NORANDA EXPLORATION COMPANY LIMITED

GEOLOGY OF THE

LOUGHEED 1-83 PROPERTY

LOUGHEED TOWNSHIP

PORCUPINE MINING DIVISION

N.T.S. 42-B-7

SEPTEMBER 1983

JAMES C. IRELAND

Dual. this file.

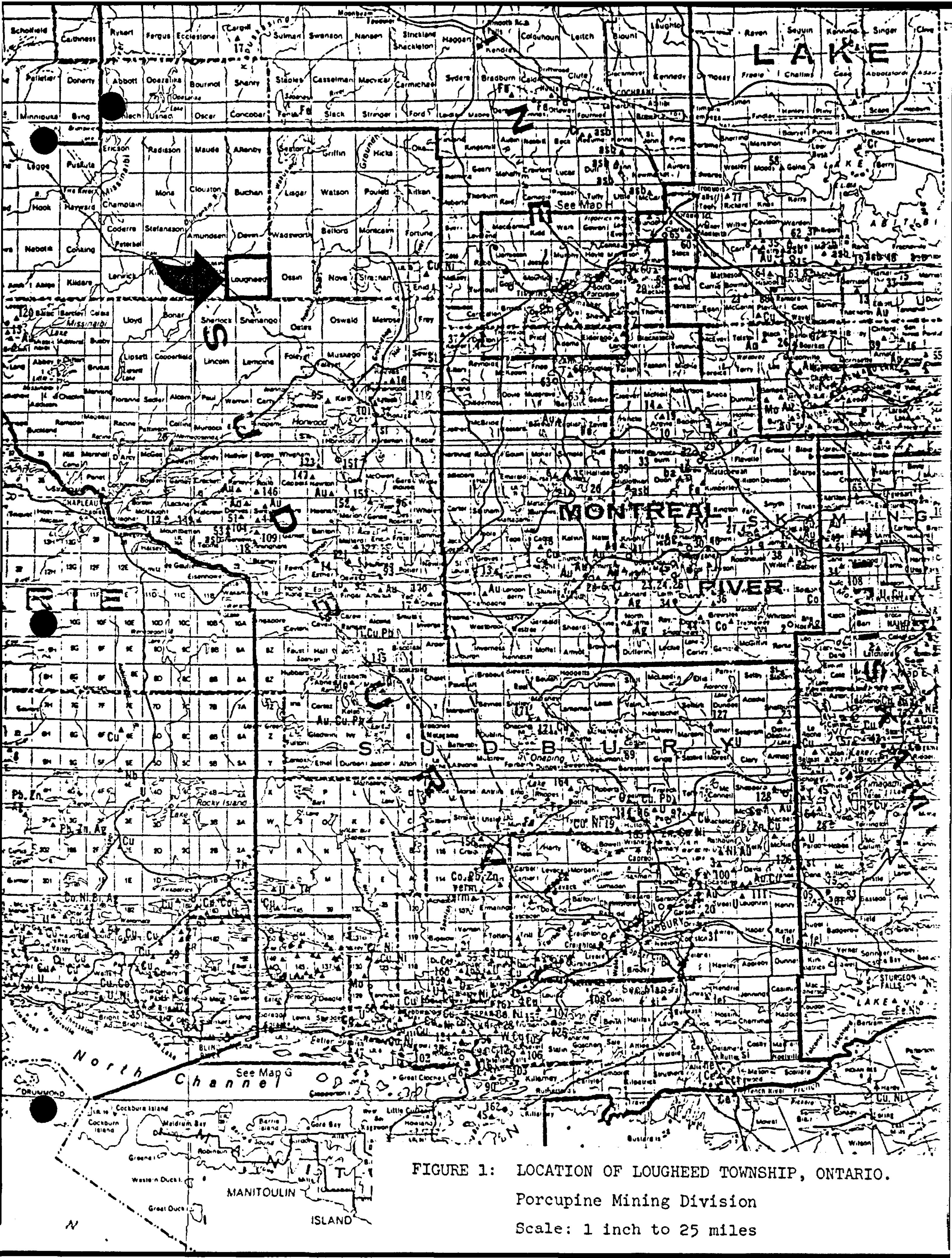


FIGURE 1: LOCATION OF LOUGHEED TOWNSHIP, ONTARIO.

