

83-#678 - 11845

10/84

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

11,845

ASSESSMENT REPORT

ON THE

GEOLOGY OF THE EHOLT AREA
(YOUNG GEORGE CLAIM GROUP)

AND

HELICOPTER INPUT E.M. SURVEY

CLAIMS: VICTOR, MOE, YOUNG GEORGE, RAM AND PASS.

GREENWOOD MINING DIVISION

NTS: 82E/2E

LATITUDE: 49 degrees 07'N. LONGITUDE: 118 degrees 32' E

OWNER: KETTLE RIVER RESOURCES LTD.

OPERATOR: KETTLE RIVER RESOURCES LTD.

CONSULTANTS: QUESTOR SURVEYS LTD.

AUTHOR: JAMES T. FYLES

DATE: OCTOBER 5, 1983

part 2
of 2

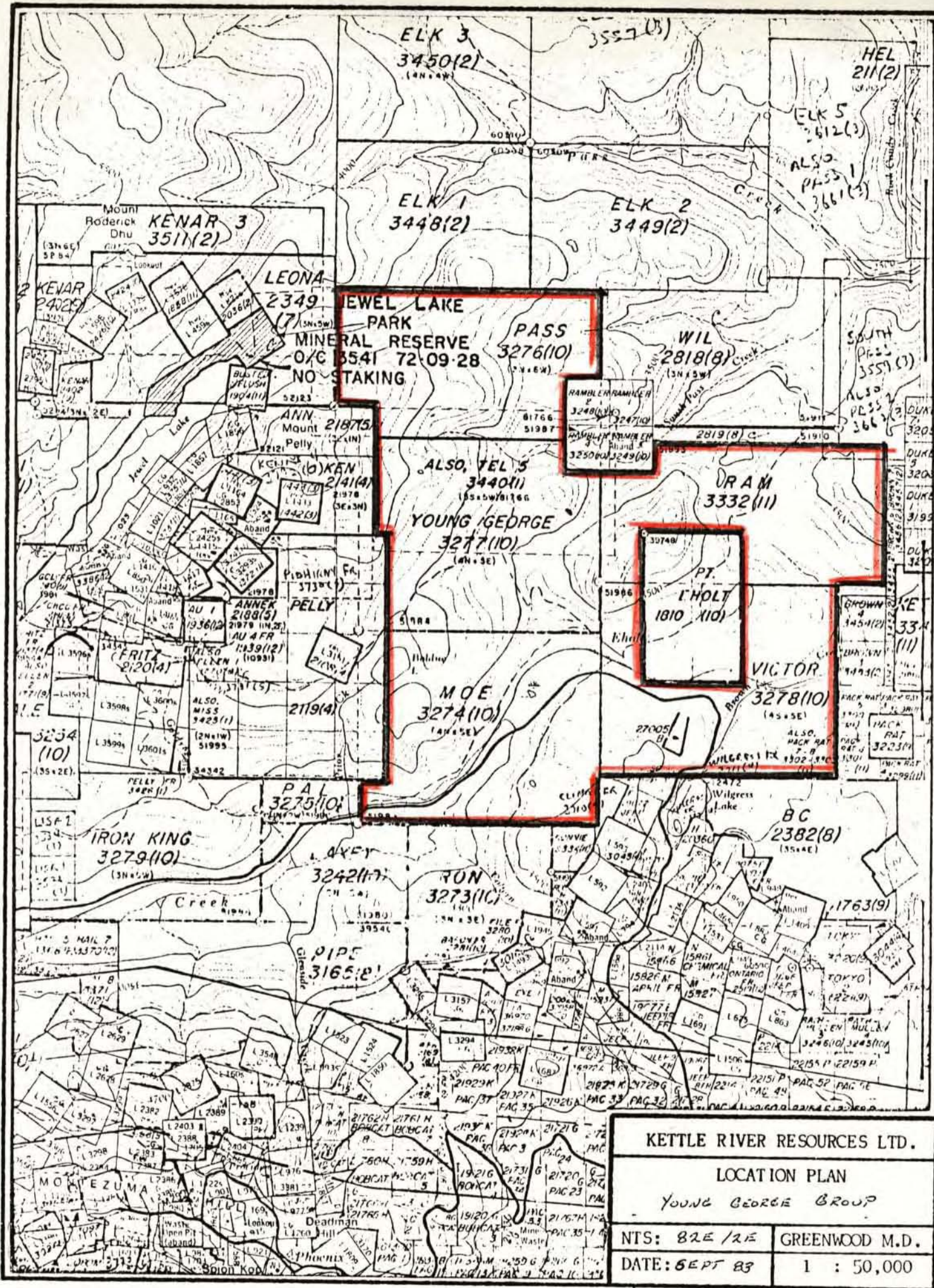
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YOUNG GEORGE PROJECT	
PROJECT NO: 25H52	OCTOBER 1983

