BRITISH COLUMBIA

PROSPECTORS ASSISTANCE PROGRAM

MINISTRY OF ENERGY AND MINES

GEOLOGICAL SURVEY BRANCH

PROGRAM YEAR:	1998/99
REPORT #:	PAP 98-6
NAME:	JOHN KEMP

Prospecting Report
John Kemp
Ref. # 98 / 99 P8

Contents

BRITISH COLUMBIA
PROSPECTORS ASSISTANCE PROGRAM
PROSPECTING REPORT FORM (continued)

B. TECHNICAL REPORT

- One technical report to be completed for each project area.
- **Refer to Program Requirements/Regulations 15 to 17, page 6.**
- If work was performed on claims a copy of the applicable assessment report may be submitted in lieu of the supporting data (see section 16) required with this TECHNICAL REPORT.

Name JOHN KEMP Reference Number 98/99 P8

LOCATION/COMMODITIES

Project Area (as listed in Part A) ARROW LAKE MINFILE No. if applicable

Location of Project Area NTS 82F5, 82E8, 82E9 Lat 49°15'/49°45' Long 118°00'/118°45'

Description of Location and Access AS DESCRIBED IN REPORT

Main Commodities Searched For PRECIOUS, BASE & INDUSTRIAL MINERALS

Known Mineral Occurrences in Project Area MOUNTAIN CHIEF, MIDAS / DEER
MANY MINOR MINFILE OCCURRENCES

WORK PERFORMED

1. Conventional Prospecting (area) 73 DAYS
2. Geological Mapping (hectares/scale)
3. Geochemical (type and no. of samples) STREAM (MOSS MAT) 34, ROCK 65
4. Geophysical (type and line km) 6 KM RANDOM MAG
5. Physical Work (type and amount) 6 KM LINECUTTING, STAKING 12
6. Drilling (no. holes, size, depth in m, total m)
7. Other (specify) HAND TRENCH 2 STAKING 4 SHOWING PROSPECT 5

SIGNIFICANT RESULTS

Commodities MOLYBDENUM/CHALCO/LEAD/ZINC Claim Name MOL, LY, & MAC

Location (show on map) Lat IN REPORT Long Elevation

Best assay/sample type IN REPORT

Description of mineralization, host rocks, anomalies
IN REPORT

Supporting data must be submitted with this TECHNICAL REPORT

Information on this form is confidential for one year from the date of receipt subject to the provisions of the *Freedom of Information Act.*

Prospecting Project
Ref. # 98/99 P8

Hydrothermal activity on the Arrow Lakes

Proposal - To carry out a regional prospecting program in the area known as the "Lower Arrow Lake". The area of interest is 20 km wide, (east / west) and 40 km long (north / south) and is divided into an east and west section by the Arrow Lake. Research shows a number of geothermal hotsprings in the area which might relate to a mineralized system.

Location - The proposed area is located in the Greenwood and Trail Creek Mining Districts, of south-central British Columbia and is on map sheets 82E08E/W & 82E09E/W. The limits of the area are Latitudes 49° 15' to 49° 45', and Longitude 118° 00' to 118° 25'.

Access - The project area was accessed on the south from the Blueberry Paulson, highway #3, via the Bulldog Mountain forestry road, and on the east from the community of Deer Park utilizing the Deer Creek forestry road. Access to the north-west section was via the North Fork and Burrell creek forestry roads north of Grand Forks. Most of the drainage's on the east side of the lake were accessed by boat from Snag bay.

Physiography - Elevations in this area range from 420 meters at the Arrow Lake to 2000 meters on the mountain peaks in the Christina Range. Ground cover is characterized by thick forest typical of a wetter climate in B. C. Glaciation has taken place and leaves a float trail to the south with extremely thick dump of glacial material on the southern shoulders of any mountain. Extremely deep cut drainage's flow into the lake from the east and west, with final drainage to the south into the Columbia river.

Geology - The geology of the project area is underlain by the Paleozoic formations of Grand Forks and Monashee Gneiss's and may include the Ordovician Mt. Robert's sedimentary package. These have been intruded by Middle Jurassic Nelson, Cretaceous and / or Jurassic Okanogan, and the Cenozoic Coryell. Tempelman-Kluit suggests that the Coryell is poorly dated and may be undifferentiated from the Jkg (Okanagan) in this area. Numerous dikes cut these intrusions. The project area is on the east side of the Republic Graben as is Mount Tolman and is in the same formations as Mount Tolman.

Structure - The most prominent regional feature in the area is defined by the Arrow Lakes, a major north trending valley with numerous smaller parallel faults.

Summary - Work on this project started by researching information of all the Minfile occurrences that were found within the boundaries of the project area. Although many occurrences were noted, the most important two were the Mountain Chief (past producing skarn deposit, Minfile # 082ESE105 and the Midas / Deer showing, Minfile # 082ESE162

Prospecting Activities - 1998

Phase - 1-Six man-days were spent in the area of the Mountain Chief, prospecting the Mt. Robert's formation. The sediment package is very interesting but the Mountain Chief, which is the main showing, is a crown grant that is presently held by others. The party that holds this concession was approached for an option, but to no avail. This could make an excellent property package and demonstrates why crown grants are holding up exploration.

The area of the Midas / Deer were located and prospected. This area was explored for a porphyry type deposit in the 1970's.

Local Geology - Bedrock is composed of a variety of intrusive rocks which range considerably in grain size, texture and composition. A hornblende biotite monzonite and a leucocratic syenite are separated by a northwest trending 600 meter wide aphanitic granite porphyry which is intruded by irregular medium grained aplitic granite bodies in the northwest.

A polylithic breccia zone trends east-west across the north-west intrusive grain and measures approximately 300 x 1200 meters. Fragment size and matrix are highly variable and the presence of breccia fragments not representing the adjoining country rocks suggests some transportation of the fragments.

A dominantly northwest striking, near-vertical swarm of feldspar porphyry, lamprophyre and dacite dikes cut most of the above units. The dikes are both pre and post brecciation except for the molybdenum positive dikes, which are contemporaneous with brecciation.

The property abounds with air-photo lineaments striking in many directions. The most prominent of these is the Deer Park Fault which has a strike of 146° and a dip of 80° to the northeast. This fault is of particular interest because it parallels the general strike of the area and cuts between the two west breccias.

On the surface the fault is easily recognized in the logged area as a slight depression roughly three meters wide cutting across country. The direction of movement on the fault is as yet unknown but might be determined on the surface if the fault was uncovered by trenching.

History - Previous exploration work dates back to the early 1900's when the property was known as the Midas Group. Most of the work at that time consisted of driving short adits and shafts on mineralized quartz veins. More recent work by West Coast Mining and Exploration, and Amax Ltd. Included geological mapping, soil sampling, geophysical surveys and diamond drilling. In 1971, West Coast Mining and Exploration drilled seven holes totaling 549m.

History, con't - During 1974, Amax Ltd. Drilled six holes totaling 1582m, bringing the total meterage drilled before Utah optioned the property in 1979 to 2121m.

The 1979 field work by Utah Mines Ltd. Consisted of geological remapping, diamond drill core relogging and localized sampling of the core, geochemical surface rock sampling and an altimeter survey.

Utah Mines Ltd. Began their first season of drilling on the property in 1980. One hole DP-14 was drilled to a depth of 762.6 metres with the objective of intersecting the source of molybdenum bearing porphyry dikes found in the breccia units.

After researching information on the Midas / Deer area, it was noted that a number of relatively good copper assays were present and none for gold. A number of samples were gathered and sent for assay with no results for gold.

Upon request, Linda Caron, M.Sc., P.Eng. visited the property and suggested numerous ideas that were followed up. One of these was to get samples from deeper in the system and since drainage's in the area are deep cutting, stream samples were taken. Good gold results from drainage's to the north and east of the exploration area were obtained but follow-up prospecting did not divulge the source. Recommendations by Linda Caron are included in this report. Creeks that returned good gold numbers were Pup Creek and Grass Creek on the north and Shields Creek on the east.

No payment was made for Linda Caron as I did work for her on her project.

Six km. of grid lines were re-established to locate and control prospecting on the property. Two four post claims (16 units each) were placed to cover this prospect. Twenty-nine man-days were allotted to this section and as this was only a small portion of the project area, it was time to return to the prospecting program. This area was carried out by day trips from Grand Forks.

Phase 2, A trailer camp was moved to Snag Bay in order to carry out stream sampling and reconnaissance of all drainage's running into the Arrow Lakes. This was carried out by use of boat and motor for all streams on the east side and many on the west. All drainage's were prospected for obvious mineral exposure as well as the lakeshore. Creeks on the east that were sampled and prospected are Octopus Cr., VanHouten Ck., (north & south), Sangrida Ck., Hutchison Ck., Gladstone Ck., Sunshine Ck., and Twobit Ck. A small dike like vein of andesite containing chalcopyrite and galena as well as a number of small epithermal veins were found on VanHouten Ck. But no size or continuity was found. Strike of these veins were consistent with all other veins on the east and west of the lake; strike 20° and dip of 85° east. Twelve man-days were used for sampling and prospecting on the east side.

Phase 3 - The area of the hydrothermal system that was located in 1997 was also extensively prospected without much encouraging results.

To the south of this system is an area of interest with many parallel veins which contain pyrite, molybdenite, and some chalcopyrite and hosted in syenite. Further south of this area and on strike is another interesting molybdenite showing, again in syenite (some

Prospecting Activities - 1998 (cont) monzonite and possible a contact). This is hosted in an major east / west structure that cuts through to the North Fork road. Many small veins were noted, with minor pyrite and nothing else. The most interesting aspect of this area was finding good molybdenum on the north side and lead and zinc on the south side of this deep drainage and again in a fractured syenite. On the initial stream sampling and on the lake shore of Bowman Ck., is a km. wide formation of very brecciated area of monzonite with mafic pyroxenite filling. Crosscutting this were andesite dikes, and in many directions. The drainage was prospected but as usual away from the lake the creek was again filled with glacial debris with little outcrop. I was going to place claims but decided that geophysics should be carried out to define a target as this area is very large. As I wanted to finish the general reconnaissance of the prospecting area, this was to be carried out later. Seventeen man-days were spent on this portion

Phase 4 - Camp was then moved to Cottonwood lake near Renata and prospecting and sampling resumed. Drainage's on the west that were sampled are Worthington Ck., Johnston Ck., Cinnamon Ck., Michaud Ck., Bowman Ck., Renata Ck., (east and west) and Faith Ck., as well as four small pups that drain out of the Mt. Roberts formation that is located north of Renata Ck., and on the west side of the lake. Results of stream sampling was not encouraging. Sixteen man-days were spent on this segment.

Phase 5 - Camp was moved to the summit of Jump Ck. and considerable time was spent in this locality in the north west of the project area. Many epithermal veins were located but returned no values. One Minfile occurrence, 082ENE045 (Nove) which was next to impossible to locate, was found in November and resulted in the staking of four two post claims. This occurrence was of disseminated chalcopyrite, pyrite & hematite with minor veinlets of galena occurring in the altered contact zone between a Paleocene Coryell intrusion and a large remnant of Cretaceous Valhalla intrusion. An old drill site was found but no core. Samples were taken with some encouraging results. Snow cover hampered prospecting, so this area will be revisited in the spring. Twelve man-days on phase 5.

Conclusion - This was a very large area to prospect with limited access. The rock formations as first were monotonous until different aspect of interest were noticed. After compiling much information and revisiting some areas, I feel confident that the idea for the prospecting proposal was well justified and successful but will require much more work.

The area (phase 3) is by far the most interesting and will have geophysics and more prospecting carried out in 1999 as well as well as work programs on Phase 1 and Phase 5.

- A total of thirty-six claims were placed, with plans for an additional 80 units in 1999
- Six km. of grid were placed as well as random traverses with a proton magnetometer (approx 6 km.)
- A total of 34 stream samples were collected.
- A total of 65 rock samples were collected.
- One area that was not visited was in the Faith Ck. area because of lack of time. This area would have to be accessed by a backpack trip consisting of numerous days.
- A total of 92 days were spent in the field

Sampling Procedure - The program of stream sampling was to use a small sluice box for a heavy stream sampling as well as the gathering of a grab silt sample. Because of the lack of mixed material (either bedrock or round boulders with no fines) and the lack of water above the alluvial fans, I decided to take a "moss mat" as moss was noted on rocks and logs on the edges and center of the streams. Moss was gathered from areas that would have accumulated fines from high water.

Approximately 6 kg of moss mat were collected, washed and screened throught an 80 mesh sieve and the material bagged and shipped to Eco -Tech labs in Kamloops. This made large samples but served the purpose as we were looking for any indication of mineralization. All coarse material that was sieved off was scrutinized for the obvious.

All rock samples were either grab or chip and were assayed at Eco -Tech labs using multi element (28) ICP plus gold.

No samples were collected specifically for rare earths, although encouraging numbers turned up in the assays and lithium was reported in the Faith Ck area in Ike Webie diary.

Samples did-not accumulate very fast as there was not a lot to sample.

Sample Results - Sample results were not big numbers but are encouraging, but do suggest that a hydrothermal (possible epithermal as all veins are vuggy) is present. The best copper number is 6151ppm , the best molybdenum is 4999 ppm , the best zinc is 2.69 % , and the best lead is 2.16 %. Best for silver is 80.5 g/t. Numbers for gold were not significant.

Magnetometer work - A number of random magnetometer traverses were made on the Midas / Deer property to locate some of the recommended target by Linda Caron that were mentioned in reports from previous work. Results of the mag work are not included in this report as it was only used to locate a number of mag highs.

