

ROBB LAKE ASSESSMENT WORK REPORT

DIAMOND DRILLING PROGRAM

MAY - JULY, 1981

ON

CLAIMS Rob 14, 15, 16, 41, 43  
Rob 56 Fr, 57 Fr  
Cleo 2, 3, 6  
MV 23, 75, 77

LIARD MINING DIVISION

NTS 94B 13E

Approx. 56°55'N 123°42'W

OWNERS: Texasgulf Canada Ltd.  
Arrow Inter-America Corp.  
Barrier Reef Resources Ltd. (N.P.L.)

MANAGER: Texasgulf Inc.

AUTHOR: R.A.F. Graham

DATE SUBMITTED: September 30, 1981

9374

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## INTRODUCTION

The Robb Lake property is situated near the headwaters of the Halfway River in the Rocky Mountains of northeastern B.C. about 200 km west-northwest of Fort St. John, and about the same distance north of Mackenzie. The closest highway point is on the Alaska Highway about 72 km to the east-northeast of the property near the very small community of Pink Mountain.

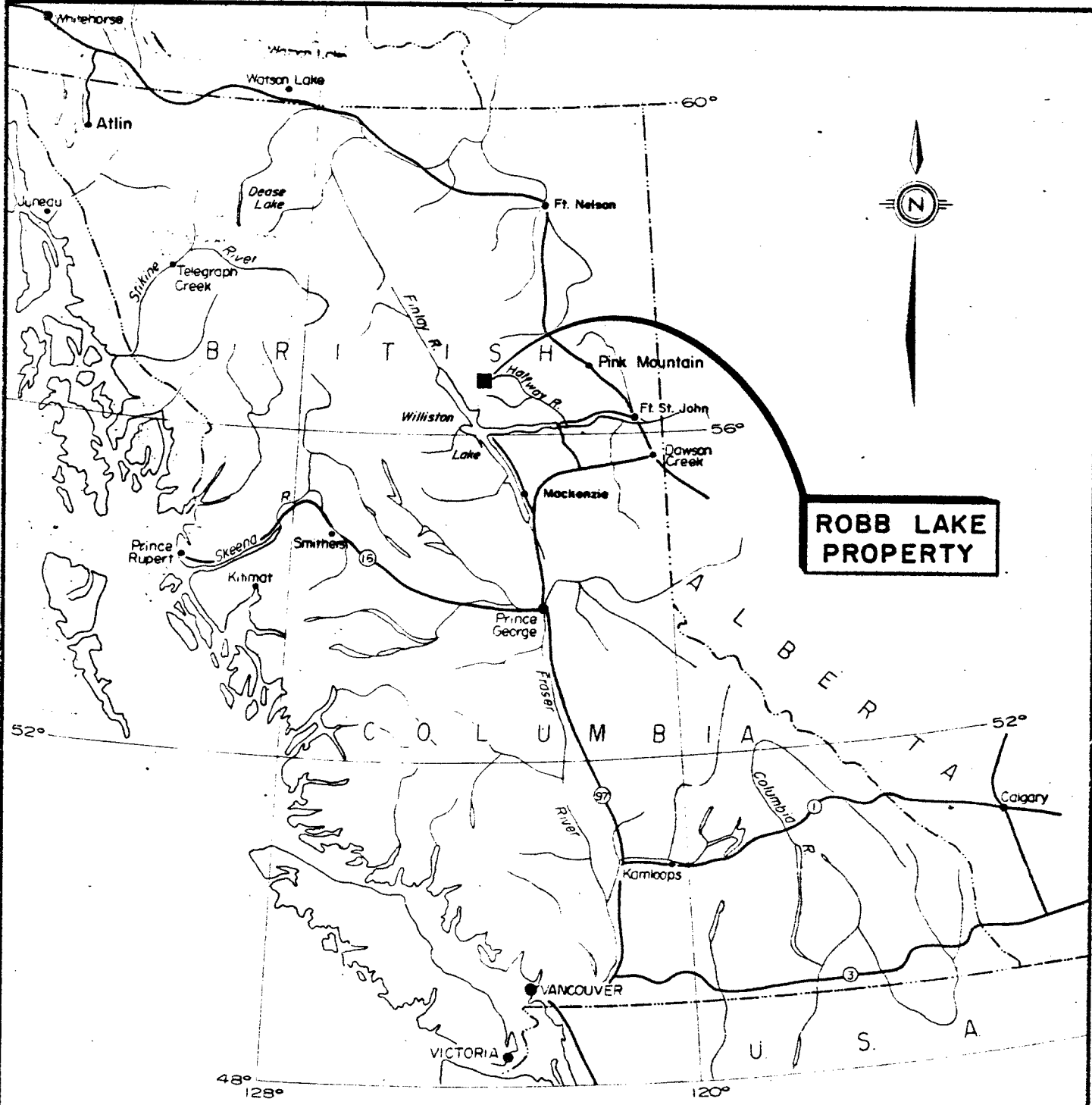
Access to the property is by air and the most suitable points of departure are Fort St. John or Mackenzie. A 915 m gravel airstrip was constructed on the property in 1972 and can be used by a limited number of aircraft types. Robb lake, 6 km west of camp, can be used to a limited extent by float planes. Good docking facilities are available at the lake.

The Robb Lake claims were staked in 1971, with a few later additions, by Peregrine Exploration (now Barrier Reef Resources), Arrow Inter-America Corp. and Ecstall Mining (now Texasgulf Canada). The three companies later pooled their claims and formed a joint venture to explore them. A total of 427 two-post claims and 16 units of one mineral claim remain in good standing. Each of the three companies owns some of the claims outright. The rest are held jointly by the three. Texasgulf Inc. is manager of the project.

The claims were staked originally to cover lead-zinc showings in carbonates of assumed Middle Devonian age. From 1972 until 1975, successive field programs of geological mapping and diamond drilling added much information on the structure, stratigraphy and mineralization controls in the area. Over the four year period 91 holes totalling 43,478 ft were diamond drilled. Drilling was aimed at a number of showings and in three of them significant mineralization was found. A total of 6.1 million short tons grading 7.3% combined lead and zinc was inferred in three separate deposits: the Lower Showing, East Webb and West Webb.

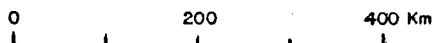


**ROBB LAKE  
PROPERTY**



**LOCATION MAP**

**ROBB LAKE JOINT VENTURE**



SCALE

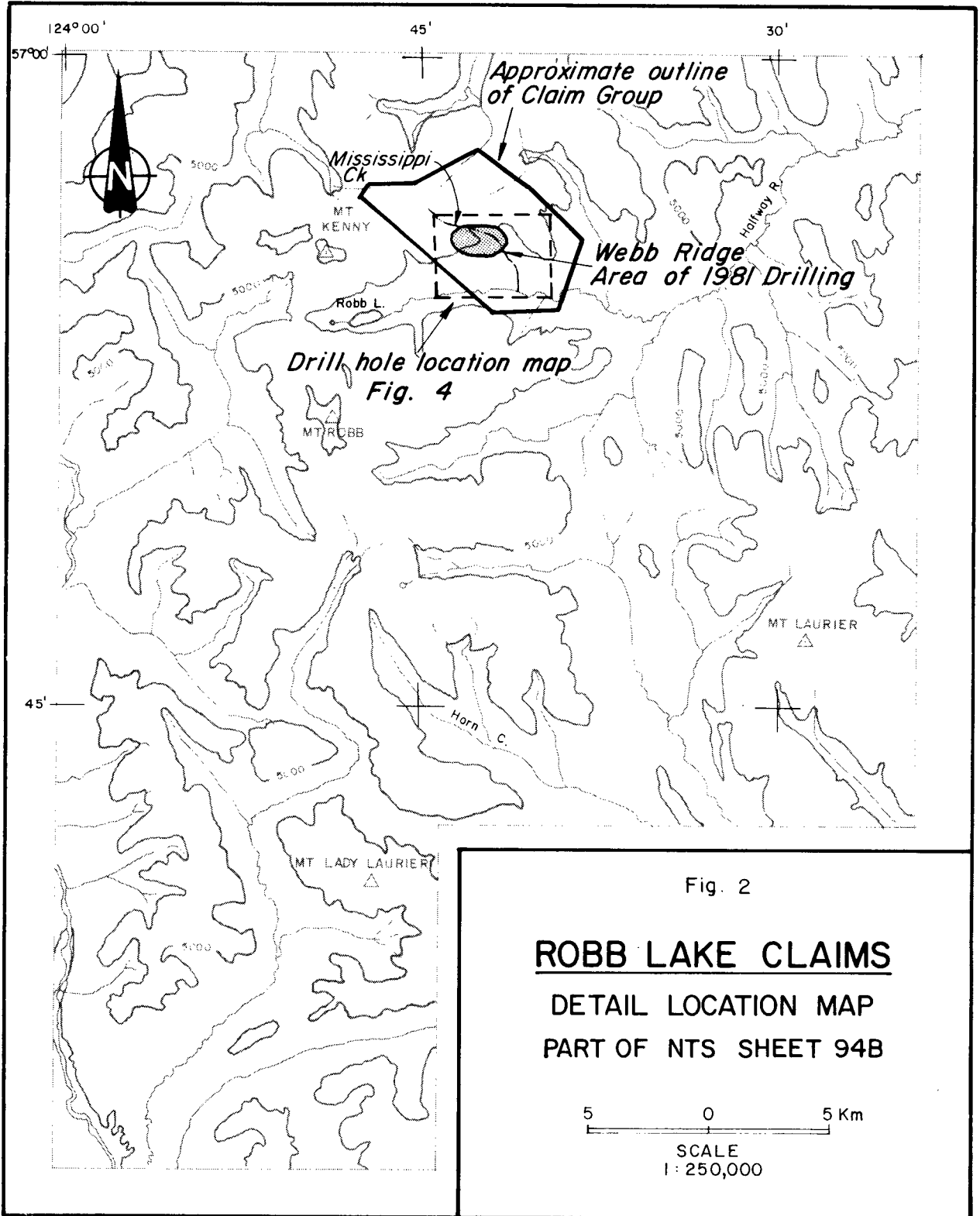


Fig. 2

**ROBB LAKE CLAIMS**  
**DETAIL LOCATION MAP**  
**PART OF NTS SHEET 94B**

5 0 5 Km  
SCALE  
1:250,000

From 1976 until 1979, the project was dormant. It was reactivated in 1980 when it was decided to carry out a grid diamond drilling program to explore for further zones of mineralization in an area where the potentially mineralized horizons lie at some depth below surface. This was a new approach to exploration at Robb Lake and was taken because mineralization associated with the known surface showings was insufficient to make a viable mining operation. The first part of the planned program was carried out in 1980 and it was essentially completed in 1981.

Mobilization of camp and drill equipment for the 1981 part of the program took place in late May. The drilling contract was awarded to Longyear Canada Ltd. One drill machine, a Longyear 38, was engaged continuously on the program from early June till the end of July. In that time 13 holes totalling 3812.48 m were drilled on 13 claims as follows:

<u>Hole No.</u>	<u>Claim</u>	<u>Depth (m)</u>
91-81	Cleo 6	544.68
92-81	Cleo 2	267.01
93-81	Rob 43	318.82
94-81	MV 77	243.84
95-81	MV 75	309.68
96-81	Rob 14	199.65
97-81	MV 23	136.25
98-81	Rob 15	117.96
99-81	Rob 41	480.06
100-81	Rob 16	322.79
101-81	Rob 57 Fr	217.63
102-81	Rob 56 Fr	207.27
103-81	Cleo 3	446.84

The size of all core is BQ and it is stored at the camp beside the airstrip on the property.

At the end of the program a survey was made of the collar location and elevation of all 13 holes (see Appendix 2).

## RESULTS OF DIAMOND DRILLING

Earlier work had shown that the Devonian carbonate succession in the Robb Lake area is about 700 m thick and that it could be divided into four units: A, B, C, D in descending order. The units of particular economic interest are B and C and each is about 300 m thick. Strata on the property are only slightly folded but have been affected by extensive thrust faulting.

Previous diamond drilling had indicated that the highest grade and most extensive mineralization occurred as continuations of showings found on Webb Ridge. It was also shown that mineralization occurred dominantly at two stratigraphic levels, one in mid Unit C, the other in Unit B. Because it appeared that both these units have considerable lateral extensions at a fairly constant level below surface to the south of Webb Ridge it was decided to start a grid drilling program in 1980 to explore both units in this region for further zones of mineralization. The program was amended in 1981 to include some ground north and east of Webb Ridge, and in addition two angle holes were drilled to test for possible vertically controlled mineralization connecting the two stratabound levels.

