

DIAMOND DRILLING ASSESSMENT REPORT

on the

RAIL MINERAL CLAIMS



116-C-8

64°23'N - 140°10'W

This report has been examined by the Geological Evaluation Unit and is recommended to the Commissioner to be considered as representation work in the amount of

\$ 19,225.00

R. Debutski *Alleg Geol*
Resident Geologist or *Oct 17/80*
Resident Mining Engineer

Noranda Exploration Company Limited

Considered as representation work under
(No Personal Liability) Section 53 (4) Yukon Quartz Mining Act.

B. R. Baxter
B. R. BAXTER
Supervising Mining Recorder

[Signature]
Commissioner of Yukon Territory

090660

September 1980

G. Macdonald

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DIAMOND DRILLING ASSESSMENT REPORT

on the

RAIL MINERAL CLAIMS

INTRODUCTION

The claims referred to in this report are held by Noranda Exploration Company Limited (No Personal Liability).

Diamond drilling was conducted between June 19 and July 9, 1980 on claims RAIL 1, 2 and 4 (YA32570/71/73) for Noranda by Drilcor Industries of Richmond, B.C. as contractor.

Four BQ holes totalling 1,526 feet were drilled. The core is stored at Whitehorse, Yukon.

Assessment credit for this drilling is applied for on claims RAIL 129-161, 163 and 165-166.

Noranda personnel engaged in this project were: A. Sleath, Geologist and G. Macdonald, Yukon District Geologist.

DRILL LOGS

The following drill logs summarize the results of the programme.



CANADA
DEPARTMENT OF
MINES AND TECHNICAL SURVEYS
SURVEYS AND MAPPING BRANCH

**YUKON
TERRITORY**

SCALE 1:4,444,444
1 inch equals approximately 71 miles

Scale
Railway
Territorial limits

POPULATED PLACES
500 to 2,500
Under 500

Densetsu
Cableways

Lambert Conformal Conic Projection with Standard Parallels at 69°N and 77°N

Reproduced from the 1:2,000,000 map of Canada by the
Surveys and Mapping Branch, Ottawa, 1963.

RECEIVED AUG 1 1980

NORANDA EXPLORATION COMPANY, LIMITED

Collared		Completed		Core Size		Property		Project No		NTS No.	
25		502		BQ		Cassiar Creek		912		116 C/8	
FIELD COORDINATES						SURVEYED COORDINATES					
Lat. 4925 N		Elev.		Dip		Lat. 9925 N		Elev.		Dip -60	
Dep. 4975 E		Depth		Bearing		Dep. 9970 E		Depth 502		Bearing grid W	
Hole No.		DDH-1									
Footage	Rec'y	Graphic Log	Description	% Sulp.	Est. Grade	Sample No.	Lt.	schee- lite	pyrrho- tite		
17 1/2	10		- overburden - boulders of varied lithology, primarily weathered meta-sediments								
52	80		- quartz-biotite schist, alteration to limonite, some rusty veinlets - possible sulfide alteration					possible trace			
			- quartz and calcite veining - some silicification at 24'								
62	95		- serpentized diopside skarn with minor phlogopite bands (disseminated pyrrhotite?)							dissem.	
72	100		- silicified schist, quartz develops as "eyes" parallel to foliation giving an augen-like texture.								
80	100		- serpentized banded diopside and phlogopite (pyrrhotite) skarn pyrrhotite non to weakly magnetic - some calcite veining								
82			- silicified schist								
87	20		- intensely fractured and broken vein quartz.								
92	100		- very rubbly - vein quartz and silicified schist								
94	100		- silicified banded skarn (?)								
123	90		- silicified schist - some calcite and quartz veining minor aplite at 104' with poss. tourmaline								
132	100		- irregularly skarnified sediments, patches of diopside skarn with moderate visible scheelite					mod.	blebs		
			- moderately magnetic pyrrhotite in blebs to 5 mm.								
138	100		- partially serpentized garnet-diopside skarn, veinlets and blebs of quartz, minor visible scheelite.					minor			

DATE 28/6/80

LOGGED BY

A.W. Sleath

NORANDA EXPLORATION COMPANY, LIMITED

Collared		Completed		Core Size		Property		Project No		NTS No.			
25		502		BQ		Cassiar Creek		912		116 C/8			
FIELD COORDINATES						SURVEYED COORDINATES							
Lat. 4925 N		Elev.		Dip		Lat. 9925 N		Elev.		Dip -60			
Dep. 4975 E		Depth		Bearing		Dep. 9970 E		Depth 502		Bearing grid W			
Hole No.		DDH - 1											
Footage	Rec'y	Graphic Log	Description					% Sulp.	Est. Grade	Sample No.	Lt.	scheelite	pyrrhotite
141			- alternating serpentized banded skarn and silicified schist.										
170	90		- highly silicified schist, moderate quartz and calcite veining, minor disseminated pyrrhotite.										minor dissem.
182	95		- serpentized banded skarn, silicified - very hard. quartz-abundant, moderate calcite veining										
191	95		- silicified schist, possible alteration of biotite to chlorite (?)										
197	100		- silicified banded skarn, some calcite veining, no scheelite noted.										
208	95		- silicified schist and siliceous intrusive intrusive - predominantly quartz with minor biotite										
213	100		- silicified, partially serpentized diopside skarn rock is mottled light and dark green.										
218	100		- silicified schist and siliceous intrusive.										
220			- highly silicified banded skarn, some alteration of biotite and diopside to serpentine.										
240			- siliceous schist, quartz as "augins" parallel to foliation.										
245	100		- serpentized and silicified garnet - diopside skarn moderate calcite veining and some visible scheelite									trace	minor
253	100		- silicified and serpentized banded skarn, visible pyrrhotite is non magnetic.									trace	minor
258	100		- marble and banded skarn (marble - uniform grey, moderately crystalline)										
261			- silicified, serpentized diopside skarn.										
268	100		- silicified schist, possible skarnification as pyrrhotite occurs as blebs & veinlets, moderate calcite veining										minor blebs & veinlets

DATE - 28/6/80

LOGGED BY - A.W. Sleath

NORANDA EXPLORATION COMPANY, LIMITED

Collared 25		Completed 502		Core Size BQ		Property Cassiar Creek			Project No 912		NTS No. 116 C/8					
FIELD COORDINATES						SURVEYED COORDINATES						Sheet 3 of 4				
St. 4925 N		Elev.		Dip		Lat. 9925 N		Elev.		Dip -60		Hole No.				
Sp. 4975 E		Depth		Bearing		Dep. 0070 E		Depth 502		Bearing grid W		DDH - 1				
Footage	Rec'y	Graphic Log	Description					% Sulp.	Est. Grade	Sample No.	Lt.	schee- lite	pyrrho- tite			
92	100	DI GI (P)	- serpentized banded skarn, disseminated pyrrhotite some layers show predominantly quartz-calcite and possible talc with little or no phlogopite and no diopside - some minor garnet-diopside skarn.													
99	90	~ ~	- partially skarnified schist, abundant calcite and also quartz as "augens"													
03		A A A	- aplitic intrusive shows remnant garnet (?) - some brecciation along contacts.													
05		GA DI	- silicified, partially serpentized garnet-diopside skarn. outside of core appears brecciated but mineralogy in split core does not reflect external differences									moderate				
14	100	A A A	- aplitic intrusive as above.													
23	90	(GA) DI	- partially serpentized banded skarn, some quartz with minor garnet-diopside, mod. calcite veining.									moderate	dissem. & blebs			
29	95	DI O	- partially serpentized banded skarn, some quartz veining, no scheelite noted.										dissem.			
35	100	DI	- serpentized diopside skarn with minor banded skarn, moderate calcite veining.									trace				
39		~ ~	- partially skarnified schist, predominant minerals calcite - quartz, possible talc.													
53		DI O	- serpentized diopside skarn, minor banded skarn abundant calcite and quartz.									moderate				
55		~ ~	- silicified biotite schist													
64	100	A A A A	- siliceous intrusive, some phases aplitic - biotite shows good foliation - contacts sharp and unbrecciated. Some aplitic or siliceous phases show greenish colour (epidote?)													

