

MAR 19770028: RICHARDSON RIVER

Received date: Dec 31, 1977

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NORCEN ENERGY RESOURCES LIMITED

1978 WORK PROPOSAL
U-AF-161(1)
QUARTZ MINERAL EXPLORATION PERMITS
#6876120002 to #6876120006

19770028

L. J. Smith, Geol.
D. A. Sawyer, P. Geol.

December, 1977

INTRODUCTION

In December of 1976, Norcen Energy Resources Limited applied for five (5) quartz mineral exploration permits in the Richardson River area of Northeastern Alberta. The Richardson Permits (#6876120002 to #6876120006) totalling 229,600 acres were granted December 23, 1976.

Surface prospecting and geochemical surveys in the general area indicated that there is a general lack of outcrop in the area, the glacial overburden has probably been transported from quite a distance, and the location of the Athabasca Formation margin is uncertain.

Late in the field season of 1977, a geological reconnaissance diamond drill program was initiated. Five drill holes totalling 557.2 m (1828 feet) were completed.

As a result of the drilling, Permits #6876120003 and #687612006 are being relinquished to the Crown. In addition, the area maintained in Permits #6876120004 and #6876120005 is being greatly reduced. The original size of Permit #6876120002 will be maintained.

An airborne electromagnetic survey and a subsequent diamond drilling follow-up program is proposed for 1978. Estimated cost of the 1978 program is \$78,375.00. Enclosed is a cheque in the amount of \$7,680.00 for renewal fees for the areas listed in detail under the section "Detailed Land Situation".

SYNOPSIS OF 1977 WORK PROGRAM

Surface prospecting and geochemical surveys indicated that the area is characterized by a general lack of outcrop, glacial overburden has been transported a great distance, and the location of the Athabasca Formation margin is uncertain.

A geological reconnaissance diamond drilling program was initiated to determine the depth of overburden, to locate the Athabasca Formation margin and to gain a stratigraphic record of the area. Five (5) diamond drill holes (totalling 557.2 m or 1828 feet) were completed late in the 1977 field season. One drill hole was located on each of the five quartz mineral exploration permits.

The drill was mobilized from Fort McMurray to Embarras via barge down the Athabasca River. The drill was mounted on a Nodwell trailer. The winter road southeast to Embarras provided good access to the first four drill sites. The fifth drill site, not accessible by road, was reached using a Bell 206B helicopter from a base camp at the Embarras air strip. Total cost of the 1977 drill program was \$61,796.00 or \$33.80/foot.

DETAILED LAND SITUATION

As a result of the work by Great Plains Development Company of Canada, Ltd. in the Archer Lake area, and more recently in the Richardson River area by the parent company, Norcen Energy Resources Limited, the areas of interest can be re-evaluated.

1. The total acreage of 48,640 acres in Permit #6876120002 will be maintained.
2. No further work is proposed for Permits #6876120003 and #6876120006.
3. Within Permit #6876120004 only the areas below will have further work commitments:

in Township 105, Range 7, W4M
Section 1, 2, 11, 12 and 14

(5 sections totalling 3,200 acres),

No further work is proposed for the remainder of the permit area.

4. Within Permit #6876120005 only the areas below will have further work commitments:

in Township 104, Range 6, W4M
Section 2 - 11 inclusive
Section 14 - 23 inclusive
Section 26 - 31 inclusive
Section 35.

in Township 104, Range 7, W4M
Section 1 - 2 inclusive
Section 11 - 14 inclusive
Section 23 - 26 inclusive
Section 35 - 36 inclusive

(39 sections totalling 24,960 acres).

No further work is proposed for the remainder of the permit area.

TOTAL AREAS RETAINED

Permit #6876120002	48,640 Acres
Permit #6876120004	<u>3,200 Acres</u>
Permit #6876120005	<u>24,960 Acres</u>
	76,800 Acres

49920
3200
46720

PROPOSED EXPLORATION PROGRAM FOR 1978

As a result of the 1977 diamond drilling program, the areas of interest were re-evaluated. Permits #6876120003 and #6876120006 will be relinquished to the Crown. The areas retained in Permits #6876120004 and #6876120005 will be reduced. The original size of Permit #6876120002 will be maintained.

The deposits at Key Lake, Maurice Bay, and Michael Lake, in Northern Saskatchewan, are found at the base of the Athabasca Formation and can be used as models for the type of structural and chemical trap favourable for uranium deposition. Faulting with graphite concentrations in the shear zones provides the reducing environment for the deposition of uranium in these deposits. These graphitic shear zones are excellent conductors readily detectable with an electromagnetic survey.

An airborne electromagnetic survey is proposed over the areas retained in Permits #6876120004 and #6876120005 and the entire Permit #6876120002.

The two accompanying maps show the proposed airborne electromagnetic survey (line spacing 1/4 mile). The line mileage over the three areas is shown below:

Permit #6876120002	<u>315</u> line miles
Permit #6876120004	35 line miles
Permit #6876120005	<u>175</u> line miles

525 line miles

Using a line mile cost of \$35.00, the total survey expenditure would be \$18,375.00.

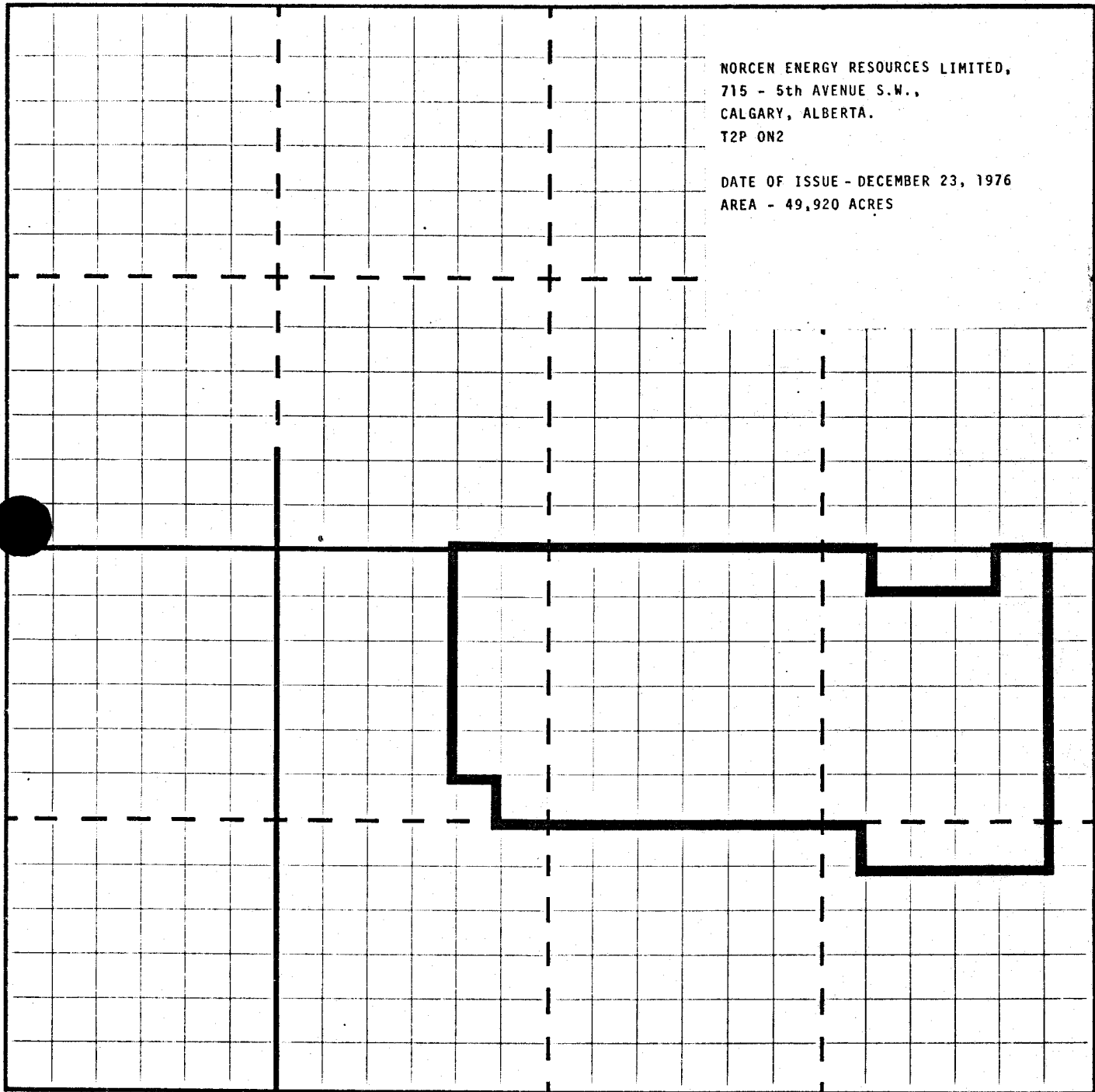
A follow-up diamond drill program is also proposed. Costs are submitted for three (3) - five hundred (500) foot holes; or a fifteen hundred (1500) foot drill program. Using the expenditures from the 1977 drill program plus an inflationary 10% figure, and adding another 10% as this is much smaller than the 1977 contract; the proposed drill program is estimated to cost \$40.00/foot or \$60,000.00

1978 PROPOSED PROGRAM

Airborne Electromagnetic Survey	\$18,375.00 ✓
Follow-up diamond drilling (includes assays, camp costs, report writing and drafting and salaries).	<u>\$60,000.00</u> ✓
	\$78,375.00

19770028.

QUARTZ MINERAL EXPLORATION PERMIT NO. 6876120005



NORCEN ENERGY RESOURCES LIMITED,
715 - 5th AVENUE S.W.,
CALGARY, ALBERTA.
T2P 0N2

DATE OF ISSUE - DECEMBER 23, 1976
AREA - 49,920 ACRES

R.

R.8

R.7

R. 6 W. 4 M.

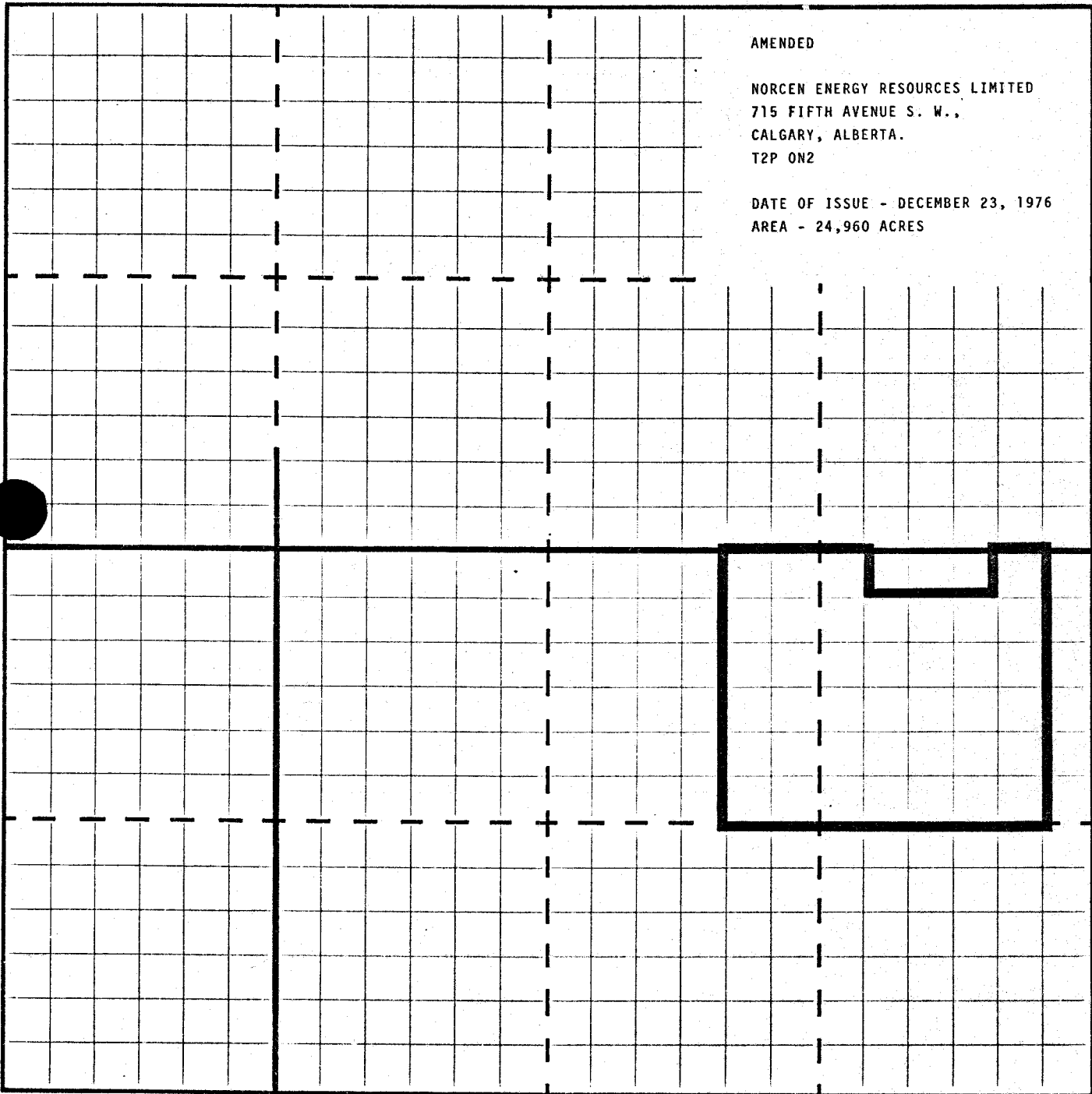
TP.

