MAR 19790008: OLD FORT BAY

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OLD FORT BAY
1978 DRILLING PROGRAM

N.T.S. 74-L-9

Morley Brown
April 2, 1979

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INTRODUCTION

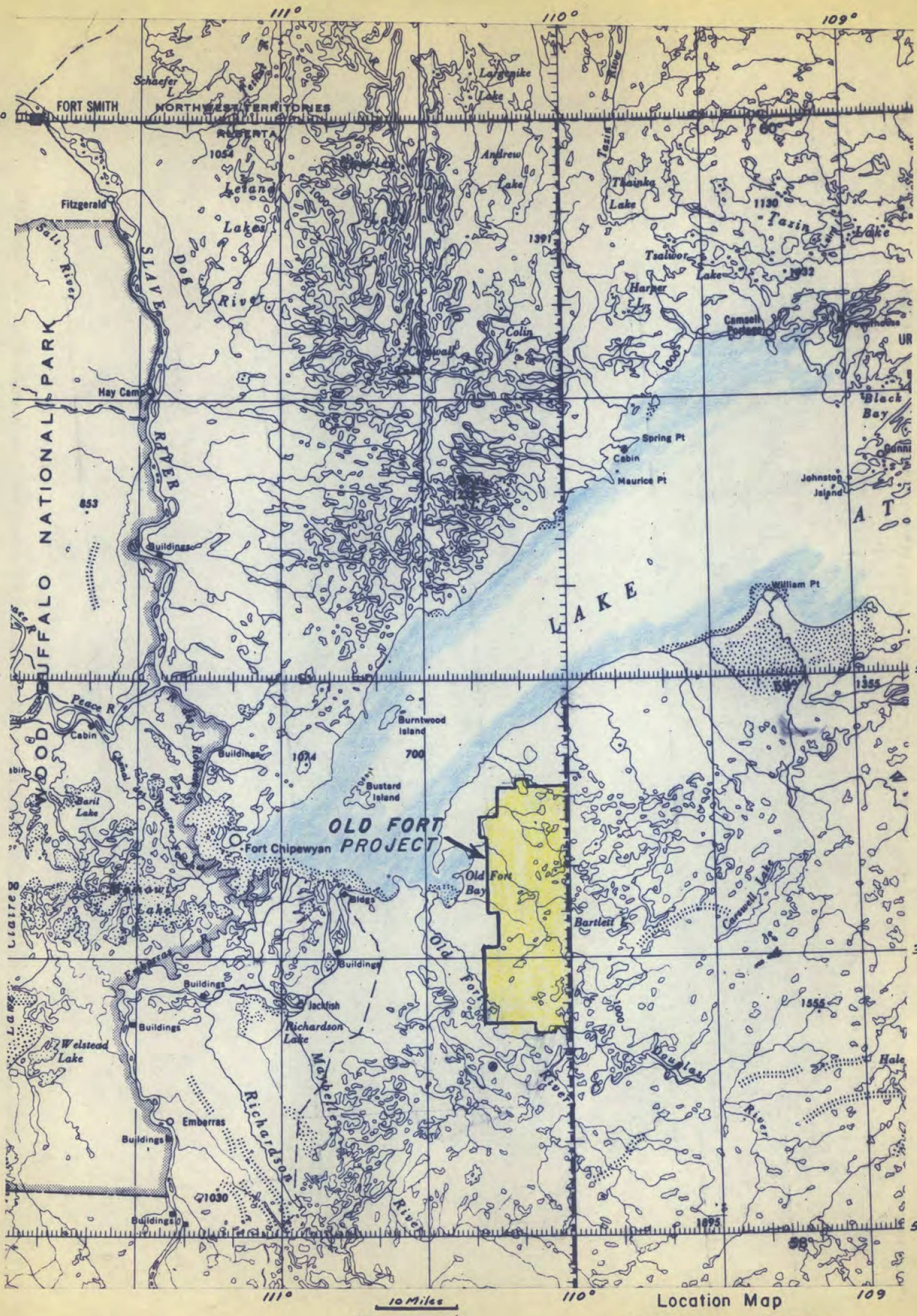
Esso Minerals Canada's property within the Old Fort Bay area N.E. Alberta consists of six (6) adjoining permits covering 179,520 acres in total; that border along the Saskatchewan-Alberta boundary. Its center lies just 35 miles E.N.E. of Fort Chipewyan, 85 miles S.W. of Uranium City and 135 N.N.W. of Fort McMurray. All centers have helicopter and float or ski equipped aircraft bases but only Uranium City provides Twin Otter service.

Amok's Cluff Lake ore body lies 35 miles east of the property center. Figure 1 shows the general outline of the property while a detailed description of the permits is contained in Appendix I.

Exploration within Esso Minerals permits 225, 235, 236, 246 687701001 and 77-479 has taken place in three phases. The first phase comprised of a test reflection seismic survey along a 22 km line running NE-SW across the property conducted by Kenning Exploration Ltd. during the months of February through April, 1978. This was followed by a grass roots gravity survey encompassing all the permits along 7 hand-cut lines, including the seismic line, the following summer. The results and recommendations of both the above exploration programs have been reviewed and submitted in report form to the Alberta Energy and Natural Resources Assessment Board for approval in September, 1978.

Further to assessment obligations, Esso Minerals was required to complete diamond drill exploratory holes on permits prior to their expiry. Consequently 4 possible drill targets were determined, one on each of permits 225, 235, 236, 246 (Figure 3). Of the four (4) planned holes two (2) have been completed to the end of November, 1978. The remaining two holes have been postponed pending results and cost evaluation of the former 2 holes.

This report includes an outline of the drilling operations and the immediate results along with a summary of the work history, logistics and cost evaluation.



Location Map

NTS 74L-8,9 Figure 1

19790008

OBJECTIVES AND OUTLINE

Esso Minerals planned four vertical diamond drill holes totalling 6,000 ft. (1808.40 meters) during the month of December, 1978, on four of its permits within the Old Fort Bay area of N.E. Alberta. The objective of the drilling program was to determine the cause of the anomalous geophysical signatures displayed in the area and test their possible association with uranium mineralization (Kirwan, 1977; Brown, 1978). All four holes were to intersect the unconformity between the Paleohelikian Athabasca formation and the Archean-Aphebian "basement" complex.

The drilling contract was assigned to Midwest Drilling, a division of Germac Enterprises Ltd., Winnipeg, Manitoba. Their drilling involvement in the Old Fort Bay area, during the previous summer, established a base camp at Stone Point on Lake Athabasca which Esso Minerals maintained as an operations base. A Bell 204B helicopter was used for mobilization and demobilization of the drill while a Jet Ranger 206B, based at camp, ferried crews and serviced the drill.

A breakdown of the work history, personnel and cost evaluation is given in the Appendix.

RESULTS

Two vertical diamond drill holes totalling 6,912 feet (1811.11 meters) were completed during the period from September 25 to November 28, 1979. Both NQ and BQ wireline were used in the drilling to alleviate the problems of caving and sanding encountered in portions of the holes. Various mud drilling techniques were also used which resulted in well drilled holes not varying more than $1 - 2^{\circ}$ from the vertical. The recovered core was logged lithologically, monitored for radioactivity by a S.R.A.T. SPP2N scintillometer and stored on the respective drill sites.

RESULTS (cont'd)

Diamond drill hole OF-78-1, with a total depth of 3,337 feet (1017.17 meters) was the only hole which intersected the unconformity between the Athabasca dandstone and the Precambian "basement" complex. Diamond drill hole OF-78-2 bottomed at 3,627 ft. (1105.51 meters). It was terminated prior to intersecting the unconformity due to excessive caving and incapacity of the drill used to handle such depths.

Both holes were logged lithologically in detail in hope that various horizons may correlate, subsequently offering a geological tool in determining the thickness of the overlying Athabasca formation. Although distinct marker beds were not observed, compositional and textural features in some units can be roughly correlated (Figures 4 & 5).

The Athabasca formation was observed to consist primarily of inter-bedded texturally immature mineralogically submature quartz sandstone and finely laminated siltstone, pelites and shales. The sandstone horizons are generally buff to cream white with extensive indian red to purple hematitic stained horizons. They display numerous structural depositional features such as convolute bedding indicative of soft sediment deformation, planar and trough cross bedding, ripple marks, scoured surfaces and minor small scale graded bedding sequences with narrow subconglomerate horizons. Porosity is variable and depends for the most part on the amount of induration. Fissile segments occur randomly throughout although are generally near fractured or fragmented core horizons.

The siltstones and pelitic shales are narrowly banded red and pale green and display platy cleavaging. They are variable in thickness but usually less than a meter in thickness. Wider horizons are noted in the upper portion of the section. In both DDH OF-78-1 and DDH OF-78-2 these beds decrease towards the bottom of the section. Portions of these beds are strongly hematitic and may contain up to 20% specularitic hematite.

In both drill holes the sandstone becomes progressively more coarsely grained and poorer sorted near the unconformity with large quartz pebble and cobble size clasts randomly dispersed throughout. This latter unit is distinct in both holes but only observed to pass into a sub-conglomerate bed above the unconformity in DDH OF-78-1.

DDH OF-78-1 intersected the unconformity between the Athabasca formation and the Precambrian "basement" complex at 3309.5 ft. (1010.12 meters). The contact is sharp with no regolith developed. Minor slickenside structural features indicative of shearing or faulting exist on the altered basement surface. The basement material displays relic gneissosity, appears to be granitic in composition, now altered to chlorite-sericite-talc. It becomes progressively cleaner and fresher near the base.

In DDH OF-78-2 the sandstone is cut by a narrow disconcordant, fairly unaltered, diabase dyke at 3284.5 ft. (1001.12 meters). The contact with the sandstone is generally sharp with no apparent chill zone or contact metamorphism observable. Shistose textured xenoliths of basement material, however, along with minor sandstone fragments are noted within the contact horizons. Very little fracturing and baking of the sandstone appears to have occurred.

A detailed lithologic log description of each hole is included in Appendix III. Figures 4 and 5 outline a schematic diagram for each hole along with corresponding descriptions.

Core samples were taken from each hole every 100 ft. (30 meters) over 1 foot sample widths and assayed for U_3O_8, Pb and Zn. The results have been included with the lithologic descriptions as well as in tabulated form in Appendix IV.

CONCLUSION AND RECOMMENDATIONS

The results of the two vertical diamond drill holes indicate depths much greater than can be explored by geophysical techniques. Targets can not be delineated with the necessary accuracy for future drilling considerations. It is, therefore, recommended that the proposed drilling program on Permits 225 and 246 not be carried out and Esso Minerals' option on these permits and Permits 235 and 236 be relinquished with the original permit holders.

Anomalous lake water and lake sediment samples from the 1977 survey on Permit No's. 687701001 and 77-479 have not been explained. The 1978 surface radiometric prospecting did not determine whether they are caused by a deep rooted source or from a transported medium on surface. A detailed geochemical soil, radon gas and ground radiometric survey should be conducted in 1979 to attempt to explain the cause of the anomalies. It is therefore recommended that Permits 687701001 and 77-479 be retained until a suitable explanation for the geochemical anomalies is determined or until such time that they expire in January and June of 1980.

REFERENCES

Brown, M. B., (1978): Exploration - 1978, Old Fort Bay. Unpublished Report prepared for Imperial Oil Limited. Assessment Report.

Kirwan, L. D., (1977): Exploration - 1977, Old Fort Bay. Unpublished Report prepared for Imperial Oil Limited.

APPENDICES

APPENDIX I

OLD FORT PERMITS - DESCRIPTION

PERMIT 225:

Optioned from C&E Exploration Ltd.
Anniversary Date: January 28, 1979

46 3/4 Sections = 29,920 Acres

Twp. 111, Rge. 2, W4	Sec:	32
Twp. 112, Rge. 1, W4	Secs:	19-21, 28-33
Twp. 112, Rge. 2, W4	Secs:	5, 8-10, 13-28, 30, 34-36
Twp. 113, Rge. 1, W4	Secs:	24, 25
Twp. 113, Rge. 2, W4	Secs:	1-3, 10, 11, 13, 14 S/2 + NE/4=15, 23

PERMIT 235:

Optioned from C&E Exploration Ltd.
Anniversary Date: May 18, 1979

46 3/4 Sections = 29,920 Acres

Twp. 111, Rge. 1, W4	Secs:	N/2 SE/4-3, 9, 10, 13-36
Twp. 111, Rge. 2, W4,	Secs:	13-16, 21-28, 33-36
Twp. 112, Rge. 2, W4,	Secs:	2-4, 11

PERMIT 236:

Optioned from C&E Exploration Ltd.
Anniversary Date: May 18, 1979

46 3/4 Sections = 29,920 Acres

Twp. 112, Rge. 1, W4	Secs:	1-18, 22-27, 34-36
Twp. 112, Rge. 2, W4	Secs:	1, 12
Twp. 113, Rge. 1, W4	Secs:	1-4, 7-12, S/2-13, 14-18, 21, SE/4-28.
Twp. 113, Rge. 2, W4	Sec.	12

PERMIT 246:

Optioned from Flin Flon Mines Ltd.
Anniversary Date: June 15, 1979

46 3/4 Sections: 29,920 Acres

Twp. 110, Rge, 1, W4	Secs:	14-36
Twp. 110, Rge. 2, W4	Secs:	25-27, 34-36
Twp. 111, Rge. 1, W4	Secs:	1, 2, SW/4-3, 4-8, 11, 12
Twp. 111, Rge. 2, W4	Secs:	1-4, E-2-5, 9-12

PERMIT 687701001:

Optioned from Flin Flon Mines Ltd.
Anniversary Date: January 4, 1980

78 Sections = 49,920 Acres

Twp. 108, Rge. 1, W4	Secs:	19-21, 28-33
Twp. 108, Rge. 2, W4	Secs:	22-27, 34-36
Twp. 109, Reg. 1, W4	Secs:	3-10, 13-36
Twp. 109, Rge. 2, W4	Secs:	1-3, 10-15, 22-27
Twp. 110, Reg. 1, W4	Secs:	1-13

PERMIT IOL 77-749: Optioned from Flin Flon Mines Ltd.
Anniversary Date: June 16, 1980

15 1/2 Sections = 9,920 Acres

Twp. 108, Rge. 1. W4 Secs: NW/4-13, N/2-14, 15 N/2 + SE/4-16.

Twp. 109, Rge. 1, W4 Secs: 1, 2, 11, 12

APPENDIX II

PERSONNEL

ESSO MINERALS CANADA

MORLEY BROWN	PROJECT GEOLOGIST
LEO KIRWAN	GEOLOGY ADVISER

MIDWEST HELICOPTERS LTD.

WAYNE MACAULAY	PILOT
WAYNE JOHNSON	PILOT
PETER MEDWYDUK	PILOT
DOUG SMALLMAN	PILOT
BOB GLENN	PILOT
RICK CAMERON	ENGINEER
DENIS TKACHUCK	ENGINEER
KEN LOSHIAVO	ENGINEER
GEORGE PRIGROSKI	ENGINEER
ANDRE ROMPRE	ENGINEER

MIDWEST DRILLING LTD.

DOUG OWEN	FOREMAN
DON MACLEOD	FOREMAN
DALE LEE	DRILLER
GLEN CAMPBELL	DRILLER
TONY BODNAR	DRILLER
GARY RUSSELL	DRILLER
JIM KREGER	HELPER
LARRY TROGLOUR	HELPER
NICK BODNAR	HELPER
GORDON KERR	COOK
HENRY ZIMMERMAN	COOK
BRIAN RUDKAVICH	COOKEE

APPENDIX II

DRILL LOG DESCRIPTIONS

DDH OF-78-1

DDH OF-78-2

DIAMOND DRILL LOG — *ESSO MINERALS CANADA*

Hole No. O.F. 78-1
Co-ordinates Lines 4350m South
Core Size 0-251 NQ
Purpose Uranium Exploration
Started September 28, 1978
Completed October 22, 1978
Drilled By Midwest Drilling Ltd.
Logged By M. G. Brown

PROPERTY Permit 235 PROJECT 5601989 NTS 74-L-9

Latitude 58°36'N
Longitude 110°06'W
Datum Level 255.22 m ASL
Azimuth
Dip -90°
Total Length
Hor. Projection -
Vert. Projection -

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DIP TESTS

TEST	FROM	TO	INTERVAL	DIP	CORR.
1	0	506	506'	89°	
2	506	1500	994'	89°	
3	1500	3000'	1500'	89°	

Meters FROM	TO	DESCRIPTION	C.P.S.	CORE REC. %	CORE SAMPLES ASSAY NUMBER	FROM	TO	WIDTH	ASSAY VALUE % U_3O_8	Pb	Zn
0	46.93	OVERBURDEN: Glacial drift and till.									
		ATHABASCA FORMATION									
46.93	52.43	QUARTZ SANDSTONE: Fine grained buff white to light red and greenish.									
		Slightly speckled appearance.									
		- Well rounded quartz grains composed 85 to 90% clay, chlorite, hematite									
		and silica grit composed matrix 10 to 15%.									
		- Minor cross bedding outlined by hematite stain.									
		- Narrow interbedded red green siltstone and gritty shale horizons -									
		finely laminated.									
		- Minor fractures: 166' @ 10° to core									
		170' @ 5° to core									
		- Core is blocky.									
		- Grades into mottled shale.									
52.43	76.96	MOTTLED SILTSTONE AND GRITTY SHALE: Indian red and light green bands			MB 01	56.69	56.99	0.3m	.002	.01	.01
		of variable width. Speckled.									
		- Very extremely fine grained quartz grains less than 1/10mm, well			MB 02	68.88	69.18	0.3m	.001	.01	.01
		rounded and poorly sorted within silica grit approx. 5 to 10%, clay									
		approx. 3 to 5%, and chlorite dust approx. 2 to 3%.									
		- Minor black micas (biotite?) occur paralle to lamanae. Some partly	1								
		or fully altered to chlorite. Up to 3% in some horizons.									
		- Hematite occurs as coating over grains and/or as dust size grains									
		within intersticies of grain boundaries.									
		- Interbedded mudstone horizons - deep indian red, generally less than									
		2 to 3 cm in width.									
		- Minor interbedded horizons of intraformational conglomerate. Clast	25	100							
		composed of chlorite altered siltstones within similar compositional									
		matrix. Clast less than 1 cm in length and approx. 1 to 2mm in width.									
		- Forms sharp contact with underlying quartz sandstone.									

