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**SUMMARY REPORT  
ON THE  
1990 EXPLORATION PROGRAM  
SPECTRUM PROPERTY**

N.T.S.: 104G/9W, 10E

LATITUDE: 57° 41'N  
LONGITUDE: 130° 29'W

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COLUMBIA GOLD MINES LTD.  
#1500-675 WEST HASTINGS STREET  
VANCOUVER, B.C.  
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BY: J.J. HYLANDS, P.Eng

**20,861**

**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**

**PART 1 OF  
4**

JANUARY, 1991

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1.0

### SUMMARY AND CONCLUSIONS

The 3125 ha Spectrum Property, consisting of 125 claim units that comprise the Spectrum and Hawk claims, occurs in the North Iskut Gold Camp within the well known Stikine Arch Region in northwestern British Columbia. The Property is located 25 kilometres west of the Stewart-Cassiar Highway and the Village of Iskut. Columbia may earn a 70% interest in the Property.

Structurally controlled high grade gold zones with disseminated low grade gold-copper mineralization are associated with a large alteration system in andesitic volcanics. Exploration has been focused on the eastern portion of the altered zone where a gold soil geochemical anomaly measuring 900 metres by 1500 metres defines a large gold mineralized system.

A program of prospecting, trenching and mapping was initiated to define continuity and grade of vein systems, determine the factors which controlled deposition, and define target areas for diamond drilling. Seventeen of twenty drill holes collared were completed to test depth and strike continuity of gold zones and the northern extension of the porphyry gold-copper mineralization.

Exploration of north-south controlling structures within and adjacent to the elongate monzonite intrusive body has led to discovery and drill definition of the East and West, QC and Porphyry Gold Zones which contain visible gold, pyrite, arsenopyrite and minor base metals within potassic to propylitic altered andesitic tuffs.

The East QC Zone has now been outlined along a 550 metre length and to a depth of 90 metres. To date 12 of 15 holes drilled have reported significant gold values that average 12.3 gm/T Au over 5.0 metres (0.36 oz/T Au over 16.3 feet). The three deepest holes, 90-46, 56 and 59, indicate increasing thickness and grade with depth with values reaching 10.3 gm/T Au over 22.8 metres (0.30 oz/ton gold over 74.8 feet). The Zone remains open along strike and to depth.

Drilling along a 300 metre strike length of the Porphyry Zone to a depth of 60 metres has intersected values to 6.8 gm/T Au over 7.6 metres (0.20 oz/ton gold over 25 feet) with several additional holes intersecting narrower higher grade intervals. The Porphyry Zone, located approximately 30 metres west of the QC mineralization, also has a steep westerly dip and occurs within a broad zone of gold-copper values grading 1.4 gm/T gold and 0.10% copper over an average 45 metre thickness.

The West QC Zone trends northwesterly and also dips steeply to the west. Five of 10 holes drilled have intersected an average grade of 15.4 gm/T over 5.0 metres (0.45 oz/ton gold over 16.3 feet) along a 760 metre strike length.

The 4440 Vein, a promising showing, with grades up to 7.9 gm/T Au over 0.7 metres, was found late in the season. Additional targetting and drilling is required to define the strike and depth extent of the Boundary - 4440 vein system.

Preliminary prospecting and sampling of areas peripheral to the large altered and mineralized gold system has been successful in defining additional high grade gold showings. Chip samples from the West Creek showing assayed 37.7 gm/T Au across 4.1 metres (1.1 oz/ton gold over 13.5 feet). Other gold veins, one of which has been previously explored from underground, occur to the north of the Porphyry and QC Zones on the Hawk claims.

Preliminary prospecting and sampling as well as one diamond drill hole was completed on north trending structurally controlled gold zones within the Hawk claims.

Although the diamond drill used in 1990 performed very well in most instances, it did not have the torque required to install casing in deep overburden or drill holes to depths beyond 200 metres. A more powerful drill will be required for the 1991 program.

Exploration funds expended by Columbia Gold Mines Ltd. in 1990 on the Spectrum Property total \$548,800.

In summary, Columbia Gold Mines' 1990 exploration program has outlined a number of northwest trending structurally controlled gold zones on the Spectrum Property. The best gold values so far have been discovered within the East QC Zone that contains gold grades of 10.3 gm/T Au along 22.8 metres (0.30 oz/ton gold over 75 feet). All mineralized zones remain open along strike and to depth with gold grades improving with depth. Further exploration is warranted in order to determine the ultimate size of these deposits through continued diamond drilling. There is promise for defining reserves in the multi-million ton range on Columbia Gold's Spectrum Property.

2.0

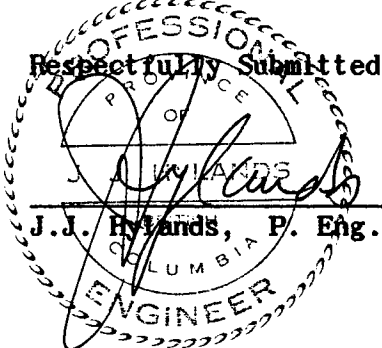
RECOMMENDED EXPLORATION PROGRAM

Based on the success of the 1990 targetting and drilling program, an accelerated exploration program is warranted.

The proposed 1991 field program should focus on reserve definition drilling of the QC and Porphyry Zones combined with continued targetting of additional gold zones elsewhere on the Property. A diamond drilling program of 4500 metres is proposed. Approximately 24 NQ holes will test a 1000 metre strike length and 150 metre depth of QC and Porphyry Gold Zones. Initial drill holes will be collared to test strike and depth continuity of mineralization intersected in holes 90-46 and 90-59. Drill hole spacing will be designed to outline a potential reserve in the order of 5.0 million tons. An additional 4 holes will test the West QC, Boundary4440 and Skarn Zones.

Additional prospecting, trench sampling and grid soil geochemical surveys are also proposed to establish drill targets on the West Creek and Hawk gold bearing structures.

The recommended exploration program will require 2.5 months to complete with a budget of \$923,000.

Respectfully Submitted  
  
J.J. Hylands, P. Eng.

3.0

## INTRODUCTION

Results of a prospecting, trenching and diamond drilling program by Columbia Gold Mines Ltd. conducted between July and October, 1990, on the Spectrum Property, Mount Edziza area, B.C., are presented in this report.

3.1

### LOCATION AND ACCESS

The nine-claim Spectrum property lies between Nuttlude Lake and Mount Edziza, approximately 85 km south-southwest of Dease Lake, B.C., on the boundary between NTS maps 104G/9W and 10E (Figure 1). Geographic co-ordinates of the center of the claim block are 57° 41'N, 130° 29'W. The claims lie on the east side of Mount Edziza Park, within the Mt. Edziza Recreation Area.

During 1990, helicopters were used to transport personnel, groceries and equipment between Tatogga Lake, on Highway 37, and the property, as well as to move the diamond drill between sites. During 1979-1980, a winter tote road was constructed between Highway 37 and a trailer camp and airstrip established on the west side of Nuttlude Lake. A four-wheel drive road, now partially washed out, provided access between the lake and the target area 3.5 km to the southwest. Use of the previous roads and tote trails are subject to approval from the Ministry of Parks.

3.2

### PHYSIOGRAPHY

The property covers the east end of a flat topped ridge and the largely easterly-facing steep slopes. The lake is at elevation 785 metres while the top of the ridge is between 1830 metres and 2060 metres. Typical alpine vegetation is found above 1252 metres with non-marketable balsam and black spruce below. The only animals observed between July and early October were gophers and porcupines.

There were many foggy mornings in August and September. Strong winds, with occasional gusts in excess of 80 kph, were not infrequent. Rainfall during the season was relatively sparse. The area is well drained, and permafrost was not encountered in any of the holes drilled. Only one creek in the alpine region had enough flow through September to supply a diamond drill, and it was frozen solid by October 5th.



COLUMBIA GOLD MINES LTD.

SPECTRUM PROPERTY

LOCATION MAPS

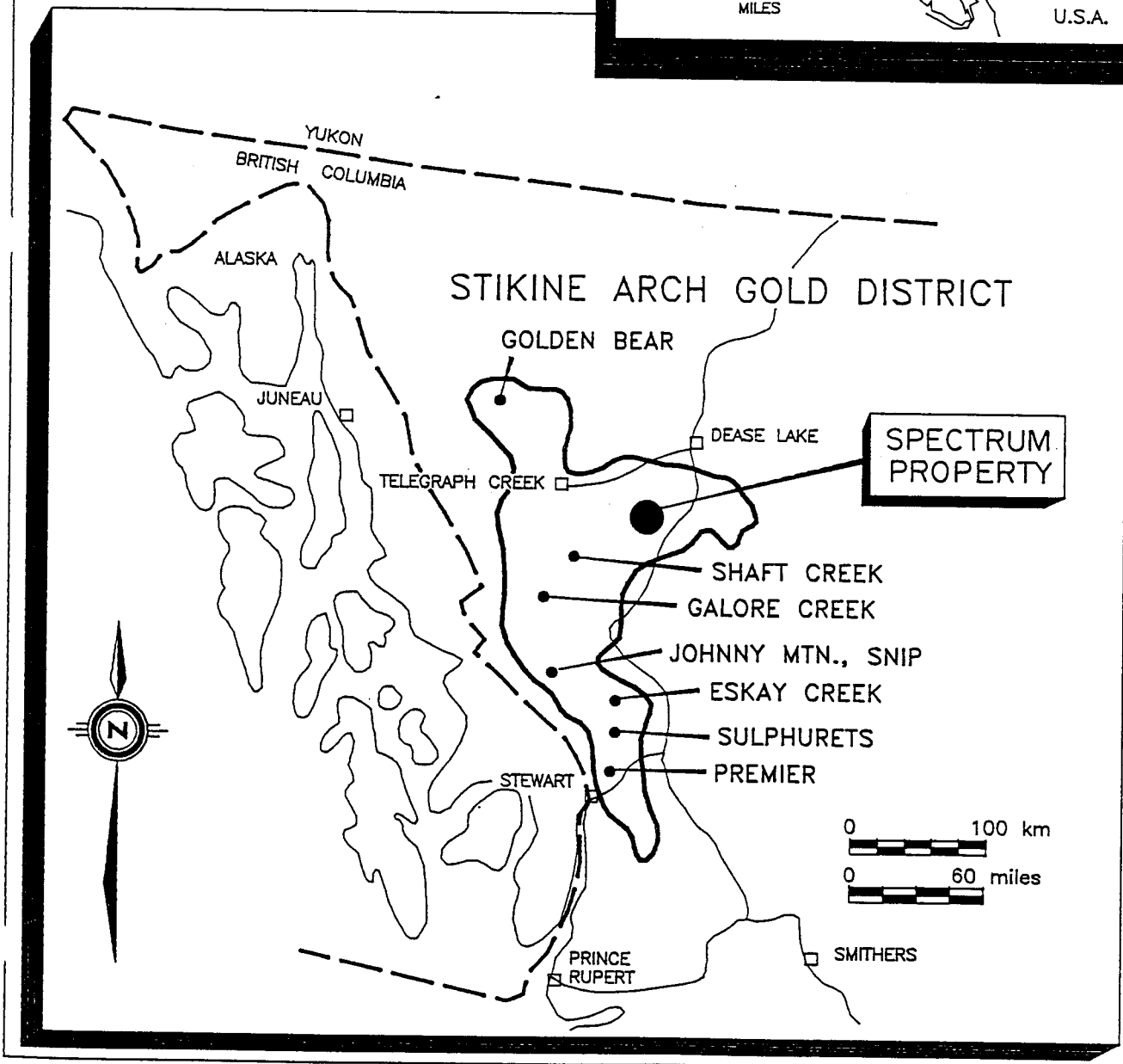
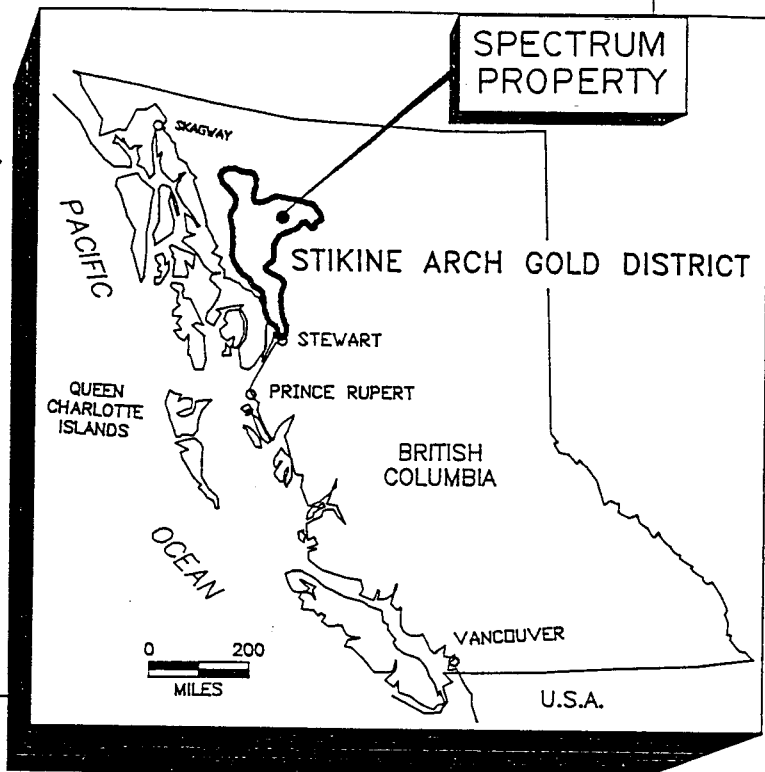


Figure No.

### 3.3

#### HISTORY

The original Spectrum claims were staked in 1969 for Spartan Explorations Ltd. to cover a porphyry-type copper discovery about four kilometres southwest of Nuttlude Lake. Some geological mapping and geophysical and geochemical surveys were completed in 1970 by Mitsui Mining and Smelting Company Ltd. The property was optioned by Imperial Oil Limited in 1971 and additional geological, geochemical and geophysical surveys were undertaken in 1971-72. In 1973, Imperial Oil completed 463 metres of BQ drilling in four holes. The first Red Dog claim was staked by Canex Placer for the Racicot Syndicate in September 1975; the second was staked in 1976. Consolidated Silver Ridge Mines Ltd. negotiated an option on the property in 1977, and conducted geological mapping, a geochemical soil survey and staked the Pink and Red claims in 1978.

This was followed in 1979 by the staking of the Camp claim, construction of a trailer camp and an airstrip on the west side of Nuttlude Lake, road building, diamond drilling of 832 metres in ten holes, and additional prospecting, mapping, and soil sampling. Another 2,400 metres was drilled in 18 holes during the 1980 program. During 1981 the Red Dog 3 and 4 claims were added to the property. Field work consisted of prospecting, mapping and geochemical rock sampling.

A vein showing north of Hawk Creek was staked, mapped and sampled by Torbret Silver Mines in 1957. In 1967, the property was staked for Shawnigan Mining and Smelting Co. Ltd. and some X-ray diamond drilling was done. The Hawk claims were staked in February 1978 for Highhawk Mines Ltd. and a program of geological mapping and soil sampling was completed over the northwest quadrant of the Hawk 1 claim. In 1979, a four-wheel drive access road was completed from the camp to the portal site at 1,280 metres elevation and a 2.0 metre by 2.6 metre exploration drift was advanced 73 metres along the main vein. The following year 240 metres of drift and cross-cut were excavated, and 430 metres of EWT and BQ core in nine holes drilled underground.

The Hawk and Red Dog claim groups were optioned by Cominco in 1984. A picket grid was established and used for soil sampling, magnetic and VLF surveys. The remainder of their program was deferred when the B.C. Government withdrew the right to explore on lands in Recreation Areas. Cominco's program was continued in 1988-89 when they drilled ten holes, totalling 1,199 metres and conducted limited geological mapping and grab and chip rock sampling.

Between 1987 and 1989 limited exploration work - rock and soil sampling, magnetic, VLF and resistivity surveys - was carried out over the Hawk 1 claim by Moongold Resources Inc.

3.4

1990 EXPLORATION PROGRAM

Columbia Gold Mines Ltd. optioned the Red Dog claim group from Calnor Resources Ltd. in April, 1990, and the Hawk claims from Newhawk Gold Mines Ltd. in August, 1990. Camp was established on July 17 using the Cominco 1989 site. The first phase of the program consisted of prospecting, hand trenching and the collection of 660 rock chip and trench samples and 351 soil samples. This was followed by the diamond drilling of 20 BQ diameter holes, totalling 2,431.8 metres. The contiguous claim holding is now called the Spectrum Property.

3.5

CLAIM DATA

The Spectrum Property consists of nine mineral claims (Figure 2), all located in the Mount Edziza Recreation Area, Liard Mining Division. The status of the claims is presented in Table 1.

TABLE 1

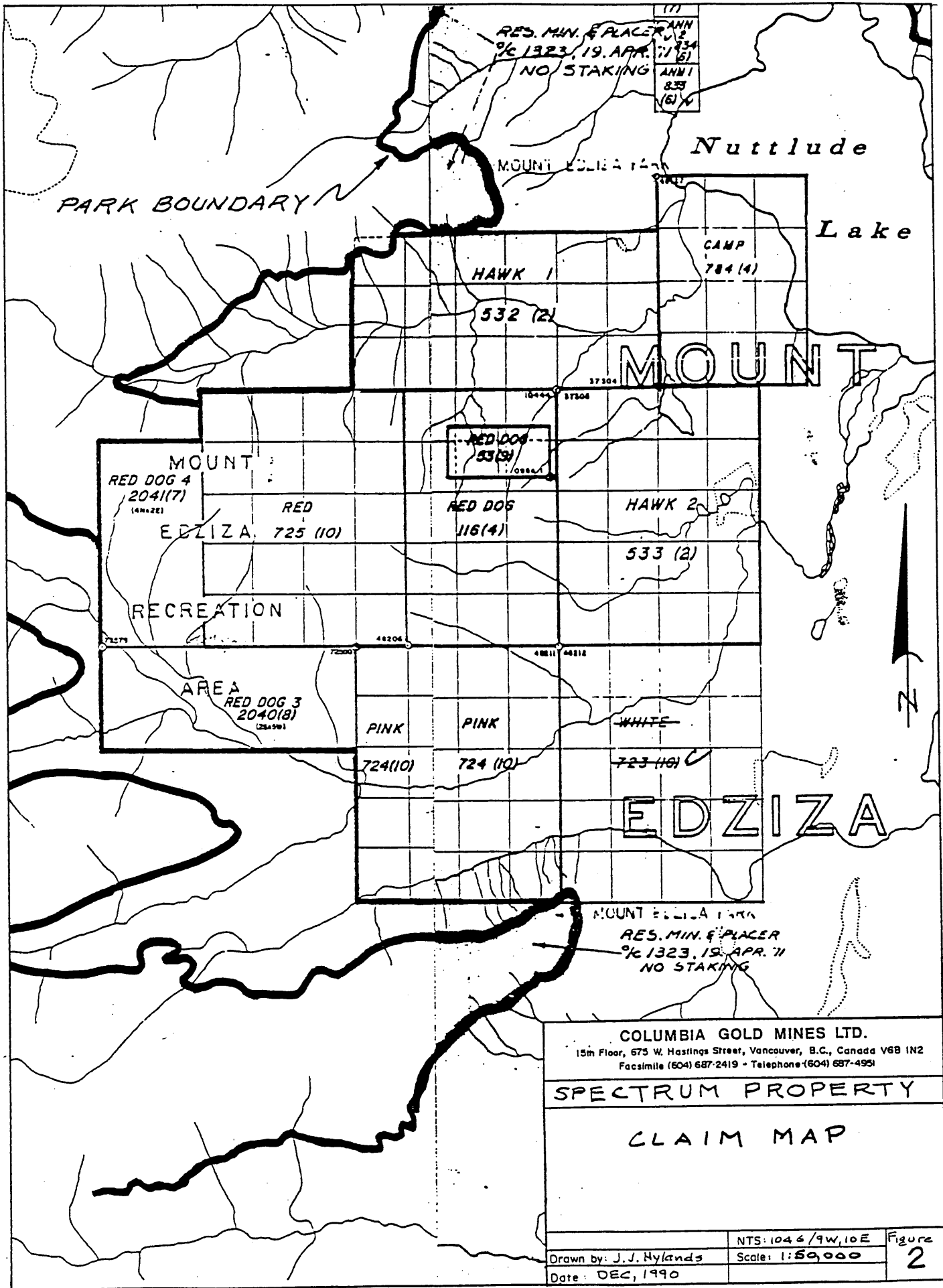
STATUS OF MINERAL CLAIMS, SPECTRUM PROPERTY

<u>CLAIM NAME</u>	<u>RECORD NUMBER</u>	<u>NUMBER OF UNITS</u>	<u>RECORD YEAR</u>	<u>EXPIRY DATE</u>	<u>OWNERSHIP</u>
Red Dog	53	2	1975	Sept. 30, 1999	1
Red Dog	116	15	1976	April 09, 2000	1
Pink	724	20	1978	Oct. 31, 2000	2
Red	725	20	1978	Oct. 31, 1999	2
Camp	784	12	1979	April 09, 2000	2
Red Dog 3	2040	10	1981	Aug. 06, 2000	2
Red Dog 4	2041	8	1981	July 07, 1999	2
Hawk 1	532	18	1978	Feb. 21, 2000	3
Hawk 2	533	20	1978	Feb. 21, 2000	3

NOTE: Ownership: 1 - 70.0% Calnor Resources Ltd.  
 25.5% Northair Mines Ltd.  
 4.5% Placer Dome Inc.

2 - 73.3% Calnor Resources Ltd.  
 26.7% Northair Mines Ltd.

3 - 50.0% Newhawk Gold Mines Ltd.  
 50.0% Northair Mines Ltd.



RES. MIN. & PLACER  
 9/6/1923, 19. APR. '71  
 NO STAKING  
 ANN 1  
 8.35  
 (5) V

(7)  
 ANN  
 7.34  
 (5)  
 ANN 1  
 8.35  
 (5) V

PARK BOUNDARY

Nutt Lake

MOUNT EDZIZA PARK

HAWK 1  
 532 (2)

CAMP  
 784 (4)

MOUNT

MOUNT  
 RED DOG 4  
 2041(7)  
 (49x22)

RED DOG  
 533 (2)

RED  
 EDZIZA 725 (10)

RED DOG  
 116 (4)

HAWK 2  
 533 (2)

RECREATION

AREA  
 RED DOG 3  
 2040(8)  
 (23x50)

PINK  
 724 (10)

PINK  
 724 (10)

WHITE  
 723 (10)

EDZIZA

MOUNT EDZIZA PARK  
 RES. MIN. & PLACER  
 9/6/1923, 19. APR. '71  
 NO STAKING

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<b>SPECTRUM PROPERTY</b>		
<b>CLAIM MAP</b>		
Drawn by: J.J. Nylands Date: DEC, 1990	NTS: 1046/9W, 10E Scale: 1:50,000	Figure <b>2</b>

4.0

GEOLOGY

4.1

REGIONAL GEOLOGY

Nuttlude Lake lies west of the Klastline Plateau and east of the Mount Edziza volcanic complex (Figure 3). The area is underlain by the Upper Triassic Stuhini Group, a generally steeply dipping assemblage of mafic tuffs, basaltic andesite flows, felsic tuffs, and lesser sandstone, siltstone and limestone (Brown and Greig, 1990). To the south of Mount Edziza and on the Klastline Plateau this package is in fault contact with Middle Jurassic basalt and pillow lavas which are overlain by Bowser Group sediments (Souther, 1972). The Upper Triassic volcanics and sediments have been intruded by small Jurassic/Cretaceous granodiorite to quartz monzonite bodies. Basalt flows and related pyroclastic rocks of the Upper Tertiary Mount Edziza/Spectrum Range volcanic complexes cover over 1500 square kilometres, and cap all the ridges in the vicinity of the Spectrum property.

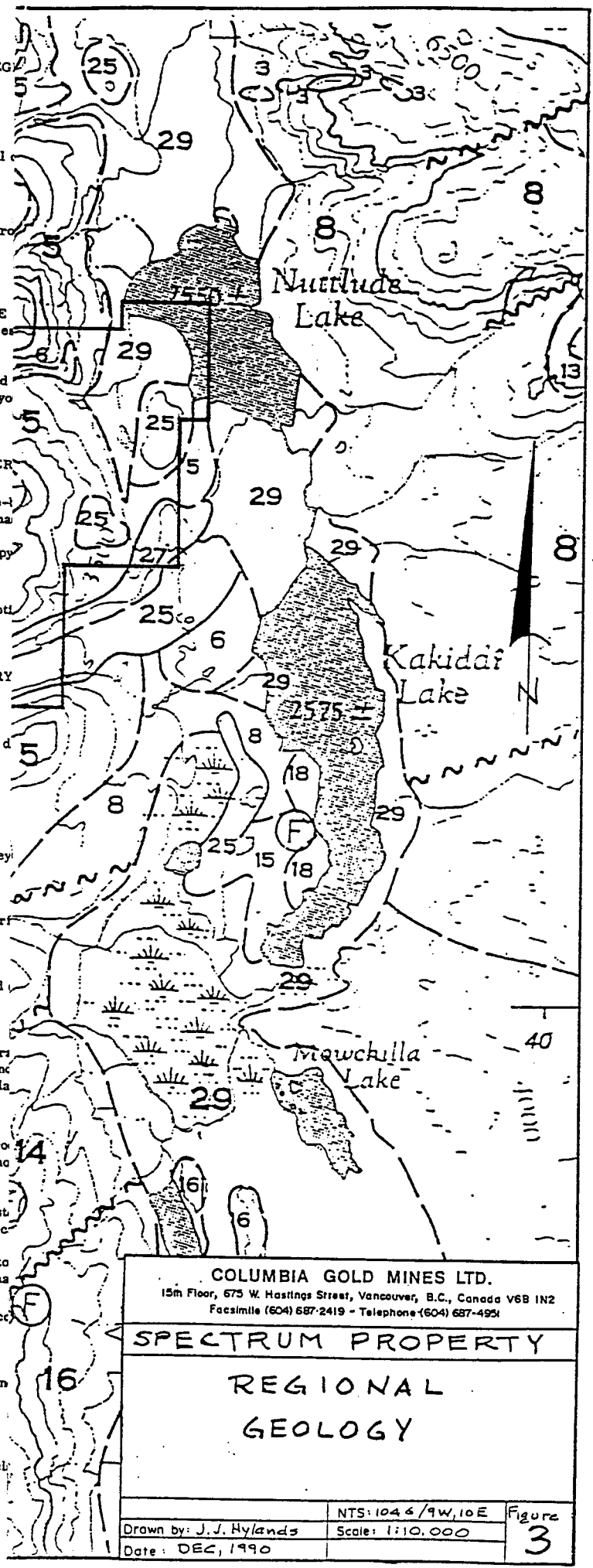
4.2

PROPERTY GEOLOGY

The geology of the property has been described in a number of previous reports (Panteleyev, 1972; Noel, 1980; 1981, Noel and Taylor, 1981; Hogarth, 1981). The claims are underlain by moderately to steeply dipping, generally northwesterly trending Upper Triassic Stuhini Group tuffs and flows, capped by flat-lying Mount Edziza basalts. There are scattered exposures at lower elevations of probable Upper Triassic siltstones, limestones and conglomerate. An elongate body of Jurassic to Cretaceous biotite hornblende granodiorite to quartz monzonite has been traced, on surface and in drill holes east of the basalt cap, from near the center of the Red Dog (116) claim north towards Hawk Creek (Plate 1).

