GEOCHEMICAL SOIL SAMPLING SURVEYS

on

PAY MINERAL CLAIM GROUP

FORTIN LAKE AREA
Watson Lake Mining Division
Yukon Territory

Long. 130 deg. 30' W.

Lat. 62 deg. 00' N.

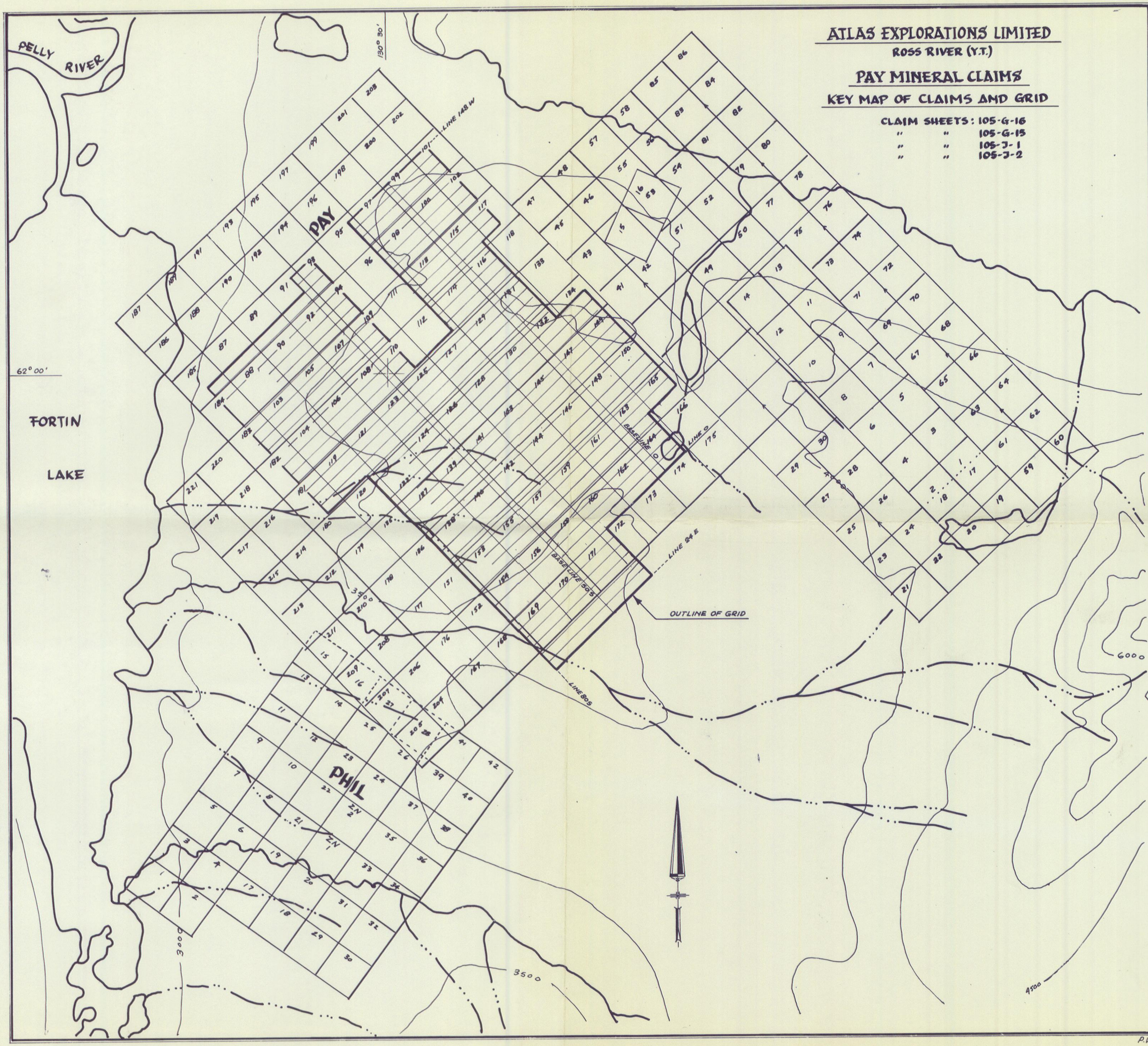
by

Clyde L. Smith
Atlas Explorations Limited

May 5 - September 5, 1967

LIST OF CLAIMS

CLAIM NUMBERS	GRANT NUMBERS	DATE RECORDED
Pay 87 - 166	Y 16981 - Y 17060	November 7, 1966
167 - 203	Y 17793 - Y 17829	June 23, 1967



ATLAS EXPLORATIONS LIMITED
ROSS RIVER (Y.T.)
PAY MINERAL CLAIMS
KEY MAP OF CLAIMS AND GRID
CLAIM SHEETS: 105-G-16
" " 105-G-15
" " 105-J-1
" " 105-J-2
PELLY RIVER
FORTIN
LAKE
62° 00'
130° 30'
PAY
PHIL
LINE 148 W
LINE 0
LINE 24 E
LINE 80S
BASELINE 0
BASELINE 80S
OUTLINE OF GRID
3500
3000
4500
6000
P.V.

TABLE OF CONTENTS

INTRODUCTION

The Pay 1 - 16 group was optioned from R. McBean on August 16, 1966, following an examination and recommendation by A. Kulan and discussions with P. Risby, who made the initial discovery. The option agreement stated that a single row of claims would be staked around the 16 claims as well as between the 1 - 14 and 15 - 16 groups, which lie separated by two claim lengths. In order to honor this agreement, a double row of claims was staked around the 1 - 14 block and claims were staked over and to the northwest of 15 - 16 so as to leave no fractions; this staking brought the total to 86 claims as of late September.

Because of a favourable geologic environment in the Pay area as well as the occurrence of mineralization on the 1 - 16 claims, a regional geochemical soil sampling program was initiated in late September. By mid-October an extensive zinc geochemical anomaly had been outlined in an area about three miles west of the 1 - 16 group.

