MAR 19710011: SOUTHWESTERN ALBERTA

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ALCOR MINERALS LTD.

GEOCHEMICAL SURVEY
OF
QUARTZ MINERAL EXPLORATION PERMIT 160
SOUTHWESTERN ALBERTA

Geographic Coordinates
49° 24' N
114° 25' W
NTS Sheet 82G/8E

by

L. B. HALFERDAHL, Ph.D., P. Geol.

April 19, 1971

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INTRODUCTION

Quartz Mineral Exploration Permit 160 lies in the Foothills of southwestern Alberta adjoining northeast of the Clark Range. It comprises 9920 acres. This report presents the results of a geochemical survey of Permit 160 which was conducted in October 1970.

SUMMARY AND RECOMMENDATIONS

A total of 106 samples of stream, spring, and lake waters in Permit 160 and some adjacent ground were collected and analyzed for copper, lead, and zinc. No significant anomalous concentrations were obtained in the copper and lead samples. Sixteen anomalous or slightly anomalous concentrations were obtained for zinc. They show no easily detectible pattern, and are considered to be due to vagaries in the geochemical mobility of zinc, whose source is in the Precambrian rocks to the south and west.

It is recommended that Permit 160 be terminated.

FIELD PROCEDURE

Samples were collected in wide mouth 10 oz. or 16 oz. polyethylene bottles with bakelite caps, lined with cardboard and waterproof paper. Before use, each bottle and cap was thoroughly rinsed with the water to be sampled; then the sample was collected; the bottle tightly closed, numbered, and notes made. The notes consisted of recording the temperature of the water, estimating or measuring the breadth of water surface and maximum depth of the stream. The pH was measured by means of alkacid test paper and found to be between $5\frac{1}{2}$ and 6 in all samples. At

the field camp most turbid samples were filtered, and then all samples were acidified with concentrated HCl, about 12N at approximately 5 cc of acid per 300 ml of sample.

LABORATORY PROCEDURE

Samples were shipped to a commercial laboratory for analysis. There 200 ml of sample was evaporated to dryness in carefully cleaned glassware, the residue taken up with 25 ml of HCl and analyzed by standard atomic absorption techniques. In samples with appreciable concentrations of copper, lead, or zinc, a portion of the sample as received was checked against the concentrated sample. This precaution ensured that any serious contamination of samples occurring in the laboratory was detected, but not contamination during collection or acidification. The detection limits for samples treated as above for copper, lead, and zinc are 2, 9, and 2 ppb respectively, so that zeros in the data mean concentrations below these limits. In spite of this, concentrations as low as 5 ppb for lead have been reported.

RESULTS

The results of the geochemical survey are shown in Figures 3, 4, and 5, and tabulated in the Appendix. Evaluation of the geochemical survey is based on the concentrations below.

	BACKGROUND	SLIGHTLY ANOMALOUS	ANOMALOUS
		Parts per Billion	
Copper	Less than 18	18 to 27	More than 27
Lead	Less than 60	60 to 90	More than 90
Zinc	Less than 65	65 to 120	More than 120

One copper concentration is slightly anomalous; all the other copper concentrations are background. All lead concentrations are background. One zinc concentration is anomalous; 15 are slightly anomalous; and the rest are background. No pattern for the anomalous and slightly anomalous zinc concentrations is readily detectible. They are regarded as illustrating the vagaries of the geochemical mobility of zinc from its source which is not believed to be in the Cretaceous rocks where the anomalous and slightly anomalous concentrations were found in the stream, spring, or lake waters. The geochemical mobility of zinc is apparently much higher than copper or lead.

CONCLUSIONS

The geochemical survey has shown three or four areas in or adjacent to Permit 160 with anomalous or slightly anomalous concentrations of zinc. No significant copper or lead anomalies were found. The zinc anomalies show no detectible pattern; they are believed to be due to the

mobility of zinc being greater than that of copper or lead in moving from its sources which are probably in the Precambrian rocks of the Purcell Series to the south and west.

