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Ministry of Energy, Mines & Petroleum Resources
Mining & Minerals Division
BC Geological Survey

Assessment Report
Title Page and Summary

TYPE OF REPORT [type of survey(s)]: Geochemical Assessment

TOTAL COST: $20,200.00

AUTHOR(S): J. T. Shearer, M.Sc. P.Geo.

SIGNATURE(S): J Shearer

NOTICE OF WORK PERMIT NUMBER(S)/DATE(S):

YEAR OF WORK: 2017

STATEMENT OF WORK - CASH PAYMENTS EVENT NUMBER(S)/DATE(S): 5661973

PROPERTY NAME: Barnes Lake

CLAIM NAME(S) (on which the work was done):

COMMODITIES SOUGHT: Phosphate

MINERAL INVENTORY MINFILE NUMBER(S), IF KNOWN:

MINING DIVISION: Fort Steele Mining Division

NTS/BCGS: 82G/07E

LATITUDE: 49 ° 28 ' " **LONGITUDE:** 114 ° 42 ' " **(at centre of work)**

OWNER(S):
1) J. T. Shearer
2)

MAILING ADDRESS:

Port Coquitlam, BC V3C 2Z1

OPERATOR(S) [who paid for the work]:
1) Same as above
2)

MAILING ADDRESS:
Same as above

PROPERTY GEOLOGY KEYWORDS (lithology, age, stratigraphy, structure, alteration, mineralization, size and attitude):
The target is a phosphatic horizon in the basal Jurassic Fernie Group
The zone is 1m to 2m thick grading around 33.5% P2O5

REFERENCES TO PREVIOUS ASSESSMENT WORK AND ASSESSMENT REPORT NUMBERS:

Assessment Reports 6859, 5556, 8989, 6365

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TYPE OF WORK IN THIS REPORT	EXTENT OF WORK (IN METRIC UNITS)	ON WHICH CLAIMS	PROJECT COSTS APPORTIONED (incl. support)
GEOLOGICAL (scale, area)			
Ground, mapping			
Photo interpretation			
GEOPHYSICAL (line-kilometres)			
Ground			
Magnetic			
Electromagnetic			
Induced Polarization			
Radiometric			
Seismic			
Other			
Airborne			
GEOCHEMICAL (number of samples analysed for...)			
Soil			4,000 00
Silt			
Rock			16,200 00
Other			
DRILLING (total metres; number of holes, size)			
Core			
Non-core			
RELATED TECHNICAL			
Sampling/assaying			
Petrographic			
Mineralographic			
Metallurgic			
PROSPECTING (scale, area)			
PREPARATORY / PHYSICAL			
Line/grid (kilometres)			
Topographic/Photogrammetric (scale, area)			
Legal surveys (scale, area)			
Road, local access (kilometres)/trail			
Trench (metres)			
Underground dev. (metres)			
Other			
		TOTAL COST:	$20,200.00

GEOCHEMICAL ASSESSMENT REPORT
ON THE
BARNES LAKE PROPERTY

49°27’10”N LATITUDE/114°44’54”W LONGITUDE
NTS: 82G/7E (82G.047)
FORT STEELE MINING DIVISION
SOUTHEASTERN BRITISH COLUMBIA
Event # 5661973

For

FERTOZ INTERNATIONAL INC.
390 Bay Street, Suite 806
Toronto, Ontario
M5H 2Y2

By

J. T. Shearer, M.Sc., P.Geo. (BC & Ontario)
Unit 5 – 2330 Tyner Street,
Port Coquitlam, BC
V3C 2Z1
Phone: 604-970-6402
E-mail: jo@HomegoldResourcesLtd.com

August 28, 2017

Fieldwork Completed Between July 1, 2017 and August 28, 2017

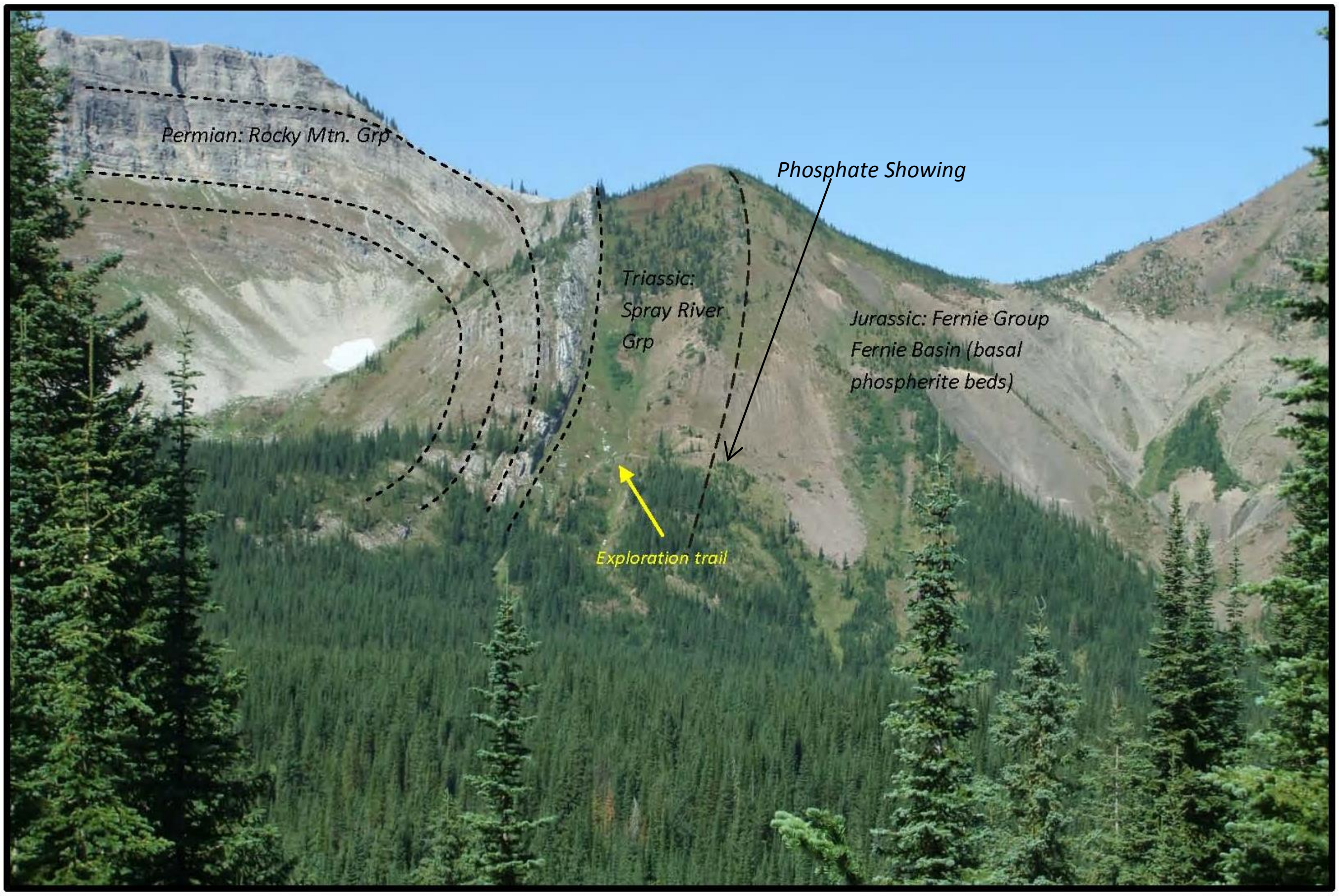

Photo looking northwesterly Barnes Lake property: folded overturned sequence of Permian – Rocky Mountain and Triassic Spray River groups with overlying Fernie Basin black shale with basal phosphate horizon characteristically occurring immediately next to the Spray River.

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SUMMARY

The Barnes Lake property consists of 4 MTO claims encompassing 1,847.72 hectares. The claims are located in the Barnes Lake/Michel Creek area of the Rocky Mountains, Fort Steele Mining Division, southeastern British Columbia, approximately 40 kilometres by road south of the town of Sparwood and 27 kilometres due east of Fernie, B.C. The property is accessed via an extensive network of logging and exploration roads.

The Barnes Lake claim was staked as part of the Crowsnest Project, whose primary objective was to evaluate the grade and continuity of the basal Fernie phosphate horizon in terms of establishing its potential as a large tonnage P_2O_5 resource. Previously, in 1990 reconnaissance and detailed geologic mapping, hand trenching, sampling, backhoe trenching and assaying was completed on the Barnes Claim. In 1990, fifty-seven rock samples were collected from *2* hand trenches and 9 backhoe trenches. The samples were analyzed for P_2O_5 (by gravimetric assay), yttrium (by XRF) and gold plus 33 trace elements (by INAA).

The Barnes Lake property is predominantly underlain by a sequence of Late Paleozoic to Mesozoic strata (Permian to Jurassic) that were deposited in the Alberta Trough under marine conditions and Late Jurassic to Cretaceous fluvio-deltaeic sediments that were subsequently deformed during the Late Cretaceous. Phosphatic rocks occur in a number of stratigraphic intervals within this sequence; however, the thickest and most continuous phosphate horizon was developed at the base of the Jurassic Fernie Group which is the focus of this project. The basal Fernie phosphatic strata are generally one to two metres thick and also contain unusually high concentrations of yttrium.

Previous work on the Barnes Lake Property suggests average grades of the basal phosphorite horizon on the property are around 22.5 per cent P_2O_5 and 610 ppm Y across 1.4 metres. In one trench, an incomplete section was measured which ran 30.5 per cent P_2O_5 and 777 ppm yttrium across 0.98 metres.

The 2017 program consisted of reconnaissance prospecting, rock sampling and establishing further access.

This 2017 work shows anomalous soil samples approximately 150m to 200m east of the main road at an elevation of approximately 1725m to 1767m. Close spaced follow-up soil samples were completed perpendicular to the road system (E-W) at 10m intervals.

Follow-up sampling and geological mapping was completed east of the main access road and also west of Michel Creek and north of Barnes Lake which confirmed the high grade (>30% P_2O_5) nature of the phosphate zone at surface.

Respectfully submitted,

J. T. Shearer, M.Sc., P.Geo. (BC & Ontario)

INTRODUCTION

Pell (1990) makes the following observations: Canada imported 2.39 million tonnes of phosphorite in 1986, approximately 80 per cent of which was used in the fertilizer industry. Other products which require the use of phosphorus include organic and inorganic chemicals, soaps and detergents, pesticides, insecticides, alloys, animal-food supplements, ceramics, beverages, catalysts, motor lubricants, dental and silicate cements (Barry, 1987). Approximately 55 million tonnes per annum are produced in the United States (Stowasser, 1989). Approximately 50 per cent of the phosphate rock imported into western Canada previously comes from Florida, the remainder being supplied from the Western U.S. (Barry, 1987) but currently the majority is imported from North Africa. Resources in Florida are rapidly being depleted (Stowasser, 1988): some experts feel that the western U.S. sources will not be able to meet the demand when Florida becomes exhausted, which suggests a possible niche for a new producer.

Phosphate rock produced in the U.S. is classified as acid or fertilizer grade, more than 31 per cent P_2O_5; furnace grade, 24 to 31 per cent P_2O_5; and beneficiation grade, 18 to 24 per cent P_2O_5. Acid grade rock is used directly in fertilizer plants, furnace grade rock is charged to electric furnaces and beneficiation grade rock is upgraded to acid or furnace feed (Stowasser, 1985).

Most commercial phosphate rock is used in fertilizer plants: feed for these plants must meet the following specifications:

P_2O_5 content: 27 to 42%
CaO/P_20_5 ratio:1.32 to 1.6
R_20_3/P_20_5:<0.1; $R_20_3=A1_20_3+Fe_20_3+MgO$
MgO content<l.O%

The phosphate rock mined in the western United States (Idaho, Montana, Wyoming, Utah) is from the Retort and Meade Peak members of the Permian Phosphoria Formation. The majority of mines are strip mining operations with ore zones ranging from 9 to 18 metres thick, with an average grade of 21.3 per cent P_2O_5. Overburden thickness is commonly 5 to 10 metres (Fantel et. al., 1984). Cominco American operated an underground phosphate mine in Montana. The phosphate horizon is 1 to 1.2 metres thick and has an average grade of >31 per cent P_2O_5. Most western U.S. phosphate ore is beneficiated by crushing, washing, classifying and drying (Stowasser, 1985). Phosphates mined in Florida and south Carolina are from the Miocene Hawthorne Formation and the younger, reworked deposits of the Bone Valley Formation. Ore thickness range from 3 to 8 metres, with overburden of 3 to 10 metres. Average grade is 7 per cent P_2O_5. Flotation processes are used to beneficiate the ores. Phosphates mined in Tennessee have a minimum cut-off grade of 16 to 17.2 per cent P_2O_5 and a minimum thickness of 0.6 to 1.2 metres (Fantel et. al., 1984). Currently, there is no by-product recovery of yttrium from any of the U. S. operations. Phosphoria formation phosphorites from the western phosphate field contain an average of 300 ppm Y; phosphorites from North Carolina and Florida contain an average of 235-300 ppm Y; and, phosphorites from Tennessee contain an average of 63 ppm Y (Altschuler, 1980). The worldwide average yttrium value in phosphorites is 260 ppm (Altschuler, 1980).

The phosphorite beds in the Jurassic Fernie Group are thin (usually 1 to 2 metres, Butrenchuk, 1987a) relative to most phosphorites mined in the United States. The Fernie phosphorites have anomalous yttrium concentrations with respect to most other sedimentary phosphate deposits. If it proves feasible to recover yttrium during the production of phosphoric acid, as has been suggested by some researchers (Altschuler, et. al:, 1967), the economics of exploiting the Fernie Group basal phosphorite horizon will become significantly more attractive.

However, the strategy employed by Fertoz in the present program is to investigate the direct application of Organic Certified Rock Phosphate to the organic farm market. Numerous contacts have been made to farmers already producing organic products.

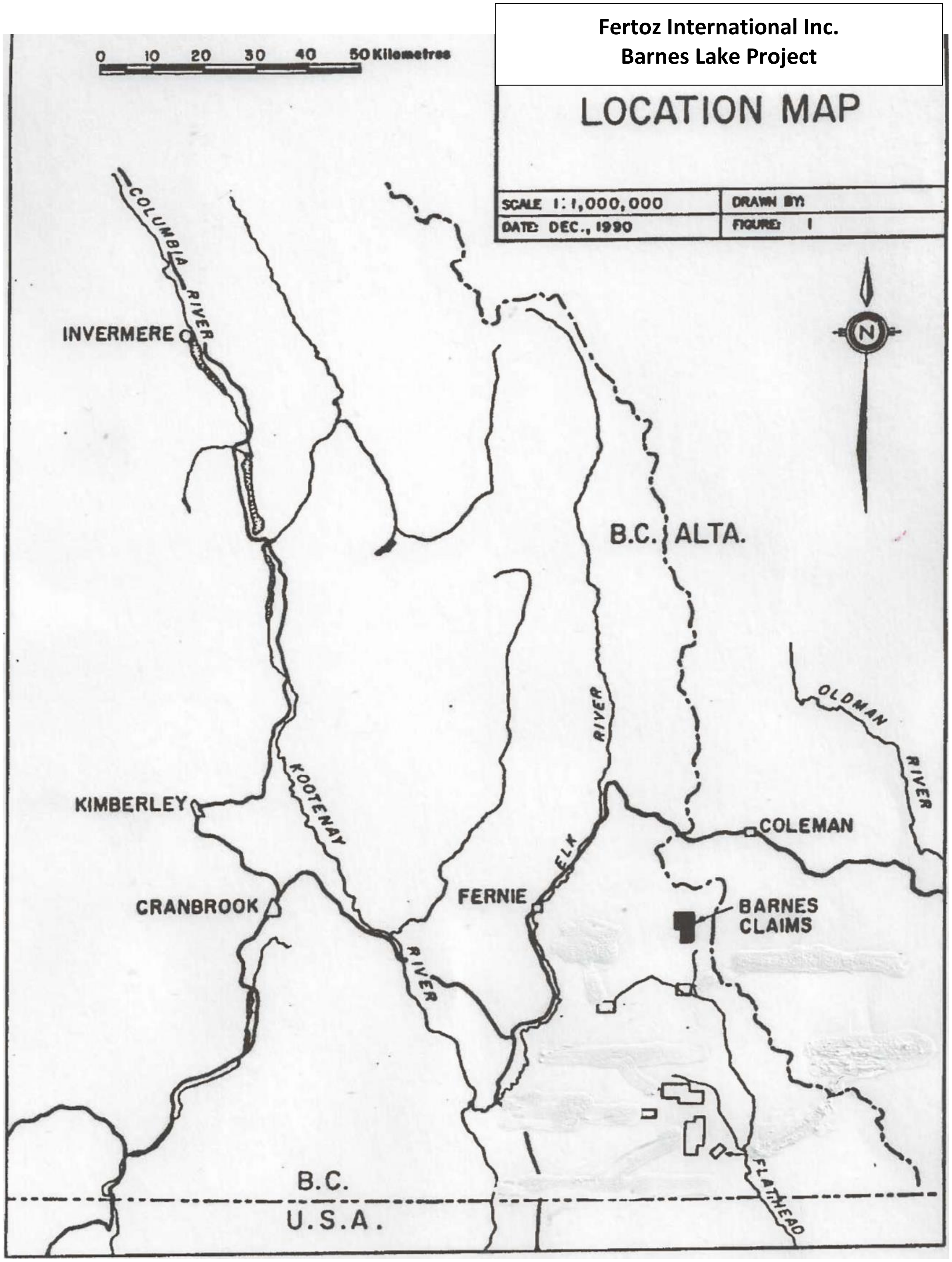


Figure 1 Location Map

PROPERTY DESCRIPTION and LOCATION

The Barnes Lake claims are located in the Barnes Lake - Michel Creek area, Flathead region, Fort Steele Mining Division, approximately 30 kilometres by road south of the town of Sparwood and 27 kilometres due east of Fernie (Figure 1). The eastern edge of the claims can be reached, by conventional vehicle, from Fernie and Sparwood by taking Highway 3 east for approximately 15 kilometres to Michel and then following the Corbin Mine road south for approximately 30 kilometres to the Corbin townsite and Coal Mountain mine. From the Corbin townsite the Michel Creek/Flathead Main haul road is followed south for around four kilometres and then a small road taken to the west that crosses Michel Creek. A four-wheel drive or all-terrain vehicle is required to follow this road, an old exploration road, southwesterly for an additional 4.5 kilometres to the main showings. Drilling in the 1960's intersected phosphorite at shallow depths on the east side of Michel Creek which was the focus of 2014 exploration.

Elevations on the property range from 1585 metres (5200 feet) to 2255 metres (7400 feet). Stands of spruce and fir are present at lower elevations: the area of the main showings is in alpine and subalpine terrain, some large fir are present but most of the area is above tree line on the west side. The east side of the claims is at a much lower elevation.

