42A01SW0036 2.7381 EBY

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REPORT ON
AIRBORNE GEOPHYSICAL SURVEYS
BURT, HOLMES AND EBY TOWNSHIPS,
DISTRICT OF TIMISKAMING, LARDER LAKE
MINING DIVISION, ONTARIO

for

BILLITON CANADA LIMITED

by

Frank L. Jagodits, P. Eng.,
Consulting Geophysicist

September 1984

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CONSULTANTS LTD.

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LIST OF ACCOMPANYING MAPS

MAP NUMBER	TITLE	SCALE
1A	Airborne Magnetometer Survey, Total Field Contours, North-South Lines	1:10,000
1B	Airborne Magnetometer Survey, Total Field Contours, East-West Lines	1:10,000
2A	Airborne Electromagnetic Survey, VLF Profiles, North-South Lines	1:10,000
2B	Airborne Electromagnetic Survey, VLF Profiles, East-West Lines	1:10,000
3A	Airborne Electromagnetic Survey, VLF Contours, North-South Lines	1:10,000
3B	Airborne Electromagnetic Survey, VLF Contours, East-West Lines	1:10,000
4	Interpretation Map	1:10,000

1. INTRODUCTION

The airborne geophysical surveys were conducted by Kenting Earth Sciences Limited of Ottawa on behalf of Billiton Canada Limited over 242 claims located in Burt, Holmes and Eby Townships, District of Timiskaming, Larder Lake Mining Division, Ontario. The combined magnetic and VLF-EM surveys, intended to aid the understanding of the subsurface geology was flown between December 13 and 15th, 1983. The Piper Navajo survey aircraft (registration C-FFRT) and crew were based in North Bay, Ontario during the survey.

The claim block is situated approximately 25 kms southwest from Kirkland Lake (Fig. 1). The surveyed claims are shown on Fig. 2 and they are listed on the "Geophysical-Geological-Geochemical Technical Data Statements" found in the Appendix.

North-south as well as east-west lines were flown; the north-south lines (206.72 l. km) cover all of the claims and the east-west lines (27.18 l. km.) cover the western half of the block.

The following report describes the survey specifications, instrumentation, presentation together with a brief discussion of the results of both surveys.

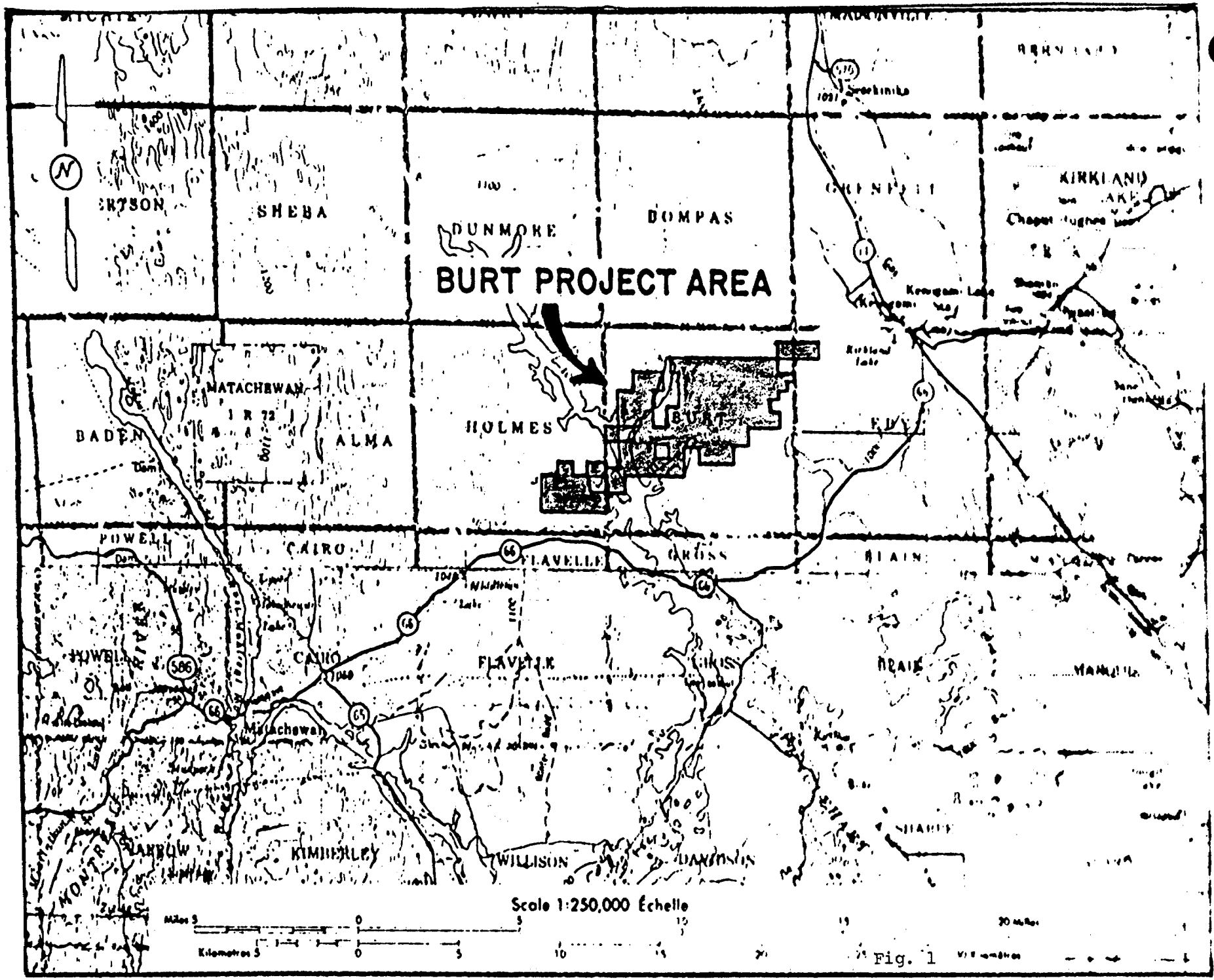

BURT PROJECT AREA
SHEBA
DUNMORE
DOMPAS
KIRKLAND
HOLMES
BURT
BADEN
ALMA
CAIRO
FLAVELLE
KIMBERLEY
WILLISON
Scale 1:250,000 Échelle

Fig. 1

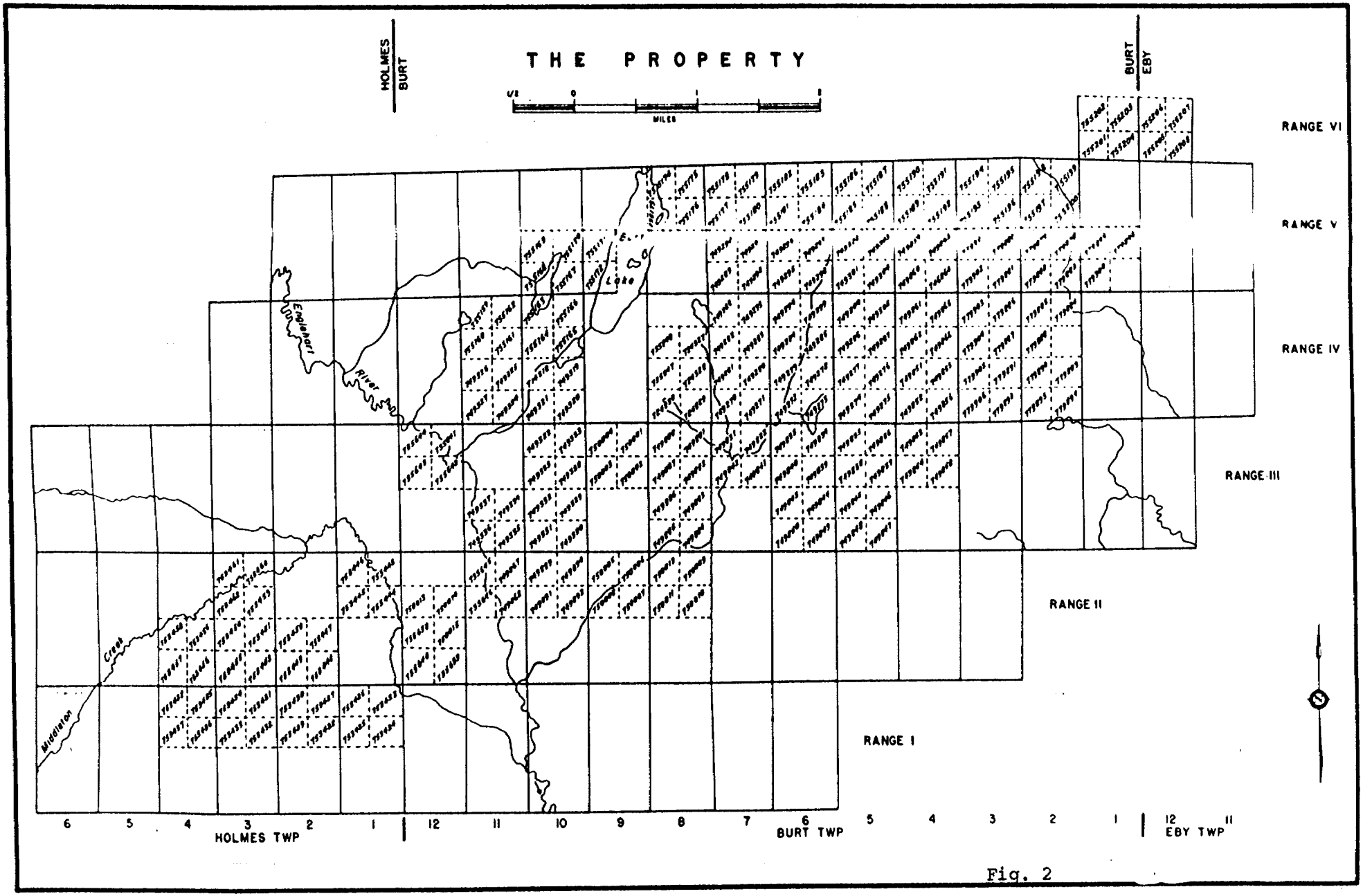

THE PROPERTY
HOLMES
BURT
BURT
EBY
MILES
RANGE VI
RANGE V
RANGE IV
RANGE III
RANGE II
RANGE I
Englehart River
Lake
Creek
Middleton
6 5 4 3 2 1 12 11 10 9 8 7 6 5 4 3 2 1 12 11
HOLMES TWP
BURT TWP
EBY TWP

Fig. 2

2. SURVEY SPECIFICATIONS AND INSTRUMENTATION

2.1 General

Two line spacings were employed: (a) north-south lines - 200 m and (b) east-west lines - 500 m. Tie-lines were also surveyed outside of the east-west coverage. The ground clearance of the aircraft was maintained at 150 m and the ground speed was about 250 km/h.

