite, pyroxene (diopside?) and alkali feldspar in a matrix of feldspar, opaques, and carbonate. The phlogopite-biotite and feldspar phenocrysts are euhedral and quite fresh, whereas the pyroxene phenocrysts are almost completely altered to chlorite, mica and carbonate. The groundmass feldspar and the phlogopite phenocrysts define a moderate developed trachytic texture.

Sample 71229

This rock is very similar to 71227. It consists of phenocrysts of phlogopite-biotite, alkali feldspar, pyroxene (diopside?) and opaques in a matrix of feldspar, biotite, opaque minerals and carbonate. The pyroxene phenocrysts are noticeably less altered in this sample. The groundmass is significantly finer-grained than sample 71227 and the trachytic texture is less well developed. This sample appears to contain less groundmass carbonate.

Chemistry

The whole rock analyses are consistent with the feldspathic nature of these samples as observed in thin section, as well as the high carbonate content (reflected in the analyses by the high LOI values). Recasting the analyses into rough normative minerals (on a quartz-free basis) fits well with the mineralogical abundances noted in

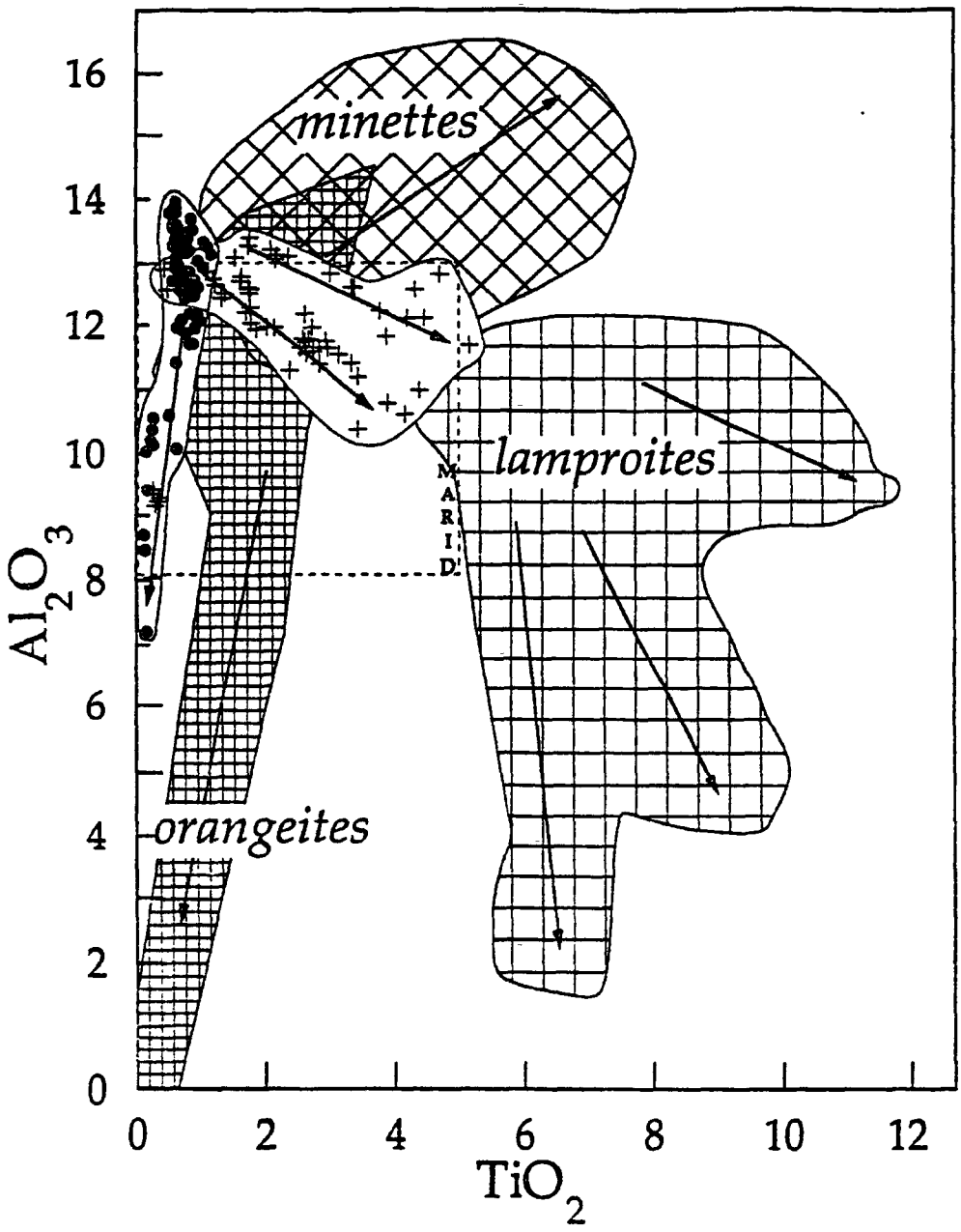


Figure 5. Compositions of phlogopite phenocrysts in minettes, lamproites, Group II kimberlites (orangeites) and CIF rocks. Crosses: CIF phenocrysts; circles: CIF glimmerites. The dashed square labelled MARID encompasses the compositions of phlogopite in a special variety of glimmerite xenoliths from kimberlites. CIF micas define a trend parallel to the lamproite trend, but at lower Ti contents. Late-crystallizing CIF micas associated with calcite follow the orangeite trend.

Source - Tony D. Peterson - GSC, Lamproites, p.9, 1993 CIM Annual Meeting, Paper #100

KENNECOTT CANADA INC.

- MEMORANDUM -

TO: Russ Cranswick

FROM: Kevin Kivi

DATE: 11 January 1994

RE: **"HAWKES" Rock Sample and Heavy Mineral Processing**

From the rock sample you forwarded labelled "Hawkes" a heavy mineral concentrate (HMC) was processed late last year. I picked the HMC and visually identified minerals using a binocular microscope. The following is my rock description and some comments about the mineralogy.

Hand specimen description:

Biotite Lamprophyre

Aphanitic leucocratic K-feldspar rich matrix, with 5-8% dark brown biotite phenocrysts 0.5-4 mm., 2-3% pale green amphiboles with felty margins, Sparse quartz xenocrysts. Pheno\xenocrysts give rock an inequigranular look. Trace pyrite.