DIAMOND DRILL LOG – *ESSO MINERALS CANADA*

Hole No. O.F. 78-1 PROPERTY Permit 235 PROJECT 5601989 NTS 74-L-9

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FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	C.P.S.	CORE REC. %	CORE SAMPLES ASSAY NUMBER	FROM	TO	WIDTH	ASSAY VALUE % U_3O_8	Pb	Zn
76.96	92.96	QUARTZ SANDSTONE: Red and buff white to greenish.									
		- Very fine grained, well to moderately rounded quartz grains within silica grit matrix forming cement.									
		- Quartz grains approx. 85 to 90%.									
		- Silica grit approx. 5 to 7%.	25	100	MB03	91.44	91.74	0.3m	.001	.01	.01
		- Biotite and mica flakes approx. 2 to 5% along some horizons.									
		- Chlorite trace to 1% - occurs as dust and as alteration of micas.									
		- Hematite occurs as grains and dust within grain intersticies and as coating in and around grains. Generally as bands (up to 5 to 7%) and less than 1% in non-hematized zones.									
		- Narrow bands less than 2 to 3cm of orthoquartzite, has glassy texture, forms banded horizons in unit.									
		- Interbedded gritty red and green shales and narrow pelitic horizons, gradiational with quartz sandstone, generally horizons less than 7 cm. More blocky and brittle than surrounding sandstone.									
		- Minor cross bedding - defined by hematite staining along laminae.									
		- Good core recovery, unit generally competent with no notable fracturing.									
92.96	114.90	Finely laminated quartz section: Fine grained moderately rounded quartz within silica grit matrix that forms cement.									
		- Quartz approx. 85 to 90%.									
		- Silica grit approx. 8 to 10%.									
		- Hematite approx. 2 to 5% as dust and staining within grain intersticies. Small grains - trace.									
		- Chlorite dust and particles less than 1% with silica grit.									
		- Unit has slight mottled appearance.	25-30	100	MB04	99.66	99.96	0.3m	.001	.01	.01
		- Unit is distinguished by finely laminated appearance - laminae defined by hematite staining.									
		- Extensive cross bedding.									
		- Interbedded gritty shale and pelite less than 5 cm wide.									
		- Unit competent, cored well with little core loss, i.e.: only a few cm between each run.									
		- grades into more broadly laminated quartz sandstone.									

DIAMOND DRILL LOG – *ESSO MINERALS CANADA*

Hole No. O.F. 78-1 PROPERTY Permit 235 PROJECT 5601989 NTS 74-L-9

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FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	C.P.S.	CORE REC. %	CORE SAMPLES ASSAY NUMBER	FROM	TO	WIDTH	ASSAY VALUE U_3O_8	Pb	Zn
114.90	132.59	QUARTZ SANDSTONE: Medium to fine grained greenish red to buff white.									
		- Much like unit 76.80 - 92.96m but contains less biotite.	20	100	MB 05	118.26	118.56	0.3m	.001	.01	tr.
		- Segments more strongly indurated resulting in 'friable' sandstone - only 0.30 meter in width.									
		- Cross-bedding horizons but not extensive.									
		- Interbedded siltstone and pelites noted @ 121.76 - 122.38m - sharp contact.									
		- Fractured at 127.25 - 128m @ 10° to core.									
132.58	136.40	MOTTLED SHALE: Red-green speckled siliceous shale.									
		- Brittle, resulting in blocky and brocken core recovery.	25-30	98							
		- Fractured along some segments but difficult to determine dip.									
		- Reasonable recovery approx. 10 cm lost between run 435 - 445'.									
136.40	143.55	QUARTZ SANDSTONE - Red-green to buff white.									
		- Like unit 377 to 435 but displays more graded bedding and cross bedding horizons.	25-30	100							
		- Minor interbedded pelite horizons of light green to indian red in color. Less than 2 cm.									
143.55	145.99	MOTTLED SHALE-PELITE: Indian red to light green speckled siliceous shale.	25-30	98							
		- Like 132.58 to 137.29m.									
		- Brittle and fractured.									
		- Minor core loss - approx. 12 cm.									
145.99	191.72	QUARTZ SANDSTONE: Buff white to greenish red, finely grained and poorly sorted.			MB 06	148.13	148.43	0.3m	.001	.01	tr.
		- Quartz grains well to moderately rounded, approx. 85 to 90%.									
		- Matrix: silica grit approx. 10 to 15%.									
		clorite - trace 0% occurs as fine dust within silica grit.									
		hematite stain and dust within grit, approx. trace 1%.									
		- Narrow siltstone and pelitic horizons less than 3 to 4 cm. Deep indian red to light greenish. Finely laminated.			MB 07	161.70	162.0	0.3m	.001	.01	tr.
		- Cross bedding - distinguished by hematite staining along laminae.			MB 08	180.89	181.19	0.3m	.001	.01	tr.
		- Unit like 377 - 435 but more blocky, slightly fractured and segments more indurated and friable.									
		- Notable siltstone horizons: 519 - 519.5 531.5 - 532									

DIAMOND DRILL LOG – *ESSO MINERALS CANADA*

Hole No. O.F. 78-1 PROPERTY Permit 235 PROJECT 5601989 NTS 74-L-9

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FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	C.P.S.	CORE REC. %	CORE SAMPLES ASSAY NUMBER	FROM	TO	WIDTH	ASSAY VALUE U_3O_8	Pb	Zn
		- Monor Fractures: 535' - 5° to core									
		520.5 - 5° to core									
		- Unit becomes progressively more competent, less clay indurated and									
		grades to more quartz rich sandstone.									
		- Two feet of core missing over entire section.									
191.72	227.69	QUARTZ SANDSTONE: Like above unit but less blocky, more competent with									
		interbedded orthoquartzite horizons of variable width, generally less									
		than 1 to 1.5 metres in width.									
		- Contains less chlorite in matrix; minor chlorite rich horizons less	25-30	100	MB 09	204.52	204.82	0.3m	.001	.01	Tr.
		than 1 metre gradational within unit.									
		- Extensive cross bedding outlined by hematite staining along lamanae.			MB 10	216.40	216.70	0.3m	.001	.01	Tr.
		- Interbedded finely laminated pelite from 210.3 to 210.9m.									
		- Fractures at 0° to 20° to core at: 188.2 - 188.8 206.5 - 207.3									
		195.5 - 195.9 212.8 - 212.8									
		200.3 - 200.6 217.0 - 217.9									
		Minor chlorite within clay, etc. along fractures.									
		- Unit grades into orthoquartzite.									
227.69	228.60	SILTSTONE: Finely laminated red and green banded.									
		- Minor intraformational cigar shaped clast less than 1 cm.	25-30	100							
		- Grades into orthoquartzite.									
228.60	272.34	ORTHOQUARTZITE: Buff white cream to redish grey.									
		- Fine grained glassy luster.									
		- Brittle core - has tinkly ring when struck.									
		- No cross bedding or graded bedding.									
		- Mottled iron stained horizons.									
		- Minor interbedded clay and pelite horizons less than 2 cm wide,									
		generally greenish grey to deep indian red. Larger unit like 227.69 -	25-30	100							
		228.6 observed from 259.8 - 260 m.									
		- Minor fracturing 0° to 20° to core at: 229.6 - 229.9, 236.22 - 236.5,									
		240.49 - 240.58, 242.77 - 242.92, 249.02 - 249.33, 252.22 - 252.37,									
		253.90 - 255.27, 256.79 - 256.94, 261.82 - 262.59, 265.48 - 266.10.									
		- Unit becomes progressively more fractured towards bottom.									
272.34	275.23	ORTHOQUARTZITE: Like above unit but extensively fractured and broken.									
		No section unfractured.									

DIAMOND DRILL LOG – *ESSO MINERALS CANADA*

Hole No. O.F. 78-1 PROPERTY Permit 235 PROJECT 5601989 NTS 74-L-9

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FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	C.P.S.	CORE REC. %	CORE SAMPLES ASSAY NUMBER	FROM	TO	WIDTH	ASSAY VALUE U_3O_8	Pb	Zn
		- Core not rubbly - still able to piece together.									
		- All fractures 0, to 20° to core.									
		- Unit progresses into extensively fractured and rubbly core of cave zone.	20	100							
275.23	278.89	ORTHOQUARTZITE: "Cave" zone - extensively fractured and broken core -									
		rubbly core.			MB 11	275.53	275.83	.03	Tr.	.01	Tr.
		- 1.68m core recovered.									
		- Lost core sections: 0.30m between 275.23 - 276.45.									
		0.86m between 276.45 - 277.67	approx 20	25							
		1.12m between 277.67 - 278.89									
		- This section was cemented twice into order that it could be drilled									
		through. Finally it was reamed by NQ rods and hole extended by BQ									
		rods.									
		- Small piece of core approx. 0.34m, fault breccia at approx. 914.5' (?).									
278.89	289.71	ORTHOQUARTZITE: Like 272.34 - 275.23									
		- Brittle core, extensively fractured and broken core.									
		- All fractures 0° to 20° to core.			MB 12	284.07	284.37	0.3m	.001	.01	Tr.
		- Interbedded siltstone and pelite horizons: 287.12 - 287.58,									
		286.82 - 286.96, 280.11 - 280.26, and 281.78 - 281.94.									
		- Unit grades into less fractured interbedded quartz sandstone and									
		orthoquartzite.									
289.56	328.26	QUARTZ SANDSTONE: Medium to fine grained red and pinkish to cream inter-			MB 13	293.21	293.51	.03m	Tr.	.01	Tr.
		bedded quartz sandstone and orthoquartzite.									
		- Orthoquartzite segments variable in width, from less than 1m to 25m.			MB 14	302.97	303.27	0.3m	Tr.	.01	.01
		Banded red and creamy pink. No cross bedding or graded bedding.									
		- Quartz sandstone displays minor cross bedding and graded bedding.			MB 15	312.42	312.72	0.3m	.001	.01	Tr.
		Contains minor chlorite, tinting laminae greenish - also observed									
		within interstices of grains and within silica grit matrix.									
		- Quartz approx. 90 to 95%.									
		- Silica grit matrix approx. 2 to 5%.									
		- Chlorite - trace to 1%									
		- Hematite - approx. 2 to 5% within intersticies and as stain around									
		grains.									
		- Interbedded siltstone and pelite horizons. Very finely laminated, red									
		to greenish grey. Within, above and/or below horizons are reworked									

DIAMOND DRILL LOG — *ESSO MINERALS CANADA*

Hole No. O.F. 78-1 PROPERTY Permit 235 PROJECT 5601989 NTS 74-L-9

WP-6733

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	C.P.S.	CORE REC. %	CORE SAMPLES ASSAY NUMBER	FROM	TO	WIDTH	ASSAY VALUE U_3O_8	PB	Zn
		green intraformational irregular to cigar shaped clasts.									
		- Minor fractures 0° to 15° to core: 299,01 - 299.47, 300.84 - 301.60,									
		304.19 - 304.65, 314.86 - 315.62, 306.78 - 306.93.									
		- 292.30 - 294.13: chlorite along fracture and within sandstone proper									
		tinting core light green and fracture dark sea green.									
		- Unit grades into greenish tinged quartz sandstone.									
328.26	332.99	QUARTZ SANDSTONE: Green, medium to fine grained quartz sandstone,									
		poorly sorted.									
		- Quartz grains, moderately rounded 95%.			MB 16	331.92	332.22	0.3	.001	.01	
		- Chlorite as dust and flakes - 3 to 5%.									
		- Hematite as stain, dust, smaller grains, trace to 1%.									
		- Silica cement with only minor silica grit.									
		- Unit displays minor cross and graded bedding.									
		- Grades into red and cream quartz sandstone.									
332.99	407.52	QUARTZ SANDSTONE: Creamy white to pink and red purple, medium to fine									
		grained, poorly sorted.			MB 17	357.53	357.83	0.3	Tr.	.01	Tr.
		- Hematite stain within intersticies of quartz grains and as small									
		grains in matrix.									
		- Composition variable: from 85 to 95% quartz			MB 18	384.05	384.35	0.3	.001	.01	Tr.
		5 to 15% silica grit matrix									
		Tr. to 5% hematite									
		Tr. to 1% chlorite									
		- Minor horizons with chlorite within matrix.									
		- Cross bedding, graded bedding - coarser grained horizons yield fining									
		upward sequence.									
		- Interbedded siltstone and pelite horizons generally less than 2 cm									
		in width, finely laminated. Two larger horizons noted at:									
		346.25 to 346.60m 347.02 to 347.47m									
		- Red to grey clay seams at random along laminae.									
		- Minor fractures at 0 to 15% to core at: 345.9									
		348.69 to 349.52, 350.38 - 350,56, 354.48 to 355.40 and									
		358.75 to 359.20.									
		- Unit becomes more finely laminated and hematite rich (i.e.: more									
		red purple) in lower 3 to 4 metres.									

DIAMOND DRILL LOG – *ESSO MINERALS CANADA*

Hole No. O.F. 78-1 PROPERTY Permit 235 PROJECT 5601989 NTS 74-L-9 Page 7 of 11

WP-6733

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	C.P.S.	CORE REC. %	CORE SAMPLES ASSAY NUMBER	FROM	TO	WIDTH	ASSAY VALUE U_3O_8	Pb	Zn
407.52	480.67	QUARTZ SANDSTONE: Deep purplish red, medium grained.									
		- Extensive graded bedding, cross bedding.									
		- Coarser segments less than 1 to 2 cm with extensive iron staining.			MB 19	473.39	473.69	0.3	.001	.01	Tr.
		- Narrow interbanded creamy white to pink quartz sandstone segments less than 10 cm.									
		- Minor iron stained clay and/or pelite seams: generally less than 2 cm and finely laminated.									
		- Prominent horizons noted at: 437.39 to 437.84, 470 to 470.36.									
		- Randomly located irregular shaped "clasts" of clay and/or red pelite occur through unit. Generally less than 2 cm in size. Appear to be reworked segments from pelite zones.									
		- Unit grades back into similar unit as 322.99 to 407.52m.									
480.67	523.34	QUARTZ SANDSTONE: Creamy white to light pink and purplish red. Medium to fine grained.									
		- Unit like 322.99 to 407.52.									
		- Minor siltstone and pelite horizons. Finely laminated red to green segments usually less than 2 to 3 cm.									
		- Unit grades into red purplish hematite stained unit and becomes progressively more speckled within hematite grains.									
523.34	558.39	QUARTZ SANDSTONE: Red purplish medium to fine grained with coarser grained segments.									
		- Like 407.52 to 480.67 but doesn't have red irregular shaped pelitic clasts.									
		- Speckled appearance to core - formed by irregular shaped speculeritic hematite occuring as dust in and around quartz grains and/or as mamillated grains.									
		- Unit grades back into "red and white" banded quartz sandstone like 480.67 to 523.34m.									
558.39	661.11	QUARTZ SANDSTONE: creamy buff white to dark grey with narrow pink and red purple horizons. Medium to fine grained with coarser grained segments.			MB 20	569.06	569.36	0.3	22	0.01	Tr.
		- Unit has speckled appearance like above unit due to irregular shaped speculeritic hematite occuring as dust and/or as grains approx. 1mm in size of the momillated or botryoidal form. Peppered occurrence of hematite observed in both fine and medium grained horizons.			MB 21	582.17	582.47	0.3	Tr.	0.01	Tr.
					MB 22	642.21	642.51	0.3	Tr.	0.01	Tr.

DIAMOND DRILL LOG – *ESSO MINERALS CANADA*

Hole No. O.F. 78-1 PROPERTY Permit 235 PROJECT 5601989 NTS 74-L-9

WP-6733

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	C.P.S.	CORE REC. %	CORE SAMPLES ASSAY NUMBER	FROM	TO	WIDTH	ASSAY VALUE U_3O_8	Pb	Zn
		- Hematite also occurs as "dust" size particles along laminae and within	20	100	MB 23	660.50	660.80	0.3	Tr.	0.01	Tr.
		intersticies of grains giving both red purple to red grey color to									
		core.									
		- Unit composed of moderately poorly sorted quartz grains within silica									
		grit matrix and clay - minor mafic constituents (magnetite and biotite?).									
		- Cross bedding and graded bedding throughout unit with finely laiminated									
		horizons approx. 10 to 12 metres in wideth interbedded.									
		- Minor pelitic horizons approx. 2 to 3 cm in width.									
		- Unit grades into coarse grained quartz sandstone with large quartz									
		clasts.									
661.11	1001.12	QUARTZ SANDSTONE: Grey and indian red purple to creamy white and light									
		orange. Color extremely variable.									
		- Poorly sorted; unit varies from medium to coarse with finer grained			MB 24	666.00	666.30	0.3	Tr.	0.01	Tr.
		horizons.									
		- Primarily medium grained, moderately rounded quartz grains within	20	100	MB 25	685.19	685.49	0.3	Tr.	0.01	Tr.
		silica grit and clay matrix. Composition is variable and depends on									
		grain size. Coarser segments generally are more hematite rich where			MB 26	700.13	700.43	0.3	Tr.	0.01	Tr.
		hematite forms stain around quartz grains and dust within intersticies.									
		Segments contain speculoritic hematite in its botryoidal form and/or			MB 27	726.64	726.94	0.3	Tr.	0.01	Tr.
		as small Tabulor crystals. Hematite also forms along fractures.									
		Minor chlorite dust is observed within matrix of some segments -			MB 28	729.08	729.38	0.3	Tr.	0.01	Tr.
		not extensive. Small detrital magnetite and minor biotite occur									
		in lower horizons of unit.			MB 29	773.28	773.58	0.3	Tr.	0.01	Tr.
		- Unit distinguished by large clasts of quartz more than 1.5 cm									
		randomly distributed through unit. Become progressively larger and			MB 30	734.57	734.87	0.3	Tr.	0.01	Tr.
		more prolific towards bottom of unit.									
		- Cross and graded bedding throughout section. Graded bedding displays			MB 31	768.10	768.40	0.3	0.001	0.01	Tr.
		fining upward sequence.									
		- Unit is competent with only minor fracturing. Extensive fractured			MB 32	827.53	827.83	0.3	Tr.	0.01	Tr.
		core from: 881.94 to 883.1m and 900.38 to 901.24m.									
		- Broken, fractured and indurated core near base of unit. Has			MB 33	855.57	855.87	0.3	Tr.	0.01	Tr.
		"crumbly" nature, yellow to buff white. Contains minor chlorite									
		within clay matrix. Jones noted at: 978.10 - 978.68, 980.24 - 980.98,			MB 34	873.86	874.16	0.3	0.001	0.01	Tr.
		988.77 - 989.62, 995.17 - 995.86.									