The mag that was used was a Scintrex Envi magnetometer (serial # 9310050) and owned by myself.

Prospecting - all roads in the area were prospected as well as well as many traverses from the height of land on the west to the west shore of the lake. Don Hairsine (prospector from Grand Forks) assisted in road prospecting, stream sampling and pick-up by boat after traverses to the lake.

MINFILE NUMBER: **082ESE162**
NATIONAL MINERAL INVENTORY: 82E2 AU4

NAME(S): **MIDAS**, DEER

STATUS: Showing
NTS MAP: 082E08E
LATITUDE: 49 20 18
LONGITUDE: 118 02 30
ELEVATION: 1633 Metres
LOCATION ACCURACY: Within 1 KM
COMMENTS: CENTRE OF CROWN GRANT L.1265

MINING DIVISION: Trail Creek
UTM ZONE: 11
NORTHING: 5465370
EASTING: 424325

COMMODITIES: Molybdenum, Copper, Tungsten, Zinc

MINERALS
SIGNIFICANT: Molybdenite, Chalcopyrite, Sphalerite, Scheelite, Fluorite
MINERALIZATION AGE: Unknown
ISOTOPIC AGE: DATING METHOD: Unknown MATERIAL DATED:

DEPOSIT
CHARACTER: Unknown
CLASSIFICATION: Unknown

HOST ROCK
DOMINANT HOST ROCK:

LITHOLOGY:

GEOLOGICAL SETTING
TECTONIC BELT:
TERRANE:

CAPSULE GEOLOGY

CORYELL SYENITE AND MONZONITE AND APHANITIC FELDSPAR PORPHYRY ARE INTRUDED BY A SWARM OF NW-STRIKING DYKES OF FELDSPAR BIOTITE PORPHYRY, SYENITE PORPHYRY, AND ANDESITE. E-TRENDING BRECCIA ZONES DISRUPTING THE DYKES ARE SURROUNDED BY A STOCKWORK OF QUARTZ AND MAGNETITE, WHICH DIMINISHES AWAY FROM THE BRECCIA. CHALCOPYRITE, AND RARE SPHALERITE AND SCHEELITE OCCUR IN BRECCIA. MOLYBDENITE OCCURS IN THE QUARTZ MONZONITE PHASE OF THE SYENITE AND DISSEMINATED IN THE SYENITE.

BIBLIOGRAPHY

EMPR GEM 1973-49, 1974-59
EMPR BULL 9-16
EMPR ASS RPT 4236, 4867, 5101, 5196, 5197, 7367, 8854, 10301
EMPR EXPL 1979-31
EMPR OF 1991-17

DATE CODED: 850724 CODED BY: GSB FIELD CHECK: N
DATE REVISED: 850724 REVISED BY: GSB FIELD CHECK: N

MINFILE NUMBER: **082ESE105** NATIONAL MINERAL INVENTORY: 82E8 Cu1

NAME(S): **MOUNTAIN CHIEF (L.2393)**

STATUS: Past Producer
NTS MAP: 082E08E
LATITUDE: 49 24 30
LONGITUDE: 118 06 00
ELEVATION: 0933 Metres
LOCATION ACCURACY: Within 500M
COMMENTS: PART OF BURNT BASIN GROUP

MINING DIVISION: Trail Creek
UTM ZONE: 11
NORTHING: 5473212
EASTING: 420201

COMMODITIES: Copper Silver Gold

MINERALS
SIGNIFICANT: Chalcopyrite Bornite Pyrite Azurite Malachite
MINERALIZATION AGE: Unknown

DEPOSIT
CHARACTER: Unknown
CLASSIFICATION: Skarn

HOST ROCK
DOMINANT HOST ROCK:

LITHOLOGY:

GEOLOGICAL SETTING
TECTONIC BELT:
TERRANE:

CAPSULE GEOLOGY

CHALCOPYRITE, BORNITE, MALACHITE, AZURITE, AND PYRITE OCCUR ALONG A LIMESTONE-GRANITE CONTACT. SAMPLES FROM THIS AREA CONTAINED 0.22 TO 2.40 PER CENT COPPER. MINERALIZATION IS IN FISSURE ZONES, WITH SLIGHT TO COMPLETE REPLACEMENT OF BLOCKS OF LIMESTONES BETWEEN FRACTURES.

BIBLIOGRAPHY

EMPR AR 1901-1225, 1917-173, 1918-182, 1919-140, 1920-137, 1922-210, 1927-328, 1955-65
EMPR GEM 1971-397
EMPR ASS RPT 930, 3090
GSC MAP 1957-6
EMR MP CORPFILE (MOUNTAIN CHIEF MINING CO., UNITED ESTELLA MINES LTD)
EMPR ASS RPT 12936

DATE CODED: 850724 CODED BY: GSB FIELD CHECK: N
DATE REVISED: 850724 REVISED BY: GO FIELD CHECK: N

MINFILE NUMBER: 082ENE045 NATIONAL MINERAL INVENTORY: 82E10 U2

NAME(S): NOVE 1 MAC CLAIMS

STATUS: *Showing* *MINING DIVISION:* *Greenwood*
NTS MAP: 082E09W UTM ZONE: 11
LATITUDE: 49 37 42 NORTHING: 5497900
LONGITUDE: 118 18 00 EASTING: 406114
ELEVATION: 1100 Metres
LOCATION ACCURACY: Within 500M
COMMENTS: CENTRE OF CLAIMS; CLAIM MAP

COMMODITIES: Copper Lead

MINERALS
SIGNIFICANT: Chalcopyrite Hematite Galena
MINERALIZATION AGE: Unknown

DEPOSIT
CHARACTER: Disseminated
CLASSIFICATION: Unknown

HOST ROCK
DOMINANT HOST ROCK:

LITHOLOGY:

GEOLOGICAL SETTING
TECTONIC BELT:
TERRANE:

CAPSULE GEOLOGY

DISSEMINATED CHALCOPYRITE, PYRITE & HEMATITE WITH MINOR VEINLETS OF GALENA OCCUR IN THE ALTERED CONTACT ZONE BETWEEN A PALEOCENE CORYELL INTRUSION & A LARGE REMNANT OF CRETACEOUS VALHALLA INTRUSION

BIBLIOGRAPHY

EMPR PF
EMPR GEM 1976-E29

DATE CODED: 850724 CODED BY: GSB FIELD CHECK: N
DATE REVISED: REVISED BY: FIELD CHECK:

MINFILE NUMBER: **082ENE013**

NATIONAL MINERAL INVENTORY:

NAME(S): **DOE**, RIVERSIDE

STATUS: Prospect
NTS MAP: 082E09W
LATITUDE: 49 31 24
LONGITUDE: 118 22 06
ELEVATION: 0900 Metres
LOCATION ACCURACY: Within 500M
COMMENTS: OLD TRENCH FROM ASSESS. REPORT 1845

MINING DIVISION: Greenwood
UTM ZONE: 11
NORTHING: 5486315
EASTING: 400967

COMMODITIES: Copper, Molybdenum

MINERALS
SIGNIFICANT: Chalcopyrite, Molybdenite
MINERALIZATION AGE: Unknown

DEPOSIT
CHARACTER: Unknown
CLASSIFICATION: Porphyry

HOST ROCK
DOMINANT HOST ROCK:

LITHOLOGY:

GEOLOGICAL SETTING
TECTONIC BELT:
TERRANE:

CAPSULE GEOLOGY

LOW GRADE PORPHYRY-TYPE MINERALIZATION OCCURS AS FRACTURE FILLINGS IN NELSON GRANODIORITE
IN NELSON GRANODIORITE, A ZONE OF FRACTURED ROCK CONTAINS STOCKWORK OF WEAKLY ALTERED AND MINERALIZED FRACTURE FILLINGS. WEAK PROPYLITIC AND ARGILLIC ALTERATION EVIDENT, WITH WEAK QUARTZ-CHALCOPYRITE-MOLYBDENITE IN FRACTURE ZONE.

BIBLIOGRAPHY

GSC MAP 6-1957
GSC MEM 56-172
EMPR ASS RPT 1845, 6018
EMPR GEM 1969-310,350, 1975-E25, 1976-E28
1925-194, 1927-225, 1928-239, 1929-254, 1930-227, 1932-122
EMPR AR 1906-164,253, 1911-176, 1914-347, 1923-179, 1924-164,
EMPR ASS RPT 8610

DATE CODED: 850724 CODED BY: GSB FIELD CHECK:
DATE REVISED: REVISED BY: FIELD CHECK:

MINFILE NUMBER: **082ESE167**
NATIONAL MINERAL INVENTORY: 082E8 Mo1

NAME(S): **WEWA**, RAM

STATUS: Showing
NTS MAP: 082E08E
LATITUDE: 49 17 00
LONGITUDE: 118 00 12
ELEVATION: 1650 Metres
LOCATION ACCURACY: Within 1 KM
COMMENTS: CENTRE OF CLAIM GROUP; CLAIM MAP BCDOM

MINING DIVISION: Trail Creek
UTM ZONE: 11
NORTHING: 5459218
EASTING: 427029

COMMODITIES: Molybdenum, Copper, Fluorite

MINERALS
SIGNIFICANT: Fluorite, Molybdenite, Chalcopyrite
MINERALIZATION AGE: Unknown

DEPOSIT
CHARACTER: Unknown
CLASSIFICATION: Industrial Min.

HOST ROCK
DOMINANT HOST ROCK:

LITHOLOGY:

GEOLOGICAL SETTING
TECTONIC BELT:
TERRANE:

CAPSULE GEOLOGY

RAM 23 TO 30 AND THE WEWA CLAIMS ARE MAINLY UNDERLAIN BY PROPYLITIZED MONZONITE INTRUDED BY A DIORITE STOCK AND BY DYKES OF DIORITE, ANDESITE, AND FELSITE PORPHYRY. FLUORITE OCCURS IN MINOR FAULT BRECCIA ON RAM 10, WEWA 29, AND RAM 30, ACCOMPANIED BY MINOR CHALCOPYRITE ON WEWA 29. A MOLYBDENITE-BEARING QUARTZ VEIN CUTS FELSITE PORPHYRY ON RAM 9.

BIBLIOGRAPHY

EMPR GEM 1972-44, 1974-59
EMPR ASS RPT 3802, 5826, 7873
EMPR OF 1992-16

DATE CODED: 850724 CODED BY: GSB FIELD CHECK: N
DATE REVISED: 850724 REVISED BY: GSB FIELD CHECK: N

MINFILE NUMBER: **082ENE056** NATIONAL MINERAL INVENTORY: 82E10 U3

NAME(S): **CRYSTAL COPPER**

STATUS: Showing
NTS MAP: 082E09W
LATITUDE: 49 34 54
LONGITUDE: 118 21 06
ELEVATION: 1000 Metres
LOCATION ACCURACY: Within 500M
COMMENTS: CENTRE OF TP 1, 3, 4, 6 CLAIMS

MINING DIVISION: Greenwood
UTM ZONE: 11
NORTHING: 5492778
EASTING: 402290

COMMODITIES: Copper, Molybdenum

MINERALS
SIGNIFICANT: Chalcopyrite, Magnetite, Molybdenite
MINERALIZATION AGE: Unknown

DEPOSIT
CHARACTER: Unknown
CLASSIFICATION: Porphyry

HOST ROCK
DOMINANT HOST ROCK: Plutonic

STRATIGRAPHIC AGE	GROUP	FORMATION	IGNEOUS/METAMORPHIC/OTHER
Carboniferous	Franklin	Unnamed/Unknown Formation	
Unknown			Unnamed/Unknown Informal

LITHOLOGY: Granodiorite
Metamorphic Rock

GEOLOGICAL SETTING
TECTONIC BELT:
TERRANE:

CAPSULE GEOLOGY

PYRITE, CHALCOPYRITE, MAGNETITE, MOLYBDENITE ARE CONFINED TO THE IMMEDIATE CONTACT OF THE GRANODIORITE BATHOLITH AND FRANKLIN GP METAMORPHICS.

BIBLIOGRAPHY

GSC MEM 56-117,170,172
GSC MAP 97A

DATE CODED: 850724 CODED BY: GSB FIELD CHECK: N
DATE REVISED: 850724 REVISED BY: GSB FIELD CHECK: N

MINFILE NUMBER: **082ENE057** NATIONAL MINERAL INVENTORY: 82E10 U3

NAME(S): **WHITE BEAR**

STATUS: Showing
NTS MAP: 082E09W
LATITUDE: 49 34 54
LONGITUDE: 118 20 36
ELEVATION: 1000 Metres
LOCATION ACCURACY: Within 500M
COMMENTS: CENTRE OF TP 1, 3, 4, 6 CLAIMS

MINING DIVISION: Greenwood
UTM ZONE: 11
NORTHING: 5492767
EASTING: 402892

COMMODITIES: Copper Molybdenum

MINERALS
SIGNIFICANT: Chalcopyrite Magnetite Molybdenite
MINERALIZATION AGE: Unknown

DEPOSIT
CHARACTER: Unknown
CLASSIFICATION: Porphyry

HOST ROCK
DOMINANT HOST ROCK:

LITHOLOGY:

GEOLOGICAL SETTING
TECTONIC BELT:
TERRANE:

CAPSULE GEOLOGY

SEE 82ENE-056 CRYSTAL COPPER.

BIBLIOGRAPHY

EMPR AR 1906-164, 1910-248, 1914-353
GSC MEM 56-116,154
GSC MAP 97A
EMPR EXPL 1979-32
EMPR ASS RPT 12508

DATE CODED: 850724 CODED BY: GSB FIELD CHECK: N
DATE REVISED: 850724 REVISED BY: GSB FIELD CHECK: N

MINFILE NUMBER: **082ENE014**

NATIONAL MINERAL INVENTORY:

NAME(S): **BEAR**, COPPER 1 ?