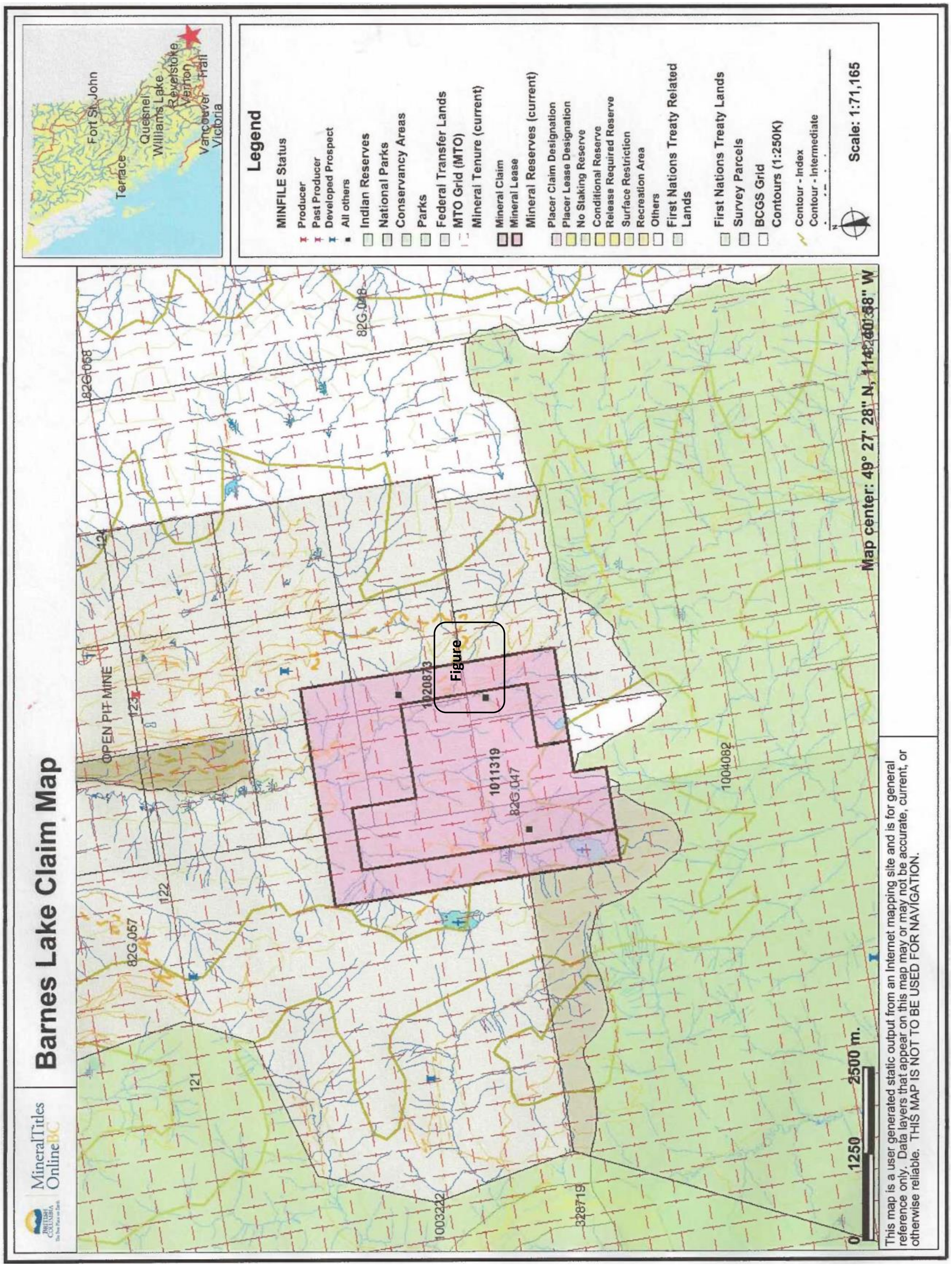


Figure 2 Claim Map

MINERAL TENURE

The Barnes Lake property, 4 claims encompassing 1,843.75 hectares was staked by Fertoz International Inc. in July 2012 and also 2013 as shown in Table 1 and Figure 2.

TABLE I
List of Claims

Name	Tenure #	Area (ha)	Current Expiry Date*	Registered Owner
Barnes Lake	1011319	608.98	May 19, 2019	Fertoz International
Barnes 2	1020873	629.88	April 18, 2019	Fertoz International
Barnes Lk 3	1046619	524.89	January 12, 2019	Fertoz International
Barnes Lk West	1055454	83.97	October 9, 2018	J. T. Shearer

Total 1,847.72 ha

*by assessment work contained in this report

Cash may be paid in lieu if no work is performed. Following revisions to the Mineral Tenures Act on July 1, 2012, claims bear the burden of $5 per hectare for the initial two years, $10 per hectare for year three and four, $15 per hectare for year five and six and $20 per hectare each year thereafter.

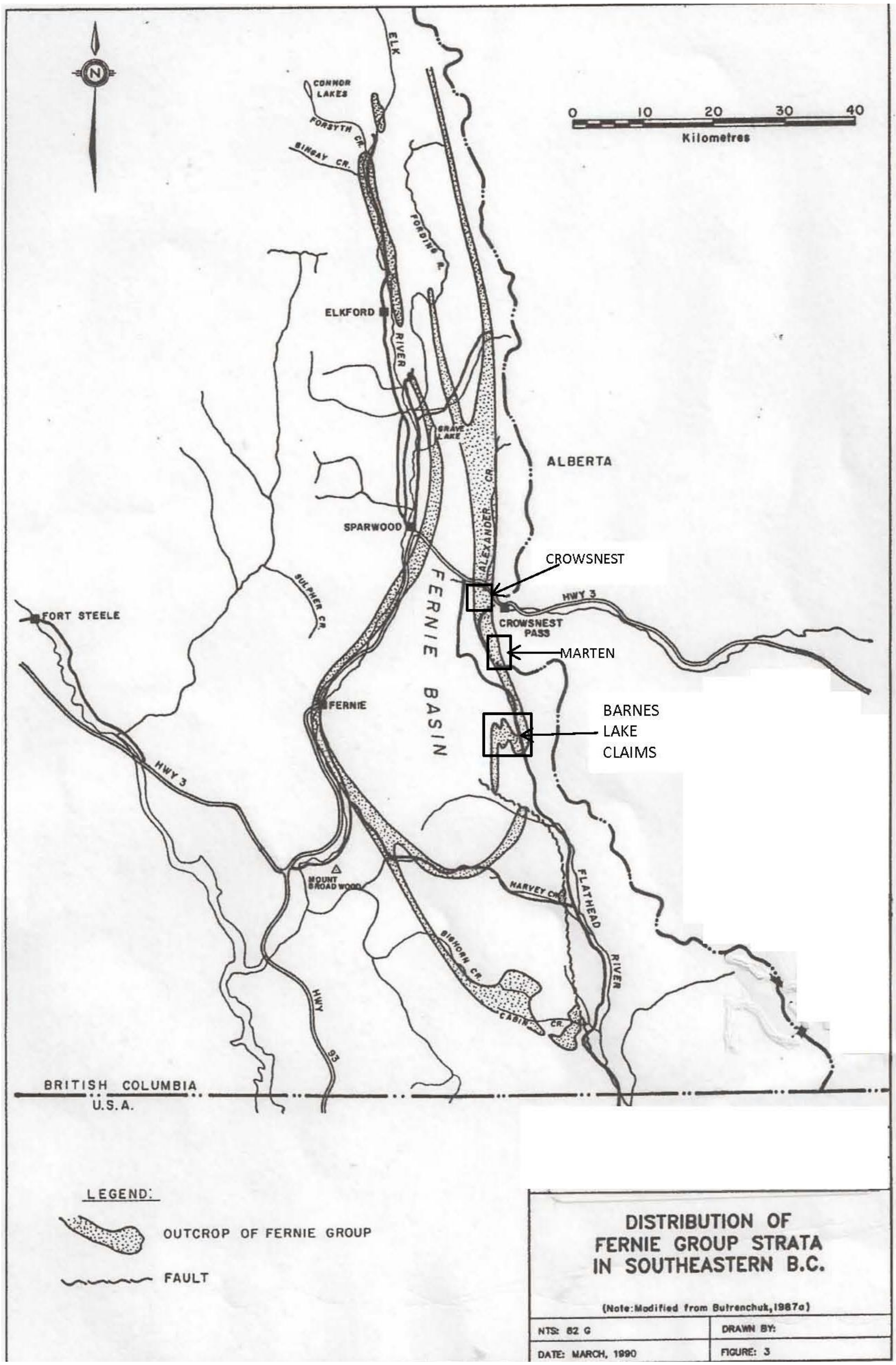


Figure 3 Distribution of Fernie Group Strata in Southern British Columbia

HISTORY

Phosphatic horizons at the base of the Jurassic Fernie Group in southeastern British Columbia were discovered in 1925 (Telfer, 1933) and have been the subject of periodic exploration by Cominco (Kenny, 1977) and others since that time. Phosphate strata in the Barnes Lake area were (in the mid and late 1970's) explored by Western Warner Oils Ltd. and Medesto Exploration Ltd. and 262,000 tonnes of phosphate to a depth of 18 metres were outlined (Dorian, 1975; Pelzer, 1977; Dales, 1978). The phosphate potential of the area was also addressed in a number of recent academic and government studies (Butrenchuk, 1987a; 198733; Macdonald, 1985; 1987).

Butrenchuk puts the potential on the east side of Michel Creek in the vicinity of the Barnes Lk Property at 4 million tonnes (Butrenchuk, 1991).

Previous Trenching (1990)

The Fernie Group rocks are generally poorly exposed; in order to measure sections through the basal phosphorite horizon it was necessary to dig trenches or pits to provide adequate sections. In the course of evaluating the economic potential of this horizon on the Barnes Lake claims, 57 samples were collected from 9 backhoe trenches and 2 hand trenches. The samples were analyzed for P_2O_5 using a gravimetric assay method, for yttrium using X-ray fluorescence (XRF) and for AU plus 33 trace elements, including some of the rare earths, using induced neutron activation analysis (INAA). As well, twenty-one samples were also analysed for major element oxide composition using the direct coupled plasma emission (DCP) method and for mercury using cold vapour atomic absorption (AA) analysis.

Nine trenches were dug using a John Deere 555 Backhoe. The trenches ranged from 3.2 to 29.6 metres in length, 1 to 4.3 metres in width and 0 to 3 metres in depth. The dimensions of individual trenches are summarized as follows:

Trench	Length (m)	Width (m)	Depth/Bank Height (m)	Material Moved (m^3)
BNT90-1	9.3	1-4.3	0-2.4	34.78
BNT90-2	12.3	1-1.5	1-2.6	26.03
BNT90-3	21.5	1	1-2.75	21.09
BNT90-4	3.3	1.3	1.8	7.72
BNT90-5	29.6	1	0-2.2	47.00
BNT90-6	13.3	1	0.4-2.8	8.86
BNT90-7	3.2	2.3	0-2.36	8.68
BNT90-8	5.35	1-3.2	2-3	28.93
BNT90-9	5.6	0.85-3.1	2-2	24.90
Total Volume of Material Moved				207.59m^3

Two hand trenches were also dug. These involved the removal of sloughed material from steeply dipping bank sections to clearly expose the phosphate strata.

Continuous samples across measured intervals were collected from all trenches. In the longer backhoe trenches, commonly more than one section was measured. Maximum depth attained by the backhoe was 3 metres: all samples collected may have been affected, to some degree, by surface weathering.

Phosphate and yttrium results, from measured sections on the Barnes Lake claims are summarized as follows:

Summary of Measured Sections, Barnes Lake Claims

		Weighted Averages*	
Section	Thickness+ (m)	P_2O_5 %	Y ppm
Hand Trenches			
BN90-23**	0.98	30.50	777
BN90-37**	0.65	27.29	658
Backhoe Trenches			
BNT90-1**	0.68	25.00	722
BNT90-2**	0.52	25.67	718
BNT90-3-1	1.11	23.16	629
BNT90-3-2	1.11	21.63	712
BNT90-4**	0.78	21.24	582
BNT90-5-1	1.24	23.73	643
BNT90-5-2**	0.75	25.14	758
BNT90-6**	0.87	24.89	712
BNT90-7	1.45	23.58	595
BNT90-8	1.62	20.94	493
BNT90-9	2.07	22.14	565

\+ Thicknesses quoted are all true stratigraphic thicknesses, either measured as such or calculated

* Measured sections are generally composed of a number of smaller interval samples; weighted averages, based on proportional sample thicknesses, were calculated to represent the yttrium and phosphate content of the entire section

** Incomplete section due to erosion or faulting

On the Barnes Lake claims, the stratigraphically complete measured sections average 22.53 per cent P_2O_5 and 606 ppm yttrium across an average thickness of 1.43 metres (1.11 to 2.07). One incomplete section contained an average of 30.5% P_2O_5 and 777 ppm Y across 0.98 metres. The values ranged from 2.66 per cent P_2O_5 and 98 ppm yttrium in shale layers within the phosphorite section to 32.18 per cent P_2O_5 and 1065 ppm yttrium in true phosphorites (Appendix 1).

In most trenches in the Barnes Lake area, the phosphorite horizon overlies orange to yellow clays (weathered Triassic siltstones) or interbedded buff to brown Triassic shales and siltstones. The lowest units commonly contain angular orange weathering fragments, probably derived from the underlying Triassic beds, that diminish in abundance upsection. The phosphorites are generally shaley to pelletal in nature and exhibit an increase in grade upsection until a fairly pure phosphorite, containing between 28 and 32% P_2O_5 is developed. Commonly, this high-grade phosphorite is black, pelletal (gritty textured) and overlain by increasingly shaley phosphorite and shale. Locally, (see trenches BNT90-7 & 8) phosphate nodules hosted in a pelletal phosphate matrix are developed in these high-grade beds. Incomplete sections exhibit similar trends, but are often complicated through mixing and erosion of units. In trenches BNT90-1 & 2 the phosphorite bed and a veneer of Triassic siltstones have been thrust westerly over very disrupted black shales and incomplete sections preserved.

All trenches were in phosphatic strata distributed along the western limb of the easternmost. Particularly in the vicinity of Trenches BNT90-3 to 6 the beds are dipping roughly parallel to slightly steeper than the hillside. This dip slope setting suggests that, in this area, it may be possible to define a fairly large deposit that is easily exploited and requires only minimal removal of overburden. Shallow drilling could be used in this area to outline reserves to an acceptable depth.

An attempt was made to access the phosphate horizon on the western limb of the syncline at the north end of the property. An old exploration road leads to the Triassic/Jurassic contact in that area.

A number of samples were analysed for their major element compositions in order to see how they compare to industry standard specifications for fertilizer plant feed. The results for samples containing greater than 20% P_2O_5 are summarized below:

Sample Number	P_2O_5%	CaO/ P_2O_5	R_2O_3*/ P_2O_5	MgO%
BNT90-1A	29.93	1.37	0.19	0.42
BNT90-1B	29.96	1.37	0.20	0.42
BNT90-1C	24.56	1.46	0.26	0.42
BNT90-2A	30.50	1.38	0.17	0.34
BNT90-2B	23.11	1.43	0.35	0.51
BNT90-3-1C	30.26	1.39	0.17	0.35
BNT90-3-1D	24.17	1.46	0.29	0.42
BNT90-3-2C	29.79	1.40	0.19	0.37
BNT90-3-2D	22.71	1.42	0.33	0.44
BNT90-23A	31.39	1.39	0.16	0.29
BNT90-23B	32.91	1.39	0.12	0.23
BNT90-9B	30.53	1.48	0.16	0.33

*$R_2O_3 = Al_2O_3 + Fe_2O_3 + MgO$

In all cases, the CaO/P_20_5 ratios and MgO contents of the raw samples meet industry standard fertilizer plant feed specifications. In many samples, the P_2O_5 grades of the individual samples are low and therefore some beneficiation would be necessary. The R_2O_3/ P_2O_5 ratios of the raw material exceed standard requirements, ranging from 0.12 to 0.35 where they need to be less than 0.1: the higher the phosphate content, however, the lower the ratio.

