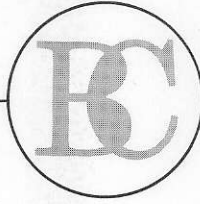


REPORT on the
THOR and EMB CLAIMS
LIARD MINING DIVISION, B.C.
for PAN CENTRAL EXPLORATIONS LTD.

by: W.R. Bacon, Ph.D., P.Eng.

673264

June 29, 1972.



BACON & CROWHURST LTD.

1720-1055 West Hastings Street
Vancouver 1, B. C.

REPORT

on the

THOR and EMB CLAIMS

LIARD MINING DIVISION, B.C.

for

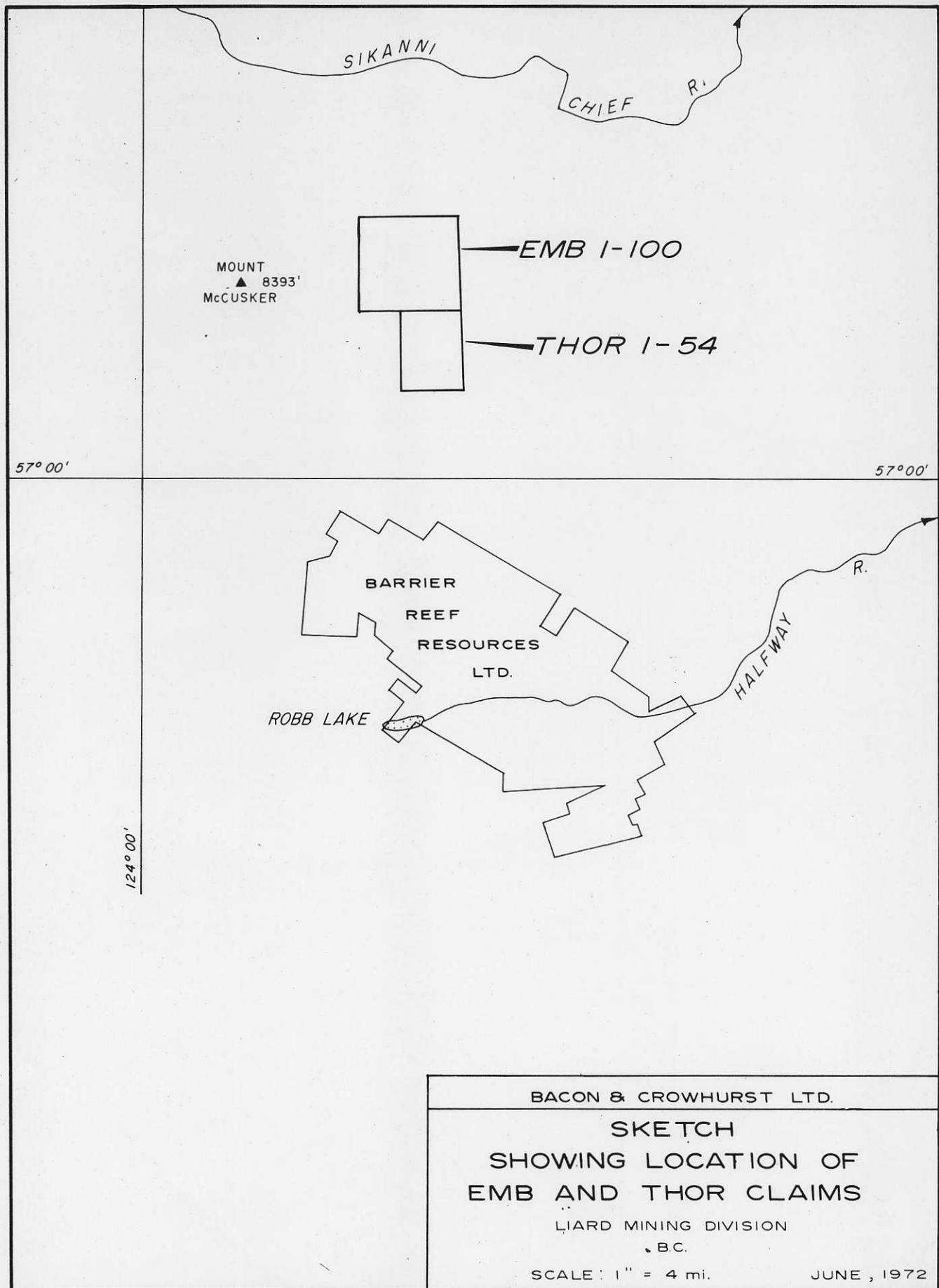
PAN CENTRAL EXPLORATIONS LTD.

by

W.R. BACON, Ph.D., P.Eng.