NORANDA EXPLORATION COMPANY, LIMITED

Collared 25	Completed 502	Core Size BQ	Property Cassiar Creek	Project No 912	NTS No. 116 C/8
FIELD COORDINATES			SURVEYED COORDINATES		
Lat. 4925 N	Elev.	Dip	Lat. 9925 N	Elev.	Dip -60
Dep. 4975 E	Depth	Bearing	Dep. 9970 E	Depth 502	Bearing grid W

Footage	Rec'y	Graphic Log	Description	% Sulp.	Est. Grade	Sample No.	Lt.	schee- lite	pyrrho- tite
58			- highly siliceous biotite schist						
78		△ △ △ △	- quartz monzonite intrusive as above.						
06		— —	- skarnified (?) schist, calcite & quartz veining, minor banded skarn.						
09		DI BL	- partially serpentinized banded skarn						
24	100	— —	- partially skarnified schist with minor banded skarn.						
27		△ △ △ △	- intrusive, possibly slightly more mafic rich than above, biotite shows some alteration to ?						
29		DI BL	- banded skarn, calcite and some quartz veining						
52		DI BL	- more or less skarnified schist, gradational contacts						
02	100	△ △ △ △	- intrusive as above, some greenish alteration (epidote?) pyrite crystals in clay gouge lining fractures						
			- some large feldspar phenocrysts near bottom of hole						

NORANDA EXPLORATION COMPANY, LIMITED

Drilled	22	Completed	182	Core Size	BQ	Property	Cassiar Creek	Project No	912	NTS No.	116 C/8
FIELD COORDINATES						SURVEYED COORDINATES				Sheet 1 of 2	
Elev.		Dip		Lat. 10 675 N		Elev.		Dip -60		Hole No.	
Depth		Bearing		Dep. 9 960 E		Depth 182		Bearing grid W		DDH-2	

Core No.	Rec'y	Graphic Log	Description	% Sulp.	Est. Grade	Sample No.	Lt.	scheelite	pyrrhotite		
27	30		- boulders of various lithologies in overburden, predominantly quartz-biotite schist.								
48	100		- weathered schists, limonite well developed as alteration of biotite and lining fractures.								
50			- minor intrusive dike, plag. phenos to 2 mm. in medium grain ground mass of quartz-plag-biotite								
52	100		- garnet-diopside skarn, moderate quartz veining, some visible scheelite					mod.	blebs & veinlets		
57	95		- silicified biotite schist								
60			- silicified banded skarn, pyrrhotite as disseminations, in phlogopite layers and non-magnetic						dissem.		
62			partially skarnified, rusty weathering, biotite schist								
67	100		- skarnified schist, predominant mineralogy is quartz-calcite-phlogopite with minor diopside & garnet.						minor		
70			- siliceous intrusive, possible remnant sulfide								
72	100		- serpentinized banded skarn, abundant quartz veining						dissem. & veinlets		
82	100		- siliceous intrusive, no visible biotite, some rusty weathering								
83	90		- silicified schist with minor garnet-diopside skarn @ 84' fault gauge (?) @ 98'								
89	95		- garnet-diopside skarn, well-developed crystalline structure with diopside crystals to 2 mm., abundant calcite and moderate quartz veining, trace moly, minor siliceous intrusive								
12	100		- very siliceous, possible altered diopside skarn (?) minor garnet-diopside skarn with visible scheelite.								

NORANDA EXPLORATION COMPANY, LIMITED

Collared	22	Completed	182	Core Size	BQ	Property	Cassiar Creek	Project No	912	NTS No.	116 C/8
FIELD COORDINATES						SURVEYED COORDINATES				Sheet 2 of 2	
Lat.		Elev.		Dip		Lat.	10 675 N	Elev.		Dip	-60
Dep.		Depth		Bearing		Dep.	9 960 E	Depth	182	Bearing	grid W
											DDH - 2

Footage	Rec'y	Graphic Log	Description	% Sulp.	Est. Grade	Sample No.	Lt.	Schee- lite	pyrrho- tite		
116	100		- banded gray & white, med. grained marble								
120			- well developed garnet-diopside skarn, abundant calcite veinlets, minor quartz					mod.	blebs & veinlets		
135			- siliceous intrusive, with some biotite foliation developed near 120' but becoming less distinct @ 135'								
141	100		- partially serpentinized banded skarn, abundant quartz some calcite veinlets, pyrrhotite weakly to strongly magnetic								
143			- siliceous schist								
144	100		- banded skarn as above								
146			- siliceous intrusive, possibly slightly more biotite rich								
150			- silicified schist.								
152	100		- banded skarn as above								
156	100		- silicified schist								
182			- medium grained, fairly acid intrusive mode quartz: plag:biotite (60:30:10)								
			- some large phenos to 20 mm. some veinlets with epidote, late stage calcite and quartz veinlets throughout								

NORANDA EXPLORATION COMPANY, LIMITED

Collared	50	Completed	43	Core Size	BQ	Property	Cassiar Creek	Project No	912	NTS No.	116 C/8
FIELD COORDINATES						SURVEYED COORDINATES				Sheet 1 of 3	
Lat.	5250 N	Elev.		Dip		Lat.	10 250 N	Elev.		Dip	- 60
Dep.	5000 E (84)	Depth		Bearing		Dep.	9 965 E	Depth	435	Bearing	grid W
											DDH - 3

Footage	Rec'y	Graphic Log	Description	% Sulp.	Est. Grade	Sample No.	Lt.	scheelite	pyrrhotite		
52			- overburden, boulders of varied lithology								
54			- silicified & hornfelsed (in places) biotite schist.								
56			- silicified diopside skarn, abundant pyrrhotite comprises up to 50 %, mod. visible scheelite					mod.	abundant		
72			- hornfelsed sediment (?), dense dark grey rock, very silicic								
92			- grey marble, some pyrrhotite as blebs, some disseminated pyrite						blebs		
97			- aplitic intrusive, very siliceous, superficially resembles marble but does not effervesce in HCl								
103			- hornfels, dark grey, pyrrhotite and calcite veinlets						veinlets		
111	50		- altered schist, core is friable and rusty						dissem.		
116	70		- intrusive core is extremely rubbly and has rusty alteration (possible altered sulfide)								
135	70		- silicified schist, quartz enrichment results in "augen" texture, minor pyrrhotite as dissem. & veinlets						dissem. & veinlets		
140			- intrusive (?), diabase dike, dark grey, med to fine grained								
159	75		- siliceous intrusive, no biotite, some alteration of feldspars to epidote (?), rusty (remnant sulfide?)								
182	40		- altered sediments, core very friable and broken.								
192	90		- altered intrusive, creamy white to slightly green (epidote?) alteration of primary mineralogy								
to quartz-calcite-talc-(epidote?). secondary pyrite occurs as cubes, fault gouge(?) 187-197'											