Respectfully submitted,

[redacted]

Edmonton, Alberta
April 19, 1971

L. B. HALFERDAHL, Ph.D., P. Geol.

CERTIFICATE

I, Laurence B. Halferdahl, with business and residence addresses in Edmonton, Alberta, do hereby certify that

1. I am a consulting geological and mineralogical engineer.
2. I am a licensed Professional Geologist in the Province of Alberta and a licensed Professional Engineer in the Province of British Columbia.
3. I am a graduate of Queen's University, Kingston, Ontario (B. Sc. in 1952 and M. Sc. in 1954 in Geological Sciences in the Faculty of Applied Science) and of the Johns Hopkins University, Baltimore, Maryland (Ph. D. in 1959 in the Department of Geology).
4. From 1957 to 1969 I was on the staff of the Research Council of Alberta as a mineralogist and geologist where I was in charge of the mineralogy laboratory and conducted various field and laboratory investigations.
5. Prior to 1957 I obtained experience in mineral exploration and mining geology with a number of mining companies.
6. The data in this report were obtained from a field program under my direction during October 1970. I personally supervised the field work from October 7-8, 13-17, and 22-29.

Respectfully submitted,

[redacted]

Edmonton, Alberta
April 19, 1971

L. B. Halferdahl, Ph.D., P. Geol.

APPENDIX: FIELD AND ANALYTICAL DATA ON WATER ANALYSES

Explanation of Column Headings

ELEV.	Elevations were obtained from topographic maps with scale 1:50,000 and contour intervals of 100 feet, and by means of pocket altimeters. Figures are in feet above mean sea level.
TEMP.	Temperatures are in degrees Centigrade.
SIZE	This refers to the size of the stream as estimated or measured by the samplers. All figures are in inches, but only two figures are significant. The first figure is the breadth of the water surface, and the second is the maximum depth.
CU, PB, ZN	These refer to the concentrations in parts per billion of copper, lead, and zinc in the waters sampled.
TYPE	This refers to the type of water sampled and is coded as follows: 1 - stream, 2 - spring or well, 3 - lake.

An N in the table means that the data so designated were not obtained.

SAMPLE	ELEV.	TEMP.	SIZE	CU	PB	ZN	TYPE
# 54	4960	6.0	60x24.0	3	N	N	1
55	5075	6.0	36x 6.0	4	N	N	1
56	5175	5.5	48x24.0	4	N	N	1
57	5400	9.0	N	3	N	N	2
58	5400	9.0	N	7	N	N	2
59	5300	5.5	60x24.0	4	N	N	1
60	5500	5.5	60x 6.0	2	N	N	1
61	5500	6.0	N	4	N	N	2
62	5625	7.0	N	4	N	N	2
63	5700	6.0	N	3	N	N	2
64	5750	7.0	N	3	N	N	2
65	5800	8.0	N	2	N	N	2
66	5825	8.0	N	4	N	N	2
67	5825	6.0	60x 6.0	3	N	N	1
68	5900	9.0	N	4	N	N	2
69	5925	10.0	N	8	N	N	2
70	5925	12.0	N	1	9	40	2
71	5900	12.0	N	23	19	11	2
72	6000	7.0	48x24.0	4	N	N	1
601	4650	N	48x 2.0	5	N	N	1
603	4800	N	48x 7.0	4	N	N	1
604	4900	N	96x 6.0	5	N	N	1
605	5100	N	96x 6.0	6	N	N	1
619	4575	N	96x10.0	5	N	N	1
800	4650	N	12x 1.0	4	N	N	1
801	4900	N	12x 3.0	8	N	N	1
1046	4800	6.0	10x 3.0	4	24	47	1
1047	4900	6.0	8x 2.0	4	24	82	1
1048	5000	5.0	5x 1.0	4	18	24	1
1049	5050	5.5	8x 5	5	24	82	1
1050	5200	5.0	4x 1.0	4	24	23	1

