

*Barnes Lake et al/s*



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

TOTAL COST: \$4,600.00

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

SIGNATURE(S): 

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

YEAR OF WORK: 2015

STATEMENT OF WORK - CASH PAYMENTS EVENT NUMBER(S)/DATE(S): 5561462

PROPERTY NAME: Barnes Lake

CLAIM NAME(S) (on which the work was done): 1020873

COMMODITIES SOUGHT: Phosphorite

MINERAL INVENTORY MINFILE NUMBER(S), IF KNOWN:

MINING DIVISION: Fort Steele Mining Division

NTS/BCGS: 82G/7E

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

OWNER(S):

1) Fertoz International Inc. 2)

MAILING ADDRESS:

Unit 5 - 2330 Tyner Street

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 22.5% P2O5

REFERENCES TO PREVIOUS ASSESSMENT WORK AND ASSESSMENT REPORT NUMBERS:

Assessment Reports: 6859, 5556, 8989, 6365

TYPE OF WORK IN THIS REPORT	EXTENT OF WORK (IN METRIC UNITS)	ON WHICH CLAIMS	PROJECT COSTS APPORTIONED (incl. support)
<b>GEOLOGICAL (scale, area)</b>			
Ground, mapping			
Photo interpretation			
<b>GEOPHYSICAL (line-kilometres)</b>			
<b>Ground</b>			
Magnetic			
Electromagnetic			
Induced Polarization			
Radiometric			
Seismic			
Other			
<b>Airborne</b>			
<b>GEOCHEMICAL (number of samples analysed for...)</b>			
Soil			
Silt			
Rock		1020873	2,000
Other			
<b>DRILLING (total metres; number of holes, size)</b>			
Core			
Non-core			
<b>RELATED TECHNICAL</b>			
Sampling/assaying		1020873	2,600
Petrographic			
Mineralographic			
Metallurgic			
<b>PROSPECTING (scale, area)</b>			
<b>PREPARATORY / PHYSICAL</b>			
Line/grid (kilometres)			
Topographic/Photogrammetric (scale, area)			
Legal surveys (scale, area)			
Road, local access (kilometres)/trail			
Trench (metres)			
Underground dev. (metres)			
Other			
		<b>TOTAL COST:</b>	<b>\$4,600.00</b>

**GEOCHEMICAL ASSESSMENT REPORT  
ON THE  
EAST 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 # 5561462**

**For**

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**By**

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**July 6, 2015**

**Fieldwork Completed Between September 15, 2014 and July 6, 2015**

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## SUMMARY

The Barnes Lake property consists of the Barnes Lake Claims. 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).

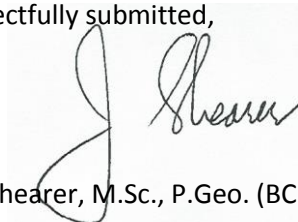
The Barnes Lake property is predominantly underlain by a sequence of Late Paleozoic to Mesozoic strata (Permian to Jurassic) that were deposited in the Alberta Trough under marine conditions and Late Jurassic to Cretaceous fluvio-deltaic sediments that were subsequently deformed during the Late Cretaceous. 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 and 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 2014-2015 program consisted of reconnaissance prospecting, rock sampling and establishing access. Twelve samples were collected and assayed. Results are contained in Appendix III. The highest  $P_2O_5$  value obtained was 1.12%.

Results of the 2015 samples show low  $P_2O_5$ . With steeper dips of the beds than expected the results suggest that the sampling so far is too high in the sedimentary sequence.

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 comes from Florida, the remainder being supplied from the Western U.S. (Barry, 1987). The majority of phosphate rock imported into eastern Canada is from Florida: minor amounts have also been imported from Togo, Tunisia and Morocco. 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/ $P_2O_5$  ratio: 1.32 to 1.6  
 $R_2O_3/P_2O_5 < 0.1$ ;  $R_2O_3 = Al_2O_3 + Fe_2O_3 + MgO$   
MgO content < 1.0%

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. As with most of the phosphate ores mined in the United States, Fernie phosphorites would require beneficiation to produce an acid grade product. 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 phosphate to organic market. Contacts have been made to farmers already producing organic products.