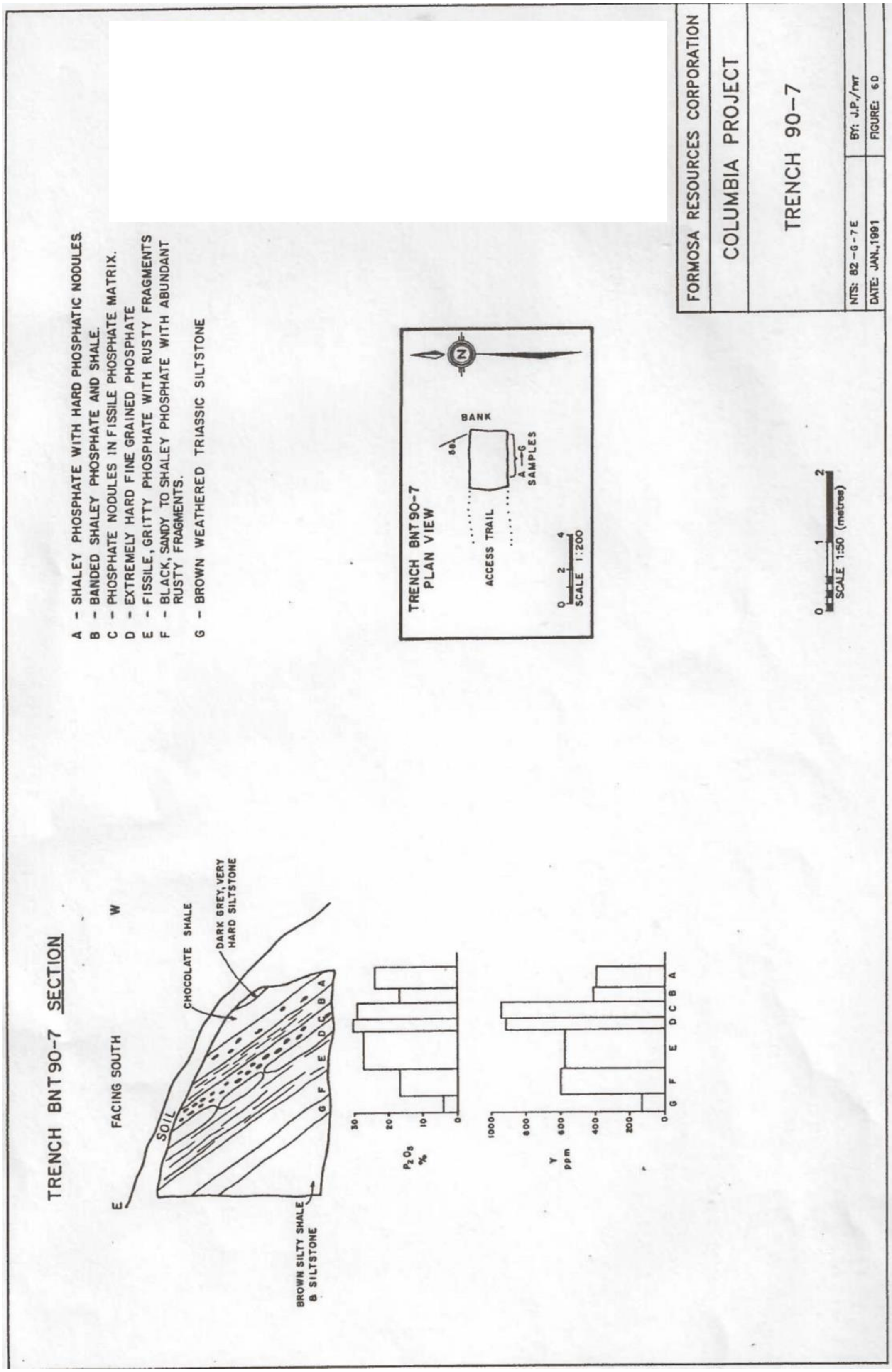


Figure 4 Previous Trench 90-7

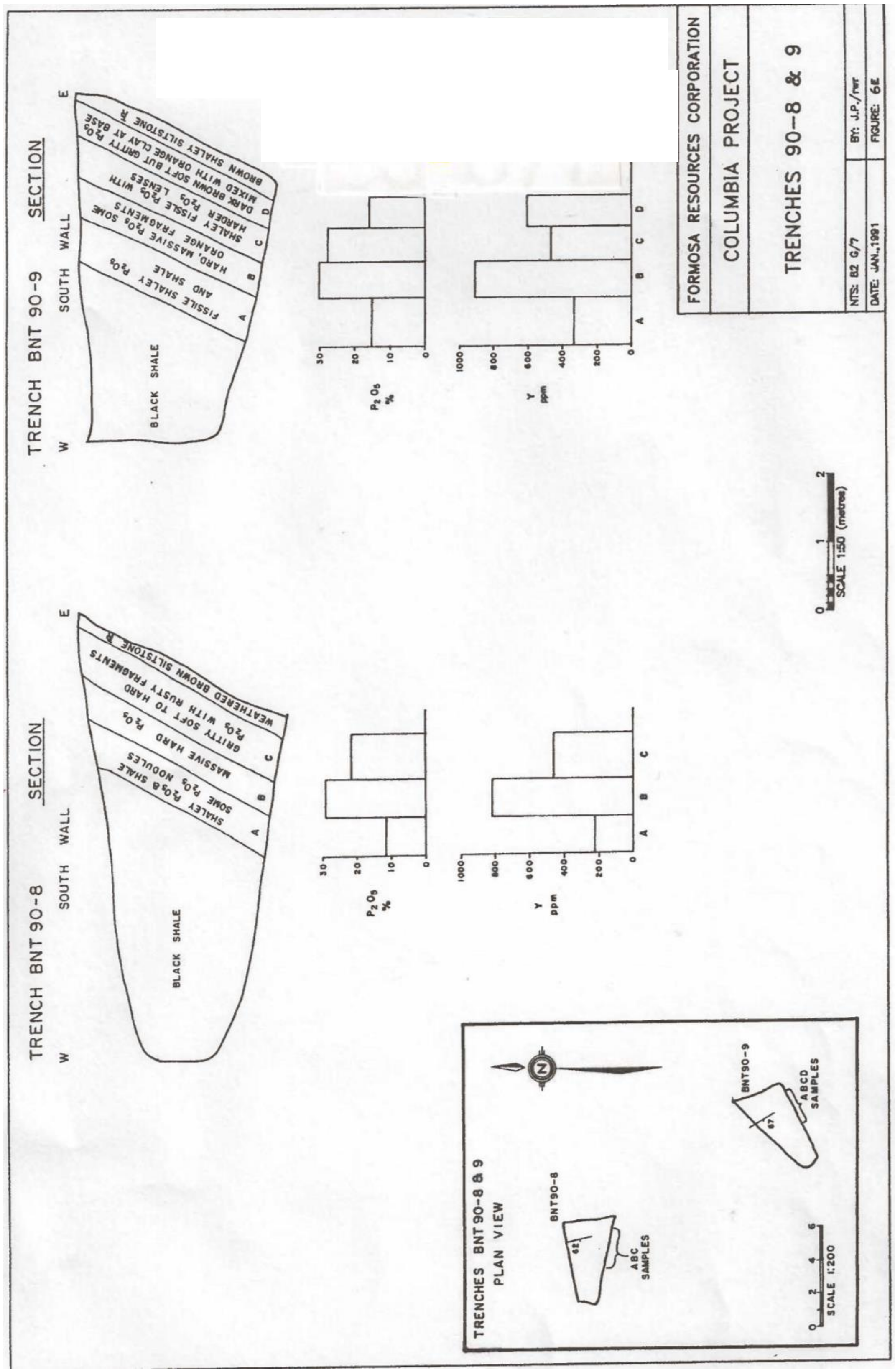


Figure 5 Trenches 90-8 & 9

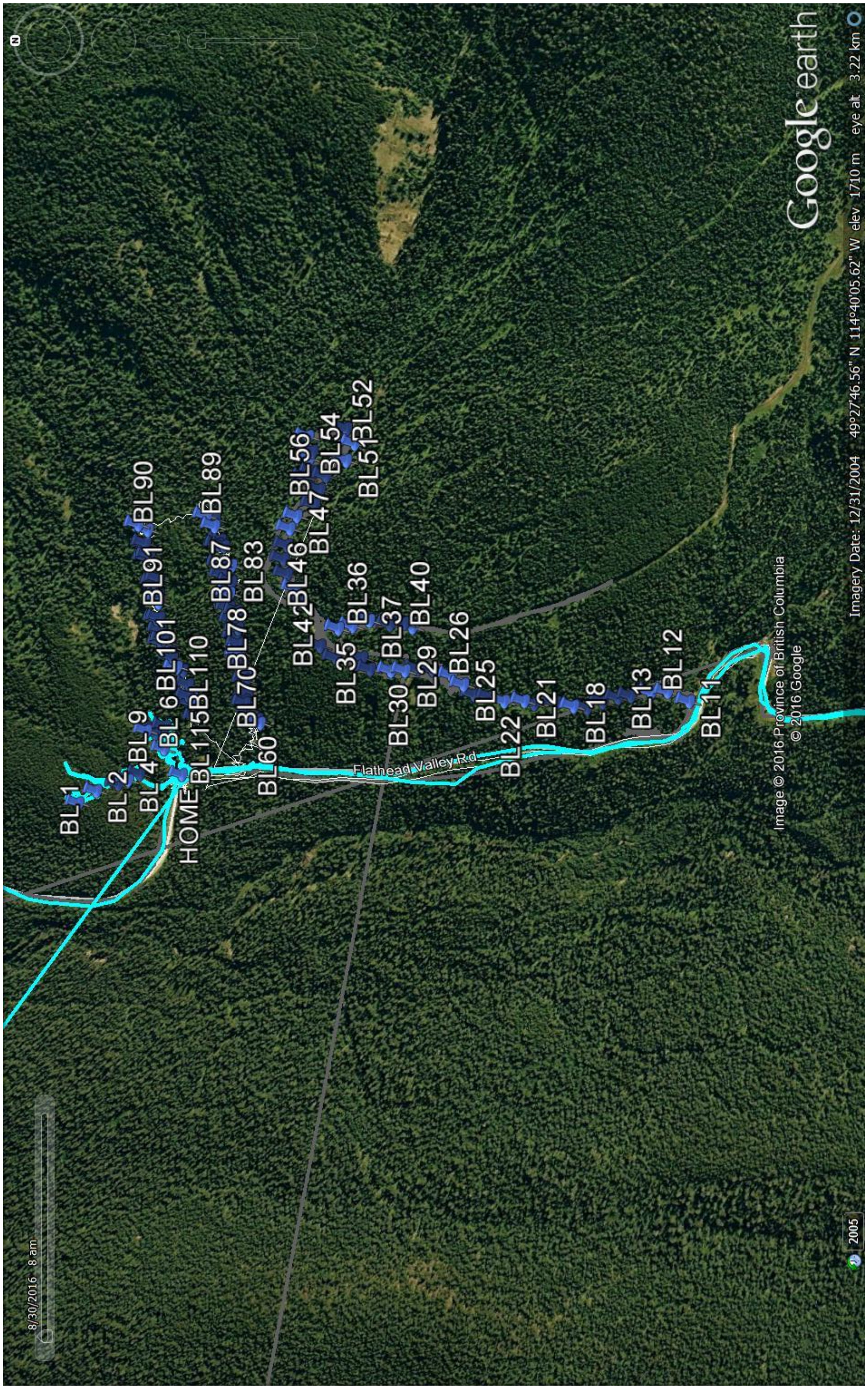


Figure 6 General Google Image of Area from 2014 Work

The 2013 program consisted of reconnaissance prospecting, rock sampling and establishing access. Thirteen samples were collected and assayed. Work in June 2013 was curtailed by unusually heavy rain which washed out the access road and the access was closed. Widespread flooding occurred in southeast BC and Alberta.

Results for 2013 sampling are generally low and sample location and P2O5 are plotted on Figures 5.

In 2014 the program consisted of prospecting the easternmost part of the claims. The area around the 1960's drill hole was examined and a suite of samples collected.

Assays were conducted by using an XRF Unit factory calibrated (Cert No. 0154-0557-1) on October 30, 2013, Instrument #540557 Type Olympus DPO-2000 Delta Premium. The instrument was calibrated using Alloy Certified reference materials by ARM1 and NIS5 standards. Only certified operators were employed and that were experienced in XRF assay procedures. Read times were 120 seconds or greater.

Results of the 2014 samples show low P_2O_5.

Work Program 2016

The program consisted of continued reconnaissance prospecting, minor rock sampling and establishing access, soil samples were collected and assayed.

Results of the XRF assays are contained in Appendix III and sample descriptions are contained in Appendix IV. Soil samples were collected with a mattock at an average depth of 20cm from mainly a poorly developed "B" horizon.

Assays were conducted by using an XRF Unit factory calibrated (Cert No. 0154-0557-1) on October 30, 2013, Instrument #540557 Type Olympus DPO-2000 Delta Premium. The instrument was calibrated using Alloy Certified reference materials by ARM1 and NIS5 standards. Only certified operators were employed and that were experienced in XRF assay procedures. Read times were 120 seconds or greater.

With steeper dips of the beds than expected the results suggest that the sampling so far, is still too high in the sedimentary sequence. Work shows slightly anomalous soil samples approximately 150m east of the main rock at an elevation of approximately 1725m to 1767m. Close spaced soil samples are recommended perpendicular to the road system (E-W) at 10m intervals. Hand trenching assisted by excavator trenching is recommended to follow up on the previous drilling and soil results.

The Barnes Lake property area is a forested area located between the south end of the Coal Mountain Mine and the upper reaches of Michel Creek. A small clearing was observed approximately 30 m to the south of a curve in the Flathead Valley Road and on the east side of the road. The small area was cleared by past operators for an historical drill site. It was also observed that a very low artesian flow of water was emanating from what is believed to be the collar of the historical drill hole. The flow is roughly estimated to be less than 0.25 litres per minute.