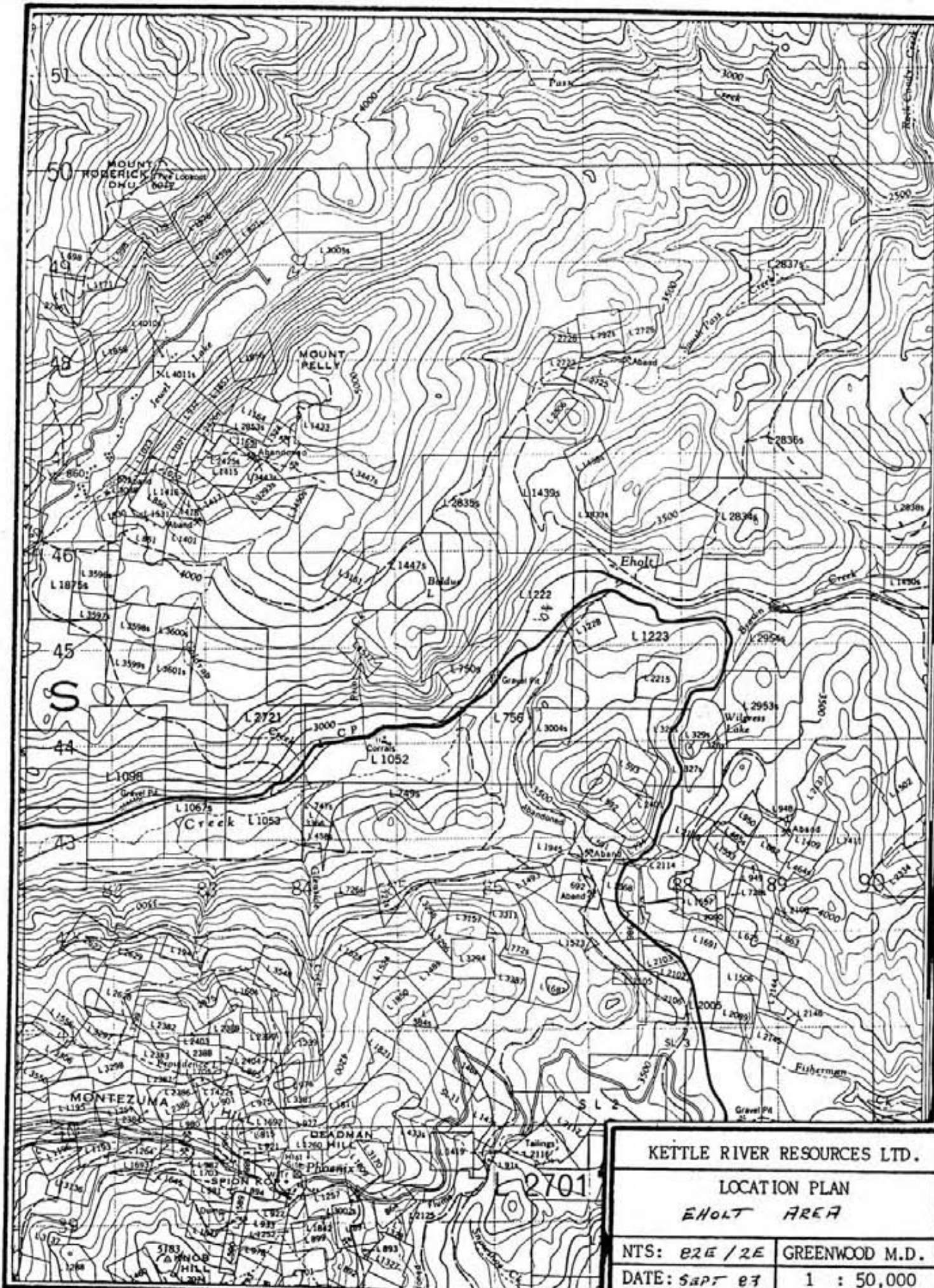
INTRODUCTION

THIS REPORT DESCRIBES THE RESULTS OF A GEOLOGICAL MAPPING PROGRAM UNDERTAKEN IN THE EHOLT AREA AND A HELICOPTER INPUT E.M. SURVEY OF A PORTION OF THE AREA ALONG WITH RESULTS OF TEST LINES OVER SEVERAL KNOWN MINERAL OCCURRENCES WITH THE 'PHOENIX CAMP.'