STATUS: Prospect
NTS MAP: 082E09W
LATITUDE: 49 31 12
LONGITUDE: 118 21 54
ELEVATION: 0933 Metres
LOCATION ACCURACY: Within 500M
COMMENTS: SHAFT FROM ASSESS. REPORT 1845
BCDOM

MINING DIVISION: Greenwood
UTM ZONE: 11
NORTHING: 5485940
EASTING: 491202

COMMODITIES: Copper, Molybdenum

MINERALS
SIGNIFICANT: Chalcopyrite, Molybdenite
MINERALIZATION AGE: Unknown

DEPOSIT
CHARACTER: Unknown
CLASSIFICATION: Porphyry

HOST ROCK
DOMINANT HOST ROCK:

LITHOLOGY:

GEOLOGICAL SETTING
TECTONIC BELT:
TERRANE:

CAPSULE GEOLOGY

LOW GRADE, PORPHYRY-TYPE MINERALIZATION OCCURS AS
FRACTURE FILLINGS IN NELSON GRANODIORITE
SEE 082ENE013-DOE.

BIBLIOGRAPHY

EMPR AR 1906-164, 1911-176, 1914-347, 1923-179, 1924-164, 1925-194,
1927-225, 1928-239, 1929-254, 1930-227, 1932-122
EMPR GEM 1969-310,350, 1975-E25, 1976-E28
EMPR ASS RPT 1845, 6018
GSC MEM 56-172
GSC MAP 6-1957
EMPR ASS RPT 8610

DATE CODED: 850724 CODED BY: GSB FIELD CHECK: N
DATE REVISED: REVISED BY: FIELD CHECK:

JOHN:

AR 5196
1974 Geological, Geochemical and Geophysical Report
Deer Park Property
M.B. Laub and J.L. LeBel
Amax

- they refer to old adits, shafts on the property. They are shown on the geology map as being in the area of the breccia zone. Have you seen these?

- they talk about an aphanitic feldspar porphyry in the SW part of the property with 12-15 fractures per foot, filled with magnetite, epidote or hematite. This should be sampled for gold.

- on the geology map he contours # of quartz-magnetite veins per foot. Try to get to the highest concentration and sample this stuff

- see the attached news release from Eastfield. They talk about magetite-sulfide breccia cobbles which run up to 15 oz/t Au in an area of syenite and trachyte stocks. It would be interesting to know what the fragments of their breccia are, if the magnetite-sulfides are the matrix, etc. ie) how does it compare to your breccia body. I'll see what I can find out.

- much of what they drilled were strong mag highs. On the east grid, there are several very strong mag highs to the north and south of the area drilled that were untested. The one north of DP74-3 is in an area of not much outcrop. It would be useful to prospect this area, locate the mag high (with your mag) and try a couple of soils for gold if there isn't much for outcrop.

- see the attached summary of the Sulfurets district. I know nothing about this, but:
  - they talk about porphyry Cu-Au in quartz-syenite type intrusives
  - pervasive Kspar-magnetite-biotite-specularite alteration
  - high level quartz-moly veins
  - quartz-sericite-chlorite-pyrite alteration at high levels (AR 5197 describes sericite-clay-carbonate-pyrite with patchy silicification which sounds similar - this suggests you are are in the wrong part of the system for Au)
  - fluorite common near the syenites
  - they also mention a pyrite rich breccia pipe which can have gold
  - My comment would be that you have many of the same characteristics. Note from the figure on Sulfurets that the Stage 2 qtz-ser-py with moly, Fl is the only stage of mineralization that doesn't have associated gold. Perhaps you could sell the concept of deep or peripheral drilling to someone. Someone who knows more about the Sulfurets district could comment on this (Dave Lefebure?)

AR 5197
1973 Geological, Geochemical and Geophysical Report
Deer, Park and Camel Claims, Deer Park MoS_2 property
H.W. Sellmer and G.M. DePaoli
Amax

- on surface quartz-vein and quartz-mag vein stockwork are most intense peripheral to the breccia

- pyrite is most intense near or within the breccia and forms a weakly developed halo around it

- fluorite, calcite, secondary biotite, hematite and magnetite occur in the breccia and near its peripheries (see comments on Sulfurets above)

- strong mag highs occur at the peripheries of the breccia zone, also in the syenite

- they talk about a shallow IP anomaly over much of the east-central grid area, with several root-like zones extending to greater depth at the edges of the breccia zone.

- best ddh intersection is West Coast Hole#7, 1971, 50 feet @ 0.22% Mo (0.3% MoS_2) from 70-120 feet depth.

- the West Coast holes were all relatively shallow:
  - ddh 1 222' dipped -50°
  - ddh 2 295' dipped -50°
  - ddh 3 93' dipped -90°
  - ddh 4 464' dipped -57°
  - ddh 5 114' dipped -90°
  - ddh 6 287' dipped -47°
  - ddh 7 282' dipped -70°

- they describe one phase of the syenite as being quartz bearing (see Sulfurets again)

AR 7367
1979 Combined Geological, Geochemical and Geophysical Report
Deer Park Groups 1 and 2
George Norman
Utah Mines

- state that the old shafts and adits were dug on mineralized quartz veins
- note area of strong quartz-sericite-pyrite zone at 73+00E 68+00N (near holes 71-1 to 71-3 and near the shaft?) This would be interesting to see.
- has drill logs for 1971 and 1974 holes. 1974 holes were somewhat deeper (150-200 metres range). Still no Au assays on core.

AR 8854
1980 Drilling Report
Deer Park Property
Tom Pollock
Utah Mines

- one hole DP-14 drilled to 763 metres deep (2502 feet)!
- still no Au assays (or Cu). Assays only for Mo, Zn, W, Fl
- Fluorine values are high ie. 2300 ppm Fl from 708-711 m

AR 10,301
1981 Drilling Report
Deer Park Molybdenum Property
Tom Pollock
Utah Mines

- hole DP-14 drilled in 1980 was deepened to 933 metres
- a second deep hole was drilled, DP-15, to 933 metres
- there was little moly mineralization in either hole
- he does describe weak to strong argillic altered zones, up to 50 metres in length, which decrease below about 700 metres depth
- some of the alteration sounds intriguing although overall the extent of alteration was limited
    - ie. DP-15 @ 480 metres. He logs clay altered intrusive with up to 1% py and a stockwork of fine dark grey qtz veinlets. It would be nice to have Au, Ag, base metal etc assays for this type of stuff
    - ie DP-15 @ 246 m where he logs strongly altered intrusive rx with an extreme quartz stockwork
- in the logs there is mention of dykes with diss gal, cpy, shal and moly ie. DP-15 @ 425m depth. This sounds similar to what you are finding on surface.

All in all, I think the best selling points will be

- you are in a big mineralized system
- that there are no gold assays from drilling
- only 2 holes test for deeper level stuff
- you wouldn't probably expect the gold to be where the moly is
- gold values in stream drainages suggest that the system could have a gold rich portion

PORPHYRY COPPER AND RELATED GOLD MINERALIZATION IN THE SULPHURETS DISTRICT OF NORTHWESTERN BRITISH COLUMBIA - IMPLICATIONS FOR INTRUSION-RELATED GOLD EXPLORATION

Jacob Margolis, Homestake Mining Company
Reno, Nevada

The Sulphurets district, 60 km northwest of Stewart and 20 km southeast of the Eskay Creek mine, contains at least four significant Cu-Au deposits: the Kerr Cu-Au (148 million tons [MT], .76% Cu, .01 opt Au), West zone Au-Ag (.71MT, .43 opt Au, 20 opt Ag), Snowfield Au (8 MT, .08 opt Au), and Mitchell Cu-Au (geologic resource of ±200 MT, .2% Cu, .025 opt Au). This report concerns the northern portion of the district on the flanks of Mitchell Valley, the area of the Mitchell and Snowfield deposits. Host rocks, apparently correlative with the Lower Jurassic Hazelton Group, include submarine hydroclastic basaltic lava flows, dioritic intrusive rocks, and volcaniclastics. Calc-alkaline granitoid (commonly quartz-syenite) stocks occur at the base of the alteration system, are altered and mineralized by stage 1 (see below), and are believed to have driven the hydrothermal activity. Fluorite (post stage 1) is common proximal to the syenites. Ar-Ar and U-Pb dating of hydrothermal tourmaline and quartz-syenite, respectively, indicate an Early Jurassic (about 192 Ma) mineralization age. A Middle Cretaceous (110 Ma) thermal event is also recognized and is probably coincident with post-mineralization low-grade greenschist metamorphism and thrusting.

Excellent exposures and high relief have facilitated the recognition of four superimposed hydrothermal/mineralization events representing a gold-enriched porphyry-epithermal transition. From earliest to latest these are:

(1) porphyry-style Cu-Au stage consisting of pervasive potassic alteration (K-feldspar-magnetite-biotite-specularite) of deep-level, intrusive quartz-syenite and surrounding volcanic rocks; Cu-Au-bearing quartz stockworks (e.g., Mitchell deposit) developed at high levels within country-rock volcanic and intrusive rocks; electrum occurs within chalcopyrite, and there is a strong positive correlation between Cu and Au;

(2) relatively high-level quartz-sericite-chlorite-pyrite alteration hosting quartz-molybdenite veins and tourmaline, both of which were introduced at this time;

(3) unmineralized, blanket-like, advanced-argillic alteration (pyrophyllite-kaolinite-woodhouseite-pyrite-barite) at high levels; and underlying massive pyrite veins enriched in Bi-Te-Sn;

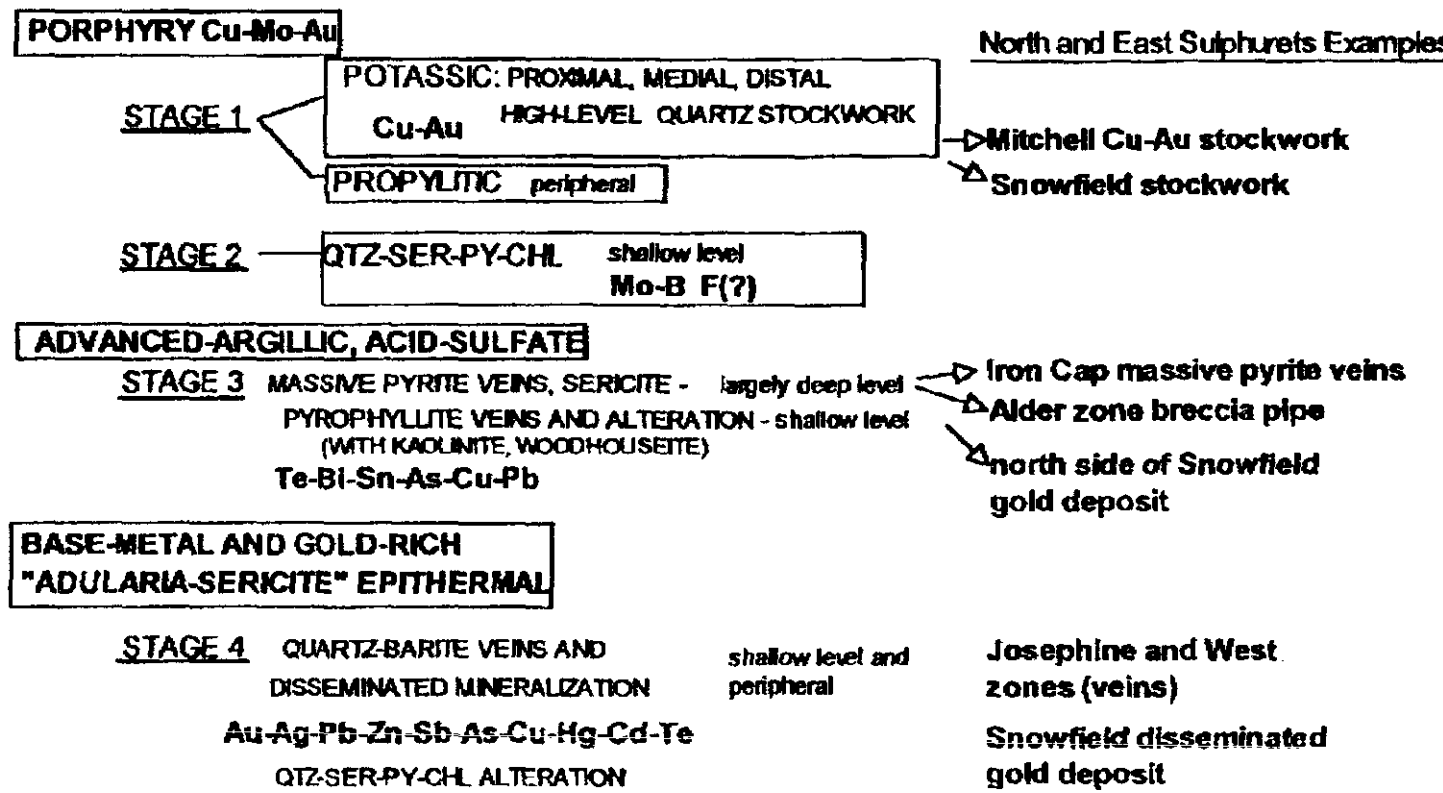
(4) gold-rich, quartz-barite veins containing galena-sphalerite-tetrahedrite-pyrargyrite-gold-acanthite (Pb-Zn-Au-Ag-Sb-Cu-Cd-Hg±Te) best developed at high and peripheral positions (West zone style); and a high-grade, basalt-hosted disseminated Au zone (Snowfield deposit) with a similar mineral assemblage. This disseminated gold mineralization occurs proximal to a high-level, stage-1 stockwork zone and beneath and laterally adjacent to an advanced-argillic cap. Gold precipitation at Snowfield apparently resulted from sulfidation of previously altered (stages 1 and 2) basaltic andesite which was highly permeable due to a coarse hydroclastic texture. Within the stage-4 veins, abundant barite and absence of adularia are evidence that fluid mixing as opposed to boiling led to precipitation of gold and metal sulfides. Although stage-3 massive pyrite veins may contain high but erratic gold grades, textural relations indicate that gold (with galena-sphalerite-tetrahedrite) was introduced by the stage-4 fluid.