Varying thicknesses of Unit B were intersected in 10 of the 13 holes and most of the upper half of Unit C was intersected in all of them. Characteristics of the units are consistent over the area drilled. Both consist of commonly cyclic shallow water carbonates which have been entirely dolomitized. Environments during carbonate deposition appear to have fluctuated from high subtidal to supratidal. The main differences between the two units involve cyclicity development, quartz content and colour. Although a certain degree of cyclicity from deeper to shallower water carbonates occurs in Unit C it is much more consistently developed in Unit B. In addition the basal or deeper water parts of cycles in Unit B consistently contain quartz sand or silt whereas in Unit C they are usually quartz free. Basal parts of cycles in Unit B also tend to be a darker grey than in Unit C.

The upper, or most shallow water, parts of cycles have been affected by solution activity which has dissolved part of the sediment, led to minor stratiform collapse brecciation, and left cavities which have been filled by secondary dolomite. Because solution activity has most commonly affected parts of the sequence deposited in a supratidal environment it is possible that material removed may have been dominantly anhydrite. There is however no direct evidence that anhydrite was originally present.

The stratiform solution breccias occur throughout the section drilled but are most strongly developed in the central and upper part of Unit C. Most of Unit C mineralization is associated with the collapse breccias though extensive volumes of breccias have remained unmineralized.

Drill holes 91-81, 94-81 and 95-81 represent the most southerly fence of holes drilled on the property. Compared with the area to the north and north-west lithologies encountered indicated a slight increase in water depth during deposition, with less development of the supratidal facies, less solution breccia and almost no indication of mineralization. Although there is some evidence of a westerly shallowing of depositional environment along the line the three holes provide an indication of a southerly or south-easterly limit to the area of exploration interest.

Hole 92-81 was drilled to explore for a continuation of mineralization between the known East Webb deposit to the NNW and a previously encountered intersection to the SSE (in hole 84-80). Significant mineralization was found at several levels in Unit C, the best being 2.69% Pb, Zn over 4 m from 176.6 to 180.6 m. (See Appendix 5 for complete assay results). Five holes were drilled in the valley of the east flowing part of Mississippi Creek north of Webb Ridge partly as reconnaissance but also to explore for a northerly continuation of the East Webb zone. One of these, hole 97-81, encountered two intercepts of high grade mineralization in Unit C: 9.01% Pb,Zn over 3 m from 34.2 to 37.2 m and 14.18% Pb,Zn over 3 m from 48.02 to 51.02 m. These intersections and those of hole 92-81 provide strong evidence of a continuity of mineralization in a zone from hole 97-81 through East Webb



to hole 84-80, a distance of over 1,100 m.

Of the other holes in Mississippi Creek valley no. 102-81 contained no mineralization and indicated a faulted northerly end to or at least displacement of the above zone. Holes 98-81 and 101-81, east and west respectively of the above zone, contained no significant mineralization. Hole 96-81, the westernmost of the holes, showed evidence of extreme solution activity in Unit C and common traces of mineralization over a large part of the section. Results may be indicative of better grade mineralization nearby.

One hole, no. 93-81 was drilled to explore for a southeastward extension of the West Webb zone but encountered no significant mineralization. Neither this hole nor those drilled to the north near Mississippi Creek are sufficient to rule out extensions of the West Webb zone.

Hole 103-81, east of Webb Ridge was a purely reconnaissance hole. It encountered long sections of low grade mineralization starting in Unit B and extending downward for about 200 m into Unit C. Several short sections of higher grade mineralization also occur, the best of which is 3.70% Pb, Zn over 6 m from 409.4 to 415.4 m. As an indication of ore grade mineralization this hole is very significant and opens up a new area for further exploration.

Two holes, 99-81 and 100-81, were drilled at  $-45^\circ$  to determine if a steeply inclined mineralized structure occurred joining the Unit B and C levels of stratabound mineralization in the West Webb area. The holes were directed in such a way as to pass through the intervening gap in opposite directions and at different levels. Hole 99-81 did not intersect any high angle mineralized structures at the lower level and also failed to encounter the previously found Unit C level mineralization. The other hole also failed to find a high angle zone but did confirm the stratabound Unit B mineralization.

The angle holes show that there is not a simple continuous high angle connector vein system joining the two main levels of stratabound mineralization, but do not completely rule out the possibility of high angle structures.

## CONCLUSIONS

Drilling has shown that stratigraphy and structure in the Webb Ridge area are close to what was predicted from surface mapping and previous drilling.

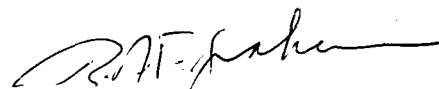
The southernmost holes drilled indicate an approach to the southern margin of the shallow water platform and hence a southern limit for exploration.

It has become possible to establish that the trend of mineralization may be north-northwestward. This has important implications in planning future drill programs.

A new zone of significant mineralization has been encountered east of Webb Ridge.

Results show that reconnaissance drilling has important application to finding and defining ore trends.

Further detail and reconnaissance work can be planned using information gained from the two phases of reconnaissance drilling.



R.A.F. Graham

APPENDIX I

Statement of Qualifications

R.A.F. Graham

APPENDIX I

Statement of Qualifications

R.A.F. Graham

B.Sc. (Geology) 1962. Queen's University of Belfast

M. Sc. (Geology) 1967. University of Western Ontario

Ph.D. (Geology) 1970. University of Western Ontario

Since 1970, employed in mineral exploration or related geological work.

*R.A.F. Graham*

APPENDIX 2

Statement of Expenditures

APPENDIX 2

Statement of Expenditures

SALARIES AND FRINGE BENEFITS, TEXASGULF INC.

D.A. Bending, Geologist May 26-Jul 31 - 67 days @ \$140	9,380.00	
M.R. Cathro, Assistant May 27-July 31 - 66 days @ \$50	3,300.00	
J.W. Leigh, Assistant May 27-Jul 17 - 52 days @ \$45	2,340.00	
G.W. Murray, Assistant May 27-Jun 3 - 8 days @ \$55	440.00	
E. Potsepp, Cook May 27-Jul 31 - 66 days @ \$105	6,930.00	
R.A.F. Graham, Project Manager 15 days @ \$200	<u>3,000.00</u>	
	25,390.00	25,390.00 -

CAMP COSTS

Includes camp equipment, camp fuel, food, communications, freight  
air charter, airline fares, expediting 43,100.00 -

on a man-day basis:

Texasgulf staff as above	284 man-days	
Pilot	67 man-days	
Bema-site prep. crew		
2 men for 25 days	50 man-days	
Drill crew		
4 men for 65 days	<u>260</u> man-days	
	651 man-days	
Camp cost per man per day		= \$66.20

DIAMOND DRILLING

Contractor's charge for diamond drilling and moving between holes	217,676.00 ✓
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HELICOPTER

Use of Soloy helicopter for crew and equipment moves during  
drilling (58 days)

total time 164.4 hours or an average 2.83 hr/day

Cost per day @ \$330 per hr = \$993.90

Total helicopter cost	54,166.00 ✓
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ASSAYS

165 assays for Pb, Zn @ \$12.50 each	2,062.50 ✓
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CORE BOXES

508 core boxes @ \$6.00	3,048.00 ✓
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MOBILIZATION

Mobilization of drill equipment and initial fuel supply:

Aircraft charges	\$30,004.00	
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Drill contractor	<u>10,345.75</u>	40,349.75 ✓
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DEMOBILIZATION

Demobilization of drill equipment:

Aircraft charges	13,029.00	
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Drill contractor	<u>6,193.00</u>	19,222.00 ✓
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SITE PREPARATION

Two-man crew for 25 days to prepare 13 drill sites	7,894.00 ✓
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EQUIPMENT RENTAL

Sperry-sun drill-hole survey equipment	3,030.00 ✓
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FUEL SUPPLY

Aircraft and drill fuel + additional transport	16,964.00 ✓
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PHOTOGRAPHY

Photographing all core	220.00 ✓
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SURVEY

Survey of drill-hole collar locations and elevations	<u>2,000.00 ✓</u>
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TOTAL	<u>435,502.25</u>
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COST DISTRIBUTION PER DIAMOND DRILL HOLE

Hole 91-81	544.68 m	drilled Jun 1-10	10 days	\$ 58,093
92-81	267.01	drilled Jun 11-15	5 days	34,067
93-81	318.82	drilled Jun 16-19	4 days	33,051
94-81	243.84	drilled Jun 20-22	3 days	27,320
95-81	309.68	drilled Jun 23-25	3 days	30,495
96-81	199.65	drilled Jun 26-28	3 days	24,588
97-81	136.25	drilled Jun 29-30	2 days	19,078
98-81	117.96	drilled Jul 1-2	2 days	18,442
99-81	480.06	drilled Jul 3-9	7 days	48,911
100-81	322.79	drilled Jul 10-16	7 days	40,086
101-81	217.63	drilled Jul 17-19	3 days	25,385
102-81	207.27	drilled Jul 20-23	4 days	26,147
103-81	446.84	drilled Jul 24-28	5 days	<u>41,956</u>
			Total	\$427,619

(Salaries and camp costs during camp set-up and tear-down not included with drilling costs)

*R. A. T. - J. A. H.*



APPENDIX 3

Surveyed Coordinates and Elevations of Diamond Drill Holes

APPENDIX 3

SURVEYED COORDINATES AND ELEVATIONS OF DIAMOND DRILL HOLES  
(measurements in feet)

<u>Hole No.</u>	<u>North</u>	<u>East</u>	<u>Elevation</u>
D.H. 91-81	71208.696	62627.497	4561.1
D.H. 92-81	73000.273	60315.083	4971.5
D.H. 93-81	73162.840	58198.022	5144.6
D.H. 94-81	71239.388	61336.494	4547.3
D.H. 95-81	71191.525	60173.734	4553.0
D.H. 96-81	75759.585	56061.915	5363.8
D.H. 97-81	75845.247	59575.239	5168.2
D.H. 98-81	75759.224	58616.827	5152.1
D.H.101-81	75282.511	60939.380	5072.5
D.H.102-81	76472.003	59666.280	5406.7
D.H.103-81	74431.905	61885.583	5049.0

APPENDIX 4

Summary logs of diamond drill-core

**TEXASGULF INC.**  
**DRILL HOLE LOG**

**HOLE NO.**  
 91-81

**DIP TEST**

DEPTH	AZIM	DIP
542 m	320°	89°

CLAIM: Cleo 6

SECTION:

LOGGED BY: D.A. Bending

DATE LOGGED: June 1981

DRILLING CO.: Longyear Canada Inc.

LOCATION(grid) NE B.C. 94B/13

LOCATION(survey) 71209N 62628E

AZIM: ELEV: 4561 ft DIP: vert

DEPTH: 544.68 CORE SIZE: BQ

STARTED: June 1, 1981

COMPLETED: June 10, 1981

CORE RECOVERY: > 95%

SUMMARY GEOLOGICAL LOG - ROBB LAKE DDH 91-81

<u>Depth (metres)</u>	<u>Description</u>
0- 15.3	Overburden - casing
15.3- 19.8	<u>Besa River Shale</u> Black graphitic shale. 5% CaCO <sub>3</sub> , with some 1-2 centimetre laminae up to 10% carbonate. Delicately laminated. Occasional concentrations of finely divided pyrite (less than 2 mm in diameter). Rare 1-2 cm white calcite veinlets. Minor shearing to produce graphitic gouge.
19.8- 45	<u>Unit A</u> Limestone and Dolostone. Bioclastic and peloidal packstone and wackestone with pelecypod, horn coral, thamnoporoid coral, amphipora and cabbage stomotaoporoid debris. Medium to dark grey. Locally brecciated and zebroid textured. Frequently burrowed. The lower contact is diffuse, gradational, characterized by an increase in sand, lighter colour and decline in bioclasts (could be as deep as 52).
45-420.5	<u>Unit B</u> Dolostone. Sandy, silty, cyclic dolostones with brecciated cycle tops and dark grey, sandy, silty, frequently laminated and birdseye textured cycle bottoms. 45-51.9: Dolostone; dark grey to light grey, burrowed, locally slumped, peloidal with minor silt and sand, diffuse birdseyes and occasional bioclasts (amphipora, horn coral, pelecypods). Some short intervals have zebroid bands and breccias. 51.9-75.0: Sandy dolostone and dolomitic sandstone, with short silty and clay-rich intervals. Peloids and burrows are prominent in intervals with low sand content. Bioclasts are a minor but

prominant constituent in some intervals including pelecypods, 2-5 cm in diameter, thamnopora, horn corals, amphipora and gastropods up to 6 cm in diameter.

75.0-96.6: Dolostone, medium to light grey, bioclastic packstone-bafflestone with hermatypic corals close to growth position in a peloidal, burrowed matrix. Spotty, locally vuggy zebroid material occurs in the matrix, with occasional mm-sized pyrite euhedra.