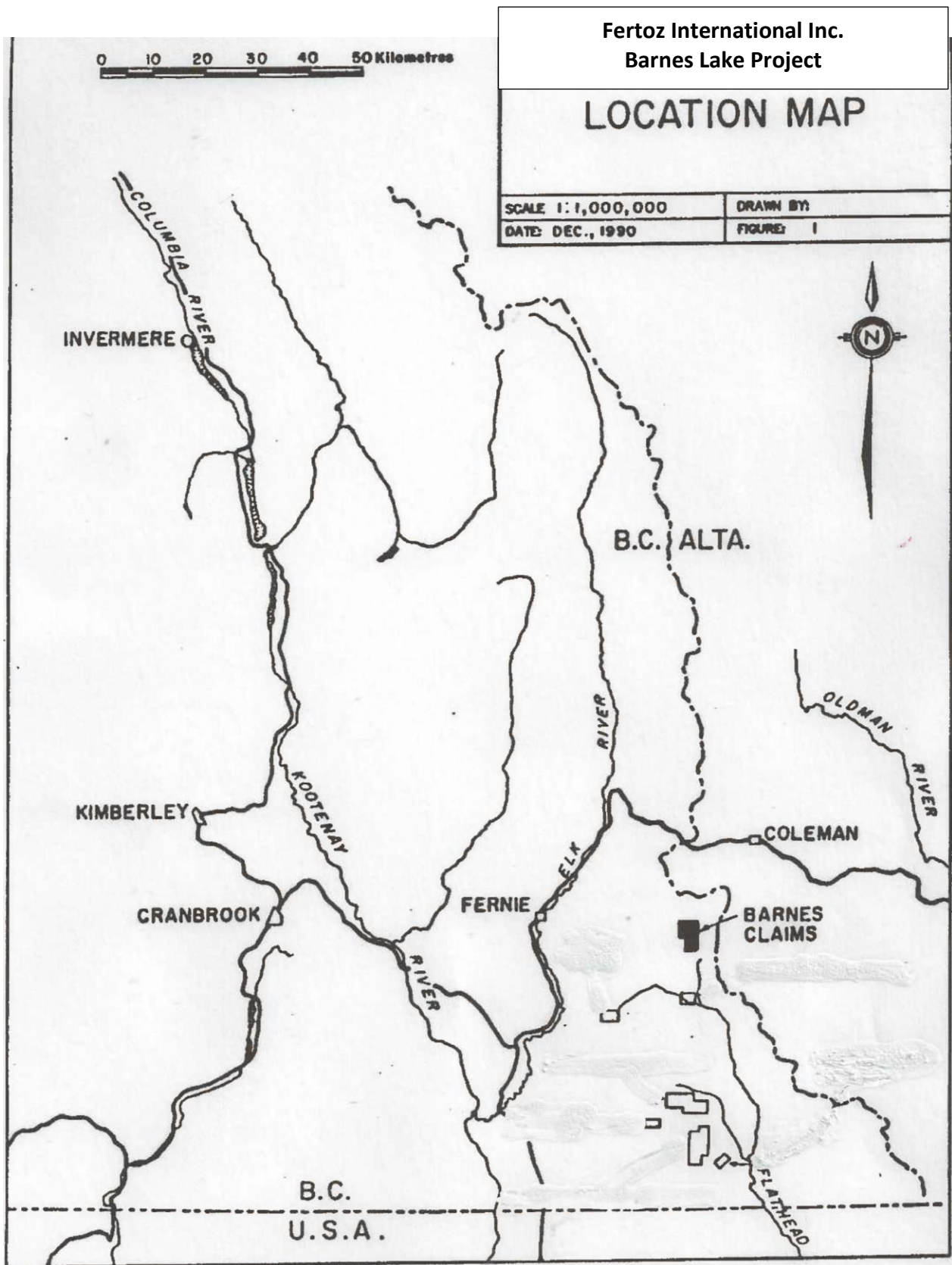


Figure 1 Location Map

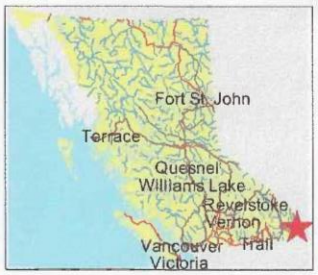
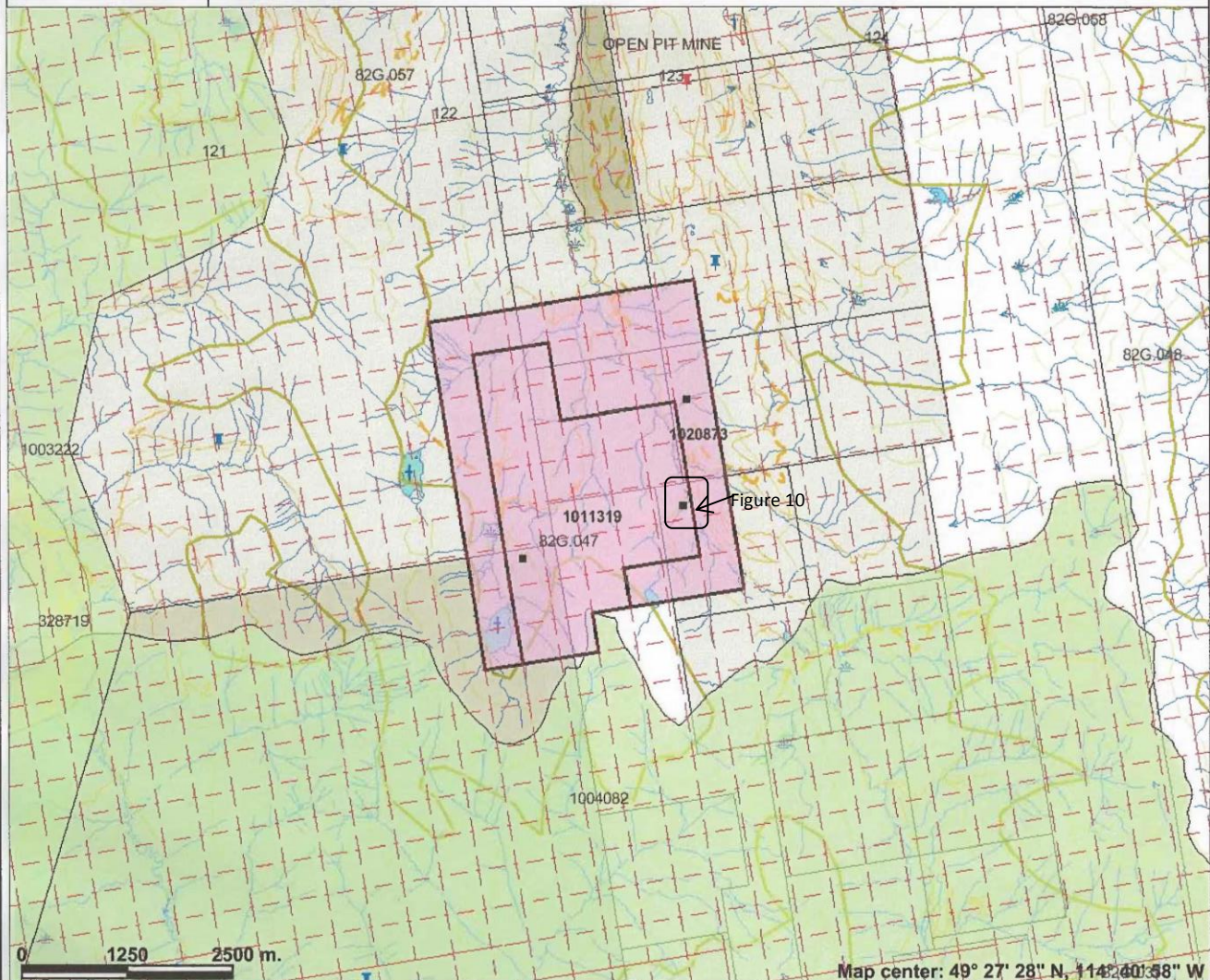
## PROPERTY DESCRIPTION and LOCATION

The Barnes Lake claims are located in the Barnes Lake - Michel Creek area, Flathead region, Fort Steele Mining Division, approximately 40 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 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.