SAMPLE	ELEV.	TEMP.	SIZE	CU	PB	ZN	TYPE
# 1051	4900	3.0	3x 5	7	11	5	1
1052	5125	3.0	2x 5	5	17	5	1
1053	5050	6.0	N	9	11	12	2
1054	5000	7.0	N	5	11	2	1
1055	5000	5.0	7x 1.5	9	N	8	1
1056	5280	4.0	3x 1.0	3	11	N	1
1057	5100	4.0	2x 1.0	3	11	N	1
1058	4800	6.0	6x 1.0	7	17	3	1
1059	4800	6.0	10x 2.0	5	17	18	1
1123	4990	1.5	3x 1.0	7	24	22	1
1124	4880	2.0	6x 5	5	24	64	1
1125	4720	2.0	2x 1.0	7	30	35	1
1126	4800	1.5	5x 1.0	3	24	41	1
1127	4950	1.0	3x 1.0	7	17	53	1
1128	5100	1.0	5x 5	4	17	23	1
1178	4900	1.5	3x 5	6	18	74	1
1179	4450	1.0	1x 5	6	18	38	1
1180	4690	1.5	3x 5	14	11	87	1
1181	4550	1.5	8x 1.0	9	18	98	1
1182	4600	1.0	N	9	18	76	1
1183	4450	1.0	1x 5	6	11	69	1
1184	4480	1.0	2x 5	11	24	78	1
1185	4590	1.5	3x 5	9	18	36	1
1186	4880	1.0	1x 5	5	24	49	1
1187	4760	1.5	2x 1.0	11	24	162	1
2113	5090	N	24x 2.0	3	9	28	1
2122	5050	6.0	12x 3.0	9	5	8	1
2123	5000	7.0	24x 3.0	8	5	15	1
2124	4990	7.0	12x 5	8	N	94	1
2125	4975	6.0	18x 2.0	13	5	74	1
2126	4900	5.0	18x 1.0	10	5	75	1

SAMPLE	ELEV.	TEMP.	SIZE	CU	PB	ZN	TYPE
# 2127	4880	6.0	24x 2.0	8	11	64	1
2128	4790	6.0	12x 1.0	9	5	42	1
2256	4500	1.5	18x 1.0	4	11	19	1
2257	4600	3.0	2x 5	6	11	15	2
2258	4600	2.0	48x 3.0	5	11	38	1
2259	4625	3.5	4x 5	5	18	20	2
2260	4700	2.0	48x 6.0	4	5	34	1
2261	4710	1.5	2x 5	2	11	10	2
2262	4800	1.0	36x 2.0	3	11	11	1
2263	4900	1.0	30x 2.0	4	11	18	1
2264	5025	2.0	36x 2.5	5	11	23	1
2265	5180	5	24x 1.0	4	11	10	1
2266	5700	1.0	48x 4.0	5	5	25	1
2267	6020	5	36x 2.0	4	11	32	1
2268	6280	5	N	6	18	21	3
2269	4590	2.0	12x 1.0	5	18	33	1
2270	4725	2.0	12x 1.0	4	11	10	1
2277	4590	2.0	36x 2.0	5	11	25	1
2278	4700	2.0	36x 2.0	6	24	19	1
2279	4790	3.0	12x 1.0	4	5	15	2
2280	4890	2.0	24x 1.0	4	11	31	1
2281	4885	3.0	12x 1.0	6	11	38	2
2282	5375	2.0	12x 5	4	11	12	1
2301	4900	5	48x 3.0	2	18	31	1
2302	4880	5	36x 1.5	3	11	39	1
2303	4700	4.0	36x 3.0	4	11	119	1
4027	5200	2.0	24x 2.0	5	17	33	1
4028	5400	2.0	12x 5	4	17	21	1
4029	5500	2.0	24x 2.0	4	17	16	1
4030	5300	2.0	12x 2.0	3	24	24	1
4031	5200	2.0	12x 1.0	3	17	28	1