99.4-201.0: Dolostone; cyclic, locally zebroid and pseudobreccia textured lithologies characteristic for unit B. Individual cycles are 3 to 4 metres thick. Cycle bottoms are medium to dark grey (sometimes bioclastic), silty, sandy, laminated, birdseye textured, occasionally slumped or intraclastic, peloidal packstones and boundstones. Bioclasts are less than 5%; they include gastropods, pelecypods, cup coral fragments, and amphipora. Cycle tops are brecciated, pseudobreccia and zebroid textured light grey neomorphic dolostone with dolomite and lesser quartz cement. Bedding dips about 20°. Occasional 1-2 cm black secondary clay seams.

201.0-237: Dolostone; grey to light grey cyclic colour variations, with individual cycles 3.5-5 metres thick. Many sandy, silty delicately laminated intervals. Occasional intraclasts. Short intervals of sandy, silty dolostone and dolomitic sandstone. Fauna is sparse except in the interval 212.3-214, in which amphipora, thamnopora, pelecypods and hermatypic stromatoporoids occur together in a patch-reef-like assemblage. Stylolites and 3-7 mm stylolitic clay seams are common. Short intervals of rubble and crackle breccia are cemented by dolomite and quartz. Minor amounts of pseudobreccia and zebroid textures are filled with white dolomite.

237-257: Dolostone; grey and light grey, with cyclic colour and texture variations 3-6 metres thick. Sparse silt near cycle bottoms. The interval 237-239 contains several 5-6 cm algal

"cabbage" structures. The interval 253-254 is bioclastic wackestone with thamnopora, horn corals, amphipora relics and peloids. Cycle bottoms are typically birdseye textured and burrowed. A small fault, dipping at 60°, cuts the core at 239m. The upper parts of cycles have pseudobreccia, zebroid and collapsed zebroid (mosaic and rubble breccia) textures, with grey and white dolomite cement. Numerous stylolites are lined with finely crystalline pyrite.

257-328.1: Dolostone; dark grey to medium-light grey, cyclic colour and texture variations 2.5-3.5 metres thick. Silty, sandy, locally intraclastic (especially along scour surfaces along cycle bottoms). Cycle bottoms are delicately laminated, burrowed or birdseye textured with some gastropod molds, amphipora ghosts and algal heads (algal heads at 272). This interval is more uniformly silty, laminated and paramorphic than the interval above. Minor primary slump breccias occur at 324 m. Short intervals of dolomite cemented rubble breccias and pseudobreccias contain traces of galena and sphalerite. Traces of sulphides occur along solution seams.

328.1-402.3: Dolostone; silty, grey and dark grey, weakly cyclic (more uniform than the overlying intervals), well laminated, locally burrowed, with some birdseye texture. Occasional amphipora relics. Dominantly silty peloidal packstone. One short zone 10-15 mm thick at 329.0 metres is pseudobreccia. Several dark grey pyritic clay seams 5-15 mm thick occur in the interval 328.1-350.0 Dolomite cemented crackle brecciation increases downward, terminating in rubble breccia at 400.0-402.3.

402.3-420.5: Dolostone; grey and light grey, silty, sandy, laminated with small slumps and intraclasts. Dolomite and quartz cemented crackle breccia is progressively more prominent, with small pods of rubble breccia in the interval 414-420. Minor pyrite and sphalerite. Note that the fragments in the breccias are fresh and angular, with no evidence for solution.

420.5-544.68 UNIT C Dolostones

420.5-454.1: Dolostone; grey and light grey, birdseye textured, delicately lamiated, with rare silt and numerous debris flows (primary breccias) with silty matrix. Crackle and minor rubble breccias are cemented with silty matrix. Crackle and minor rubble breccias are cemented with grey and white dolomite cement. All fragments are sharply angular. Traces galena, sphalerite and pyrite. The true B/C contact may be either the top or base of this interval.

454.1-475: Dolostone; grey to light grey, with cyclic colour variations 3-4 m thick. The primary features preserved are intra-clasts, burrows, slumps, rare cup coral relics. Most of the interval is pseudobreccia and rubble breccia with vuggy white dolomite cements. The remainder is mostly porphyrotopic. Traces pyrite. Common stylolites.

475-489.3: Dolostone; light grey, very weakly cyclic, with 3 metres per cycle. Burrowed, peloidal, slumped (primary debris flow breccias), packstones and wackestones with short intervals of vuggy pseudo-breccia, rubble breccia, and porphyrotopic fabric. Occasional stylolites. Traces pyrite.

489.3-492.0: Tectonic breccia in dolostone. Not typical or well developed. Uniformly shattered, sheared dolostone, recemented with a grey mosaic of dolomite. The shears that are visible dip 75° to 85°

492.0-507.8: Dolostone; grey and light grey, finely crystalline, characterized by primary debris flow breccias, burrows and a vague peloidal texture. Diffuse birdseyes occur in some short intervals. This is crosscut by occasional stylolites, and minor dolomite cemented rubble and crackle breccias with traces of pyrite.

*R.H.T. Fisher*



507.8-517.0: Dolostone; light grey, with no primary fabric. Rubble breccia composed of collapsed zebroid and equant fragments, short intervals of pseudobreccia and boxwork (breccia-moldic) fabrics, and some porphyrotopic, more uniform dolostone.

517.0-544.7: Dolostone; finely crystalline, grey and light grey with weakly cyclic (4-6 metres per cycle) variations. Locally laminated and peloidal, with some birdseyes and numerous primary debris flow breccias. In the interval 543-544, dolomite lined vugs are moldic after clasts in a debris flow. Traces of pyrite occur in 10-15 cm thick intervals of pseudobreccia and rubble breccia. Occasional stylolites, and thin (.5 cm or less) secondary clay seams.

544.68: End of hole. Stopped above the Angular Sand Marker because the facies were interpreted as too unfavourable for further work at this depth.

*RAF: J. Baker*

**TEXASGULF INC.**  
**DRILL HOLE LOG**

**HOLE NO.**  
 92-81

CLAIM: Cleo 2

SECTION:

LOGGED BY: D.A. Bending

DATE LOGGED: June 1981

DRILLING CO.: Longyear Canada Inc.

LOCATION(grid) NE B.C. 94B/13

LOCATION(survey) 73000N 60315E

AZIM: ELEV: 4972 ft DIP: vert

DEPTH: 267.01 CORE SIZE: BQ

STARTED: June 11, 1981

COMPLETED: June 15, 1981

CORE RECOVERY: > 95%

**DIP TEST**

DEPTH	AZIM	DIP
131 m		vert.
262 m		vert.

SUMMARY GEOLOGICAL LOG - DDH 92-81

<u>Depth (metres)</u>	<u>Description</u>
0- 25.9	Overburden
25.9- 72.3	<u>Unit B Dolostones</u> Medium to dark grey, frequently delicately laminated, silty, locally sandy, peloidal packstones and wackestones. The interval 25-48 metres is characterized by weakly cyclic colour and texture variations and occasional slumps. (18-72.3 is uniform, silty, sandy (up to 10% silt + sand) and laminated). Rare burrows. Sparse dolomite cemented fractures. Some short intervals with porphyrotopic and weak pseudobreccia textures.
72.3-267.0	<u>Unit C Dolostone</u> 72.3-99.2: Dolostone; birdseye textured, locally burrowed, peloidal wackestone and boundstone with some amphipora (82-82.5 is about 5% amphipora). The interval 96.5-99.2 is silty and sandy, with several 10 cm intervals bearing up to 20% sand and silt. 99.2-120.0: Dolostone; dominantly pseudobreccia, mosaic and rubble breccia. Short porphyrotopic intervals. Short intervals 116.2-117, 117.2-117.8 contain pure white crystalline dolomite as open space fillings. Sphalerite and galena occur in rubble breccia and breccia-moldic fabric 118-120. 119-120 contains about 3% combined Pb + Zn. 120.0-153.0: Dolostone; medium and light grey, medium to finely crystalline with weakly cyclic colour and texture variations (3-4 metres per cycle). Peloidal, occasionally birdseye textured with porphyrotopic, spotty pseudobreccia, and zebroid textures present in lighter intervals. Minor rubble breccia and white dolomite void fillings. 153-175.2: Dolostone; light grey with short grey intervals. Weakly cyclic, with individual cycles 4 to 5 metres thick.

Primary fabrics are rare; peloids, thamnoporoid coral fragments, diffuse birdseye textures, and occasional amphipora are the only recognizable primary features. Porphyrotopic and incipient pseudobreccia fabrics are prominent in the interval 153-162. The interval 162-172.5 is more coarsely crystalline pseudobreccia. 172.5-172.9 is soft dolomitic gouge and tectonic breccia in a fault that dips 60°-70°. Sphalerite, galena, and pyrite occur along steep fractures and in the clay-rich matrix of rubble breccia in the interval 157-158, and in small breccia pockets and along stylolites 166-168. Grades are low, less than 2-3% combined metals across any interval. 173-175.2 crackle breccia with dolomite and minor sphalerite cement.

175.2-195.2: Dolostone, medium and light grey, peloidal, burrowed locally birdseye textured. Rubble and mosaic breccias, cemented with dolomite and sulphides, comprise about 40% of the interval. The breccias crosscut the pseudobreccia and porphyrotopic textures that are generally predominant. Sphalerite, galena, and lesser pyrite occur as cements in breccias, disseminated in the clay-rich insoluble residue matrix of some of the rubble breccia, along stylolitic solution seams, and finely disseminated in pseudobreccia. The top of the run beginning at 185 m is filled with muddy, sandy debris, which may represent a clay seam. The top of the run beginning at 193.4 is filled with 30-40 cm of uncemented quartz and polymineralic sand.

195.2-246.7: Dolostone characterized by common short brecciated intervals and cyclic colour and texture variations, with 3-4 metres per cycle. The bases of the cycles are generally medium to dark grey, paramorphic, locally bioclastic, burrowed or delicately laminated, occasionally birdseye textured, peloidal packstones and wackstones. Cycle tops are porphyrotopic to pseudobreccia

textured, frequently brecciated, medium crystalline dolostones with grey and white dolomite cements. Clastic constituents include peloids, grapestones, dark grey platy intraclasts, amphipora and rare pelecypod tests 3-5 cm in longest dimension. Traces of pyrite and sphalerite are present in breccias and along stylolitic clay seams.

246.7-257.2: Dolostone; medium to light grey, with a vague colour cyclicity becoming progressively more uniform with depth. Medium to finely crystalline porphyrotopic, with .5 to 1 metre intervals of zebroid, vuggy pseudobreccia, and breccia-moldic fabric. White dolomite cement in breccia and pseudobreccia is less prominent toward the base of the interval, where it is superceded by grey crystalline dolomite. Localized, 1-3 mm pockets of intercrystalline and stylolitic pyrobituminous residue.

257.2-267.0: Dolostone; medium to light grey, finely crystalline, burrowed, locally slumped. Sparse floating sand at 257.5-258. 260-262 is sandy, with up to 10% sand in individual 5-10 cm beds. Locally delicately laminated, with dip 23°. Very sparse 2-3 cm thick lenses of pseudobreccia. Several 2 to 8 mm thick grey stylolitic clay seams.

267.01

END OF HOLE.

*R.D.T. Parker*

**TEXASGULF INC.**  
**DRILL HOLE LOG**

**HOLE NO.**  
 93-81

**CLAIM:** Rob 43

**SECTION:**

**LOGGED BY:** D.A. Bending

**DATE LOGGED:** June 1981

**DRILLING CO.:** Longyear Canada Inc.

**LOCATION(grid)** NE B.C. 94B/13

**LOCATION(survey)** 73163N 58198E

**AZIM:**           **ELEV:** 5145 ft **DIP:** Vert.

**DEPTH:** 318.82m      **CORE SIZE:** BQ

**STARTED:**    June 16 1981

**COMPLETED:** June 19 1981

**CORE RECOVERY:** > 95%

**DIP TEST**

DEPTH	AZIM	DIP
198 m		vert.
317	75°	89°

SUMMARY GEOLOGICAL LOG - DDH 93-81

<u>Depth (metres)</u>	<u>Description</u>
6.4	Overburden - Casing
6.4-143	<u>Unit B Dolostones</u> 6.4-43.2: Dolostone; cyclic colour and texture variations, with birdseye textured, silty, locally sandy intervals, light grey, burrowed peloidal and grapestone bearing wackestones, and short intervals of pseudobreccia, rubble and mosaic breccia. Cycles are 2.5 to 4 metres thick. Breccias are cemented with white dolomite. Traces of pyrite occur finely disseminated and along stylolites. Bedding dips about 20°. 43.2-68.3: Dolostone with cyclic colour and texture variations dominated by porphyrotopic and pseudobreccia textures. Short intervals are silty, medium grey, laminated or burrowed: Most of the interval is fine to coarse pseudobreccia with grey and white dolomite cement and many pyritic stylolites. Traces of sphalerite occur in pseudobreccia at 52-53 m. 68.3-120: Dolostone with weakly cyclic colour and texture variations dominated by silty, sandy, birdseye textured or burrowed intervals. Short intervals of intraclastic packstone occur at 76 and 95 metres. Traces of sphalerite and pyrite occur in breccia and along fractures. Scattered amphipora. 120-143: Dolostone; generally uniform, silty, medium to dark grey peloidal packstones. Much is delicately laminated but some intervals are burrowed. Minor PbS and ZnS occur in a sparse crackle breccia with white dolomite.