Vancouver, B.C.

June 29, 1972



BACON & CROWHURST LTD.

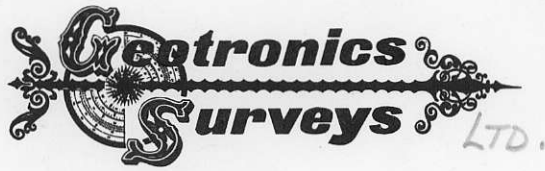
SKETCH
SHOWING LOCATION OF
EMB AND THOR CLAIMS

LIARD MINING DIVISION
B.C.

SCALE: 1" = 4 mi.

JUNE, 1972

*\$ 15,000 down
\$ 8,000 including notes
letter on July 20/72.*



514-602 West Hastings Street, Vancouver, British Columbia, Canada * Telephone 687-6671

In 2 weeks time

June 28, 1972

20 days in field

Bacon & Crowhurst, Consultants,
1055 West Hastings Street,
Vancouver 1, B.C.

ATTENTION: Dr. W.R. Bacon

Dear Dr. Bacon:

Re: Proposed Seismic Investigation, Robb Lake Area,
British Columbia

Further to our recent meeting regarding the above-mentioned seismic investigation, we understand that this work entails approximately 18 line miles of seismic refraction survey. Since you are interested in rock depths up to 500 to 600 feet, we would use a 12 geophone spread approximately 2,500 feet long. The technique employed would yield depth determinations at 2,500 foot intervals along the presently established claim location lines.

It is our experience that a five-man crew, 2 geophysicists and 3 field assistants would minimize the survey cost considering field conditions and survey technique.

The estimated costs for this type of survey is:

1) Field work @ \$750.00/line mile	\$ 13,500.00
2) Explosives, instrument rental, etc.	1,250.00
3) Interpretation and report (fixed amount)	2,500.00
4) Mobilization and demobilization (assuming operations from a single base camp)	<u>7,000.00</u> ✓
Total estimated cost	<u>\$ 24,250.00</u>

CONTINUED

June 28, 1972

Bacon & Crowhurst, Consultants

The field work is an estimate only, based on our previous experience with this type of survey, and would vary with field conditions.