SAMPLE	ELEV.	TEMP.	SIZE	CU	PB	ZN	TYPE
# 4032	5100	2.0	6x 5	2	24	17	2
4033	5000	4.0	12x 5	6	30	16	1
4034	5100	4.0	24x 1.0	5	24	33	1
4035	4700	5.0	12x 5	11	11	53	1
4036	4650	9.0	N	9	5	12	3
4037	4750	5.0	12x 5	7	5	23	1
4038	4890	5.0	12x 5	10	11	16	1
5000	4600	1.5	6x 1.0	7	11	66	1
5001	4700	2.0	12x 1.0	9	17	69	1
5002	4900	3.0	18x 1.0	9	30	17	1
5057	5080	N	12x 1.0	2	18	28	1
5058	5000	1.0	3x 4.0	9	11	31	2
5059	4990	N	1x 1.0	3	18	39	1
5060	4960	N	12x 2.0	4	17	41	1

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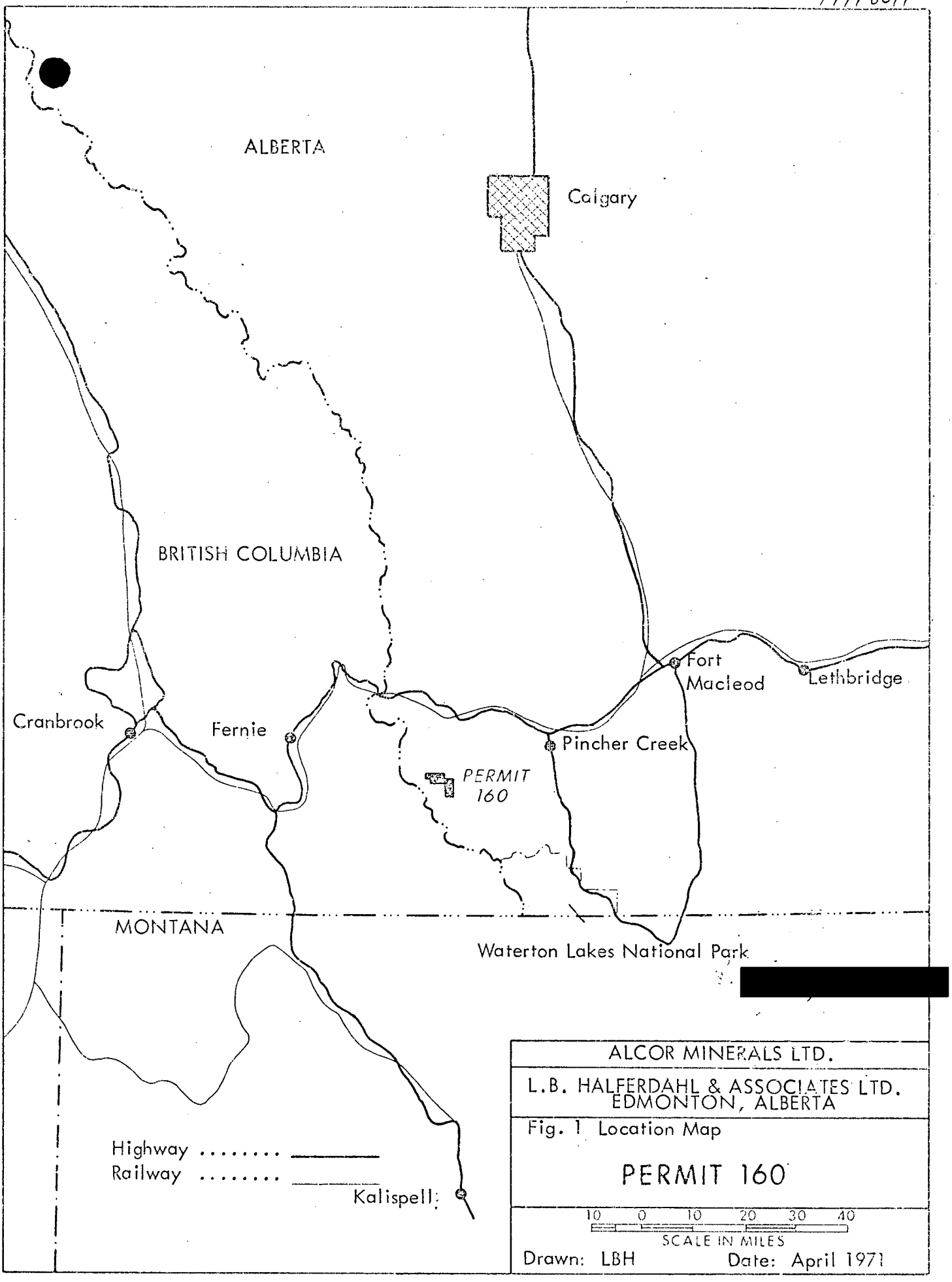

