



42A06SW0058 2.11404 PRICE

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Report on the Geology
of the
Croxall-Kangas Option
(Assessment Report)

Chevron Canada-Umex Inc. Joint Venture
Price, Ogden and Thorneloe Townships
District of Cochrane, Ontario
Porcupine Mining Division
NTS 42-A-5/6

June 14, 1988

David Mullen
Consulting Geologist
RECEIVED

JUL 20 1988

MINING LANDS SECTION

RECOMMENDATIONS

The intensity of alteration, structural deformation and stratigraphic position exhibited by the limited exposure on the Croxall-Kangas Option suggests this property has excellent gold potential. Ground geophysical surveys (mag, EM) should be conducted over the gridded portion of the claim block to better outline the lithologic and structural complexities and define potential diamond drill targets. Power stripping in areas of limited overburden cover (5 meters or less) would be a cost effective way of obtaining additional geological information prior to a drill program as well as providing needed assessment work credits.



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INTRODUCTION

A geological mapping survey was conducted by the writer over the gridded portion of the Croxall-Kangas Option from May 29 to June 8, 1988. Mapping was done at 1:5000 scale making use of a N-S line grid spaced at 100 meter intervals mostly cut during the winter of 1988. All pickets of the grid were re-erected.

The current grid was only cut over a portion of the claim block in Price Township and does not cover claims in adjoining Odgen and Thorneloe Townships.

LOCATION, ACCESS and TOPOGRAPHY

The Croxall-Kangas property is located approximately 16 kilometers southwest of the City of Timmins, in northwest Price, southern Odgen and eastern Thorneloe Townships (Figure 1).

Access is provided by two main all weather gravel roads. The Wawaitin Falls Road crosses the northern part of the gridded area while the Waferboard Road branches south from the Wawaitin Falls Road and skirts the eastern side of the southern grid. Numerous logging roads branch from both above roads providing excellent access to all areas of the property. A high voltage hydro-electric transmission line diagonally crosses the gridded area.

The gridded portion of the claim block is dominated by numerous undulating sand ridges (aeolian dunes), representing reworked glacio-fluvial deposits (eskers, kames). Wind direction appears to have been predominantly from the northeast before vegetation cover halted further advance. These deposits are thicker to the north and east where relief is over 25 meters. Several small kettle lakes are found along the eastern, western and northern boundaries. One dry kettle was

