1,496

GEOLOGICAL, GEOCHEMICAL and GEOPHYSICAL REPORT

Boyd 1 Claim

Revelstoke Mining Division

for

Dome Exploration (Canada) Ltd., Salsigne Exploration Ltd.,

and

Union Oil Company of Canada Ltd.

MINERAL RESOURCES BE	RANCH
ASSESSMENT REPOR	RΤ
NO	-

Ъу

T. Booth J. R. Woodcock

J. R. Woodcock Consultants Ltd., 1521 Pemberton Avenue North Vancouver, B. C.

é

November, 1977

TABLE OF CONTENTS

 \bigcirc

ALL NO

C

	PAGE NO.
INTRODUCTION	1
LOCATION AND ACCESS	l
GEOLOGY AND MINERALIZATION	2
Rock Units	2
Dolomite-Quartz Alteration	2
Structure	3
GEOCHEMISTRY	
Geochemical Techniques	3
Geochemical Results	4
GEOPHYSICS	6
CONCLUSIONS	6

TABLES

1.	Camp Creek Rock Samples	5
2.	Comparison of Geochemical Analysis and Assays	5

FIGURES

la.	Index Map					la
lb.	Claim Map					1b
2.	Geology				In	pocket
3.	Sample Numbers				In	pocket
4	Copper in Soil				In	pocket
5.	Lead Geochemistry				In	pocket
6.	Zinc Geochemistry				In	pocket
7.	Rock Geochemistry				In	pocket
8.	Slope Measurements				In	pocket
9.	EM Results				In	pocket

APPENDIX

Analytical Procedures Statement of Qualifications of T. Booth Statement of Costs

E

 \bigcirc

INTRODUCTION

The Boyd 1 claim was staked in September, 1976 to cover a lead-zinc geochemical anomaly discovered during a reconnaissance geochemical program. Work on the claim in late September, 1976, consisted of line-cutting, soil sampling, stream sediment sampling, geologic mapping and Crone EM shootback surveying. This work was done by a four man crew with Terry Booth in charge and supervised by J. R. Woodcock. Work on the claim in mid July, 1977 consisted of additional soil and stream sediment sampling, rock sampling, geological mapping and line cutting. This work was done by a three man crew with J. R. Woodcock in charge. Additional examination of geochemical anomalies was done on September 23 by J. R. Woodcock and T. Booth.

Boyd 1, tag number 07140, record number 287 (10) and record date October 5, 1976 was staked by Terry Booth on September 18, 1976 for J. R. Woodcock. The work was paid for by Dome Exploration (Canada) Ltd., Salsigne Exploration Ltd., and Union Oil Company of Canada Ltd.

LOCATION AND ACCESS

50

The Boyd 1 claim is at the head of Boyd Creek along the north-east side of the valley. The center of this claim is at latitude (54) 51' N, longitude 117° 29' W, N.T.S. map 82M/13E and 82M/14W, (figures 1 a and 1 b). Figure 1 b also shows the location of the Kootenay Chief property.

эK

The property is 53 km southeast of Revelstoke. Access is by helicopter from Revelstoke.

Elevation of the ridge top is 8300 feet (2490 meters) and the elevation of the valley bottom is 4400 feet (1320 meters). The slope on the area of the grid varies from 15° to 45°. To aid in interpretation, slope measurements were taken over the main part of the geochemical anomaly. These are shown on figure 6.

The bottom of Boyd Creek valley is covered by a heavy growth of cedar and hemlock. On the area of the grid the forest consists of spruce and balsam. An undergrowth of thick brush occurs in many places.

GEOLOGY AND MINERALIZATION

The accompanying geological map, scale 1:10,000, (figure 2) presents the data obtained by T. Booth and J. R. Woodcock. Above an elevation of 6900 feet (2070 meters), outcrops are abundant but below this elevation, exposures are confined largely to the steep beds of the creeks. An almost continuous exposure occurs along Carbonate King Creek. Abundant exposures also occur in Lean-to Creek and along part of a dry creek bed between the above two creeks. For convenience of reference this small creek has been named "Camp Creek".



