83-#166 - #11263

4

GEOLOGICAL BRANCH
ASSESSMENT REPORT

11,263

Report on
Trenching and Sampling
on the
Kelly 1 - 5 and Trish 1 - 2
Mineral Claims

Located on Lang Creek, in the
Vancouver Mining Division
NTS 92 F/16 W
British Columbia
at
49° 48' N. Latitude
124° 25' W. Longitude

for
FARGO OIL CORPORATION
by
G. R. Hilchey, P.ENG.
April 1983

GORDON HILCHEY AND ASSOCIATES LTD.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF APPENDICES

1. INTRODUCTION

During August 1981 a germanium/gallium metal prospect located near Lang Bay, British Columbia, approximately 15 kilometres southeast of Powell River, was sampled by the writer on behalf of Fargo Oil Corporation. Analyses of the samples displayed varying amounts of the metals germanium and gallium. The prospect had been acquired by the Company in August 1981 from a syndicate that had staked the area in April and May 1981.

In April 1982 a second sampling program was carried out by the writer in order to determine if the germanium/gallium was distributed uniformly throughout the coal-bearing horizon or concentrated in the base and/or top. Assay results lead to the conclusion that germanium and gallium were fairly uniformly distributed throughout the seam.

In September 1982 the writer supervised a third sampling program for the purpose of confirming the earlier assay results and testing the volatilization of the germanium bearing material. The samples collected were shipped in their natural state (i.e. no sample preparation before analysis) to various assay laboratories in the United States and Europe.

During 1982 Dr. Paul Blaisdell Queneau, P.Eng., a consulting metallurgist was introduced to the Lang Bay project and is currently involved in the preparation of a prefeasibility study on the project on behalf of AMAX of Canada Ltd.

2. LIST OF CLAIMS

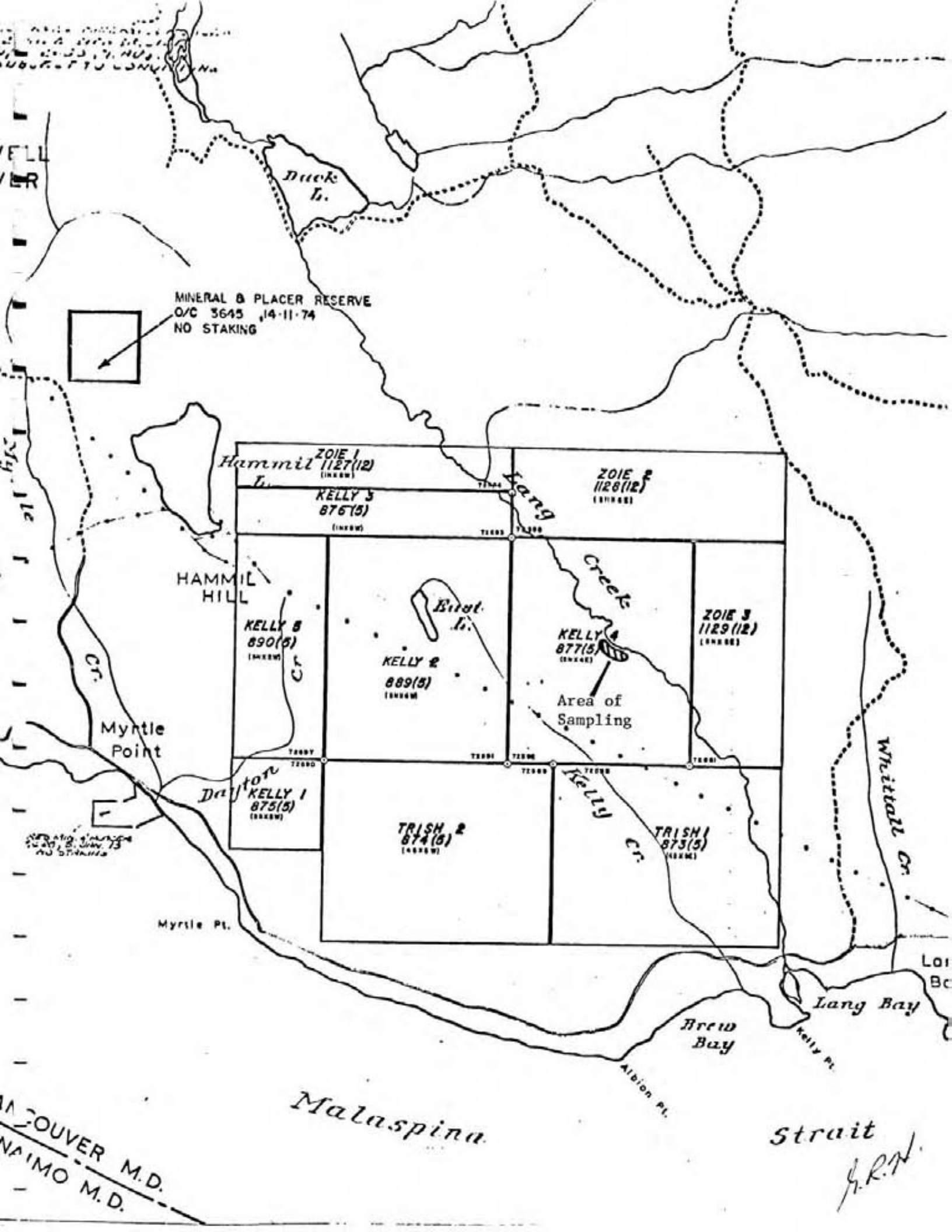
Examination of mineral titles registered with the British Columbia Department of Mines and Petroleum Resources indicates the existence of the following mineral claims covering the area of the Lang Creek prospect near Powell River, B.C.:

Claim Name	Record Number	Number of Units	Expiry Date
Trish 1	873	20	May 4, 1983
Trish 2	874	20	May 4, 1983
Kelly 1	875	04	May 4, 1983
Kelly 2	889	20	May 8, 1983
Kelly 3	876	06	May 4, 1983
Kelly 4	877	20	May 4, 1983
Kelly 5	890	10	May 8, 1983
Zoie 1	1127	06	Dec. 15, 1983
Zoie 2	1128	12	Dec. 15, 1983
Zoie 3	1129	10	Dec. 15, 1983

PROPERTY LOCATION MAP

0 100 200 MILES
0 100 200 400 KILOMETRES

J.R.H.


MINERAL & PLACER RESERVE
O/C 3645 14-11-74
NO STAKING
Duck L.
Hammil L.
ZOIE 1
1127(12)
KELLY 3
876(5)
ZOIE 2
1128(12)
Lang Creek
HAMMIL HILL
KELLY 6
890(6)
Bird L.
KELLY 2
889(5)
KELLY 4
877(5)
Area of Sampling
ZOIE 3
1129(12)
Cr.
Myrtle Point
Dayton
KELLY 1
875(5)
TRISH 2
874(6)
Kelly Cr.
TRISH 1
873(5)
Whittall Cr.
Myrtle Pt.
Lang Bay
Brew Bay
Kelly Pt.
Albion Pt.
Malaspina Strait
VANCOUVER M.D.
NANAIMO M.D.

In summary there are 10 claims consisting of 128 units all owned by Fargo Oil Corporation. This report pertains to the Trish 1-2 and Kelly 1-5 mineral claims.

3. LOCATION

The claim group lies 15 km southeast of the town of Powell River, B.C. centered on Lang creek. General boundaries are Malaspina Strait between Lang Bay and Myrtle Point to the south, Myrtle creek and Hammill lake to the west and northwest, the eastern arm of Lang creek to the north and Whittall creek to the east. The approximate coordinates are 49° 48' N and 124° 25' W. The NTS map reference for the area is 92F/16W.

4. ACCESS

Highway 101 follows the coast from Saltery Bay to Powell River and passes very near to the southern border of the Kelly claim group. A good paved secondary road connecting to Highway 101 between Lang creek and Kelly creek extends north and then west where a tote road in fairly good condition after being cleared of underbrush by a bulldozer, gives access to the outcrop area where the sampling was undertaken.

5. TOPOGRAPHY AND VEGETATION

The gently rolling terrain is basically flat with an elevation of approximately 800 ft. a.s.l. in the northeast corner of the property. The ground slopes down in a gentle fashion towards Malaspina Strait to the south. Lang creek has cut its valley about 100 ft. below the general level of the surrounding area.

The area has a thick second growth of timber consisting mainly of fir, hemlock, and cedar with alder found along the stream and creek banks.

The water supply is plentiful due to the many streams and creeks, the main ones being centrally located Lang creek and Kelly creek, both flowing southeasterly and to the west, Deighton creek flowing southerly into Malaspina strait. Dissecting the property in a northwest to southeast line is a high tension power line.

The climate is mild with an annual rainfall from 40 to 50 inches and minimal snowfall in the winter.

J.R.H.

6. HISTORY

In 1948 a spectrographic research study on the coals of British Columbia discovered high values of germanium in the carbonaceous material found in the Lang creek area. In 1957 the mineral rights to the area were acquired by the now defunct Taiga Mines Ltd. which carried out a bulldozer trenching and drilling program during 1958 and 1959.

In 1981 the property was acquired by the current owner, Fargo Oil Corporation who conducted a trenching and sampling program in August 1981.