HMC description:

The HMC (s.g.>2.84 g/cm^3) included 95% brown biotite and also:

1 round limonite; 3 chromite(?)(2 octahedron), these are weakly magnetic and likely high in FeO.; 1 almandine garnet, pink dodecahedron; Numerous pale green to green amphibole; 23 apatite and 2 barite.

Electron microprobe work on the chromites revealed that these are not chromite at all, instead grains 1 & 2 are titanomagnetite octahedra and grain 3 is an ilmentite-magnetite exsolution (see attached certificate). Minerals identified are not characteristic of mantle sourced rock, like kimberlite and lamproite, and therefore do not have diamond potential.

Regards,

Kevin Kivi
Geologist

Chemex Labs Ltd.

Analytical Chemists * Geochemists * Registered Assayers
212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE. 604-984-0221

To KENNECOTT CANADA, INC.

354 - 200 GRANVILLE ST.
VANCOUVER, BC
V6C 1S4

Project : 05-428
Comments: ATTN: RUSS CRANSWICK

Page Number : 1-B
Total Pages : 1
Certificate Date: 08-NOV-93
Invoice No. : I9323368
P.O. Number :
Account : KAV

CERTIFICATE OF ANALYSIS A9323368

SAMPLE	PREP CODE		TiO2 %	LOI %	TOTAL %	Ba ppm	Rb ppm	Sr ppm	Nb ppm	Zr ppm	Y ppm	Ba %
VR02990	299	200	0.77	2.49	100.35	4690	155	810	20	270	30	0.3

CERTIFICATION: Stuart Buchler

Chemex Labs Ltd.

Analytical Chemists * Geochemists * Registered Assayers
212 Brooksbank Ave., North Vancouver
Bntish Columbia, Canada V7J 2C1
PHONE: 604-984-0221

KENNECOTT CANADA, INC

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Project : 05-428
Comments: ATTN: RUSS CRANSWICK

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Total Pages :1
Certificate Date: 28-OCT-93
Invoice No. :19323366
P.O. Number :
Account :KAV

CERTIFICATE OF ANALYSIS A9323366

SAMPLE	PREP CODE		Au ppb FA+AA	Ag ppm	Al %	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm
VR02990	208	274	< 5	0.8	1.16	12	1150	3.5	< 2	1.18	< 0.5	17	46	40	4.23	10	< 1	0.42	80	1.64	590

CERTIFICATION Stuart Bichler

Chemex Labs Ltd.

Analytical Chemists * Geochemists * Registered Assayers
212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221

KENNECOTT CANADA, INC

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Total Pages : 1
Certificate Date: 28-OCT-93
Invoice No. : I9323366
P.O. Number :
Account : KAV

CERTIFICATE OF ANALYSIS A9323366

SAMPLE	PREP CODE	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
VR02990	208 274	2	0.13	31	2210	34	4	10	108	0.40	< 10	< 10	121	< 10	72

CERTIFICATION Stuart Bichler

Chemex Labs Ltd.