FIGURE Id

LOCATION MAP FOR BOYD CLAIMS

 \bigcirc

 \mathbf{C}

C

N.T.S. MAPS 82K/I3E AND 82K/14W



6496

The geology of the region is shown on the Geological Survey open file map of the Lardeau West Half $(82 \text{ K-W}^{\frac{1}{2}})$ by P. D. Read and J. O. Wheeler. Additional data on the lithology of this stratigraphic interval can be obtained from the PhD thesis of Dr. Robert Thompson. The geological map of the present report is a lithological map. However, an attempt to correlate the map units with the formations shown on Dr. Read's map are indicated at the sections mapped along Carbonate King Creek. A few comments on the individual formations as they appear on the Boyd property are presented.

Rock Units

The published geological map shows that the Badshot Formation and formations of the Hamill Group are repeated several times at Carbonate King Creek. The Hamill Group, exposed at the head of Carbonate King Creek, forms the backbone of the rugged mountains to the northeast of Boyd Creek. Lying along the southwest side of this quartzite formation is a persistent white limestone bed which has been assigned to the Badshot Formation and, in this report, will be called the "Main Badshot limestone." Some additional strata (phyllites and limy formations) lying southwest of this Main Badshot limestone bed are also included in the Badshot Formation. Two additional limestone beds to the southwest of the Main limestone bed are also interpreted as repeated horizons of the Badshot Formation.

On the southwest side of the northeast bed of the Badshot Formation (i.e. between the two exposed beds of Badshot limestone) is a unit that has been correlated with the Index Formation. This unit changes across section in a northeasterly direction from a dark gray to black, slightly limy phyllite containing minor limestone to a dark gray or black limestone near the Badshot Formation.

In our mapping we have recognized the persistent Main limestone unit adjacent to the Hamill quartzites (upper reaches of Carbonate King Creek) and another persistent limestone horizon which can be traced through the mineralized adits of the Kootenay Chief and adjacent crown granted claims, across Carbonate King Creek, and onto the Boyd property where it projects along the geochemical anomaly. This unit will be called the "Mineralized Badshot limestone bed."

At the Kootenay Chief property, the white mineralized limestone bed is thinly banded and about 15 meters thick. It is bounded on the northeast by rusty-weathering phyllites and on the southwest by about 35 meters of black phyllites, some of which are limy.

Dolomite-Quartz Alteration

Alteration of limy formations to a dolomite-quartz rock is widespread, especially along the Mineralized Badshot bed. The result is a maroon-to rustyweathering dolomite, generally gray to white on the fresh surface, and generally cut by quartz veinlets. These dolomite zones vary from 2 meters to 12 meters in thickness. The quartz veinlets occur in a variety of directions and, in places, are abundant enough to form a quartz stockwork. Alteration to dolomitequartz is quite irregular and it obviously crosscuts the formation in many places.

At the Kootenay Chief property some of the quartz is vuggy with drusy cavities. Some galena mineralization is associated with this type of dolomitequartz.

* See figure 1 b for location of Kootenay Chief Property.

At the Kootenay Chief and in other exposed parts of the mineralized bed, the dolomitization is localized along the east side of the limestone at the contact with rusty-weathering limy phyllites. Part of it is probably within these rusty phyllites. In other places (throughout the Index Formation and the remainder of the Badshot Formation) the limy phyllites are irregularly dolomatized and the resulting rock forms relatively resistant exposures. Because this dolomite-quartz rock can form within or adjacent to mapped limestone units and within limy phyllites and because these limy units change sharply along strike to a non-limy lithology, it is impossible to assign individual dolomite outcrops in overburden areas to a specific horizon.

Exposures of good dolomite-quartz rock have been found in several places on the Boyd property. Near line 600 N, 150 W, a possible outcrop (or rubble) of this rock contains sparse galena. Other exposures on the property have no visible galena.

Structure

Most of the strata in the area of the property have fairly consistent attitudes with strikes between 130° and 140° and with steep dips ranging from 80° southwest to 70° northeast. An exception to this are the rocks between L 750 N and L 900 N where the strikes are 105° and 115° and the dips are 35° and 25° northeast. Colour and grain size banding of the quartzite and colour banding of the limestone indicate that bedding in most places is parallel to the metamorphic foliation.