7. GEOLOGY

The following description of the geology of the area of interest and of the germanium bearing formations was written by F. C. Buckland, P.Eng., President of Taiga Mines Ltd. It was published in the September 1959 issue of the "Western Miner and Oil Review":

> The low-lying plains, along the north side of the Strait of Malaspina, in the vicinity of Lang Creek southeast of Powell River, B.C., are underlain by thick sandstone-conglomerate-shale formations of Eocene age. The proven extent of this formation is about one mile by four miles and the possible extent about three miles by five. The present indicated thickness is about 1,500 feet. The sedimentary series is underlain by a weathered granite. The contact can be observed in the valley of Lang Creek.
>
> Throughout these sediments there are seams and fragments of coal. Whenever fresh bright coal from the formations has been assayed, it has been found to contain appreciable amounts of germanium. Except for the basal beds, directly overlying the granite basement, the enclosing sandstone and shale is essentially barren.
>
> Germanium-bearing coal fragments were located at that time in two different types of deposits in the series:
>
> **Sandstone-type Occurrence—**
>
> Coal was found to occur as thin, discontinuous lenses from 0.01 inch to 3 inches in thickness and, commonly, less than 10 feet in length; and in chunks and pieces of coarse coal up to 3 feet in diameter.

J.R.H

This type of deposit is probably the result of coalification of logs and branches, etc., deposited with the sandstone. Deposits of this type will naturally be somewhat erratic but sufficient deposition was discovered to indicate that certain areas and beds might be of ore grade.

Shale-type Occurrence—

Lenses of coal usually ¼ inch or less thick and a few inches long occur in a grey silty shale. Large chunks of coal are found intermittently.

Basal Beds—

In April 1959, Dr. A. C. Skerl suggested an examination of the beds towards the base of the sedimentary series, these being of possible greater economic value than those at higher elevations. Immediately a discovery was made of a basal member of the series containing a high percentage of coal and containing germanium in the carbonaceous bed itself, as well as in the coal. Coal occurs on, or a few feet above, the granite basement in a brown to black carbonaceous bed of varying thickness up to perhaps 20 feet. The coal occurs in lenses and narrow beds in the formation from a few thousandths of an inch up to several inches in individual seams. This basal member has been designated as "Brown-bed" by company engineers and has now been proven to occur over a very considerable lateral extent.

8. CURRENT WORK

In April 1982 the writer supervised a sampling program at the same site as the 1981 sampling program. This program was recommended by Wright Engineers Limited, consultants to Fargo Oil Corporation, in order to test the reported tendency of germanium to be concentrated at the floor and roof of coal seams.

A CAT 235 hydraulic excavator opened up fresh cuts and samples were collected at 10 centimetre intervals across the face of the germanium/gallium bearing stratum and delivered to Bacon, Donaldson and Associates Ltd. Sample splits were prepared for analyses as per instructions of Mr. C. O. Ingamells, a research metallurgist who was present during the sampling program.

The splits were then shipped to various laboratories for analyses including Hazen Research, Inc., Golden, Colorado and AMAX Base Metals Research & Development, Inc., Carteret, New Jersey.

The analytical results of these samples varied greatly from very high to very low for both germanium and gallium throughout the entire seam. Due to the wide range in the assay results from the April 1982 sampling program it was the conclusion of Dr. Queneau and a number of laboratories which received the April 1982 samples that another sampling program should be undertaken for the purpose of confirmatory analyses. It was also decided that the samples from this next program should be assayed in their natural state without any preliminary preparation.

In September 1982 the writer supervised the sampling program at the same location as the previous two programs. A John Deere 690 Hoe made fresh cuts in two outcrop areas and a total of twenty-three samples with a combined weight of approximately 100 kilograms were taken over the face of the seam.

The writer then divided each sample into four parts. These sub-samples were shipped in five gallon insulated metal containers to protect against possible volatilization at elevated temperatures, to the same laboratories that received the April 1982 samples in addition to Alfred H. Knight (International) Ltd., Merseyside, England.

Except for one assay house there was a degree of similarity in the germanium results in the 40 to 60 gms/ton range. Eagle-Picher Industries, Inc. which produced 200+ gms/ton results from the April 1982 samples assayed the September samples at 16 gms/ton. Upon consultation with Eagle-Picher it was concluded that the company was not able to analyse reliably the low-grade Lang Bay germanium material.

Gallium analyses have been confirmed in the 200 to 250 gms/ton range.

9. CURRENT RESEARCH

In November 1982, Bacon, Donaldson & Associates Ltd. initiated a preliminary beneficiation test program and in March 1983 they reported some success in concentrating germanium and gallium in a carbon fraction of the Lang Bay material by flotation and heavy liquid separations.

A two phase test program has been recommended by Bacon, Donaldson to establish conditions for the commercial production of a concentrate from the germanium/gallium bearing material found at the Lang Bay property.

G. R. H.

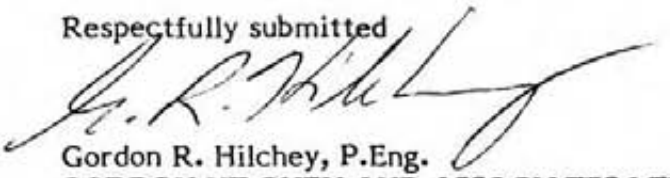
The first stage would consist of a four month laboratory program to establish the unit operations and conditions required for optimum separation of the carbon fraction. Both gravity concentration and flotation techniques would be employed.

The second stage would be a locked cycle test employing those optimum conditions developed in Stage One. The purpose for such a test would be to confirm concentrate grades and recoveries to be achieved and to produce sufficient concentrate for commercial purposes.

At the recommendation of Dr. Queneau a bulk sample will be delivered to Australia for beneficiation tests in a Reichert spiral exclusively designed for coaly material with a high ash content. The results of such a test will be influential in the decision whether to proceed with gravity concentration or to focus on flotation technology.

If these recommendations are carried out, a bulk sampling program will be undertaken first in order to supply Bacon, Donaldson with approximately one tonne of material for their test work.

Respectfully submitted



Gordon R. Hilchey, P.Eng.
GORDON HILCHEY AND ASSOCIATES LTD.

April 15, 1983

REPORT ON SAMPLING
LANG BAY GERMANIUM DEPOSIT
SEPTEMBER 3, 1982

for

FARGO OIL CORPORATION

By

G. R. Hilchey, P.Eng.

GORDON HILCHEY AND ASSOCIATES LTD.

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REPORT ON SAMPLING
LANG BAY GERMANIUM DEPOSIT
SEPTEMBER 3, 1982

One of the major problems of the Lang Bay germanium deposit has been the analytical methods and, apparently, the sample handling procedure. Recently Eagle-Picher has done repeated analyses by various methods and are apparently satisfied that they have the correct germanium content within reasonable limits.

Sample-handling may have been the main problem. Until the most recent samples were processed, the samples were oven dried at about 100° C. The latest samples were air-dried at ambient temperature (20° C) and yielded significantly higher values than oven dried samples analyzed by the same methods. It can be concluded from this that at least some of the germanium occurs in a state which volatalizes at relatively low temperatures. Therefore the current samples have been kept below 20° C with "freezer packs" and insulation. We do not believe that volatalization would start until significantly higher temperatures than 20° C are reached but this precaution is taken to avoid the risk of higher temperatures during storage and shipment.

A description of the samples taken on September 3, 1982 is appended.

DISTRIBUTION OF GERMANIUM

The germanium in the Lang Bay property of Fargo Oil Corp. has until recently been assumed to be in the coaly material. It was therefore inferred that the more coal the more germanium. It was found that material relatively high in vitrain contained less

germanium than brownish clay and arkose which appeared to contain fine organic material, particularly near the top of the brown horizon (locally called a "brown bed"). At first this was assumed to mean that the germanium was absorbed onto the surface of the organic material and that since the finely divided material had more surface area it would absorb more germanium. This has not yet been disproved. It should also be noted that non-carbonaceous material has not been sampled until recently.

Some twenty years ago an attempt was made to concentrate the carbonaceous material by separation from the silicate material with perchlorethylene (dry-cleaning solvent). The resulting coal was found to be very low in germanium. The filtered solvent was a dark amber brown. I do not know if a metallurgical balance was done on the various products but I do recall the conclusion that the germanium had gone onto solution in the perchlorethylene. The analytical procedures at that time were suspect, however, and the accuracy of the conclusion may also be suspect.

It has been suggested that the germanium occurs in or associated with pyrite. Pyrite has been observed only rarely but there is extremely finely divided pyrite in some but not all vitrain.

Recent very close sampling (10 cm intervals) disclosed, on the basis of the latest and presumably best sample handling and analytical procedures, that there is little if any relationship between germanium content and carbonaceous content. We therefore have to look for some other association for the germanium than the carbonaceous material.

Examination of the current samples shows that there are several types of material in the formation:

1) a grey or greenish grey weathered arkose containing quartz grains, clay minerals, biotite and/or chlorite with or without a small percentage of vitrain.

2) a brown version of the above

3) a grey to light tan clay without carbonaceous material. Some sections contain a small amount of quartz grains

4) a brown version of the above - may contain a little carbonaceous material

5) a greenish grey weathered igneous rock - probably originally a granodiorite or quartz-diorite. The feldspars have been weathered to clay minerals and the ferro-magnesians appear to be altered to chlorite. This is the basement underlying the sedimentary formation.

6) a red arkose. The iron in most of the formation is in the ferrous state but occasionally red oxides of iron are found giving a distinct reddish colour. This has been referred to as "red bed."

Previous drilling revealed a considerable amount of ground water - most holes "made water" and one flowed under artesian pressure. This formation water is not available for sampling at the present time. A sample of ground water was taken during the most recent sampling but it is not known how much of it is surface water and how much, if any, is water from the formation.

The source of the germanium is unknown but it is thought that it entered the formation with ground water sometime after the formation was laid down but not in Recent time. On the other hand it has not been proved that the germanium was not deposited with the sediments.

The mode of occurrence of the germanium in the formation is also unknown. As noted above, it had been previously assumed that all the germanium was in the carbonaceous material. The recent detailed sampling throws considerable doubt on this

idea. Furthermore, it may be difficult to develop a satisfactory extraction process until it is known exactly where and how the germanium occurs. Examination under a hand lens suggests that there are only two possible places for the germanium other than the carbonaceous material: either in the clay or in the ferro-magnesian minerals (chlorite/biotite).