The majority of work during 1990 was concentrated on the intrusion and the adjacent altered volcanics. Panteleyev (1972) classified the intrusive rock as a granodiorite or quartz-bearing monzodiorite. Three specimens of intrusive submitted for whole rock analysis by Cominco (MacRobbie, 1989b) were concluded to be granodiorite, granite and quartz monzodiorite. During the 1990 field season, the elongate intrusive was labelled a quartz monzonite for continuity with previous work. In general, the intrusive is pink to grey, equigranular to porphyritic, with approximately 10% quartz, 20% K-Feldspar, 60% plagioclase, 6% biotite and hornblende, 2% accessory minerals and 2% pyrite and chalcopyrite. Alteration minerals include biotite, sericite, and quartz-K-feldspar veins near the center, changing outward to a propylitic assemblage of chlorite, epidote, minor sericite and carbonate.

- QUATERNARY**  
**PLEISTOCENE AND RECENT**
- 29 Fluvialite gravel; sand, silt; glacial
  - 28 Hot-spring deposit, tufa, aragonite
  - 27 Olivine basalt, related pyroclastic rocks; some of 29
- TERTIARY AND QUATERNARY**  
**UPPER TERTIARY AND PLEISTOCENE**
- 26 Rhyolite and dacite flows, lava domes, volcanic intrusions; minor basalt
  - 25 Basalt, olivine basalt, dacite, related intrusions; minor rhyolite; in part of
- CRETACEOUS AND TERTIARY**  
**UPPER CRETACEOUS AND LOWER TERTIARY**  
**SUSTUT GROUP**
- 21 Chert-pebble conglomerate, granite-sandstone, arkose, siltstone, carbonaceous shale
  - 20 Felsite, quartz-feldspar porphyry, pyroclastic; part equivalent to 22
  - 19 Medium-to coarse-grained, pink biotite granite
- JURASSIC AND/OR CRETACEOUS**  
**POST-UPPER TRIASSIC PRE-TERTIARY**
- 18 Hornblende diorite
  - 17 Granodiorite, quartz diorite; minor diorite
- JURASSIC**  
**MIDDLE (?) AND UPPER JURASSIC**  
**BOWSER GROUP**
- 16 Chert-pebble conglomerate, grit, grey shale; may include some 13
- MIDDLE JURASSIC**
- 15 Basalt, pillow lava, tuff-breccia, derived subvolcanic intrusions
- LOWER AND MIDDLE JURASSIC**
- 14 Shale, minor siltstone, siliceous and ironstone
- LOWER JURASSIC**
- 13 Conglomerate, polymictic conglomerate, greywacke, siltstone; basaltic and andesitic pillow-breccia and derived volcanics
- TRIASSIC**  
**UPPER TRIASSIC**
- 8 Augite-andesite flows, pyroclastic rocks, related subvolcanic intrusions; minor conglomerate
  - 7 Siltstone, thin-bedded siliceous siltstone, dolomitic siltstone, greywacke, volcanic sandstone
  - 6 Limestone, fetid argillaceous limestone, limestone; may be in part younger than 7
  - 5 Greywacke, siltstone, shale; minor conglomerate
- MIDDLE TRIASSIC**
- 4 Shale, concretionary black shale; minor limestone
- PERMIAN**  
**MIDDLE AND UPPER PERMIAN**
- 3 Limestone, thick-bedded mainly bioclastic limestone and tuff



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**SPECTRUM PROPERTY**

**REGIONAL GEOLOGY**

Drawn by: J. J. Hylands	NTS: 1044/9W, 10E	Figure <b>3</b>
Date: DEC, 1990	Scale: 1:10,000	

Volcanic rocks observed in core from the footwall of the intrusion were predominately ash tuffs, with crystal, lapilli or lithic tuff intervals. These were locally intensely and variably hornfelsed and silicified. Bedding angles were seldom discernible. A propylitic alteration suite was evident, consisting of chlorite, epidote and minor K-feldspar. Pyrite was common, varying from 1% to occasionally 10%. Outcropping volcanic units within the area of interest consist of very rusty, silicious, pyritic ash or crystal tuffs.

Feldspar porphyry bodies up to 50 metres wide, probably of andesitic composition, were seen 400 to 500 metres east and west of the quartz monzonite. In drill core from the eastern exposure the feldspar porphyry graded into a crystal tuff. Two grab samples of this unit, sent for whole rock analysis, (MacRobbie, 1989b) were classified as monzodiorite and monzonite.

Zones of calc-silicate alteration (chlorite + actinolite, ± epidote ± garnet) and very silicious tuff ("cherty tuff") were seen in drill holes south of section 9600 N, and in scattered outcrops south of section 9400 N. These calc-silicate skarns were usually dark green and silicious.

#### 4.3

#### MINERALIZATION

Gold mineralization is associated with a large 2500 metre by 1400 metre alteration system within andesite volcanics. Exploration has been focused on the eastern portion of the altered zone where a gold soil geochemical anomaly measuring 1500 metres by 900 metres defines the area of interest which hosts several of the gold zones discovered on the Property.

Three styles of gold mineralization have been identified:

- 1) "Porphyry" copper-gold. Disseminated pyrite and chalcopyrite in argillically to propylitically altered quartz monzonite, as well as within altered volcanic units within 20 metres of the intrusive contact. Wide zones to 105 metres of low grade gold-copper mineralization grading to 1.4 gm/T (0.04 oz/t) gold with copper values averaging approximately 0.10% Cu have outlined. There is poor correlation between gold and copper with respect to individual assayed intervals.

- 2) Pyrite, quartz and quartz-carbonate veins. These structurally controlled zones typically contain pyrite + pyrrhotite, arsenopyrite, chalcopyrite, sphalerite, ± visible gold within a quartz-carbonate gangue. These veins appear to post date and cut the earlier disseminated porphyry-type copper-gold mineralization. In order of deposition: carbonate, quartz-carbonate, quartz, pyrite. Gold values are erratic within zone boundaries but can average to 10.28 gm/T Au (0.30 oz/t). Samples with over 34 gm/T Au have associated visible gold and often scheelite mineralization.
- 3) Calc-silicate zones. Majority have pyrite + pyrrhotite, with variable magnetite, chalcopyrite and arsenopyrite with rare visible gold. The zones may have thin, massive pyrite - magnetite - chalcopyrite - arsenopyrite within a quartz-carbonate gangue. These veins appear to post date and cut the earlier horizons. "Skarns" locally contain gold values in excess of 3.4 gm/T (0.1 opt Au), as observed in DDH 90-47 and Trench 26.

Gold mineralization has been outlined by the 1990 trenching and drilling programs. Exploration of north-south controlling structures has led to discovery and drill definition of East and West. QC and Porphyry Gold Zones which contain visible gold, pyrite, arsenopyrite and minor base metals within potassic to propylitic altered andesite tuffs.

Preliminary prospecting and sampling of areas peripheral to the large altered and mineralized gold system has been successful in defining additional high grade gold showings. Chip samples from the West Creek showing assayed 37.3 gm/T Au across 4.1 metres (1.1 oz/ton gold over 13.5 feet).

Previous exploration on the Hawk Property has led to the discovery of gold showings on-trend to gold-bearing zones located on the Spectrum Property. Earlier sampling, underground drifting and drilling on the Hawk claim was focused on the Central vein which averages 29.1 gm/T gold along a length of 200 metres. Surface samples vary to 37.7 gm/T Au over 1.0 metres. Underground drifting and drilling programs have defined continuity of the structure for a length of 160 metres and depth of 90 metres.



5.0

## GEOCHEMISTRY

5.1

### PROGRAM

Soil samples were collected from four reconnaissance traverses and a small detail grid. Three of the reconnaissance traverses were along West, Monday and GR Creeks on the Red and Red Dog 4 claims in the southwest corner of the property. Samples were collected, at approximately 25 metre intervals on alternating sides of each creek (Plate 3), from the "B" soil horizon and placed in numbered kraft paper bags. The stations were marked on the ground with numbered flagging tape. On the fourth traverse samples of talus fines were collected at 25 metre intervals near the top of the scree slopes between stations FST 01 and FST 101 (Plate 2).

Prospecting and trenching results indicated there was a mineralized zone trending from Road Trench 1 and Trench 6 towards Trench 8 (Plate 4). The area northwest of the creek to line 9200 E is covered by "soil" derived from the Edziza basalt cap rock. Previous soil samples from this area returned background values in gold. The grid shown on Plate 4 was established and soil sampled to determine if the gold-bearing trend extended beneath the barren soil cover. This required sampling soil derived from the underlying pyritic Stuhini volcanics, distinctively reddish-orange compared to the greenish basalt-derived overburden. At sites marked "no sample", pits 1.5 m deep failed to reach Stuhini soils. Soil samples were placed in Kraft paper bags marked with grid co-ordinates.

All soil samples were sent to Min-En Laboratories, 705 West 15th Street, North Vancouver, for drying, screening and analysis for gold. Description of their standard procedure is in Appendix A. The analytical results are plotted on Plates 2, 3, and 4; the assay certificates may be noted in Appendix B.

5.2

### RESULTS

Significant gold results from the three soil traverses in the GR showing area were predominantly within 50 to 100 metres of the south ends of the lines (Plate 3). These values varied from 12 ppb to 394 ppb gold. Most rock samples of altered and mineralized volcanics found on GR and West Creeks within the soil gold anomaly returned gold values greater than 100 ppb, and five were over 3.4 gm/T Au (WC Showing).

The gold results from the "talus fines" samples varied from a low of 1 ppb to a high of 3700 ppb (Plate 4). Values greater than 100 ppb are considered strongly anomalous, while those above 1000 ppb probably indicate proximal mineralization. Samples FST 54 to 61 were collected downslope from the Fog Showing and reflect the values found there. Trenches 1 to 3 were excavated above samples FST 65 to 74. Most of the trench rock samples gave gold values above 120 ppb. Samples FST 90 to 101 were collected below a large unexplored exposure of rusty volcanics.

The majority of the soil samples from the detailed grid (Plate 5) returned gold values in excess of 50 ppb, and 19% were 1000 ppb or higher. Three anomalies can be defined by contouring the 100 ppb Au values. Anomaly A covers the largest area, includes Road Trench 1 and the east end of Trench 6. The northwest trending fingers of the anomaly parallel the strike of mineralized veins. Over 30% of the gold values in Anomaly A are greater than 1000 ppb. The trend of Anomaly B parallels Anomaly A, and it may reflect a similar structural control. The values in Anomaly C are possibly related to scattered narrow mineralized veins found upslope.

6.0

#### TRENCHING AND ROCK SAMPLING

6.1

##### PROGRAM

Although extensive gold-and-copper in soil anomalies have been defined by previous soil sampling programs, there was very little evidence of a prior concerted effort to find the sources of these except in the vicinity of the intrusion. The prospecting and trenching phase of the 1990 exploration program was concentrated in four areas:

- 1) The belt of rusty Stuhini volcanic exposures between the Fog Showing and the intrusion;
- 2) The northern extension of the intrusion;
- 3) The southern extension of the intrusion; and
- 4) The north trending zone of feldspar porphyry exposures east of the intrusion.

The general exploration technique used was to find mineralized veins and veinlets in outcrop, collect 5 to 10 kg soil samples from below the exposures, and pan the soil samples in camp. Hand trenches were excavated above the sample locations that returned visible gold. The rock exposed in the trenches was mapped, and chip sampled across one to two metre intervals. A total of 560 continuous chip samples were taken, representing 631.1 metres of exposure in 47 trenches and outcrop. Trench locations are shown on Plates 2, 3, 5 and 6, geology and sampling results are illustrated on Figures 4 to 10. The trench data is summarized in Table 2. The sample numbers are from the 24000 to 24750 tag series. The grid co-ordinates and azimuth for each trench were determined at the 0 metre end. All the trench sample results are listed on the Sample Ledgers in Appendix C.

TABLE 2 SUMMARY OF 1990 TRENCH DATA

TRENCH NO.	GRID N	LOCATION E	ELEV. m	AZ DEGREES	LENGTH m	SAMPLED FROM-TO	SAMPLE NUMBERS	NO. OF SAMPLES
ROAD #1	9985	9487	1572	258	32	E-W	028-050, 101-109	32
1	10052	9049	1660	183	11	N-S	017-027	11
2	10038	9053	1659	191	16	N-S	001-016	16
3	10017	9057	1664	190	38	N-S	110-147	38
4	10002	9126	1638	150	5	NW-SE	148-153	6
5	9998	9137	1634	150	22	NW-SE	154-175	22
6	9911	9432	1618	260	24	E-W	176-194	19
7	9876	9395	1635	155	4.7	N-S	195-199	5
8	10078	9293	1545	130	12	NW-SE	200, 551-561	12
9	9900	9304	1621	202	10	N-S	562-571	10
10	10029	9757	1495	145	36.4	NW-SE	506-523	18
11	9897	9595	1590	184	19	N-S	572-590	19
12	9875	9588	1604	170	8	N-S	591-598	8
13	9865	9585	1611	165	9	N-S	599-600, 251-257, 528	9
14	9827	9565	1635	305	12	NW-SE	351-362	12
15	9818	9572	1638	227	8	NE-SW	363-370, 529	8
16	9715	9647	1649	190	8	N-S	371-378	8
17	9878	9831	1537	125	12	NW-SE	262-266, 497-499	5
18	9925	10068	1459	054	5	NE-SW	267-271, 500	5
19	10177	10014	1397	077	27	W-E	381-407	27
20A	9885	10182	1425	045	17	SW-NE	408-424	17
20B	9893	10196	1418	050	17	SW-NE	425-441	17
21	9913	10182	1417	075	9	W-E	273-281	9
22	9900	9987	1480	055	16	SW-NE	282-297	16
23	9937	10040	1457	050	11	SW-NE	298-300, 451-458	11
24	10025	10130	1409	040	13	SW-NE	459-470	12
25	10044	10147	1400	030	16	SW-NE	471-486	16
26	9393	9892	1586	000	14.6	S-N	232-245	14
27	10024	9886	1465	040	12	SW-NE	601-612	12
28	10014	9882	1470	055	6.5	SW-NE	613-619	7
29	10030	9873	1463	190	26	N-S	620-642	23
30	10010	9873	1474	195	4	N-S	493-496	4
31	10155	9957	1396	087-026	8.8	W-E	643-650, 442-444	11
32	10163	9864	1375	026	14.2	N-S	651-665	15
33	9420	9924	1572	000	15.2	S-N	307-316	11
34	10206	10085	1384	019	8.6	S-N	666-674	9
35	10075	8618	1676	051	9.1	SW-NE	079-086	8
36	9992	8705	1670	054	7.8	SW-NE	087-093	7
37	10065	8627	1680	065	3.2	SW-NE	094-096	3
38	10058	8632	1682	080	15.2	W-E	099-100, 201-208	10
39	10080	8644	1667	090	21.3	W-E	209-222	14
40	10070	8663	1666	000	4.3	S-N	223-225	3
41	10090	9840	1429	045-113	18.3	W-E	501-504	4
42	10053	9776	1475	350	3.5	S-N	226-228	3
43	N.W. GOSSAN			345	5.9	S-N	072-075	4
44	N.W. GOSSAN			355	4.9	S-N	076-077	2
45	9477	9898	1583	068	4.0	SW-NE	301-303	3
46	WC CONT. CHIP				5.3	W-E	063-067	5
					<u>630.8</u>			<u>560</u>

6.2

TRENCHING RESULTS

The Fog Showing was identified in 1984, and tested with drill hole 89-38 in 1989. Six continuous chip traverses were sampled during 1990 (Trenches 35-40, Figure 9) across zones of narrow quartz-sulphide veins in limonitic, silicious, andesitic tuffs and flows. Native gold was seen in one 5 m vein at the southwest end of Trench 35, which returned 7.5 gm/T Au over 0.76 metres. With one exception, the remainder of the samples returned less than 1000 ppb gold. Fractures generally strike 130°-150° and dip /65°-80° to the southwest.

Trenches 1 to 3 (Figure 4) were excavated east of the Fog Showing to test similar narrow veins in pyritic tuff. Sample 24126 from a leached zone in Trench 3 assayed 0.111 opt Au over 1 metre; few of the remaining samples exceeded 1000ppb gold. Although the predominant vein orientation in these trenches is 155°-175°/ 50°-80° SW, cross fractures at 080°/50°-60°N are locally developed. These trenches are directly upslope of talus samples FST 65-74.

Visible gold was obtained in panned samples of soils taken below Trenches 4 and 5 (Figure 4). Trench 4 uncovered brecciated to gouged material with very low values in gold. Trench 5 exposed a light grey-green silicious tuff with 3-5% pyrite. Fracture orientations varied widely and only one thin mineralized vein was seen. Gold results were generally low, and did not explain the visible gold in the adjacent soil. Trench 8 (Plate 4 and Figure 5) was excavated in sub-outcrop of Stuhini tuff in the middle of Edziza-derived overburden; gold was visible in panned samples of soil taken immediately down slope. A shear zone (160°/50°SW) was exposed with intense silica alteration in the hanging wall, but gold values were generally low. This trench tested one of the soil geochemical trends on the detailed grid.

A large number of mineralized fractures, with veins from 5 m to 10 cm wide, was exposed in silicious tuff in Road Trench #1 (Figure 4). Attitudes vary between 138°/78° SW and 205°/70° NW. Fine gold was seen in panned samples of rubble, but only one chip sample assayed above 1000 ppb gold. A sample of a 1 cm vein from this interval assayed 24.0 gm/T Au. A number of soil samples were taken across the slope above Road Trench #1, and panned. Trenches 6 and 7 (Figure 5) were located as a result. Very good results in gold were returned by samples from both trenches with assays of 23.8 gm/T Au and 1.68 gm/T Au, both across 3 metres in Trench 6, and 0.093 opt Au across 3 metres in Trench 7. The higher grade samples in Trench 6 were from a yellow stained (scorodite), sheared and fractured zone trending 135°/ 60°-70° NE. Trench 7 exposed sub-outcrop of yellow stained gouge and rusty stained, very silicious fractured tuff.

Trench 9 (Figure 5) was excavated east of a large bleached white to yellow alteration zone in fault gouge. Sheared and fractured crystal tuff/feldspar porphyry was exposed. Gold values were less than 1000 ppb.

Six trenches (11-16) were dug immediately west of the intrusion to test a zone of bleached, altered tuffs. Fine flakes of gold were seen in a number of panned samples from below Trench 11 (See Figure 6). Bedrock exposures in these trenches were predominately of extensively fractured and altered, bleached and yellow stained, very silicious tuffs. The south end of Trench 11 and north end of Trench 12 were stopped in a basalt dyke; the contacts were at 120°-125°/75°-80° SW. Trench 15 was oriented perpendicular to a very silicious shear zone striking 140°/75°SW. This zone was barren. Chip samples from the remainder of the trenches were in the 100 ppb gold ranges, and two contiguous one metre samples from Trench 11 averaged 1.54 gm/T Au.

The northern extension (Norex) of the intrusion, north of drill hole S-2, was tested with a number of trenches. Two trenches, 10 and 42 (Figures 6 and 10), were excavated to sample the tuffs in the hanging wall of the quartz monzonite. None of the samples from these trenches exceeded 250 ppb Au. Malachite stained subcrop near the center of the quartz monzonite was sampled in Trench 41 (Figure 10). Gold values were in the 200 ppb to 500 ppb range. Better values were obtained from samples of intrusive in Trench 17 (Figure 7) near the hanging wall contact 1.34 gm/T Au over 5 metres. The quartz monzonite was typically weathered, soft and rusty stained, with numerous narrow quartz veins.

The remainder of the trenches (27-30 and 32, Figures 8 and 9) were located to test a zone of quartz-carbonate veining associated with very weathered and leached quartz monzonite close to the underlying volcanics. The veining and alteration may occupy a fault zone which strikes 355°. The best gold results were from samples of rusty ash tuff near the quartz monzonite contact in Trenches 29 and 30 (1.16 gm/T Au/1 metre and 1.37 gm/T Au/1 metre, respectively) and from a two metre section of quartz monzonite in Trench 32 (1.92 gm/T Au). The remainder of the gold results from Trenches 27 to 30 were relatively elevated, averaging 465 ppb Au.

Five holes were drilled in 1989 to test the southern extension of the quartz monzonite. All were terminated short of their objective due to squeezing ground. An 8.8 metre sample of fragments of altered volcanic and quartz monzonite from immediately below the collar of hole 89-33 assayed 10.0 gm/T Au. Three exposures in the vicinity were chip sampled during 1990. Trench 26 (Figure 8) sampled 14.6 m of andesitic tuff and quartz monzonite at the collar of hole 89-33. The results were very encouraging with gold assays of 5.1 gm/T Au over 13.6 metres including 9.25 gm/T Au over 6.25 metres. The higher grade material occurred within a silicious, pyritic andesitic tuff with traces of arsenopyrite and chalcopyrite.

Trench 33 (Figure 9) was excavated in subcropping rusty ash tuff 40 metres northeast of Trench 26. The majority of the samples returned less than 0.14 gm/T Au. Similar results were obtained from samples from Trench 45 (See Figure 10). This trench was oriented approximately perpendicular to the regional trend.

A number of targets for trenching were identified in the gullies draining the east side of the intrusion through prospecting and panning. Panned samples of soil in the vicinity of Trenches 20A, 20B and 21 (Figure 7) were found to contain numerous fine to medium grained flakes of gold. Mineralization in thin fractures exposed in the feldspar porphyry in the creek bottom consisted of quartz, pyrite and arsenopyrite. Most had a strike around 160° and dipped vertically to steeply west. Pieces of float arsenopyrite vein material to 3 cm thick were found in overburden in the gully. At least one gold-bearing zone can be defined from the sampling results in these trenches. The zone trends 145°, while the mineralized fractures within it have average strikes of 165°/70°W and 205°/80°E. Gold assays within the zone varied from a low of .10 gm/T to 7.1 gm/T; 40% were over 3.4 gm/T. The overall average is 2.78 gm/T Au, over a width of 7 metres.

Trench 18 (Figure 7) was excavated to find the source of gold in pan concentrates. Rusty and weathered ash-crystal tuff or feldspar porphyry was exposed. Five, one metre samples averaged 1.5 gm/T opt Au. Assays for metallic gold indicated there was particulate gold in sample 24270. Trenches 22 to 25 (Figure 8) were sampled in the bottom of the gully north of Trench 18. Trench 22 exposed rusty, fractured ash and ash-crystal tuffs. Over 50% of the samples exceeded 0.7gm/T Au. Similar rock was found in Trench 23, but only the sample from a yellow stained shear zone was high in gold - 10.66 gm/T over 1 metre. One sample from each of Trenches 24 and 25 exceeded 3.4 gm/T Au.

Three high grade gold veins (17.0 gm/T Au over 10 to 25 cm) were exposed in a road cut in 1979, and called the Barrel Showing by Cominco (Pauwels & Sorbara, 1985). Trench 19 was excavated to expose these veins. Three one metre samples of crystal-ash tuff, each of which included a 10 to 15 cm shear zone mineralized with quartz-carbonate veining and trace to minor pyrite, arsenopyrite and manganese oxides, assayed 2.22gm/T Au, 1.58 gm/T Au, and 1.81 gm/T Au (Figure 7). Weathered vein material from the shear in the first sample was panned, and native gold was visible in the concentrate. Metallic gold analyses of the three samples indicated that the last sample probably contained relatively coarse particulate gold.

Trenches 31 and 34 (Figure 9) sampled narrow shear zones west and east of Trench 19, respectively. A sample over 0.35 m of poorly mineralized grey silicious ash tuff from Trench 31 assayed 13.2 gm/T Au; the shear zone returned 525 ppb Au. A two metre section of crystal tuff in Trench 34 averaged 0.96 gm/T Au.

Two trenches (43 and 44, Figure 10 and Plate 6) were sampled in the Northwest Gossan. Only one sample returned over 5 ppb Au. Trench 46 (See Figure 10 and Plate 3) was excavated across a shear zone in the soil gold geochemical anomaly east of West Creek. One sample across 0.76 metres of iron-oxide-stained silica boxworks with 5-7% pyrite assayed 202.7gm/T Au.

Detailed mapping of many of the trenches revealed that, west of the intrusion, the majority of the mineralized veins were in fractures striking predominantly 140° to 160° and dipping steeply southwest. On the east side of the quartz monzonite the mineralized fractures were oriented 160° to 170° and dipped vertically to steeply west. The best gold grades were obtained from shear zones mineralized by quartz-carbonate veins with pyrite and arsenopyrite, or the weathered and oxidized (yellow-stained) equivalents.

Diamond drilling targets were selected, on the basis of the results from trench samples, between Trenches 6 and Road #1; beneath Trenches 20A, 20B and 21; under Trench 26; and the vicinity of Trench 17. The quartz-carbonate vein zone exposed in Trenches 29, 30 and 32 was sampled by three drill holes, and one hole was drilled beneath Trench 31.

### 6.3

#### ROCK SAMPLING RESULTS

In addition to the trench sampling program, 95 individual rock chip, grab or float samples were taken. Grid locations, analytical results and brief descriptions of these are presented in Table 3. All samples were analyzed for gold, either geochemically or by fire assay, by Min-En Laboratories. Several samples were also analyzed for copper or zinc. The analytical procedures are in Appendix A. Rock sample locations are shown on Plates 2, 3 and 5.

Samples from the vicinity of the "4440 Vein" returned consistently high gold values. This showing was found in an overburden covered area by prospecting north of Trenches 19 and 34 late in the 1990 program. Another group of high grade samples (24247, 248, 250, 677) were taken in the "Skarn Showing" area. Samples 24060-062, with 1.95 gm/T to 5.4 gm/T Au, were taken from the "WC showing". Three grab samples of 1 cm to 2 cm quartz-carbonate veins found north of Trench 9 returned high gold assays 4.1, 26.0 and 36.0 gm/T gold. Metallic gold analyses of the last two indicate the presence of particulate gold.