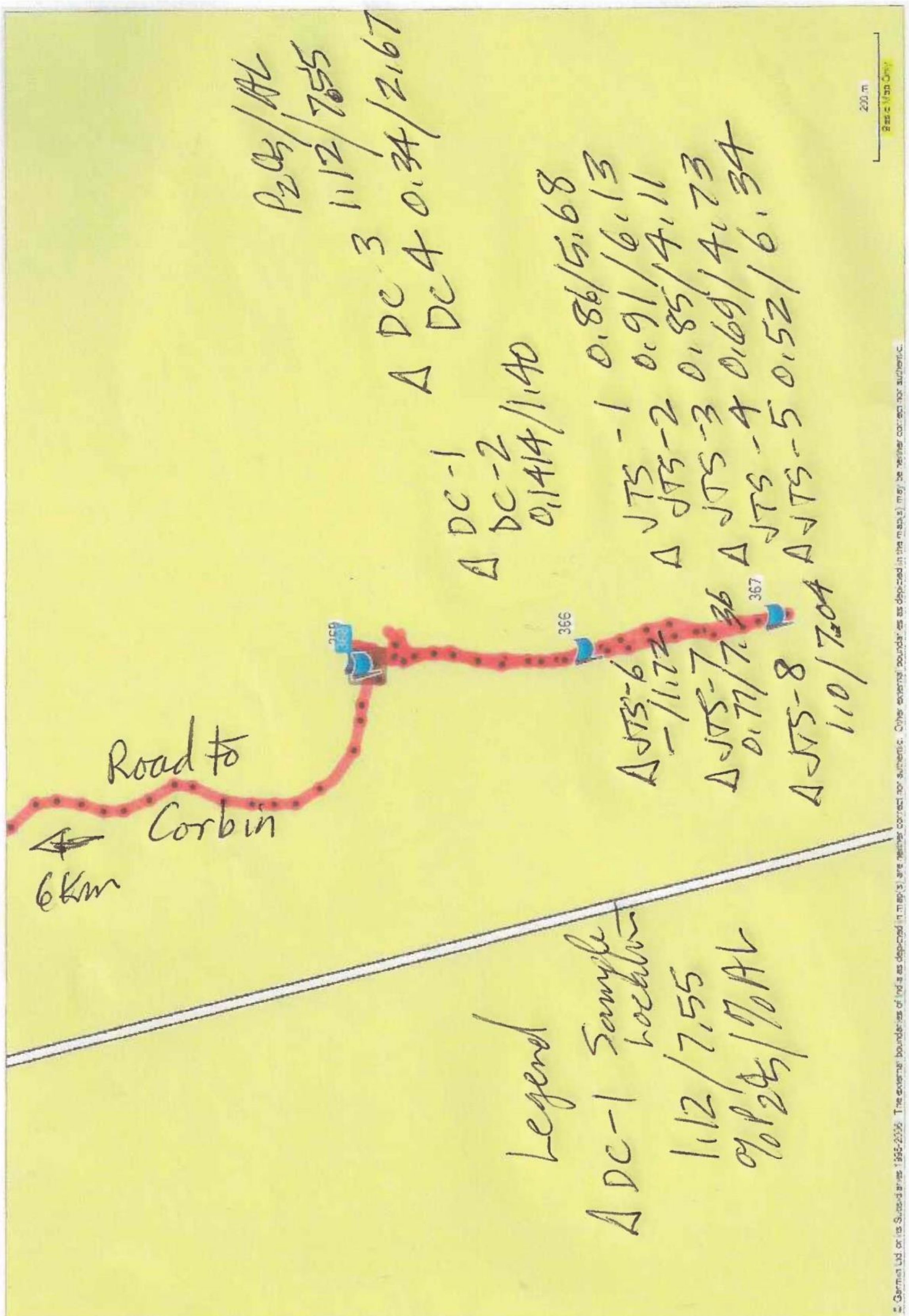


Figure 7 Results of Assays Plotted from 2014 Work

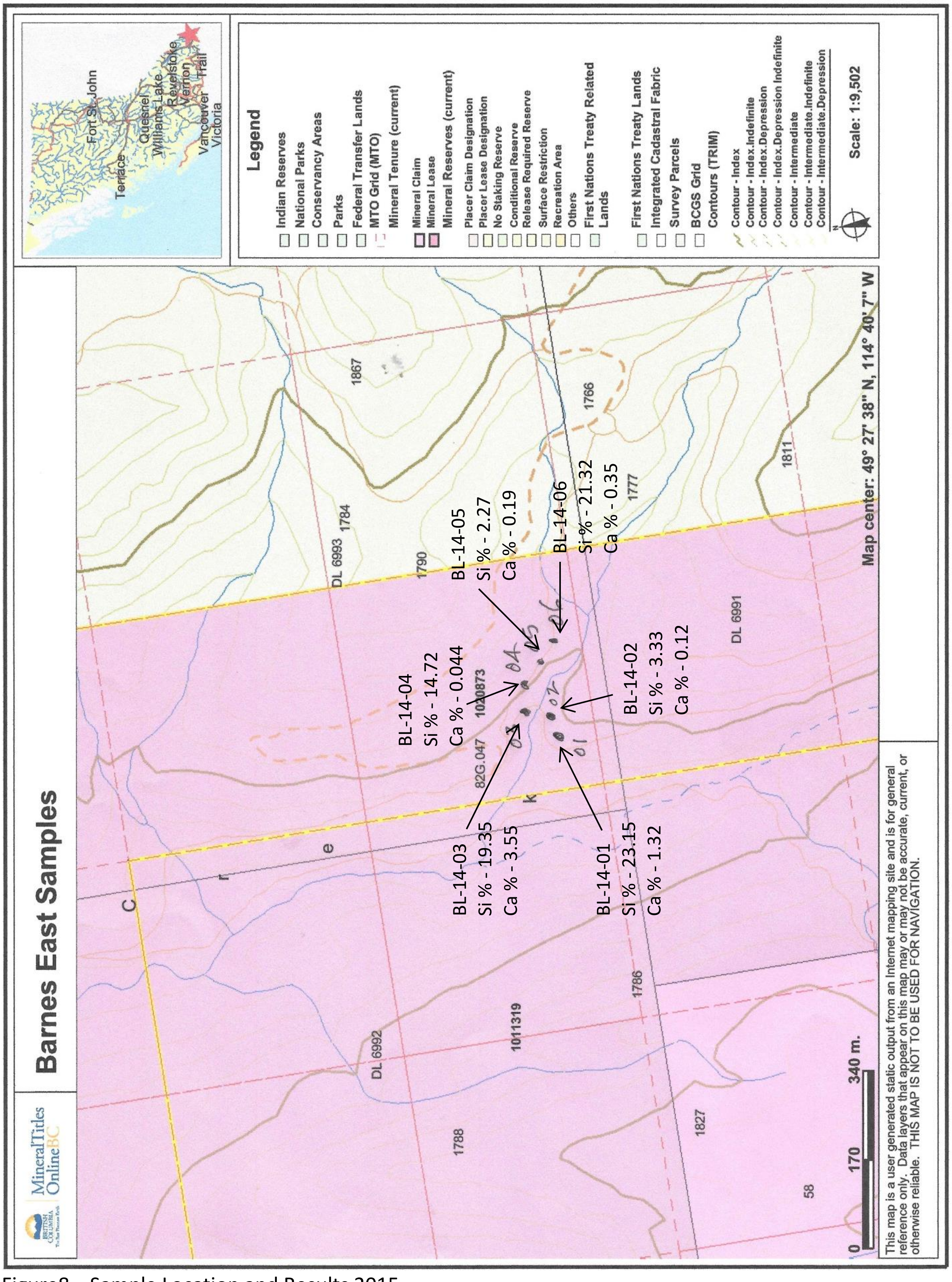


Figure8 Sample Location and Results 2015

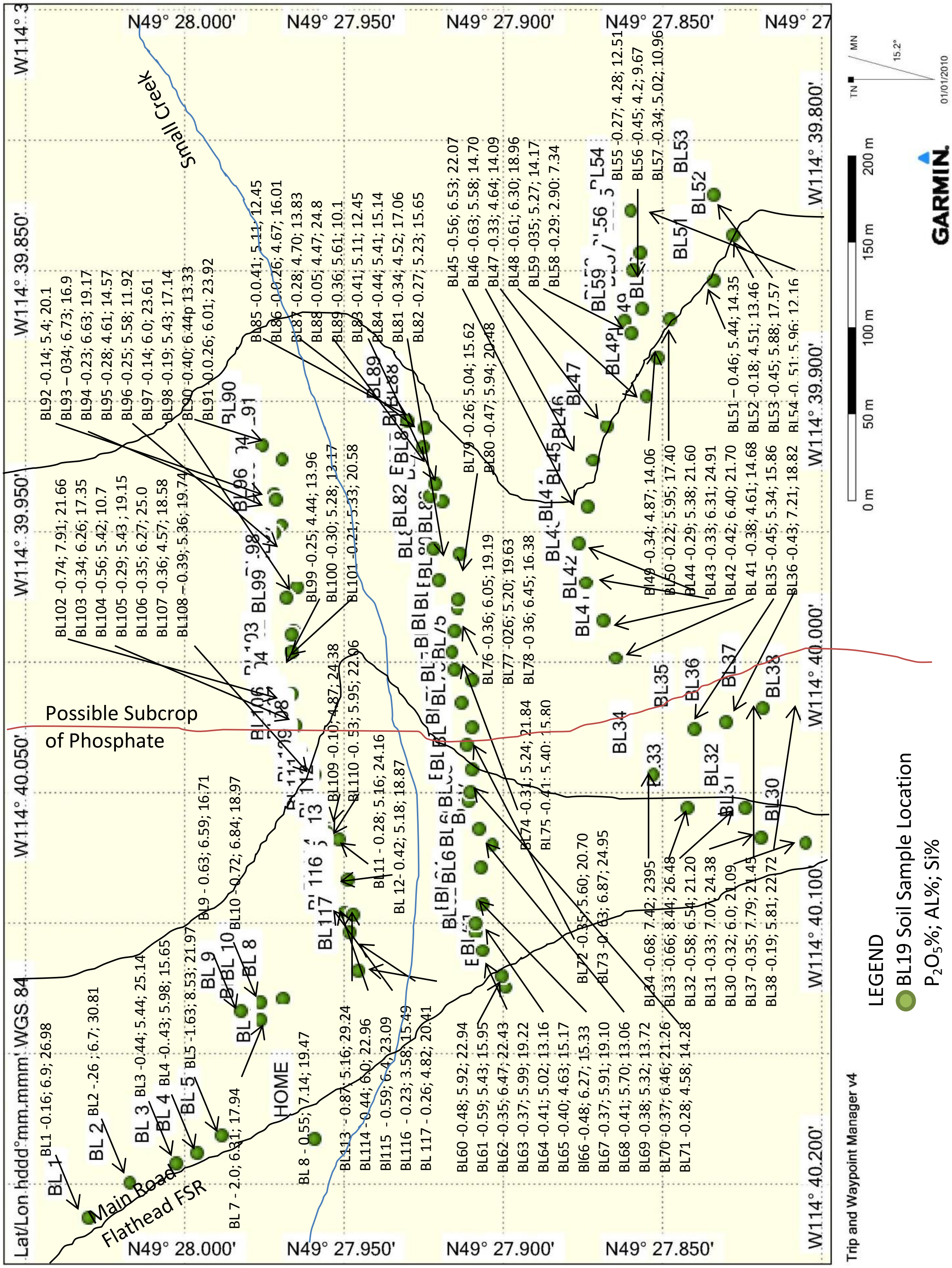


Figure 9 Sample Locations and Assay Results 2016

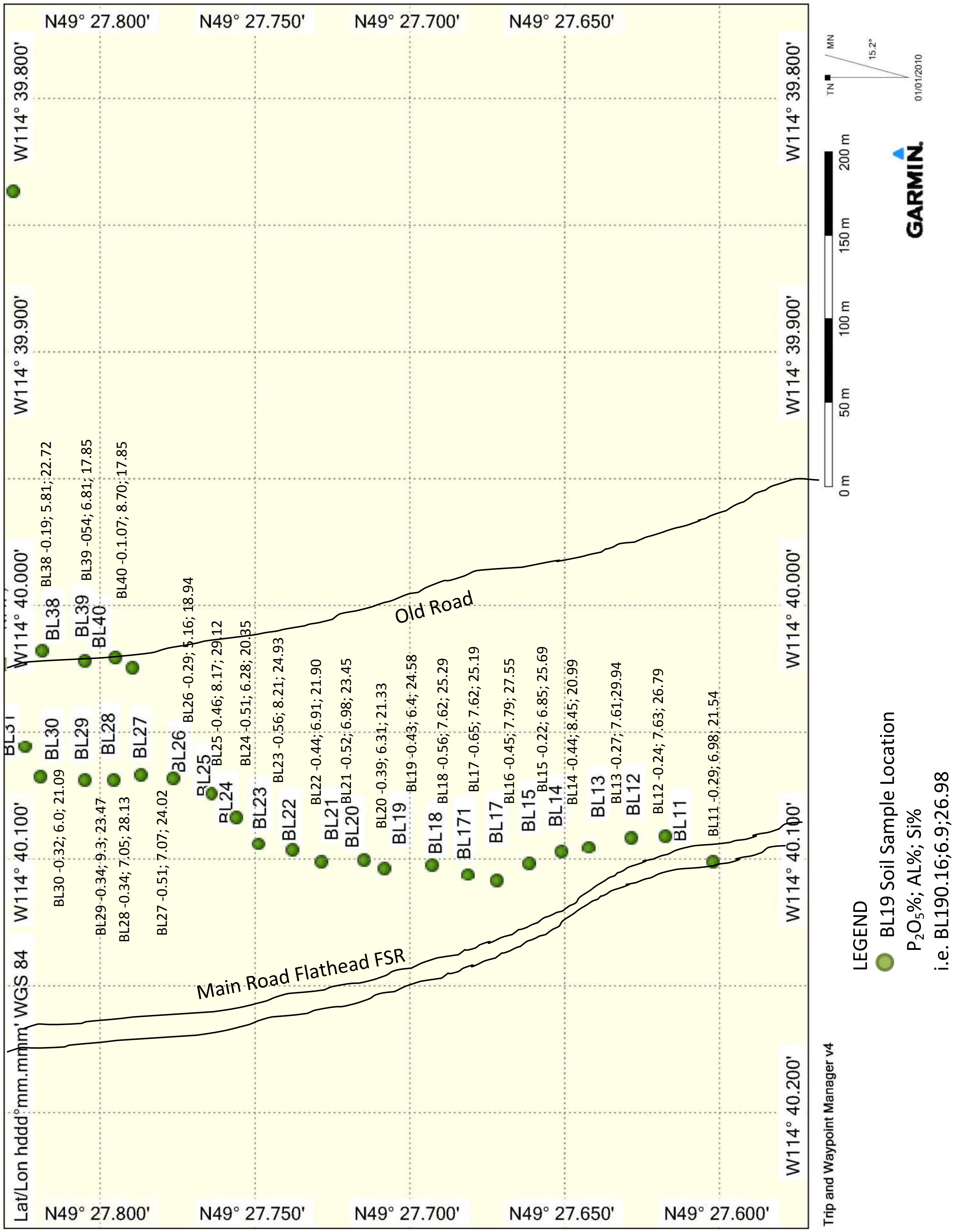


Figure 9 Sample Locations and Assay Results 2016

At the apex of the sharp curve in the Flathead Valley Road, a small creek was observed flowing over bedrock then through a culvert under the above noted road and then empties into Michel Creek.

The Barnes Lake property area is a forested area located between the south end of the Coal Mountain Mine and the upper reaches of Michel Creek. A small clearing was observed approximately 30 m to the south of a curve in the Flathead Valley Road and on the east side of the road. The small area was cleared by past operators for an historical drill site. It was also observed that a very low artesian flow of water was emanating from what is believed to be the collar of the historical drill hole. The flow is roughly estimated to be less than 0.25 litres per minute.

At the apex of the sharp curve in the Flathead Valley Road, a small creek was observed flowing over bedrock then through a culvert under the above noted road and then empties into Michel Creek.

Michel Creek is located up-gradient (upstream) of the Coal Mountain coal mine in the vicinity of the Barnes Lake property. There were no other drainages or seepages observed along the Flathead Valley Road where it traverses the Barnes Lake property.

2016 Surface Water Sampling

A total of three (3) surface water samples were collected from two creek drainages and an artesian water flow (previously described) from an historic drill hole. The three water samples were submitted to the ALS Environmental laboratory in Burnaby, BC for analysis of Total and Dissolved metals, Hardness, Alkalinity (5 types), Acidity, Fluoride, Dissolved Chloride and Sulphate, Nitrite (N), Nitrate (N), Nitrate plus Nitrite (N), Total and Dissolved Phosphorous and Orthophosphate and Ph.

The samples were identified as BLSW 1 to BLSW 3. The analytical results are presented on attached Tables 1 to 4 and are briefly described as follows:

The sample locations are shown on attached Figure 14 and are briefly described as follows:

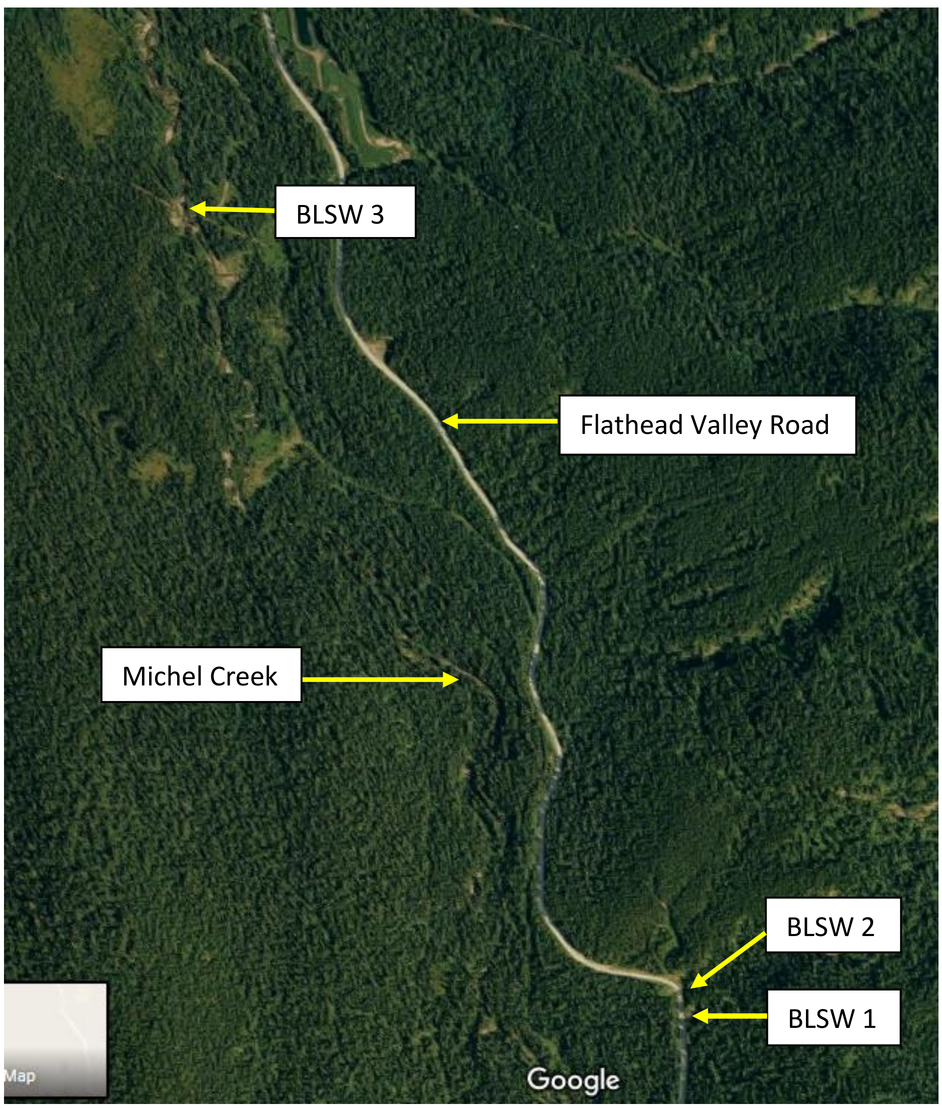
BLSW 1 – Sample was collected from a small puddle of water that has emanated from an historic drill hole on the property. The water is an artesian flow from what is assumed to be the collar of the old borehole. Old drill logs indicated that the borehole intersected a thin bed of phosphorite at a depth of 7.6 metre below grade. The water flow rate is very low and appears to be less than 0.25 litres per minute. The water had dampened the area for approximately 9 m^2 in the cleared area around the assumed collar of the historical drill hole. Sample BLSW 1 was located at UTM Coordinates 11U 668853 5481838.

BLSW 2 – Sample was collected from a small creek flowing over bedrock near the apex of a sharp curve in the Flathead Valley Road and approximately 25 north of sample BLSW 1. The sample was collected in the creek approximately 2 m east of the road before it entered a culvert. Sample BLSW 2 was located at UTM Coordinates 11U 668849 5481864.

BLSW 3 – Sample was collected from the Michel Creek approximately 1.3 km north-northwest of sample BLSW 2 west of the Flathead Valley Road and is downstream from samples BLSW 1 and BLSW 2. The sample location BLSW 3 on Michel Creek is upstream (up-gradient) of the Coal Mountain coal mine. This is in contrast to the Marten Landing sample MLSW 4 which is located on Michel Creek downstream (down gradient) of the Coal Mountain coal mine. Sample BLSW 3 is located at UTM Coordinates 11U 668182 5482837.

Analytical Results

From the dissolved and total metals analyses and the anion analyses, the hardness concentrations ($CaCO_3$) were slightly elevated and ranged from 107 to 171 mg/L in the three samples analyzed. The field Ph levels were also found to be at 8.4 to 9.0 which are at or just below the BC Water Quality Guidelines (WQG) which has a range of >6.5 to <9. The hardness and Ph levels are likely due to the natural underlying geological formations in the immediate area; however, more geological information is required. It has been reported that a phosphorite unit was intersected in the historic drill hole; however, more details are not available at this time. From the more alkaline Ph level it is likely that carbonate is derived by nearby limestone formations as indicated by total and dissolved calcium concentrations.



N

Figure 10 – Surface Water Sample Location Map

200 m

Total Metals

The total metals parameters presented on Table 1 have concentrations less than the applicable BC Approved and Working Water Quality Guidelines (WQG) for freshwater aquatic life (AW_{FW}) and Contaminated Sites Regulation (CSR) drinking water (DW) standards with the exception of sodium which exceeds the CSR DW standard of 200,000ug/L with a concentration of 210,000 ug/L. The CSR standard for sodium only applies to esthetic values such as taste and colour and not to toxicity.

In general, WQG are applied to total metals and hardness concentrations are generally applied to individual metal parameter concentrations. Ph is also applied but in a smaller number of metals. Dissolved metals concentrations are generally applied to CSR standards with adjustments also made for Hardness and Ph.

For aluminum, the WQG applies to dissolved aluminum only. The results for Total Aluminum for the three water samples are elevated above the dissolved aluminum WQG of 50 ug/L; however, there are no guidelines for Total Aluminum. As observed on Table 1, CSR standards are presented for comparison only as they apply primarily to groundwater and not surface water. Standards for drinking water (DW) in Schedule 6 and Schedule 10 of the BC Contaminated Sites Regulation (CSR), which are typically 10 times higher than the BC WQG

Dissolved Metals

The dissolved metals parameters have concentrations less than the applicable WQG AW_{FW}, WQG_{DW} and CSR DW. For the most part, the concentrations of dissolved metals are similar to the total metals concentration. As with total metals concentrations, the application of hardness and Ph to certain dissolved metal concentrations using the specified WQG equations has also increased the concentration limits before exceedances occur.

The concentrations of total and dissolved selenium and cadmium in the three Barnes Lake water samples (BLSW 1 to BLSW 3) were less than the reported laboratory detection limit which is also less than the WQG and CSR guidelines and standards.

Conventional Parameters

Total Alkalinity concentrations for samples BLSW 1 to BLSW 3 reflects the elevated hardness and calcium concentrations found in these three samples along with Ph levels of 8.4 to 9.0 (towards the alkaline side of the neutral range of Ph from 6.5 to 9). From Table 3 the total alkalinity of these three samples exceeds the WQG AW_{FW} range of 20 mg/L; however, in the natural environment of this area, it is likely that the area has low sensitivity to acid inputs. In low sensitivity environments, total alkalinity concentrations are permitted to exceed 20 mg/L. There are no guidelines under the WQG or CSR standards for PP Alkalinity ($CaCO_3$), Bicarbonate Alkalinity (HCO_3), Carbonate Alkalinity (CO_3) nor for Hydroxide Alkalinity (OH).

For Anions such as Fluoride (total) the range of concentrations to exceed the WQG is between 1.36 and 1.55 based on the application of hardness ranging from 107 to 171 mg/L for samples BLSW 1 to BLSW 3. The Fluoride concentration of these four samples is, therefore, less than the guidelines and CSR DW standard.

Dissolve Chloride ion (CL) and Dissolved Sulphate concentrations for the four samples previously noted are well below the WQG guidelines and CSR DW standard.

Concentrations of Nitrate (N), Nitrite (N) and Nitrate plus Nitrite (N) are also less than the applicable WQG guidelines and CSR DW standards.

As previously noted, Ph levels were found to be between 8.4 and 9.0 for the three water samples are at or are just below the BC Water Quality Guidelines (WQG) which has a range of >6.5 to <9. The acidity concentration at was 3,3 mg/L at BLSW 1 and less than the reported laboratory detection limit at BLSW 2. Acidity at sample BLSW 3 was 1 mg/L which is at the laboratory detection limit. There are no guidelines under the WQG nor the CSR for acidity.

Conclusions

Elevated hardness and Ph levels in the drainages at the Barnes Lake project site have a buffering or neutralizing effect on total and dissolved metals concentrations that may be exposed to the natural environment. The elevated hardness and Ph levels also appear to be derived from the natural underlying geologic strata as it undergoes weathering and releases several species of alkalinity to the other strata and overlying soil. To date sulphides have been not observed in the field. The current surface water sample results for total and dissolved metals provide some support for these findings.

The surface water sampling program conducted in August indicated generally low concentrations of total metals and dissolved metals. This may indicate that there is low potential for metals to leach from the potential discovery and exposure phosphorite material at concentrations that could exceed water quality guidelines. This is particularly evident in sample BLSW 1 where phosphorite material was apparently intersected in the historical drill hole. Artesian water from the historical drill hole collected as sample BLSW 1 supports this low potential with total and dissolved metals concentrations less than the WQG. It is also noted that in the Barnes Lake property area that total and dissolved selenium concentrations in Michel Creek in sample BLSW 3 were less than the laboratory detection limits. As Michel Creek in the area of the Barnes Lake Property is located upstream (up-gradient) on the Coal Mountain coal mine confirms the influence of coal deposits on selenium levels in Michel Creek where concentrations of selenium exceed WQG downstream of the Coal Mountain mine at samples site MLSW 4 at the Marten Landing project site.

Metals Notes Table
Marten Project

METALS NOTES: CSR AW_{FW}

Cd 0.1 @ H<30
0.3 @ H=30-<90
0.5 @ H=90-<150
0.6 @ H=150-<210
0.8 @ H=210-<270
0.9 @ H=270-<330
1.1 @ H=330-<390
1.2 @ H=390-<450
1.3 @ H=450-<500

Cu 20 @ H<50
30 @ H=50-<75
40 @ H=75-<100
50 @ H=100-<125
60 @ H=125-<150
70 @ H=150-<175
80 @ H=175-<200
90 @ H>=200

Zn 75@ H<90
150 @ H=90-<100
900 @ H=100-<200
1650 @ H=200-<300
2400 @ H=300-<400
3150@ H=400-<500

Ni 250 @ H<60
650 @ H=60-<120
1100 @ H=120-<180
1500 @ H>=180

Pb 40 @ H<50
50 @ H=50-<100
60 @ H=100-<200
110 @ H=200-<300
160 @ H>=300

Ag 0.5 @ H<=100
15 @ H>100

CONV. PARAMETER NOTES: CSR AW

N Nitrite
0.2 @ Cl<2 mg/L
0.4 @ Cl=2-<4
0.6 @ Cl=4-<6
0.8 @ Cl=6-<8
1 @ Cl=8-<10
2 @ Cl>=10

F 0.2 @ H<50
0.3 @ H>=50

Total Alkalinity
< 10 mg/L highly senstive to acidic inputs
10-20 mg/L moderately senstive
> 20 mg/L low sensitivity

CONV. PARAMETER NOTES: WQG AWFW

N Nitrite
0.06 @ Cl<2 mg/L
0.12 @ 2-4
0.18 @ 4-6
0.24 @ 6-8
0.30 @ 8-10
0.60 @ >10

METALS NOTES: WQG AW_{FW}

Al 100 @ pH>=6.5
7.4 @ pH=6.4
4.7 @ pH=6
2.3 @ pH=5
2.0 @ pH<=4

Cd 0.01 @ H=30
0.02 @ H=60
0.03 @ H=90
0.04 @ H=120
0.05 @ H=150
0.06 @ H=210
0.13 @ H=500
0.24 @ H=1000
0.44 @ H=2000
0.62 @ H=3000
0.79 @ H=4000
0.96 @ H=5000

Cu 2.9 @ H=10
6.7 @ H=50
11.4 @ H=100
49 @ H=500
96 @ H=1000
190 @ H=2000
378 @ H=4000
472 @ H=5000

Pb 3 @ H=< 8
4 @ H=10
34 @ H=50
82 @ H=100
633 @ H=500
1531 @ H=1000
3699 @ H=2000
8940 @ H=4000
11877 @ H=5000

Mn Acute
800 @ H=25
1100 @ H=50
1600 @ H=100
2200 @ H=150
3800 @ H=300

Mn Chronic
700 @ H=25
800 @ H=50
1000 @ H=100
1300 @ H=150
1900 @ H=300

Ni 25 @ H=0-60
65 @ H=60-120
110 @ H=120-180
150 @ H=>180

Ag 0.1 @ H=<100
3.0 @ H>100

Tl 6.3 ug/L human health, consumption of organism only
Ti 2000 ug/L mean threshold level Scenedesmus
4600 ug/L mean threshold level Daphnia
K 373,000-432,000 ug/L threshold for Daphnia immobilization

Zn Max
33 @ H=<90
40 @ H=100
115 @ H=200
190 @ H=300
265 @ H=400
341 @ H=500
716 @ H=1000
2966 @ H=4000
3716 @ H=5000

Zn 30 day average
7.5 @ H=<90
15 @ H=100
90 @ H=200
165 @ H=165
240 @ H=400
315 @ H=500

Ca <4000 highly sensitive to acid inputs
4000-8000 moderately sensitive
>8000 low sensitivity
the more restrictive of calcium or alkalinity applies

Alkalinity
<10000 highly sensitive to acid inputs
10000-20000 mod sensitive to acid inputs
>20000 low sensitivity

METALS NOTES: WQG AW_M

Mn 100 ug/L guideline to protect consumers of shellfish

METALS NOTES: PL/RL (AW_{FW})

Cd pH<7.0 = 2
pH 7.0-<7.5 = 2.5
pH 7.5-<8.0 = 25
pH≥ 8.0 = 35

Cu pH<5.0 = 90
pH 5.0-<5.5 = 100
pH≥5.5 = 150

Pb pH<5.5 = 150
pH 5.5-<6.0 = 250
pH≥6.0 = 500

Zn pH<6.0 = 150
pH 6.0-<6.5 = 300
pH≥6.5 = 450

METALS NOTES: PL/RL (DW)

Cd pH<6.5 = 1.5
pH 6.5-<7.0 = 3
pH 7.0-<7.5 = 15
pH≥7.5 = 35

Cu at any pH = 150

Pb pH<6.0 = 100
pH 6.0-<6.5 = 250
pH≥6.5 = 500

Zn pH<5.0 = 150
pH 5.0-<5.5 = 200
pH 5.5-<6.0 = 300
pH≥6.0 = 450

METALS NOTES: IL (AW_{FW})

Cd pH<7.0 = 2
pH 7.0-<7.5 = 2.5
pH 7.5-<8.0 = 25
pH≥8.0 = 150

Cu pH<5.0 = 90
pH 5.0-<5.5 = 100
pH 5.5-<6.0 = 200
pH≥6.0 = 250

Pb pH<5.5 = 150
pH 5.5-<6.0 = 250
pH≥6.0 = 2000

Zn pH<6.0 = 150
pH 6.0-<6.5 = 300
pH≥6.5 = 600

METALS NOTES: IL (DW)

Cd pH<6.5 = 1.5
pH 6.5-<7.0 = 3
pH 7.0-<7.5 = 15
pH 7.5-<8.0 = 200
pH≥8.0 = 500

Cu at any pH = 250

Pb pH<6.0 = 100
pH 6.0-<6.5 = 250
pH≥6.5 = 2000

Zn pH<5.0 = 150
pH 5.0-<5.5 = 200
pH 5.5-<6.0 = 300
pH≥6.0 = 600

REGIONAL GEOLOGY

The Barnes Lake area is underlain by a series of predominantly marine strata which range in age from Devonian to Jurassic and non-marine fluvio-deltaic sediments of late Jurassic to Cretaceous age. Reconnaissance geological mapping in the region (Newmarch, 1953; Price,1965; 1964; 1962; 1961) has shown that these strata are now exposed in a broad, doubly plunging syncinorium, commonly referred to as the Fernie Basin. This synclinorium is broadly delineated by the distribution of the Jurassic Fernie Group in southeastern British Columbia (Figure 3): the structure is complicated by second order folds and later faults, both easterly directed thrusts and west-side down normal faults.