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Fig. 1 Location Map

PERMIT 160

10 0 10 20 30 40
SCALE IN MILES

Drawn: LBH Date: April 1971

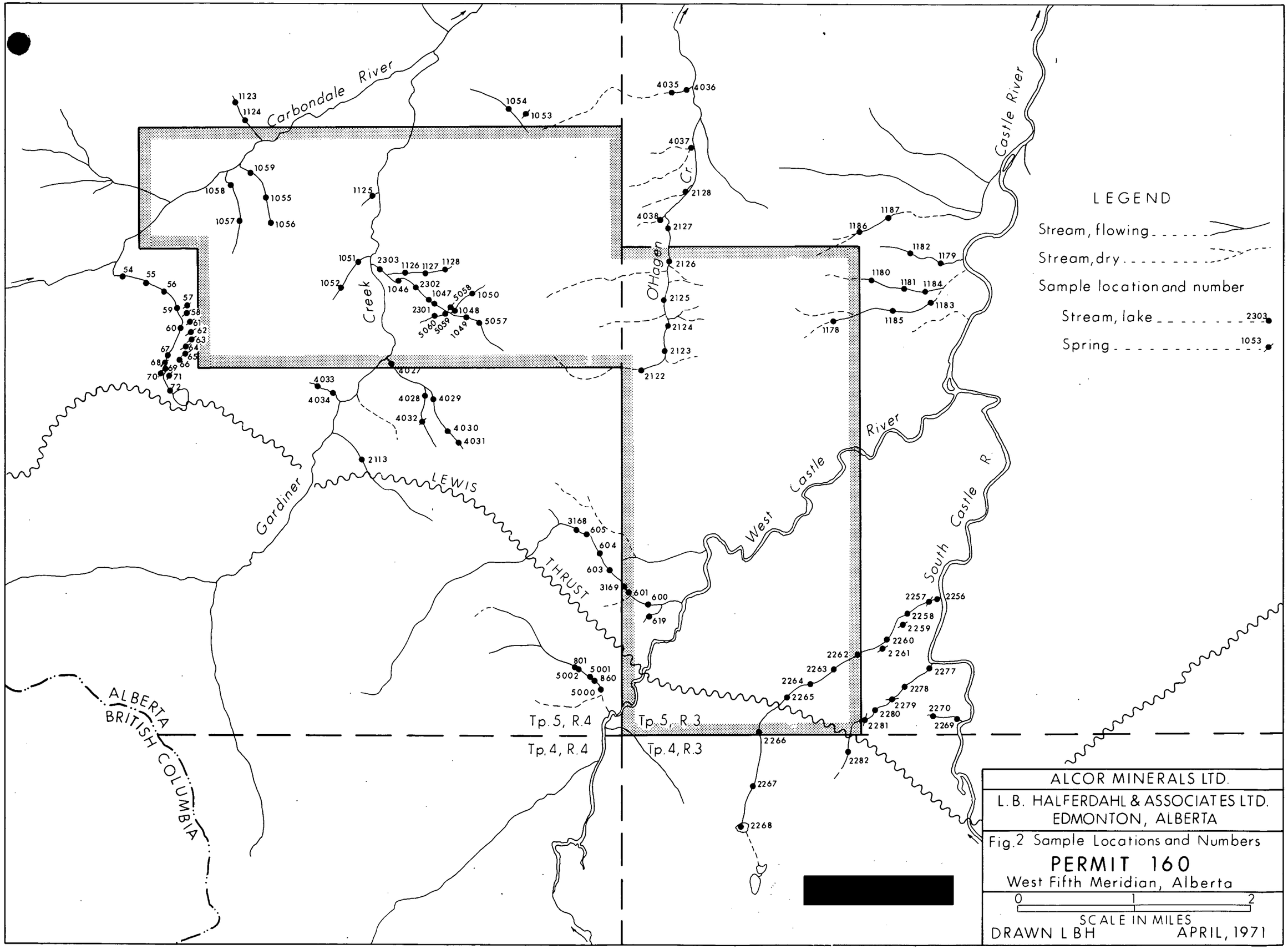
Carbondale River
Castle River
Creek
O'Hagen Cr.
River
Gardiner
LEWIS
THRUST
West Castle
South Castle R.
ALBERTA
BRITISH COLUMBIA
Tp. 5, R. 4
Tp. 5, R. 3
Tp. 4, R. 4
Tp. 4, R. 3
LEGEND
Stream, flowing
Stream, dry
Sample location and number
Stream, lake 2303
Spring 1053
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Fig. 2 Sample Locations and Numbers
PERMIT 160
West Fifth Meridian, Alberta
0 1 2
SCALE IN MILES
DRAWN L B H
APRIL, 1971