**TABLE 3 SUMMARY OF 1990 GRAB AND CHIP SAMPLE DATA**

SAMPLE NO.	TYPE	GRID LOCATION		ELEV m	AU		MET opt	CU ppm	COMMENTS
		N	E		ppb	opt			
24051	0.9	9297	9402	1660	25				qc vn in AN, 15-20% py, 2-3% sp.
24052	G	9293	9410	1650	80				from vn in 24051.
24053	1.1	GR Creek			4900	.149			30% py, 15% sp, 10% tt+gn, 5% as
24054	0.6	GR Creek			40				qc+py vns in FP
24055	0.9	GR Creek			5				MnOx in FP
24056	0.6	GR Creek			1250	0.47			10-15% qc+py in FP
24057	0.9	GR Creek			30				MnOx in FP
24058	1.2	GR Creek			5				Shear, altered VL tuff
24059	1.5	West Creek			5				7-10% qc vns in AN tuff
24060	0.2	West Creek			1650	.057			qc vn, 10-15% py, 5-7% gn, 3-5% cp
24061	1.1	West Creek			4250	.158			qc vns in AN tuff, sil, py, cp, sp, gn
24062	1.1	West Creek			5100	.137			qc xwk in AN tuff, cp, py, gn, sp
24068	0.6	West Creek			410				FeOx, MnOx, py, sp, rubble
24069	F	Monday Creek			25				qc vn, FeOx, MnOx, py
24070	0.9	Monday Creek			5				cal. vns w/py in AN
24071	F	Monday Creek			35				qc + py vns in Sil. tuff (?)
24078	1.8	NW Gossan			5				Bx, cal, py, FeOx
24097	1.1	Gr Creek			3050	.088			q + FeOx vn w/sp, gn, py, as, cp
24098	0.9	GR Creek			3310	.110			across vn .5 m N of 24097
24229	1.5	10117	9762	1460	80				AN tuff, bx, sil, py
24230	1.4	10114	9775	1461	115				QM, py
24231	1.2	10133	9853	1396	155				QM, sheared, FeOx, py, mal.
24246	1.8	9122	9595	1512		.009		3490	CS, sil, chl, cal
24247	2.1	9118	9594	1513		.359		6950	CS, mt, mal.
24248	1.2	9107	9581	1522		.446		21000	CT, ep, chl.
24249	1.2	9388	9897	1583		.465		665	VL, FeOx, py, as in vns
24250	0.3	9122	9595	1512		1.721		70,000	q xwk, w/in 24246
24258	G	10158	9860	1378	10500	.344			QM, sheared
24259	0.08	10570	10100	1198	865				q vn, FeOx, Sil, tuff
24260	G	10643	10140	1173	35				Tuff, sil, chl, + py
24261	1.0	10670	10205	1143	3000	.085			Tuff(?), sil, felsic
24272	1.0	10101	9997	1426	2440	.071			Vn zone, py, sp
24304	1.5	9476	9909	1579	10	.001		43	AT, sil, 2-3% py, FeOx
24305	2.1	9478	9913	1578	120	.004		49	continuous with 24304
24306	1.8	9474	9914	1576	10	.001		239	VL, sil, 2-3% py, FeOx
24317	G	9432	9979	1570	10	.001		1590	Q xwk w/10-15% as + py, FeOx
24318	3.4	9873	9038	1691	10	.001		105	AT, sil, 1% py + as, FeOx

TABLE 3 SUMMARY OF 1990 GRAB AND CHIP SAMPLE DATA

(Cont'd)

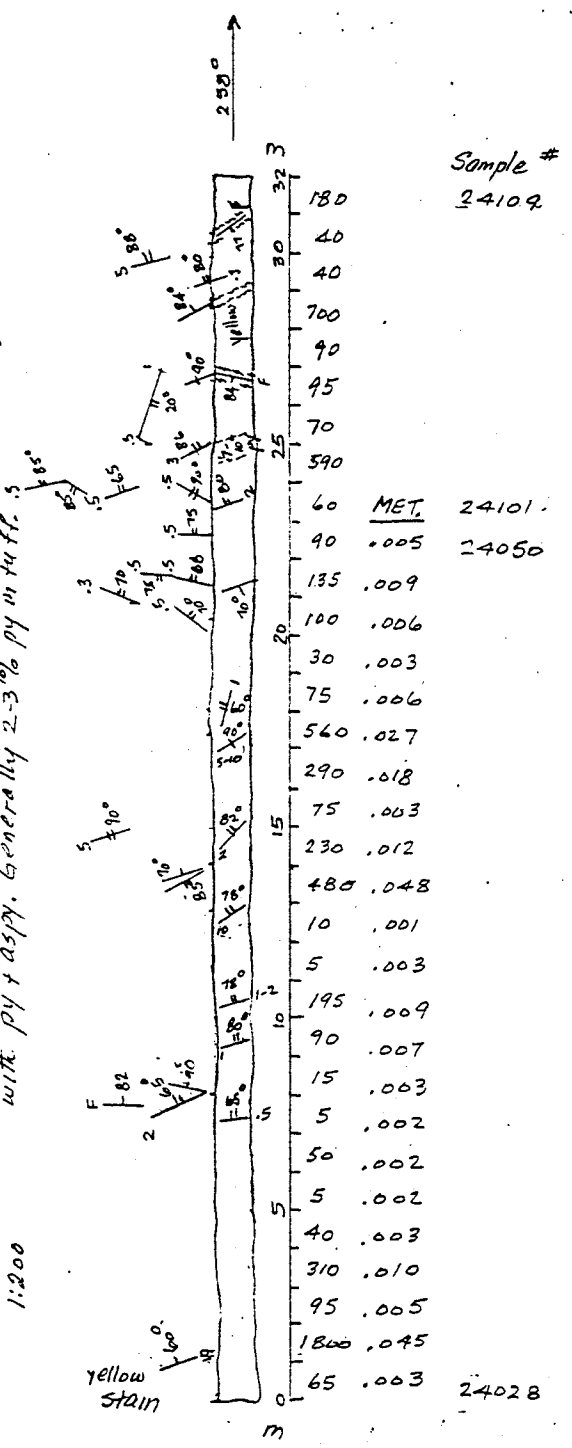
NO.	GRID SAMPLE TYPE	LOCATION		ELEV m	AU		MET opt	CU ppm	COMMENTS
		N	E		ppb	opt			
24319	1.8	9868	9036	1691	60	.002		149	continuous with 24318
24320	2.7	9877	9040	1691	950	.028		139	AT, q vns, FeOx, 2-3% py ± as
24321	2.1	9889	9045	1691	200	.006		45	AT, sil, 1-2% py + as, FeOx
24379	1.0	10005	10094	1433	1210	.035			qc + py + as vn
24380	0.8	10010	10092	1436	2510	.073			qc + py + as vn
24445	0.9	10132	9866	1390	290				QM, qc + py vns
24446	0.9	10132	9866	1390	181				continuous w/24445
24447	F	10400	9550	1405	300	.009		343	qc + py, as, sp
24448	G	10326	10047	1310	6550	.191		1200	4440 Vein, "top"
24449	G	10326	10047	1310	8640	.252		670	4440 Vein, "bottom"
24487	G	10485	10035	1238	22			442	Diss py, po
24488	0.08	10596	10113	1190	3420	.103		350	qc vn, w/py, as
24489	G	10657	10175	1150	41			340	DC + py, po; represents 61 m exposure
24490	G	10326	10047	1310	19200	.700		706	4440 Vein, qc + py, as, sp
24491	G	10014	9889	1465	389			2330	QM, qc + sp, py, as
24492	G	10020	9873	1468	502			2980	QM, q vns w/cp, FeOx
24505	2.0	10155	10018	1407	180				AT, sil, diss. py, po, as
24524	G	9921	9308	1608	3050	.120			qc + py, as vn. in FP
24525	0.7	10075	10126	1420	1800	.053			qc + py, as vn, oxidized
24526	0.7	10075	10126	1420	166				oxidized FP HW of 24525 vn
24527	G	10067	10127	1419	11500	.362			vn material, 10 m S of 24525, (S89MR03)
24675	1.2	10242	10160	1345	1990	.058		167	Lower vein in road cut
24676	1.2	10248	10155	1345	260	.008		46	Upper vein in road cut
24677	1.2	9111	9594	1514	5250	.153		9910	Q vns in tuff, py, cp
24678	0.4	9098	9565	1539	240	.007		570	Tuff, sil, py, cp
24679	0.65	9054	9550	1529	210	.006		275	Q vns, py
24680	0.9	9052	9552	1528	420	.012		154	qc zone, py
24681	1.0	9053	9540	1533	190	.006		794	
24682	0.4	9053	9540	1533	740	.022		142	
24683	0.5	10326	10047	1310	1940	.057	.062	176	4440 Vein, qc + py, as, sp
24684	0.2	10330	10046	1307	16400	.478	.494	512	4440 Vein, qc + py, as,
24685	0.7	10332	10046	1302	7600	.222	.231	970	4440 Vein, qc + py, as
24686	0.5	10334	10045	1399	7820	.228	.181	1310	4440 Vein, qc + py, as
24687	0.8	10339	10047	1295	280	.008	.008	472	Tuff, 1% py
24688	F	?	?	?	7410	.216	.221	177	qc, 20% py, .5% as
24689	G	8982	9656	1466	170	.005		37	qc, 2-5% py
24690	G	8942	9638	1488	20	.001		9	qc
24691	G	8886	9627	1518	360	.011		196	clay + qc, sp, gn, py
24692	G	8983	9608	1478	20	.001		17	qc, 50% py, sp, gn
24693	G	9483	9985	1573	23950	.699	.640	214	1 cm seam, w/in 24029, Rd. Tr. #1
24694	G	9471	9983	1575	980	.029		283	3 X 5 cm seams w/in 24041, Rd. Tr. #1

TABLE 3 SUMMARY OF 1990 GRAB AND CHIP SAMPLE DATA

(Cont'd)

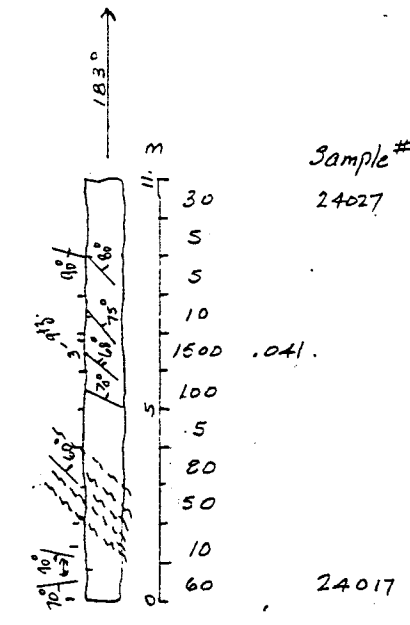
NO.	GRID SAMPLE TYPE	LOCATION		ELEV m	AU		MET		CU ppm	COMMENTS
		N	E		ppb	opt	opt	ppm		
24695	1.6	?	?	?	170	.005				AN, 15-20% py
24696	0.7	?	?	?	590	.017				AN, altered, 15-20% py, (2m W of 695)
24697	G	9877	9290	1632	380	.011				AN, 15-30% py, sp, cp, cal. vns
24698	G	9898	9294	1619	20	.001				AN, 10-15% py,
24699	G	9928	9299	1599	30	.001				AN, 10% py,
24700	G	9935	9300	1594	450	.013				AN, altered, 15-30% py, below 699
24701	G	9935	9300	1594	26000	.758	.885			q vn in AN, py, gn
24702	G	10134	9440	1493	36050	1.051	1.205			q vn
24703	G	9936	10226	1384	10440	.305	.397			qc vn, below Tr. #20B
24704	G				1780	.052		251		Vn. rock, sil. tuff, 15% py, 5% as
24705	G	samples			1360	.040		340		Vn. rock, as above
24706	G	from			1420	.041		132		Vn rock, 10% py, 2% as, 1% sp
24707	G	dump			320	.009		1810		chl. tuff, 30% py in veinlets
24708	G	at mouth			10	.001		1215		chl. tuff, 10% diss. py
24709	G	of adit			180	.005		256		Tuff, epidote, 20-30% py
24710	G	Hawk 1			20	.001		143		Tuff, as above
24711	G	claim			10	.001		231		Tuff, as above

ROAD TRENCH #1  
1:200  
Sil. tuff, weakly chloritic, rusty fractures, narrow qtz + carbonate veins, locally with py + aspy. Generally 2-3% py in tuff.



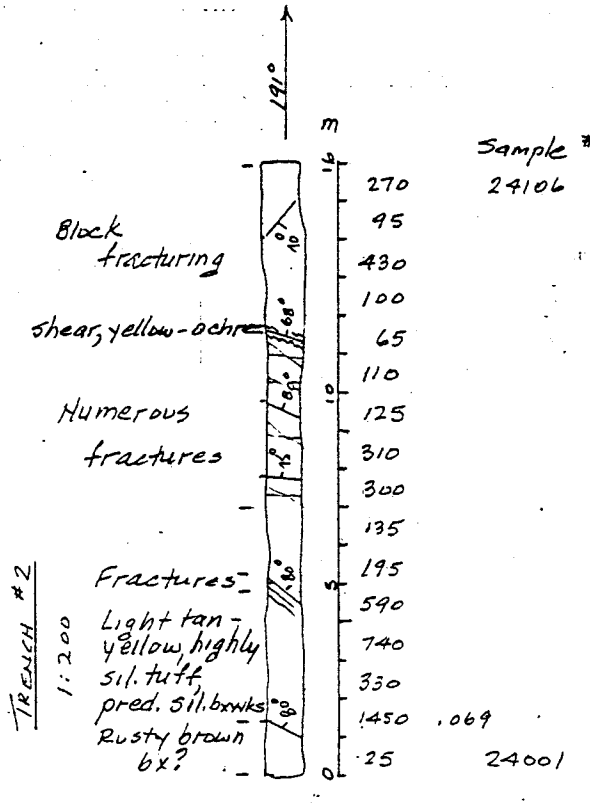
Sample #  
24109  
24101  
24050  
24028

TRENCH #1  
1:200  
Rusty stained, bleached-leached tuff(?)



Sample #  
24017  
24027  
2401

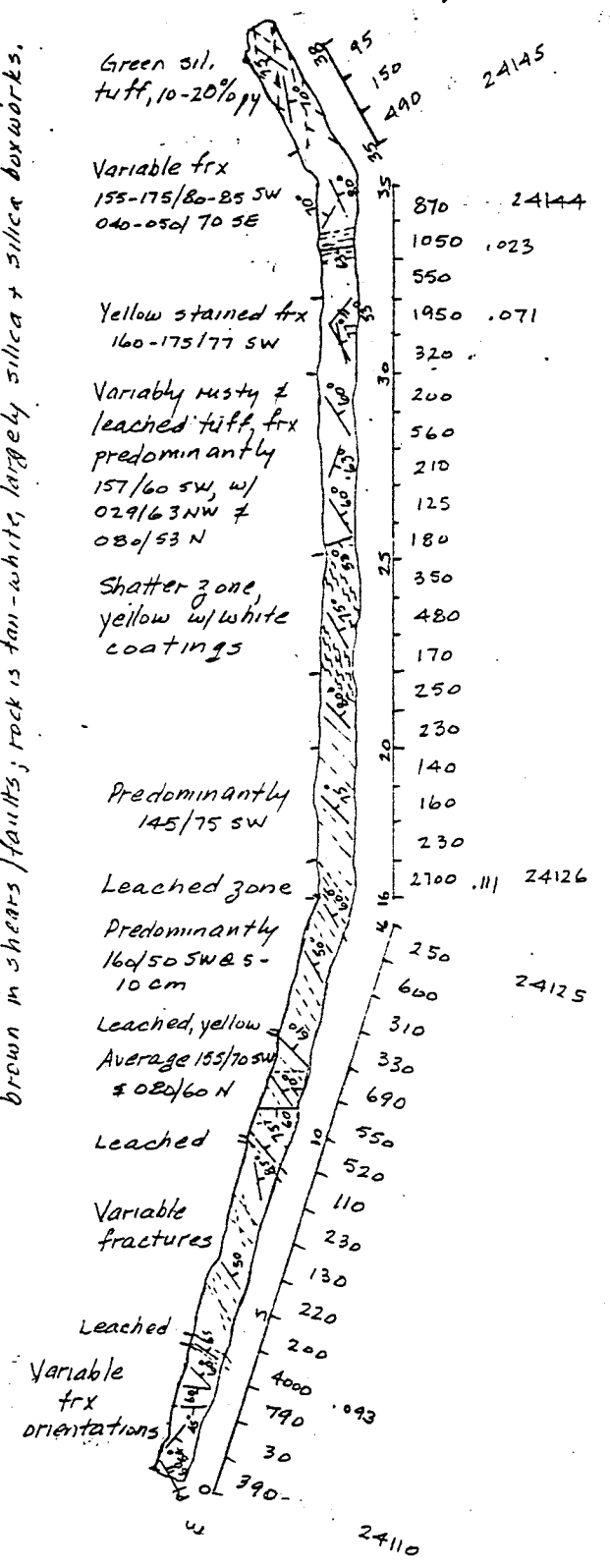
TRENCH #2  
1:200



Sample #  
24106  
24001  
0.069

TRENCH #3  
1:200

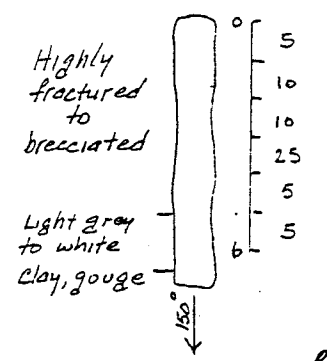
Light greenish-grey pyritic tuff. Locally py increases from 3-5% to 20%. Occasional epidote alteration. Generally rusty brown in outcrop except yellow-brown in shears/faults; rock is tan-white, largely silicea + silica boxworks.



Sample #  
24147  
24145  
24144  
24126  
24125  
24110  
24110  
0.093

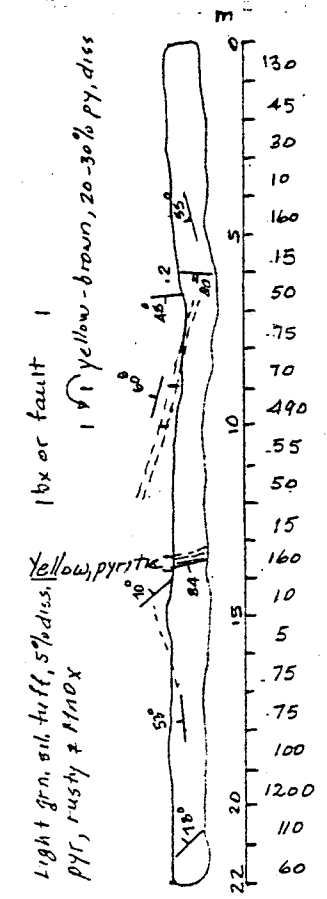
TRENCH #4  
1:200

Highly fractured to brecciated tuff, very rusty staining, fault?

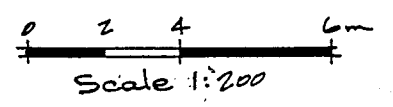


Sample #  
24148  
24153

TRENCH #5  
1:200  
Light grey green tuff, siliceous, pyritic, 3-5%, locally 7-10%. Rusty to pale, leached.



Sample #  
24154  
24175



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**SPECTRUM PROPERTY**

**TRENCH MAP**  
**ROAD TRENCH 1**  
**TRENCH 1, 2, 3, 4 and 5**

LIARD MINING DIVISION P.C.

Geology by: J.J.H. & K.L.C.	NTS: 1048/9WIDE	Fig. No.
Drawn by: J.J.H.	Scale: 1:200	4
Date: November 1990		

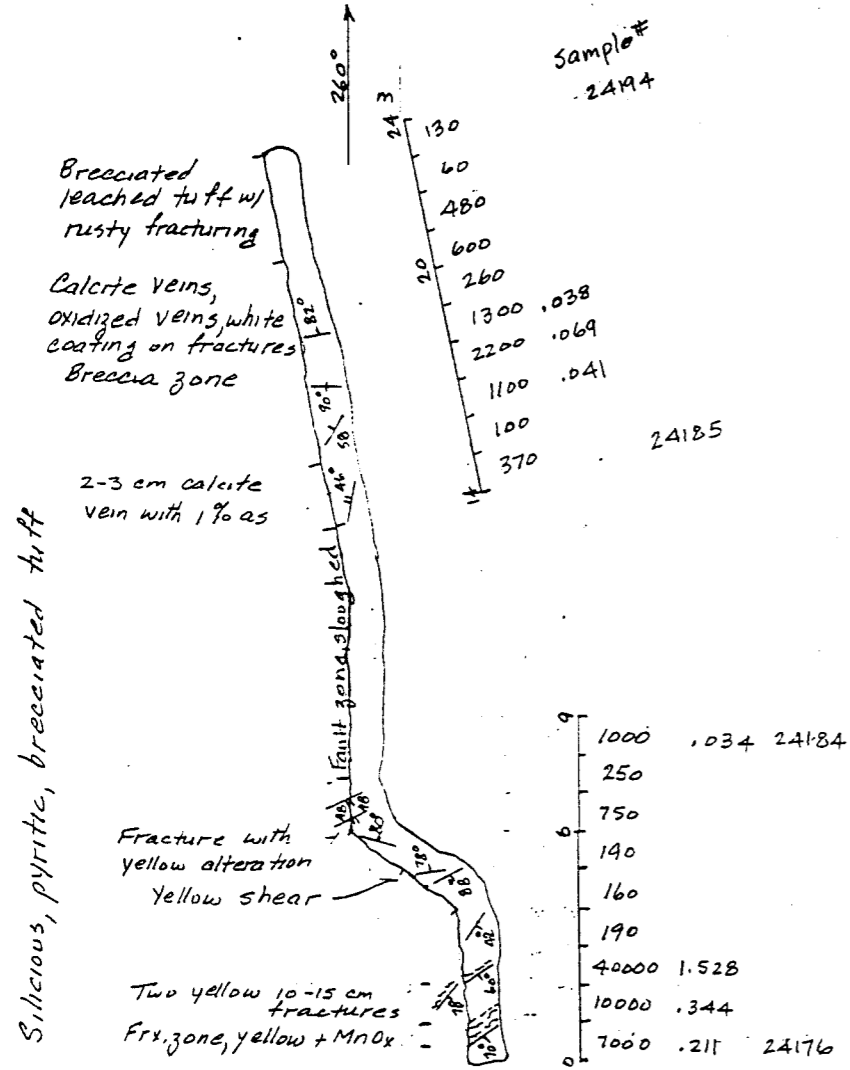
GEOLOGICAL BRANCH  
ASSESSMENT REPORT

GEOLOGICAL BRANCH  
ASSESSMENT REPORT

20,861  
PART 1 OF 4

TRENCH #6

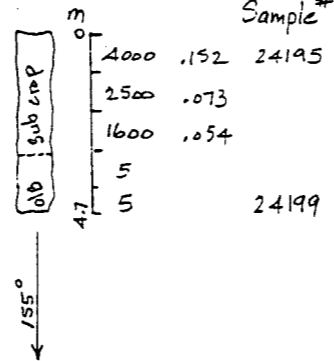
1:200



TRENCH #7

1:200

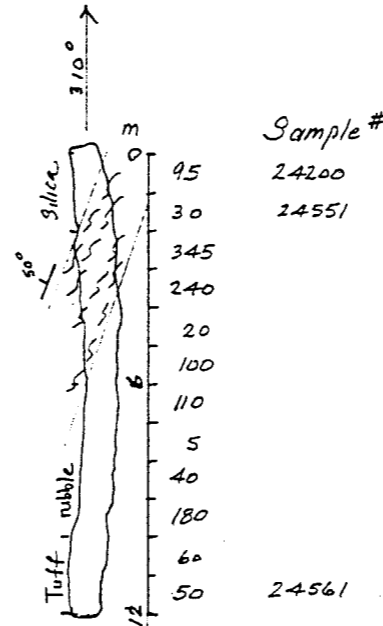
Yellow gouge & rusty coated fractured tuff, very sil., 5-15% py, looks like chert locally; oolitic grey green, 3% py; sections of "frothy" boxwork silice. Pred. sub crop, particularly at south end.



TRENCH #8

1:2000

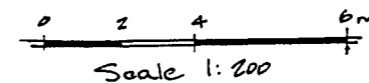
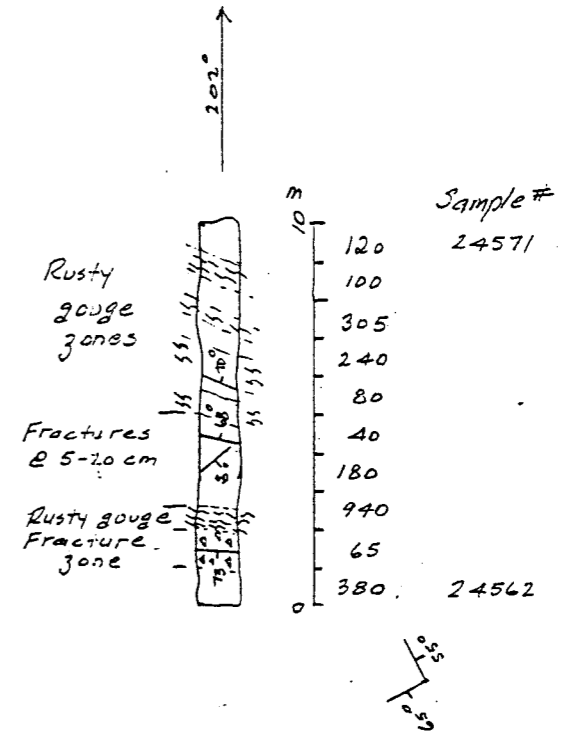
Most of trench is sub outcrop rubble. Weakly pyritic greenish tuff, 10-12m. Rusty shear 71m wide, 2-6m. HW is leached tuff(C), mostly silica w/minor py, 72m thick.



