

# 4796

GEOCHEMISTRY REPORT

- on the -

92I/13D

SALLUS CREEK PROPERTY

- for -

CANADIAN JOHNS - MANVILLE CO. LTD.,

Box 1500,  
ASBESTOS, P. Q.

COVERING: Sallus 114, 116 - 118, 121, and 123 MINERAL CLAIMS

LOCATED: (1). 12 miles NE of Lillooet, B. C.  
(2). NTS - 92I/12E.  
(3).  $50^{\circ} 47' N, 121^{\circ} 48' W$ .

Prepared by:

KERR, DAWSON AND ASSOCIATES LTD.,  
#9 - 219 Victoria Street,  
KAMLOOPS, B. C.

John R. Kerr, P. Eng.,  
December, 1973.

Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 4796 MAP

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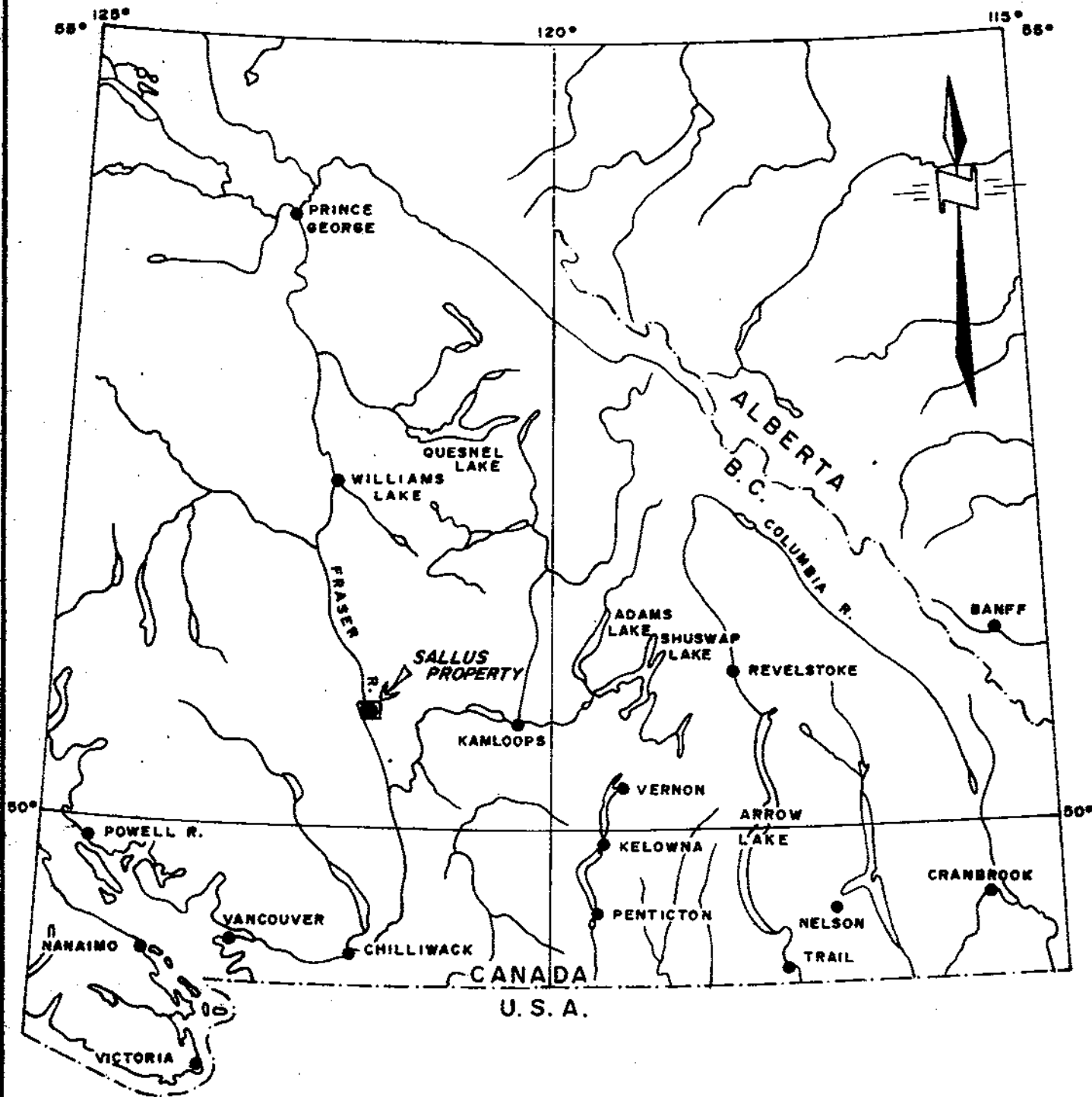
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### SUMMARY AND CONCLUSIONS

The 1973 geochemical programme at Sallus Creek was intended to delineate specific Zn - Cu rich horizons in black argillite. Previous sampling had indicated the entire argillite zone to be anomalous. Drilling into the unweathered argillite at depth indicates sub-economic values of copper and zinc.

A total of 596 talus fines samples were collected and geochemically analyzed for Cu, Zn, and CxZn. Statistical analyses were completed on each group of sample data, and anomalous categories were derived. Interpretation of anomalies therefore provides zones of Cu-Zn concentration in argillite.

It is shown that the previous drill holes did not intersect the downdip projection of surface Cu-Zn zones. On the basis of this, further drilling is recommended, preferably by percussion methods, to intersect the downdip projection of surface anomalies.



