E.R.J.

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REPORT

on

PROPOSED MINING PROGRAMME

REXSPAR URANIUM & METALS MINING CO. LIMITED

KAMLOOPS MINING DIVISION

BRITISH COLUMBIA

August 1, 1955
2642 Nelson Avenue
West Vancouver, B. C.

S. M. Manning
Professional Mining Engineer
Province of British Columbia

R E P O R T

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C E R T I F I C A T E

I, S. M. Manning, of the City of Vancouver, in the Province of British Columbia, HEREBY CERTIFY:

1. THAT I am a Mining Engineer with business address at 2642 Nelson Avenue, West Vancouver, B. C.

2. THAT I was registered as a Professional Mining Engineer of the Province of British Columbia in 1934 and have been practicing my profession for thirty years.

3. THAT I have no direct or indirect interest whatsoever, nor do I expect to receive any, in the property of Rexspar Uranium & Metals Mining Co. Limited, as covered in the report which is attached hereto, and have no interest, nor do I expect to receive or acquire any interest, in the securities of the Rexspar Uranium & Metals Co. Limited.

4. THAT the accompanying Report is based on an examination of the property during December 4th to December 20th inclusive, 1954, July 1955, and a study of all available engineering records on file at the property.

These records consist of

(a) the logs of all diamond drill holes,
(b) the core of all diamond drill holes. These, with few exceptions, are kept in two good buildings, are in numerical order, well stored and in good condition;
(c) geologic and assay plans and sections covering the

  (1) surface
  (2) underground workings,
  (3) diamond drill holes;

(d) self potential plans;
(e) plans of the proposed method of mining the indicated and partially developed orebodies;
(f) geological reports written over the past four years by various engineers such as Leaming, Gatenby, etc.;
(g) annual reports by Ferguson, Atkins and Scott.

S. M. Manning

MAPS

	Scale
Areal Map - Mineral Claims - Geology	1" = 1000'
Section G' - G"	1" = 1000'
Section H - H'	1" = 1000'
"A" Zone Plan - Ore Outline	1" = 20'
"BD" Zone Open Pit Contours	1" = 20'
"BD" Zone Open Pit with Access Roads	1" = 100'

SECTIONS

	Scale
"BD" Zone	
Cross Sections Nos. 246 - 252 Inclusive	1" = 20'
Longitudinal Sections No. 9 - 19 Inclusive	1" = 20'
"A" Zone	
Cross Sections Nos. 45 - 52 Inclusive (47, 50, 51 missing)	1" = 20'
Longitudinal Sections through "A" Orebody miss	1" = 20'
Longitudinal Sections through Reference Line miss	1" = 20'
Longitudinal Sections through Reference Line plus 50 N.E. to 250 N.E. Inclusive.	1" = 20'

5 NE missing

INDEX

INDEX

INTRODUCTION

The group of claims first received attention in 1918 when Fluorspar was discovered on the property. Later, some attention was paid to a bog manganese deposit, and to some lead-zinc showings.

Attention was drawn to the property during the second world war when it was again investigated for fluorspar, and in 1942-43 about 5,000 feet of diamond drilling was completed on the Fluorite Zone.

The presence of uranium mineralization on the property was first suspected in late 1949 and confirmed in 1950.

Active prospecting and development of the uranium showings continued in the five following years. This consisted of surface prospecting, underground development and diamond drilling, together with continuous geological surveying and mapping of the underground workings and surface rock exposures.

As a result of this work, which is still incomplete, two bodies of uranium ore have been outlined and developed and several other radioactive areas have been discovered which are now being tested.

PROPERTY AND TITLE

The property consists of one hundred and twelve claims and fractions, all of which are in good standing as of August, 1955. They cover an area rectangular in shape approximately 4½ miles long by 2 miles wide.

Of the one hundred and twelve claims, twenty-three contiguous and adjoining claims of this group have been surveyed by a registered British Columbia Land Surveyor and have been Crown Granted. Further surveying is being done at the present time.

The title to the property is held by:-

Rexspar Uranium & Metals Mining Co. Limited
Suite 1922, 44 King Street West,
Toronto, Ontario.

LOCATION AND ACCESSIBILITY

The property is located at Birch Island, B. C., a small settlement on the North Thompson River. It is a small farming community through which runs the Canadian National Railway. Birch Island is 12 hours by train from Vancouver, B. C., and 2 hours by train and 3 hours by a fair all-weather automobile road from Kamloops, B. C.

The claims lie on the south side of the main line of the railway, which at Birch Island station, runs east and west along the south shore of the North Thompson River. The property, roughly rectangular in shape, extends southerly from the railway for a distance of approximately four and one-half miles. In a west-east direction

the claims extend from the ridge west of Foghorn Creek easterly to Cedar Creek and beyond. Foghorn Creek runs northerly towards Birch Island.

The ore bodies found and developed on the property lie about two and one-half miles due south of Birch Island Station and are reached from there by an all-weather truck and auto road 7.5 miles in length.

PHYSICAL FEATURES

Elevations vary from 1,480 feet at Birch Island station to 5,000 feet at the southern end of the property.

The claims cover hills which slope moderately to the north except where creeks running nearly due north cut deeply into them.

The moderate slopes are covered with gravel and small trees and lend themselves to easy and cheap road construction.

Precipitation:

Full precipitation and temperature records from 1932 to 1945 from Molliets sheep ranch at Vavenby are as follows:

Rain (av. per year)	12.40"	Average Annual Snowfall 3.66 feet
Snow (equiv. rain)	4.40"	Lowest Recorded Temp. -45° (Jan. 1943)
Tot.	16.80"	

Conditions at Birch Island would be practically identical with those at Molliets sheep ranch at Vavenby.

From the experience of the past two winters it is estimated that 3 to 3½' of snow lay on the ground at camp level; and in the Valley at the lower mill site, the depth of snow was 1' to 1½'.

MINERALOGY

A mineralogical report by the Radioactivity Division of the Department of Mines and Technical Surveys of Ottawa was made on two classes of rock which comprised a three hundred and seventy pound bulk sample assaying 0.082% U_3O_8 (chemical) and 0.091% U_3O_8 (radiometric). This report states in part:

"1. (a) Dark coloured, medium grained, predominantly biotite-rock.

(b) Light coloured, very fine grained rock in which feldspar and quartz are more abundant than the mica.

2. The dark rock is more schistose and more heavily pyritized than the massive light coloured rock.

3. The radioactivity is due to a uraniferous thorite and

pitchblende. The thorite is more abundant and usually occurs in the dark-coloured biotite-rock while the pitchblende is formed in the lighter, more feldspathic rock."

The dark coloured biotite-rock containing the uraniferous thorite is the ore type rock.

GEOLOGY

(See map No.111-1 and cross Sections G-G, H-H)

The area of the property was mapped geologically in 1930 by J. F. Walker, of the Geological Survey of Canada. His findings are in Summary Report 1930, Part A.

Walker states (the Company's property) is underlain by "metamorphosed sediments of the Pre-Cambrian age, cut by later granodiorite intrusives". Locally the trachyte is considered to be of Pre-Cambrian age and the overlying andesite of triassic.

Mr.Walker's report was used as a basis for the recent geological mapping which was conducted by Mr.S.Leaming,assisted by L. Gatenby, A.McLeish and J.Landry; and was under the continuous supervision of Technical Mine Consultants Limited, since 1950.

A Petrographic report by the University of Toronto in early 1953 made on twenty-six specimens from the property indicate four or five groups of rocks.

(1) Tuffs with trachytic fragments embedded in biotite-sericite matrix possibly formed by the metamorphism of an argillaceous matrix of the fragments (mineralized zones).

(2) Highly feldspathic, fine grained porphyritic trachytic tuffs with possibly one or two flows of the same composition (possibly simply large fragments).

(3) Rocks consisting almost exclusively of biotite-sericite.

(4) Rocks consisting chiefly of pegmatitic albite.

(5) Rocks consisting principally of silty argillite.

The basement rocks underlying the property outcrop north and south of the mineralized zones and extend northerly close to Birch Island. They consist chiefly of a schistose light coloured rock of which the chief mineral appears to be sericite. These rocks contain occasional argillaceous bands and lenses varying in thickness from one foot to fifty feet.