The clay occurs in two forms - clay horizons which were apparently deposited as clay and weathered arkose in which the unweathered feldspars were altered to clay minerals after deposition. The two forms of clay should be analyzed separately to determine if they have a significantly different germanium content.

The colour of the clay is apparently not significant but this would be verified by comparing analyses of grey and brown members of the formation.

The chlorite/biotite should be separated from the clay if possible and analysed separately to determine if the Ge is in the chlorite. If this is not practical, perhaps analysis for iron might establish whether or not there is a consistent Ge/Fe ratio.

It is also possible that the germanium is still in solution in the formation water. Until good samples can be taken of the formation water from drill holes it will be impossible to verify this.

There is also a possibility that the germanium occurs in more than one form or in more than one mineral. Analyses of the current samples should help to determine this.

Regarding the volatility of the germanium in the sample material, this can be readily determined from the current samples. The samples should be air-dried at low temperatures and split. The different splits should be heated to various temperatures before analysis. Comparison of Ge content and heating temperature should settle this matter permanently.

If, as suspected, a significant amount of germanium is in the clay, X-ray analysis to determine the clay minerals will probably be necessary before starting research on an extraction process.

CONCLUSIONS AND RECOMMENDATIONS

Once it has been determined where the germanium occurs in the sample material, considerations of the physics and chemistry of the material should lead to intelligent research for developing an extraction process.

Mr. Ingamells will undoubtedly have some more valuable contributions to make at this point.

It is recommended that the various samples be analyzed for germanium by methods recommended by Eagle-Picher before any research is done on extraction processes. Once the analytical results are available the individual samples can be grouped into a few larger samples.

Most of the above remarks probably also apply to gallium in the sample material.

GORDON HILCHEY AND ASSOCIATES LTD.

Gordon R. Hilchey, P.Eng.

8 September 1982

FARGO OIL CORPORATION
LANG CREEK PROPERTY SAMPLES

Sept. 3/82

PIT NO. 1 (WEST) - NO. 1 is stratigraphically highest.

	Sample No.	Width	Weight Kg	Description
	1(no duplicate)	20 cm	2.4	Med.grained light grey weathered arkose-est-2% ferro-magnesians (biotite and/or chlorite) - a few small fragments of vitrain est. 1%.
	2	10 cm	1.8	As above
	2(a)		1.15	
	3	10 cm	1.65	As above except no vitrain obs.
	3(a)		1.25	
	4	15 cm	0.9	Med.grained weathered arkose - 2% FeMg.(biotite and/or chlorite) conspic. red iron oxide stain ("red bed") - no vitrain.
"Red bed"	4(a)		1.4	
	5	12 cm	0.8	As above but a little coarser grained
	5(a)		0.5	
	6	16 cm	2.5	Med.grain light grey weathered arkose-est.2% FeMg's (biotite/ chlorite ?)
	6(a)		1.3	
	7	14 cm	1.05	Med.brown clay w/ some qtz. frag-
	7(a)		1.15	ments 1% vitrain-est. 2% chlorite
	8	14 cm	1.3	Med.grey weathered arkose
	8(a)		1.0	1% vitrain)-est. 2% biotite/ chlorite
	9	20 cm	1.0	Light grey weathered akrose
	9(a)		1.0	1% vitrain)-est. 2% biotite/ chlorite

PIT NO. 1 (WEST) - NO. 1 is stratigraphically highest. - Continued

Sample No.	Width	Weight Kg	Description
10	13 cm	0.9	Brownish grey clay some qtz.grains
10(a)		1.35	1% vitrain
11	15 cm	0.7	Brownish grey clayey arkose
11(a)		1.0	similar to above except sandy
			1% vitrain - Tr. pyrite
12	43 cm	3.6	Grey-brown sandy clay
12(a)		2.9	1% vitrain
13	25 cm	2.1	Grey-brown clayey arkose
13(a)		2.0	1% vitrain
14	26 cm	1.55	Med.grey arkose, a little lower
14(a)		1.8	qtz.content and much less FeMg's than samples 1 - 6
15	40 cm	5.8	Greenish grey rock est. 4-5%
15(a)		3.45	FeMg's(chlorite ?), qtz. content low (est. 5%).
			Weathered QD/GD ?
			Basement
		48.15	

FARGO OIL CORPORATION
LANG CREEK PROPERTY SAMPLES

PIT NO. 2 (EAST) - SAMPLE 21 is topographically highest.

	Sample No.	Width	Weight Kg	Description
	21	65 cm	7.5	Greenish grey weathered
	21(a)		1.3	QD/GD-glacially transported(?)
	Spec.		0.4	5% qtz.-5% FeMg's (chlorite) - looks crumpled in O/C
	22	15 cm	0.85	Dk.Brownish-blk.clay - a little
	22(a)		1.05	sand. 1% vitrain
	23	8 cm	0.8	V.Dk.Brownish-blk. hard
	23(a)		0.9	sandy text. weathered arkose ?
"Brown bed"				1% vitrain - some chlorite ?
	24	17 cm	1.4	Dk.grey clayey sand -
	24(a)		1.6	arkosic ? - 1% vitrain
	25	80 cm	4.3	Light greyish tan clay
	25(a)		6.2	w/small % Qtz.-Only trace
Grey-Tan				of FeMg-No vitrain
Clay	26	30 cm	2.0	
	26(a)		2.3	
	27	70 cm	4.0	Light greenish grey
	27(a)		4.0	QD/GD w. 5% chlorite
	Spec.		2.0	Weathered feldspars - includes some clay from higher in formation
	28	30 cm	1.4	As above
	28(a)		1.15	
			43.15	

This entire exposure appears to have been disturbed by glacial action and is of doubtful value from a geological point of view. Mineralogically and metallurgically the samples are of value.

APRIL 1982 SAMPLING PROGRAM

SUMMARY OF ASSAY RESULTS

Samples

AREA 1

Pit 1

25 samples collected every 10 centimetres over face of germanium/gallium bearing seam commencing at base of seam.

Pit 2

23 samples collected every 10 centimetres over face of germanium/gallium bearing seam commencing at base of seam.

Sample Preparation

Sample preparation carried out by Bacon, Donaldson & Associates Ltd.

Samples were passed through a set of screens to -100 mesh and then riffle split into four (4) quarters.

Analyses

Samples forwarded to the following laboratories for germanium and gallium analyses:

Eagle-Picher Industries, Inc., Quapaw, Oklahoma
AMAX Base Metals Research & Development, Inc., Carteret, New Jersey
Hazen Research, Inc., Golden, Colorado
Canyonlands 21st Century Corp., Blanding, Utah
Laboratoire D'analyses Bachelet, Angleur, Belgium

The assay results are as follows:

AREA 1

Pit 1

Sample Number	Germanium values ppm					Gallium values ppm		
	Eagle-Picher	AMAX	Hazen Research	Canyonlands	La Bachelet	Eagle-Picher	AMAX	Canyonlands
33101	190					600		-
02	230					600		-
03	190			450/2/30		500		132
04	190					400		-
05	170					400		-
06	200					460		-
07	210					400		-
08	250					400		-
09	250			400/2/30		400		122
10	190					600		-
11	320					500		-
13	250					500		-
14	130					500		-
15	170					600		-
16	330					600		-
17	150					700		-
18	160					600		-
19	250					400		-
20	260					400		-
21	240					400		-
22	270					400		-
23	210					400		-
24	170					500		-
25	230					400		-
26	260					500		-
Pit I (Composite)		40	80		44		260	

There was no sample 33112.

AREA 1

Pit 2

Sample Number	Germanium values ppm Eagle-Picher	Gallium values ppm Eagle-Picher
33127	300	400
28	230	400
29	250	400
30	200	500
31	170	500
32	170	400
33	220	400
34	370	300
35	230	300
36	190	300
37	160	300
38	220	300
39	190	300
40	190	300
41	190	500
42	240	500
43	220	400
44	230	400
45	290	300
46	330	400
47	260	300
48	230	400
49	200	300
A	190	300
B	180	400

Sample A - No number - light coloured
Sample B - No number - dark coloured

There was no Sample 33112.

SEPTEMBER 1982 SAMPLING PROGRAM

SUMMARY OF ASSAY RESULTS

Samples

AREA 1
Pit 1
2 identical sets of 15 samples were collected from top to bottom of germanium/gallium seam.

AREA 2
Pit 3
2 identical sets of 8 samples were collected from top to bottom of germanium/gallium seam.

Sample Preparation

There was no sample preparation as samples were shipped in their natural state to laboratories for analyses.

Analyses

Samples forwarded to:

Alfred H. Knight International Ltd., Merseyside, England.
AMAX Base Metals Research & Development, Inc., Carteret, New Jersey.
Canyonlands 21st Century Corp., Blanding, Utah.
Eagle-Picher Industries, Inc., Quapaw, Oklahoma.