# Barnes Lake Claim Map



### Legend

**MINFILE Status**

- X Producer
- X Past Producer
- X Developed Prospect
- X All others

**Land Status**

- Indian Reserves
- National Parks
- Conservancy Areas
- Parks
- Federal Transfer Lands
- MTO Grid (MTO)
- Mineral Tenure (current)
- Mineral Claim
- Mineral Lease

**Mineral Reserves (current)**

- Placer Claim Designation
- Placer Lease Designation
- No Staking Reserve
- Conditional Reserve
- Release Required Reserve
- Surface Restriction
- Recreation Area
- Others
- First Nations Treaty Related Lands

**Other Features**

- First Nations Treaty Lands
- Survey Parcels
- BCGS Grid
- Contours (1:250K)
- Contour - Index
- Contour - Intermediate

**Scale: 1:71,165**

This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

Figure 2 Claim Map

## MINERAL TENURE

The Barnes Lake property, 2 claims encompassing 1,238.36 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	July 19, 2017	Fertoz International
Barnes 2	1020873	629.88	October 18, 2016	Fertoz International

Total 1,238.36 ha

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.



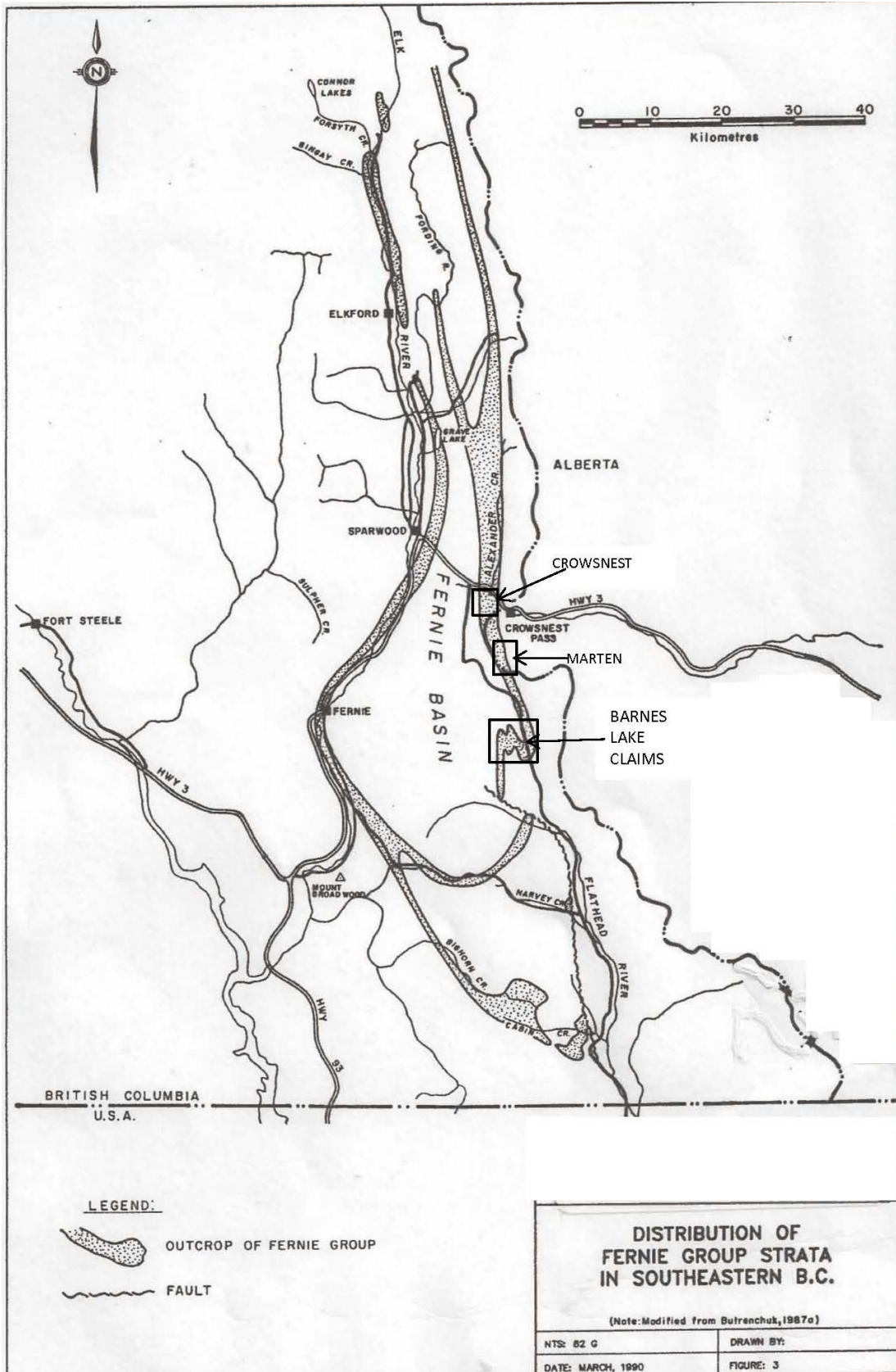


Figure 3 Distribution of Fernie Group Strata in Southern British Columbia

## 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; 1987b; 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<sub>2</sub>O<sub>5</sub> 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 <sup>3</sup> )
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 <sup>3</sup>

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

Section	Thickness+ (m)	Weighted Averages*	
		P <sub>2</sub> O <sub>5</sub> %	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<sub>2</sub>O<sub>5</sub> 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<sub>2</sub>O<sub>5</sub> and 777 ppm Y across 0.98 metres. The values ranged from 2.66 per cent P<sub>2</sub>O<sub>5</sub> and 98 ppm yttrium in shale layers within the phosphorite section to 32.18 per cent P<sub>2</sub>O<sub>5</sub> 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<sub>2</sub>O<sub>5</sub> 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 anticline (Figure 5). 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<sub>2</sub>O<sub>5</sub> are summarized below:

Sample Number	P <sub>2</sub> O <sub>5</sub> %	CaO/ P <sub>2</sub> O <sub>5</sub>	R <sub>2</sub> O <sub>3</sub> */ P <sub>2</sub> O <sub>5</sub>	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<sub>2</sub>O<sub>3</sub> = Al<sub>2</sub>O<sub>3</sub> + Fe<sub>2</sub>O<sub>3</sub> + MgO

In all cases, the CaO/P<sub>2</sub>O<sub>5</sub> ratios and MgO contents of the raw samples meet industry standard fertilizer plant feed specifications. In many samples, the P<sub>2</sub>O<sub>5</sub> grades of the individual samples are low and therefore some beneficiation would be necessary. The R<sub>2</sub>O<sub>3</sub>/ P<sub>2</sub>O<sub>5</sub> 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