Visual navigation was employed using uncontrolled lay-down photo-mosaic.

2.2 Instrumentation

The Scintrex model VIW 23I 1A1 optically pumped cesium vapour magnetometer, mounted in a tail stinger was employed for the measurement of the total magnetic field.

For the VLF-EM survey the Hertz Industries Totem 2A system, measuring the total field and quadrature component of the vertical field was utilized. VLF transmitters NLK (Jim Creek, Washington, f= 24.8 kHz) and NSS (Annapolis, Md, f= 21.4 kHz) provided the primary field for the north-south and east-west surveys respectively.

The geophysical data were sampled every 0.25 seconds and were recorded in digital form on the KDSS-5 data acquisition system and analogue charts were plotted by software in the KDSS-5 on a Centronix model 122 Printer/Plotter.

The ground clearance of the aircraft was measured using a Honeywell radar altimeter model HG 7602. The AS-5 flight path camera was employed operating in the strip mode.

3. DATA REDUCTION AND PRESENTATION

Uncontrolled photomoasics at a scale of 1:10,000 serve as the base map for the presentation of the geophysical results. The flight path of the aircraft was recovered on the base map using the 35 mm. flight path film. The flight path was subsequently digitized and was subjected to a speed check.

The compilation of the magnetic and VLF-EM commenced after the mersing of the flight path and the airborne data. The initial step of the magnetic reduction is the removal of the single point spikes with a pattern recognition algorithm using fourth differences.

The levelled magnetic data were gridded using 10.16 grid cells per inch and was computer contoured using a basic interval of 10 gammas.

The VLF-EM data were levelled by establishing zero levels on all flights and by level adjustments correcting for deviations from base levels.

The VLF results are presented in two formats: (a) as profiles of the total field and the quadrature component along the flight lines and (b) as contours of the total field using 0.5% contour interval.

The line profile data were also submitted by contractor on an archieve tape.

Results derived from the north-south and east-west surveys are presented on separate maps, however, only one interpretation map was prepared combining the study of both surveys.

4. DISCUSSION OF THE RESULTS

The following geological notes are based on Maps 2078 and 2239, Holmes-Burt and Eby-Otto Areas (published by the Ontario Department of Mines in 1966 and 1972 respectively).

The central part of the claim block is covered by recent sediments lacking outcrop. The three rock types west of the Engelhart River, which crosses the property in a north-northwest direction are: (a) the Huronian Gowganda Formation (quartzite, slate and argillite and greywacke) underlies the central, larger part, (b) syenitic and (c) basic intrusive rocks which occur to the north and to the south of the Gowganda respectively.

Nearly all of the claim block east of the Engelhart River is shown to be underlain by the Gowganda excepting along the southeastern margin of the blcok. Here, mafic and intermediate composition volcanics are mapped with minor occurrence of granitic rocks. Matachewan diabase dykes are not indicated within the property but shown elsewhere on the geologic maps. A northeast, east-northeast striking iron formation within mafic to intermediate volcanics occurs about 1.6 km south of the property.

From the description of the rocks of the Gowganda Formation it can be safely assumed that they are non-magnetic. Hence it is not surprising that nearly all of the observed magnetic anomalies are broad, suggestive of deeper sources in the Archean. There are only a handful complete anomalies, the others are incomplete occurring along the edges of the property. Depth determinations using the method described by Vacquier (Ref. 1) result in a depth to the magnetic sources of about 150 m (below ground surface). Since the anomaly induces, used for the calculations cannot be accurately defined, the above

depth should be considered as a rough approximation. Nevertheless, it can be said that the three anomalies investigated (A, B and C) have their sources at a depth of at least 75-100 m.

It is suggested that the Gowganda Formation cover prevail over the entire claim block. The Archean rocks underlying the Gowganda are believed to be largely non-magnetic. The magnetic anomalies thought to represent intrusions of felsic to intermediate composition (intermediates dominating). The likelihood of volcanics causing the anomalies along the eastern border of block is considered to be quite certain. The approximate outline of the magnetic sources are demarked on the Interpretation Map. Whenever possible bodies signified by residual anomalies superimposed on the broader, major features are also indicated. In addition, the axis of magnetic trends which would signal dykes (e.g. MT1 and MT2) are also shown.

The VLF-EM surveys revealed that the main strikes of shearing and/or faulting are northwest, north-northwest and northeast, however, nearly east-west conductors are also present, albeit less frequent. The strike length of the features are quite variable, but conductor systems V1, V2 and V3 stand out as possible indicators of northwest and northeast "regional" structures. Conductor V4 associated with MT1 may indicate the contact of a dyke, which in turn may have been emplaced along a regional, northwest trending zone of weakness.

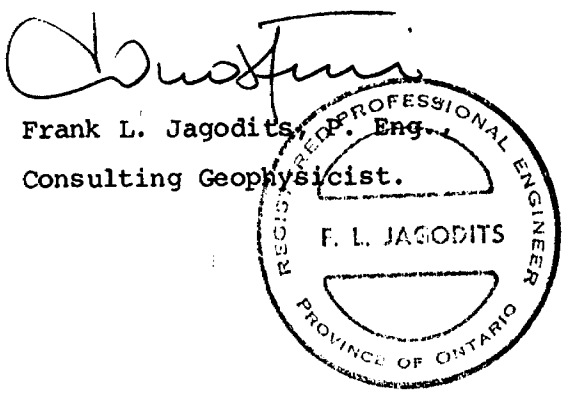
5. SUMMARY

During mid-December of 1983 airborne magnetic and VLF-EM surveys were conducted over 242 claims located in Burt, Holmes and Eby Townships (southwest of Kirkland Lake).

The magnetic contour map suggests that the claim block is underlain by the non-magnetic, Huronian Gowganda Formation and that the sources of the magnetic anomalies are within the Archean beneath the Gowganda. The magnetic anomaly sources are more than likely basic to intermediate composition intrusives, however intermediate to basic volcanics are the likely sources of anomalies at the eastern edge of the area. Depth determinations indicate that the approximate minimum thickness of the Gowganda is in the order of 75-100 m.

The main directions of structural deformation indicated by the VLF-EM results are: northwest, north-northwest and northeast. Conductor Systems V1, V2, V3 and V4 may be construed to depict regional faults and/or shears.

Respectfully submitted,



Frank L. Jagodits, P. Eng.
Consulting Geophysicist.

FLJ:sb
September 24, 1984

6. REFERENCES

1. Vacquier, V., Steenland, N.C., Henderson, R. G. and Zietz, I. (1951) Interpretation of Aeromagnetic Maps, The Geological Society of America, Memoir 47.

7. APPENDIX

LIST OF PERSONNEL

NAME	ADDRESS	
G. Carter	380 Hunt Club Rd., OTTAWA, Ontario. K1G 3N3	Pilot
S. Hay	"	Pilot
M. Andrews	"	Electronic Technician
J. Simpson	"	Data Technician
D. Darbha	"	Geophysicist
		Drafting
S. Blunt	Excalibur Int. Cons.	Typing
F. L. Jagodits	19 Orangewood Cr., AGINCOURT, Ontario. M1W 1C5	Cons. Geophysicist Reporting

CERTIFICATE

I, Francis Loui Jagodits, of the Borough of Scarborough, County of York, Province of Ontario, do hereby certify that:

1. I am a geophysical engineer residing at 19 Orangewood Crescent, Agincourt, Ontario.

2. I am a graduate of the Technical University of Sopron, Hungary with Dipl. Eng. degree in geophysical engineering (1956).

3. I am a member of the Society of Exploration Geophysicists, the European Association of Exploration Geophysicists, the Canadian Geophysical Union and Fellow of the Geological Association of Canada.

4. I am a professional engineer, registered in the Province of Ontario.

5. I have no direct or indirect interest, nor do I expect to receive any interest directly or indirectly in the property or securities of Billiton Canada Ltd.

6. The statements made in this report are based on study of published and unpublished private reports.

7. Permission is granted to use in whole or in part for assessment and qualifications requirements but not for advertising purposes.

Dated at Scarborough,

This 24th day of September, 1984.

Francis L. Jagodits, Dipl. Eng. P. Eng.

REGISTERED PROFESSIONAL ENGINEER
F. L. JAGODITS
PROVINCE OF ONTARIO

Lands Mines

Ministry of Natural Resources
Ontario

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

42A01SW0036 2.7381 EBY

900

(Prob L735638)

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Type of Survey(s)	Township or Area
Airborne Geophysical	Burt, Holmes, Eby

Claim Holder(s)	Prospector's Licence No.
Billiton Canada Limited, Bertrand Dallaire	T1535 M21563

Address: Suite 1006, 141 Adelaide Street West, Toronto, Ontario M5H 3L9

Survey Company	Date of Survey (from & to)						Total Miles of line Cut
	Day	Mo.	Yr.	Day	Mo.	Yr.	
Kenting Earth Sciences Limited	13	12	83	15	12	83	

Name and Address of Author (of Geo-Technical report): F.L. Jagodits, P. Eng. 19 Orangewood Cres., Agincourt, Ontario M1W 1C5

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	
	- Magnetometer	
For each additional survey: using the same grid: Enter 20 days (for each)	- Radiometric	
	- Other	
	Geological	
	Geochemical	

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

LAPIDER LAKE MINING DIVISION RECEIVED SEP 24 1984 AM PM 7 8 9 10 11 12 1 2 3 4 5 6

Airborne Credits		Days per Claim
Note: Special provisions credits do not apply to Airborne Surveys.	Electromagnetic	8.45
	Magnetometer	8.45
	Radiometric	

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.

