

83-#672-11785

14E4

**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**

**11,785**



GEOLOGICAL RECONNAISSANCE REPORT  
ERIE CREEK CLAIMS  
NELSON MINING DIVISION  
NTS 82 F/6  
Lat: 49°19' Long: 117°24'

OWNED BY  
R.T. JOVESKI & G.W. SINDEN

OPERATOR: GREENWICH RESOURCES. INC.

CONSULTANT CONTRACTOR: ROBERTSON RESEARCH CANADA LIMITED

REPORT BY  
KENNETH KONKIN, Geological Assistant and  
DAVID S. EVANS, Ph.D., P. Geol.,  
Consultant to  
ROBERTSON RESEARCH CANADA LIMITED

NOVEMBER 1983

11785

TABLE OF CONTENTS

	<u>Page No.</u>
1. SUMMARY .....	1
2. INTRODUCTION .....	2
2.1 Location and Access .....	2
2.2 Physiography and Climate .....	3
2.3 History of Mining in the Erie Creek Area ..	3
3. GEOLOGY .....	5
3.1 Regional and Local Geology .....	5
3.2 Mineralization .....	6
4. DISCUSSION .....	7
5. CONCLUSIONS .....	9
6. RECOMMENDATIONS .....	10
7. SELECTED REFERENCES .....	11
CERTIFICATES .....	12

LIST OF FIGURES

Page No.

Figure 1: Property Index Map ..... Following Page 2  
Figure 2: Erie Creek Claims and Geology ..... Following Page 2  
Figure 3: Sample Location and Geology ..... Rear pocket

LIST OF TABLES

Table 1: Mineral Claims ..... 2

LIST OF APPENDICES

Appendix 1: Analytical Information  
Appendix 2: Geochemical Data  
Appendix 3: Statement of Exploration Expenditures

1. SUMMARY

Geological reconnaissance on the Erie Creek property has confirmed the presence of favourable Rossland Group rocks and extensions of the promising "structo-environmental" trend from the formerly producing Second Relief Mine.

It is concluded that a follow-up program to include a cut grid, a magnetic survey, a vertical loop electromagnetic survey and additional geological mapping will serve to identify potential drill targets in overburden covered areas of Erie Creek Valley.