TRENCH #9

1:2000

Green grey to bleached yellow x1 tuff, locally por<sup>ls</sup>, py 3-10%



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SPECTRUM PROPERTY

TRENCH MAP

TRENCH 6, 7, 8 and 9

LIARD MINING DIVISION

Geology by: JJH & KK  
Drawn by: JJH  
Date: November 1990

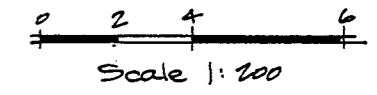
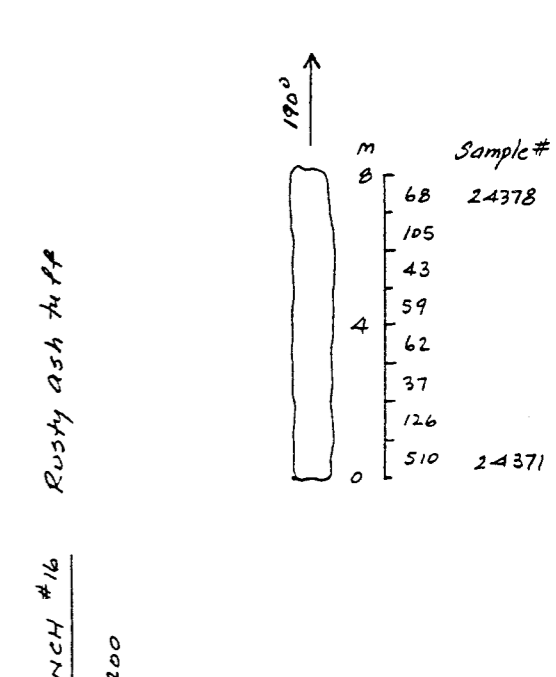
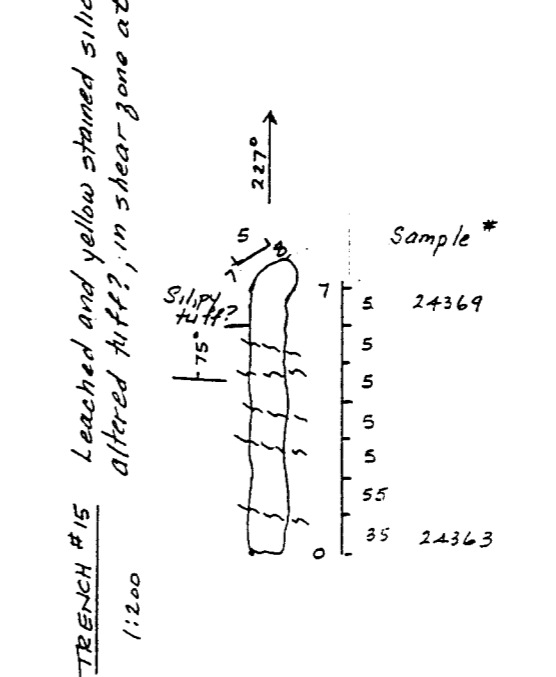
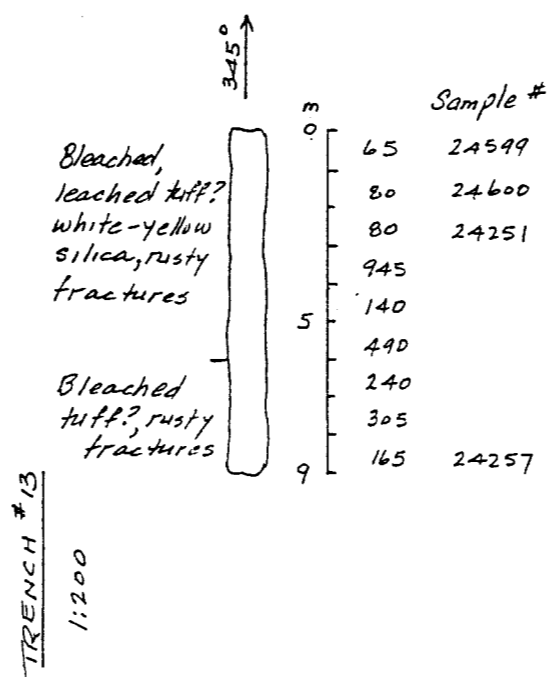
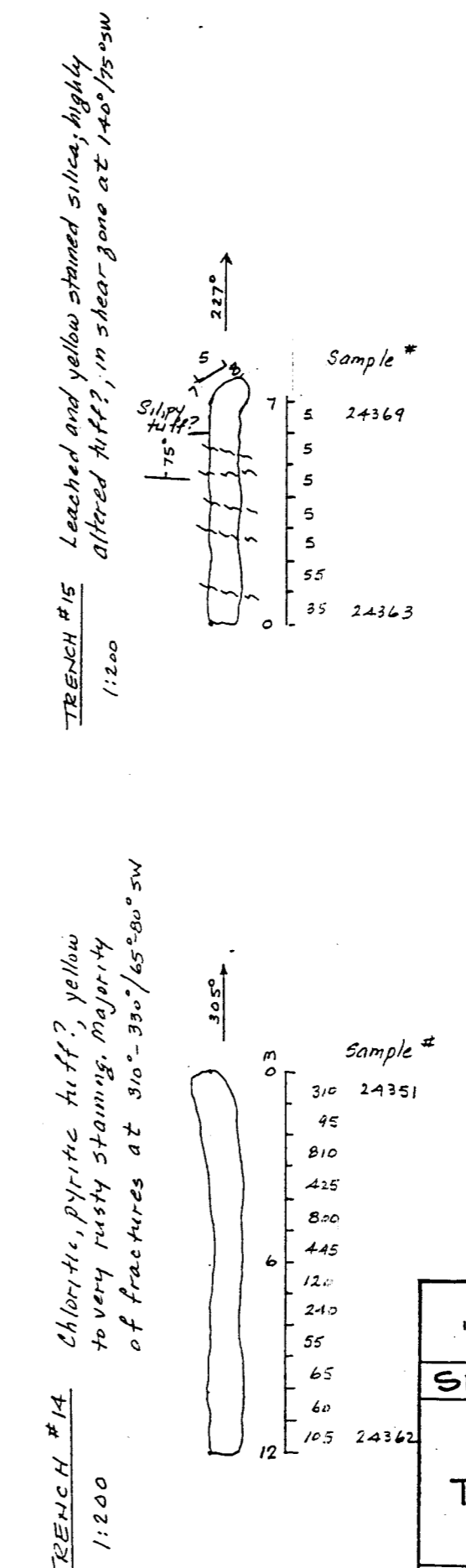
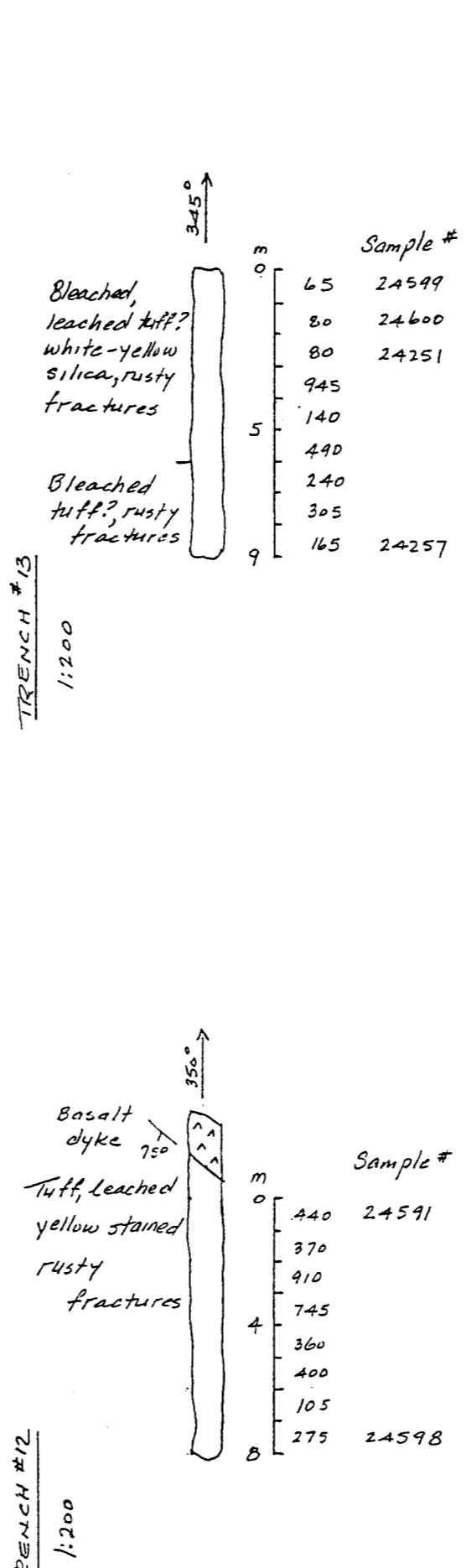
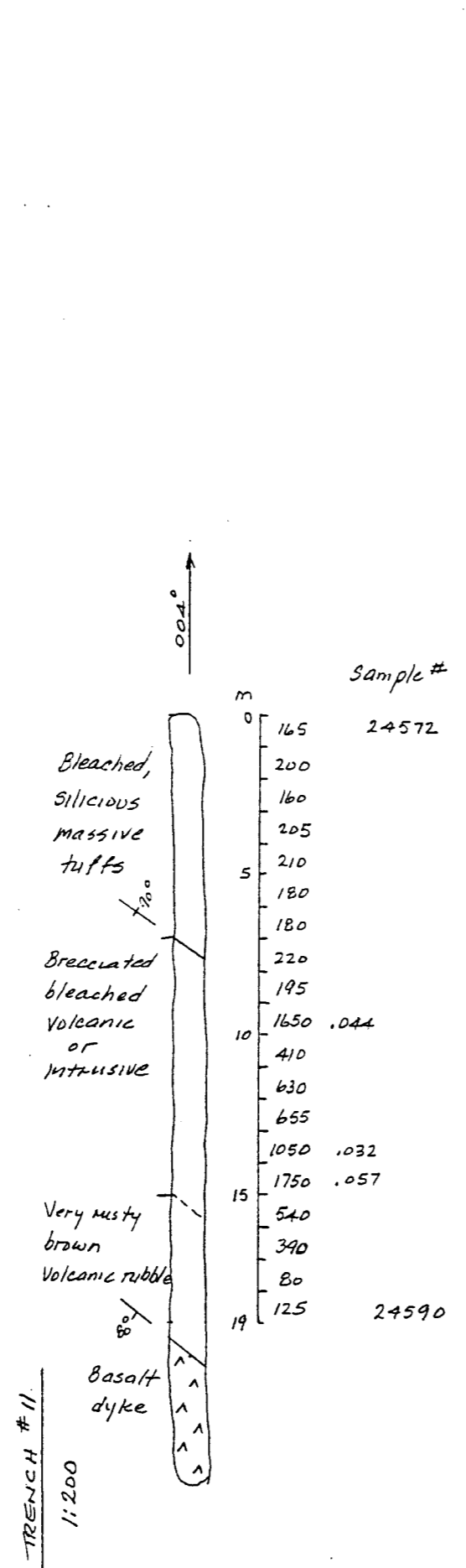
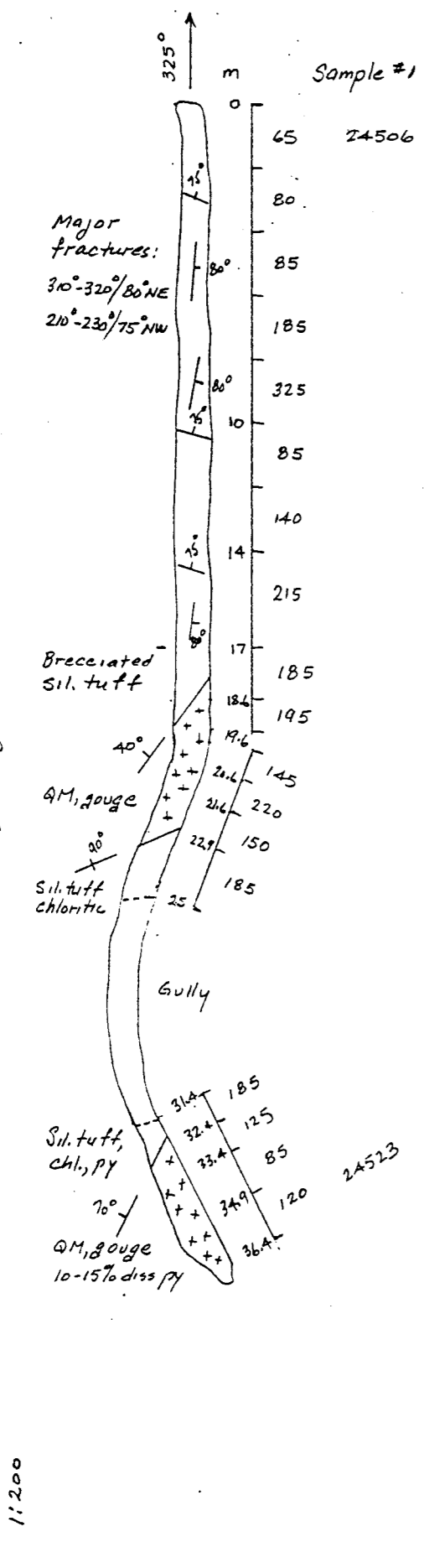
NTS: 104G/9E, 10W  
Scale: 1:200

Fig. No  
5

BC.

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TRENCH #10 Tuff, rusty, pyritic, chloritic, and quartz monzonite, white to light orange, weathered, soft



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**SPECTRUM PROPERTY**

**TRENCH MAP**

**TRENCH 10, 11, 12, 13, 14, 15 and 16**

Geology by: J.J.H., K.K.	NTS: 104G/9 W10 E	Fig. No
Drawn by: J.J.H.	Scale: 1:200	6
Date: November 1990		

**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**

**20,861**

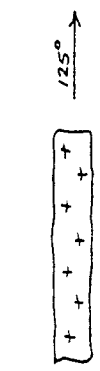
**PART 1 OF 4**

TRENCH # 18 Rusty ash-crystal tuft or feldspar porphyry



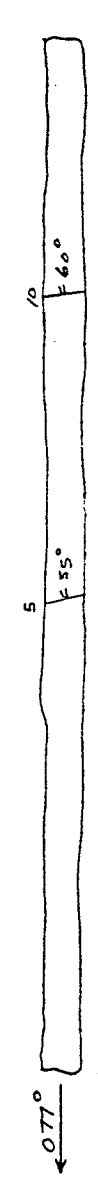
Depth (m)	Sample #	MET.
0-3	24267	1660 .048
3-5	24271	1180 .037 .087 3180 .023 .140 1190 .035 .031

TRENCH # 17 QM, weathered, misty



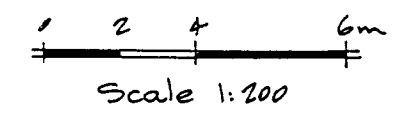
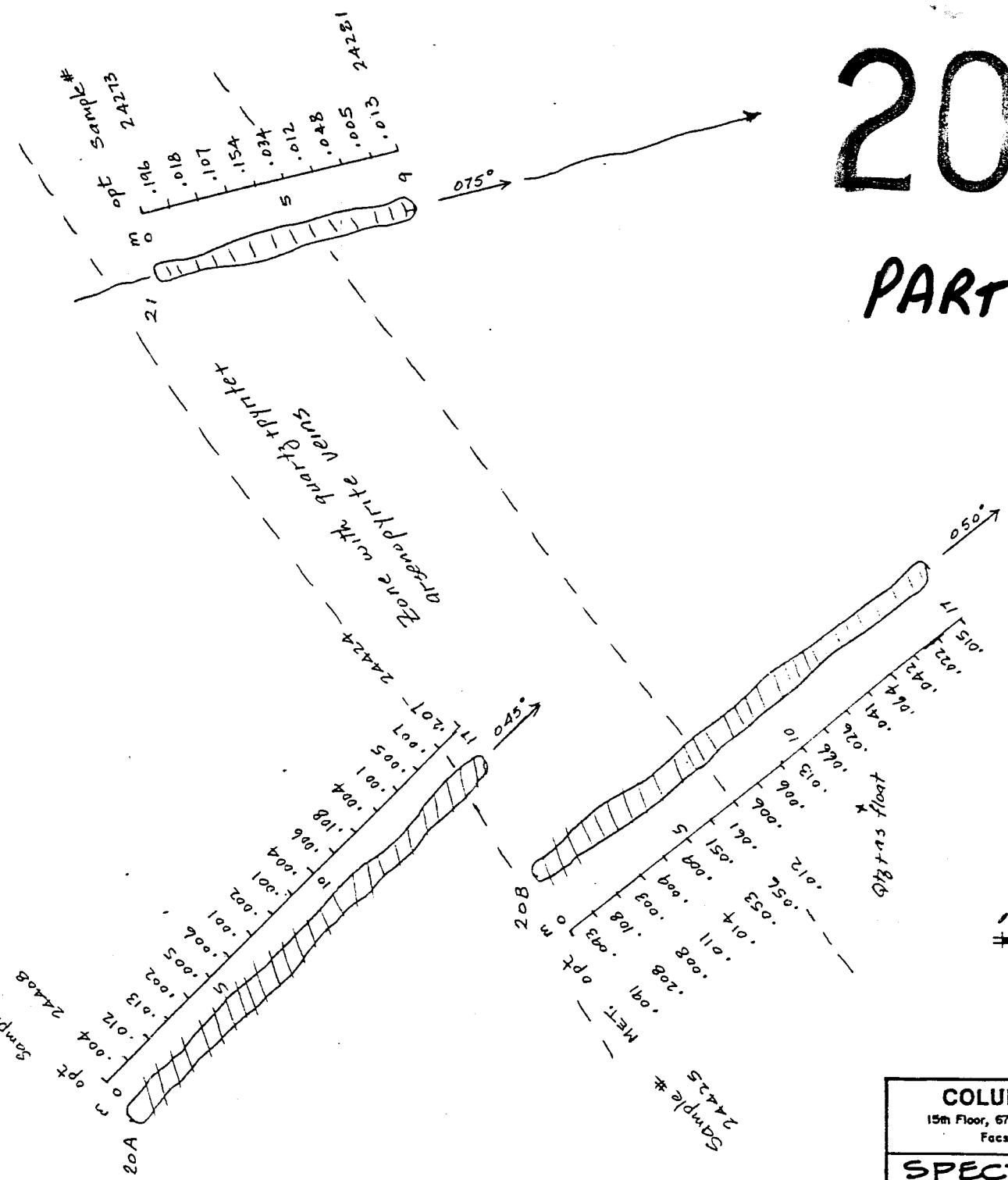
Depth (m)	Sample #	MET.
0-3	24499	1350 .041
3-6	24266	1890 .053
6-9	MET.	1000 .029
9-10	24262	1060 .034 .032
10-12	24262	1040 .038 .030
12-15	24262	605

TRENCH # 19 Predominantly crystal-ash tuft or feldspar porphyry, with local narrow (10-15cm) shears @ 155-160°/55-60° W, mineralized with quartz-carbonate veins ± MnO<sub>4</sub>, pyrite, arsenopyrite. Tuft is fractured, very rusty, oxidized. Exposed in road cut.



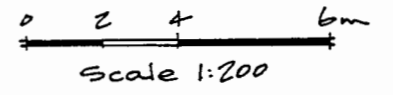
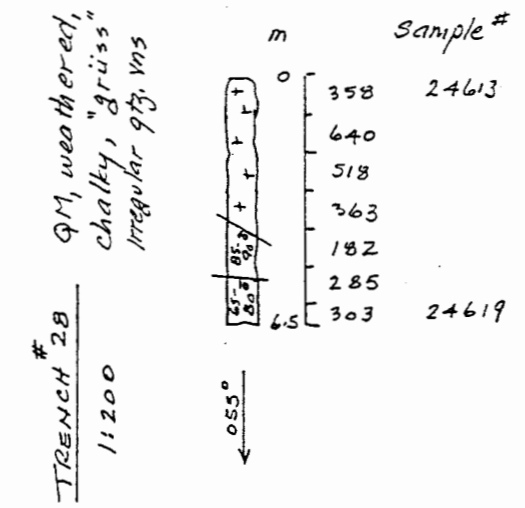
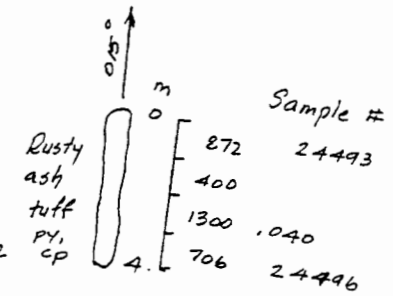
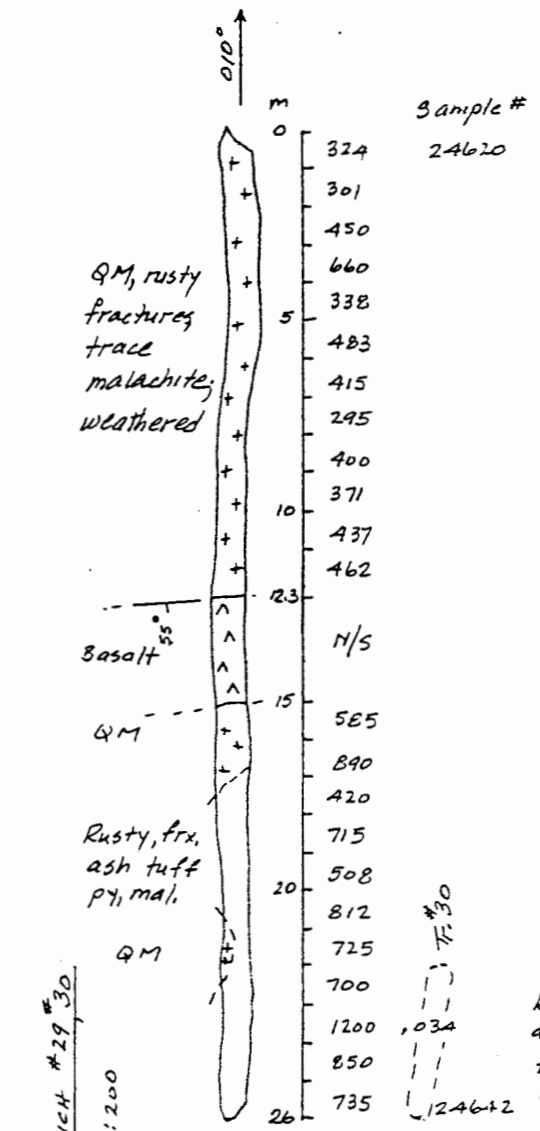
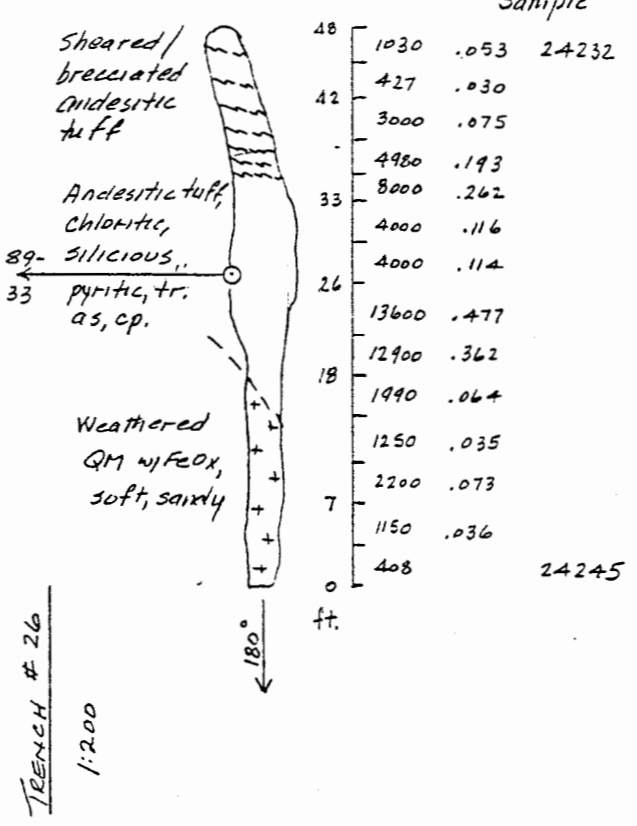
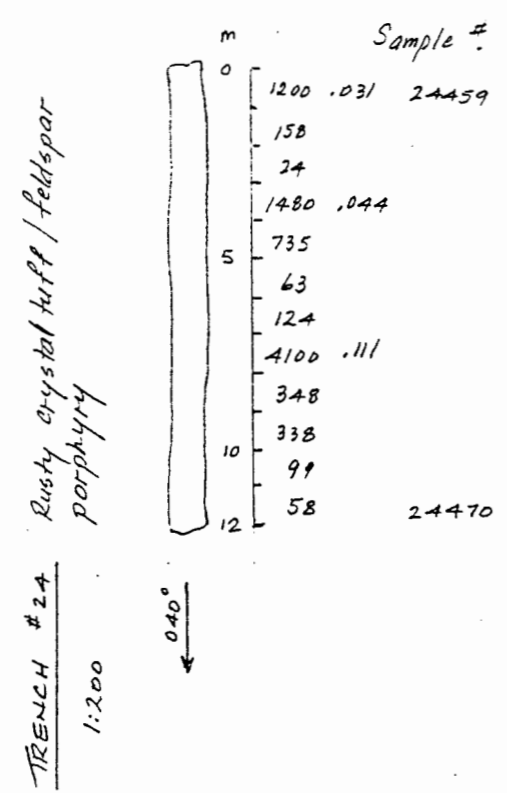
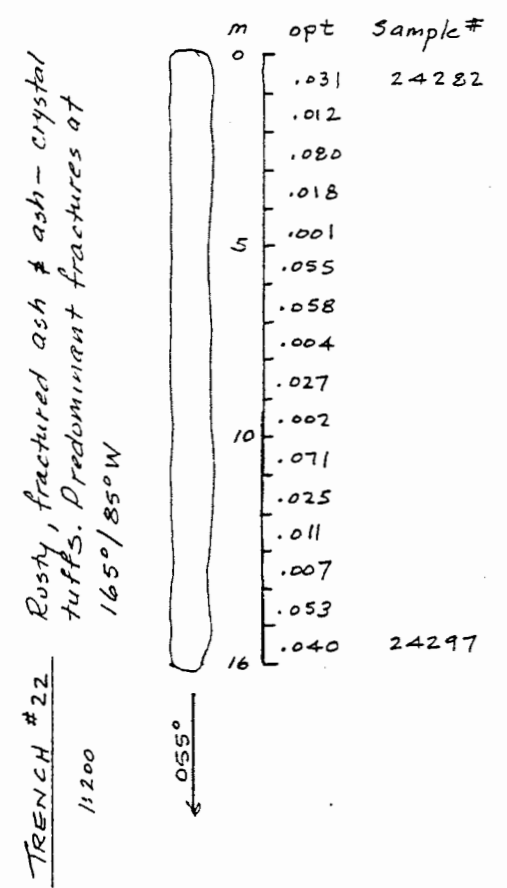
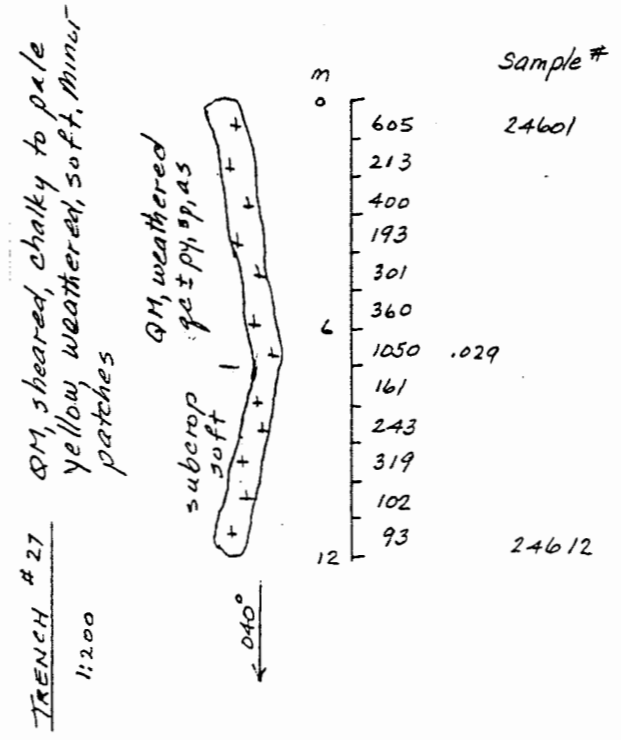
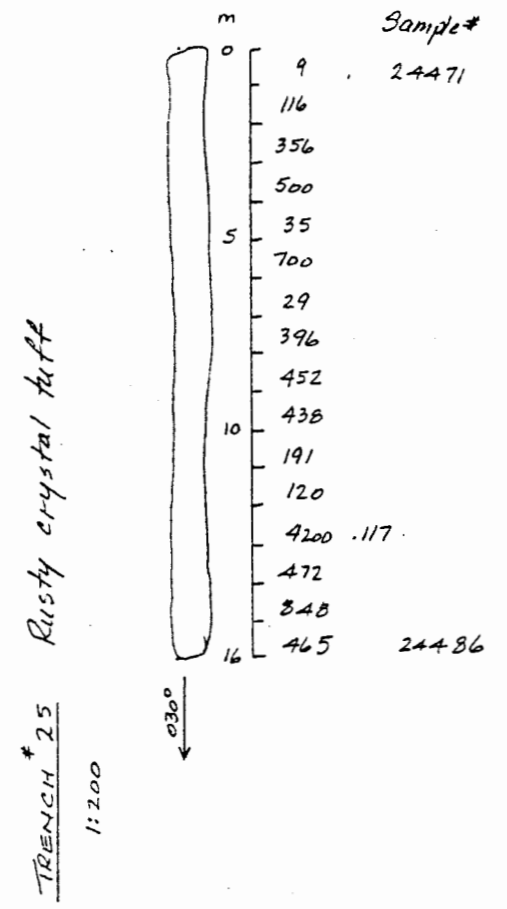
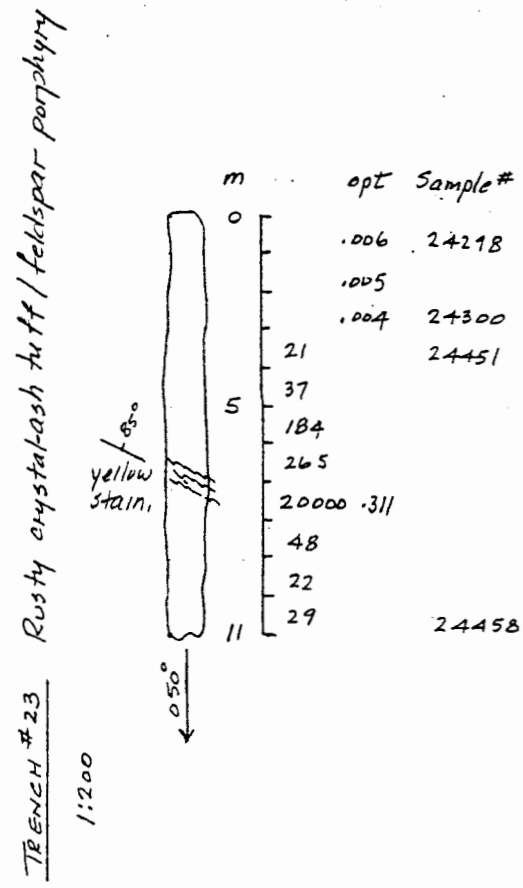
Depth (m)	Sample #	MET.
0-5	24381	56
5-10	MET.	123 138 44 49 217
10-15	24407	2150 .065 .073 263 175 418 266 43 38 109 1540 .046 .030
15-20	24407	42 3 1750 .053 .112
20-27	24407	23 39 2 193 48 10 61 2 222