A summary of the assay results follows:

AREA 1

PIT 1

Sample No.	Width	Values ppm Ge				Values ppm Ga		
		A.H. Knight	AMAX	Canyon - lands	Eagle - Picher	A.H. Knight	AMAX	Canyon- lands
1(no duplicate)	20 cm							
2	10 cm							
2(a)								
3	10 cm	15				24		
3(a)								
4	15 cm							
4(a)								
5	12 cm							
5(a)								
6	16 cm							
6(a)								
7	14 cm							
7(a)					5			
8	14 cm							
8(a)					0			
9	20 cm				14			
9(a)								
10	13 cm							
10(a)					12			
11	15 cm							
11(a)					10			
12	43 cm							
12(a)				275-2-30	38			146
13	25 cm	76				37		
13(a)								
14	26 cm							
14(a)								
15	40 cm							
15(a)								
Composite			20				200	

AREA 2

PIT 3

Sample No.	Width	Germaniun Values ppm A.H. Knight	Germaniun Values ppm Canyon-lands	Gallium Values ppm A.H. Knight	Gallium Values ppm Canyon-lands
21	65 cm				
21(a)					
Spec.					
22	15 cm				
22(a)			363-2-30		154
23	8 cm				
23(a)		58			
24	17 cm				
24(a)					
25	80 cm				
25(a)					
26	30 cm				
26(a)					
27	70 cm				
27(a)					
Spec.					
28	30 cm				
28(a)					
Composite (Pit 1 & 3)					
Undried		60		60	
Dried		68		35	
Standardized with Sodium Carbonate		55		40	

BACON, DONALDSON & ASSOCIATES LTD.
Consulting Engineers

2036 Columbia St., Vancouver, B.C. V5Y 3E1 • Tel. 879-8461, Telex 04-53437

LANG BAY

6 SAMPLES

SAMPLE PREPARATION

PROCEDURES

CARRIED OUT FOR:

Fargo Oil Corporation
9th Floor
850 West Hastings St.
Vancouver, B. C.
V6C 1E1

Attention: Mr. Rod Snyder

File No. 3817
1982 May 13

BACON, DONALDSON & ASSOCIATES LTD.
Consulting Engineers

2036 Columbia St., Vancouver, B.C. V5Y 3E1 • Tel. 879-8461, Telex 04-53437

1982 May 12

File No. 3817

Fargo Oil Corporation
9th Floor
850 West Hastings St.
Vancouver, B. C.
V6C 1E1

Attention: Mr. Rod Snyder

Dear Sirs:

Re: Lang Bay April 6 Samples
Sample preparation procedures

The following procedures were applied to your samples:

1) Each sample was removed from the sample bag and the bag thoroughly cleaned--the samples were dried at room temperature.

2) The description of sample (colour, particle size and approximate coal content by visual inspection) was tabulated (see appended pages).

3) A nest of screens, 10 mesh, 20 mesh, 48 mesh and 100 mesh were set up on a Ro-tap (Tyler).

4) The entire sample was placed on the top screen and the oversize material was crushed (in many small increment changes) to pass the top screen.

. . . 2

5) The top screen was removed and the above procedure (4) was repeated for the new top screen.

6) This procedure (4 & 5) was repeated until all the sample was minus 100 mesh.

7) The minus 100 mesh material was mixed thoroughly and riffle split into 4 quarters.

8) The samples were delivered to Fargo Oil Corporation office.

Please note that during the screening and crushing procedures the behaviour of the mineral components was observed closely. There was no evidence of any smearing or hangup of any constituents during the processing.

We trust this is the information you desire.

Yours very truly,

Bacon, Donaldson & Associates Ltd.

W. G. Bacon, Ph.D., P. Eng.

WGB:pam

FILE NO. 3817 DATE: 1982 May 13

TEST NO.

NOTE: Smearing Rated From 0 to 5, 0 = none, 2 = slight

AMPLE	MESH	CRUSHING STICK	CRUSHING SMEAR	GRIND RAPID	PASS QUICK	OTHER MINERAL	COAL SEGREGAT.* DURING MIX
3110	10		1	✓	breaks ✓ while screen		No
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100						"
3143	10		0	✓	✓		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65						"
	100		0	✓	✓		"
116	10		1	✓	✓		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65						"
	100		0	✓	✓		"
33101	10		0	✓	break ✓ while screen		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"

* Segregation

FILE NO. 3817 DATE: 1982 May 13

TEST NO.

AMPLE	MESH	CRUSHING STICK	CRUSHING SMEAR	GRIND RAPID	PASS QUICK	OTHER MINERAL	COAL SEGREGAT. DURING MIX
33102	10		1	✓	break on screen ✓		No
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"
33121	10		1	✓	✓		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"
33107	10		0	✓	3		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"
33119	10		0	✓	✓		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"

* Segregation

FILE NO. 3817 DATE: 1982 May 13

TEST NO.

AMPLE	MESH	CRUSHING STICK	CRUSHING SMEAR	GRIND RAPID	PASS QUICK	OTHER MINERAL	COAL SEGREGAT. DURING MI*
3142	10		1	✓	✓		No
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"
33127	10		1	✓	✓		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"
3128	10		0	✓	✓		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"
33129	10		4	✓	✓		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"

* Segregation

FILE NO. 3817 DATE: 1982 May 13

TEST NO.

AMPLE	MESH	CRUSHING STICK	CRUSHING SMEAR	GRIND RAPID	PASS QUICK	OTHER MINERAL	COAL SEGREGAT.* DURING MIX
33137	10		3	✓	✓		No
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"
33105	10		2	✓	✓		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	/	✓		"
33111	10		1	✓	✓		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"
33140	10		0	✓	✓		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"

* Segregation

FILE NO. 3817 DATE: 1982 May 13

TEST NO.

SAMPLE	MESH	CRUSHING STICK	CRUSHING SMEAR	GRIND RAPID	PASS QUICK	OTHER MINERAL	COAL SEGREGAT.* DURING MIX
33115	10		0	✓	✓		No
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"
33117	10		0	✓	✓		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"
33148	10		0	✓	✓		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"
33133	10		0	✓	✓		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"

*Segregation

FILE NO. 3817 DATE: 1982 May 13

TEST NO.

AMPLE	MESH	CRUSHING STICK	CRUSHING SMEAR	GRIND RAPID	PASS QUICK	OTHER MINERAL	COAL SEGREGAT.* DURING MIX
3146	10		0	✓	✓		No
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"
33134	10		0	✓	✓		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"
3114	10		2	✓	✓		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"
33147	10		0	✓	✓		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"

Segregation

FILE NO. 3817 DATE: 1982 May 13

TEST NO.

SAMPLE	MESH	CRUSHING STICK	CRUSHING SMEAR	GRIND RAPID	PASS QUICK	OTHER MINERAL	COAL SEGREGAT.* DURING MIX
33108	10		1	✓	✓		NO
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"
33109	10		1	✓	✓		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"
33149	10		0	✓	✓		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"
33138	10		0	✓	✓		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100						

*Segregation

FILE NO. 3817 DATE: 1982 May 13

TEST NO.

SAMPLE	MESH	CRUSHING STICK	CRUSHING SMEAR	GRIND RAPID	PASS QUICK	OTHER MINERAL	COAL SEGREGAT.* DURING MI
33135	10		0	✓	✓		No
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"
33125	10		0	✓	✓		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"
33136	10		0	✓	break up on screen		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"
33144	10		0	✓	break up on screen		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"

*Segregation

FILE NO. 3817 DATE: 1982 May 13

TEST NO.

AMPLE	MESH	CRUSHING STICK	CRUSHING SMEAR	GRIND RAPID	PASS QUICK	OTHER MINERAL	COAL SEGREGAT.* DURING MIX
3118	10		0	✓	✓		NO
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"
33103	10		0	✓	✓		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"
3145	10		0	✓	✓		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	0		"
	100		0	✓	✓		"
33131	10		1	✓	✓		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"

*Segregation

FILE NO. 3817 DATE: 1982 May 13

TEST NO.

AMPLE	MESH	CRUSHING STICK	CRUSHING SMEAR	GRIND RAPID	PASS QUICK	OTHER MINERAL	COAL SEGREGAT.* DURING MIX
3113	10		2	1	1		NO
	20		0	2	1		"
	35		0	1	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"
3141	10		1	✓	✓		"
	20		0	1	✓		"
	35		0	1	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"
3120	10		0	✓	✓		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"
33106	10		0	✓	✓		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"

*Segregation

FILE NO. 3817 DATE: 1982 May 13

TEST NO.

SAMPLE	MESH	CRUSHING STICK	CRUSHING SMEAR	GRIND RAPID	PASS QUICK	OTHER MINERAL	COAL SEGREGAT.* DURING MIX
33122	10		0	✓	✓		NO
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"
33132	10		0	✓	✓		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"
33124	10		0	✓	✓		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"
33123	10		0	✓	✓		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"

*Segregation

FILE NO. 3817 DATE: 1982 May 13

TEST NO.

SAMPLE	MESH	CRUSHING STICK	CRUSHING SMEAR	GRIND RAPID	PASS QUICK	OTHER MINERAL	COAL SEGREGAT.* DURING MIX
33126	10		0	✓	✓		NO
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"
33139	10		0	✓	✓		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"
33130	10		0	✓	✓		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"
33104	10		0	✓	✓		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"

*Segregation

FILE NO. 3817 DATE: 1982 May 13

TEST NO.

SAMPLE	MESH	CRUSHING STICK	CRUSHING SMEAR	GRIND RAPID	PASS QUICK	OTHER MINERAL	COAL SEGREGAT.* DURING MIX
NO I.D.	10		0	✓	✓		NO
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"
NO I.D.	10		0	✓	✓		"
	20		0	✓	✓		"
	35		0	✓	✓		"
	65		0	✓	✓		"
	100		0	✓	✓		"

*Segregation

FILE NO. 3817 DATE: 1982 May 14

TEST NO.

SAMPLE	COLOR		PART	SIZE	VISUAL COAL CONTENT	
3101	grey	black	1" to	-325		<1%
33102	grey	black	1 1/2" to	-325		<1%
3103	grey	brown	1" to	-325		neg.
33104		black	3/4" to	-325		~40%
3105		black	1" to	-325		~2%
3106	black		1/2" to	-325		~40%
33107	black		1/2" to	-325		>1%
3108	grey	black	3/4" to	-325		~10 to 20%
33109						
3110	brown	black	1" to	-325		~1%
3111						
33112						
3113	brown	black	3/4" to	-325		<1%
33114	grey	brown	1 1/2" to	-325		neg.
3115	grey	brown	1" to	-325		<1%
3116	grey	black	1 1/2" to	-325		<1%
33117	grey	black	1" to	-325		~2%
3118	brown	black	1/2" to	-325		~1%
33119	grey	brown	1" to	-325		<1%
3120	grey		3/4" to	-325		<1%
3121	grey		1/2" to	-325		neg.