INTEREST IN THE AREA WAS SPURRED BY EXAMINATIONS OF SEVERAL OLD WORKINGS WHICH INDICATED THE POTENTIAL FOR SULPHIDE MINERALIZATION WITHIN THE BROOKLYN FORMATION ROCKS. THE GEOLOGICAL MAPPING PROGRAM WAS AN ATTEMPT TO DELINEATE THE BROOKLYN FORMATION IN OUTCROP AREAS AND THE HELICOPTER INPUT E.M. SURVEY TO LOCATE CONDUCTIVE TARGETS IN OVERBURDEN COVERED AREAS.



KETTLE RIVER RESOURCES LTD.	
LOCATION PLAN	
YOUNG GEORGE GROUP	
NTS: 82E 12E	GREENWOOD M.D.
DATE: SEPT 83	1 : 50,000



KETTLE RIVER RESOURCES LTD.	
LOCATION PLAN	
EHOLT AREA	
NTS: B2E / 2E	GREENWOOD M.D.
DATE: SEPT 87	1 : 50,000

LOCATION ACCESS PHYSIOGRAPHY:

THE YOUNG GEORGE CLAIM GROUP IS LOCATED IN THE EHOLT AREA APPROXIMATELY 16 KM NORTH OF GRAND FORKS AND 12 KM NORTH EAST OF GREENWOOD, B.C.

HIGHWAY #3, THE EHOLT-JEWEL LAKE ROAD AND NUMEROUS LOGGING AND MINING ROADS PROVIDE CONVENIENT ACCESS TO MOST OF THE CLAIMED AREA.

ELEVATIONS ON THE CLAIMS RANGE FROM 3000 FT TO 4500 FT ABOVE SEA LEVEL. TOPOGRAPHY CONSISTS OF MODERATE TO STEEP SLOPES FLANKING THE EHOLT, BROWN AND SOUTH PASS CREEK VALLEYS. MIXED FOREST VEGETATION IS GENERALLY FAIRLY DENSE THROUGHOUT THE CLAIM AREA, PARTICULARLY ON THE NORTH SLOPES. THE MAJORITY OF THE AREA IS TILL COVERED.

CLAIMS:

THE FOLLOWING CLAIMS COMPRISE THE YOUNG GEORGE GROUP. ALL ARE OWNED BY KETTLE RIVER RESOURCES LTD.

<u>CLAIM</u>	<u>RECORD NO.</u>	<u>MONTH</u>	<u>UNITS</u>
MOE	3274	10	20
YOUNG GEORGE	3277	10	20
PASS	3276	10	18
VICTOR	3278	10	20
RAM	3332	11	18

NOTES ON THE GEOLOGY OF THE EHOLT AREA

THE GEOLOGY OF THE EHOLT AREA MUST BE INTERPRETED FROM A FEW AREAS OF ABUNDANT OUTCROPS WHICH ARE SEPARATED BY RELATIVELY LARGE BELTS OF TILL AND GRAVEL. THE PRE-TERTIARY ROCKS IN THE AREA ARE IN THE UPPER GREENSCHIST FACIES OF REGIONAL METAMORPHISM AND HAVE ALSO BEEN SUBJECTED TO WIDESPREAD THERMAL METAMORPHISM. STRATIGRAPHIC CORRELATIONS ARE BASED ON EXTENSIVE MAPPING OF COMPANY CLAIMS TO THE SOUTH IN AREAS OF BETTER EXPOSURE AND LOWER METAMORPHISM GRADES. THE ATTACHED MAP WAS PREPARED ON A SCALE OF 1,000 FEET TO THE INCH USING A BASE MAP ON THAT SCALE AND AIR PHOTOS. THE WORK WAS DONE IN LATE AUGUST AND SEPTEMBER 1983.

THE EHOLT AREA CONTAINS PARTS OF THE KNOB HILL AND BROOKLYN FORMATIONS, AN INTRUSIVE OF PORPHYRITIC DIORITE EXTENDING NORTHWARD FROM THE EMMA MINE IN THE SUMMIT CAMP AND TERTIARY ROCKS INCLUDING ARKOSE AND A WIDE VARIETY OF VOLCANIC AND INTRUSIVE ROCKS.

PRE-TERTIARY ROCKS

ROCKS OF THE KNOB HILL FORMATION ARE EXPOSED IN SMALL BLUFFS WEST OF EHOLT AND ALONG THE ABANDONED RAILWAY FROM EHOLT TO SUMMIT CAMP AND ON THE SLOPES ABOVE IT. WEST OF EHOLT THEY ARE GREY TO BUFF MOTTLED RECRYSTALLIZED CHERT AND MINOR AMOUNTS OF DARK GREEN VERY FINE GRAINED AMPHIBOLITE. IN THE AREA ALONG THE RAILROAD GRADE, DISTINCTIVE UNITS OF CHERT, AMPHIBOLITE AND DARK GREY TO BLACK SILICEOUS SILTSTONE AND ARGILLITE CAN BE IDENTIFIED. THESE UNITS TREND EASTWARD AND PROBABLY DIP AT MODERATE ANGLES TO THE NORTH PARALLEL TO A VERY POORLY DEFINED FOLIATION IN THE ARGILLITE.

