

FORT STEELE MINING DIVISION

REPORT ON

DIAMOND CORE DRILLING

PH GROUP AND W1. GROUP CLAIMS

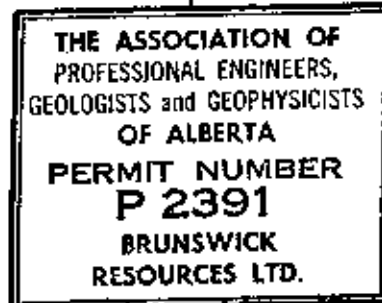
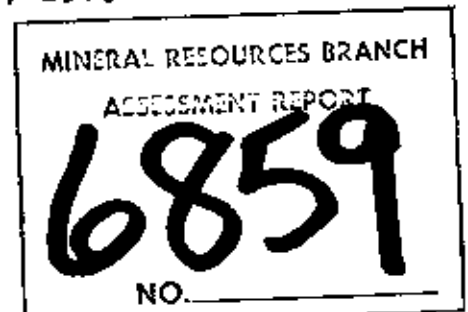
NTS LOCATION: 82G 7/E
CO-ORDINATES: 49°27' North, 114°42' West
OPERATOR: Cochrane Oil & Gas Ltd.
REPORT PREPARED
BY: R. Graeme Dales
UNDER SUPERVISION
OF: Brunswick Resources Ltd.
APEGGA Permit P2391
M. Aileen Pelzer, P. Geol.
APEGGA Permit 23377

DATE TECHNICAL REPORT PREPARED: July 14, 1978

DATE REPORT SUBMITTED: July 28, 1978

COCHRANE OIL & GAS LTD.
WESTERN WARNER OILS LTD.
Reg. Owner,

July 28, 1978



M. Aileen Pelzer

TABLE OF CONTENTS

	Page
INTRODUCTION	1
EXPLORATION HISTORY	2
GEOLOGY	4
INTERPRETATION OF DRILLING RESULTS	5
Interpretive Section - DDH 1978	7
- DDH 1969	
ILLUSTRATIONS	8
Mineralization in Phosphatic Rocks	
MAPS	9
Location of Claims	
Location of DDH's	
Surface and Interpreted Geology	
APPENDIX I	10
Assays	
APPENDIX II	11
Core Descriptions	
APPENDIX III	15
Drillers Logs 1978	
APPENDIX IV	16
Core Location	
APPENDIX V	18
Itemized Cost Statement on Work Done	
APPENDIX VI	22
Report on Occurrence of Uranium	
Mineralization in Phosphatic Rocks	

Introduction

This report will serve to amalgamate previously reported data and recent diamond core drilling results on the PH group and WW group claims.

Forty claims numbered WW 1, WW 2, WW 4, WW 6 - WW 12 inclusive, WW 45 - WW 60 inclusive, WW 83 - WW 88 inclusive and WW 97 - WW 104 inclusive are registered in the name of S.R. Dunn and are held in trust for Western Warner Oils Ltd.

Nine claims numbered PH 1 - PH 9 inclusive are registered in the name of J.S. Adamson and are held in trust for Cochrane Oil & Gas Ltd. (formerly Modesto Exploration Ltd.).

All claims are located in the Flathead Valley of British Columbia on or adjacent to the Flathead Forestry Road 16 miles (26 km) south of its junction with B.C. Highway #3 and approximately 5 miles (8 km) south of the settlement of Corbin (See Map 1).

Bush trails providing access by 4-wheel drive vehicle have been previously constructed by various interests.

Exploration History

Since 1968, Western Warner Oils Ltd. and Medesto Exploration Ltd. have actively investigated the claim groups mentioned above with respect to establishing the presence of economic occurrences of phosphate - bearing rock at the base of the Fernie Shale. Prior to 1968, Imperial Oil Ltd. examined much of the ground in question and conducted a diamond core drilling program before relinquishing rights to the property.

Work completed to date consists of numerous drill holes, a seismic study to determine overburden depth, trenching by hand and utilizing a bulldozer, and basic geological mapping (see G.S.C. Mem. 336; reports by Brunswick Resources Ltd., 1968 - 1978; report by D.K. Robertson, 1976; report by Dornian Consultants, 1975).

It has been assumed, on the basis of previous reports, that a bed of phosphorite averaging 3-1/2 feet (1 m) in thickness and grading from 27% - 33% P_2O_5 occurs at the base of the Fernie Group, directly overlying the Spray River siltstone. Various attempts to verify these assumptions have been made.

The occurrence of phosphate - rich beds in the basal portion of the Fernie shale in south - eastern B.C. is well known. Telfer (Can. Inst. Min. Metall., 1933) lists a section in the Fernie area containing a basal 2.3 foot (0.6 m) showing of oolitic phosphorite having a grade equivalent to 24.3% P_2O_5 , and another section in the Crowsnest area containing a 2.7 foot

(0.6 m) exposure of the same horizon grading 25% P_2O_5 . Outcrops of this basal Fernie phosphorite occur on some of the WW claims, but not on any of the PH claims. Its presence on the latter has been established by diamond drill holes. Analyses of core from holes drilled in 1972 (report by E.E. Pelzer, P. Geol.) showed grades of 12.65% to 28.46% P_2O_5 .

Bulk sampling of the phosphorite horizon in trench exposures (WW claims) yielded substantially higher results of 25.5% - 28.5% (E.E. Pelzer, 1972). The increase in grade is thought to be due to calcite leaching in the near surface but to what depth this effect persists is unknown.

The same report estimates that a total of 288,000 tons of phosphate rock is available for strip mining above a depth of 50 feet (18 m) assuming bed thickness of 3 feet (1 m), reported grades of P_2O_5 , and known geological dips and topographic conditions.

An ongoing project investigating the association of uranium with phosphatic rock of the basal shales of the Fernie Group has been undertaken by various researchers at the Department of Geology, University of Alberta, Edmonton and a preliminary report is appended, (see Appendix VI).

Geology

The Fernie Group (Jurassic) overlies progressively older marine sedimentary strata from west to east and north to south. In the Rocky Mountains of southern Alberta and British Columbia the basal Fernie Group lies disconformably on Lower Triassic Spray River siltstones. The Fernie - Spray River contact is marked only by an abrupt change in lithology and not an angular unconformity.

The surface geology of the report area has been mapped at a scale of 1:63,360 on Geological Survey of Canada Map 1154 A. Brief field examination suggests that the Fernie - Spray River contact (see Map 2) as shown is probably accurate to \pm 250 feet (76 m) where the contact appears as a dashed line and to \pm 500 feet (152 m) where it appears as a dotted line.

Blocky talus of Spray River siltstone and rubbly shale slopes of the Fernie permit reasonable confidence in the designated contact. A break in slope is often apparent at the contact.

Structurally the area is not complex although dips can be in the moderate to high range, (25° - 65°). From both the G.S.C. map and field observations it is obvious that the dip of the Fernie - Spray River contact varies considerably along strike. Minor thrust faults are to be expected in such an area. These have not been observed in the field but there is evidence of extensive faulting in drill core.