## 2. INTRODUCTION

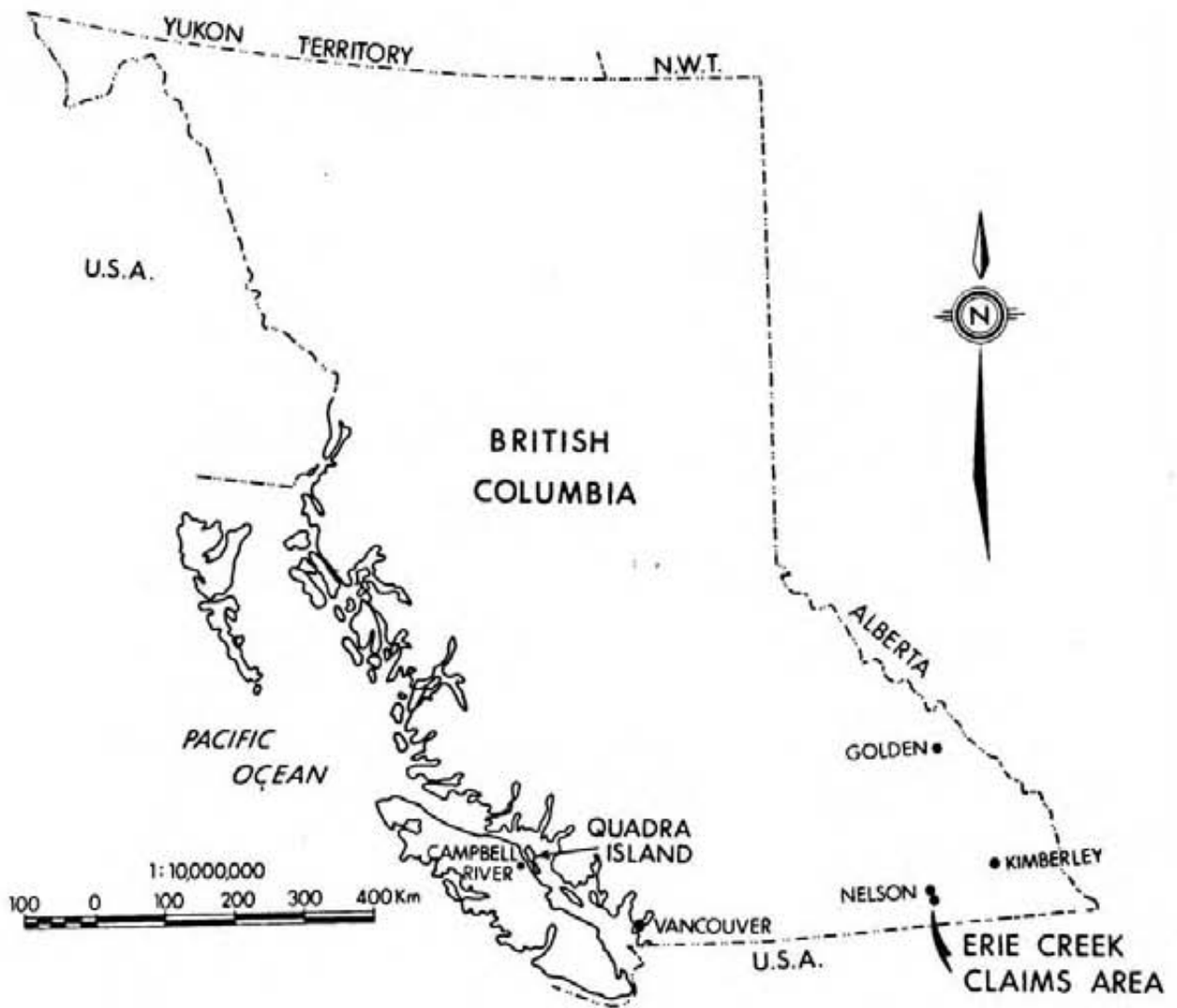
### 2.1 Location and Access

The Erie Creek claims (Table 1) are located in the Nelson Mining Division of southeastern British Columbia, approximately 22 km south-southwest of the city of Nelson (Figure 1).

The property is accessible by Forestry roads along Erie Creek to Provincial Highway #3 between Fruitvale and Salmo, B.C. (Figure 2).

TABLE 1  
MINERAL CLAIMS

<u>Claim</u>	<u>Record No.</u>	<u>Month of Record</u>	<u>Owner</u>
Martha Washington	2813	Nov.	G.W. Sinden
Chief Fr.	2812	Nov.	G.W. Sinden
Kvist Fr.	2811	Nov.	G.W. Sinden
Polly Fr.	2810	Nov.	G.W. Sinden
Andy Fr.	2989	May.	G.W. Sinden
Erie 1-5 (incl.)	3207- 3211(incl)	May	R.T. Joveski








GREENWICH RESOURCES INC.