GEOCHEMISTRY

Geochemical Techniques

A grid was established on the slope above the anomalies indicated in the original reconnaissance work. This grid consisted of a blazed and flagged baseline with crosslines at 150 meter intervals. Soil samples were taken at 50 meter intervals on the cross lines. The soil samples were generally taken from the B horizon at an average depth of 15 centimeters. Over much of the steep slope good soil profiles are lacking. Downslope creep has mixed the various horizons of the podsols with rock fragments.

A stream which flows across the north end of the grid was also sampled. No silt samples were taken on Camp Creek because it was completely dry.

Rock samples were taken from various formations on the property and from the Kootenay Chief property. The rock samples were taken as either chip or grab samples along a direction perpendicular to the bedding.

The samples were prepared and analyzed at Vangeochem Laboratories Ltd. In the preparation, the soil and silt samples were dried, sieved, and the -80 mesh portion of the sample was used in the analysis. The rock samples were dried and ground to -100 mesh in preparation for analysis. The analytical procedures are outlined in the appendix.

The 1976 samples were analyzed for copper, lead and zinc. The 1977 samples were analyzed for lead and zinc.

Geochemical Results

()~

The geochemical data for soil samples show an area anomalous in lead and zinc (figures 3 to 6).

The lead results and the zinc results show coincident anomalies along the southwest side of the grid. These anomalies extend the full length of the grid, but appear to be closing at both ends and on the east side. The anomaly is partly open down slope to the west. The lead anomaly with values >200 ppm has an overall length in the order of 1400 meters. The zinc anomaly with values >200 ppm has an overall length in the order of 1800 meters. The central higher part of these anomalies, with lead values over 300 ppm, has a length of about 900 meters. Although the peak of the zinc anomaly, with values up to 2780 ppm, is only partly coincident with the peak of the lead anomaly, the overall anomalies are generally co-extensive.

In addition to the main anomalous area, some slightly anomalous lead and zinc values occur in the southeast and northwest corners of the grid.

Copper is not anomalous; most values are below 20 ppm and all values are below 50 ppm.

With the steep topography of this area, one would expect down slope migration of the soil and the contained anomalous lead-zinc values. However, the close correlation of the cut-off contours uphill (i.e. 100 ppm lead and 200 ppm zinc) and the linear nature of these contours leads one to suspect that the uphill cut-off of the anomalies should reflect quite accurately the uphill cut-off of any underlying zone of mineralization. The minor differences in positions of the peak values within these anomalies might be contributed to differences in down slope migration.

A line of soil samples were taken 80 meters northwest of the Kootenay Chief adit, across a dolomitized zone. The soils were very shallow resting on the dolomite bedrock. The soils were brown and the profile was poorly developed because of a down slope creep. Sample spacing was three to four meters. The line of samples started in the rusty phyllite northeast of the dolomite and ended over the white limestone southwest of the dolomite. The dolomite contains a good quartz stockwork in places; however no galena could be found. The geochemical values increase as one goes down the slope across the dolomite. These values range from 385 ppm to 770 ppm for Zn and from 120 ppm to 332 ppm for Pb. A rock chip sample across the dolomite-quartz analyzed 46 ppm Pb and 257 ppm Zn.

A chip sample across the white limestone, 150 meters southeast of the Kootenay Chief prospect returned 36 ppm Pb and 20 ppm Zn; a grab sample across the adjacent dolomite on the east analyzed 485 ppm Pb and 362 ppm Zn and a grab sample across 30 meters of the black limy slate to the southwest of the limestone analyzed 30 ppm Pb and 60 ppm Zn. None of these units contained visible mineralization.