Porcupine Mining Division

Scale: 1 inch to 25 miles

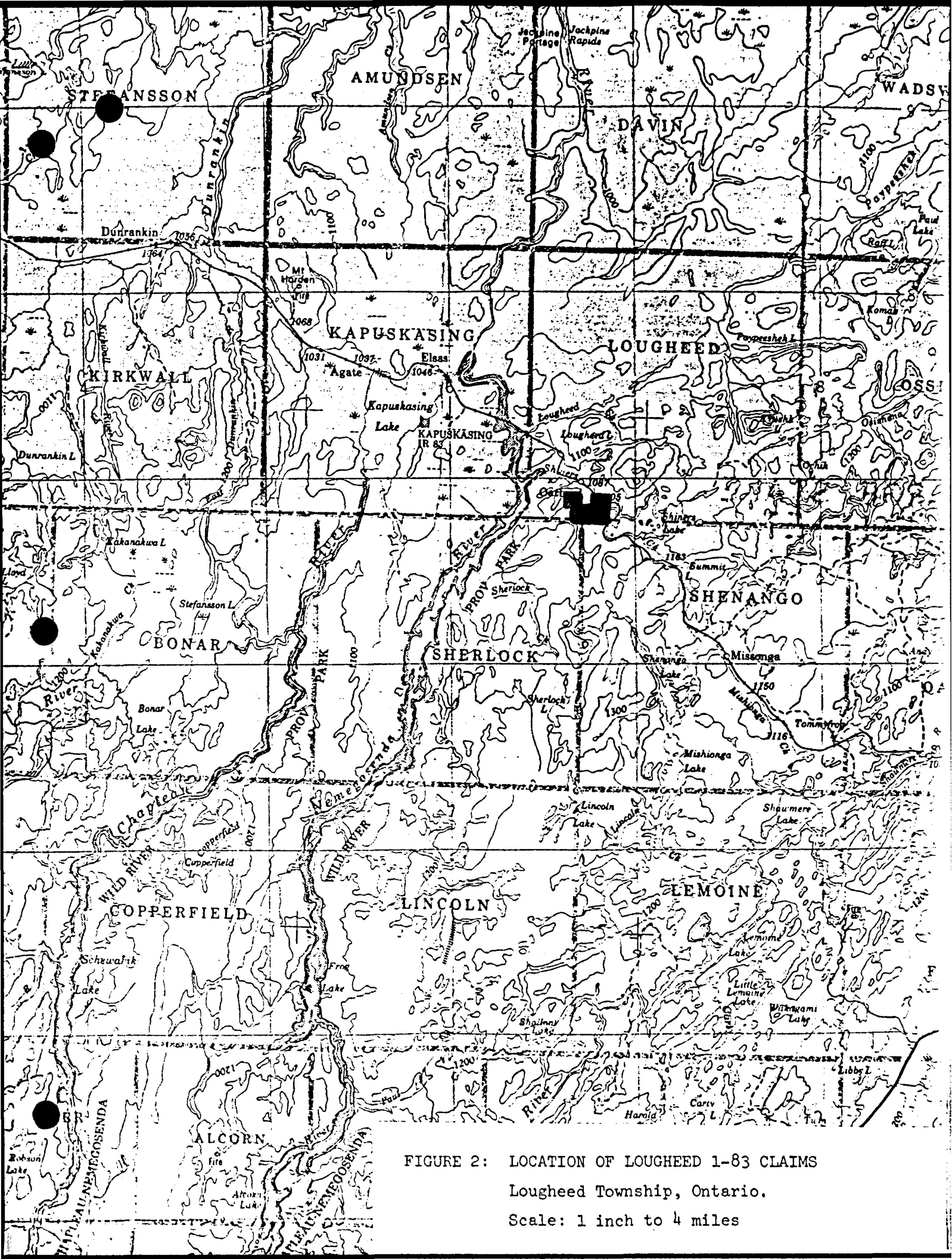


FIGURE 2: LOCATION OF LOUGHEED 1-83 CLAIMS

Lougheed Township, Ontario.