143 -318.82 Unit C Dolostones

143-154.65: Dolostone; silty, locally sandy, medium to dark grey, generally birdseye textured. Very sparse dolomite cemented crackle breccia.

154.65-186.5: Dolostone; rubble breccia comprised of dolostone fragments without distinct primary textures. Light grey and white zoned dolomite cements. Scattered sphalerite and galena. Some finely disseminated pyrite in fragments 165-167. Traces pyrobitumen. 10-15 cm intervals with dark insoluble residue-rich matrix are irregularly distributed throughout the breccia.

186.5-197.0: Dolostone; medium to light grey, locally birdseye textured, locally grapestone bearing packstone-wackestone. Brecciation is limited to dolomite cemented crackle breccia and isolated rubble breccia pods.

197.0-212.7: Dolostone; rubble breccia with light grey dolostone clasts showing very low primary textures. One 4.5 cm gastropod occurs at 201.5. Breccia texture varies from coarse collapsed zebroid fabric to very finely divided clasts in an organic-rich 'trash' matrix with traces of sphalerite. Abundant laminated geopetal structures in matrix-rich intervals. Occasional stylolites.

212.7-240.4: Dolostone with weakly cyclic colour and texture variations. Individual cycles are 4-5 metres thick. The base of each cycle is medium grey, locally burrowed, birdseye textured peloidal wackestone. The upper parts of each cycle vary from porphyrotopic to vuggy pseudobreccia textured. 236-237 contain some amphipora and thamnopora ghosts.



240.4-250.5: Dolstone; medium to light grey, finely crystalline, generally birdseye textured. Occasional grapestones.

246.5-246.8 is burrowed amphipora bafflestone. 244.4-245.4 is pseudobreccia and rubble breccia with stylolitic contacts, traces of pyrobitumen, and minor pyrite.

250-260.8: Dolostone, medium to light grey, with irregular porphyrotopic, pseudobreccia, and pseudobreccia textures. Some zebroid banding. Traces pyrite. Sparse stylolites

260.8-266.9: Rubble breccia with dolomite and colloform pyrite cement. Localized pockets of laminated insoluble residues. Scattered sphalerite crystals.

266.9-274.4: Dolostone; primary fabrics are dominated by slumps and occasional birdseye textures. Sparse floating sand grains occur at 272.0. Crackle and rubble breccias are cemented with dolomite and colloform pyrite.

274.4-276.0: Grey sandy birdseye textured peloidal boundstone - Angular Sand Marker

276.0-318.8: Dolostone with cyclic colour and texture variations becoming progressively more uniform toward the base of the interval. Primary fabrics are dominated by burrows and peloids, with occasional intraclasts, amphipora ghosts and birdseyes. A pelocypod mold 1.5 cm in diameter occurs at 318.5. Secondary textures 276.0-385 are dominated by pseudobreccia, pods of rubble breccia, and stylolites. These features become progressively less common with depth; the interval 300-318.8 is more uniformly grey, porphyrotopic. Pyrite occurs along stylolites and lining voids in pseudobreccia.

318.82

END OF HOLE

*RF-pal*

**TEXASGULF INC.**  
**DRILL HOLE LOG**

HOLE NO.  
94-81

CLAIM: MV 77

SECTION:

LOGGED BY: D.A. Bending

DATE LOGGED: June 1981

DRILLING CO.: Longyear Canada Inc.

LOCATION(grid) NE B.C. 94B/13

LOCATION(survey) 71239N 61336E

AZIM: ELEV: 4547 ft DIP: vert

DEPTH: 243.84m CORE SIZE:

STARTED: June 20, 1981

COMPLETED: June 22, 1981

CORE RECOVERY: > 95%

**DIP TEST**

DEPTH	AZIM	DIP

NOT SURVEYED

SUMMARY GEOLOGICAL LOG - DDH 94-81

<u>Depth (metres)</u>	<u>Description</u>
0 - 6.4	Overburden
6.4 - 69.0	<p data-bbox="505 541 784 573"><u>Unit B Dolostones</u></p> <p data-bbox="505 590 1482 772">Medium to dark grey, silty, locally sandy, peloidal packstone and wackestone. Intraclasts and grapestones occur in some short (less than one metre) intervals. The interval 60-69.4 is more uniform, delicately laminated.</p>
69.0 -243.84	<p data-bbox="505 783 784 814"><u>Unit C Dolostones</u></p> <p data-bbox="505 831 1466 957">69.0-80.2: Dolostone with birdseye textures. Medium to dark grey, locally slumped, locally silty, peloidal wackestone and boundstone.</p> <p data-bbox="505 974 1498 1205">80.2-123.7: Dolostone; dominantly breccia and pseudobreccia without distinct primary textures. Zebroid bands are prominent in the interval 105-109. Colour is light grey with some medium grey intervals. Scattered traces of pyrobitumen and sphalerite occur in the breccias.</p> <p data-bbox="505 1222 1466 1444">123.7-157.5: Dolostone with cyclic colour and texture variations; birdseye textured, locally amphipora bearing intervals alternate with brecciated, porphyrotopic and pseudobreccia textured intervals without discrete primary fabrics. Individual cycles are five to seven metres thick.</p> <p data-bbox="505 1461 1531 1587">157.2-181.2: Dolostone; generally medium to light grey birdseye textured peloidal wackestones. 167.0-167.6 is slumped. The interval 168.0-170.0 contains scattered amphipora.</p> <p data-bbox="505 1604 1547 1688">181.2-182.7: Dolostone; tectonic breccia with the most prominent shears dipping 60-75°.</p> <p data-bbox="505 1705 1565 1969">182.7-205.3: Dolostone; medium to light grey, finely crystalline. Primary fabrics include scattered grapestones (originally mapped in part as the Angular Sand Marker), slumps, burrows, and a short interval (191.8-192.3) of amphipora packstone. Much of the interval is porphyrotopic to weakly pseudobreccia textured. 182.7-185 is complex pseudobreccia and boxwork</p>

texture. Zebra bands are prominent 200-201. From 202 to 206.3 crackle breccia becomes increasingly well developed. Traces of sphalerite are scattered from 182.7 to 195. Traces of pyrobitumen are present in the breccias. 206.3-224.6: Dolostone; medium to light grey, birdseye textured, peloidal dolostone, with occasional grapestone and sand sized black intraclasts. Short intervals of dolomite and pyrite cemented mosaic and rubble breccia are separated by pervasive crackle breccia; all breccias are cemented by dolomite and lesser pyrite (pyrite forms 1-3 mm rims on fragments). Traces of pyrobitumen.

243.84

END OF HOLE.

*RFI. pick*

# TEXASGULF INC.

## DRILL HOLE LOG

HOLE NO.  
95-81

CLAIM: MV 75

SECTION:

LOGGED BY: D.A. Bending

DATE LOGGED: June 1981

DRILLING CO.: Longyear Canada Inc.

LOCATION(grid) NE B.C. 94B/13

LOCATION(survey) 71192N 60174E

AZIM: ELEV: 4553 ft DIP: vert

DEPTH: 309.68 m CORE SIZE: BQ

STARTED: June 23, 1981

COMPLETED: June 25, 1981

CORE RECOVERY: > 95%

### DIP TEST

DEPTH	AZIM	DIP
308 m	40°	89°

SUMMARY GEOLOGICAL LOG - DDH 95-81

<u>Depth (metres)</u>	<u>Description</u>
0 - 3.6	Overburden
3.6 -132.9	<u>Unit B Dolostones</u>
	<p>3.6-49.6: Dolostone; cyclic (3-4 metres per cycle), grey to light grey, silty. Some short (0.5 metre) intervals are intraclastic packstones. Most of the interval is burrowed, but some short sections contain well preserved birdseye textures. Porphyrotopic and weakly developed pseudobreccia fabrics occur in most light coloured intervals. Stylolites are common, frequently very delicate in texture, and lined with traces of pyrobitumen. Bedding dips about 12°.</p>
	<p>49.6-106.3: Dolostone; generally silty peloidal packstone, with short birdseye textured intervals. Colour and texture vary in 2-3 metre cycles. Several 5-6 cm pelecypod relics occur in the interval 70-72 metres. Well developed pseudo-breccia textures occur at 56.2-56.4, 68.5-68.8, and 82.7-82.9. 82.7-82.9 is about 10% colloform pyrite. Sparse, scattered crackle breccias occur cemented with white dolomite.</p>
	<p>106.3-132.9: Dolostone; generally uniform, grey and medium to light grey with sparse silt and occasional diffuse birdseyes. Pyrite, sphalerite, and galena occur scattered through pervasive, dolomite cemented rubble and crackle breccias.</p>
132.9-309.68	<u>Unit C Dolostones</u>
	<p>132.9-147.0: Dolostones; silty, grey, birdseye textured, peloidal packstone and wackestone (boundstone). The interval is dominated by rubble and lesser crackle breccia, cemented</p>

by dolomite, with lesser pyrite and scattered shales of sphalerite.

147.0-180.7: Dolostone; medium and light grey, with some silty intervals. Scattered diffuse birdseye textures. Local pods of slumps ('matrix breccia'). 163.9-169 is silty, intraclastic peloidal packstone. The rocks are generally rubble breccias with minor pseudobreccia and crackle breccia. Pyrite and lesser galena and sphalerite occur in scattered accumulations (always less than 1% sulphides) in the dolomite cemented breccia.

180.7-204.5: Dolostone; medium to light grey, with diffuse cyclic colour and texture variations. Generally peloidal locally birdseye textured dolostone. Minor local slumps. A vague amphipora mold occurs at 198.7. 200.8-201.0 is a tectonic breccia with shears dipping at 60°-65°.

1-2 metre intervals of zebooid and pseudobreccia textures are scattered throughout. Dolomite cemented rubble breccia with traces of sphalerite occurs 189.6-190.5.

204.5-225: Dolostone with diffuse cyclic colour and texture variations 4 to 6 metres thick. The upper 3 to 4 metres of each cycle is light grey, with no distinct primary texture. The base of each cycle is birdseye textured, occasionally amphipora bearing, peloidal wackestone. Most of the interval has pseudobreccia, small pods of rubble breccia, and sporadic crackle breccia textures, with dolomite cement.

225-253.4: Dolostone; medium to light grey, peloidal, burrowed medium to finely crystalline. Scattered, locally coarse and vuggy pseudobreccia. Common stylolites and dark grey stylolitic clay seams. Traces pyrite and pyrobitumen.

276.5-278.5: Dolostone (Angular Sand Marker); grey finely crystalline, sandy, birdseye textured peloidal packstone.

278.5-285: Dolostone with cyclic colour and texture variations. Burrows are widespread and locally prominent. Dessication cracks are well preserved at 283.8. Short intervals of pseudobreccia and rubble breccia are cemented with dolomite lesser pyrite, and traces of sphalerite.

285-309.68: Dolostone with prominent burrows, diffuse peloids, and many stylolites. Pseudobreccia occurs in small pods near the top of the interval and becomes progressively less abundant in more uniform lithologies toward the base of the interval.

309.68

END OF HOLE.

*R.A.T. - prob*



**TEXASGULF INC.**  
**DRILL HOLE LOG**

HOLE NO.  
 96-81

CLAIM: Rob 14

SECTION:

LOGGED BY: D.A. Bending

DATE LOGGED: June 1981

DRILLING CO.: Longyear Canada Inc.

LOCATION(grid) NE B.C. 94B/13

LOCATION(survey) 75760N 56062E

AZIM: ELEV: 5364 ft DIP: vert

DEPTH: 199.65 m CORE SIZE: BQ

STARTED: June 26, 1981

COMPLETED: June 28, 1981

CORE RECOVERY: > 95%

**DIP TEST**

DEPTH	AZIM	DIP
99 m	20°	88°
200	20°	87°

SUMMARY GEOLOGICAL LOG - DDH 96-81

<u>Depth</u> <u>(metres)</u>	<u>Description</u>
0 - 14.33	Overburden
14.33 - 199.65	<u>Unit C Dolostones</u>

14.33-32.0: Dolostone; mixed fragments in rubble breccia. The predominant lithology is grapestone bearing peloidal wackestones and packstones with occasional amphipora and diffuse burrows. The breccia is cemented with dolomite with lesser sphalerite and galena.

32.0-70.3: Dolostone with diffuse cyclic primary coloured texture variations and dolomite cemented crackle, rubble and mosaic breccias. Vague birdseyes and amphipora ghosts in a locally burrowed peloidal packstone comprise the dominant lithology. Shines of sphalerite and galena (the best is 5% over 20 cm at 40 m) occur in small pods of rubble breccia and pseudobreccia.