THE KNOB HILL ROCKS ARE OVERLAIN BY THE BROOKLYN FORMATION WHICH CONTAINS UPPER TRIASSIC FOSSILS IN LIMSTONES 4 KM SOUTH OF THE AREA. THE BASE OF THE BROOKLYN, IDENTIFIED IN THE PAST AS AN UNCONFORMITY IS PRESENT IN THE EHOLT AREA ON THE WESTERN SLOPES OF EMMA RIDGE AND ALONG THE RAILROAD GRADE TO THE NORTHWEST BUT ALTHOUGH IT CAN BE LOCATED APPROXIMATELY, IT IS NOT EXPOSED. THE BASAL UNIT IS CHERT BRECCIA, REFERRED TO IN THE PHOENIX AREA AS SHARPSTONE CONGLOMERATE (SEE SERAPHIM 1956.) IN THE EHOLT AREA, IT IS BUFF TO GREY WEATHERING AND CONSISTS OF ANGULAR FRAGMENTS OF LIGHT COLORED CHERT, QUARTZ, JASPER, VOLCANIC ROCKS AND RARELY LIMESTONE, MAINLY LESS THAN 3CM ACROSS, IN A DARK GREY SILICEOUS MATRIX. BEDDING IS RARELY VISIBLE, BUT AT A FEW LOCALITIES THE STRIKE IS TO THE NORTH AND THE DIP IS NEARLY VERTICAL. IN THE AREA NORTH OF EHOLT, CHERT BRECCIA IS FOUND ONLY IN ONE ROCKCUT ON THE OLD JEWEL LAKE ROAD. IT IS EAST (AND SOUTH) OF A SINGLE OUTCROP OF SILICEOUS ARGILLITE AND CHERT (KNOB HILL) AND BENEATH BLUFFS OF SILICATE MARBLE TO THE EAST. WHILE THE EVIDENCE IS MINIMAL, THE SEQUENCE AND POSITION OF THESE OUTCROPS IS DISTINCTIVE ENOUGH TO BE REASONABLY SURE OF THE CORRELATIONS AND THAT THE BROOKLYN CHERT BRECCIA AND LIMSTONES CONTINUE NORTHWARD THROUGH THE TILL-COVERED AREAS OF THE YOUNG GEORGE CLAIM.

THE BROOKLYN LIMESTONE WHICH OVERLIES THE CHERT BRECCIA IN THE EHOLT AREA IS NORMALLY A MASSIVE LIGHT GREY TO WHITE, MASSIVE, FINE TO MEDIUM GRAINED MARBLE. LOCALLY IT IS GREY BANDED CRYSTALLINE LIMESTONE AND IN THE BLUFFS NORTH OF EHOLT IT IS WHITE COARSELY CRYSTALLINE SILICEOUS MARBLE CONTAINING WELL CLEAVED BLADES OF A WHITE SILICATE (TREMOLITE OR WOLLASTONITE.)

A VOLCANIC COMPLEX CONSISTING OF GREENSTONE AND/OR MICRODIORITE LIES ABOVE THE BROOKLYN LIMESTONE IN THE EHOLT AREA. THE GREENSTONE AND MICRODIORITE ARE DARK GREEN APHANITIC TO VERY FINE GRAINED MASSIVE ROCKS IN WHICH PLAGIOCLASE, AND LESS COMMONLY HORNBLENDE CAN BE DISTINGUISHED WITH A HAND LENS. WEATHERED SURFACES ARE COMMONLY MOTTLED AND THESE ROCKS WITH A UNIFORM TEXTURE GRADE Laterally INTO TWO DISTINCTIVE FRAGMENTAL FACIES.

ONE IS BRECCIATED GREENSTONE CONTAINING SUBANGULAR FRAGMENTS OF GREENSTONE UP TO 10 CM ACROSS IN A MATRIX OF THE SAME ROCK WITH A CRUSHED APPEARANCE. THIS ROCK IS WELL EXPOSED ON THE OPEN SLOPES OF EHOLT RIDGE WHERE IT FORMS A NORTHWESTERLY TRENDING, STEEPLY DIPPING LAYER AS MUCH AS 100M WIDE, GRADING Laterally INTO MASSIVE GREENSTONE. THE OTHER FRAGMENTAL VARIETY IS A VOLCANIC BRECCIA WITH ROUNDED AND ANGULAR FRAGMENTS OF PORPHYRITIC VOLCANIC ROCK AND LOCALLY OF LIMESTONE 5-10CM ACROSS IN A MATRIX OF GREENSTONE. THE WESTERN CONTACT OF THESE GREENSTONES AND MICRODIORITES WITH THE BROOKLYN LIMESTONE APPEARS TO BE TRANSGRESSIVE AND IS IN PART INTRUSIVE.