Department of  
 Mines and Petroleum Resources  
 ASSESSMENT REPORT  
 NO. **4796** MAP #1

CANADIAN JOHNS - MANVILLE CO. LTD. KAMLOOPS, B. C.	
LOCATION MAP	
SALLUS CREEK PROJ. 406	
LILLOOET MINING DIVISION BRITISH COLUMBIA	
Date: MAY 1973	Scale: 1" = 64 Miles
Dwn by: WESTERN MAPPING	Dwg no. 406 - 1

INTRODUCTION

Following the discovery of highly anomalous silts from Sallus Creek in the spring of 1969, crews of Canadian Johns - Manville staked approximately 120 claims along the western contact of the Mt. Martley Stock. An additional 60 claims in subsequent years were staked to cover the northern and southeastern portion of the contact zone. Reconnaissance mapping and geochemistry were completed over the entire claim area in 1969 and 1970. During the spring of 1970, detailed mapping geochemistry and I. P. surveys were completed over a possible porphyry Cu-Mo deposit in the southern portion of the claim area. In the fall and early winter of 1970, detailed mapping, sampling, and diamond drilling were completed in black argillite near the contact of the stock, in the northern portion of the claims. The black argillite was found to be very anomalous in zinc and copper, and moderately anomalous in molybdenum, lead, and silver. Diamond drilling proved to be unsuccessful in that penetration of the black argillite was costly, and after three attempts, the programme was abandoned.

The 1973 field programme was to detail the black argillite by surface bedrock and talus geochemical methods, in attempt to delineate specific anomalous horizons or zones within the black argillite. It was hoped that this programme would give more precise drill targets, and determine if the 1970 drill programme intersected the downdip projection of these surface anomalies. The programme was completed in two phases, June 21st. and 22nd., and October 17th. to 24th., 1973. This report summarizes the 1973 programme.

Normal introductory remarks regarding location, access, topography, etc., are well documented in earlier reports by F. D. Forgeron, 1970, Conn and Lin, 1971, and Schrijiver, 1971, and are only summarized below. The Sallus group of claims are located 10 - 12 miles northeast of Lillooet. The portion of the claims covered in this survey are the portion of the claims between the north fork of Sallus Creek and Pavilion Lake, namely Sallus 114, 116 - 118, 121, and 123. Access into this area is possible leaving Highway #12, at the east end of Crown Lake, and thence southwest along logging roads, and a recently constructed mine road for approximately 8 miles. The end of this road is the area of exploration interest. Figure #406-73-2 shows the survey area with respect to the claim block, and access road from Highway #12.

In the survey area, the topography is quite steep, the slope gradient being 40 - 45°. Relief within the area is in excess of 2,500 ft., ranging from 3,500 ft. in Sallus Creek to over 6,000 ft. in the northern portion of the area.

GEOLOGY

The regional geology of the Sallus Creek area is well documented by the G. S. C. map sheet 1010A, Geology of the Ashcroft Map Area, by S. Duffel and K. C. McTaggart, and by previous private publications by the staff of Canadian Johns - Manville Co. Ltd. A portion of the claim area is documented in the B. C. Department of Mines Bulletin No. 44, Geology of the Fraser River between Lillooet and Big Bar Creek, by H. P. Trettin.

The claim area is shown to be underlain by the western contact of the Mt. Martley stock. The stock can be described as a medium - coarse grained massive granodiorite with local secondary silicification and sericitization near the contacts. Pervasive quartz veins and aplite dikes are found within the stock near the contact. The stock intrudes sedimentary rocks of the Permian Cache Creek group, which is subdivided into two main lithologies, limestone and argillite. Intense thermal alteration of the sediments is evident near the contact of the Mt. Martley stock. Limestone, in part, is totally recrystallized and could be classified as a marble. Intense pyritization of the argillites is present near the stock contacts, evidenced on surface by rust colouration and gossans.

The survey area was not mapped during the 1973 survey. In 1970, Lin and Choi mapped the area on a scale of 1":200', and this map has been submitted with earlier reports. The main geological contacts are shown on the enclosed geochemical maps.



Rocks underlying the survey area are interbedded light grey to dark grey laminated and recrystallized limestone, and black, somewhat fissile argillite. On surface, the argillite is very rusty and weathered. Geochemistry has indicated this rock to contain 0.2 - 2.0% Zn, and 0.02 - 0.25% Cu, with moderately high contents of Pb, Ag, and Mo. Diamond drilling indicates intense surface weathering and oxidation to depths of 100 ft. Below this horizon sulphides, mainly pyrite, is abundant in the rock (2-5% content).

There are two known anomalous black argillite horizons that are of economic importance. One further horizon is indicated by geochemical interpretation. The largest black argillite zone is at least 2,500 ft. long by 500 ft. wide. The extent of other zones is unknown.

GEOCHEMISTRYFIELD TECHNIQUES:

During the periods June 21st. - 22nd., and October 17th. - 24th., 1973, 596 samples of talus fines or loose bedrock were collected from 100 ft. contours across the anomalous black argillite zones. Samples were collected at 20 ft. intervals along each contour. Stations were marked by red flagging, coded with appropriate sample number at each sample point, and permanent wooden stakes were established at every 100 ft. interval. Samples were identified SD - to distinguish the project, 53- to distinguish the contour, and numbered in sequence of collection along each contour.

Samples collected were all coded at talus fines; however, some samples were probably loose weathered bedrock. It was intended to collect all samples from black argillite; however, as the contact is not well defined, and to ensure that traverses were completed across the argillite horizon, a good portion of the samples were collected from limestone.

In addition to noting sample locations and proper coding of samples, notes were recorded regarding colour, texture, depth of sample and general remarks e.g. terraine and basic rock - types. All samples were collected by J. Binnie, a capable and experienced field assistant.

ANALYTICAL TECHNIQUES:

All samples were packaged and submitted to the Vancouver laboratories of Bondar - Clegg and Co. Ltd. The samples were dried at 40° - 50° C in infra - red ovens, and sieved to -80 mesh in Tyler screens. An aliquot of the -80 mesh fraction was digested in hot aqua regia to extract the copper and zinc, and the metal content of each sample was determined by atomic absorption methods at a detection limit of 1 ppm.

A second determination of zinc was performed by cold extractable methods, extracting the zinc in cold 0.5N HCl, and the metal content determined by atomic absorption methods. These results are referred to as cold extractable zinc (C x Zn).