70.3-107.7: Dolostone; much is breccia and pseudobreccia with few distinct primary fabrics. The interval 87.5 to 97 is peloidal wackestone and birdseye textured laminates with sparse crackle breccia, short intervals of mosaic breccia, and shines of sphalerite and galena. Zebroid and pseudobreccia fabrics are prominent.

70.3-107.7. In the interval 78-80 scattered shines of sphalerite occur in the pyrobituminous matrix of rubble breccia. The trashy, matrix-rich breccia is locally cut by steep, irregular pyrobituminous and pyritic clay seams.

107.7-120.7. Dolostones; largely rubble breccia with

organic-rich matrix, fine delicate platy clasts, and traces of sphalerite. Primary lithologies are dominated by birdseye textures, locally delicate laminations, grapestones and peloids. The interval 100.0-100.5 contains about 10% sphalerite and galena in rubble breccia.

120.7-121.7: Sandy finely crystalline dolostone. Angular Sand Marker.

121.7-128.3: Dolostone; generally rubble breccia with platy clasts and a matrix rich in organics. Burrowed peloidal wackestones are preserved in some clasts. Finely divided pyrite occurs in the matrix. The fabric is cut by numerous 1-2 cm dark grey clay and black clay seams.

128-153.6: Dolostone; weakly cyclic, burrowed, occasionally amphipora bearing, peloidal wackestone-packstone. The interval 128.3-132.2 is characterized by delicate crinkly laminations in a very weakly porphyrotopic dolostone with intercrystalline organic residues, and numerous stylolites. In the remainder of the interval 128.3-153.6 porphyrotopic and lesser pseudo-breccia textures are common, with dolomite cemented crackle and rubble breccia and traces of sphalerite.

153.6-187.0: Dolostone; mostly rubble and subordinate crackle breccia without distinct primary textures. Among the few primary textures preserved are a 6 cm gastropod at 155.5 and birdseye textures at 172.5. The interval is characterized by diverse solution fractures, including pseudobreccia, rubble breccia and boxwork fabrics. Sphalerite is ubiquitous but low grade. Some of the rubble breccias contain re-brecciated white crystalline dolomite. Pyrobitumen and organic-rich residues are present in all the breccias.

187.0-199.65: Medium to light grey dolostone with colours and textures becoming progressively more uniform with depth. Amphipora and pelecypod fragments are present at 187-187.5. The remainder of the interval is burrowed fine to medium crystalline dolostone with spotty pseudobreccia and numerous delicate pyrobituminous stylolites.

199.65

END OF HOLE.

*RAT. J. Baker*

**TEXASGULF INC.**  
**DRILL HOLE LOG**

HOLE NO.  
 97-81

CLAIM: MV 23

SECTION:

LOGGED BY: D.A. Bending

DATE LOGGED: July 1981

DRILLING CO.: Longyear Canada Inc.

LOCATION(grid) NE B.C. 94 B/13

LOCATION(survey) 75845N 59575E

AZIM: ELEV: 5168 ft DIP: vert

DEPTH: 136.25 m CORE SIZE: BQ

STARTED: June 29, 1981

COMPLETED: June 30, 1981

CORE RECOVERY: > 95%

**DIP TEST**

DEPTH	AZIM	DIP
68 m	60°	88°
136 m	75°	89°

SUMMARY GEOLOGICAL LOG - DDH 97-81

<u>Depth (metres)</u>	<u>Description</u>
0 - 19.92	Overburden. Some cobbles contain sphalerite in rubble breccia.
19.42-136.25	<u>Unit C Dolostones</u> 19.42-30.0: Dolostone; rubble breccia with dolomite, pyrite and sphalerite cement, and few distinct primary features. 29.5-30.0 contains 5% amhipora. Clasts consist of light grey medium to finely crystalline dolostone. 30.0-53.0: Dolostone; dominantly mosaic and rubble breccia with lesser crackle breccia. Primary features show a diffuse cyclic color and texture variation dominated by medium grey birdseye textured peloidal boundstones but alternating with light grey uniform, burrowed, locally grapestone bearing dolostones. Breccias are cemented with sphalerite and dolomite, with sphalerite locally dominant. 53.0-107.8. Dolostone with cyclic colour variations from grey to light grey; the grey intervals are birdseye textured and locally burrowed. The lighter intervals are burrowed, peloidal packstones. Each cucle is three to four metres. 0.2-0.5 metre intervals of pseudobreccia are distributed through the sequence at cycle tops, along with pods of rubble breccia. Pyrobitumen is present in most breccias. Sphalerite occurs locally in rubble breccia and along stylolites. 107.8-107.9: Angular Sand Marker; light grey sandy finely crystalline dolostone.

107.9-112.5: Dolostone; medium to light grey, burrowed, peloidal, medium to finely crystalline. The interval is characterized by numerous stylolites in porphyrotopic dolostone, with weakly developed pseudobreccia. Sphalerite occurs in the pseudobreccia, finely disseminated and along stylolites.

112.5-136.5: Dolostone with cyclic colour and texture variations becoming progressively more uniform with depth. The interval is generally medium and light grey, burrowed peloidal wackestone. Scattered amphipora relics occur 117-120. Two large (5 cm) pelecypod shells occur at 113.0. The interval 112.5-124 is characterized by abundant stylolites and 1-2 mm thick clay seams in porphyrotopic dolostone. Several 15-20 cm thick pods of pseudobreccia occur in the interval 125-130.

136.5 END OF HOLE.

*RST. J. J. J.*

**TEXASGULF INC.**  
**DRILL HOLE LOG**

**HOLE NO.**  
 98-81

**DIP TEST**

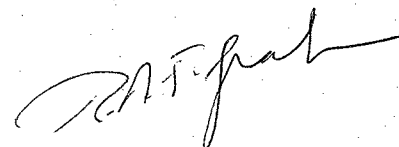
DEPTH	AZIM	DIP
116 m		vert.

CLAIM: Rob 15
SECTION:
LOGGED BY: D.A. Bending
DATE LOGGED: July 1981
DRILLING CO.: Longyear Canada Inc.
LOCATION(grid) NE B.C. 94B/13
LOCATION(survey) 75759N 58617E
AZIM: ELEV: 5152 ftDIP: vert
DEPTH: 117.96 m CORE SIZE: BQ
STARTED: July 1, 1981
COMPLETED: July 2, 1981
CORE RECOVERY: > 95%



SUMMARY GEOLOGICAL LOG - DDH 98-81

<u>Depth (metres)</u>	<u>Description</u>
0 - 8.23	Overburden
8.23-117.96	<p data-bbox="483 562 762 595"><u>Unit C Dolostones</u></p> <p data-bbox="483 612 1453 892">8.23-29.4: Dolostone; medium to light grey, locally burrowed medium to finely crystalline dolostones. Several amphipora fragments are present at 12.0 metres. A 2 x 4 cm brachiopod mold is present at 21.5 m. Spotty, locally zebroid pseudobreccia is ubiquitous, interspaced with numerous fine stylolites. Traces of pyrite are present 24.5 to 29.0 metres.</p> <p data-bbox="483 909 1449 1039">29.4-40.9. Dolostone; light grey pseudobreccia and zebroid textured dolostone with occasional 10-15 cm pods of rubble breccia. Traces of pyrite and pyrobitumen occur throughout.</p> <p data-bbox="483 1056 1437 1231">40.9-43.9: Light grey, birdseye textured or burrowed grapestone bearing peloidal wackestone. Amphipora fragments are present 42.1 to 42.50. Several stylolites, minor vuggy pseudobreccia.</p> <p data-bbox="483 1248 1422 1334">43.9-45.45: Angular Sand Marker. Five to ten percent sand grains in paramorphic peloidal wackestone.</p> <p data-bbox="483 1351 1485 1720">45.45-117.4: Dolostone; medium to light grey, faintly cyclic, burrowed peloidal packstones. Diffuse amphipora relics are present 47.0-47.5. Spheroidal algal heads 3-4 cm in diameter are present 67.5-67.8 m. A recrystallized horn coral fragment is present at 110.0 metres. Secondary textures are dominated by ubiquitous stylolites in a porphyrotopic, locally pseudobreccia textured host. Traces of pyrite and pyrobitumen occur in pseudobreccia and along stylolites.</p> <p data-bbox="483 1737 675 1767">END OF HOLE.</p>
117.96	



**TEXASGULF INC.**  
**DRILL HOLE LOG**

**HOLE NO.**  
 99-81

**CLAIM:** Rob 41

**SECTION:**

**LOGGED BY:** D.A. Bending

**DATE LOGGED:** July 1981

**DRILLING CO.:** Longyear Canada Inc.

**LOCATION(grid)** NE B.C. 94 B/13

**LOCATION(survey)** 73742N 56599E

**AZIM:** 48° **ELEV:** 5616 ft **DIP:** -45°

**DEPTH:** 480.06 m **CORE SIZE:** BQ

**STARTED:** July 3, 1981

**COMPLETED:** July 9, 1981

**CORE RECOVERY:** >95%

**DIP TEST**

DEPTH	AZIM	DIP
118 m	51°	46°
305	54°	50°
366	52°	51°
480	53°	53°

SUMMARY GEOLOGICAL LOG - DDH 99-81

<u>Depth (metres)</u>	<u>Description</u>
0 - 9.15	Overburden - alluvium and talus
9.15- 71.2	<u>Shale Breccia.</u> Dark grey shale and limy shale in a breccia with very dark grey dirty limestone matrix and sporadic white calcite veinlets. The calcite veinlets are restricted to the fragments. Pyrite occurs as fragments, disseminated in the shale fragments (up to 30% pyrite) and as small isolated concretions in the matrix. The matrix is slumped and chaotic, dark grey limestone. In the interval 10-15 metres, the calcite veinlets are stained orange with limonite. The interval 46.4-49 metres is sheared, slicken-sided and broken into a tectonic breccia.
71.2-112.9	<u>Shale-slump and Debris Flows</u> Limy shale. More uniformly dark coloured and textured than the interval above. Irregular, deformed shale fragments are floating in a deformed matrix of similar composition. Interpreted as debris flows. Many 1-2 mm wisps of finely divided pyrite with diffuse margins. The interval 98.4-98.7 contains about 50% pyrite in delicate framboids. 107.3-108.0 contains angular fragments of sandy birdseye textured dolostone. Minor shoring is reflected in slickensides 112.0-112.9.
112.9-220.9	<u>West Webb Breccia</u> Breccia. Fragments of lithologies characteristic for Unit B. Grey and white dolomite cement. Traces of pyrobitumen 112.9-115 and 160.5-170.5. Locally common pyrobitumen 184-220.9. Traces of pyrite, sphalerite, and

galena are scattered throughout the interval. In the intervals 159-160 and 194.5-195.5, fragments in the breccia are impregnated with pyrite. Some fragments are nearly pure pyrite. 188-190 is about 5% disseminated pyrite.

220.9-229.5 Unit B

Dolostone; silty, uniform, locally sandy, delicately laminated. Very delicate stylolites. The interval 220.9-223.6 contains several gouge zones and short intervals of tectonic breccia.

229.5-480.06 Unit C

229.5-250.3. Dolostone; birdseye textured, laminated peloidal packstone and boundstone. Sparse silt, rare sand, occasional amphipora and gastropod fragments. Minor local mosaic and crackle breccia with quartz, dolomite, pyrite and traces of sphalerite.

250.3-296.0. Dolostone; cyclic, with lithology dominated by short intervals of paramorphic, locally birdseye textured, amphipora bearing, locally burrowed peloidal wackstone. The breccias and open spaces in the pseudobreccia are cemented with light grey and white dolomite.

296.0-345. Dolostone; cyclic. 3-5 metre cycles consist of birdseye textured intervals, burrowed peloidal wackstones, pseudobreccia and zebroid textured intervals.

Irregular dolomite cemented crackle and rubble breccia pods crosscut this pattern. Minor amounts of sphalerite occur in pseudobreccia, crackle and rubble breccia. The most attractive concentrations are in steep fractures in crackle breccia, in the intervals 328.7-329.0 (estimated 3% Zn) and 344.82. 345.67 (estimated 5% Pb, 3% Zn).

345.0-395.4. Dolostone: This interval is dominated by pseudobreccia, mosaic and rubble breccia with no distinct primary features. Short intervals zebroid bands. In the intervals preserving primary textures, diffuse birdseyes, amphipora ghosts and burrows are present. Traces of pyrobitumen and sphalerite are scattered throughout the brecciated intervals.

395.4-397.4. Angular Sand Marker. Dolostone with peloids, diffuse birdseyes, and about 3% sand grains. Crosscut by 1-2 mm white dolomite cemented fractures.

397.4-412.4. Dolostone. Light grey, breccia and pseudo-breccia textured medium crystalline dolostone. Many stylolites. Short intervals (less than one metre) with well preserved burrows and peloids. Shines of sphalerite and pyrobitumen occur throughout the breccias and pseudobreccias.