Mining Claims Traversed (List in numerical sequence)

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.
L	735638	16.9
	735639	16.9
	735640	16.9
	735641	16.9
	735642	16.9
	735643	16.9
	735644	16.9
	735645	16.9
	735646	16.9
	749318	16.9
	749319	16.9
	749320	16.9
	749321	16.9
	749322	16.9
	749323	16.9
	749324	16.9
	749325	16.9
	749326	16.9
	749327	16.9
	749328	16.9
	749329	16.9
	749330	16.9
	749331	16.9

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.
L	749332	16.9
	749333	16.9
	749334	16.9
	749335	16.9
	749336	16.9
	749337	16.9
	749889	16.9
	749890	16.9
	749891	16.9
	749892	16.9
	750002	16.9
	750003	16.9
	750004	16.9
	750005	16.9
	750006	16.9
	750007	16.9
	750008	16.9
	750011	16.9
	750012	16.9
	750013	16.9
	750014	16.9
	750015	16.9
	753423	16.9

Total number of mining claims covered by this report of work: 84

For Office Use Only

Total Days Cr. Recorded	Date Recorded	Mining Recorder
1419.6	SEP 24 1984	
	Date Approved as Recorded	Branch Director
	see revised statement	

Date	Recorded Holder or Agent (Signature)
Sept 21/84	

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

F.L. Jagodits, P. Eng.
19 Orangewood Cres.,
Agincourt, Ontario M1W 1C5

Date Certified: Sept. 1[illegible]

Certified by (Signature): F. L. JAGODITS

REGISTERED PROFESSIONAL ENGINEER PROVINCE OF ONTARIO

MINING CLAIMS TRAVERSED (CONT'D.)

Mining Claim Prefix	Number	Expend. Cr. Days
L	753424	16.9
	753425	16.9
	753426	16.9
	753427	16.9
	753428	16.9
	753429	16.9
	753430	16.9
	753431	16.9
	753432	16.9
	753433	16.9
	753434	16.9
	753435	16.9
	753436	16.9
	753443	16.9
	753444	16.9
	753445	16.9
	753446	16.9
	753447	16.9
	753448	16.9
	753449	16.9
	753450	16.9
	753451	16.9
	753452	16.9
	753453	16.9
	753454	16.9
	753455	16.9
	753456	16.9
	753459	16.9
	753460	16.9
	753461	16.9
	753462	16.9
	755160	16.9
	755161	16.9
	755164	16.9
	755165	16.9
	749867	16.9
	749868	16.9
	749887	16.9

Ministry of Natural Resources

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

(L 724827)

The 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.

Nov 23rd

Type of Survey(s): Airborne Geophysical

Township or Area: Burt, Holmes, Eby

Claim Holder(s): Billiton Canada Limited, Bertrand Dallaire, Maurice Gauthier

Prospector's Licence No.: T1535 M21563 M21562

Address: Suite 1006, 141 Adelaide Street West, Toronto, Ontario M5H 3L9

Survey Company: Kenting Earth Sciences Limited

Date of Survey (from & to): 13 12 83 (Day / Mo. / Yr.) — 15 12 83 (Day / Mo. / Yr.)

Total Miles of line Cut:

Name and Address of Author (of Geo-Technical report): F.L. Jagodits, P. Eng. 19 Orangewood Crescent Agincourt, Ontario M1W 1C5

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	
	· Magnetometer	
For each additional survey: using the same grid: Enter 20 days (for each)	· Radiometric	
	· Other	
	Geological	
	Geochemical	

Man Days		Days per Claim
Complete reverse side and enter total(s) here	Geophysical · Electromagnetic	
	· Magnetometer	
	· Radiometric	
	· Other	
	Geological	
	Geochemical	

Airborne Credits		Days per Claim
Note: Special provisions credits do not apply to Airborne Surveys.	Electromagnetic	21.2
	Magnetometer	21.2
	Radiometric	

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Mining Claims Traversed (List in numerical sequence)

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.
L	724827	42.4
	724828	42.4
	724829	42.4
	724830	42.4
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	735639	42.4
	735640	42.4
	735641	42.4
	735642	42.4
	735643	42.4
	735644	42.4
	735645	42.4
	735646	42.4
	735647	42.4
	735648	42.4
	749270	42.4
	749271	42.4
	749272	42.4
	749273	42.4
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	749275	42.4
	749276	42.4
	749277	42.4

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.
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	749280	42.4
	749281	42.4
	749282	42.4
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	749284	42.4
	749285	42.4
	749286	42.4
	749287	42.4
	749288	42.4
	749289	42.4
	749290	42.4
	749291	42.4
	749292	42.4
	749293	42.4
	749294	42.4
	749295	42.4
	749296	42.4
	749297	42.4
	749298	42.4
	749299	42.4
	749300	42.4

Total number of mining claims covered by this report of work: 242

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: Nov 21st 1984

Recorded Holder or Agent (Signature):

For Office Use Only

Total Days Cr. Recorded: 10,2608

Date Recorded: SEP 24 1984

Mining Recorder:

Date Approved as Recorded: Nov 13/84

Branch Director:

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:
F.L. Jagodits, P. Eng. 19 Orangewood Cr.
Agincourt, Ontario M1W 1C5

Date Certified: August 14/84

Certified By (Signature):

F. L. JAGODITS
PROFESSIONAL ENGINEER
PROVINCE OF ONTARIO

Mining Claims Traversed (List in numerical sequence)

Prefix	Claim Number	Expend Days Cr.	Prefix	Claim Number	Expend Days Cr.
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	749305	42.4		749855	42.4
	749318	42.4		749856	42.4
	749319	42.4		749857	42.4
	749320	42.4		749858	42.4
	749321	42.4		749859	42.4
	749322	42.4		749860	42.4
	749323	42.4		749861	42.4
	749324	42.4		749862	42.4
	749325	42.4		749863	42.4
	749326	42.4		749864	42.4
	749327	42.4		749865	42.4
	749328	42.4		749866	42.4
	749329	42.4		749867	42.4
	749330	42.4		749868	42.4
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	749850	42.4		750015	42.4

Mining Claims Traversed (Cont'd.)

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	755203	42.4
	755204	42.4
	755205	42.4
	755207	42.4
	755208	42.4
	779878	42.4
	779879	42.4
	779880	42.4
	779881	42.4
	779882	42.4
	779883	42.4
	779884	42.4
	779885	42.4
	779886	42.4
	779887	42.4
	779888	42.4
	779889	42.4
	779890	42.4
	779891	42.4
	779892	42.4
	779893	42.4
	779894	42.4
	779898	42.4
	779899	42.4
	779900	42.4
	779901	42.4
	779902	42.4
	779903	42.4
	779904	42.4
	779905	42.4
	779906	42.4

Ontario

Ministry of Natural Resources

File _____

GEOPHYSICAL – GEOLOGICAL – GEOCHEMICAL TECHNICAL DATA STATEMENT

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) Airborne Magnetic and VLF-EM

Township or Area Burt, Holmes and Eby Twps.

Claim Holder(s) Billiton Canada Ltd.,
Bertrand Dallaire

Survey Company Kenting Earth Sciences Ltd.

Author of Report Frank L. Jagodits, P. Eng.

Address of Author 19 Orangewood Cr., Agincourt, Ont. M1W 1C5

Covering Dates of Survey Dec. 13-15, 1983
(linecutting to office)

Total Miles of Line Cut _____

MINING CLAIMS TRAVERSED
List numerically

(prefix) (number)

See attached list

If space insufficient, attach list

SPECIAL PROVISIONS CREDITS REQUESTED

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

ENTER 20 days for each additional survey using same grid.

DAYS per claim

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

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

Magnetometer 8.45 Electromagnetic 8.45 Radiometric _____
(enter days per claim)

DATE: OCT. 1. 1984 SIGNATURE: _____
Author of Report or Agent

Res. Geol. _____ Qualifications _____

Previous Surveys

File No.	Type	Date	Claim Holder

TOTAL CLAIMS _____

OFFICE USE ONLY

837 (5/79)

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) Magnetometer and VLF-EM

Instrument(s) Scintrex VIW 23I 1A2 (cesium vapour mag.) Hertz Totem 2A
(specify for each type of survey)

Accuracy 0.01 nT, 1%
(specify for each type of survey)

Aircraft used Piper Navajo, C-FFRY

Sensor altitude 150 m

Navigation and flight path recovery method Visual navigation from photomosaic, flight path film and photomosaic

Aircraft altitude 150 m Line Spacing 500 m

Miles flown over total area 38.7 mi (62.3 km) Over claims only 16.89 mi (27.32 km)

VLF Transmitter: NSS, Annapolis, Md. f=21.4 kHz

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 _____

Ontario

Ministry of Natural Resources

File _____

GEOPHYSICAL – GEOLOGICAL – GEOCHEMICAL TECHNICAL DATA STATEMENT

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) Airborne Magnetic & VLF-EM

Township or Area Burt, Holmes and Eby Twps.

Claim Holder(s) Billiton Canada Ltd.

Bertrand Callaire, Maurice Gauthier

Survey Company Kenting Earth Sciences Ltd.

Author of Report Frank I. Jagodits, P. Eng.

Address of Author 19 Orangewood Cr., Agincourt, Ont. M1W 1C5

Covering Dates of Survey Dec. 13-15, 1983 (linecutting to office)

Total Miles of Line Cut _____

MINING CLAIMS TRAVERSED
List numerically

(prefix) (number)

See attached list

TOTAL CLAIMS _____

If space insufficient, attach list

SPECIAL PROVISIONS CREDITS REQUESTED

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

ENTER 20 days for each additional survey using same grid.