Carbondale River

Creek

O'Hagen Cr.

Castle River

Castle River

Castle R.

West

South Castle

Gardiner

LEWIS

THRUST

ALBERTA

BRITISH COLUMBIA

Tp. 5, R. 4

Tp. 4, R. 4

Tp. 5, R. 3

Tp. 4, R. 3

LEGEND

Stream, flowing

Stream, dry

Sample location with copper concentration in p.p.b.

Stream, lake — 6

Spring — 4

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Fig. 3 Copper Concentrations in Waters

PERMIT 160

West Fifth Meridian, Alberta

0 1 2

SCALE IN MILES

DRAWN LBH APRIL, 1971

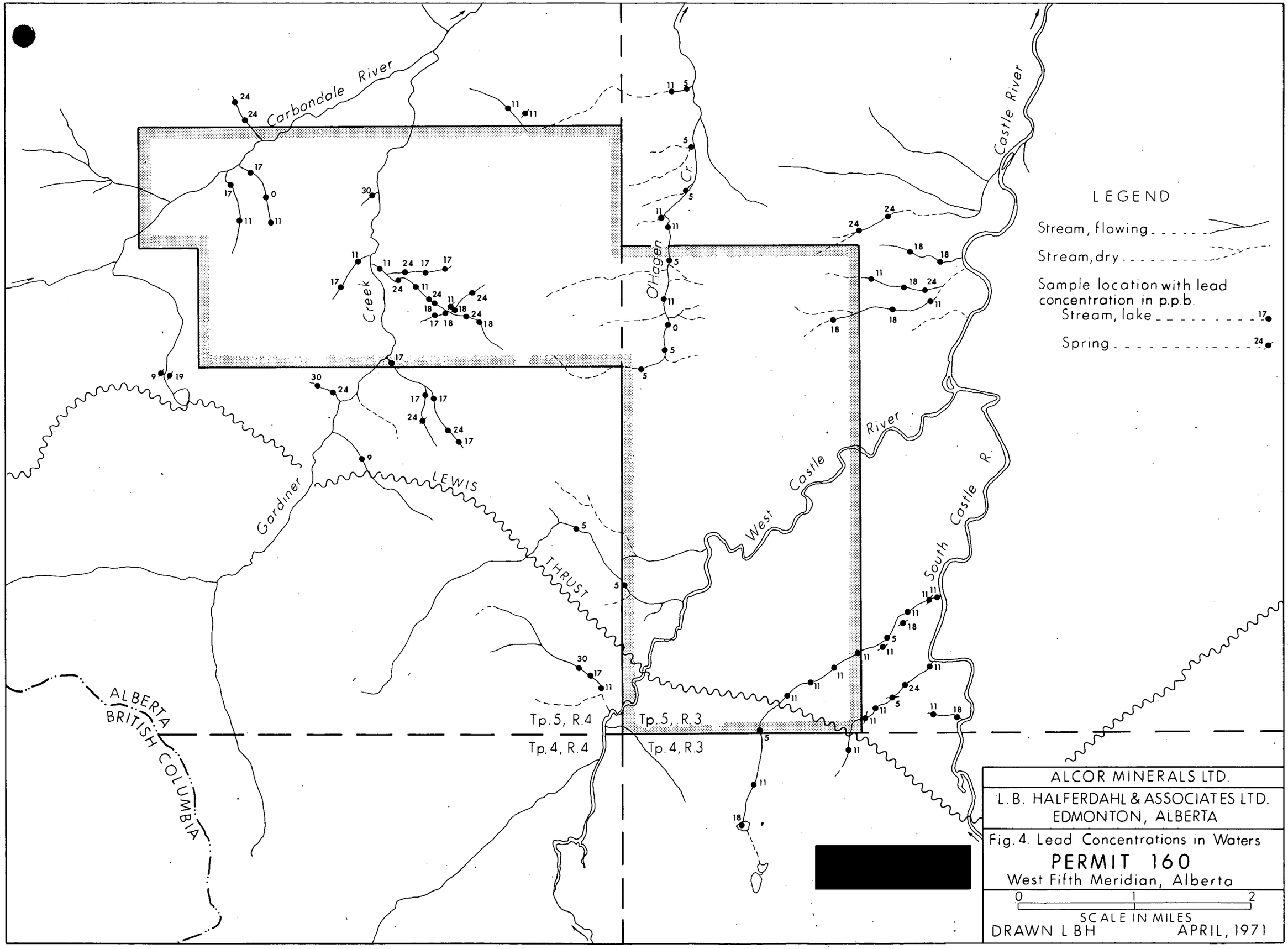
Carbondale River
Creek
O'Hagen Cr.
Castle River
Castle River
West
Castle R.
South
Gardiner
LEWIS
THRUST
ALBERTA
BRITISH COLUMBIA
Tp. 5, R. 4
Tp. 4, R. 4
Tp. 5, R. 3
Tp. 4, R. 3
LEGEND
Stream, flowing
Stream, dry
Sample location with lead concentration in p.p.b.
Stream, lake 17
Spring 24
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Fig. 4. Lead Concentrations in Waters
PERMIT 160
West Fifth Meridian, Alberta
0 1 2
SCALE IN MILES
DRAWN L B H
APRIL, 1971