NORANDA EXPLORATION COMPANY, LIMITED

Collared 50		Completed 435		Core Size BQ		Property Cassiar Creek			Project No 912		NTS No. 116 C/E			
FIELD COORDINATES						SURVEYED COORDINATES						Sheet 2 of 3		
Lat. 5250 N		Elev.		Dip		Lat. 10 250 N		Elev.		Dip - 60		Hole No.		
Dep. 5000 E (BL)		Depth		Bearing		Dep. 9 965 E		Depth 435		Bearing grid W		DDH - 3		
Footage	Rec'y	Graphic Log	Description					% Sulp.	Est. Grade	Sample No.	Lt.	schee- lite	pyrrho- tite	
225	80		-hornfels, some serpentinaization											
235	90		- above grades to fine grain diopside skarn, partially serpentinized										dissem & blebs	
238	100		- intrusive, granodiorite (?)											
242	80		- schist											
247			- mainly serpentinized diopside skarn but some phlogopitic bands, some calcite veining											
262	95		- extremely siliceous sediments, development of quartz "augen" texture, minor banded skarn.											
			- minor diabase dike@ 259', plagphenos to 2 mm.											
266	100		-partially serpentinized banded skarn											
275	70		- silicified schist.											
277			- minor garnet-diopside skarn, abundant quartz, some calcite veining, abundant pyrrhotite as blebs & dissem.									mod.	blebs & dissem.	
285	100		- banded skarn and partially skarnified siliceous sediments.											
292	100		- altered intrusive, rock very rusty, limonite lines fractures and is distributed throughout											
301	100		- above grades to less rusty med-grained quartz monzonite, primary mineralogy appears altered to quartz-calcite-talc, limonites abundant as fracture filling.											
307	100		- appearance of clay mineral (Kaolinite?)											

NORANDA EXPLORATION COMPANY, LIMITED

Collared	50	Completed	435	Core Size	BQ	Property	Cassiar Creek	Project No	912	NTS No.	116 C/B	
FIELD COORDINATES						SURVEYED COORDINATES						
Lat.	5250 N	Elev.		Dip		Lat.	10 250 N	Elev.		Dip	-60	
Dep.	5000 E (84)	Depth		Bearing		Dep.	9 965 E	Depth	435	Bearing	grid W	
											Hole No.	DDH - 3

Footage	Rec'y	Graphic Log	Description	% Sulp.	Est. Grade	Sample No.	Lt.	schee- lite	pyrrho- tite
322		△ △ △	- as above but little calcite, pyrite appears as blebs, some epidote (?) possible						
337	90	△ △ △	- secondary K - feldspar, salmon pink crystals pyrite becoming less abundant and more dissem.						
447	90	△ △ △ △	- core extremely rubbly, primary quartz remains clay alteration intense.						
57	90	△ △ △	- secondary quartz veining, core becoming more silica cemented, less pyrite						
64	100	△ △ △ △	- extremely siliceous intrusive, primarily quartz, minor calcite, pyrite approx 20% of rock as stringers oriented perpendicular to core axis.						
68		△ △ △ △ △ △	- bleached, white rock, quartz stringers with pyrite in quartz-wollastonite (?) matrix.						
75	90	△ △ △ △	- banded, siliceous rock, xenolith of sediment in intrusive.						
94	90	△ △ △ △	- creamy to yellow mottled intrusive, no moly noted but pyrite common as blebs, some moly, clay line fractures						
96		△ △ △ △	- patchy, rusty altered intrusive, no moly noted but pyrite as blebs & dissem.						
35		△ △ △ △	- quartz monzonite to granodiorite - some clay alteration and limonite developed.						

NORANDA EXPLORATION COMPANY, LIMITED

Drilled	34	Completed	407	Core Size	BO	Property	Cassiar Creek	Project No	912	NTS No.	116 C/B
FIELD COORDINATES						SURVEYED COORDINATES				Sheet 1 of 3	
Lat.	5150N	Elev.		Dip		Lat.	10 150 N	Elev.		Dip	-60
Dep.	4990E	Depth		Bearing		Dep.	9 960 E	Depth	407	Bearing	grid W
										Hole No. DDH - 4	

Footage	Rec'y	Graphic Log	Description	% Sulp.	Est. Grade	Sample No.	Lt.	scheelite	pyrrhotite
34			- overburden, boulders of various lithologies including granite, schist and some skarn						
32	60		- garnet-diopside skarn, mod. to intense calcite veins with mod. to abundant visible scheelite, abundant pyrrhotite					mod - abundant	abundant
36			- dappled whit and grey crystalline marble						
37			- intrusive dike, probable fault contact at lower margin.						
37	10		- very broken core, probable fault zone, garnet-diopside skarn has visible scheelite.					mod.	
37	10		- white and grey crystalline marble						
39	70		- partially silicified quartz-biotite schist, minor intrusive dikes						
42			- banded phlogopite rich skarn, abundant pyrrhotite						dissem. & veinlets
45			- intrusive dike - aplitic to quartz monzonite						
49	80		- phlogopite rich skarn, as above						
37	80		- diopside (?) skarn - epidote (?) minor garnet, no visible scheelite						
47	90		- siliceous schist, very hard, bleached, some calcite veining.						
54	90		- partially skarnified schist, some banded phlogopite diopside (?) skarn.						
60	70		- dike, lower contact possibly faulted.						
57			- partially skarnified siliceous schist						

DATE 12/7/80

LOGGED BY A.W. Sleath

NORANDA EXPLORATION COMPANY, LIMITED

Collared 34	Completed 407	Core Size BQ	Property Cassiar Creek	Project No 912	NTS No. 116 C/8
FIELD COORDINATES			SURVEYED COORDINATES		
Lat. 5150 N	Elev.	Dip	Lat. 10 150 N	Elev.	Dip -60
Dep. 4990 E	Depth	Bearing	Dep. 9 96Q E	Depth 407	Bearing grid W
			Sheet 2 of 3		
			Hole No. DDH - 4		

Footage	Rec'y	Graphic Log	Description	% Sulp.	Est. Grade	Sample No.	Lt.	scheelite	pyrrhotite
69		DI BT (PO)	- banded skarn, pyrrhotite throughout						
77	100	~ ~	- partially skarnified siliceous schist						
79		2 DI BT (PO)	- minor banded skarn						
88	100	~ ~	- silicified schist						
90		Δ Δ Δ	- intrusive dike						
00		~ ~	- silicified schist						
01		Δ Δ Δ	- dike						
04		~ ~	- silicified schist						
11		BT	- primarily phlogopite skarn with mod. garnet-diopside, some visible scheelite					mod.	
15		~ ~	- partially skarnified biotite schist, abundant limonite (alteration of biotite)						
17		Δ Δ Δ	- aplitic intrusive dike						
19		DI	-biotite skarn, brown phlogopite with pyrrhotite quartz-calcite, some serpentinization						dissem.
23		DI	-serpentinized diopside skarn, mod. calcite vein/ing.						
28		DI(?)	- silicified green skarn, possible originally diopside skarn or lamprophyre dike (?).						
30		DI BT	- serpentinized banded skarn.						