TRENCHES 20A, 20B, 21 Crystal-ash tuft/feldspar porphyry with ±1mm parallel joints (30-40/metre) oriented 160°-170°/60°-80° W. Occasional cross fractures at 19°-22°/70°-85° E; 1-2 cm quartz veins in scattered joints, carrying pyrite ± arsenopyrite



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<b>SPECTRUM PROPERTY</b>		
<b>TRENCH MAP</b>		
<b>TRENCH 17, 18, 19, 20A, 20B and 21</b>		
LIAED MINING DIVISION		P.C.
Geology by: J.J.H., K.L.C.	NTS: 104G/9N/10E	Fig. No
Drawn by: J.J.H.	Scale: 1:200	7
Date: November 1990		

# 20861 PART 1 OF 4



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**SPECTRUM PROPERTY**

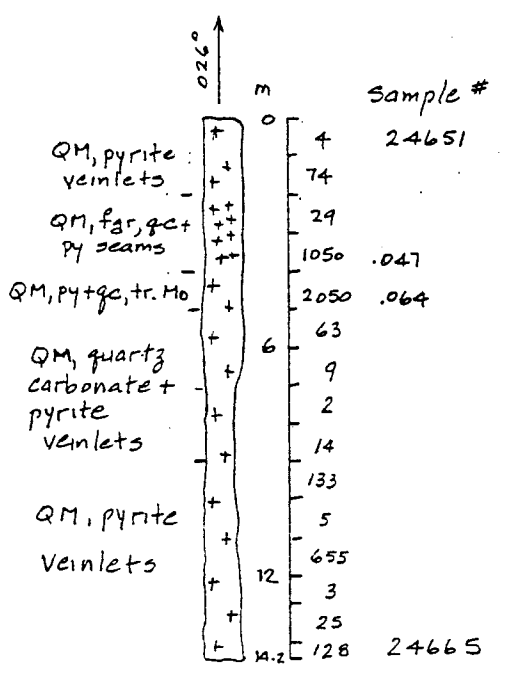
**TRENCH MAP**  
TRENCH 22, 23, 24, 25  
26, 27, 28, 29 and 30

LIARD. MINING DIVISION P.C.

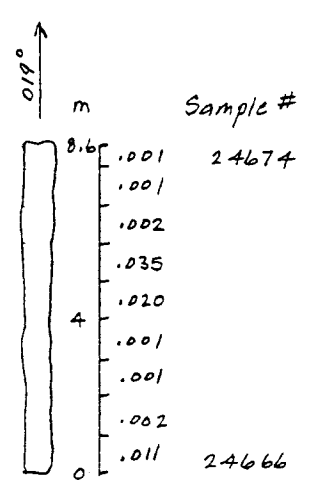
Geology by: J.J.H, I.C.K	NTS: 104G/QW, 10E	Fig. No
Drawn by: J.J.H	Scale: 1:200	8
Date: November 1990		



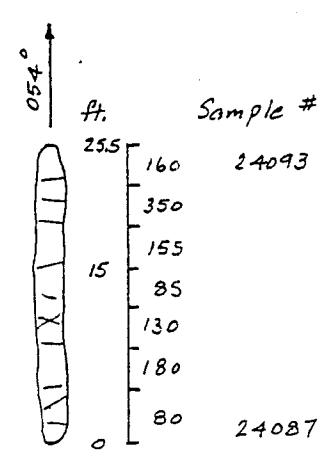
TRENCH #32  
1:200



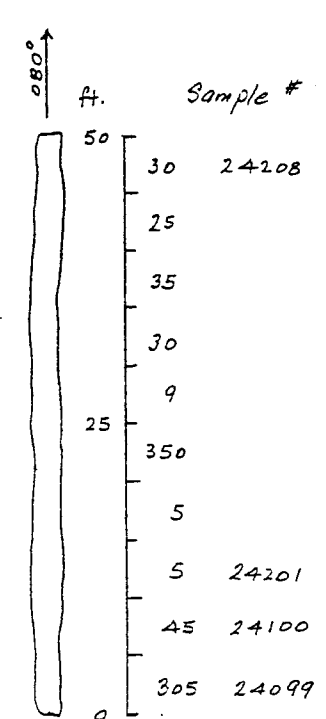
TRENCH #34  
Crystal tuff / feldspar porphyry



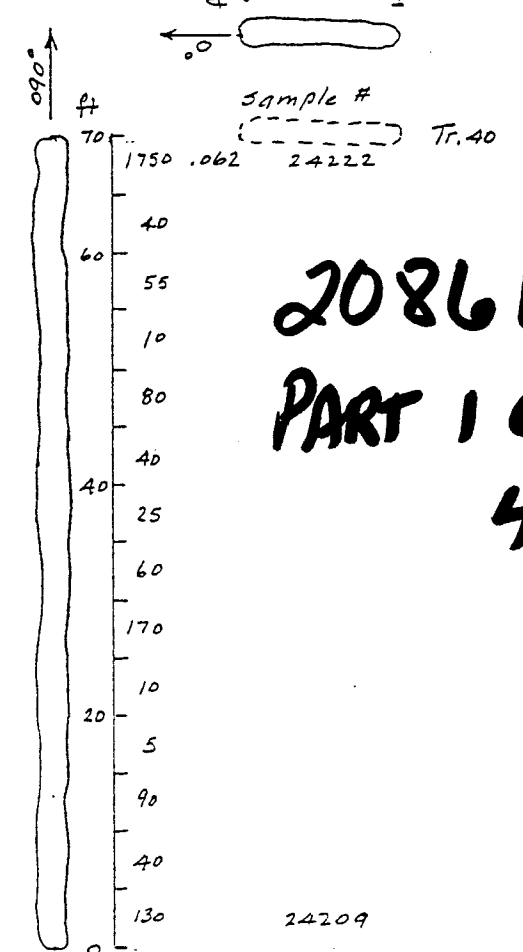
TRENCH #36  
1:200  
Flow or tuff, silicified, limonitic, 5-7% narrow qtz veins, 3-5% py, tr-1% cp. Vens generally trend 130°-150°



TRENCH #38  
1:200  
Ash-crystal tuff, silicious, 3-5% 1-3cm qtz-calcite-gauge stringers, 2-3% pyrite

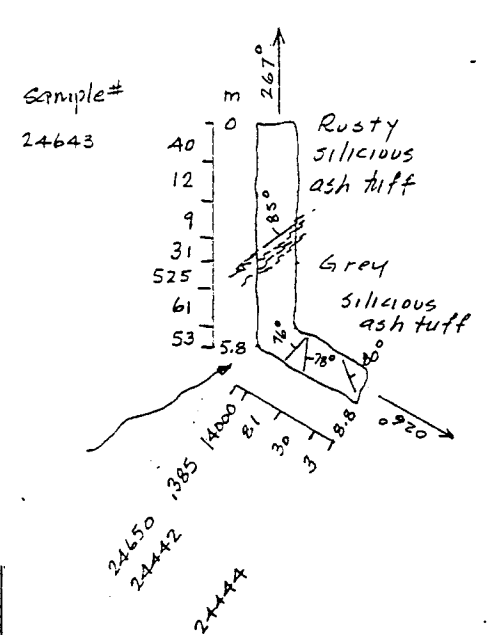


TRENCH #39, 40  
1:200  
Ash-crystal tuff, silicious, 3-5% veinlet pyrite. 5-7% quartz veinlets in Tr. 40

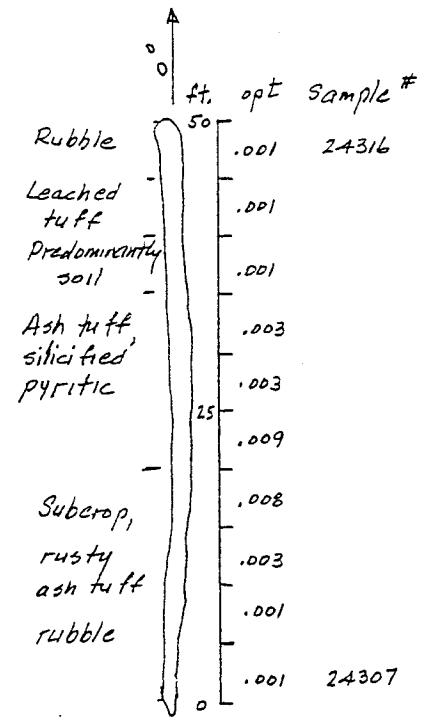


20861  
PART 1 OF 4

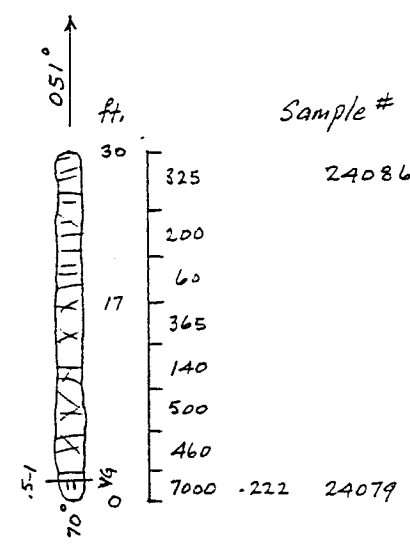
TRENCH #31  
1:200



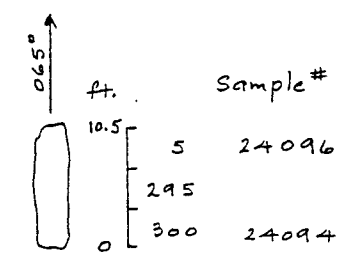
TRENCH #33



TRENCH #35  
1:200  
Andesitic tuff or flow, silicified. 5-7% narrow quartz veins @ 135°-150°/45°-80° SW; 2-3% py



TRENCH #37  
1:200  
Ash-crystal tuff, very silicious, 3-5% qtz. vns, 3-5% py + as



Scale 1:200

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**SPECTRUM PROPERTY**

**TRENCH MAP**  
TRENCH 31, 32, 33, 34  
35, 36, 37, 38, 39, 40  
LIARD MINING DIVISION BC.

Geology by: J.J.H. K.K. NTS: 1046, 9W, 10E  
Drawn by: J.J.H. Scale: 1:200  
Date: November 90

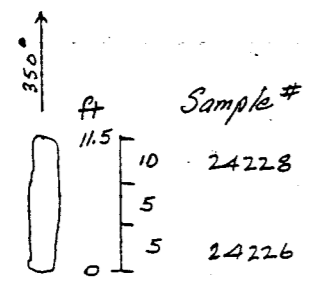
9

GEOLOGICAL BRANCH  
ASSESSMENT REPORT

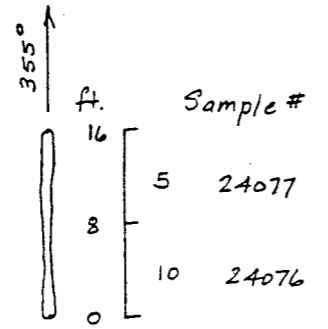
# 20,861

## PART 1 OF 4

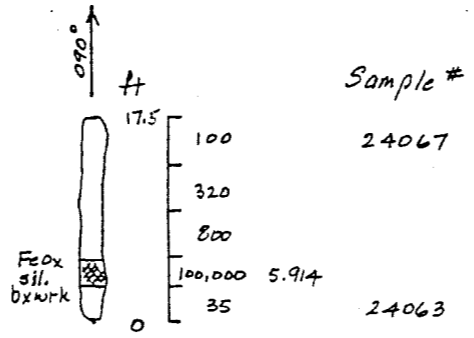
TRENCH #42  
11200  
Altered andesite tuff  
3-5% pyrite.



TRENCH #44  
1:200  
N.W. GOSSAN  
Andesitic ash tuff, silicious, yellow and  
FeOx stained, 2-3% pyrite

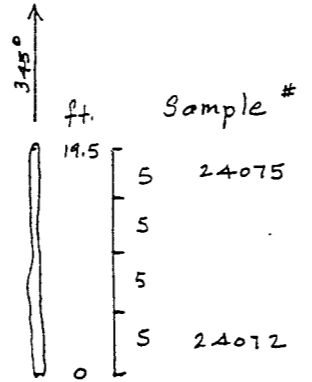


TRENCH #46  
1:200  
WEST CREEK, GR AREA  
Andesitic tuff, egf, 2-3% py, locally sheared.

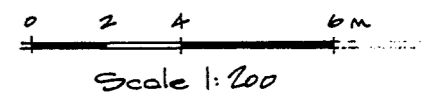
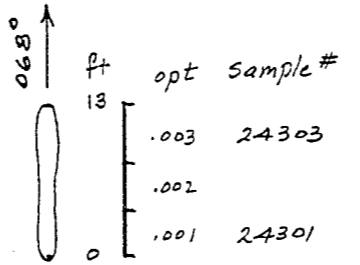


TRENCH #41  
1:200  
QM, weathered, chalky, grüss,  
2-3% diss. pyrite, minor FeOx,  
locally malachite + chalcopyrite

TRENCH #43  
1:200  
N.W. GOSSAN.  
Sheared (brecciated?) andesitic  
tuff, 7-10% gtz. veinlets,  
3-5% pyrite.



TRENCH #45  
1:200  
Ash tuff, silicious, locally  
sheared, 1-3% pyrite



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15th Floor, 675 W. Hastings Street, Vancouver, B.C., Canada V6B 1N2		
Facsimile (604) 687-2419 - Telephone (604) 687-4951		
SPECTRUM PROPERTY		
TRENCH MAP		
TRENCH 41, 42, 43, 44, 45 and 46		
Geology by: JJH KK	NTS: 10AG/9W, 10E	Fig. No.
Drawn by: JJH	Scale: 1:200	10
Date: November 1990		

7.0

## DIAMOND DRILLING

7.1

### PROGRAM

Between 1973 and 1989, 31 surface holes were drilled on the Red Dog claims for a total of 4894.5 metres. During 1990 Columbia Gold Mines Ltd. drilled 2431.8 metres in 20 BQ diameter holes. Three of these were terminated before reaching bedrock.

J.T. Thomas Diamond Drilling Ltd., Smithers, B.C., supplied a hydraulic JT-600 drill, BQ rods, BQTK core barrel and ancillary equipment, and a four-man crew. The drill was mobilized onto the property on August 22, drilling commenced on August 23rd and was completed on September 29th. The drill was demobilized September 30th. Drill sites were prepared by a two-man crew under contract from Gordon Clark and Associates of Whitehorse, Y.T. Stable drill sites were difficult to construct on steep slopes underlain by intrusive rock. Water for drilling was obtained from a sump above the camp. This source ceased to flow on October 5 due to freezing. Drill moves were conducted by helicopter. A Hughes 500 D, Bell 206 B or Bell 205 were used at various times during the course of the program.

The average penetration rate, including all delays, was 32.9 metre/shift, with an average core recovery of 84.2%. The core is stored at the campsite on the Red Dog claim, with core from holes 12-14, 16-20, 24,25 and 89-33 to 89-42. All core was split and analyzed for gold and copper by Min-En Labs of North Vancouver, B.C. Min-En's standard techniques are presented in Appendix A. Erratic gold assay results from a number of trench and core samples indicated the presence of coarse grained "Free" gold. A screen analysis for gold was performed on the rejects from these samples. After grinding and pulverizing, the pulp was sieved using a 120 mesh screen. The +120 mesh material was weighed and assayed, and two one assay ton samples of the -120 mesh pulp were assayed. The results were combined to give a final "metallic assay" value also reported on sample ledgers, trench plans and drill hole sections labelled as "MET Au". For many samples, the values were significantly higher than the initial assay results.

Half of the 1990 drill holes were in the vicinity of the quartz monzonite, while eleven holes were drilled to investigate additional gold zones identified by prospecting and trenching. Data for the 1990 holes is summarized in Table 4. All the hole locations are shown on Figure 11 and Plate 2. The geology and analytical results for individual holes are plotted on Plates 7 to 33. Core logs, sample ledger sheets, and analytical certificates may be noted in Appendices D and E. Table 5 summarizes all significant drill hole assays obtained on the Spectrum Property.

20861  
PART 1 OF 4

# COLUMBIA GOLD MINES LTD. SPECTRUM PROPERTY

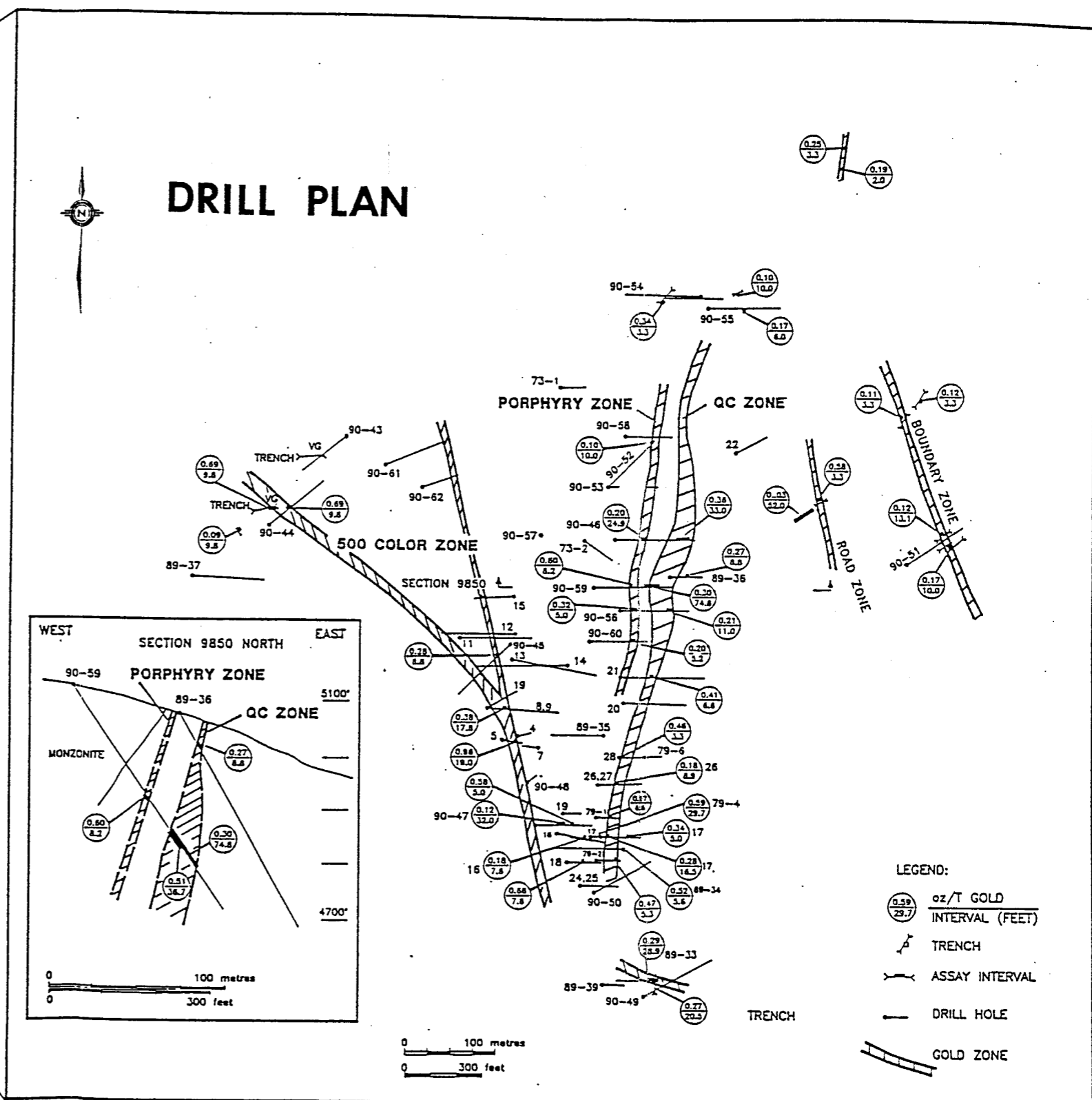
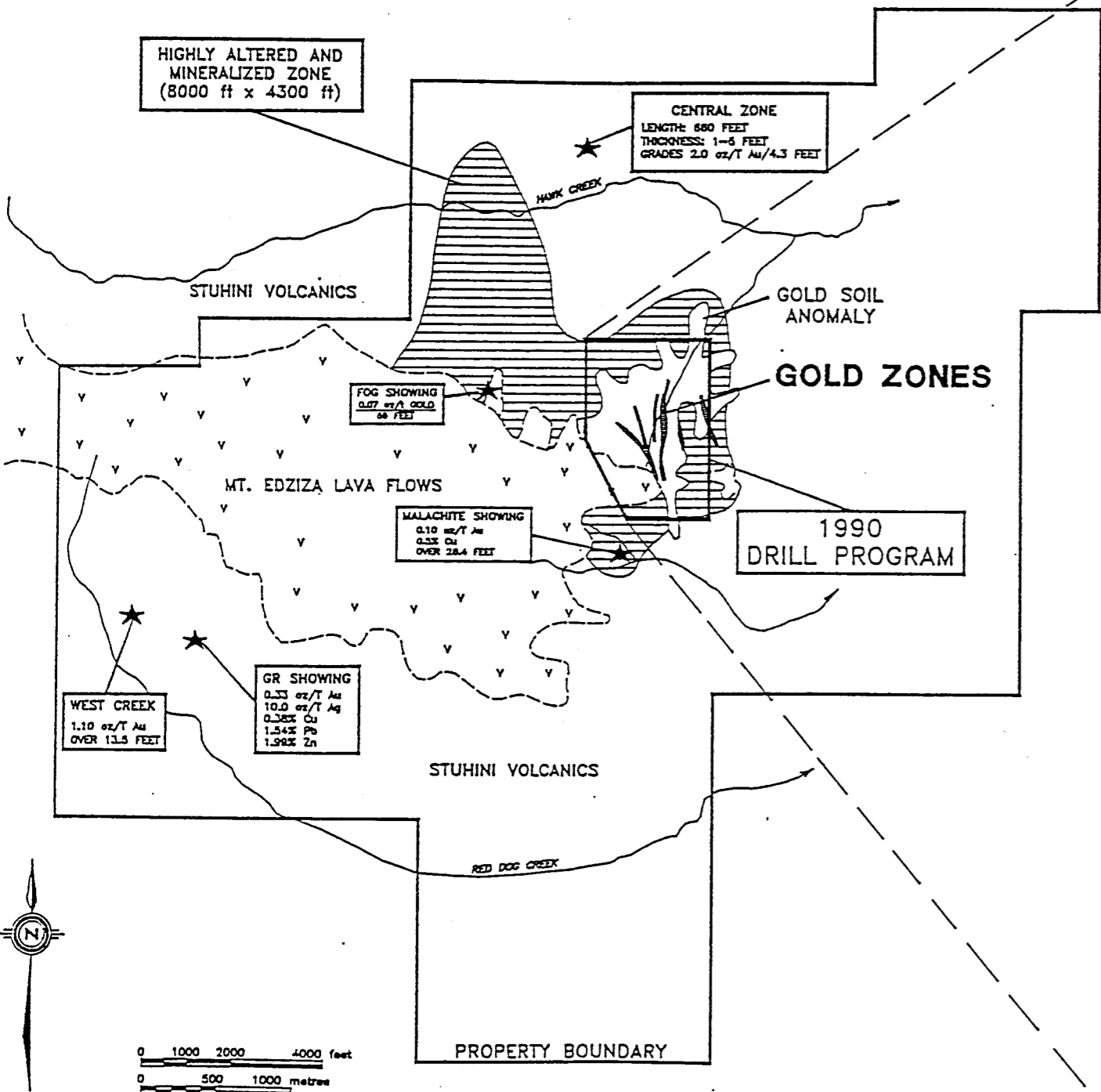


FIGURE 11.