At the top of the schists are several of these dark argillaceous lenses, one of which is fifty feet thick.

Overlying this argillaceous bed is a thick bed of trachyte varying in thickness from fifty feet to four hundred feet. This is the ore bearing member of the series.

Capping this and outcropping on the south west limits of the property is a green rock of andesitic composition, the schistose

parts of which are called chlorite schists. Associated with the green-gray rocks are some whitish sericitic-carbonaceous rocks, possibly sediments.

The beds strike approximately north 30 degrees east and dip 25 degrees northwesterly or with the hill.

ORE BODIES AND ORE RESERVES

Proving and assessing the ore bodies has been vigorously pursued since 1950. This work has been under the direction of A. B. Ferguson (now manager of Panel Consolidated), W. Atkins (now manager of Rix Athabasca), J. Scott, resident manager and S. M. Manning of Technical Mine Consultants Limited.

In the year 1951 some surface prospecting, some bulk sampling and metallurgical testing of the then known uranium-bearing areas were undertaken at a cost of $8,073.41.

In 1952 a surface diamond drilling programme was inaugurated in late June and completed in mid December of that year. Most of the drilling was on two areas known as the "A" and the "Black Diamond" or "BD". Total expenditures for the year were $80,807.74.

In 1953 further surface exploration and diamond drilling were begun in May and when nearing completion in the fall, a programme of underground development and diamond drilling was then commenced.

Underground work on the "BD" area consisted of a crosscut at elevations 3,330 feet above sea level. It was driven easterly for a length of 189.5 feet. Total expenditures for the year amounted to $181,818.34.

In 1954 the underground work was continued, together with further surface exploration and diamond drilling.

Underground work on the "BD" zone, which was completed in April, consisted of 813.5 feet of drifts and crosscuts, and 66.0 feet of raises.

The drifts and crosscuts were just under the main ore zone but two downward undulations in the bottom of the ore body were exposed by the workings.

Total expenditures for the year amounted to $198,711.02.

During the 1955 season commencing in January 1955 further underground work was carried out on the "A" zone; consisting of drifting, cross-cutting, raising and underground diamond drilling. This work was completed at the end of June and since then surface diamond drilling has been carried out on the "A" zone, "BD" zone and the area between the Fluorite and "BD" zones.

The estimated expenditures for the above will amount to $121,942.00.

Result of Exploration Work

As a result of the years' work listed above,

(1) the limits and grade of two ore bodies have been fairly closely defined. One is in the "BD" area and the other in the "A" area,

(2) work in several additional promising areas is continuing mainly as surface drilling exploration. Probably these areas will increase the ore reserves appreciably.

Total Ore Reserves (see tabulation)

	Tons	Grade%	Lbs./T
"BD" orebody	459,967	.0855	1.710
"A" "	617,232	.0855	1.711
Total	1,077,199	.0855	1.7105

Calculation of Ore Reserves
(See plans "BD" and "A" areas
scale 1" equals 20 feet;
Cross sections 246.5 to 252.0
Longitudinal sections 9 to 19)

Vertical cross sections and longitudinal sections were drawn through the "BD" ore body and cross sections only through the "A" ore body. They are at horizontal intervals of 50 feet. Ore outlines were plotted on the sections according to assays and diamond drill hole geology, and the areas thus outlined calculated. These areas were considered constant for a distance of 25 feet on both sides of the section line and were multiplied by 50 to give the cubic contents per section.

The remaining [illegible] accepted.

CALCULATIONS OF ORE RESERVES

BD ZONE

1 ton = 9.1 cu. ft.
Length for each section 50 ft.

Section	Area Sq. Ft.	Assay% U_3O_8	Area x Assay	Volume Cu. Ft.	Tonnage	Lbs.U_3O_8/T
247.0	0					
247.5	10446	0.055	570.770	522,300	57,396	1.100
248.0	10733	0.0868	931.510	536,650	59,032	1.736
248.5	12348	0.078	959.170	617,400	67,846	1.560
249.0	12064	0.0983	1186.233	603,200	66,352	1.966
249.5	14655	0.0826	1210.485	732,750	80,603	1.652
250.0	13010	0.0973	1266.475	655,500	72,105	1.946
250.5	6924	0.1008	697.704	346,200	38,082	2.015
251.0	3373	0.0957	322.778	168,650	18,551	1.914
Totals	83533	0.0855	7145.125	4,182,650	459,967	1.710
					387,593	

A ZONE

Section	Tons x Grade		Tonnage	Lbs.U_3O_8/T
45	69152		38,033	1.792
46	105262		53,463	1.968
47	153712		82,577	1.861
48	173424		97,664	1.775
49	138021		106,910	1.291
50	190008		109,100	1.743
51	178209		86,378	2.063
52	10888	(25 ft. length only)	10,360	1.051
Ref. & 100' N.E.	5528		4,422	1.25
" & 200' N.E.	5445		4,950	1.10
" & 250' N. E.	9281		6,875	1.35
" & 300' N. E.	1452		1,452	1.00
" & 350' N. E.	16722		14,058	1.19
" & 400' N. E.	594		990	0.60
Totals	1056698		617,232	1.711
			520,000	
Totals BD and A Zones			1,077,199	1.711

METHOD OF ORE CALCULATION

1. The ore structure or occurrence of the BD zone based on geological reports, logs of diamond drill holes and assays, was first drawn on each of the ten cross sections, then all occurrences grading .05% of U_3O_8 and over were colored solid red and those of.03% up to .049% U_3O_8 were hatched in red.

2. The outline of the area to be mined per each cross section was then outlined in green.

3. Each area was then subdivided into blocks so as to include at least one set of assays per block. These blocks are outlined in green also.

4. The ten cross sections #247 to 251.5 inclusive show the ore areas and these 10 areas are subdivided into 95 blocks as shown on the attached maps.

5. Twelve longitudinal sections #9 to 19 inclusive also show the ore areas. It will be noted that the low grade bands indicated by the cross sections show up quite clearly on these sections also. They lie in a more or less horizontal attitude indicating that these fairly flat dipping sheets might be able to be mined separately.

6. On the "A" zone the ore was blocked out similar to the "BD" zone as shown on 14 cross-sections attached.

OVERBURDEN

This is a calculation of the cubic yards of overburden lying above the ore zone and extending to the surface and has to be removed in order to permit the ore body to be mined by the open pit method. This amounts to 412,906 cubic yards in the BD zone and 253,850 cubic yards in the A zone, for a total of 666,756 cubic yards.

In this method it is proposed to remove the overburden with the aid of contractors prior to mining the ore..

In the BD zone the mine engineers calculate that 73% or 301,421 cubic yards of the overburden in this zone is loose gravel or loose rock to be mined by shovelling, bulldozing or slushing.

In the A zone diamond drilling tests show that the loose rock averages 5 feet in depth, giving a total of 32,500 cubic yards.

Summary of Overburden Yardage

	Total Waste	Loose Waste	Solid Waste
A zone	253,850	32,500	221,350
BD Zone	412,906	301,421	111,475
	666,756	333,921	332,825

OPEN PIT MINING

Due consideration has been given to various methods of mining and it has been decided to remove the waste on both ore bodies with the aid of contractors, then mine the ore with Company equipment and staff on a selective mining basis. Because of the attitude of the ore bodies and the fact that ore lenses are intercalated with bands of low grade material, it is advisable to mine selectively to regulate grade to meet requirements.

It is considered advisable to do the mining in the more temperate season, April 1st to December 1st, and to mine and store in this period sufficient ore to satisfy the mill requirements of 500 tons per day for 360 milling days or 180,000 tons of ore per year. To win this ore it is required to mine 71,460 tons of low grade material for a total of 251,460 tons. This tonnage or 84,666 cubic yards are required to be mined in 8 months or in 190 mining days. This amounts to $\frac{84,666}{8}$ = 10,583. cubic yards per month of 26 working days or 407 cubic yards per day = 1209 tons per mining day of which 862 tons is ore and 347 tons is low grade.