TP.

TP.104

TP.103

QUARTZ MINERAL EXPLORATION PERMIT NO. 6876120005_a



AMENDED

NORCEN ENERGY RESOURCES LIMITED
715 FIFTH AVENUE S. W.,
CALGARY, ALBERTA.
T2P 0N2

DATE OF ISSUE - DECEMBER 23, 1976
AREA - 24,960 ACRES

TP.

TP.

TP.104

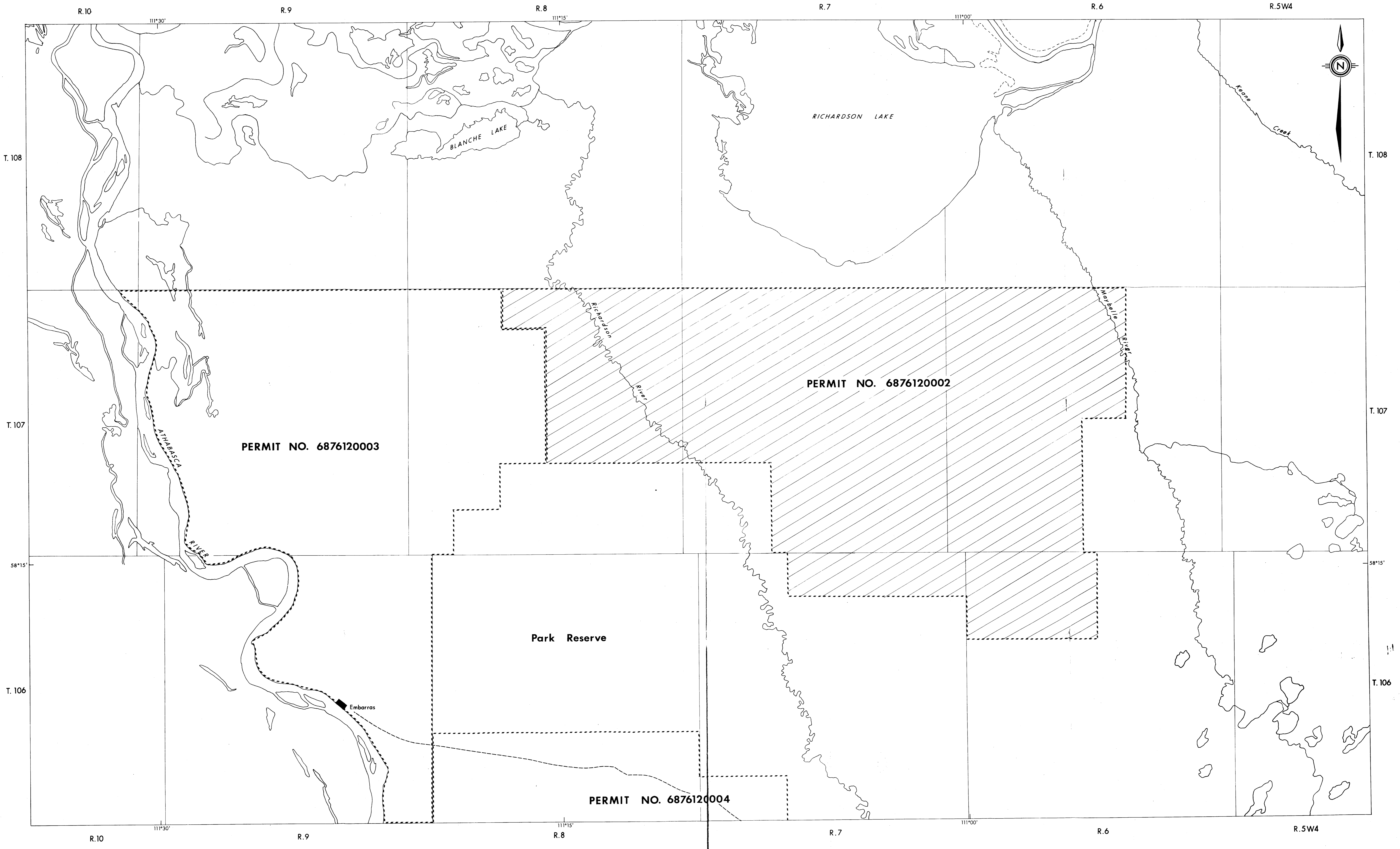
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R.

R.

R. 7

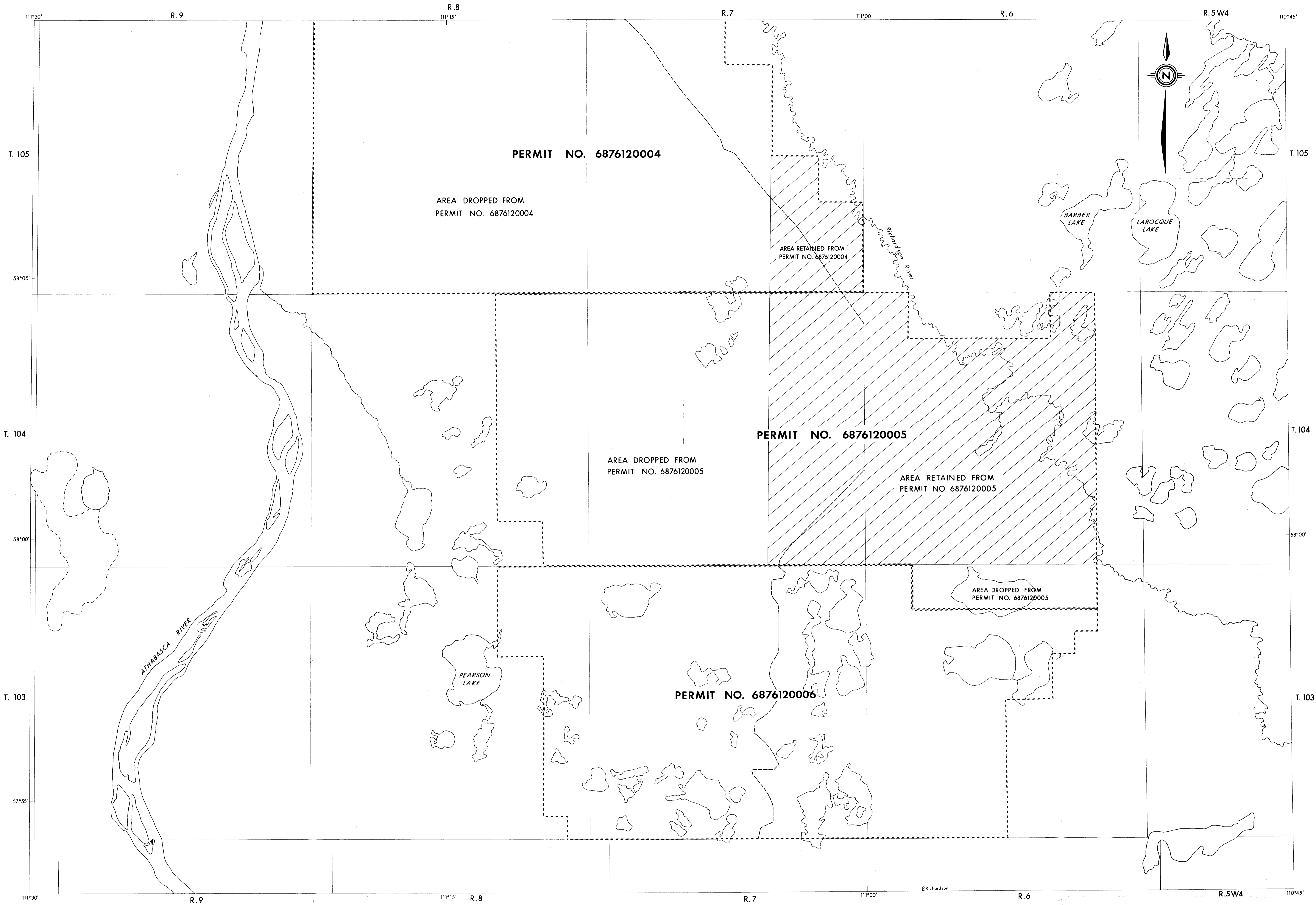
R. 6 W. 4 M.