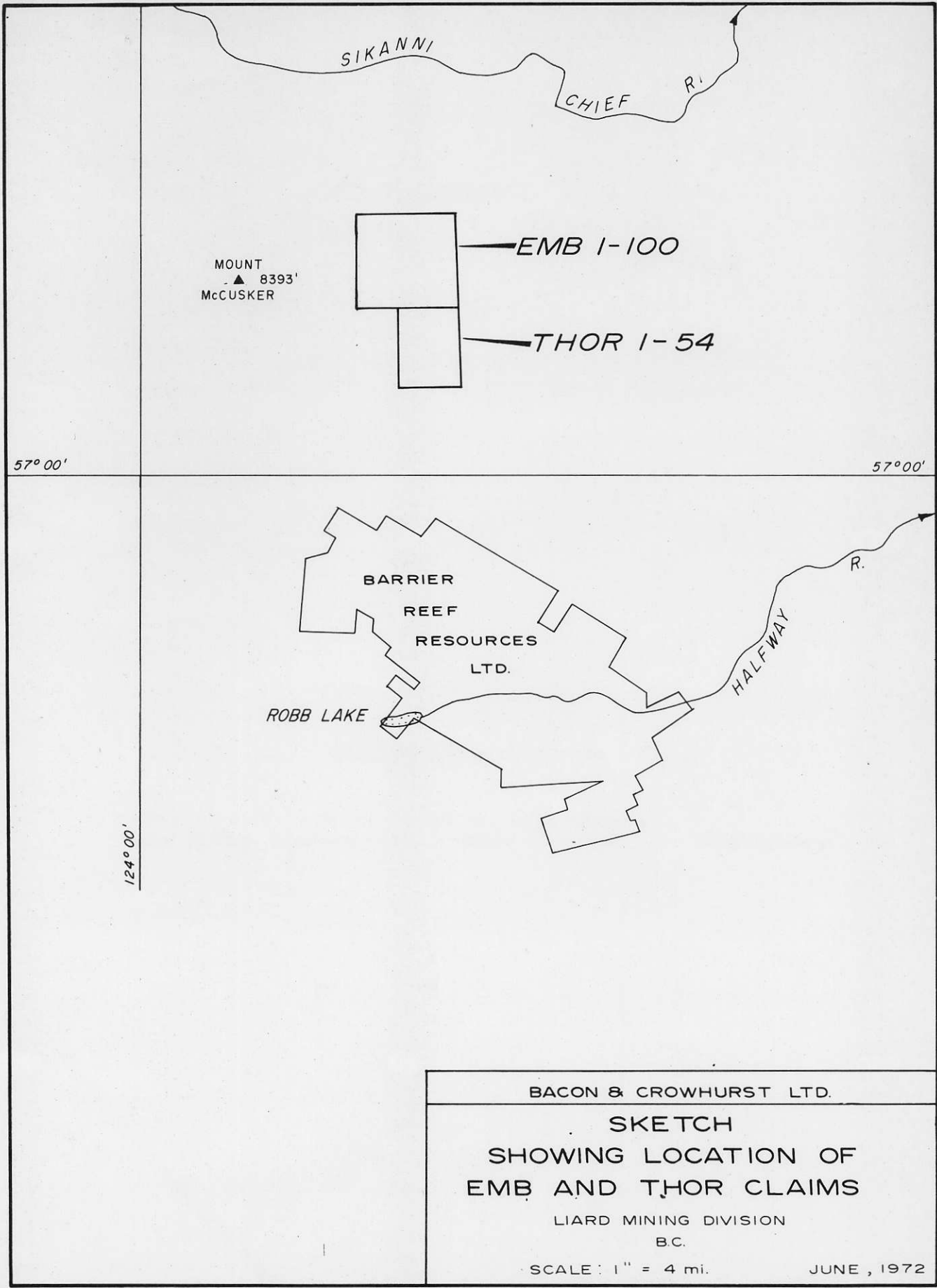
Should you find the above estimate in excess of your budgeted amount for this property, we could modify the survey technique to determine "spot" depths over the claims area for approximately \$10,000.00 to \$15,000.00.

Yours truly,

GEOTRONICS SURVEYS LTD.

Per: *Howard Larson*

H.A. Larson, Geophysicist



BACON & CROWHURST LTD.

SKETCH
SHOWING LOCATION OF
EMB AND THOR CLAIMS

LIARD MINING DIVISION
B.C.

SCALE: 1" = 4 mi.

JUNE, 1972

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ILLUSTRATION

Sketch showing Location of EMB and Thor Claims,
Liard Mining Division, B.C. - Scale 1" = 4 mi.

Frontispiece

INTRODUCTION

The Thor and EMB claims form a contiguous group of 154 claims in the southwest corner of the Trutch map-area. As shown on the location sketch, they are between the Sikanni Chief River and Halfway River. The former is a tributary of the Fort Nelson River which flows into the Liard River; the latter is a tributary of the Peace River.

Physiographically the claims are on the eastern margin of the Rocky Mountains. Specifically they are on the eastern slope of Mount McCusker which rises to an elevation of 8393 feet.

The topography of the Thor claims and the main part of the EMB claims is gentle and elevations are in the 4000-5000 foot range. The western part of the EMB claims is quite mountainous and elevations are of the order of 7000 feet at the west boundary.

The claims were examined by the writer on June 22, 1972. Both groups were staked early in May, 1972, the Thor by N. Wychopen and the EMB by A. Harman. Several posts were examined on each group and the staking appears to be done in accordance with the Mineral Act. On both groups the location lines were very well blazed.

GEOLOGY

As noted above, the claims in question are in the southwest corner of the Trutch area. The rocks in this area are Paleozoic sediments which have not been subdivided on the most recent map (Map 12-1963) published by the Geological Survey of Canada.