The ratio of ore to overburden is 1 to 2. 50% of the overburden is loose and 50% solid. Thus for every cubic yard of ore plus low grade mined, 1 cubic yard of loose waste and 1 cubic yard of solid waste has to be mined.

Gravel 1 cubic foot = 100 lbs.
Solid gneiss 1 cubic foot = 170 lbs.
Schist 1 cubic foot = 168 lbs.

1 ton gravel or loose rock = 20 cubic feet 1 cubic yard = 1.35 tons
1 ton waste rock in place = 11.9 cubic feet 1 cubic yard = 2.27 tons
1 ton ore in place = 9.1 cubic feet 1 cubic yard = 2.97 tons

The ore and waste in the pit area has a flat, 15 degree dip with the hill and it is believed the walls of the pit will therefore stand well on a 70 degree slope. On this basis benches 30 feet in height with berms 10 feet wide are laid out for the open pit as shown on the 20 scale plan, but would be mined in sections governed by the attitude of the ore body and low grade bands. The benches are plotted on each cross section line of the plan and then sketched between the cross section lines. The sketched part will therefore not be accurate.

DETAILS OF MINING METHOD

On examination of the sections it is obvious that the most flexible mining method must be adopted.

With this in mind it has been decided to work the pits by 30' benches. Then by using wagon-drills, jack-hammers, slushers and loading equipment the ore and low grade can be mined and moved separately.

Drilling and blasting 407 cubic yards with wagon drills - Canadian Ingersoll Rand. Rate of drilling 2¼ inch bit = 1 foot per minute. This is based on 1 1/8 inch bit drilling 1.67 feet per minute at Rexspar.

Spacing: Holes 7 feet apart, rows 5 feet apart to commence with. Experience will decide correct spacing in the various types of ground encountered.

Benches 30 feet deep.

Holes 32 feet deep.

Holes required 10.

Footage to be drilled 320 feet.

Changes required 3.

Steel required 12 ft., 22 ft. and 32 ft.

Drilling time 288 minutes = 5 hours 20 minutes. Say 6 hours not counting changes.

Length of cut 73 feet.

Width of cut 5 feet.

Volume $\frac{73 \times 5 \times 30}{27}$ = 408 cubic yards.

It is planned to keep the drilling well in advance of the working face to obtain information by probing and spot sampling thus enabling the engineer to plan the blasting programme. It is also planned to check each truck load by scintillation counters.

It is best to blast as many holes as possible at the same time because the gas pressure developed in each hole working against that developed in the other holes gives better fragmentation.

SUMMARY OF MINING COSTS

Direct costs per ton based on mining 180,000 tons of ore per year of 208 working days in 8 months working period; in addition mining, removing and stock piling 71,460 tons of intercalated low grade material.

	Ore	Low Grade
BD Zone	154,913 cu. yds.	61,554 cu. yds.
A Zone	207,822 cu. yds.	82,578 cu. yds.

Ratio Low Grade:Ore - 1:2.5

	$ Per Ton	P
Ore Breaking	0.182	11
Air Supply	0.047	11
Loading	0.111	12
Establishment of Benches	0.022	12
Sub-Total	0.362	
Removal of Overburden	0.486	13-14
Drill Steel and Bits	0.047	14
Clearing Pit Sites	0.005	14
Road Maintenance	0.021	14
Hauling: Ore 7.5 miles @ 4¢ per ton mile (exclusive of depreciation on equipment - see pg. 16)	0.301	15-16
Storage	0.063	16-17
Total Direct Cost.....	1.285	

Indirect Costs

			P
Mining Supervision, etc.	.224		18
Laboratory	.055		18
	.279		
Sub-Total.....		.279	
Total.....		$1.564	

	$ Per Ton
	1.564 (Bt. Fwd.)

General Costs

Accommodation	.092	
Surface	.132	
Administration	.206	
	.430	
Mill portion 50%, Mine portion 50% = .215		.215
Power misc.		.040
Total Cost.....		$1.819

MINING COSTS

Orebreaking by Open Pit — Crew Required and Costs - Breaking and loading 407 cu. yds. per day or 862 tons ore and 347 tons low grade. Total tons 1209.

Drilling:	1 blaster at $15.00 per day	-	$15.00
	1 miner at $15.00 per day	-	15.00
	1 helper at $12.00 per day	-	12.00
	Bonus	-	15.00
			$57.00

Powder: $24.00/100 lbs. f.o.b. the mine

Required 1 lb. of 75% Forcite per cu. yd.
= 470 lbs. x $\frac{24}{100}$ = 97.68

Caps required: 10 caps @ 25¢ = 2.50

Total $157.18

	$ Per Ton
Cost per ton = $\frac{\$157.18}{862}$ =	.182

$\frac{\$157.18}{407}$ = $.386 per cu. yd.

Air Requirements

Operator (also as machine doctor, bit grinder, etc.) per day	$20.00
Fuel (48 gal. per day @ 24¢)	11.52
Oil	1.00
Repairs and Maintenance @ $8.00 per day	8.00
Cost Per Day...	$40.52

Cost per ton ore = $\frac{\$40.52}{862}$ =	.047

$\frac{\$40.52}{407}$ = $.100 per cu. yd.

Total per cu. yd. = $0.486.

Total Cost... $.229

$ Per Ton

.229 (Bt. Fwd)

Loading

Eimco operator @ $20.00 per day
" helper @ $12.00 per day

Overtime and Bonus
$10.00 $42.00

Fuel, oil, maintenance @ $6.75 per hour $54.00

$96.00

Cost per ton ore = $\frac{\$96.00}{862}$ .111

$\frac{\$96.00}{407}$ = $0.235 per cu.yd.

Eimco 105 has 1½ cu.yd.bucket - above $6.75 per hr. based on Copper Mountain cost for 1½ cu.yd.Northwestern Shovel.

Establishment of Benches in Ore and Low Grade

5000' of Benches to cut by mining at 40' per day.

Per day crew:	2 miners	$30.00	
	1 helper	12.00	
	1 loading operator	20.00	
	1 padman	12.00	
	1 mechanic compressor man	20.00	$94.00
	Bonus	30.00	30.00
	Operation Cost Per day		20.52
	" " " " Eimco Loader		54.00
Explosives:	100 lbs.forcite @ 24¢/lb.		24.00
	12 caps @ 25¢		3.00
		Per Day	$225.52

Total tonnage 12,500 tons i.e.125 days = 28,190.00
Less average cost per ton loaded @ .340 = 4,250.00
Extra cost to be added $23,940.00

i.e.add extra mining cost of $\frac{23,940}{1,077,199}$ = .022

Sub-total $ .362

$ Per Ton
.362 (Bt. Fwd.)

Overburden Removal

	Total cu. yd.	Loose cu. yd.	Solid cu. yd.
A Zone	253,850	32,500	221,350
BD Zone	412,906	301,421	111,475
	666,756	333,921	332,825

solid rock x 164% = broken yardage to move
loose overburden x 113% = " " " "

i.e. solid = 332,825 x 164% = 545,833 broken cu. yds.
loose = 333,921 x 113% = 377,331 " " "
923,164 " " "

	Loose For Moving	Broken Solid For Moving	
A Zone	36,725	363,014	tot. 399,739
BD Zone	340,606	182,819	tot. 523,425
	377,331	545,833	tot. 923,164
	(40.9%)	(59.1%)	(100%)

It is planned to remove the overburden as far by bulldozer as possible. The engineers estimate that 88% can be moved in this manner and the remaining 12% to be loaded and trucked i.e. 812,384 cu. yds. to be bulldozed and
110,780 cu. yds. to be loaded and trucked.

Operations will be carried out on both pits simultaneously at the rate of 1000 cu. yds. per day from each. It will require 2.42 years to remove the overburden.

Cost of Overburden Removal

Bulldozing: Require 2 TD-18 machines
1 TD-24 machine

The International Harvester Co. quote operating costs:
TD-18 per hr. 9.35 = per day 8 hrs. = 74.80
TD-24 per hr. 10.38 = " " " " = 83.04

Above costs include diesel fuel, lubricating oil, repairs, maintenance and operator's time @ $2.25 per hour.