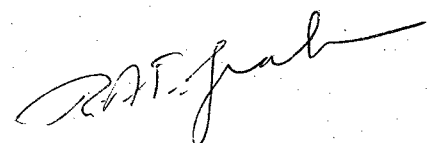
412.2-421.2. Dolostone; medium to light grey, finely crystalline, burrowed peloidal wackestones. Occasional amphipora ghosts, diffuse peloids. ZnS occurs in fractures and late pores.

421.2-459.6. Dolostone; dominated by porphyrotopic, zebroid and pseudobreccia textures with significant but lesser intervals of rubble and mosaic breccia. Sphalerite and pyrobitumen occur throughout the interval in low grades. Very few primary textures are preserved; peloids and diffuse birdseyes are locally evident.

459.6-480.6. Dolostone; burrowed, locally birdseye textured, weakly cyclic, medium crystalline. Spotty zebroid bands and pseudobreccia. Common stylolites with dark grey clay-rich residues and traces of pyrite. Colour and texture become progressively more uniform with depth.

480.06

END OF HOLE.

A handwritten signature in black ink, appearing to read "R.H. Jubb", is located in the bottom right corner of the page.

# TEXASGULF INC.

## DRILL HOLE LOG

HOLE NO.  
100-81

CLAIM: Rob 16

SECTION:

LOGGED BY: D.A. Bending

DATE LOGGED: July 1981

DRILLING CO.: Longyear Canada Inc.

LOCATION(grid) NE B.C. 94 B/13

LOCATION(survey) 74497N 57490E

AZIM: 228° ELEV 5875 ft DIP: -45°

DEPTH: 322.79 m CORE SIZE: BQ

STARTED: July 10, 1981

COMPLETED: July 16, 1981

CORE RECOVERY: >95%

### DIP TEST

DEPTH	AZIM	DIP
220 m	243°	52°
305	244°	53°

SUMMARY GEOLOGICAL LOG - DDH 100-81

<u>Depth (metres)</u>	<u>Description</u>
0 -1.524	Overburden
1.524-322.79	<p data-bbox="491 534 774 577"><u>Unit B Dolostones</u></p> <p data-bbox="491 584 1420 1015">1.524-38.5: Dolostones with cyclic colour and texture variations. Generally sandy, silty, light grey, birdseye textured. Very light grey intervals are uniformly crystalline or peloidal. Individual cycles are five to eight metres thick. Small patches of pseudobreccia and zebroid texture are present throughout the interval, but are best developed in the upper parts of each cycle. Short intervals of quartz and dolomite cemented crackle, mosaic and rubble breccia occur near cycle tops.</p> <p data-bbox="491 1026 1428 1360">38.5-59.85: Dolostone and dolomitic sandstone. Generally uniform texture, with cyclic colour variations and very localized (10 to 20 cm) concentrations of quartz sand. Birdseye textures are well preserved 45.5 to 45.6 and 49.7 to 57.5 metres. Sparse dolomite cemented crackle breccia. Traces pyrobitumen in pseudobreccia. Several irregular black clay-rich stylolitic seams.</p> <p data-bbox="491 1371 1452 1651">59.85-69.8: Grey to light grey medium to finely crystalline dolostone with very few primary features. Stachyodes relics occur in a peloidal packstone at 63.7 metres. Pseudobreccia and zeboid bands occur in the intervals 60-61, 63-65, and 67-69 metres. These fabrics are cut by sporadic quartz and dolomite cemented crackle and rubble breccia.</p> <p data-bbox="491 1662 1476 1744">69.8-79.3: Sandy, silty birdseye textured light grey dolostone and dolomitic sandstone with occasional stylolites.</p>

This is cut by irregular quartz and dolomite cemented crackle, rubble and mosaic breccias.

79.3-101.6: Silty, sandy dolostone with cyclic colour and texture variations. Individual cycles are two to five metres of core. The most abundant primary lithology is silty, sandy, birdseye textured (locally grapestone bearing) cryptalgal laminate. *Amphipora* relics are present 86.8-87.4. Some very light grey intervals (near cycle tops) do not show primary fabrics. Secondary features are dominated by spotty zebroid and pseudobreccia textures with dolomite cement and traces of pyrite. Stylolites are sparse but widespread. The interval 93.1 to 96.7 is rubble breccia with some dark pyrobituminous matrix and about 10% dolomite cement.

101.6-108.6: Light grey sandy dolostone and dolomitic sandstone with delicate laminae and locally well preserved birdseye textures, sparse crackle breccia, and delicate stylolites.

108.6-125.4: Dolostone with cyclic colour and texture variations. Pseudobreccia and zebroid bands in varying degrees of development are ubiquitous. Primary fabrics are dominated by 3 to 4 metre cyclic alternations between sandy, silty cryptalgal laminates and burrowed peloidal wackestones.

125.4-151.0: Sandy, silty, grey and light grey dolostone with birdseye textured algal boundstones, some delicately laminated intervals, occasional grapestones and one short zone (144.3-145.0) of slumping. Many delicate stylolites. Traces of pyrobitumen occur in sparse dolomite cemented fractures. Coarse vuggy pseudobreccia occurs 130.5-131.0, and 132.2 to 133.0.

151.0-176.8: Dolostone with prominently cyclic colour and texture variations. Each cycle is two to three metres of core length.



176.8-206.0: Dolostone; cyclic, medium to light grey, silty, burrowed and locally birdseye textured. Porphyrotopic and incipient pseudobreccia textured intervals grade into mosaic and rubble breccia in 197-204°. Sphalerite and galena impregnate the organic-rich matrix of 25 cm of rubble breccia in the interval 175-175.25. Sphalerite and galena are predominant cements in mosaic breccia in the interval 197-205.7. The interval 205.0-206.0 is characterized by rich galena and lesser sphalerite in black organic-rich insoluble residues.

206.-238.9: Dolostone; silty, cyclic, locally intraclastic peloidal wackestone. Some short (less than one metre) intervals are birdseye textured. Irregular zebra bands and pods of pseudobreccia and breccia are present 206.-208.0, 213.4-217.0, 223.-224, and 227 to 238. Traces of sphalerite, pyrite and pyrobitumen occur along stylolites and in breccias.

238.9-248.5: Silty, locally laminated, frequently burrowed grey peloidal wackestone with short intervals of amphipora bafflestone.

248.5-266.7: Grey and light grey, silty birdseye textured and burrowed dolostones. Stylolites, pseudobreccia, and 0.5-1 metre pods of dolomite cemented rubble breccia occur in light coloured intervals. Traces of sphalerite and pyrobitumen occur in most late pores and along stylolites

266.7-322.78: Dolostone - generally uniform, grey, burrowed or laminated silty dolostone. Locally sandy with occasional amphipora fragments. Diffuse tectonic breccia occurs 280-281. Dolomite cemented crackle breccia is present 268 to 305 and 319 to 322.78.

322.79 END OF HOLE

*RAT-just*

**TEXASGULF INC.**  
**DRILL HOLE LOG**

**HOLE NO.**  
 101-81

CLAIM: Rob 57 Fr

SECTION:

LOGGED BY: D.A. Bending

DATE LOGGED: July 1981

DRILLING CO.: Longyear Canada Inc.

LOCATION(grid) NE B.C. 94B/13

LOCATION(survey) 75283N 60939E

AZIM: ELEV: 5073ft DIP: vert

DEPTH: 217.63 CORE SIZE: BQ

STARTED: July 17, 1981

COMPLETED: July 19, 1981

CORE RECOVERY: >95%

**DIP TEST**

DEPTH	AZIM	DIP
106 m		vert
213		vert

SUMMARY GEOLOGICAL LOG - ROBB LAKE DDH 101-81

<u>Depth (metres)</u>	<u>Description</u>
0 - 10.69	Overburden - casing
10.69-217.63	<p>Dolostone - Unit B? (B/C contact not defined)</p> <p>10.69-71.05: Grey and light grey, locally silty and sandy dolostone with cyclic colour and texture variations. Individual cycles are three to five metres thick. The base of each cycle is generally medium grey, silty, sandy, birdseye textured laminae. The upper two to four metres of each cycle are light grey, with porphyrotopic, pseudo-breccia, zebroid, and local rubble breccia textures. The breccias are cemented with dolomite, quartz, and traces of sphalerite. Stylolites are sparse but widespread. In the interval 32 to 35 metres several black clay seams 1-2 cm thick have developed along stylolites. Diffuse amphipora fragments occur at 20, 44, and 66.5 metres. The interval 57.6-57.9 is an amphipora bafflestone.</p> <p>71.05-84.35: Silty, sandy, medium grey dolostones. Most of the interval is burrowed, sandy peloidal packstone. 75.2-77.0 is locally birdseye textured, pedloidal, with thamnopora relics and diffuse amphipora fragments.</p> <p>84.35-89.3: Light grey dolostone; locally sandy but generally showing no primary texture. Most of the interval shows pseudobreccia and zebroid fabrics and occasional stylolites.</p> <p>89.3-97.5: Sandy, silty, medium grey birdseye textured dolostone. Delicately preserved desiccation cracks; infilled with dolomitic sandstone, occur at 94.5 metres. Amphipora fragments occur in very sandy, locally birdseye textured dolostone in the interval 94.6-95.0.</p> <p>97.5-115.6: Dolostone; the interval is best characterized by abundant breccias, pseudobreccia, and zebroid bands. Primary textures are dominated by weakly cyclic alternations</p>

of grey, silty, sandy, birdseye textured dolostones and more uniform, light grey, peloidal wackestones.

115.6-135.5: Dolostone with grey, silty, sandy, birdseye textured intervals and light grey, burrowed and faintly peloidal zones. The borrows are generally diffuse, highlighted by disseminated pyrite. The lighter intervals are also characterized by zebroid and pseudobreccia textures and more abundant stylolites. The interval 128.8-130.5 displays especially well developed pseudobreccia with some rubble breccia cemented by sphalerite, galena, and pyrite.

135.5-153.0: Grey and light grey generally laminated, silty and sandy dolostone with rare stylolites and occasional mm thick dolomite cemented fractures.

153.0-165.0: Dolostone; grey and light grey, silty, locally sandy, locally intraclastic and grapestone bearing. Some 1-2 metre intervals are burrowed. Stylolites are ubiquitous but most abundant in darker coloured intervals. Spotty pseudobreccia is present at 153.0, and in the interval 164.2-165. Dolomite cemented rubble breccia is present in the interval 153-155. Traces of sphalerite occur in sphalerite cemented fractures 156-158.

165-170.65: Light grey burrowed peloidal intraclastic packstone with 0.5-1 metre zones of dolomite cemented rubble, mosaic, and crackle breccia.

170.65-183.9: Dolostone: variably grey and light grey (cyclic, with 2.5 to 3 metres per cycle), silty, locally sandy, occasionally burrowed and peloidal. Sparse local birdseye textures occur at 176 and 187.6, 176.2-176.4 is slumped. Stylolites are abundant in darker intervals.

Dolomite cemented mosaic and crackle breccia occurs  
180-184. 176.0-176.1 is weakly developed pseudobreccia.

183.9-217.62: Dolostone. Uniformly medium to light grey,  
silty, locally sandy, occasionally birdseye textured but  
generally burrowed. Some sparse dolomite cemented crackle  
breccia. Occasional clay-lined stylolites with traces  
of pyrite. The interval 212.4-217.62 contains intraclasts,  
grapestones, and silt in a peloid intraclastic packstone.

217.63

END OF HOLE.

*R. H. Johnson*

# TEXASGULF INC.

## DRILL HOLE LOG

HOLE NO.  
102-81

CLAIM: Rob 56 Fr

SECTION:

LOGGED BY: D.A. Bending

DATE LOGGED: July 1981

DRILLING CO.: Longyear Canada Inc.

LOCATION(grid) NE B.C. 94 B/13

LOCATION(survey) 76472N 59666E

AZIM: ELEV: 5407 DIP: vert.

DEPTH: 207.27 m CORE SIZE: BQ

STARTED: July 20, 1981

COMPLETED: July 23, 1981

CORE RECOVERY: > 95%

### DIP TEST

DEPTH	AZIM	DIP
104 m	165°	89°
207	175°	88°

SUMMARY GEOLOGICAL LOG - DDH 102-81

<u>Depth (metres)</u>	<u>Description</u>
0 - 20.73	Overburden
20.73- 59.8	<u>Unit B Dolostones</u> Medium to dark grey, silty, occasionally sandy, generally uniformly delicately laminated with diffuse peloids and very rare birdseyes. Widespread crackle and mosaic breccia becomes gradually more intensely developed to 52.0, where some rubble breccia occurs. The breccias are cemented with dolomite, pyrite and sphalerite.
59.8 -207.27	<u>Unit C Dolostones</u> 59.8-74.4: Dolostones; medium to light grey, birdseye textured, (68.4-70.2 is sandy and silty), locally slumped peloidal packstone and boundstone. Sphalerite, galena and dolomite occur as cements in crackle, rubble, and mosaic breccia. 74.4-124.5: Light grey medium crystalline dolostone with only short intervals preserving primary textures. The interval 75.2-75.7 is peloidal intraclastic packstone. Diffuse birdseyes are present 76.2-76.4, 85.0-85.4, 99.4-100.4, and 119-120.5. Most of the interval is disrupted by pseudobreccia and mosaic or rubble breccia textures, largely dolomite cemented but frequently containing 1-2% reddish brown sphalerite. Pyrobitumen occurs in pores in breccias and along stylolites, frequently accompanied by pyrite. 124.5-159.2: Dolostone; variably light grey, with diffuse cyclic colour and texture variations. Short paramorphic intervals preserve birdseye textures, some burrows, pelecypod fragments and amphipora ghosts. Most of the section is medium crystalline, porphyrotopic textured. 0.5-1 metre intervals of zeborid, pseudobreccia, mosaic and rubble breccia occur near cycle tops. The breccias are cemented by dolomite and traces of sphalerite.