THE EMMA PORPHYRY, NAMED BY CHURCH (1983), IS AN OFFSHOOT OF A LARGE BODY OF GRANDIORITE WHICH LIES SOUTHWEST OF EHOLT. IT IS A GREY FINEGRAINED PORPHYRY WITH PHENOCRYSTS OF PLAGIOCLASE AND LOCALLY PLAGIOCLASE AND HORNBLende WHICH FORMS A STEEPLY DIPPING DYKE-LIKE BODY ALONG THE CREST OF THE EMMA RIDGE AND PROBABY TERMINATES WEST OF THE NORTH END OF WILGRESS LAKE. IT IS CUT BY TERTIARY MONZONITE AND PORPHYRITIC DYKES. (K/A AGE OF 140 ± 5 MA IS REPORTED BY CHURCH (1983, P5.)

TERTIARY ROCKS

TERTIARY ROCKS FORM PART OF A BASIN IN THE NORTHEASTERN CORNER OF THE EHOLT AREA AS WELL AS NUMEROUS DYKES AND IRREGULAR SMALL INTRUSIONS THROUGHOUT THE AREA.

SCATTERED OUTCROPS OF LIGHT GREY AND LIGHT BUFF ARKOSE AND ASKOSIC CONGLOMERATE AND SANDSTONE AROUND THE NORTHERN END OF WILGRESS LAKE AND ON THE RIDGES TO THE NORTH AND NORTHWEST ARE TYPICAL OF THE BASAL TERTIARY KETTLE RIVER FORMATION. NO PRIMARY STRUCTURES WERE FOUND WHICH WOULD INDICATE THE ATTITUDE OF THIS FORMATION. JUDGING FROM ITS DISTRIBUTION, HOWEVER, THE DIP MAY BE TO THE EAST AND NORTH. VESICULAR, BUFF, GREY TO PINKISH FELDSPAR PORPHYRY AND BRECCIA LIE EAST OF THE WESTERN MOST ARKOSE AND ARE REFERRED AS MAFIC PHONOLITE BY CHURCH (1983, P4) BELONGING TO THE MARRON FORMATION WHICH OVERLIES THE KETTLE RIVER. THE INTRUSIVE ROCKS INCLUDE PINKISH BUFF BIOTITE-SYENITE, GREY MONZONITE AND DARK GREY DIORITE AS WELL AS FELDSPAR PORPHYRIES WITH A WIDE VARIETY OF TEXTURES. THEY ARE MAINLY IRREGULAR DYKES COMMONLY WITH LOW TO MODERATE DIPS EITHER TO THE NORTH OR NORTHWEST.

STRUCTURE

ROCKS OF THE BROOKLYN FORMATION DIP STEEPLY AND TREND NORTH THROUGH MOST OF THE AREA. NORTH OF EHOLT, THE BROOKLYN LIMESTONE AND BRECCIA ZONES WITHIN THE GREENSTONE STRIKE NORTHWEST AND ARE VERTICALLY REFLECTING A REGIONAL SWING IN THE STRIKE ACROSS THE YOUNG GEORGE CLAIM.

A SIGNIFICANT FAULT, CALLED THE MOE FAULT, WITH ALMOST 1,000 M OF LEFT HAND OFFSET TRENDS NORTHEAST ACROSS THE AREA. IT IS EXPOSED AS A ZONE OF INTENSE CRUSHING AND BRECCIATION A FEW METERS THICK ALONG THE RAILROAD GRADE SOUTH OF EHOLT WHERE IT STRIKES NORTHEAST AND DIPS 65 DEGREES TO THE SOUTHEAST. IT TRUNCATES A DYKE-LIKE MASS OF TERTIARY FELDSPAR PORPHYRY IN THIS AREA AND PROBABLY IS DOWNTHROWN ON THE SOUTHEAST. THE CONFIGURATION OF THE TERTIARY BASIN IN THE NORTHEASTERN PART OF THE AREA IS POORLY KNOWN BUT PROBABLY SYN-AND POST-TERTIARY FAULTS ARE ASSOCIATED WITH IT, ONE OF WHICH IS THE MOE FAULT.