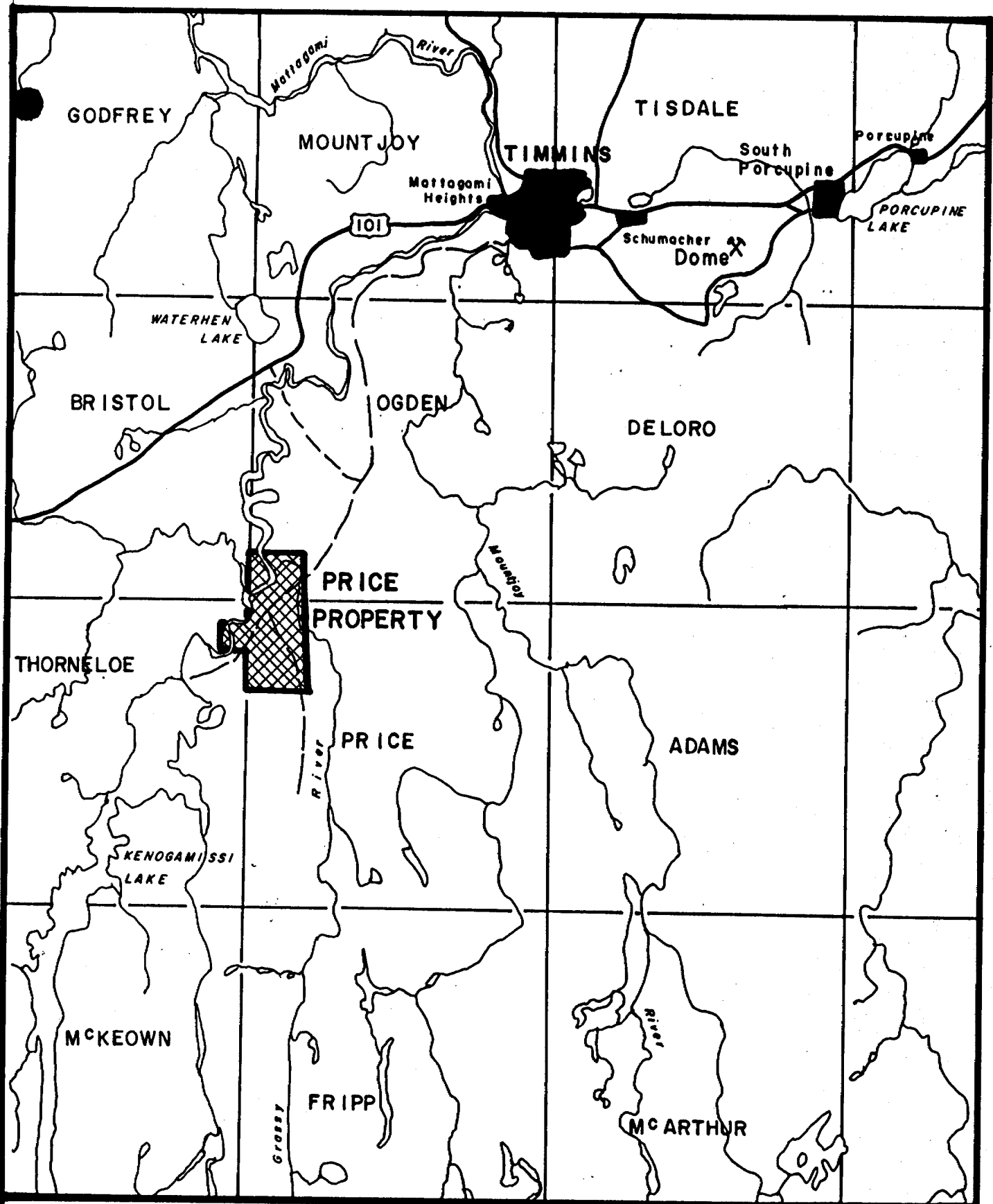


Figure 1



CHEVRON - UMEX J V	
CROXALL - KANGAS OPTION PRICE TOWNSHIP	
PROPERTY MAP	
Date : 21/06/88	Data : Mullen
	Drawn : L

also noted. A broad swampy area occurs in the northern part of the southern grid while narrow valleys between the sand ridges are often wet. The Mattagami River crosses the northwest corner of the claim block while the Grassy River approximately marks the eastern boundary.

Over the past 30 years most of the property has been logged with tree size reflecting the various ages of timber harvesting. The most recent cutting operations were in the southern part of the south grid. Tree types include mainly second growth poplar, moose maple and reforested jackpine. Locally are stands of birch, spruce and balsam. The swampy areas contain cedar, alder and spruce.

Because of the cutting operations and rapid growth of poplar and the reforested jackpine, claim lines and posts were virtually impossible to find and follow.

PROPERTY STATUS

The Croxall-Kangas claim block consists of 72 contiguous unpatented mining claims totalling approximately 1165 hectares (2880 acres). Of the 72, 48 are in Price Township, 20 in Ogden Township and 4 in Thorneloe Township. Claim numbers are listed below.

Price Township (covered by grid):

P-849065, P-849066, P-849069, P-871793 to P-871797 inclusive,
P-880298, P-880301 to P-880310, P-889259 to P-889264 inclusive,
P-900409 to P-900415 inclusive, P-988131 to P-988134 inclusive

Price Township (not covered by grid):

P-849067, P-849068, P-871790 to P-871792 inclusive, P-880299,
P-880300, P-1033734 to P-1033737 inclusive, P-1033744

Ogden Township (not covered by grid):

P-998017 to P-988024 inclusive, P-988246 to P-988257 inclusive

Thorneloe Township (not covered by grid):

P-880296, P-880297, P-905586, P-905587

PREVIOUS WORK

The Croxall-Kangas property has been investigated by several exploration companies and individuals over the past 50 years although only two drill holes were collared on the current gridded portion of the claim block. Several airborne surveys have covered various parts of the property, the most recent being flown by Chevron Canada in 1987.

In 1946 Bruin Yellowknife Mines Ltd. conducted a ground magnetic survey on a claim block that overlapped the southern portion of the current grid. No further work was filed by this company. Also during 1946 Goldmont Porcupine Mining Syndicate surveyed a single E-W line across the center of the property. No follow-up work was submitted.