Two gold environments are present at Sulphurets:

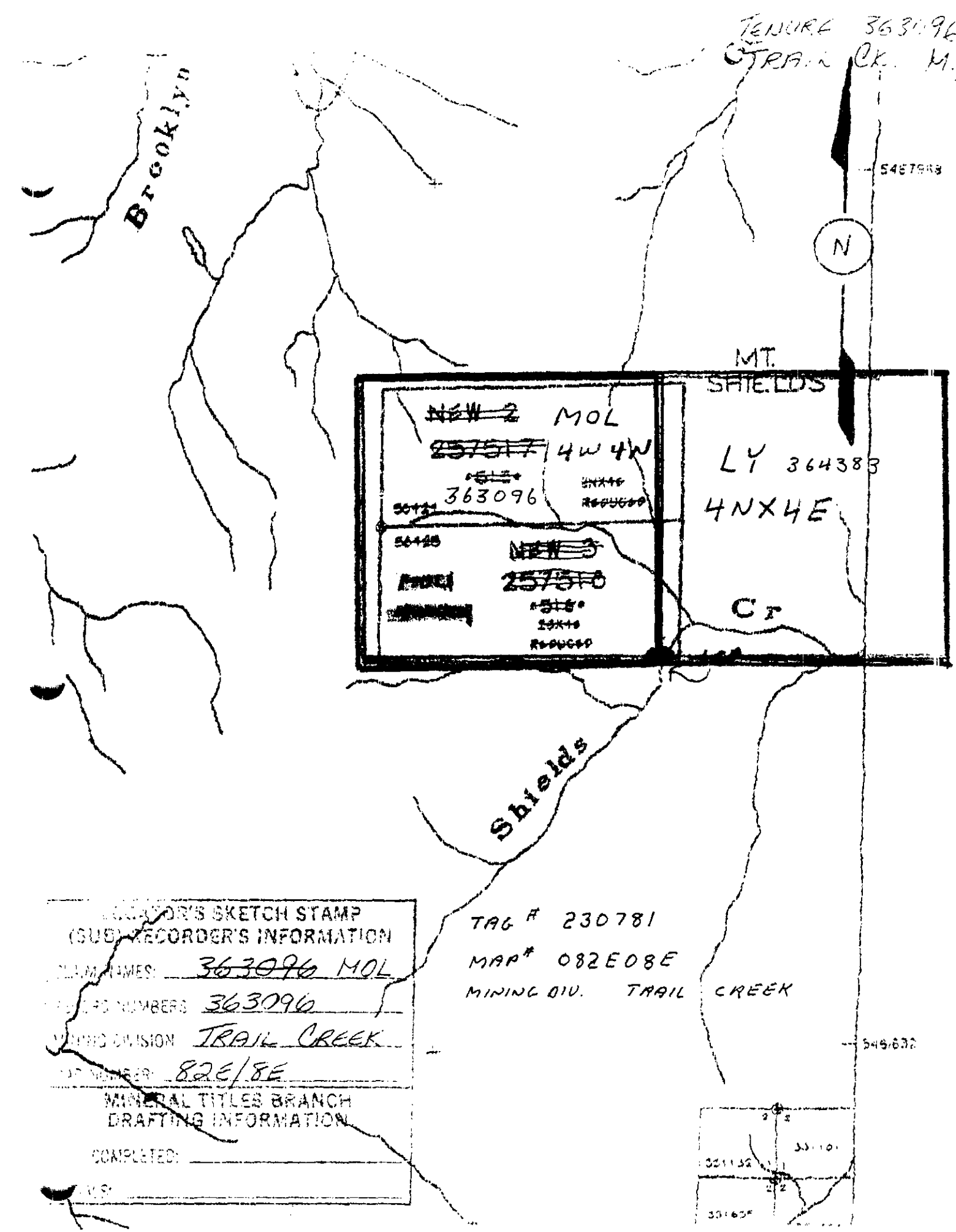
(1) earliest, central (within or above granitoid), porphyry-Cu stage, with gold apparently carried as a chloride complex at relatively high temperature in a dominantly magmatic fluid of high salinity;

(2) latest, typically high-level and distal (to granitoid and stage-1 system), base-metal related, gold mineralization akin to adularia-sericite type epithermal systems, with gold apparently carried as a sulfide complex at lower temperatures in a relatively alkaline and reduced fluid with a larger component of meteoric water. Stable isotope data provide evidence for these two fluid types and temperatures.

Exploration in porphyry-style systems must be geared to recognize and target these two settings, as both may be economically viable. In addition, a third, rarer setting, not present at Sulphurets is the acid-sulfate-related enargite-gold (high sulfidation) style of mineralization; such deposits typically occur in a high-level and central position relative to underlying causative porphyry intrusions and potassic Cu-rich mineralization. It is possible that such a system existed in the advanced-argillic zone at Sulphurets but was eroded. However, the temporal transition from the acidic stage-3 system to the more alkaline and gold-rich stage 4 system at Sulphurets is an emerging characteristic of at least some high sulfidation gold deposits. Although the early, high-temperature Cu-Au environment is similar in most districts, the late, generally peripheral, lower-temperature gold system may assume a variety of deposit styles, chiefly dependent upon host-rock type, precipitation mechanisms, and hydrothermal flow regimes. The distinctive transition from Cu precipitation to Mo-B-F precipitation is consistent with the protracted exsolution of magmatic aqueous fluids from the crystallizing silicic melt, as demonstrated in experimental studies of other workers.



MARGOLIS FIG. 11 40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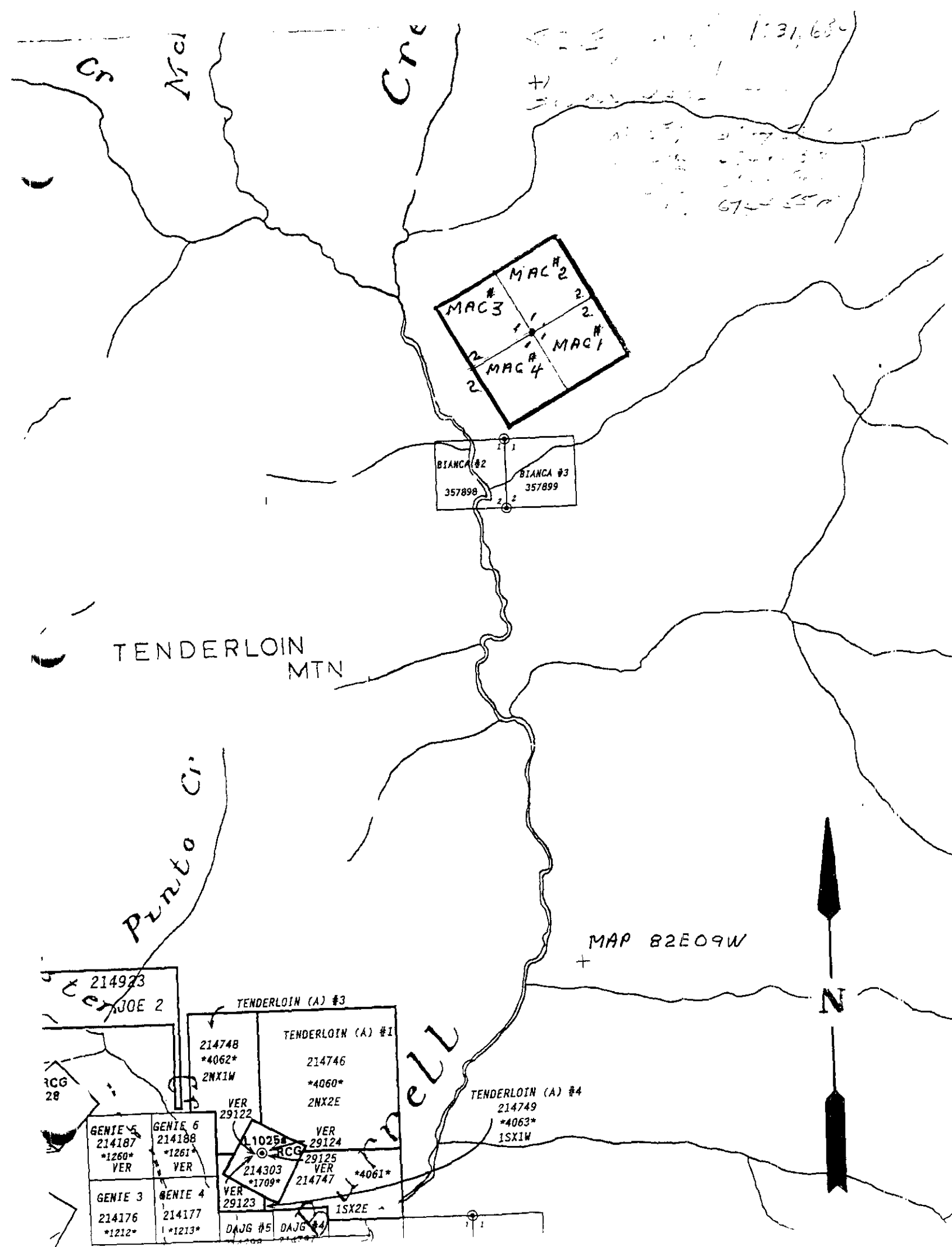
TRAIL Ck. M.D.
Brooklyn
N
MT. SHIELDS
NEW 2 MOL
257517 4W 4W
363096
LY 364383
4NX4E
Cr
Shields
TAG # 230781
MAP # 082E08E
MINING DIV. TRAIL CREEK
SURVEYOR'S SKETCH STAMP
(SUB) RECORDER'S INFORMATION
TENURE NUMBERS: 363096 MOL
OTHER TENURE NUMBERS: 363096
MINING DIVISION: TRAIL CREEK
NTS NUMBER: 82E/8E
MINERAL TITLES BRANCH
DRAFTING INFORMATION
COMPLETED:
NTS: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MAC 3
MAC 1
MAC 4
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357898
BIANCA #3
357899
TENDERLOIN
MTN
Pinto Cr
MAP 82E09W
N
214923
JOE 2
TENDERLOIN (A) #3
214748
4062
2NX1W
TENDERLOIN (A) #1
214746
4060
2NX2E
VER
29122
VER
29124
TENDERLOIN (A) #4
214749
4063
1SX1W
GENIE 5
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VER
GENIE 6
214188
*1261
VER
L1025
RCG
214303
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VER
214747
4061
VER
29123
GENIE 3
214176
1212
GENIE 4
214177
1213
DAJG #5
DAJG #4
1SX2E

18-Sep-98

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V2C 6T4

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Fax : 604-573-4557

ICP CERTIFICATE OF ANALYSIS AK 98-535

ROCK SAMPLES

RAINBOWS & SUNSHINE
BOX 866
GRAND FORKS, BC
V0H 1H0

ATTENTION: JOHN KEMP

No. of samples received: 7
Sample type: Rock
PROJECT #: ARROW
SHIPMENT #: 6
Samples submitted by: J. Kemp

Values in ppm unless otherwise reported

Et #.	Tag #	Au(ppb)	Ag	Al %	As	Ba	Bi	Ca %	Cd	Co	Cr	Cu	Fe %	La	Mg %	Mn	Mo	Na %	Ni	P	Pb	Sb	Sn	Sr	Ti %	U	V	W	Y	Zn
R59	DJ40	5	0.2	0.78	<5	245	<5	2.42	2	14	114	284	4.59	120	0.95	1222	2341	0.05	18	1920	28	<5	<20	148	0.03	<10	43	<10	14	170
R60	DJ41	5	<0.2	0.44	<5	40	<5	2.39	<1	31	17	423	>10	<10	0.44	564	19	0.08	4	5200	<2	<5	<20	118	0.08	<10	435	<10	<1	61
R61	DJ42	10	5.8	0.69	<5	25	<5	2.29	65	8	51	111	5.02	200	0.41	>10000	<1	0.05	3	280	1570	<5	<20	97	0.07	<10	52	<10	13	>10000
R62	DJ44	5	2.8	0.31	<5	110	<5	0.05	2	11	104	143	7.65	100	0.04	1916	195	0.04	12	120	234	<5	<20	8	0.02	<10	33	10	6	271
R63	DJ45	5	8.2	0.40	5	65	<5	1.31	9	10	90	918	2.91	190	0.37	1666	27	0.06	4	850	1168	<5	<20	249	0.02	<10	19	<10	17	1660
R64	DJ46	5	1.0	0.21	<5	95	<5	0.57	<1	5	160	11	1.94	30	0.03	1905	22	<0.01	7	550	624	<5	<20	74	<0.01	<10	7	<10	10	122
R65	DJ47	5	1.4	2.71	55	1110	<5	1.62	<1	34	86	99	9.69	1910	3.25	2725	73	0.04	32	6170	180	<5	<20	179	0.12	<10	130	<10	21	253
QC DATA:																														
Resplit:																														
R/S 1	DJ40	5	0.2	0.82	<5	265	<5	2.48	<1	14	120	268	4.67	130	0.99	1292	2256	0.05	19	1920	30	<5	<20	156	0.03	<10	44	<10	16	165
Repeat:																														
1	DJ40	5	0.2	0.77	<5	230	<5	2.38	1	13	112	288	4.51	130	0.95	1212	2247	0.04	17	1920	30	<5	<20	143	0.03	<10	42	<10	15	172
Standard:																														
GEO'98		140	1.2	1.82	60	165	5	1.79	<1	20	62	84	4.13	<10	0.99	710	11	0.03	22	690	22	<5	<20	60	0.12	<10	79	<10	6	80