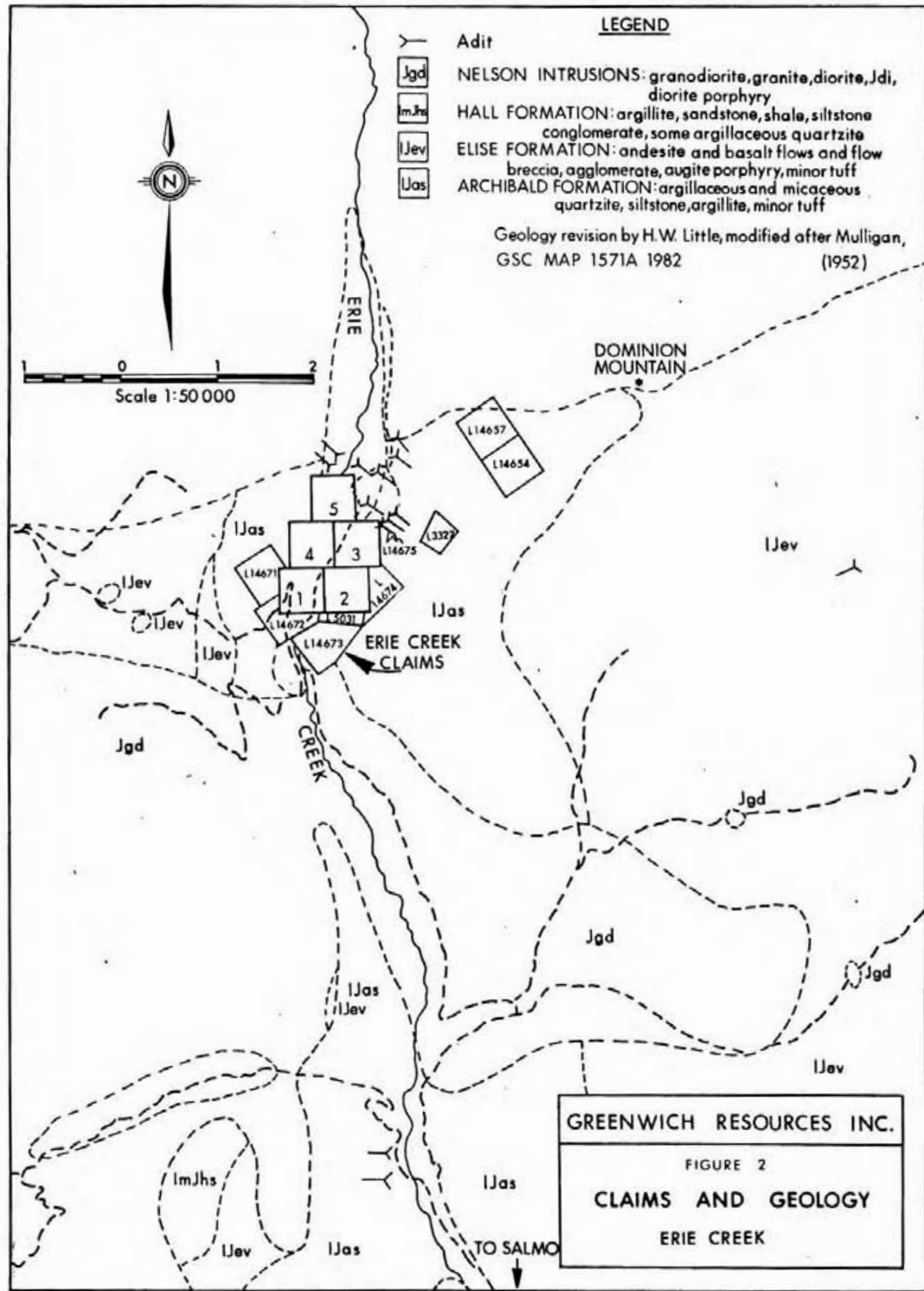
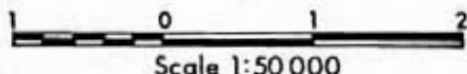
FIGURE 1

PROPERTY INDEX MAP

**LEGEND**

-  Adit
-  NELSON INTRUSIONS: granodiorite, granite, diorite, Jdi, diorite porphyry
-  HALL FORMATION: argillite, sandstone, shale, siltstone conglomerate, some argillaceous quartzite
-  ELISE FORMATION: andesite and basalt flows and flow breccia, agglomerate, augite porphyry, minor tuff
-  ARCHIBALD FORMATION: argillaceous and micaceous quartzite, siltstone, argillite, minor tuff

Geology revision by H.W. Little, modified after Mulligan, GSC MAP 1571A 1982 (1952)



## 2.2 Physiography and Climate

The topography is rugged and outcrop is normally only found at higher elevations. Valleys tend to be heavily vegetated. The claims identified in Table 1 lie, for the most part, along the Erie Creek Valley.

Climate of the West Kootenay region is characterized by warm summers, normally extending from May to September, a cool and damp fall and spring, and relatively mild winters.

## 2.3 History of Mining in the Erie Creek Area

The mining history of the Erie Creek area has been dominated by development and exploitation of vein ore-bodies at the Second Relief Mine.

The property is described in many of the B.C. Minister of Mines reports; but is probably best documented in Cockfield's Memoir 191 on the Lode Gold Deposits of the Ymir-Nelson area (Cockfield, 1936).

The ore deposits are described as fissure veins in the Rossland Group rocks, primarily the Elise Formation. The veins strike northeast and dip steeply to the northwest. Ore minerals include pyrite, pyrrhotite, chalcopyrite and the occasional occurrence of molybdenite. Gangue mineralogy consists of minor quartz, magnetite, garnet and epidote, an assemblage consistent with high temperature formation.