A few miles farther south, in the northwest corner of the Halfway River map-area, the Paleozoic rocks are subdivided. In fact the Devonian section has been measured on the property of Barrier Reef Resources Ltd. and is as follows*:

Upper Devonian		
Besa River shale		230 feet thick
Middle Devonian		
Dolomite with sandy and silty sections; breccia		2070 " "

The Middle Devonian rests on 1780 feet of Silurian sediments, mainly dolomite with minor sandstone and limestone.

The sediments on the Barrier Reef property are folded along NNW axes and dip steeply in places.

Staking in the area has been occasioned by the discovery of zinc-lead mineralization in Middle Devonian carbonates on the Barrier Reef property. The mineral is found in brecciated sections of dolomitic beds.

* G.S.C. Paper 69-11, pp. 117-8.

Little is actually known about the geology on the Thor and the majority of the EMB claims because of overburden. This ground, however, is obviously underlain by Paleozoic sediments and, in view of the nature of the surface, one can assume that the Besa River shales are present. These shales are dark grey to black, fissile to thin-bedded and highly incompetent. The formation weathers easily because of its relative softness and for this reason tends to be largely tree covered in the valleys and to form gentle slopes within the mountains. This describes the terrain of the Thor and most of the EMB claims.

Beneath the Besa River occurs the Middle Devonian carbonates - at some presently unknown depth - depending to some extent upon the deformation that has occurred in the claims vicinity.

The brecciated sections of the Middle Devonian dolimitized carbonate beds form the prospective loci.

RECOMMENDATION

It is recommended that a seismic refraction survey be undertaken along the location lines of both Thor and EMB claim groups, excepting that portion of the EMB group that is mountainous. This would involve about 18 miles of line.

Once the Besa River-Middle Devonian interface has been established, drilling is the next step, provided the interface is not so deep as to render exploration of the Middle Devonian impractical.

COST ESTIMATEPhase 1 - Seismic Refraction Survey

Field work, 18 miles @ \$750/line mile	\$13,500
Explosives, instrument rental, etc.	1,250
Interpretation and report	2,500
Mobilization and demobilization (assuming operations from a single camp)	<u>7,000</u>
	<u>\$24,250</u>

Phase 2 - Diamond Drilling

5000 ft. of AQ wireline drilling at \$10/ft.	\$50,000
Mobilization, demobilization	10,000
Transportation (mainly helicopter)	10,000
Geology, engineering, supervision and possibly assaying	<u>5,000</u>
	<u>\$75,000</u>
	<u>\$99,250</u>

Respectfully submitted,

BACON & CROWHURST LTD.



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

CERTIFICATE

I, William R. Bacon, with business address at
1720 - 1055 W. Hastings St., Vancouver, 1, British Columbia,
DO HEREBY CERTIFY THAT:

1. I am a consulting geological engineer.
2. I am a graduate of the University of British Columbia with B.A.Sc. (1939) and M.A.Sc. (1942) degrees in Geological Engineering.
3. I am a graduate of the University of Toronto with a Ph.D (1952) degree in Economic Geology.
4. I have practised my profession for thirty years in Canada, South America and Australia. During the past twenty years, the majority of my time has been spent in British Columbia; it includes seven years (1949-56) as geologist with the B.C. Department of Mines.
5. I personally examined the Thor and EMB claims in the Liard Mining Division, B.C., on June 22nd, 1972.
6. I have no interest, direct or indirect, in the Thor and EMB claims nor do I expect to acquire any such interest. I have no shares in Pan Central Explorations Ltd. nor do I expect to acquire any.



W.R. Bacon, Ph.D., F.Eng.

Vancouver, Canada.
June 29th, 1972.

June 29th, 1972.

362-2493

Mr. Murray Watts,
715 - 159 Bay St.,
Toronto, 1, Ontario.

Dear Murray:

Herewith a report on the Thor and EMB claim groups which may be quite timely - shares of Barrier Reef have risen \$2.00 today. This report is patterned on dozens of others I have done for the Vancouver Stock Exchange and I know it will be acceptable here. Whether or not you intend to raise money in Vancouver, I do not know.