CLASSIFICATION OF DATA:

All samples collected in 1973 were plotted on a 1":100 ft. base map with the main rock contacts. The rock contacts are based on interpretation from previous geological mapping, and field notes of the samplers. A cursory review of the sample results indicates that there are definitely two distinct populations of values for each group of metals, and these two populations are directly related to the two rock types. As the purpose of the programme was an attempt to delineate anomalous horizons or zones within the argillites, only the samples from within the contact boundaries were used for statistical analyses. In addition, approximately 100 samples from previous surveys were used for zinc and copper interpretation. CxZn values were not obtained from the original samples; therefore, only the 1973 sample values were used in CxZn interpretation.

Statistical analyses were completed for each metal on all sample results from within argillite. A cumulative frequency diagram was drawn on probability-log paper, and the best fit straight line was drawn. The straight line for both Zn and Cu shows slight deviation; however, there are two distinct populations for CxZn. The reason for two populations is unknown; however, could be attributed to:

- (1). A more complex geological pattern than currently presumed.
- (2). Mixing of the two rocks near the contact.
- (3). Various possible forms of oxidized zinc that would be definitely accentuated in CxZn determinations.
- (4). Specific argillite horizons that carry different backgrounds of zinc.

From the statistical analyses, the sample data were classified into the following anomaly classification:

		<u>Cu ppm</u>	<u>Zn ppm</u>	<u>CxZn ppm</u>
Negative	0 - b	0 - 204	0 - 2070	0 - 388
Possibly Anomalous	b - (b+x)	204 - 462	2070 - 4320	388 - 1070
Probably Anomalous	(b+s)-t	462 - 1030	4320 - 9020	1070 - 2970
Definitely Anomalous	> t	> 1030	> 9020	> 2970

where b - background (arithmetic mean)  
 s - standard deviation  
 t - threshold, derived from 2nd.  
 probit of cumulative frequency  
 distribution.

PRESENTATION OF DATA:

All sample location points and values were plotted on Figure #406 - 73 - 3 (Zinc), Figure #406 - 73 - 4 (Copper), and Figure #406 - 73 - 5 (CxZn), with the following coding of anomalous categories:

- 0 - Negative
- ⊖ - Possibly Anomalous
- ⊙ - Probably Anomalous
- ⊗ - Definitely Anomalous

It must be pointed out that samples in limestone were given the same anomalous categories, and anomalous stations probably reflect underlying argillite.

Anomalous zones are represented by interpreted contours of definite - probable values (strong zones), and possible - probable values (moderate zones).

DISCUSSION OF RESULTS

Results of the 1973 detailed sampling programme indicates that there are zones of low - grade Cu - Zn concentration in the black argillite. The largest and strongest zone of Cu - Zn concentration is on the 4,800, 4,900, and 5,000 ft. contour, the zone being 1,000 ft. long by up to 300 ft. wide. Geochemical analysis of surface samples indicate the southwestern portion of this zone to be 5,000 - 18,000 ppm Zn, and 500 - 2,500 ppm Cu, which possibly represents an average of 0.1% Cu, and 1.0% Zn in rock.

The next largest zone, located in the small black argillite horizon to the southeast measures 100 - 200' wide by 500 ft. long, and is open to the northeast. Geochemical values indicate 0.1% Cu and 1.0% Zn in rock. It must be assumed that surface leaching and oxidation will have considerable effect on surface values, and therefore one may expect the grades of both metals to be better below the leached surface zone.

The cold extractable zinc analysis was completed on the samples in hopes of better interpretation and delineation of zinc anomalies. The cumulative frequency diagram of CxZn definitely shows two zinc populations, probably related to specific zinc bearing horizons in black argillite. Also anomaly cut-offs on the CxZn interpretation are very exaggerated providing a sharper contour gradient for delineating the anomaly.

Diamond drilling completed in 1970 only penetrated the upper third of the main argillite zone, and has not intersected the projection of Cu - Zn concentration as delineated from the 1973 programme. Assays and geochemical analysis of the drill core, below the leached surface zone, does show improved grades of mineralization. It is therefore

recommended that further drilling be completed to intersect the interpreted Cu-Zn horizons. As difficulty has been encountered in diamond drilling at great depths, a series of shallow percussion drill holes set-up on top of anomalies is suggested as a more practical and less expensive method.

Respectfully Submitted by:

KERR, DAWSON, AND ASSOCIATES LTD.,



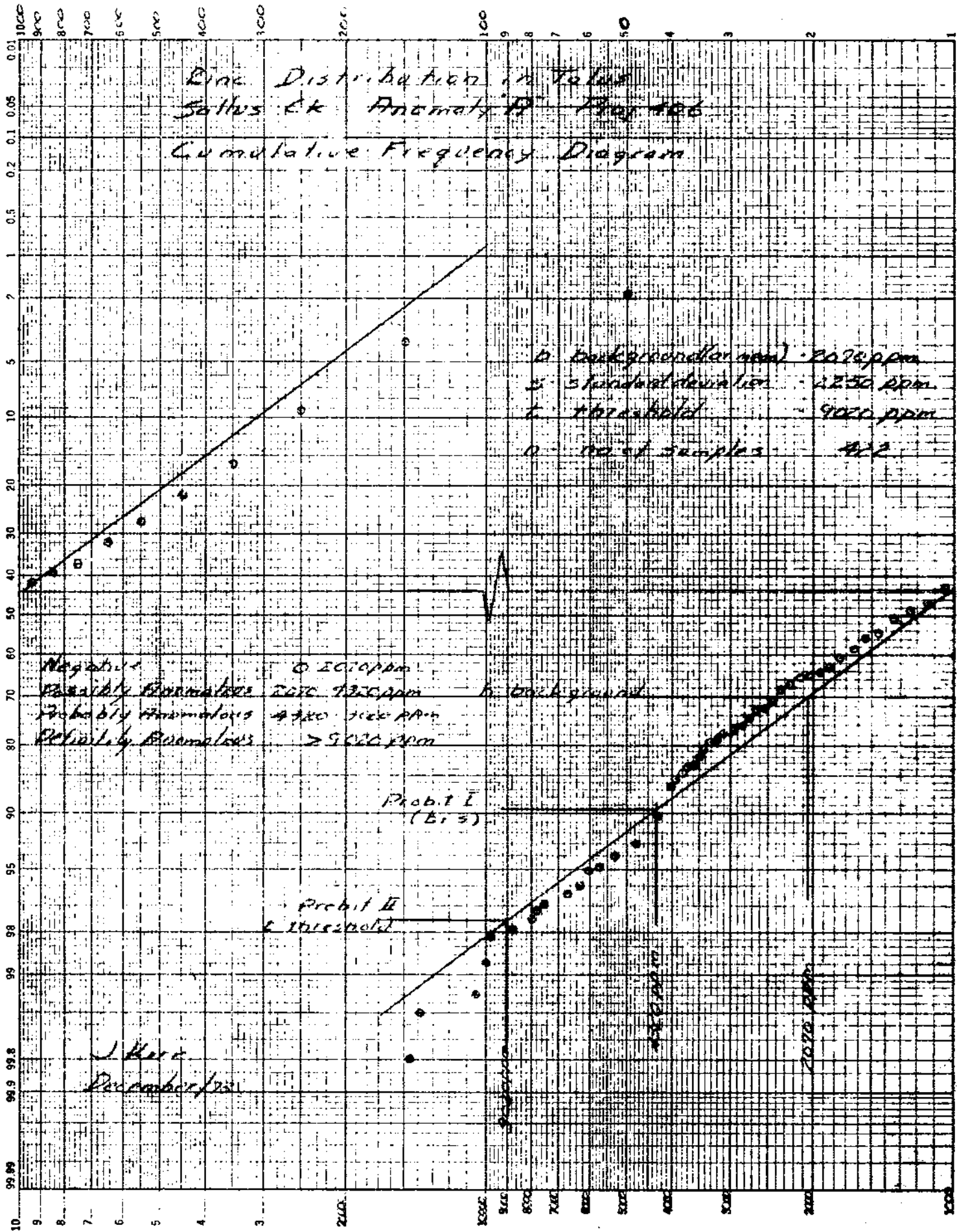
*John R. Kerr*  
\_\_\_\_\_  
John R. Kerr, P. Eng.,  
GEOLOGIST

December, 1973,  
KAMLOOPS, B. C.

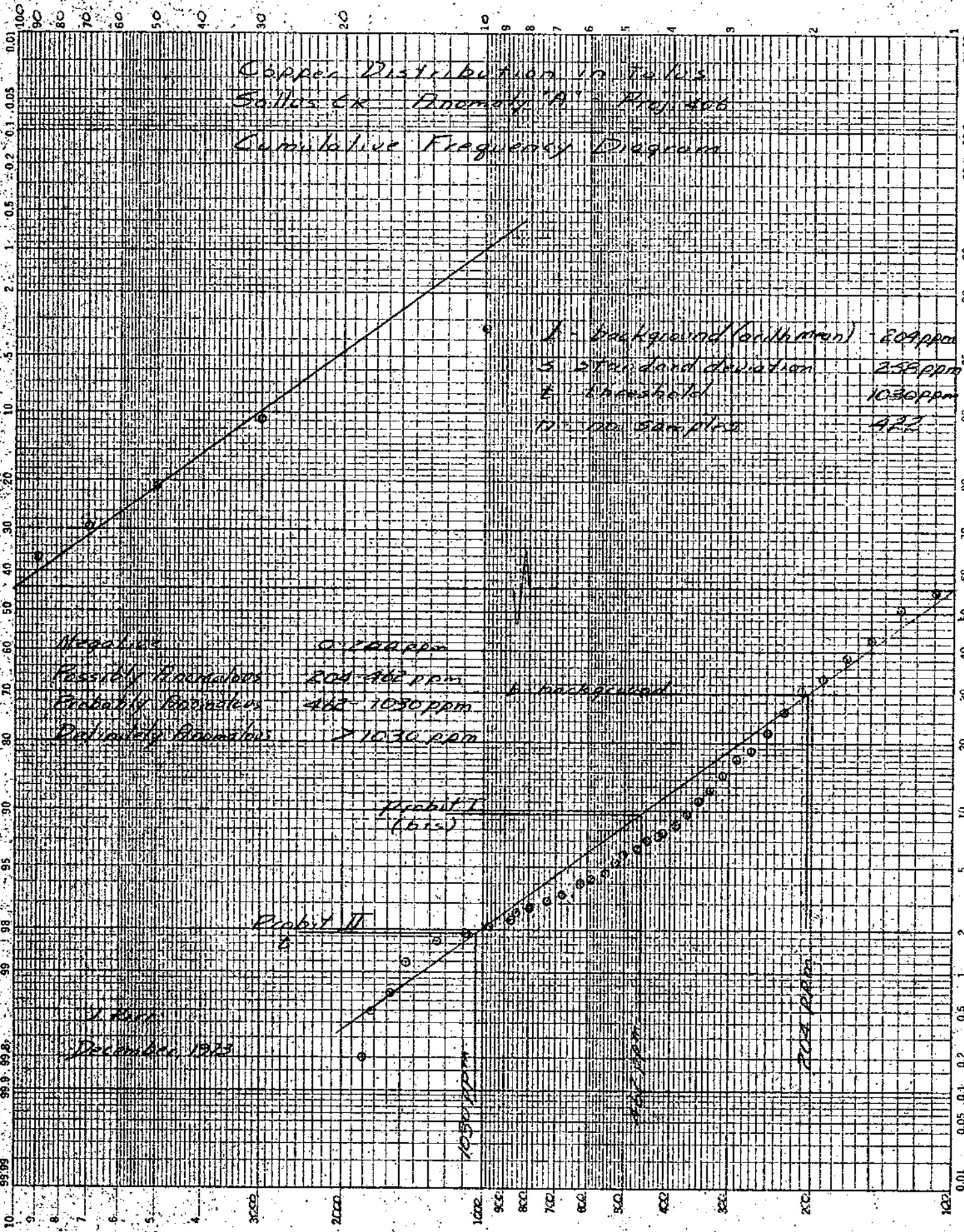
APPENDIX A

CUMULATIVE FREQUENCY DIAGRAMS





K-2 PROBABILITY 46 8043  
 X-2 LOG CYCLES  
 KEUFFEL & ESSER CO.