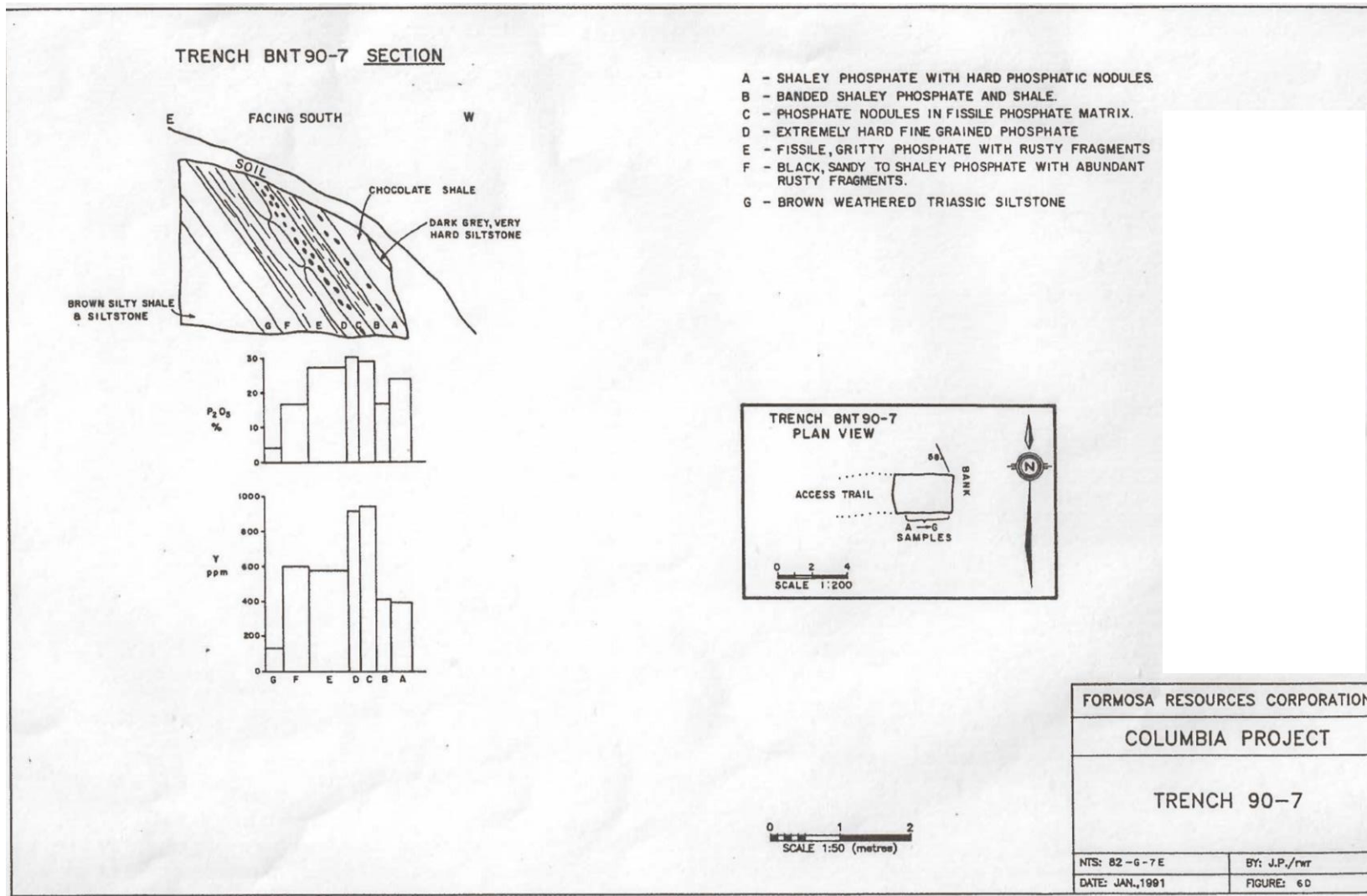


Figure 5 Trenches 90-8 & 9

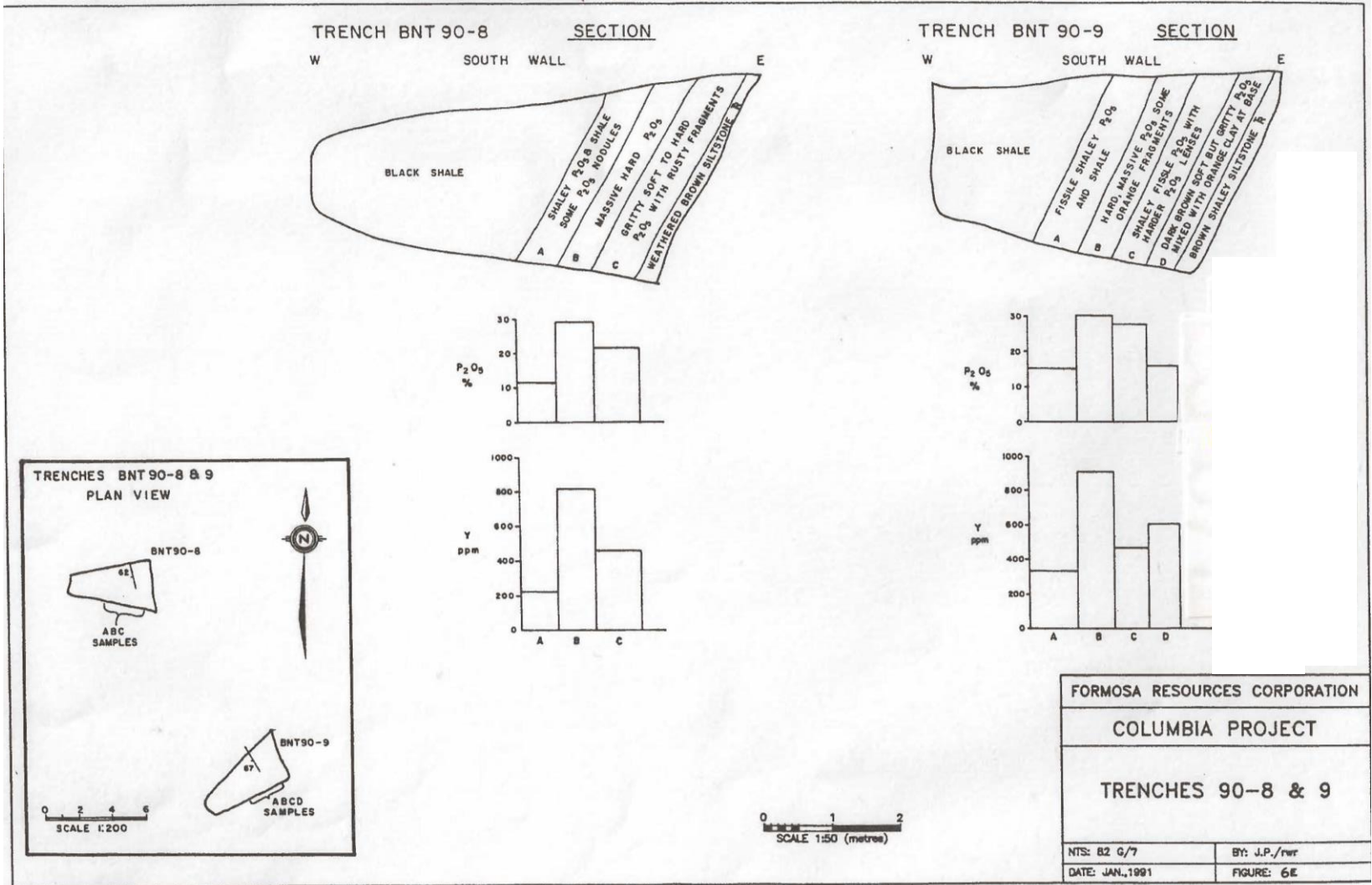






Figure 6 General Google Image of Area

## Work Program 2014

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 P<sub>2</sub>O<sub>5</sub> 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.

Results of the XRF assays are contained in Appendix III and sample descriptions are contained in Appendix IV.

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<sub>2</sub>O<sub>5</sub>.





Figure 7 Garmin Map, General Location

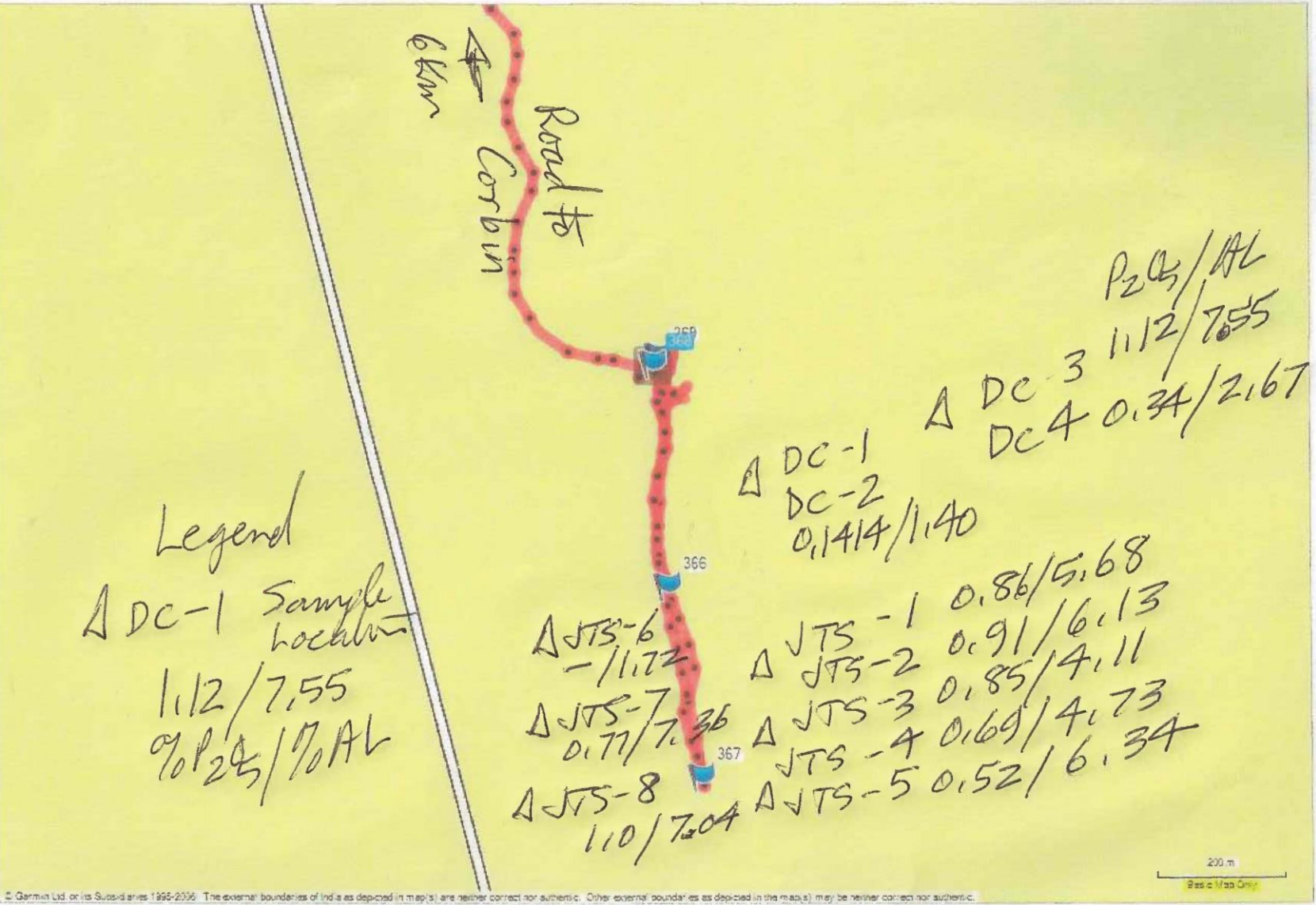


Figure 8 Results of Assays Plotted

## 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 synclinorium, 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 <sub>2</sub> O <sub>5</sub> )	
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	Whitehorse Fm.	-dolomite, limestone, siltstone				
	Sulphur Mtn. 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	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)	0.6	9.5	
			-basal conglomerate-chert with phosphate pebbles present (<1 metre)	0.5-1.0	13-18	
	unconformity					
	Rose 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 coquinoïd horizons present	0.4-1.0	1.7-6.0	
	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 coquinoïd horizon	0.3	11.4	
Mississippian	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	Kananaskis Fm. (±55)	-dolomite, silty, commonly contains chert nodules or beds	-locally, minor phosphatic siltstone in uppermost part of section		
Tunnel Mtn 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 southeastern 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 9 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  $P_2O_5$  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<sub>2</sub>O<sub>5</sub> 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).