During 1964 North Rock Explorations Ltd. drilled two holes on the northern gridded area, approximately located on claims P-900414 and P-889263. The drill collars were not found during the mapping survey. Hole NR-1 was drilled due south to a depth of 201.8 meters (662 ft) intersecting "Temiskaming" metasediments and tuffs, some of which were graphitic. Overburden depth was 39.8 meters. Hole NR-2 was abandoned at 76.5 meters (251 ft.) while still in overburden indicating a bedrock depth in excess of 63 meters.

Acme Gas and Oil Co. Ltd. conducted an airborne magnetic-electromagnetic survey over the southern portion of the claim block during 1966. In 1970 the same company examined the same area with a ground VLF survey. No further work was filed by Acme.

Robert Rousseau established 4 trenches on current claims P-880306, P-900409 and P-988131 during 1982 and 1984. No assays were submitted.

Samin Canada flew an AEM-mag survey over the southern part of the claim group in 1983.

Herman Tittley conducted a ground magnetic survey for Mike Deschene over part of the northern gridded area during 1985.

In 1986 Croxall-Kangas dug a 175 meter long trench on present claim P-871797 and also carried out some plugger work. Later in the same year Croxall-Kangas put in an 82 meter long trench and 3 pits 200 meters to the east of the first trench.

Chevron Canada flew an airborne magnetic-VLF survey over the claim block in 1987 and established a small grid over part of the southern portion of the claim group. During the winter of 1987/88 this grid was expanded to its current size which now covers most of the claims in Price Township.

REGIONAL GEOLOGY

The Croxall-Kangas property lies approximately 18 kilometers west of the famous Porcupine Gold camp on the west side of the north trending Mattagami River Fault. The property straddles the Tisdale-Deloro Supergroup boundary and is bisected by the Porcupine-Destor Break (Pyke 1982). Most of the gold mines of the area are found in Tisdale Supergroup rocks, north of the Porcupine-Destor Break.

The older Deloro Supergroup rocks consist primarily of calc-alkalic andesites capped and interlayered with chert-magnetite and chert-sulphide iron formation. The younger Tisdale Supergroup rocks have a base consisting of komatiitic and high magnesium tholeiitic basalts grading upwards into high iron tholeiites in turn overlain by calc-alkalic felsic tuffs and fragmentals. Westward along strike these volcanic sequences thin and interfinger with Porcupine Group Sediments (Pyke 1982). The rocks on the Croxall-Kangas property are part of this more distal assemblage.

Movement on the Mattagami River Fault is sinistral with a horizontal displacement of approximately 10 kilometers. The vertical component is not known but is probably significant (on the order of 1-2 kilometers) based on the abundance of north trending diabase dykes found on the west side of the fault.

PROPERTY GEOLOGY

Outcrop on the Croxall-Kangas property is not abundant, occurring as isolated exposures and in trenches along a ridge stretching from approximately L2W to L14W between 1S and 5S. Other outcrops are found near TL 7N at L6W and L19W respectively and at L5W, 2+50N. No outcrop is present on the northern grid but specimens of diamond drill core are available for hole NR-1 at the Ontario Government core library facilities in Timmins.

The southern part of the property is underlain by strongly foliated and folded intermediate schists intercalated with two or three bands of white to purple-grey chert, chert-magnetite and chert-pyrite iron formation. A persistent band of strongly carbonatized (ankeritic) "quartz-bubble schist" interpreted as pillowed amygdaloidal basalt is traceable for approximately 500 meters along strike. The amygdules ranging in size from 5mm to 5cm are predominantly quartz filled although carbonate was noted on a few exposures. Usually the carbonate has weathered out leaving the rock with a pitted surface.

The "quartz bubble schist" is intruded(?) by altered komatiitic dykes ranging from weakly talcose to strongly carbonatized with green mica (fuchsite) bearing varieties.

Immediately north of the iron formations is a single outcrop of folded and crenulated dark green chlorite schist (mafic volcanic?) intruded by a light grey to buff ankeritic felsic (aplite) dyke. The dyke is also folded. An old pit investigated part of the dyke cut by several pyritic quartz veins. Pyrite also occurs marginal to the veins.