DIAMOND DRILL LOG – *ESSO MINERALS CANADA*

Hole No: O.F. 78-1 PROPERTY Permit 235 PROJECT 5601989 NTS 74-1-9

WP-6733

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	C.P.S.	CORE REC. %	CORE SAMPLES ASSAY NUMBER	FROM	TO	WIDTH	ASSAY VALUE U_3O_8	Pb	Zn
		- Unit becomes more indurated towards contact displaying a fissle			MB 35	895.19	895.49	0.3	Tr.	0.01	Tr.
		nature.									
		- Unit generally quite competent, very little core loss, only inches			MB 36	904.04	904.34	0.3	0.001	0.01	Tr.
		lost at start and end of runs.									
					MB 37	916.53	916.83	0.3	0.001	0.01	Tr.
		CONTACT									
					MB 38	943.97	944.17	0.3	0.001	0.01	Tr.
	1001.12	SANDSTONE/DIABASE:									
		Above unit is altered and clay indurated near base. Larger fragments			MB 39	974.45	974.75	0.3	0.001	0.01	Tr.
		and/or clasts of altered schistose material within the lower segments.									
		Lower metre extensively altered - matrix composed primarily of chlorite			MB 40	977.80	978.10	0.3	0.001	0.01	Tr.
		and sericite yielding greenish tinge to core. Passes into extensively									
		altered and friable fine grained diabase-contains smaller xenoliths of			MB 41	988.47	989.41	1.0	0.001	0.01	Tr.
		quartz sandstone. Diabase appears to have broken and fragmented while									
		cooling during intrusive phase. Becomes "fresher" at approx. 1001.87m.			MB 42	1000.96	1001.96	1.0	0.001	0.01	Tr.
1001.12	1008.43	DIABASE: Dark greenish black. Extremely fine grained. Ophetic or									
		diabasic texture - plagioclase feldspar subhedral lath shaped crystals									
		embedded in a mesostasis of pyroxene and/or hornblende crystals.	30	100	MB 43	1004.01	1004.31	0.3	0.001	0.01	Tr.
		- Core is brittle and tinkly sounding when struck.									
		- Unit display very little alteration - only minor chlorite-serpentine									
		alteration yielding green tinge.									
		- Upper contact with Athabasca sandstone sharp and unit displays									
		weathered zone for approx. 1 metre. Altered to chlorite and									
		serpentine. Forms fairly distinct lower contact with conglomerate									
		and quartz sandstone of similar texture and composition as that of									
		above unit - 810 to 1001m.									
1008.43	1008.74	MISSING CORE - Marks end of drill run.									
		CONTACT									
	1008.74	DIABASE/SANDSTONE: Diabase probably dike that intersected sandstone of			MB 44	1008.58	1011.58	1.0	0.001	0.01	Tr.
		Athabasca Formation just above unconformaty between PreCambrian									
		-basement' and Helikian sandstone.									

DIAMOND DRILL LOG — *ESSO MINERALS CANADA*

Hole No. O.F. 78-1 PROPERTY Permit 235 PROJECT 5601989 NTS 74-L-9

WP-6733

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	C.P.S.	CORE REC. %	CORE SAMPLES ASSAY NUMBER	FROM	TO	WIDTH	ASSAY VALUE U_3O_8	Pb	Zn
		- Dike doesn't display chill zone nor any apparent metasomatic effect within sandstone. Extensively altered to chlorite-serpentine in lower 15 cm yielding light green color.									
		- Lower 6cm of altered zone contains hematized schistose material along with larger quartz grains and smaller sandstone fragments.									
		- Contact sharp with coarse grained sandstone and interbedded sub-conglomerate.									
1008.74	1010.12	CONGLOMERATE-SANDSTONE: Unit similar to lower section of unit 661 - 1001m. Large clasts of sandstone and allogenic hematized schistose textured fragments within silica grit, clay, argillaceous matrix.									
		- Interbedded with horizons of coarse grained quartz sandstone.									
		- Unit forms sharp contact with lower PreCambrian basement complex. Actually contact not observable but no observable regolith appears to be developed.									
		- Unit may represent block within basement fracture or crevass, or block of country rock intersected by diabase dike near contact (?) or emplaced during diabase intrusion phase.									
		CONTACT									
1010.12		SANDSTONE/PRECAMBRIAN BASEMENT: Barrow conglomerate and sandstone unit forms a sharp shear plane contact with PreCambrian granitic gneiss basement complex. No developed regolith observable - core becomes clay indurated and slightly fissle with slickensides developed along fracture planes. Approx. 5 to 8 cm core missing at critical zone. Actual contact not observable.									
		- Upper portion of gneissic complex fractured and extensively altered also containing slickensides.									
		- Thus actual contact may be a small shear and/or extensive fracture. This may further support the theory that the above sandstone unit may represent a block of country rock faulted within the basement complex rather than deposited insitu and/or emplaced during intrusion of the upper-most member diabase dike.									

DIAMOND DRILL LOG — *ESSO MINERALS CANADA*

Hole No. O.F. 78-1 PROPERTY Permit 235 PROJECT 5601989 NTS 74-L-9

WP-6733

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	C.P.S.	CORE REC. %	CORE SAMPLES ASSAY NUMBER	FROM	TO	WIDTH	ASSAY VALUE U_3O_8	Pb	Zn
1010.12	1017.12	GRANITIC GNEISS: Extensively altered medium to coarse grained. Buff			MB 45	1010.72	1011.02	0.3	0.001	0.01	Tr.
		white green and indian red.									
		- Feldspars altered to kaolinite and sericite.			MB 46	1015.20	1016.50	0.3	Tr.	0.01	Tr.
		- Mafics display relic platy cleavage, that is probably biotite and									
		now altered to hematite.									
		- Gneissosity approx. 30° to core (60° from horizontal).									
		- Unit intercollated with extensively altered pegmatite horizons.									
		END OF HOLE - Hole not probed.									

DIAMOND DRILL LOG — *ESSO MINERALS CANADA*

Hole No. OF-78-2
Co-ordinates
Core Size NQ (1000') BQ (1000' to Bottom)
Purpose URANIUM TEST
Started October 24, 1978
Completed November 28, 1978
Drilled By Midwest Drilling Ltd.
Logged By M. Brown

PROPERTY PERMIT 236 PROJECT OLD FORT #5601989 NTS

Latitude 58° 48'N
Longitude 10° 02'W
Datum Level 282.65m. A.S.L.
Azimuth -
Dip 90°
Total Length 3627' (1105.5m)
Hor. Projection
Vert. Projection

WP-6233

DIP TESTS

TEST	FROM	TO	INTERVAL	DIP	CORR.
H_2F	0	500	500	90°	
H_2F	500	1000	1000	87°	
H_2F	1000	3000	2000	87°	

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	C.P.S.	CORE REC. %	CORE SAMPLES ASSAY NUMBER	FROM	TO	WIDTH	ASSAY VALUE U_3O_8	Pb	Zn
0	27'	OVERBURDEN: Glacial Drift - Till.									
	8.23m										
		ATHABASCA FORMATION									
27'	117'	INTERBEDDED PELITE AND SANDSTONE									
8.23m	35.66m	QUARTZ SANDSTONE: Buff white cream to pink and light indian red.									
		- Medium to fine grained with narrow coarser grained segments.									
		- Composed primarily of quartz grains within silica grit. Clay - argilite < 2%. Hematite rich horizons generally slightly more friable and coarser grains and/or within grain intersticies as part of matrix, also distinguished cross bedded horizons forming along laminae.									
			20	100%	MB47	16.76	17.06	0.3	tr	0.01	tr
		- Unit distinguished by interbedded pelite and siltstone beds < 1/2 meter in width at random segments throughout. Generally light greyish green to red with narrow zones of extensively hematized deep indian red rock. These segments contain ≈ 45-50% hematite - platy cleavage noted.			MB48	21.95	22.15	0.3	tr	0.01	tr
					MB49	25.91	26.11	0.3	tr	0.01	tr
		- Contacts with quartz sandstone sharp.			MB52	30.17	30.47	0.3	tr	0.01	tr
		- Core is blocky and segmented, however no fracturing evident.									
		- Unit grades into cream to pinkish quartz sandstone.									

DIAMOND DRILL LOG – *ESSO MINERALS CANADA*

Hole No. OF-78-2 PROPERTY _____ PROJECT _____ NTS 74L-9

WP-6733

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	C.P.S.	CORE REC. %	CORE SAMPLES ASSAY NUMBER	FROM m	TO m	WIDTH	ASSAY VALUE U_3O_8	Pb	Zn
117'	430'	QUARTZ SANDSTONE:									
36.55m	131.06	- Creamy white to pinkish, fine to medium grained with narrow coarse									
		grained segments.			MB50	38.71	39.01	0.3	tr	0.01	tr
		- Moderately rounded poorly sorted quartz grains within silica grit									
		matrix. Less than 1% mafic constituent (magnetite).			MB51	53.95	54.15	0.3	tr	0.01	tr
		- Extensively cross bedded and prevalent graded bedding.									
		- Interbedded hematite stained, finely laminated pelite and siltstone			MB53	54.56	54.86	0.3	tr	0.01	tr
		horizons occur at: 43.28 to 45.11m									
		54.25 to 55.47m			MB54	66.45	66.75	0.3	tr	0.01	0.03
		72.69 to 73.83m	20	100%							
		- Competent core with only one noted fracture zone from: 87.48 to			MB55	85.34	85.64	0.3	tr	0.01	tr
		93.57 meters. Fractures run almost parallel to core and infilled									
		with either hematite, argillaceous material (≈25%).			MB56	90.52	90.82	0.3	tr	0.01	tr
		- Bedding attitude is horizontal to subhorizontal.									
		- Unit grades into hematite stained red sandstone.			MB57	109.73	110.03	0.3	tr	0.01	tr
430'	487'	RED QUARTZ SANDSTONE:									
131.06	148.44m	- Indian red - pink medium to fine grained.									
		- Like above unit but extensively hematite stained and contain no	20	100%	MB58	133.20	133.50	0.3	tr	0.01	tr
		interbedded pelite - siltstone segments.									
		- Grades into buff white slightly friable quartz sandstone.			MB59	142.65	142.85	0.3	tr	0.01	0.01
					MB60	146.30	146.60	0.3	tr	0.01	tr
487'	527'	INTERBEDDED RED QUARTZ SANDSTONE - Pelite									
148.44m	160.63m	- Sandstone buff white and pink to deep indian red and rusty color.			MB61	152.10	152.40	0.3	tr	0.01	tr
		- Grain size extremely variable, unit is poorly sorted; generally									
		medium grained with randomly thickening coarse and finer horizons.			MB62	148.74	148.00	0.3	tr	0.01	tr
		- Hematite staining occurs extensively within coarser grained more									
		fissile and porous horizons. Occurs primarily as dust within			MB63	154.53	154.83	0.3	tr	0.01	tr
		matrix and/or stain on quartz grains but also noted in its									
		specularitic form displaying platy cleavage and steel grey luster			MB64	155.45	155.75	0.3	tr	0.01	tr
		composing up to 35-40% of the whole.	15.20	100%							
		- Minor cross bedding and graded bedding sequences are poorly developed.									

DIAMOND DRILL LOG — *ESSO MINERALS CANADA*

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FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	C.P.S.	CORE REC. %	CORE SAMPLES ASSAY NUMBER	FROM	TO	WIDTH	ASSAY VALUE U_3O_8	Pb	Zn
		- Pelite beds - generally < 1 meter; finely laminated and speckled									
		in appearance. Light green to rusty indian red. May be slighly									
		fissile.									
		- Core is blocky and fractured. Fractures generally small and spread									
		rather than localized; primarily 25-30° to core but some more									
		steeply dipping.									
		- Unit becomes more competent and less fractured near its base and									
		grades into quartz sandstone similar to unit 35.66 to 131.05									
		meters.									
527'	639'	QUARTZ SANDSTONE:									
160.63	194.77	- Creamy white with pink and indian red intercolated hematite									
		stained horizons.			MB65	173.43	173.73	0.3	tr	0.01	tr
		- Hematite rich segments contain specularitic hematite composing as									
		much as 30% of the whole.			MB66	192.02	192.32	0.3	tr	0.01	tr
		- Unit similar unit 35.66 to 131.06 meters but no pelitic beds occur.	20	100%							
		- Minor fracturing at ≈ 20-30° to core random through unit.									
		- Contact gradational with coarsely grained indian red quartz sandstone.									
639'	727'	INTERBEDDED RED QUARTZ SANDSTONE AND SILTSTONE - Pelite									
194.77m	221.59m	SANDSTONE: Creamy white pink to indian red									
		- Coarse to medium grained with narrow finely laminated finer grained									
		segments.									
		- Extensively hematized horizons display metalic luster where			MB67	205.13	205.43	0.3	0.001	0.01	tr
		specularitic hematite composes ≈ 30% of the whole.									
		- Cross and graded bedded.			MB68	196.60	196.90	0.3	tr	0.01	tr
			20	100%							
		PELITE - SILTSTONE: Red and green finely laminated with mottled			MB69	209.40	209.70	0.3	tr	0.01	tr
		appearance.									
		- Beds < 1 meter wide.									
		- Contacts between pelite and sandstone sharp and horizontal. Silt-									
		stone generally displays gradational contacts.									
		- Unit grades into medium grained finely laminated red-purple quartz									
		sandstone.									

DIAMOND DRILL LOG – *ESSO MINERALS CANADA*

Hole No. OF-78-2 PROPERTY _____ PROJECT _____ NTS 74L-9

WP-6733

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	C.P.S.	CORE REC. %	CORE SAMPLES ASSAY NUMBER	FROM	TO	WIDTH	ASSAY VALUE U_3O_8	Pb	Zn
727′	979′	RED QUARTZ SANDSTONE:									
221.59	283.16m	- Purplish red with narrow (< 10 cm) creamy white-pink segements at random horizons.			MB70	239.90	240.20	0.3	tr	tr	tr
		- Medium grained, narrow coarser grained segments.			MB71	246.28	246.58	0.3	0.001	0.01	tr
		- Unit finely laminated and extensively cross bedded; hematite stain along laminae. Non-hematite segments not finely laminated but may be slightly mottled.			MB72	249.02	249.32	0.3	tr	tr	tr
		- Minor chlorite observed along some laminae yielding slight greenish tinge.			MB73	261.21	261.51	0.3	tr	0.01	0.01
		- Graded bedding displays granule to pebble size clasts.	20	100%	MB74	289.86	290.16	0.3	tr	0.01	tr
		- Pelite - siltstone noted at 266.7 to 267.61m									
		270.02 to 270.58m									
		- Fractured and friable core at: 268 to 270.97m									
		275.54 to 275.84m									
		282.24 to 282.85m									
		- Unit becomes progressively more friable near base and forms a gradational contact.									
979′	1025′	INDURATED QUARTZ SANDSTONE:									
283.16	312.42m	- Creamy white pink to deep purplish red. Medium to fine grained.									
		- Like above unit but extensively altered and friable.									
		- Core is blocky and fragmented.									
		- Narrow (< 10-12 cm) horizons of more competent less fissile quartz sandstone.									
		- Interbedded pelite - argillaceous segments - < 3 cm in width.	20	96%							
		- Unit passes into extensive fractured fragmented and friable core.									
		- Approximately 1½ feet core missing at bottom of unit.									
DRILL	RUN										
1025′	1028′	INDURATED RED QUARTZ SANDSTONE:									
312.42	323.33m	- Like above unit, fragmented and broken core. Part of fracture zone.	20	63%	MB75	312.42	313.42	1.0	0.001	tr	tr
		- 2 ft. core recovered, 1 ft. lost.									