Analytical Chemists * Geochemists * Registered Assayers
212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
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Page Number :A
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Certificate Date: 08-NOV-93
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P.O. Number :
Account :KAV

CERTIFICATE OF ANALYSIS A9323368

SAMPLE	PREP CODE		Al2O3 %	CaO %	Cr2O3 %	Fe2O3 %	K2O %	MgO %	MnO %	Na2O %	P2O5 %	SiO2 %
VR02990	299	200	14.57	2.94	< 0.01	6.50	5.73	3.37	0.09	3.69	0.46	59.74

CERTIFICATION:

CHROMITE-ILMENITE, KENNECOTT, MAINES Jan. 8 1994, R.L.B.

	1	2	3
SIO2	1.19	.37	.60
TIO2	2.47	2.12	30.27
A203	.50	52	.24
C203	.09	.09	.12
FEO	86.06	88.48	61.56
MNO	43	46	1.76
MGO	.45	.11	.54
ZNO	.00	.10	.00
NIO	.07	.05	.07
SUM	91.26	92.30	94.54

SI	.476	*	.149	*	.000	*
TI	.742	*	.641	*	7.291	*
AL	.235	*	.246	*	.091	*
CR	.028	*	.029	*	.030	*
FE	28.735	*	29.740	*	16.484	*
MN	.145	*	.157	*	.477	*
MG	.268	*	.066	*	.258	*
ZN	.000	*	.030	*	.000	*
NI	.022	30.651	.016	31.073	.018	24.649
O	32.000	*	32.000	*	32.000	*
	F/M	107.843		453.685		63.794
	F/FM	.991		.998		.985

1 CRAN GRAIN 1
2 CRAN GRAIN 2
3 CRAN GRAIN 3

Kennecott Canada Inc.

Petrography and Mineralogy of Three Rock Samples From Hawk-1 Area.

SUMMARY

On November 3rd., 1993, three rock samples and were received for petrographic and mineralogical examination. The samples, all from the Hawk-1 area, were marked 1-a, 1-b and 1-c. Polished thin sections prepared from each of the samples were also provided.

Examination of the samples indicates that they likely all originated as the same rock type; they differ now only in the extend to which they have been subjected to secondary alteration.

The original rock was a trachyte which likely was emplaced as a flow or a minor intrusion. The observed texture and mineralogy are typical of trachytes - large subhedral sanidine phenocrysts are set in a fine pilotaxitic matrix composed mainly of sub-parallel feldspar microlites. Also present are many smaller phenocrysts of clinopyroxene and biotite and minor amounts of apatite and magnetite.

There are no indications of any direct petrological affinity to kimberlite.

The three samples are described individually below and typical textural features are illustrated in the accompanying plates.

PETROGRAPHY

Sample Hawk-1-c

This is the least altered of the three samples and is, therefore, described first.

The hand specimen has a dark grey, aphanitic matrix in which are set many elongate biotite laths, equant greenish pyroxene grains and occasional sub-rounded to lath-shaped feldspar phenocrysts.

The estimated modal composition of this rock, based on examination of the accompanying polished thin-section is:

Fine feldspathic matrix	: 85.0
Sanidine phenocrysts	: 1.5
Clinopyroxene	: 7.5
Biotite	: 5.0
Apatite	: 0.5
Ore	: 0.5

Examination of the thin-section shows that the matrix consists predominantly of abundant fine feldspar microlites and scattered specks of iron oxide. The feldspar microlites display the sub-parallel fluxional mode of occurrence considered to be typical of trachytic rocks.

Scattered throughout this fine matrix are phenocrysts of sanidine, clinopyroxene and biotite.

Sanidine forms occasional subhedral to euhedral phenocrysts up to 5.0mm in length. It is generally fresh and occasionally shows simple Carlsbad twinning (Plates 1 & 2)

The clinopyroxene is a pale green, faintly pleochroic variety which occasionally displays distinct zoning. It forms subhedral to occasionally euhedral grains, up to about 2.0mm in width, which are often partially, and sometimes completely, replaced by irregular intergrowths of carbonate, serpentine and chlorite (Plate 3).

The biotite is strongly pleochroic in shades of medium to dark brown and often displays prominent twinning. It forms euhedral laths, up to 2.0mm in length; the extremities of some of these laths are corroded and sub-rounded suggesting

partial resorption of this mineral (Plate 5) Some biotite is also found as fine intergrowths within the secondary carbonate replacing clinopyroxene phenocrysts.

There are also rare, much smaller euhedral apatite grains. They seldom exceed 0.5mm in length and are generally completely fresh and unaltered.

In addition to the very fine, dusty opaques in the matrix there are occasional somewhat larger (to 0.2mm) equant opaque grains scattered throughout the rock. They are made up mainly of magnetite but contain minor ilmenite intergrowths.