Gold content averaged about 0.4 oz/ton during the mine life and it is estimated that about 100,000 ounces were produced during the period 1900 - 1950.

One vein, known as the Second Relief Vein, has supplied almost all of the production. This vein follows the hanging wall of a diorite-porphry dyke some 10 m to 15 m in width. Contact relationships indicate the mineralization was introduced subsequent to dyke emplacement with gold values ranging across widths from a few centimetres up to 4 m. The Second Relief vein was developed on six levels over an elevation of about 150 m.

In addition to porphyry dykes a few lamprophyre dykes are evidenced. These units are believed to be the youngest of the dyke rocks as one cuts the Second Relief Vein and one intrudes the Nelson Granite. These features are of some importance in assessing regional mineral potential as many gold veins in the Nelson-Ymir area shown a penecontemporaneous development and association between lamprophyre dyke and precious metal-bearing quartz vein systems.

### 3. GEOLOGY

#### 3.1 Regional and Local Geology

The Erie Creek claims are underlain by two major rock units: the Lower Jurassic Rossland Group and the Upper Jurassic-Cretaceous Nelson Intrusives (Little, 1982). The relationship between the two units is disconformable contact with Nelson Plutonic rocks intruding the overlying Rossland Group volcanic and sedimentary formations and units.

The Rossland Group can be divided into two formations: the Archibald Formation and the later Elise Formation (once called the Beaver Mountain Formation). The Erie Creek property is predominantly underlain by the Elise Formation which primarily consists of andesite flows, augite-feldspar porphyry and flow breccias with minor tuffs.

The Elise Formation is pre-dated by the Archibald Formation which consists of siltstone, argillite, flow breccias and minor tuffs.

The Nelson Intrusives consists of granodiorites, granite porphyry and diorites. This unit rarely appears on the Erie Creek property. The surficial expression is in the form of porphyritic granite dykes. The dump sites at the Second Relief Mine include many granodiorite fragments.

### 3.2 Mineralization

At the Second Relief Mine, the sulphide mineralization is normally contained at the contact zones of the various units in the Elise Formation. The mine dumps have characteristic occurrences of disseminated and semi-massive pyrrhotite and pyrite with some chalcopyrite. These semi-massive sulphides are accompanied by minor quartz. This may infer the possibility of local replacement ores.

High gold values (22, 600 ppb) were obtained from sampling the East #2 Adit quartz vein. This location (Figure 3) is east of Erie Creek claims but gold values up to 16,000 ppb (random dump grab sample) were obtained from within the assumed boundaries of the property.

4. DISCUSSION

Reconnaissance geological mapping and sampling on the Erie Creek claims and in the Second Relief Mine area has confirmed the presence of two porphyritic units which trend onto the Greenwich property; and, represent potentially favourable host(s) for precious metal-bearing veins. A significant unit exposed in the map area is the Feldspar Poryphyry (Unit 2, Figure 3). This unit, in addition to feldspar phenocrysts, contains small augite phenocrysts, has an altered dark green andesitic matrix and hosts quartz veins. Unit 4 is a Felsic Quartz - Eye Porphyry containing less than 10% mafics; and, may be an earlier less zoned equivalent of Unit 2. Both units are considered favourable indications for new and extension developments of precious-metal bearing hydrothermal vein systems.

Assay data (Appendix 2) shows a sympathetic distribution of Ag and Au; but, little correlation between Au and Cu. This feature suggests a somewhat revised model from Cockfield's hypothesis for ore genesis at Second Relief, and, accordingly, affects future exploration activities.

Field relationships suggest that sequential cooling of successive volcanic flows and units within the Elise Formations has provided conformable zones of weakness for emplacement of the subvolcanic porphyritic dyke intrusions of the Nelson Granite. These dilations have provided a structural setting for the development of extensive hydrothermal systems which may not only enhance iron-rich metasomatic activity (i.e. development of epidote, garnet,

pyrrhotite) but may also provide an environment for additional (later) replacement sulphide ores. This two phase model may account for the persistence of the Second Relief Vein and longevity of mining.

The above model is suggestive of higher temperatures and pressures than is normally characteristic of hydrothermal vein development, and, provides a basis for further exploration of the Erie Creek claims.