DATE 12/7/80

LOGGED BY A.W. Sleath

NORANDA EXPLORATION COMPANY, LIMITED

Collared 34	Completed 407	Core Size BQ	Property Cassiar Creek	Project No 912	NTS No. 116 C/8
FIELD COORDINATES			SURVEYED COORDINATES		
Lat. 5150 N	Elev.	Dip	Lat. 10 150 N	Elev.	Dip - 60
Dep. 4990 E	Depth	Bearing	Dep. 9 960-E	Depth 407	Bearing grid W
			Hole No. DDH - 4		

Footage	Rec'y	Graphic Log	Description	% Sulp.	Est. Grade	Sample No.	Lt.	scheelite	pyrrhotite		
46	100	A Δ Δ	- intrusive - minor siliceous schist 237 - 239'								
53		= DI = = BI	-partially serpentized banded skarn, no sulfide abundant quartz & calcite veining								
55	100	A Δ A	- intrusive, aplitic in places, minor schist (xenolith) @ 279'								
59		— —	-biotite-hornblende (?) hornfels								
92	95	— —	- siliceous schist - minor intrusive								
99		² BI ² =	- silicified banded skarn, pyrrhotite as dissem. & blebs, no scheelite noted.							dissem. & blebs	
106	100	BI =	- silicified banded skarn, abundant quartz and moderate calcite veining.								
106		— —	- partially skarnified schist, additional quartz-calcite, original & secondary biotite, some talc.								
106		A Δ A	-intrusive								
105	100	— Δ	- alternating silicified banded skarn and intrusive.								
102		— —	- siliceous schist								
108		= DI = = BI =	- partially serpentized banded skarn.								
108		² BI :	- silicified banded skarn, minor scheelite @ 387'							minor	
107		A Δ A	- main body intrusive, med. grained granodiorite (?) - minor dissem. moly and chalcopryrite								
			- near bottom of hole, large plagphenos to 2 cm.								

DATE 12/7/80

LOGGED BY A.W. Sleath


A P P E N D I C E S



STATEMENT OF QUALIFICATIONS

I, GLEN MACDONALD, of the City of Whitehorse in the Yukon Territory, DO
HEREBY CERTIFY that:

1. I have been employed as a Geologist by Noranda Exploration Company Limited (No Personal Liability) since May 1976.
2. I am a graduate of the University of British Columbia, with a Bachelor of Science degree in Geology.
3. I am a member of the Canadian Institute of Mining and Metallurgy.




G. Macdonald, Geologist,
Noranda Exploration Company Limited
(N.P.L.)

STATEMENT OF QUALIFICATIONS

I, Alan Sleath of the City of Vancouver, British Columbia, do hereby certify that:

1. I have been employed as a geologist by Noranda Exploration Company, Limited (No Personal Liability) since May 1980.
2. I am a graduate of the University of British Columbia, with a Bachelor of Applied Science degree in Geological Engineering.

A handwritten signature in cursive script that reads "Alan Sleath". The signature is written in black ink and is positioned above a horizontal line.

Alan Sleath, Geologist

NORANDA EXPLORATION COMPANY, LIMITED

STATEMENT OF COST

PROJECT CASSIAR CREEK (912)

DATE August 22, 1980

TYPE OF REPORT Drilling

a) Wages:

No. of Days 42

Rate per Day \$61.67619

Month Of: January 1, 1980 to July 31, 1980

Total Wages 42 x \$ 61.67619 2,590.40

b) Food and Accomodation:

No of days 42

Rate per day \$17.159286

Month of: January 1, 1980 to July 31, 1980

Total Cost 42 x \$ 17.59286 720.69

c) Transportation:

No of days 42

Rate per day \$247.70857

Month of: January 1, 1980 to July 31, 1980

Total Cost 42 x \$ 247.70857 10,403.76

d) Instrument Rental:

Type of Instrument

No of days

Rate per day \$

Month of:

Total Cost X \$

Type of Instrument

No of days

Rate per day \$

Month of:

Total Cost X \$

f) Analysis
(See attached schedule)

g) Cost of preparation of Report

Author

Drafting

Typing

h) Other:

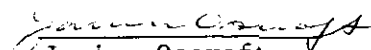
Contractors	23,773.42	
Camp & Field Supplies	400.73	<u>24,174.15</u>

Total Cost \$37,889.00

e) Unit costs for Other

No of days	42	
Dates From:	January 1, 1980 to July 31, 1980	
XXXXXXXXXX		
No. of Units	479.46 Meters/	
Unit Costs	\$49.58374 / m	
Total Cost	\$49.58374x 479.46	\$23,773.42

The exploration cost of \$37,889.00 is certified correct.


Janice Oscroft
Br. Accountant

REPORT OF PRELIMINARY DRILLING AND
ASSOCIATED ACTIVITIES
ROAD 1-4 and RAIL 1-212 MINERAL CLAIMS
(CASSIAR CREEK 116C/8)

NORANDA EXPLORATION COMPANY, LIMITED
(NO PERSONAL LIABILITY)

August 1980

Alan Sleath

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INTRODUCTION

This preliminary report covers drilling and associated activities on the Road 1-4 and Rail 1-212 claims, between June 15 and July 8, 1980. The work covered by this report was confined to the area of Grid 1 in the vicinity of Rail 31-32 claims (Figure 1 in pocket).

Work carried out in the period included cutting and surveying 750 m (2460 ft.) of baseline, surveying 4 drill sites, and drilling 465 m (1526 ft.) in 4 holes. Recovered core has been stored in the warehouse of Noranda Exploration of Whitehorse, Y.T. In addition, a base camp was established at the site of the original Pionjar Creek camp.

LINECUTTING

It was decided that the original Grid 1 established during July 1979 provided insufficient location control. A new baseline was established approximately parallel to the original. This was cut and stations were surveyed in every 50 m. Drill hole locations, which had been approximately established on the original grid, were then surveyed from the new baseline. All linecutting and survey work was done by the author and D. van Dieren. This work was Completed by June 20.

DRILLING

Approximately 465 m (1526 ft.) of drilling was carried out in 4 holes. Drilling was carried out by Drilcor Industries of Richmond, B.C. under contract to Noranda Exploration Company, Limited. The machine used was the Hydro-Wink, a small helicopter-portable hydraulic diamond drill. Drilling was carried out over the period June 21 to July 8 by two 2-man shifts. Helicopter support for camp maintenance and drill moves was provided by Trans North Turbo Air Ltd. Bell 206 Helicopters based in Dawson City were utilized. Total helicopter time used was 41.3 hours. This included time spent moving a fly camp which was doing mapping and sampling in conjunction with this project.

LITHOLOGIES

Schist

Nasina Series meta-sediments observed in the drill core are predominantly biotite rich, siliceous schists. Prominent foliation is generally developed except where the sediments are silicified. In these sections, sediments are hornfelsed and silica enriched. Quartz "eyes" are developed parallel to foliation giving an augen-like texture. This silicified rock is extremely hard and generally competent.

Throughout most sections, meta-sediments show evidence of alteration by hydrothermal fluids. Silica enrichment has been discussed, but in addition there is complete gradation between relatively un-weathered quartz-biotite schist and totally "skarnified" rock. Thus, contacts are gradational between meta-sediments and the various skarn types discussed below.