Scale: 1 inch to 4 miles

N.T.S. 42-B-7

LOUGHEED 1-83

LOCATION AND ACCESS

The property is situated within the Kapuskasing Structural Zone in the southwest corner of Lougheed Township, the Porcupine Mining Division, in Northeastern Ontario. The nearest community in the area is Elsas, a small hamlet located on the C.N.R. mainline approximately 60 km northwest of Foleyet, Ontario. Access to the property can be gained by rail or float plane from Foleyet.

CONCLUSIONS

The property is underlain by a diverse sequence of mafic to felsic ortho and paragneiss. The dominant foliation is roughly east-west with highly variable south dips.

Two separate magnetite iron formation are exposed on the property. They are well preserved compared to the surrounding lithology, and exibit primary bedding features.

PROPERTY STATUS

Lougheed 1-83 consists of sixteen contiguous unpatented mining claims numbered P-725914, P-725929, inclusive, staked during the period June 17, 18 and 19, 1983. The anniversary date for the claims is July 18, 1984. To date there is inadequate assessment work completed to hold all of the claims past their anniversary date, as a portion of the claims require winter work. A total of 11 km of grid was cut and mapping was carried out on August 9, 1983 over 8 of the 16 claims covering the central portion of the claims.

TOPOGRAPHY

Relief in the claim block is moderate with a maximum of 150' on the immediate claims. The area is covered by an overmature poplar, birch and spruce forest with heavy undergrowth of alder and hazel.

PREVIOUS WORK

The area covered by the claims and the south part of the present survey was under option to the Mining Corporation of Canada Ltd., in 1957 as a magnetite showing. Assays of 16.62% Fe and 18.02% Fe were obtained. No other work was recorded.

REGIONAL GEOLOGY

The Oatland project area is situated within the Kapuskasing Structural Zone, a northeast trending zone of high grade metamorphic rocks. The structure appears to be fault bounded on the southeast but displays a gradational contact to the west into low grade volcanic rocks of the Michipicoten-Wawa greenstone belt.

The Kapuskasing Structural Zone comprises generally northeast-striking, northwest dipping belts of mafic, intermediate and felsic volcanic gneisses and broad areas of sedimentary gneiss. The southern part of the Oatland project area has been intruded by the Shenango alkali intrusive complex.

The Shenango complex is composed of a monzonitic core and a peripheral unit of syenodiorite and hornblende syenite. Numerous offshoots of hornblende syenite occur to the northwest of the main intrusive body.

The orientation of gneissosity and lithological contacts make up the prominent east-northeast structural grain of the structural zone. The gneissosity in all rock types is folded about gently plunging northeast trending axes. Plunge reversals are common and can be related to a gently southeast plunging warp axis.

Faulting in the area is predominantly northeast with diabase dykes occupying many of the fault zones. Locally cataclastic gneissic breccias are recognized.

Overall metamorphism in the structural zone is granulite facies with local areas of retrograde metamorphism to upper greenschist facies.

PROPERTY GEOLOGY

The Lougheed 1-83 property is underlain by a diverse sequence of mafic to felsic gneisses and thick, monotonous sedimentary gneiss sequences. Oxide and silicate facies Banded Iron Formation is exposed on the north and south portions of the map area. The iron formation is generally low in magnetite content.

A thick, monotonous sequence of metasedimentary gneiss underlies the central portion of the map area. Stratigraphy becomes much more diverse, with mafic to intermediate amphibolitic gneiss and felsic to siliceous gneiss all occuring in the vicinity of the iron formation.