Claims 87 - 166 were staked to cover this anomaly; they were tied to the previous group so as to leave no intervening ground open. In order to enclose anomalies extending off the group, adjoining claims were attached to the northwest, southwest, and southeast sides of the 87 - 166 blocks in early June, 1967 (167-203) and early August, 1967 (204-221). The Pay fractions were staked to cover wedge-shaped fractions within the Pay 87 - 166 area.

In mid-August, 1967, an independent prospector, G. Lishy, discovered zinc in an exposure about one-half mile south of the margin of the Pay group. Lishy staked the Zn. 1 - 2 claims over the showing and subsequently optioned them to Atlas. In order to cover adjoining ground as well as to tie the showing to the Pay group, the Phil 1 - 42 claims were staked in early September, 1967.

LOCATION AND ACCESS

The Pay group is centered roughly at latitude 62 deg. 00' North and longitude 130 deg. 30' West and covers the adjoining corners of claim sheets 105-G-15, 105-G-16, 105-J-1, and 105-J-2. The group lies immediately east of Fortin Lake and extends about five miles east of the Lake. Two smaller groups were recently staked to the northwest and southeast by Spartan Explorations.

Access to the property is by float or ski aircraft landing on Fortin Lake or Pay Lake. A tote-trail runs through the property from north of Finlayson Lake on the Ross River - Watson Lake Road. The trail may be negotiated with difficulty by bombardier in the summer or by 4-wheel drive vehicle in the winter.

GEOLOGY

The Pay area is underlain by a northwesterly-striking, moderately-dipping sequence of Middle-Upper Cambrian, Silurian-Devonian and Upper Devonian metasedimentary rocks which are open-folded and cut by numerous faults. The area of the main Pay geochemical zones covers a contact area between older Middle-Upper Cambrian phyllites to the northeast and overlying Silurian-Devonian carbonaceous dolomites to the southwest; the two units are separated by a northwesterly-trending fault.