Norcen
Energy Resources Limited

NORTHEASTERN ALBERTA PERMIT AREAS
AIRBORNE ELECTROMAGNETIC
SURVEY LINES PROPOSED FOR
1978 PROGRAM

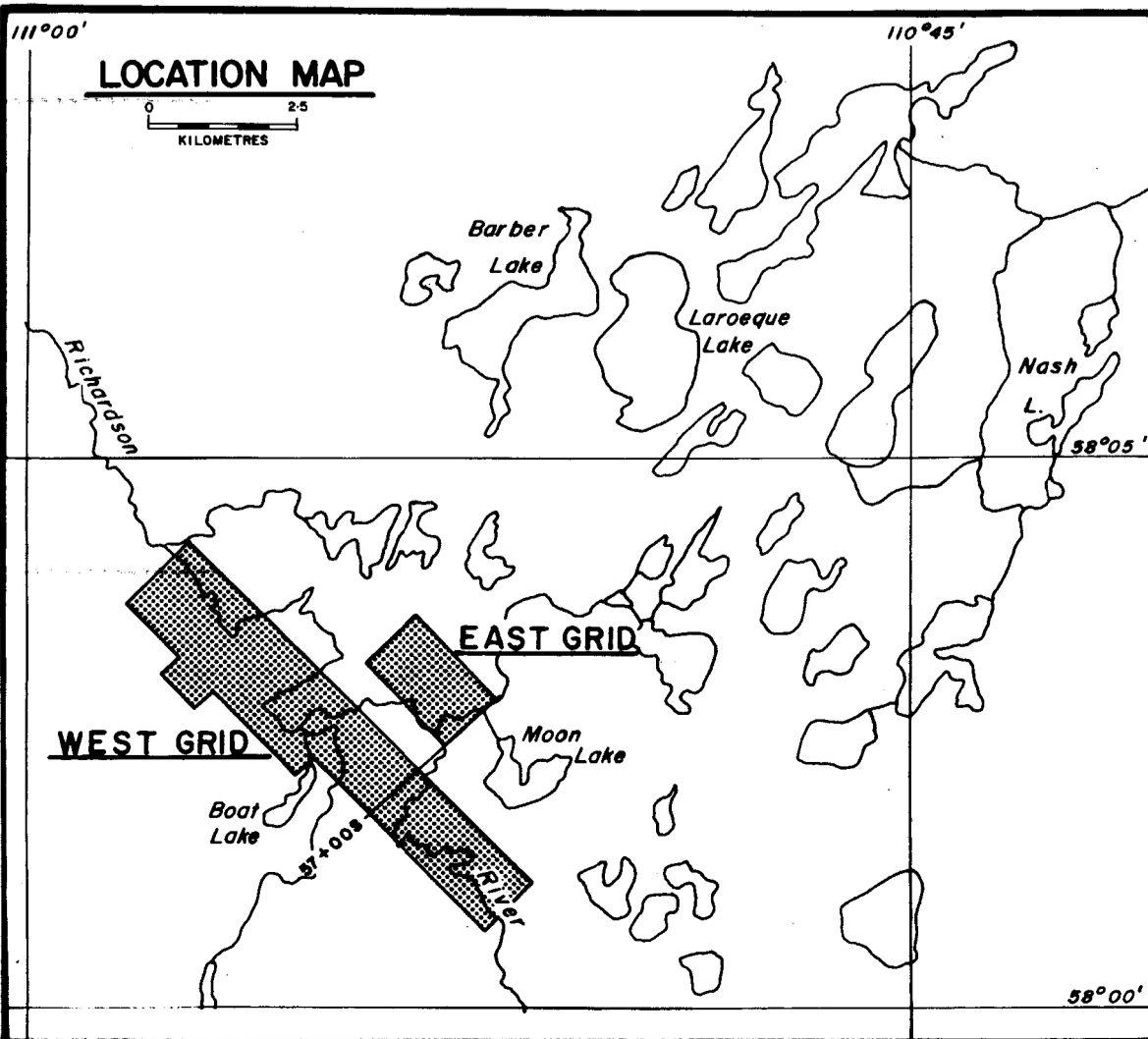
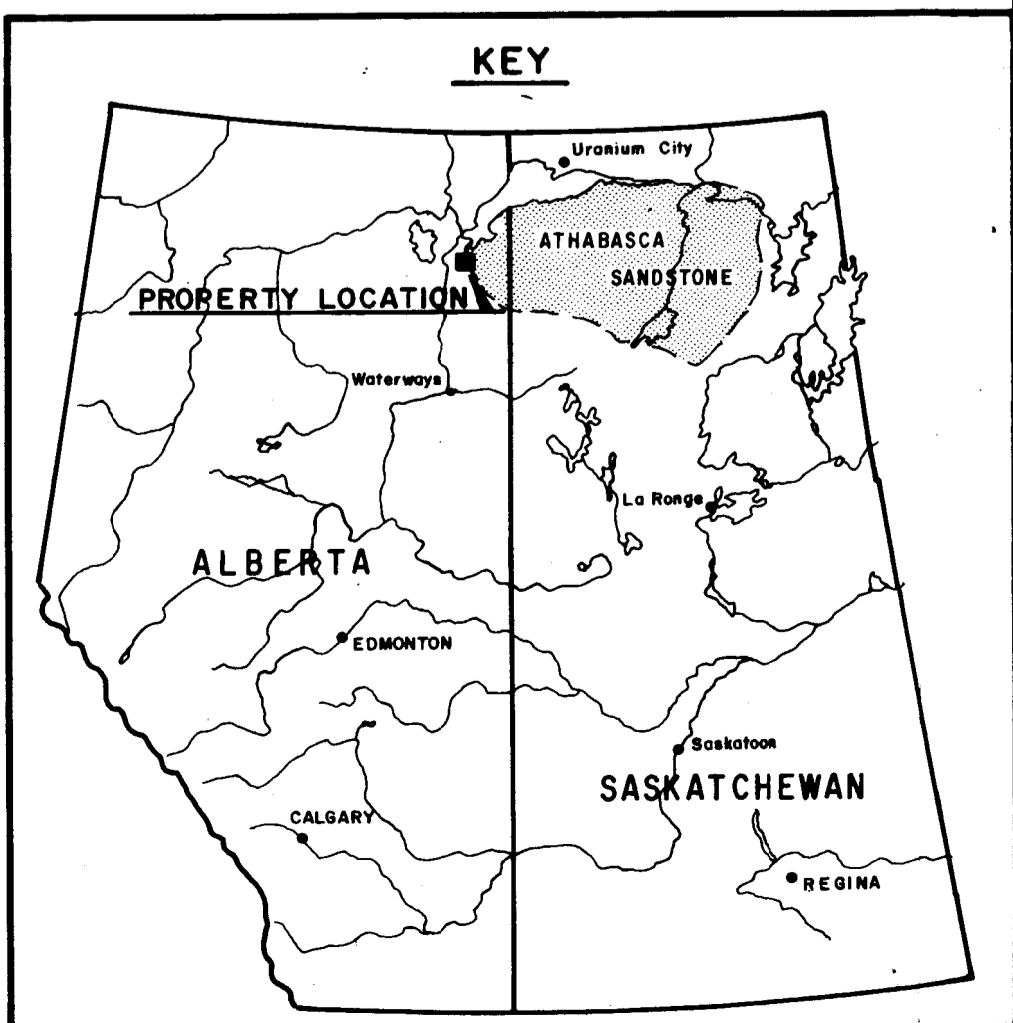
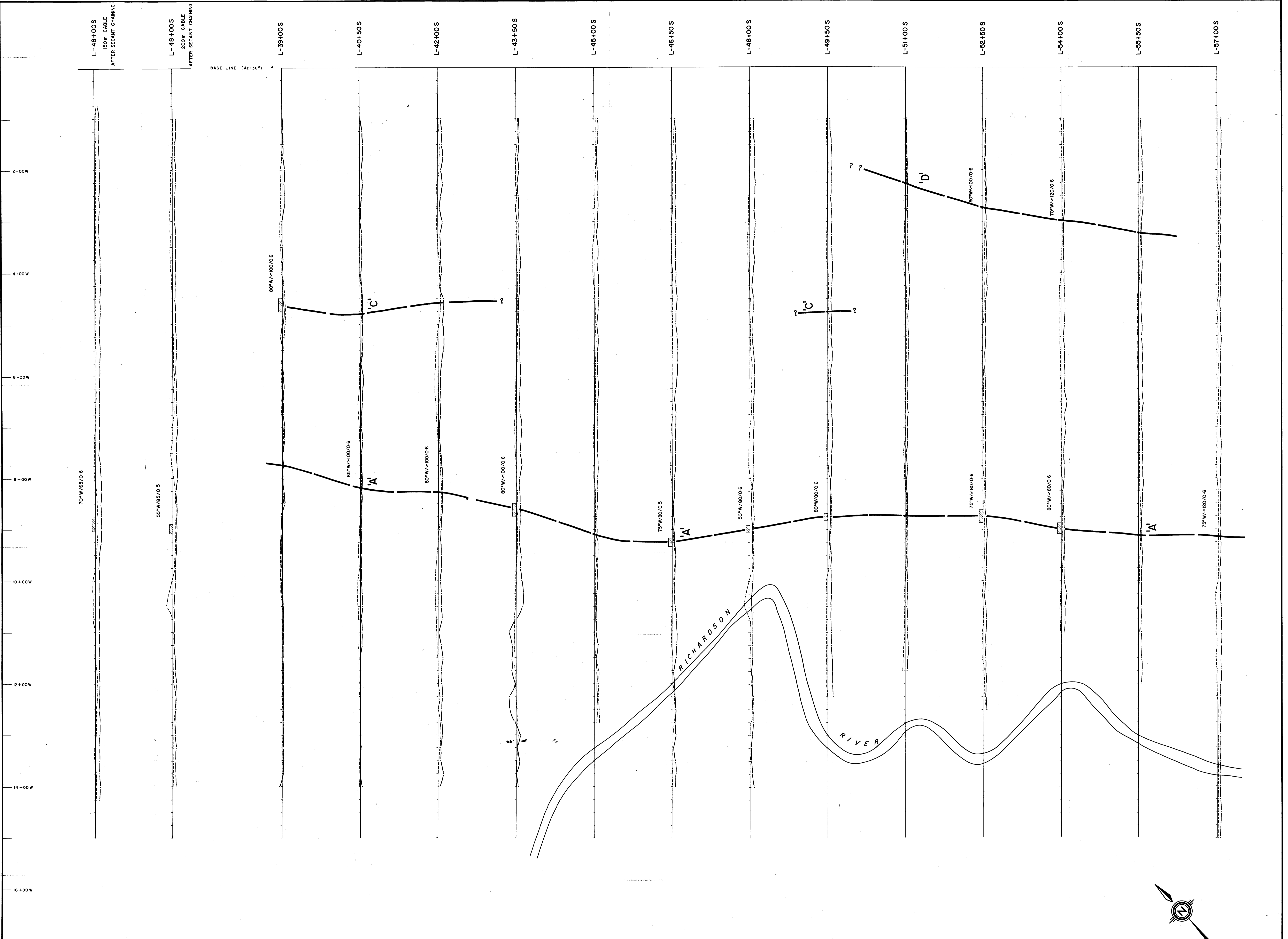
0 200 400 600 meters
Scale 1:50,000
L. Smith
December 1977



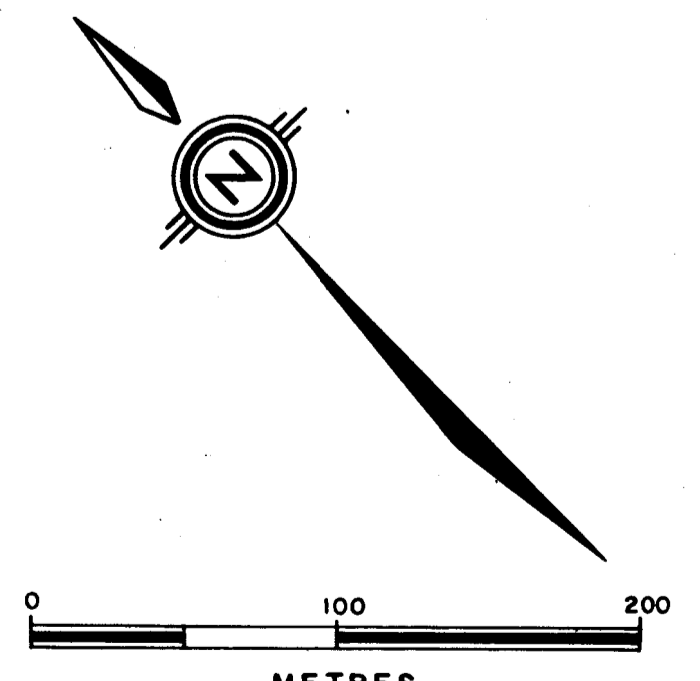
Norcen
Energy Resources Limited

NORTHEASTERN ALBERTA PERMIT AREAS
AIRBORNE ELECTROMAGNETIC
SURVEY LINES PROPOSED FOR
1978 PROGRAM

0 200 400 600 meters
Scale 1:50,000
L. Smith
December 1977



- LEGEND**
- APEX PARAMETERS MAX MIN II
 - 444 Hz
 - 200 Meter Cable
 - In Phase Profile Profile Scale: +20% 0 -20%
 - Quadrature Profile
 - Width Estimate
 - 80°W/100/0/6 Dip (Degrees) / Depth (Meters) / Conductivity Thickness (Mchs)
 - Conductor Axis
 - Possible Conductor (Fault/Shear Zone)
 - Plotting Designation