DIAMOND DRILL LOG – *ESSO MINERALS CANADA*

Hole No. OF-78-2 PROPERTY _____ PROJECT _____ NTS 74L-9

WP-6733

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	C.P.S.	CORE REC. %	CORE SAMPLES ASSAY NUMBER	FROM	TO	WIDTH	ASSAY VALUE U_3O_8	Pb	Zn
DRILL	RUN										
1028'	1037'	INDURATED BUFF WHITE QUARTZ SANDSTONE:									
313.33	316.07	- Like above unit, fragmented and broken core.									
		- Part of fracture zone.	20	12%	MB76	316.07	317.07	1.0	tr	0.001	tr
		- 1 foot core recovered, 8 ft. lost.									
		- Most of this section drilled was sand that washed away. Extensive									
		mud was pumped through in order to build a wall and prevent cave.									
DRILL	RUN										
1037'	1040'	INDURATED QUARTZ SANDSTONE:									
316.07	316.99	- Like above unit, fragmented and broken core.									
		- Part of fracture zone.	20	40%							
		- 1/2 ft. core recover - 2½ ft. lost									
DRILL	RUN										
1040'	1042'	SILTSTONE:									
316.99	317.60m	- Red-green, fine laminated									
		- Blocky and fragmented core.	20	100%							
		- Part of fracture zone.									
		- Grades into friable slighly blocky core.									
1042'	1117'	INTERBEDDED QUARTZ SANDSTONE AND PELITE SANDSTONE:									
317.60	340.46	- Buff white to slightly pinkish and green.									
		- Unit is moderately indurated with chlorite - sericite along cross									
		bedding laminae. Finely laminated segments occur extenuated by									
		hematite stain along bedding horizons.			MB77	317.45	317.75	0.3	0.001	0.01	tr.
		- Becomes more mottled near base of unit. Pelite.									
		- Beds generally deep purplish red, finely laminated and display platy	15-20	100%	MB78	319.74	320.04	0.3	tr	tr	tr
		cleavage.									
		- Width varies from 1/2 - 3 meters.			MB79	321.56	321.86	0.3	tr	0.01	tr
		- Unit is unfractured. Contacts generally sharp indicating horizontal									
		to near horizontal bedding.			MB80	333.16	333.56	0.3	0.001	0.01	0.01
		- Unit grades into friable speckled quartz sandstone.									
					MB81	334.37	334.67	0.3	0.001	tr	tr

DIAMOND DRILL LOG – *ESSO MINERALS CANADA*

Hole No. OF-78-2 PROPERTY _____ PROJECT _____ NTS 74L-9

WP-6733

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	C.P.S.	CORE REC. %	CORE SAMPLES ASSAY NUMBER	FROM	TO	WIDTH	ASSAY VALUE U_3O_8	Pb	Zn
1117'	1190'	INDURATED QUARTZ SANDSTONE:									
340.46	362.71	- Medium grained red-green to buff white with mottled or speckled appearance.									
		- Extensively friable with matrix of chlorite-sericite composed up to 5% along some horizons yielding greenish tinge to core.			MB82	352.35	352.65	0.3	0.001	0.001	tr
		(i.e.) hematite stained laminae interbedded with randomly rich chlorite segments			MB83	359.97	360.17	0.3	0.001	0.01	0.01
		- Narrow finely laminated segments.			MB84	356.92	357.22	0.03	0.001	0.01	tr
		- Core is fissile and "pitted" in texture, i.e. sandstone is easily crumbled by hand.									
		- Unit forms sharp horizontal contact with lower shale unit.									
1190'	1312	INTERBEDDED SILTSTONE - PELITE									
362.71	399.80	Siltstone - Intercollated red-light green. Mottled or speckled in appearance.									
		- Finely laminated, may display intraformational conglomerate with small clasts near contacts indicated reworking of sediment.									
		Pelite - Generally deep purplish red with finely laminated dark greenish grey horizons.									
		- Platy cleavage, fissile nature.									
			20	100%	MB85	363.63	363.93	0.3	0.001	0.01	tr
		- Contacts between units may be gradational or sharp; mark horizontal bedding attitude.			MB86	365.46	365.76	0.3	0.001	tr	tr
		- Beds vary in thickness pelite beds < 10 meters.									
		- Unit becomes progressively more interbedded with extremely fine grained sandstone and forms an indiscreet contact with an interbedded quartz sandstone-siltstone unit.			MB87	373.99	374.29	0.3	0.001	0.01	tr
					MB88	379.78	380.08	0.3	0.001	0.01	0.01
					MB89	391.97	392.27	0.3	0.001	0.01	tr

DIAMOND DRILL LOG – *ESSO MINERALS CANADA*

Hole No. OF-78-2 PROPERTY _____ PROJECT _____ NTS 74L-9

WP-6733

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	C.P.S.	CORE REC. %	CORE SAMPLES ASSAY NUMBER	FROM	TO	WIDTH	ASSAY VALUE U_3O_8	Pb	Zn
1312'	1437'	INTERBEDDED SANDSTONE- SILTSTONE									
399.90	438.00m	SILTSTONE:									
		- Beds like those above form gradational and/or sharp contacts with narrow pelite horizons < 1 meter.									
		- May display intraformational fine clasted conglomerates near contacts indicated a reworking or remobilization of sediment after deposition.			MB90	406.90	407.20	0.3	0.001	0.01	tr
		SANDSTONE: Fine graded and progressively coarser toward base.									
		- Buff white to greenish with hematized red stained horizons (generally along laminae).									
		- Clay indurated yield greenish color and giving friable nature to core.	15-20	100%	MB91	416.66	416.96	0.3	0.001	0.01	tr
		- Cross and graded bedding evident extenuated by chlorite-sericite and primarily hematite along laminae.			MB92	425.81	427.11	0.3	0.003	0.01	tr
		- Segments are mottled like sandstone unit 340.46 - 362.72.									
		- Unit becomes progressively more sandstone rich near base and finely grades indistinctly into competent non-fissile quartz sandstone.									
1437'	1490'	RED QUARTZ SANDSTONE:									
438.00	454.15m	- Medium grained with coarser and finer gradationally interbedded horizons.									
		- Red purple with narrow cream white segments. Hematite occurs as dust and small grains around grains or within matrix and along laminae.									
		- Minor chlorite noted along laminae ≈ tr-1%.									
		- Minor cross and graded bedding.	15-20	100%	MB93	441.05	441.35	0.3	0.004	0.01	tr
		- Narrow interbedded pelite horizons - contacts generally sharp, may be reworked displaying clasts of pelite within sandstone or narrow intraformational conglomerate.			MB94	448.67	448.97	0.3	0.001	0.01	tr
		- Pelite horizons become more prevalent near base of unit and therefore contact with lower unit indiscreetly defined.									

DIAMOND DRILL LOG – *ESSO MINERALS CANADA*

Hole No. OF-78-2 PROPERTY _____ PROJECT _____ NTS 74L-9 Page 8 of 12

WP-8733

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	C.P.S.	CORE REC. %	CORE SAMPLES ASSAY NUMBER	FROM	TO	WIDTH	ASSAY VALUE U_3O_8	Pb	Zn
1490'	1540'	INTERBEDDED QUARTZ SANDSTONE - PELITE									
454.15	469.39m	SANDSTONE:									
		- Medium grained, mottled textured, buff white to indian red.			MB95	459.33	459.63	0.30	0.001	.01	tr
		- Hematite staining extensive along laminae.			MB96	464.21	464.51	0.30	0.001	.01	tr
		- Cross-bedding and graded bedding.									
		- Contacts with pelite horizontal to near horizontal generally									
		sharp but may be reworked to form intraformational conglomerates or									
a		as clasts within sandstone.									
			15-20	99%							
		PELITE:									
		- Deep purple red and green, finely laminated and displays platy									
		cleavage. Slightly blocky.									
		- Beds ≈ < 1 meters in thickness with sandstone bed ≈ 1 - 2 meters.									
		- Minor narrow < 6cm - 10cm siltstone segments gradational into									
		pelite and silty shale beds.									
		- Unit is competent with little to no fracturing.									
		- Only minor core loss < 1 - 2cm in between drill runs.									
1540'	1607'	QUARTZ SANDSTONE:									
469.39	489.81m	- Interbedded creamy buff white and indian red to pinkish red. Medium			MB97	473.96	474.26	0.30	0.001	0.01	tr
		grained with gradational fine and coarser grained segments.									
		- Unit composed of primarily quartz sandstone within silica grit									
		(≈ 7-10%) and clay-chlorite-sericite (≈ 203%) matrix.									
		- Hematite forms stain around quartz grains and as dust within									
		matrix in red segments. Also forms as larger grains in specularitic									
		form to give core a peppered or speckled nature. Generally									
		distinguishes cross bedding laminae.									
		- Unit basically interbedded orthoquartzite, quartz sandstone and									
		slighly friable quartz sandstone. The latter segments narrow and									
		not fissile. The former are of variable thickness but generally									
		less than one meter and appear gradational.	15-20	99%							
		- Unit is cross and graded bedded.									
		- Competent with little to no fracturing.									
		- Very little core loss, only 1-3cm at most at end of each drill run.									

DIAMOND DRILL LOG — *ESSO MINERALS CANADA*

Hole No. OF-78-2 PROPERTY _____ PROJECT _____ NTS 74L-9 Page 9 of 12

WP-6733

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	C.P.S.	CORE REC. %	CORE SAMPLES ASSAY NUMBER	FROM	TO	WIDTH	ASSAY VALUE U_3O_8	Pb	Zn
		- Unit forms indiscreet contact with interbedded quartz sandstone and pelite.									
1607'	1647'	INTERBEDDED QUARTZ SANDSTONE - PELITE									
489.81	502.00m	- Unit like 454.15 - 469.39m but contains slightly more siltstone horizons.	15-20	100%	MB98	492.86	493.16	0.03	0.001	0.01	tr
					MB99	496.82	497.12	0.3	0.001	0.01	tr
1647'	1827'	QUARTZ SANDSTONE:									
502.00	556.87m	- Interbedded buff white to indian red to pinkish red sandstone like unit 469.39 - 489.81.	15%	100%	MB99	507.49	507.79	0.3	0.001	0.01	tr
		- Very little core loss only minor segments at end of each drill run.									
1827'	1864'	INTERBEDDED SANDSTONE - SILTSTONE - PELITE			MB100	507.49	507.79	0.3	0.001	0.01	tr
556.87	568.15m	- Unit similar to 489.91 - 502.01 meters	15	100%							
		- Contacts between siltstone - pelite gradational and beds of variable width - generally < 1/2 meter.			MB101	518.77	519.07	0.3	0.001	0.01	tr
		- Pelite beds readily segregated from siltstone beds by dark red color and platy cleavage.			MB102	528.52	528.82	0.3	tr	0.01	tr
		- Unit competent with no fracturing. Siltstone and pelite beds slightly blocky and more brittle.			MB103	530.52	530.82	0.3	0.001	0.01	tr
		- Forms indiscreet contact with quartz sandstone.			MN104	545.59	545.89	0.3	0.001	0.01	tr
1864'	2107'	QUARTZ SANDSTONE: Interbedded buff white cream to indian red, grey red.			MB105	559.91	560.21	0.3	0.001	0.01	tr
568.15	641.60	Medium grained with gradational finer and coarser grained segments.									
		- Unit is like unit 502.00 - 556.87m but contains irregular, variable in size (from < cm-2cm), clasts of pelite. Generally light green due to sericite, chlorite composition. Soft and easily scratched by fingernail.			MB106	577.90	578.20	0.3	0.001	0.01	tr
					MB107	592.83	593.13	0.3	0.001	0.01	tr
		- Unit slighly fractured throughout - fractures @ 20 - 25° to core and contain hematite stain and minor lead as finely scattered euhedral-subhedral crystals.			MB108	607.77	608.87	0.3	0.001	0.01	tr
					MB109	617.83	618.13	0.3	tr	0.01	tr

DIAMOND DRILL LOG — *ESSO MINERALS CANADA*

Hole No. OF-78-2 PROPERTY _____ PROJECT _____ NTS 74L-9

WP-6733

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	C.P.S.	CORE REC. %	CORE SAMPLES ASSAY NUMBER	FROM	TO	WIDTH	ASSAY VALUE U_3O_8	Pb	Zn
		- Major fracture segments at: 639.0 640.02m @ 20°			MB110	629.41	629.71	0.3	tr	0.01	tr
		646.50 - 649.91m @ 5°									
		652.63 - 652.93m @ 5° to core			MB111	633.06	633.36	0.3	tr	0.01	tr
		664.38 - 664.91m @ 1-5° to core									
		673.76 - 674.61m @ 1-5° to core			MB112	632.92	633.22	0.3	tr	0.01	tr
		700.34 - 701.03m @ 3° to core									
		- Unit is slightly blocky throughout.			MB113	639.17	639.47	0.3	0.001	0.01	tr
		- Unit forms sharp contact with interbedded quartz sandstone - siltstone - pelite.									
2107'	2140'	INTERBEDDED SANDSTONE - SILTSTONE - PELITE:			MB114	645.26	645.56	0.3	tr	0.01	tr
641.60	651.27m	SANDSTONE: Medium to fine grained greyish red and buff to creamy white.									
		- Much like above sandstone unit.			MB115	657.45	657.75	0.3	0.001	0.01	tr
		SILTSTONE: Red and green to buff white. Finely laminated and slightly mottled.									
		- Contact with sandstone and/or pelite generally gradational.									
		PELITE: Finely laminated dark red. Forms sharp contact with sandstone and outline horizontal bedding attitude - extremely fissile.									
		- Unit similar to 556.87 - 568.15 meters.									
		- Competent with little to no fracturing.									
		- Contact marked as last pelite - siltstone bed @ 652.27.									
2140'	2357'	QUARTZ SANDSTONE:									
652.27	715.37m	- Interbedded red purple and creamy white quartz sandstone with narrow (< 1 meter) orthoquartzite horizons.			MB116	678.79	679.09	0.3	tr	0.01	tr
		- Fine to medium grained with gradational coarser grained segments.			MB117	692.50	692.80	0.3	tr	0.01	tr
		- Unit is similar to 568-641m but doesn't contain pelitic clasts. Also less chlorite observed within matrix and along laminae.			MB118	711.40	711.70	0.3	tr	0.01	tr
		- Cross and graded bedding; hematite staining extensive along coarse grained segments.			MB119	718.11	718.41	0.3	tr	0.01	tr
		- Interbedded pelite with quartz sandstone from 695.86 to 700.13.									
		- Unit is competent with slight fracturing throughout. Major fracturing generally 0.20° to core:									

DIAMOND DRILL LOG — *ESSO MINERALS CANADA*

Hole No. OF-78-2 PROPERTY _____ PROJECT _____ NTS 74L-9

WP-6733

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	C.P.S.	CORE REC. %	CORE SAMPLES ASSAY NUMBER	FROM	TO	WIDTH	ASSAY VALUE U_3O_8	Pb	Zn
		- Noted from: 686.65 to 686.56m			MB120	727.56	727.86	0.3	tr	0.01	tr
		724.81 to 725.12m			MB121	732.13	732.43	0.3	0.001	0.01	tr
		726.64 to 726.95m			MB122	748.89	749.19	0.3	tr	0.01	tr
		732.43 to 732.74m			MB123	761.06	761.36	0.3	tr	0.01	tr
			15%	100%	MB124	773.28	773.58	0.3	tr	0.01	tr
		- Unit becomes progressively more "spotted" with hematite in form			MB125	784.56	789.86	0.3	tr	0.01	tr
		of graphs of mamillated crystal form.			MB126	795.33	795.83	0.3	tr	0.01	tr
		- Form gradational and indiscreet contact.			MB127	799.49	799.79	0.3	tr	0.01	tr
					MB128	810.16	810.46	0.3	tr	0.01	0.01
2357'	2597'	QUARTZ SANDSTONE:			MB129	829.97	830.27	0.3	tr	0.01	0.01
715.37	791.57m	- Like above unit but is spotted in appearance.			MB130	833.63	833.93	0.3	0.002	0.01	0.01
		- Speckly appearance due to hematite forming stain and/or grains -			MB131	848.87	849.17	0.3	0.001	0.01	0.01
		crystals of specularitic hematite in its botryoidal form.			MB132	851.00	851.30	0.3	tr	0.01	tr
		- Hematite also extensive along more coarsely grained segments.			MB133	863.19	863.49	0.3	tr	0.01	tr
		- Unit becomes progressively more hematite "patchy" and grades into			MB134	869.29	869.59	0.3	tr	0.01	tr
		more extensively hematized quartz sandstone with only narrow cream			MB135	893.67	893.97	0.3	tr	0.01	tr
		to pink colored sandstone segments.			MB136	898.25	898.55	0.3	tr	0.01	tr
					MB137	907.08	907.30	0.3	tr	0.01	tr
2597'	3147'	RED QUARTZ SANDSTONE:			MB138	915.92	916.22	0.3	tr	0.01	tr
791.57	959.20m	- Like above unit but extensive hematite stained with narrow < 10cm			MB139	924.76	925.06	0.3	tr	0.01	tr
		cream white to pink horizons.			MB140	934.82	934.12	0.3	tr	0.01	tr
		- Unit is spotted by hematite but also displays more extensive hematite			MB141	946.40	946.70	0.3	tr	0.01	tr
		stained network of irregular "patches" and "blebs".			MB142	959.82	960.12	0.3	0.001	0.01	tr
					MB143	969.87	970.17	0.3	0.001	0.01	tr
					MB144	976.88	977.18	0.3	tr	0.01	tr
					MB145	982.07	982.37	0.3	0.001	0.01	tr
					MB146	1004.62	1004.92	0.3	0.001	0.01	tr
					MB147	1021.08	1021.38	0.3	tr	0.01	tr
					MB148	1027.48	1027.78	0.3	tr	0.01	tr
					MB149	1037.84	1038.14	0.3	0.001	0.01	tr
					MB150	1040.28	1040.58	0.3	tr	0.01	tr
					MB151	1053.69	1053.99	0.3	tr	0.01	tr

DIAMOND DRILL LOG — *ESSO MINERALS CANADA*

Hole No. OF-78-2 PROPERTY _____ PROJECT _____ NTS 74L-9 Page 12 of 12

WP-6733

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	C.P.S.	CORE REC. %	CORE SAMPLES ASSAY NUMBER	FROM	TO	WIDTH	ASSAY VALUE U_3O_8	Pb	Zn
3147′	3627′	QUARTZ SANDSTONE: Medium to coarse grained with finer grained			MB152	1029.30	1029.60	0.3	0.001	0.01	tr
959.2m	1105.5m	segments. Unit composed primarily of quartz grains within clay-silica			MB153	1031.44	1031.74	0.3	tr	0.01	tr
		grit matrix.			MB154	1059.79	1060.09	0.3	tr	0.01	tr
		- Unit distinguished by large randomly spaced quartz pebble to			MB155			0.3	tr	0.01	tr
		rounded cobble sized clasts.									
		- Unit is banded creamy buff white - may be patchy due to irregular									
		bleaching.									
		END OF HOLE: Terminated due to caving and loss of circulation.									
		Hole not protected.									

APPENDIX IV

TABULATED ASSAY VALUES

DDH OF-78-1

DDH OF-78-2

To: ESSO MINERALS CANADA
Minerals Dept .
500 - 6th Avenue S.W.
CALGARY , Alberta T2P 0S1
Attn : Morley Brown

File No. 16186
Date November 17th , 1978
Samples Rock
Project # 560 - 1989

Certificate of ASSAY

LORING LABORATORIES LTD.