A "host dolomite" unit within the carbonaceous dolomite sequence is mineralized with sphalerite, galena, pyrite, and minor chalcopyrite. Geochemical anomalies are related to this mineralization.

SURVEY TECHNIQUES

Line Cutting

Soil sampling surveys were conducted on a grid consisting of a total of 90.9 miles of cut line. The grid is made up of three base lines (O, 50S, and 100S) which trend N. 45 deg. W. Cross-lines over most of the grid are at 400-foot intervals and run from O to 114 W; 800-foot spaced cross-lines were cut southwest of the 100S base line.

Soil Sampling

The soil sampling survey was carried out in conjunction with the electromagnetic and magnetic survey. Several soil samplers were employed for the entire survey.

The samples were obtained by use of a prospector's grub hoe which was found adequate as a tool for cutting through layers of organic material overlying the soil. Samples were taken at 100-foot stations over the same grid area as geophysical data was obtained from.

Due to the inconsistency of specific soil horizons as well as variable depths to favourable horizons, samples were taken from an average depth of approximately one and one-half feet. Soils of the upper B-horizon were usually encountered. Soils of large organic content were not sampled. In areas of immature soils, the C-horizon was sampled. Approximately 100 grams of soil from each sample site were placed in Kraft bags which were then periodically shipped to the soil testing laboratory at Ross River.

Method of Analysis

All samples were analyzed at a complete testing laboratory at Ross River. When the samples were received, each was dried while in its Kraft bag, then screened to 80 mesh, weighed out to 0.5 grams and digested in hot aqua regia. Samples were then diluted, clarified for 20 hours and then tested for copper, lead and zinc content on an atomic absorption spectrophotometer. The 'AA' unit used was a Perkins Elmer Model 320 and accuracy of the instrument ideally is 1% of the amount of metal present.

Individual cathode lamps were used for each element determination; a direct readout is given of the element being tested and two determinations per minute can be made with ease.

Treatment of Data

All results of geochemical tests were returned to the field as soon as possible. Results in parts per million (ppm) were plotted on field data sheets kept by the field soil sampler. The field data sheets were kept as a record of each sample taken, noting particulars concerning drainage, topography, physiography, soil type and depth of sample. This information was compiled for use in further detailed geochemical studies.

Separate maps were prepared using a scale of 1" = 400' and 1" = 1,000', as was used for geophysical data, showing values obtained for copper, lead and zinc, profiles of values and contoured values. Contour intervals varied according to results obtained in parts per million. Maps for each element were compiled separately in order to aid comparative study of geophysical, geologic, and geochemical results. A development map for each area has also been prepared showing general compilation of geochemical-geophysical data.

Geochemical Environment, Soil Types, Nature of Dispersion

Topography in the area of the Pay geochemical anomaly is gently-rolling and slopes westward to Fortin Lake. Local relief is up to 50 feet between northwesterly-trending elongate depressions and irregular elongate ridges. Drainage is sluggish and stream flow is minimal except in major westerly-flowing streams. Ground water level is high and emerges in abundant seepages, swamps and small creeks. Permafrost is erratic in distribution butoccurs over about 70 percent of the area. Vegetation consists mainly of dwarf birch with stands of spruce, poplar, and tamarack.

Glacial striations are clearly recognizable in the field and on air photos: the direction of glacial movement was east-west. It is believed that a piedmont glacier moved westerly through the Pelly Lakes valley and was fed by tributary glaciers entering from the southeast and north. Glacial erratics may be found on the highest mountain peaks and remnants of lateral moraine occur up to elevations of 5,000 feet.