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4-Sep-98

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ICP CERTIFICATE OF ANALYSIS AK 98-498

Post-it™ Fax Note 7671E | Date Sept 4 | # of pages ▸ 2
To | From
Co./Dept. ROCK | Co. SAMPLES
Phone # | Phone #
Fax # | Fax #

RAINBOWS & SUNSHINE
BOX 866
GRAND FORKS, BC
V0H 1H0

ATTENTION: JOHN KEMP

No. of samples received: 13
Sample type: ROCK
PROJECT #: ARROW
SHIPMENT #: 5
Samples submitted by: J. KEMP

Values in ppm unless otherwise reported

Et #.	Tag #	Au(ppb)	Ag	Al %	As	Ba	Bi	Ca %	Cd	Co	Cr	Cu	Fe %	La	Mg %	Mn	Mo	Na %	Ni	P	Pb	Sb	Sn	Sr	Ti %	U	V	W	Y	Zn
R 46	DJ - 27	10	1.4	0.15	<5	335	<5	0.30	<1	5	173	10	1.98	30	0.01	159	19	<0.01	5	1180	110	<5	<20	49	<0.01	<10	8	<10	2	22
R 47	DJ - 28	5	<0.2	0.48	<5	85	<5	0.36	<1	4	96	29	1.48	60	0.34	235	3	0.04	3	610	14	<5	<20	28	0.01	<10	19	<10	12	27
R 48	DJ - 29	5	<0.2	0.19	<5	25	15	0.03	<1	8	130	13	6.81	<10	0.02	92	11	0.03	<1	30	6	<5	<20	3	<0.01	<10	22	<10	<1	8
R 49	DJ - 30	5	<0.2	0.17	<5	80	<5	0.04	<1	2	151	7	1.08	30	<0.01	315	10	0.01	<1	190	26	<5	<20	7	<0.01	<10	2	<10	<1	12
R 50	DJ - 31	140	25.4	0.84	<5	580	<5	0.59	<1	10	68	5947	4.65	150	0.52	1291	11	0.06	4	930	568	<5	<20	70	0.01	<10	41	<10	11	160
R 51	DJ - 32	5	<0.2	2.12	<5	210	<5	2.48	<1	26	116	45	5.86	60	2.66	824	4	0.06	81	2700	6	<5	<20	101	0.07	<10	94	<10	8	68
R 52	DJ - 33	5	2.2	0.26	<5	60	<5	0.35	<1	6	84	76	2.59	70	0.09	216	16	0.01	6	1310	92	<5	<20	15	<0.01	<10	9	<10	7	45
R 53	DJ - 34	5	0.2	0.73	<5	40	<5	1.05	<1	10	85	28	3.21	130	0.69	492	8	0.03	17	2070	20	<5	<20	51	0.02	<10	28	<10	13	45
R 54	DJ - 35	5	0.2	0.18	<5	125	<5	0.06	<1	<1	113	11	1.16	30	0.04	49	141	0.04	<1	420	112	<5	<20	23	<0.01	<10	6	<10	<1	13
R 55	DJ - 36	5	<0.2	0.17	<5	45	<5	0.10	<1	1	67	12	1.17	<10	<0.01	1039	4	0.05	<1	310	74	<5	<20	31	0.02	<10	22	<10	<1	86
R 56	DJ - 37	5	<0.2	0.45	<5	260	<5	4.15	<1	13	53	128	3.21	<10	0.80	2640	<1	0.03	9	2870	20	<5	<20	4073	0.14	<10	72	<10	8	114
R 57	DJ - 38	5	1.8	1.11	<5	455	<5	2.17	18	13	67	983	3.71	70	1.02	1029	76	0.02	26	2740	1670	<5	<20	177	<0.01	<10	50	<10	6	1716
R 58	DJ - 39	5	19.6	0.96	<5	45	<5	5.74	60	13	41	5553	3.65	70	0.87	6925	2	0.05	2	1810	>10000	<5	<20	398	0.03	<10	51	<10	<1	>10000
QC DATA:																														
Resplit:																														
R/S 1	DJ - 27	10	1.6	0.17	<5	365	<5	0.32	<1	5	162	11	2.15	30	0.01	167	18	<0.01	6	1210	118	<5	<20	51	<0.01	<10	9	<10	2	24
Repeat:																														
1	DJ - 27	5	1.4	0.16	<5	345	<5	0.30	<1	5	177	14	2.01	30	0.01	169	19	<0.01	6	1200	120	<5	<20	50	<0.01	<10	8	<10	3	24
10	DJ - 36	-	<0.2	0.17	<5	45	<5	0.10	<1	2	67	13	1.19	<10	<0.01	1053	3	0.05	<1	310	84	<5	<20	33	0.02	<10	23	<10	<1	90
Standard:																														
GEO'98		135	1.0	1.76	65	155	<5	1.72	<1	19	62	84	4.13	<10	0.94	696	<1	0.02	23	660	22	<5	<20	55	0.11	<10	77	<10	6	72

df/493
XLS/98
fax: 250-442-3401

ECO-TECH LABORATORIES LTD.
per Frank J. Pezzotti, A.Sc.T.
B.C. Certified Assayer

13-Aug-98

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ICP CERTIFICATE OF ANALYSIS AK 98-416

ROCK SAMPLES

RAINBOWS & SUNSHINE
BOX 866
GRAND FORKS, BC
V0H 1H0

ATTENTION: JOHN KEMP

No. of samples received:7
Sample type: ROCK
PROJECT #: ARROW
SHIPMENT #: 4
Samples submitted by: JOHN KEMP

Values in ppm unless other reported

Et #.	Tag #	Au(pp	Ag	Al %	As	Ba	Bi	Ca %	Cd	Co	Cr	Cu	Fe %	La	Mg %	Mn	Mo	Na %	Ni	P	Pb	Sb	Sn	Sr	Ti %	U	V	W	Y	Zn
R40	DJ - 21		0.6	0.44	<5	80	<5	0.21	<1	18	91	130	7.36	40	0.41	188	683	0.06	4	1450	30	<5	<20	26	0.03	10	49	20	<1	34
R41	DJ - 22		<0.2	0.30	<5	100	<5	0.09	1	5	90	69	3.98	20	0.13	89	4907	0.06	<1	630	838	<5	<20	21	0.02	<10	25	10	<1	27
R42	DJ - 23		1.0	0.34	<5	90	<5	0.15	1	6	76	24	5.17	30	0.23	143	4999	0.08	2	1040	3864	<5	<20	53	0.04	<10	19	<10	<1	56
R43	DJ - 24		0.8	0.92	<5	50	<5	0.79	<1	38	62	166	7.99	80	0.73	252	72	0.07	40	4040	38	<5	<20	41	0.06	<10	25	<10	9	27
R44	DJ - 25		0.4	0.62	5	95	<5	0.28	<1	4	113	22	2.11	110	0.57	224	158	0.07	1	1610	674	<5	<20	20	0.06	<10	17	<10	8	50
R45	DJ - 26		0.2	3.65	20	965	<5	9.36	<1	<1	91	15	2.26	130	0.19	118	26	1.10	<1	1500	42	<5	<20	397	0.02	<10	18	<10	13	24
QC DATA:																														
Resplit:																														
1	DJ - 21		0.6	0.43	<5	90	<5	0.21	<1	12	94	128	6.93	40	0.39	179	706	0.06	2	1390	28	<5	<20	21	0.03	10	49	20	<1	32
Repeat:																														
1	DJ - 21		1.0	0.45	<5	85	<5	0.24	<1	18	90	131	7.38	40	0.41	189	695	0.07	2	1470	32	<5	<20	26	0.03	10	49	20	<1	35
Standard:																														
GEO'98			1.2	1.68	60	160	<5	1.68	<1	19	59	80	4.04	<10	0.92	669	11	0.03	21	660	22	<5	<20	56	0.10	<10	74	<10	3	66

*NOTE: * = Results still to co*

df/410
XLS/98

ECO-TECH LABORATORIES LTD.
per Frank J. Pezzotti, A.Sc.T.
B.C. Certified Assayer

13-Jul-98

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Fax : 604-573-4557

ICP CERTIFICATE OF ANALYSIS AK 98-297

RAINBOWS & SUNSHINE
BOX 866
GRAND FORKS, BC
V0H 1H0

ATTENTION: JOHN KEMP

ROCK SAMPLES

No. of samples received: 20
Sample type: Rock
PROJECT #: ARROW
SHIPMENT #: 3
Samples submitted by: John Kemp

Values in ppm unless otherwise reported

Et #.	Tag #	Au(ppb)	Ag	Al %	As	Ba	Bi	Ca %	Cd	Co	Cr	Cu	Fe %	La	Mg %	Mn	Mo	Na %	Ni	P	Pb	Sb	Sn	Sr	Ti %	U	V	W	Y	Zn
R 20	DJ-01-98	5	<0.2	0.95	<5	240	10	0.70	<1	9	91	15	3.19	20	0.76	308	5	0.08	1	1880	4	<5	<20	51	0.14	<10	54	<10	3	62
R 21	DJ-02-98	5	<0.2	0.36	<5	60	<5	0.05	<1	1	146	4	1.05	40	0.13	1747	16	0.02	3	50	10	<5	<20	18	<0.01	<10	3	<10	2	64
R 22	DJ-03-98	5	0.6	0.23	<5	50	<5	0.02	<1	<1	36	3	1.51	120	0.01	112	6	0.05	<1	90	24	<5	<20	22	<0.01	<10	<1	<10	<1	35
R 23	DJ-04-98	5	0.8	0.24	<5	45	<5	0.05	<1	1	28	5	1.08	<10	0.01	22	7	0.03	<1	120	72	<5	<20	41	<0.01	<10	2	<10	<1	15
R 24	DJ-05-98	5	0.6	0.30	<5	95	5	0.40	<1	3	35	3	1.51	<10	0.06	635	5	0.04	<1	240	14	<5	<20	160	<0.01	<10	22	<10	4	9
R 25	DJ-06-98	5	<0.2	1.57	20	50	5	0.73	<1	16	74	31	3.39	70	1.22	419	13	0.01	23	2910	20	5	<20	91	<0.01	<10	52	<10	4	72
R 26	DJ-07-98	5	<0.2	1.06	<5	75	<5	0.44	<1	10	40	28	2.57	70	0.60	594	13	0.04	10	1460	44	<5	<20	64	<0.01	<10	21	<10	4	91
R 27	DJ-08-98	270	>30	0.75	70	35	<5	0.06	2	22	30	2671	7.71	70	0.08	1152	130	0.02	<1	160	>10000	<5	<20	10	0.02	<10	15	<10	<1	2457
R 28	DJ-09-98	5	1.0	1.86	<5	155	<5	3.40	1	3	76	111	1.64	80	0.05	1083	1325	0.47	<1	110	326	<5	<20	41	<0.01	<10	2	<10	21	423
R 29	DJ-10-98	5	<0.2	0.80	<5	215	<5	0.40	<1	8	39	21	3.94	210	0.74	215	154	0.06	<1	1750	32	<5	<20	61	0.12	<10	53	<10	12	29
R 30	DJ-11-98	5	0.2	1.14	<5	310	<5	0.57	<1	12	54	115	5.37	280	1.07	393	391	0.06	6	2570	58	<5	<20	57	0.11	<10	75	<10	16	62
R 31	DJ-12-98	15	6.0	0.45	<5	40	10	0.31	2	7	57	53	4.14	100	0.22	553	1222	0.04	2	1460	1230	<5	<20	27	<0.01	<10	13	<10	4	650
R 32	DJ-13-98	5	2.6	0.73	<5	60	<5	0.40	4	13	51	54	3.24	150	0.52	2589	376	0.04	5	1480	492	<5	<20	58	<0.01	<10	9	<10	15	787
R 33	DJ-14-98	5	0.4	0.40	<5	60	<5	0.27	<1	3	66	7	2.14	40	0.05	172	18	0.05	<1	700	26	<5	<20	35	<0.01	<10	10	<10	6	20
R 34	DJ-15-98	5	<0.2	0.23	<5	240	<5	0.02	<1	<1	123	4	1.25	10	<0.01	33	11	0.01	<1	190	120	<5	<20	47	<0.01	<10	1	<10	3	<1
R 35	DJ-16-98	10	<0.2	0.67	<5	40	<5	0.45	<1	35	65	54	6.40	80	0.85	224	197	0.07	26	2010	16	<5	<20	39	0.08	<10	35	<10	7	29
R 36	DJ-17-98	5	<0.2	0.79	10	35	<5	0.90	<1	14	110	58	3.48	130	0.74	494	54	0.03	36	2430	42	<5	<20	103	0.08	<10	27	<10	11	54
R 37	DJ-18-98	5	<0.2	1.68	<5	50	15	6.90	<1	27	209	16	4.40	100	2.61	2654	13	0.03	77	4770	36	10	<20	348	0.22	<10	69	<10	6	90
R 38	DJ-19-98	5	1.2	1.72	<5	40	<5	0.96	<1	53	92	381	>10	80	1.33	715	30	0.04	77	4600	136	<5	<20	35	0.12	<10	46	<10	<1	69
R 39	DJ-20-98	10	1.0	0.30	<5	50	<5	0.24	2	4	140	39	1.95	100	0.15	78	500	0.05	8	1420	486	<5	<20	44	0.03	<10	8	<10	7	514