FILE NO. 3817 DATE: 1982 May 14

TEST NO.

SAMPLE	COLOR		PART	SIZE	VISUAL COAL CONTENT	
33122	grey	brown	1" to	-325		neg.
33123	grey	brown	2 1/2" to	-325		neg.
33124	grey	brown	3/4" to	-325		neg.
33125	grey	black	3/4" to	-325		neg.
33126	grey	brown	1" to	-325		neg.
33127	grey	brown	1 1/2" to	-325		neg.
33128	grey		1" to	-325		neg.
33129	grey		2" to	-325		<1%
33130	grey		1 1/2" to	-325		neg.
33131	grey	black	1" to	-325		~1%
33132	grey	brown	1 1/2" to	-325		neg.
33133	grey	brown	1 1/2" to	-325		neg.
33134	grey	brown	1 1/2" to	-325		<1%
33135	grey	brown	2" to	-325		neg.
33136	grey		2" to	-325		neg.
33137	grey	brown	1 1/2" to	-325		neg.
33138	grey	brown	1" to	-325		<1%
33139	grey		1 1/2" to	-325		~1%
33140	grey		1" to	-325		neg.
33141	grey		2" to	-325		neg.
33142	grey	brown	1 1/2" to	-325		<1%
33143	brown	grey	1" to	-325		neg.
33144	grey	brown	1" to	-325		neg.

FILE NO. 3817 DATE: 1982 May 14

TEST NO.

AMPLE	COLOR		PART	SIZE	VISUAL COAL	CONTENT	
33145	grey	brown	1" to	-325		<1%	
33146							
33147	grey		1 1/2" to	-325		neg.	
33148	grey		1 1/2" to	-325		neg.	
33149	grey		1 1/2" to	-325		neg.	
33150							
No I.D.	grey		7" to	-3"		>1%	
No I.D.	brown	black	1" to	-325		<1%	

1030

EAGLE-PICHER INDUSTRIES, INC.

ELECTRO-OPTIC MATERIALS DEPARTMENT

P. O. Box 737
Quapaw, Oklahoma 74363

Phone 918-673-1650
TWX 910-840-3271

July 16, 1982

Fargo Oil Corporation
9th Floor
850 W. Hastings Street
Vancouver, B. C. VGC 1E1
Canada

ATTENTION: Lauch Ferris

Dear Lauch:

We have completed our analyses of the vitrain samples you sent us, and the data are tabulated on the attached sheet. As stated previously the Ge data are quite consistent with multiple analyses, and we feel confident about them. The Ga analyses are still erratic so we are less comfortable with them. We noted that the Ga concentrations appeared to be much higher than we determined on any of your earlier samples, so we re-assayed the older samples and found that they were reporting much higher now than before. We do not understand this change and look forward to comparing our analyses with others you might receive. We do recognize that these Ga concentrations are still far below levels that we are used to working with, even though they're sharply higher than before. Maybe we're just below our level of competence. At any rate we will look forward to discussing the current data with you.

Sincerely,

J. H. Adams
Plant Manager

JHA/cr

Enclosure

EAGLE PICHER

Lot No.	ppm Ge	ppm Ga	Lot No.	ppm Ge	ppm Ga
33101	190	600	33127	300	400
02	230	600	28	230	400
03	190	500	29	250	400
04	190	400	30	200	500
05	170	400	31	170	500
06	200	460	32	170	400
07	210	400	33	220	400
08	250	400	34	370	300
09	250	400	35	230	300
10	190	600	36	190	300
11	320	500	37	160	300
13	250	500	38	220	300
14	130	500	39	190	300
15	170	600	40	190	300
16	330	600	41	190	500
17	150	700	42	240	500
18	160	600	43	220	400
19	250	400	44	230	400
20	260	400	45	290	300
21	240	400	46	330	400
22	270	400	47	260	300
23	210	400	48	230	400
24	170	500	49	200	300
25	230	400	A*	190	300
26	260	500	B*	180	400

* Sample A had no number and was light colored.
Sample B had no number and was dark colored.

There was no sample 33112.

BACON, DONALDSON & ASSOCIATES LTD.
Consulting Engineers

2036 Columbia St., Vancouver, B.C. V5Y 3E1 • Tel. 879-8461, Telex 04-53437

1982 October 05

Fargo Oil Corporation
9th Floor-850 W. Hastings St.
Vancouver, B. C.
V6C 1E1

Attention: R.M. Snyder

Dear Sir:

Ten samples of ore were assayed as per your instructions in the letter of September 16, 1982. The potassium content was found to be higher than the sodium and the samples were assayed for potassium in triplicate. A larger sample size was used for Series B and C and these should be more accurate than Series A.

At the meeting on September 28th an inquiry was made about the sodium assays. These were done on the B Series and reported to Paul Queneau on the phone October 5th. I have also converted the results into %K and %Na as well as showing the reported $\%K_2O$ and $\%Na_2O$ values.

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Sample	%K_2O			%Na_2O	%K			%Na
	A	B	C	B	A	B	C	B
33102	0.50	0.48	0.50	0.11	0.42	0.40	0.42	0.08
33115	0.89	0.80	0.80	0.27	0.74	0.66	0.66	0.20
33116	0.75	0.72	0.72	0.29	0.62	0.60	0.60	0.22
33117	0.65	0.60	0.60	0.40	0.54	0.50	0.50	0.30
33118	0.75	0.70	0.74	0.21	0.62	0.58	0.61	0.16
33134	1.04	1.00	0.98	0.55	0.86	0.83	0.81	0.41
33137	0.80	0.74	0.74	0.49	0.66	0.61	0.61	0.36
33139	0.80	0.74	0.72	0.27	0.66	0.61	0.60	0.20
33145	0.55	0.58	0.58	0.54	0.46	0.48	0.48	0.40
33149	0.42	0.40	0.40	0.44	0.35	0.33	0.33	0.33

Yours truly,

Bacon, Donaldson & Associates Ltd.

R. Raudsepp

R. Raudsepp, M.A.Sc.

RR:pam

RECEIVED NOV 2 3 1982

Alfred H. Knight International Ltd.

Alfred H. Knight International Ltd.
Church Road, Seacombe, Wallasey,
Merseyside, L44 6JG. U.K.
Telephone: 051-639 7511
Telegrams: Assayers Wallasey.
Telex: 629648

Samplers and Assayers Est. 1881

Registered In London No. 90032
Registered Office: Seacombe

JFLK/SEJ

16th November 1982

Mr. Lauch F. Farris,
Fargo Oil Corporation,
9th Floor, 850 W. Hastings St.
VANCOUVER BC
V6C 1E1
Canada.

Dear Mr.Farris,

Further to my telex of today. I hope you will not think that between early October and today very little has been achieved on the samples you sent, which were packeted so carefully, but we have in truth in view of the importance of this matter decided to "feel" our way.

One thing which has perplexed us is how volatile the Germanium may be in samples drawn from the prospect area. Our conclusions which may be wrong are the following. If a material is inclined to be volatile it has a vapour pressure and this vapour pressure will act and, of course, be more evident the higher the ambient temperature. If material of this nature has been lying about near the surface, or even well below the surface but in porous ground for centuries then it seems to us it is likely that it has stabilised and the readily volatile materials will already have been lost. Is this logical ?

We have done the following. We have made a composite sample of the 42 samples sent in exact equal weight proportions. We have assayed the sample after mixing it in the undried state then dried a proportion of it, stabilised another portion with Sodium Carbonate and below are the findings for both Germanium and Gallium. We have taken three of the samples and using our standard Germanium method have the following results :

	Ge	Ga
Composite Sample undried	60 ppm	30 ppm
Composite Sample dried	68 ppm	35 ppm
Composite Sample standardised with Sodium Carbonate	55 ppm	40 ppm
Sample No. 3	15 ppm	24 ppm
Sample No. 13	76 ppm	37 ppm
Sample No. 23	58 ppm	11 ppm

We are proceeding with further tests using entirely different analytical techniques and hope to report to you within the next two weeks.

Yours sincerely,

J.F.L. KNIGHT

FARGO OIL

SPECTROCHEMICAL DETERMINATION OF GERMANIUM AND GALLIUM

CANYONLANDS 21ST CENTURY CORP.

JANUARY 31, 1983
REVISED MARCH 31, 1983

INTRODUCTION

This report determines the following objectives:

1. The result of germanium using spectrochemical determination was determined to be 15 ppm.

2. The result of spectrochemical determination of germanium in Fargo Oil Samples by x-ray fluorescence gave a maximum value of 36 ppm germanium.

3. A phase I sample, in triplicate, was sent to Laboratoire D' Analyses Bachelet in Angleur Belgium for analysis. Their analysis for germanium shows 44, 58, 42 ppm in the sample. Their method of analysis was unavailable.

4. The result of determination of gallium using atomic absorption methods show gallium to be at 241.5 ppm $\pm$ 17.8.

CANYONLANDS 21ST. CENTURY CORP.

P. O. BOX 2100 • BLANDING, UTAH 84511 • PHONE: (801) 678-2211

FARGO OIL SAMPLES II

SPECTROCHEMICAL DETERMINATION OF GERMANIUM AND GALLIUM

1. 1.1 A phase 2 composite mixture of the Fargo oil specimens was made up by combining 10g each of the following samples from lot #3817: 33101,33102, 33104-08, 33110, 33111 and 33113-33149. The composite mixture was homogenized by a 24 hour rotation in the porcelain mill.