A carbonate horizon crops out in the bed of Carbonate King Creek, about 300 meters southwest of the main limestone horizon. This carbonate bed is dolomitized in the central part (see figure 2). A grab sample of the shallow soil on this dolomite-quartz outcrop analyzed 265 ppm Fb and 200 ppm Zn and a grab sample of the rock analyzed 45 ppm Fb and 65 ppm Zn. A grab sample of dolomite-quartz from a possible outcrop at line 600 N, 200 W analyzed 70 ppm Fb and 35 ppm Zn and a grab sample of similar rock from line 900 N, 200 W analyzed 47 ppm Fb and 18 ppm Zn. A soil sample off the second outcrop analyzed 72 ppm Fb and 310 ppm Zn.

All the exposed rock units along a section of Camp Creek were sampled. This was done to see if there was a correlation between the lead and zinc soil anomaly and a high metal background in any of the rock units. The results are shown in figure 7 and table 1. Some of the higher results were checked by assays. Table 2 shows the comparison between the geochemical results and the assays.

			ound of eer nock pumpter		
Sample Number	e (Width meters)	Rock Type	Lead (ppm)	Zinc (ppm)
T 520	R	2	white micaceous limestone	86	358
T 521	R	6	rusty weathering sericite phyllite	83	1360
T 522	R	4 1	muscovite phyllite	75	137
T 523	R	1	muscovite phyllite	62	73
т 524	R	3.5	garnet sericite phyllite	95	406
T 525	R	2	garnet sericite phyllite	40	59
т 526	R	2	quartzose sericite phyllite	. 72	470
T 527	R	3	quartzose sericite phyllite	64	510
т 528	R	2	quartzose sericite phyllite	55	403
T 529	R	0.6	rotten and rusty sericite phyllite	1750	7100
T 530	R	0.4	dark green-gray phyllite	275	299
T 531	R	5	dark gray phyllite	102	278
T 532	R	4.5	dark gray phyllite	23	108
Note:	above	samples are	e continuous chip samples		
W 222	R	unsifted	sample of soil and rock debris	1400	970
W 223	R	grab samp weathering	le from outcrop and talus of rusty g limy phyllite	700	800

m	Λ ΤΟ	T 17	7
- 14	НD	متسل	1

amp Creek Rock Samples

		TABLE 2		
Sample Number	Lead (ppm)	Lead (%)	Zinc (ppm)	Zinc (%)
T 529 R	1750	0.225	7100	1.090
T 530 R	275	0.035	299	0.046
W 222 R	1400	0.16		
W 223 R	700	0.08		

The sample with the highest results, T 529 R, which assayed 0.225% lead and 1.090% zinc was taken near the contact of the lighter quartzose sericite phyllite and the darker chloritic phyllites. This highly anomalous section coincides with the area of highest zinc values in soil and is on strike with the area of highest lead values in soil.

The analytical results for most of the soil samples show similar lead and zinc values. In the results for the rock samples the zinc values are much higher than the lead. This may indicate a leaching of zinc from the soil but not from the fresher bedrock in the creek bed.

Slope measurements were taken over the most geochemically anomalous area of the grid. The results are shown in percent slope (figure 6). These results failed to reveal any correlation between geochemical anomalies and steep slopes or benches.

On the air photos of the property a prominent white zone on the ground extends in a northwest direction for approximately 600 meters. It is approximately 30 meters wide. This zone appears to pass through the soil geochemical anomalies. It also lies about 50 meters southwest of the highly anomalous rock samples in Camp Creek. Initially the senior writer suggested that this zone could be a line of outcrops of white weathering limestone or a high bench of lake sand. Field observations from the air have shown it to be a zone of sparse vegetation. The zone can not be easily detected on the ground and has not been accurately tied into the grid lines.

GEOPHYSICS

A Crone EM Shootback survey was done over the most geochemically anomalous area of the grid. The method involves two coils, a transmitter and a receiver, spaced 100 meters apart. The resulting measurement was plotted at a point halfway between the two coils. Measurements were taken at 50 meter intervals along the cross lines.

The results are shown in plan on figure 9. No anomalous areas were found.

CONCLUSIONS

Soils formed on many of the areas of dolomite-quartz alteration can be very anomalous in Pb and Zn. The rock itself may contain slightly high Pb (45, 47, 60, 70 ppm) but it is not highly anomalous in either Pb or Zn.