159.2-169.4: Dolostone; light grey with faint burrows and very diffuse birdseyes. Porphyrotopic, vuggy texture to wide-spread, amid 0.5-1 metre intervals of rubble breccia. The breccias are generally cemented with dolomite with traces of sphalerite. 6 cm of tectonic breccia occurs at 163.8 metres. 169.4-171.0: Light grey finely crystalline dolostone with 5% floating sand grains and diffuse birdseyes.

Angular Sand Marker

171.0-209.4: Grey and light grey dolostone with diffuse cyclic colour and texture variations. Most of the interval is burrowed, with the burrows highlighted by crystallinity variations and traces of pyrobitumen. 185.6-186.0 is amphipora bearing peloidal wackestone. Stylolites are present through much of the interval. The interval 177.1 to 177.3 is about 50% dark grey secondary clay seams with about 5% finely disseminated sphalerite. Porphyrotopic and incipient pseudobreccia textures are prominent 171.0-180 and 200-205 but the fabrics and colours are progressively more uniform with depth.

207.27

END OF HOLE.

*RAT-just*



**TEXASGULF INC.**  
**DRILL HOLE LOG**

HOLE NO.  
 103-81

CLAIM: Cleo 3

SECTION:

LOGGED BY: D.A. Bending

DATE LOGGED: July 1981

DRILLING CO.: Longyear Canada Inc.

LOCATION(grid) NE B.C. 94B/13

LOCATION(survey) 74431N 61886E

AZIM: ELEV: 5049 DIP: Vert

DEPTH: 446.84 m CORE SIZE:

STARTED: July 24, 1981

COMPLETED: July 28, 1981

CORE RECOVERY: > 95%

**DIP TEST**

DEPTH	AZIM	DIP
220 m		vert
430	30°	89°

GEOLOGICAL SUMMARY LOG - DDH 103-81

0 - 1.52 Overburden

1.52-308.0 Unit B Dolostones

1.52-15.7: Light grey medium crystalline dolostone with vuggy zebroid bands and pseudobreccia. Dolomite and lesser quartz cement. In the interval 7 to 8 metres, the fabric is crosscut by a steep zone of dolomite cemented rubble breccia.

15.7-129.7: Dolostones with cyclic colour and texture variations. The base of each cyclic interval is silty, sandy medium to dark grey, birdseye textured paramorphic dolostones that grade upward into more uniform, burrowed silty dolostones. The upper parts of each cycle are porphyrotopic, zebroid, or pseudobreccia textured with very short intervals of mosaic and rubble breccia. The breccias and open spaces are infilled with white dolomite, Sphalerite and galena fill open space in a 15 cm thick interval at 45.5-45.7. The cycles are each 2 to 4 metres in thickness.

129.7-160.6: Grey and light grey, locally silty and sandy dolostone with cyclic colour and texture variations. Brecciation is limited to 1-2 metre intervals but is generally more widespread than the intervals above. The dolomite cemented rubble and mosaic breccias grade through zebroid and pseudobreccia textures to undisturbed primary lithologies. Primary lithologies are typically birdseye textured silty laminates toward base of cycles and uniform, burrowed peloidal wackestones toward the top. The interval 151.8-159.7 is more uniformly grey, silty and sandy, with birdseye textures.

160.6-166.1: Dolostone with textures dominated by rubble breccia, pseudobreccia and zebra bands with pyrobitumen, traces of sphalerite, galena, and pyrite, and light grey dolomite cements. Two cycles are spanned by this interval; the base of each cycle is silty, sandy, birdseye textured or burrowed grey dolostone that grades upward into neomorphic, brecciated textures.

166.1-216.8: Silty, locally sandy dolostone with cyclic colour and texture variations. Darker intervals are delicately laminated and birdseye textured. The majority of the section is uniform, burrowed silty (locally sandy) peloidal packstone. 170.6-170.9 and 193.0-193.1 are intraclastic packstones. The only secondary features are occasional stylolites and three 20-30 cm sections of patchy pseudobreccia in the interval 201-203.

216.8-225.4: Dolostone with cyclic colour variations, with each cycle 3-4 metres thick. Most is medium grey, delicately laminated or burrowed and silty. 224.8 to 225.2 and 221.0-221.5 are delicate pseudobreccia. 216.8-217.4 and 219.6-220.4, are rubble breccia intervals, separated by crackle breccia. Traces of pyrite and sphalerite occur in the breccias and along stylolites.

225.4-308.0: Dolostones; generally medium grey silty dolostone with delicate laminations, some uniformly burrowed intervals and occasional diffuse birdseyes. 276.5-278.2 contains delicate birdseyes. Most of the interval 225.4-308.0 contains crackle breccias (progressively more dilutant toward the base of the zone) that are cemented with white dolomite, sphalerite, and galena. Pods of mosaic and rubble breccia are present 229.-230, 239.5-240.0, 244-245, 254-255, 256-257, 269-270.3, and scattered between 275-297. 20 cm of tectonic breccia, with shears dipping 20-30°, is present 245.4-245.6. Sphalerite and galena are widespread but very low grade (less than 1% combined overall).

308.0-446.84

Unit C Dolostones

308.0-328.5: Medium grey, silty, birdseye textured peloidal dolostone. 308.0 to 311 and 314 to 316 are dolomite cemented crackle breccias. The rest of the interval is open mosaic and rubble breccia with dolomite and lesser quartz, sphalerite and galena. The fragments in the breccia are sharply angular and show no evidence of solution.

328.5-343.65: Light grey medium crystalline dolostone clasts in a finely divided rubble breccia. Sphalerite occurs between fragments and along bituminous stylolites. Two generations of breccia exist - the earlier is cemented with light grey dolomite, and the later with white dolomite and sphalerite. Sphalerite is concentrated in pockets of dark grey insoluble-rich trash. Overall grades are low, less than 2% Zn.

343.65-354.4: Dolostone; burrowed, locally birdseye textured light grey peloidal wackestone. Occasional stylolites. Sparse dolomite cemented crackle breccia.

254.4-374.8: Light grey medium crystalline dolostone with few primary textures except diffuse birdseyes and a few amphipora ghosts at 360.0 metres. Most of the interval is disturbed by pseudobreccia and weakly developed zebroid fabric with spotty sphalerite. 368.5-372.0 and 374.0. rubble breccia with dolomite and sphalerite cement.

374.8-405.0: Grey and light grey dolostone with diffuse irregular, 3 to 6 metre thick cyclic colour variations. Primary fabrics where preserved include grapestones, short birdseye textured intervals, occasional amphipora ghosts, and burrows. The lighter parts of each cycle are characterized by porphyratopic, pseudo-breccia, and zebroid textures. Stylolites and dark grey stylolite clay seams are common. Sphalerite occurs as traces in pseudo-breccia and very local rich accumulations. 384.0-384.1 contains rich Pb and ZnS in a black clay seam.

405.0-416.7: Light grey pseudobreccia and mosaic breccia textured dolostone with sphalerite and some dolomite cements.

Sphalerite is distributed throughout the interval but the best grade occurs in the interval 411.0-415.9; with average grade about 6.5% Zn.

416.7-421.9: Light grey dolostone with diffuse birdseyes, weakly developed pseudobreccias and stylolites. Sphalerite and galena occur along solution seams and finely disseminated. 421.9-422.4; Angular Sand Marker. Sand grains floating in finely crystalline light grey dolostone.

422.9-433.8: Dolostone; generally light grey, with no primary fabrics except diffuse burrows. Most of the interval is pseudobreccia. the interval 422.4-425.9 is about 5% sphalerite with dolomite and traces of pyrobitumen. The interval 425.9-431.0 is dominated by stylolites and pseudobreccia with pyrobitumen. 432.0-434.0 is vuggy pseudobreccia with traces of sphalerite.

433.8-446.84: Dolostone: Uniformly light grey, medium to finely crystalline, with occasional stylolites and short vuggy intervals.

446.84

END OF HOLE.

*R.H. Frab*

APPENDIX 5

Assays of diamond drill-core

D.D.H. No.	Intercept (m)	Length (m)	Sample No.	% Pb	% Zn	% Pb+Zn
92-81	119.0 -120.00	1.05	5701	2.30	0.12	2.42
	156.95-159.15	2.20	5702	0.98	0.77	1.75
	163.70-164.20	0.5	5703	3.55	0.73	4.28
	164.20-165.55	1.35	5704	0.02	0.01	0.03
	165.55-166.55	1.00	5708	0.26	0.95	1.21
	166.55-167.55	1.0	5705	0.34	3.90	4.24
	175.60-176.60	1.0	5706	0.02	0.73	0.75
	176.60-178.10	1.5	5707	0.02	2.90	2.92
	178.10-179.60	1.5	5709	0.01	1.55	1.56
	179.60-180.60	1.0	5710	0.02	4.00	4.02
	182.84-184.34	1.5	5711	0.01	1.40	1.41
	186.60-188.2	1.5	5712	0.01	0.54	0.55
	191.08-192.08	1.0	5713	0.82	0.55	1.37
	192.08-193.00	1.0	5714	2.50	1.38	3.88
	193.90-195.00	1.1	5715	0.60	1.96	2.56
96-81	22.73- 24.63	1.9	5717	0.02	0.26	0.28
	40.15- 41.89	1.74	5716	0.08	0.39	0.47
	76.75- 77.75	1.0	5718	0.02	0.39	0.41
	95.12- 96.12	1.0	5719	0.16	0.20	0.36
	99.50-100.00	0.5	5720	0.01	0.02	0.03

D.D.H. No.	Intercept (m)	Length (m)	Sample No.	% Pb	% Zn	% Pb+Zn
96-81 cont'd	100.00-100.5	0.5	5721	0.02	2.78	2.80
	100.05-101.5	1.0	5722	< .01	0.03	0.03
	113.31-114.31	1.0	5723	< .01	0.01	0.01
	114.31-116.21	2.0	5724	< .01	0.01	0.01
	148.4-149.4	1.0	5725	< .01	0.13	0.13
	151.32-152.32	1.0	5726	< .01	0.81	0.81
	152.32-153.32	1.0	5727	< .01	0.56	0.56
	153.32-154.32	1.0	5728	0.02	4.50	4.52
	154.32-155.32	1.0	5729	< .01	0.60	0.60
	162.53-163.53	1.0	5730	< .01	0.22	0.22
	163.53-164.53	1.0	5731	< .01	< .01	< .01
	164.53-165.03	0.5	5732	< .01	< .01	< .01
	167.11-168.11	1.0	5734	< .01	0.37	0.37
	168.11-169.11	1.0	5735	< .01	0.08	0.08
	169.11-170.11	1.0	5736	< .01	0.04	0.04
97-81	19.42- 20.42	1.0	5801	< .01	1.18	1.18
	20.42- 21.42	1.0	5802	0.01	1.41	1.42
	21.42- 22.42	1.0	5803	< .01	0.16	0.16
	22.42- 23.47	1.05	5804	< .01	0.64	0.64
	23.47- 24.47	1.0	5805	< .01	0.83	0.83
	24.47- 25.49	1.02	5806	< .01	0.34	0.34
	25.49- 26.52	1.03	5807	0.02	1.25	1.27
	26.52- 28.65	2.13	5808	< 0.01	1.10	1.10
	28.65- 29.65	1.0	5809	0.09	4.20	4.29
	29.65- 30.15	0.5	5810	0.01	1.78	1.79