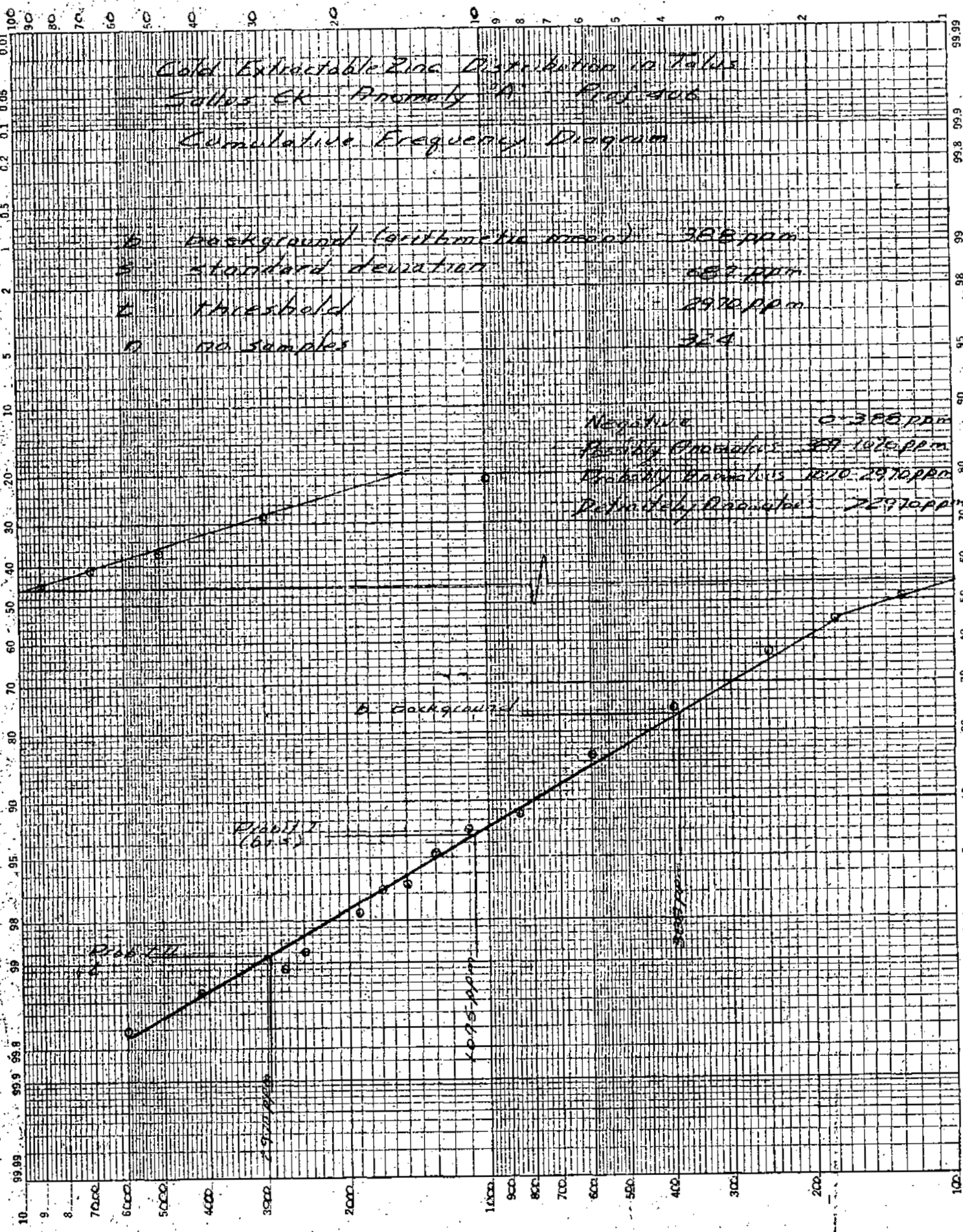


K&E PROBABILITY 48-8043  
 X 2 LOG CYCLES MADE IN U.S.A.  
 KUPPEL & ESSER CO.

Cold Extractable Zinc Distribution in Talus  
 Gallegos Ek Anomaly "A" Proj 406  
 Cumulative Frequency Diagram

b background (arithmetic mean) - 388 ppm  
 s standard deviation - 687 ppm  
 t threshold - 2970 ppm  
 n no samples - 324

Negative - 0.388 ppm  
 Possibly Overstated - 39.1075 ppm  
 Probably Overstated - 1070.2970 ppm  
 Definitely Overstated - 22970 ppm



APPENDIX B

COST STATEMENT

COST STATEMENT

SALLUS CREEK - PROJECT #406

(1).	Labour - June 21st. and 22nd., 1973, and October 17th. - 24th., 1973.		
	J. Binnie - Sr. Assistant 10 days at \$40.00 per day . . . .	\$400.00	
	R. Willis, Jr. Geologist 2 days at \$35.00 per day . . . .	70.00	
	B. Dykeman, Jr. Assistant 9 days at \$30.00 per day . . . .	<u>240.00</u>	\$ 710.00
(2).	Transportation		
	4 x 4 truck - 10 days at \$20.00 per day . . . .		200.00
(3).	Room and Board		
	20 man days at \$16.00 per man/day . . . . .		320.00
(4).	Geochemical Analysis		
	596 samples at \$2.16 per sample . . . . .		1,287.36
	Cu, Zn, and CxZn Includes preparation and 20% discount		
(5).	Interpretation and Report Preparation		
	J. Kerr . . . . .	\$700.00	
	Drafting . . . . .	320.00	
	Reproduction and Photocopying . . . . .	30.00	
	Secretarial . . . . .	<u>24.00</u>	<u>1,074.00</u>
	TOTAL COSTS . . . . .		<u><u>\$3,591.36</u></u>

 *John R. Kerr*

APPENDIX C

WRITER'S CERTIFICATE

JOHN R. KERR, P.ENG.