25-Nov-97

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ICP CERTIFICATE OF ANALYSIS AK 97-1299

RAINBOWS & SUNSHINE
BOX 866
GRAND FORKS, BC
V0H 1H0

ATTENTION: JOHN KEMP

ROCK SAMPLES

No. of samples received: 13
Sample type: ROCK
PROJECT #: NONE GIVEN
SHIPMENT #: NONE GIVEN
Samples submitted by: J. KEMP

Values in ppm unless otherwise reported

Et #.	Tag #	Au(ppb)	Ag	Al %	As	Ba	Bi	Ca %	Cd	Co	Cr	Cu	Fe %	La	Mg %	Mn	Mo	Na %	Ni	P	Pb	Sb	Sn	Sr	Ti %	U	V	W	Y	Zn
R07	JD 97-2	10	<0.2	0.65	<5	140	<5	1.14	<1	4	57	8	2.05	100	0.02	748	3	0.27	4	670	14	<5	<20	30	0.03	<10	23	<10	11	41
R08	JD 97-3	5	0.4	0.28	5	50	<5	0.28	<1	4	46	5	2.50	160	<0.01	656	6	0.10	2	280	16	<5	<20	9	0.03	<10	12	<10	6	46
R09	JD 97-4	10	0.4	0.51	10	120	<5	0.44	<1	3	29	9	2.07	230	<0.01	517	4	0.08	<1	150	26	<5	<20	15	0.03	<10	9	<10	7	51
R10	JD 97-5	5	9.8	0.61	25	40	<5	0.50	<1	8	61	842	2.10	130	0.03	801	29	0.09	1	280	4968	<5	<20	16	0.01	<10	4	<10	15	813
R11	JD 97-6	5	2.2	0.24	<5	35	<5	0.06	2	5	42	77	4.48	80	<0.01	1391	24	0.04	<1	170	534	<5	<20	7	0.03	<10	12	<10	9	701
R12	JD 97-7	5	0.8	1.37	<5	90	<5	2.20	<1	3	38	130	1.61	60	0.03	1194	511	0.34	<1	130	304	<5	<20	35	<0.01	<10	3	<10	19	1300
R13	JD 97-8	5	5.4	1.33	<5	725	10	8.55	14	11	70	43	7.32	100	1.14	5054	36	0.02	19	920	702	<5	<20	611	0.04	<10	68	<10	8	3070
R14	JD 97-9	5	3.8	1.45	<5	405	<5	2.34	<1	17	85	1009	4.86	70	1.51	948	22	0.04	21	3200	76	<5	<20	139	0.05	<10	70	<10	9	178
R15	JD 97-10	15	17.8	0.71	<5	325	<5	0.95	<1	10	38	6151	4.26	150	0.47	1569	8	0.04	8	860	144	<5	<20	90	0.02	<10	43	<10	11	187
R16	JD 97-11	35	12.8	0.36	75	35	<5	0.18	<1	5	195	28	1.06	20	0.17	138	92	<0.01	17	470	12	<5	<20	22	<0.01	<10	43	<10	1	21
R17	JD 97-12	5	0.8	0.21	<5	40	<5	0.05	<1	<1	57	20	0.73	110	0.01	167	5	0.05	2	30	8	<5	<20	11	<0.01	<10	<1	<10	4	6
R18	JD 97-13	5	1.0	1.22	<5	30	<5	3.48	<1	13	89	23	3.34	90	0.87	1024	14	<0.01	22	1900	136	<5	<20	226	<0.01	<10	24	<10	6	96
R19	JD 97-14	5	0.2	0.24	<5	35	<5	0.13	<1	2	59	20	1.43	10	0.06	648	7	0.04	2	290	276	<5	<20	23	0.01	<10	25	<10	1	133
QC DATA:																														
Resplit:																														
R/S 1	JD 97-2	5	0.4	0.70	<5	150	<5	1.20	<1	5	59	9	2.12	110	0.03	826	3	0.25	4	730	18	<5	<20	38	0.04	<10	26	<10	13	41
Repeat:																														
1	JD 97-2	10	<0.2	0.59	<5	130	<5	1.02	<1	4	51	9	1.78	90	0.02	678	3	0.26	3	610	22	<5	<20	29	0.03	<10	20	<10	10	50
Standard:																														
GEO'97		-	1.4	1.85	60	170	<5	1.86	<1	21	65	89	4.28	<10	0.98	729	<1	0.03	22	720	24	<5	<20	65	0.12	<10	83	<10	5	75

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29-Oct-98

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ICP CERTIFICATE OF ANALYSIS AK 98-663

ROCK SAMPLES

RAINBOWS & SUNSHINE
BOX 866
GRAND FORKS, BC
V0H 1H0

ATTENTION: JOHN KEMP

No. of samples received: 6
Sample type: Rock
PROJECT #: ARROW
SHIPMENT #: 7
Samples submitted by: J. Kemp

Values in ppm unless otherwise reported

Et #.	Tag #	Au(ppb)	Ag	Al %	As	Ba	Bi	Ca %	Cd	Co	Cr	Cu	Fe %	La	Mg %	Mn	Mo	Na %	Ni	P	Pb	Sb	Sn	Sr	Ti %	U	V	W	Y	Zn
R01	BARRY #1	25	1.6	0.27	<5	290	<5	0.09	21	6	45	2597	1.28	<10	0.03	662	4	0.03	2	120	8464	<5	<20	54	<0.01	<10	12	<10	5	5405
R02	BARRY #2	5	18.0	0.05	<5	110	40	0.01	30	2	162	33	0.82	<10	<0.01	164	22	<0.01	3	<10	248	<5	<20	29	<0.01	<10	3	<10	<1	692
R03	BARRY #3	5	0.2	0.20	<5	55	<5	0.49	<1	5	93	6	1.63	20	0.03	341	8	0.02	4	470	34	<5	<20	29	<0.01	<10	19	<10	8	42
R04	BARRY #4	5	2.2	0.27	<5	115	<5	0.53	39	4	59	1750	0.90	<10	0.08	665	113	0.04	<1	20	>10000	<5	<20	1373	<0.01	<10	9	<10	2	4375
R05	BARRY #5	5	0.4	0.25	<5	170	<5	0.09	<1	5	73	12	2.07	<10	0.02	1151	6	0.03	3	210	196	<5	20	28	<0.01	<10	26	<10	9	118
R06	P-1	5	10.6	0.20	<5	85	65	0.04	1	4	171	57	2.88	<10	0.07	363	114	0.01	4	110	154	<5	20	44	<0.01	<10	5	<10	<1	158
	QC DATA:																													
	Resplit:																													
R/S 1	BARRY #1	35	1.6	0.27	<5	275	<5	0.09	21	6	52	2578	1.27	<10	0.03	686	4	0.03	3	130	8356	<5	<20	55	<0.01	<10	12	<10	4	5308
	Repeat:																													
1	BARRY #1	5	1.6	0.27	<5	275	<5	0.09	22	6	46	2724	1.32	<10	0.03	685	5	0.03	2	130	8862	<5	<20	56	<0.01	<10	12	<10	4	5614
	Standard:																													
GEO'98		140	1.2	1.70	60	170	5	1.86	<1	18	66	91	3.93	<10	0.98	663	<1	0.02	25	650	22	<5	<20	56	0.10	<10	74	<10	6	74

df/643
XLS/98
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30-Oct-98

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ICP CERTIFICATE OF ANALYSIS AK 98-662

STREAM SAMPLES

RAINBOWS & SUNSHINE
BOX 866
GRAND FORKS, BC
V0H 1H0

ATTENTION: JOHN KEMP

No. of samples received: 9
Sample type: Soil/Stream
PROJECT #: ARROW
SHIPMENT #: 7
Samples submitted by: J. Kemp

Values in ppm unless otherwise reported

Et #.	Tag #	Au(ppb)	Ag	Al %	As	Ba	Bi	Ca %	Cd	Co	Cr	Cu	Fe %	La	Mg %	Mn	Mo	Na %	Ni	P	Pb	Sb	Sn	Sr	Ti %	U	V	W	Y	Zn
S 26	79 PUP	<5	<0.2	0.74	<5	65	10	0.60	<1	8	44	11	4.58	30	0.20	289	1	0.02	9	640	12	<5	<20	54	0.06	<10	121	<10	4	35
S 27	BOWMAN #2	<5	<0.2	0.83	<5	75	10	0.55	<1	8	28	7	3.58	50	0.28	470	<1	0.02	8	1460	16	<5	<20	48	0.08	<10	72	<10	9	44
S 28	REN-NF	<5	<0.2	0.55	<5	70	20	0.65	<1	11	78	5	8.01	40	0.31	399	3	0.01	25	1990	6	<5	<20	49	0.07	<10	163	<10	<1	39
S 29	REN-SF	<5	<0.2	0.66	<5	95	10	0.69	<1	8	34	6	5.85	40	0.18	324	2	0.01	8	2000	8	<5	<20	66	0.06	<10	146	<10	4	37
S 30	FAITH #1	275	<0.2	0.56	<5	140	15	1.37	1	18	259	15	>10	70	0.36	345	5	0.02	26	4540	6	<5	<20	93	0.09	<10	417	<10	7	40
S 31	80 PUP	<5	<0.2	2.21	<5	115	<5	0.31	<1	8	21	11	3.02	20	0.25	233	<1	0.02	15	1130	20	<5	<20	42	0.11	<10	53	<10	6	83
S 32	81 PUP	<5	<0.2	2.22	<5	100	10	0.55	<1	9	20	19	2.76	40	0.27	462	<1	0.03	11	620	22	<5	<20	60	0.12	<10	46	<10	25	63
S 33	82 PUP	<5	<0.2	1.26	<5	80	<5	0.29	<1	9	30	11	2.94	30	0.37	238	<1	0.02	13	420	14	<5	<20	36	0.10	<10	60	<10	6	42
S 34	83 PUP	<5	<0.2	2.18	10	250	5	0.36	<1	6	14	13	2.34	40	0.22	625	<1	0.02	8	1210	40	<5	<20	49	0.11	<10	39	<10	13	68
	QC DATA:																													
	Repeat:																													
1	79 PUP	<5	<0.2	0.74	<5	60	10	0.59	<1	8	44	9	4.53	30	0.19	283	2	0.02	9	650	12	<5	<20	52	0.06	10	119	<10	4	34
	Standard:																													
	GEO'98	130	1.2	1.78	65	170	<5	1.73	<1	19	66	82	3.96	<10	0.95	669	<1	0.02	24	630	20	<5	<20	62	0.11	<10	76	<10	5	67

df/637
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18-Sep-98

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ICP CERTIFICATE OF ANALYSIS AK 98-536

STREAM SAMPLES

RAINBOWS & SUNSHINE
BOX 866
GRAND FORKS, BC
V0H 1H0

ATTENTION: JOHN KEMP

No. of samples received: 8
Sample type: Stream
PROJECT #: ARROW
SHIPMENT #: 8
Samples submitted by: J. Kemp

Values in ppm unless otherwise reported

Et #.	Tag #	Au(ppb)	Ag	Al %	As	Ba	Bi	Ca %	Cd	Co	Cr	Cu	Fe %	La	Mg %	Mn	Mo	Na %	Ni	P	Pb	Sb	Sn	Sr	Ti %	U	V	W	Y	Zn
S 18	JDN#3	5	<0.2	0.60	<5	95	15	0.79	1	18	146	16	>10	50	0.36	527	8	0.02	17	2430	14	<5	<20	50	0.08	<10	263	<10	<1	46
S 19	TO-BIT#1	5	<0.2	0.65	<5	60	15	0.69	<1	16	89	15	9.03	10	0.30	422	3	0.02	11	1280	8	<5	<20	54	0.10	<10	230	10	<1	47
S 20	OCTO#1	5	<0.2	0.67	<5	95	10	0.74	<1	12	75	9	7.91	40	0.38	345	3	0.02	10	2310	8	<5	<20	42	0.09	<10	183	<10	11	39
S 21	SUN-5#1	5	<0.2	0.76	<5	85	15	0.93	1	16	86	18	>10	70	0.28	640	3	0.02	11	2010	20	<5	<20	105	0.13	<10	230	<10	<1	71
S 22	GRITA#1	5	<0.2	0.45	<5	105	25	1.48	2	23	245	15	>10	100	0.26	424	9	0.03	23	4860	12	<5	<20	95	0.09	<10	465	<10	<1	42
S 23	BOWMAN#1	5	<0.2	0.61	<5	70	15	0.76	<1	17	87	12	>10	50	0.24	638	4	0.02	13	2030	12	<5	<20	57	0.12	<10	287	<10	<1	55
S 24	HUTCH#1	5	<0.2	0.64	<5	115	15	1.62	1	24	217	16	>10	110	0.39	646	8	0.05	21	4730	8	<5	<20	130	0.12	<10	446	<10	<1	52
S 25	WORTH#1	5	<0.2	0.80	<5	105	5	0.58	1	9	55	9	4.91	40	0.31	521	3	0.02	10	1350	14	<5	<20	50	0.07	<10	105	<10	4	52
	QC DATA:																													
	Repeat:																													
1	JDN#3	5	<0.2	0.66	<5	95	10	0.81	1	19	145	16	>10	50	0.41	572	7	0.02	17	2450	18	<5	<20	54	0.09	<10	263	<10	<1	50
	Standard:																													
	GEO'98	140	1.0	1.82	65	155	5	1.84	<1	19	60	77	4.13	<10	0.96	664	<1	0.02	24	670	18	<5	<20	64	0.13	<10	84	<10	6	66