North and west of the previously described units are outcrops of strongly to intensely foliated and chevron folded "mixed fragmental" material (conglomerate) containing (in decreasing abundance) clasts of felsic volcanic, quartz-feldspar porphyry, feldspar-phyric intermediate volcanic and carbonatized mafic volcanic. Rare clasts of "quartz bubble schist" were noted on one outcrop. Clast sizes range from less than 1 cm to over 1 meter and appear matrix supported; the matrix being composed of chloritic and ankeritic material.

Two isolated outcrops of felsic and mafic schist are located along TL 7N. Their lateral extent is not known.


At least four northwest trending diabase dykes cut the volcanic-sedimentary schists on the property. A strongly magnetic gabbro (diabase?) occurs in the southeast corner of the grid.

Diamond drilling on the northern grid of the property revealed the presence of "Temiskaming-type" sediments and tuffs, some of which were graphitic.

STRUCTURAL GEOLOGY

At least two phases of deformation have affected the volcanic rocks on the Croxall-Kangas property. The initial phase of deformation (D1) consists of the development of a strong approximately E-W

predominantly steep north dipping schistosity probably related to the formation of the Porcupine-Destor Break. Excellent asymmetrical pull-apart structures in brittle cherty iron formation suggest sinistral movement of the "Break". This S1 fabric has been folded during a younger (D2) event along NNE trending axes. Textbook crenulation cleavages have developed parallel to subparallel to the axial planes of chevron style folds. The D2 deformation is a WNW-ESE directed compression but its cause is not known.



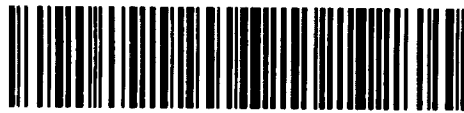
David V. Mullen
Consulting Geologist

REFERENCES

- Pyke, D.R.,
1982: Geology of the Timmins Area, District of Cochrane.
Ontario Geological Survey Geological Report 219, 141p.
Accompanied by Coloured Map 2455 , scale 1:50000, 3
Charts and 1 Sheet Microfiche.



Ministry of
Northern Development
and Mines



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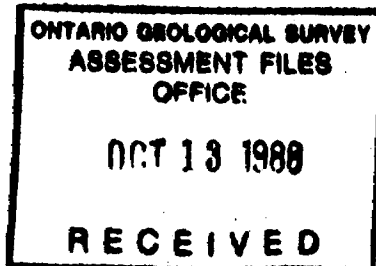
Ontario

Ministère du
Développement du Nord
et des Mines

September 7, 1988

Your File: W8806-224
Our File : 2.11404

Mining Recorder
Ministry of Northern Development and Mines
60 Wilson Avenue
Timmins, Ontario
P4N 2S7



Dear Sir:

RE: Notice of Intent dated August 19, 1988,
Geochemical Survey submitted on
Mining Claims P 849065 et al in the Township
of Price.

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,

W.R. Cowan, Manager
Mining Lands Section
Mines & Minerals Division

Whitney Block, Room 6610
Queen's Park
Toronto, Ontario
M7A 1W3
Telephone: (416) 965-4888

A SH:sc

cc: Chevron Minerals Ltd.
#1714
390 Bay Street
Toronto, Ontario
M5H 2Y2

cc: Mr. David V. Mullen
735 Melrose Blvd
Timmins, Ontario
P4N 5H9

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

cc: Resident Geologist
Timmins, Ontario



Recorded Holder
Chevron Minerals Ltd.

Township of ~~XXX~~
Price

Type of survey and number of Assessment days credit per claim	Mining Claims Assessed
Geophysical	
Electromagnetic _____ days	P 849065-66-69 871793 to 797 inclusive 880298 880301 to 310 inclusive 889259 889261 to 264 inclusive 900409 to 415 inclusive 988131-32
Magnetometer _____ days	
Radiometric _____ days	
Induced polarization _____ days	
Other _____ days	
Section 77 (19) See "Mining Claims Assessed" column	
Geological _____ days	
Geochemical <u>40</u> days	
Man days <input type="checkbox"/> Airborne <input type="checkbox"/>	
Special provision <input checked="" type="checkbox"/> Ground <input checked="" type="checkbox"/>	
<input type="checkbox"/> Credits have been reduced because of partial coverage of claims.	
<input type="checkbox"/> 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

20 days

P 889260

No credits have been allowed for the following mining claims

not sufficiently covered by the survey insufficient technical data filed

P 988133-34

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.