MINERAL POTENTIAL

EXPERIENCE IN THE PHOENIX CAMP AND ELSEWHERE IN THE GREENWOOD AREA HAS SHOWN THAT GOLD AND COPPER MINERALIZATION OCCURS ALONG FAVOURABLE STRATIGRAPHIC ZONES WITHIN THE BROOKLYN FORMATION. SOME OF THESE ZONES PASS THROUGH THE MOE AND YOUNG GEORGE CLAIMS AND ARE KNOWN TO BE MINERALIZED. THE BROOKLYN LIMESTONE IN THE EHOLT AREA CONTAINS INTERBEDS OF VOLCANOCLASTIC ROCKS SOME OF WHICH ARE ASSOCIATED WITH SKARN, SULPHIDES AND ZONES OF MASSIVE PYRITE. OLD WORKINGS, MANY OF WHICH HAVE NOT BEEN RECENTLY RE-EVALUATED ARE COMMON IN AREAS OF OUTCROP. THE CHANCE FOR DISCOVERING SIGNIFICANT GOLD AND COPPER MINERALIZATION BOTH IN THE OUTCROP AREAS AND IN THE COVERED AREAS SEEMS GOOD.

James T. Fyles
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JAMES T. FYLES
OCT. 5, 1983

REFERENCES:

CHURCH, B.N. 1983 GEOLOGY IN BRITISH COLUMBIA.
GEOLOGY IN THE VICINITY OF THE ORO
DENORO MINE.
BC MINISTRY ENERGY MINES AND
PETROLEUM RESOURCES PP1-13.

SERAPHIM, R.H. 1956 GEOLOGY AND COPPER DEPOSITS OF
THE BOUNDARY DISTRICT,
BRITISH COLUMBIA.
CIM BULL. VOL 49 NO 3
P. 684

STATEMENT OF QUALIFICATIONS

I, JAMES T. FYLES OF 1720 KINGSBERRY CRESCENT, VICTORIA, B.C. HEREBY CERTIFY THAT:

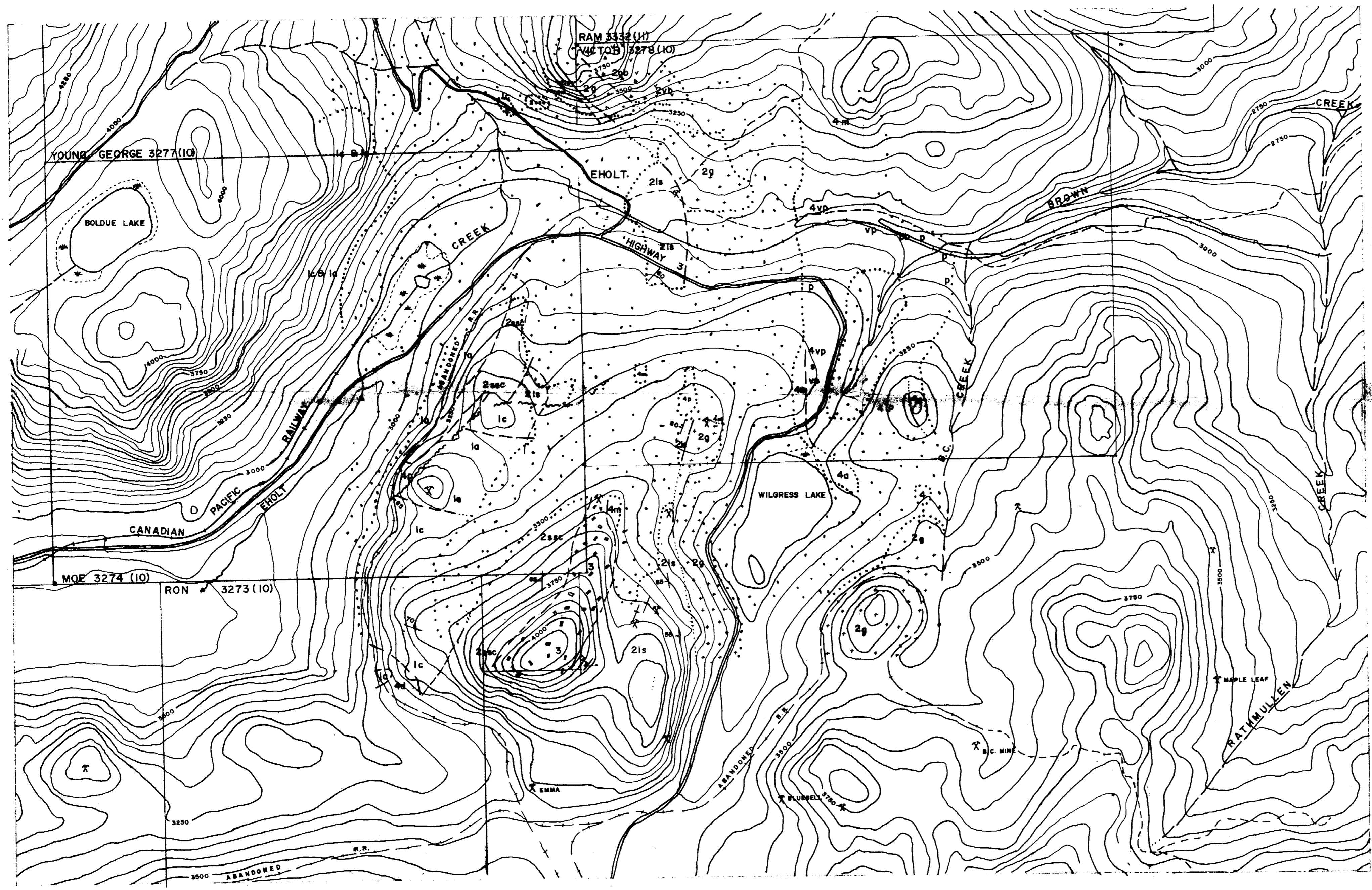
- 1) I AM A CONSULTING GEOLOGIST AND DIRECTOR OF KETTLE RIVER RESOURCES LTD.
- 2) I HAVE PRACTICED MY PROFESSION IN BRITISH COLUMBIA SINCE 1948.
- 3) I AM A GRADUATE OF THE UNIVERSITY OF BRITISH COLUMBIA (BAsc'47, MAsc'49) AND OF COLUMBIA UNIVERSITY (PhD'54).
- 4) I AM A REGISTERED PROFESSIONAL ENGINEER IN BRITISH COLUMBIA (#2563), A FELLOW OF THE GEOLOGICAL ASSOCIATION OF CANADA, A FELLOW OF THE SOCIETY OF ECONOMIC GEOLOGISTS AND A MEMBER OF THE CANADIAN INSTITUTE OF MINING AND METALLURGY.
- 5) THIS REPORT IS BASED ON FIELD WORK DONE BY ME IN THE AREA SHOWN ON THE INCLUDED MAP.