The regional geological extent and distribution of the Rossland Group in the Erie Creek Valley (GSC Map 1571A) infers that the maximum thickness of volcano-sedimentary rocks should occur in topographically low areas of the Erie 1-5 claims (Figure 2). To effectively continue exploration on the Erie Creek claims will require application of techniques to overcome extensive coluvial deposits in the Erie Creek Valley. Geochemistry, other than basal till/coluvial sampling, will not provide reliable results in determining subcropping mineralization and/or favourable structo-environmental settings. However, geophysical surveys, with proper orientation control in areas of outcrop should provide useful direct and indirect data in areas of overburden. Magnetic survey(s) are necessary to define lithologies, faults and contacts. Electromagnetic survey(s), possibly vertical loop, are needed to define potential sources of semi-massive sulphide mineralization. It is possible that the disseminated to semi-massive nature of the known ore occurrences at Second Relief will respond more favourably to an Induced Polarization Survey.

5. CONCLUSIONS

- i) Geological reconnaissance activities in the Erie Creek claim area has provided data to understand and develop an ore genesis model at the Second Relief Mine.
- ii) The potential for an equivalent ore-body(s) on the Erie Creek claims to the original Second Relief Mine (approximately 200,000 tons at 0.5 opt Au) is considered excellent. A genetic model, based on acquired field data and observed relationships suggests that environment for extensive hydrothermal vein development exists on the Erie Creek Property.
- iii) Further exploration activities will require extensive use of geophysical surveys to determine favourable stratigraphies and structures. Use of geochemistry is not recommended as a cost effective exploration tool at this time.

6. RECOMMENDATIONS

- i) Additional contiguous claims should be acquired, where possible, to cover prospective areas of Rossland Group rocks, particularly where Elise Formation volcanic units may occur.
- ii) A cut grid, with control lines extending across both prospective and known stratigraphies, structures and veins is recommended.
- iii) Magnetic and vertical loop electromagnetic surveys should be undertaken at optimum measurement stations and distributions to define promising and favourable subcropping lithologies and structures.
- iv) Additional geological mapping and sampling should be carried out, where possible, to aid in defining regional and local stratigraphies and structures that may host precious metal-bearing veins.

7. SELECTED REFERENCES

COCKFIELD, W.E., 1936.

Lode Gold Deposits of the Ymir-Nelson Area, British Columbia, C.S.C. Memoir 191.

LITTLE, H.W., 1960.

Nelson Map-Area, West Half British Columbia (82 F W1/2), G.S.C. Memoir 308, 205 p.

LITTLE, H.W., 1982.

Bonnington Map-Area, British Columbia, G.S.C. Map 1571A.

MULLIGAN, R., 1952.

Bonnington Map-Area, British Columbia, G.S.C. Paper 52-13.




CERTIFICATE

I, David S. Evans, currently residing at 5232 Viceroy Drive N.W., Calgary, Alberta T3A 0V7, hereby certify that:

1. I am a mining exploration geologist and have practised my profession since 1966.
2. I am a graduate of the University of British Columbia with a B.Sc. (1966) in Chemistry and Geology, and a graduate of the Royal School of Mines, University of London, U.K. with a Ph.D. (1971) in Applied Geochemistry.
3. I am a registered Professional Geologist with the Association of Professional Engineers, Geologists and Geophysicists of Alberta, a Member of the Association of Exploration Geochemists, and a Fellow of the Geological Association of Canada.
4. I visited the Erie Creek property on May 23 and June 17, 1983.
5. The work in this report was carried out under my supervision.

Nov. 27, 1983

Date

A circular seal for a Professional Geologist. The outer ring contains the text "PROFESSIONAL GEOLOGIST" at the top and "ALBERTA" at the bottom. The inner circle contains the name "DAVID S. EVANS" and a small emblem of a geological hammer and pickaxe.  
David S. Evans.

David S. Evans, Ph.D., P. Geol.

CERTIFICATE

I, Ken Konkin currently residing at 5959 Student Union Mall, Gage Towers, University of British Columbia, Vancouver, British Columbia hereby certify that:

1. I am a 4th year student in Geology at the University of British Columbia, Vancouver, British Columbia.
2. I have been employed by Robertson Research Canada Limited for three consecutive field seasons (1981-1983) as a geological assistant in base and precious metals exploration in British Columbia and Alaska.
3. I carried out the preliminary evaluation and sampling program on the Erie Creek Claims from May 23 through August 21, 1983.