Sample Hawk-1-a

This hand specimen is similar in general appearance to Hawk-1-c, described above. It contains and a dark sub-angular fragment about 2.0cm in width of a dark graywacke-type rock; this is probably a lithic fragment of country rock caught up in the trachytic magma.

Estimated modal composition of the thin-section prepared from this sample is:

Fine Feldspathic Matrix	: 87.0
Sanidine phenocrysts	: 1.5
Altered Clinopyroxene	: 5.0
Biotite	: 5.0
Apatite	: 0 5
Magnetite	: 1.0

Examination of the thin section shows that the matrix is again feldspar-rich and displays typical trachytic texture; set in this fine matrix are occasional large sanidine phenocrysts and abundant smaller phenocrysts of biotite and altered clinopyroxene. Apatite and magnetite occur in minor amounts.

The sanidine occurs as subhedral phenocrysts up to about 5.0mm in width which are generally fresh and occasionally display simple twinning.

Biotite forms strongly pleochroic laths up to 2.0mm in length which are often somewhat corroded. Twinning is common

The clinopyroxene grains in this sample are much more heavily altered than was the case in 1-c. Most of are almost completely replaced by secondary carbonate or carbonate-chlorite intergrowths (Plate 4). Aggregations of fine secondary biotite laths are, in some cases, intergrown with these carbonate-chlorite pseudomorphs after pyroxene

Apatite forms occasional fine subhedral to euhedral laths (Plate 6). Magnetite occurs fine equant grains which contain minor ilmenite intergrowths.

The slide is traversed by an irregular quartz veinlet about 2.0mm in width.

Sample Hawk-1-b

This specimen is similar in general appearance and texture to sample 1-a. However it appears to have undergone pervasive oxidation and is light brown in colour. Probably because of the altered condition of this rock, the polished thin section accompanying is very thin and irregular in thickness and there are many holes marking sites from which phenocrysts have been plucked during polishing. The modal composition estimated from this slide may, therefore, not accurately reflect the make-up of the rock before polishing.

Estimated modal composition:

Fine feldspathic Matrix	: 90.0
Sanidine Phenocrysts	: 2.5
Pseudomorphs after Pyroxene	: 1.5
Biotite laths	: 5.0
Apatite	: 0.5
Magnetite	: 0.5

Although many grains have been plucked from this slide during polishing, it appears to have originally been mineralogically and texturally similar to Sample 1-a described above. It has a fine matrix displaying trachytic texture and there are many biotite phenocrysts scattered throughout. Altered pyroxene grains appear to have been present but most have been plucked out during polishing.

Large rectangular holes suggest that some sanidine phenocrysts have been removed but a few are still present and some display carlsbad twinnning.

A few fine apatite laths, like those seen in sample 1-a (Plate 6), are set in the feldspathic matrix.

Ore minerals, mainly magnetite, occur as fine dust in the trachytic matrix and as occasional subhedral grains up to 0 5mm in diameter. Minor amounts of ilmenite occur as irregular intergrowths within the magnetite grains.