JAMES T. FYLES
VICTORIA, B.C.

STATEMENT OF COSTS

1)	JAMES T. FYLES, GEOLOGIST 8 DAYS FIELD WORK AUG 15-SEPT 23 2 DAYS REPORT PREPARATION 10 DAYS @ \$350/DAY	3,500.00
2)	FIELD ASSISTANT: S. FYLES 4 DAYS @ \$50/DAY	200.00
3)	DRAFTING AND REPORT PREPARATION: R. REID 2 DAYS @ \$150/DAY	300.00
4)	ROOM & BOARD 12 DAYS @ \$30/DAY	360.00
5)	4X4 VEHICLE 8 DAYS @ \$36/DAY	288.00
6)	SECRETARIAL, PRINTING, OFFICE ETC.	100.00
7)	QUESTOR SURVEYS INV#25H52	<u>8,500.00</u>
	TOTAL:	<u>\$13,248.00</u> =====

GEOLOGY of the EHOLT AREA



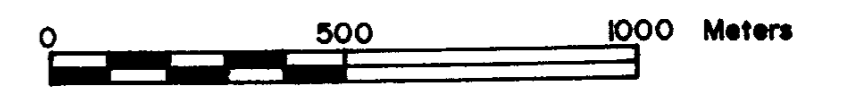
LEGEND

- TERTIARY**
- 4 VOLCANIC & INTRUSIVE ROCKS
d Diorite, m Monzonite, p Feldspar porphyry,
s Syenite, v Vesicular
 - 4a ARKOSE
- CRETACEOUS**
- 3 EMMA PORPHYRY
- UPPER TRIASSIC — BROOKLYN FORMATION**
- 2g,gb,vb GREENSTONE, GREENSTONE BRECCIA, VOLCANIC BRECCIA
 - 2is MARBLE & SILICATE MARBLE
 - 2ssc CHERT BRECCIA & META CHERT BRECCIA
- PRE - TRIASSIC**
- 1c QUARTZITE (Meta Chert & Meta Siltstone)
 - 1a AMPHIBOLITE