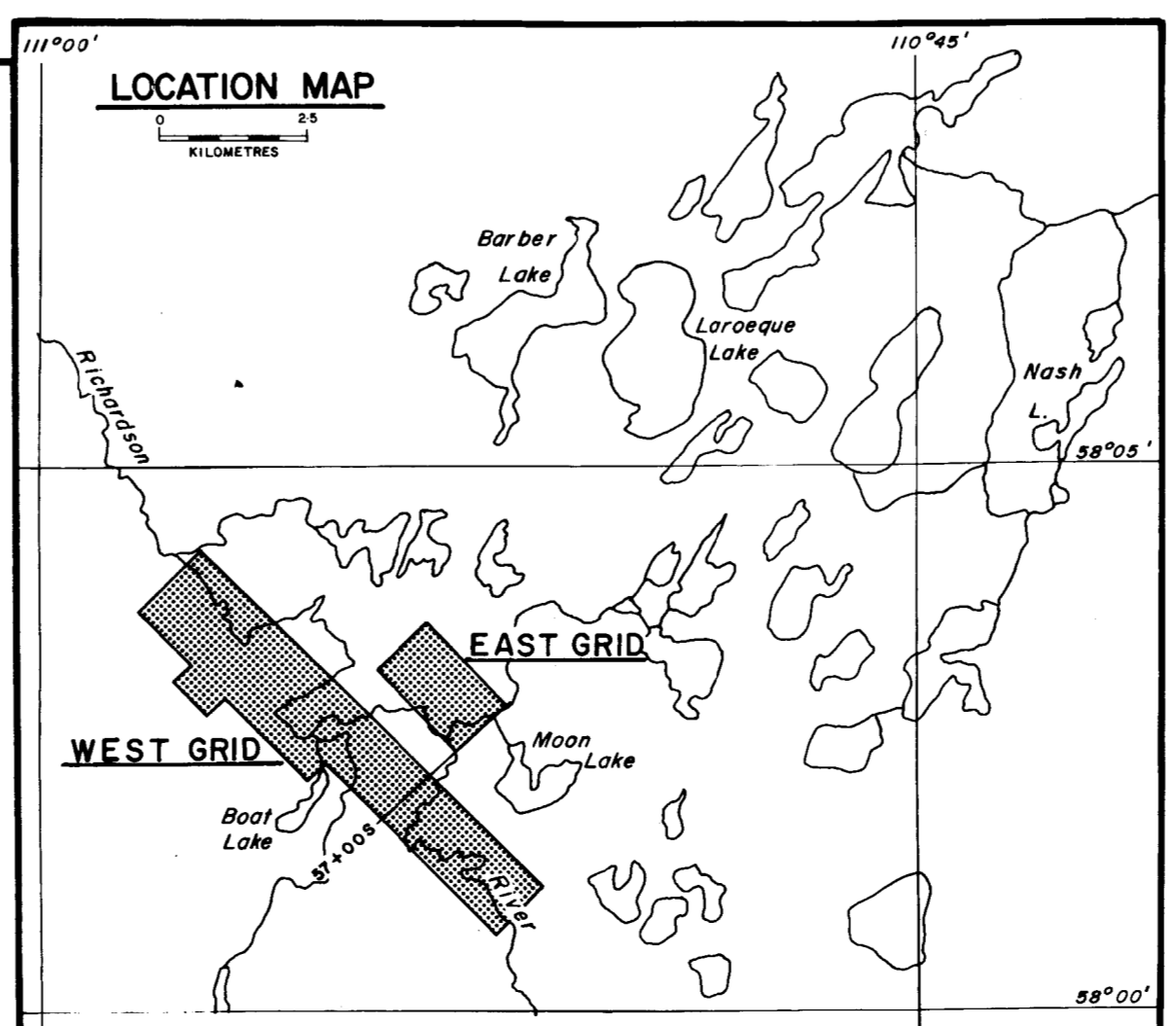
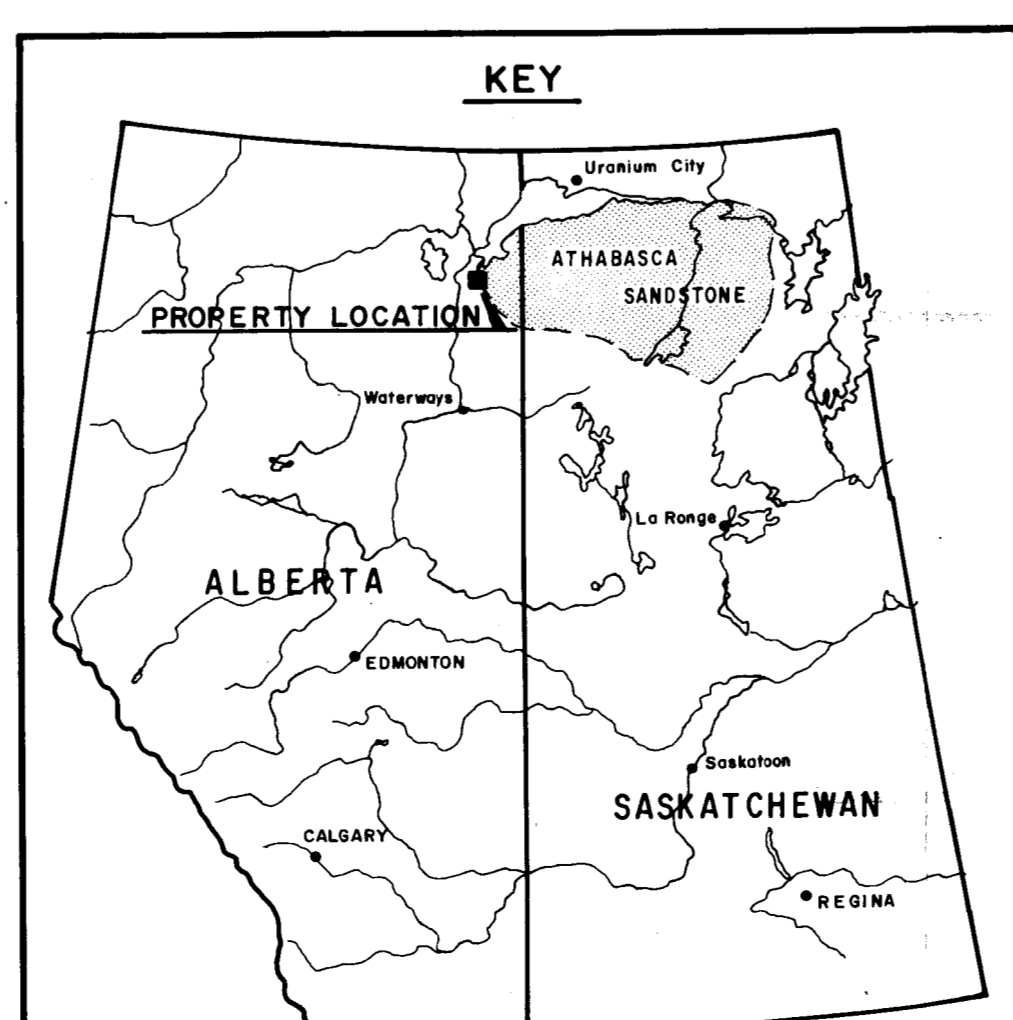
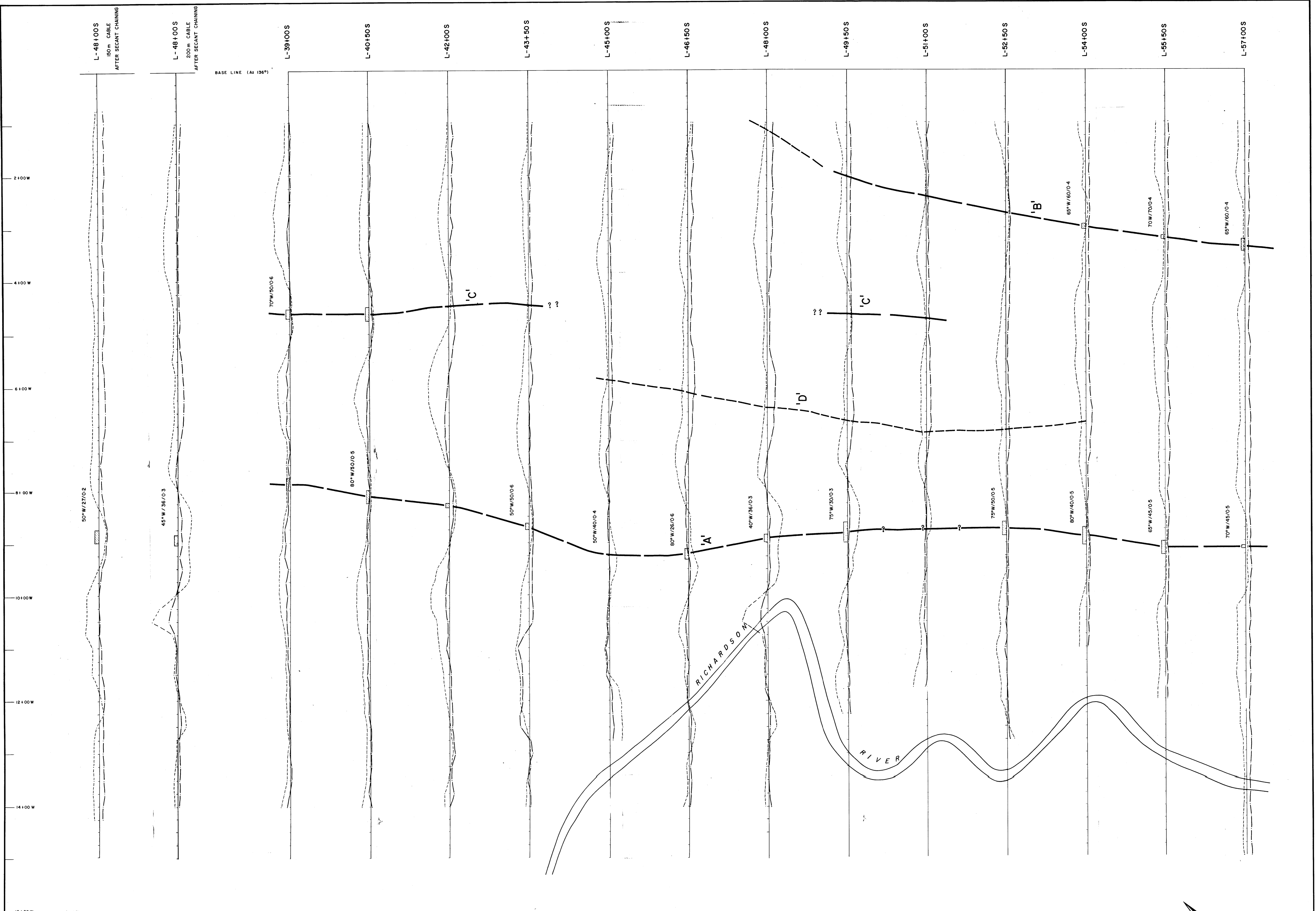


NORCEN ENERGY RESOURCES

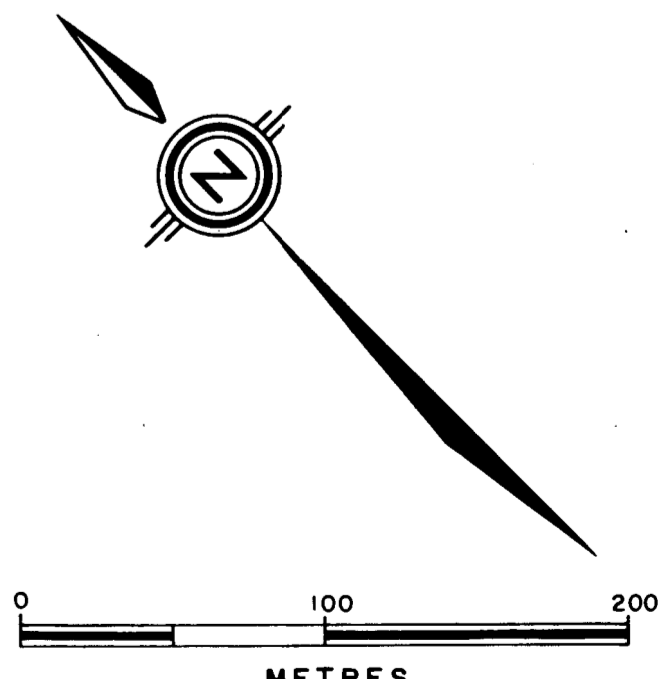
RICHARDSON RIVER AREA, ALBERTA
 PERMIT No. 687620005
HORIZONTAL LOOP SURVEY
 EAST GRID

Project No: C 358	By: D. Jones
Scale: 1:2500	Drawn: gmes
Drawing No: 3	Date: May, 1979

MPH MPH Consulting Limited



- LEGEND**
- APEX PARAMETRICS MAX MIN II
 - 1777 Hz
 - 200 Meter Cable
 - In Phase Profile
 - Quadrature Profile
 - Width Estimate
 - Dip (Degrees) / Depth (Meters) / Conductivity Thickness (Mohs)
 - Conductor Axis
 - Possible Conductor (Fault / Shear Zone)
 - Plotting Designation



NORCEN ENERGY RESOURCES

RICHARDSON RIVER AREA, ALBERTA
 PERMIT No. 6876120005
HORIZONTAL LOOP SURVEY
 EAST GRID

Project No: C 358	By: D. Jones
Scale: 1:2500	Drawn: gmes
Drawing No: 4	Date: May, 1979

MPH Consulting Limited

L-39+00 S L-40+50 S L-42+00 S L-43+50 S L-45+00 S L-46+50 S L-48+00 S L-49+50 S L-51+00 S L-52+50 S L-54+00 S L-55+50 S L-57+00 S

BASELINE
(AZ 136°)