TABLE OF FORMATIONS

Unit 8	Diabase
Unit 7	Felsic Intrusive
Unit 6	Mafic Intrusive
Unit 5	Chemical Sediment (chert, B.I.F., carbonate)
Unit 4	Volcaniclastic to Clastic Sediment
Unit 3	Felsic Gneiss (Rhyolitic to Dacitic ?)
Unit 2	Intermediate Gneiss (Andesitic ?)
Unit 1	Mafic Gneiss (Basaltic to Andesitic ?)

TEXTURAL DISCRIPTIONS

gn - gneissic

g - granitic

MAFIC VOLCANIC GNEISS

Mafic amphibolitic gneisses occur as both thick, discrete units and thinner intercalated units within both felsic gneisses and sedimentary gneisses. They are black to dark green in colour, usually medium grained although some phases are extremely coarse grained, and generally exhibit a distinct gneissic texture. Mineralogically, amphibole is dominant with subordinate plagioclase and red garnet, which can vary from 5 to 25% of the rock. Garnets appear to be obiquitous throughout the stratigraphic assemblage.

FELSIC VOLCANIC GNEISS

Felsic gneisses occur as finely banded quartzitic and quartzofeldspathic units with intercalated mafic gneiss bands, and as thicker, less foliated units that exhibit a fragmental nature. Mafic fragments are often present within the felsic gneisses, but their appearance is erratic. Garnets are present, but to a lesser degree.

"QUARTZITE" (SILICEOUS IRON FORMATION):

Pyrrhotite-magnetite siliceous iron formation occurs as a distinct marker unit within the mafic and felsic gneisses. Coarse recrystallized silica makes up the majority of the unit, which varies in thickness from 5m to 15m, while magnetite with minor pyrrhotite make up anywhere from 3% to 20% of the rock. Where exposed on surface, magnetite occurs much more frequently than pyrrhotite. Garnets are present but are confined to the magnetite-pyrrhotite phases of the unit.

SEDIMENTARY GNEISS

Garnetiferous sedimentary gneisses are generally fine-grained, variable in composition from quartzofeldspathic to amphibolitic, and exhibit a granular or gritty texture in fresh surfaces. The mafic component is always amphibole and biotite with amphibole the more common constituant. Mafic gneisses are commonly intercalated with the sediments.

STRUCTURAL GEOLOGY

Trends of the individual units are generally east-west with units exhibiting gentle south dips in the 25-30 degree range with the exception of the "quartzitic" siliceous iron formation, which dips from 60 to 80 degrees to the south. The area is cut by numerous local faults which trend approximately N60 degrees E with only minor lateral displacement. The iron formation appears to be displaced by a north trending dextral strike slip fault with a lateral displacement of approximately 1 km. The fault cuts through the center of the grid.

MINERALIZATION

Lean, oxide facies banded iron formation has been observed in outcrop in two separate areas on the property. On the northwest part of claim P-725927, a 12 meter wide iron formation is exposed and has been traced along strike for 200 meters.

On the central portion of the claims near the southeast corner of claim P-725922, 5 meters of lean magnilite iron formation is exposed. This unit can be traced for 125 meters along strike.

Minor disseminated pyrrhotite occurs in a garnetiferous cherty, siliceous unit on the southeast corner of the mapped area.

STATEMENT OF QUALIFICATION

I, JAMES C. IRELAND, OF 147 WENDE AVENUE, TIMMINS, ONTARIO, HEREBY DECLARE THAT:

1. I AM A GRADUATE IN GEOLOGY FROM LAURENTIAN UNIVERSITY, SUDBURY, ONTARIO AND DID GRADUATE IN 1982.

2. I AM A QUALIFIED GEOLOGIST PRESENTLY EMPLOYED BY NORANDA INC., AND HAVE WORKED IN THEIR EMPLOY SINCE 1982.

3. I WAS DIRECTLY INVOLVED IN THE WORK CARRIED OUT ON THE PROPERTY DESCRIBED AND DID SUPERVISE, ON-SITE, THE WORK DESCRIBED.

4. I HAVE NO PERSONAL INTEREST IN THE PROPERTY DESCRIBED AND DID CARRY OUT THE WORK SOLELY FOR THE INTEREST OF NORANDA INC.