2 TD-18 machines	149.60
1 TD-24	83.04
3 helpers	36.00
Bonus	30.00
Diff. on Operators Wages 25¢ per hour	12.00
	$310.64

In each 1000 cu. yds. of broken material there are 409 cu. yds. from the loose material and 591 cu. yds. from the solid.
591 cu. yds. = 360 cu. yds. in place
164%
88% can be bulldozed = 880 cu. yds.
12% has to be loaded = 120 " "

	$ Per Ton
	.362 (Bt. Fwd.)
360 cu. yds. of solid to drill and blast at the mining cost of $.486 = $174.96	
Bulldozing 880 cu. yds. ($0.353 per cu. yd.)	310.64
Loading 120 cu. yds. @ $.235 (page 12)	28.20
Hauling 120 cu. yds. 1 mile @ 15¢ per ton mile = 44.5¢ per cu. yd. mile	53.40
	$567.20

Cost per cu. yd. = $.567

Total cost for 923,164 cu. yd. = $523,434.00

Overburden removal per ton of ore = $\frac{\$523,434}{1,077,199}$ = $.486

Drill Steel and Bits Required per Year (180,000 Tons of Ore)

Wagon drills will require 10 sets steel per year 1¼" round lugged 12 ft. - 22 ft. - 32 ft. $600.00

Estimate bits to drill 500 feet each
" 120,000 feet of drilling - 240 bits
@ $28.40 = 6,816.00

Plugger steel, carbide tipped, will require
10 sets per year, Copco steel at $70.80 per set 708.00
with 20 short lengths @ $15.80 316.00
$8,440.00

Cost per ton = $\frac{8,440.00}{180,000}$ = .047

Clearing Pit Sites

(150 ac)

10 acres @ $500 per acre = $5000

cost per cu. yd. overburden = $.007

cost per ton of ore = $\frac{5000}{1,077,199}$ = .005

Road Maintenance

For gravel roads maintenance costs average $500 per mile per year

$\frac{7.5 \text{ miles} \times 500}{180,000}$ = $.021 per ton of ore .021

$.921

$1,000 per Yukon Convert

$ Per Ton
.921 (Bt. Fwd.)

Hauling:

1 cu. yd. ore solid = 1.64 cu. yds broken
1 cu. yd. ore broken =1.81 tons

It is considered good practice to contract the hauling of ore rather than to do it with Company trucks. Besides being a major item of capital cost Company trucks require a Company repair shop with expensive machinery, welding equipment and mechanics, etc. Company drivers with no personal interest in their vehicles are not considerate of the machine resulting in very heavy maintenance charges.

To haul 407 cu. yds. = 1,209 tons per 8 hrs.
= 862 tons H.G. 7½ miles (374 tons L.G. 1 mile)

Ore

Distance 7.5 miles
Trips per 8 hrs. = 8
Trucks 40 ton capacity, cos t $48,000.00 each
1 truck hauls 8 x 40 = 320 tons per day
Therefore $\frac{862}{320}$ = 3 trucks required

Low Grade

Distance 1 mile for low grade
Trucks loads $\frac{347}{40}$ = 8.7

One truck can handle this in 4 hours allowing 4 hours per day for maintenance of 4 trucks.

Required 4 trucks at $48,000 each, one as spare. Depreciation over 6 years on 10,000 hours.

Recommend 300 H.P. trucks type 25 L.D. 17 cu. yd. side dump with large tires, semi automatic transmission, hydraulic booster and hydro tarder at $48,000 ea.

Operating Costs per Truck

	Per Hour
Wages 1 driver @ $20 per day	$ 2.50
Fuel 7 gals. per hour @ 20¢ gal.	1.40
Engine oil	.30
Repairs 10,000 hour basis ($15,000)	1.50
Tires 1 set = $11,000 good for 5,000 hrs.	2.20
Tire maintenance	.20
	$ 8.10

$ Per Ton
.921 (Bt. Fwd.)

Hauling: (cont'd)

Per 8 hours =$64.80 x 4 trucks = $259.20 per day

Cost per ton = $\frac{259.20}{862}$ = .301

Operating cost per ton mile = $\frac{0.301}{7.5}$ = $0.04

Depreciation on basis of 10,000 hours
= $4.80 per hour.

Per 8 hours = $38.40 x 4 trucks
= $153.60

Cost per ton $\frac{153.60}{862}$ = $0.178

Depreciation cost per ton mile = $\frac{0.178}{7.5}$ = $.024

Total .. .. $.064

Sub-Total $1.222

Ore Storage:

On the basis of operating the open pit and underground mine 8 months in the summer season only at 862 tons per day and the mill all year at 500 tons per day, ore storage facilities are a necessity.

There is an excellent site at the foot of the bench on the same lot as the mill or on Lot 2618.

Required to have stored at the end of the season's 8 months' operation a further 4 months' supply, namely 60,000 tons, or 20,202 cu. yds. or 33,131 cu. yds. of broken muck. This is equivalent to a cube 200 feet long, 100 feet high and 61 feet wide.

The ore would be dumped along the 37 degree sloping hillside for a length of 223 feet at an elevation of 40 feet vertically above the flats and when the full 60,000 tons of ore are stored the dimensions at the top of the pile would be rectangular in shape, 166 feet along the hillside by 100 feet wide. This pile, sloping at 37 degrees would extend out on the flats from the bottom of the hill for the same width as the top, namely 100 feet. Its sides sloping also at 37 degrees would extend a maximum length along the hillside of 276 feet.

It is planned to feed the mill direct for the 8 months' period and stock pile 60,000 tons for the 4 months' period.

$ Per Ton
1.222 (Bt. Fwd.)

Ore Storage: (cont'd)

During the 4 months one man with a bulldozer can keep the mill supplied.

Costs: $9.35 per hour = per day $74.80
Total Cost for period: $8,976

spread over 180,000 tons = cost per ton = $0.05

One truck spotter-grizzley man is required at $12.00 per day for 190 days per year = $2,280 for 180,000 tons = $.013 per ton.

Total Storage cost per ton of ore .063

Total $1.285

539
1.819

INDIRECT COSTS

			Per Ton
Mining:			
Supervision per year			
Foreman @ $25 per day	7,800		
2 Samplers $400 per month	9,600	$17,400	$.097
Engineering and Geology		12,000	.067
Main air and water lines maintenance		1,000	.005
Dry operation and maintenance	2,800		
Dry heating	2,800	5,600	.031
Camp lighting 10 KW		1,800	.010
Transportation engineers		2,400	.014
		$40,200	

Cost per ton $\frac{48,710}{180,000}$ = ... $0.224

Laboratory for Mine:

Operation	$7,000
Supplies	2,600
Maintenance	400
	$10,000

Cost per ton 0.055

Total $0.279

1400
300
420000

GENERAL FOR WHOLE CAMP

	$ Per Ton
	.279 (Bt. Fwd.)

1. Accommodation
2. Surface
3. Administration
4. Power

ACCOMMODATION:

2 cookhouses, one at Mine and one at Mill
4 Houses for Married Men
30 Single Men - board - $2.25 per day

			Cost per Ton
Cookhouse	operation	$16,800	
"	food	23,000	
"	maintenance	430	
Bunkhouse	operation	4,700	
"	heating	4,200	
"	maintenance	800	
Townsite	"	250	
Dwelling	"	500	
"	heating	1,300	
Garbage removal		540	
Guest accommodation		300	
		52,820	.294
Less Cookhouse revenue @ 2.25/day		$24,300	
" Bunkhouse " @ 1.00/day		10,800	
" Dwelling " @ 25.00/month		1,200	
		-$36,300	
		-36,300	-.202
		16,520	.092

No school required - there is one at Birch Island.

POWER MISCELLANEOUS: (see page 23)

386 horsepower has been alloted for miscellaneous use such as shops, power plant operation, camp heating, camp lighting, etc.