Oct. 31, 1983  
Date

Ken Konkin  
Ken Konkin

APPENDIX 1

ANALYTICAL INFORMATION

Laboratory: Terramin Research Labs Ltd.,  
Calgary, Alberta

Mesh Size: Rocks: -100

Extraction: For Cu/Co:  $\text{HNO}_3/\text{HClO}_4$  to dryness, taken  
up in HCl  
For As: Aqua Regia dissolution, Arsine  
gas by hydride generation  
For Au/Ag: Fire Assay fusion, cupellation  
and acid dissolution of precious  
metals bead

Analyses: Atomic Absorption

APPENDIX 2

GEOCHEMICAL DATA



# TERRAMIN RESEARCH LABS LTD.

## ANALYTICAL REPORT

Job # 83-123

Date

Client Project ERIE

Page 4/7

Sample No.	Au ppb	Ag ppb	As ppm	Cu ppm	Co ppm
Trench T-1 a	800	1050	172.	730	14
T-1 b	674	1020	166.	830	16
T-3 a	1330	900	160.	156	5
T-3 b	1240	630	36.	320	7
T-3 c	2000	1220	108.	171	5
T-3 d	4660	1580	72.	340	6
T-3 e	2660	2300	730.	1040	13
Rock Adit #1 West	8060	10600	50.	920	15
Adit #1 East	5160	1290	14.	530	10
Adit #2 West	586	10000	48.	4400	44
Adit #2 East	7480	2700	54.	1270	11
Adit #2 East Footwall	40	160	20.	109	14
Adit #2 East-Hanging Wall	18	100	1.6	29	7
Adit #2 East-Quartz Vein	22600	7000	11.0	1640	5
Adit #3 East	9500	4000	950.	2200	16
West Trench #1	8880	5600	90.	2700	13
West Trench #2	5160	5500	54.	2400	38
D #1	16000	1920	400.	670	12
D #2	2840	3200	230.	1270	14
D #3	12200	3100	220.	730	16
WD #1	5260	17200	210.	1800	35
WR 125 M	8	80	1.4	24	11
WR 150 M	42	70	0.4	10	5
WR 200 M	18	1210	2.8	240	9

APPENDIX 3

STATEMENT OF  
EXPLORATION EXPENDITURES

STATEMENT OF 1983 EXPENDITURES  
ERIE CREEK CLAIMS

NAME/ADDRESS	DAYS ON PROPERTY	WAGES			SUBSISTENCE		
		DAYS WORKED	DAILY RATE	TOTAL WAGES	TOTAL DAYS	RATE PER DAY	AMOUNT
Gordon W. Sinden, Senior Technologist, 330, 604 - 1 Street S.W., Calgary, Alberta. T2P 1M7	May 23, June 17	2	\$155.00	\$ 310.00	2	\$ 25.00	\$ 50.00
David S. Evans, Exploration Manager/Geochemist, 330, 604 - 1 Street S.W., Calgary, Alberta. T2P 1M7	May 23 June 17	2	\$360.00	\$ 720.00	2	\$ 25.00	\$ 50.00
T. Joveski Geological Assistant 330, 604 - 1 Street S.W. Calgary, Alberta. T2P 1M7	May 23,26,31 June 2,3,6,7 8,17	9	\$110.00	\$ 990.00	9	\$ 25.00	\$225.00
K. Konkin Geological Assistant 330, 604 - 1 Street S.W. Calgary, Alberta. T2P 1M7	May 23,26,31 June 2-4,6,7 8,17 July 29,30 Aug 14,15,16 21	16	\$110.00	\$1,760.00	16	\$ 25.00	\$400.00
		<b>TOTAL</b>		<b>\$3,780.00</b>	<b>TOTAL</b>		<b>\$725.00</b>