D.D.H. No.	Intercept (m)	Length (m)	Sample No.	% Pb	% Zn	% Pb+Zn
97-81 cont'd	30.15- 31.15	1.0	5811	0.01	6.88	6.89
	31.15- 32.15	1.0	5812	<0.01	0.23	0.23
	32.15- 33.15	1.0	5813	< .01	0.04	0.04
	33.15- 34.20	1.05	5814	< .01	0.11	0.11
	34.20- 35.20	1.0	5815	0.33	6.08	6.41
	35.20- 36.20	1.0	5816	0.35	9.60	9.95
	36.20- 37.20	1.0	5817	0.06	10.60	10.66
	48.02- 49.02	1.0	5818	0.02	14.05	14.07
	49.02- 50.02	1.0	5819	0.01	20.08	20.09
	50.02- 51.02	1.0	5820	0.01	8.40	8.41
	51.02- 51.52	0.5	5821	0.02	5.80	5.82
	51.52- 52.52	1.0	5822	<0.01	2.12	2.13
	52.52- 53.52	1.0	5823	<0.01	2.60	2.61
	37.2- 38.2	1.0	5824	< .01	0.08	0.08
	38.2- 39.2	1.0	5825	< .01	0.12	0.12
	108.96-109.96	1.0	5827	0.08	1.68	1.76
	109.96-110.46	0.5	5828	0.01	5.72	5.73
	110.46-111.46	1.0	5829	0.01	1.51	1.52
	111.46-112.56	1.1	5830	<.01	1.44	1.44
	95.35- 95.95	0.6	5826	0.12	7.20	7.32
99-81	328.70-329.80	1.1	5737	0.11	1.46	1.57
	344.82-345.67	0.87	5738	0.98	1.36	2.34
	356.11-357.31	1.2	5739	0.44	0.21	0.65

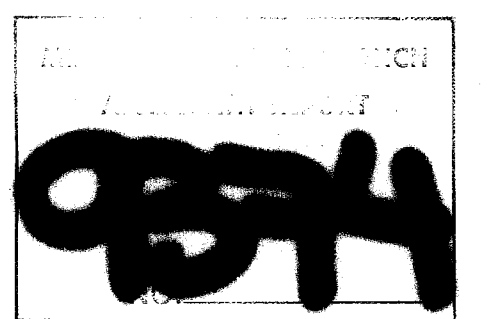
5831

D.D.H. No.	Intercept (m)	Length (m)	Sample No.	% Pb	% Zn	% Pb+Zn
99-81 cont'd	401.44-402.74	1.3	5740	0.01	0.16	0.17
	402.74-403.74	1.0	5741	< .01	1.16	1.16
	403.74-404.74	1.0	5742	< .01	0.20	0.20
	404.74-405.74	1.0	5743	< .01	0.32	0.32
	405.74-406.74	1.0	5744	< .01	0.28	0.28
	406.74-407.44	0.7	5745	< .01	0.01	0.01
	407.44-408.44	1.0	5746	< .01	0.26	0.26
	408.44-409.44	1.0	5747	< .01	0.36	0.36
	411.03-412.43	1.4	5748	< .01	0.13	0.13
	414.42-414.42	0.5	5749	< .01	0.23	0.23
	414.42-415.92	1.0	5750	< .01	1.50	1.50
	419.17-420.57	1.4	5751	0.07	0.58	0.65
	422.58-424.05	1.5	5752	0.01	0.84	0.85
	424.05-425.05	1.0	5753	< .01	0.18	0.18
	425.05-426.05	1.0	5754	< .01	0.27	0.27
	427.05-428.05	1.0	5755	< .01	0.24	0.24
	440.30-441.5	0.8	5756	< .01	0.52	0.52
	432.07-433.07	1.0	5757	< .01	0.23	0.23
	435.68-436.28	0.6	5758	0.21	2.50	2.71
100-81	194.17-195.17	1.0	5759	1.62	0.24	1.86
	195.17-196.17	1.0	5760	1.02	0.67	1.69
	196.17-197.02	0.85	5761	0.19	1.71	1.90
	197.02-198.02	1.0	5762	0.63	3.11	3.74



D.D.H. No.	Intercept (m)	Length (m)	Sample No.	% Pb	% Zn	% Pb+Zn
103-81	258.50-259.50	1.0	5832	0.57	1.24	1.81
	282.64-283.54	0.9	5833	0.01	2.10	2.11
	303.50-304.50	1.0	5834	0.05	0.88	0.93
	304.50-305.50	1.0	5835	0.38	0.38	0.76
	305.50-306.50	1.0	5836	0.07	1.33	1.40
	306.50-307.00	0.5	5837	0.08	1.42	1.50
	323.27-324.07	0.8	5838	0.06	0.88	0.94
	324.07-325.95	1.88	5839	0.09	2.69	2.78
	325.95-326.95	1.0	5840	0.08	1.05	1.13
	326.95-328.01	1.06	5841	0.07	1.20	1.27
	330.57-331.57	1.0	5842	< .01	0.39	0.39
	331.57-332.57	1.0	5843	< .01	0.49	0.49
	332.57-333.57	1.0	5844	< .01	1.02	1.02
	333.57-334.57	1.0	5845	< .01	1.44	1.44
	334.57-335.57	1.0	5896	< .01	0.92	0.92
	335.57-336.57	1.0	5847	< .01	1.76	1.76
	336.57-337.07	0.5	5848	< .01	1.47	1.47
	337.07-337.96	0.9	5849	< .01	0.13	0.13
	337.96-338.46	0.5	5850	< .01	0.40	0.40
	338.46-339.46	1.0	5851	< .01	1.73	1.73
	339.46-340.43	0.97	5852	0.13	0.70	0.83
	342.19-342.69	0.5	5853	< .01	0.76	0.76
	342.69-343.69	1.0	5854	< .01	1.28	1.28
	360.575-361.075	0.5	5855	< .01	0.70	0.70
	361.075-362.575	1.5	5856	< .01	1.53	1.53
	362.575-363.475	0.9	5857	< .01	0.83	0.83
	363.475-364.325	1.85	5858	< .01	0.84	0.84

D.D.H. No.	Intercept (m)	Length (m)	Sample No.	% Pb	% Zn	% Pb+Zn
103-81 cont'd	370.085-371.085	1.0	5859	<.01	1.16	1.16
	371.085-372.085	1.0	5860	<.01	1.41	1.41
	372.085-372.735	0.65	5861	<.01	2.40	2.40
	396.64-397.19	0.55	5862	0.01	2.75	2.76
	398.74-399.19	0.45	5863	<.01	2.17	2.17
	399.99-400.29	0.3	5864	<.01	4.10	4.10
	404.40-405.40	1.0	5865	0.08	1.36	1.44
	405.40-406.40	1.0	5865	<.01	1.63	1.63
	406.40-407.40	1.0	5867	<.01	0.23	0.23
	407.40-408.40	1.0	5868	<.01	0.85	0.85
	408.40-409.40	1.0	5869	<.01	0.68	0.68
	409.40-410.40	1.0	5870	0.19	5.20	5.39
	410.40-411.40	1.0	5871	<.01	1.98	1.98
	411.40-412.40	1.0	5872	<.01	2.37	2.37
	412.40-413.40	1.0	5873	<.01	5.80	5.80
	413.40-414.40	1.0	5874	<.01	4.20	4.20
	414.40-415.40	1.0	5875	<.01	2.43	2.43
	415.40-415.90	0.5	5876	<.01	2.15	2.15
	415.90-416.90	1.0	5877	<.01	0.49	1.38
	416.90-417.90	1.0	5878	<.01	1.41	1.41
	417.90-418.90	1.0	5879	<.01	2.15	2.15
	418.90-419.90	1.0	5880	<.18	0.49	0.67
	419.90-420.25	0.35	5881	2.43	2.45	4.87
	422.49-423.49	1.0	5882	0.01	2.30	2.31
	424.49-423.49	1.0	5883	.04	1.40	1.44
	424.49-425.49	1.0	5884	1.15	0.98	2.13
	425.49-426.49	1.0	5885	0.06	0.5	0.59
	426.49-427.01	0.52	5886	1.18	1.60	2.78



*R.A.F. John*

Figure 3

**Texasgulf Inc.**  
**ROBB LAKE JOINT VENTURE**  
 COMPOSITE PLAN OF MINERAL CLAIMS  
 SHOWING 1981 GROUPING

NTS 94/B13

WORK BY	DRAWN BY	DATE	DRW.G NO.
R A FG	E R	SEPT 22, 1981	

0 250 500 1000 1500 2000 M  
 0 1000 2000 4000 6000 FT



**LEGEND**

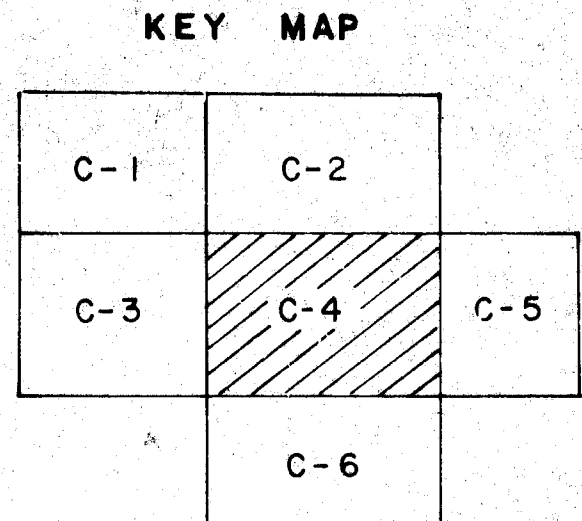
BEARINGS ARE ASTROMIC AND ARE DERIVED BY SOLAR OBSERVATION REFERRED TO THE MERIDIAN THROUGH STA. 8101.

CO-ORDINATES WERE DERIVED BY MATCHING PHYSICAL FEATURES ON 1" = 500' TOPOGRAPHIC SHEET #4 (BY M.S.E.L. DATED MAY 12, 1972).

ELEVATIONS ARE BY TRIG. HEIGHTING AND ARE REFERRED TO PHOTOGRAMMETRIC SPOT HEIGHTS ON M.S.E.L. SHEET #4. ELEVATIONS ARE APPROXIMATELY GEODETIC.

- IP 8202 DENOTES STANDARD B.C.L.S. IRON SURVEY POST WITH NUMBERED ALUMINUM IDENTIFICATION TAG.
- SP 8167 DENOTES 12" SPIKE SET IN ROCK WITH NUMBERED ALUMINUM IDENTIFICATION TAG.
- 8145 DENOTES TRAVERSE HUB
- 1 DENOTES #1 LOCATION POST
- 2 DENOTES #2 LOCATION POST
- WP DENOTES WITNESS POST
- WT DENOTES WITNESS
- DENOTES TRUE POSITION OF WITNESSED CLAIM POST—NO POST SET IN FIELD
- DENOTES CLAIM POST

FOR CO-ORDINATES OF TRUE CLAIM CORNERS ADJACENT TO WT: P'S SET DURING SURVEY, SEE TABULATED LIST DATED 1972.



**NOTE:** Original drawing done using measurements of the imperial system and at a scale of 1 in = 500 ft. Scale has been changed to 1:5,000 but grid and elevations are still given in feet.

\* Indicates 1981 Drill Holes

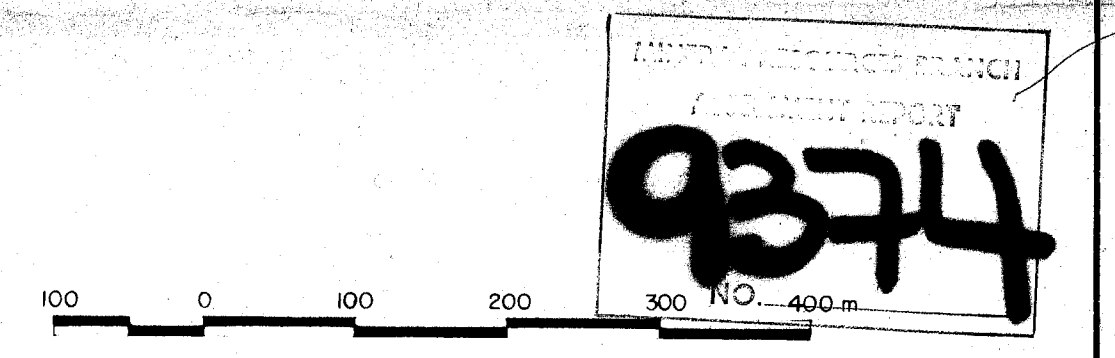


Figure 4  
Index see Figure 2

3	SEP/81	FBI drilling, 14 DDH 91-81 to 103-81, added	RAFR
2	SEP/80	1980 drilling, 14 DDH 81-80 to 90-80, added	RAFR
1	AUG/74	D.H. NO. 30 - N#52 ADDED	J.S. J.S. J.M.
REV	NO	DATE	REVISION
DR	CH	APP	
<b>TexasGulf Inc.</b>			
<b>ROBB LAKE JOINT VENTURE</b>			
<b>LOCATION LINE SURVEY OF MINERAL CLAIMS</b>			
NTS 94B/13			
<b>McELHANNEY ASSOCIATES</b>			
PROFESSIONAL LAND SURVEYORS			
VANCOUVER, B.C.			
DESIGNED	J.W.K.S.	SCALE:	1:5,000
DRAWN	K.M.S.	DATE:	NOV. 1972
CHECKED	J.W.K.S.	JOB NO.:	03649-0
APPROVED	D.S.M.	CLIENT DWG. NO.	MCASSOC DWG. NO.
			C-4