Twenty-four hand trenches and pits were sampled and logged in an orientation survey between L40W and L56W in the easterly geochemical zone. Typical soil profiles consist of: 2-4" decayed organic material (A_1), 1-2" white volcanic ash, 2-18" coarse light gray-brown coloured sandy soil (locally has small clay percentage) (A_2), 2-36" dark gray-brown clay (locally silty or pebbly, with up to 60% phyllite chips) (B_1), 0-36" dark gray-brown sandy clay (with up to 60% phyllite chips) (B_2), parental ground moraine material of 95+% phyllitechips and rubble with rare granitic erratics and up to 5% mineralized dolomite (C). The soil appears to be relatively mature for tundra types because a fairly distinct B horizon with ferruginous content can be recognized. Immaturity is suggested, however, by rapid changes in profiles over short distances. Also, the abundance of phyllite in parent material has no doubt contributed to rapid development of a clay-rich B horizon. Furthermore, sluggish drainage, high water table and abundant clays suggest that soils developed under conditions of limited aeration.

Throughout the area of the Pay geochemical anomaly, dispersion appears to have occurred almost exclusively by physical transport of mineralized material through glacial action. The following facts support this conclusion. (1) Pits and trenches put down in areas of anomalous zinc geochemistry exposed glacial moraine rich in phyllite containing angular boulders and fragments of zinc mineralized dolomite.

(2) Zinc geochemical results in pit profiles (sample interval, 6 inches) are erratic, do not show a definitive relation to the B horizon, and are highest in parental moraine where mineralized material may be observed; these facts suggest that chemical soil-forming processes have had little influence on dispersion.

(3) Anomalies commonly lie on ridges and not in adjacent depressions where ground water emerges; if zinc were being carried by ground waters, high values should be found in low ground at points of ground water emergence where precipitation would normally occur.

(4) Soils are obviously transported; diamond drilling of anomalies encountered phyllite-rich morainal overburden underlain by carbonaceous dolomite bedrock; furthermore, the soils are the obvious result of glacial transport rather than colluvial or alluvial action.

(5) Phyllite crops out immediately east (up the glacial direction) of the anomalies and is the most logical morainal material. (Glacial studies commonly show that the bulk of moraine is made up of material derived within 1-2 miles of the site of deposition).

(6) Chemical oxidation appears to be minimal (except for sphalerite) because pyrite, chalcopyrite, and galena are fresh and un-oxidized.

<u>Description of Anomalies</u>

Important geochemical zones in the Pay area consist mainly of elongate zinc anomalies with minor related lead highs. A frequency distribution histogram of zinc values shows that background over the Pay grid averages about 60 ppm. with a distinct threshold value of about 250 ppm. The histogram further suggests that a local background level exists between 250 ppm. and 600 ppm; significant anomalies are therefore defined as those above 600 ppm. The significance of the 600 ppm. contour lead may be seen on the zinc contour map - anomalies are most clearly outlined at this level.

Zinc anomalies on the Pay group consist of four major zones averaging about 3,000 feet in length which are elongate, intense, and arranged end-to-end in a northwesterly direction with a slight <u>en echelon</u> configuration. In addition, a broad irregular anomaly occurs separated from the linear group and several small peaks occur scattered south of the main trend. Of the four major zones, the two central zones are most intense.

The zone which occurs between L40W, 47S and L76W, 69S ranges from 100 to 400 feet wide within the 1,000 ppm contour and reaches four distinct peaks of over 4,000 ppm Zn. Two bulldozer trenches, one long hand trench and several small trenches and pits were put down on this anomaly. In the area between L40W and L48W trenches exposed a bed of dolomite (90+ feet thick in one trench) irregularly mineralized with sphalerite, galena in quartz veins, pyrite, rare chalcopyrite, quartz, calcite, and minor siderite. The dolomite is locally silicified and pyritized, and commonly brecciated. Three chip samples taken across significant lengths ran 3.8% Zn. over 25 feet, 1.9% Zn. over 90 feet, and 1.42% Zn. over 95 feet. Winkie drilling to the southeast on the same anomaly penetrated carbonaceous dolomites beneath ground moraine.