Interpretation of Diamond Drilling Results

During June 1978, three holes were drilled at the locations indicated on Map 1. A summary of the attitudes of the drill holes is shown below:

	<u>Azimuth</u>	<u>Inclination</u>
Med 78-1	90°	45°
Med 78-2	90°	45°
WW 78-1	250°	45°

One of the holes (Med 78-1) intersected at right angles the Fernie - Spray River contact and a zone of oolitic phosphate-bearing shale 2 - 3 feet (0.7 - 1.0 m) thick at a depth of 32 feet (10 m). The other two holes were drilled to depths of 33-1/2 feet (10 m) (Med 78-2) and 48 feet (16 m) (WW 78-1) without encountering the disconformity at the base of the Fernie Group.

The interpretive section drawn using information gathered from Med 78-1 and a reported hole drilled in 1969 are shown in Fig. 1.

Core axis-bedding angles in hole Med 78-1 indicate that the Jurassic - Triassic contact has a dip of 45° at that locality. In hole WW 78-1, the core axis-bedding angles range from 20° - 45° but it is uncertain whether the bedding dips are gentler or steeper than 45°.

Due to the limited success of the 1978 drilling

program, specific recommendations and conclusions would not be justified at this time.

Interpretive Section -

Fig. 1 - DD Holes Med 78-1 and 1969

E - W Sectional Drawing
through DDH Med 78-1 & 1969 Hole
PH Group Claims

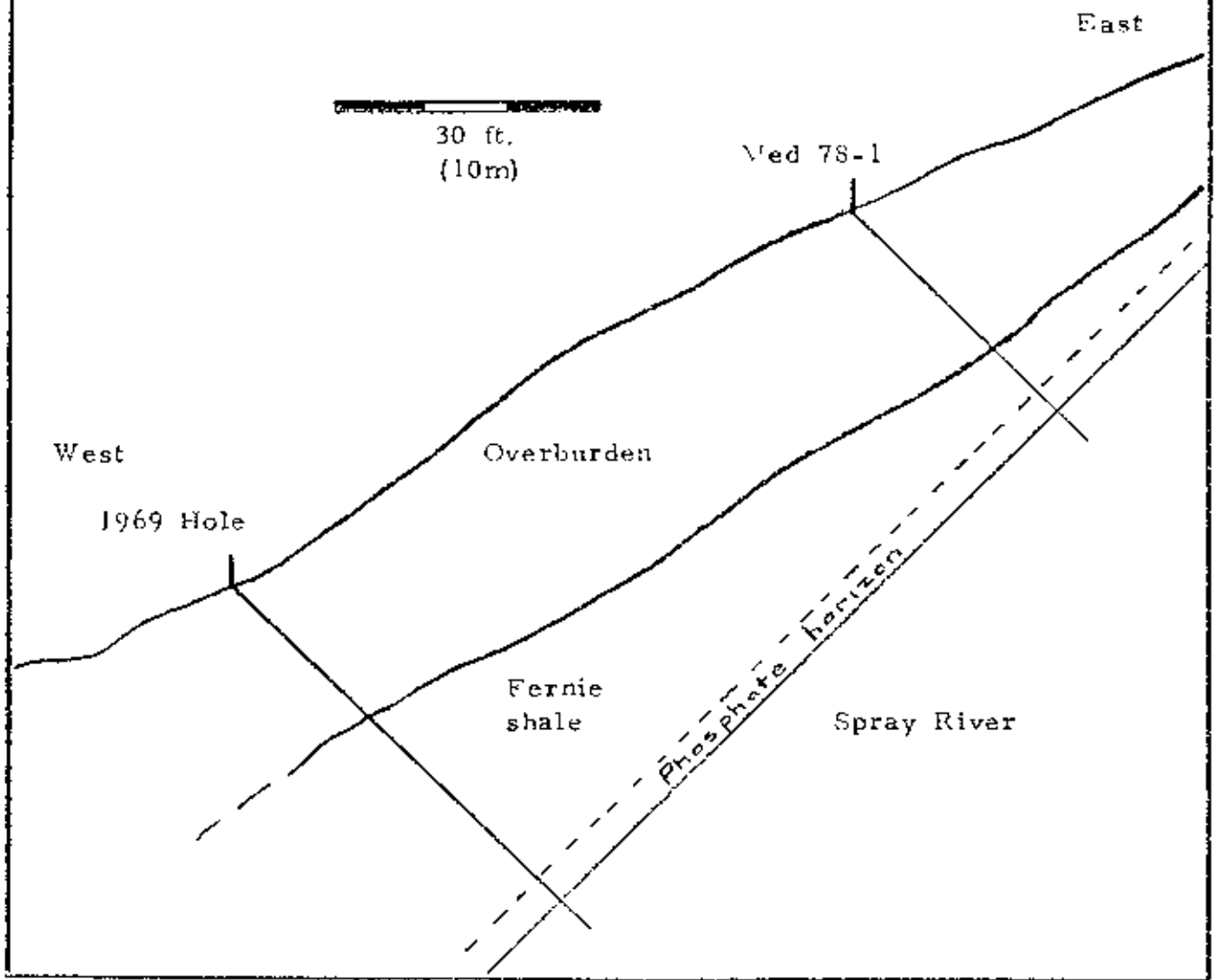


FIGURE 1

Illustrations -

Fig. II - Section through Phosphorite Bed

Fig. III - Schematic Logs on DDH Location
1978

SCHEMATIC LOGS ON DDH LOCATIONS - 1978

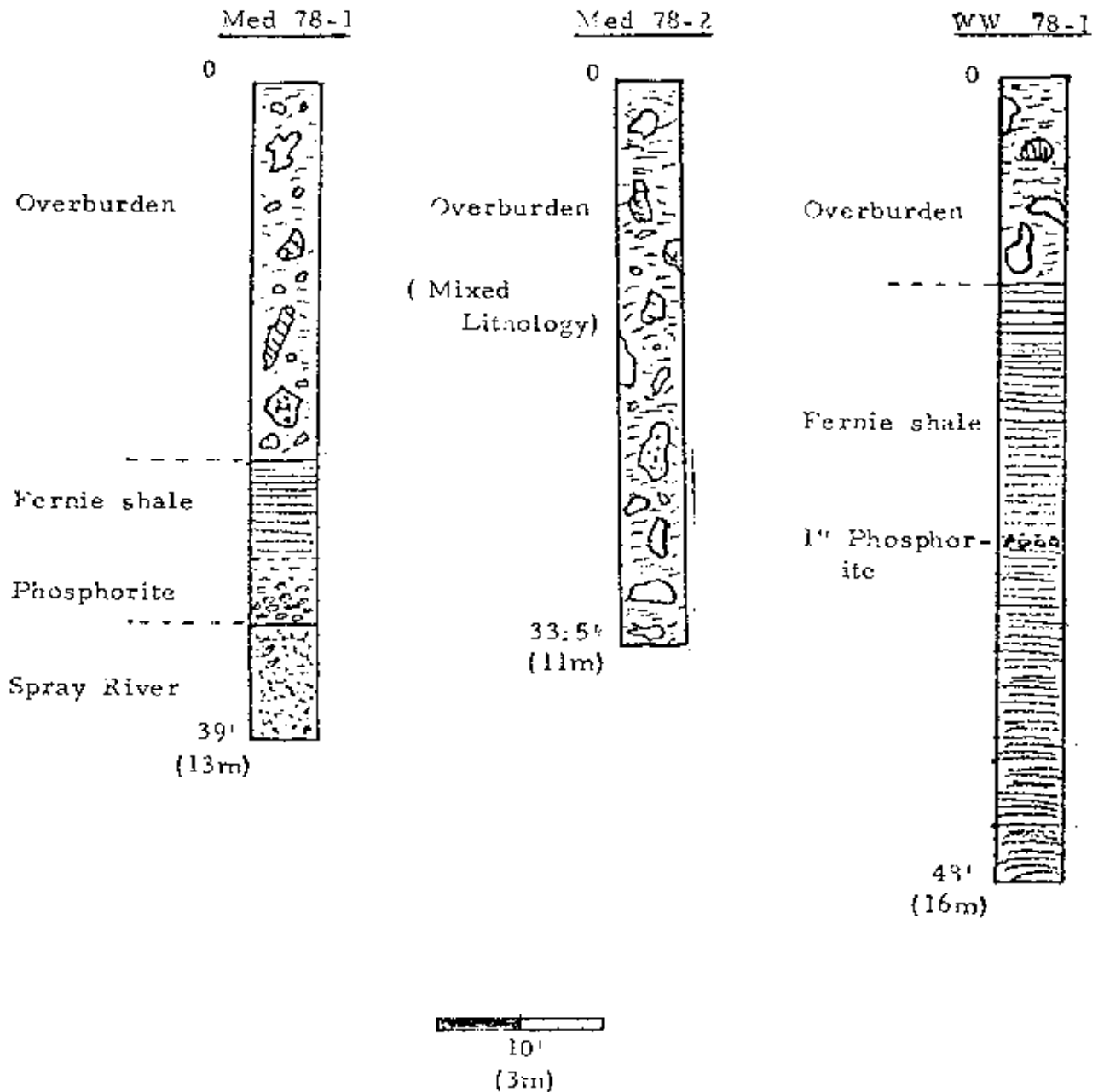
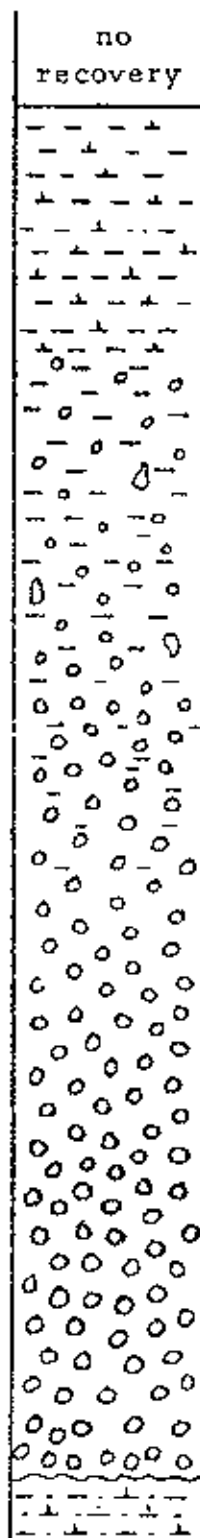


FIGURE 3

Interval: 30' to 31.75'

Recovery: 1.25'



Fernie formation
Black calcareous shale,
no apparent phosphate

Pelleted oolitic phosphorite, some
shale clasts; oolite size and abundance
increases with depth.

Rock has bluish tint.

Reacts to HCl:Molybdic acid solutions

Scale: 1" = 4"

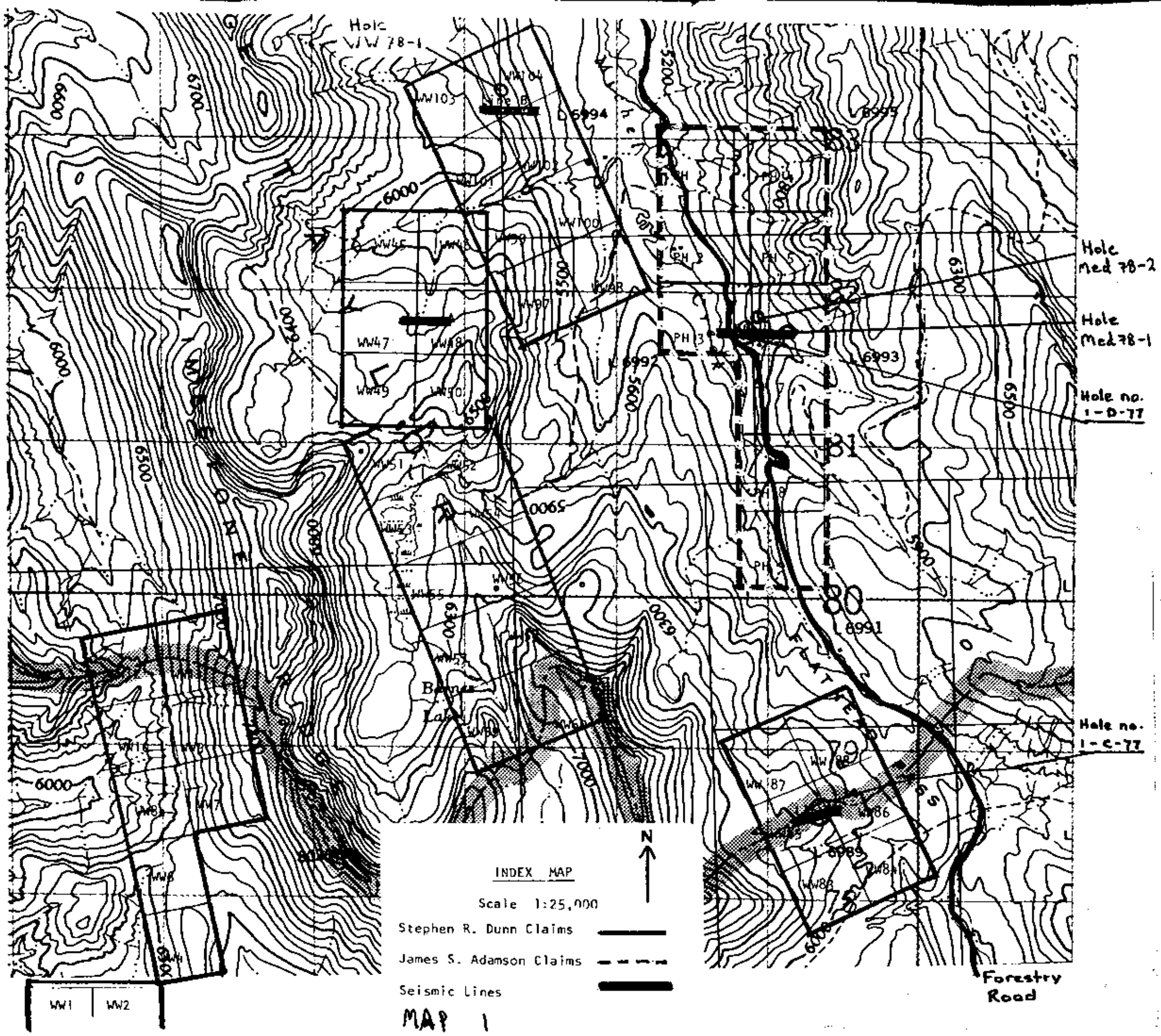
31.75' Basal unconformity
Spray River formation