1.2 The phase 2 composite was used as a base for all subsequent analytical work.

2. Determination of Germanium

2.1 Preparation of standards by the method of standard additions was done as follows: to phase 2 composite mixtures, to be used as bases, the following additions of GeO_2 were made: 5ppm, 10ppm, 20ppm, 40ppm, and 60ppm. The additions were of stock amounts of GeO_2 diluted down with phase 2 powder. The above materials totaling about 2g, were thoroughly mixed in a Spex Mill.

2.1.1 A portion of the phase 2 composite was reserved for the determination of Ge.

2.2 The following iron lines were used as internal standard: Fe 3031.639A and Fe 3040.428A, against Ge 3039.064A.

2.3 In the tabulation of data to follow, the step used from the 7 step filter is recorded.

2.3.1 Results are in percent transmission for line denisty. Intensity ratios are finite numbers.

2.4 A plot of ppm GeO_2(Ge) against the intensity ratio Fe 3040.428/ Ge 3039.064 follows as Curve I. This curve is based on the standard addition method; a second curve, drawn parallel to this one passes through the apex. Using the data from TABLE VI we find 15ppm of Ge from the latter plot.

TABLE I A

5.0ppm GeO_2 - 6th Step

Run	Ge 3039.064	Fe 3031.639	I/Io	Fe 3040.428	I/Io
1	97.3	20.0	0.25	23.9	0.26
2	89.7	11.2	0.27	12.2	0.28
3	94.7	12.5	0.23	19.4	0.28
4	94.9	13.6	0.24	19.9	0.28
Average			0.25		0.28

TABLE I B

5.0ppm GeO_2 - 4th step

Run	Ge 3039.064	Fe 3031.639	I/Io	Fe 3040.428	I/Io
1	64.3	8.1	0.35	8.7	0.37
2	54.5	4.5	0.28	4.3	0.28
3	49.9	8.4	0.43	4.9	0.32
Average			0.35		0.32

TABLE II

10ppm GeO_2 - 4th step

Run	Ge 3039.064	Fe 3031.639	I/Io	Fe 3040.428	I/Io
1	78.9	9.0	0.30	9.6	0.31
2	89.5	7.8	0.22	9.0	0.24
3	90.1	9.2	0.24	9.6	0.24
4	88.4	8.3	0.24	7.4	0.22
5	91.7	7.4	0.20	8.7	0.22
Average			0.24		0.25

TABLE III A

20ppm GeO_2 - 6th step

Run	Ge 3039.064	Fe 3031.639	I/Io	Fe 3040.428	I/Io
1	98.2	28.6	0.28	34.5	0.30
2	82.3	19.0	0.40	18.5	0.40
3	83.4	18.5	0.39	21.8	0.42
4	72.4	29.2	0.57	34.3	0.61
5	22.2	10.3	0.70	11.1	0.73
Average			0.47		0.49

TABLE III B

20ppm GeO_2 - 4th step

Run	Ge 3039.064	Fe 3031.639	I/Io	Fe 3040.428	I/Io
1	53.9	8.8	0.42	8.4	0.41
2	31.9	4.7	0.39	4.5	0.38
3	39.6	8.2	0.48	8.2	0.48
4	22.9	9.2	0.66	9.2	0.66
5	8.1	8.3	1.01	3.0	0.55
Average			0.59		0.50

TABLE IV A

40ppm GeO_2 - 6th step

Run	Ge 3039.064	Fe 3031.639	I/Io	Fe 3040.428	I/Io
1	58.0	13.1	0.48	19.0	0.57
2	7.3	12.8	1.32	12.0	1.26
3	4.7	3.8	0.88	2.6	0.67
4	43.5	10.1	0.48	11.3	0.50
Average			0.79		0.75

TABLE IV B

40ppm GeO_2 - 4th step

Run	Ge 3039.064	Fe 3031.639	I/Io	Fe 3040.428	I/Io
1	19.0	9.0	0.71	4.0	0.45
2	12.0	4.5	0.59	3.2	0.48
Average			0.65		0.47

TABLE V

60ppm GeO_2 - 6th step

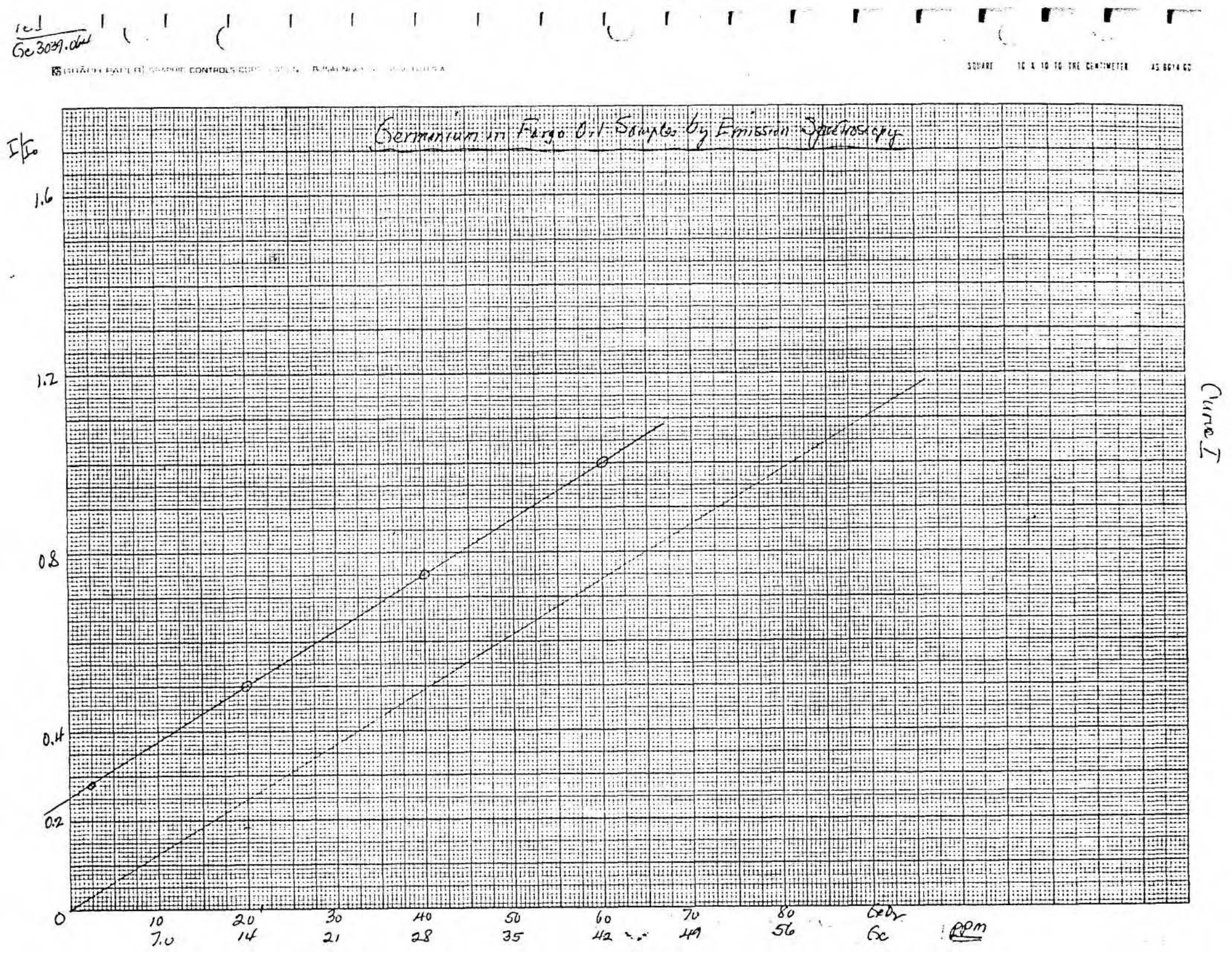
Run	Ge 3039.064	Fe 3031.639	I/Io	Fe 3040.428	I/Io
1	21.4	19.5	0.96	20.0	0.97
2	10.6	10.3	0.98	12.8	1.10
3	2.8	3.3	1.12	3.1	1.06
4	13.2	9.0	0.84	11.0	0.91
Average			0.98		1.01

TABLE VI

Phase 2 Composite - No GeO_2 added - 4th step

Run	Ge 3039.064	Fe 3031.639	I/Io	Fe 3040.428	I/Io
1	89.4	9.9	0.26	4.4	0.16
2	90.3	4.7	0.16	3.6	0.14
3	92.2	3.8	0.22	9.9	0.23
Average			0.21		0.18

rel
Ge3039.dat



3. Spectrochemical Determination of Germanium in Fargo Oil Samples by X-Ray Fluorescence

3.1 This technique was utilized in an effort to correlate values by Ge in Fargo oil samples.

3.1.1 The runs were made on a standard Ge XRD-5 x-ray spectrometer using a LiF crystal and scintillation counter. Standards were prepared by mixing the base phase 2 composite using with previously mixed composite plus GeO_2 in the following concentrations: 10ppm, 25ppm, 50ppm, 100ppm, and 250ppm of GeO_2. This material in turn was mixed 1:1 with 100 mesh bakelite powder (using a Spex Mill). About 3 grams of the latter were hydraulically pressed into a pellet; the resultant pellet was then placed in the x-ray sample compartment. Samples of composite alone were prepared in the same manner.

3.1.2 Ten runs were made on each standard and composite. For each run a sample was irradiated for 100 seconds and recorded as counts per second. Instrument equilibrated for 10 minutes before runs were made.