The limy rusty-weathering phyllite samples on line 1050 N at 200 W and southeast of that in Camp Creek are the source of the anomalous lead and zinc at that site. These are the only outstanding geochemical values found in any rocks. Thus the limy phyllites are definitely one of the sources of the metals and may be the main source.

Dolomitization at the Kootenay Chief prospect occurs between the white limestone and the rusty-weathering phyllite. It is quite possible that much of this dolomite may have formed from the limy phyllites rather than from the white limestone. Certainly in other places it does form from limy phyllitic material. Thus the source of the lead and zinc within the dolomitized zone could be reconstitution of the metals contained within the limy phyllites.

In conclusion, the main source of the lead and zinc for the anomalies on Boyd Creek are the rusty-weathering limy phyllite and the dolomitized limy formations. Galena concentrations which can be recognized with the hand lens or the naked eye also will add to the anomalies; however just how much comes from this source can not be determined.

<u>4 R. Woodcock</u> J. R. Woodcock

T. D. Booth

October 31, 1977

()



VANGEOCHEM LAB LTD. 1521 PEMBERTON AVE., NORTH VANCOUVER, B.C., CANADA 604-5xxxxxx?

V7P 2S3

.2

986-5211

October 26, 1977

To: J. R. Woodcock Consultants Ltd. 1521 Pemberton Ave. North Vancouver, B C V7P 2S3

From: Vangeochem Lab Limited. 1521 Pemberton Ave. North Vancouver, B C V7P 2S3

Subject: Analytical procedure used to determine hot acid soluble Cu,Pb, and Zn in geochemical silt, soil, and rock samples.

RE: Boyd Property Project, 1977

- 1. Samples Preparation
 - (a) Geochemical rock, silt, and soil samples were shipped to the Lab by Greyhound Bus Express. The rock samples were either stored in 8" x 13" plastic bags or in 4" x 9" cotton mailing bags. The silt and soil samples were stored in the wet-strength 3¹/₂" x 6¹/₂" Kraft paper bags.
 - (b) The wet samples were dried in a ventilated oven over-night.
 - (c) The dried soil or silt samples were sifted by using a shaking machine with an 80-mesh stainless steel sieves. The plus 80mesh fraction materilas were rejected and the minus 80-mesh fraction materials were transferred into a coin envelopes for analyses later.
 - (d) The dried rock samples were crushed and pulverized by using disc mill to minus 100-mesh. The pulverized samples were stored in the 4" x 6" paper bags for later analysis.

-2-

2. Method of Digestion

- (a) 0.50 gram of the minus 80-mesh samples was used. samples were weighed out by using a top-loading balance.
- (b) samples were heated in a sand bath with nitric and perchloric acids (15% to 85% by volume of the concentrated acids respectively.)
- (c) The digested samples were diluted with demineralized water to a fixed volume and shaken.

3. Method of Analysis

Cu, Pb, and Zn analyses were determined by using a Techtron Atomic Absorption Spectrophotometer Model AA4 or AA5 with their respective hollow cathode lamps. The digested samples were aspirated directly into an air and acetylene mixture flame. The results, in parts per million, were calculated by comparing a set of standards to calibrate the atomic absorptions units.

4. Analysts

The analyses were supervised or determined by Mr. Conway Chun or Mr. E. Tang and the laboratory staff.

Eddie Tang VANGEOCHEM ZAB LTD.

ET:rn

STATEMENT OF QUALIFICATIONS OF TERRY BOOTH

B.Sc (geology), University of British Columbia, 1976. Education:

1971 - 1974 -- summers - employed by the Geological Survey Experience: of Canada as a field assistant doing geological mapping.

> 1975 -- summer - employed by Noranda Exploration as a party chief doing reconnaissance geochemical exploration.

1976 - 1977 -- employed by J. R. Woodcock Consultants Ltd. as a geologist doing regional exploration including geological mapping, geochemistry, prospecting and geophysical surveys.