2+00 W

4+00 W

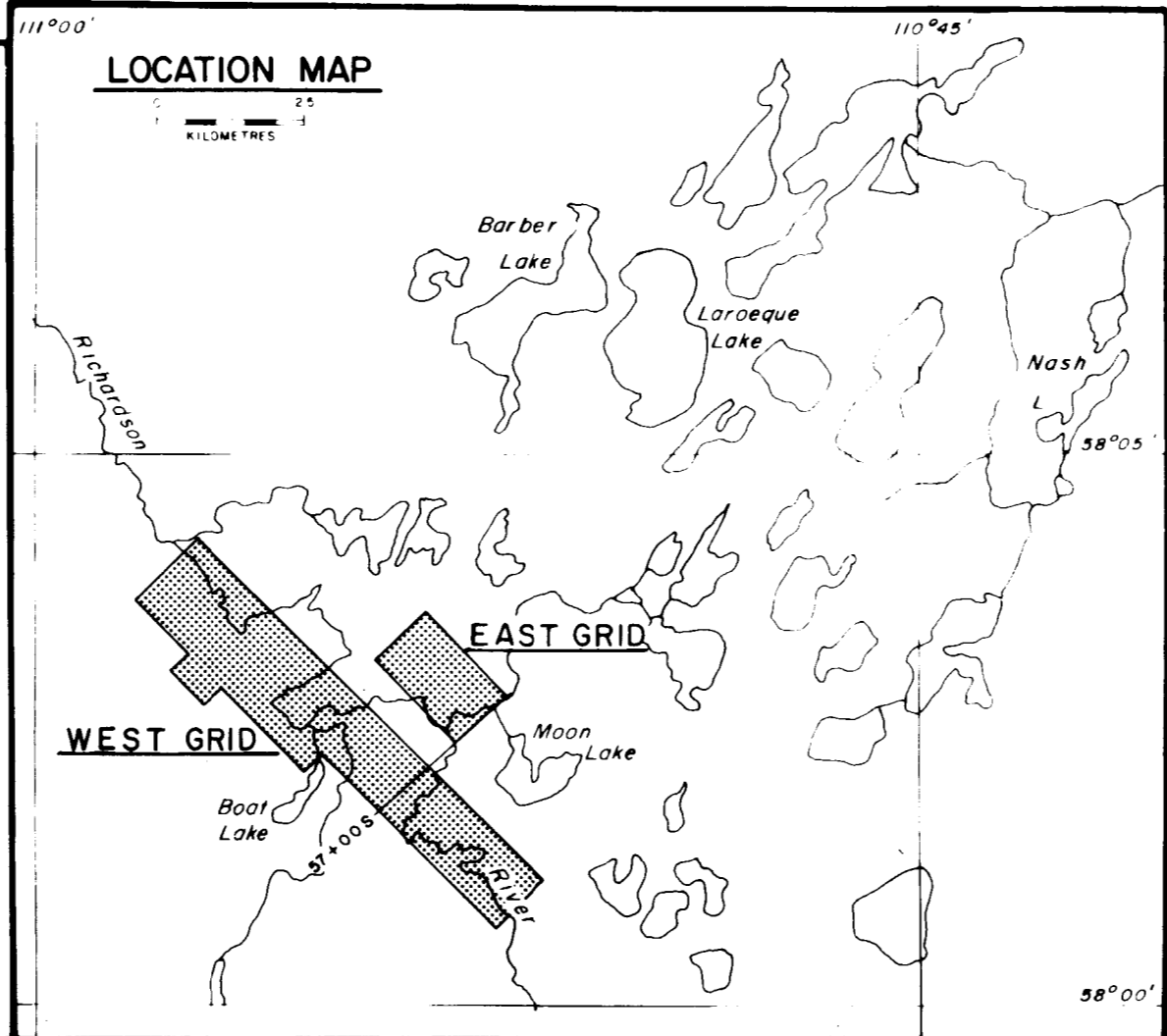
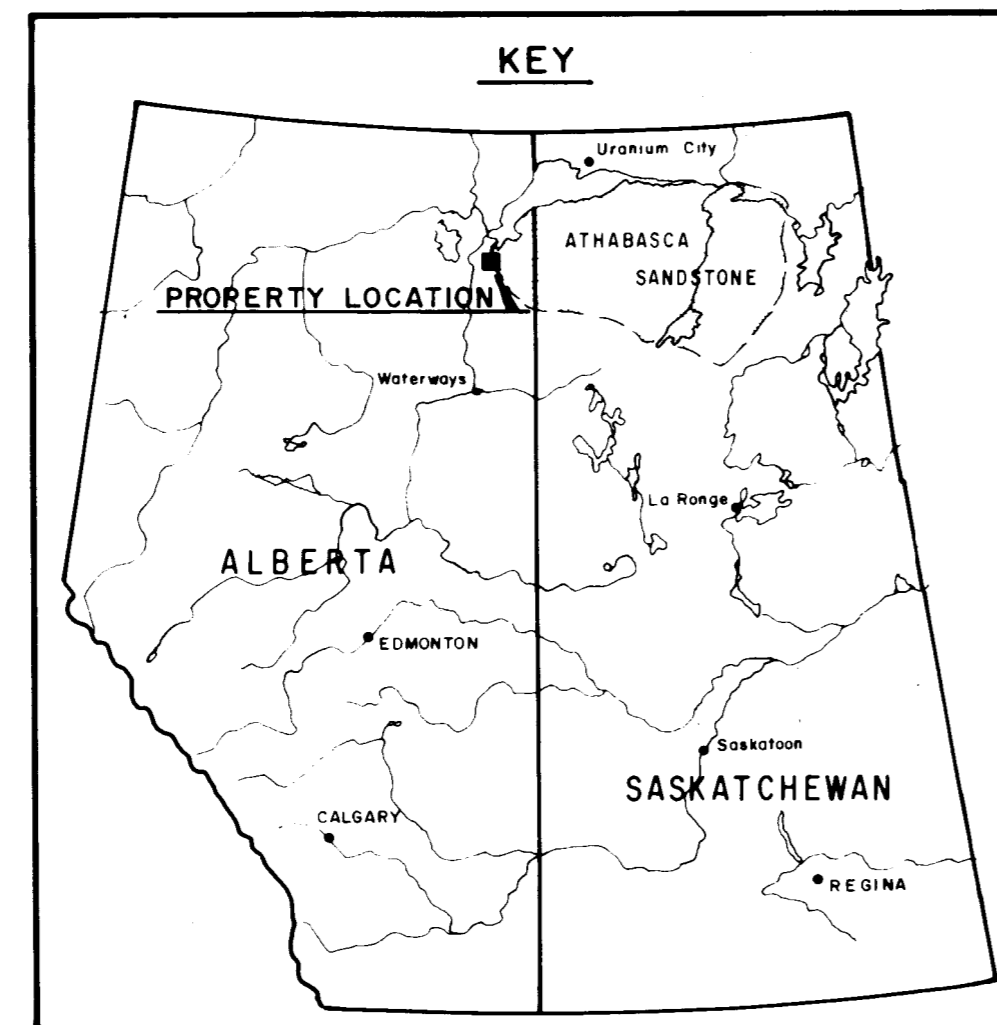
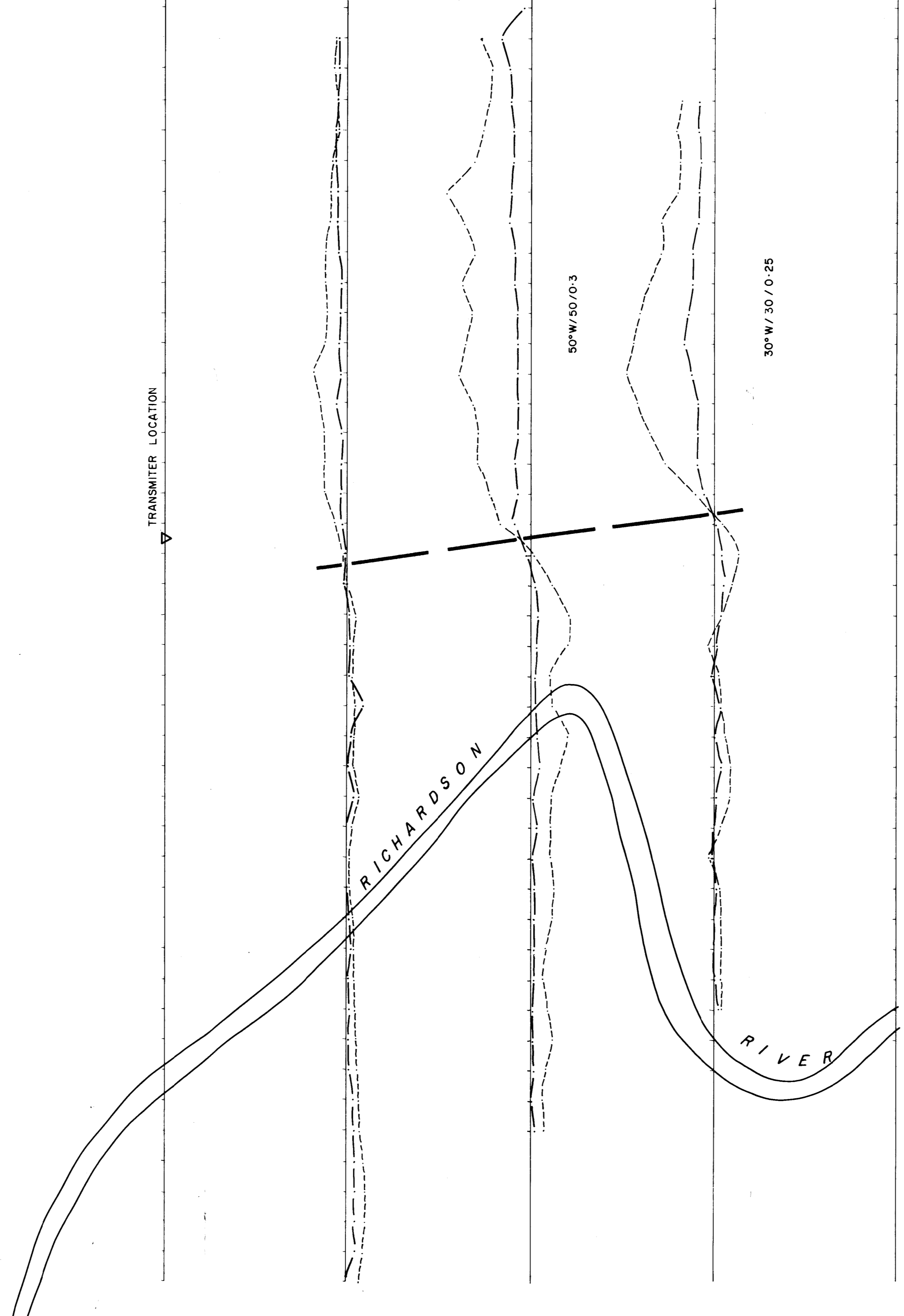
6+00 W

8+00 W

10+00 W

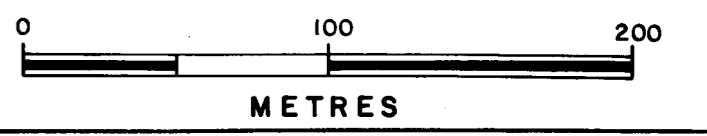
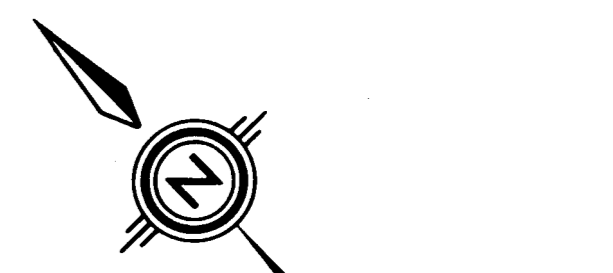
12+00 W