DAYS per claim

Geophysical

--Electromagnetic _____

--Magnetometer _____

--Radiometric _____

--Other _____

Geological _____

Geochemical _____

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

Magnetometer 21.2 Electromagnetic 21.2 Radiometric _____
(enter days per claim)

DATE: Oct. 1, 1984 SIGNATURE: _____
Author of Report or Agent

FILED PROFESSIONAL ENGINEER PROVINCE OF ONTARIO

GEOPHYSICAL CREDITS

Res. Geol. _____ Qualifications 2500

Previous Surveys

File No.	Type	Date	Claim Holder

OFFICE USE ONLY

837 (5/79)

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) Magnetometer and VLF-EM

Instrument(s) Scintrex VIW 23I 1A1 (Cesium Vapour Mag.), Hertz Totem 2A

(specify for each type of survey)

Accuracy 0.01 nT, 1s

(specify for each type of survey)

Aircraft used Piper Navajo, C-FERY

Sensor altitude 150 m

Navigation and flight path recovery method Visual navigation from photomosaic, flight path film and photomosaic

Aircraft altitude 150 m Line Spacing ~~200 m~~

Miles flown over total area ~~309.3 mi. (497.66 km)~~ Over claims only ~~128.48 mi. (206.72 km)~~

VLF transmitter: NAA, Cutler, Maine, f = 24.8 kHz

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_____

Mining Claims Traversed (List in numerical sequence)

Prefix	Claim Number
L	724827
	724828
	724829
	724830
	735638
	735639
	735640
	735641
	735642
	735643
	735644
	735645
	735646
	735647
	735648
	749270
	749271
	749272
	749273
	749274
	749275
	749276
	749277
	749278
	749279
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	749291
	749292
	749293
	749294
	749295
	749296
	749297
	749298
	749299
	749300 ✓

Prefix	Claim Number
L	749301
	749302
	749303
	749304
	749305
	749318
	749319
	749320
	749321
	749322
	749323
	749324
	749325
	749326
	749327
	749328
	749329
	749330
	749331
	749332
	749333
	749334
	749335
	749336
	749337
	749831
	749832
	749833
	749834
	749835
	749836
	749837
	749838
	749839
	749840
	749841
	749842
	749843
	749844
	749845
	749846
	749847
	749848
	749849
	749850
	749851

Prefix	Claim Number
L	749852
	749853
	749854
	749855
	749856
	749857
	749858
	749859
	749860
	749861
	749862
	749863
	749864
	749865
	749866
	749867
	749868
	749881
	749882
	749883
	749884
	749885
	749886
	749887
	749888
	749889
	749890
	749891
	749892
	750001
	750002
	750003
	750004
	750005
	750006
	750007
	750008
	750009
	750010
	750011
	750012
	750013
	750014
	750015
	753423
	753424

Mining Claims Traversed (cont.)

Prefix	Claim Number
L	753425
	753426
	753427
	753428
	753430
	753431
	753432
	753433
	753434
	753435
	753436
	753437
	753438
	753443
	753444
	753445
	753446
	753447
	753448
	753449
	753450
	753451
	753452
	753453
	753454
	753455
	753456
	753457
	753458
	753459
	753460
	753461
	753462
	755159
	755160
	755161
	755162
	755163
	755164
	755165
	755166
	755167
	755168
	755169
	755170
	755171
	755172
	755173
	755175
	755176

Prefix	Claim Number
L	755177
	755180
	755181
	755182
	755183
	755184
	755185
	755186
	755188
	755189
	755190
	755191
	755192
	755193
	755194
	755195
	755196
	755197
	755198
	755199
	755200
	755201
	755202
	755203
	755204
	755205
	755207
	755208
	779878
	779879
	779880
	779881
	779882
	779883
	779884
	779885
	779886
	779887
	779888
	779889
	779890
	779891
	779892
	779893
	779894
	779898
	779899
	779900
	779901
	779902
	779803
	779804

Mining Claims Traversed (List in numerical sequence)

Prefix	Claim Number
L	735638
	735639
	735640
	735641
	735642
	735643
	735644
	735645
	735646
	749318
	749319
	749320
	749321
	749322
	749323
	749324
	749325
	749326
	749327
	749328
	749329
	749330
	749331
	749332
	749333
	749334
	749335
	749336
	749337
	749889
	749890
	749891
	749892
	750002
	750003
	750004
	750005
	750006
	750007
	750008

Prefix	Claim Number
L	750011
	750012
	750013
	750014
	750015
	753423
	753427
	753428
	753429
	753430
	753431
	753432
	753433
	753434
	753435
	753436
	753443
	753444
	753445
	753446
	753447
	753448
	753449
	753450
	753451
	753452
	753453
	753454
	753455
	753456
	753459
	753460
	753461
	753464
	755160
	755164
	755165
	749867
	749868
	749887

Billiton Canada Ltd.

Suite 1006
141 Adelaide Street West
Toronto, Ontario M5H 3L9

Telephone (416) 362-6624
Telex 06-23518

RECEIVED
Land Management Branch
CIRCULATE [ ]
COMMENTS PLEASE [ ]
BY
NOV - 6 1984
S. E. YUNT
W. L. GOOD
E. J. HOGAN
W. P. BROOK
R. 6643

November 1, 1984

S.E. Yunt
Director - Land Management Branch
Ministry of Natural Resources
Whitney Block, Room 6643
Queens Park
Toronto, Ontario
M7A 1W3

Dear Sir:

Herewith please find 2 copies of an assessment report prepared for Billiton Canada Limited covering an airborne geophysical survey carried out over claims in Burt, Holmes and Eby townships, Larder Lake, Mining Division, District of Timiskaming, Ontario.

Yours sincerely,

H.J. Coates
Senior Geologist

Encl.

cc: G.J. Kolezar
Mining Recorder-Larder Lake
P.O. Box 984
4 Government Road East
Kirkland Lake, Ontario
P2N 1A2

Mining Lands Section

File No 2·7381

Control Sheet

TYPE OF SURVEY

✓ GEOPHYSICAL

____ GEOLOGICAL

____ GEOCHEMICAL

____ EXPENDITURE

MINING LANDS COMMENTS:

1 approval #422

1 notice of intent #423

Doug

Signature of Assessor

12/11/84

Date

LD

1984 12 14

Your File: 423
Our File: 2.7381

Mining Recorder
Ministry of Natural Resources
4 Government Road East
Kirkland Lake, Ontario
P2N 1A2

Dear Sir:

RE: Notice of Intent dated November 15, 1984.
Airborne Geophysical (Electromagnetic,, Magnetometer) Survey on Mining Claims L 735638 et al in the Townships of Burt, Holmes and Eby.

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)965-6918

D. Isherwood:sc

cc: Billiton Canada Limited
Bertrand Dallaire
Maurice Gauthier
Suite 1006
141 Adelaide Street West
Toronto, Ontario
M5H 3L9

cc: F.L. Jagodits, P. Eng.
19 Orangewood Crescent
Agincourt, Ontario
M1W 1C5

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

cc: Resident Geologist
Kirkland Lake, Ontrio

Ministry of Natural Resources
Ontario

Technical Assessment Work Credits

File 2.7381

Date 1984 11 15

Mining Recorder's Report of Work No. 423

Recorded Holder: BILLITON CANADA LIMITED, BERTRAND DALLAIRE

Township or Area: BURT, HOLMES, EBY TOWNSHIPS

Type of survey and number of Assessment days credit per claim	Mining Claims Assessed
Geophysical	
Electromagnetic 9 days	L 735638 to 646 inclusive
Magnetometer 9 days	749318 to 328 inclusive
Radiometric ____ days	749330-331
Induced polarization ____ days	749333
Other ____ days	749335-336
Section 77 (19) See "Mining Claims Assessed" column	749867-868
Geological ____ days	749887
Geochemical ____ days	749889 to 892 inclusive
Man days ☐ Airborne ☒	750002 to 008 inclusive
Special provision ☐ Ground ☐	750011 to 015 inclusive
☐ Credits have been reduced because of partial coverage of claims.	753424-425
☐ Credits have been reduced because of corrections to work dates and figures of applicant.	753428-429
	753432-433
	753436
	753443 to 456 inclusive
	753459 to 462 inclusive
	755160-161
	755164-165

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

L 749329
749332
749334
749337

L 753423
753426-427
753430-431
753434-435

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:

Ministry of Natural Resources

Ontario

Nov. 30/84

1984 11 15

Your File: 423
Our File: 2.7381

Mining Recorder
Ministry of Natural Resources
4 Government Road East
Kirkland Lake, Ontario
P2N 1A2

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

D. Isherwood:mc

Encls.

cc: Billiton Canada Limited
Bertrand Dallaire
Maurice Gauthier
Suite 1006
141 Adelaide Street West
Toronto, Ontario
M5H 3L9

cc: F.L. Jagodits, P.Eng.
19 Orangewood Crescent
Agincourt, Ontario
M1W 1C5

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

Ministry of Natural Resources

Ontario

Notice of Intent

for Technical Reports

1984 11 16

2.7381/423

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.