DBooth verified by J Recoodcock

COSTS - BOYD PROJECT

WAGE COSTS:

 \bigcirc

 \bigcirc

 \bigcirc

N. Wychopen Sept. 20-25/76	6 days @ \$ 85.00	\$ 510.00	
C. Beaulieu Sept. 20-25/76	6 days @ \$ 62.00	372.00	
L. Soet Sept. 19-25/76	7 days @ \$ 62.00	434.00	
M. Currey July 24-31/77	8 days @ \$ 70.00	560.00	
P. Stanneck July 24-31/77	8 days @ \$ 70.00	560.00	
T. Booth Sept. 19-25/76	7 days @ \$100.00	700.00	-
T. Booth June 26/77	1 day @ \$110.00	110.00	
T. Booth July 24/77	[±] / ₂ day @ \$110.00	55.00	
T. Booth Sept. 23/77	1 day @ \$110.00	110,00	
T. Booth Oct. 28-Nov. 18/76	5 days @ \$100.00	500.00	
J. R. Woodcock June 26/77	l day @ \$210.00	210.00	
J. R. Woodcock July 24-31/77	7 [±] days @ \$210.00	1,575.00	
J. R. Woodcock Sept. 23/77	l day @ \$210.00	210.00	
J. R. Woodcock Sept. 30-Nov. 24,		• • •	
1977	2 days @ \$210.00	420,00	
J. R. Woodcock Aug. 10-Oct. 1/77	2 days @ \$210.00	420.00	\$ 6,746.00
			. Царана 19
MISCELLANEOUS COSTS:			
Helicopter charges		\$3,970.00	
Vehicle rent and expense		625.00	
Food, meals, and camp field equ	ipment rental	1,190.00	
EM equipment rental		540.00	
Geochemical analyses		615.00	
Maps and reproduction		360.00	
Miscellaneous supplies and expe	nses	335.00	\$ 7,635.00

TOTAL

\$14,381.00



15

60

50

25

XI

LEGEND



5000

M O

7500

D

PINE

- IPBC Broadview Formation (Lardeau Group)
- IPIP Index Formation (Lardeau Group)
- IPBC Badshot Formation
- ICMV Mohican Formation (Hamill Group)
- ICMAS Marsh Adams Formation (Hamill Group)

4

Symbols

1

Geological contact - defined

Geological contact — assumed

XX Bedding (vertical, inclined)

Areas of outcrop which were examined

NOTES EXPANDED FROM 1150,000 NATIONAL TOPOGRAPHIC MAP 82K/13E B 82K/14W. Boyd 1 Claim Record Number 287 (10) Revelstoke Mining Division November 1, 1977 MADU

CONTOUR INTERVAL 100 FEET.



Doyu i Olalm
Record Number 287 (10)
Revelstoke Mining Division
November 1, 1977 A. Riclochtoch
DOME, SALSIGNE, UNION OIL
ARROW PROJECT
(BOYD PROPERTY)
GEOLOGY
Scale 00 100 0 100 200 300 400 500 600 700 800 ПНИНИИ НОСТИНИТИИ МЕТПЕЗ
J.R. WOODCOCK CONSULTANTS LIMITED
te-Revised October 1977 Figure No 2



ARROW PROJECT

O SOIL SAMPLE

TOPOGRAPHIC CONTOUR INTERVAL 500 FEET. GEOCHEMICAL CONTOURS ARE IN ppm. SAMPLE VALUES IN ppm.

Boyd 1 Claim Record Number 287 (10) Revelstoke Mining Division November 1, 1977

LEGEND

CLAIM POST

-2 DIP ANGLE IN DEGREES

NOTES

COIL SEPARATION 100 METRES FREQUENCY USED 1830 Hz

MINERAL	RESOURCES E	RANCH
ASSE	SSMENT REPO	RT
Sec.	110	1

D	OME, SALSIGNE, UNION OIL
	ARROW PROJECT
	(BOYD PROPERTY)
EM	RESULTS (CRONE SHOOTBACK)
	SCALE 0 100 200 300 400
J. R.	WOODCOCK CONSULTANTS LIMITED
Date – Nove	mber 1976 Figure No. 9