I did a fair bit of investigating with regard to seismic work and believe that Geotronics Surveys would be as reasonable as anyone else and probably more reliable. I enclose copy of their letter for your perusal.

I am going north again tomorrow but will be in the office Tuesday morning, July 4th. Please give me a ring should you have any questions about the Robb Lake area or anything else for that matter.

Sincerely,

BACON & CROWHURST LTD.

W.R. Bacon

WRB/ic
Encl's.

July 21st, 1972.

PAN Central Explorations Ltd.,
715 - 159 Bay St.,
Toronto, 1, Ontario.

Attention: Mr. Graham Ackerley

Dear Graham:

Referring to our conversation of July 20th, I am writing to remind you that Geotronics Surveys Ltd., the company that will be undertaking a seismic survey of the THOR and the EMB claim groups will require a cheque for \$15,000 prior to the date of commencement. Date of commencement should be early in August.

I expect that you would like me to go up for a day during the course of the job to check on progress. Please advise me on this.

I have just received a rather curious call from Mike Dumoulin, a lawyer here in Vancouver. He had a letter from PAN Central asking him to enquire when my Robb Lake report would be ready. I told him this report had been mailed to Toronto on June 29th and I was sure that if you had not received it, I would have been advised of this fact.

Yours sincerely,

BACON & CROWHURST LTD.

W.R. Bacon

WRB/ic

PAN Central Explorations Limited

SUITE 420 - 159 BAY STREET

TORONTO 1, ONTARIO

362-2493

August 21, 1972

Dr. W.R. Bacon,
514 - 602 West Hastings Street,
Vancouver, B.C.

Dear Bill;

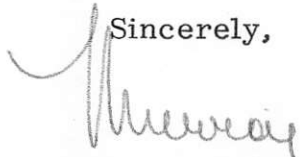
The latest rumour that I have on the Robb Lake area suggests reasonably important implications of a low-grade but good size zinc potential - perhaps enough for open pit purposes in one case at least.

It is suggested sufficient encouragement is there to justify a considerable exploration expenditure.

In the meantime - a discovery of a mineral occurrence in the Yukon has come to our attention that may be of considerable interest. I will let you know.

Best regards,

Sincerely,



Murray Watts

MW/hs

P.S.

I will want to see concrete results on the Robb Lake main find before spending our next money to keep the claims in good standing.

M. W.

September 15th, 1972.

Mr. Murray Watts,
PAN Central Explorations Limited,
420 - 159 Bay St.,
Toronto, 1, Ontario.

Dear Murray:

I did not bother answering your letter of August 21st before this because I had been busy on a number of things and had no occasion to return to Robb Lake.

Yesterday I had business with a company client who has substantial holdings in the area and I got a little first hand information which I consider completely reliable.

From a geological standpoint, it would appear that the brecciation and porosity of the carbonate at Robb Lake is not as intense as at Pine Point; rather it is more like East Tennessee.

The diamond drill program of 30 holes has been terminated for this year and my informant suggests there has been some considerable encouragement. Apparently two bulldozers are on their way into the property now to build an airstrip.

From another source, I understand that Cominco has one drill at Redfern Lake, some 20 miles north of Barrier Reef and in the Finlay Forks area away to the south.

In closing, I would point out again that the situation at Robb Lake is not as easy as Pine Point, largely because of the structure and the topography. There may be possibilities for open pits but this would only be possible where the topography permits.

Best regards,

Sincerely,

BACON & CROWHURST LTD.

W.R. Bacon

WRB/ic

June 27th, 1972.

Mr. Murray Watts,
715 - 159 Bay St.,
Toronto, 1, Ontario.

Dear Murray:

On Thursday, June 22nd, Graham Ackerley and I flew to Prince George by C.P.A., took a Cessna charter to MacKenzie on Williston Lake, thence to the Robb Lake area by B47 helicopter. This arrangement permitted us to get in, see things, and get out the same day - and was probably cheaper (and a good deal more certain) than if we had tried to get in by helicopter from Fort St. John.