SAMPLE No.	CHEMICAL %U308	CHEMICAL U308 PPM	% Pb	% Zn
" ROCK SAMPLES "				
MB - 1	.002	23.6	.01	.01
MB - 2	.001	12.6	.01	.01
MB - 3	.001	5.2	.01	.01
MB - 4	.001	5.9	.01	.01
MB - 5	.001	8.7	.01	Trace
MB - 6	.001	9.1	.01	Trace
MB - 7	.001	5.9	.01	Trace
MB - 8	.001	9.1	.01	Trace
MB - 9	.001	9.7	.01	Trace
MB - 10	.001	10.7	.01	Trace
MB - 11	Trace	4.5	.01	Trace
MB - 12	.001	9.3	.01	Trace
MB - 13	Trace	4.4	.01	Trace
MB - 14	Trace	2.2	.01	Trace
MB - 15	.001	5.9	.01	Trace
MB - 16	.001	8.5	.01	Trace
MB - 17	Trace	2.2	.01	Trace
MB - 18	.001	7.0	.01	Trace
MB - 19	.001	7.4	.01	Trace
MB - 20	Trace	2.2	.01	Trace

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

Rejects Retained one month.

Pulps Retained one month unless specific arrangements made in advance.

[redacted]

Licensed Assayer of British Columbia

To: ESSO MINERALS CANADA
Minerals Dept.
500 - 6th Avenue S.W.
CALGARY , Alberta T2P 0S1
Attn : Morley Brown

File No. 16186
Date November 17th , 1978
Samples Rock
Project # 560 - 1989

Certificate of ASSAY

LORING LABORATORIES LTD.

SAMPLE No.	CHEMICAL % U308	CHEMICAL U308 PPM	% Pb	% Zn
MB - 21	Trace	1.9	.01	Trace
MB - 22	Trace	1.5	.01	Trace
MB - 23	Trace	3.1	.01	Trace
MB - 24	Trace	4.6	.01	Trace
MB - 25	Trace	4.4	.01	Trace
MB - 26	Trace	3.6	.01	Trace
MB - 27	Trace	3.3	.01	Trace
MB - 28	Trace	3.8	.01	Trace
MB - 29	Trace	3.1	.01	Trace
MB - 30	Trace	4.1	.01	Trace
MB - 31	.001	5.6	.01	Trace
MB - 32	Trace	4.6	.01	Trace
MB - 33	Trace	3.1	.01	Trace
MB - 34	.001	8.0	.01	Trace
MB - 35	Trace	4.9	.01	Trace
MB - 36	.001	9.4	.01	Trace
MB - 37	.001	7.3	.01	Trace
MB - 38	.001	6.3	.01	Trace
MB - 39	Trace	3.7	.01	Trace
MB - 40	.001	6.6	.01	Trace
MB - 41	.001	8.0	.01	Trace

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

Rejects Retained one month.

Pulps Retained one month unless specific arrangements made in advance.

[redacted]

Licensed Assayer of British Columbia

To: ESSO MINERALS CANADA
Minerals Dept .
500 - 6th Avenue S.W.
CALGARY , Alberta T2P 0S1
Attn ; Morley Brown

File No. 16186
Date November 17th , 1978
Samples Rock
Project # 560 - 1989

Certificate of ASSAY

LORING LABORATORIES LTD.

SAMPLE No.	CHEMICAL % U308	CHEMICAL U308 PPM	% Pb	% Zn
MB - 42	.001	5.2	.01	Trace
MB - 43	.001	6.6	.01	Trace
MB - 44	Trace	4.4	.01	Trace
MB - 45	.001	7.0	.01	Trace
MB - 46	Trace	4.1	.01	Trace

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

Rejects Retained one month.

Pulps Retained one month unless specific arrangements made in advance.

[redacted]

Licensed Assayer of British Columbia

To: ESSO MINERALS CANADA
500 - 6th Avenue S.W.
CALGARY , Alberta T2P 0S1

Attn : Morley Brown

File No. 16187
Date November 17th , 1978
Samples Core

Project # 560 - 1989

Certificate of ASSAY

LORING LABORATORIES LTD.

SAMPLE No.	CHEMICAL % U308	PPM U308	% Pb	% Zn
" CORE SAMPLES "				
MB - 47	Trace	4.1	.01	Trace
MB - 48	Trace	5.4	.01	Trace
MB - 49	Trace	3.5	.01	Trace
MB - 50	Trace	2.2	.01	Trace
MB - 51	Trace	2.2	.01	.01
MB - 52	.001	10.2	.01	Trace
MB - 53	Trace	3.8	.01	Trace
MB - 54	Trace	2.2	.01	.03
MB - 55	Trace	3.2	.01	Trace
MB - 56	Trace	2.5	.01	Trace
MB - 57	Trace	3.5	.01	Trace
MB - 58	Trace	2.5	.01	Trace
MB - 59	Trace	1.7	.01	.01
MB - 60	Trace	1.0	.01	Trace
MB - 61	Trace	3.7	.01	Trace
MB - 62	Trace	1.7	.01	Trace
MB - 63	Trace	1.7	.01	Trace
MB - 64	Trace	5.0	.01	Trace
MB - 65	Trace	3.7	.01	Trace

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

Rejects Retained one month.

Pulps Retained one month unless specific arrangements made in advance.

[redacted]

Licensed Assayer of British Columbia

To: ESSO MINERALS CANADA
500 - 6th S.W.
CALGARY , Alberta T2P 0S1

Attn : Morley Brown

File No. 16187
Date November 17th , 1978
Samples Core
Project # 560 - 1989

Certificate of ASSAY

LORING LABORATORIES LTD.

SAMPLE No.	CHEMICAL % U308	PPM U308	% Pb	% Zn
MB - 66	Trace	1.7	.01	Trace
MB - 67	.001	7.0	.01	Trace
MB - 68	Trace	3.7	.01	Trace
MB - 69	Trace	4.3	.01	Trace
MB - 70	Trace	1.8	Trace	Trace
MB - 71	.001	6.1	.01	Trace
MB - 72	Trace	2.6	Trace	Trace
MB - 73	Trace	1.8	.01	.01
MB - 74	Trace	1.1	.01	Trace
MB - 75	.001	5.5	Trace	Trace
MB - 76	Trace	1.8	.01	Trace
MB - 77	.001	6.3	.01	Trace
MB - 78	Trace	1.8	Trace	Trace
MB - 79	Trace	4.1	.01	Trace
MB - 80	.001	9.2	.01	Trace
MB - 81	.001	5.8	Trace	Trace
MB - 82	.001	8.6	.01	Trace
MB - 83	.001	9.2	.01	.01
MB - 84	.001	12.5	.01	Trace
MB - 85	.001	10.8	.01	Trace
MB - 86	.001	10.8	Trace	Trace

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[redacted]
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500 - 6th Avenue S.W.
CALGARY , Alberta T2P 0S1

Attn : Morley Brown

File No. 16187
Date November 17th , 1978
Samples Core
Project # 560 - 1989

Certificate of ASSAY

LORING LABORATORIES LTD.

SAMPLE No.	CHEMICAL % U308	PPM U308	% Pb	% Zn
MB - 87	.001	12.5	.01	Trace
MB - 88	.002	21.3	.01	.01
MB - 89	.001	12.8	.01	Trace
MB - 90	.001	10.3	.01	Trace
MB - 91	.001	12.6	.01	Trace
MB - 92	.003	31.4	.01	Trace
MB - 93	.004	41.9	.01	.01
MB - 94	.001	5.9	.01	Trace
MB - 95	.001	11.0	.01	Trace
MB - 96	.001	7.4	.01	Trace
MB - 97	.001	11.0	.01	Trace
MB - 98	.002	24.9	.01	Trace
MB - 99	.006	61.0	.01	.01
MB - 100	.008	84.8	.01	.01
MB - 101	.001	12.6	.01	Trace
MB - 103	.001	6.9	.01	Trace
MB - 104	Trace	4.4	.01	Trace
MB - 105	.001	5.9	.01	Trace
MB - 106	.001	13.1	.01	Trace
MB - 107	.001	5.4	.01	Trace
MB - 108	Trace	3.3	Trace	Trace

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[redacted]

Licensed Assayer of British Columbia

To: ESSO MINERALS CANADA
500 - 6th Avenue S.W.
CALGARY , Alberta T2P 0S1

Attn : Morley Brown

File No. 16187
Date November 17th , 1978
Samples Core
Project # 560 - 1989

Certificate of ASSAY

LORING LABORATORIES LTD.

SAMPLE No.	CHEMICAL % U308	PPM U308	% Pb	% Zn
MB - 109	Trace	2.3	.01	Trace
MB - 110	Trace	2.5	.01	Trace
MB - 111	Trace	3.6	.01	Trace
MB - 112	Trace	2.5	.01	Trace

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

Rejects Retained one month.

Pulps Retained one month unless specific arrangements made in advance.

[redacted]
Licensed Assayer of British Columbia

To: ESSO MINERALS CANADA,
Minerals Section,
[redacted] - 6th Avenue S.W.,
Calgary, Alberta T2P 0S1

ATTN: Morley Brown

File No. 16197
Date November 21, 1978
Samples Cores
Project # 560-1989

Certificate of ASSAY

LORING LABORATORIES LTD.

SAMPLE No.	Chemical % U3O8	Chemical PPM U3O8	% Pb	% Zn
"Core Samples"				
MB-113	.001	8.0	.01	Trace
MB-114	Trace	3.3	.01	Trace
MB-115	.001	6.1	.01	Trace
MB-116	Trace	3.6	.01	Trace
MB-117	Trace	3.0	.01	Trace
MB-118	Trace	1.9	.01	Trace
MB-119	Trace	2.5	.01	Trace
MB-120	Trace	2.5	.01	Trace
MB-121	.001	5.8	.01	Trace
MB-122	Trace	1.9	.01	Trace
MB-123	Trace	3.1	.01	Trace
MB-124	Trace	3.3	.01	Trace
MB-125	Trace	2.8	.01	Trace
MB-126	Trace	4.4	.01	.01
MB-127	Trace	4.7	.01	Trace
MB-128	Trace	3.3	.01	.01
MB-129	Trace	3.9	.01	.01
MB-130	.002	21.0	.01	.01
MB-131	.001	6.7	.01	.01

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

Rejects Retained one month.

Pulps Retained one month unless specific arrangements made in advance.

[redacted]
Licensed Assayer of British Columbia

To: ESSO MINERALS CANADA,
Minerals Section,
500 - 6th Avenue S.W.,
Calgary, Alberta T2P 0S1

ATTN: Morley Brown

File No. 16197
Date November 21, 1978
Samples Cores
Project # 560-1989

Certificate of ASSAY

LORING LABORATORIES LTD.

SAMPLE No.	Chemical % U308	Chemical PPM U308	% Pb	% Zn
MB-132	Trace	2.5	.01	Trace
MB-133	Trace	2.5	.01	Trace
MB-134	Trace	3.0	.01	Trace
MB-135	Trace	2.5	.01	Trace
MB-136	Trace	0.8	.01	Trace
MB-137	Trace	3.0	.01	Trace
MB-138	Trace	0.8	.01	Trace
MB-139	Trace	1.2	.01	Trace
MB-140	Trace	3.6	.01	Trace
MB-141	Trace	2.5	.01	Trace
MB-102	Trace	2.5	.01	Trace

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

Rejects Retained one month.

Pulps Retained one month unless specific arrangements made in advance.

[redacted]
Licensed Assayer of British Columbia

To: ESSO MINERALS CANADA,
500 - 6th Avenue S.W.,
[redacted]gary, Alberta T2P 0S1

ATTN: Morley Brown

File No. 16250
Date November 29, 1978
Samples Cores
Project # 560-1989

Certificate of ASSAY

LORING LABORATORIES LTD.

SAMPLE No.	Chemical % U3O8	Chemical PPM U3O8	% Pb	% Zn
"Core Samples"				
MB 142	.001	7.6	.01	Trace
MB 143	.001	6.3	.01	Trace
MB 144	Trace	3.6	.01	Trace
MB 145	.001	6.3	.01	Trace
MB 146	.001	5.2	.02	Trace
MB 147	Trace	4.0	.01	Trace
MB 148	Trace	4.3	.01	Trace
MB 149	.001	6.2	.01	Trace
MB 150	Trace	3.3	.01	Trace
MB 151	Trace	4.3	.01	Trace
MB 152	.001	5.7	.01	Trace
MB 153	Trace	1.4	.01	Trace
MB 154	Trace	4.3	.01	Trace
MB 155	Trace	3.3	.01	Trace
MB 156	.001	5.7	.01	Trace
MB 157	Trace	4.3	.01	Trace
MB 158	Trace	4.3	.01	Trace
MB 159	Trace	2.7	.01	Trace
MB 160	Trace	1.5	.01	Trace

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

Rejects Retained one month.

Pulps Retained one month unless specific arrangements made in advance.

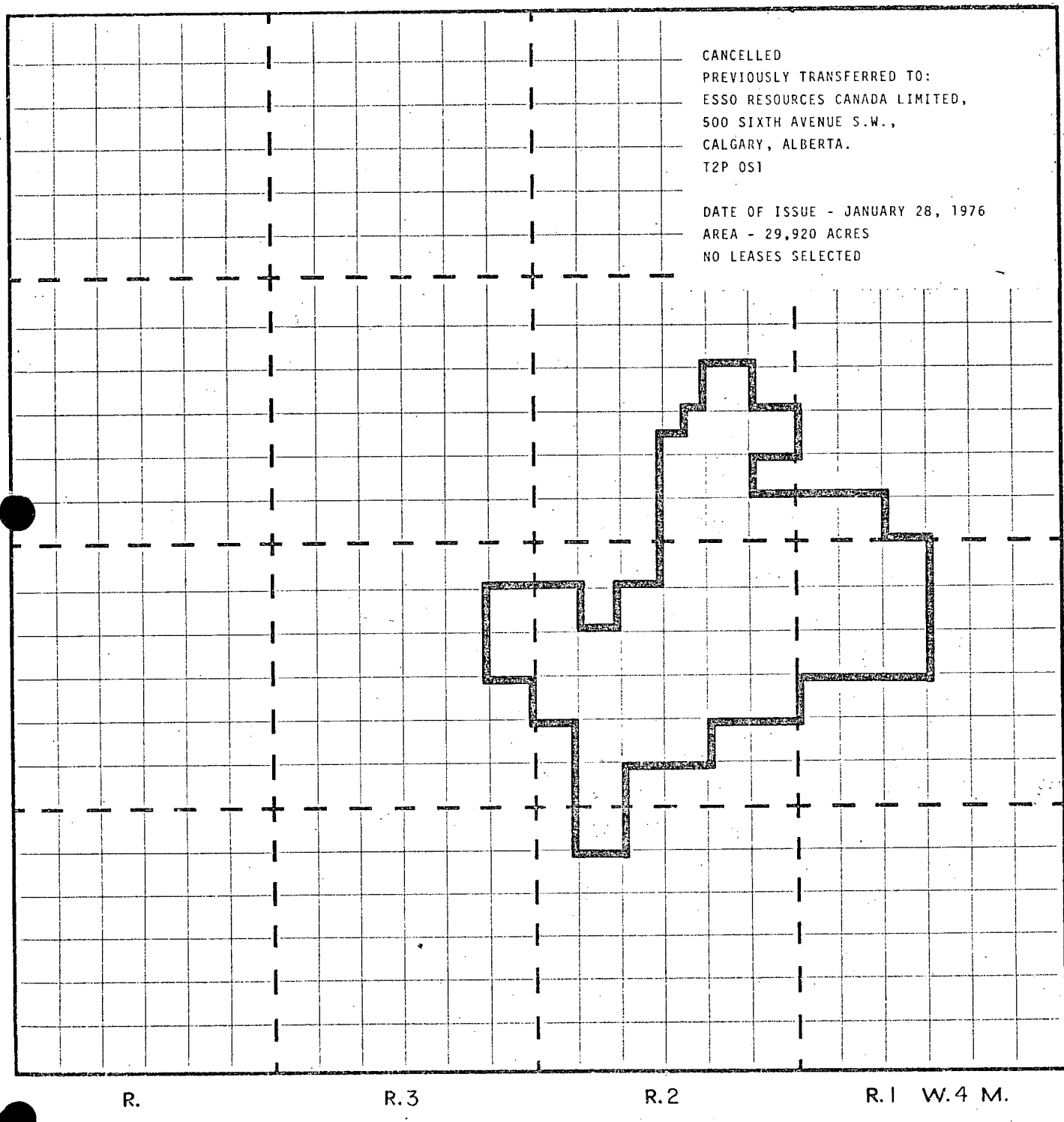
[redacted]
Licensed Assayer of British Columbia

