

COMBINED GEOLOGICAL AND GEOCHEMICAL REPORT

KAY GROUP

62° 31' N 129° 24' E

NAHANI MINING DIVISION

105 I/11

P.M. McAndless
J.D. Knauer
G.E. Dirom, P. Eng.

Noranda Exploration Company Limited

August 7, 1973

August 21 - August 27, 1973

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

\$3697.07

D.B. Craig

Resident Geologist or
~~Resident Mining Engineer~~

Considered as representation work under
Section 53 (4) Yukon Quartz Mining Act

[Signature]
Commissioner of Yukon Territory

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COMBINED GEOLOGICAL
and
GEOCHEMICAL REPORT
on the
KAY GROUP

Noranda Exploration Company Limited

INTRODUCTION

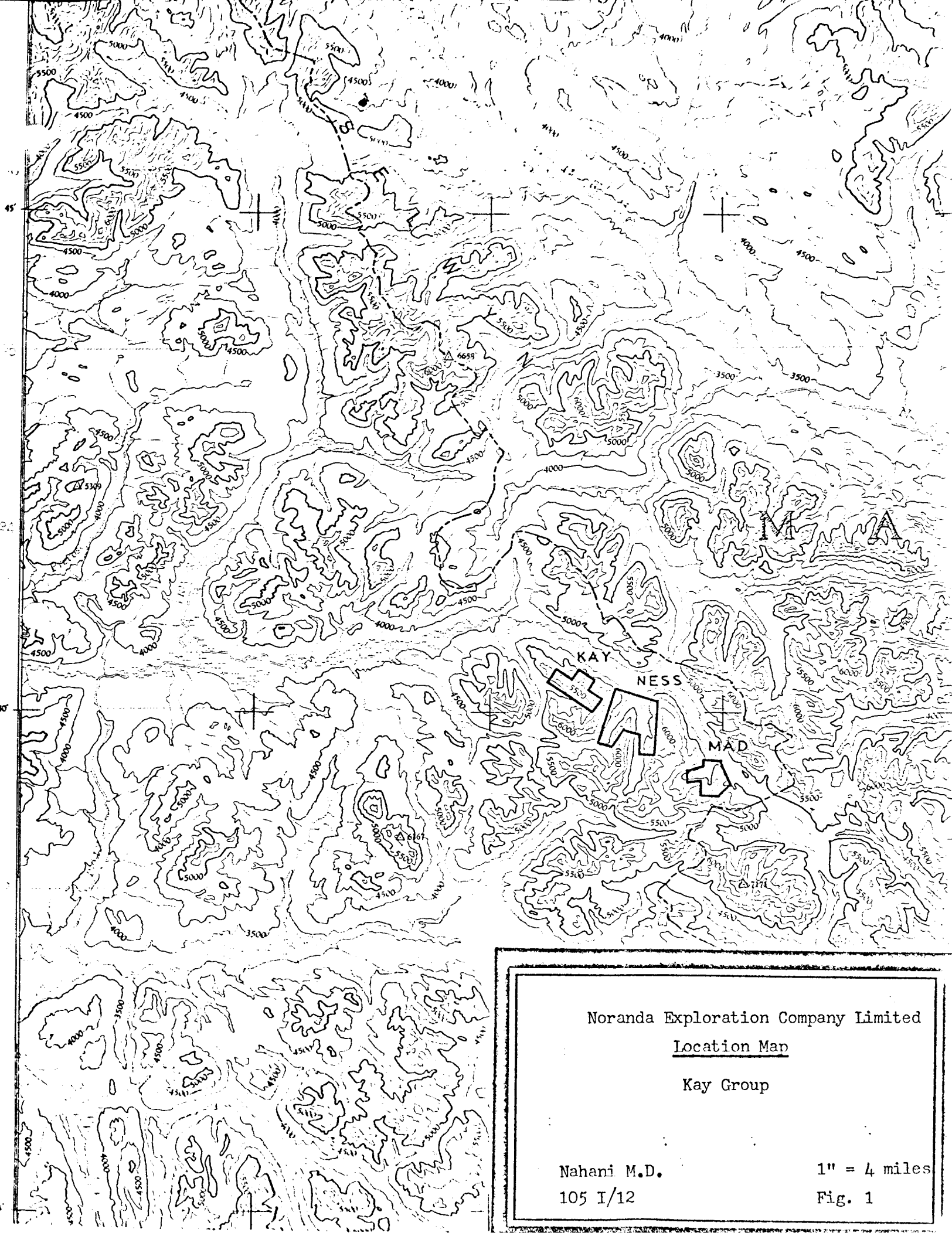
The claims referred to in this report are registered in the name of Noranda Exploration Company Limited (No Personal Liability). The claim group consists of 16 mineral claims.