TRIM LINE

W.342

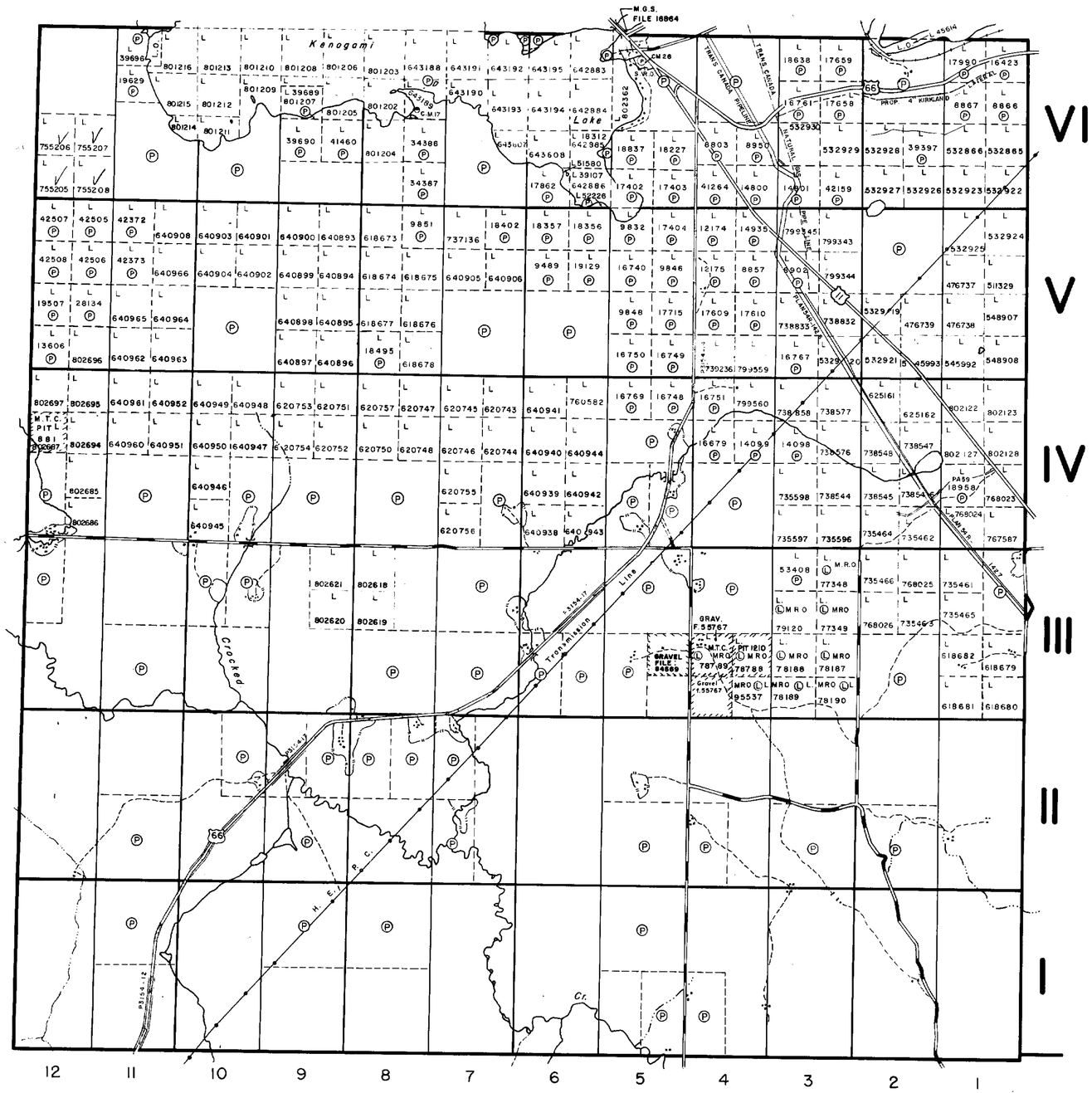
EBY TWP

W.342

Grenfell Twp. M.351

Burt Twp. M.334

Otto Twp. M.379



Blain Twp. M.418

K. Kalamov

THE TOWNSHIP OF

EBY

DISTRICT OF TIMISKAMING

LARDER LAKE MINING DIVISION

SCALE: 1-INCH=40 CHAINS

LEGEND

PATENTED LAND	P
CROWN LAND SALE	C.S.
LEASES	L
LOCATED LAND	Loc.
LICENSE OF OCCUPATION	L.O.
MINING RIGHTS ONLY	M.R.O.
SURFACE RIGHTS ONLY	S.R.O.
ROADS	
IMPROVED ROADS	
KING'S HIGHWAYS	
RAILWAYS	
POWER LINES	
MARSH OR MUSKEG	
MINES	
CANCELLED	C.

NOTES

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

AREAS WITHDRAWN FROM STAKING
under Sec. 43 of The Mining Act (R.S.O. 1970).

Order No.	File	Date	Disposition

PLAN NO.- M-345

ONTARIO
MINISTRY OF NATURAL RESOURCES
SURVEYS AND MAPPING BRANCH

TRIM LINE

42A01SW0036 2.7381 EBY

M.334 BURT TWP. M.334

BURT TOWNSHIP

LARDER LAKE MINING DIVISION

DISTRICT OF TIMISKAMING

SCALE 40 CHAINS TO ONE INCH

M.334

LEGEND

PATENTED LAND	P
CROWN LAND SALE	C.S.
LEASES	L
LICENSE OF OCCUPATION	L.O.
LOCATED LAND	Loc.
MINING RIGHTS ONLY	M.R.O.
SURFACE RIGHTS ONLY	S.R.O.
CANCELLED	C.

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
R1	W.7/74	104317	21/2/74	S.R.O.
R2	W.71/76	100581	15/12/76	S.R.O.
R3	NR W. 33/79	139857	14/5/79	S.R.O.
R4	NR W. 92/80	129365	9/7/80	S.R.O.
R5	W. 24/82	188522	29/11/82	S.R.O. & M.R.

BOMPAS TWP.

HOLMES TWP.

EBY TWP.

GROSS TWP.

Portage 3 Miles

Burt Lake

AREA WITHDRAWN FROM STAKING SECTION 42 MINING ACT

FILE 164586

TOWER SITE 739647 S.R.O. RESERVED

CABIN SITE

MNR Res. 28 Pit NT269 File 10474

English River

Gravel File: 186049

D.H.O. PIT 1315

VI V IV III II

12 11 10 9 8 7 6 5 4 3 2 1

ONTARIO

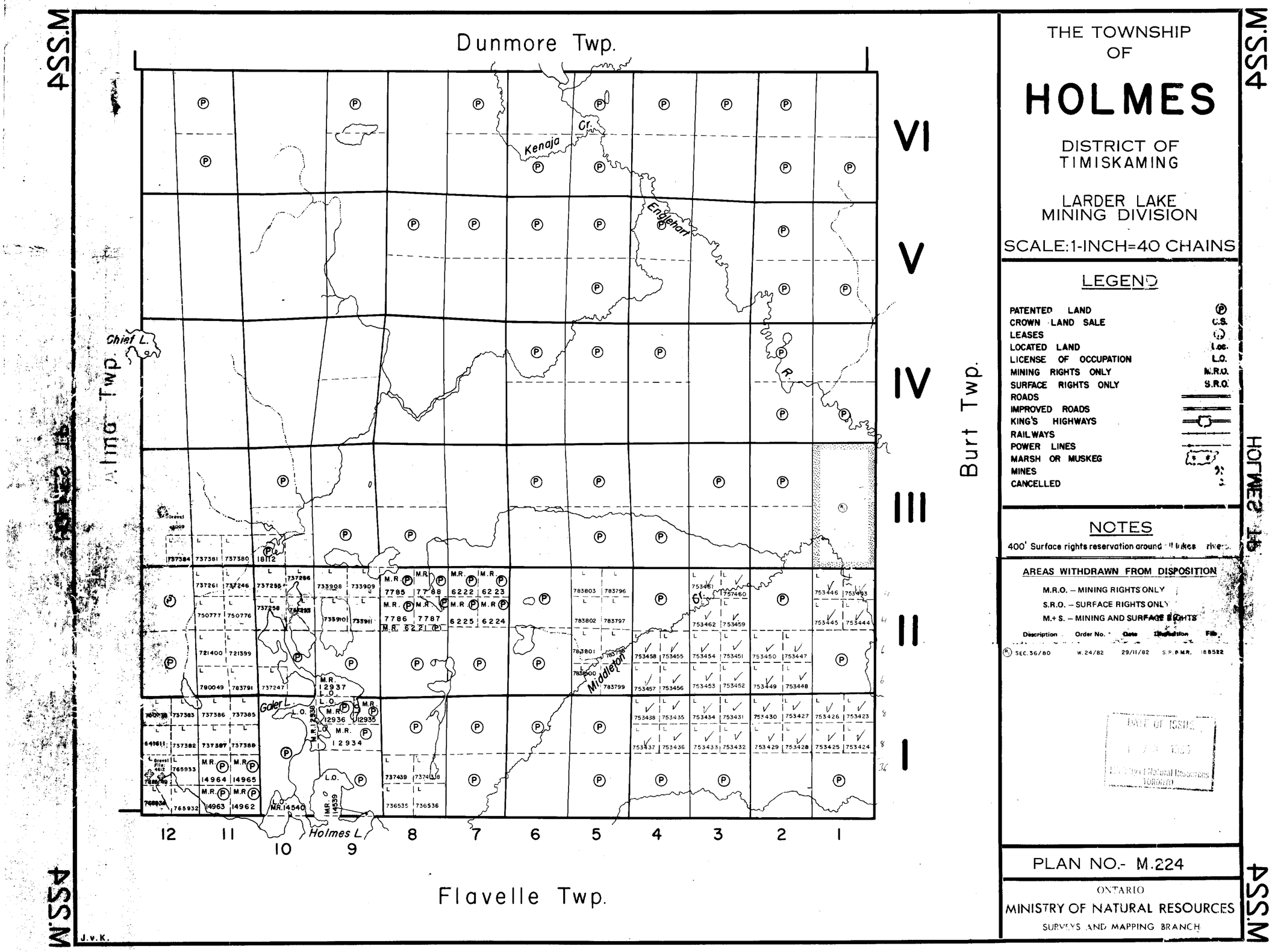
MINISTRY OF NATURAL RESOURCES

SURVEYS AND MAPPING BRANCH

M.334 BURT TWP. M.334

42A01SW0036 2.7381 EBY

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THE TOWNSHIP
OF

HOLMES

DISTRICT OF
TIMISKAMING

LARDER LAKE
MINING DIVISION

SCALE: 1-INCH=40 CHAINS

LEGEND

PATENTED LAND	(P)
CROWN LAND SALE	C.S.
LEASES	(L)
LOCATED LAND	Loc.
LICENSE OF OCCUPATION	L.O.
MINING RIGHTS ONLY	M.R.O.
SURFACE RIGHTS ONLY	S.R.O.
ROADS	
IMPROVED ROADS	
KING'S HIGHWAYS	
RAILWAYS	
POWER LINES	
MARSH OR MUSKEG	
MINES	
CANCELLED	

NOTES

400' Surface rights reservation around all lakes & rivers.