APPENDIX V

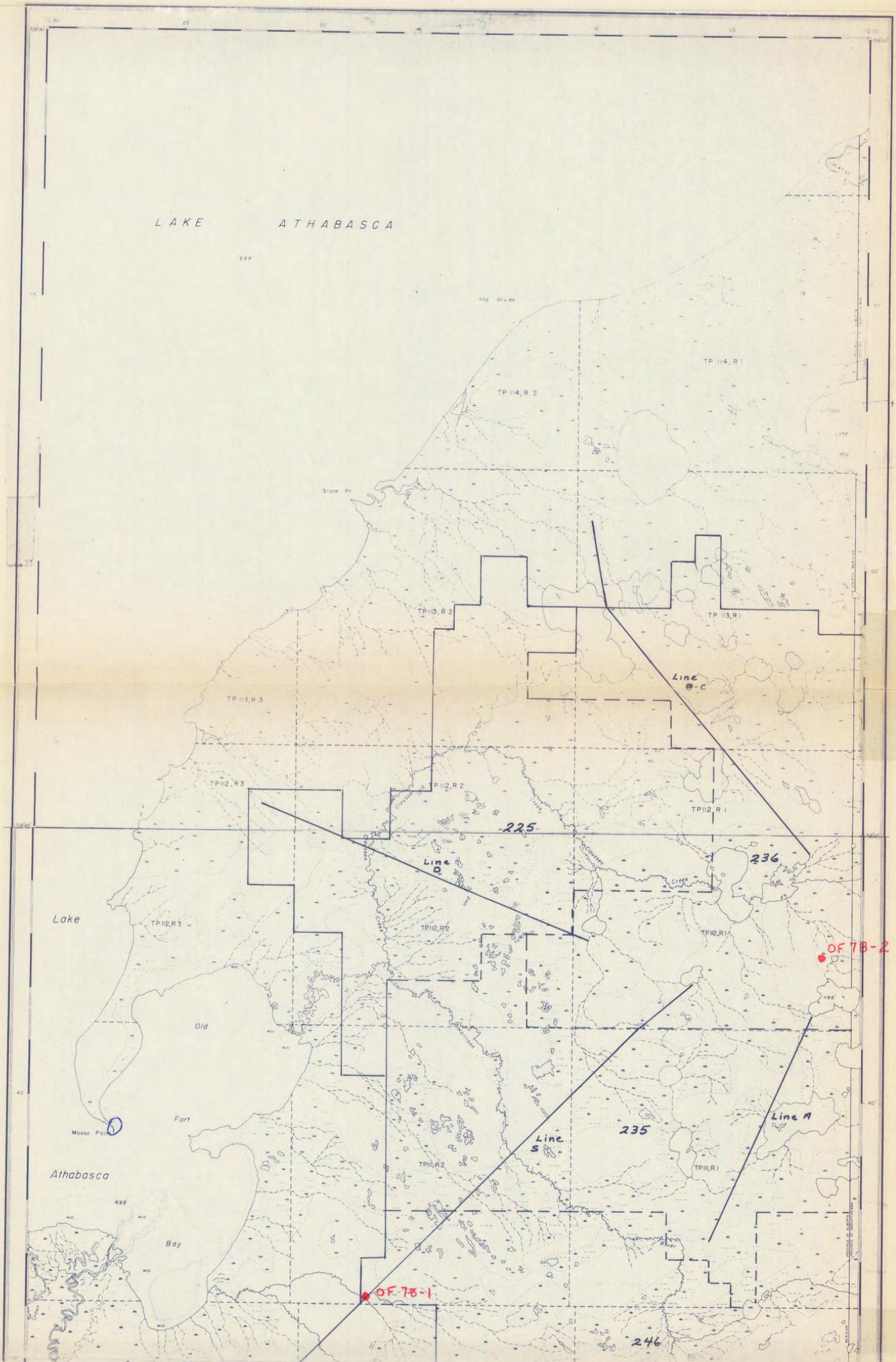
COST BREAKDOWN

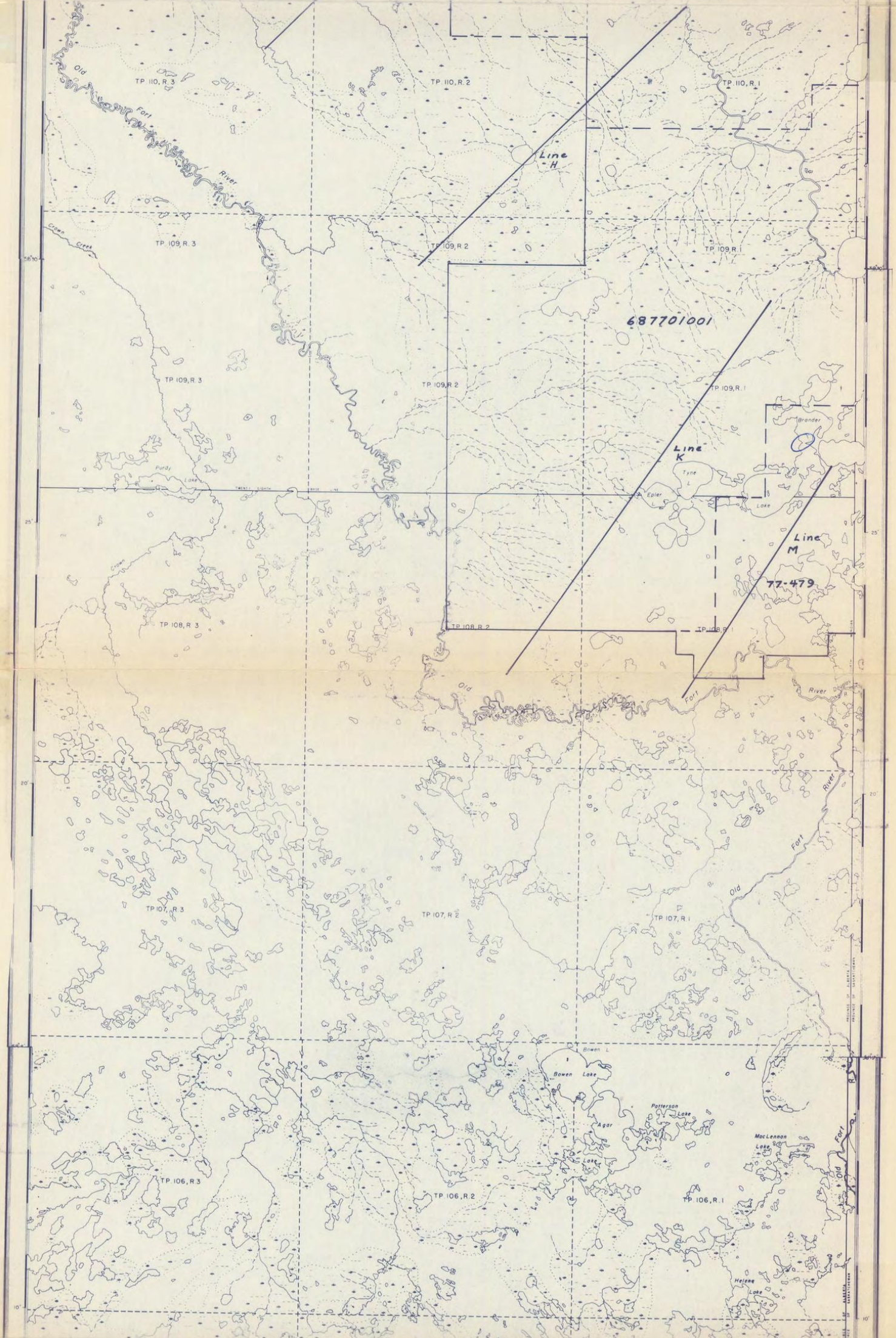
DRILL COSTS			
DDH OF-78-1			
	DRILL FOOTAGE COSTS	78,267.50	
	REAMING & CEMENTING	7,316.17	
	TESTS	240.00	$ 85,823.67
DDH OF-78-2			
	DRILL FOOTAGE COSTS	86,242.50	
	TESTS	200.00	86,442.50
MOBILIZATION AND DEMOBILIZATION			
	INCLUDES BARGE FREIGHT & AIRCRAFT COSTS		14,379.00
CAMP OPERATION COSTS			4,572.00
HELICOPTER COSTS			
	BELL 206B	41,180.11	
	BELL 204B	21,485.82	62,665.93
SUPPLIES AND MISCELLANEOUS			
	CORE BOXES		2,899.45
	FUEL - JET B 140 BBLS @ 72/BBL		10,080.00
GEOCHEMICAL ASSAYS			
	160 SAMPLES U_3O_8 @ 11.00/SAMPLE		1,760.00
	160 SAMPLES Pb @ 6.00/SAMPLE		960.00
	160 SAMPLES Zn @ 6.00/SAMPLE		960.00
	TOTAL		$ 265,970.55

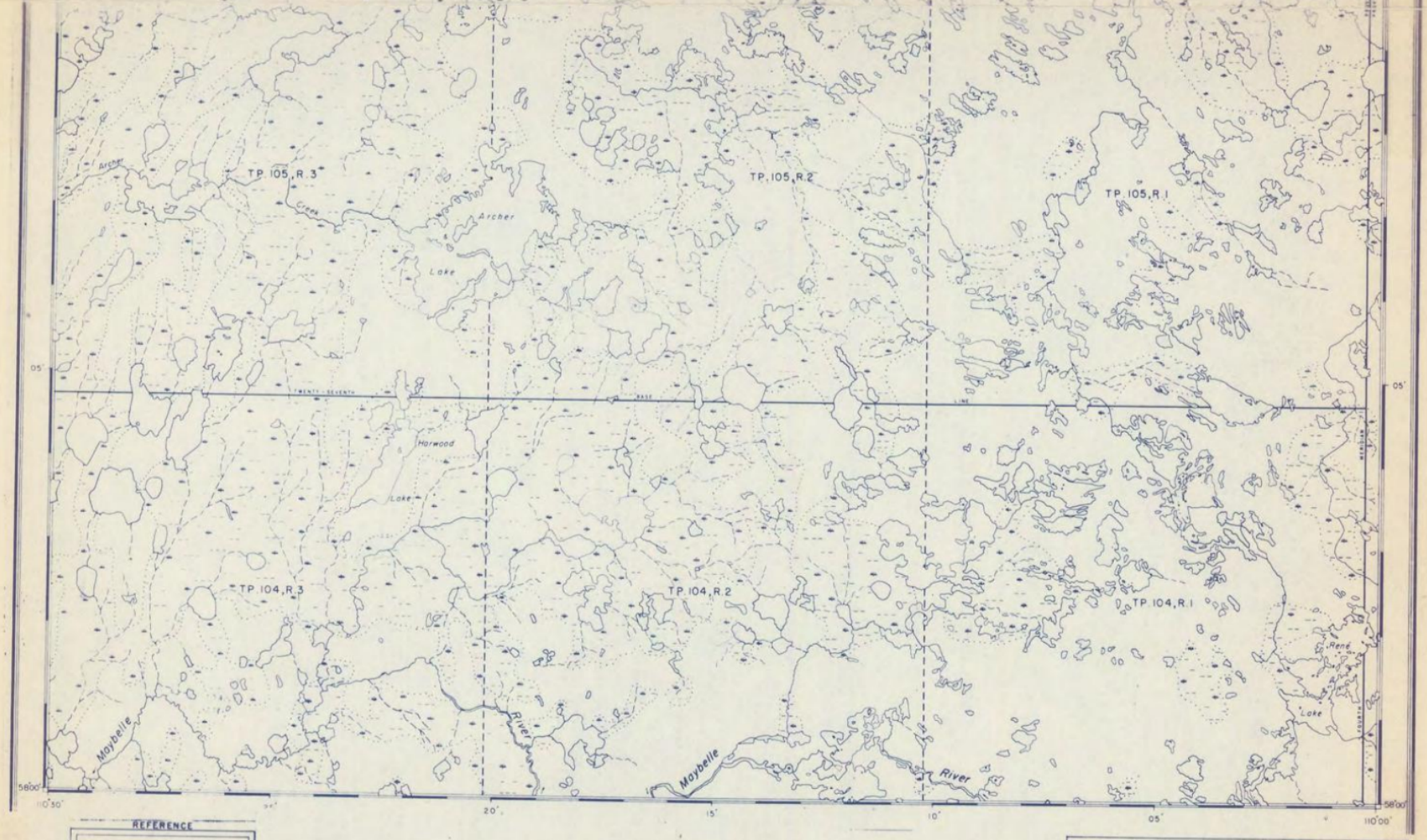
QUARTZ MINERAL EXPLORATION PERMIT No. 225



19790008


LAKE ATHABASCA
Pte Bruce
Stone Pt
TP 114, R 1
TP 114, R 2
TP 113, R 2
TP 113, R 1
TP 113, R 3
Line B-C
TP 112, R 3
TP 112, R 2
TP 112, R 1
225
236
Line D
Lake
TP 112, R 3
TP 112, R 2
TP 112, R 1
OF 78-2
Old
Fort
Moose Point
Athabasca
Bay
Line S
235
Line A
TP 111, R 2
TP 111, R 1
OF 78-1
246


TP 110, R 3
TP 110, R 2
TP 110, R 1
Old Fort River
Line H
Crow Creek
TP 109, R 3
TP 109, R 2
TP 109, R 1
687701001
TP 109, R 3
TP 109, R 2
TP 109, R 1
Brander
Line K
Purdy Lake
Tyne L
Epler L
Lake
Line M
77-479
TP 108, R 3
TP 108, R 2
TP 108, R 1
Old Fort River
TP 107, R 3
TP 107, R 2
TP 107, R 1
Bowen L
Bowen Lake
Patterson Lake
Agar Lake
MacLennan Lake
TP 106, R 3
TP 106, R 2
TP 106, R 1
Helene Lake



REFERENCE

OIL PIPE LINE
GAS PIPE LINE
RIVER & LAKE
INTERMITTENT LAKE & STREAM
HIGH WATER MARK
DITCH
SAND OR MUD
SWAMP
CHURCH
SCHOOL
FORESTRY CABIN
FORESTRY LOOKOUT TOWER
SAW MILL

19790008

ESSO MINERALS CANADA
(IMPERIAL OIL LIMITED)

OLD FORT PROJECT (1978)

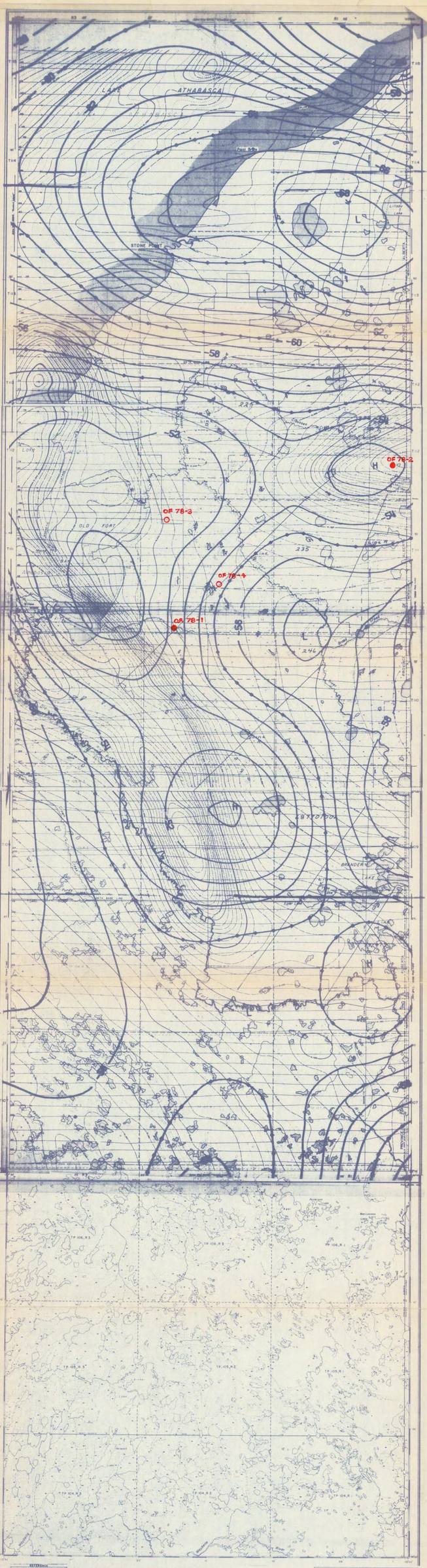
PERMIT BOUNDARY

SCALE		NTS 74 L 8,9
FILE NO.	DRAWING NO.	PROJECT NO.
DRAWN BY	DATE	REVISED

Figure 2

151

(151)



REFERENCE

● DIAMOND DRILL HOLE COMPLETED

○ DIAMOND DRILL HOLE PROPOSED

ESSO MINERALS CANADA
(IMPERIAL OIL LIMITED)

OLD FORT PROJECT (1978)