Veining is ubiquitous within these rocks. Quartz and calcite veining occur on all scales from veinlets less than 0.1 mm to veins 1 or more cm wide. No scheelite was noted associated with any unskarnified rocks of this series.

Skarn

Three basic types of skarn assemblage were observed. These were: banded skarn, diopside skarn and garnet-diopside skarn. Separation of the three types is mostly subjective, however, and all contacts are gradational.

Banded Skarn

Physical appearance of the banded skarn is distinctive. Dirty brown bands irregularly cut dull green rock. On a fresh surface, the bands can be seen to be phlogopite rich with or without disseminated pyrrhotite. This pyrrhotite is extremely fine-grained and may be non-magnetic to moderately magnetic. Outside surfaces of the core show copper coloured flashes which are phlogopite.

Greenish portions of the rock consist of fine-to-medium grained diopside and calcite or quartz. Some diopside rich portions may be partially to wholly serpentized.

Diopside Skarn

Medium to dark green in colour, this unit is identical to the greenish portions of the banded skarn. Individual diopside crystals may reach 1 cm in length but are commonly much smaller. Serpentinization is common and fairly widespread.

Garnet-Diopside Skarn

This unit is essentially the same as pure diopside skarn but has large irregular patches of garnet. This is blood red to slightly orange and is generally massive although discreet crystals may be seen. Probable composition, judging by colour, is grossular-almandine solid solution.

Marble

Marble is relatively common in outcrop on the property but was not observed to any extent in core. In outcrop, this unit is medium grained, crystalline and dappled white-grey in colour. Core is similar, although recoveries were generally poor when drilling in this unit.

Intrusive

The main body of the intrusive is a medium-grained quartz monzonite. This unit shows substantial variation with aplitic and pegmatitic phases. Exclusive of the border phases, however, the unit shows considerable homogeneity. Numerous dykes, presumably offshoots of the main body, cut the stratigraphy at all levels encountered and seem parallel to the foliation of the metasediments.

Considerable alteration exists. Plagioclase seems altered to epidote and there is good development of secondary clay mineral (kaolinite?) in some sections. Secondary pyrite as small cubes, blebs and disseminations is common, especially associated with other types of alteration. Talc is common and secondary calcite and quartz veining is ubiquitous.

Results

A summary of the criteria used to locate the 4 holes drilled may be found in Table 1. The purpose of these holes was to better define geologic conditions in the area and provide some insight for the location of further work. The programme was, therefore, reconnaissance in nature.

Sections for the holes (Figure 2 in pocket) indicate substantial if discontinuous intersection with skarn. Higher tungsten seem slightly associated with the development of garnet-diopside skarn. The presence or absence of pyrrhotite has no noticeable effect.

Assays for other elements are insignificant.

TABLE 1

SUMMARY OF HOLES DDH-1, 2, 3, and 4.

- DDH-1 (9925N, 9970E)
- moderate VLF anomaly, weak mag anomaly
 - mineralized outcrop in vicinity (0.22% W_3)
 - moderate geochem sownslope
 - favourable geology
- DDH-2 (10675N, 9960E)
- strong mag anomaly, moderate VLF anomaly
 - mineralized float nearby (0.4 - 0.5% W_3)
 - moderate geochem anomaly
 - favourable geology
- DDH-3 (10250N, 9965E)
- strong VLF, moderate mag anomaly
 - mineralized float 150 m north and south (to 4% W_3)
 - strong geochem anomaly
 - favourable geology
- DDH-4 (10150N, 9960E)
- moderate VLF, moderate mag anomaly
 - mineralized float nearby (to 4% W_3)
 - strong geochem anomaly
 - favourable geology

CONCLUSIONS AND RECOMMENDATIONS

Although this initial drilling failed to intersect high-grade mineralization, the results are encouraging. Some tungsten mineralization was found and substantial skarn zones were intersected which could have been favourable to scheelite deposition.

Controls on the distribution of scheelite mineralization are diffuse and no clearcut associations are apparent. This will make the location of future drill targets virtually impossible by geophysical means. Geologic mapping and possibly deep overburden sampling will undoubtedly provide a superior indication of mineral potential. Further stream sediment sampling would not be worthwhile.

Three types of further work is suggested for this area: Firstly, an airbourne survey should be flown to establish with greater certainty the location of the contact between Nasina Series metasediments and the Cretaceous intrusive. Good control should be obtainable with air photos even at low altitude. This survey should cover the entire mapped area of the intrusive body and extend beyond its boundaries by at least 2-3 miles. This will allow establishment of regional background values, hopefully beyond the aureole of contact alteration.

Secondly, further geologic work is recommended. This will likely entail the establishment of further grid lines to maintain good location control. Further soil sampling along these grid lines is also recommended and possibly deep overburden sampling in selected areas might be effective. Ground geophysics could also be done in conjunction with other work.

Thirdly, an extensive second phase drill programme should be undertaken. This seems to be the only foolproof method of determining the geology and economic potential of the property. Suggested locations for further exploratory work in the Grid 1 area are indicated in figure 3. These are primarily based on two rationales:

- 1) To explore the area further away from the sediment/intrusive contact;
- 2) The presence of marble, indicating an abundance of Ca, may be important for the formation of economic scheelite mineralization.

Additionally, drilling in the Grid 2 area should be undertaken. This will provide some knowledge about another area of the contact and avoid concentration of all resources on one small area. Total contact length probably exceeds 30 km and concentration on one area could lead to disastrous oversights.

The author feels this property deserves further work in the areas indicated. Relatively easy access to road transport would make even a small deposit viable. Early results should not be taken as discouraging as they were spread relatively far apart in areas of poor exposure. Good mineralization grading to 4% WO_3 have been located on the property and there is every reason to expect that elsewhere on the claim block the same could be found.

APPENDIX 1

ASSAY RESULTS DDH-1, 2, 3, and 4

Rossbacher Laboratory Ltd.

GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S. SPRINGER AVE.,
BURNABY, B. C.
CANADA
TELEPHONE: 299-6910
AREA CODE: 604

AMENDED

CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 80410-1

TO: NORANDA EXPLORATION CO LTD.
1050 Davie St.
Vancouver, B.C.