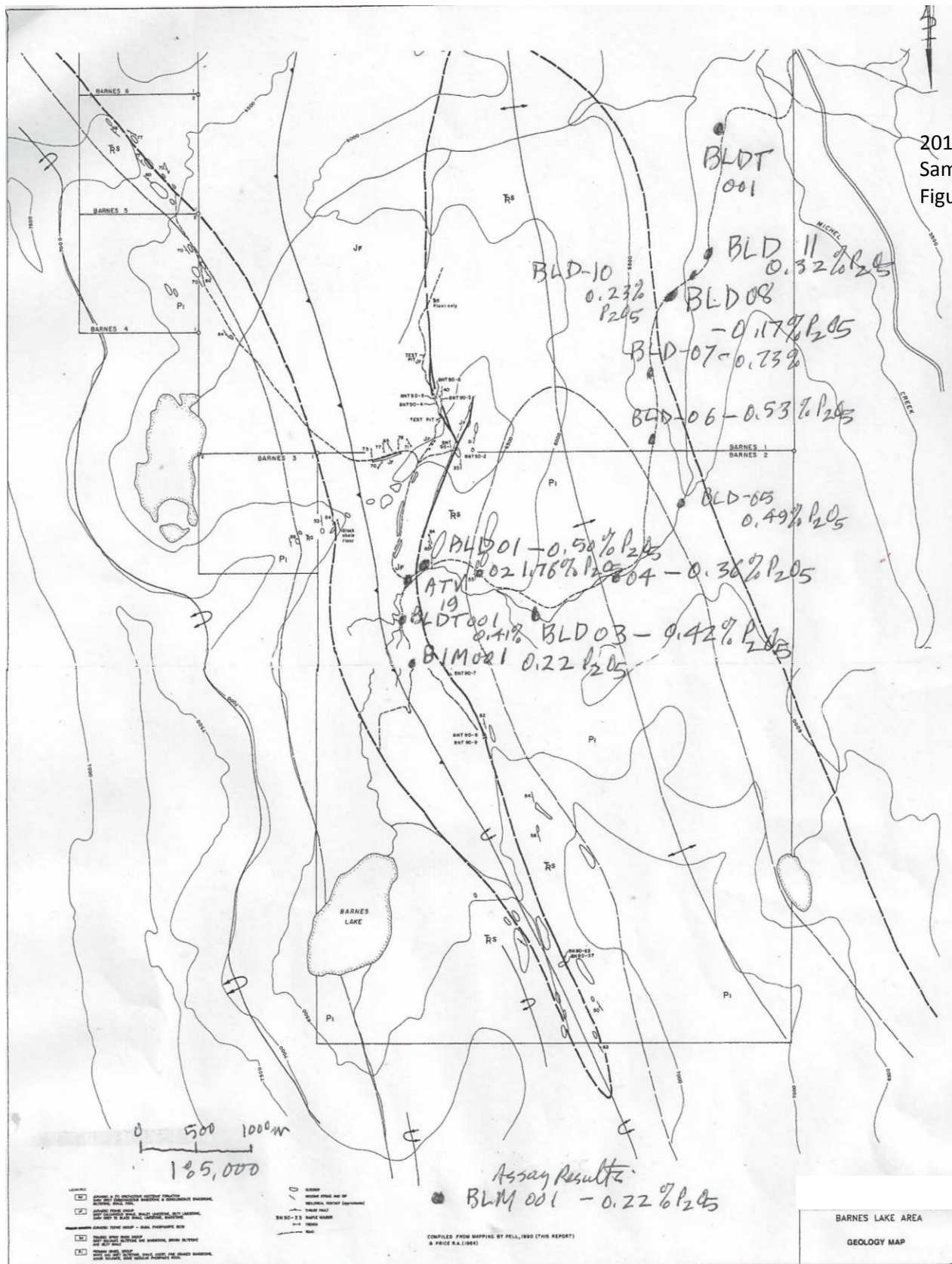


Figure 10 Detail Geology and Sample Location and Results 2013 Samples

## 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.

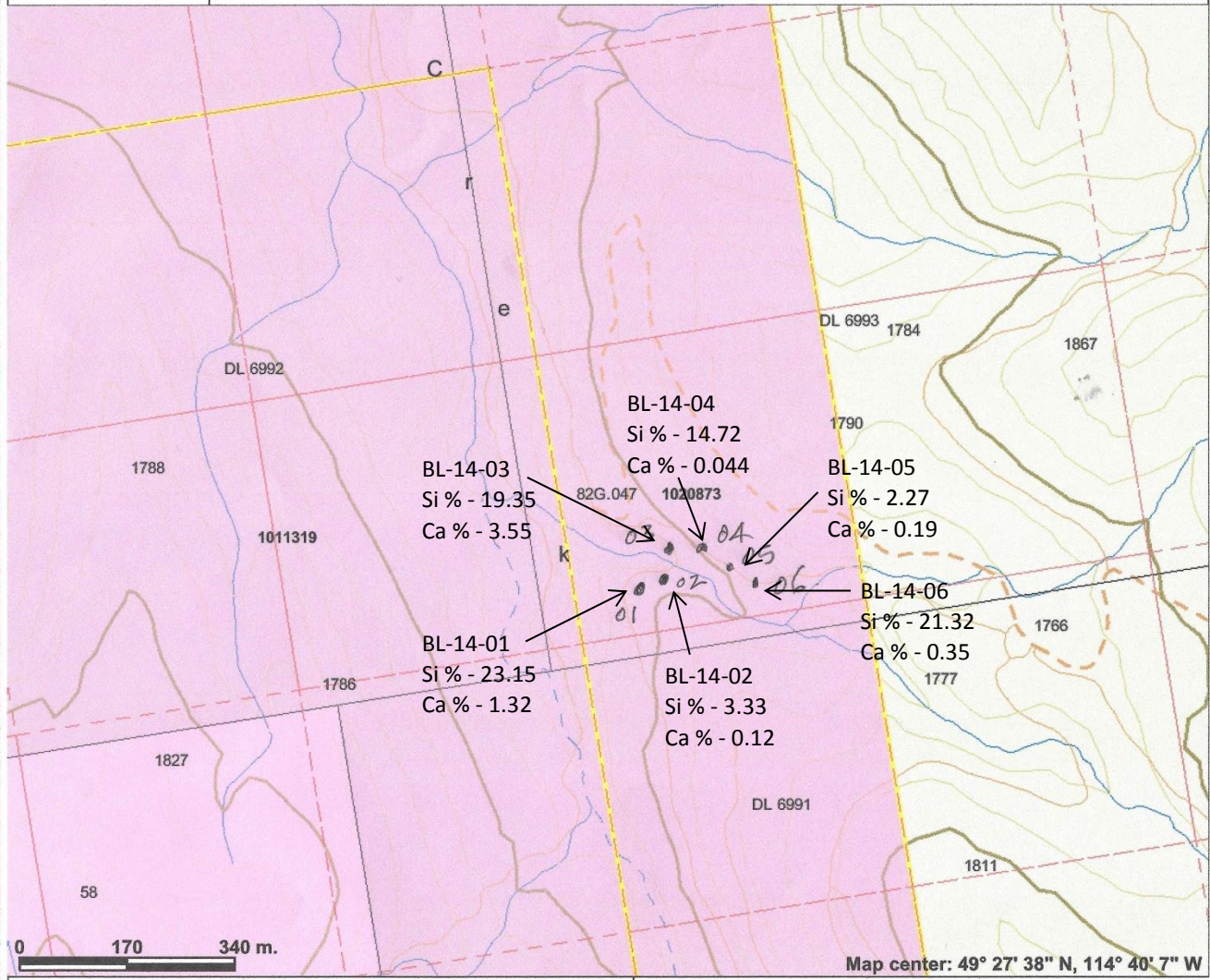
On the northwestern corner of the property, gritty grey sandstones, siltstones and thin coal beds of the late Jurassic to Cretaceous Kootenay Formation crop out, but were not examined in detail.