Phosphatic horizons (Figure 4) are known to occur at a number of intervals within the Paleozoic and Mesozoic stratigraphic section (Butrenchuk, 1987a; Kenny, 1977; Macdonald, 1987; Telfer, 1933). Phosphatic strata at the base of the Fernie Group are considered to have the best potential (Butrenchuk, 1987a; Macdonald, 1987).

Age	Group/Formation (Thickness,metres)	Lithology	Phosphatic Horizons	Thickness (metres)	Grade (% P_2O_5)
Cretaceous	Kootenay Fm.	-grey to black carbonaceous siltstone and sandstone; nonmarine;coal			
Jurassic	Fernie Gp. (+244)	-black shale,siltstone,limestone; marine to nonmarine at top -glauconitic shale in upper section -belemnites; common fossil	-approximately 60 metres above base low-grade phosphate bearing calcareous sandstone horizon or phosphatic shale -Bajocian -basal phosphate in Sinemurian strata; generally pelletal/oolitic; rarely nodular;1-2 metres thick; locally two phosphate horizons; top of phosphate may be marked by a yellowish-orange weathering marker bed.	1-2	11-30
------------	------------	------------regional unconformity	------------	------------	------------
Triassic	SPRAY RIVER GP. — Whitehorse Fm.	-dolomite,limestone,siltstone			
	SPRAY RIVER GP. — Sulphur Mntn. Fm. (100-496)	-grey to rusty brown weathering sequence of siltstone, calcareous siltstone and sandstone,shale, silty dolomite and limestone	-nonphosphatic in southeastern British Columbia		
------------	------------	------------regional unconformity	------------	------------	------------
Permian	ROCKY MOUNTAIN SUPERGROUP — ISHBEL GROUP — Ranger Canyon Fm. (1-60)	-sequence of chert,sandstone and siltstone;minor dolomite and gypsum;conglomerate at base -shallow marine deposition	-upper portion-brown,nodular phosphatic sandstone;also rare pelletal phosphatic sandstone (few centimetres to +4 metres) -basal conglomerate-chert with phosphate pebbles present (≤1 metre)	0.6 0.5-1.0	9.5 13-18
	------------	------unconformity	------------	------------	------------
	ROCKY MOUNTAIN SUPERGROUP — ISHBEL GROUP — Ross Creek Fm.(90-150)	-sequence of siltstone,shale chert,carbonate and phosphatic horizons areally restricted to Telford thrust sheet -west of Elk River,shallow marine deposition	-phosphate in a number of horizons as nodules and finely disseminated granules within the matrix -phosphatic coquinoid horizons present	0.4-1.0	1.7-6.0
	ROCKY MOUNTAIN SUPERGROUP — ISHBEL GROUP — Telford Fm. (210-225)	-sequence of sandy carbonate containing abundant brachiopod fauna;minor sandstone -shallow marine deposition	-rare,very thin beds or laminae of phosphate;rare phosphatized coquinoid horizon	0.3	11.4
	ROCKY MOUNTAIN SUPERGROUP — Johnson Canyon Fm. (1-60)	-thinly bedded,rhythmic sequence of siltstone,chert,shale, sandstone and minor carbonate; basal conglomerate -shallow marine deposition	-locally present as a black phosphatic siltstone or pelletal phosphate -phosphate generally present as black ovoid nodules in light coloured siltstone;phosphatic interval ranges in thickness from 1-22 metres -basal conglomerate (maximum 30 cm thick) contains chert and phosphate pebbles	0.2-0.3 1-22 1-2	3.0-4.0 0.1-11.0 14.2-21.2
------------	------------	------------regional unconformity	------------	------------	------------
Pennsylvanian	SPRAY LAKES GP. — Kananaskis Fm. (±55)	-dolomite,silty,commonly contains chert nodules or beds	-locally,minor phosphatic siltstone in uppermost part of section		
	SPRAY LAKES GP. — Tunnel Mntn Fm. (±500)	-dolomitic sandstone and siltstone			
Mississippian	Rundle Gp. (±700)	-limestone,dolomite,minor shale, sandstone and cherty limestone			
	Banff Fm. (280-430)	-shale,dolomite,limestone			
Devonian-Mississippian	Exshaw Fm. (6-30)	-black shale,limestone -areally restricted in south-eastern British Columbia	-an upper nodular horizon -phosphatic shale and pelletal phosphate 2-3 metres above base -basal phosphate <1 metre thick		
Devonian	Palliser Fm.	-limestone			

FIGURE 4: STRATIGRAPHIC SUMMARY INCLUDING PHOSPHATE-BEARING HORIZONS IN SOUTHEASTERN BRITISH COLUMBIA (modified from Butrenchuk, 1987a). Thickness not to scale.

Figure 11 Stratigraphic Summary

REGIONAL STRATIGRAPHY

Upper Devonian strata exposed in the vicinity of the Fernie Basin consist of massive, grey, fine grained, cliff forming limestones of the Palliser Formation. These limestones are commonly mottled and locally interbedded with brown dolostones. They are overlain by the Devono-Mississippian Exshaw Formation, which predominantly consists of black, fissile shale, cherty shale, siltstone and minor limestone (Kenny, 1977). The Exshaw Formation is generally 6 to 30 metres in thickness (Figure 4). Four phosphatic horizons exist within the Exshaw Formation: the lowest is less than 50 cm thick and has grades of less than 9 per cent P_2O_5; the middle two horizons are both around one metre thick, have grades of up to 10 per cent P_2O_5 and are separated by approximately two metres of shale: and the uppermost phosphatic zone, which has very limited extent, contains grades which always exceed 15 per cent P_2O_5 and is always less than 15 cm thick (Macdonald, 1987).

The Mississippian Banff Formation has a gradational contact with the underlying Exshaw Formation. It is 280 to 430 metres thick and consists of dark grey, fissile shale and bands of argillaceous limestone that grade upwards into dark grey, massive, finely crystalline limestone and dolostone. The Rundle Group, which is also Mississippian in age, conformably overlies the Banff Formation and attains a thickness of approximately 700 metres. It consists of a series of resistant, thick-bedded crinoidal limestones, grey and black, finely crystalline limestones, dark, argillaceous limestones, dolostones and minor black and green shale (Butrenchuk, 1987a: Kenny, 1977).

Conformably overlying the Mississippian carbonates are Pennsylvanian strata of the Spray Lakes Group which consist of a lower unit, the Tunnel Mountain Formation and an upper unit, the Kananaskis Formation. The Tunnel Mountain Formation comprises a uniform, monotonous sequence of reddish-brown weathering dolomitic sandstone and siltstone that attains a maximum thickness of 500 metres at its western margin, near the Elk River. The Tunnel Mountain Formation is disconformably overlain by the Kananaskis Formation which consists of light grey, silty dolostones and dolomitic siltstones and is generally around 55 metres thick. Chert nodules and intraformational chert breccias are found in the upper part of the section. Slightly phosphatic horizons, containing up to 9 per cent P_2O_5, are reported as rare occurrences within the Kananaskis Formation (Macdonald, 1987).

The Kananaskis Formation of the Spray Lakes Group is unconformably overlain by Permian strata of the Ishbel Group. Together, the Spray Lake Group and the Ishbel Group comprise the Rocky Mountain Supergroup (Figure 4). The Ishbel Group, which has been correlated with the Phosphoria Formation in the western United States, consists of the Johnston Canyon, Telford, Ross Creek and Ranger Canyon formations, from oldest to youngest, respectively.

The Johnston Canyon Formation comprises a series of recessive weathering, thin to medium-bedded siltstones, silty carbonate rocks and sandstones, with minor shale and chert. It varies from 1 to 60 metres in thickness and commonly contains phosphatic rocks. Thin, intraformational, phosphate-pebble conglomerate beds are common throughout the formation and, locally, mark its base. Phosphate is present as black nodules in distinct horizons within the siltstones, locally cements siltstone beds and, locally occurs in pelletal siltstone or pelletal silty phosphorite beds which are slightly greater than 1 metre in thickness (Butrenchuk, 1987a; Macdonald, 1987). The pelletal phosphorites can contain up to 21 per cent P_2O_5, but are of limited distribution: the basal conglomerate is less than 50 centimetres thick and generally contains 3-4 per cent P_2O_5, only; the nodular and phosphate pebble-conglomerate beds can have cumulate thicknesses of up to 22 metres, but grades rarely exceed 10 per cent P_20_5 over a few 10s of centimetres.

The Telford and Ross Creek Formations, which attain thicknesses of 210-225 and 90-150 metres respectively, are of limited distribution, exposed only in the Telford Thrust, west of the Elk Valley in the Sparwood region. The Telford Formation consists of resistant-weathering, thick-bedded, sandy, oolitic and fossiliferous rocks. Rarely, slightly phosphatic horizons are present, with grades commonly around 11 per cent P_2O_5 across 30 centimetres. The Ross Creek Formation is composed of recessive, thin-bedded siltstone, argillaceous siltstone, minor carbonate and chert. Nodular phosphate horizons are present throughout this unit and are best developed in the upper portions. Locally, phosphatic coquinoid beds are also present. Reported phosphate grades are only 1.7 to 6 per cent P_2O_5 (Butrenchuk, 1987a; Macdonald, 1987).

The Ranger Canyon Formation, which can be up to 60 metres thick, paraconformably to disconformably overlies the Ross Creek Formation. It predominantly consists of resistant, cliff-forming, thick-bedded, blue-grey cherts, cherty sandstones, siltstones, fine sandstones and conglomerates. Minor gypsum and dolomite are also present. The base of the formation is marked by thin, phosphate-cemented, chert-pebble conglomerates that locally contain massive, phosphatic intraclasts. Phosphate also occurs as nodules in brownish weathering sandstone beds in the upper part of the formation. With the exception of phosphatic strata near the Fernie ski hill, most of the horizons are reportedly low grade: the highest values reported are 13.3 per cent P_2O_5 across 0.5 metres (Butrenchuk, 1987a; Macdonald, 1987).

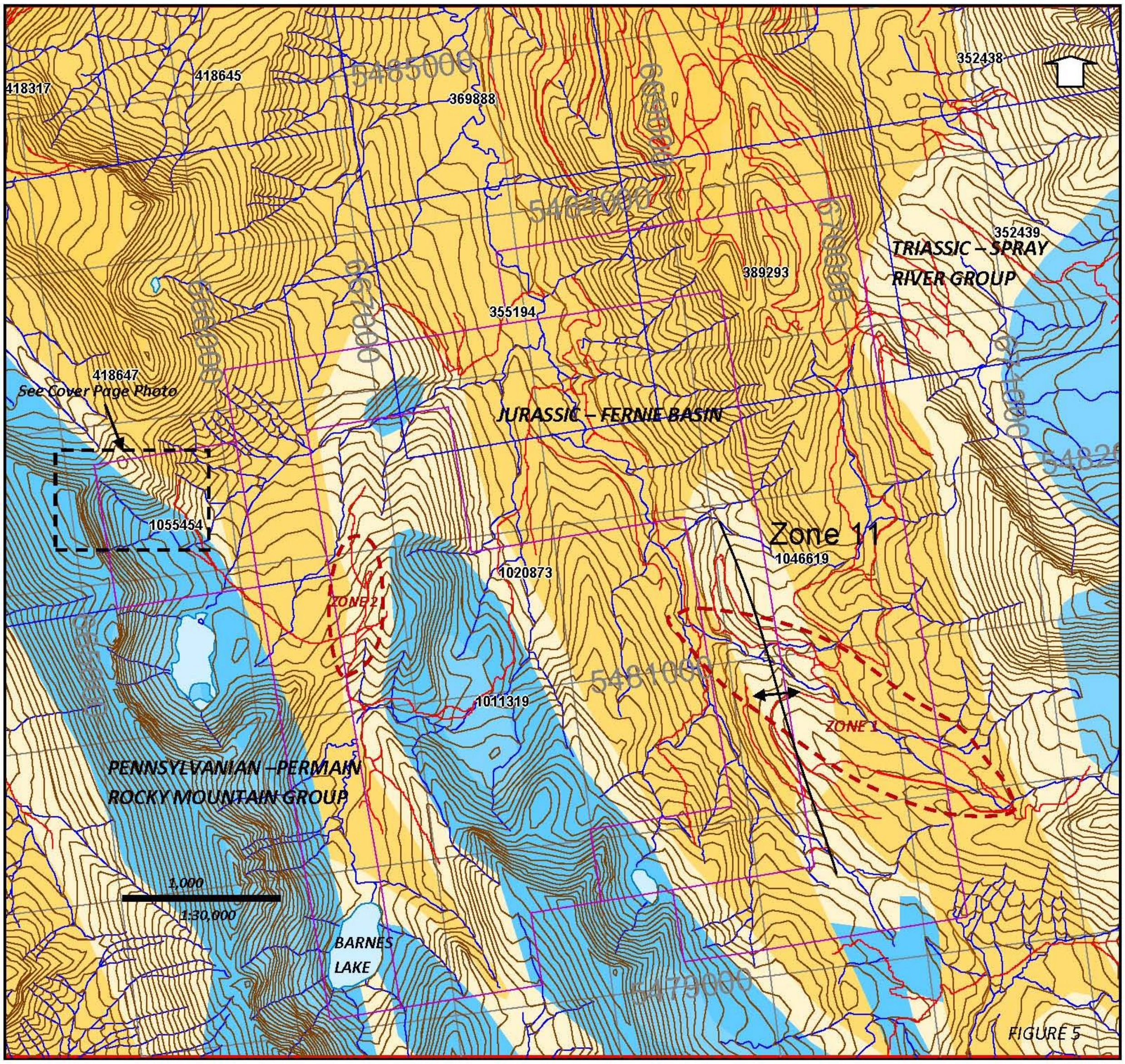
Permian strata are unconformably overlain by the Triassic Sulphur Mountain Formation of the Spray River Group. The Sulphur Mountain Formation is between 100 and 496 metres thick and typically consists of rusty brown weathering, medium-bedded siltstones, calcareous and dolomitic siltstones, silty dolostones and limestones and minor shale. Locally, the Sulphur Mountain Formation is overlain by pale weathering, variegated dolostones, limestones, sandstones and intraformational breccias of the Whitehorse Formation. The Whitehorse Formation, which can be from 6 to 418 metres in thickness, is middle to upper Triassic in age and is the upper member of the Spray River Group. It is not present in most areas (Butrenchuk, 1987a).

The Jurassic Fernie Group unconformably overlies the Triassic strata. It consists of a lower zone of dark grey to black shales, dark brown shales, phosphates and minor limestones, siltstones and sandstones (the basal phosphate zone and equivalent Nordegg Member, Poker Chip Shales and the Rock Creek Member), a middle unit of light grey shale, calcareous sandstone and sandy limestone (the Grey Beds) and an upper unit of yellowish-grey to pale brown or dark grey weathering glauconitic sandstone and shale grading upwards into interbedded fine grained sandstone, siltstone and black shales (the Green and Passage beds). In southeastern British Columbia, the Fernie Group is 70 to 376 metres in thickness and generally thickens to the west (Freebold, 1957; Kenny, 1977; Macdonald, 1987; Price, 1965).

The base of the Fernie Group is marked by a persistent pelletal phosphorite horizon that is 1 to 2 metres in thickness and generally contains greater than 15 per cent P_2O_5; grades up to 30 per cent P_2O_5 have been found. It commonly consists of two pelletal phosphorite beds separated by a thin, chocolate brown to black phosphatic shale bed. The basal phosphorite rests either directly on Triassic strata or is separated from the underlying rocks by a thin phosphatic conglomerate. Phosphatic shales of variable thickness, generally less than 3 metres, overlie the phosphorites. The top of this sequence is locally marked by a yellow-orange bentonite bed. This part of the formation is Sinemurian in age and generally considered to be a lateral facies of the Nordegg Member and Nordegg equivalent beds. A second phosphatic horizon is present in the Bajocian Rock Creek Member, approximately 60 metres above the base of the Fernie Group. This zone is extremely low grade, generally containing less than one per cent

P_2O_5 and is often associated with belemnite-bearing calcareous sandstone beds (Butrenchuk, 1987a; Freebold, 1957; Macdonald, 1987).

The Kootenay Formation, of upper Jurassic to Cretaceous age, overlies rocks of the Fernie Group. It consists of dark grey carbonaceous sandstone, gritty to conglomeratic sandstone, siltstone, shale and coal and can be from 150 to 520 metres thick (Price, 1965).



BARNES LAKE PROPERTY is underlain by 3 main rock formations: (i) Pennsylvanian-Permian-Rocky Mountain Group: dolomitic siltstone; (ii) Triassic – Spray River Group: tan-creamy colour, siltstone and shale: (iii) Jurassic – Fernie Group (Fernie Basin): recessive, dark grey-black, shale and siltstone. Mapped and sampled areas are noted above as Zone 1 and Zone 2. Zone 1 is mapped as antiform structure disc used in more detail below from work in 2017.

Figure 12 Barnes Lake Property – Detail Geology

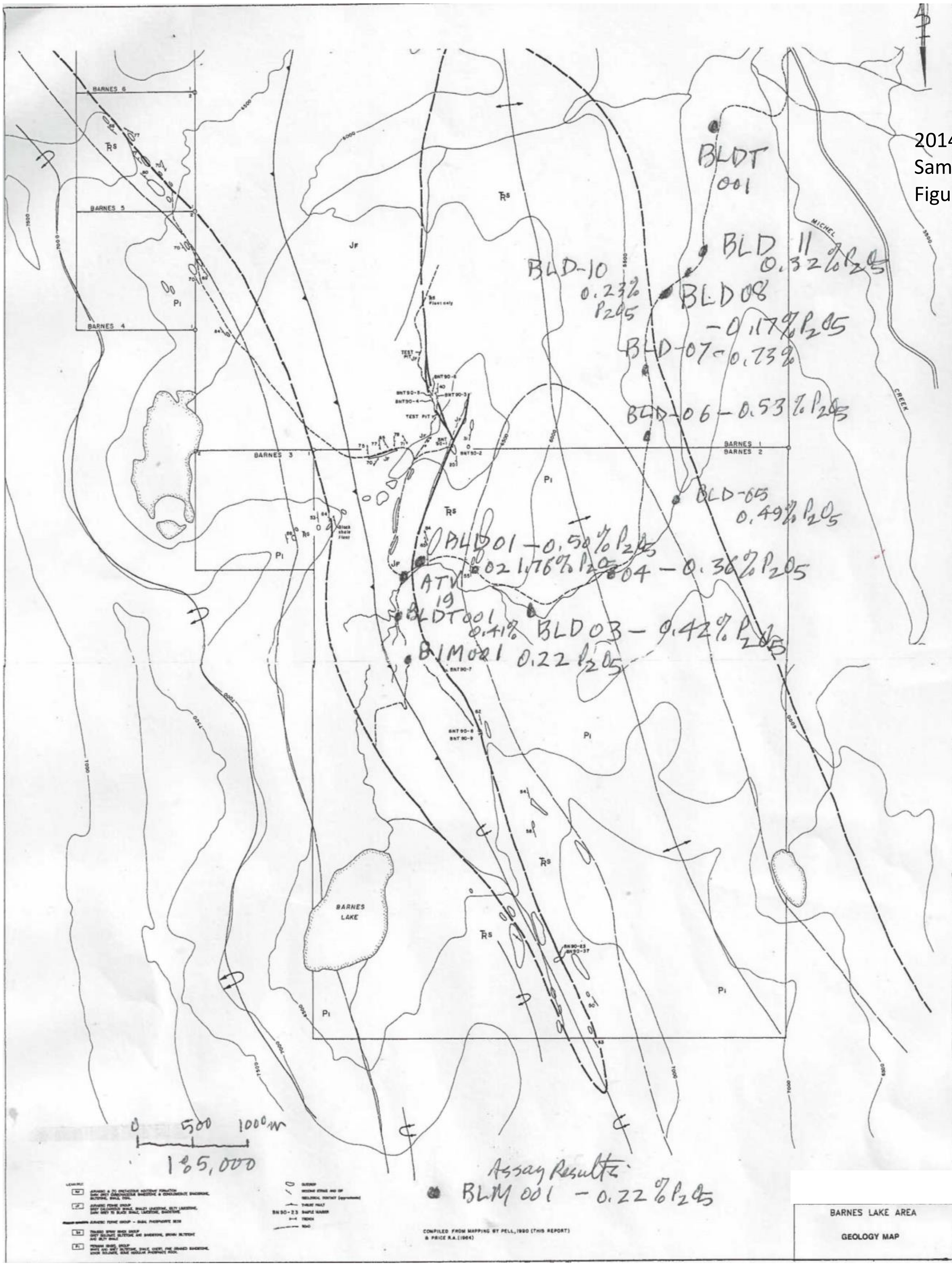


Figure 13 Detail Geology (refer to Figure 12 for colour copy)

PROPERTY GEOLOGY

The Barnes Lake area is underlain by a sequence of sedimentary rocks which range from Permian to Lower Cretaceous in age (Figure 5). Geological mapping (using topographic base map + altimeter control) at a scale of 1:5,000, concentrated on locating the basal Fernie Group phosphorite horizon, which marks the Triassic/Jurassic boundary in this region.