NOTE: * = Au results still to come

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4-Sep-98

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ICP CERTIFICATE OF ANALYSIS AK 98-499

RAINBOWS & SUNSHINE
BOX 866
GRAND FORKS, BC
V0H 1H0

ATTENTION: JOHN KEMP

STREAM SAMPLES

No. of samples received: 15
Sample type: Moss/Silt
PROJECT #: ARROW
SHIPMENT #: 5
Samples submitted by: J. Kemp

Values in ppm unless otherwise reported

Et #	Tag #	Au(ppb)	Ag	Al %	As	Ba	Bi	Ca %	Cd	Co	Cr	Cu	Fe %	La	Mg %	Mn	Mo	Na %	Ni	P	Pb	Sb	Sn	Sr	Ti %	U	V	W	Y	Zn
S03	SHIELDS #3	-345	<0.2	1.05	<5	200	<5	0.64	<1	7	32	13	2.65	40	0.36	321	<1	0.02	19	1230	20	<5	<20	64	0.08	<10	47	<10	6	46
S04	SHIELDS #4	>1000	4.6	0.62	<5	180	5	0.99	<1	9	53	10	4.73	70	0.38	310	<1	0.02	14	3060	12	<5	<20	87	0.10	<10	97	<10	2	47
S05	SHIELDS #5	5	<0.2	0.68	<5	220	<5	1.18	<1	11	85	10	5.12	70	0.52	431	<1	0.02	19	3700	14	<5	<20	119	0.11	<10	110	<10	4	68
S06	SHIELDS #6	330	<0.2	1.03	<5	395	<5	1.42	1	10	58	17	4.13	80	0.74	377	<1	0.02	25	3320	56	<5	<20	243	0.16	<10	74	<10	11	74
S07	SHIELDS #7	5	1.0	0.80	<5	200	<5	1.08	<1	10	52	12	6.17	90	0.42	325	2	0.02	16	3380	24	<5	<20	103	0.09	<10	119	<10	11	66
S08	SHIELDS #8	5	<0.2	0.67	<5	145	<5	0.91	<1	11	65	13	7.48	90	0.30	539	6	0.02	14	3020	30	<5	<20	72	0.07	<10	131	<10	6	97
S09	HOTCHRIDA #1	5	<0.2	0.46	<5	95	15	1.36	2	21	204	14	>10	100	0.27	494	9	0.03	20	4380	8	<5	<20	89	0.10	<10	422	<10	<1	57
S10	VAN HOUTEN #1	5	<0.2	0.65	<5	115	10	0.86	<1	14	161	11	8.06	50	0.49	333	2	0.02	25	2600	8	<5	<20	65	0.10	<10	203	<10	2	38
S11	CINNAMON #1	5	<0.2	0.77	<5	145	<5	0.47	<1	7	30	8	4.80	110	0.14	585	4	0.02	5	1280	30	<5	<20	47	0.05	<10	77	<10	16	82
S12	CINNAMON #2	5	<0.2	0.47	<5	110	10	0.62	<1	11	74	13	9.27	80	0.14	520	6	0.01	8	1890	20	<5	<20	52	0.09	<10	166	<10	3	79
S13	GLADSTONE #1	5	<0.2	0.43	<5	85	20	1.09	2	21	140	16	>10	80	0.16	714	10	0.03	14	3330	10	<5	<20	65	0.12	<10	410	<10	<1	80
S14	MICHAUD #1	5	<0.2	0.80	<5	115	<5	0.51	<1	7	33	9	4.79	120	0.16	671	4	0.01	4	1240	32	<5	<20	50	0.05	<10	79	<10	14	91
S15	MICHAUD #2	5	<0.2	0.81	<5	125	<5	0.63	<1	9	48	10	5.80	130	0.22	606	4	0.02	7	1410	28	<5	<20	64	0.08	<10	102	<10	15	81
S16	JON #1	5	<0.2	0.49	<5	55	<5	0.29	<1	6	20	6	2.65	30	0.36	334	1	0.01	3	810	12	<5	<20	21	0.04	<10	40	<10	3	37
S17	JON #2	>1000	<0.2	0.40	<5	90	15	0.79	2	26	251	25	>10	20	0.18	411	15	0.01	28	2430	18	<5	<20	41	0.11	10	451	<10	<1	68
QC DATA:																														
Repeat:																														
1	SHIELDS #3	345	<0.2	1.08	<5	205	<5	0.65	<1	7	34	13	2.81	40	0.37	331	<1	0.02	20	1280	20	<5	<20	65	0.08	<10	51	<10	6	47
10	CINNAMON #2	-	<0.2	0.48	<5	105	15	0.61	<1	11	73	12	9.03	80	0.15	543	5	0.01	8	1860	20	<5	<20	51	0.10	<10	162	<10	4	74
Standard:																														
GEO'98		130	1.0	1.73	65	150	<5	1.86	<1	18	66	76	4.18	<10	0.96	667	<1	0.03	22	670	24	<5	<20	57	0.11	<10	78	<10	5	69

df/493
XLS/98
fax: 250-442-3401

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18-Aug-98

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10041 East Trans Canada Highway
KAMLOOPS, B.C.
V2C 6T4

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

ICP CERTIFICATE OF ANALYSIS AK 98-415

RAINBOWS & SUNSHINE
BOX 866
GRAND FORKS, BC
V0H 1H0

ATTENTION: JOHN KEMP

STREAM SAMPLES

No. of samples received:2
Sample type: STREAM
PROJECT #: ARROW
SHIPMENT #: 4
Samples submitted by: JOHN KEMP

Values in ppm unless otherwise reported

Et #.	Tag #	Au(ppb)	Ag	Al %	As	Ba	Bi	Ca %	Cd	Co	Cr	Cu	Fe %	La	Mg %	Mn	Mo	Na %	Ni	P	Pb	Sb	Sn	Sr	Ti %	U	V	W	Y	Zn
S01	SHIELDS - 01	825	<0.2	0.63	<5	170	<5	1.07	1	19	145	39	>10	100	0.35	409	12	0.02	26	3510	24	<5	<20	78	0.07	<10	304	10	<1	92
S02	SHIELDS - 02	660	<0.2	0.49	<5	105	20	0.89	2	17	261	31	>10	40	0.26	374	9	0.02	31	2710	22	<5	<20	63	0.07	<10	342	<10	<1	127

QC DATA:

Repeat:

1	SHIELDS - 01	>1000	<0.2	0.61	<5	160	<5	1.04	1	19	142	38	>10	100	0.33	394	12	0.01	23	3440	22	<5	<20	72	0.07	<10	292	10	<1	89

Standard:

GEO'98		-	1.4	1.74	60	155	<5	1.74	<1	19	56	82	4.37	<10	0.92	678	<1	0.03	23	700	16	<5	<20	56	0.11	<10	80	<10	4	70

df/413
XLS/98

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ASSAYING
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ANALYTICAL CHEMISTRY
ENVIRONMENTAL TESTING

10041 E. Trans Canada Hwy., R.R. #2, Kamloops, B.C. V2C 6T4 Phone (250) 573-5700
Fax (250) 573-4557

CERTIFICATE OF ASSAY AK 98-297

RAINBOWS & SUNSHINE
BOX 866
GRAND FORKS, BC
V0H 1H0

16-Jul-98

ATTENTION: JOHN KEMP

No. of samples received: 20
Sample type: Rock
PROJECT #: ARROW
SHIPMENT #: 3
Samples submitted by: John Kemp

ET #.	Tag #	Ag (g/t)	Ag (oz/t)	Pb (%)
8	DJ-08-98	80.5	2.35	1.08

QC/DATA:

Repeat:

8	DJ-08-98	80.0	2.33	1.08

Standard:

Mp-IA	69.7	2.03	4.33

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Frank J. Pezzotti, A.Sc.T.
B.C. Certified Assayer

XLS/98
fax: 250-442-3401

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ENVIRONMENTAL TESTING

10041 E. Trans Canada Hwy., R.R. #2, Kamloops, B.C. V2C 6T4
Phone (250) 573-5700 Fax (250) 573-4557
email: ecotech@mail.wkpowerlink.com

CERTIFICATE OF ASSAY AK 98-498

RAINBOWS & SUNSHINE 8-Sep-98
BOX 866
GRAND FORKS, BC
V0H 1H0

ATTENTION: JOHN KEMP

No. of samples received: 13
Sample type: Rock
PROJECT #: ARROW
SHIPMENT #: 5
Samples submitted by: J. Kemp

ET #.	Tag #	Pb (%)	Zn (%)
13	DJ - 39	2.69	1.76

QC/DATA:

Repeat:

13	DJ - 39	2.71	1.77

Standard:

Mp-IA	4.33	
CPb-1		4.42

per
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Frank J. Pezzotti, A.Sc.T.
B.C. Certified Assayer

XLS/98
fax: 250-442-3401

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Phone (250) 573-5700 Fax (250) 573-4557
email: ecotech@mail.wkpowerlink.com

CERTIFICATE OF ASSAY AK 98-535

RAINBOWS & SUNSHINE
BOX 866
GRAND FORKS, BC
V0H 1H0

16-Sep-98

ATTENTION: JOHN KEMP

No. of samples received: 7
Sample type: Rock
PROJECT #: ARROW
SHIPMENT #: 6
Samples submitted by: J. Kemp

ET #.	Tag #	Zn (%)
3	DJ42	2.16

QC/DATA:
Standard:
Cpb-1 4.42

per

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B.C. Certified Assayer

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Phone (250) 573-5700 Fax (250) 573-4557
email: ecotech@mail.wkpowerlink.com

CERTIFICATE OF ASSAY AK 98-663

RAINBOWS & SUNSHINE
BOX 866
GRAND FORKS, BC
V0H 1H0

30-Oct-98

ATTENTION: JOHN KEMP

No. of samples received: 6
Sample type: Rock
PROJECT #: ARROW
SHIPMENT #: 7
Samples submitted by: J. Kemp

ET #.	Tag #	Pb (%)
4	BARRY #4	1.79

QC/DATA:

Repeat:

4	BARRY #4	1.75

Standard:

Mp-IA	4.33

ECO-TECH LABORATORIES LTD.
per Frank J. Pezzotti, A.Sc.T.
B.C. Certified Assayer

XLS/98

CANADA

EDITION 2 — 82 E/9

Military users, refer to this map as: / Référence de cette carte pour usage militaire:		
	SERIES	A 721 SÉRIE
	MAP	82 E/9 CARTE
	EDITION	2 MCE EDITION

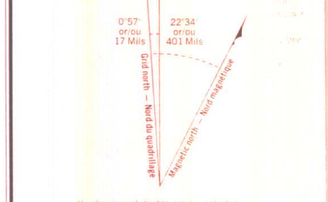
GLOSSARY GLOSSAIRE

Airfield	Terrain d'aviation
Arena	Arena
City Limits	Limites de ville
Customs	Douane
Ditch	Fossé
Dugout	Abreuvoir
Dump	Dépotoir
Filtration Plant	Usine de filtration
Gas	Gaz
Golf Course	Terrain de golf
Junk Yard	Ferraille
Kiln	Four
Lookout	Belvédère
Mine Waste	Déblai de mine
Oil Wells	Puits de pétrole
Park	Parc
Rink	Patinoire
Senior Citizens Home	Foyer de l'âge d'or
Ski Area	Station de ski
String Bog	Fondrière à filaments
Surveyed Line	Ligne arpentée
Tank	Réservoir
Water	Eau
Winter Road	Chemin d'hiver

For a complete glossary see reverse side
Pour un glossaire complet, voir au verso

ABBREVIATIONS ABRÉVIATIONS

Aband	Abandoned	Abandonné, ée
C	Cemetery	Cimetière
CO	County	Comté
E	Elevator	Élevateur
Fy	Ferry	Traversier
IR	Indian Reserve	Reserve indienne
H	Hospital	Hôpital
L	Lot	Lot
Micro	Microwave	Micro-ondes
Mun	Municipality	Municipalité
P	Post Office	Bureau de poste
PH	Power House	Centrale électrique
RCMP	Royal Canadian Mounted Police	Gendarmerie Royale Canadienne
Res	Reservoir	Reservoir
Trans Sta	Transformer Station	Poste de transformateurs
TFL	Tree Farm Licence	Licence de sylviculture



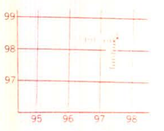
Use diagram only to obtain numerical values
APPROXIMATE MEAN DECLINATION 1978
FOR CENTRE OF MAP
Annual change decreasing 4.9

N'utiliser le diagramme que pour obtenir les valeurs numériques
DÉCLINAISON MOYENNE APPROXIMATIVE
AU CENTRE DE LA CARTE EN 1978
Variation annuelle décroissante 4.9

ONE THOUSAND METRE
UNIVERSAL TRANSVERSE MERCATOR GRID
ZONE 11
QUADRILLAGE DE MILLE MÈTRES
TRANSVERSE UNIVERSEL DE MERCATOR

GRID ZONE DESIGNATION / DESIGNATION DE LA ZONE DU QUADRILLAGE	100,000 M. SQUARE IDENTIFICATION / IDENTIFICATION DU CARRÉ DE 100,000 M.
11 U	LF MF 55 / LE ME 4

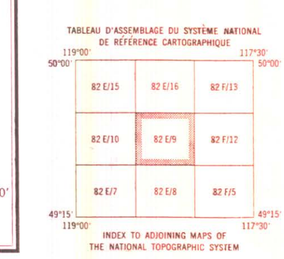
EXAMPLE OF METHOD USED
TO GIVE A REFERENCE TO NEAREST 100 METRES
EXEMPLE DE LA METHODE EMPLOYÉE
POUR FIXER DES REPÈRES À 100 METRES PRES



REFERENCE POINT / POINT DE REPERE	CHURCH - EGLISE	(as above) (ci-dessus)
EASTING: Read number on grid line immediately to left of point. LONGITUDE EST: Noter le chiffre de la ligne du quadrillage immédiatement à gauche du repère.		97
Estimate tenths of a square from this line eastward to point. Estimer le nombre de dixièmes du carré entre cette ligne et le repère en direction est		5 / 975
NORTHING: Read number on grid line immediately below point. LATITUDE NORD: Noter le chiffre de la ligne du quadrillage immédiatement en-dessous du repère.		98
Estimate tenths of a square from this line northward to point. Estimer le nombre de dixièmes du carré entre cette ligne et le repère en direction nord.		4 / 984
GRID REFERENCE / REFERENCE AU QUADRILLAGE		975984

Nearest similar grid reference 100 000 metres (about 63 miles).
La prochaine référence similaire est à 100 000 mètres (environ 63 milles).