For the mine it amounts to 0.04 per ton	.040	.040
	.092	.319

SURFACE:

			Cost per Ton
			.092 (Bt. Fwd
Supervision	$ 6,000		.319
Warehouse	6,000		
Freight	600		
Garbage	200		
Plumbing Shop	350		
Electrical Shop	500		
Carpenter Shop	900		
Machine Shop	2,000		
Truck Operation and Maintenance	2,400	run-about truck for odd jobs	
Tractor Operation	500	odd jobs only	
Tractor Maintenance	500		
Road Maintenance	1,000	odd jobs	
Winter Maintenance	400		
Yard Clean-up	500		
First Aid	1,400		
Recreation	400		
Fire Protection	100		
Total	$23,750		$.132

ADMINISTRATION:

Supervision (Management and Toronto Office)	$12,000		
Mine Office (Accountant Assistant and Typist)	12,000		
Legal Expense	2,000		
Audit fees	2,000		
Insurance and Fire Protection	8,000		
Travel Expense	1,000		
Taxes	500		
Less Purchase Discount	-300		
	$37,200		$.206
			$ .430
		½ to mill; ½ to mine	.215
		Total Indirect Cost	$.534

TOTAL MINING COSTS

Direct and Indirect	1.819
Depreciation write-off - 6 years or on $532,391 for 1,077,199 tons	.494
Total cost per ton of ore at mill	$2.313

CAPITAL REQUIREMENTS

Ore Breaking:			
2 I.R. wagon drills @ $3,813	$7,626		
Hoses and piping	640		
Grinder	500		
		$8,766	
2 Holman 2 5/8" rock drills @ $395	790		
2 " airlegs @ $175	350		
3 " oilers @ $22	66		
2 sets hoses and couplings @ $60	120		
		1,326	
1 I.R. 600 cu. ft. compressor		19,405	$29,497
Ore Loading:			
1 Northwestern Shovel 1½ cu. yd. cap.			53,640
1 Eimco 105 Loader			22,820
			76 460
Overburden:			
2 TD-18 bulldozers		48,000	
1 TD-24 "		31,500	79,500
1 I.R. wagon drill complete			4,383
2 Holman rock drills complete			1,326
1 I.R. 600 cu. ft. compressor			19,405 25,114
Overburden Loading:			
1 Eimco 105 Loader			22,820
			$233,391

Road Construction:

It will be necessary to reconstruct part of the present road and build 3 miles of new road for a total length of 7½ miles.

The road is planned for a width of 18 feet with no part of it having a grade of over 7%. It will be ditched and have sulverts where necessary.

Capital cost for 3 miles and culverts 3 miles		50,000	
In addition there will be 5,740 feet of branch "main" roads to the open pit at a cost of		13,000	
Side roads to the "main" roads to the pit total 4,450 feet and will cost		3,000	
Improvement to "A" area road		3,000	
New road to mill site - 1 mile		10,000	
	Total Cost	$79,000	
A. Gravelling 28,000 cu. yds. @ $1.00 per cu.yd.		28,000	
		107,000	107,000
Transport of ore, low grade and waste done by owner-driven trucks on contract or if Company-owned trucks are used-			192,000
		Total	$532,391

Depreciation $\frac{\$532,391}{1,077,199}$ = $0.494 per ton

ELECTRICAL POWER REQUIREMENTS

75 ~~60~~ Tons per day

		H.P.	H.P.
Shops, Power Plant, Lighting Water etc.			386
Crusher plant 32" x 40"	8 hrs/night	290	
Grinding	24 hrs/day	70	
	Sub-Total		360
Leaching Plant (one tower 6' x 30')			
1 - Two stage air compressor 175 Psi 600 C.F.M.		150	
1 - Surge Tank etc.		7½	
2 - 6' x 8' Drum filters @ 3 H.P. each		6	
2 - Repulpers @ 3 H.P. each		6	
1 - Vacuum Pump & Equipment for filter		11½	
3 - 5' x 5' Agitators and ppte. Tanks		7	
1 - Clarifier 4' x 8' leaf mid. Vacuum pump		1½	
1 - Reagent Bin and two feeders		1	
1 - Filter press		½	
1 - Automatic sampler		¼	
Sundry pumps, SRL, olivite, etc.		109	
	Total leaching		300
Total connected load H.P.			1046
" " " Kw.			780

Steam required to satisfy Electrical and Process Requirements (20# steam per Kw.)

Connected load 780 Kw. @ 85% = 663	
663 Kw. @ 20# =	13260
Process steam	3000
TOTAL	16260

ELECTRICAL POWER REQUIREMENTS

500 Tons per day

		H.P.
Shops, Power Plant, Lighting, Water etc.	*(386)	386
Crushing Plant 32" x 40"	*(290)	290
Grinding & Thickening	*(70)	558
Leaching		1250
Filtration		227
Ion Exchange and Precipitation		113
Mill Miscellaneous		65
Pilot Plant	*(300)	300
TOTAL	*(1046)	3189

* = Pilot Plant.

Increase in load = 3189 - 1046 = 2143 H.P.
" " " = 1599 Kw.

Steam required to satisfy Electrical and Process Requirements (20# steam per Kw.)

Connected additional load 1599 Kw. @ 85% = 1359

1359 Kw. @ 20# =	27180	lbs. of steam per hour
Additional process steam	18000	" " " " "
Total additional	43180	" " " " "
Pilot Plant	16260	" " " " "
Total connected load steam =	61440	" " " " "
By running crushing plant at night save 290 H.P. = 216 Kw. at 85% = 184 Kw.	- 3680	" " " " "
Total steam load	57760	" " " " "
3 Units each	19253	" " " " "

Total Kw. 2888 per hour.

" H.P. 3871 per hour.

Prente 4600

POWER PLANT

CAPITAL COSTS

Boiler and Alternator requirements

A 400 H.P. Water tube boiler will generate 24000# steam at 225 psig therefore require 3-400 H.P. boilers = 72,000# steam.

A	60 TON		500 TON	
	Boiler (1)		Boiler	
	1 400 H.P. 225 psig Water Tube Boiler Automatic stoker, coal handling conveyors feed-bins, ash disposal smoke stack etc. used unit	$ 88,700.00	3-400 H.P. units as per 60 ton job A(1) 3 used units	$253,000.00
	Turbine House (2)		Turbine House	
	Complete with 1000 Kw. 2300 volt turbo-alternator with all accessories and with water supply for condensing unit available and close by. used unit	$ 71,500.00	Complete with 2000 Kw. 2300 volt Turbo-alternator unit and all accessories etc. as A(2)	$ 86,000.00
	TOTAL	$160,200.00		$339,000.00

TRANSMISSION LINES

Mill to Mine, 3 miles.

Three miles, 2300 Volt, alternatively 4000 volt, 3 phase, 60 cycle wood pole, Copper Conductor Transmission Line - 2000 KVA - across sloping wooded country not mountainous.

Line	$13,000.00
Double Transformations	$25,000.00
TOTAL	$38,000.00

Hydro Electric Plant 2-350 H.P. units total 700 H.P.

500 ft. head, horizontal pipe length 7150'

Water turbines complete with generators and all accessories = $160,100.00

POWER COST

Coal at $1.00 per ton F.O.B. Pithead plus $3.90 freight total $4.90 at Birch Island
57760# steam = 2888 Kw. per hour
1# Coal = 10,000 B.T.U. Water Tube Boiler 80% eff. = 8,000 B.T.U.
1,000 B.T.U. = 1# steam. Therefore $\frac{8,000}{1,000}$ = 8# steam per lb. coal.
Require 57,760#steam per hour (can produce 72,000# steam)

Coal cost = $\frac{57,760}{8}$ = 7220.0# of coal per hour say 7200#

= 3.6 tons per hour
86.4 " " day
31,104.0 " " year

3.6 tons @ 4.90 = Cost per hour $17.6400

Cost per year = $152,409.60

Per Kw. hour = $\frac{\$17.64}{2888 \text{ Kw.}}$ = ... $.00611

Labour Cost

		Per month
1st Class 1 Foreman $25/da. ($650 mo.)		$ 650.00
" " 3 Operators $2.50/hr.$20/da. ($520 mo.)		$1560.00
3rd " 3 Helpers $1.50/hr. $12/da ($312 mo.)		$ 936.00
	Total	$3146.00

Cost per year $37,752 Per hour .. .. $ 4.3694

Per Kw. hour = $\frac{4.3694}{2888}$ = ... $.00151

Supplies

100% of labour per year $37,752 Per hour .. .. $ 4.3694
Per Kw. hour .. .. $.00151

Total per year $227,913.60 Per hour $26.3788

Per Kw. hour = $\frac{26.3788}{2888}$ = $.00913

Per H.P. " = $\frac{26.3788}{3671}$ = $.00681

Operating cost per ton $\frac{\$227,913.60}{\$180,000}$ = $1.2662

Depreciation " " " $\frac{\$339,000}{\$1,077,199}$ = $0.3147

Total cost per ton $1.5809

Ratio Mill = $\frac{3543 \text{ H.P.}}{3671 \text{ H.P.}}$ = $\frac{91.2\%}{100.0\%}$ = $\frac{\$1.159}{\$1.262}$
Total

STEAM COST

Per 1000 lbs. steam = $\frac{\$26.3788}{57.76}$ = $0.4570

Power Costs (cont'd)

Most of the total power produced has been taken care of in the mill report except that pertaining to shops, power plant operation, camp heating, camp lighting, etc.