<u>Claim Name</u>	<u>Grant Number</u>
Kay #1	Y70707
Kay #2	Y70708
Kay #3	Y70709
Kay #4	Y70710
Kay #5	Y70711
Kay #6	Y70712
Kay #7	Y70713
Kay #8	Y70714
Kay #9	Y70715
Kay #10	Y70716
Kay #11	Y70717
Kay #12	Y70718
Kay #13	Y70719
Kay #14	Y70720
Kay #15	Y70721
Kay #16	Y70722

The Kay claim group is located approximately 179 miles north of Watson Lake, Yukon Territory, on a tributary of the Pelly River. Access to the property is by means of helicopter or fixed wing from Watson Lake. The claim group lies on west trending valleys and ridges. Elevation ranges from 4900 to 6000 feet a.s.l.

Geological and geochemical surveys were carried out by Noranda Exploration Company Limited during the periods August 7, 1973 and August 21 to August 27, 1973. The work was performed under the direction of G.E. Dirom, P. Eng. with field supervision by P.M. McAndless (geological). Geochemical field and laboratory procedure was co-ordinated by J.D. Knauer.

The geological survey was plotted on a 1 inch to 1000 feet airphoto controlled topographic base map. The geochemical stream sediment survey was plotted on the same scale base map.



Noranda Exploration Company Limited
Location Map
Kay Group

Nahani M.D. 1" = 4 miles
105 I/12 Fig. 1

GEOLOGY

The geological survey was recorded on a 1 inch to 1000 foot, airphoto controlled, topographic base map. Geological investigation was restricted mainly to ridge tops where rock was best exposed.

Stratigraphy

The Kay claim group is underlain by a sequence of sedimentary rocks of Devonian and Mississippian age (G.S.C., Map 8-1967, Nahani). A Black Clastic Unit (Nahani Formation (?)) was the only formation exposed. The Road River Formation and a Wavy Banded Unit (Broken Skull Formation (?)) possibly transect the northern most section of the claims, but talus and overburden have concealed them.

Table of Formations

Era	Period	Formation and thickness (feet)	Lithology
Paleozoic	Devonian and Mississippian (?)	Black Clastics >5000 (Nahani (?))	interbedded silty, sandy and pebble shale, chert sandstone and pebble conglomerate.

The Black Clastic Unit which overlies the Road River Formation and Wavy Banded Unit comprises resistant, thick-bedded, grey weathering, repetitive interbeds of silty, sandy and pebble shale as well as chert sandstone and chert-pebble conglomerate.

Dark grey, laminated, fissile to platy, silty shale possibly represents the basal beds of the thick clastic sequence. These well cleaved, iron-stained, somewhat recessive rocks grade into coarser fraction interbeds of sandy and pebble shale. These fine to coarse-grained, green-grey weathering rocks are relatively resistant and well defined beds that range up to 300 feet thick. A 100 foot wide band of very resistant, light grey weathering, medium to very coarse-grained chert sandstone combined with chert-pebble conglomerate transect the northern section of the claims. The Black Clastic Unit occupies all of the claim group. This unit is probably comparable to the Nahani Formation of Devonian and Mississippian age. No exposed Road River Formation or Wavy Banded Unit were located although possibly concealed by talus and overburden in the northern most section of the claims.

Structure

A northwesterly trending, narrow, open anticline with steep dipping limbs is the dominant structural feature on the Kay claim group. Local drag folding is evident particularly in the silty shales. The average

dip of the beds is 75 degrees near the anticlinal axis with moderate dips away from the axis. The chert-pebble conglomerate couldn't be traced on the southern limb of the anticline due to a lack of outcrop.

Mineralization

No visible lead, zinc and copper mineralization was encountered on the Kay claim group.