TABLEAU D'ASSEMBLAGE DU SYSTÈME NATIONAL DE RÉFÉRENCE CARTOGRAPHIQUE



INDEX TO ADJOINING MAPS OF
THE NATIONAL TOPOGRAPHIC SYSTEM

98-06 (1)

BURRELL CREEK
82 E/9
EDITION 2

BURRELL CREEK
BRITISH COLUMBIA

Scale 1:50,000 Échelle

Miles 0 1 2 3 Miles
Metres 1000 0 1000 2000 3000 4000 Mètres
Yards 1000 0 1000 2000 3000 4000 Verges

less than 2 lanes / moins de 2 voies
VOIR AU VERSO

CONVERSION SCALE FOR ELEVATIONS — ECHELLE DE CONVERSION DES ÉLÉVATIONS

Metres 30 20 10 0 50 100 150 200 250 300 Metres
Feet 100 50 0 100 200 300 400 500 600 700 800 900 1000 Pieds

CONTOUR INTERVAL 100 FEET
Elevations in Feet above Mean Sea Level
North American Datum 1927
Transverse Mercator Projection

EQUIDISTANCE DES COURBES 100 PIEDS
Élevations en pieds au-dessus du niveau moyen de la mer
Système de reference geodesique nord-americain. 1927
Projection transverse de Mercator

Coordinate Conversion NAD 27 to NAD 83 (WGS 84)
Mean values for this map

Geographic:	Latitude -	subtract	0.33"
	Longitude -	add	4.11"
Grid:	Northing -	add	210m
	Easting -	subtract	80m

Conversion des coordonnées NAD 27 à NAD 83 (WGS 84)
Valeurs moyennes pour cette carte

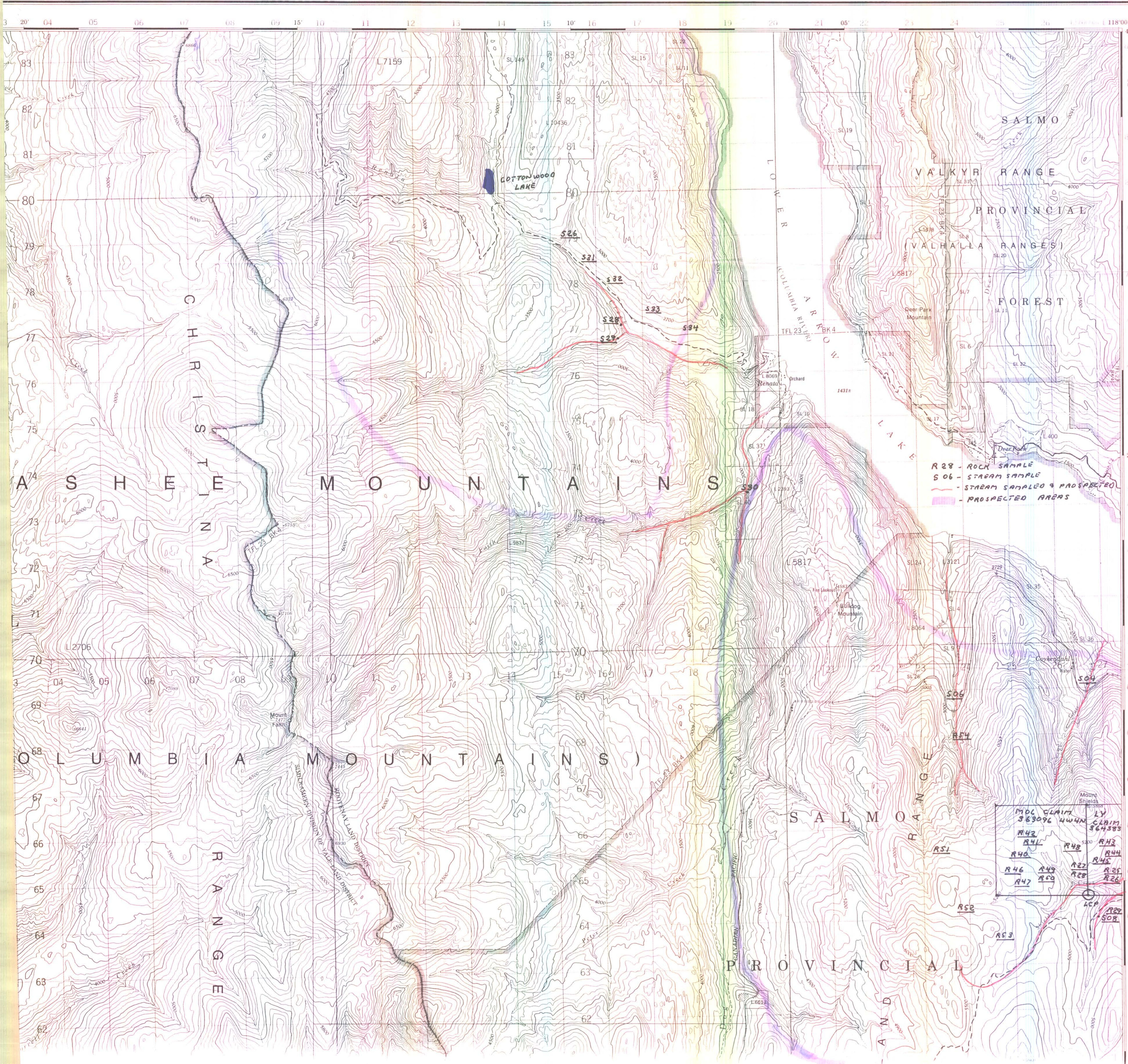
Coordonnées géographiques :	Latitude -	soustraire	0.33"
	Longitude -	additionner	4.11"
Quadrillage	Ordonnée (N) -	additionner	210m
	Abscisse (E) -	soustraire	80m

Établie par la DIRECTION DES LEVÉS ET DE LA CARTOGRAPHIE, MINISTÈRE DE L'ÉNERGIE, DES MINES ET DES RESSOURCES. Mise à jour à l'aide de photographies aériennes prises en 1975. Vérification des ouvrages en 1976. Renseignements à jour en 1976.

Ces cartes sont en vente au Bureau des Cartes du Canada, ministère de l'Énergie, des Mines et des Ressources, Ottawa, ou chez le vendeur le plus près.

CANADA SAMPLE LOCATION EDITION 2 SCALE 1:50.000 82 E/8

Military users, refer to this map as: Référence de cette carte pour usage militaire:	SERIES A 721 SÉRIE MAP 82 E/8 CARTE EDITION 2 MCE ÉDITION



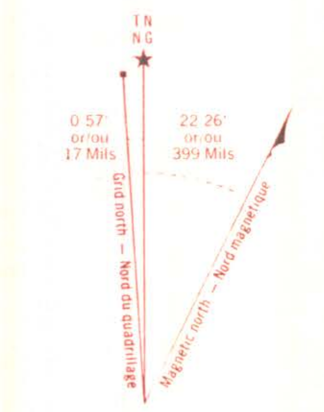
R 28 - ROCK SAMPLE
S 06 - STREAM SAMPLE
〰 - STREAM SAMPLED & PROSPECTED
▨ - PROSPECTED AREAS

GLOSSARY GLOSSAIRE

Airfield	Champ d'atterrissage
Arena	Aréna
Canal	Canal
City Limits	Limites de ville
Customs	Douanes
Ditch	Fossé
Dugout	Abreuvoir
Dump	Dépotoir
Factory	Usine
Filtration Plant	Usine de filtration
Gas	Gaz
Golf Course	Terrain de golf
Irrigation Canal	Canal d'irrigation
Junk Yard	Dépôt de ferrailles
Kiln	Four
Lookout	Poste d'observation
Oil Wells	Puits de pétrole
Park	Parc
Pipeline	Pipeline
Rink	Patinoire
Senior Citizens Home	Foyer pour citoyens de l'âge d'or
Silo	Silo
Ski Area	Station de ski
String Bog	Marécage en enfilade
Surveyed Line	Ligne arpentée
Tailings	Terrils
Tank	Réservoir
Water	Eau
Winter Road	Chemin d'hiver

ABBREVIATIONS ABRÉVIATIONS

Aband	Abandoned	Abandonné
C	Cemetery	Cimetière
CO	County	Comté
E	Elevator	Élévateur
Fy	Ferry	Traversier
IR	Indian Reserve	Réserve indienne
H	Hospital	Hôpital
L	Lot	Lot
Micro	Microwave	Micro-ondes
Mun	Municipality	Municipalité
P	Post Office	Bureau de poste
PH	Power House	Centrale électrique
RCMP	Royal Canadian Mounted Police	Gendarmerie Royale Canadienne
Res	Reservoir	Réservoir
Transf	Transformer	Transformateur
TFL	Tree Farm Licence	Licence de sylviculture



Use diagram only to obtain numerical values
APPROXIMATE MEAN DECLINATION 1978
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Annual change decreasing 4.9'

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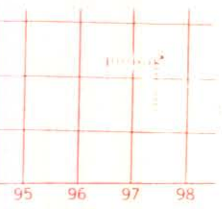
AU CENTRE DE LA CARTE EN 1978
Variation annuelle décroissante 4.9'

ONE THOUSAND METRE
UNIVERSAL TRANSVERSE MERCATOR GRID
ZONE 11
QUADRILLAGE DE MILLE MÈTRES
TRANSVERSE UNIVERSEL DE MERCATOR

GRID ZONE DESIGNATION DÉSIGNATION DE LA ZONE DU QUADRILLAGE	100,000 M. SQUARE IDENTIFICATION IDENTIFICATION DU CARRÉ DE 100,000 M
11 U	LE ME 4

98-06 ②

EXAMPLE OF METHOD USED
TO GIVE A REFERENCE TO NEAREST 100 METRES
EXEMPLE DE LA MÉTHODE EMPLOYÉE
POUR FIXER DES REPÈRES À 100 MÈTRES PRÈS



REFERENCE POINT / POINT DE REPÈRE: CHURCH EGLISE (as above) (ci-dessus)

EASTING: Read number on grid line immediately to left of point:
LONGITUDE EST: Noter le chiffre de la ligne du quadrillage immédiatement à gauche du repère: 97

Estimate tenths of a square from this line eastward to point.
Estimer le nombre de dixièmes du carré entre cette ligne et le repère en direction est: 5

975

NORTHING: Read number on grid line immediately below point
LATITUDE NORD: Noter le chiffre de la ligne du quadrillage immédiatement en dessous du repère: 98

Estimate tenths of a square from this line northward to point
Estimer le nombre de dixièmes du carré

118°00′ 49°30′ 55′ 50′ 45′

SALMO FOREST

SALMO

NORNS (VALHALLA FOREST)

SELKIRK

VALLEY

(VALHALLA RANGES)

COLUMBIA

ROSSLAND RANGE

ROBSON RIDGE

PINE RIDGE

ARROW LAKE

TREE FARM LICENCE 23 BLOCK 4

L 10505 L 10506 L 10507 L 10508 L 10509 L 10510 L 10511 L 10512 L 10513 L 10514 L 10515 L 10516 L 10517 L 10518 L 10519 L 10520 L 10521

L 5816 L 5817 L 4599

Ladybird Mountain A 7417

Salmo Forest SL 33 L 8318 L 8316 L 8317 L 8319 L 8315 L 8321 L 8320 L 8702 L 8703 L 8070 10384 9479 L 9068 L 9154 9373 L 8322 L 7603 L 7669 1473 9352 L 14972 1454 1474 SL 1 SL 5 SL 6 SL 3 SL 7 L 3260 1458 SL 2 L 13028 L 13982 L 4268 L 15657 L 15656 L 6884 L 6885 L 15658 L 7606 SL 4 L 9353 L 13564 1755 1800 1431± 1410 L 7473 L 6591

Boat Houses Boat House Marina Yacht Club & Marina Rifle Range Gate Trans Sta Hugh Keenleyside Dam Crane Sawmill Kraft Water Pumping Sta. CANADIAN PACIFIC SYRINGA CREEK PROVINCIAL PARK Gem Hill

R36 - ROCK SAMPLE
S02 - STREAM SAMPLE
- STREAM SAMPLED & PROSPECTED
- PROSPECTED AREAS

R39 R36 R35 R37 R32 R30 R31 A3H R33 LY CLAIM S01 S07 S05 S03