GEOLOGICAL ENGINEER


9-219 VICTORIA STREET  
KAMLOOPS, B.C.

PHONE (604) 374-6427

WRITER'S CERTIFICATE

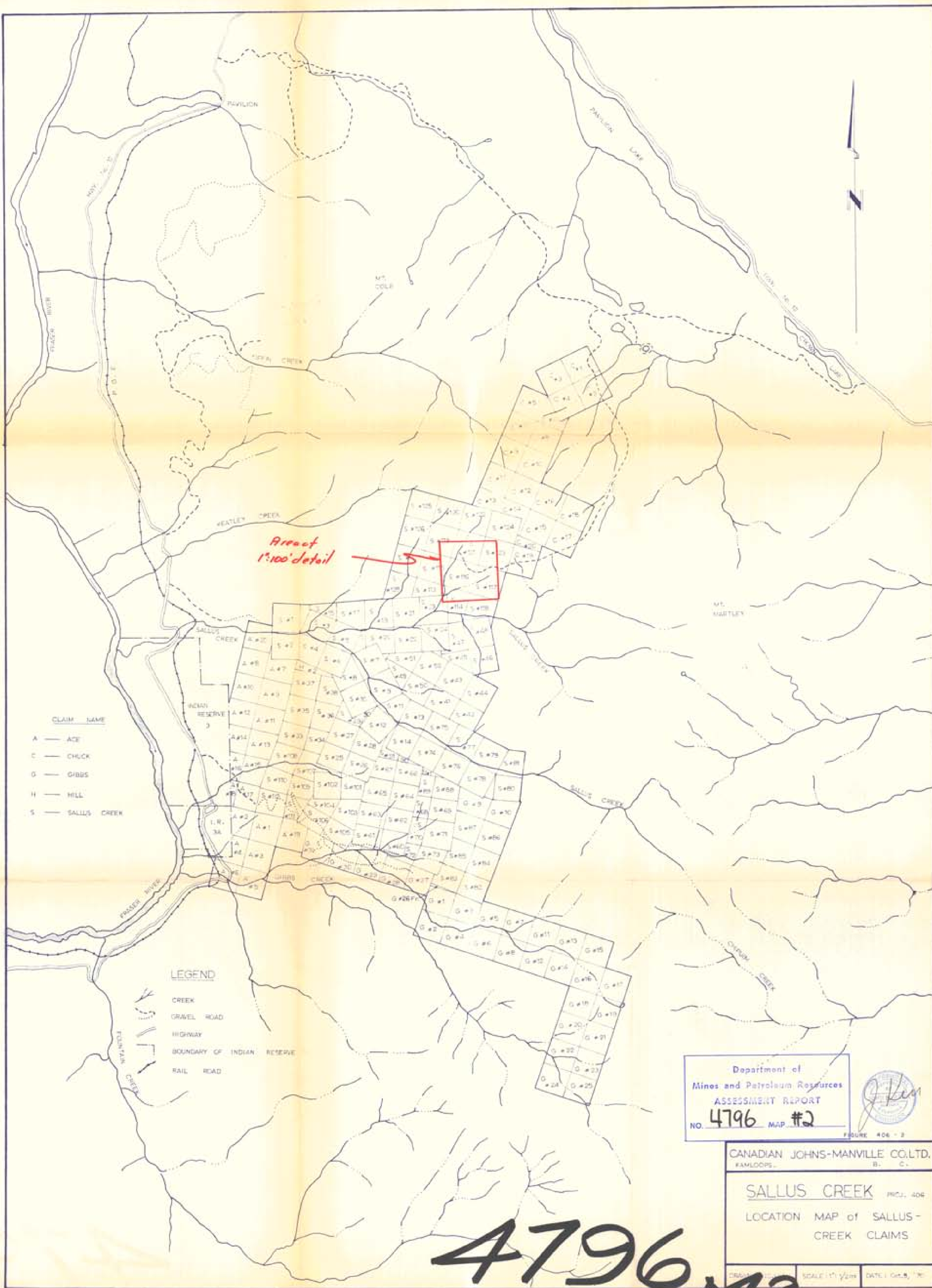
I, JOHN R. KERR, OF KAMLOOPS, B. C. HEREBY CERTIFY THAT:

- (1). I am a member of the Association of Professional Engineers in the Province of British Columbia, and a Fellow of the Geological Association of Canada.
- (2). I am employed by Kerr, Dawson and Associates Ltd., with my office at #9 - 219 Victoria Street, Kamloops, B. C.
- (3). I have practiced as a geologist for 9½ years since graduation from the University of British Columbia in 1964 with a B. A. Sc. in Geological Engineering.
- (4). I have no direct interest or holdings of securities of Canadian Johns - Manville Co. Ltd., or in the Sallus claims described in this report.
- (5). The work described in this report was completed from June 21st. - 22nd., and October 17th. - 24th., 1973, and was supervised directly by myself.
- (6). The costs, as shown in Appendix B of this report, are to the best of my knowledge, correct.
- (7). This report is based on published and unpublished data, my own personal knowledge of the area, and the field data collected during the field programme.

  
\_\_\_\_\_  
John R. Kerr, P. Eng.

December, 1973,  
KAMLOOPS, B. C.