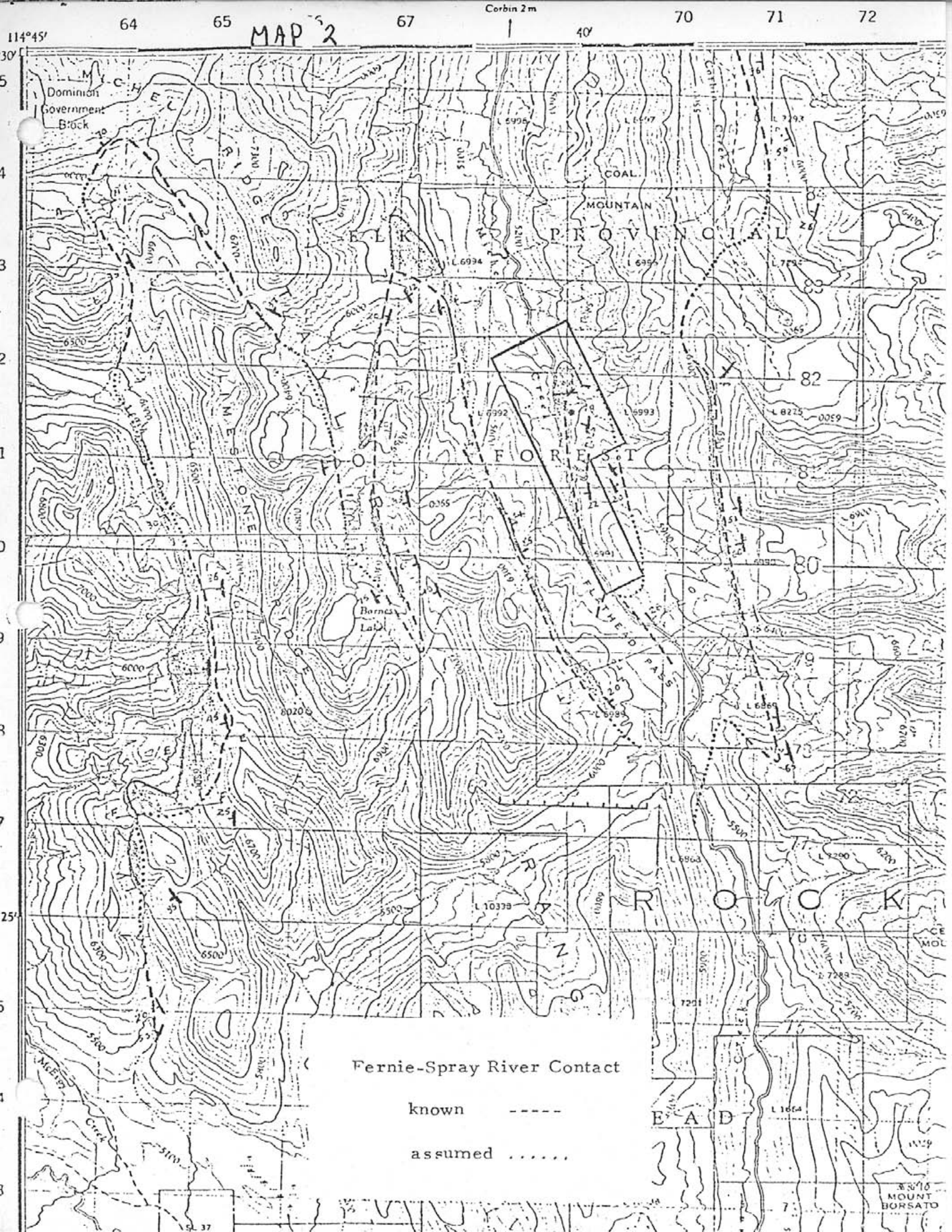
FIGURE 2

Maps -

I - Location of Claims
Location of DD Holes

II - Surface and Interpretive Geology





Dominion
Government
Block

Fernie-Spray River Contact

known -----

assumed

3316
MOUNT
BORRATO

Appendix I - Assays

- P_2O_5 - Gravimetric
- U_3O_8 - Fluorimetric
- Zn - Atomic Absorption

To: Cochrane Oil & Gas Ltd.,
 215A - 10th Street N.W.
 CALGARY, Alta T2N 1V5



File No. 15363
 Date July 4, 1978
 Samples Chip

ATTENTION: Geo. Evans

Certificate of
 ASSAY of
LORING LABORATORIES LTD.

SAMPLE No.	%	Chemical	%
	Zn	3308PPM	P705
<u>"Chip Samples"</u>			
WW - 78 - 1	.04	-	-
MED - 78 - 1	-	37.4	11.92

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
 Pulps Retained one month
 unless specific arrangements
 made in advance.

A. M. Isaac

Licensed Assayer of British Columbia

Appendix II - Drilling Program and
Core Descriptions

Appendix II - Drilling Program and Core Description

Hole: Med 78-1
Spudded: June 21, 1978
Cased for 22' (7 m)
Depth at termination: 39' (13 m)

<u>Drilled Interval</u>	<u>Recovery</u>	<u>Description</u>
24-28'	11" (broken)	black, fissile calcareous shale; minor reaction to HCl:Molybdic acid solutions indicating some P ₂ O ₅ .
28-30'	0	cuttings indicate same lithology as previous interval.
30-31-3/4'	1-1/4' rubble, chips, broken	fine grain size calcareous shale, grading rapidly (top 4") to oolitic, pelleted phosphatic shale. Pellets and oolites increase in size with depth. Contains small (.1-.2") shale clasts. Basal unconformity well exposed. Thickness of phosphorite bed is 12". See Fig. 2.
31-3/4' - 39'	7-1/4' complete, competent core	fine grain size, calcareous, light grey Spray River siltstone. CaCO ₃ filled veins, bedding approximately 1 core axis, perpendicular to core axis.

Hole: Med 78-2

Spudded: June 22, 1978

Cased for 24' (8 m)

Depth at termination: 33-1/2' (11 m)

<u>Drilled Interval</u>	<u>Recovery</u>	<u>Description</u>
0-24'	0	casing through overburden.
24' - 33-1/2'	very poor except in large boulders	loosely compacted accumulation of boulders up to 2-1/2' thick and gravels of mixed lithologies. Recovered intervals of fine grained shaley limestone, limestone breccia, silty, argillaceous sandstone, black calcareous shale. Hole abandoned at 33-1/2' without reaching bedrock.