INVOICE NO. 0257

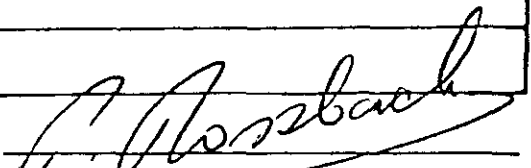
DATE RECEIVED

ATTN: 912 # 7-82 CASSIAR CREEK A.S.K. tk

DATE ANALYSED Aug, 1980

SAMPLE NO.:	% WO ₃	% T.Mo	oz/T Au	oz/T Ag
P 6326	0.05	0.001	0.001	0.02
6327	0.01	0.001	0.001	0.02
6328	0.01	0.001	0.001	0.02
6329	0.01	0.001	0.001	0.02
6330	0.01	0.001	0.001	0.02
6331	0.06	0.004	0.001	0.02
6332	0.02	0.001	0.001	0.02
6333	0.02	0.001	0.001	0.02
6334	0.01	0.001	0.001	0.02
6335	0.01	0.001	0.001	0.02
6336	0.01	0.001	0.001	0.02
6337	0.01	0.001	0.001	0.02
6338	0.01	0.001	0.001	0.02
6339	0.01	0.001	0.001	0.02
6340	0.01	0.001	0.001	0.02
6341	0.01	0.002	0.001	0.02
6342	0.01	0.008	0.001	0.02
6343	0.01	0.001	0.001	0.02
6344	0.01	0.001	0.002	0.02
6345	0.01	0.001	0.001	0.02
6346	0.01	0.001	0.001	0.02
6347	0.01	0.001	0.001	0.02
6348	0.01	0.001	0.001	0.02
6349	0.01	0.001	0.001	0.02
6350	0.01	0.001	0.001	0.02
6351	0.01	0.001	0.001	0.02
6352	0.01	0.001	0.001	0.02
6353	0.01	0.001	0.001	0.02
6354	0.01	0.001	0.001	0.02
6355	0.01	0.001	0.001	0.02
6356	0.01	0.006	0.001	0.02
6357	0.14	0.001	0.001	0.02
6358	0.01	0.001	0.001	0.02
6359	0.01	0.001	0.001	0.02
6360	0.01	0.001	0.001	0.02
6361	0.03	0.001	0.001	0.02
6362	0.02	0.001	0.001	0.02
6363	0.01	0.001	0.001	0.02
6364	0.01	0.001	0.001	0.02
6365	0.01	0.001	0.016	0.02

Certified by



APPENDIX 2

SAMPLE REPORTS DDH-1, 2, 3, and 4

NORANDA EXPLORATION COMPANY, LIMITED

N.T.S. 116C/8

PROPERTY CASSIAR CREEK - 912

DATE 5/7/80

SAMPLE REPORT

SAMPLE NO.	LOCATION & DESCRIPTION	TYPE	WIDTH Length	oz/T		ASSAYS		%		SAMPLED BY
				Au	Ag			W ₃	T. Mo	
P6365	DDH-3 64-66' silicified diopside skarn with moderate visible scheelite	split core	2 ft	0.016	0.02			0.01	0.001	A.W.S.
P6366	DDH-3 99-103' dark grey hornfels, siliceous, pyrrhotite veinlets	"	4 ft	0.001	0.02			0.01	0.001	A.W.S.
P6367	DDH-3 127-132' possible partially skarnified sediments, pyrrhotite as disseminations & veinlets	"	5 ft	0.001	0.02			0.01	0.001	A.W.S.
P6368	DDH-3 22-227' partially serpentinized, fine grained diopside skarn	"	5 ft	0.001	0.02			0.01	0.001	A.W.S.
P6369	DDH-3 227-232' as P6368	"	5 ft	0.001	0.02			0.01	0.001	A.W.S.
P6370	DDH-3 242-247' banded skarn, mainly serpentinized diopside skarn with minor biotite	"	5 ft	0.001	0.02			0.01	0.001	A.W.S.
P6371	DDH-3 262-265' partially serpentinized banded skarn, minor diopside skarn	"	3 ft	0.001	0.02			0.01	0.001	A.W.S.
P6372	DDH-3 275-277' garnet-diopside skarn, abundant pyrrhotite, moderate scheelite	"	2 ft	0.001	0.02			0.12	0.001	A.W.S.

NORANDA EXPLORATION COMPANY, LIMITED

N.T.S. 116C/8

PROPERTY CASSIAR CREEK - 912

DATE 3/7/80

SAMPLE REPORT

SAMPLE NO.	LOCATION & DESCRIPTION	TYPE	WIDTH Length	oz/T		ASSAYS		%		SAMPLED BY
				Au	Ag		WO	T. Mo		
P6353	DDH-1 275-279' banded calcite-quartz and biotite (pyrrhotite) skarn	split core	4 ft	0.001	0.02		0.01		0.001	A.W.S.
P6354	DDH-1 279-284' banded skarn minor garnet-diopside skarn	"	5 ft	0.001	0.02		0.01		0.001	A.W.S.
P6355	DDH-1 284-289' as for P6354	"	5 ft	0.001	0.02		0.01		0.001	A.W.S.
P6356	DDH-1 289-292' as for P6354	"	3 ft	0.001	0.02		0.01		0.006	A.W.S.
P6357	DDH-1 303-305' partially serpentinized garnet-diopside skarn	"	2 ft	0.001	0.02		0.14		0.001	A.W.S.
P6358	DDH-1 314-319' partially serpentinized diopside skarn	"	5 ft	0.001	0.02		0.01		0.001	A.W.S.
P6359	DDH-1 319-323' as P6358	"	4 ft	0.001	0.02		0.01		0.001	A.W.S.
P6360	DDH-1 329-335' serpentinized diopside skarn	"	6 ft	0.001	0.02		0.01		0.001	A.W.S.
P6361	DDH-1 339-344' diopside skarn with minor banded skarn	"	5 ft	0.001	0.02		0.03		0.001	A.W.S.

NORANDA EXPLORATION COMPANY, LIMITED

N.T.S. 116C/8

PROPERTY CASSIAR CREEK - 912

DATE 2/7/80

SAMPLE REPORT

SAMPLE NO.	LOCATION & DESCRIPTION	TYPE	DEPTH Length	OZ/T		ASSAYS		%		SAMPLED BY
				Au	Ag			WO ₃	T. Mo	
P6344	DDH-1 176-182' silicified, partly serpentized banded skarn	split core	6 ft	0.002	0.02			0.01	0.001	A.W.S.
P6345	DDH-1 208-213' silicified diopside skarn	"	5 ft	0.001	0.02			0.01	0.001	A.W.S.
P6346	DDH-1 218-220' silicified banded skarn	"	2 ft	0.001	0.02			0.01	0.001	A.W.S.
P6347	DDH-1 240-245' silicified, serpentized garnet-diopside skarn - minor scheelite	"	5 ft	0.001	0.02			0.01	0.001	A.W.S.
P6348	DDH-1 245-250' silicified, serpentized banded skarn	"	5 ft	0.001	0.02			0.01	0.001	A.W.S.
P6349	DDH-1 150-253' as P6348	"	3 ft	0.001	0.02			0.01	0.001	A.W.S.
P6350	DDH-1 253-258' marble and banded skarn	"	5 ft	0.001	0.02			0.01	0.001	A.W.S.
P6351	DDH-1 258-261' serpentized diopside skarn	"	3 ft	0.001	0.02			0.01	0.001	A.W.S.
P6352	DDH-1 270-275' banded calcite-quartz and biotite (pyrrhotite) skarn	"	5 ft	0.001	0.02			0.01	0.001	A.W.S.