STATEMENT OF 1983 EXPENDITURES  
ERIE CREEK CLAIMS

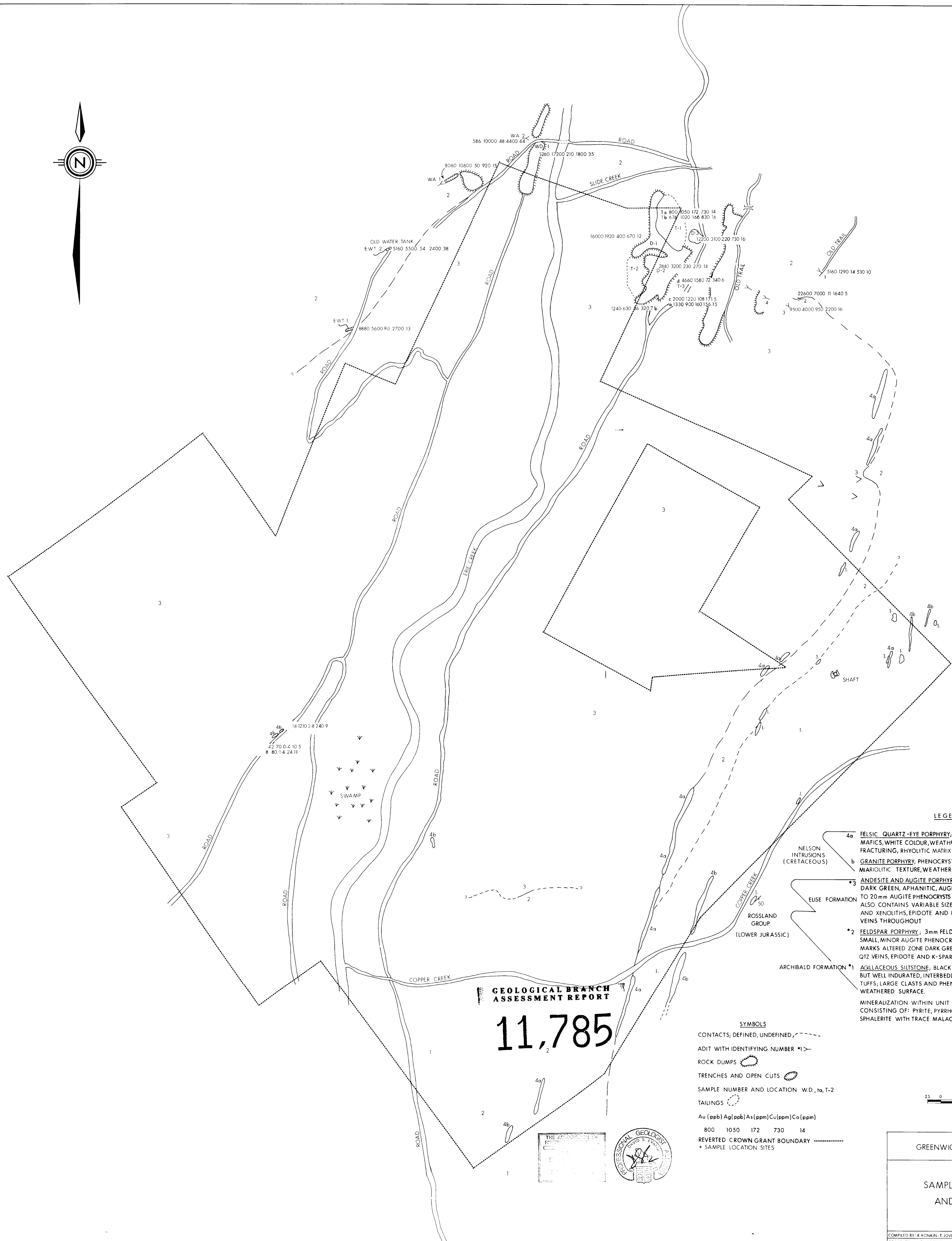
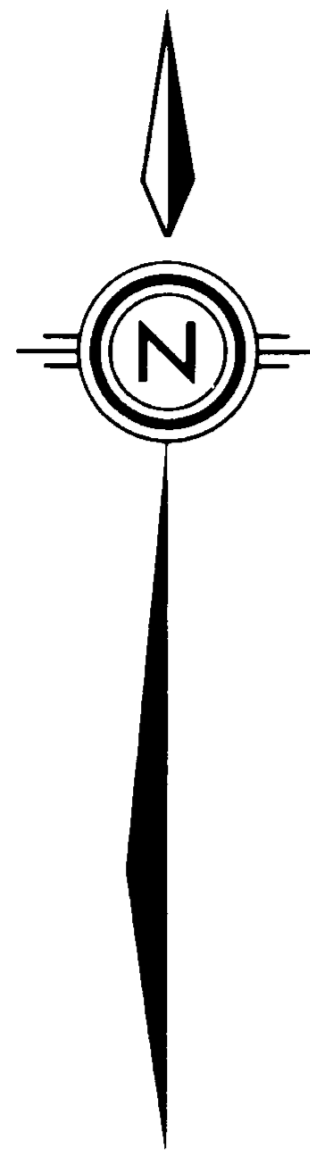
Other Expenditures