- CLAIM NAME
- A — ACE
  - C — CHUCK
  - G — GIBBS
  - H — HILL
  - S — SALLUS CREEK

- LEGEND
- CREEK
  - GRAVEL ROAD
  - HIGHWAY
  - BOUNDARY OF INDIAN RESERVE
  - RAIL ROAD

Department of  
 Mines and Petroleum Resources  
 ASSESSMENT REPORT  
 NO. 4796 MAP #2



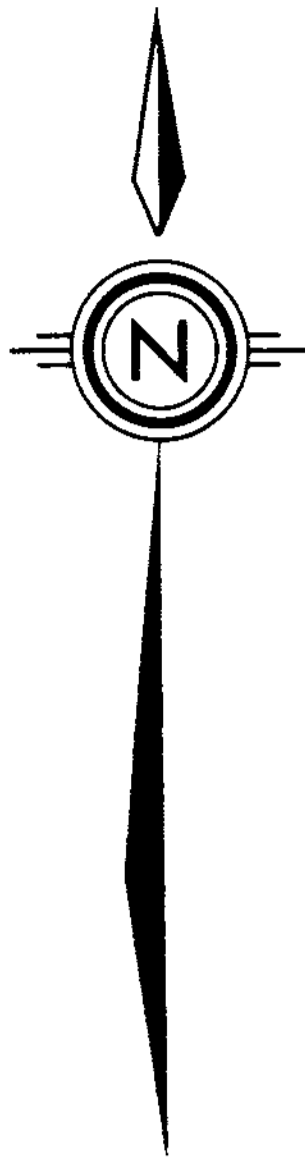
CANADIAN JOHNS-MANVILLE CO. LTD.  
 RAMLOOPS B. C.

SALLUS CREEK PROJ. 406  
 LOCATION MAP of SALLUS-  
 CREEK CLAIMS

4796 M2

SCALE 1" = 1/2 MI DATE: Oct. 8, '70





**- LEGEND -**

- 1500 ○ SOILS AND TALUS SAMPLE POINTS COLLECTED 1973. PPM. ZINC.
- 1000 ○ SOILS AND TALUS SAMPLE POINTS COLLECTED 1971.
- GEOLOGICAL CONTACT.
- STRONG ZINC ANOMALY 5000 - 15,000 ppm.
- MODERATE ZINC ANOMALY 2500 - 4999 ppm.

PREPARED FOR: NO. 4796 MAP #3  
CANADIAN JOHNS-MANVILLE CO. LTD.

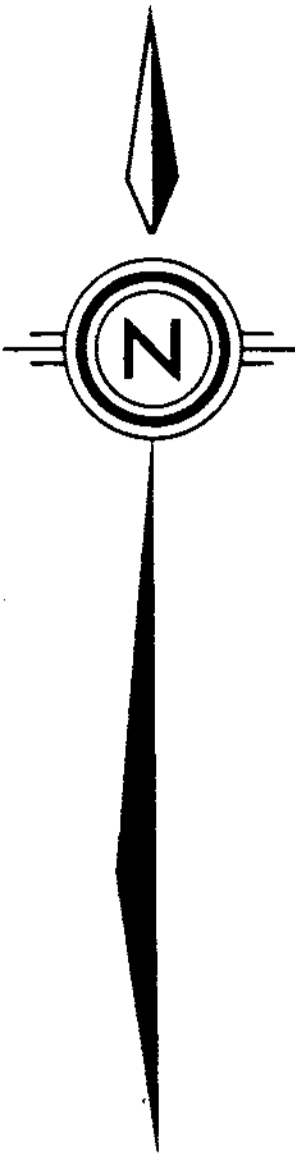
SALLUS CREEK PROJECT 406  
**ZINC DISTRIBUTION  
IN TALUS  
ANOMALY "A" AREA**

Technical Work By: C.J.M. Date: DECEMBER 1973  
Drawn By: T.V. Scale: 1" = 100'  
Approved By: J. KERR Drawing No. 406-73-3

- GEOCHEMICAL CLASSIFICATION  
ZINC (based on samples only within Black Argillite)**
- NEGATIVE 0 - 2050 ppm.
  - ⊕ POSSIBLY ANOMALOUS 2051 - 4320 ppm.
  - PROBABLY ANOMALOUS 4321 - 9020 ppm.
  - DEFINITELY ANOMALOUS > 9020 ppm.

**NOTE:**  
GEOCHEMICAL CLASSIFICATION BASED ON STATISTICAL ANALYSIS OF ZINC RESULTS BOUNDED WITHIN BLACK ARGILLITE.  
b - background (arithmetic mean) - 2050 ppm.  
s - standard deviation - 2250 ppm.  
THE SAME ANOMALOUS LIMITS WERE USED FOR SAMPLES COLLECTED OUTSIDE OF THE BLACK ARGILLITE (LIMESTONE). ANOMALIES IN LIMESTONE PROBABLY REFLECT ZONES WITHIN UNMAPPED BLACK ARGILLITE, OR CONTAMINATION FROM DOWNHILL DISPERSION NEAR THE CONTACT. STATISTICS ON SAMPLES COLLECTED FROM THE LIMESTONE WAS CONFINED TO CALCULATING THE ARITHMETIC MEAN: m = 620 ppm.