Glen Sinclair
Min Scan Consultants Ltd.
Toronto, November 1993

PLATES

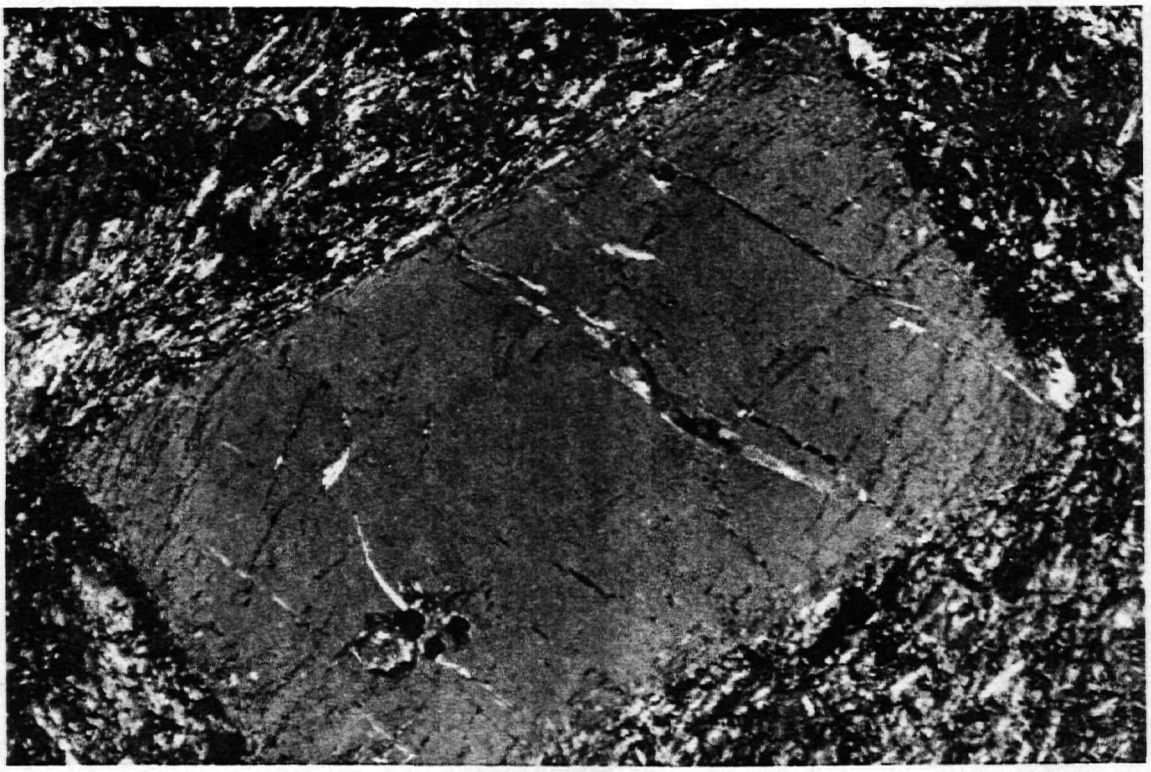

Plate 1: Sample Hawk-1-c: Euhedral Sanidine phenocryst enclosed by fine grained, feldspar-rich matrix. Sanidine grains contains a small, strongly birefringent, inclusion of clinopyroxene.
Crossed Polarizers. Scale |----------| 400 microns

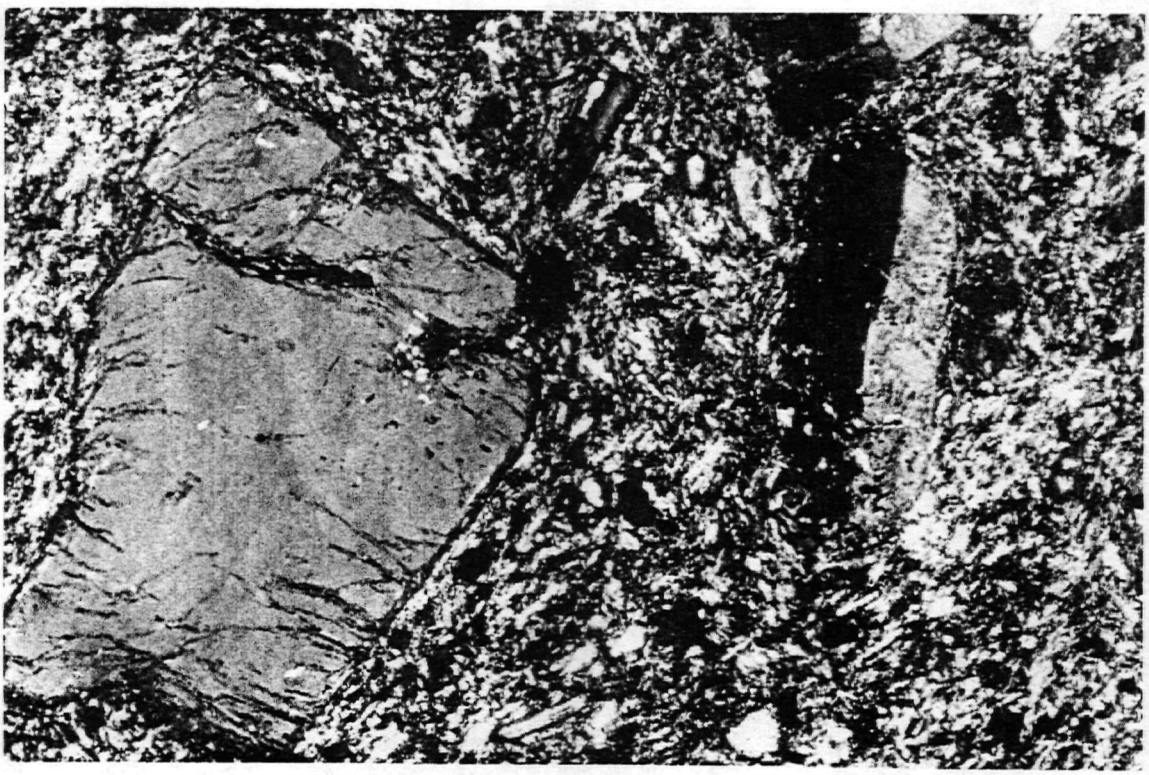

Plate 2: Sample Hawk-1-c: Two subhedral sanidine phenocrysts. The smaller one, on the right, displays simple, carlsbad twinning.
Crossed Polarizers. Scale |----------| 400 microns