Hole: WW 78-1
Spudded: June 26, 1978
Cased to: 12' (4 m)
Depth at termination: 48' (16 m)

<u>Drilled Interval</u>	<u>Recovery</u>	<u>Description</u>
0-12'	0	overburden
12' - 33-1/2'	17'10" broken, some frag- mented	black fossiliferous Fernie shale, rusty weathering, CaCO ₃ filled veins finely banded, highly fractured, bed- ding @ 20° to core axis. Some pyrite, slicken sides @ 45° to core axis. Minor (1") oolitic, pelleted beds, bituminous layers, evidence of fault gouge.
33-1/2' - 48'	3'11" poor recovery some cut- tings taken @ 40', 42', 45' 48'	badly broken, faulted shale as before, increased disseminated pyrite, some bands (approx. 1/2") pure pyrite plus bands of silt and sand. Bedding - core axis angle approx. 45°. Core extremely friable. Changed to B.Q. at 33-1/2'.

Core stored at
Cochrane Oil & Gas Ltd,
Calgary

Appendix III - Drillers Logs

ELGIN EXPLORATION COMPANY LIMITED

DAILY DIAMOND DRILL REPORT

PROJECT <i>COCHRANE OIL & GAS</i>		NO. <i>76-3</i>		FOREMAN <i>V. G. BARRILL</i>				DATE <i>July 20/78</i>				DIP ANGLE															
SHIFT	PERSONNEL	RATING	TOTAL HOURS	HOLE NO	CORE SIZE	CORE FROM	CORE TO	CORE REC	CORE HOURS	CASE FROM	CASE TO	CASE SIZE	CASE HOURS	NON CORE FROM	NON CORE TO	NON CORE HOURS	FISHING	SURVEY	CEMENTING	STAND BY	WATER SUPPLY	MOVING	SETTING UP	REPAIRS	TRAVEL	DRILL RENTAL COMPANY HOURS	TRAVEL
	<i>V. G. BARRILL</i>		<i>11 1/2</i>	<i>1</i>																							
	<i>D. BARRILL</i>		<i>11 1/2</i>																								
	<i>A. WIPF</i>		<i>11 1/2</i>																								

BIT NO.	TYPE	SIZE		FROM		TO		HOLE NO	FROM		TO		HOLE NO

EQUIP USED UP, WORN OUT, LOST IN HOLE, BROKEN, ETC.

ADDITIVES, CEMENT USED

OIL, FUEL, SPARE PARTS USED

TRUCK, TRACTOR, TRACKED VEHICLE HOURS

REMARKS

TRAVEL TIME, LOADING & UNLOADING 9 HRS

MOVE & SETTING UP ON NO 1 DRILL SITE 3 1/2 HRS

FOREMAN *V. G. Barrill*

CO. REP *[Signature]*

ELGIN EXPLORATION COMPANY LIMITED

DAILY DIAMOND DRILL REPORT

PROJECT COCHRANE OIL & GAS		NO. 76-3		FOREMAN V. GREENIE				DATE June 21/79				DIP ANGLE 45°																
SHIFT	PERSONNEL	RATING	TOTAL HOURS	HOLE NO.	CORE SIZE	CORE FROM	CORE TO	CORE REC.	CORE HOURS	CASE FROM	CASE TO	CASE SIZE	CASE HOURS	NON CORE FROM	NON CORE TO	NON CORE HOURS	FISHING	SURVEY	CEMENTING	STAND BY	WATER SUPPLY	MOVING	SETTING UP	REPAIRS	TRAVEL	ONLL REPTAL	COMPANY HOURS	TRAVEL TIME
	V. GREENIE		12	#1	HQ					0	21	HW	7 1/2	0	21	-							2 1/2					2
	D. BURRILL		12																									
	A. WIFE		12																									

BIT NO.	TYPE	SIZE	FROM	TO	HOLE NO.	FROM	TO	HOLE NO.
4205943	IMP HQ	0	21	#1				
CASING SHOE								
68799	IMP HW	0	21					

EQUIP USED UP, WORN OUT, LOST IN HOLE, BROKEN, ETC.

ADDITIVES, CEMENT USED

1 X HQ CORE BOX FOR HOLE #1

OIL, FUEL, SPARE PARTS USED

TRUCK, TRACTOR, TRACKED VEHICLE HOURS

REMARKS

TRAVEL TIME IS TRIP FROM COCHRAN TO DRILL SITE & RETURN

FOREMAN *V. Greenie*

CO. REP *[Signature]*

ELGIN EXPLORATION COMPANY LIMITED

DAILY DIAMOND DRILL REPORT

PROJECT <i>Cochrane Drill Pits</i>		NO. <i>76-3</i>		FOREMAN <i>V. Grenkie</i>				DATE <i>June 22/78</i>		DIP ANGLE <i>-45°</i>																	
SHIFT	PERSONNEL	RATING	TOTAL HOURS	MOLE NO.	CORE SIZE	CORE FROM	CORE TO	CORE REC.	CORE HOURS	CASE FROM	CASE TO	CASE SIZE	CASE HOURS	NON CORE FROM	NON CORE TO	NON CORE HOURS	FISHING	SURVEY	CEMENTING	STAND BY	WATER SUPPLY	MOVING	SETTING UP	REPAIRS	TRAVEL	DRILL HEATL COMPANY HOURS	TRAVEL TIME
	<i>V. GRENKIE</i>		<i>12</i>	<i>#1</i>	<i>HQ</i>	<i>21</i>	<i>39</i>			<i>21</i>	<i>25</i>	<i>HW</i>		<i>21</i>	<i>25</i>	<i>-</i>									<i>2</i>	<i>12</i>	
	<i>D. BURRILL</i>		<i>12</i>	<i>#2</i>	<i>HW</i>					<i>0</i>	<i>10</i>	<i>HW</i>		<i>0</i>	<i>11</i>	<i>-</i>							<i>3 1/2</i>				
	<i>A. WIPF</i>		<i>12</i>																								

BIT NO.	TYPE	SIZE	FROM	TO	MOLE NO.	FROM	TO	MOLE NO.
<i>4205943</i>	<i>IMP</i>	<i>HW</i>	<i>21</i>	<i>39</i>	<i>#1</i>	<i>0</i>	<i>11</i>	<i>#2</i>
CASING SHOE								
<i>68799</i>	<i>IMP</i>	<i>HW</i>	<i>21</i>	<i>25</i>	<i>#1</i>	<i>0</i>	<i>10</i>	<i>#2</i>

EQUIP USED UP, WORN OUT, LOST IN HOLE, BROKEN, ETC.