2.11404 Mining Act

Type of Survey(s) Linecutting and Geology		Township or Area Price Township	
Claim Holder(s) Chevron Minerals Ltd.		Prospector's Licence No. T-1690	
Address #1714 - 390 Bay Street, Toronto, Ontario M5H 2Y2			
Survey Company Timmins Geophysics/Henry Gonzalez/Dave Mullen.		Date of Survey (from & to) 01 Day 09 Mo. 87 Yr. 08 Day 06 Mo. 88 Yr.	Total Miles of line Cut 39.3 (63.3 km)
Name and Address of Author (of Geo-Technical report) David V. Mullen 735 Melrose Blvd., Timmins, Ontario P4N 5H9			

Credits Requested per Each Claim in Columns at right

Special Provisions	Geophysical	Days per Claim
For first survey: Enter 40 days. (This includes line cutting)	- Electromagnetic	
	- Magnetometer	
For each additional survey: using the same grid: Enter 20 days (for each)	- Radiometric	
	- Other	
	Geological	40
	Geochemical	

Man Days	Geophysical	Days per Claim
Complete reverse side and enter total	- Electromagnetic	
	- Magnetometer	
	- Radiometric	
	- Other	
	Geological	
	Geochemical	

Airborne Credits	Geophysical	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		Expend. Days Cr.	Mining Claim		Expend. Days Cr.
Prefix	Number		Prefix	Number	
P	849065		P	889263	
	849066			889264	
	849069			900409	
	871793			900410	
	871794			900411	
	871795			900412	
	871796			900413	
	871797			900414	
	880298			900415	
	880301			988131	
	880302			988132	
	880303			988133	
	880304			988134	
	880305				
	880306				
	880307				
	880308				
	880309				
	880310				
	889259				
	889260				
	889261				
	889262				

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.

Date July 8, 1988 Recorded/Holder or Agent (Signature) [Signature]

For Office Use Only

Total Days Cr. Recorded 11440 Date Recorded 7/12/88 Mining Recorder [Signature]

Date Approved as Recorded 7/12/88 Branch Director [Signature]

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
W.E. Glenn, #1714 - 390 Bay Street, Toronto, Ontario M5H 2Y2

Date Certified July 11, 1988 Certified by [Signature]

RECEIVED
AUG 15 1988
MINING LANDS SECTION

RECORDED
JUL 12 1988

Total number of mining claims covered by this report of work. **36**



TO BE ATTACHED AS AN APPENDIX TO TECHNICAL REPORT
FACTS SHOWN HERE NEED NOT BE REPEATED IN REPORT
TECHNICAL REPORT MUST CONTAIN INTERPRETATION, CONCLUSIONS ETC.

Type of Survey(s) Geological
Township or Area Price Township
Claim Holder(s) Chevron Minerals Ltd.
#1714 - 390 Bay Street, Toronto, Ontario
Survey Company Timmins Geophysics / David Mullen
Author of Report David Mullen
Address of Author 735 Melrose Blvd., Timmins, Ontario
Covering Dates of Survey September 1, 1987 - June 8, 1988
(linecutting to office)
Total Miles of Line Cut 39.3 miles

MINING CLAIMS TRAVERSED
List numerically

P849065	P889262
P849066	P889263
P849069	P889264
P871793	P900409
P871794	P900410
P871795	P900411
P871796	P900412
P871797	P900413
P880298	P900414
P880301	P900415
P880302	P988131
P880303	P988132
P880304	P988133
P880305	P988134
P880306	
P880307	
P880308	
P880309	
P880310	
P889259	
P889260	
P889261	

If space insufficient, attach list

**SPECIAL PROVISIONS
CREDITS REQUESTED**

DAYS
per claim

ENTER 40 days (includes
line cutting) for first
survey.

ENTER 20 days for each
additional survey using
same grid.