AREAS WITHDRAWN FROM DISPOSITION

M.R.O. – MINING RIGHTS ONLY
S.R.O. – SURFACE RIGHTS ONLY
M.+ S. – MINING AND SURFACE RIGHTS

Description	Order No.	Date	Disposition	File
(R) SEC. 36/80	W. 24/82	29/11/82	S.R.&M.R.	188522

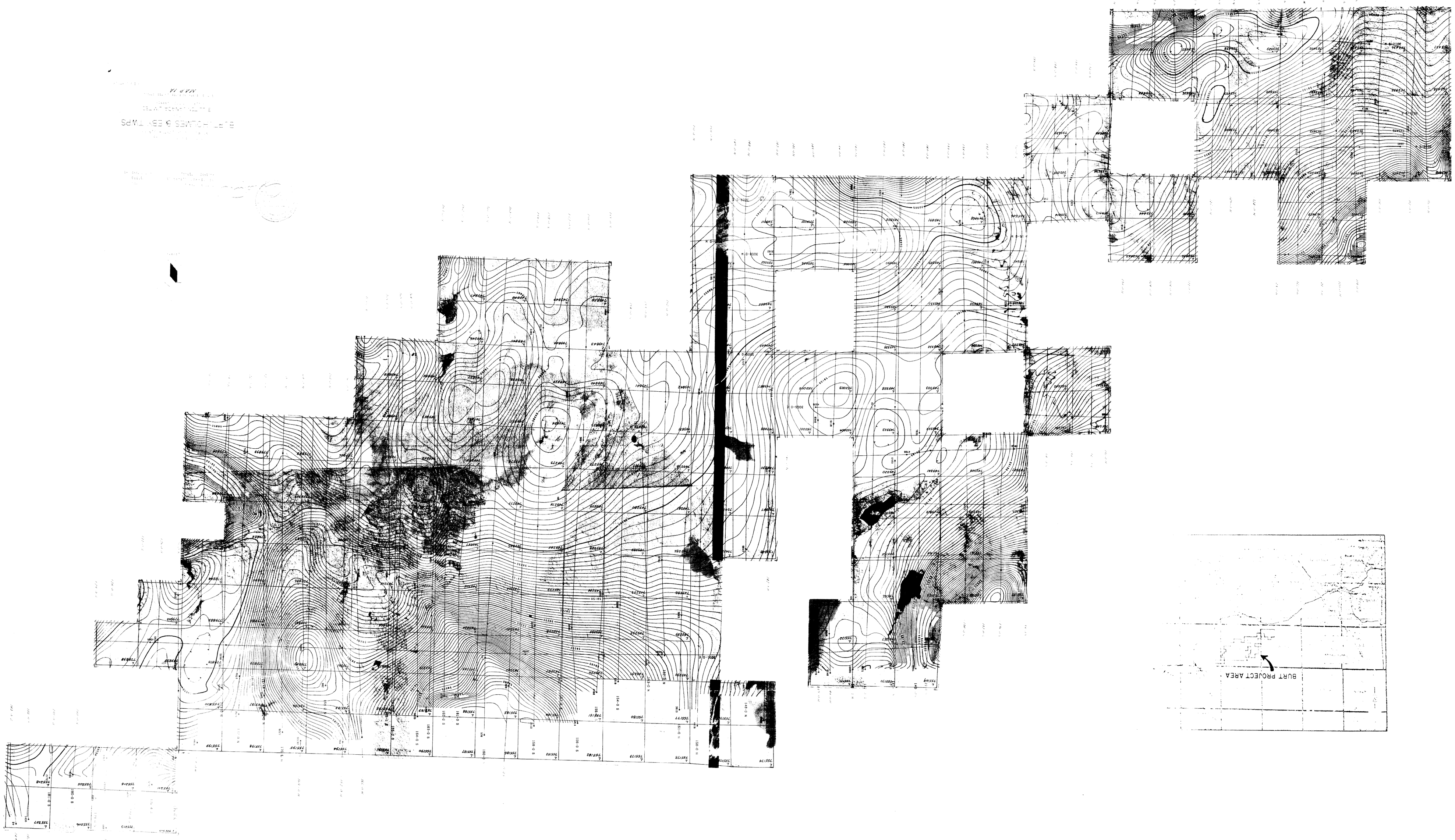
DATE OF ISSUE
1 JAN 1983
Ministry of Natural Resources
TORONTO

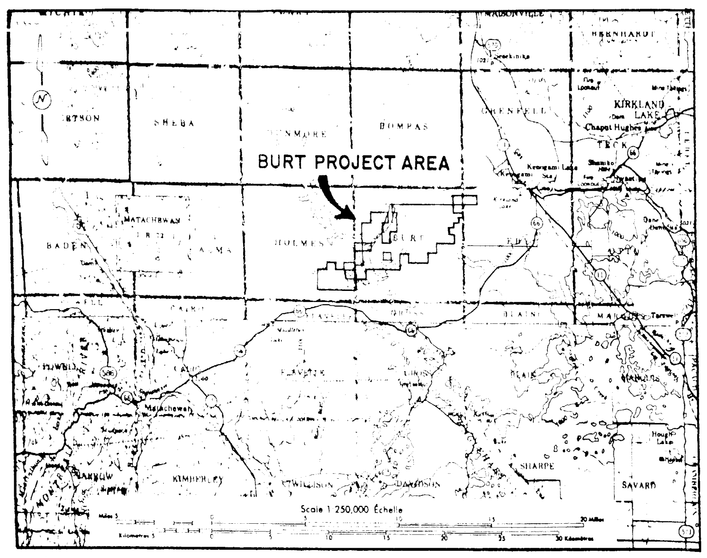
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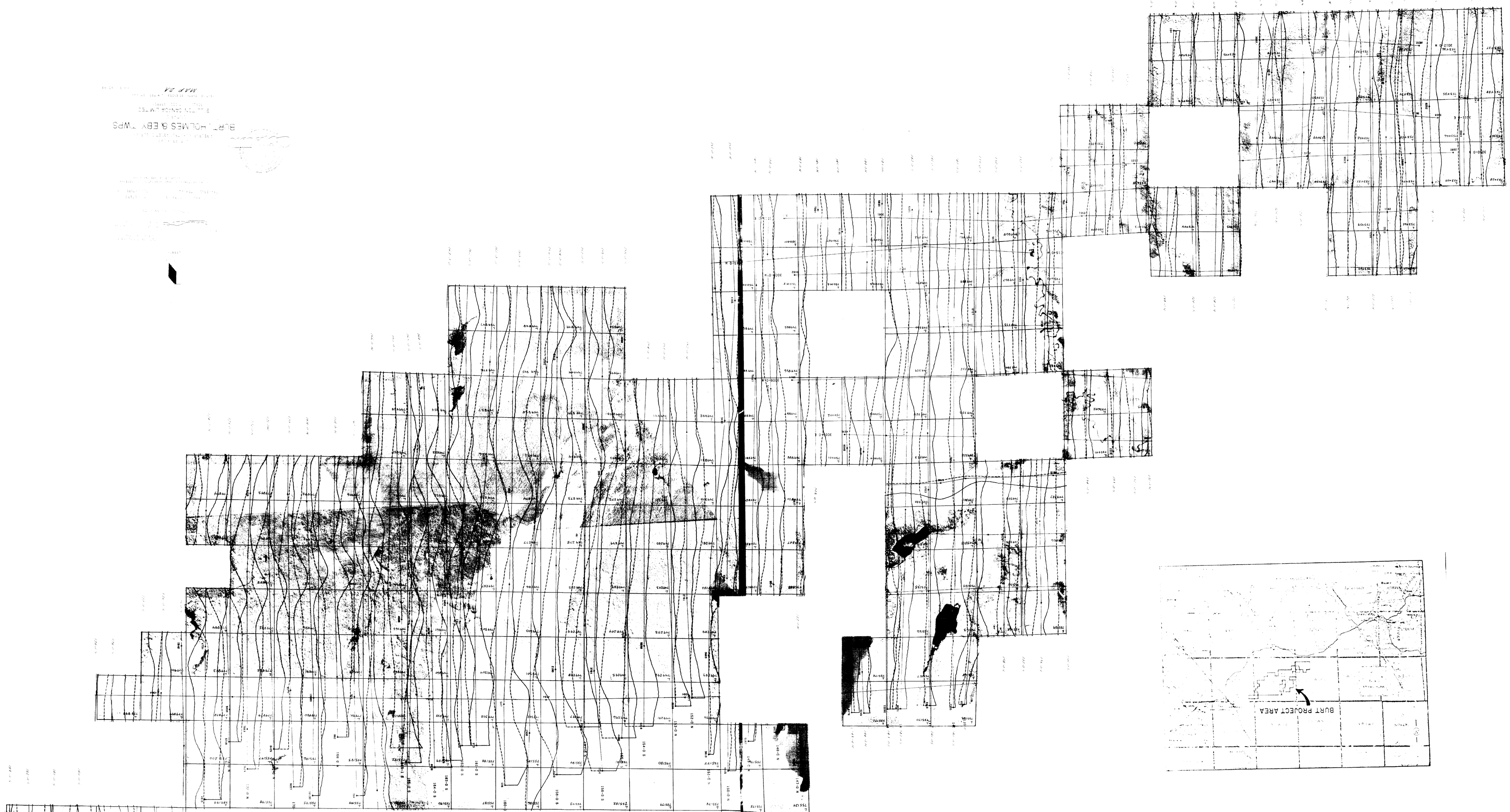