We had lunch at the Barrier Reef camp which is being managed by Cordilleran Engineering - a company of young, erstwhile Haileybury School of Mines livewires who have been in Vancouver for 7-8 years. Barrier Reef is partly Conwest, partly Texas Gulf (40%), partly Grace and partly Cordilleran. We saw some well mineralized (zinc and lead) specimens and gazed at a slightly orange coloured outcrop part way up the steep mountainside. We got very little information otherwise but gained the impression that the property could stand some additional experience in the form of a good sedimentary geologist or two.

A helicopter was carrying tripod poles to one drill setup which was 1-2 miles up the valley from another setup we had spotted on the way in. The drills have not arrived but are expected shortly. Canadian Longyear has the contract.

There is a great deal of exposure on the Barrier Reef claims - between 4500 feet and 7000 feet above sea level. Folding occurs along axes striking NNW. The sedimentary section on the Barrier Reef property, as measured by the G.S.C. (Paper 69-11, pp. 117-8) is:-

Upper Devonian		
Besa River shale	-	230 feet thick
Middle Devonian		
Dolomite with sandy and silty sections; breccia	-	2070 " "
Silurian		
Dolomite; minor sandstone, limestone	-	1780 " "

The Middle Devonian rocks are the important ones and brecciation is a 'must' as far as zinc-lead mineralization is concerned. In the Middle Devonian on the Barrier Reef property, beds of dolomite breccia occur between 1070 feet and 1370 feet down in the 2070 foot section.

After lunch, we pushed off by helicopter to check out the Thor and EMB groups which are only 6-10 miles due north of Barrier Reef. These claims are well staked and 'on the beam' to Redfern Lake but the Thor claims are completely covered by overburden and only a fraction of the EMB claims, the high western part, show outcrop.

Thus, although these two claim groups are strategically located, details of their geology remain uncertain. Dr. Gordon Taylor, who has spent 10 years mapping northeastern B.C. with the G.S.C., figures that the overburden covers Besa River shale of unknown thickness (deformation could thicken or thin). Beneath the Besa River, there is little doubt that the Middle Devonian occurs and this, of course, is the prospective formation. A seismic survey could ascertain the thickness

of the Besa River, i.e. the depth of the top of the Middle Devonian. Determining this is of paramount importance before any further exploration procedure is contemplated.

I intend to get some facts regarding seismic work and its present cost, and will be including a recommendation for its use in my qualifying report. My report will also recommend a second phase featuring diamond drilling and a total cost estimate for the program of \$150,000. As far as I can see, this should be a minimum amount to be raised but I would only be prepared to keep pace with results forthcoming from the Barrier Reef program. A minimum of \$15,400 of acceptable work must be undertaken for assessment purposes - to hold the 154 claims for one year.

I can look after this undertaking if you wish, contracting the seismic work.

There is a second shale-carbonate front, much farther north, in the vicinity of the Yukon border. Taylor has found zinc-lead mineralization here also and states that the geological situation here is identical with that south of Redfern Lake. Graham and I have discussed this and believe it should be worthy of attention on your part. Graham asked me if I could line up a couple of good prospectors if needed but I'm afraid this is not too easy out here, particularly at this stage of the season. Graham thinks he could still get a couple of live ones back east.

The location of this second area, according to Taylor, can be found in "An aspect of sedimentary basin evolution; the concentration of Mississippi Valley type ores during late stages of diagenesis" by

S.A. Jackson and F.W. Beales. This was published in the Bulletin of Canadian Petroleum Geology, Vol. 15, No. 4, Dec., 1967.

A further guide to this second area might be the government claim maps for B.C. and Yukon as Taylor intimated that some exploration is already underway in the area. He expected it to be the scene of another rush once a good showing was found.

Well, I'll get on with a qualifying report now - and will have two copies in the mail by the end of the week.

Sincerely,

BACON & CROWHURST LTD.

W.R. Bacon

WRB/ic

612 - Langford Beds

- 1) Bull. 186, Dominion Stratigraphy of
Northern B.C. ✓ North Okanagan
 - 2) Bull. of Canadian Petroleum Geology
Vol. 15, No. 4, Dec. 1967
" An aspect of sedimentary Basin
Evolution: the concentration of Mississippi
Valley-type ore during late stages
of Diagenesis.
J.A. Jackson and F.W. Barber
 - 3) G.S.C. Paper 69-11. ✓
Halfway River Map. Area, B.C.
by E.J.W. Irish
-

Basin R.
Pine Point - part Prognostic.