STRATIGRAPHY

The Barnes Lake claims are underlain by strata correlative with the Ranger Canyon Formation of the Permian Ishbel Group, the Sulphur Mountain Formation of the Triassic Spray River Group and the Jurassic Fernie Group (Figures 5). Ishbel Group strata older than the Ranger Canyon Formation may also be present on the property, but little attention was paid to this part of the stratigraphy. Late Jurassic to early Cretaceous sandstones, siltstones and coal beds of the Kootenay Formation are exposed on a ridge crests on the northwestern corner of the claims (Figure 5).

Rocks assigned to the Ranger Canyon Formation are predominantly medium to thick bedded, cream to buff to light grey weathering, fine grained sandstones, siltstones and dolomitic siltstones with white to light grey fresh surfaces. Locally, thin cherty and chert nodule rich layers are present within the siltstones. Thin grey limey beds may also be present, interlayered with the siltstones and are particularly common at the top of the section, immediately underlying Triassic siltstones. These limey beds are locally fossiliferous, containing rugosan corals and possible crinoid fragments. At one location, along the main access road, dark grey siltstones containing black phosphate nodules were present near the top of the Permian section and were overlain by grey calcareous beds.

Rocks correlative with the Triassic Sulphur Mountain Formation in the Barnes Lake area are predominantly buff, yellowish-brown and chocolate brown weathering, thin to medium bedded siltstones and shaley siltstone with a grey to buff fresh surface. Horizons consisting of dark brown shale with thin siltstone interlayers are common within this formation and, throughout much of the property, occur at the top of the formation.

Fernie Group rocks are recessive weathering and for the most part not well exposed. Where the base of the Fernie is exposed and the section complete, it is marked by a phosphorite horizon that is commonly 1.1 to 2.1 metres thick. In many areas the top of the section has been eroded and therefore thicknesses impossible to estimate; locally, backthrusting has placed Triassic and basal Jurassic strata over Jurassic Fernie shales, disrupting the sequence. The basal phosphorite horizon generally consists of poorly to well consolidated, gritty, pelletal phosphorite and shaley phosphorite capped by phosphatic shale. Trenches and hand pits at the southern part of the property revealed beds containing phosphate nodules within a pelletal phosphorite matrix. Brown and black shales commonly overlie the phosphorites; locally, extremely hard, dark grey nodular siltstone layers occur within the shales immediately overlying the phosphatic sequence.

The monotonous, fissile black shales which overlie the basal Fernie phosphorites give way, upsection to black, brown and dark grey shales with interbedded boudinaged buff to orange weathering dolostones, buff fossiliferous fine-grained sandstones and light grey limestone beds. Further upsection light grey to yellowish grey calcareous shales occur within the Fernie Group.

On the northwestern corner of the property, gritty grey sandstones, siltstones and thin coal beds of the late Jurassic to Cretaceous Kootenay Formation crop out, but were not examined in detail.

STRUCTURE

The structure of the Barnes Lake are is dominated by a pair of north-northwest trending, upright to overturned anticlines and the intervening overturned syncline which is cored, in the central and northern part of the property, by a thrust fault. At the south end of the property, parasitic folds on the limbs of these major structures affect outcrop patterns. Small backthrusts occur along the western limb of the easternmost anticline and locally disrupt phosphatic strata.

WORK PROGRAM 2017

The work was conducted between August 17 and August 26, 2017, which included locating historical phosphate workings, re-sampling a number of old trenches, reconnaissance mapping, prospecting and soil sampling.

For mapping and sampling control, maps were downloaded from BC Mineral Title Onling and hand held Garmin – GPSmap60CSx was utilized. Most times the accuracy of GPS readings were within ± 3 metres of the mapping (i.e. rock outcrop) or sampling site. Each rock outcrop was briefly noted in field book and plotted on base map and each grab sample collected was briefly described with GPS position recorded, photographs were also taken as part of field documentation.

The Property is along the front ranges of the Rocky Mountains in southeastern British Columbia.

Assays were conducted by using an XRF Unit factory calibrated (Cert No. 0154-0557-1) on October 30, 2013, Instrument #540557 Type Olympus DPO-2000 Delta Premium. The instrument was calibrated using Alloy Certified reference materials by ARM1 and NIS5 standards. Only certified operators were employed and that were experienced in XRF assay procedures. Read times were 120 seconds or greater.

BARNES LAKE RECONNAISSANCE MAPPING AND SAMPLING

Reconnaissance mapping and sampling surveys were carried in two separate areas (Zones 1 & 2) of the Barnes Lake property. A mapping traverse was conducted up a stream bed with the objective of locating a historical sample point that reported to contain rich (>30% $P2O5$) phosphate. Garmin-GPS was used to position all bedrock outcrop encountered with photographs.

Reconnaissance survey was conducted up stream along creek bed, which exposes a section of mildly folded bedrock comprised of black shale and gray siltstone (Fernie Basin) and tan-creamy coloured siltstone and silty-sandstone (Spray River) rocks. Each rock outcrop encountered was marked with Garmin GPS and identified with survey station (e.g. BL-OC2) with accuracy of ± 3 metres. Each ID outcrop was also briefly described and noted in field book included structure. Table 1 below brief describes grab samples collected and rock outcrops encountered.

ID Number	Sample Type	Brief Description	GPS Station (± m)
BL-01dc	Grab sample	Black shale some nodules <10%	668900E-5481889N
BL-06dc	Grab sample	Black shale, carbonaceous w/abundant slickensides	669333E-5481598N

ID Number	Bedrock Outcrop	Brief Description	GPS Station (± m)
BL-OC2	Mapped	Tan colour, silty-sandstone	669340E-5481653N
BL-OC5	Mapped bedrock	Fine gr., brownish siltstone	668970E-5481917N
BL-OC6	outcrop creek bed	Bedded siltstone Bedding dips 20° westerly (photo)	668993E-5481923N
BL-OC7	As above	Siltstone as above, beds dip west	669042E-5481904N
BL-OC8	Along creek bed	Thick, tan colour siltstone beds dipping 20-25° west (photo)	669056E-5481882N
BL-OC9	Creek exposure	Fine grain siltstone with dips as above	669097E-5481835N

BL-OC10	As above	Subcrop of oxidized siltstone	669449E-5481603N
BL-OC11	Outcrop along creek	Finely laminated black shale strike: north, dip: approx. 35°	669494E-5481609N
BL-OC12	As above	Black shale with siltstone interbeds	669599E-5481552N
BL-OC13	Along creek bed	(Fernie) black shale, strike north dip 45-50° west	669695E-5481523N
BL-OC14	Exposed along creek bank	Anticline with siltstone and overlying carbonaceous black shale (photo)	669743E-5481510N

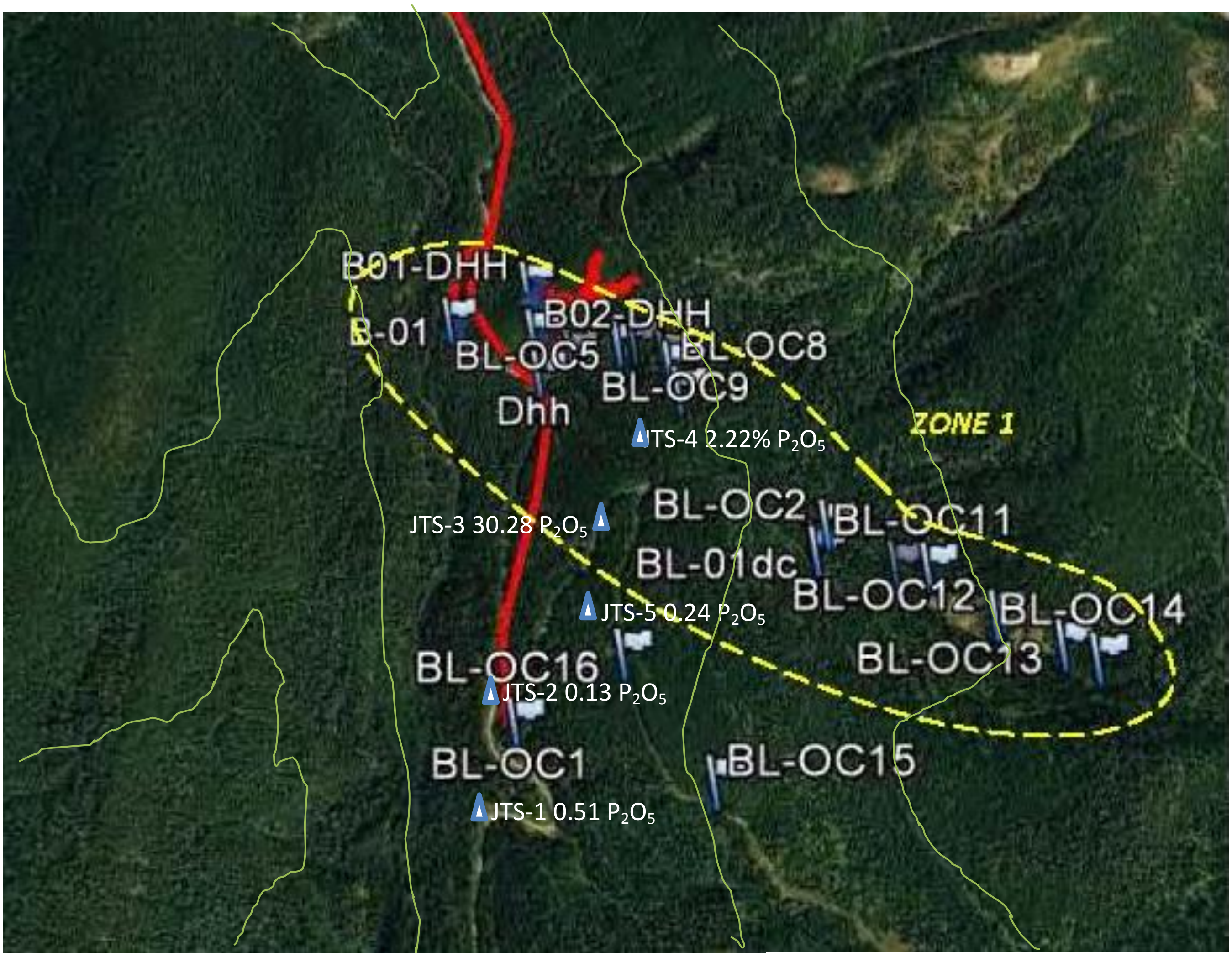


Figure 14 Reconnaissance Mapping and Sampling 2017

Legend
JTS – Rock Sample 0.13 P_2O_5
BLOC-16 Geological Station
Road
Contours
Area of P_2O_5 (Yellow Line)

ZONE 1: GPS reconnaissance survey points – Mapped Bedrock Geology

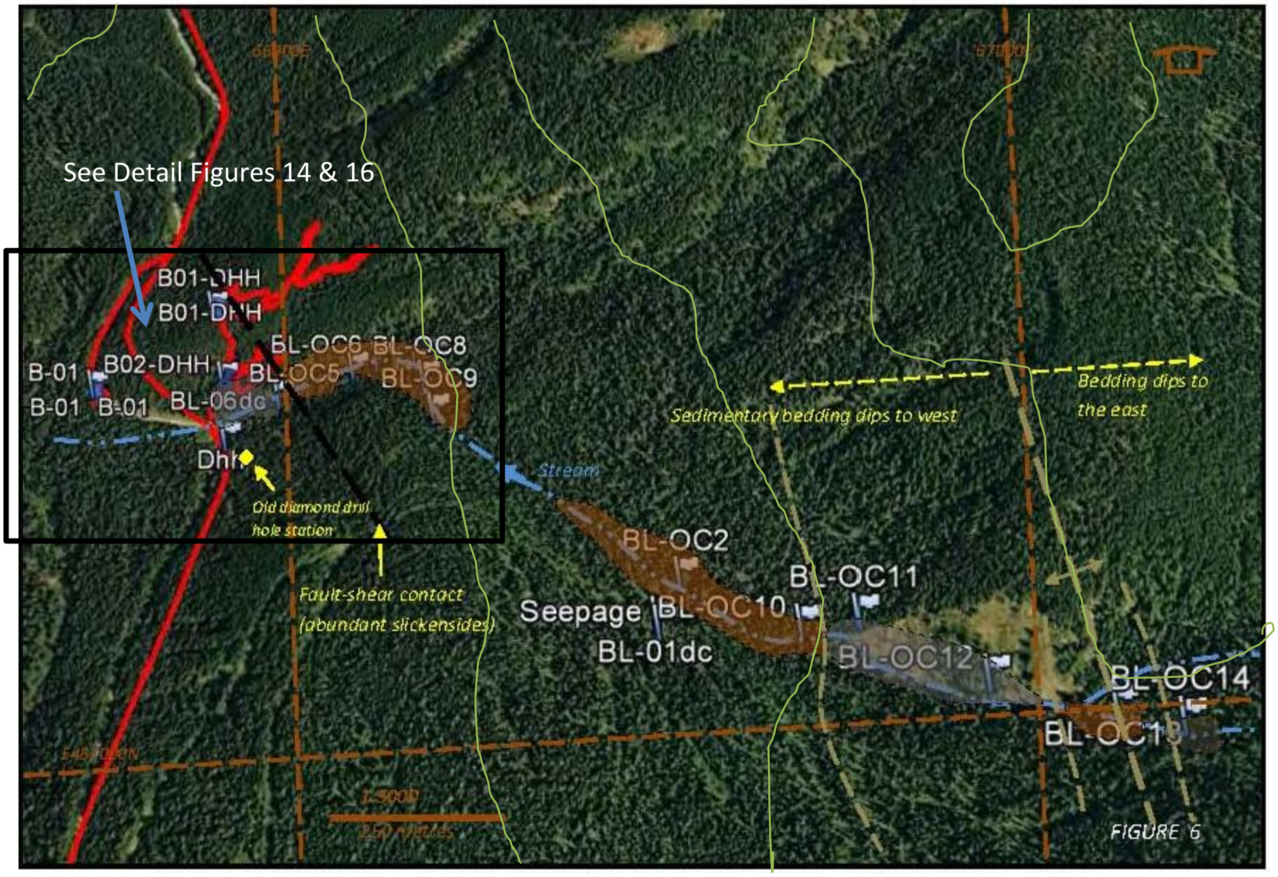


Figure 15 Zone 1

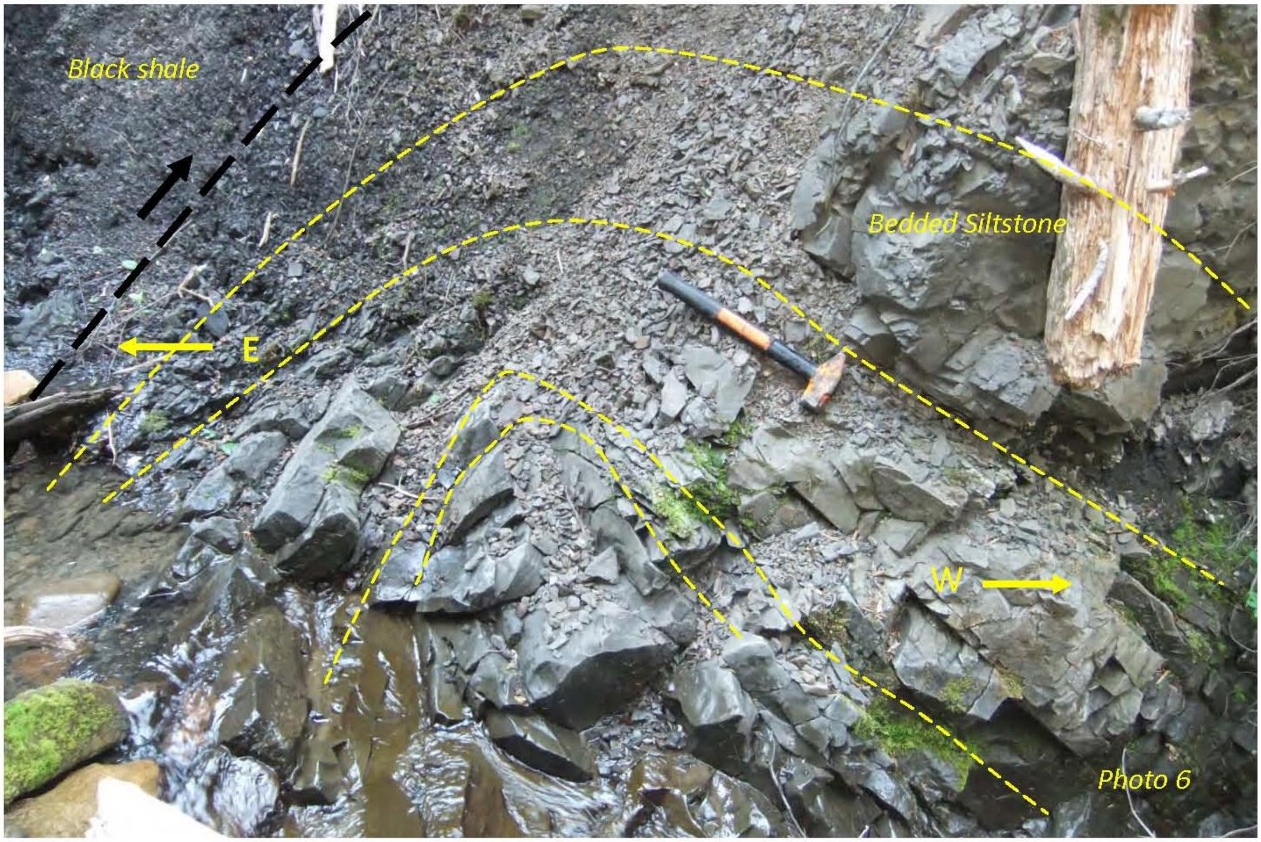
Legend

- BLOC-16 Geological Station
- Road
- Contours

Dominate bedrock outcrop mapped along creek section in Figure 6 above is underlain by north-northwest striking, moderately west dipping brownish-tan coloured siltstone and fine grain, silty-sandstone, which makes up part of the Spray River group (Photo 5). This unit is in contact with overlying west dipping gray-black shale belonging to the Fernie Group. Structurally, the bedding gradually dips from about 20o southwesterly to about 50o west along the upper section of the creek. At station BL-OC14 here exposed on the creek bank anticline structure where the bedding changes dip from west to east (see Photo 6 below and Figure 6 above).

Bedded siltstone exposed along creek dipping about 20° west-southwesterly. Part of the Spray River Formation. Bedding increases in dip angle to about 50° further upstream (above). At station BL-OC14 bedding abruptly dips easterly.