14+00 W

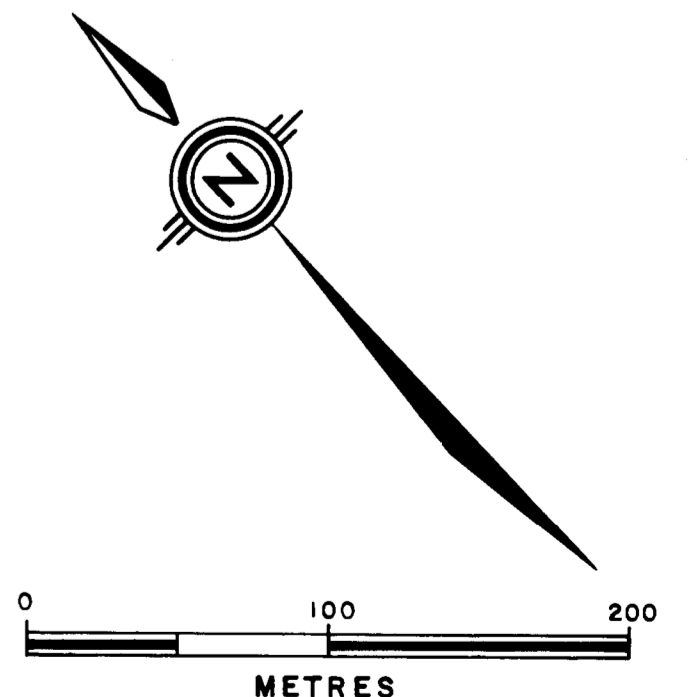
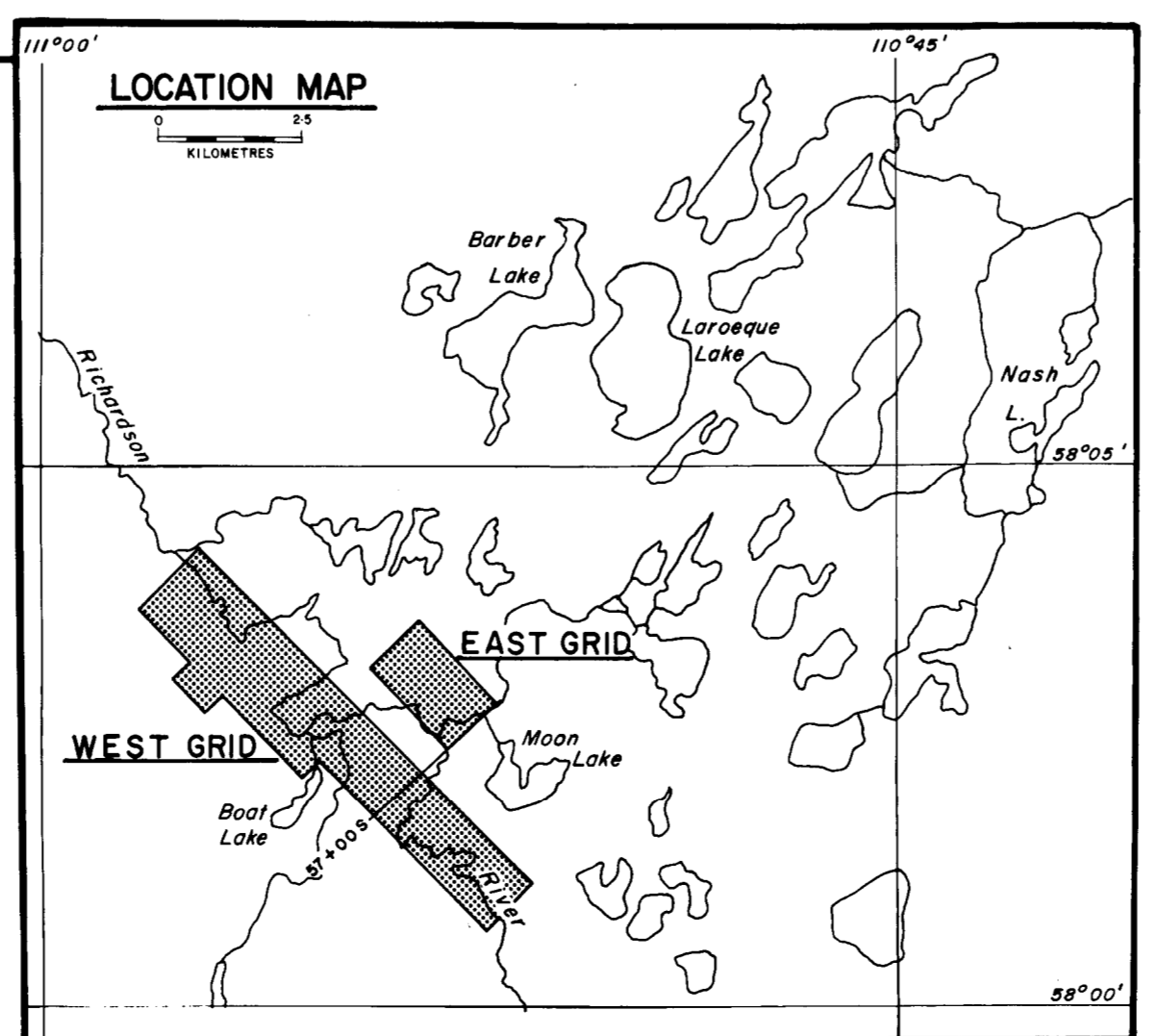
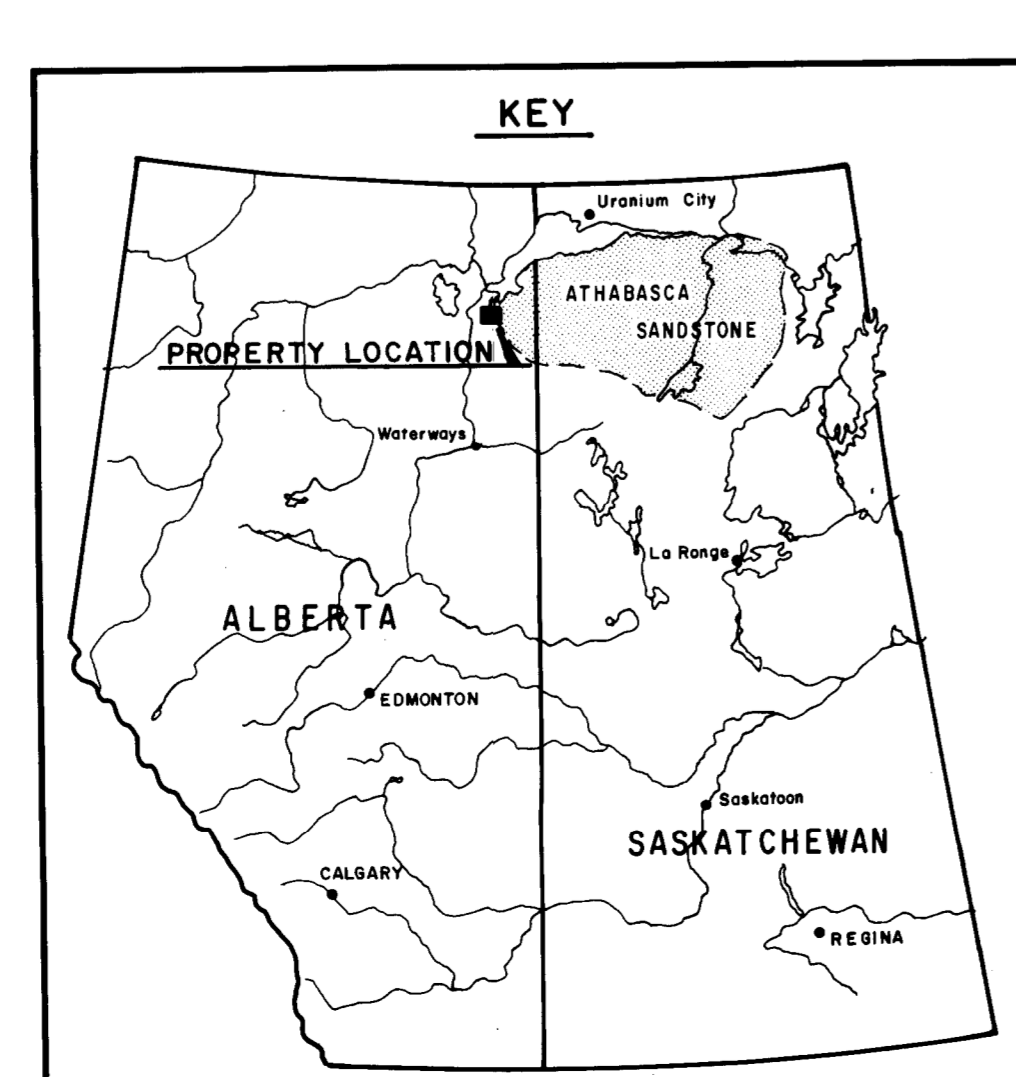
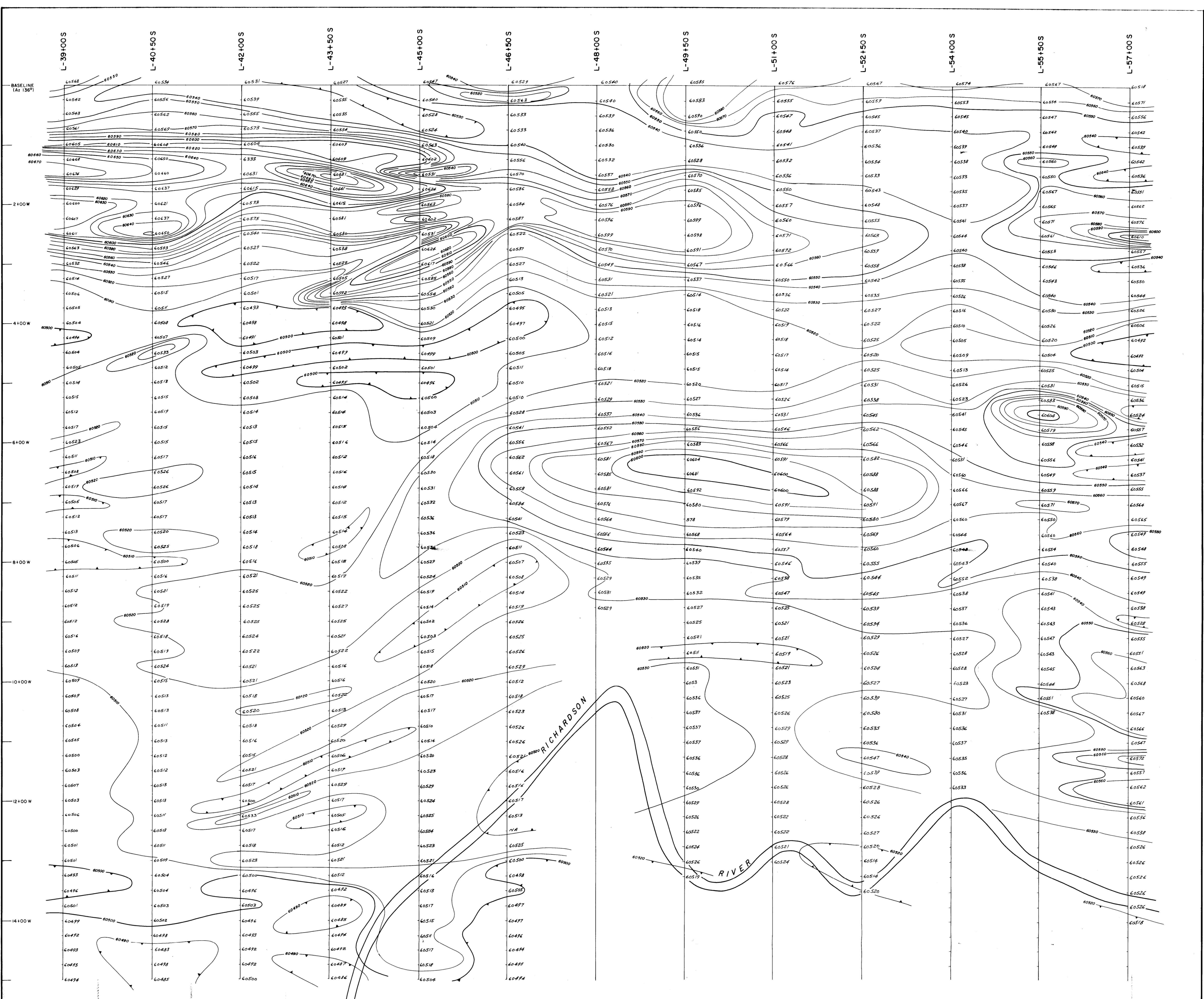


LEGEND


- VERTICAL LOOP FIXED TRANSMITTER
- McPHAR SSIS
- Low Frequency 1000 Hz
- High Frequency 5000 Hz
- Conductor Axis
- Transmitter Location
- 60°/60/0.6 Dip (Degrees) / Depth (Meters) / Conductivity Thickness (Mohs)
- Profile Scale: +20% 0 -20%