TABLE 4 DIAMOND DRILL HOLE SUMMARY, 1990 DRILLING

DDH #	CO-ORDINATES		ELEV. m	AZIMUTH DEGREES	DIP DEG.	% CORE RECOVERY	START DATE	END DATE	SECTION	LENGTH m	CUMUL LENGTH
	N	E									
90-43	9992	9523	1565	230	-45	86.9	23/8/90	24/8/90	90-43	101.2	101.2
44	9897	9422	1625	050	-50	90.5	25/8/90	26/8/90	90-43	121.9	223.1
45	9745	9704	1617	230	-45	82.2	27/8/90	28/8/90	90-45	108.2	331.3
46	9890	9819	1533	909	-55	86.8	29/8/90	31/8/90	9890N	182.9	514.2
47	9554	9741	1677	090	-70	94.4	31/8/90	02/9/90	9550N	182.9	697.1
48	9609	9729	1673	060	-70	54.1	03/9/90	04/9/90	90-48	30.5	727.6
48A	9609	9729	1673	060	-60	39.1	03/9/90	03/9/90	90-48	25.6	753.2
488	9609	9729	1673	060	-65	51.9	03/9/90	03/9/90	90-48	21.3	774.5
49	9380	9850	1606	060	-46	87.8	05/9/90	05/9/90	90-49	121.9	896.4
50	9450	9805	1632	060	-45	93.0	06/9/90	07/9/90	90-50	109.1	1005.5
51	9879	10148	1434	055	-45	93.8	08/9/90	09/9/90	90-51	126.5	1132.0
52	9945	9814	1510	042	-60	88.4	10/9/90	12/9/90	90-52	169.5	1301.5
52A	9945	9814	1510	042	-45	0	10/9/90	10/9/90	90-52	21.3	1322.8
54	10170	9897	1377	270	-45	94.4	13/9/90	14/9/90	10170N	118.9	1485.9
55	10142	9918	1390	090	-45	95.8	15/9/90	16/9/90	10140N	115.8	1601.7
56	9817	9833	1559	090	-55	95.4	16/9/90	17/9/90	9820N	137.2	1738.9
57	9895	9749	1547	090	-55	0	18/9/90	18/9/90	9890N	48.8	1787.7
58	10010	9838	1479	090	-60	84.4	19/9/90	20/9/90	10010N	149.4	1937.1
59	9845	9805	1560	090	-55	91.1	22/9/90	23/9/90	9845N	152.4	2089.5
60	9780	9800	1581	090	-55	95.6	24/9/90	25/9/90	9780N	129.5	2219.0
61	9967	9564	1566	070	-55	62.2	25/9/90	26/9/90	90-61	118.3	2337.3
62	9917	9614	1567	070	-70	85.4	27/9/90	29/9/90	90-62	94.5	2431.8

TABLE 5 SUMMARY OF DRILL HOLE ASSAYS

HOLE NO.	ZONE	INTERVAL (m)	LENGTH (m)	GOLD gm/T
S-2	Porphyry	99.0 - 101.5	2.5	7.88
S-4	Porphyry	23.2 - 26.2	3.0	13.71
	EQC	92.0 - 101.2	9.2	20.23
		92.0 - 95.1	3.1	50.74
79-1	Porphyry	28.2 - 31.0	2.8	7.20
	EQC	103.0 - 104.5	1.5	4.46
79-2	EQC	67.4 - 69.0	1.6	16.46
79-5	WQC	33.8 - 39.6	5.8	32.91
	WQC	37.3 - 39.6	2.3	80.91
79-8	WQC	29.6 - 35.0	5.4	13.03
79-16	Porphyry	82.2 - 84.5	2.3	6.17
79-17	Porphyry	47.5 - 49.0	1.5	16.11
	EQC	64.0 - 65.5	1.5	11.66
79-18	Porphyry	54.7 - 57.0	2.3	22.63
79-19	Porphyry	101.4 - 103.4	2.0	9.26
79-21	Porphyry	97.5 - 99.5	2.0	14.06
79-22	Porphyry	41.3 - 43.3	2.0	4.80
79-26	EQC	103.9 - 106.6	2.7	6.17
79-27	EQC	90.0 - 92.5	2.5	4.46
79-28	EQC	32.0 - 33.0	1.0	15.77
89-33	WQC?	0.6 - 9.4	8.8	9.94
89-34	EQC	61.6 - 63.3	1.7	17.83
	Porphyry	152.4 - 153.3	0.9	9.26
90-38	Fog	108.5 - 110.5	2.0	9.26
90-44	500 Colour	51.2 - 53.3	2.1	5.48
90-45	500 Colour	24.1 - 26.8	2.7	9.60
90-46	Porphyry	45.7 - 53.3	7.6	6.86
	EQC	114.3 - 124.4	10.1	12.34
90-47	Porphyry	62.5 - 68.6	6.1	4.46
	EQC	110.9 - 112.5	1.6	19.88
90-56	Porphyry	29.0 - 30.5	1.5	10.97
	EQC	96.0 - 106.7	10.1	4.80
		100.3 - 103.6	3.3	7.20
90-59	Porphyry	76.0 - 78.4	2.4	20.57
	EQC	100.6 - 123.4	22.8	10.28
90-60	Porphyry	81.4 - 83.0	1.6	6.86

7.2

RESULTS

7.2.1

500 COLOUR ZONE

Two holes were drilled to test the northwest end of the 500 Colour Zone that was outlined by 1990 panning, prospecting and the sampling results from Trenches 6-9, 11-16, and Road 1. Based on the orientation of mineralized fractures, the zone has an average strike of 140 degrees and dips very steeply to the southwest. Hole 90-43 tested the ground below Trench Road 1 (Plate 5 and 7). A quartz-carbonate and pyrite vein zone, which could correlate with veining at the east end of the trench, was intersected between 61.7 and 64.0 metres. Hole 90-44 was drilled beneath the east end of Trench 6, which averaged 23.8 gm/T Au over 3 metres. A 2.1 metre interval below the trench returned 5.59 gm/T Au.

The 500 Colour Zone was also tested by hole 90-45 (Plate 8). A number of quartz monzonite dykes cutting ash tuffs were intersected, with one 2.1 metre interval averaging 2.09 gm/T Au. The possibility of a mineralized trend on the west side of the intrusion paralleling the 160 - 170 degree strike seen on the east side was explored by holes 90-61 and 90-62 (Plates 9 and 10). Both holes intersected altered tuffs, but were stopped short of their target depth by broken squeezing ground in faults. A barren quartz-carbonate vein zone was identified near the bottom of hole 90-62 (Western QC?).

Three holes were drilled across the southeasterly projection of the 500 Colour Zone. Three attempts to complete 90-48 were stopped by squeezing ground. The site was abandoned. Hole 90-49 (Plate 12) was drilled to test the depth extension of the gold-bearing zone outlined by results from near the collar of hole 89-33 and Trench 26. Although a monzonite dyke which may correlate with the quartz monzonite in hole 89-33 was intersected in the hole, no significant gold values were obtained. Drill hole 90-50 intersected the monzonite intrusion and a variety of footwall lithologies including ash and ash-crystal tuffs, cherty tuffs and minor calc-silicate altered volcanics. Two intervals of low-grade gold mineralization were defined in hole 90-50.

### 7.2.2

#### BOUNDARY ZONE

One hole, 90-51, was drilled to sample the Boundary Zone defined by results from Trenches 20A, 20B, 21, 24, 25 and surface samples. Although the hole was collared on the Red Dog claim, most of the hole tested the Boundary Zone on the adjacent Hawk 1 claim. A low grade zone, 0.021 opt Au over 10.3 metres, was intersected beneath the higher grade zone outlined in trenches 20A, 20B and 21 (Plate 14). Lithologies in the core and on surface consisted of ash-crystal and ash tuffs with closely-spaced, parallel thin fractures containing pyrite. Thicker, quartz-carbonate-pyrite-arsenopyrite veins exposed by trenching were not seen in core.

### 7.2.3

#### NOREX AREA

A fault zone with quartz-carbonate-sulphide veins was discovered on the east side of the monzonite intrusion. Two attempts were made to drill test this mineralization below Trenches 27-30. The first hole, 90-52 (Plate 15), was oriented to test the quartz monzonite-volcanic contact beneath the trenches. A quartz-carbonate vein zone was intersected between 140.9 and 142.6 metres, with no significant gold values. Gold mineralization, grading 2.57 gm/T Au over 5.4 metres, was intersected from an underlying fault zone with pyrite, arsenopyrite and clasts of quartz-carbonate. The hole was stopped by "squeezing ground" - a 0.3 m shear in quartz monzonite at 168.2 metres with quartz + calcite veins, pyrite and arsenopyrite. A second hole, 90-53, was collared on the same site to explore the ground north of 90-46, but the attempt was unsuccessful due to the small drill being unable to penetrate excessive overburden. Hole 90-58 was drilled from west of the trenches. A wide zone of altered quartz monzonite with 5%-40% narrow quartz veins in contact with a narrow zone of quartz-carbonate-veined ash tuff was intersected between 21.3 and 55.0 metres; gold assays were less than 0.70 gm/T (Plate 17). A 40 cm band of silicious pyritic tuff at 141 metres returned 3.94 gm/T Au. The northern surface exposure of the fault and vein zone was found in Trench 32. Hole 90-54 (Plate 18) was drilled beneath the trench. Gold assays were uniformly low. The best grades were obtained from two narrow faults, with pyrite, arsenopyrite and sphalerite, intersected between 110 and 113 metres.

Hole 90-55 (Plate 19) returned two intervals of greater than 3.4 gm/T Au from just below the collar, but did not intersect an obvious extension of the mineralization in Trench 31. A narrow mineralized fault zone at the approximate expected depth was barren.



7.2.4

PORPHYRY AND QC ZONES

Previous drilling on the Spectrum property was concentrated between 9600E and 9950E on Sections 9500N to 9750N. A geological reserve of 2.4 million tons grading 1.27 gm/T (0.037 opt) Au has been reported (Noel and Taylor, 1981), based on the results from holes 79-1, 2, 6, 16 to 21 and 24 to 28. The gold-bearing zone occurs within the east or footwall side of the intrusion and adjacent underlying volcanics. The mineralized zone appeared to have a flatter westerly dip than the intrusive contact. Drill holes outlining this reserve are plotted on Plates 23 to 32.

Re-interpretation of the previous drilling results led to the definition of three mineralized zones (Plate 4):

1) A western quartz-carbonate (WQC) zone which locally contains significant gold mineralization (>3.4 gm/T Au over 2m true width);

2) A broad central zone of low grade porphyry gold-copper mineralization which is largely restricted to the intrusion; and

3) One or more eastern quartz-carbonate-sulphide vein zones occurring in both the intrusion and volcanics that contain significant gold values. Porphyry and EQC Zones.

The western QC was intersected in nine previous drill holes, and contained gold mineralization in seven. Grades varied from 0.75gm/T Au/4.8 metres to 4.32 gm/T Au over 17.9 metres. Barren quartz-carbonate vein mineralization was intersected in the remaining holes. The porphyry gold-copper zone was present in all but two of the earlier holes which intersected the intrusion, and particularly the eastern contact with the tuff package. Gold grades were variable between 0.99gm/T and 2.19 gm/T over widths of 6 to 82 metres, and the copper content was typically 0.10% to 0.30% for those intersections where copper was determined. The zone appears to widen to the north.

Within this relatively wide low grade deposit, much narrower and higher grade, steeply dipping quartz-carbonate-sulphide vein zones were delineated from prior drilling results. One of these near the eastern intrusive - volcanic contact appeared to be continuous from 9525N to 9740N. The width varied from 1.5 metres to over 4.0 metres, and the grade was generally in excess of 0.10 opt Au. This is labelled the Porphyry zone on Plate 34.

The eastern QC was intersected in all the drill holes which penetrated the footwall volcanics. The true width of the intersections varied from 1.0 to 3.4 metres. The majority carried 0.08 to 0.10 opt Au, but two intersections were significantly higher - 0.174 opt Au/4.0 meters and 0.364 opt Au/3.7 metres.

Five holes were drilled during 1990 (90-46, 56, 57, 59 and 60) to sample the northern extension of the Porphyry and Eastern QC zones, and one (90-47) to corroborate the results in holes 16 and S-4. Two gold-bearing zones were intersected in hole 90-46. The upper zone, which averaged 4.45 gm/T Au over 14.8 metres, contained quartz-carbonate-pyrite-arsenopyrite-calcopyrite veins and visible gold. The EQC, between 114.3 and 132.9 metres, returned an average of 7.23 gm/T across 15.0 metres. The predominant mineralization was disseminated and vein pyrite with minor sphalerite, arsenopyrite, and quartz-carbonate veins. The copper content of the quartz monzonite near the collar of the hole was typical of the porphyry gold-copper zone, but the gold content was lower. Hole 90-57 was collared west of 90-46 to test the down dip extension of mineralization intersected in Hole 46, but was terminated when excessive overburden was encountered.

A 12.2 metre thick zone of disseminated mineralization which averaged 0.86 gm/T Au and 0.25% Cu was intersected in hole 90-59 (See Plate 21). This was followed by 2.5 metres of pyrite-arsenopyrite-chalcopyrite-scheelite-gold mineralization in ash tuff which returned 20.57 gm/T Au. The eastern QC zone, intersected at a depth of 70 metres, averaged 9.29 gm/T Au over 25.6 metres between 100.6 and 126.2 metres in hole 90-59.

In hole 90-56, the Porphyry Zone averaged 10.9 gm/T Au over 1.5 metres (Plate 22). A three meter interval of pyrite + pyrrhotite averaged 2.9 gm/T Au between 64.0 and 67.0 metres. The eastern QC zone was intersected between 88.4 and 106.7 metres, and averaged 3.26 gm/T Au. A wide zone of intrusive-hosted gold-copper mineralization was returned by hole 90-60 (Plate 23) -1.1 gm/T Au and 0.21% Cu over 48.7 metres. This was closely followed by a 9.4 metre interval in ash tuff which returned 2.0 gm/T Au and 0.32% Cu, and included the Porphyry Zone which returned 6.86 gm/T Au over 1.5 metres. Between 117.4 and 123.4 metres, pyritic ash tuff with minor quartz-calcite veins averaged 2.78 gm/T Au, with 1.5 metres of 8.5 gm/T Au.

The results from hole 90-47 confirmed the widths and grades returned by hole 16, but failed to intersect a high grade zone comparable to that in drill hole S-4.

Limited drilling to date suggests the disseminated copper-gold mineralization decreases to the north.

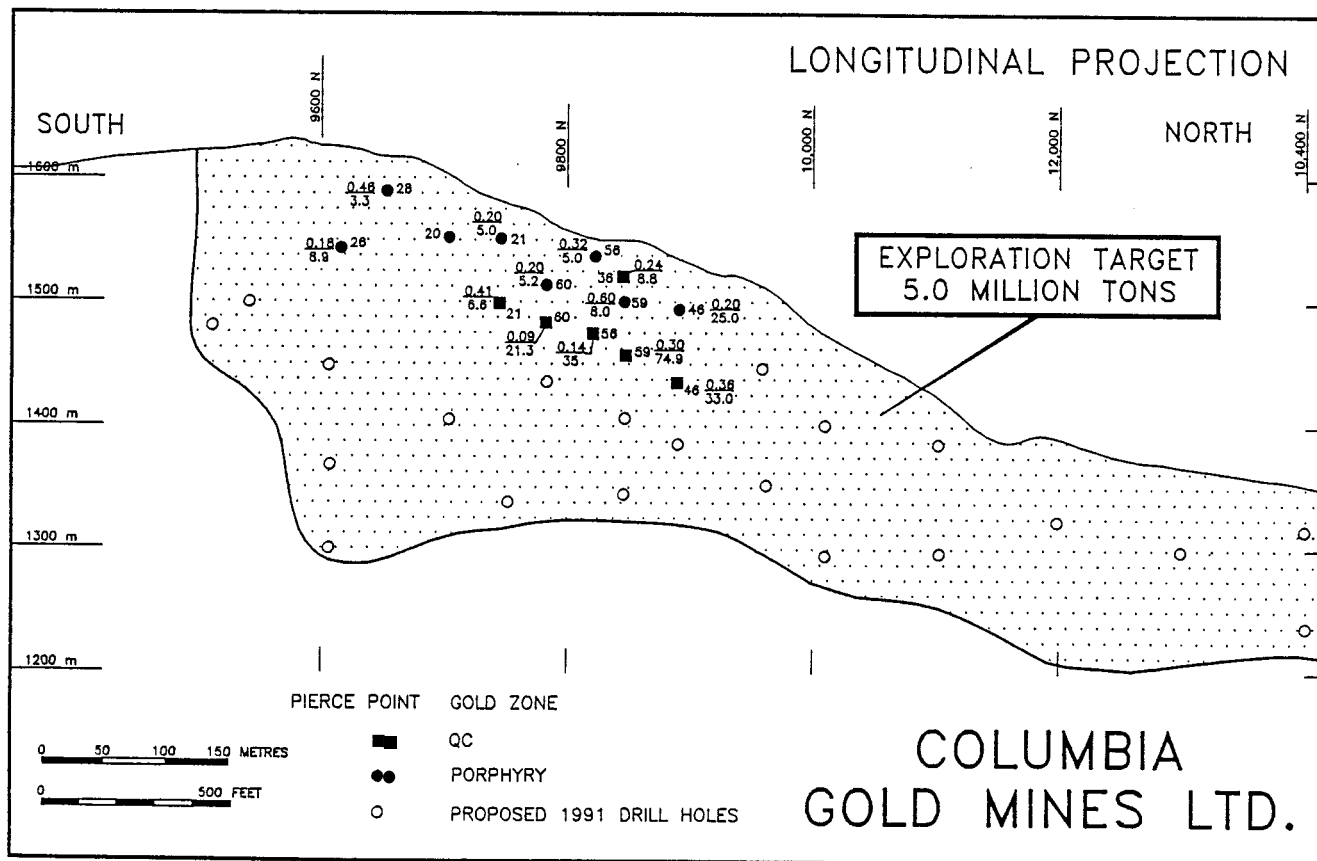
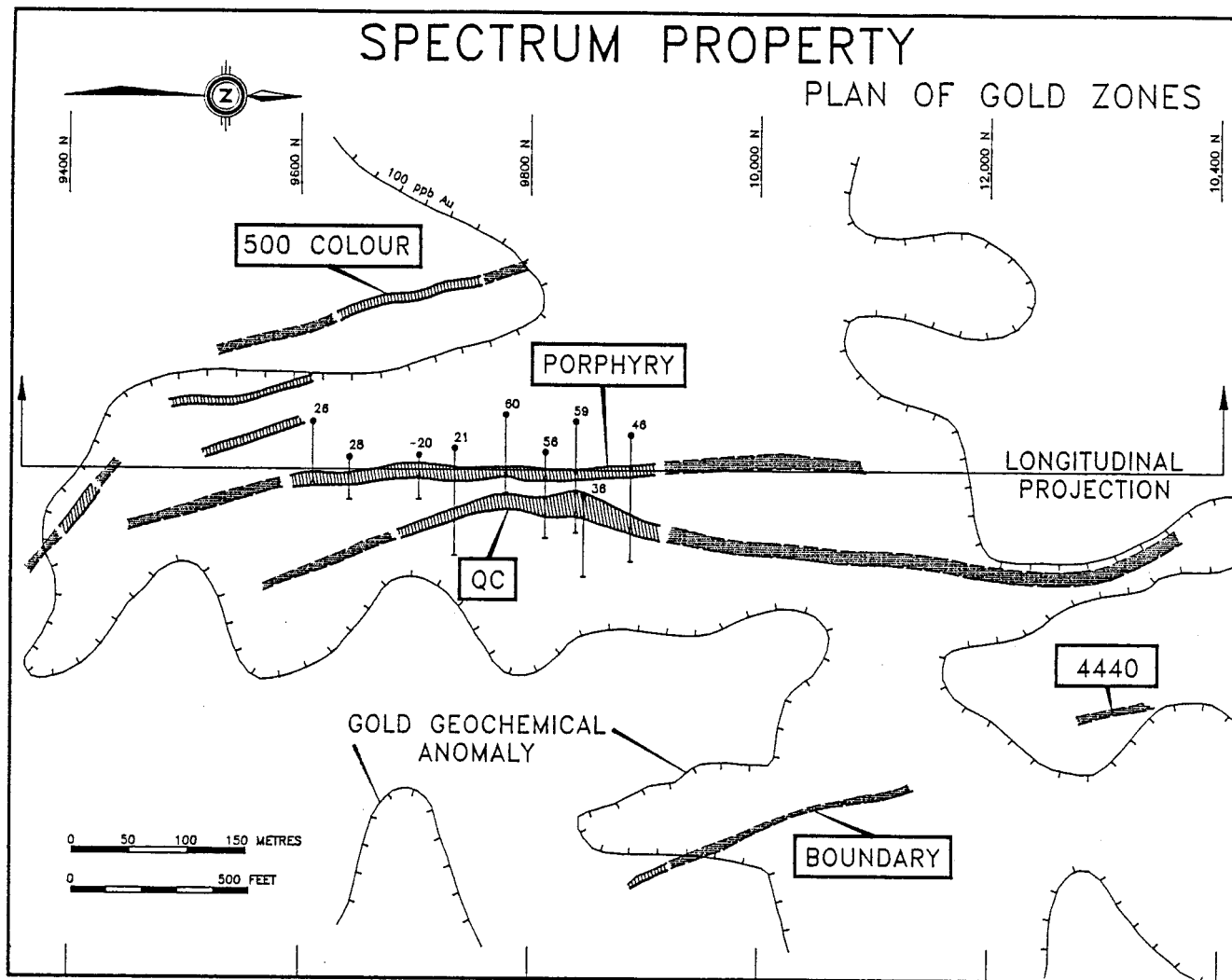


FIGURE 12.

8.0

### EXPLORATION POTENTIAL

The drilling results to date indicate that there are north trending, steeply dipping, narrow and high-grade gold-bearing veins or vein systems within a large altered zone on the property (Figure 12). The quartz-carbonate-sulphide vein systems vary in true width from 3.5 metres to over 20 metres, with average grades across these widths varying to 12.34 gm/T (0.36 opt) Au. Within individual vein systems are 0.5 to 1.5 metre intersections carrying up to 116.5 gm/T (3.4 opt) Au which appear to be vertically continuous. The Porphyry and QC Zones located near the east contact of the quartz monzonite have been traced continuously in drill holes for 400 metres and remain open along strike and to depth. The western system, with sporadic gold mineralization, has been outlined for a 250 metre length. With the widths and grades found to date, a viable deposit could be developed if sufficient tonnage can be delineated. A multi-million ton reserve of gold mineralization will be targetted in the 1991 exploration program.

The gold values returned by surface samples from the Boundary-4440 vein system and Skarn showing are very encouraging. Trenching and diamond drilling are required to delineate and sample these targets.

Limited surface exploration on the Hawk 1 claim and in the West Creek area has indicated the presence of structurally controlled gold-bearing veins. Prospecting, soil sampling and trenching are needed to define diamond drill targets.

9.0

### PROPOSED 1991 EXPLORATION PROGRAM

A diamond drilling program of 4600 metres in approximately 26 holes is proposed for the Spectrum property. Twenty-two of these holes are planned to test the Porphyry and QC vein systems along a strike length of 1000 metres and to a depth of 150 metres. Three drill holes will explore the Boundary-4440 vein zone and one drill hole will test the depth continuity of the Skarn showing. The locations of these proposed holes are shown on Plate 34 with collar co-ordinates and depths listed in Table 6. Based on past drilling performance in this area, the program could require 2 1/2 months to complete. The proposal program is anticipated to commence in early June.

Prospecting, trenching and soil sampling programs in the West Creek/GR Creek and Hawk 1 claim areas would take place concurrently. Establishing and sampling of soil grids and construction of diamond drill sites will be contracted out. A Hughes 500D helicopter will be based on the property to facilitate drill and crew moves. Travel time for the drill crews would be reduced and radio-telephone communications improved if the camp was re-located to the vicinity of 9600N, 10100E.

The cost of the 1991 program is budgeted at \$923,000.

TABLE 6 PROPOSED 1991 DRILL HOLES

<u>TARGET</u>	<u>PROPOSED HOLE</u>	<u>COLLAR NORTH</u>	<u>CO-ORDINATES EAST</u>	<u>DIP DEG.</u>	<u>DEPTH m</u>
Porphyry & Eastern QC Vein Zones	91A	9845	9780	-60	200
	91B	9900	9750	-60	280
	91C	9780	9755	-60	230
	91D	9845	9715	-60	300
	91E	9950	9815	-45	150
	91F	9950	9770	-60	240
	91G	9700	9765	-60	280
	91H	9740	9700	-60	330
	91I	9600	9855	-60	200
	91J	9600	9800	-60	280
	91K	10010	9780	-60	200
	91L	10010	9885	-60	150
	91M	10100	9890	-45	100
	91N	10100	9810	-45	100
	91O	10200	9900	-45	100
	91P	10200	9835	-60	200
	91Q	10300	9890	-60	100
91R	10400	9850	-50	80	
91S	10010	9720	-60	250	
<u>91Y</u>	9500	9835	-60	<u>100</u>	
	20 HOLES				3970
Western QC Vein Zone	91W	9600	9690	-60	100
	<u>91X</u>	9890	9650	-60	<u>100</u>
	2 HOLES				200
Boundary - 44440 Vein Zone	91T	10320	10000	-45	100
	91U	10100	10065	-45	100
	<u>91V</u>	10010	10085	-60	<u>100</u>
	3 HOLES				300
Skarn Showing	<u>91Z</u>	9120N	6535	-60	<u>100</u>
Total	26 HOLES				4570

10.0

SUMMARY OF EXPLORATION EXPENDITURES  
For the Period Aug. 6th to Oct. 31st, 1990)

<u>EXPLORATION FUNCTION</u>	<u>EXPENDITURES</u>
	<u>\$</u>
Analysis - Geochemical	2,547.00
Analysis - Assays	40,033.75
Accommodation	13,917.38
Consulting - Geological	15,133.66
Drafting, Maps & Prints	458.50
Expediting, Telephone, etc.	4,368.73
Drilling	222,400.81
Equipment - Lease & Rental	1,391.69
Equipment - Consumables	2,370.68
Fuel	11,495.32
Salaries & Wages	39,977.64
Transportation - Airlines	4,739.78
- Helicopter	127,714.58
- Vehicles	1,785.30
- Freight	6,565.39
Trenching, Drill Site Prep	5,543.95
Miscellaneous	347.00
Project Management Fees	<u>49,956.26</u>
 TOTAL FIELD EXPENDITURES	 <u>\$548,800.16</u>

11.0

PROPOSED 1991 BUDGET

	<u>\$</u>
Analysis - geochemical	8,000
- assay	56,600
Accommodation	20,000
Consulting - geological	39,000
- metallurgical	1,000
Drafting	16,000
Expediting	7,000
Drilling	410,000
Equipment - leased	4,000
- consumable	5,000
Fuel	8,000
Property Maintenance	2,500
Salaries & Wages	80,000
Surveys - grid and soil sampling	6,000
- control	6,000
Transportation - Airlines	5,000
- fixed wing	2,000
- helicopter	135,000
- vehicle	2,500
- freight	10,000
Drill site preparation	<u>31,000</u>
	854,600
Project Management Fee (8%)	<u>68,400</u>
	<u>\$923,000</u>

**HYLANDS GEOLOGICAL SERVICES LTD.**

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12.0

STATEMENT OF QUALIFICATIONS

I, J.J.Hylands, hereby certify that:

- 1) I am a consulting geologist with residence at 1430 Inglewood Avenue, West Vancouver, B.C., V7T 1Z1.
- 2) I graduated from the University of British Columbia with the degree of BSc, Geology, in 1966.
- 3) I have practiced my profession since graduation, in Canada, the United States and the Philippines.
- 4) I have been a member of the Association of Professional Engineers of British Columbia since 1971.
- 5) I personally supervised the fieldwork on the Spectrum property for Columbia Gold Mines Ltd. between July 25 and October 7, 1990.
- 6) I hold no direct or indirect interest in the property, nor in any securities of Columbia Gold Mines Ltd. or associated companies, and I do not expect to receive any.

Hylands Geological Services Ltd.





13.0

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- Souther, J.G., 1972; Telegraph Creek Map Area, B.C.; GSC Paper 71-44.

**APPENDIX A**  
**ANALYTICAL PROCEDURES**  
**MIN-EN LABS**



**MINERAL  
• ENVIRONMENTS  
LABORATORIES**

Division of Assayers Corp. Ltd.

**ANALYTICAL PROCEDURE REPORT FOR ASSESSMENT WORK:**

**-----  
PROCEDURE FOR AG, CU, PB, ZN, NI, CO OR CD GEOCHEM  
-----**

Samples are processed by Min-En Laboratories at 705 West 15th Street, North Vancouver, employing the following procedures.