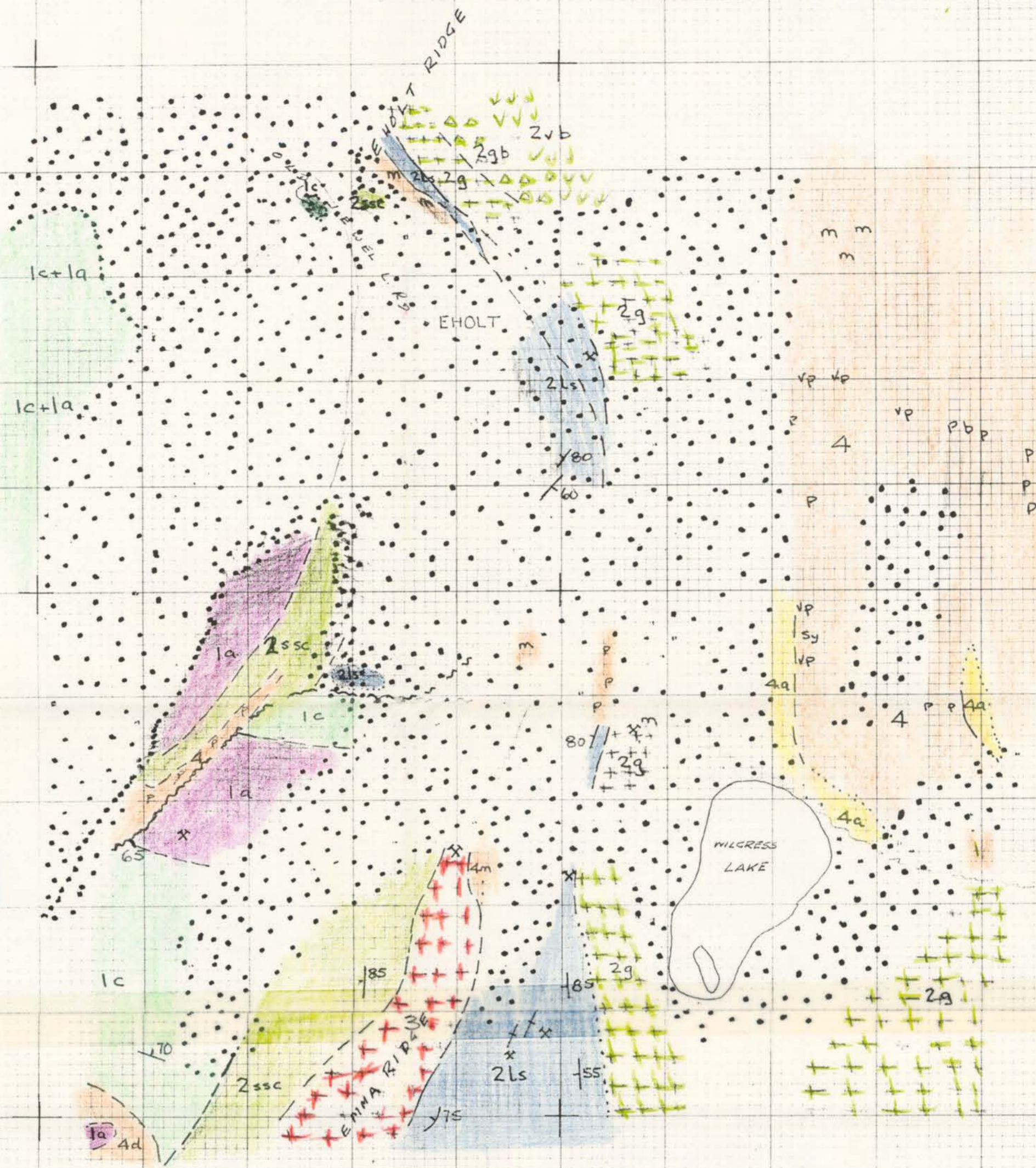
SYMBOLS

- Areas of little or no outcrop
- Fault: located, approximate, assumed
- - - Contact: located, approximate, assumed
- ~ Attitude of foliation
- x Mine site, Workings, Pit or Trench

GEOLOGY BY: J.T. FYLES September 1983



Scale 1:12,000
(1"=1000')



GEOLOGY OF THE EHOLT AREA

LEGEND

TERTIARY

- 4d VOLCANIC & INTRUSIVE ROCKS
d DIORITE, m MONZONITE P FELDSPAR PORPHYRY
s SYENITE v VESICULAR
- 4a ARKOSE

CRETACEOUS

- + + + EMMA PORPHYRY

UPPER TRIASSIC - BROOKLYN FORMATION

- 2g, 2b, 2c, 2d GREENSTONE, GREENSTONE BRECCIA & VOLCANIC BRECCIA
- 2ls MARBLE & SILICATE MARBLE
- 2zsc CHERT BRECCIA & META CHERT BRECCIA

PRE-TRIASSIC

- 1c QUARTZITE (META CHERT & META SILTSTONE)
- 1a AMPHIBOLITE

••••• AREAS OF LITTLE OR NO OUTCROP

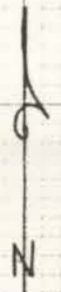
FAULT - LOCATED APPROX. ASSUMED

CONTACT LOCATED APPROX ASSUMED

X PIT OR TRENCH

30 ATTITUDE OF FOLIATION

GEOLOGY BY J.T. FYLES SEPT 1983



1" = 1000 FT

GEOLOGICAL BRANCH
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of 2