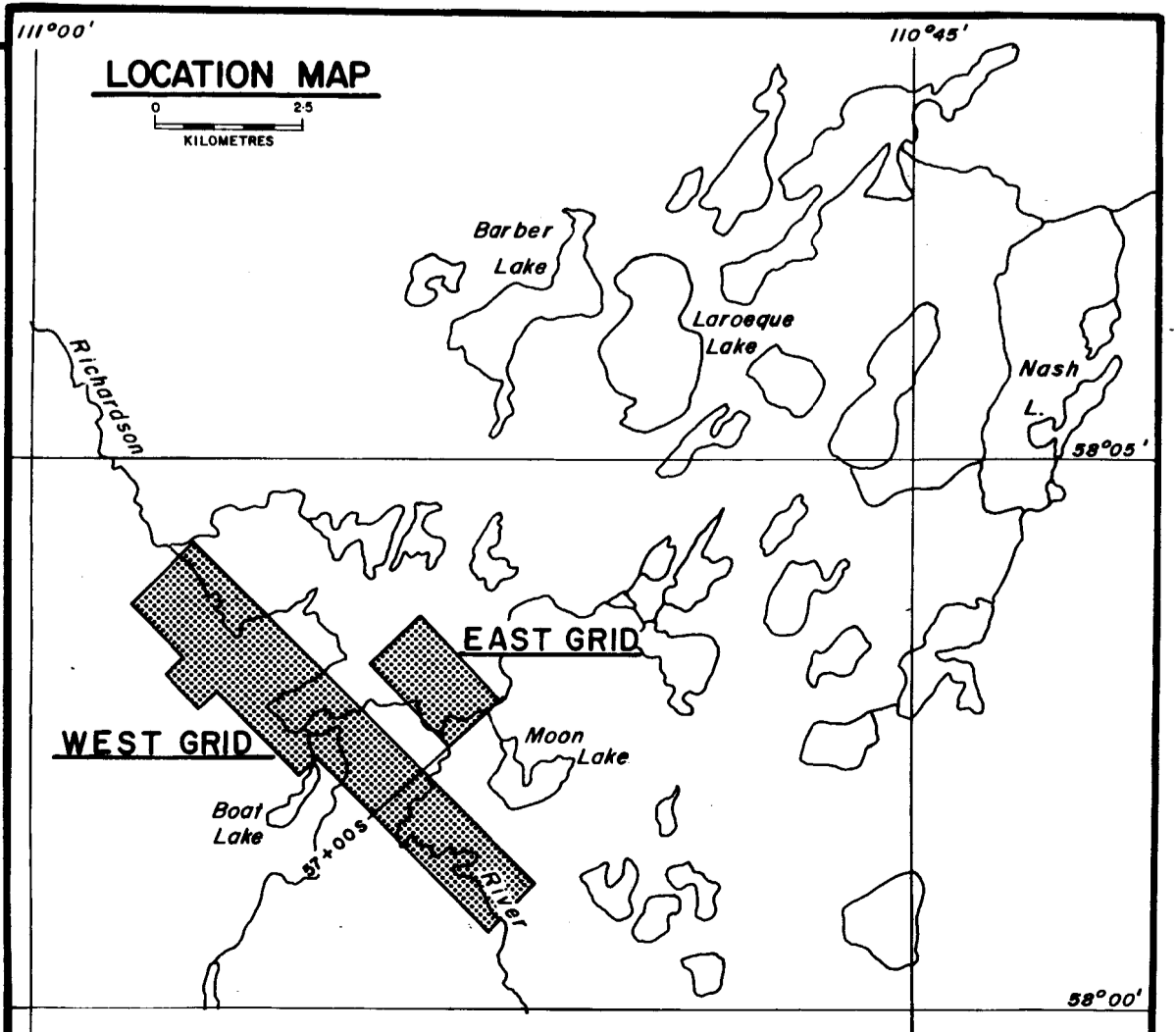
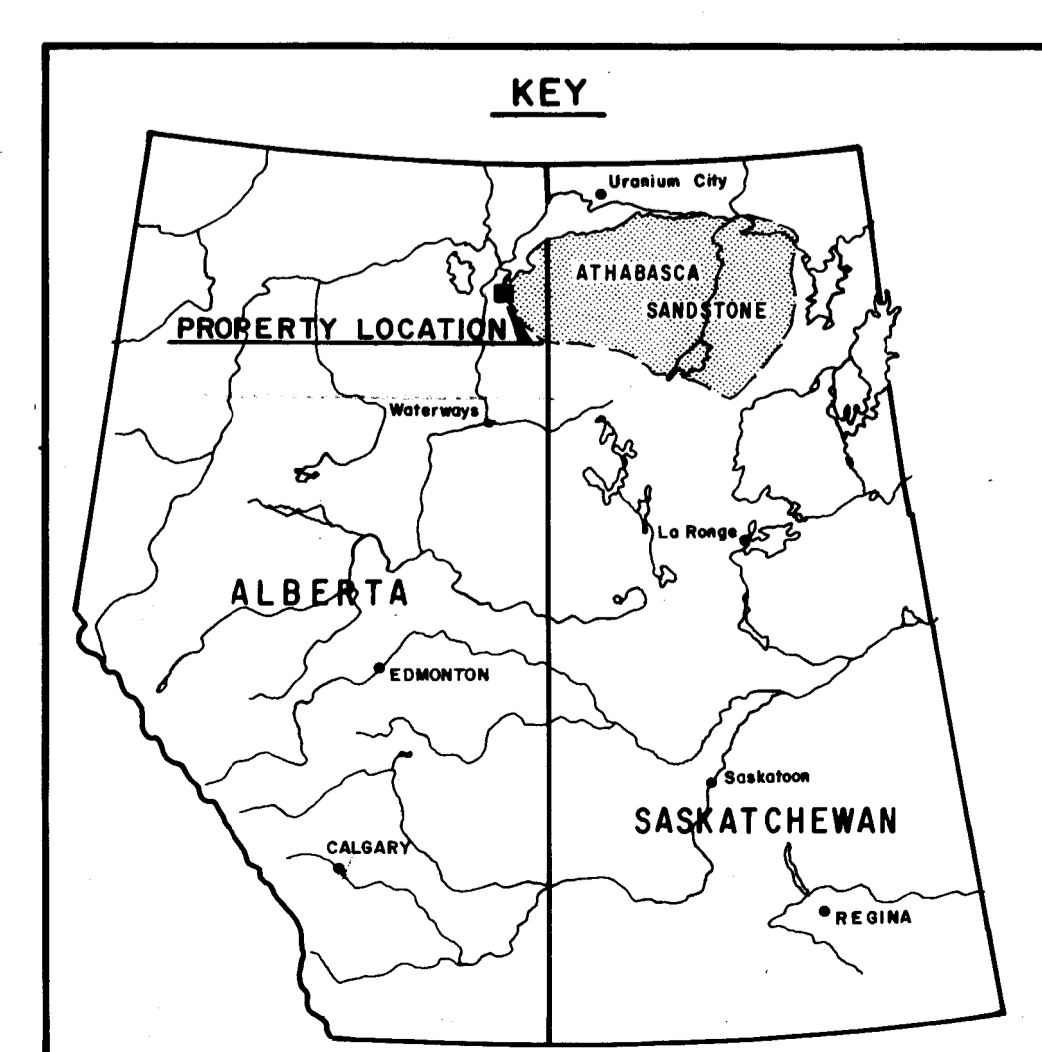
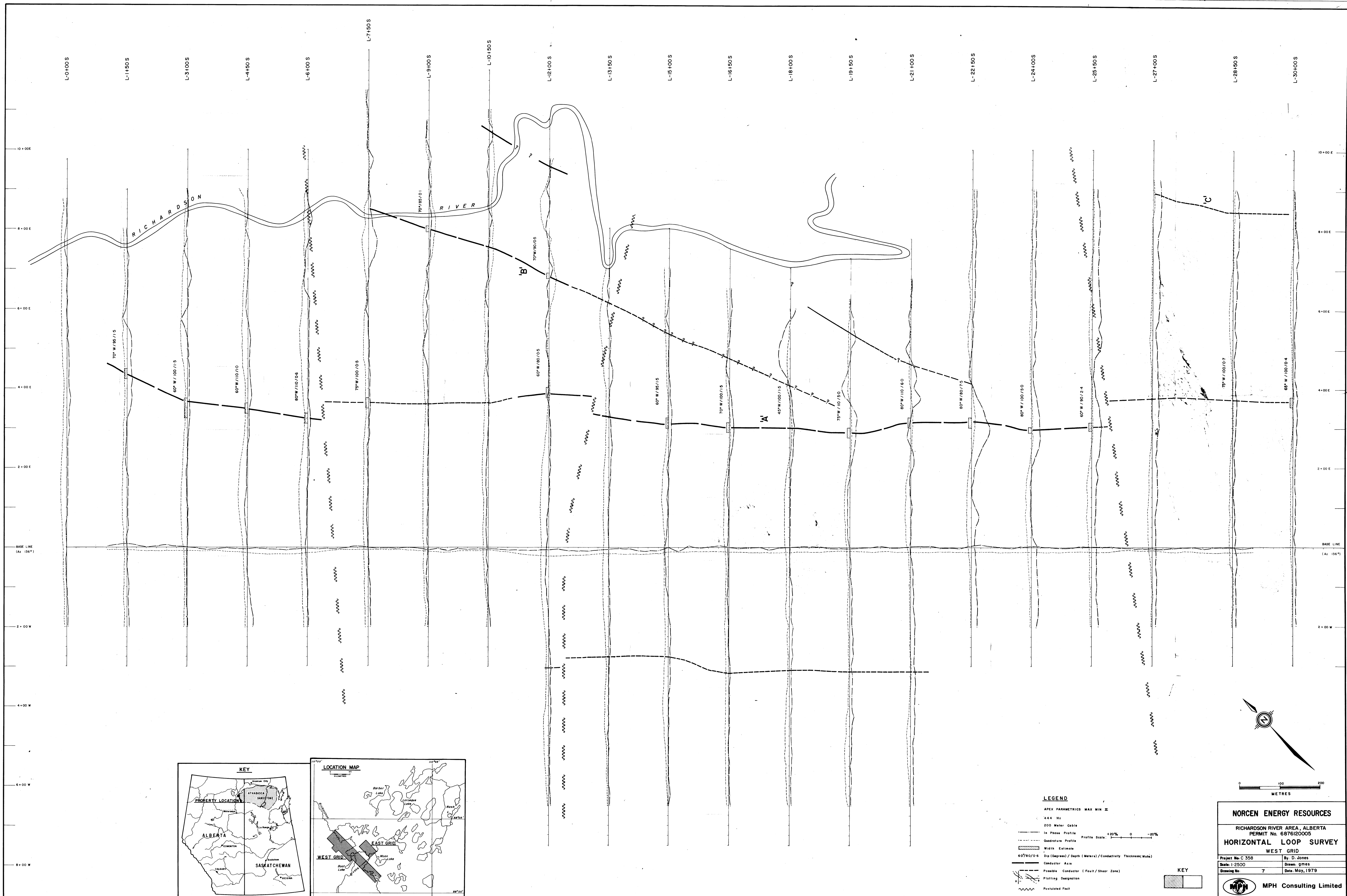


NORCEN ENERGY RESOURCES	
RICHARDSON RIVER AREA, ALBERTA PERMIT No. 6876120005	
VERTICAL LOOP SURVEY	
EAST GRID	
Project No: C 358	By: D. Jones
Scale: 1:2500	Drawn: g m e s
Drawing No: 5	Date: May, 1979
 MPH Consulting Limited	

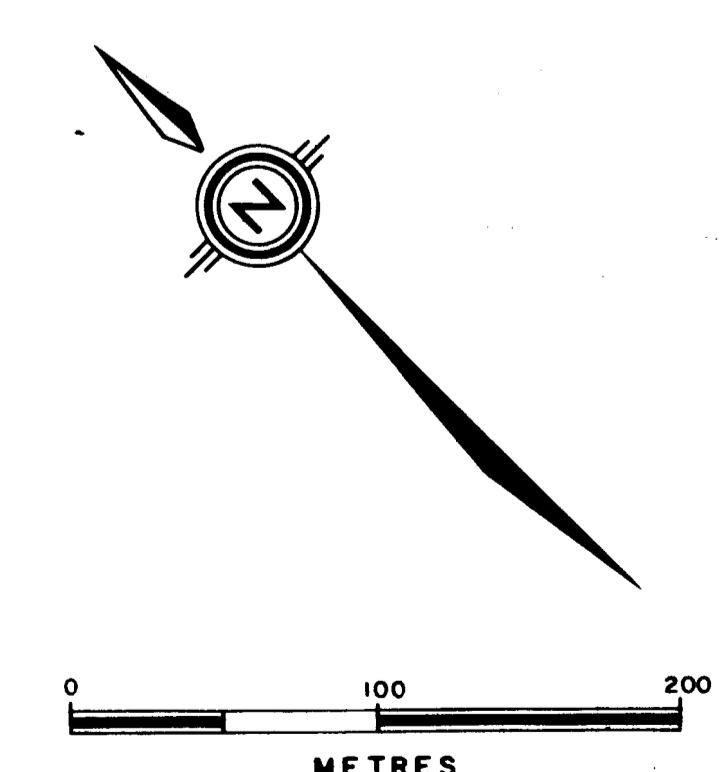
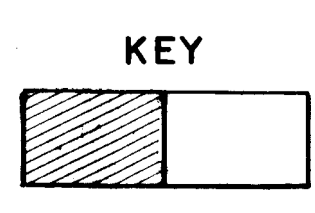


LEGEND
 EXPLORATION GEOMETRICS (Model G-816)
 Magnetic values in gammas (corrected)
 Magnetic contours
 Contour interval 10 gammas
 Magnetic low

NORCEN ENERGY RESOURCES	
RICHARDSON RIVER AREA, ALBERTA PERMIT No. 6876120005	
MAGNETIC SURVEY	
EAST GRID	
Project No. C 358	By: D. Jones
Scale: 1:2500	Drawn: gmes
Drawing No. 6	Date: May, 1979
 MPH Consulting Limited	



- LEGEND**
- APEX PARAMETERS MAX MIN SE
 - 444 Hz
 - 200 Meter Cable
 - In Phase Profile Profile Scale: +20% 0 -20%
 - Quadrature Profile
 - Width Estimate
 - 60°90/06 Dip (Degrees) / Depth (Meters) / Conductivity Thickness (Mohm)
 - Conductor Axis
 - Possible Conductor (Fault/Shear Zone)
 - Plotting Designation
 - Percolated Fault