5. THE STATEMENTS MADE IN THIS REPORT ARE TRUE AND ACCURATE WITHIN THE LIMITS OF MY ABILITY.

DATED: August 9, 1984

James C. Ireland

NORANDA INC.

JAMES C. IRELAND

900

Mining Lands Section

File No 2.7056

Control Sheet

TYPE OF SURVEY

____ GEOPHYSICAL

__V__ GEOLOGICAL

____ GEOCHEMICAL

____ EXPENDITURE

MINING LANDS COMMENTS:

Doug

Signature of Assessor

LD

27/08/84

Date

1984 09 26

Your File: 291/84
Our File: 2.7056

Mining Recorder
Ministry of Natural Resources
60 Wilson Avenue
Timmins, Ontario
P4N 2S7

Dear Sir:

RE: Notice of Intent dated September 4, 1984
Geological Survey on Mining Claims P 725922
et al in the Township of Lougheed

The assessment work credits, as listed with the above-mentioned Notice of Intent, have been approved as of the above date.

Please inform the recorded holder of these mining claims and so indicate on your records.

Yours sincerely,

S.E. Yundt
Director
Land Management Branch

Whitney Block, Room 6643
Queen's Park
Toronto, Ontario
M7A 1W3
Phone:(416)965-4888

D. Isherwood:mc

cc: Noranda Exploration Company, Limited
Suite 400
55 Yonge Street
Toronto, Ontario
M5E 1J4

cc: Noranda Exploration Company, Limited
P.O. Box 1205
Timmins, Ontario
P4N 7J5
Attention: R.C. Denommee

cc: Mr. G.H. Ferguson
Mining & Lands Commissioner
Toronto, Ontario

cc: Resident Geologist
Timmins, Ontario

Encl.

Ministry of Natural Resources
Ontario

Technical Assessment Work Credits

File 2.7056

Date 1984 09 04

Mining Recorder's Report of Work No. 291-84

Recorded Holder: NORANDA EXPLORATION COMPANY, LIMITED

Township or Area: LOUGHEED TOWNSHIP

Type of survey and number of Assessment days credit per claim	Mining Claims Assessed
Geophysical	P 725922 to 928 inclusive
Electromagnetic _____ days	
Magnetometer _____ days	
Radiometric _____ days	
Induced polarization _____ days	
Other _____ days	
Section 77 (19) See "Mining Claims Assessed" column	
Geological 29 days	
Geochemical _____ days	
Man days ☐ Airborne ☐	
Special provision ☒ Ground ☒	
☒ Credits have been reduced because of partial coverage of claims.	
☐ Credits have been reduced because of corrections to work dates and figures of applicant.	

Special credits under section 77 (16) for the following mining claims

No credits have been allowed for the following mining claims

☐ not sufficiently covered by the survey ☒ Insufficient technical data filed

P 725929

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical — 80; Geological — 40; Geochemical — 40; Section 77 (19) — 60:

828 (83/6)

Ministry of
Natural
Resources

Ontario

Sept/19/84

1984 09 04

Your File: 291/84
Our File: 2.7056

Bruce W. Hanley
Mining Recorder
Ministry of Natural Resources
60 Wilson Avenue
Timmins, Ontario
P4N 2S7

Dear Sir:

Enclosed are two copies of a Notice of Intent with statements listing a reduced rate of assessment work credits to be allowed for a technical survey. Please forward one copy to the recorded holder of the claims and retain the other. In approximately fifteen days from the above date, a final letter of approval of these credits will be sent to you. On receipt of the approval letter, you may then change the work entries on the claim record sheets.

For further information, if required, please contact Mr. R.J. Pichette at 416/965-4888.