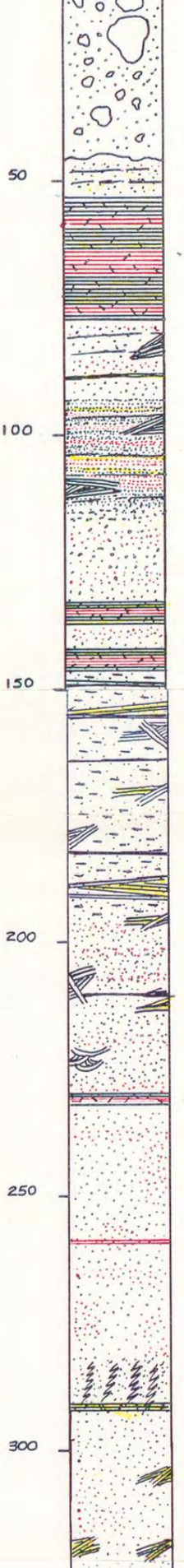
CONTOUR MAP
GRAVITY AND MAGNETICS

SCALE	NTS
FILE NO.	DRAWING NO.
DRAWN BY	PROJECT NO.
	REVISED

19790008

FIGURE 3

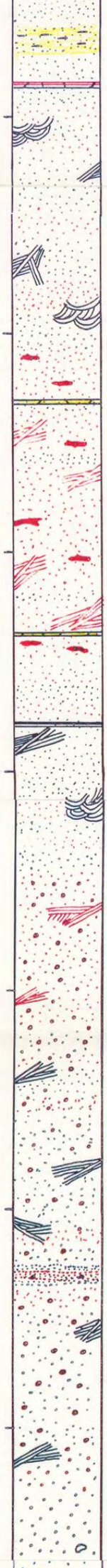
PROTEROZOIC SECTION
OLD FORT BAY, ALBERTA
DIAMOND DRILL HOLE 78–1



0 - 46.93m	OVERBURDEN :	GLACIAL DRIFT AND TILL.
46.93 - 52.43 m	QUARTZ SANDSTONE :	FINE GRAINED. BUFF WHITE TO LIGHT RED AND GREEN. CROSS BEDDING OUTLINED BY HEMATITE STAINING ALONG LAMINAE. CORE IS BLOCKLY. NARROW INTERBEDDED RED GREEN SILTSTONE AND PELITES.
52.43 - 76.96 m	MOTTLED SILTSTONE AND SHALE :	INDIAN RED AND LIGHT GREEN SPECKLED PELITE (SHALE) AND INTERBEDDED SILTSTONE. SILICEOUS COMPOSITION WITH MINOR BIOTITE, CHLORITE AND HEMATITE. FINELY LAMINATED.
76.96 - 92.96 m	QUARTZ SANSTONE :	BUFF WHITE TO RED GREEN. FINE GRAINED. CHLORITE AND SILICA GRIT MATRIX AND CEMENT. CROSS BEDDING OUTLINED BY HEMATITE STAINING. NARROW ORTHOQUARTZITE BANDS < 2-3cm FORMING BANDED HORIZONS. MINOR PELITE AND SILTSTONE SEGMENTS < 7cm. GRADES INTO FINELY LAMINATED SANDSTONE.
92.96 - 114.90m	QUARTZ SANDSTONE:	FINE GRAINED FINELY LAMINATED RED TO SLIGHT GREEN TINGED SSTN. HEMATITE STAINING ALONG LAMINAE OUTLINES EXTENSIVE CROSS BEDDING. MINOR INTERBEDDED GRITTY SHALE AND PELITE. GRADATIONAL CONTACT WITH LESS FINELY LAMINATED QUARTZ SANDSTONE.
114.90 - 132.59 m	QUARTZ SANDSTONE:	MEDIUM TO FINE GRAINED GREENISH RED TO BUFF WHITE QTZ SSTN. LIKE ABOVE UNIT 76 - 92.96 METERS BUT CONTAINS LESS BIOTITE.
132.59 - 136.40m	MOTTLED SHALE:	RED - GREEN SPECKLED SILICEOUS SHALE. BRITTLE NATURE - CORE IS BLOCKY
136.40 - 143.55m	QUARTZ SANDSTONE:	LIKE ABOVE UNIT 114.90 - 132.59m BUT MORE EXTENSIVELY CROSS BEDDED.
143.55 - 145.99 m	MOTTLED SHALE:	LIKE ABOVE UNIT 132.59 - 136.40m.
145.99 - 191.72m	QUARTZ SANDSTONE :	BUFF WHITE TO GREENISH RED FINELY GRAINED POORLY SORTED. MINOR CHLORITE WITHIN SILICA GRIT MARIX - CEMENT. UNIT SLIGHTLY INDURATED AND FRIABLE. BLOCKY CORE WITH NARROW RUBBLY SEGMENTS. CROSS AND GRADED BEDDING. NARROW SILTSTONE AND PELITE HORIZONS. POROSITY ≈ 12 - 20%. UNIT GRADES QUARTZ SANDSTONE OF LESS BLOCKY AND INDURATED NATURE.
191.72 - 227.69 m	QUARTZ SANDSTONE :	LIKE ABOVE UNIT BUT MORE COMPETANT, LESS BLOCKY AND CONTAINS ONLY MINOR CHLORITE ALONG LAMINAE. POROSITY ≈ 10-12%. INTERBEDDED ORTHOQUARTZITE HORIZONS. ≈ 2 meters IN WIDTH. UNIT GRADES INTO ORTHOQUARTZITE
227.69 - 228.60	SILTSTONE :	FINELY LAMINATED RED - GREEN. INTRAFORATIONAL CIGAR SHAPED CLASTS. GRADES INTO ORTHOQUARTZITE
228.60 - 272.34 m	ORTHOQUARTZITE:	CREAMY WHITE TO REDDISH GREY AND PINK. FINE GRAINED - GLASSY TEXTURE. BRITTLE CORE, ONLY MINOR FRACTURING. NO CROSS BEDDING, MINOR INTERBEDDED SILTSTONE AND PELITE HORIZONS. UNIT BECOMES MORE FRACTURED AND BROKEN TOWARDS BOTTOM.
272.34 - 289.56m	ORTHOQUARTZITE:	LIKE ABOVE UNIT BUT EXTENSIVELY FRACTURED AND BROKEN CORE. RUBBLY CORE OVER SECTION. ≈ 2 meter CORE LOSS - CAVE ZONE. FRAGMENT OF CORE ≈ 278.59 IS BRECCIA.
289.56 - 328.26	QUARTZ SANDSTONE :	MEDIUM TO FINE GRAINED RED AND PINKISH TO CREAM INTERBEDDED ORTHOQUARTZITE AND QUARTZ SANDSTONE. MINOR INTERBEDDED SILTSTONE AND PELITE SEGMENTS. MINOR FRACTURES, CROSS BEDDING WITHIN QUARTZ SANDSTONE HORIZONS. CHLORITE ALONG SOME FRACTURES AND WITHIN LAMINAE. UNIT GRADES INTO GREEN QUARTZ SANDSTONE.

11/11

12/12



328.26 - 332.99m

QUARTZ SANDSTONE: LIGHT GREEN MEDIUM TO FINE GRAINED. CHLORITE CONTENT ≈ 3% AS DUST AND FLAKES WITHIN QUARTZ INTERSTICIES. MINOR CROSS BEDDING. POROSITY ≈ 5%. UNIT CLAY INDURATED BUT COMPETANT. FORMS GRADATIONAL CONTACT ABOVE AND BELOW.

332.99 - 407.52m

QUARTZ SANDSTONE: CREAMY WHITE TO PINK AND RED PURPLE. Qtz GRAINS WITHIN SILICA GRIT MATRIX. MINOR CHLORITE ALONG LAMINAE. CROSS BEDDING AND GRADED BEDDING DISPLAYING FINING UPWARD SEQUENCE. INTERBEDDED SILTSTONE AND PELITE HORIZONS. UNIT HAS VARIABLE POROSITY DEPENDING ON GRAIN SIZE - MEDIUM TO FINELY GRAINED WITH COARSER SEGMENTS ALONG GRADED BEDDED SEAMS. MINOR FRACTURES. UNIT BECOMES PROGESSIVELY MORE FINELY LAMINATED NEAR ITS BASE. GRADES INTO INDIAN RED STRONGLY HEMATIZED QUARTZ SANDSTONE.

407.52 - 480.67m

QUARTZ SANDSTONE: DEEP PURPLISH RED, MEDIUM GRAINED WITH COARSERS HORIZONS AT GRADED BEDDING SEGMENTS. NARROW INTERBANDED CREAMY WHITE TO PINK QUARTZ SANDSTONE. MINOR IRON STAINED CLAY AND/OR PELITE SEAMS, GENERALLY < 2cm IN THICKNESS. UNIT DISTINGUISHED BY RANDOMLY LOCATED IRREGULAR SHAPED "CLASTS" OF CLAY AND/OR PELITE. EXTENSIVE HEMATITE STAIN AND LARGER GRAINS IN MAMILLATED FORM WITHIN MATRIX. EXTENSIVE CROSS BEDDING AND GRADED BEDDING. UNIT GRADES INTO SIMILAR UNIT AS ABOVE.

13/13

480.67 - 523.34m

QUARTZ SANDSTONE: CREAMY WHITE TO LIGHT PINK AND RED PURPLE. MEDIUM TO FINE GRAINED. UNIT LIKE 322 - 407m. UNIT GRADES INTO HEMATITE STAINED CORE AND BECOMES PROGRESSIVELY MORE SPECKLED WITHIN MATRIX DUE TO SPECULARITIC HEMATITE IN ITS MAMILLATED FORM.

523.34 - 558.39m

QUARTZ SANDSTONE: RED PURPLISH MEDIUM TO FINE GRAINED WITH NARROW COARSER GRAINED SEGMENTS. LIKE 407.52 to 480.67m BUT DOESN'T CONTAIN CLAY AND PELITE CLASTS. UNIT HAS SPECKLED APPEARACE — FORMED BY IRREGULAR SHAPED SPECULARITIC HEMATITE OCCURING AS DUST IN MATRIX AND OR AS STAIN AROUND GRAINS OR AS HEMATITE IN ITS MAMILLATED FORM. UNIT GRADES BACK INTO INDIAN RED AND CREAMY WHITE BANDED QUARTZ SANDSTONE LIKE 480.67 to 523.34m.

558.39 - 661.11m

QUARTZ SANDSTONE: CREAMY BUFF WHITE TO DARK GREY WITH NARROW PINK AND RED PURPLE HORIZONS. MEDIUM TO FINE GRAINED WITH COARSE GRAINED SEGMENTS. PEPPERED APPEARANCE DUE TO SPECULARITIC HEMATITE OCCURING AS LOCALISED DUST AND/OR GRAINS ≈ 1mm IN SIZE OF MAMILLATED OR BOTRYOIDAL FORM. HEMATITE ALSO FORMS DUST SIZED PARTICLES ALONG LAMINAE AND WITHIN MATRIX AND GRAIN INTERSTICIES YEILDING RED PURPLE TO GREY COLOR OF SOME HORIZONS. UNIT COMPOSED OF QUARTZS GRAINS OF VARIABLE SIZE WITHIN SILICA GRIT AND CLAY MATRIX. EXTENSIVELY CROSS BEDDED WITH DISTINCT GRADED BEDDING ALONG SOME HORIZONS. MINOR PELTIC HORIZONS ≈ 2-3cm IN WIDTH. UNIT GRADES INTO COARSE TO MEDIUM GRAINED SANDSTONE WITH DISTINCT LARGE QUARTZ CLASTS.

14/14

FORMATION

HELIKIAN ATHABASCA

700

750

800

661.11 - 1001.12 m

QUARTZ SANDSTONE : GREY AND INDIAN RED PURPLE. TO CREAMY WHITE AND LIGHT ORANGE. POORLY SORTED, UNIT VARIES FROM MEDIUM TO COARSE GRAINED WITH INTERCOLLATED FINER GRAINED HORIZONS. PRIMARILY MEDIUM GRAINED QUARTZ GRAINS WITHIN SILICA GRIT AND CLAY MATRIX. COARSER SEGMENTS MORE HEMATITE RICH. HEMATITE FORMS STAIN AROUND GRAINS AND DUST WITHIN INTERSTICIES. SEGMENTS CONTAIN SPECULARITIC HEMATITE IN ITS BOTRYOIDAL FORM AND/OR AS SMALL TABULAR CRYSTALS. SMALL DETRITALS GRAINS OF MAGNETITE AND BIOTITE OCCUR IN RANDOM SECTIONS → BECOME MORE EXTENSIVE IN LOWER SEGMENTS. EXTENSIVE CROSS BEDDING AND GRADED BEDDING THROUGH ENTIRE SECTION. UNIT IS QUITE COMPETANT ONLY MINOR FRACTURING. UNIT BECOMES MORE FISSLE AND SEGMENTS ARE CLAY INDURATED WITH ≈ 2% CHLORITE IN MATRIX TOWARDS CONTACT. UNIT DISTINGUISHED BY QUARTZ PEBBLE AND /OR COBBLES SCATTERED RANDOMLY THROUGH ENTIRE UNIT.

15/15

950

1000

1000 meters

SECTION SPLICE : MARKS SCALE CHANGE FROM 1cm = 10m to 1cm = 1m. ENABLES EASIER DISPLAY OF CONTACTS AND NARROW PRE € UNIT.

HELIKIAN BASIC INTRUSIVE

1000

1005

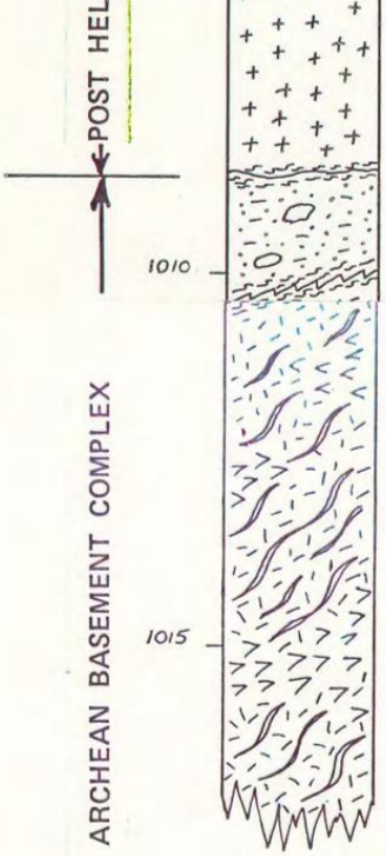
1001.12 m

CONTACT

ATHABASCA SANDSTONE FORMATION AND DIABASE DIKE.
SANDSTONE CLAY INDURATED AND FISSLE WITH LARGER FRAGMENTS OF ALTERED -HEMATIZED- SCHISTOSE TEXTURED ALLOGENIC MATERIAL. MATRIX ALTERED TO CHLORITE AND SERICITE YEILDING GREENISH TINGE. PASSES SHARPLY INTO EXTENSIVELY ALTERED FRIABLE FINE GRAINED DIABASE CONTAINING SMALLER XENOLITHS OF QUARTZ SANDSTONE. DIABASE UNIT IS FRAGMENTED AND/OR BROCKEN WITHIN METER OF CONTACT INDICATING POSSIBLE "COLD" INTRUSIVE NATURE. EXTENSIVE ALTERATION HAS MASKED ANY POSSIBLE DETECTION OF CONTACT METAMORPHIC EFFECT.

1001.12 - 1008.74 m

DIABASE DIKE : DARK GREENISH BLACK. EXTREMELY FINE GRAINED. DISPLAYS OPHITIC OR DIABASIC TECTURE. CORE IS BRITTLE AND TINKLY WHEN STRUCK. ONLY MINOR CHLORITE AND SERPENTINE ALTERATION AWAY FROM CONTACTS.



1008.74 meters	CONTACT:	DIABASE DIKE AND SANDSTONE "BLOCK." DIABASE EXTENSIVELY ALTERED TOWARDS LOWER METER. ALTERED ZONE CONTAINS FRAGMENTS OF HEMATIZED SCHISTOSE MATERIAL ALONG WITH LARGER QUARTZ GRAINS AND SMALLER SANDSTONE FRAGMENTS. ABUTS SHARPLY WITH ALTERED QUARTZ SANDSTONE – SUBCONGLOMERATE. NO CHILL ZONE OR CONTACT METAMORPHIC EFFECT OBSERVED.
1008.74 – 1010.12 m	SANDSTONE BLOCK:	UNIT SIMILAR IN COMPOSITION AND TEXTURE TO LOWER SECTION OF QUARTZ SANDSTONE UNIT 661.11m to 1001.12m. UNIT MAY REPRESENT BLOCK WITHIN BASEMENT CREVASS OR SHEAR AND/OR IMPLACED DURING DIABASE INTRUSIVE PHASE.
1010.12 meters	CONTACT:	SANDSTONE BLOCK AND GRANITIC GNEISS OF PRE E BASEMENT COMPEX. ≈5-8cm CORE MISSING AT CRITICAL ZONE ∴ ACTUAL CONTACT NOT OBSERV NO DEVELOPED REGOLITH OBSERVED – SANDSTONE BECOMES MORE INDURAT AND FISSLE TOWARDS FRACTURED END WITH SLICKENSIDES DEVELOPED ALO THE FRACTURE PLANES. PASSES SHARPLY INTO FRACTURED GRANITIC GNEISS WITH SLICKENSIDES ALONG FRACTURE PLANES. CONTACT ∴ MOST LIKELY A SHEAR OR FRACTURE SUGGESTING THAT THE SANDSTONE UNIT MAY BE A BLOCK
1010.12 – 1017.12 m – ?	GRANITIC GNEISS:	PRECAMBRIAN "BASEMENT" COMPLEX. EXTENSIVELY ALTERED – BUFF WHITE GREEN AND INDIAN RED. MEDIUM TO COARSE GRAINED. GNEISSOSITY ≈ 30° TO CORE. AUGEN TEXTURE NOTED ALONG SOME HORIZONS. UNIT INTERCOLATED WITH EXTENSIVELY ALTERED PEGMATITIC SEGMENTS

END OF HOLE: NO RADIOACTIVITY ENCOUNTERED. HOLE NOT PROBED.

LOGGED BY MORLEY BROWN
ESSO MINERALS CANADA
NOVEMBER 1978

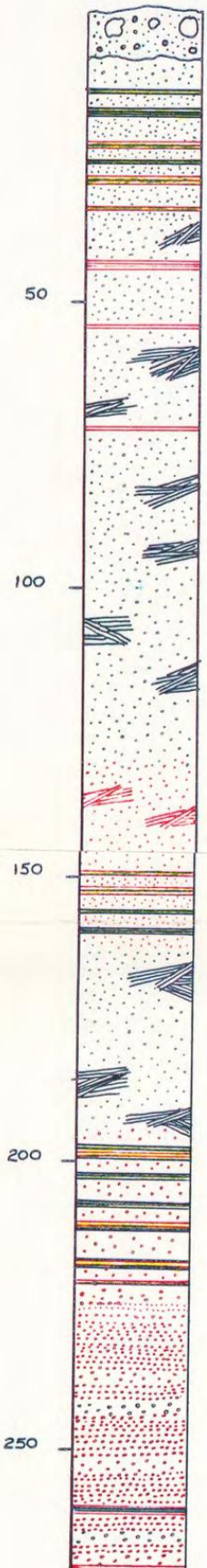
LOCATION:	PERMIT 246 LINES 4350 m SOUTH
COORDINATES:	58° 36' N 110° 16' W
ELEVATION:	255.22 METRES A.S.L.
DIP:	90°
LENGTH:	1017.12 METRES
SCALE:	/cm = 10 METRES

Figure 4

19790008

78-1

PROTEROZOIC SECTION
OLD FORT BAY, ALBERTA
DIAMOND DRILL HOLE 78–2



0 - 8.23 m — OVERBURDEN: GLACIAL DRIFT AND TILL.

8.23 - 35.66 m — INTERBEDDED QUARTZ SANDSTONE AND PELITE: BUFF WHITE CREAM TO PINK AND LIGHT INDIAN RED. MEDIUM TO FINE GRAINED WITH NARROW COARSER GRAINED SEGMENTS. HEMATITE STAINING PRIMARILY ALONG COARSER GRAINED SEGMENTS. PELITE BEDS LIGHT GREEN TO INDIAN RED. DISPLAY FINE LAMINATIONS AND PLATY CLEAVAGE. NARROW PELITE HORIZONS CONTAIN 45-50 % SPECULARITIC HEMATITE. CONTACTS SHARP.
UNIT IS BLOCKY AND SEGMENTED. NO FRACTURING. GRADES INTO CREAMY PINK QUARTZ SANDSTONE.

35.66 - 131.06 m — QUARTZ SANDSTONE: CREAMY WHITE TO PINKISH. FINE TO MEDIUM GRAINED WITH NARROW COARSER GRAINED SEGMENTS. MODERATELY ROUNDED POORLY SORTED QUARTZ GRAINS WITHIN SILICA GRIT MATRIX. MAFIC CONSTITUENT < 1 %. EXTENSIVELY CROSS BEDDING AND PREVOLENT GRADED BEDDING. NARROW INTERBEDDED HEMATITE STAINED FINELY LAMINATED PELITE AND SILTSTONE HORIZONS. UNIT IS COMPETANT WITH ONLY MINOR FRACTURING. UNIT GRADES INTO HEMATITE STAINED RED QUARTZ SANDSTONE.