NORANDA EXPLORATION COMPANY, LIMITED

N.T.S. 116C/8

PROPERTY CASSIAR CREEK - 912

DATE 2/7/80

SAMPLE R E P O R T

SAMPLE NO.	LOCATION & DESCRIPTION	TYPE	Width Length	oz/T		ASSAYS		%		SAMPLED BY
				Au	Ag		W ₀₃	T. Mo		
P6335	DDH-1 52-57' serpentized diopside skarn	split core	5 ft	0.001	0.02		0.01		0.001	A.W.S.
P6336	DDH-1 57-62' serpentized diopside skarn	"	5 ft	0.001	0.02	/	0.01		0.001	A.W.S.
P6337	DDH-1 72-76' serpentized banded skarn, diopside (quartz) and biotite (pyrrhotite) irregularly banded	"	4 ft	0.001	0.02		0.01		0.001	A.W.S.
P6338	DDH-1 76-80' serpentized banded diopside (quartz) and biotite (pyrrhotite) skarn	"	4 ft	0.001	0.02		0.01		0.001	A.W.S.
P6339	DDH-1 92-94' silicified banded skarn	"	2 ft	0.001	0.02		0.01		0.001	A.W.S.
P6340	DDH-1 123-127' partially skarnified schist and serpentized diopside skarn	"	4 ft	0.001	0.02		0.09		0.001	A.W.S.
P6341	DDH-1 127-132' as for P6340	"	5 ft	0.001	0.02		0.01		0.002	A.W.S.
P6342	DDH-1 132-138' partially serpentized garnet-diopside skarn	"	6 ft	0.001	0.02		0.01		0.008	A.W.S.
P6343	DDH-1 170-176' silicified partly serpentized banded skarn	"	6 ft	0.001	0.02		0.01		0.001	A.W.S.

NORANDA EXPLORATION COMPANY, LIMITED

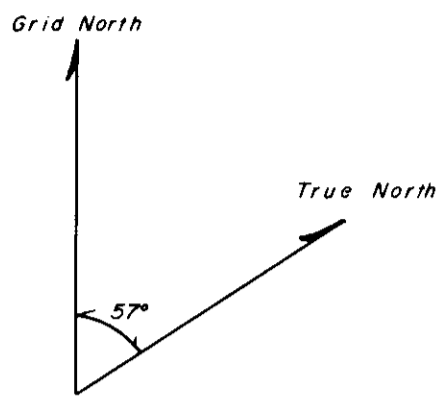
N.T.S. 116C/8

PROPERTY CASSIAR CREEK (912)

DATE 28/6/80

SAMPLE REPORT

SAMPLE NO.	LOCATION & DESCRIPTION	TYPE	WIDTH Length	oz/T		ASSAYS		%		SAMPLED BY
				Au	Ag		W ₃	T. Mo		
P6326	Hole DDH-2 50-52' garnet-diopside skarn with visible scheelite	split core	2 ft	0.001	0.02		0.05		0.001	A.W.S.
P6327	Hole DDH-2 57-60' silicified banded diopside and biotite (pyrrhotite) skarn	"	3 ft	0.001	0.02		0.01		0.001	A.W.S.
P6328	Hole DDH-2 62-67' calcite skarn, minor pyrrhotite	"	5 ft	0.001	0.02		0.01		0.001	A.W.S.
P6329	Hole DDH-2 70-72' serpentized, banded diopside and biotite (pyrrhotite) skarn	"	2 ft	0.001	0.02		0.01		0.001	A.W.S.
P6330	Hole DDH-2 104-107' crystalline garnet-diopside skarn, possible trace molybdenite	"	3 ft	0.001	0.02		0.01		0.001	A.W.S.
P6331	Hole DDH-2 109-112' siliceous diopside skarn, minor garnet-diopside skarn	"	3 ft	0.001	0.02		0.06		0.004	A.W.S.
P6332	Hole DDH-2 116-120' garnet-diopside skarn to pyrrhotite as blebs & veinlets, visible scheelite	"	4 ft	0.001	0.02		0.02		0.001	A.W.S.
P6333	Hole DDH-2 135-141' serpentized, banded diopside and biotite (pyrrhotite) skarn	"	6 ft	0.001	0.02		0.02		0.001	A.W.S.



DHH-2

10,700 N

10,675 N

TOP OF CUT BANK
DEFINE STRATIGRAPHY

10,600 N

10,500 N

10,400 N

10,300 N

DDH-3

STEP BACK AND UP STRATIGRAPHY

10,200 N

DDH-4

STEP BACK AND UP STRATIGRAPHY

10,100 N

NEAR MARBLE
EXPOSURE

GOOD GEOCHEM RESPONSE

10,000 N

DDH-1

GOOD GEOCHEM RESPONSE

9,900 N

9,975 E

10,000 E

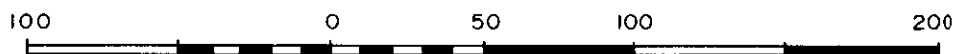
⊕ EXISTING DRILL HOLES

○ PROPOSED AREAS FOR FURTHER DRILLING

J. Macdonald

CASSIAR CREEK PROJECT

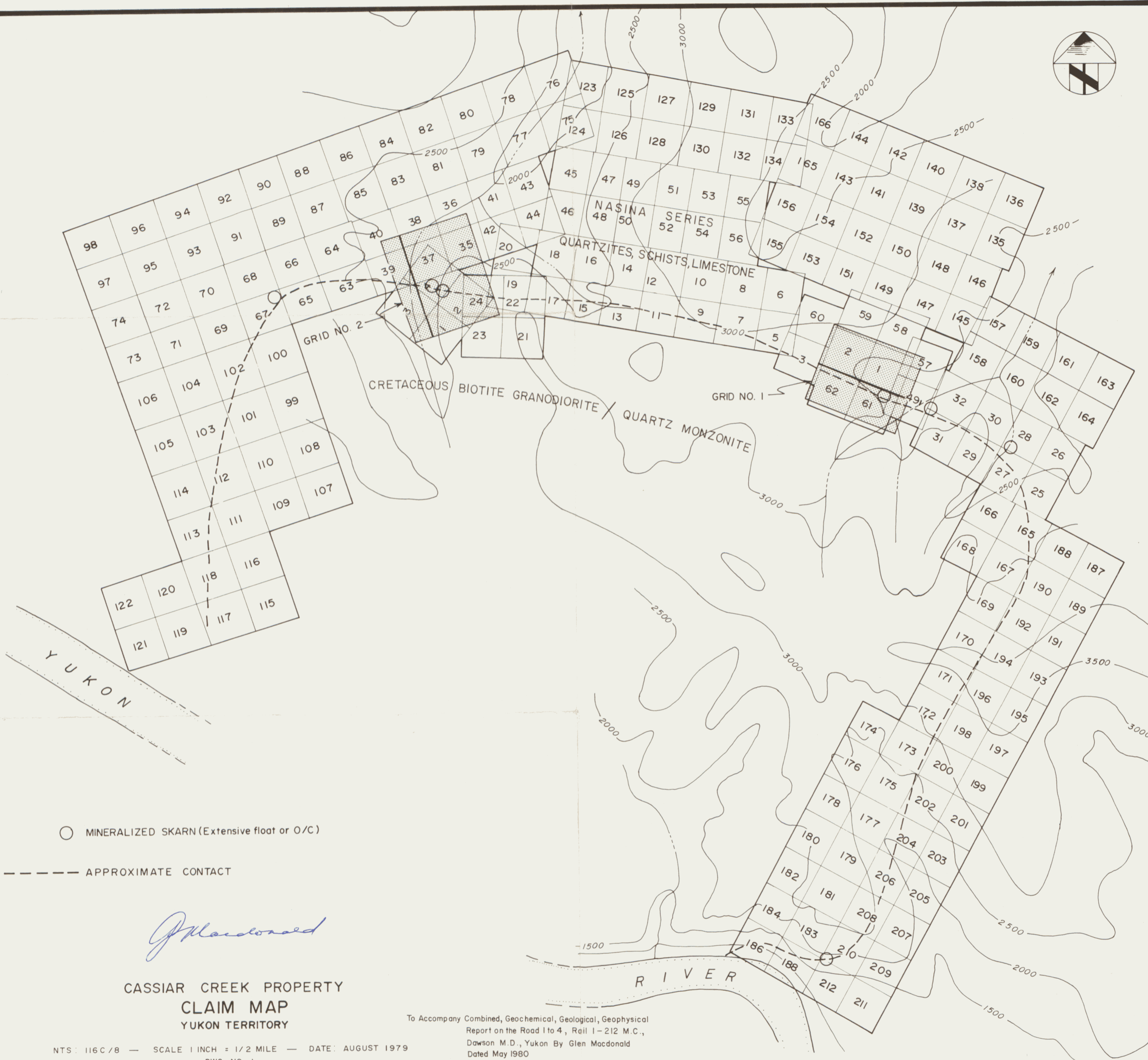
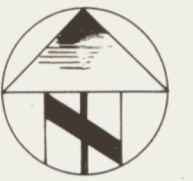
PROPOSED FURTHER EXPLORATION DRILLING