GEOCHEMICAL STREAM SEDIMENT SURVEY

All stream sediments were analyzed for copper, lead, zinc, molybdenum and cadmium in the Noranda Exploration Company Limited laboratory, located at 1050 Davie Street, Vancouver 5, B.C. The analyst was Evert VanLeeuwen.

Sampling Method

Samples were obtained by collecting the finest transported material available - preferably silt, from the centre portion of the creek, away from the creek banks. The samples were placed in "Hi Wet Strength 3½" x 6 1/8" Open End" envelopes and the sample number and collectors initials marked on the envelopes with indelible felt pen. Stream sediments were taken wherever possible on all the main drainages and their tributaries. The sample interval varied but was approximately one sample every 500 feet, if possible.

Laboratory Determination Method

The samples are first placed in a drying cabinet for a period of 24 to 48 hours. The sample material is then screened and sifted to obtain a -80 mesh fraction.

The determination procedure for soluble copper, lead, and zinc is as follows:

0.200 grams of the -80 mesh material is digested with 5 ml. of 0.5 NHCl to a boil for 25 minutes. The sample is brought back to 5 ml. with 0.5 NHCl after cooling. A Varian Techtron Model AA-5 Atomic Absorption Spectrophotometer was used to determine the parts per million copper, zinc, and lead content in each sample.

The determination procedure for total cadmium and molybdenum is as follows:

0.200 grams of the -80 mesh material is digested in 2 ml. of HClO₄ and 0.5 ml. of HNO₃ for approximately four hours. Following digestion, each sample is diluted to 5 ml. with demineralized H₂O. A Varian Techtron Model AA-5 Atomic Absorption Spectrophotometer was used to determine the parts per million lead and molybdenum content in each sample.

The theory of Atomic Absorption Spectrophotometer is fully described in the literature and will not be described in this report.

Presentation of Results

Results of the stream sediment survey are presented in Drawing No's. 4, 5, and 6 of this report; plan maps (scale 1 inch = 1000 feet) showing copper/molybdenum, lead/zinc and cadmium.

Discussion of Results

Stream sediments were taken in the area of the Kay Group of mineral claims

and analyzed for copper, molybdenum, lead, zinc, and cadmium. The evaluation of the content of the above elements at each sample location in conjunction with the geology of the area did not show any anomalous results in the stream sediments.

CONCLUSIONS AND RECOMMENDATIONS

No visible lead, zinc, or copper mineralization was encountered.

A limited geochemical soil survey may be warranted in areas covered.

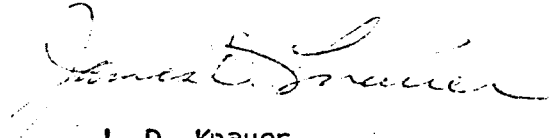
Respectfully submitted,

A handwritten signature in black ink, appearing to read "G.E. Dirom". The signature is written in a cursive style with a prominent flourish at the end.

G.E. Dirom, P. Eng.

A handwritten signature in black ink, appearing to read "P.M. McAndless". The signature is written in a cursive style with a large initial "P".

P.M. McAndless,
Geologist

A handwritten signature in black ink, appearing to read "J. D. Knauer". The signature is written in a cursive style with a large initial "J".

J. D. Knauer,
Geochemist.

APPENDIX I

Statement of Qualifications

Statement of Qualifications

I, Patrick M. McAndless of the City of White Rock, Province of British Columbia, do certify that:

1. I have been an employee of Noranda Exploration Company, Limited, since May 1973.
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 Geological Association of Canada.
4. I have held the position of geologist for Noranda Exploration Company, Limited since May 1973..



Patrick M. McAndless

Geologist

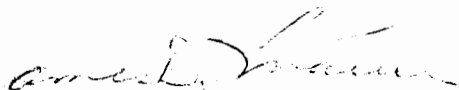
Noranda Exploration Company, Limited
(No Personal Liability)

Statement of Qualifications

I, James D. Knauer of the City of Vancouver, Province of British Columbia, do certify that :

1. I have been an employee of Noranda Exploration Company, Limited since August, 1964.
2. I am a graduate of the University of New Mexico with a Bachelor of Science Degree in Geology.
3. I am a member of the Geochemical Society, Canadian Institute of Mining and Metallurgy and Association of Exploration Geochemists.
4. I have held the position of Geochemist for Noranda Exploration Company, Limited, British Columbia, since June, 1965.