After drying the samples at 95 C, soil and stream sediment samples are screened by 80 mesh sieve to obtain the minus 80 mesh fraction for analysis. The rock samples are crushed by jaw crusher and pulverized on a ring mill pulverizer.

0.50 gram of the sample is digested for 2 hours with an aqua regia mixture. After cooling samples are diluted to standard volume.

The solutions are analysed on atomic absorption spectrometers using the appropriate standard sets. A background correction can be applied to Ag, Pb, and Cd if requested.



ANALYTICAL PRECEDURE REPORT FOR ASSESSMENT WORK:

-----  
PROCEDURE FOR WET GOLD GEOCHEMICAL ANALYSIS  
-----

Samples are processed by Min-En Laboratories, at 705 West 15th Street, North Vancouver, employing the following procedures.

After drying the samples at 95 C, soil and stream sediment samples are screened by 80 mesh sieve to obtain the minus 80 mesh fraction for analysis. The rock samples are crushed by a jaw crusher and pulverized on a ring mill pulverizer.

5.00 grams of sample is weighed into porcelain crucibles and cindered @ 800 C for 3 hours. Samples are then transferred to beakers and digested using aqua regia, diluted to volume and mixed.

Further oxidation and treatment of 75% of the above solution is then extracted for gold by Methyl Iso-butyl Ketone.

The MIBK solutions are analyzed on an atomic absorption spectrometer using a suitable standard set.



**GOLD ASSAY PROCEDURE:**  
-----

Samples are dried @ 95 C and when dry are crushed on a jaw crusher. The 1/4 inch output of the jaw crusher is put through a secondary roll crusher to reduce it to - 1/8 inch. The whole sample is then riffled on a Jones Riffle down to a statistically representative 300 - 400 gram sub-sample (in accordance with Gy's statistical rules). This sub-sample is then pulverized on a ring pulverizer to 95% minus 120 mesh, rolled and bagged for analysis. The remaining reject from the Jones Riffle is bagged and stored.

Samples are fire assayed using one assay ton sample weight. The samples are fluxed, a silver inquart added and mixed. The assays are fused in batches of 24 assays along with a natural standard and a blank. This batch of 26 assays is carried through the whole procedure as a set. After cupellation the precious metal beads are transferred into new glassware, dissolved, diluted to volume and mixed.

These aqua regia solutions are analyzed on an atomic absorption spectrometer using a suitable standard set. The natural standard fused along with this set must be within 3 standard deviations of its known or the whole set is re-assayed. Likewise the blank must be less than 0.015 g/tonne.



ANALYTICAL PROCEDURE REPORT FOR ASSESSMENT WORK

PROCEDURE FOR AU, PT OR PD FIRE GEOCHEM

Geochemical samples for Au Pt Pd are processed by Min-En Laboratories, at 705 West 15th St., North Vancouver, B. C., laboratory employing the following procedures:

After drying the samples at 95 C, soil and stream sediment samples are screened by 80 mesh sieve to obtain the minus 80 mesh fraction for analysis. The rock samples are crushed and pulverized on a ring mill pulverizer.

A suitable sample weight; 15.00 or 30.00 grams is fire assay preconcentrated. The precious metal beads are taken into solution with aqua regia and made to volume.

For Au only, samples are aspirated on an atomic absorption spectrometer with a suitable set of standard solutions. If samples are for Au plus Pt or Pd, the sample solution is analyzed in an inductively coupled plasma spectrometer with reference to a suitable standard set.

**APPENDIX B**  
**ANALYTICAL CERTIFICATES**  
**GEOCHEMISTRY**



# MIN-EN LABORATORIES

SPECIALISTS IN MINERAL ENVIRONMENTS  
CHEMISTS • ASSAYERS • ANALYSTS • GEOCHEMISTS

705 WEST 15TH STREET  
NORTH VANCOUVER, B.C. CANADA V7M 1T2  
TELEPHONE (604) 980-5814 OR (604) 988-4524  
TELEX: VIA U.S.A. 7601067 • FAX (604) 980-9621

**TIMMINS OFFICE:**  
33 EAST IROQUOIS ROAD  
P.O. BOX 867  
TIMMINS, ONTARIO CANADA P4N 7G7  
TELEPHONE: (705) 264-9996

## Geochemical Analysis Certificate

OS-0207-SG1

Company: COLUMBIA GOLD MINES  
Project: SPECTRUM  
Attn: W.ROBERTS

Date: AUG-04-90  
Copy 1. COLUMBIA GOLD MINES, VANCOUVER, B.C.  
2. COLUMBIA GOLD MINES, C/O MIN-EN LABS

We hereby certify the following Geochemical Analysis of 30 SOIL samples submitted JUL-26-90 by W.ROBERTS.

Sample Number	AU-FIRE PPB
WCT 01	1
WCT 02	2
WCT 03	2
WCT 04	8
WCT 05	2
WCT 06	3
WCT 07	18
WCT 08	14
WCT 09	12
WCT 10	7
WCT 11	8
WCT 12	3
WCT 13	2
WCT 14	4
WCT 15	2
WCT 16	2
WCT 17	1
WCT 18	2
WCT 19	3
WCT 20	13
WCT 21	4
WCT 22	8
WCT 23	11
WCT 24	3
WCT 25	4
WCT 26	32
WCT 27	2
WCT 28	8
WCT 29	1
WCT 30	2

Certified by \_\_\_\_\_

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FAX (604) 980-9621

**THUNDER BAY LAB.:**  
TELEPHONE (807) 622-8958  
FAX (807) 623-5931

**SMITHERS LAB.:**  
TELEPHONE/FAX (604) 847-3004

Geochemical Analysis Certificate

OS-0207-SG2

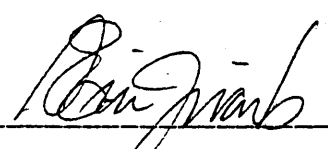
Company: COLUMBIA GOLD MINES  
Project: SPECTRUM  
Attn: W. ROBERTS

Date: AUG-06-90

Copy 1. COLUMBIA GOLD MINES, VANCOUVER, B.C.  
2. COLUMBIA GOLD MINES, C/O MIN-EN LABS

We hereby certify the following Geochemical Analysis of 30 SOIL samples submitted JUL-26-90 by W. ROBERTS.

Sample Number	AU-FIRE PFB
WCT 31	2
WCT 32	1
WCT 33	4
WCT 34	17
WCT 35	1
WCT 36	1
WCT 37	1
WCT 38	2
WCT 39	1
WCT 40	3
WCT 41	12
WCT 42	322
MCT 01	3
MCT 02	9
MCT 03	2
MCT 04	6
MCT 05	15
MCT 06	11
MCT 07	8
MCT 08	2
MCT 09	4
MCT 10	97
MCT 11	38
MCT 12	48
MCT 13	6
MCT 14	4
MCT 15	1
MCT 16	18
MCT 17	2
MCT 18	2

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FAX (604) 980-9621

**THUNDER BAY LAB.:**  
TELEPHONE (807) 622-8958  
FAX (807) 623-5931

**SMITHERS LAB.:**  
TELEPHONE/FAX (604) 847-3004

***Geochemical Analysis Certificate*** OS-0207-SG3

Company: **COLUMBIA GOLD MINES**  
Project: **SPECTRUM**  
Attn: **W. ROBERTS**

Date: **AUG-06-90**  
Copy 1. **COLUMBIA GOLD MINES, VANCOUVER, B.C.**  
2. **COLUMBIA GOLD MINES, C/O MIN-EN LABS**

**We hereby certify the following Geochemical Analysis of 30 SOIL samples submitted JUL-26-90 by W.ROBERTS.**

Sample Number	AU-FIRE PPB
MCT 19	103
MCT 20	14
MCT 21	9
MCT 22	3
MCT 23	4
MCT 24	3
MCT 25	2
MCT 26	1
MCT 27	5
MCT 28	2
MCT 29	16
MCT 30	1
MCT 31	45
MCT 32	38
MCT 33	20
MCT 34	6
MCT 35	19
FST 01	40
FST 01	22
FST 02	13
FST 03	22
FST 04	7
FST 05	13
FST 06	1
FST 07	9
FST 08	26
FST 09	15
FST 10	54
FST 11	60
FST 12	82

Certified by *[Signature]*

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FAX (604) 980-9621

**THUNDER BAY LAB.:**  
TELEPHONE (807) 622-8958  
FAX (807) 623-5931

**SMITHERS LAB.:**  
TELEPHONE/FAX (604) 847-3004

Geochemical Analysis Certificate

OS-0207-SG4

Company: COLUMBIA GOLD MINES  
Project: SPECTRUM  
Attn: W. ROBERTS

Date: AUG-06-90

Copy 1. COLUMBIA GOLD MINES, VANCOUVER, B.C.  
2. COLUMBIA GOLD MINES, C/O MIN-EN LABS

We hereby certify the following Geochemical Analysis of 30 SOIL samples submitted JUL-26-90 by W. ROBERTS.

Sample Number	AU-FIRE PPB
FST 13	21
FST 14	57
FST 15	22
FST 16	15
FST 17	34
-----	
FST 18	38
FST 19	41
FST 20	641
FST 21	112
FST 22	114
-----	
FST 23	26
FST 24	3
FST 25	45
FST 26	94
FST 27	31
-----	
FST 28	60
FST 29	116
FST 30	92
FST 31	100
FST 33	57
-----	
FST 34	18
FST 36	26
FST 38	2
FST 39	48
FST 40	29
-----	
FST 41	9
FST 42	31
FST 43	2
FST 45	2
FST 46	32

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**THUNDER BAY LAB.:**  
TELEPHONE (807) 622-8958  
FAX (807) 623-5931

**SMITHERS LAB.:**  
TELEPHONE/FAX (604) 847-3004

*Geochemical Analysis Certificate*

OS-0207-SG5

Company: COLUMBIA GOLD MINES  
Project: SPECTRUM  
Attn: W. ROBERTS

Date: AUG-06-90

Copy 1. COLUMBIA GOLD MINES, VANCOUVER, B.C.  
2. COLUMBIA GOLD MINES, C/O MIN-EN LABS

We hereby certify the following Geochemical Analysis of 30 SOIL samples submitted JUL-26-90 by W. ROBERTS.

Sample Number	AU-FIRE PPB
FST 47	39
FST 48	74
FST 49	37
FST 50	17
FST 51	22
-----	
GRT 01	3
GRT 02	9
GRT 03	24
GRT 04	3
GRT 05	2
-----	
GRT 06	6
GRT 07	1
GRT 08	2
GRT 09	2
GRT 10	1
-----	
GRT 11	6
GRT 12	12
GRT 13	2
GRT 14	5
GRT 15	9
-----	
GRT 16	1
GRT 17	1
GRT 18	2
GRT 19	1
GRT 20	18
-----	
GRT 21	20
GRT 22	13
GRT 23	394
GRT 24	26
GRT 25	3

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TELEX: VIA U.S.A. 7601067 • FAX (604) 980-9621

**TIMMINS OFFICE:**  
33 EAST IROQUOIS ROAD  
P.O. BOX 867  
TIMMINS, ONTARIO CANADA P4N 7G7  
TELEPHONE: (705) 264-9996

## Geochemical Analysis Certificate

OS-0207-SG6

Company: COLUMBIA GOLD MINES  
Project: SPECTRUM  
Attn: W. ROBERTS

Date: AUG-04-90

Copy 1. COLUMBIA GOLD MINES, VANCOUVER, B.C.  
2. COLUMBIA GOLD MINES, C/D MIN-EN LABS

We hereby certify the following Geochemical Analysis of 7 ROCK samples submitted JUL-26-90 by W.ROBERTS.

Sample Number	AU-FIRE PPB
GRT-26	2
GRT-27	37
GRT-28	34
GRT-29	16
GRT-30	9
GRT-31	142
GRT-32	39

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TELEPHONE (807) 622-8958  
FAX (807) 623-5931

**SMITHERS LAB.:**  
TELEPHONE/FAX (604) 847-3004

Geochemical Analysis Certificate

OS-0213-SG4

Company: **COLUMBIA GOLD MINES**  
Project: **SPECTRUM**  
Attn: **WAYNE ROBERTS**

Date: **AUG-06-90**  
Copy 1. **COLUMBIA GOLD MINES, VANCOUVER, B.C.**

*We hereby certify the following Geochemical Analysis of 28 SOIL samples submitted JUL-31-90 by WAYNE ROBERTS.*

Sample Number	AU-WET PPB
L101+00N 91+00E	125
L101+00N 91+10E	1000
L101+00N 91+20E	165
L101+00N 91+30E	1000
L101+00N 91+40E	160
L101+00N 91+50E	355
L101+00N 91+60E	320
L101+00N 91+70E	5
L101+00N 91+80E	190
L101+00N 91+90E	90
L101+00N 92+00E	35
L101+00N 92+10E	5
L101+00N 92+20E	5
L101+00N 92+30E	5
L101+00N 92+40E	10
L101+00N 92+50E	30
L101+00N 92+60E	5
L101+00N 92+70E	40
L101+00N 92+80E	75
L101+00N 92+90E	120
L101+00N 93+00E	N/S
L101+00N 93+10E	N/S
L101+00N 93+20E	300
L101+00N 93+30E	3450
L101+00N 93+40E	30
L101+00N 93+50E	20
L101+00N 93+60E	95
L101+00N 93+70E	80
L101+00N 93+80E	120
L101+00N 93+90E	25

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 TELEPHONE (807) 622-8958  
 FAX (807) 623-5931

**SMITHERS LAB.:**  
 TELEPHONE/FAX (604) 847-3004

Geochemical Analysis Certificate

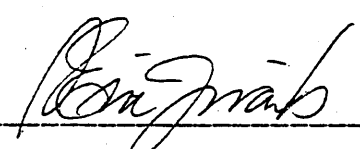
OS-0213-SG5

Company: **COLUMBIA GOLD MINES**  
 Project: **SPECTRUM**  
 Attn: **WAYNE ROBERTS**

Date: **AUG-06-90**  
 Copy 1. **COLUMBIA GOLD MINES, VANCOUVER, B.C.**

We hereby certify the following Geochemical Analysis of 30 SOIL samples submitted JUL-31-90 by WAYNE ROBERTS.

Sample Number	AU-WET PPB
L101+00N 94+00E	250
FST 52	5
FST 53	200
FST 54	300
FST 55	1800
FST 56	2400
FST 57	1750
FST 58	320
FST 59	150
FST 60	365
FST 61	225
FST 62	90
FST 63	125
FST 64	10
FST 65	780
FST 66	3250
FST 67	3700
FST 68	625
FST 69	850
FST 70	1020
FST 71	400
FST 72	200
FST 73	50
FST 74	185
FST 75	25
FST 76	80
FST 77	40
FST 78	95
FST 79	45
FST 80	210

Certified by 

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TELEX: VIA U.S.A. 7601067 • FAX (604) 980-9621

**TIMMINS OFFICE:**  
33 EAST IROQUOIS ROAD  
P.O. BOX 867  
TIMMINS, ONTARIO CANADA P4N 7G7  
TELEPHONE: (705) 264-9996

## Geochemical Analysis Certificate

OS-0213-SG6

Company: COLUMBIA GOLD MINES LTD.  
Project: SPECTRUM  
Attn: W. ROBERTS

Date: AUG-08-90  
Copy 1. COLUMBIA GOLD MINES, VANCOUVER, B.C.  
2. COLUMBIA GOLD MINES, C/O MIN-EN LABS

*We hereby certify* the following Geochemical Analysis of 21 SOIL samples submitted JUL-30-90 by W. ROBERTS.

Sample Number	AU-WET PPB
FST-81	285
FST-82	60
FST-83	45
FST-84	85
FST-85	180
FST-86	85
FST-87	80
FST-88	70
FST-89	75
FST-90	245
FST-91	230
FST-92	240
FST-93	685
FST-94	1000
FST-95	580
FST-96	255
FST-97	780
FST-98	120
FST-99	195
FST-100	50
FST-101	110

Certified by \_\_\_\_\_

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**AUG 16 1990**

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NORTH VANCOUVER, B.C. CANADA V7M 1T2  
TELEPHONE (604) 980-5814 OR (604) 988-4524  
TELEX: VIA U.S.A. 7601067 •FAX (604) 980-9621

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P.O. BOX 867  
TIMMINS, ONTARIO CANADA P4N 7G7  
TELEPHONE: (705) 264-9996

*Assay Certificate*

**OS-0213-SA1**

Company: **COLUMBIA GOLD MINES LTD.**  
Project: **SPECTRUM**  
Attn: **W. ROBERTS**

Date: **AUG-08-90**  
Copy 1. **COLUMBIA GOLD MINES, VANCOUVER, B.C.**  
Copy 2. **COLUMBIA GOLD MINES, C/O MIN-EN LABS**

*We hereby certify the following Assay of 10 SOIL samples submitted JUL-30-90 by W.ROBERTS.*

Sample Number	AU g/tonne	AU oz/ton
L101+00N 91+10E	1.00	.029
L101+00N 91+30E	1.02	.030
L101+00N 93+30E	3.90	.114
FST-55	2.14	.062
FST-56	2.62	.076
FST-57	2.35	.069
FST-66	3.00	.088
FST-67	4.40	.128
FST-70	1.00	.029
FST-94	1.06	.031

Certified by *[Signature]*  
MIN-EN LABORATORIES



**MIN-EN  
LABORATORIES**

AUG 16 1990

705 WEST 15TH STREET  
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TELEX: VIA U.S.A. 7601067 • FAX (604) 980-9621

**TIMMINS OFFICE:**

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P.O. BOX 867  
TIMMINS, ONTARIO CANADA P4N 7G7  
TELEPHONE: (705) 264-9996

**SPECIALISTS IN MINERAL ENVIRONMENTS**  
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Geochemical Analysis Certificate

OS-0224-SG1

Company: COLUMBIA GOLD MINES LTD.  
Project: SPECTRUM  
Attn: W.ROBERTS

Date: AUG-08-90

Copy 1. COLUMBIA GOLD MINES, VANCOUVER, B.C.  
2. COLUMBIA GOLD MINES, C/O MIN-EN LABS

We hereby certify the following Geochemical Analysis of 30 SOIL samples submitted JUL-31-90 by W.ROBERTS.

Sample Number	AU-WET PPB
10000N 9100E	385
10000N 9110E	1500
10000N 9120E	240
10000N 9130E	200
10000N 9140E	1950
10000N 9150E	1050
10000N 9160E	270
10000N 9170E	140
10000N 9180E	25
10000N 9190E	135
10000N 9200E	105
10000N 9210E	145
10000N 9220E	325
10000N 9230E	130
10000N 9240E	85
10000N 9250E	70
10000N 9270E	190
10000N 9280E	165
10000N 9290E	80
10000N 9300E	50
10000N 9320E	240
10000N 9410E	1450
10000N 9420E	750
10000N 9430E	2000
10000N 9440E	2000
10000N 9450E	360
10000N 9460E	500
10000N 9470E	180
10000N 9480E	115
10000N 9490E	70

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TELEX: VIA U.S.A. 7601067 • FAX (604) 980-9621

**TIMMINS OFFICE:**  
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P.O. BOX 867  
TIMMINS, ONTARIO CANADA P4N 7G7  
TELEPHONE: (705) 264-9996

**Geochemical Analysis Certificate** OS-0224-SG2

Company: **COLUMBIA GOLD MINES LTD.**  
Project: **SPECTRUM**  
Attn: **W.ROBERTS**

Date: **AUG-08-90**  
Copy 1. **COLUMBIA GOLD MINES, VANCOUVER, B.C.**  
2. **COLUMBIA GOLD MINES, C/O MIN-EN LABS**

**We hereby certify the following Geochemical Analysis of 30 SOIL samples submitted JUL-31-90 by W.ROBERTS.**

Sample Number	AU-WET PPB
10000N 9500E	10
10000N 9330E	50
10000N 9340E	280
10000N 9350E	270
10000N 9360E	1300
10000N 9370E	615
10000N 9380E	3600
10000N 9390E	2000
10000N 9400E	2500
9850N 9400E	50
9860N 9400E	70
9870N 9400E	8000
9880N 9400E	1050
9890N 9400E	10000
9900N 9400E	1400
9910N 9400E	1200
9920N 9400E	175
9930N 9400E	1080
9940N 9400E	1900
9950N 9400E	4400
9960N 9400E	3000
9970N 9400E	2000
9980N 9400E	1550
9990N 9400E	1000
10010N 9400E	1850
10020N 9400E	1200
10030N 9400E	850
10040N 9400E	1000
10060N 9400E	80
10070N 9400E	190

Certified by 

**MIN-EN LABORATORIES**



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NORTH VANCOUVER, B.C. CANADA V7M 1T2  
TELEPHONE (604) 980-5814 OR (604) 988-4524  
TELEX: VIA U.S.A. 7601067 • FAX (604) 980-9621

**TIMMINS OFFICE:**  
33 EAST IROQUOIS ROAD  
P.O. BOX 867  
TIMMINS, ONTARIO CANADA P4N 7G7  
TELEPHONE: (705) 264-9996

Geochemical Analysis Certificate

OS-0224-SG3

Company: **COLUMBIA GOLD MINES LTD.**  
Project: **SPECTRUM**  
Attn: **W. ROBERTS**

Date: **AUG-08-90**  
Copy 1. **COLUMBIA GOLD MINES, VANCOUVER, B.C.**  
2. **COLUMBIA GOLD MINES, C/O MIN-EN LABS**

*We hereby certify the following Geochemical Analysis of 30 SOIL samples submitted JUL-31-90 by W. ROBERTS.*

Sample Number	AU-WET PPB
10080N 9400E	220
10090N 9400E	525
10100N 9410E	150
10100N 9420E	450
10100N 9430E	120
10100N 9440E	690
10100N 9450E	1000
10100N 9460E	2000
10100N 9470E	430
10100N 9480E	250
10100N 9490E	140
10100N 9500E	310
10050N 9330E	800
10050N 9340E	80
10050N 9350E	140
10050N 9370E	350
10050N 9380E	150
10050N 9400E	460
10050N 9410E	1800
10050N 9420E	40
10050N 9430E	2300
10050N 9440E	880
10050N 9450E	320
10050N 9460E	160
10050N 9470E	310
10050N 9480E	260
10050N 9490E	270
10050N 9500E	210
10050N 9100E	330
10050N 9110E	390

Certified by \_\_\_\_\_

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TELEPHONE (604) 980-5814 OR (604) 988-4524  
FAX (604) 980-9621

THUNDER BAY LAB.:  
TELEPHONE (807) 622-8958  
FAX (807) 623-5931

SMITHERS LAB.:  
TELEPHONE/FAX (604) 847-3004

Geochemical Analysis Certificate

0S-0224-SG4

Company: COLUMBIA GOLD MINES  
Project: SPECTRUM  
Attn: WAYNE ROBERTS

Date: AUG-05-90

Copy 1. COLUMBIA GOLD MINES, VANCOUVER, B.C.

We hereby certify the following Geochemical Analysis of 19 ROCK samples submitted JUL-28-90 by WAYNE ROBERTS.

Sample Number	AU-WET PPB
10050N 9120E	215
10050N 9130E	170
10050N 9140E	35
10050N 9150E	185
10050N 9160E	50
10050N 9170E	890
10050N 9180E	110
10050N 9190E	90
10050N 9200E	165
10050N 9210E	145
10050N 9220E	60
10050N 9240E	100
10050N 9250E	110
10050N 9260E	55
10050N 9270E	115
10050N 9280E	90
NOREX 1	280
NOREX 2	550
NOREX 3	335

Certified by

MIN-EN LABORATORIES



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TELEPHONE (604) 980-5814 OR (604) 988-4524  
TELEX: VIA U.S.A. 7601067 • FAX (604) 980-9621

TIMMINS OFFICE:  
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P.O. BOX 867  
TIMMINS, ONTARIO CANADA P4N 7G7  
TELEPHONE: (705) 264-9996

Assay Certificate

OS-0224-SA1

Company: COLUMBIA GOLD MINES LTD.  
Project: SPECTRUM  
Attn: W. ROBERTS

Date: AUG-08-90

Copy 1. COLUMBIA GOLD MINES, VANCOUVER, B.C.  
2. COLUMBIA GOLD MINES, C/O MIN-EN LABS

We hereby certify the following Assay of 29 SOIL samples submitted JUL-31-90 by W.ROBERTS.