SCALE IN METERS

1: 2,500

FIG. 3

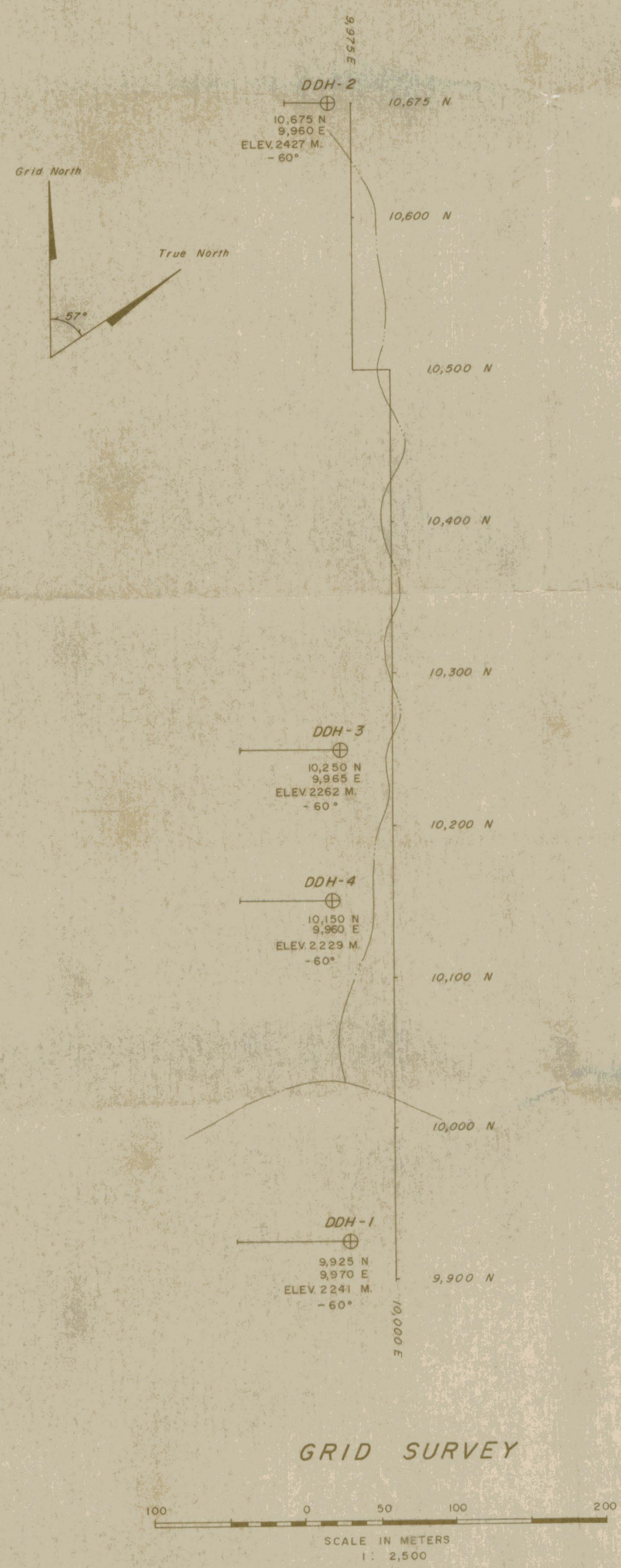


J. Macdonald

CASSIAR CREEK PROPERTY
CLAIM MAP
YUKON TERRITORY

NTS: 116C/8 — SCALE 1 INCH = 1/2 MILE — DATE: AUGUST 1979
DWG. NO. 1

To Accompany Combined, Geochemical, Geological, Geophysical
Report on the Road 1 to 4, Reil 1-212 M.C.,
Dawson M.D., Yukon By Glen Macdonald
Dated May 1980



LEGEND

- OVERBURDEN - FROZEN OR PARTIALLY FROZEN SOIL WITH ABUNDANT WEATHERED BOULDERS OF VARYING LITHOLOGY (Schist, Intrusive, Skarn)
- SCHIST - NASINA "SERIES" METASEDIMENTS, MAINLY QUARTZ - BIOTITE SCHIST ENRICHMENT IN CALCITE AND/OR QUARTZ IS WIDESPREAD, BUT VARIABLE. SILICA ENRICHMENT MAY TAKE THE FORM OF "EYES" RESEMBLING AUGEN TEXTURE.
- MARBLE - GREY AND WHITE DAPPLED, MEDIUM GRAINED.
- BANDED SKARN - INTERCALATED BIOTITE (VAR. PHLOGOPITE) AND DIOPSIDE SKARN. BIOTITE MAY HAVE NON TO MODERATELY MAGNETIC PYRRHOTITE AS DISSEMINATIONS. SILIFICATION COMMON, QUARTZ AND CALCITE VEINING ABSENT TO MODERATE.
- DIOPSIDE SKARN - CONTAINS DIOPSIDE CRYSTALS TO 2 MM. QUARTZ AND CALCITE ARE COMMON. PYRRHOTITE OCCURS AS DISSEMINATIONS, BLEBS OR VEINLETS. MAY BE PARTIALLY TO TOTALLY SERPENTINIZED.
- GARNET - DIOPSIDE SKARN - MOTTLED RED AND GREEN, MAY BE SERPENTINIZED. PYRRHOTITE COMMON AS BLEBS OR VEINLETS.
- VEIN QUARTZ - PURE WHITE TO MILKEY - OCCURS AS STRINGERS AND VEINS OFTEN ASSOCIATED WITH INTRUSIVE DIKES. (Only thickness greater than one foot noted as separate lithologic unit.)
- INTRUSIVE - MAINLY MEDIUM GRAINED QUARTZ MONZONITE. SOME APLITIC AND PEGMATITIC PHASES. SOME EPIDOTE AND KAOLINITE ALTERATION. CONTACTS GENERALLY SHARP BUT MAY SHOW BRECCIATION.

ASSAY ORDER - W_{O_3} / %



J. McDonald

REVISED	CASSIAR CREEK PROJECT	
SEPT 1980	GEOLOGICAL SECTIONS	
	DDH-1, 2, 3 & 4	
PROJ. No. 912	SURVEY BY: AWS	DATE: JULY 1, 1980
N.T.S. 116 C/B	DRAWN BY: J.V.V.	SCALE:
DWG. No.	NORANDA EXPLORATION	
	OFFICE: VANCOUVER	