386 horse power has been alloted for the above miscellaneous uses and for contingencies.

It amounts to $0.132 per ton and has been split 30% to the mine and 70% to the mill namely $0.040 and $0.092 per ton.

REXSPAR URANIUM & METALS MINING CO. LIMITED

STAFF AND LABOUR		COST $/TON
General Office:		
Manager @ $750.00 per month	$9,000	
Accountant @ $400.00 per month	4,800	
Timekeeper @ $300.00 per month	3,600	
Typist @ $175.00 per month	2,100	
Warehouseman @ $300.00 per month	3,600	
First Aid - Clerk @ $250.00 per month	3,000	
	$26,100	0.145
Mine 50% = 0.072		
Mill 50% = 0.073		
Power House:		
1 - 1st class foreman @ $650.00 per month	7,800	
3 - 1st class operators @ $520.00 per month	18,720	
3 - 3rd class helpers @ $312.00 per month	11,232	
	$37,752	0.210
Mill 100%		
Mine Nil		
Shops Operation:		312 days
Machine shop - 2 mechanics @ $2.50 per hr.	12,480	
Electrical shop - 1 electrician @ $2.50/hr.	6,240	
Plumbing shop - 1 plumber @ $2.50/hr.	6,240	
Carpenter shop - 1 carpenter @ $2.50/hr.	6,240	
4 helpers @ $12.00 per day	14,976	
	$46,176	0.256
Mine 10% = 0.026		
Mill 90% = 0.23		

REXSPAR URANIUM & METALS MINING CO. LIMITED

MINE		COST $/TON
Supervision:		
Engineer @ $540.00 per month	$6,480	
Geologist @ $460.00 per month	5,520	
2 samplers @ $300.00 per month	7,200	
1 assayer @ $450.00 per month	5,400	
1 assistant assayer @ $250.00 per month	3,000	
	$27,600	0.153
Operation: (for 8 months only)		
1 foreman @ $25.00 per day	5,200	
Ore:		
1 blaster @ $20.00 per day	4,160	
1 miner @ $20.00 per day	4,160	
1 helper @ $17.00 per day	3,536	
1 compressor-operator - mechanic @ $20.00 per day	4,160	
Loading Ore:		
1 shovel or Eimco operator @ $25.00 per day	5,200	
1 padman @ $17.00 per day	3,536	
Overburden:		
1 blaster @ $20.00 per day	4,160	
1 miner @ $20.00 per day	4,160	
1 helper @ $17.00 per day	3,536	
1 compressor-operator - mechanic @ $20.00 per day	4,160	
3 bulldozer operators @ $20.00 per day	12,480	
3 helpers @ $17.00 per day	10,608	
1 loader-operator @ $25.00 per day	5,200	
Extra Men for Benches, etc.:		
2 miners @ $20.00 per day	8,320	
1 helper @ $17.00 per day	3,536	
	$86,112	.478)
		) .570
Hauling:		
4 truck drivers @ $2.50 per hour	16,640	.092)

BUILDINGS

(a),(b),(c),(d)	$122,430
(e)	9,394
(f)	20,878
(g)	1,292
(h)	1,870
(i)	1,320
	$157,184

(a)	Dwellings - as per Wright Engineers 5 houses (2 bedrooms, min.)		$45,000
(b)	Office - as per Wright Engineers		21,000
(c)	Bunkhouses, as per Wright Engineers 3 - 14 man bunkhouses		25,500
(d)	Cookery - as per Wright Engineers for 40 men		13,500
			105,000
		Contingencies 10%	10,500
			115,500
		Design 6%	6,930
			$122,430

(e)	Warehouse 20' x 50' @ $7.00 per sq. ft.		7,000
	Warehouse Equipment :		
	Platform scales	125.00	
	Table "	35.00	
	2 handled cart	30.00	
	Adding machine	400.00	
	Typewriter	250.00	
	Card Wheel Ledger	400.00	
	Furniture	300.00	
			1,540
			8,540
		Contingencies 10%	854
			$9,394

(f)	Shops All shops in one building 20' x 70' = 1400 sq. ft. @ $7.00 per sq. ft.		9,800
	Machine Shop Equipment:		
	Small lathe	2,000	
	Drill press	800	
	Blacksmith forge & anvil	250	
	Arc welder	1,690	
	Oxy welder	200	
	1 grinder	250	
	Pipe threader	500	
	Power hacksaw	400	
	Pipe cutter	350	
	Vise	125	
	Misc. tools	1,000	
			7,565
			$17,365

(f)	Shops (cont'd)			$17,365 (Bt. Fwd)
	Carpenter Shop Equipment:			
	Bench saw	500		
	Portable power saw	225		
	Saw set	60		
	Vise	100		885
	Electrical Shop Equipment:			
	Water distiller	80		
	Battery charger	150		
	Chain Block and misc. tools	500		730
				18,980
			Contingencies 10%	1,898
				$20,878
(g)	Oil House			
	12 x 12 @ $7.00 per sq. ft.			1,000
	Equipment:			
	Chain block	100		
	Faucets and stand	75		
		175		175
				1,175
			Contingencies 10%	117
				$1,292
(h)	First Aid Station			
	14 x 14 building @ $7.00 per sq. ft.			1,400
	First Aid Equipment			300
				1,700
			Contingencies 10%	170
				$1,870
(i)	Fire-fighting Equipment			
	3 hydrants	570		
	Hose and fittings	630		1,200
			Contingencies 10%	120
				$1,320

WATER SUPPLY

Domestic and Mill

Foghorn Creek is the only creek on the property or in the near vicinity that can be relied upon to supply water all year round in sufficient quantities for the mill and mill-camp facilities.

Water rights are held on this Creek as follows:

Mr. Moss - 60.8 acre feet 1 acre feet equals 43,560 cu. ft. - 272,250 gals.
75.0 " "

135.8 " " 5,915,448 cu. ft. equals 36,971,550 gals.

C.N.R. 40,000 gallons per day
Forestry 1,000 gallons per day
Rexspar 25,000 " " "

The Moss rights are for irrigation purposes and the water therefore is used for a short time only during the summer months. One measurement taken on January 9th, 1955, of Foghorn Creek where it passes into a culvert under the C.N.R. tracks measured 420 cu. ft. per minute or 2,625 gallons per minute. This would supply Moss' requirements in 235 hours or less than 10 days; and the others in 16 minutes.

It would seem therefore, based on the January measurement, that there is plenty of water for domestic and mill requirements.

Required a 4 in. wooden pipe line 5,000 feet long

Costs for the first 2,500 feet - 50 foot head @ $0.91		$2,275.00
second 2,500 " - 100 " " @ 0.93		2,235.00
200 " - 200 " " @ 0.98		196.00
Sub-Total		4,796.00
One 50,000 gallon wooden storage tank installed at Birch Island		4,500.00
Installation of pipe and small Dam		1,000.00
		10,296.00
+ 15% Contingencies		1,544.00
Total		$11,840.00

The 4 inch diameter wooden pipe will deliver 200 Imperial gallons a minute. Alternatively a well can be sunk on the flats on the south side of the railroad at Birch Island and water supplied by pump to a storage tank for domestic purposes.