Sample Number	AU g/tonne	AU oz/ton
10000N 9110E	1.10	.032
10000N 9140E	2.12	.062
10000N 9150E	1.18	.034
10000N 9410E	1.39	.041
10000N 9430E	1.82	.053
10000N 9440E	1.40	.041
10000N 9360E	1.90	.055
10000N 9380E	4.60	.134
10000N 9390E	2.21	.064
10000N 9400E	3.35	.098
9870N 9400E	8.42	.246
9880N 9400E	1.00	.029
9890N 9400E	12.90	.376
9900N 9400E	1.72	.050
9910N 9400E	1.36	.040
9930N 9400E	1.17	.034
9940N 9400E	2.60	.076
9950N 9400E	5.90	.172
9960N 9400E	2.20	.064
9970N 9400E	1.21	.035
9980N 9400E	1.37	.040
9990N 9400E	.96	.028
10010N 9400E	2.02	.059
10020N 9400E	1.02	.030
10040N 9400E	1.10	.032
10100N 9450E	.81	.024
10100N 9460E	2.20	.064
10050N 9410E	1.92	.056
10050N 9430E	2.21	.064

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MIN-EN LABORATORIES

APPENDIX C  
TRENCH SAMPLE LEDGERS

SPECTRUM

Property

SAMPLE LEDGER

SSAY TAG No.	SAMPLE INTERVAL		SAMPLE LENGTH		ppb Au	Ag	gm/T Au	opt Au	DESCRIPTION
	Metres	Feet	Metres	Feet					
24001	0-1m		1.0m		25				TRENCH #2 10100N 90150E AV ZONE
002	1-2m		1.0m		1450		2.35	.069	" " "
003	2-3m		1.0m		330				" " "
004	3-4m		1.0m		740				" " "
005	4-5m		1.0m		590				" " "
006	5-6m		1.0m		195				" " "
007	6-7m		1.0m		135				" " "
008	7-8m		1.0m		300				" " "
009	8-9m		1.0m		310				" " "
010	9-10m		1.0m		125				" " "
011	10-11m		1.0m		110				" " "
012	11-12m		1.0m		65				" " "
013	12-13m		1.0m		100				" " "
014	13-14m		1.0m		430				" " "
015	14-15m		1.0m		95				" " "
016	15-16m		1.0m		270				" " "
017	0-1m		1.0m		60				TRENCH #1 10100N 90150E " "
018	1-2m		1.0m		10				" " "
019	2-3m		1.0m		50				" " "
020	3-4m		1.0m		85				" " "



## SPECTRUM

Property

## SAMPLE LEDGER

ASSAY TAG No.	SAMPLE INTERVAL		SAMPLE LENGTH		ppb Au	µct. Au opt	g/T Au	opt Au	DESCRIPTION
	Metres	Feet	Metres	Feet					
24021	4-5m		1.0m		5				TRENCH #1 10100N 90150E AM ZONE
022	5-6m		1.0m		100				" " "
023	6-7m		1.0m		1500		1.39	.041	" " "
024	7-8m		1.0m		10				" " "
025	8-9m		1.0m		5				" " "
026	9-10m		1.0m		5				" " "
027	10-11m		1.0m		30				" " "
028	0-1m		1.0m		65	.003			ROAD TRENCH #1 AU ZONE
029	1-2m		1.0m		1800	.045	2.02	.059	" " "
030	2-3m		1.0m		45	.005			" " "
031	3-4m		1.0m		310	.010			" " "
032	4-5m		1.0m		40	.003			" " "
033	5-6m		1.0m		5	.002			" " "
034	6-7m		1.0m		50	.002			" " "
035	7-8m		1.0m		5	.002			" " "
036	8-9m		1.0m		15	.003			" " "
037	9-10m		1.0m		90	.007			" " "
038	10-11m		1.0m		195	.009			" " "
039	11-12m		1.0m		5	.003			" " "
040	12-13m		1.0m		10	.001			" " "

SPECTRUM

Property

## SAMPLE LEDGER

ASSAY TAG No.	SAMPLE INTERVAL		SAMPLE LENGTH		ppb Au	Met. pm opt			DESCRIPTION
	Metres	Feet	Metres	Feet					
24041	13-14m		1.0m		480	.048			ROAD TRENCH # 1 AU ZONE
042	14-15m		1.0m		230	.012			" " "
043	15-16m		1.0m		75	.003			" " "
044	16-17m		1.0m		290	.018			" " "
045	17-18m		1.0m		560	.027			" " "
046	18-19m		1.0m		75	.006			" " "
047	19-20m		1.0m		30	.003			" " "
048	20-21m		1.0m		100	.006			" " "
049	21-22m		1.0m		135	.009			" " "
050	22-23m		1.0m		90	.005			" " "
24101	23-24m		1.0m		60				" " "
102	24-25m		1.0m		590				" " "
103	25-26m		1.0m		70				" " "
104	26-27m		1.0m		95				" " "
105	27-28m		1.0m		90				" " "
106	28-29m		1.0m		700				" " "
107	29-30m		1.0m		40				" " "
108	30-31m		1.0m		40				" " "
109	31-32m		1.0m		180				" " "
110	0-1m		1.0m		390				TRENCH # 3 10+00N 90+50E "

SPECTRUM

Property

SAMPLE LEDGER

ASSAY TAG No.	SAMPLE INTERVAL		SAMPLE LENGTH		ppb Au	Ag	g/T Au	opt Au	DESCRIPTION
	Metres	Feet	Metres	Feet					
24111	1-2m		1.0m		30				TRENCH #3 10700N 90+50E Au Zone
112	2-3m		1.0m		790				" " "
113	3-4m		1.0m		4000		3.18	.093	" " "
114	4-5m		1.0m		200				" " "
115	5-6m		1.0m		220				" " "
116	6-7m		1.0m		130				" " "
117	7-8m		1.0m		230				" " "
118	8-9m		1.0m		110				" " "
119	9-10m		1.0m		520				" " "
120	10-11m		1.0m		550				" " "
121	11-12m		1.0m		690				" " "
122	12-13m		1.0m		330				" " "
123	13-14m		1.0m		310				" " "
124	14-15m		1.0m		600				" " "
125	15-16m		1.0m		250				" " "
126	16-17m		1.0m		2700		3.80	0.111	" " "
127	17-18m		1.0m		230				" " "
128	18-19m		1.0m		160				" " "
129	19-20m		1.0m		140				" " "
130	20-21m		1.0m		230				" " "



SPECTRUM

Property

SAMPLE LEDGER

ASSAY TAG No.	SAMPLE INTERVAL		SAMPLE LENGTH		ppb Au	Ag	g/t	opt	DESCRIPTION
	Metres	Feet	Metres	Feet					
24140	30-31m		1.0m		320			TR. 3	10+00N 90+50E
141	31-32m		1.0m		1950		2.43 .071	"	"
142	32-33m		1.0m		550			"	"
143	33-34m		1.0m		1050		0.80 .023	"	"
144	34-35m		1.0m		870			"	"
145	35-36m		1.0m		490			"	"
146	36-37m		1.0m		150			"	"
147	37-38m		1.0m		95			"	"
148	0-1m		1.0m		5			TR. 4	
149	1-2m		1.0m		10			"	"
150	2-3m		1.0m		10			"	"
151	3-4m		1.0m		25			"	"
152	4-5m		1.0m		5			"	"
153	5-6m		1.0m		5			"	"
4154	0-1m		1.0m		130			TR. 5	
155	1-2m		1.0m		45			"	"
156	2-3m		1.0m		30			"	"
157	3-4m		1.0m		10			"	"
158	4-5m		1.0m		160			"	"
159	5-6m		1.0m		15			"	"



SPECTRUM

Property

## SAMPLE LEDGER

ASSAY TAG No.	SAMPLE INTERVAL		SAMPLE LENGTH		ppb Au	Ag	g/T Au	opt Au	DESCRIPTION
	Metres	Feet	Metres	Feet					
24176	0-1m		1.0m		7000		7.25	.211	TRENCH # 6 EAST END
177	1-2m		1.0m		10000		11.80	.344	" " .694 opt Au / 2m
178	2-3m		1.0m		40000		52.40	1.528	" "
179	3-4m		1.0m		190				" "
180	4-5m		1.0m		160				" "
181	5-6m		1.0m		190				" "
182	6-7m		1.0m		750				
183	7-8m		1.0m		250				
184	8-9m		1.0m		1000		1.15	.034	← NO SAMPLES 9-14m (5m)
185	14-15m		1.0m		370				
186	15-16m		1.0m		100				4.27g/T Au / 19m
187	16-17m		1.0m		1100		1.42	.041	.125 opt / 19m
188	17-18m		1.0m		2200		2.37	.069	
189	18-19m		1.0m		1300		1.29	.038	
190	19-20m		1.0m		260				
191	20-21m		1.0m		600				
192	21-22m		1.0m		480				
193	22-23m		1.0m		60				
194	23-24m		1.0m		130				WEST END
195	0-1m		1.0m		4000		5.20	.152	TRENCH # 7 NORTH END

SPECTRUM

Property

SAMPLE LEDGER

ASSAY TAG No.	SAMPLE INTERVAL		SAMPLE LENGTH		ppb Au	Ag	g/T	opt	DESCRIPTION
	Metres	Feet	Metres	Feet					
24196	1-2m		1.0m		2500		2.50	.073	TRENCH #7 NORTH END
197	2-3m		1.0m		1600		1.84	.054	↓ 2.018 g/T Au/1.7m opt/1.7m SOUTH END
198	3-4m		1.0m		5				
199	4-4.7m		.7m		5				
24200	0-1m		1.0m		95			TRENCH #8 WEST END	
24551	1-2m		1.0m		30				↓
552	2-3m		1.0m		345				
553	3-4m		1.0m		240				
554	4-5m		1.0m		20				
555	5-6m		1.0m		100				
556	6-7m		1.0m		110				
557	7-8m		1.0m		5				
558	8-9m		1.0m		40				
559	9-10m		1.0m		180				
560	10-11m		1.0m		60				
561	11-12m		1.0m		50				





SPECTRUM Property

## SAMPLE LEDGER

SSAY TAG No.	SAMPLE INTERVAL		SAMPLE LENGTH		Au	Ag			DESCRIPTION
	Metres	Feet	Metres	Feet					
24506	0 - 2.0		2		65				Norex Sil. tuff, min py ± (po, aspy) <u>TF. 10</u>
507	2.0 - 4.0		2		80				" " " %
508	4.0 - 6.0		2		85				" " " "
509	6.0 - 8.0		2		185				" " " "
510	8.0 - 10.0		2		325				" " " "
511	10.0 - 12.0		2		85				" " " "
512	12.0 - 14.0		2		140				" " " "
513	14.0 - 17.0		3.0		215				" " " "
514	17.0 - 18.6		1.6		185				" , bx?, Sub % , rusty yellow + orange, + Mn
515	18.6 - 19.6		1.0		195				QM + gouge, faulted?, no vis. sul. %
516	19.6 - 20.6		1.0		145				" " " " %
517	20.6 - 21.6		1.0		220				" " " " "
518	21.6 - 22.9		1.3		150				" " " " "
519	22.9 - 25.0		2.1		185				Sil chloritic tuff, diss py; massive rock %
520	31.4 - 32.4		1.0		185				Chloritic volcanic - tuff? diss py. Rubble
24521	22.4 - 33.4		1.0		125				Norex, QM, rusty orange, 10-15% diss py
522	33.4 - 34.9		1.5		85				" " " "
523	34.9 - 36.4		1.5		120				" " " "

SPECTRUM Property

## SAMPLE LEDGER

SAY TAG No.	SAMPLE INTERVAL		SAMPLE LENGTH		ppb Au	Ag	g/T	opt	DESCRIPTION
	Metres	Feet	Metres	Feet					
24572	0-1		1		165				TR# 11 <i>Roody sil tuff</i>
24573	1-2		1		200				<i>pyrite</i>
24574	2-3		1		160				
24575	3-4		1		205				
24576	4-5		1		210				
24577	5-6		1		180				
24578	6-7		1		180				
24579	7-8		1		220				
24580	8-9		1		195				
24581	9-10		1		1650		1.52	.044	
24582	10-11		1		410				
24583	11-12		1		630				
24584	12-13		1		655				
24585	13-14		1		1050		1.10	.032	
24586	14-15		1		1750		1.96	.057	
24587	15-16		1		540				
24588	16-17		1		390				
24589	17-18		1		80				
24590	18-18		1		125				





SPECTRUM Property

SAMPLE LEDGER

SAY TAG No.	SAMPLE INTERVAL		SAMPLE LENGTH		ppb Au	g/t	opt	DESCRIPTION
	Metres	Feet	Metres	Feet				
24863	0-1		1.0	↑	35			Tr #15, east end,
364	1-2		1.0	↑	55			
365	2-3		1.0	↑	5			
366	3-4		1.0	↑	5			
367	4-5		1.0	↑	5			
368	5-6		1.0	↑	5			
369	6-7		1.0	↑	5			
370	7-8		1.0	↑	5			Tr #15, west end
371	0-1		1.0	↓	510			Tr #16, north end,
372	1-2		1.0	↓	126			
373	2-3		1.0	↓	37			
374	3-4		1.0	↓	62			
375	4-5		1.0	↓	59			126 ppb/8m
376	5-6		1.0	↓	43			
377	6-7		1.0	↓	105			
378	7-8		1.0	↓	68			Tr #16, south end

SPECTRUM Property

SAMPLE LEUGER

SAY TAG No.	SAMPLE INTERVAL		SAMPLE LENGTH		ppb Au	MET <sup>0.2/T</sup> Au	g/T	opt	DESCRIPTION	MET <sup>0.2/T</sup> Au
	Metres	feet	Metres	feet						
24262	0-1		1.0	↑	605				Tr #17, west end, QM on rd. west of 89-36	
263	1-2		1.0	↑	1040	.030	1.29	.038	"	.02
264	2-3		1.0	↑	1060	.032	1.18	.034	"	.03
265	3-4		1.0	↑	1000		1.00	.029	"	
266	4-5		1.0	↓	1890		1.82	.053	Tr #17, east end.	
267	0-1		1.0	↑	1660		1.65	.048	Tr #18, NE end, S. side gully, 200 m E	
268	1-2		1.0	↑	253				075° from 89-36.	
269	2-3		1.0	↑	1180	.087	1.27	.037	"	.05
270	3-4		1.0	↑	3180	.140	3.20	.093	"	.11
271	4-5		1.0	↓	1190	.031	1.19	.035	Tr #18, SW end	.02
272	0-1		1.0				2.44	.071	Min. vein structure in ck bed below Tr #12, 1.20 1/2	
24381	0-1		1.0	↑	56				Tr #19, west end	
382	1-2		1.0	↑	123				"	
383	2-3		1.0	↑	138				"	
384	3-4		1.0	↑	44				"	
385	4-5		1.0	↑	49				"	
386	5-6		1.0	↑	217				"	
387	6-7		1.0		2150	.073	2.24	.065	"	.03
388	7-8		1.0		263				"	

SPECTRUM

Property

SAMPLE LEDGER

SAY TAG No.	SAMPLE INTERVAL		SAMPLE LENGTH		ppb Au	MBT oz/t Au	S/T Au	opt Au	DESCRIPTION
	Metres	Feet	Metres	Feet					
24389	8-9		1.0		175				Trench #19
390	9-10		1.0		418				"
391	10-11		1.0		266				"
392	11-12		1.0		43				"
393	12-13		1.0		38				"
394	13-14		1.0		109				"
395	14-15		1.0		1540	.030	1.57	.046	"
396	15-16		1.0		42				"
397	16-17		1.0		3				"
398	17-18		1.0		1750	.112	1.83	.053	"
399	18-19		1.0		23				"
400	19-20		1.0		39				
401	20-21		1.0		2				"
402	21-22		1.0		193				"
403	22-23		1.0		48				"
404	23-24		1.0		10				"
405	24-25		1.0		61				"
406	25-26		1.0		2				"
407	26-27		1.0		222				Trench #19, east end
24528	3-4		1.0		203				Tr #13, 24251 (err 11/6)
524	4-5		1.0		39				#15, 24366 (5/17/6)





SPECTRUM

Property

SAMPLE LEDGER

SAY TAG No.	SAMPLE INTERVAL Metres	SAMPLE Metres	LENGTH Met g/T opt	g/T Au	opt AgL				DESCRIPTION
4425	0-1	1.0m	3.12/.091	3.19	.093				TRENCH 20-B
426	1-2	1.0m	7.2/.208	3.69	.108				
427	2-3	1.0m	.26/.008	.10	.003				
428	3-4	1.0m	.38/.011	.30	.009				
429	4-5	1.0m	.47/.014	.32	.009				
430	5-6	1.0m	1.81/.053	1.74	.051				
431	6-7	1.0m	1.93/.056	2.08	.061				
432	7-8	1.0m	.41/.012	0.21	.006				
433	8-9	1.0m		.20	.006				
434	9-10	1.0m		.43	.013				.037 opt / 17m
435	10-11	1.0m		2.27	.066				
436	11-12	1.0m		.90	.026				
437	12-13	1.0m		1.39	.041				
438	13-14	1.0m		2.21	.064				
439	14-15	1.0m		1.43	.042				
440	15-16	1.0m		.76	.022				
441	16-17	1.0m		.50	.015				





SPECTRUM

Property

SAMPLE LEDGER

ASSAY TAG No.	SAMPLE INTERVAL Metres	INTERVAL Feet	SAMPLE LENGTH Metres	LENGTH Feet	oz/T Au	PPb Au Ag	% Cu	PPM Cu	DESCRIPTION	
24298	0-1		1.0		.006		.035		TRENCH 23	
299	1-2		1.0		.005		.027		↓	
300	2-3		1.0		.004		.025			
24451	3-4		1.0			21		203		
452	4-5		1.0			37		171		
453	5-6		1.0			184		187		
454	6-7		1.0			265		300		
455	7-8		1.0		.311 / .58	20,000		280		Assay for metallics !!
456	8-9		1.0			48		176		
457	9-10		1.0			22		130		
458	10-11		1.0			29		132		
24459	0-1		1.0		.031	1200		134	TRENCH 24	
460	1-2		1.0			158		81	↓	
461	2-3		1.0			24		22		
462	3-4		1.0		.044	1480		20		
463	4-5		1.0			735		86		
464	5-6		1.0			63		70		
465	6-7		1.0			124		81		
466	7-8		1.0		.111	4100		227		

SPECTRUM Property

SAMPLE LEDGER

SAY TAG No.	SAMPLE INTERVAL		SAMPLE LENGTH		ppb Au	oz/T Au Ag	ppm. Cu	DESCRIPTION
	Metres	Feet	Metres	Feet				
<del>24466</del>	<del>8-9</del>		1.0					TRENCH #24
467	8-9 9-10		1.0		348		65	↓
468	9-10 10-11		1.0		338		88	
469	10-11 11-12		1.0		99		32	
470	11-12 12-13		1.0		58		32	
24471	0-1		1.0		9		76	TRENCH #25
472	1-2		1.0		116		40	↓
473	2-3		1.0		356		56	
474	3-4		1.0		500		51	
475	4-5		1.0		35		41	
476	5-6		1.0		700		20	
477	6-7		1.0		29		22	
478	7-8		1.0		396		20	
479	8-9		1.0		452		100	
480	9-10		1.0		438		71	
481	10-11		1.0		191			
482	11-12		1.0		120			
483	12-13		1.0		4200	.117		
484	13-14		1.0		472			

SPECTRUM

Property

## SAMPLE LEDGER

SAY TAG No.	SAMPLE INTERVAL		SAMPLE LENGTH		ppb Au	oz/T Au Ag	ppm Cu		DESCRIPTION
	Metres	Feet	Metres	Feet					
24485	14-15		1.0		848		90		TRENCH 25
486	15-16		1.0		465		62		" "
24232		0-3.5		3.5	408	.112	580	Arw	TRENCH 26 D.D.H. 5:3
24233		3.5-7.0		3.5	1150	.036	620	.126	
234		7.0-10.5		3.5	2200	.073	730	.256	
235		10.5-14.5		4.0	1250	.035	1050	.140	
236		14.5-18.0		3.5	1990	.064	1200	.224	
237		18.0-21.5		3.5	12900	.362	1320	1.267	
238		21.5-26.0		4.5	13,600	.477	1400	2.146	
239		26.0-29.5		3.5	4000	.114	1900	.399	
240		29.5-33.0		3.5	4000	.116	2500	.406	
241		33.0-35.5		2.5	8000	.262	2400	.655	
242		35.5-38.5		3.0	4980	.193	1500	.519	
243		38.5-42.0		3.5	3000	.075	1600	.263	
244		42.0-45.0		3.0	427	.030	140	.090	
245		45.0-48.0		3.0	1030	.053	1470	.159	
				<u>44.5</u>					
								<u>6.71</u>	

Handwritten annotations on the right side of the table:

- Vertical arrows indicating depths: 44.5 ft, 20.5 ft, 17.5 ft.
- Other annotations: 0.27, 0.28, 0.15 oz/T, 2 ppm.





SPECTRUM

Property

SAMPLE LEDGER

ASSAY TAG No.	SAMPLE INTERVAL		SAMPLE LENGTH		ppb Au	Cu			DESCRIPTION
	Metres	Feet	Metres	Feet					
24620	0-1		1.0		324				TRENCH # 29 intrusive
621	1-2		1.0		301				" "
622	2-3		1.0		450				" "
623	3-4		1.0		660				" "
624	4-5		1.0		338				" "
625	5-6		1.0		483				" "
626	6-7		1.0		415				" "
627	7-8		1.0		295				" "
628	8-9		1.0		400			561 ppb / 23.3m	" "
629	9-10		1.0		371				" "
630	10-11		1.0		437				" "
631	11-12.3		1.3		462			BASALT: 12.3-15.0m	" "
632	15-16		1.0		585	4210			intrusive
633	16-17		1.0		890	2100			Volcanics FE
634	17-18		1.0		420	3700			" " " "
635	18-19		1.0		715	3160			" " " "
636	19-20		1.0		508	2680			" " " "
637	20-21		1.0		812	2200			Volcanic intrusive contact
638	21-22		1.0		725	625			intrusive volcanic "
639	22-23		1.0		700	3010			Volcanics FE

SPECTRUM Property

## SAMPLE LEDGER

SAY TAG No.	SAMPLE INTERVAL		SAMPLE LENGTH		ppb Au	ppm Cu Ag	opt Au	DESCRIPTION
	Metres	Feet	Metres	Feet				
24640	23-24		1.0		1200	2650	.034	TRENCH #29 Volcanics FE, Cu
641	24-25		1.0		850	1140		↓ " "
642	25-26		1.0		735	610		↓ intrusive
24493	0-1		1.0		872	4150		TRENCH 30 Volcanics FE, Cu, Py
494	1-2		1.0		400	3420		↓ " "
495	2-3		1.0		1300	5640	.040	↓ " "
496	3-4		1.0		706	4550		↓ " "
24497	3-4		1.0		880	4370		RESAMPLE TRENCH 17 Volcanics FE, Cu
498	4-5		1.0		2000	7980	.057	" "
499	5-6		1.0		1350	4480	.041	" "
4500	0-1		1.0		4000		.114	RESAMPLE TRENCH 18



SPECTRUM Property

SAMPLE LEDGER

SAY TAG No.	SAMPLE INTERVAL		SAMPLE LENGTH		ppb Au	Ag	Au oz/t	DESCRIPTION
	Metres	Feet	Metres	Feet				
24651	0-1m		1.0		4			TRENCH 32 INTRUSIVE
652	1-2m		1.0		74			" "
653	2-3m		1.0		29			" "
654	3-4m		1.0		1050		.047	" "
655	4-5m		1.0		2050		.064	" "
656	5-6m		1.0		63			" "
657	6-7m		1.0		9			" "
658	7-8m		1.0		2			" "
659	8-9m		1.0		14			" "
660	9-10m		1.0		133			" "
661	10-11m		1.0		5			" "
662	11-12m		1.0		655			" "
663	12-12.7m		.7		3			" "
664	12.7-13.7m		1.0m		25			" "
665	13.7-14.2m		.5m		128			" "

## SPECTRUM Property

## SAMPLE LEDGER

ASSAY TAG No.	SAMPLE INTERVAL		SAMPLE LENGTH		Au	Ag			DESCRIPTION
	Metres	Feet	Metres	Feet					
24307		0-5		5.0	.01	.001	38	Trench #33 mod Fe-ox rubble, subcomp	
08		5-10		5.0	.03	.001	349	" " " " " "	
09		10-15		5.0	.10	.003	745	" " " " " "	
10		15-20		5.0	.26	.008	555	" " " " " "	
11		20-25		5.0	.31	.009	374	" " rock rubble, lim, silicified ash tuff 2-3?	
12		25-30		5.0	.11	.003	318	" " " " " " " " " "	
13		30-35		5.0	.10	.003	415	" " lim. box text rubble & gts pods 1-2? AS 5-3?	
14		35-40		5.0	.01	.001	460	" " Fe-ox rock rubble - soil	
15		40-45		5.0	.01	.001	54	" " lim. ox gts silicified leached vol 2-3? AS, 2-3?	
16		45-50		5.0	.03	.001	249	" " " " " " rock rubble	
4666	0-1m		1.0		.38	.011	255	TRENCH #34	
667	1-2m		1.0		.08	.002	269	↓	
668	2-3m		1.0		.02	.001	228		
669	3-4m		1.0		.02	.001	251		
670	4-5m		1.0		.69	.020	314		
671	5-6m		1.0		1.20	.035	317		
672	6-7m		1.0		.06	.002	296		
673	7-8m		1.0		.01	.001	265		
674	8-8.6m		0.6		.01	.001	248		

## SPECTRUM Property

## SAMPLE LEDGER

SSAY TAG No.	SAMPLE Metres	INTERVAL Feet	SAMPLE Metres	LENGTH Feet	Au	Ag			DESCRIPTION
24079		0-2.5	↑	2.5	7000		7.62	0.222	Rog Show: V. l. in gl <sup>2</sup> sh. in 5-79, in sil <sup>2</sup> and. <sup>2-3%</sup>
80		2.5-6.0	↑	3.5	460				" " 5-79, length sh. in and, 2-3%
81		6.0-9.5	↑	3.5	500				as above
82		9.5-13.5	↑	4.0	140				" "
83		13.5-17.0	↑	3.5	365				" "
84		17.0-21	↑	4.0	60				" "
85		21-25	↑	4.0	200				" "
86		25-30	↓	5.0	325				" "
87		0-4.5	↓	4.5	80				sil <sup>2</sup> limon flow buff, 3-5% pt, <sup>4-19% CP, 5-7%</sup> minor oxides
88		4.5-9.0	↓	3.5	180				as above
89		9.0-11.5	↓	3.5	130				" "
90		11.5-15	↓	3.5	85				" "
24091		15-18.5	↓	3.5	155				as 24087
92		18.5-22	↓	3.5	350				" "
93		22-25.5	↓	3.5	160				" "
94		0-3	↓	3.0	300				Rog Show very sil <sup>2</sup> ash flow buff / <sup>3-5% gl<sup>2</sup> sh.</sup> <del>all</del> <sup>3-5%</sup>
95		3-6.5	↓	3.5	295				" " " " " " " " " "
96		6.5-10.5	↓	4.0	5				" " 24095



SAMPLE LEDGER

SAY TAG No.	SAMPLE INTERVAL		SAMPLE LENGTH		ppb Au	Ag	opt Au	DESCRIPTION
	Metres	Feet	Metres	Feet				
24209		0-5	↑	5.0	130			Fog: s. / ed ash / xll / full, 3 5% un. / ed Pt
10		5-10		5.0	40			" " " " " " " "
11		10-15		5.0	90			" " " " " " " "
12		15-20		5.0	5			" " " " " " " "
13		20-25		5.0	10			" " " " " " " "
14		25-30		5.0	170			" " " " " " " "
15		30-35		5.0	60			" " " " " " " "
16		35-40		5.0	25			" " " " " " " "
17		40-45	↑	5.0	40			" " " " " " " "
18		45-50		5.0	80			" " " " " " " "
19		50-55		5.0	10			" " " " " " " "
20		55-60		5.0	55			" " " " " " " "
21		60-65		5.0	40			" " " " " " " "
22		65-70	↓	5.0	1750	.062		" " " " " " " "
23		0-5	↑	5.0	160			" " " " " " " " 5-74 <sup>St.</sup>
24		5-9		4.0	220			" " " " " " " "
25		9-14	↓	5.0	325			" " " " " " " " 10-167



SPECTRUM Property

SAMPLE LEDGER

SSAY TAG No.	SAMPLE INTERVAL		SAMPLE LENGTH		Au	Ag			DESCRIPTION
	Metres	Feet	Metres	Feet					
24501	0-3.0		3.0		480				Talus fines, Norex, DM subcrop
502	3-7.9		4.9		325				" " " " "
503	7.9-12.8		4.9		340				" " " " "
504	12.8-18.3		5.5		210				" " " " "
24226	0-4		4.0		5				Red Dog zone North Extension a ft and. tuff, 3-5% Py
27	4-7.5		3.5		5				" " " " " " "
28	7.5-11.0		4.5		10				" " " " " " "
24072	0-5.5		5.5		5				N.W Gossan <del>fine</del> sheared and tuff, 1-12 tuff slingers 3-5%
73	5.5-10.5		5.0		5				" " " " " " "
74	10.5-15.5		5.0		5				" " " " " " "
75	15.5-19.5		4.0		5				" " " " " " "
24076	0-8.0		8.0		10				N.W Gossan yellow fine gr. <sup>2-3% Py</sup> and siliceous ash tuff
77	8.0-16.0		8.0		5				" " " " " " "
24301	0-4		4.0		.01	.001		45	DDM #33 alca siliceous ash tuff 1-2% Py
302	4-8		4.0		.08	.002		91	" " " " " " 2-3% "
03	8-13		5.0		.11	.003		228	" " " " slingers 1-2%
24063	0-3.0		3.0		35				" " c.g. andesite tuff, no vis sxs. with loc. <sup>4-6% Py</sup>
64	3.0-5.5		2.5		100,000	202.78	5.914		" " intense frox boxwork text of <sup>1/2</sup> (25%) 5-7% Py
65	5.5-9.5		4.0		800				" " c.g. andesite tuff 2-3% Py, 1-1% Cr
66	9.5-13.5		4.0		320				as above
67	13.5-17.5		4.0		100				" " but well sheared & rubble.

SPECT90  
DECEMBER 1990