The most intense zinc geochemical zone occurs between the area of L80W 68S, and L120W, 74S. It contains a sub-zone of about 1,400 feet long and about 200 feet wide enclosed by the 3,000 ppm contour; peak values are over 9,000 ppm. No exposure occurs in the area of the anomaly but sericitic phyllite crops out just to the northeast. Winkie drilling of the anomaly penetrated carbonaceous dolomite beneath ground moraine overburden, which averages about 20 feet thick. Several hand trenches put down by T. Skonseng in the anomaly area exposed angular blocks of mineralized dolomite in phyllite-rich ground moraine; numerous blocks carried up to 20% Zn. (visual).

A broad anomalous Zn. area occurs along base line 0 between L104W and L140W; it consists of four separate smaller zones enclosed by the 1,000 ppm. contour; peak values in the area are over 6,500 ppm. A small trench northeast of the zone exposed a 4-foot wide quartz vein-breccia zone carrying up to 11.8% Pb. with 1.3 oz/ton Ag. No exposures were made on the Zn. anomaly.

Lead geochemical results are erratic and only locally intense. The only important anomalies occur northeast of the main Zn. geochemical anomaly near its northwesterly end where small zones up to 600 feet long occur; a peak of 14,800 ppm. is the highest Pb. value in the grid area. The fact that higher Pb. geochemical values occur northeast of the Zn. geochemical zone probably reflects Pb. mineralization for it is notable that to the southeast, in the area which was trenched, Pb. veins occur on the northeast side of the exposure; this same relation appears along Base Line 0 at L136 (see above).

Copper geochemical results appear to be of little significance. Only small isolated anomalies of low intensity occur along and to the northeast of the main zinc anomaly. Because chalcopyrite has been noted with the zinc mineralization, some of these anomalies may reflect minor concentrations of copper; none are sufficiently intense to warrant follow-up work, however.

Interpretation

The coincidence of high Zn. geochemical results and the Zn. mineralization in dolomite between L40W and L48W proves that, at least in part, the extensive Zn. geochemical zone of the Pay group accurately reflects mineralization in place. Attempts were made to reach bedrock in several places northwest and southeast of this area. In most cases, overburden could not be penetrated due to difficulties in drilling with the Winkie or because overburden was too thick for trenching. Wherever drilling reached bedrock, however, carbonaceous dolomite was encountered; host dolomite could not be located by geochemical anomaly drilling. The cause of anomalies in these outlying areas was shown to be zinc mineralized dolomite blocks occuring as erratics in phyllite-rich ground moraine.

Because anomalies over large parts of the Pay area are definitely transported, the problem remains to locate the source of mineralization in these areas. Accepting glacial transport as a means of dispersion, it is notable that patterns are not more fan-like and diffuse. Anomalies are intense and linear, and show highest peaks on the northeast side (up-glacier); also, direction of glacial movement was at an angle of about 30 degrees to anomaly trends. These facts appear to support the theory that mineralization lies beneath or a short distance east of the northeastern edge of the anomalies. Because geophysical methods have proven singularly unsatisfactory in detecting the host unit, it is recommended that diamond drilling be undertaken in an attempt to locate mineralization, first of all, in zones of most intense geochemical values.

Respectfully submitted,
Clyde L. Smith
Chief Geologist

SUMMARY OF COSTS

PAY Geochem:

(A) GEOCHEM:

1.	(a)	Footage Sampled:	475,000 feet		
	(b)	Samples Taken:	6,373 samples		
	(c)	Taken by:	Chris Scott, Charlie Wicks, Gerry Hayne, James Watt, and several natives. (F. Charlie and B. Etzel)		
2.	(a)	Wages:	13 man days x $15.50 daily wages of C. Scott	$ 201.50	
			48 man days x $15.50 daily wages of C. Wicks	744.00	
			13 man days x $17.50 daily wages of G. Hayne	227.50	
			7 man days x $17.50 daily wages of J. Watt	122.50	
			29 man days x $20.00 daily wages of natives	580.00	
					$ 1,875.5
	(b)	Helicopter Support:	9.2 hours @ $112.00 per hour	1,030.40	
	(c)	Fixed Wing Support:	4 round trips from Ross River to PAY Camp = (140 miles @ .85 per mi.) 4 x $119.00	476.00	
	(d)	Subsistence Cost:	110 man days x $8.00 per man day	880.00	
	(e)	Analysis Cost:	6,373 samples x $2.50 per sample processing cost	15,932.50	
	(f)	Supplies and Miscellaneous Equipment:		400.00	
	(g)	Travel:	From Vancouver and Ross River $15.00/man x 7 men	105.00	

(h)	Supervision Cost:	110 man days x $3.20 per man day	$ 352.00	
(i)	Interpretation and Report Presentation:	DRAFTING:		
		5 man days x $21.00 daily wage of P. Vlasveld	105.00	
		5 man days x $17.50 daily wage of B. MacDonald	87.50	
		20 man days x $18.30 daily wages of J. Boateng	366.00	
		30 man days x $8.00 daily subsistence cost per man	240.00	
		30 man days x $3.20 daily supervision cost per man	96.00	
		INTERPRETATION:		
		C. Smith and J. Brock 10 man days x $75.00 per man day	750.00	
				1,644.5
(j)	Overhead:	15% of total = 15% x $22,695.90	3,404.38	

TOTAL COST OF GEOCHEM SAMPLING AND PROCESSING $26,100.2

TELEPHONE 685-4331

(APPENDIX II)

ATLAS EXPLORATIONS LIMITED
(N. P. L.)
330 MARINE BUILDING
355 BURRARD STREET
VANCOUVER 1, B.C.

AFFIDAVIT SUPPORTING SUMMARY OF COSTS:

I, Clyde L. Smith, Chief Geologist, Atlas Explorations Limited of Vancouver, B.C., do hereby state that, to the best of my knowledge and belief, the statement of costs as presented in Appendix I of this Report - "Geochemical Soil Sampling Survey on Pay Mineral Claim Group" is both true and correct.

DATED at Vancouver, B.C., this 14th day of November, 1967.

Clyde L. Smith

A Commissioner for taking
Affidavits in the
Yukon Territory

(APPENDIX III)

PERSONNEL

Bill Etzel	Soil Sampler & Line Cutter	Ross River, Y. T.
Chris Scott	" " " "	West Vancouver, B. C.
Charles Wicks	" " " "	Antigonish, N.S.
Robert Etzel	" " " "	Ross River, Y. T.
John Acklack	" " " "	Ross River, Y. T.
Franklin Charlie	Soil Sampler	Ross River, Y. T.
Sam McLeod	Soil Sampler	Ross River, Y. T.
Mike Shorty	Line Cutter	Ross River, Y. T.
Mack Peters	Line Cutter	Ross River, Y. T.

ATLAS EXPLORATIONS LIMITED

ROSS RIVER (Y.T.)

SHELDON REGION

PAY MINERAL CLAIMS

GEOCHEMICAL SOIL SAMPLING SURVEY, COPPER, LEAD & ZINC
RESULTS BY ATOMIC ABSORPTION
SPECTROPHOTOMETER ANALYSIS

SOIL SAMPLERS: C. WICKS + B. ETZEL

DRAWN BY: J.N. BOATENG

400 0 400 800
scale in feet

ATLAS EXPLORATIONS LIMITED

ROSS RIVER (Y.T.)

SHELDON REGION

PAY MINERAL CLAIMS

GEOCHEMICAL SOIL SAMPLING SURVEY, COPPER LEAD & ZINC

RESULTS BY ATOMIC ABSORPTION

SPECTROPHOTOMETER ANALYSIS

VALUES

SOIL SAMPLERS: C.WICKS, F.CHARLIE + G.HAINE

DRAWN BY: J.N.B. + P.V.