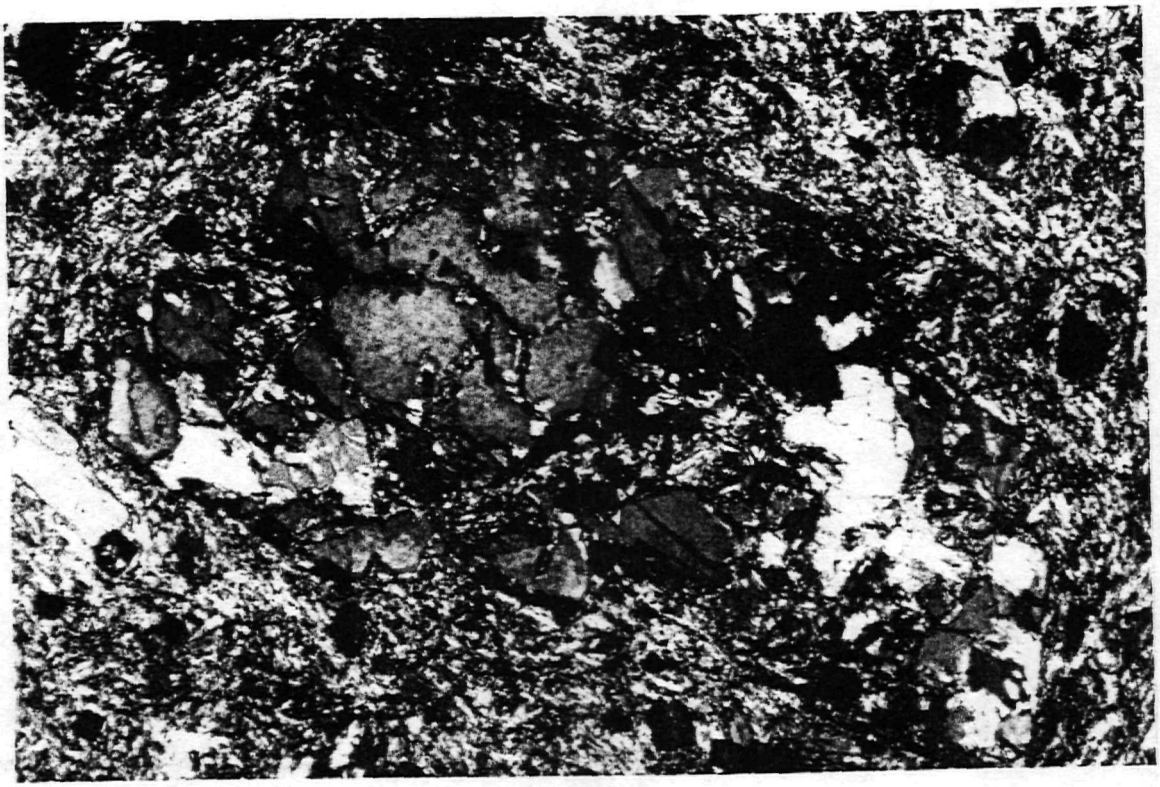

Plate 3: Sample Hawk-1-c: A large clinopyroxene phenocryst occupies most of this field. It is partially replaced by intergrowths of serpentine and carbonate.
Crossed Polarizers. Scale |----------| 400 microns