Rexspar's Production Plans

By John W. Scott

Manager, Rexspar Uranium & Metals Mining Co. Ltd.

DEVELOPMENT work on the Rexspar property at Birch Island, B.C., has now advanced to the point where production plans for a 500-ton per day operation are being prepared.

Final calculations on the over-all grade and tonnage of uranium deposits are now being made. Estimates will soon be ready for a production contract submission. Metallurgical test work is reaching a successful conclusion and pilot plant design is underway.

Detailed surface diamond drilling and underground exploration have delimited two major ore lenses, designated the "A" and "BD" zones, proving a large tonnage of commercial ore.

Exploratory drilling is continuing on additional favorable areas adjacent to the orebodies outlined, with several outlying areas of high radio-activity and favorable structure awaiting further attention.

Development work on the property to date totals approximately 31,000 feet of surface diamond drilling, 8,300 feet of underground diamond drilling, 1,700 ft. of drifting and crosscutting, and 470 ft. of raising, with a large proportion of this work concentrated on the "A" and "BD" orebodies.

Geologically, these orebodies occur in trachytic breccia, flows, and possibly tuffs which overlie with apparent conformity a thick sequence of fissile thin-bedded quartzites and argillites.

All are considered to be in the pre-Cambrian Shuswap series. Dips are gentle to moderate.

J. W. Scott, author of this article, and S. M. Manning, engineer of Technical Mine Consultants, Ltd., photographed at Birch Island, rail point which serves the Rexspar operation.

"A" Zone

The "A" zone orebody was discovered by the earliest uranium prospecting on the property, outcropping on the East slope of the main ridge between Foghorn and Holt Creeks, some 70 or 80 ft. below the crest of the ridge.

After some trenching and sampling of the outcrops in 1951, surface diamond drilling was undertaken in 1952 and 1953. Thirty-four holes totalling approximately 5,400 ft., were drilled at roughly 50 foot spacing on lines 75 ft. apart, across the comparatively flat top of the ridge above the outcrops.

This work outlined a lenticular orebody apparently striking about N. 15 degrees E. and dipping 30 degrees northwest into the hill.

Length outlined was approximately 500 ft., slope depth 125 ft., and average thickness 19 ft.

The northeasterly holes on the boundary of this drilling showed some irregular ore intersections and, late in 1954, a programme of underground development was approved to test these showings, and to obtain more definite information on the down-dip behaviour of the previously outlined ore.

Underground work was started in early January, 1955, continuing until the end of May.

An adit was driven directly N. 30 degrees W. at the north end of the established ore lens, and at elevation 3,840, some 30 ft. below the lowest previous ore intersections.

The adit intersected low grade ore type material from the collar, with good grade ore coming in at about 100 ft. in the adit and continuing for an additional 200 ft.

A drift to the north was driven on the best ore section, continuing in ore for some 160 ft. in this direction.

A south branch was driven off the

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main adit to get under the known lens, and orepass and manway raises were put up to the footwall of the ore. From the top of the ore pass a 25 degree raise was driven up the footwall of the ore to surface on the top of the ridge, having a total length of 217 ft.

Two additional short raises, spaced at 70-ft. intervals along the footwall raise, were driven up through the ore lens normal to the dip.

These latter raises intersected ore thicknesses of 37 and 47 ft. An enlarged programme of underground diamond drilling was undertaken when it became apparent that a major addition to the ore lens was in sight. In all, 706 ft. of drifting and crosscutting, 405 ft. of raising, and 3,549 ft. of underground drilling were completed by the end of May.

A supplementary programme of close spaced surface diamond drilling was started on completion of the underground work, to fill in the complete detailed outline of the ore lens.

This work was finished at the end of July, with 4,021 ft. drilled in 39 holes.

The orebody extends for a length of about 700 ft., outcropping on the top of the ridge at its southern extremity, and angling down the east slope at an approximate N. 25 degrees E. direction.

Average width down the slope is about 180 ft., with an average ore thickness nearing 50 ft. The lens is very favorably situated for open-pit mining, with ore extending close to the surface over most of the area.

"BD" Zone

The "BD" zone area, lying on the steep westerly slope of the main ridge leading down to Foghorn Creek, and located approximately 1,600 ft. distant and 500 ft. below the "A" zone, was located during the early exploratory work in 1951.

Surface drilling totalling approximately 8,100 ft. in 37 holes was completed in this area during 1952 and 1953, indicating a very substantial ore lens extending 250 ft. on strike (N. 30 degrees E.), 250 ft. down dip, and averaging approximately 50 ft. thick.

These favorable results, combined with increasing difficulty in drilling through increasing depths of overburden to the north, led to the decision to undertake a programme of underground development on the lens during the winter of 1953-54.

A crosscut adit was driven at elevation 3330, passing through 120 ft. of low-grade ore at the portal, and continuing under the main lens to its approximate north-south axis.

Drifts were then driven north and south to the limits of the lens, with an additional central east-west crosscut driven to provide diamond drill stations. A single raise was driven up through the ore lens, showing a 62 ft. ore section.

This programme was completed in May, 1954, with drifting and crosscutting totalling 10,003 ft., raising 66 ft., and underground drilling 4,755 ft., in 48 holes. An additional 2,068 ft. of surface drilling in 14 holes was completed following the underground work, to further explore the down-dip extension of the ore lens.

The completely outlined lens showed a strike length of 500 ft., slope depth averaged 250 ft., with average thickness 50 ft.

Here again the ore lens is favorably located for open pit mining, lying closely conformable to the steep east slope of Foghorn Creek under fairly shallow overburden and waste rock. Increasing depth of overburden to the north will require underground mining methods for a small proportion of the ore.

Additional Ore Possibilities

Current exploration is being concentrated around the periphery of the main ridge between the "A" and "BD" zones, an area considered to be most favorable for the discovery of additional ore bodies.

The known bodies occur as replacement lenses in a member of the main trachyte series, locally known as the pyrite-mica formation. This formation is characteristically made up of trachyte fragments in a sheared matrix consisting of biotite with some sericite, abundant pyrite, and varying amounts of fluorite and celestite.

Control of the localization of ore lenses within the pyrite-mica formation is not well understood, but appears to be related to the intensity of faulting and fracturing, and also to crystallization of the biotite and pyrite.

Beds showing coarse biotite and cubic pyrite have not shown ore grade values to date—where these constituents are fine grained and the formation shows a characteristic schistose and banded structure, ore values occur.

Previous exploratory drilling on the ridge circumference has shown widespread pyrite-mica occurrences with thicknesses up to 100 ft.

Current drilling in an area some 1000 ft north of the "BD" zone has yielded a 15-foot intersection of commercial ore.

Somewhat narrower intersections in previous holes in the vicinity indicate the possibility of a fair sized ore lens here, and drilling is being concentrated in the neighboring area.

Major occurrences of the favorable formation have also been found on the lower slopes of the North Thompson Valley along Cedar Creek, on claims held by Deer Horn Mines Ltd.—some three miles distant from the known orebodies. Little work has been done to explore the possibilities here, but a limited drilling programme is planned for the current season.

Some trenching and diamond drilling have been carried out on favorable showings on the west bank of Foghorn Creek, opposite the "BD" orebody. Drilling results have been unsatisfactory, with very poor core recovery due to the difficult slide rock and overburden conditions. A further programme of limited underground exploration from the known ore grade showings, has been prepared for this area.

Production Plans

Studies of mining plans, mill locations, water and power supply, etc., were started early in the current season and are now well advanced.

Detailed surveys and calculations for open pit operation on both the "A" and "BD" orebodies have been completed. Overburden and waste to be removed from the "A" orebody totals 250,000 cu. yds.; from the "BD" orebody approximately 400,000 cu. yds.

The favorable location of the orebodies on the relatively steep slopes of the ridge provides close and convenient dumping areas for waste, and ensures relatively low cost operation. Existing access roads to both zones can readily be improved for mining operations at low cost.