ADDITIVES, CEMENT USED

OIL, FUEL, SPARE PARTS USED

TRUCK, TRACTOR, TRACKED VEHICLE HOURS

REMARKS

HOLE #1 COMPLETED @ 39'

DRILLING TIME: 6 1/2 HRS

MOVING & SET-UP 3 1/2

TRAVEL

2

12 HRS

FOREMAN *V. Grenkie*

CO. REP *R. Dal...*

ELGIN EXPLORATION COMPANY LIMITED

DAILY DIAMOND DRILL REPORT

PROJECT <i>COCUIRANE C. 14 CAS</i>		NO. <i>76-3</i>		FOREMAN <i>V. GRENNIE</i>			DATE <i>June 23/79</i>			DIP ANGLE <i>45°</i>																	
SHIFT	PERSONNEL	RATING	TOTAL HOURS	HOLE NO.	CORE SIZE	CORE FROM	CORE TO	CORE REC	CORE HOURS	CASE FROM	CASE TO	CASE SIZE	CASE HOURS	NON CORE FROM	NON CORE TO	NON CORE HOURS	FISHING	SURVEY	CEMENTING	STAND BY	WATER SUPPLY	MOVING	SETTING UP	REPAIRS	TRAVEL	DRILL RENTAL COMPANY HOURS	TRAVEL TIME
	<i>V. GRENNIE</i>		<i>8</i>																								
	<i>D. BURRILL</i>		<i>8</i>																								
	<i>A. WIPF</i>		<i>8</i>																								

BIT NO.	TYPE	SIZE	FROM	TO	HOLE NO.	FROM	TO	HOLE NO.

EQUIP USED UP, WORN OUT, LOST IN HOLE, BROKEN, ETC.

ADDITIVES, CEMENT USED

OIL, FUEL, SPARE PARTS USED

TRUCK, TRACTOR, TRACKED VEHICLE HOURS

REMARKS

WEATHER SHIFT

RAINING HEAVILY

FOREMAN *V. Grennie*

CO. REP *R. D. ...*

ELGIN EXPLORATION COMPANY LIMITED

DAILY DIAMOND DRILL REPORT

PROJECT <i>COLUMBIAN OIL CAS</i>		NO. <i>76-3</i>		FOREMAN <i>V. GRENKIE</i>				DATE <i>June 24/79</i>			DIP ANGLE <i>115°</i>																
SHIFT	PERSONNEL	RATING	TOTAL HOURS	HOLE NO.	CORE SIZE	CORE FROM	CORE TO	CORE REC.	CORE HOURS	CASE FROM	CASE TO	CASE SIZE	CASE HOURS	NON CORE FROM	NON CORE TO	NON CORE HOURS	FISHING	SURVEY	CEMENTING	STAND BY	WATER SUPPLY	MOVING	SETTING UP	REPAIRS	TRAVEL	DRILL RENTAL COMPANY HOURS	TRAVEL TIME
	<i>V. GRENKIE</i>		<i>13</i>	<i>#2</i>	<i>11 1/2</i>					<i>0</i>	<i>24</i>	<i>11/4</i>	<i>10</i>	<i>11</i>	<i>33 1/2</i>									<i>1</i>	<i>2</i>	<i>12</i>	
	<i>D. BURRILL</i>		<i>13</i>																				<i>1</i>				
	<i>A. WIFE</i>		<i>13</i>																				<i>1</i>				

BIT NO.	TYPE	SIZE	FROM	TO	HOLE NO.	FROM	TO	HOLE NO.
<i>4205943</i>	<i>IMP</i>	<i>11/4</i>	<i>11</i>	<i>18</i>	<i>#2</i>			
<i>4205944</i>	<i>"</i>	<i>"</i>	<i>18</i>	<i>33 1/2</i>	<i>#2</i>			
CASING SHOE								
<i>68799</i>	<i>IMP</i>	<i>11/4</i>	<i>10</i>	<i>24</i>	<i>#2</i>			

EQUIP USED UP, WORN OUT, LOST IN HOLE, BROKEN, ETC.

ADDITIVES, CEMENT USED

OIL, FUEL, SPARE PARTS USED

TRUCK, TRACTOR, TRACKED VEHICLE HOURS

REMARKS

*BLEW HYD. HOSE ON MACHINE
REPAIRS TO SAME.*

*OVERBURDEN IN HOLE #2 IS
VERY DIFFICULT BOULDER ARE
CONTINUOUS UP TO 18" THICK -
VERY HARD.
CASING SHOE WORN OUT @ 24"*

FOREMAN

V. Grenkie

CO. REP.

W. D. ...

ELGIN EXPLORATION COMPANY LIMITED

DAILY DIAMOND DRILL REPORT

PROJECT <i>Canadian Diamonds</i>			NO. <i>76-3</i>				FOREMAN <i>V. Grenier</i>				DATE <i>June 25/77</i>				DIP ANGLE													
SHIFT	PERSONNEL	RATING	TOTAL HOURS	HOLE NO.	CORE SIZE	CORE FROM	CORE TO	CORE REC.	CORE HOURS	CASE FROM	CASE TO	CASE SIZE	CASE HOURS	NON CORE FROM	NON CORE TO	NON CORE HOURS	FISHING	SURVEY	CEMENTING	STAND BY	WATER SUPPLY	MOVING	SETTING UP	REPAIRS	TRAVEL	DRILL RENTAL	COMPANY HOURS	TRAVEL TIME
	<i>V. Grenier</i>		<i>8</i>	<i>1-2</i>																					<i>2</i>	<i>6</i>		
	<i>D. Burrill</i>		<i>8</i>																									
	<i>A. Wipf</i>		<i>8</i>																									

BIT NO.	TYPE	SIZE	FROM		TO		HOLE NO.	FROM		TO		HOLE NO.
CASING SHOE												
EQUIP USED UP, WORN OUT, LOST in HOLE, BROKEN, ETC.												

ADDITIVES, CEMENT USED
OIL, FUEL, SPARE PARTS USED
TRUCK, TRACTOR, TRACKED VEHICLE HOURS

REMARKS
PULL RODS & CASING ON Hole #2
TOTAL DEPTH 33 1/2'
TEAR DOWN & MOVE TO NEW
LOCATION (#3)
WEATHER BAD (RAIN)

FOREMAN *W. H. Gie*

CO. REP *R. D. D...*

ELGIN EXPLORATION COMPANY LIMITED

DAILY DIAMOND DRILL REPORT

PROJECT <i>Cochrane Diamonds</i>		NO. <i>76-3</i>		FOREMAN <i>V. Greenie</i>				DATE <i>JUNE 26th & 27</i>				DIP ANGLE <i>1/2°</i>																	
SHIFT	PERSONNEL	RATING	TOTAL HOURS	HOLE NO.	CORE SIZE	CORE FROM	CORE TO	CORE REC.	CORE HOURS	CASE FROM	CASE TO	CASE SIZE	CASE HOURS	NON CORE FROM	NON CORE TO	NON CORE HOURS	FISHING	SURVEY	CEMENTING	STAND BY	WATER SUPPLY	MOVING	SETTING UP	REPAIRS	TRAVEL	DRILL RENTAL	COMPANY HOURS	TRAVEL TIME	
	<i>V. Greenie</i>		<i>12</i>	<i>3</i>	<i>40</i>	<i>12</i>	<i>32 1/2</i>		<i>6</i>	<i>0</i>	<i>13</i>	<i>4W</i>	<i>3 1/2</i>	<i>0</i>	<i>12</i>								<i>12</i>		<i>2</i>	<i>12</i>			
	<i>D. Burrill</i>		<i>12</i>																										
	<i>A. WIFE</i>		<i>12</i>																										
<i>JUNE 27th</i>																													
	<i>V. Greenie</i>		<i>14</i>	<i>3</i>	<i>40</i>	<i>32 1/2</i>	<i>39</i>																						
	<i>D. Burrill</i>		<i>14</i>		<i>38</i>	<i>38</i>	<i>49</i>																						
	<i>A. WIFE</i>		<i>14</i>																										