## STRUCTURE

The structure of the Barnes Lake area 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.



# Barnes East Samples



### Legend

- Indian Reserves
  - National Parks
  - Conservancy Areas
  - Parks
  - Federal Transfer Lands
  - MTO Grid (MTO)
  - Mineral Tenure (current)**
  - Mineral Claim
  - Mineral Lease
  - Mineral Reserves (current)**
  - Placer Claim Designation
  - Placer Lease Designation
  - No Staking Reserve
  - Conditional Reserve
  - Release Required Reserve
  - Surface Restriction
  - Recreation Area
  - Others
  - First Nations Treaty Related Lands
  - First Nations Treaty Lands
  - Integrated Cadastral Fabric
  - Survey Parcels
  - BCGS Grid
  - Contours (TRIM)**
  - Contour - Index
  - Contour - Index.Indefinite
  - Contour - Index.Depression
  - Contour - Index.Depression Indefinite
  - Contour - Intermediate
  - Contour - Intermediate.Indefinite
  - Contour - Intermediate.Depression
- Scale: 1:9,502

This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

Figure 11 Sample Location and Results





Figure 12 Google Image of Area



## WORK PROGRAM 2014-2015

The 2014-2015 program consisted of continued reconnaissance prospecting, rock sampling and establishing access, samples were collected and assayed.

Results for 2014-2015 sampling are generally low and sample location and Si and Ca values are plotted on Figures 11.

In 2015 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. Continued sampling is required "lower" in the stratigraphy.

Results of the XRF assays are contained in Appendix III and sample descriptions are contained in Appendix IV.

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 2015 samples show low  $P_2O_5$ . With steeper dips of the beds than expected the results suggest that the sampling so far is too high in the sedimentary sequence.

## 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.

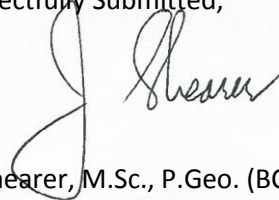
The work done to date has been preliminary and has not addressed questions such as the effects of surface weathering and the potential of changes in grade with depth from surface. As well, it will be necessary to examine the reality of extracting yttrium during phosphoric acid process before a final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

The 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.

In 2015 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 and assayed.

Results of the 2015 samples show low  $P_2O_5$ . With steeper dips of the beds than expected the results suggest that the sampling so far is too high in the sedimentary sequence.

Respectfully Submitted,



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



## REFERENCES

- Altschuler, Z.S. (1980):  
The geochemistry of trace elements in marine phosphorites, part 1: Characteristic abundances and enrichment: Society of Economic Paleontologists and Mineralogists, Special Publication NO. 29, pp. 19-30.
- Altschuler, Z.S., Berman, S. and Cuttitta, F. (1967):  
Rare earths in phosphorites-Geochemistry and potential recovery: USGS Professional Paper 575B, pp. B1-B9.
- Barry, G.S. (1987):  
Phosphate: in Canadian Minerals Yearbook, 1987 Edition, Energy, Mines and Resources Canada, pp. 49.1-49.7.
- Butrenchuk, S.B. (1997):  
Phosphate deposits in British Columbia; BC Ministry of Energy, Mines and Petroleum Resources, Bulletin 97.
- (1987a):  
Phosphates in southeastern British Columbia (82G and 82J); BC Ministry of Energy, Mines and Petroleum Resources, Open File 1987-16, 103p.
- (1987b):  
Phosphate Inventory (82G and J); in Geological Fieldwork, 1986, BC Ministry of Energy, Mines and Petroleum Resources Paper 1987-1, pp. 289-302.
- Christie, R. L. (1978):  
Sedimentary Phosphate Deposits, Geological Survey Paper 78-20.
- (1979):  
Phosphorites in Sedimentary Basins of Western Canada; in Current Research, Part B, Geological Survey of Canada, Paper 79-1B, pp. 253-258.
- Dales, G. D. (1978):  
Report on diamond Core Drilling – PH and WW Group Claims; BC Ministry of Energy, Mines and Petroleum Resources Assessment Report 6859.
- Dorian, N. (1975):  
Refraction seismic survey on the Flathead phosphate claims: BC Ministry of Energy, Mines and Petroleum Resources Assessment Report 5556.
- Fantel, R.J., Anstett, T.F., Peterson, G.R., Porter, K.E. and Sullivan, D.E. (1984):  
Phosphate rock availability-World; US Department of the Interior, Bureau of Mines Information Circular 8989, 65p.