Due to the strong possibility of finding new orebodies at lower levels, and also to the necessity of bringing in large supplies of fuel and materials for the treatment process, a mill site in the North Thompson valley, adjacent to the C.N.R. main line, has been selected. Property in the selected area has been acquired for plant and camp construction, and preliminary plans have been drawn up. The location chosen offers optimum conditions for both construction and operation.

With the known and potential orebodies spread over a three mile horizontal, and 2500 ft. vertical range, truck haulage from the mining area to the plant is considered the most satisfactory method of ore transport.

Haul from the "A" and "BD" open pits will be about 8 miles. Plans for improving and relocating in part, the existing road to Birch Island to meet ore haul reqiurements have ben completed.

Complete plans for submission to the Dominion Government agency are well advanced, and an early decision on production is anticipated.

EXCLUSIVE CONNECTION WITH WESTERN UNION CABLE SERVICE

FORM 6102

CANADIAN NATIONAL TELEGRAPHS

J. R. WHITE, GENERAL MANAGER
TORONTO

CLASS OF SERVICE DESIRED
FULL RATE
DAY LETTER
NIGHT MESSAGE
NIGHT LETTER

PLACE X OPPOSITE SERVICE DESIRED

CHECK	RECEIVERS NO.	TIME FILED	CHARGE TO DEPT. OR ADDRESS

Send the following message, subject to the terms on back hereof, which are hereby agreed to

NIGHT LETTER
FEBRUARY 3, 1958

JOHN W. SCOTT, MINE MANAGER,
REXSPAR URANIUM,
BIRCH ISLAND, B.C.

RESERVES JULY THIRTY FIRST DILUTION FIVE PERCENT PITS TEN PERCENT UNDER-GROUND "A" PIT SEVEN FOUR FOUR EIGHT ONE OUGHT TONS AT ONE POINT FIVE SIX POUNDS "B" PIT ONE ONE SEVEN TWO FOUR THREE AT ONE POINT SIX THREE EIGHT "B" UNDERGROUND ONE THREE ONE SEVEN TWO SIX AT ONE FIVE SIX FOUR TOTAL "B" TWO FOUR EIGHT NINE SIX NINE AT ONE POINT FIVE NINE "BD" PIT SIX SEVEN SEVEN FOUR ONE OUGHT AT ONE POINT FIVE THREE TWO "BD" UNDERGROUND THREE FIVE SIX FOUR AT ONE POINT FOUR ONE LOWER "BD" UNDERGROUND FOUR FOUR ONE SEVEN SIX AT ONE POINT THREE SEVEN SEVEN TOTAL "BD" SEVEN TWO FIVE ONE FIVE OUGHT AT ONE POINT FIVE TWO TWO TOTAL OF THREE ZONES ONE SEVEN ONE EIGHT NINE TWO NINE TONS AT ONE POINT FIVE FIVE POUNDS SENDING LETTER

W.C. RINGSLEBEN,
77 YORK STREET, ROOM 113,
TORONTO, ONTARIO

Lexspaw Reserves @ 10 cf/ton mill @ 600/day

Present reserves 980 200 @ 1.71

Recoverable @ 88.5% 1 483 386 #

Gross revenue @ 10.50 15 575 553

Op Cost allow 5% dilution recalc. min & est. new mill cost to total 8.90/ton incl 23¢ dev

1,029,210 tons @ 8.90 9 159 969

Revenue minus op cost 6,415,584

		op cost	
At 8.67 (no dilution no dev.)	15 575 553	− 8.67 (980 200) =	$ 7,079,486
10.5% dil.		8,919,810	6,595,743

Lexspaw Reserves @ 10.8 cf/ton mill @ 500/day

Reserves 907 593 tons @ 1.71 1 373 806 #

@ 88.5% recovery

Gross Revenue @ 10.50 14,421,813

Op cost, no dilution no development revised mining & est. mill cost total 8.67 for 907 593 tons. 7 865 806

Revenue minus op cost → 6,556,007

Mine capital cost & "A" zone stripping 550,000

Cost of 500 ton mill 4,100,000 AGW.

1 483 386
569 789

2 053 125
1 627 565

425,560

On Huston costs @ 88.5% recovery following revisions are made

	Tons 1,136,457	
Total lbs recoverable	1,538,763	= 7 lbs/ton required
Gross Revenue	16,157,012	
Less Op Cost	$ 5 962 993	
Tons reqd to fulfill contract	379883	
Lbs " " " "	514362	
Gross revenue from addit	5 400 801	
Op Cost @ 8.97	3 407 551	
Less Op. Cost	1 993 250	

Total Revenue minus op. cost 7,956,243

Development Cost.

To date roughly 400,000 in direct expenditure on DDrilling & Underground development yields (Huston) 1136457 Tons. Additional 380,000 tons reqd should be obtainable for $380,000 or say 20¢ per ton total.

Reducing development cost to 20¢ per ton rev Full contract Total revenue minus op cost $8,790,230

On Huston basis reduce Dev. cost to 56¢/ton

Gross Revenue less op cost on 1136457 tons $6,515,336

Addit ore at recoverable 1.5 lbs. 514 362 lbs reqd.

342,908 tons Gross revenue	5 400 801
Op cost @ 848	2 907 860 ok.
Total revenue - op. cost	$ 2,493,041

Full contract Revenue less op cost $9,008,377

Kerrspar Reserves @ 10 cu ft/ton.

Present minable reserves ~~88~~ – 980,200 tons @ 1.71 lbs. (72%)

Recoverable @ 88.5%	1,483,386
Gross revenue @ 10.50	15,575,553
Op Cost @ 5% dilution, 300000 dev cost 30¢/ton 8.52/ton on 1,029,210 tons	8 768; 869
Revenue less op cost (Houston)	$ 6,806,684
Revenue less op cost @ ~~900~~ 897/ton 15 575 553 – 9,232,014	$ 6,343,539

Additional lbs reqd to fulfill contract 569 739	
✓ tons ✓ ✓ ✓ ✓ @ 1.51b. recoverable	379,826
Gross revenue @ 10.50	$ 5,982,260 ~~3,988,173~~
Op Cost @ 8.52 ~~569,739~~ x 379 826	3 236 118
Revenue less op. cost	$ 2,746,142
@ 897 5,982,260 – 3,407,739	2,574,521

Total revenue minus op cost @ 8.54	9,552,826 ~~10,042,802~~
✓ ✓ minus ✓ @ 897	8,918,060

Lexspar ~~Lyd~~ reserves using 10.8 cft./ton.

Present minable reserves 907,593 tons @ 1.71 lbs. (67% rough)

Recoverable U_3O_8 @ 88.5% 1,373,506 lbs.

Gross Revenue @ 10.50 $14 421 813

Op cost @ 5% dilution, $300,000 dev cost, $8.54/ton (329/ton.)

952,973 × 8.54 8 138 390

Revenue less op cost 6,283,423

(Revenue less op cost @ 89¢/lb ~~3~~ 14421813 − 8548167 5,873,646)

Lbs rqd to fulfil contract 679619

Tons " " " (1.5 recoverable) 453,080

Gross revenue @ 10.50 7,136,000

Op cost @ 8.54 × 453080 ~~5 803 946~~ 3 869 303

Revenue less op cost ~~3 332,054~~ 3,266,697

@ 89¢ 7136000 − 4064128 = 3,071,872

Total revenue minus op cost @ 8.54 $9,550,120

" " " " " @ 8.97 $8,945,518

900,000 6 283 423 / 400 000 / 6,683,400

1373506 / 679619 / 205312

135000 / 4 / 540000

10.50 / .18 / 8.40 / 1.050

Pyrite	22	5.0	110
Biotite	10	2.9	29
Fluorite	2.0	3.1	6.2
Celestite	2.0	3.9	7.8
Albite	32	2.6	83.2
Microcline	32	2.55	81.6
			317.8

32
2.6
1.92
64
83.2
2.55
32
81.0
765
81.6

20 5 100
80 2.6 208
3.08

32 | 425 560 | 328.500
32
96
295
264
316
264
520