BIT NO.	TYPE	SIZE	FROM	TO	HOLE NO.	FROM	TO	HOLE NO.
<i>4205944</i>	<i>IMP</i>	<i>110</i>	<i>0</i>	<i>33 1/2</i>	<i>3</i>	<i>32 1/2</i>	<i>39</i>	<i>3</i>
<i>4205550</i>	<i>IMP</i>	<i>HW</i>	<i>0</i>	<i>13</i>	<i>3</i>			

EQUIP USED UP, WORN OUT, LOST IN HOLE, BROKEN, ETC.
USED UP 1 X 50% X HQ REAMERS Well

ADDITIVES, CEMENT USED

OIL, FUEL, SPARE PARTS USED
TOTAL OF 5 X HQ CORE BOXES USED ON JOB.

TRUCK, TRACTOR, TRACKED VEHICLE HOURS

REMARKS
*1 X 10' X 30' DRILL ROD BROKEN IN HOLE.
 HARD, STICKY FIRMIE SHALE.*

JUNE 22
40 BIT WORK OUT @ 38'
30' FROM 38-49
BROKE 1/2 HISE IN DERRICK
PULL FLOOR RIG TO ROAD 1 LON
SMALL BOX RIG IN @ 8 P.M.

FOREMAN *V. Greenie*

CO. REP *V. Greenie*

Appendix IV - Core Location

Core located:

Cochrane Oil & Gas Ltd.
Calgary, Alberta

Appendix V - Itemized Cost Statement

WW and PH CLAIMS (jointly)

WW Claims 80% - PH Claims 20%

VALUATION OF WORK

1978

(a)

<u># of Days</u>	<u>Rates Per Day</u>	<u>Specific Dates</u>	<u>Total Wages</u>	<u>Persons Employed #</u>	<u>Employed Type</u>
2	\$ 60	June 20/21	\$ 240	2	Management
2	60	June 26/27	240	2	Management
7	125	June 20-27	875	1	Geologist
TOTAL.....					\$1,355.00

(b)

FOOD and ACCOMMODATION

Company paid for food and lodging for the 3 man drilling crew and for the Geologist. The group stayed in Coleman, B.C. and drove daily to the drilling sites. (round trip - 68 miles)

TOTAL for food and accommodation..510.74

(Drill crew - 8 days)

(Geologist - 7 days)

In addition the Company paid for meals for two management representatives as noted in (a) above (June 20/21 & June 26/27)

TOTAL.....44.10

(c)

TRANSPORTATION

Company paid for private auto transportation as required @20¢ per mile and 4-wheel drive transportation @40¢ per mile.

<u>DATE</u>	<u>TRIP</u>	<u>MILEAGE</u>	
		<u>AUTO</u>	<u>4 x 4</u>
June 20/21	Calgary - Drill site - Calgary	387	
June 26/27	Calgary - Drill site - Calgary	387	
June 20	Coleman - Drill site - Coleman		68

<u>DATE</u>	<u>TRIP</u>	<u>MILEAGE</u>	
		<u>AUTO</u>	<u>4 x 4</u>
June 20	Calgary - Drill site - Coleman		198
June 21	Coleman - Drill site - Coleman		68
June 22	" " " "		68
June 23	" " " "		68
June 24	" " " "		68
June 25	" " " "		68
June 26	" " " "		68
June 27	" " " "		68
June 27	Coleman - Calgary		198
	TOTAL MILEAGE....	774	940

Auto cost = 774 x 20¢ = \$154.80

4 x 4 cost = 940 x 40¢ = \$376.00

TOTAL.....\$ 530.80

(d)

There were no instrument rentals.

(e)

DIAMOND CORE DRILLING - Contractor, Elgin Exploration Company

Dates - June 20th to 27th incl.

Equipment - Modified 38 Longyear mounted on track vehicle.

Cores - H and BQ as per report.

Elgin Drilling invoice includes:

- a. Cost of moving men and equipment Calgary - drill site - Calgary
- b. Core boxes
- c. Wages of drilling crew
- d. Standby time for weather
- e. Drilling bits

TOTAL Elgin invoice.....\$6,267.10

(f)

ASSAYS

Loring Laboratories of Calgary carried out all assay work. Methods are described in the Report.

July/78 - Assays for Zn, P₂O₅, U₃O₈

TOTAL Loring invoice.....\$ 25.00

(g)

Geological Consulting, supervision, examination and report preparation and writing.

TOTAL.....\$1,500.00

4.

Drill crew had to be transported from Calgary - Drill Site - Calgary as well as from Coleman to Drill Site and return each day substantially adding to costs.

Difficult drilling conditions - Bit costs ran about 18% of total Elgin invoice.

Travel time each day amounted to 2 hours.

5.

Costs are summarized as follows:

Wages	Section A	\$1,355.00
Food & Accommodation	Section B	554.84
Transportation	Section C	530.80
Drilling Contractor	Section E	6,267.10
Assays	Section F	25.00
Report & Supervision	Section G	1,500.00
		<u>\$10,232.74</u>

Section E Projects

Diamond Core Drilling	\$ 8,732.74
Report & Supervision	<u>1,500.00</u>
	\$10,232.74

WW Claims - 80% = \$8,186.19

PH Claims - 20% = \$2,046.35

Appendix VI - Occurrence of Uranium
Mineralization in Phosphatic
Rocks



November 28, 1977

Mr. C. Dales
7820 Calla Donna Place S.W.
Calgary, Alberta
T2V 2R1

Dear Carl:

Enclosed please find the report which you have been waiting for. It is important to note that the phosphate prospect was only briefly examined on two occasions but as Chris Van Dyke progresses with his thesis, I am sure that you will receive some more information.

I must also emphasize that the samples were all from weathered outcrop. It would be interesting to see if fresh samples (diamond drill core) would carry higher values of uranium.

Yours very truly,

W.C. Bale

WCB:heh
Encl.

THE ASSOCIATION OF URANIUM
WITH PHOSPHATIC ROCK
IN THE
BASAL SHALES OF THE FERNIE GROUP

by

W.C. Bale
Department of Geology
University of Alberta
Edmonton, Alberta

INTRODUCTION:

The Department of Geology, University of Alberta, has recently begun a study of uranium resource evaluation in Alberta. With the recent increases in the price of uranium, it has become apparent that explorationists will be examining a variety of low grade uranium potentials. The association of uranium with sedimentary phosphatic rocks provide Alberta with the possibility of producing uranium as a by-product from phosphate production. Although no phosphate ore is mined in Alberta at the present time, favourable phosphate prospects do exist.