3.1.3 The spectrogoniometer was set at 36.34° which is the germanium $K\alpha$ line.

3.1.4 The following table records the values obtained.

GERMANIUM BY X-RAY FLUORESCENCE

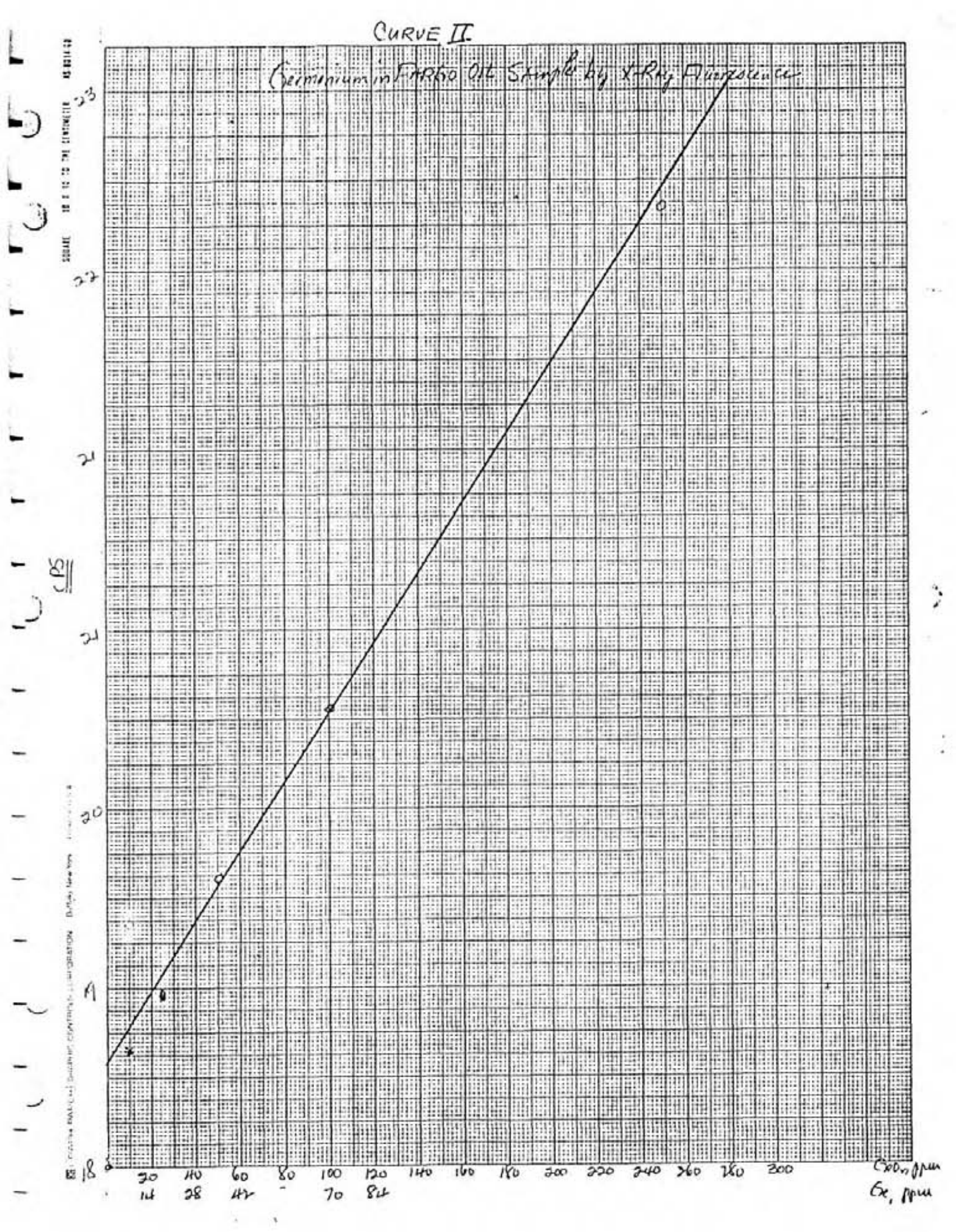
TABLE VII

Results in Counts Per Second (CPS)

Run	10ppm	25ppm	50ppm	100ppm	250ppm
1	18.54	18.91	19.66	20.34	22.14
2	18.42	18.81	19.75	20.25	22.29
3	18.64	18.95	19.81	20.71	22.30
4	18.64	18.90	19.51	20.54	22.57
5	18.69	18.93	19.41	20.62	22.38
6	18.71	18.87	19.70	20.57	22.59
7	18.59	19.16	19.67	20.87	22.41
8	18.71	19.06	19.63	20.60	22.35
9	18.80	19.09	19.45	20.76	22.08
10	18.89	18.92	19.61	20.47	22.38
Average	18.66	18.97	19.62	20.57	22.35

3.1.5 Data from Table VII was plotted on Curve II. Computation from this curve gave a maximum value of 36ppm Ge for phase 2 composite.

3.1.6 Concentration of Ge in composite was determined by method of additions.


CURVE II.
Germanium in FARRO OIL Sample by X-Ray Fluorescence
23
22
21
20
19
18
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
Ge, ppm

4. Determination of gallium using Atomic Absorption Methods

4.1 The sample was fused in Lithium Metaborate ($LiBO_2$) and filled to volume. Initial AA reading of the fusion showed gallium to be at approximately 2000 ppm. The fusion was then extracted first using Methylisobutyl keytone (MIBK), this was then stripped with water and the water read on the AA. Duplicate samples were run using MIBK and Isopropyl Ether as an extractor giving us an average of Ga concentration of 241.5 ppm. (Results of those readings are listed below).

A sample was run using a method of standard additions to determine the effectiveness of the extraction process. It was determined that 97% of the gallium was extracted. It is evident that the reading without the extraction process shows a number of matrix and interference problems. The extraction process, we feel, gives us a truer Ga content.

4.2 A gallium curve was set on an Instrumentation Laboratory 551 AA using gallium line 287.4.

4.3 Standard were checked that were near the AA reading all standards checked to ± .25 ppm.

Ga by Atomic Absorption

Table IX

Extractor	AA reading		Ga ppm
MIBK (different dilution)	1.9		228
MIBK	4.8		246
Isopropyl Ether	4.2		252
Isopropyl Ether	4.0		240
		Average	241.5

Reports on the Lang Bay Germanium/Gallium Property on behalf of Fargo Oil Corporation

June 15, 1981	-	Roy Ellerman, Senior Vice President Mining & Technology, Wright Engineers Limited, Vancouver, B.C. "Lang Creek Germanium Deposit - Review of Data"
September 8, 1981	-	Gordon R. Hilchey, P.Eng., Gordon R. Hilchey and Associates Ltd., Vancouver, B.C. "Report on Sampling of Fargo Oil Corporation Property Lang Creek - Powell River Area, B.C."
September 9, 1981	-	R. W. Edwards, E.I.T., Bacon, Donaldson & Associates Ltd., Vancouver, B.C. "Report on Preparation of Lang Bay, B.C. Samples"
February 1982	-	Dr. L. J. Cabri, Research Scientist, Mineralogy Section, Mineral Sciences Laboratories CANMET, Energy, Mines and Resources, Ottawa, Canada "Preliminary Mineralogical Examination of a Germanium Prospect from Lang Creek, Powell River Area, British Columbia"
March 30, 1982	-	J. H. Adams, Vice President, Specialty Metals Division, Eagle-Picher Industries, Inc. Quapaw, Oklahoma "Letter Report on Lang Bay Phase I Sample Analyses"
May 1982	-	Gordon R. Hilchey, Gordon R. Hilchey and Associates Ltd., Vancouver, B.C. "Report on Trenching and Sampling of Kelly 1-5 and Trish 1-2 Mineral Claims"
May 13, 1982	-	W. G. Bacon, Ph.D., P.Eng., Bacon, Donaldson & Associates Ltd., Vancouver, B.C. "Lang Bay Sample Preparation Procedures"
July 16, 1982	-	J. H. Adams, Eagle-Picher Industries, Inc., Quapaw, Oklahoma "Letter Report on Lang Bay Phase II Sample Analyses"
September 8, 1982	-	Gordon R. Hilchey, Gordon R. Hilchey and Associates Ltd., Vancouver, B.C. "Report on Sampling Lang Bay Germanium Deposit September 3, 1982"
September 23, 1982	-	John E. Litz, Project Manager, Hazen Research (International) Inc., Golden, Colorado "Report on Lang Bay Acid Leach Amenability Test"
September 30, 1982	-	Dr. Thomas S. MacKey, P.E., Key Metals and Minerals Engineering Corporation, Texas City, Texas "Capital and Operating Cost Estimates for A Grass-Roots TBRC Installation"

October 9, 1982 - Paul B. Queneau, Ph.D., P.E., Consulting Metallurgist, Golden, Colorado
"Recovery of Germanium and Gallium at Lang Bay, British Columbia"

October 28, 1982 - Gordon S. Bird, President, Canyonland 21st Century Corp., Blanding, Utah
"Report on Germanium and Gallium Determinations on Lang Bay Samples"

November 1, 1982 - Paul B. Queneau, Ph.D., P.E., Consulting Engineer, Golden, Colorado
"Recovery of Germanium and Gallium from Lang Bay - Progress Report"

November 16, 1982 - John F. L. Knight, Alfred H. Knight International Ltd., Wallasey, England
"Letter Report on Sample Analyses of Phase III Sampling Program, Lang Bay, British Columbia"

December 7, 1982 - M. Dale Slade, Director, Research & Development, Canyonlands 21st Century Corporation, Blanding, Utah
"Spectrochemical Determination of Germanium"

December 9, 1982 - M. G. Price, M.Sc., Queenstake Resources Ltd.
"Prospecting Report on the Zoie 1-3 Mineral Claims"

December 15, 1982 - Paul B. Queneau, Ph.D., P.E., Consulting Engineer, Golden, Colorado
"Status of Lang Bay Ge-Ga Analyses"

January 31, 1983 - M. Dale Slade, Director, Research & Development, Canyonlands 21st Century Corporation, Blanding, Utah
"Spectrochemical Determination of Germanium and Gallium"

February 17, 1983 - Paul B. Queneau, Ph.D., P.E., Consulting Engineer, Golden, Colorado
"Status of Fargo Oil's Lang Bay Ge-Ga Prospect"

March 17, 1983 - M. J. A. Vreugde, Ph.D., P.Eng., Bacon, Donaldson & Associates Ltd.
"Proposal for Beneficiation of Germanium-Gallium Occurrence at Lang Bay, B.C."