Geophysical
-Electromagnetic _____
-Magnetometer _____
-Radiometric _____
-Other _____
Geological 40
Geochemical _____

AIRBORNE CREDITS (Special provision credits do not apply to airborne surveys)

Magnetometer Electromagnetic Radiometric
(enter days per claim)

DATE: July 11, 1988 SIGNATURE: [Signature]
Author of Report or Agent

Res. Geol. _____ Qualifications 2.1814

Previous Surveys

File No.	Type	Date	Claim Holder

TOTAL CLAIMS 36

OFFICE USE ONLY

GEOPHYSICAL TECHNICAL DATA

GROUND SURVEYS – If more than one survey, specify data for each type of survey

Number of Stations _____ Number of Readings _____
Station interval _____ Line spacing _____
Profile scale _____
Contour interval _____

MAGNETIC

Instrument _____
Accuracy – Scale constant _____
Diurnal correction method _____
Base Station check-in interval (hours) _____
Base Station location and value _____

ELECTROMAGNETIC

Instrument _____
Coil configuration _____
Coil separation _____
Accuracy _____
Method: Fixed transmitter Shoot back In line Parallel line
Frequency _____
(specify V.L.F. station)
Parameters measured _____

GRAVITY

Instrument _____
Scale constant _____
Corrections made _____

Base station value and location _____

Elevation accuracy _____

INDUCED POLARIZATION RESISTIVITY

Instrument _____
Method Time Domain Frequency Domain
Parameters – On time _____ Frequency _____
– Off time _____ Range _____
– Delay time _____
– Integration time _____
Power _____
Electrode array _____
Electrode spacing _____
Type of electrode _____

SELF POTENTIAL

Instrument _____ Range _____

Survey Method _____

Corrections made _____

RADIOMETRIC

Instrument _____

Values measured _____

Energy windows (levels) _____

Height of instrument _____ Background Count _____

Size of detector _____

Overburden _____

(type, depth – include outcrop map)

OTHERS (SEISMIC, DRILL WELL LOGGING ETC.)

Type of survey _____

Instrument _____

Accuracy _____

Parameters measured _____

Additional information (for understanding results) _____

AIRBORNE SURVEYS

Type of survey(s) _____

Instrument(s) _____
(specify for each type of survey)

Accuracy _____
(specify for each type of survey)

Aircraft used _____

Sensor altitude _____

Navigation and flight path recovery method _____

Aircraft altitude _____ Line Spacing _____

Miles flown over total area _____ Over claims only _____

GEOCHEMICAL SURVEY - PROCEDURE RECORD

Numbers of claims from which samples taken _____

Total Number of Samples _____

Type of Sample _____
(Nature of Material)

Average Sample Weight _____

Method of Collection _____

Soil Horizon Sampled _____

Horizon Development _____

Sample Depth _____

Terrain _____

Drainage Development _____

Estimated Range of Overburden Thickness _____

SAMPLE PREPARATION

(Includes drying, screening, crushing, ashing)

Mesh size of fraction used for analysis _____

General _____

ANALYTICAL METHODS

Values expressed in: per cent
p. p. m.
p. p. b.

Cu, Pb, Zn, Ni, Co, Ag, Mo, As, -(circle)

Others _____

Field Analysis (_____ tests)

Extraction Method _____

Analytical Method _____

Reagents Used _____

Field Laboratory Analysis

No. (_____ tests)

Extraction Method _____

Analytical Method _____

Reagents Used _____

Commercial Laboratory (_____ tests)