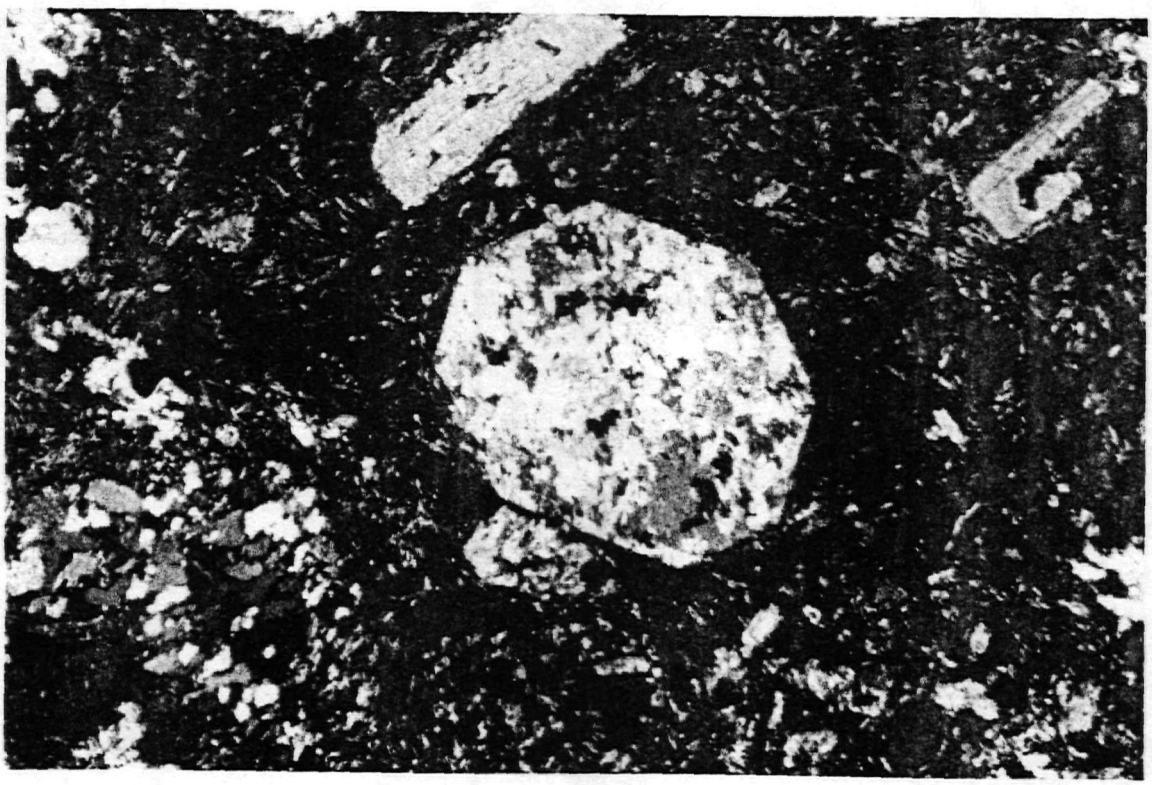

Plate 4: Sample Hawk-1-a: The clinopyroxene in the centre of this field retains its euhedral form but has been completely replaced by carbonate. Crossed Polarizers. Scale |----------| 400 microns

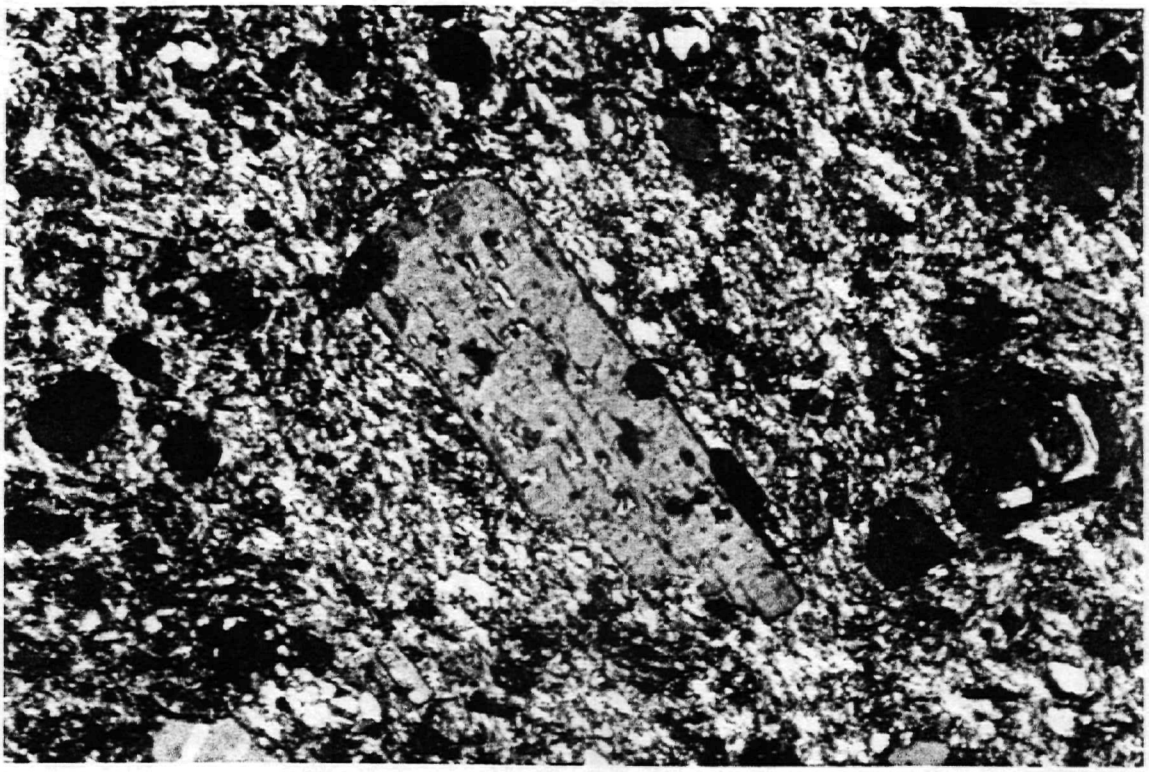

Plate 5: Sample Hawk-1-c: A biotite phenocryst enclosed in a fine trachytic matrix. One end of the biotite lath has been corroded during partial resorption.
Crossed Polarizers. Scale !----------! 400 microns