DATE: AUGUST 1967

400 0 400 800


92W 88W 84W 80W 76W 72W 68W 64W 60W 56W 52W 48W 44W 40W 36W 32W 28W 24W 20W 16W 12W 8W 4W 0 4E 8E 12E 16E 20E 24E
140W 136W 132W 128W 124W 120W 116W 112W 108W 104W 100W 96W
140W 120W 112W 104W 96W 88W 80W 72W 64W 56W 48W 40W 32W 24W 16W 8W 0
ATLAS EXPLORATIONS LTD
ROSS RIVER, YUKON
SHELDON PROJECT
PAY MINERAL CLAIMS
GEOCHEMICAL SOIL SAMPLING SURVEY
DEVELOPMENT MAP
Party Chief : P. Neilson
Soil Samplers : C. Wicks, B. Etzel & J. Watts
Date : August 1967
Drawn By: MB.
Cu 40 ppm Contour
Pb. 40 ppm Contour
Zn. 1000 ppm Contour
Claim Posts : PAY o
SCALE
400' 200' 0 400' 800'

ATLAS EXPLORATIONS LIMITED

ROSS RIVER (Y.T.)

SHELDON REGION

PAY MINERAL CLAIMS

GEOCHEMICAL SOIL SAMPLING SURVEY, COPPER LEAD & ZINC

RESULTS BY ATOMIC ABSORPTION

SPECTROPHOTOMETER ANALYSIS

ZINC CONTOUR MAP

SOIL SAMPLERS: C.WICKS, F.CHARLIE + G.HAYNE

DRAWN : BY : P.J.F. VLASVELD

DATE : NOV. 1967

400 0 400 800

scale in feet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ROSS RIVER, YUKON
SHELDON PROJECT
PAY MINERAL CLAIMS
GEOCHEMICAL SOIL SAMPLING SURVEY
Pb. CONTOUR MAP
SOIL SAMPLER: C.WICKS
20 p.p.m (60, 100 etc.)
40 p.p.m. (80, 120 etc.)
DRAWN BY: J.N. BOATENG
DATE: AUGUST 1967
400 0 400 800
scale in feet


140W
136W
132W
128W
124W
120W
116W
112W
108W
104W
100W
96W
92W
88W
84W
80W
76W
72W
68W
64W
60W
56W
52W
48W
44W
40W
36W
32W
28W
24W
20W
16W
12W
8W
4W
0
4E
8E
12E
16E
20E
24E
B.L.#3
ATLAS EXPLORATIONS LTD
ROSS RIVER, YUKON
SHELDON PROJECT
PAY MINERAL CLAIMS
GEOCHEMICAL SOIL SAMPLING SURVEY
Cu. CONTOUR MAP
SOIL SAMPLER: C.WICKS
20, 60, p.p.m. etc.
40, 80, p.p.m. etc.
DRAWN BY: J.N. BOATENG
DATE: AUGUST 1967
400 0 400 800
scale in feet


ATLAS EXPLORATIONS LTD
ROSS RIVER, YUKON
SHELDON PROJECT
PAY MINERAL CLAIMS
GEOCHEMICAL SOIL SAMPLING SURVEY
Zn. CONTOUR MAP
SOIL SAMPLER: C.WICKS
200, 600, contour
1000 p.p.m.
DRAWN BY: J.N. BOATENG
DATE: AUGUST 1967
400 0 400 800
scale in feet
140W 136W 132W 128W 124W 120W 116W 112W 108W 104W 100W 96W
92W 88W 84W 80W 76W 72W 68W 64W 60W 56W 52W 48W 44W 40W 36W 32W 28W 24W 20W 16W 12W 8W 4W 0 4E 8E 12E 16E 20E 24E
140W 120W 112W 104W 96W 80W 80W 72W 64W 56W 48W 40W 32W 24W 16W 8W 0