- Freebold, H. (1957):  
The Jurassic Fernie Group in the Canadian Rocky Mountains and Foothills; Geological Survey of Canada, Memoir 287, 197p.
- Hartley, G. S. (1981):  
Physical Work and Investigation of Mineralization on the Zip 1 Claim, Assessment Report 9142
- Heffernan, K.J. (1980):  
Report on Geological Mapping, Sampling and Drilling Wapiti #1-25 Claims Liard Mining Division, Esso Resources Canada, Assessment Report 8407, Minerals Resources Branch, Dept. of Mining and Petroleum Resources of British Columbia.
- Henneberry (1997):  
Fernie Phosphate Project, 1996 Exploration Program, May 20, 1997 Assessment Report 25079
- (1998):  
Fernie Phosphate Project, 1998 Assessment Report, September 1, 1998, Assessment Report 25644
- Kenny, R.L. (1977):  
Exploration for phosphate in southeastern British Columbia by Cominco Ltd.; Paper presented at Canadian Institute of Mining and Metallurgy, Annual Meeting, Ottawa, Ontario.
- Macdonald, D.E. (1987):  
Geology and resource potential of phosphates in Alberta: Alberta Research Council, Earth Sciences Report 87-2, 65p.
- (1985):  
Geology and resource potential of phosphates in Alberta and portions of southeastern British Columbia: unpublished M.Sc. Thesis, University of Alberta, 238p.
- Newmarch, C.B. (1953):  
Geology of the Crowsnest Coal Basin with special reference to the Fernie area: BC Department of Mines, Bulletin No. 33, 107p.
- Norman, G. & Renning, M. (2008A):  
2008 Reconnaissance Exploration and Hand Trenching Assessment Report on the Wapiti Phosphate Prospect, for Pacific Ridge Exploration Ltd. and Lateegra Gold Corp. Submitted February, 2009.
- (2008B):  
2008 Reconnaissance Exploration and Hand Trenching Assessment Report on the Tumbler Ridge Phosphate Prospect, for Pacific Ridge Exploration Ltd. Submitted February, 2009.
- Pell, J. (1990):  
Geological, Lithochemical and Trenching Report on the Barnes #1-#6 Claims for Formosa Resources Corporation, December 15, 1990

- Pelzer, M.A. (1977):  
Geological and drilling report, 1977 field work, phosphate properties, Flathead area, British Columbia: BC Ministry of Energy, Mines and Petroleum Resources Assessment Report 6365.
- Price, R.A. (1965):  
Flathead map area, British Columbia and Alberta: Geological Survey of Canada Memoir 336.
- (1964):  
Flathead (Upper Flathead, east half), British Columbia-Alberta, Geological Survey of Canada Map 1154A (1:50,000).
- (1962):  
Ferne map area, east half, Alberta and British Columbia, 82G/E /2: Geological Survey of Canada, Paper 61-24.
- (1961):  
Ferne (East half) Geological Survey of Canada Map 35-1961 (1:126,720).
- Shearer, J. T. (2012):  
Geological and Airphoto Interpretation Assessment Report on the Wapiti Phosphorite Zones, for Fertoz International Inc., April 18, 2012
- (2013)  
Prospecting Assessment Report on the Barnes Lake Property, dated July 30, 2013 for Fertoz International Inc.
- (2014)  
Geological and Geochemical Assessment Report on the Barnes Lake Property, dated July 3, 2014 for Fertoz International Inc.
- Stowasser, W.E. (1989):  
Marketable phosphate rock - January 1989: US Bureau of Mines, Mineral Industry Surveys, Phosphate Rock Monthly, 8p.
- (1988):  
Phosphate rock; US Department of the Interior, Bureau of Mines Phosphate Rock Minerals Yearbook, 15p.
- (1985):  
Phosphate rock; in Mineral Facts and Problems, 1985 Edition, US Department of the Interior, Bureau of Mines Bulletin 675, pp. 579-594.
- Telfer, L. (1933):  
Phosphate in the Canadian Rockies: The Canadian Mining and Metallurgical Bulletin-1933, No. 260, pp. 566-605.

**APPENDIX I**

**STATEMENT of QUALIFICATIONS**

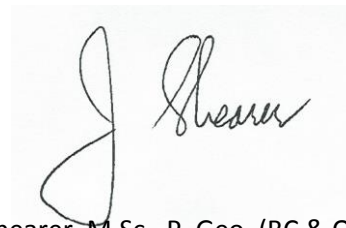
**July 6, 2015**

## 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 July 6, 2015.
6. I have visited the property on September 20+21, 2014. 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 6<sup>th</sup> day of July, 2015.

A handwritten signature in black ink, appearing to read 'J. Shearer', is written over a light blue rectangular background.

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



**APPENDIX II**

**STATEMENT of COSTS**

**July 6, 2015**

Appendix II  
**Barnes Lake Property**  
**Statement of Costs 2014 - 2015**

		Total without GST
J. T. Shearer, M.Sc., P.Geo. (BC & Ontario), Project Supervisor 2 days @ \$700/day, Sept. 20+21, 2014, including travel		\$ 1,400.00
D. Cardinal, B.Sc., P.Geo. 2 days @ \$600/day, Sept. 20+21, 2014, including travel		\$ 1,200.00
	Subtotal	\$ 2,600.00
Transportation		
Truck, 3 days @ \$120/day		240.00
Fuel		200.00
Hotel		220.00
XRF		400.00
Report Preparation		700.00
Word Processing		300.00
	Subtotal	\$ 2,060.00
	<b>Total</b>	<b>\$ 4,660.00</b>

Event #	5561462
Date Filed	July 6, 2015
Amount	\$ 4,600.00
PAC	\$ 240.87
Total Filed	\$ 4,840.87

**APPENDIX III**

**ASSAY RESULTS**

**July 6, 2015**

## Barnes Lake Assay Results

All assays by XRF (see page 23)

**APPENDIX IV**

**SAMPLE DESCRIPTIONS**

**July 6, 2015**

## Barnes Lake Sample Descriptions

DL-14-1	Greenish sandstone, foliated, indurated, overall dark grey to black
DL-14-02	Brown weathering, siliceous siltstone
DL-14-03	Brown weathering, black to dark grey, fined grained siltstone
DL-14-04	Quartzite, dark grey to brownish in colour
DL-14-05	Silty shale, dark grey, very fine grained
DL-14-06	Black shale, very fine grained, somewhat schistose

DL-14-1	49°27'31.83"N	+	114°40'07.30"W	Elev. 1687m
DL-14-02	49°27'32.09"N	+	114°40'05.81"W	Elev. 1694m
DL-14-03	49°27'34.25"N	+	114°40'05.65"W	Elev. 1675m
DL-14-04	49°27'34.87"N	+	114°40'05.05"W	Elev. 1683m
DL-14-05	49°27'34.25"N	+	114°40'02.19"W	Elev. 1692m
DL-14-06	49°27'33.28"N	+	114°39'59.86"W	Elev. 1704m