Dated at Vancouver
this 5th day of
December, 1973



James D. Knauer,
Geochemist,
Noranda Exploration Company, Limited,
(No Personal Liability)

CERTIFICATE

I, GAVIN EWAN DIROM, of the City of Vancouver, Province of British Columbia, do certify that:

1. I am a Geological Engineer residing at 1011 Arlington Crescent, North Vancouver, B.C.
2. I am a graduate of the University of British Columbia with a B.A.Sc Degree (1962) in Geological Engineering and a M.A.Sc Degree (1965) in Geophysics.
- 3.. I am a Member of the Canadian Institute of Mining and Metallurgy.
4. I am a registered Professional Engineer in the Province of British Columbia and Ontario.
- 5.. I have been employed as a geologist for Noranda Exploration Company, Limited since June 1962 and have held the position of District Geologist since March 1967.

Dated at Vancouver, this 5th day of December, 1973.



GAVIN E. DIROM, M.A.Sc., P. Eng.

NORANDA EXPLORATION COMPANY, LIMITED

Personnel Engaged In Survey

P. McAndless	14447 Blackburn Crescent	White Rock, B.C.
K. Bond	2212 Uxbridge Drive	Calgary, Alberta
R. Wilson	P. O. Box 670	Smithers, B.C.
G. Gibson	1110 Lawson Avenue	Kelowna, B.C.
L. Soet	4135 East Pender Street	Burnaby, B.C.

APPENDIX II

Statutory Declaration
Application for a Certificate of Work
Application to Group Mineral Claims

DOMINION OF CANADA:
PROVINCE OF BRITISH COLUMBIA:
To Wit:

In the Matter of a statement of exploration costs on 16 mineral claims in the Watson Lake Mining District having grant numbers Y70707 to Y70722.

I, Patrick M. McAndless, Agent for Noranda Exploration Company, Limited (No Personal Liability)

both of 1050 Davie Street, Vancouver, B.C. V6E 1M4

in the Province of British Columbia, do solemnly declare that the cost of a Combined Geological-Geochemical Survey on the above noted claim was:

1. Labour Cost:	Employee	Rate/ Day	Geological Days	Geochemical Days	Total Days	Cost
	P. McAndless	\$33.83	4	—	4	\$135.32
	K. Bond	\$25.37	4	—	4	\$101.48
	R. Wilson	\$16.92	5	—	5	\$ 84.60
	G. Gibson	\$20.09	2	1	3	\$ 60.27
	L. Soet	\$17.97	4	2	6	<u>\$107.82</u>
						\$ 489.49
2.	Topographic Map					\$ 261.56
3.	Accommodation costs					\$ 157.72
4.	Camp costs					\$ 277.38
5.	Transportation costs					\$2250.92
6.	Consulting, G.E. Dirom, P. Eng., 2 days @ \$100.00					\$ 200.00
7.	Assay costs:					
	30 Zn determination @ \$1.00			\$30.00		
	30 Pb determination @ \$.25			\$ 7.50		
	30 Cu determination @ \$.25			\$ 7.50		
	30 Mo determination @ \$.25			\$ 7.50		
	30 Cd determination @ \$.25			<u>\$ 7.50</u>		
						<u>\$ 60.00</u>
	Total cost of survey					<u>\$3697.07</u>

And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the "Canada Evidence Act."

Declared before me at the City
of Vancouver, in the
Province of British Columbia, this 5th
day of December 1973, A.D.

P. M. McAndless

Russell Bell

A Commissioner for taking Affidavits within British Columbia or
A Notary Public in and for the Province of British Columbia.



Department of Indian Affairs and Northern Development

YUKON QUARTZ MINING ACT

FOR "C" - APPLICATION FOR A CERTIFICATE OF WORK

(This form required in duplicate with sketch showing location of work.)