Rock samples collected to the south in Spray River Formation quartzite are plotted on Figure 14. Follow-up water samples were also assayed as shown in Appendix V.

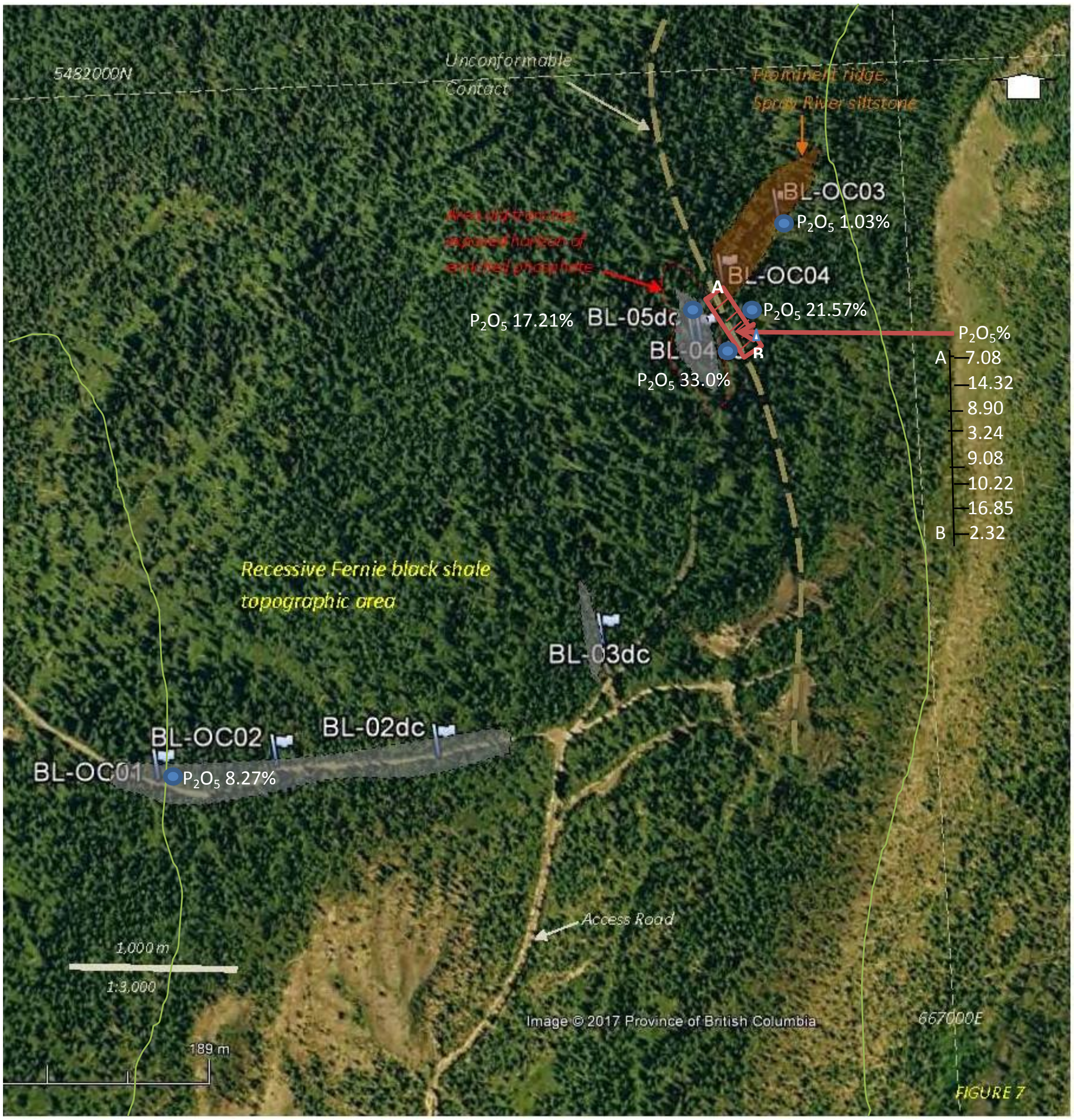


At station BL-OC14 (Photo looking southerly) an anticlinal structure was mapped as shown above photo with shear zone of thrusted black shale over folded siltstone. All sedimentary beds mapped up to this point dipped westerly here attitude of bedding abruptly changes east.

ZONE 2: HIGH GRADE PHOSPHATE ZONE

Zone 2 is located about 2.5 km due north-northwest (see Figure 16) of Zone 1 discussed above. Zone 2 covers a series of older (1990) trenches which report high grade (30.5%) phosphate mineralization. Reconnaissance mapping and sampling was over this phosphate zone and a number of trenches sampled. This area was mapped at a scale of 1:3000 and all mapped rock outcrops and grab sample sites plotted onto base map utilizing hand-held Garmin GPS as well, detail field notes were taken at each mapping and sampling station. GPS survey stations were transferred and overlaid unto a Google earth map.

West Side of Barnes Lake



Zone 2: GPS control points, BL-OC1 denotes bedrock 'outcrop' (i.e. outcrop 1) and BL-02dc (i.e. d.cardinal sample 2) denotes grab sample location. Area mapped is dominantly underlain mildly foliated, westerly dipping black shale part of the Fernie Formation overlying and in contact with Spray River siltstone.

Legend
Soil Sample
Contours
Area of P_2O_5 (Yellow Line)

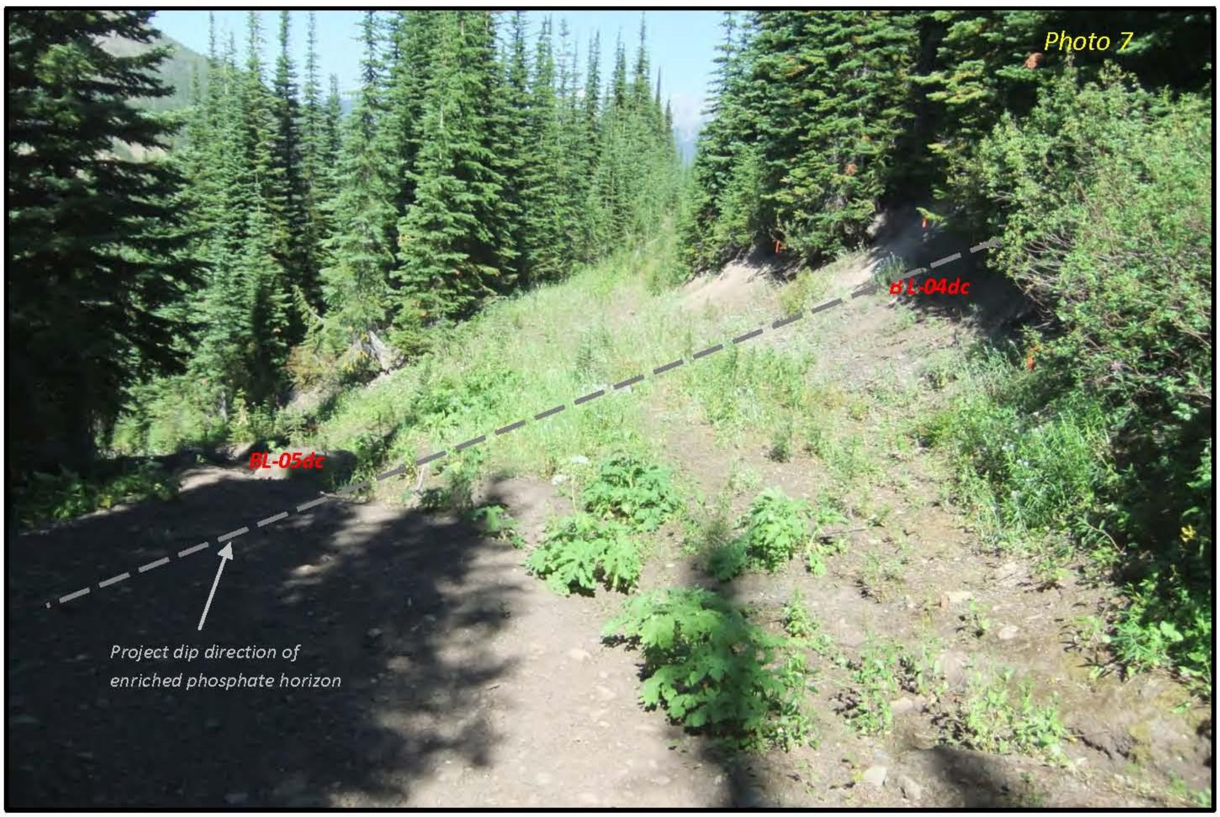
Figure 16 Zone 2

Grab Sample GPS Locations:

Sample ID	Brief Description	GPS Location
BL-02dc	Fernie black shale, foliated, steeply dipping to the west	666607E-5481543N
BL-03dc	Sooty, carbonaceous black shale	666712E-5481543N
BL-04dc	Old trench site, phosphate-rich with >20% nodules black shale (photos)	666776E-5481766N
BL-05dc	Old trench along access road, phosphate >20% nodules black shale (photos)	666771E-5481766N

Bedrock outcrop GPS Locations:

BL-OC01	Thin-bedded shale, foliated steeply dipping (>70°)	666415E-5481458N
BL-OC02	Black shale, weakly phosphatic, <10% nodules	666497E-5481466N
BL-0C03	Silty, fine gr. sandstone (Spray River)	666832E-5481860N
BL-0C04	Thin-bedded, tan coloured silty-sandstone. Probable Spray River Formation	666792E-5481812N



GPS sample location sites noted in red. Old trench-road cuts expose high grade (>20-25% phosphate. Photo looking north. Phosphate bed approx. 35-40o dip west.

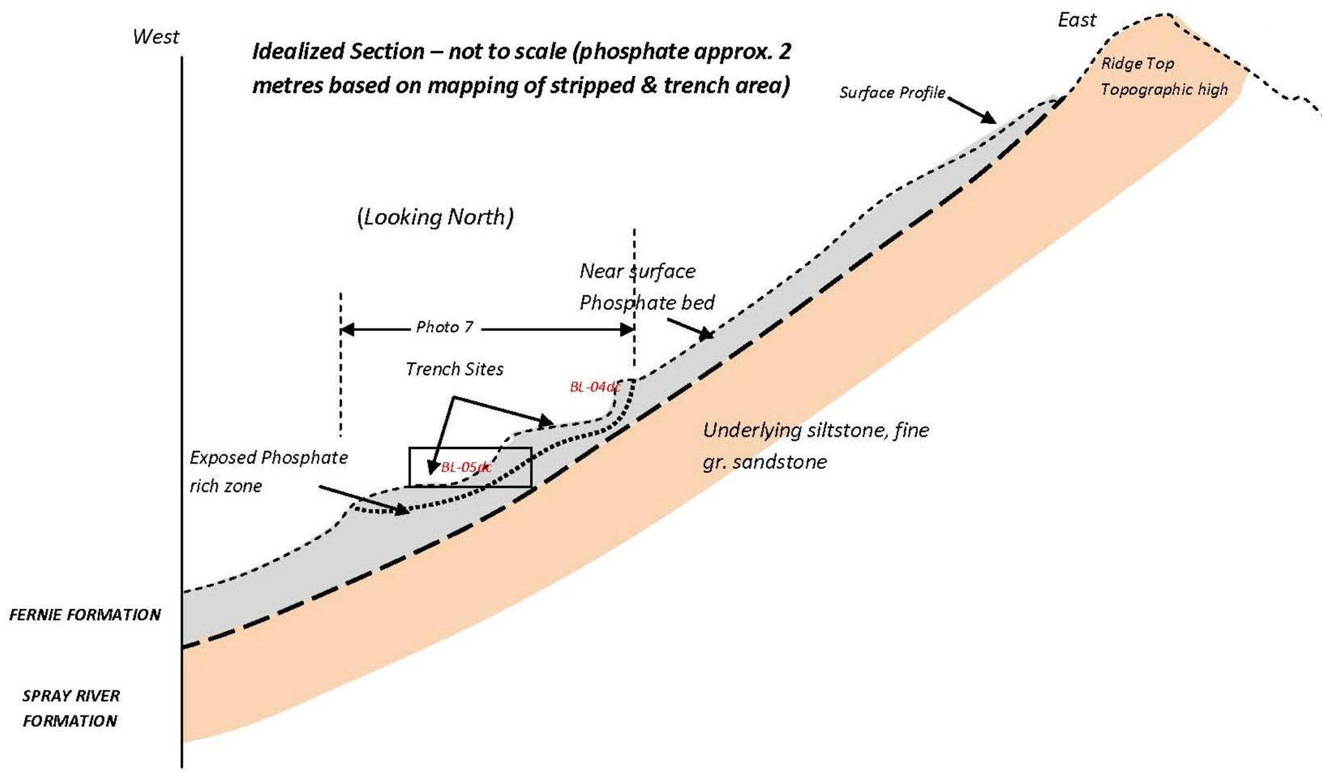


Figure 17 Idealized Section

Zone 2 area represents highly enrich phosphate horizon. Old trenches and stripped area, as shown in Photo 7and depicted in idealized schematic section above, expose part of the phosphate. Here the phosphate bed appears to be at least 2 metres thick and near to surface with shallow (<1m thick) overburden. It dips about 35-40° west approximately slope of surface profile. It is underlain by siltstone and fine grain, silty sandstone of the Spray River Formation, which is exposed just to the east and up slope of the stripped area. Overall dip and foliation of the black shale suggest structure is part of east limb of a synform. Examination of fresh phosphate mineralization hosted in black shale contains abundant nodules >20% (historical analysis returned >30% P_2O_5).

This zone 2 is an excellent exploration target and future bulk sample test site. More detail mapping is required and structural interpretation in order to constrain the enriched phosphate horizon.

CONCLUSIONS and RECOMMENDATIONS

The Barnes Lake claims, which can be reached by road from Sparwood, B.C., is underlain by a series of Upper Paleozoic and Mesozoic strata that were deposited off the western margin of North America between the Permian and late Jurassic. Considerable phosphatic strata occur at the base of the Jurassic Fernie Group, and in addition to P_2O_5, contain anomalous concentrations of yttrium. On the Barnes Lake claims, phosphorites (>12% P_2O_5) average around 660 ppm Y vs 260 ppm, which is the worldwide phosphorite average.

On the Barnes Lake claims, complete sections of the phosphatic strata are 1.11 to 2.1 metres in thickness and average 22.5 per cent P_2O_5 and 610 ppm yttrium. One incomplete section, where the upper beds were eroded away, was 0.98 metres in thickness and contained 30.5 per cent P_2O_5 and 777 ppm yttrium (Pell, 1990).

North of Barnes Lake, on the western limb of the easternmost anticline, an area was located where the phosphate horizon dips in a downslope direction at an angle approximately parallel to or slightly steeper than the slope: this scenario is favourable for exploiting the resource with minimal removal of overburden.

Beneficiation would be required to produce a product that would meet fertilizer plant feed specifications but the material appears suitable for the direct application, organic market without further upgrading.

The work done to date has been preliminary and has not addressed questions such as the effects of surface weathering and the potential of changes in grade with depth from surface. As well, it will be necessary to examine the reality of extracting yttrium during phosphoric acid process before a final assessment can be made.

The previous 2013 program consisted of reconnaissance prospecting, rock sampling and establishing access. Thirteen samples were collected and assayed. Work in June 2013 was curtailed by unusually heavy rain which washed out the access road and the access was closed. Widespread flooding occurred in southeast BC and Alberta.

Work in 2016 shows slightly anomalous soil samples approximately 150m to 200m east of the main rock at an elevation of approximately 1725m to 1767m. Close spaced soil samples are recommended perpendicular to the road system (E-W) at 10m intervals. Hand trenching assisted by excavator trenching is recommended to follow up on the previous drilling and soil results.

Follow-up sampling and geological mapping was completed in 2017 east of the main access road and also west of Michel Creek and north of Barnes Lake which confirmed the high grade (>30% P_2O_5) nature of the phosphate zone at surface. This zone 2 is an excellent exploration target and future bulk sample test site. More detail mapping is required and structural interpretation in order to constrain the enriched phosphate horizon.

Respectfully Submitted,

J. T. Shearer, M.Sc., P.Geo. (BC & Ontario)

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APPENDIX I

STATEMENT of QUALIFICATIONS

AUGUST 28, 2017

STATEMENT of QUALIFICATIONS

I, Johan T. Shearer of Unit 5 – 2330 Tyner Street, in the City of Port Coquitlam, in the Province of British Columbia, do hereby certify:

1. I graduated in Honours Geology (B.Sc., 1973) from the University of British Columbia and the University of London, Imperial College, (M.Sc. 1977).

2. I have practiced my profession as an Exploration Geologist continuously since graduation and have been employed by such mining companies as McIntyre Mines Ltd., J.C. Stephen Explorations Ltd., Carolin Mines Ltd. and TRM Engineering Ltd. I am presently employed by Homegold Resources Ltd.

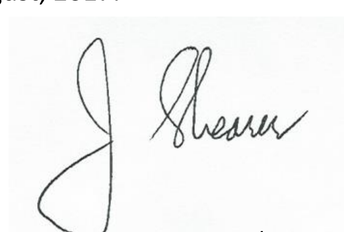
3. I am a fellow of the Geological Association of Canada (Fellow No. F439). I am also a member of the Canadian Institute of Mining and Metallurgy, the Geological Society of London and the Mineralogical Association of Canada. I am a member in good standing of the Association of Professional Engineers and Geoscientists of British Columbia (P.Geo., Member Number 19,279).

4. I am an independent consulting geologist employed since December 1986 by Homegold Resources Ltd. At Unit #5 2330 Tyner Street, Port Coquitlam, British Columbia.

5. I am the author of the report entitled "Geochemical Assessment Report on the Barnes Lake Property" dated August 28, 2017.

6. I have visited the property from August 20-26, 2017. I have carried out mapping and sample collection and am familiar with the regional geology and geology of nearby properties. I have become familiar with the previous work conducted on the Barnes Lake Project by examining in detail the available reports and maps and have discussed previous work with persons knowledgeable of the area.

Dated at Port Coquitlam, British Columbia, this 28th day of August, 2017.