Field Office Rental	\$ 150.00
Supplies and Equipment	115.00
Truck Rental (incl. gas, oil, maintenance)	750.00
Mileage and Expenses	450.00
Freight	60.00
Communications - Telephone	30.00
Analyses	366.00
Drafting	<u>150.00</u>
Total Other Expenditures	<u>\$2,071.00</u>

Summary

Total Wages	\$3,780.00
Total Subsistence	725.00
Total Other Expenditures	<u>2,071.00</u>
Total Project Costs	6,576.00
Report Preparation	<u>985.00</u>
TOTAL 1983 EXPENDITURES	<u>\$7,561.00</u>





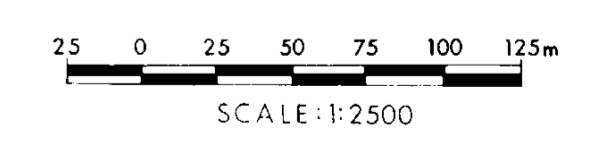
**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**  
**11,785**

**LEGEND**

- 4a FELSIC QUARTZ-EYE PORPHYRY, CONTAINS LESS THAN 10% MAFICS, WHITE COLOUR, WEATHERS BUFF RESISTANT, ANGULAR FRACTURING, RHYOLITIC MATRIX 3mm QTZ PHENOCRYSTS.
- b GRANITE PORPHYRY, PHENOCRYSTS OF QTZ AND FELDSPAR, MIAROLITIC TEXTURE, WEATHERS LIGHT TO MEDIUM GREY
- 3 ANDESITE AND AUGITE PORPHYRY, ANDESITE IS MEDIUM TO DARK GREEN, APHANITIC, AUGITE PORPHYRY CONTAINS 3mm TO 20mm AUGITE PHENOCRYSTS WITH AN ANDESITIC MATRIX, ALSO CONTAINS VARIABLE SIZED FELDSPAR PHENOCRYSTS AND XENOLITHS, EPIDOTE AND K-SPAR ALTERATION WITH QTZ VEINS THROUGHOUT
- 2 FELDSPAR PORPHYRY; 3mm FELDSPAR PHENOCRYSTS, CONTAINS SMALL, MINOR AUGITE PHENOCRYSTS, RUSTY WEATHERING, MARKS ALTERED ZONE DARK GREEN ANDESITIC MATRIX CONTAINS QTZ VEINS, EPIDOTE AND K-SPAR ALTERATION.
- 1 ARCHIBALD FORMATION \*1 AGILLACEOUS SILTSTONE; BLACK RUSTY WEATHERED, FRACTURED BUT WELL INDURATED, INTERBEDDED WITH MINOR FLOW TUFFS; LARGE CLASTS AND PHENOCRYSTS (4cm) PALE GREEN WEATHERED SURFACE. MINERALIZATION WITHIN UNIT AND ALONG CONTACTS CONSISTING OF: PYRITE, PYRRHOTITE, MAGNETITE, SPHALERITE WITH TRACE MALACHITE AND AZURITE.

**SYMBOLS**

- CONTACTS; DEFINED, UNDEFINED
- ADIT WITH IDENTIFYING NUMBER \*1
- ROCK DUMPS
- TRENCHES AND OPEN CUTS
- SAMPLE NUMBER AND LOCATION W.D., 1a, T-2
- TAILINGS
- Au (ppb) Ag (ppb) As (ppm) Cu (ppm) Co (ppm)
- 800 1050 172 730 14
- REVERTED CROWN GRANT BOUNDARY
- + SAMPLE LOCATION SITES



GREENWICH RESOURCES INC.

FIGURE 3  
SAMPLE LOCATION  
AND GEOLOGY