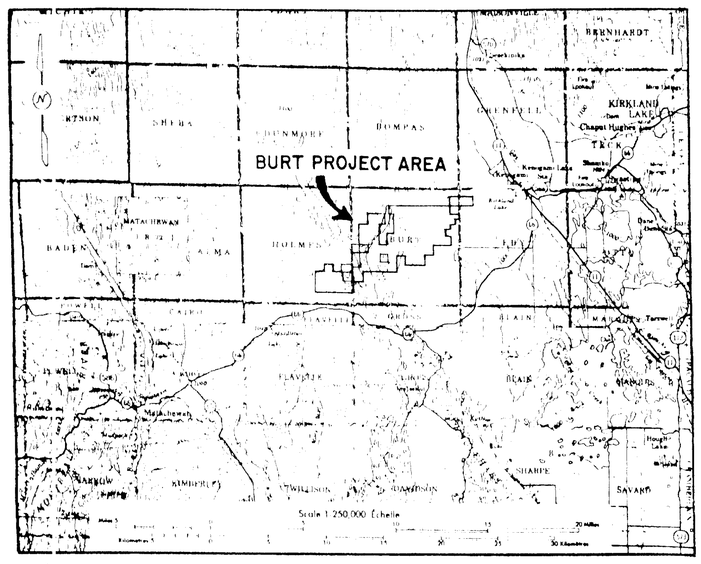
BURT, HOLMES & EBY TWPS

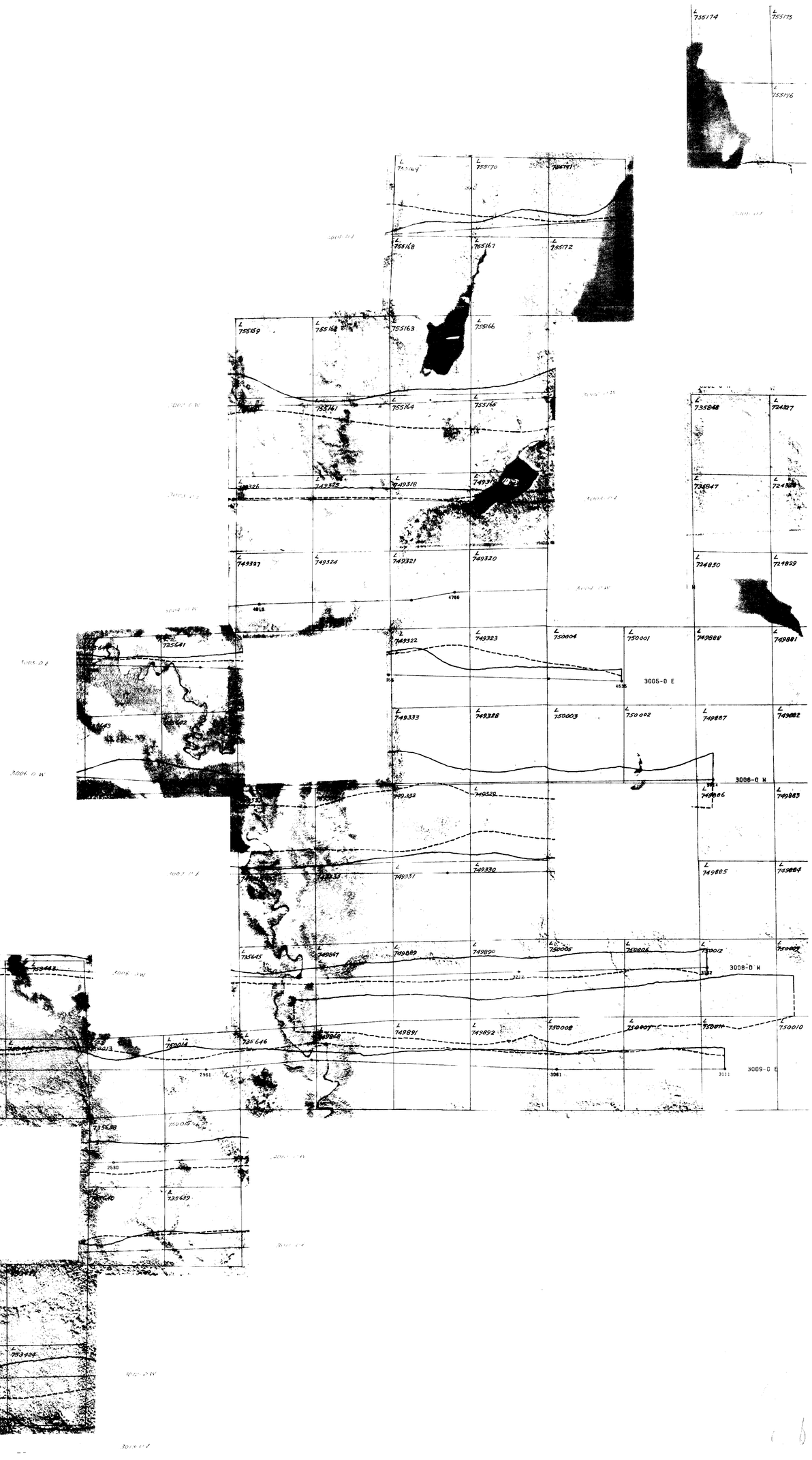
BELLTON CANADA LIMITED

MAP 1B



BURT PROJECT AREA



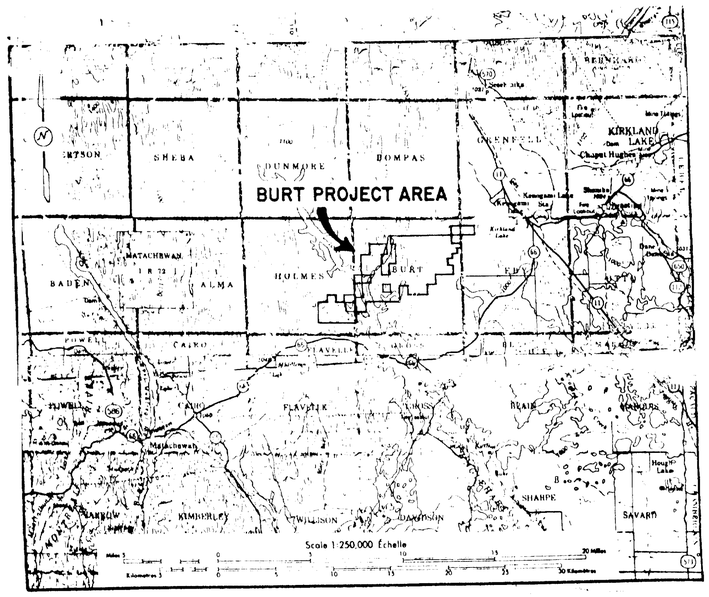


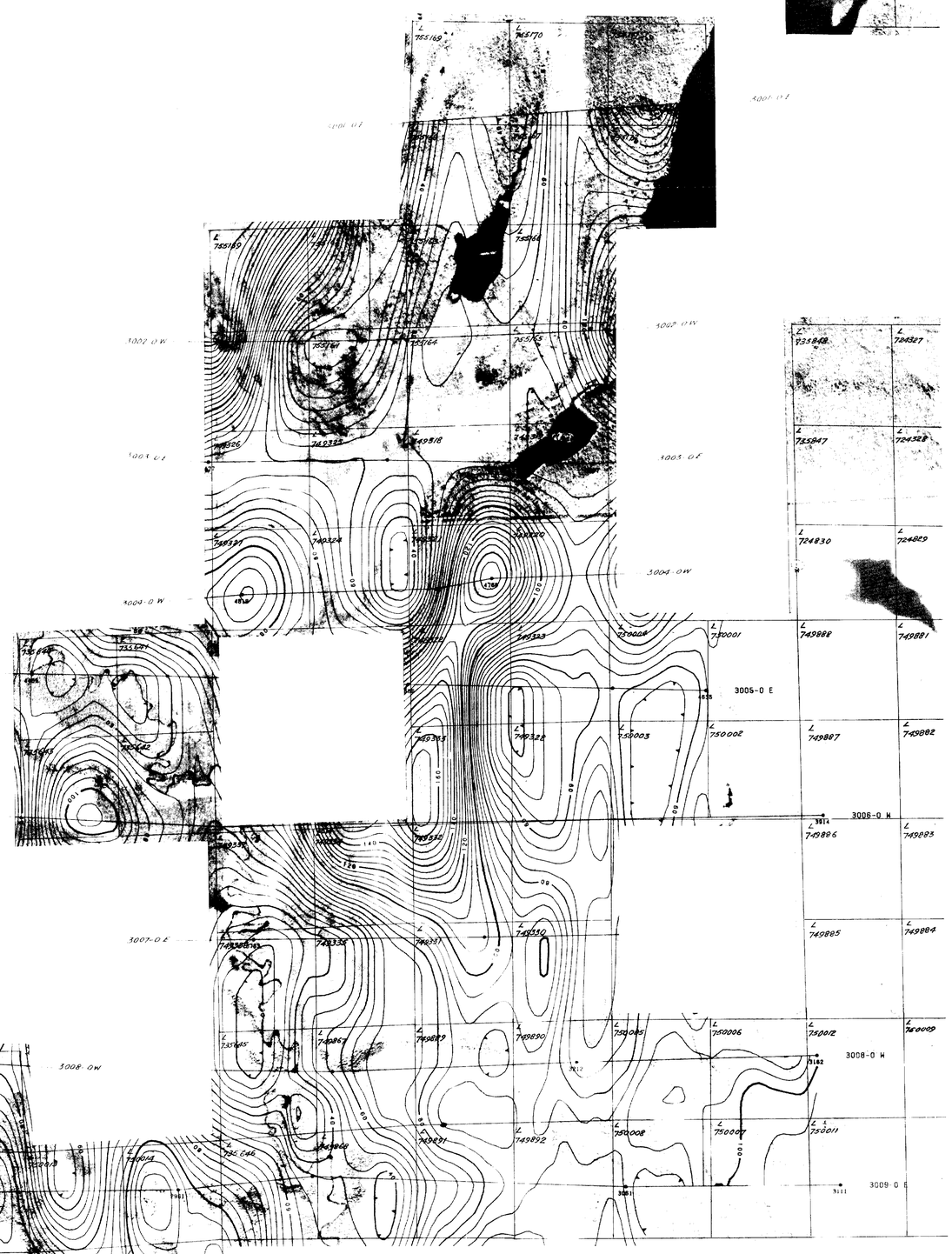
BURT, HOLMES & EBY TWPS

ONTARIO

BILLITON CANADA LIMITED

MAP 2B







HURT, HOLMES & ERBY TWPS.
for
BELLHOLDEN CANADA LIMITED
MAP 3B

Approx. outline of magnetic body A, B & C: Anomalies used for depth determinations