Yours sincerely,

S.E. Yundt
Director
Land Management Branch

Whitney Block, Room 6643
Queen's Park
Toronto, Ontario
M7A 1W3

RD D. Isherwood:mc
Encls.

cc: Noranda Exploration Company, Limited
Suite 400
55 Yonge Street
Toronto, Ontario
M5E 1J4

cc: Noranda Exploration Company, Limited
P.O. Box 1205
Timmins, Ontario
P4N 7J5
Att: R.C. Denommee

cc: Mr. G.H. Ferguson
Mining & Lands Commissioner
Toronto, Ontario

845

Ministry of Natural Resources

Ontario

Notice of Intent

for Technical Reports

1984 09 04

2.7056/291-84

An examination of your survey report indicates that the requirements of The Ontario Mining Act have not been fully met to warrant maximum assessment work credits. This notice is merely a warning that you will not be allowed the number of assessment work days credits that you expected and also that in approximately 15 days from the above date, the mining recorder will be authorized to change the entries on his record sheets to agree with the enclosed statement. Please note that until such time as the recorder actually changes the entry on the record sheet, the status of the claim remains unchanged.

If you are of the opinion that these changes by the mining recorder will jeopardize your claims, you may during the next fifteen days apply to the Mining and Lands Commissioner for an extension of time. Abstracts should be sent with your application.

If the reduced rate of credits does not jeopardize the status of the claims then you need not seek relief from the Mining and Lands Commissioner and this Notice of Intent may be disregarded.

If your survey was submitted and assessed under the "Special Provision-Performance and Coverage" method and you are of the opinion that a re-appraisal under the "Man-days" method would result in the approval of a greater number of days credit per claim, you may, within the said fifteen day period, submit assessment work breakdowns listing the employees names, addresses and the dates and hours they worked. The new work breakdowns should be submitted direct to the Land Management Branch, Toronto. The report will be re-assessed and a new statement of credits based on actual days worked will be issued.

2.7056 LOUGHEED 1-83

Sept 11 82

Ministry of Natural Resources
Ontario

Report of Work
(Geophysical, Geological, Geochemical and Expenditures)

W.R. # 291/84

Mining Act

Instructions: – Please type or print.
– If number of mining claims traversed exceeds space on this form, attach a list.
Note: – Only days credits calculated in the "Expenditures" section may be entered in the "Expend. Days Cr." columns.
– Do not use shaded areas below.

Type of Survey(s)	Township or Area
GEOLOGICAL	LOUGHEED

Claim Holder(s)	Prospector's Licence No.
NORANDA EXPLORATION COMPANY LIMITED	A-34387

Address: SUITE 400 - 55 YONGE STREET, TORONTO, ONTARIO

Survey Company	Date of Survey (from & to)	Total Miles of line Cut
NORANDA CREW	09 08 83 (Day Mo. Yr.) 10 08 83 (Day Mo. Yr.)	11.0 KM

Name and Address of Author (of Geo-Technical report): JAMES IRELAND, P. O. BOX 1205, TIMMINS, ONTARIO

Credits Requested per Each Claim in Columns at right

Special Provisions		Days per Claim
For first survey: Enter 40 days. (This includes line cutting)	Geophysical - Electromagnetic	
	Geophysical - Magnetometer	
For each additional survey: using the same grid: Enter 20 days (for each)	Geophysical - Radiometric	
	Geophysical - Other	
	Geological	40
	Geochemical	
Man Days		**Days per Claim**
Complete reverse side and enter total(s) here	Geophysical - Electromagnetic	
	Geophysical - Magnetometer	
	Geophysical - Radiometric	
	Geophysical - Other	
	Geological	
	Geochemical	
Airborne Credits		**Days per Claim**
Note: Special provisions credits do not apply to Airborne Surveys.	Electromagnetic	
	Magnetometer	
	Radiometric	

Mining Claims Traversed (List in numerical sequence)

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.	Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.
P	725922				
	725923				
	725924				
	725925				
	725926				
	725927				
	725928				
	725929				

RECEIVED
JUL 30 1984
MINING LANDS SECTION

RECORDED
JUL 13 1984
Receipt No. 30

PORCUPINE MINING DIVISION
RECEIVED
JUL 13 1984
A.M. 7 8 9 10 11 12 1 2 3 4 5 6 P.M.

see revised statement

Total number of mining claims covered by this report of work: 8

Expenditures (excludes power stripping)

Type of Work Performed

Performed on Claim(s)

Calculation of Expenditure Days Credits

Total Expenditures: $ ÷ 15 = Total Days Credits

Instructions
Total Days Credits may be apportioned at the claim holder's choice. Enter number of days credits per claim selected in columns at right.