Name of Laboratory _____

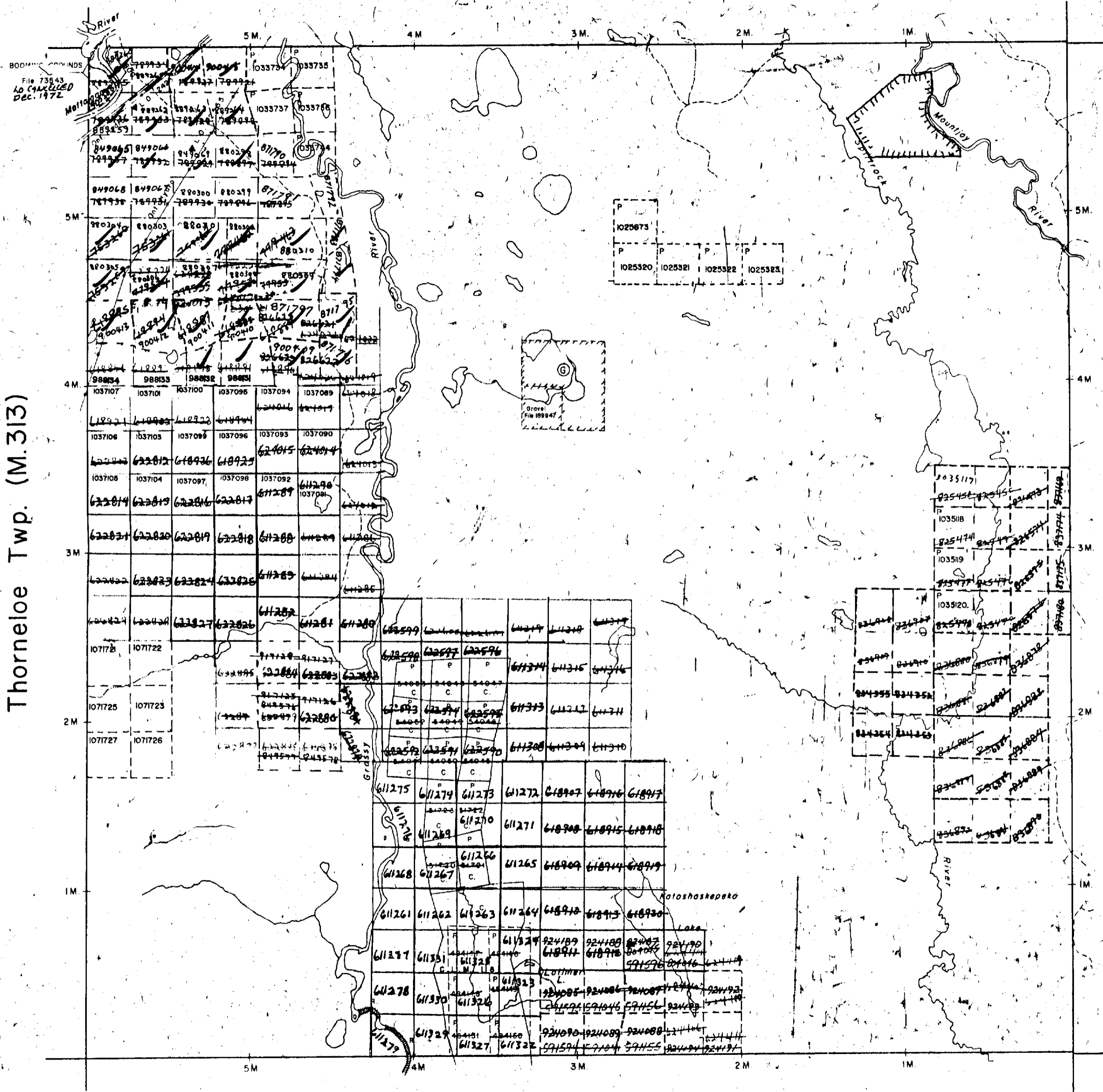
Extraction Method _____

Analytical Method _____

Reagents Used _____

General _____

Ogden Twp. (M.305)



Thorneloe Twp. (M.313)

Adams Twp. (M.261)

THE TOWNSHIP OF

PRICE.

DISTRICT OF COCHRANE

PORCUPINE MINING DIVISION

SCALE: 1-INCH = 40 CHAINS

DISPOSITION OF CROWN LANDS

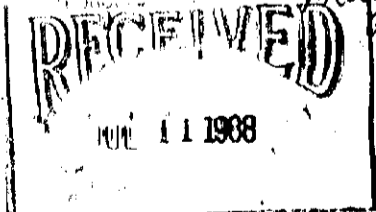
- PATENT, SURFACE AND MINING RIGHTS ●
- " SURFACE RIGHTS ONLY ○
- " MINING RIGHTS ONLY ◐
- LEASE, SURFACE AND MINING RIGHTS ■
- " SURFACE RIGHTS ONLY ◑
- " MINING RIGHTS ONLY ◒
- LICENCE OF OCCUPATION ▼
- ROADS
- IMPROVED ROADS ————
- KING'S HIGHWAYS ————
- RAILWAYS ————
- POWER LINES ————
- MARSH OR MUSKEG ————
- MINES ————
- CANCELLED ————

NOTES

400' surface rights reservation along the shores of all lakes and rivers.

Areas withdrawn from staking under Section 43 of the Mining Act (R.S.O. 1970).
Order No. File Date Disposition

PLANNED REFORESTATION



SAND AND GRAVEL

Ⓞ QUARRY PERMIT

Rec. Oct. 3/79
This township lies within the Municipality of the CITY of TIMMINS.

PLAN NO. M-307

ONTARIO
MINISTRY OF NATURAL RESOURCES
SURVEY AND MAPPING BRANCH

Fripp Twp. (M.281)