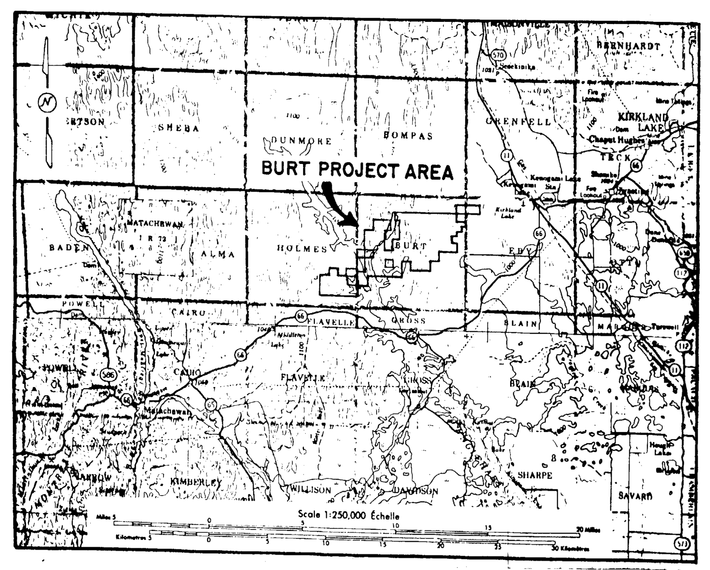
MT1 — M — Magnetic trends

Interpreted fault and / or shear zone

V1A — Axis of VLF – EM conductor

i — Intrusive

v — Volcanic



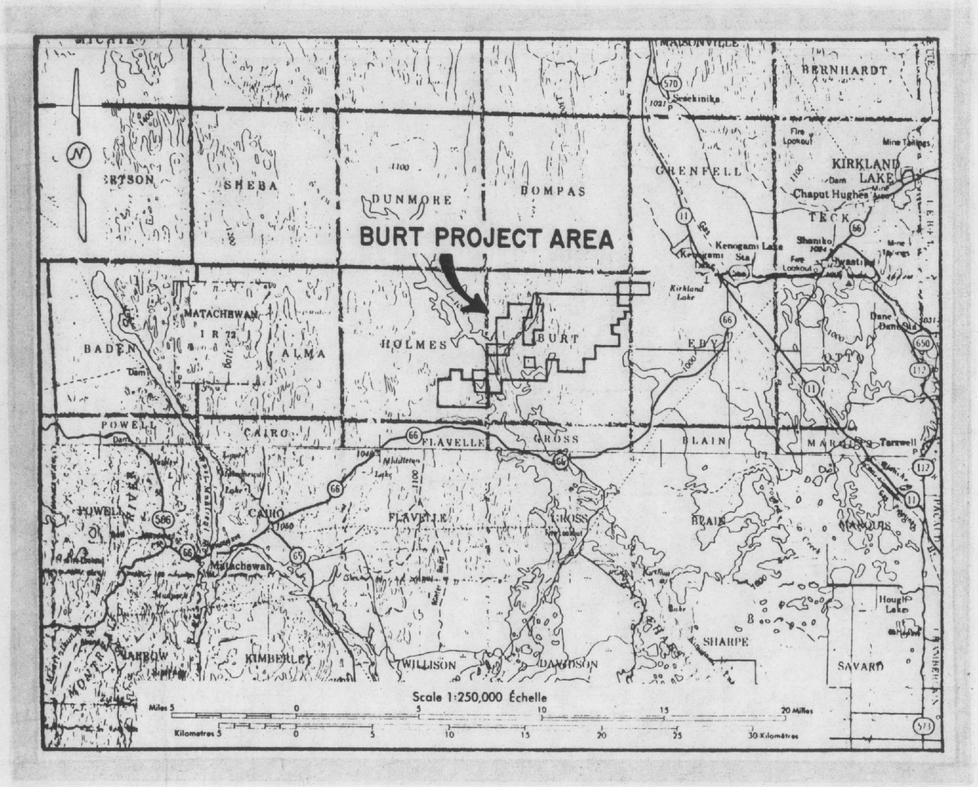
BILLITON CANADA LIMITED

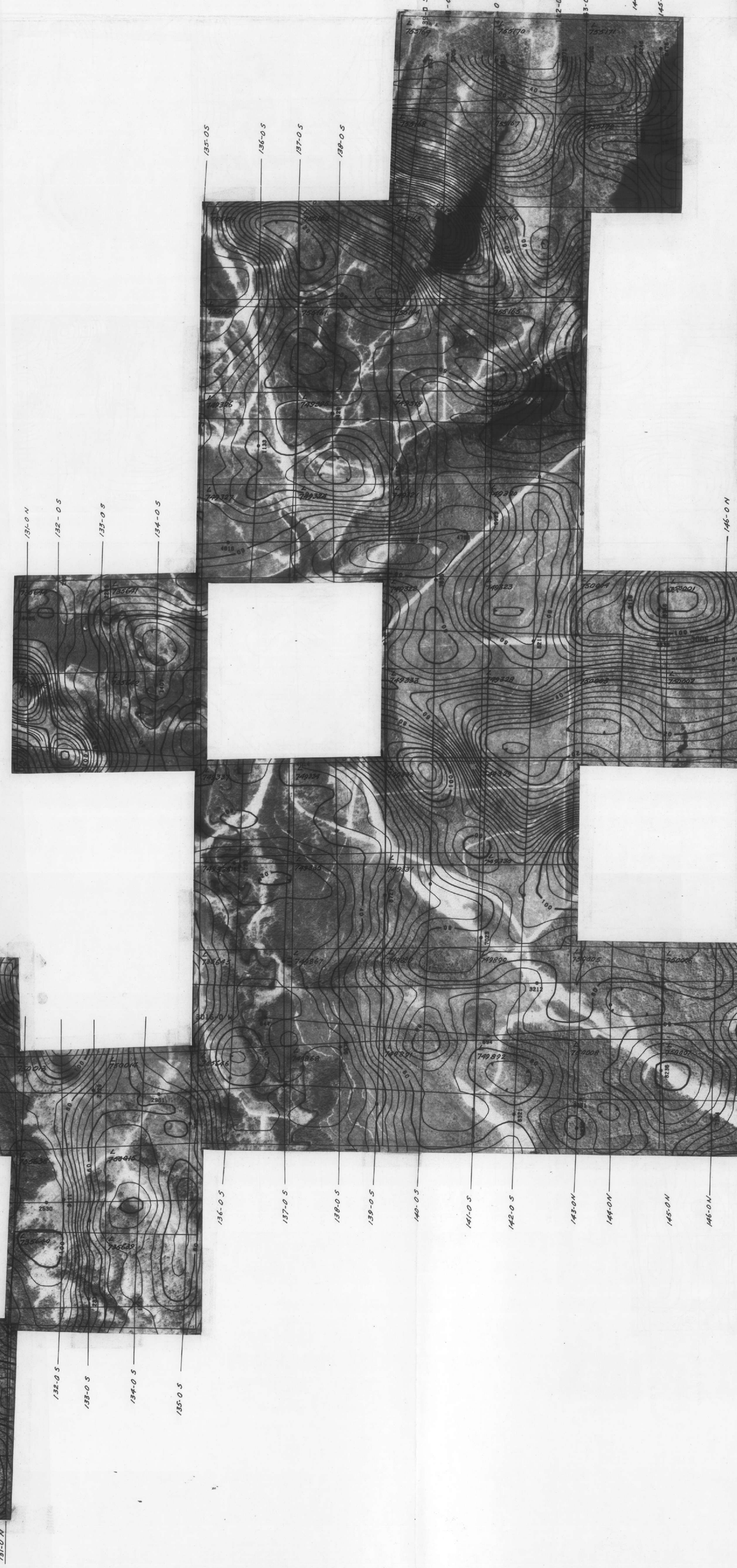
BURT PROPERTY

AIRBORNE GEOPHYSICAL SURVEYS

INTERPRETATION MAP

AUTHOR: F. L. Jagodits	MAP NO: NTS: 42A/1	SCALE: 1 : 10,000
DRAWN BY: komi	DATE: Oct. '84	REPORT:
		ENCL. NO: MAP 4





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(APPROX.)

CONTOUR INTERVAL 5%
MEAN TERRAIN CLEARANCE . . . . 150 METERS
TRAVERSE INTERVAL . . . . . 200 METERS N-S

VLF TRANSMITTERS - JIM CREEK, WASHINGTON, NLK, f=24.8 kHz
ANNAPOLIS, Md., NSS, f=21.4 kHz

VLF CONTOURS
AIRBORNE ELECTROMAGNETIC SURVEY

BURT, HOLMES & EBY TWPS

ONTARIO

BILLITON CANADA LIMITED

SCALE 1:10,000 (APPROX.)

KENTING EARTH SCIENCES LIMITED, OTTAWA

MAP 3A

K.E.S.L. 83098

REGISTERED PROFESSIONAL ENGINEER
E. L. JACKSITS
PROVINCE OF ONTARIO

2.7381