Basin R. (1000' ^{thick}) could
be quite thick (200' - 2000') on
watts ground.

Basin R. - 1000' a fair bit of manganese
Pine Point -
Dumoulin - 600' * (BRECCIATION)
Stone. * (DIAGONITIZATION)
(NOT REEF)

* Homonal seismic to locate the
shale - carbonate contact.

1970 - Guide Book of Edmonton Geological
Society.

Y/BC

AH

R.

~~RK~~

PR

Besa Shale (black, siliceous, very incompetent)

Latchwa

FFS

Mudwa

SK
EBL

Stone Pt.

WM

M
BL/En f

Darudini

Sulp.

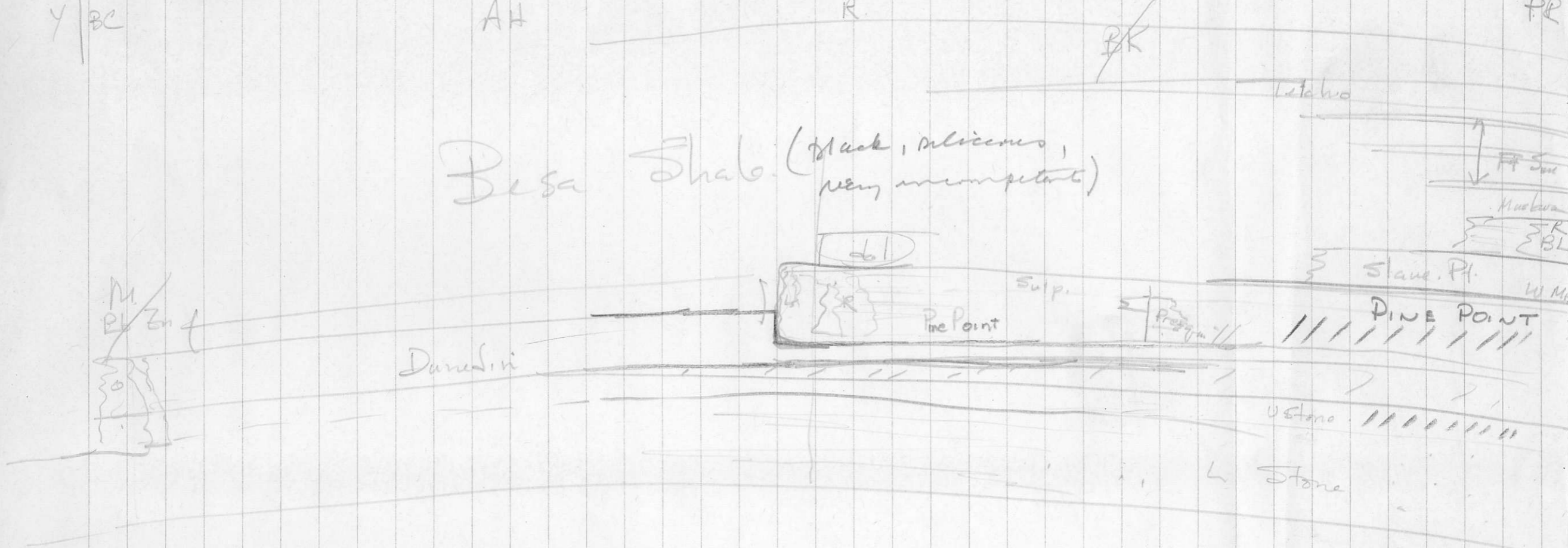
Pine Point

Presyn

PINE POINT

U Stone

L Stone



Thor LEMB.

Line (at 1500 intervals).

a) Cutting. $30 \text{ mi.} \times \$175 = \$5,000$

b) Sweeney. $50 \text{ mi.} \times \$500 = \underline{25,000}$
S.T. $\underline{\$30,000}$

Mobilization & Demobilization $= \underline{\$20,000}$
Supplies S.T. $\underline{\$50,000}$

Dredging - $5000 \text{ ft.} \times \$20/\text{ft.} = \underline{\underline{\$100,000}}$
(AQ material) $\underline{\underline{\$150,000}}$

Qualifying report.