J.T. Shearer, M.Sc., P. Geo. (BC & Ontario)

APPENDIX II

STATEMENT of COSTS

AUGUST 28, 2017

Appendix II

Barnes Lake Property
Statement of Costs 2017

Wages	Total without GST
J. T. Shearer, M.Sc., P.Geo, Geologist 6 days @ $700/day, August 20-26, 2017	$4,200.00
Dan Cardinal, B.Sc., P.Geo., Geologist 8 days @ $650/day, August 20-27, 2017	5,200.00
Subtotal Wages	$9,400.00
Transportation	
Truck 1 – 6 days @ $120/day	720.00
Truck 2 – 8 days @ $100/day	800.00
Fuel	966.00
ATV+Trailer+Truck	600.00
Hotel, Fernie	1,100.00
Meals	1,066.00
Eric MacKenzie, 6 days @ $350/day, August 20-26, 2017	2,100.00
Analytical, Water sAmples	1,175.00
XRF Assays & Certified Operator	500.00
Data Compilation and Interpretation	700.00
Report Writing	1,400.00
Word Processing and Reproduction	350.00
Subtotal Expenses	$11,477.00
Total	**$20,877.00**

Event #	5661973
Date Filed	August 28, 2017
Amount	$ 20,200.00
PAC	$ 8,338.43
Total Filed	$ 28,538.43

APPENDIX III

ASSAY RESULTS

AUGUST 28, 2017

Barnes Lake 2017

Date	Reading	Mg	Mg +/-	Al	Al +/-	Si	Si +/-	P	P +/-	S	S +/-	Cl	Cl +/-	K	K +/-	Ca	Ca +/-	Ti	Ti +/-	V	V +/-
21/08/2017	N.Rd.Qtzite JTS-1	ND		2.5565	0.0431	38.44	0.18	0.5131	0.0217	0.1426	0.0034	ND		0.1167	0.0039	ND		0.1272	0.0161	ND	
21/08/2017	JTS-2	ND		0.7669	0.0393	3.57	0.0326	0.1257	0.0222	0.0616	0.0024	ND		0.0406	0.0023	43.39	0.31	0.0574	0.0182	0.032	0.0101
21/08/2017	JTS-3	ND		5.25	0.06	35.32	0.17	0.2792	0.0203	0.129	0.0034	ND		2.5895	0.0142	0.9827	0.0089	0.3372	0.0208	ND	
21/08/2017	JTS-4	ND		1.1416	0.038	35.77	0.18	2.2164	0.0338	0.1909	0.0038	ND		ND		2.0416	0.0128	0.1112	0.0164	ND	
21/08/2017	JTS-5	2.31	0.22	2.5115	0.0475	8.33	0.06	0.2405	0.0242	0.1316	0.0028	ND		0.3036	0.0035	48.83	0.28	0.112	0.0187	0.0298	0.0096
24/08/2017	BL-02-DC	ND		11.02	0.09	17.06	0.11	8.27	0.07	0.1776	0.0036	ND		1.2807	0.0095	1.3032	0.0105	0.4418	0.0204	0.0273	0.0077
24/08/2017	BL-02-DC	ND		8.41	0.09	18.08	0.12	2.8585	0.0365	0.1572	0.0035	ND		1.4453	0.0111	0.2931	0.0059	0.5433	0.0218	ND	
24/08/2017	BL-02-DC	ND		7.43	0.07	25.02	0.15	4.4495	0.0456	0.1668	0.0036	ND		1.3368	0.0095	3.3354	0.021	0.4387	0.0215	0.0425	0.0086
24/08/2017	BL-02-DC	ND		11.93	0.09	21.49	0.12	4.6515	0.0442	0.1365	0.0033	ND		1.755	0.0112	0.9693	0.0088	0.3703	0.0189	0.0335	0.0076
24/08/2017	BL-03-DC	ND		9.29	0.07	25.93	0.13	1.0318	0.0217	0.1115	0.0028	ND		2.3941	0.0134	0.3519	0.0064	0.4076	0.0191	0.0251	0.0073
24/08/2017	BL-04-DC	ND		7.14	0.07	17.8	0.1	21.57	0.13	0.219	0.0042	ND		2.8649	0.0164	22.63	0.12	0.5309	0.0286	0.0467	0.0115
24/08/2017	BL-04-DC	ND		6.13	0.07	19.38	0.11	19.78	0.13	0.2565	0.0045	ND		3.2646	0.0195	18.55	0.1	0.6305	0.0309	ND	
24/08/2017	BL-04-DC	ND		7.47	0.08	20.86	0.13	11.55	0.09	0.2227	0.0047	ND		3.9336	0.026	10.3	0.07	0.5976	0.0307	ND	
24/08/2017	BL-05-DC	ND		6.43	0.07	17.34	0.11	17.09	0.12	0.2618	0.0046	ND		3.217	0.0209	18.14	0.11	0.4811	0.0291	0.043	0.0118
24/08/2017	BL-05-DC	ND		5.99	0.06	20.18	0.11	17.21	0.11	0.2312	0.004	ND		3.6435	0.0207	13.71	0.07	0.4661	0.0251	ND	
24/08/2017	BL-05-DC	ND		7.92	0.07	21.28	0.12	12.92	0.09	0.243	0.0043	ND		4.0819	0.0234	14.25	0.08	0.5948	0.0292	ND	
24/08/2017	BLNW-1S	ND		9.24	0.07	25.94	0.12	7.08	0.05	0.1619	0.003	ND		1.3372	0.0081	1.4672	0.0097	0.4211	0.0189	0.0328	0.0074
24/08/2017	BLNW-2S	ND		6.53	0.06	21.87	0.12	14.32	0.09	0.1625	0.0033	ND		2.3876	0.0137	8.6896	0.0459	0.3382	0.0202	0.0479	0.0087
24/08/2017	BLNW-3S	ND		8.97	0.07	25.86	0.13	8.9	0.06	0.2122	0.0037	ND		3.5411	0.0189	6.1575	0.0321	0.5974	0.0252	0.0638	0.01
24/08/2017	BLNW-4S	ND		9.08	0.07	25.19	0.13	3.238	0.0337	0.1819	0.0031	ND		3.2785	0.0176	1.2581	0.0095	0.4545	0.0198	ND	
24/08/2017	BLNW-5S	ND		8.17	0.06	29.25	0.13	9.08	0.06	0.1555	0.0031	ND		2.0091	0.0108	4.3739	0.0217	0.5932	0.0227	0.0465	0.0087
24/08/2017	BLNW-6S	ND		6.57	0.06	22.87	0.12	10.22	0.07	0.1166	0.0028	ND		2.0361	0.0117	5.8399	0.0308	0.4531	0.0206	0.0259	0.0079
24/08/2017	BLNW-7S	ND		9.94	0.07	24.27	0.11	16.85	0.1	0.1442	0.0034	ND		2.4115	0.0128	9.5137	0.0447	0.5789	0.0247	0.0708	0.0101
24/08/2017	BLNW-8S	0.55	0.13	8.71	0.07	22.25	0.13	2.3182	0.0291	0.1288	0.0028	ND		2.8296	0.017	0.2486	0.0059	0.3936	0.0191	0.0602	0.0081

Cr	Cr +/-	Mn	Mn +/-	Fe	Fe +/-	Co	Co +/-	Ni	Ni +/-	Cu	Cu +/-	Zn	Zn +/-	As	As +/-	Se	Se +/-	Rb	Rb +/-	Sr	Sr +/-	Y
ND		0.0144	0.0028	0.6403	0.01	ND		ND		ND		0.0015	0.0004	0.0011	0.0002	ND		0.0008	0.0001	0.0003	0.0001	ND
ND		0.6065	0.0146	0.9106	0.0168	ND		ND		0.0035	0.0009	0.1027	0.0024	ND		ND		0.0016	0.0002	0.0124	0.0003	0.0014
ND		0.0642	0.0043	1.4915	0.0165	ND		0.0077	0.001	ND		0.0027	0.0004	ND		ND		0.0074	0.0002	0.0037	0.0002	0.0013
ND		0.0509	0.004	0.3252	0.0075	ND		ND		0.0043	0.0007	0.0027	0.0004	0.0008	0.0003	ND		0.0006	0.0001	0.0019	0.0001	0.0005
ND		0.0185	0.0037	0.4626	0.0106	ND		0.005	0.0011	0.0116	0.0011	0.0587	0.0016	ND		ND		0.0008	0.0001	0.0265	0.0005	ND
0.0353	0.0042	0.1316	0.0055	6.7724	0.0494	ND		0.0196	0.0014	ND		0.0926	0.002	0.0043	0.0004	ND		0.0029	0.0002	0.0166	0.0003	0.0152
0.0312	0.0041	0.756	0.0127	6.75	0.05	ND		0.0177	0.0015	ND		0.0989	0.0021	0.0054	0.0005	ND		0.0036	0.0002	0.0097	0.0003	0.0052
0.0235	0.0042	0.3535	0.0088	6.2909	0.0457	ND		0.0153	0.0014	ND		0.1721	0.0028	0.0033	0.0004	ND		0.0023	0.0002	0.0174	0.0004	0.0153
0.0308	0.0041	0.7322	0.0118	6.1846	0.0425	ND		0.0153	0.0013	0.0023	0.0008	0.0612	0.0015	0.0042	0.0004	ND		0.0025	0.0002	0.012	0.0003	0.0106
0.0139	0.0034	0.0315	0.0032	4.1316	0.0295	ND		0.0085	0.001	0.0045	0.0007	0.0202	0.0008	0.0019	0.0003	ND		0.0149	0.0003	0.0093	0.0002	0.0043
0.0421	0.0059	0.037	0.0046	1.5531	0.0199	ND		0.0045	0.0011	0.0081	0.001	0.0138	0.0009	0.0013	0.0004	ND		0.0029	0.0002	0.0487	0.0006	0.0323
0.0365	0.0058	0.0343	0.0046	1.9527	0.0233	ND		0.0071	0.0012	0.0098	0.0011	0.0127	0.0009	0.0018	0.0004	ND		0.0044	0.0003	0.0421	0.0006	0.0275
0.0384	0.0059	0.2118	0.0088	3.202	0.0331	ND		0.0128	0.0015	0.01	0.0012	0.0208	0.0011	0.0017	0.0004	ND		0.0054	0.0003	0.0413	0.0006	0.0315
0.0439	0.0063	0.1516	0.0077	1.9876	0.0247	ND		0.0092	0.0013	0.0093	0.0012	0.017	0.001	ND		ND		0.0044	0.0003	0.045	0.0007	0.0303
0.0443	0.0055	0.1955	0.0076	2.3227	0.0238	ND		0.012	0.0012	0.0078	0.001	0.0419	0.0013	0.0019	0.0004	ND		0.007	0.0003	0.0325	0.0005	0.0233
0.0332	0.0055	0.1593	0.0073	2.0327	0.0231	ND		0.0058	0.0011	0.009	0.0011	0.0156	0.0009	0.0017	0.0004	ND		0.0051	0.0003	0.0379	0.0006	0.0252
0.0104	0.0032	0.0548	0.0036	3.3198	0.0243	ND		ND		0.0031	0.0006	0.009	0.0006	0.0011	0.0003	ND		0.0057	0.0002	0.0143	0.0003	0.0129
0.0269	0.0043	0.0669	0.0045	3.8471	0.0302	ND		0.0074	0.001	0.0042	0.0008	0.0112	0.0007	0.0019	0.0004	ND		0.0052	0.0002	0.0265	0.0004	0.0468
0.0413	0.005	0.0742	0.0049	4.5514	0.0338	ND		0.0157	0.0013	0.0102	0.001	0.0183	0.0009	0.0036	0.0004	0.0007	0.0002	0.0095	0.0003	0.0306	0.0005	0.0497
0.0136	0.0034	0.0622	0.004	6.2647	0.0402	ND		0.0072	0.001	0.0082	0.0009	0.0135	0.0007	0.003	0.0004	ND		0.0127	0.0003	0.0131	0.0003	0.0097
0.0215	0.004	0.1456	0.0056	4.8749	0.0324	ND		0.0123	0.0011	0.0049	0.0008	0.0189	0.0008	0.0034	0.0004	0.0004	0.0001	0.0082	0.0003	0.0212	0.0003	0.0332
0.0162	0.0037	0.1885	0.0062	3.8651	0.0289	ND		0.0062	0.0009	0.0051	0.0008	0.0094	0.0006	0.0021	0.0003	ND		0.0059	0.0002	0.0183	0.0003	0.0382
0.0292	0.0047	0.0712	0.0047	3.7992	0.029	ND		0.011	0.0012	0.0069	0.0009	0.0211	0.0009	0.0016	0.0003	ND		0.0067	0.0003	0.0329	0.0005	0.0471
0.0214	0.0037	0.0561	0.0039	5.0317	0.0366	ND		0.0118	0.0011	0.0089	0.0009	0.0137	0.0008	0.003	0.0003	0.0007	0.0001	0.013	0.0003	0.009	0.0002	0.0092

Y +/-	Zr	Zr +/-	Mo	Mo +/-	Ag	Ag +/-	Cd	Cd +/-	Sn	Sn +/-	Sb	Sb +/-	W	W +/-	Hg	Hg +/-	Pb	Pb +/-	Bi	Bi +/-	Th	Th +/-	U	U +/-	LE	LE +/-
	0.0277	0.0004	ND		ND		ND		ND		ND		ND		ND		0.0026	0.0003	ND		ND		ND		57.41	0.2
0.0002	0.0083	0.0003	ND		ND		ND		ND		ND		ND		ND		0.0043	0.0005	ND		ND		ND		50.31	0.27
0.0002	0.0202	0.0003	ND		ND		ND		ND		ND		ND		ND		0.0036	0.0004	ND		ND		ND		53.51	0.22
0.0001	0.018	0.0003	ND		ND		ND		ND		ND		ND		ND		0.0027	0.0003	ND		ND		ND		58.12	0.2
	0.0008	0.0002	ND		ND		ND		ND		ND		ND		ND		0.0049	0.0005	ND		ND		ND		36.62	0.29
0.0003	0.0198	0.0004	ND		ND		ND		ND		ND		ND		ND		0.0053	0.0005	ND		0.0052	0.0007	0.0019	0.0004	53.3	0.25
0.0003	0.0152	0.0004	0.0009	0.0002	ND		ND		ND		ND		ND		ND		0.0066	0.0005	ND		0.0028	0.0007	ND		60.51	0.25
0.0004	0.0192	0.0004	0.0008	0.0002	ND		ND		ND		ND		ND		ND		0.0047	0.0005	ND		0.0035	0.0007	ND		50.86	0.26
0.0003	0.0181	0.0004	ND		ND		ND		ND		ND		ND		ND		0.0036	0.0004	ND		0.0031	0.0007	ND		51.58	0.25
0.0002	0.0169	0.0003	ND		ND		ND		ND		ND		ND		ND		0.004	0.0004	ND		ND		ND		56.2	0.22
0.0005	0.025	0.0005	0.0007	0.0002	ND		ND		ND		ND		ND		ND		0.0046	0.0005	ND		ND		0.0025	0.0005	25.43	0.28
0.0005	0.0399	0.0006	0.002	0.0002	ND		ND		ND		ND		ND		ND		0.0043	0.0005	ND		ND		0.0034	0.0005	29.82	0.29
0.0006	0.04	0.0006	0.0017	0.0003	ND		ND		ND		ND		ND		ND		0.0055	0.0006	ND		ND		0.0026	0.0005	41.44	0.3
0.0005	0.0367	0.0006	0.0027	0.0003	ND		ND		ND		ND		ND		ND		0.0058	0.0006	ND		ND		0.0022	0.0005	34.66	0.3
0.0004	0.044	0.0006	0.0048	0.0002	ND		ND		ND		ND		ND		ND		0.0042	0.0005	ND		0.0029	0.0007	0.0044	0.0005	35.82	0.27
0.0005	0.0397	0.0006	0.0015	0.0002	ND		ND		ND		ND		ND		ND		0.0046	0.0005	ND		ND		0.0029	0.0005	36.34	0.28
0.0003	0.0278	0.0004	ND		ND		ND		ND		ND		ND		ND		0.0037	0.0003	ND		ND		ND		50.87	0.21
0.0006	0.046	0.0005	ND		ND		ND		ND		ND		ND		ND		0.005	0.0004	ND		ND		0.0019	0.0004	41.57	0.24
0.0006	0.0326	0.0005	0.0015	0.0002	ND		ND		ND		ND		ND		0.0019	0.0005	0.0047	0.0005	ND		ND		0.0046	0.0005	40.84	0.25
0.0003	0.0245	0.0004	ND		ND		ND		ND		ND		ND		ND		0.0041	0.0004	ND		ND		0.0017	0.0004	50.87	0.23
0.0005	0.0367	0.0005	0.0009	0.0002	ND		ND		ND		ND		ND		0.0014	0.0004	0.0042	0.0004	ND		ND		0.004	0.0004	41.13	0.23
0.0005	0.054	0.0005	ND		ND		ND		ND		ND		ND		0.0015	0.0004	0.0028	0.0004	ND		ND		0.0027	0.0004	47.66	0.23
0.0006	0.0309	0.0004	0.0012	0.0002	ND		ND		ND		ND		ND		ND		0.0038	0.0004	ND		ND		0.0043	0.0005	32.16	0.25
0.0003	0.0349	0.0004	0.0009	0.0002	ND		ND		ND		ND		ND		ND		0.0028	0.0004	ND		ND		0.0023	0.0004	57.29	0.24

APPENDIX IV

SAMPLE DESCRIPTIONS

AUGUST 28, 2017

Barnes Lake Sample Descriptions

Sample	GPS	
BLNW-1S	666795 5481764	Soils
BLNW-2S	666796 5481758	Soils
BLNW-3S	666798 5481753	Soils
BLNW-4S	666794 5481739	Soils
BLNW-5S	666777 5481774	Soils
BLNW-6S	666777 5481763	Soils
BLNW-7S	666778 5481760	Soils
BLNW-8S	666776 5481775	Soils

ID Number	Brief Description	GPS Station (± m)
BL-01dc	Black shale some nodules <10%	668900E-5481889N
BL-06dc	Black shale, carbonaceous w/abundant slickensides	669333E-5481598N

ID Number	Brief Description	GPS Station (± m)
BL-OC2	Tan colour, silty-sandstone	669340E-5481653N
BL-OC5	Fine gr., brownish siltstone	668970E-5481917N
BL-OC6	Bedded siltstone Bedding dips 20° westerly (photo)	668993E-5481923N
BL-OC7	Siltstone as above, beds dip west	669042E-5481904N
BL-OC8	Thick, tan colour siltstone beds dipping 20-25° west (photo)	669056E-5481882N
BL-OC9	Fine grain siltstone with dips as above	669097E-5481835N
BL-OC10	Subcrop of oxidized siltstone	669449E-5481603N
BL-OC11	Finely laminated black shale strike: north, dip: approx. 35°	669494E-5481609N
BL-OC12	Black shale with siltstone interbeds	669599E-5481552N
BL-OC13	(Fernie) black shale, strike north dip 45-50° west	669695E-5481523N
BL-OC14	Anticline with siltstone and overlying carbonaceous black shale (photo)	669743E-5481510N

Grab Sample GPS Locations:

Sample ID	Brief Description	GPS Location
BL-02dc	Fernie black shale, foliated, steeply dipping to the west	666607E-5481543N
BL-03dc	Sooty, carbonaceous black shale	666712E-5481543N
BL-04dc	Old trench site, phosphate-rich with >20% nodules black shale (photos)	666776E-5481766N
BL-05dc	Old trench along access road, phosphate >20% nodules black shale (photos)	666771E-5481766N

Bedrock outcrop GPS Locations:

BL-OC01	Thin-bedded shale, foliated steeply dipping (>70°)	666415E-5481458N
BL-OC02	Black shale, weakly phosphatic, <10% nodules	666497E-5481466N
BL-0C03	Silty, fine gr. sandstone (Spray River)	666832E-5481860N
BL-0C04	Thin-bedded, tan coloured silty-sandstone. Probable Spray River Formation	666792E-5481812N

Sample		Reading No.	P_2O_5
BL-02 DC	Rock	08/24/17 #3/#4/#5/#6	8.27%/2.86%/4.45%/4.65%
BL-03 DC	Rock	08/24/17 #8	1.03%
BL-04 DC	Rock	08/24/17 #9/#10/#11	21.57%/19.78%/11.55%
BL-05 DC	Rock	08/24/17 #12/#13/#14	17.09%/17.21%/12.92%
BLNW-1S	Soil	08/24/17 #16	7.08%
BLNW-2S	Soil	08/24/17 #18	14.32%
BLNW-3S	Soil	08/24/17 #19	8.90%
BLNW-4S	Soil	08/24/17 #20	3.24%
BLNW-5S	Soil	08/24/17 #21	9.08%
BLNW-6S	Soil	08/24/17 #22	10.22%
BLNW-7S	Soil	08/24/17 #23	16.85%
BLNW-8S	Soil	08/24/17 #24	2.32%
BL-06 DC	Rock	Slickenside 2nd time	5401/3862
Marten 2nd	Rock		22.06

N.ROAD QTZITE JTS-1	Rock	#25	5131 White quartzite, muscovite
JTS-2	Rock	#26	1257 Brown quartzite, shaley
JTS-3	Rock	#27	2792 Micaceous sandstone, slabby
JTS-4	Rock	#28	2.22% Chalky siltstone
JTS-5	Rock	#29	2405 Black shaley limestone

APPENDIX V

WATER SAMPLES

AUGUST 28, 2017

Barnes Lake Water Samples for Brian Lennan

Sample #	Ph	Condition	Temperature	GPS	Date	Comment
BLSW-17-1	9.2	468	10.6	0660472 5493174	23-08-17 9:27AM	Total water?? Bottle broken
BLSW-17-1A						
BLSW-17-2	8.8	322	10.4	0668854 5481855	23-08-17 1:08PM	
BLSW-17-2A						
BLSW-17-3	8.6	230	14.2	0667924 5484329	23-08-17 1:58PM	
BLSW-17-3A						

APPENDIX VI

SAMPLE LOCATIONS

AUGUST 28, 2017

Barnes Lake 2016 Sample Location Waypoints

Sample List Barnes Lake 2017

Sample	GPS
BLSW-17-1	066472 5493174
BLSW-17-1A	066472 5493174
BLSW-17-2	0668854 5481855
BLSW-17-2A	0668854 5481855
BLSW-17-3	0667924 5484329
BLSW-17-3A	0667924 5484329
BLNW-1S	666795 5481764
BLNW-2S	666796 5481758
BLNW-3S	666798 5481753
BLNW-4S	666794 5481739
BLNW-5S	666777 5481774
BLNW-6S	666777 5481763
BLNW-7S	666778 5481760
BLNW-8S	666776 5481775