I (Name)	P. M. McAndless	Occupation	Geologist
(Postal Address)	1050 Davie Street, Vancouver, B.C. V6E 1M4		

OFFICE DATE STAMP

MAKE OATH AND SAY, THAT :-

- I am the owner, or agent of the owner, of the mineral claim(s) to which reference is made herein.
- I have done, or caused to be done, work on the following mineral claim(s):
(Here list claims on which work was actually done by number and name)

Kay 1 - 16

situated at N. of Summit Lake Claim Sheet No. 105 I/11
 in the Watson Lake Mining District, to the value of at least \$1600.00
 dollars, since the 28th day of November 19 72.

to represent the following mineral claims under the authority of Grouping Certificate No. _____
 (Here list claims to be renewed by number and name in numerical order)

Claim	Grant No.	Assessment Period	Claim	Grant No.	Assessment Period
Kay 1	Y70707	1 year	Kay 9	Y70715	1 year
Kay 2	Y70708	1 year	Kay 10	Y70716	1 year
Kay 3	Y70709	1 year	Kay 11	Y70717	1 year
Kay 4	Y70710	1 year	Kay 12	Y70718	1 year
Kay 5	Y70711	1 year	Kay 13	Y70719	1 year
Kay 6	Y70712	1 year	Kay 14	Y70720	1 year
Kay 7	Y70713	1 year	Kay 15	Y70721	1 year
Kay 8	Y70714	1 year	Kay 16	Y70722	1 year

- The following is a detailed statement of such work: (Set out full particulars of the work done in the twelve months in which such work is required to be done, as shown by Section 53.)
 A combined Geological - Geochemical Survey as per accompanying Report and Statutory Declaration of Costs.

in before me at Vancouver, B.C.
5th day of December 19 73

Bruce Bell
 Commissioner for Oaths for Yukon Territory.
 British Columbia

P. M. McAndless
 Applicant.



DEPARTMENT OF INDIAN AFFAIRS AND NORTHERN DEVELOPMENT

Yukon Quartz Mining Act

APPLICATION TO GROUP MINERAL CLAIMS

MINING DISTRICT <u>Watson Lake</u>	CLAIM SHEET NO. <u>105 I/11</u>
------------------------------------	---------------------------------

I (WE) THE UNDERSIGNED OWNER(S) OR AGENT(S) OF THE OWNER(S) OF THE FOLLOWING MINERAL CLAIMS

OFFICE DATE STAMP

Kay 1 - 16

Grant No's. Y70707 - 70722

GIVE NOTICE OF INTENTION TO GROUP THE SAID CLAIMS FOR THE PERFORMANCE OF WORK AND DO HEREBY APPLY UNDER THE PROVISIONS OF SECTION 52 OF THE YUKON QUARTZ MINING ACT FOR A CERTIFICATE IN FORM "E"

I(WE) HEREBY CERTIFY THAT THE ABOVE CLAIMS ARE ADJOINING

DATED AT Vancouver, B.C.

THIS 5th DAY OF December 19 73

P. M. McAndless

P. M. McAndless, Agent for

Noranda Exploration Company, Limited

(No Personal Liability)

FOR OFFICE USE ONLY.	
FORM "E" NO.	_____
RECEIPT NO.	_____
DATE APPLIED:	_____

APPENDIX III

Expenditures Incurred in Performing the Work
Including All Statements and Vouchers

NORANDA EXPLORATION COMPANY, LIMITED
(NO PERSONAL LIABILITY)

PELLY RIVER PROJECT - (902)

STATEMENT OF COSTS

MAD Claims	40 man days
NESS Claims	30 " "
KAY Claims	22 " "
Other Work	<u>28 " "</u>
	<u>120 " "</u>

1. Topographic Map by Lockwood Survey Corporation Limited, Vancouver, B.C.

Cost of Map	<u>\$ 784.70</u>
Pro rated to MAD Claims	261.57
" " to NESS Claims	261.57
" " to KAY Claims	<u>261.57</u>
	<u>\$ 784.70</u>

2. Accommodation : Cedar Lodge Motel \$ 860.28

Pro rated to MAD Claims	(40/120)	286.76
" " to NESS Claims	(30/120)	215.07
" " to KAY Claims	(22/120)	157.72
" " to Other Work	(28/120)	<u>200.73</u>
		<u>\$ 860.28</u>