Plate 6: Sample Hawk-1-a: A small, euhedral apatite lath lies at the centre of this field. Also visible are many fine 'microphenocrysts' of biotite. The feldspar-rich matrix shows pilotaxitic texture.
Crossed Polarizers. Scale !----------! 400 microns

Canamera
GEOLOGICAL LTD.

1367 Crown Street
North Vancouver, B.C.
V7J 1G4
Tel: (604)983-7088
Fax: (604)983-7089

November 1, 1993

Mr. Victor Mitander
P.O. Box 9211
Whitehorse, YT

Dear Mr. Mitander:

Re: Sample Analysis

The following is my report on the sample you submitted to Canamera. My examination was conducted on October 21, 1993.

Sample description

As received, the sample was in two portions, one being a sample of milled material, supposedly from a ball mill, and the other being a sample of simply crushed material.

1. The crushed material was submitted to tabling and magnetic separation following our standard procedures. The various fractions produced were examined for their mineral content.

   (a) *VM-1,PCD fraction wt. 0.60 gm.*
   The sample consists mainly of pyrite, dark mica (probably biotite),olivine in various stages of alteration, minor pyroxene, and light minerals including feldspar and quartz. No indicator minerals are present.

   (b) *VM-1,MAG fraction, wt.0.04 gm*
   This sample contains only a few grains of biotite. The original sample contained too many magnetic minerals for our separator, so they were removed with a hand magnet and are described separately.

   (c) *VM-1,IL fraction, wt 1.80 gm*
   The mineral composition of this fraction is mainly biotite and olivine. There are also many pyrite grains present. These grains almost all have a dark red coating on them and, at first glance, look very much like garnets.

Under a hand lens this mistake would be most likely, however, upon breaking a few of them, it can be seen that the interiors are usually pyrite. Also present are minor amounts of pyroxene, quartz, feldspar, and a fine-grained light coloured material that looks like nepheline. Identification of this mineral with the microscope here is impossible.

(d) *VM-1,NM fraction,wt 0.41 gm*
This fraction is almost entirely quartz and feldspar. There are one or two grains of pyrite and olivine.

(e) *VM-1 hand magnet fraction,wt.137.1 gm*
The material in this fraction consists mainly of grains of fine-grained light coloured material too fine to be identified but resembling fine-grained andesite. It contains up to 10% inclusions of what is probably magnetite. This is sufficient to render all of the grains magnetically susceptable to a hand magnet. There are also a few grains of magnetite, olivine and pyrite in this sample but they too seem to contain inclusions of magnetite.

2. The ball-milled sample was split in half using a hand magnet prior to examination. The amounts in the two fractions were roughly equal.

(a) *VM ball mill mags.*
The magnetic fraction contains many free grains of magnetite. This accounts for probably more than 50% of the sample. Many other grains contain inclusions of magnetic material similiar to that found in 1(e) above. The remainder of the sample is olivine, pyrite and biotite. These may also contain magnetic inclusions, and some are composite grains with attached magnetite.

(d) *VM ball mill non mags*
This fraction consists of olivine, quartz, pyrite, feldspar and the fine grained material previously discussed. Several grains of each of the following were also seen: zircon, arsenopyrite(?). Garnets are also present in relative abundance. The percentage of garnet could be as high as 2-3. The garnets are cinnamon to pink in colour and are probably almandine or grossular based in colour. They vary from euhedral well-formed crystals to small fragments and are very clean. They also have the appearance of not belonging. While all the other grains have some degree of alteration, as well as rounding and abrasion by the milling process, the garnets without exception are clean grains and, in many cases, are larger than any other grains in the sample. The garnets were not observed at all in any other material examined in this work.

Conclusions

The primary minerals in the two samples examined were olivine, mica, quartz and feldspar. There was also a large fraction consisting of a fine-grained material resembling andesite under the binocular microscope. This material was usually associated with magnetite inclusions. In only one fraction were there any garnets and my reservations about these grains are given above. In any case the garnets are probably almandine or grossular in composition based on colour alone. No material resembling pyrope or chrome diopside was observed during the course of examining these samples.

If you have any questions, please do not hesitate to give me a call.

Yours truly,

CANAMERA GEOLOGICAL LTD.

per: Dave Watson
Mineralogist