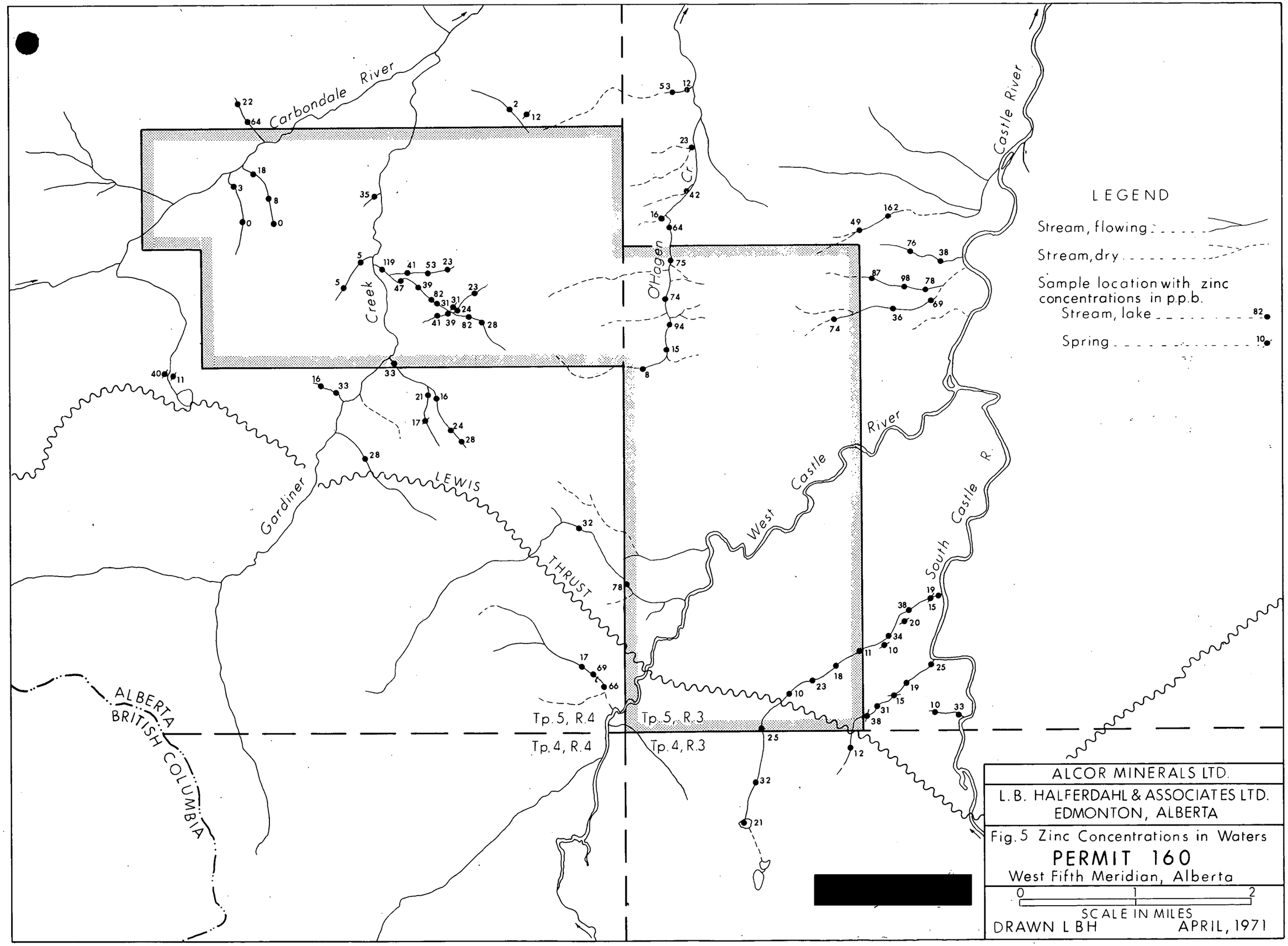
Carbondale River
Creek
O'Hagen Cr
Castle River
Castle River
West Castle River
South Castle R.
LEWIS
THRUST
Gardiner
ALBERTA
BRITISH COLUMBIA
Tp. 5, R. 4
Tp. 5, R. 3
Tp. 4, R. 4
Tp. 4, R. 3
LEGEND
Stream, flowing
Stream, dry
Sample location with zinc concentrations in p.p.b.
Stream, lake 82
Spring 10
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Fig. 5 Zinc Concentrations in Waters
PERMIT 160
West Fifth Meridian, Alberta
0 1 2
SCALE IN MILES
DRAWN L B H
APRIL, 1971