REFERENCES

Gordon R. Hilchey, P.Eng.	Progress Report On The Taiga Mines Limited Property, Powell River Area, B.C. May 2, 1959
Dr. A. C. Skerl, ARSM, Ph.D., P.Eng.	Report On The Germanium Property of Taiga Mines Limited, Lang Creek, Powell River Area, British Columbia September 1, 1959
F. C. Buckland, P.Eng. President, Taiga Mines Ltd.	Germanium In British Columbia September 1959
C. Oliver Ingamells	Memorandum of Preliminary Observations and Subsampling Procedures at Lang Bay, British Columbia
Dr. Paul B. Queneau, Ph.D., P.Eng.	Recovery of Germanium and Gallium at Lang Bay, British Columbia, October 9, 1982
Dr. Paul B. Queneau, Ph.D., P.Eng.	Status of Fargo Oil's Lang Bay Ge-Ga Prospect, April 17, 1983
Dr. Morris J.A. Vreugde, Ph.D., P.Eng.	Proposal for Beneficiation of Germanium-Gallium Occurrence at Lang Bay, B.C., March 17, 2983

PHASE II SAMPLING PROGRAM
ITEMIZED COST STATEMENT

1.	Professional Fees & Services				
	G. R. Hilchey,: P.Eng.	1 day in field (Apr.4)	@	$ 400.00	
		Expenses		92.40	
	C.O.Ingamells:	1 day in field (Apr.4)	@	430.00	
		preparation of reports - 3 days		1,290.00	
		Expenses		378.72	
					$2,591.12
2.	Equipment				
	Best Bulldozing	- CAT 235 (Apr.4)		$1,055.00	
	Various Sampling Supplies			286.44	
					1,341.44
3.	Food & Accommodation				773.58
4.	Transportation				
	Air fare			$ 534.00	
	Taxi			11.00	
	B.C. Ferries			42.00	
	Parking			18.00	
			605 X 20% =		121.00
5.	Sample Preparation				
	Bacon, Donaldson & Associates Ltd.				3,733.50
6.	Freight				
	Shipment of samples from Lang Bay to Bacon, Donaldson & Associates, Vancouver B.C.				252.38
7.	Mineralogical Analyses				
	Bacon, Donaldson & Associates Ltd.				403.00
					$9,216.02

PHASE III SAMPLING PROGRAM
ITEMIZED COST STATEMENT

1.	Professional Fees & Services				
	G. R. Hilchey,: P.Eng.	2 days in field(Sept.2,3) @		$ 800.00	
		Sample logging, report, etc.(Sept.4,7,8,9)-1½days @		600.00	
		Expenses		28.00	
	C.O.Ingamells:	Consultant @		494.00	
	Key Metals & Minerals Engr. Corp. Report on estimated installation costs of a TBRC at Lang Bay			3,079.00	
					$ 5,001.00
2.	Equipment				
	Best Bulldozing - John Deere 690 Hoe			$ 717.50	
	Fischer Scientific-5 gal. Pyrex container			191.85	
	Army & Navy - Supplies			73.75	
	Plastic Shop - Styrofoam insulation/ plastic bags			119.69	
	Deakin Equipment - Ten 5 gal. metal containers			62.73	
	Miscellaneous			98.27	
					1,263.79
3.	Food & Accommodation				371.99
4.	Transportation				
	Air fare			$ 536.00	
	B.C. Ferries (Sept. 2-3)			35.50	
	Parking			16.50	
	Gas			5.00	
			593 X 20% =		118.60
5.	Freight				
	Livingston International Freight Inc.			$ 628.58	
	Shipment of samples from Lang Bay to Vancouver			269.77	252,38
	Express Airborne			66.89	
	Air Freight			26.00	
	Shipment to Airport			24.00	
	Customs			10.00	
	Argus Carriers			6.00	
	Courier Service			3.75	
					1,034.99

6. Mineralogical Analyses

Canyonlands 21st Century Corp.	4,779.45	
Chemex Labs	7.00	
		4,786.45

7. Miscellaneous

Photography	198.87	
Film processing	133.56	
Copytime - printing	28.08	
		360.51
		$12,937.33

PHASE II	$ 9,216.02
PHASE III	12,937.33
TOTAL	$22,153.35

microfilm not required T.K

CANYONLANDS 21ST CENTURY CORP.

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Vancouver B.C. V6C 1E1 CANADA

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11/30/82				2% 10 net 30	A2633

67 hours @ $30/hr	$2,010.00

FARGO OIL

DATE 2/5/2/83 AMOUNT 2,[illegible]

CK# _____ ACCOUNT 370 Long Boy

PAYMENT APPROVED MD

ADDS. & EXTENSIONS CHECKED _____

CODING CHECKED _____

RECEIVED DEC 1 5 1982

SERVICE CHARGE "A SERVICE CHARGE AT THE RATE OF 1½% PER MONTH (18% PER YEAR ANNUAL PERCENTAGE RATE) WILL BE ASSESSED ON THE UNPAID BALANCE OF ALL ACCOUNTS MORE THAN 30 DAYS PAST DUE."

THANK YOU

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62 hours @ $30/hr.	$1,860.00

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DATE 2/3/83 AMOUNT

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Rgd Pleasant Co.

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US $2,010.00
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US $3,870.00 X 1.235 = CDN $4,779.45

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Invoice No. 0706

File No. 4061

In Account With Fargo Oil Corporation
9th Floor - 850 West Hastings Street
VANCOUVER, B.C.
V6C 1E1

Purchase Order No.

Date 1982 October 07

Re: Chemical Analysis for Sodium and Potassium in Ten Ore Samples

40 Determinations @ $10 each	$ 400.00
Delivery . FARGO OIL	3.50
	$ 403.50

DATE Oct 14/82 AMOUNT 403.50
CK# _____ ACCOUNT Long Lay
PAYMENT APPROVED [signature]
ADDS. & EXTENSIONS CHECKED _____
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This is a professional invoice and is due when presented.
2% per month charged on invoices over 30 days.

KEY METALS AND MINERALS
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TEXAS CITY, TEXAS 77590

INVOICE

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Fargo Oil Company
9th Floor 850 West Hastings Street
Vancouver, BC, Canada V6C 1E1 Canada

Attn: Mr. Lock Farris

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Invoice 739

YOUR ORDER NO.	DATE SHIPPED	SHIPPED VIA	F.O.B. POINT	SALESMAN	TERMS
					Net

QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL AMOUNT
	Technical Adviser Services Preparation of Preliminary Report #1 "CAPITAL and OPERATING COST ESTIMATES FOR A GRASS ROOTS TBRC INSTALLATION"		
	TOTAL DUE		$2,500 00

PAID ON
DATE 28/10/82 AMOUNT 2,500
CK# [illegible] ACCOUNT Long Bay
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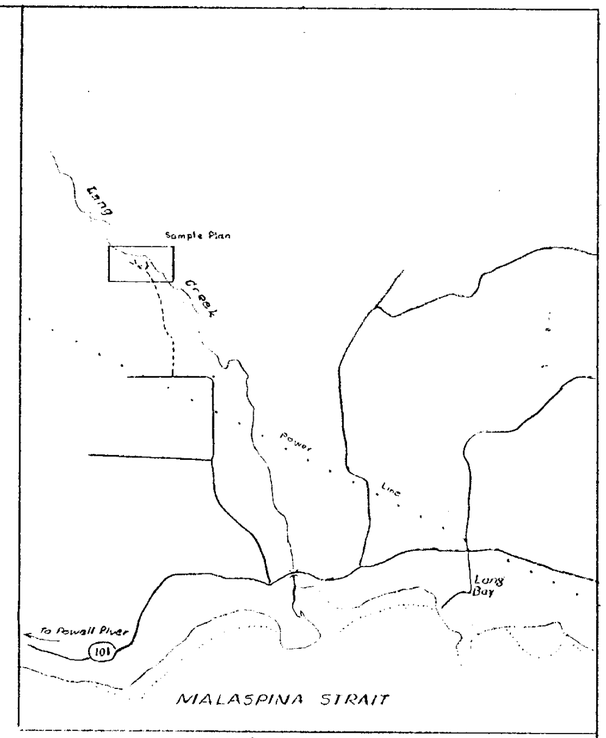
ADDS. & EXTENSIONS CHECKED
CODING CHECKED

Thank You

ORIGINAL

FORM NO. 1414C. THE WILLIAMHOUSE INC., P.O. BOX 1393, HAGERSTOWN, MD. 21740

US $2,500.00
1.235
CDN $3,079



Scale: 1:50,000

PIT Nº 1 5 m. high × 2 m. wide × 3 m. deep

PIT Nº 2 6 m. high × 2 m. wide × 3 m. deep

AREA 1

Lang Creek

AREA 2

PIT Nº 3 6m. high × 2m. wide × 3m deep

1.50 km to Nº 1 KELLY 4

Access road

N

GEOLOGICAL BRANCH
ASSESSMENT REPORT

11,263

FARGO OIL CORPORATION

LANG BAY GERMANIUM PROPERTY

SAMPLE PLAN

0 50 100
Scale: metres

G.R.H.

Drawn by: G.R.H.