3. Camp Costs :

L.C. Sands Ltd.,	\$ 11.85	
Northern Metallic Sales (Yukon) Ltd.	38.45	
Thompson's Yukon Foods Ltd.,	1,372.49	
Miscellaneous expense account items	<u>90.21</u>	<u>\$ 1,513.00</u>
Pro rated to MAD Claims	(40/120)	504.33
" " to NESS Claims	(30/120)	378.25
" " to KAY Claims	(22/120)	277.38
" " to Other Work	(28/120)	<u>353.04</u>
		<u>\$1,513.00</u>

4. Transportation :

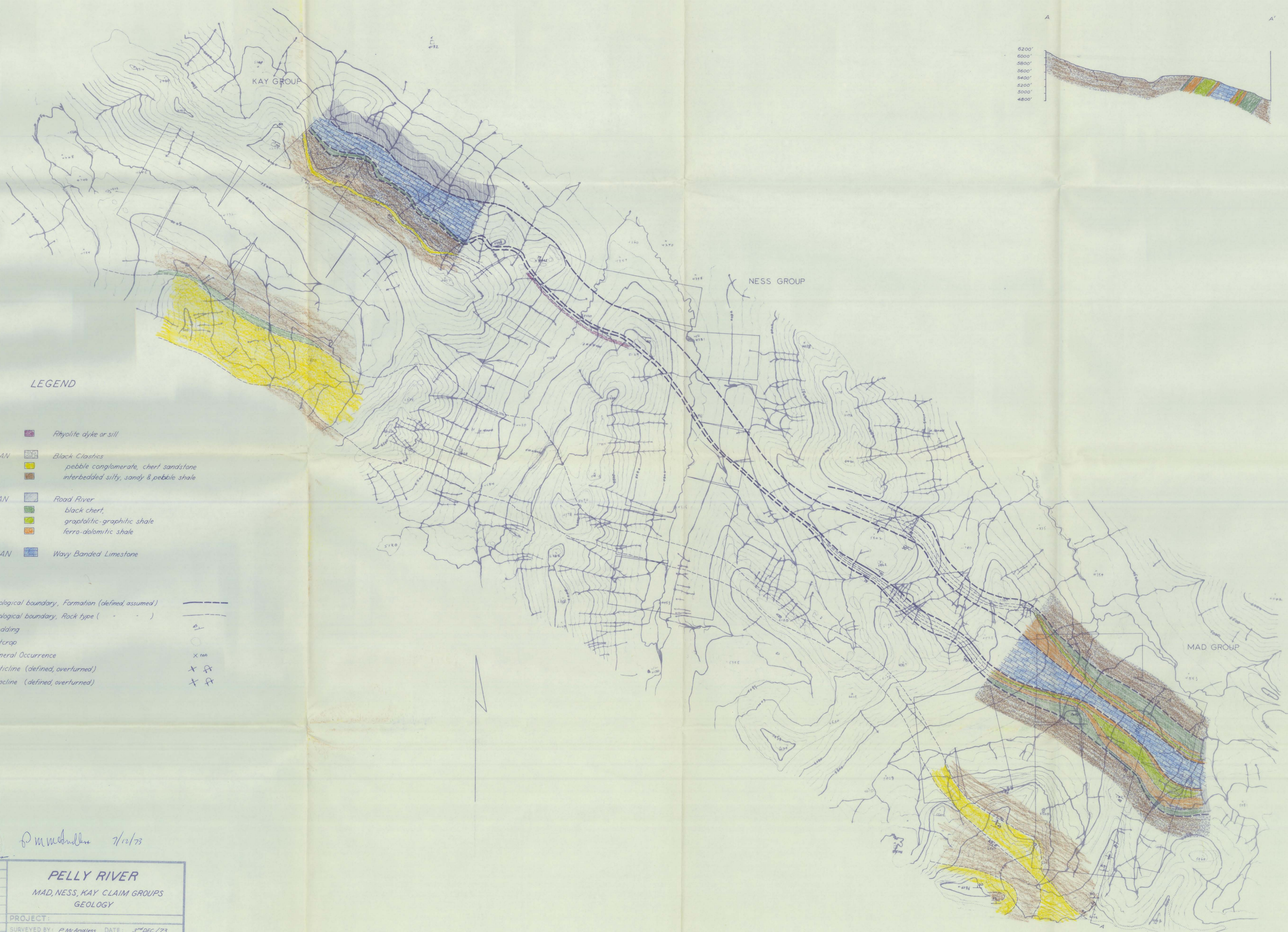
Alpine Helicopters Ltd.,	\$ 192.00	
Avis	128.87	
B.C. Yukon Air Service	3,834.91	
Frontier Helicopters Ltd.,	7,293.70	
Watson Lake Aviation Gas Sales	821.25	
Miscellaneous expense account items	<u>7.00</u>	<u>\$12,277.73</u>
Pro rated to MAD Claims	(40/120)	4,092.58
" " to NESS Claims	(30/120)	3,069.43
" " to KAY Claims	(22/120)	2,250.92
" " to Other Work	(28/120)	<u>2,864.80</u>
		<u>\$12,277.73</u>