For Office Use Only		
Total Days Cr. Recorded: 320	Date Recorded: July 13, 1984	Mining Recorder: Stanley
	Date Approved as Recorded	Branch Mining Recorder

Date	Recorded Holder or Agent (Signature)
JULY 13/84	R.C. Denommee

Certification Verifying Report of Work

I hereby certify that I have a personal and intimate knowledge of the facts set forth in the Report of Work annexed hereto, having performed the work or witnessed same during and/or after its completion and the annexed report is true.

Name and Postal Address of Person Certifying: R.C. DENOMMEE, P.O. BOX 1205, TIMMINS, ONTARIO

Date Certified: July 13/84

Certified by (Signature): R.C. Denommee

0362 (81/9)

1984 08 24

Your File: 291
Our File: 2.7056

Mr. Bruce Hanley
Mining Recorder
Ministry of Natural Resources
60 Wilson Avenue
Timmins, Ontario
P4N 2S7

Dear Sir:

We have received reports and maps for a Geological Survey submitted under Special Provisions (credit for Performance and Coverage) on Mining Claims P 725922 et al in the Township of Lougheed.

This material will be examined and assessed and a statement of assessment work credits will be issued.

Yours sincerely,

S.E. Yundt
Director
Land Management Branch

Whitney Block, Room 6643
Queen's Park
Toronto, Ontario
M7A 1W3
Phone: (416)965-6918

A. Barr:sc

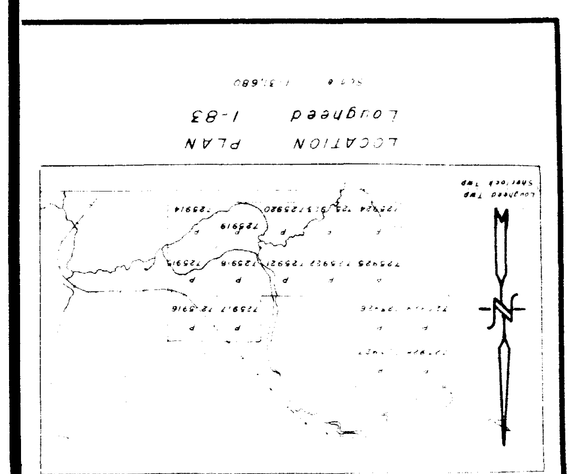
cc: Noranda Exploration Company Ltd
Suite 400
55 Yonge Street
Toronto, Ontario
M5E 1J4

cc: Noranda Exploration Company Ltd
P.O. Box 1205
Timmins, Ontario
Attn: R.C. Denommee

2.7056

725922	✓
923	2/4
924	3/4
925	2/4
926	1/4
927	✓
928	3/4
929	0

$$\frac{7 \times 40}{7+2.75} = 28.7$$



LOCATION PLAN
Lougheed 1-83
Scale 1:680

LEGEND

8 Diabase
7 Felsic Intrusive
6 Mafic Intrusive
5 Chemical Sediments
4 Volcaniclastic to Clastic Sediments
3 Felsic Gneiss (Rhyolitic to Dacitic?)
2 Intermediate Gneiss (Andesitic?)
1 Mafic Gneiss (Basaltic to Andesitic?)

TEXTURES	MINERAL
gn - gneiss	gt - garnetiferous
g - granitic	w - magnetite - bearing

Geological Survey
Lougheed 1-83

Lougheed Twp. Ontario

27056.

PROJ. No. 1358
PROJECT:
N.T.S. 42 E 7
SURVEYED BY:
DATE:
DRAWN BY:
SCALE: 1:2500
NORANDA EXPLORATION CO., LTD.
OFFICE: TIMMINS, ONT.

200