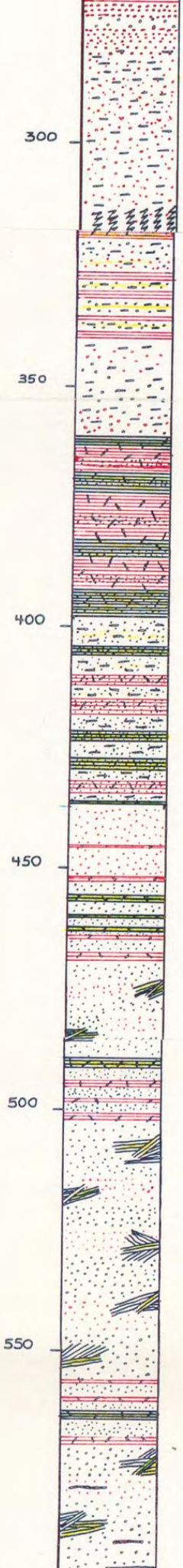
131.06 - 148.44 m — RED QUARTZ SANDSTONE: INDIAN RED TO PINK. MEDIUM TO FINE GRAINED. LIKE ABOVE UNIT BUT HEMATITE STAINED. GRADATIONAL CONTACT WITH BUFF WHITE SLIGHTLY FISSLE QUARTZ SANDSTONE.

148.44 - 160.63 m — INTERBEDDED RED QUARTZ SANDSTONE - PELITE: PINK TO DEEP INDIAN RED AND RUSTY BROWNISH RED. HEMATITE STAINING EXTENSIVELY WITHIN COARSER GRAINED SEGMENTS. VARIABLE GRAIN SIZE THROUGHOUT, PRIMARILY MEDIUM TO FINE GRAINED. PELITE BEDS < 1 meter IN THICKNESS. SPECKLED. PLATY CLEAVAGE. UNIT IS BLOCKY AND FRACTURED; BECOMES MORE COMPETANT AND GRADES INTO CREAMY SANDSTONE.

160.63 - 194.77 m — QUARTZ SANDSTONE: CREAMY WHITE WITH PINK AND INDIAN RED INTERCOLLATED HEMATITE HORIZONS. — MAY COMPOSE AS MUCH AS 35 % OF THE WHOLE. UNIT SIMILAR TO UNIT 35.66 to 131.06 m. GRADES INTO GREYISH RED QUARTZ SANDSTONE

194.77 - 221.59 m — INTERBEDDED RED QUARTZ SANDSTONE - SILTSTONE - PELITE: SANDSTONE BEDS MEDIUM TO COARSELY GRAINED WITH NARROW FINELY LAMINATED SEGMENTS. HEMATITE STAINED WITH SEGMENTS ≈ ½ meter IN WIDTH COMPOSED OF ≈ 30 % SPECULARITIC HEMATITE. CROSS AND GRADED BEDDING. SILTSTONE - PELITE BEDS ≈ 1 METER THICK. RED GREEN, FINELY LAMINATED, MOTTLED AND DISPLAY HORIZONTAL BEDDING. SILTSTONE CONTACTS GRADATIONAL, PELITE SHARP.

221.59 - 283.16 m — RED QUARTZ SANDSTONE: MEDIUM GRAINED WITH NARROW COARSER AND FINER GRAINED SEGMENTS. UNIT FINELY LAMINATED AND EXTENSIVELY CROSS BEDDING. NARROW NON HEMATITE STAINED SEGMENTS ≈ 10-15 cm SLIGHTLY MOTTLED. GRADED BEDDING DISPLAYS CLASTS UPTO 1 cm IN SIZE. NARROW - < 1 meter PELITE - SILTSTONE HORIZONS. CORE IS ONLY MINORLY FRACTURED BUT UNIT BECOMES MORE PROGRESSIVELY INDURATED AND FISSLE TOWARDS BASE. FORMS GRADATIONAL CONTACT WITH INDURATED SANDSTONE UNIT.



HELIKIAN ATHABASCA SANDSTONE

283.16 - 312.42m — INDURATED QUARTZ SANDSTONE: CREAMY WHITE PINK TO DEEP PURPUSH RED, MEDIUM TO FINE GRAINED. LIKE ABOVE UNIT BUT EXTENSIVELY CLAY INDURATED AND FISSLE. CORE IS BLOCKY AND FRAGMENTED. UNIT PASSES INTO FRACTURE CORE ZONE.

312.42 - 316.99m — FRACTURED FISSLE QUARTZ SANDSTONE: RED AND CREAM COLORED, INDURATED AND FISSLE. CORE IS EXTENSIVELY FRAGMENTED AND BROCKEN. ONLY ONE METER RECOVERED. CAVE ZONE.

317.60 - 340.46m — INTERBEDDED QUARTZ SANDSTONE - PELITE: SANDSTONE BEDS BUFF WHITE TO SLIGHTLY PINKISH AND GREEN. SLIGHTLY INDURATED WITH CHLORITE SERICITE ALONG LAMINAE. FINELY LAMINATED SEGMENTS OUTLINED BY HEMATITE STAIN. SLIGHTLY MOTTLED NEAR BASE. PELITE BEDS DEEP PURPLISH RED FINELY LAMINATED. WIDTH VARIES FROM 1/2 - 3 METERS. CONTACTS WITH SANDSTONE SHARP AND OUTLINE A HORIZONTAL BEDDING ATTITUDE.

340.46 - 362.71m — INDURATED QUARTZ SANDSTONE: MEDIUM GRAINED RED GREEN TO BUFF WHITE WITH SLIGHT MOTTLED APPEARANCE. EXTENSIVE CHLORITE SERICITE IN MATRIX AND ALONG LAMINAE. UNIT IS FISSLE. FORMS SHARP CONTACT WITH LOWER SHALE UNIT.

362.71 - 399.80m — INTERBEDDED SILTSTONE - PELITE: SILTSTONE, RED AND GREEN FINELY LAMINATED WITH SLIGHT MOTTLED APPEARANCE. CONTACTS WITH PELITE GRADATIONAL - BEDDING ATTITUDE HORIZONTAL. PELITE BEDS < 5-6 meters. DARK INDIAN RED WITH FINELY LAMINATED GREENISH GREY HORIZONS. PLATY CLEAVAGE. UNIT GRADUALLY BECOMES MORE INTERBEDDED WITH FINE GRAINED QUARTZ SANDSTONE. - CONTACT GRADATIONAL.

399.90 - 438.00m — INTERBEDDED SANDSTONE - SILTSTONE: SANDSTONE - FINE GRAINED PROGESSIVELY COARSER NEAR THE BOTTOM. BUFF WHITE TO GREENISH WITH HEMATITE STAINED HORIZONS AND LAMINAE. UNIT IS CLAY INDUARATE YIELDING GREENISH TINGE AND HAS FISSLE NATURE. SEGMENTS ARE MOTTLED LIKE 340.46 TO 362.72. EXTENSIVELY CROSS AND GRADED BEDDED. SILTSTONE BEDS ≈ < 1 meter AND LIKE THOSE ABOVE. UNIT FORMS GRADATIONAL CONTACT.

438.00 - 454.16m — RED QUARTZ SANDSTONE: MEDIUM GRAINED WITH FINE AND COARSE GRAINED SEGMENTS GRADATIONALLY INTERBEDDED. HEMATITE STAINING AROUND GRAINS AND AS DUST WITHIN MATRIX AND/OR ALONG LAMINAE, GIVES CORE INDIAN RED COLOR. MINOR CHLORITE ALONG LAMINAE TINTING SEGMENTS GREENISH. NARROW INTERBEDDED PELITE BEDS < 5-10cm. BECOME MORE PREVOLENT NEAR BASE OF UNIT FORMING GRADATIONAL CONTACT.

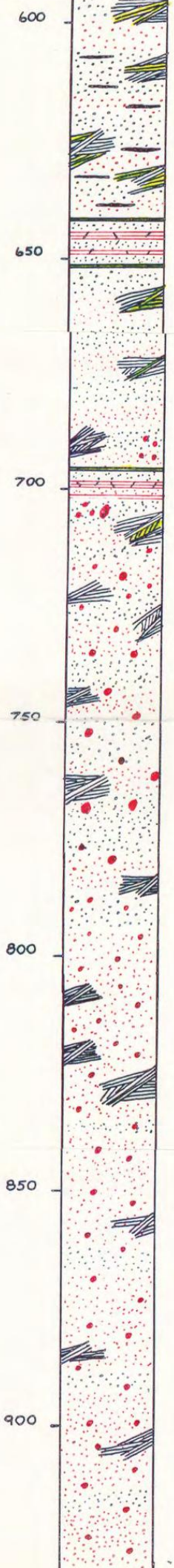
454.16 - 469.39m — INTERBEDDED QUARTZ SANDSTONE - PELITE: SANDSTONE BEDS BUFF WHITE AND INDIAN RED. EXTENSIVE CROSS AND GRADED BEDDING OUTLINED BY HEMATITE STAIN ALONG LAMINAE. CONTACTS WITH PELITE BEDS SHARP AND OUTLINE HORIZONTAL BEDDING ATTITUDE. PELITE BEDS < 1 meter AND LIKE THOSE FROM 399.90 - 438.00m.

469.39 - 489.81m — QUARTZ SANDSTONE: INTERBANDED RED GREY AND CREAMY WHITE. UNIT LIKE UNIT 502.00 - 556.87m.

489.81 - 502.00m — INTERBEDDED QUARTZ SANDSTONE - PELITE: UNIT LIKE 454.16 - 469.39m. BUT CONTAINS MORE SILTSTONE BEDS.

502.00m - 556.87m — QUARTZ SANDSTONE: INTERBANDED CREAMY BUFF WHITE AND INDIAN RED TO PINKISH RED. MEDIUM GRAINED WITH GRADATIONAL FINE AND COARSER SEGMENTS. CLAY - SERICITE CHLORITE COMPOSED 2-3% OF THE MATRIX, TINTING SOME LAMINAE LIGHT GREEN. HEMATITE FORMS DUST OR STAIN ALONG LAMINAE AND/OR WITHIN MATRIX RED STAINED SEGMENTS MAY BE PEPPERED WITH SMALL DISSEMINATED SPECULARITIC HEMATITE GIVING THOSE SEGMENTS SPECKLED APPEARANCE. UNIT ETENSIVELY CROSS AND GRADED BEDDED, COMPETENT WITH NO MAJOR FRACTURING, AND PASSES INTO INTERBEDDED UNIT.

556.87 - 568.15m — INTERBEDDED QUARTZ SANDSTONE - SILTSTONE - PELITE: UNIT SIMILAR TO 489.81 - 502.01 meters. CONTACTS BETWEEN SILTSTONE - PELITE GRADATIONAL. BEDS OF VARIABLE WIDTH - GENERALLY < 1/2 meter. PELITE BEDS READILY SEGREGATED FROM SILTSTONE BEDS BY DARK RED COLOR AND PLATY CLEAVAGE. UNIT IS COMPETANT. SILTSTONE BEDS AND PELITE SLIGHTLY BLOCKY AND MORE BRITTLE, NO FRACTURING. FORMS INDISCRETE CONTACT IE. PELITE-SILTSTONE BEDS TERMINATE AT 568.15m.



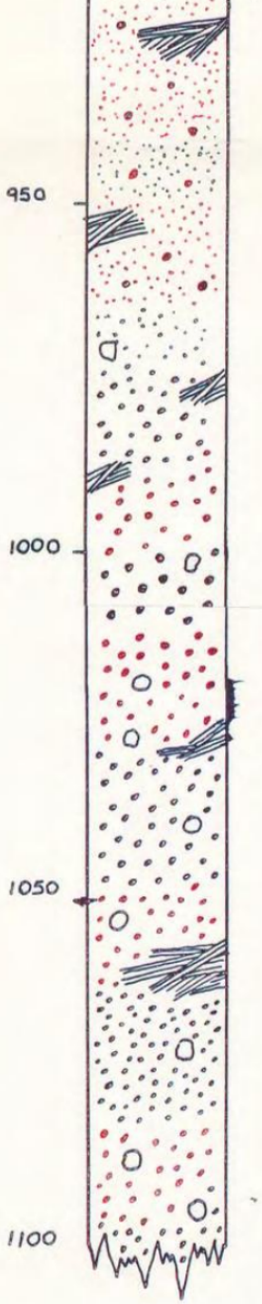
568.15 - 641.60m — QUARTZ SANDSTONE: UNIT LIKE 502.00 - 556.87 meters BUT CONTAINS IRREGULAR VARIABLE IN SIZE (< cm to 2cm) LONG AND NARROW CLASTS OF PELITE OR CLAY. CLASTS LIGHT GREENISH DUE TO CHLORITE - SERICITE COMPOSITION; SOFT AND EASILY SCRATCHED. PROBABLY REPRESENTS REWORKED AND/OR ERODED LOCAL PELITE BEDS. UNIT IS SLIGHTLY FRACTURED WITH ANGLES VARING FROM 0 - 25° TO CORE. MINOR FRACTURES CONTAIN SMALL (< 1mm) EUHEDRAL TO SUBHEDRAL GALENA CRYSTALS. UNIT ALSO SLIGHTLY BLOCKY. CONTACT WITH LOWER UNIT SHARP AND MARKS HORIZONTAL BEDDING ATTITUDE.

641.60 - 652.27 — INTERBEDDED QUARTZ SANDSTONE - SILTSTONE - PELITE: UNIT SIMILAR TO UNIT 556.87 - 568.15 meters. PELITE BEDS FINELY LAMINATED AND FORM SHARP CONTACT WITH SANDSTONE OUTLINING HORIZONTAL BEDDING ATTITUDE. COMPETENT UNIT WITH LITTLE TO NO FRACTURING BUT MAY BE SLIGHTLY BLOCKY. LOWER CONTACT SHARP AND MARKED BY LAST PELITE - SILTSTONE BED.

652.27 - 715.37m — QUARTZ SANDSTONE: INTERBANDED CREAMY WHITE AND RED PURPLE. FINE TO MEDIUM GRAINED WITH GRADATIONAL COARSER GRAINED SEGMENTS. UNIT IS SIMILAR TO UNIT 568 - 641 BUT DOESN'T CONTAIN PELITIC CLASTS, AND CONTAINS LESS CHLORITE - SERICITE ALONG LAMINAE. UNIT EXTENSIVELY CROSS AND GRADED BEDDED - EXTENSIVE HEMATITE STAIN AND DUST ALONG COARSER GRAINED SEGMENTS. INTERBEDDED ORTHOQUARTZITE HORIZONS (GENERALLY < 1 meter). PELITE BEDS < ½ meter INTERBEDDED FROM 695.86 - 700.13 m. FRACTURING IS MINIMAL; UNIT COMPETANT. HEMATITE FORM SPOTTY OR SPECKLED SEGMENTS WHICH BECOME PROGRESSIVELY MORE NOTED NEAR BASE OF UNIT OUTLINING AN INDISCREET GRADATIONAL CONTACT.

715.37 - 791.57m — QUARTZ SANDSTONE: LIKE ABOVE UNIT BUT SPOTTED WITH HEMATITE RICH "DOTS". FORMED BY SPECULARITIC HEMATITE AND/OR DUST AROUND GRAINS AND IN MATRIX LOCALIZED AND FORMING PEPPERED APPEARANCE. UNIT HAS SIMILAR OUTWARD APPEARANCE AS UNIT 558.39 - 661.11m IN DDH # OF 78-1. GRADES INTO MORE EXTENSIVELY HEMATIZED RED QUARTS SANDSTONE.

791.57 - 962.25m — RED QUARTZ SANDSTONE: LIKE ABOVE UNIT BUT DISTINQUISHED BY EXTENSIVE HEMATITE STAIN THROUGH THE ENTIRE UNIT. "DOTTY" APPEARACE DUE TO LOCALIZED HEMATITE STAINING STILL EVIDENT. "PATCHY" APPEARANCE DUE TO IRREGULAR BLEACHING OF SANDSTONE STILL EVIDENT ALONG SOME HORIZONS. UNIT IS CROSS BEDDED AND EXTENSIVELY GRADED BEDDED. MINOR HORIZONS CONTAIN > 10% CLAY, SILT AND/OR MUD IN THE MATRIX. FISSLE UNITS EVIDENT ONLY ALONG COARSLY GRAINED AND EXTENSIVELY HEMATIZED HORIZONS. POROSITY IS VARIBLE THROUGHOUT THE ENTIRE UNIT ≈ 7 - 10% BUT < 15%. MINOR ORTHOQUARTZITE HORIZONS < 1 METER IN WIDTH



962.25 - 1105.12m TO ? QUARTZ SANDSTONE : MEDIUM TO COARSE GRAINED WITH NARROW FINER GRAINED SEGMENTS. UNIT COMPOSED PRIMARILY OF QUARTZ GRAINS WITHIN CLAY AND SILICA GRIT MATRIX. UNIT IS IDENDICAL TO THAT FOUND IN GE. 78-2 527.21 - 825.01m. UNIT DISTINGUISH BY LARGE RANDOMLY SPACED QUARTZ PEBBLE TO ROUNDED COBBLE SIZED CLASTS. UNIT IS BANDED RED AND CREAMY TO BUFF WHITE. MAY BE PATCHY DUE TO IRREGULAR BLEACHING.

END OF HOLE - LOST DUE TO CIRCULATION. ESTIMATED METERAGE TO BASEMENT ≈ 152.4m.
NO RADIOACTIVITY OBSERVED - HOLE NOT LOGGED - (PROBED).

LOGGED BY MORLEY BROWN
ESSO MINERALS CANADA
NOVEMBER 1978

LOCATION:	PERMIT 236
COORDINATES:	58° 44' N 110° 02' W
ELEVATION:	282.65 METRES
DEPTH:	1105.50 METRES
DIP:	90°

Figure #5

19790008

78-2