P. M. W. Andrews 7/12/73

REVISED	PELLY RIVER	
	MAD, NESS & KAY CLAIMS	
PROJECT:		
PROJ. NO. 902	SURVEYED BY:	DATE: 28 NOVEMBER 1973
N.T.S. 1/251/12	DRAWN BY:	SCALE: 1" = 1000'
DWG. NO. 2	NORANDA EXPLORATION CO. LTD.	
	OFFICE:	

CROSS SECTION



LEGEND

- Rhyolite dyke or sill
- DEVONIAN**
 - Black Clastics
 - pebble conglomerate, chert sandstone
 - interbedded silty, sandy & pebble shale
- ORDOVICIAN**
 - Road River
 - black chert,
 - graptolitic-graphitic shale
 - ferro-aluminic shale
- CAMBRIAN**
 - Wavy Banded Limestone

- Geological boundary, Formation (defined, assumed)
- Geological boundary, Rock type ()
- Bedding
- Outcrop
- Mineral Occurrence
- Anticline (defined, overturned)
- Syncline (defined, overturned)

P. McAndrews 7/12/73

REVISED	PELLY RIVER	
	MAD, NESS, KAY CLAIM GROUPS	
	GEOLOGY	
PROJECT:		
PROJ. NO 902	SURVEYED BY: P. McAndrews	DATE: 3 RD DEC. 73
N.T.S. 105/12N	DRAWN BY: D. Phillips	SCALE: 1" = 1000'
DWG. NO 3	NORANDA EXPLORATION CO. LTD.	
	OFFICE	



D. M. Whittaker 7/12/73

REVISED	PELLY RIVER	
	MAD, NESS & KAY CLAIMS	
	KAY GROUP - Cu and Mo deposits	
	PROJECT: GEOCHEMICAL STREAM SEDIMENT SURVEY	
PROJ. NO. 902	SURVEYED BY:	DATE 28 NOVEMBER 1973
N.T.S. 105/1/2	DRAWN BY:	SCALE 1" = 1000'
DWG. NO. 4	NORANDA EXPLORATION CO. LTD.	
	OFFICE	

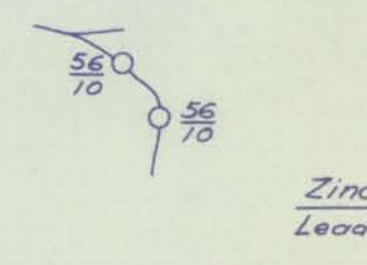
Copper

Molybdenum



P.M. McArthur 7/12/73

REVISED	PELLY RIVER	
	MAD, NESS & KAY CLAIMS	
	KAY GROUP - Zn and Pb in ppm	
PROJECT: GEOCHEMICAL STREAM SEDIMENT SURVEY		
PROJ. No 902	SURVEYED BY:	DATE 28 NOVEMBER 1973
N.T.S. 105/1/72	DRAWN BY:	SCALE 1" = 1000'
DWG. No 5	NORANDA EXPLORATION CO. LTD.	
	OFFICE	





D.M. Williams 7/12/73

REVISED	PELLY RIVER	
	MAD, NESS & KAY CLAIMS	
	KAY GROUP - Cd in ppm	
	PROJECT: GEOCHEMICAL STREAM SEDIMENT SURVEY	
PROJ No 902	SURVEYED BY	DATE 28 NOVEMBER 1973
N.T.S. 105/112	DRAWN BY	SCALE 1" = 1000'
DWG No	NORANDA EXPLORATION CO. LTD.	
6	OFFICE	