**4796 M3**



**GEOCHEMICAL CLASSIFICATION**

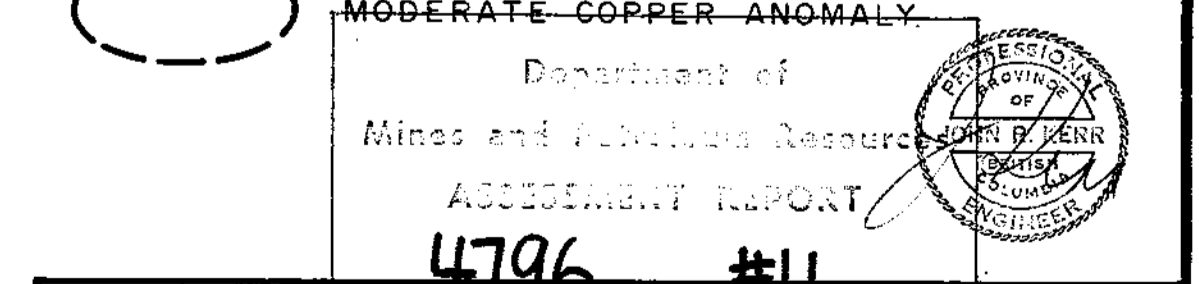
- NEGATIVE 0 - 204 ppm.
- ⊕ POSSIBLY ANOMALOUS 205 - 462 ppm.
- PROBABLY ANOMALOUS 463 - 1030 ppm.
- DEFINITELY ANOMALOUS > 1030 ppm.

**NOTE:**

GEOCHEMICAL CLASSIFICATION BASED ON STATISTICAL ANALYSIS OF COPPER RESULTS BOUNDED WITHIN BLACK ARGILLITE.  
 b - background - 204 ppm.  
 s - standard deviation - 258 ppm.  
 THE SAME ANOMALOUS LIMITS WERE USED FOR INTERPRETATION OF SAMPLES COLLECTED IN LIMESTONE. ANOMALIES IN THE LIMESTONE PROBABLY REFLECT UNMAPPED ARGILLITE, OR CONTAMINATION FROM DOWNHILL DISPERSION NEAR THE CONTACT.

**- LEGEND -**

- SOILS AND TALUS SAMPLE POINTS COLLECTED 1973. PPM CU.
- SOILS AND TALUS SAMPLE POINTS COLLECTED 1971.
- GEOLOGICAL CONTACT.
- ▨ STRONG COPPER ANOMALY.
- MODERATE COPPER ANOMALY.



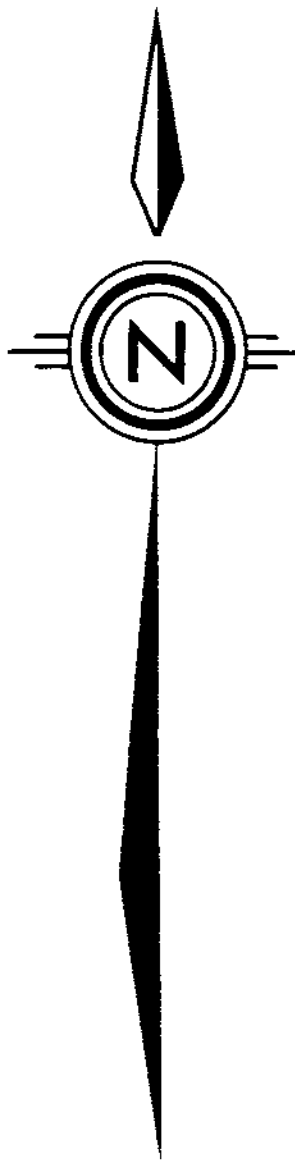
PREPARED FOR NO. **4796 #4**  
**CANADIAN JOHNS-MANVILLE CO. LTD.**

SALLUS CREEK PROJECT 406  
**COPPER DISTRIBUTION  
 IN TALUS  
 ANOMALY "A" AREA**

Technical Work By: C.J.M. Date: DECEMBER 1973  
 Drawn By: T.V. Scale: 1" = 100'  
 Approved: J. KERR Drawing No. 406-73-4

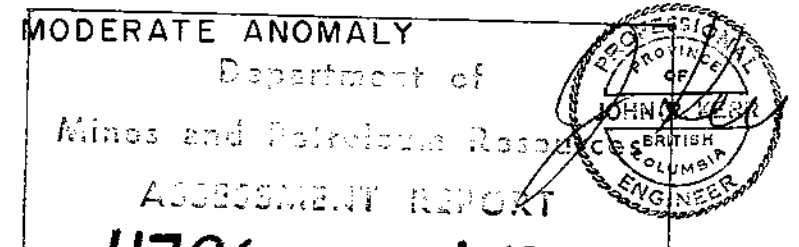
**4796 MA**





— LEGEND —

- 130 ○ SOILS AND TALUS SAMPLE POINTS COLLECTED 1973.
- SOILS AND TALUS SAMPLE POINTS COLLECTED 1971.
- GEOLOGICAL CONTACT.
- ▨ STRONG ANOMALY
- MODERATE ANOMALY



PREPARED FOR NO. **4796** MAP #5  
 CANADIAN JOHNS-MANVILLE CO. LTD.

GEOCHEMICAL CLASSIFICATION  
 COLD EXTRACTABLE ZINC

- NEGATIVE 0 - 388 ppm
- ⊕ POSSIBLY ANOMALOUS 389 - 1070 ppm
- PROBABLY ANOMALOUS 1071 - 2970
- DEFINITELY ANOMALOUS > 2970

NOTE:

GEOCHEMICAL CLASSIFICATION BASED ON STATISTICAL ANALYSIS OF COLD EXTRACTABLE ZINC RESULTS BOUNDED WITHIN BLACK ARGILLITE:  
 b - background - 388 ppm  
 c - standard deviation - 687 ppm  
 THE SAME ANOMALOUS LIMITS WERE USED FOR INTERPRETATION OF SAMPLES COLLECTED IN LIMESTONE. ANOMALIES WITHIN LIMESTONE PROBABLY REFLECT UNMAPPED ARGILLITE OR CONTAMINATION FROM DOWNHILL DISPERSION NEAR THE CONTACT.

**4796 M5**

SALLUS CREEK PROJECT 406  
 COLD EXTRACTABLE ZINC  
 DISTRIBUTION IN TALUS  
 ANOMALY "A" AREA

Technical Work By: C.J.M. Date: DECEMBER 1973  
 Drawn By: T.V. Scale: 1" = 100'  
 Approved By: J. FERR Drawing No. 406-73-5