The study to date has included a reference search, cursory sampling of phosphates (from Medesto Exploration's Barnes Lake prospect), and laboratory analysis for uranium. This report will summarize our present knowledge of uranium found within the phosphates near Barnes Lake.

GEOLOGY:

In southeastern British Columbia, sedimentary phosphate rocks occur in an area extending from Fernie to the Alberta-British Columbia boundary and from the International boundary northwards to the headwaters of the Elk River. The phosphate occurs at the following four levels within the Upper Devonian to Jurassic stratigraphic succession:

1. Phosphatic sandstone within the Rock Creek Member of the lower part of the Fernie Group;
2. Pelletal phosphate rock and phosphatic shale at the base of the Fernie Group;
3. Pelletal phosphate rock with minor phosphatic sandstone and shale within the Permian Ishbel Formation;
4. Nodule and pelletal phosphate rock within the shales of the lower part of the Banff-Evsharo sequence.

At Barnes Lake, pelletal phosphate and phosphatic rock occurs within the basal shales of the Fernie Group. It is black, fine-grained, and has a bituminous odour when struck by a hammer. The majority of the phosphate is found as oolites, pellets, and concretions ranging in size from a fraction of a millimeter to 15 centimeters, and is set in a calcareous matrix. Sand grains are scattered throughout the matrix.

Two sections were examined at Barnes Lake and both exhibit similar field relationships. The Jurassic Fernie Group consists of grey and black shales with intercalations of sandstone, glauconitic sandstone, and limestones. The Fernie Group rests disconformably on top of the Triassic Spray River Formation, a dolomitic-argillaceous siltstone. The thickness of these formations was not determined, but the contact between them can be observed. The phosphatic rock is concentrated at the Spray River - Fernie contact, although minor phosphate, usually disseminated, is found higher up in the Fernie. The thickness of the concentrated phosphate horizon ranges between 1 and 3 meters. It is important to note that intercalations of phosphatic shales occur within the concentrated phosphate horizon. The weathered surfaces often show a characteristic bluish to whitish "bloom".

A scintillometer survey was conducted over the two sections with a SARAT-SPP2. It was noted that the concentrated phosphate horizon was slightly more radioactive than the Fernie shales or the Spray River siltstones. Counts ranged between 20 cps - 30 cps over the shales and siltstones, while the phosphate horizon expressed counts between 25 cps - 40 cps. It is important to note that the anomalous expression from the phosphate is masked out by any substantial amount of overburden.

LABORATORY STUDIES:

Samples of phosphatic rock were brought back to the Department of Geology and analyzed for uranium. It was found that all the samples carried uranium and the concentrations ranged between 20 and 70 ppm. The analysis was done utilizing a gamma-ray spectrometer. Two samples were sent to Loring Laboratories in Calgary to be used as a cross-check with our method and to also be analyzed for vanadium. Chemical analysis of these two samples gave the following results:

Sample No.	U ₃ O ₈ (ppm)	P ₂ O ₅ (%)	V ₂ O ₅ (%)
1	38.9	29.6	trace
2	26.4	30.1	0.03

The U₃O₈ values are intermediate with the values determined by gamma-ray spectrometry and suggest that our method is reliable.

A radioluxograph was taken of a prepared phosphate sample and shows that the uranium is found to be finely disseminated throughout the nodule.

ECONOMIC CONSIDERATIONS:

To date a number of sedimentary phosphate deposits are currently extracting uranium as a by-product. The most notable samples are the Floridian deposits where the Freeport Uranium Recovery Company is anticipating to recover uranium from phosphates averaging approximately 110 ppm. In addition to this, phosphate plants in Calgary and Medicine Hat extract uranium from phosphates mined in the Western United States.

Uranium is recovered in the normal wet process phosphoric acid plant operation. Studies by Freeport indicate that 90% of the uranium is leached out during phosphate acid digestion and that 97% of this is recovered by a simple solvent extraction at a cost of approximately \$10 per pound of uranium produced.

At present, phosphate deposits of western Canada compare unfavourably with deposits in the western U.S. because of the high costs associated with mining thin beds and the lack of economic concentration methods. It must also be emphasized that when evaluating phosphate deposits, many factors other than tonnage and grade must be considered. Incompetent shale beds can be complicated by structural deformation and create ground conditions that result in high mining costs. Further factors which must be considered are transportation, the critical calcium to phosphate ratio and erratic market patterns.

The association of uranium and vanadium with sedimentary phosphatic rocks make many western Canadian phosphate prospects more attractive.

To: MEDESTO EXPLORATIONS,
15.A - 10th St. N.W.,
Calgary, Alberta



File No. 12627
Date January 17, 1977
Samples Chip

ATTN: Mr. G. Evans

Certificate of
ASSAY of
LORING LABORATORIES LTD.

SAMPLE No.	U308 PCN
<p><u>"Chip Sample"</u> Sample # 1</p>	<p>52.0</p> <p>I Herely Certify THAT THE ABOVE RESULTS ARE THOSE ASSAYS MADE BY ME UPON THE HERFIN DESCRIBED SAMPLES</p>

Rejects Retained one month.
Pulps Retained one month
unless specific arrangements
made in advance.

Licensed Assayer of British Columbia

To: MEDESTO EXPLORATIONS,
215 A - 10th Street N.W.,
Calgary, Alberta



File No. 13837
Date August 29, 1977
Samples Powder

ATTN: Mr. G. Evans

Certificate of
ASSAY of
LORING LABORATORIES LTD.

SAMPLE No.	% P205
<u>"Corrected Values"</u> # 77-1 # 007	 31.2 30.4

I Herby Certify THAT THE ABOVE RESULTS ARE THOSE
ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
Pulps Retained one month
unless specific arrangements
made in advance.

E. D. M. Goad
Licensed Assayer of British Columbia

To: MEDESTO EXPLORATIONS,
215A - 10th Street N.W.,
Calgary, Alberta



File No. 13837
Date August 17, 1977
Samples Pulp

ATTN: Mr. G. Evans

Certificate of
ASSAY of
LORING LABORATORIES LTD.

SAMPLE No.	Chemical U308 PPM	% P205
<p>"Pulp Sample"</p> <p># 77-1</p>	<p>66.7</p>	<p>7.42</p>

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
Pulps Retained one month
unless specific arrangements
made in advance.

C. L. M. J. O. A. C.
Licensed Assayer of British Columbia

R. GRAEME DALES

Statement of Qualifications

Academic Bachelor of Arts 1977 (Economics)
University of Alberta
Edmonton, Alberta

Master of Science 1978 (Geology)
University of Toronto
Toronto, Ontario

Practical Summer Employment

1976,1977 - Chevron Standard Ltd.
Minerals Staff
901 - 355 Burrard St.
Vancouver, B.C.

1975 - Energy Mines and Resources
CANMET
I.S.P.G.
Calgary, Alberta

1968-1974 - Western Warner Oils Ltd.
Medesto Explorations Ltd.
215A - 10 St. N.W.
Calgary, Alberta

R. Graeme Dales