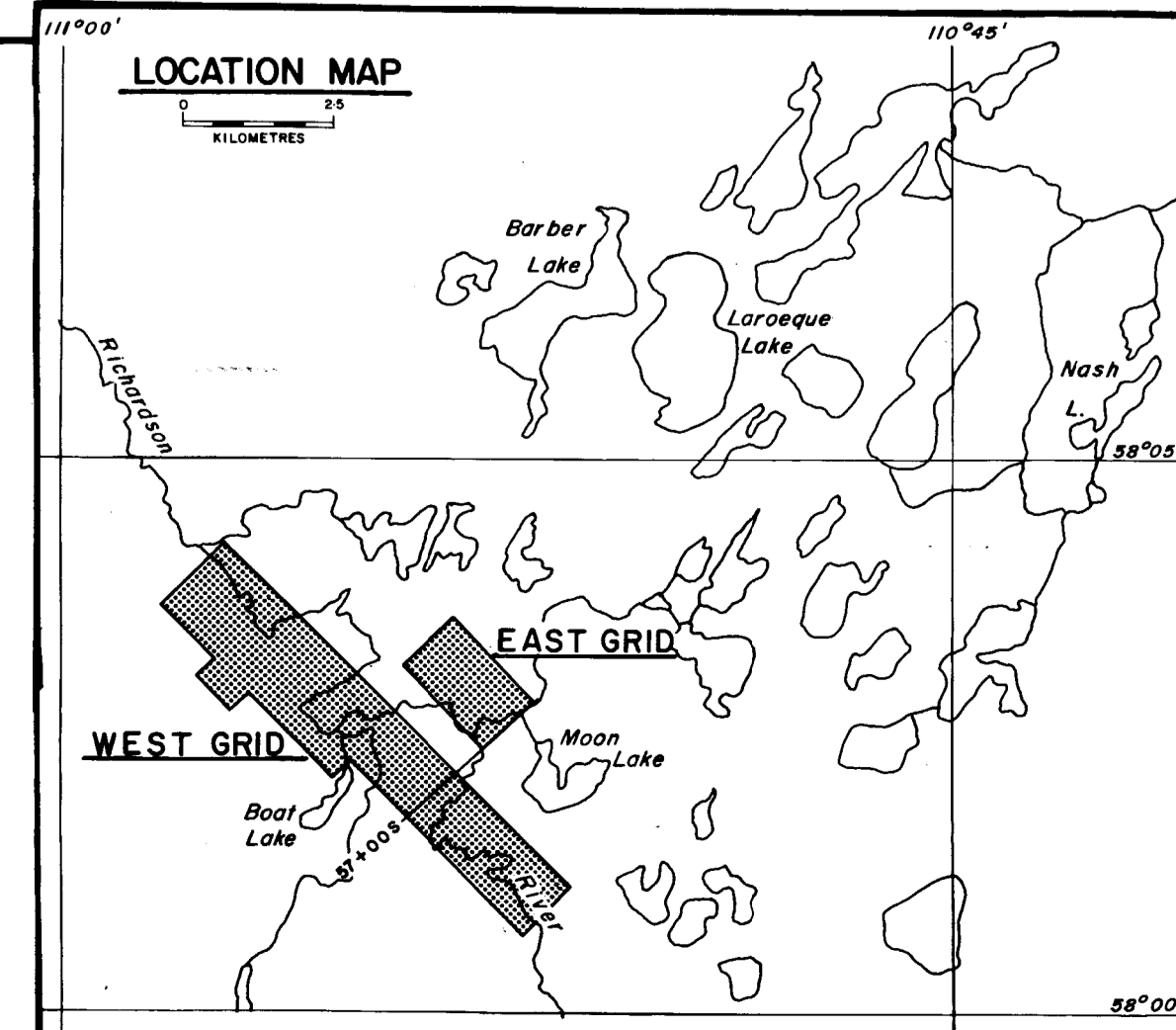
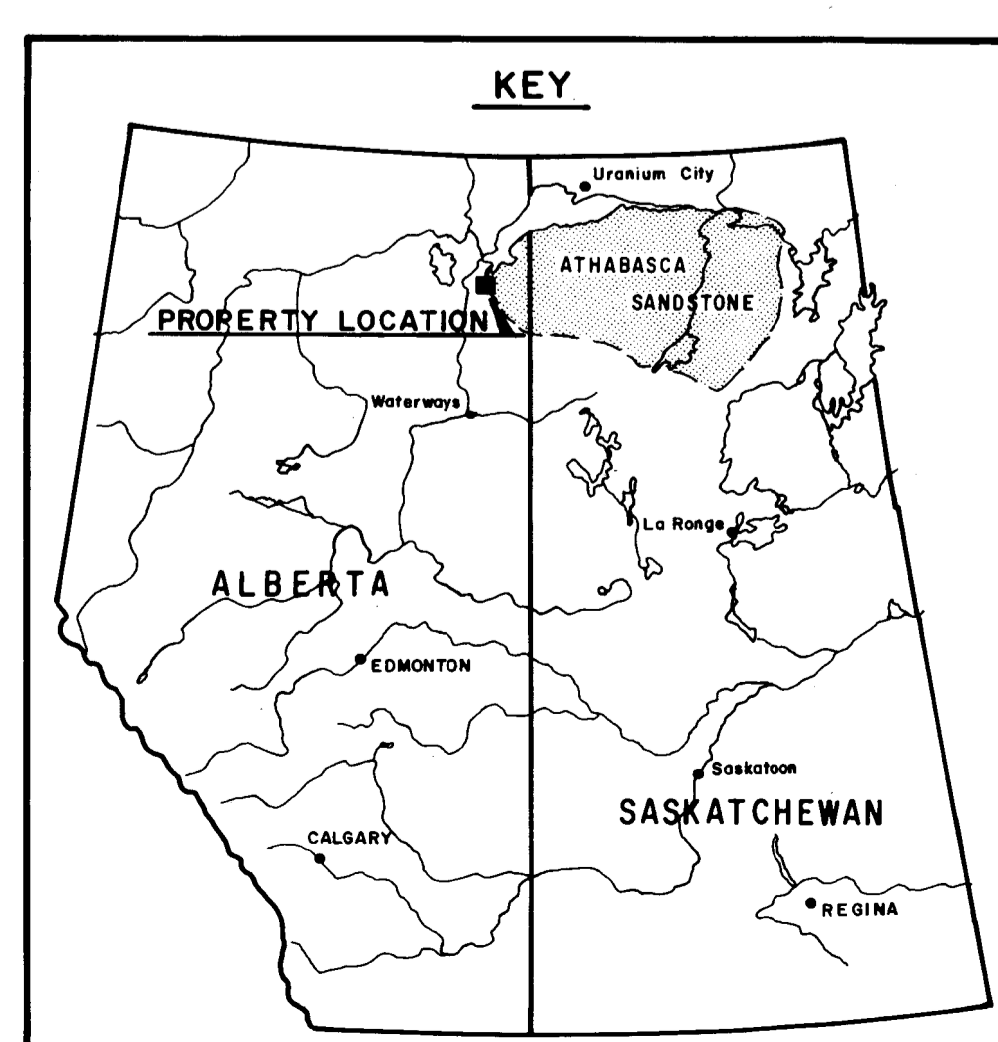
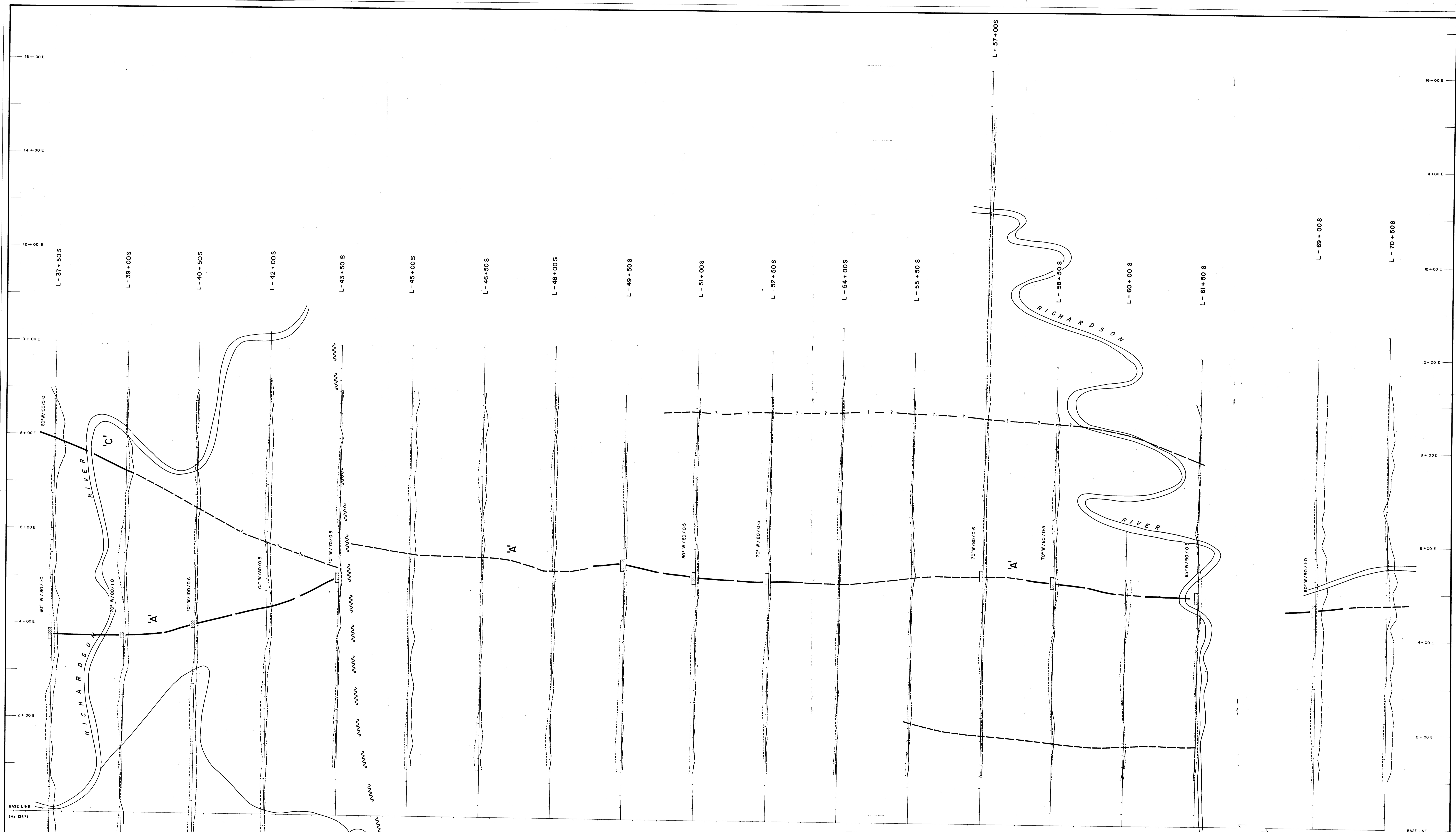


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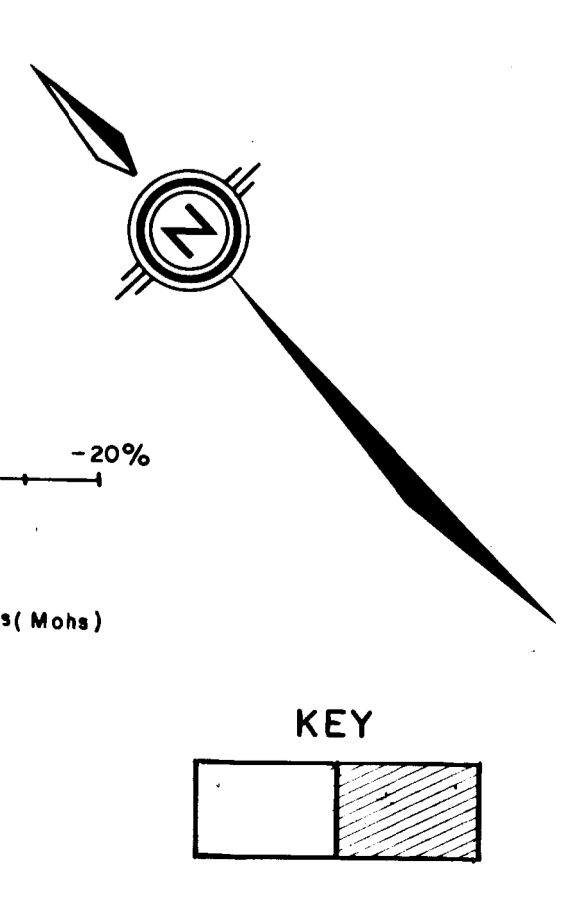
RICHARDSON RIVER AREA, ALBERTA
 PERMIT No. 687620005
HORIZONTAL LOOP SURVEY
 WEST GRID

Project No. C 358	By: D. Jones
Scale: 1:2500	Drawn: gmes
Drawing No. 7	Date: May, 1979

MPH Consulting Limited



- LEGEND**
- APEX PARAMETRICS MAX MIN II
 - 444 Hz
 - 200 Meter Cable
 - - - In Phase Profile Profile Scale: +20% 0 -20%
 - - - Quadrature Profile
 - ▨ Width Estimate
 - 60°W/80°/0-6 Dip (Degrees) / Depth (Meters) / Conductivity Thickness (Mohm)
 - Conductor Axis
 - - - Possible Conductor (Fault/Shear Zone)
 - Plotting Designation
 - ~ Postulated Fault

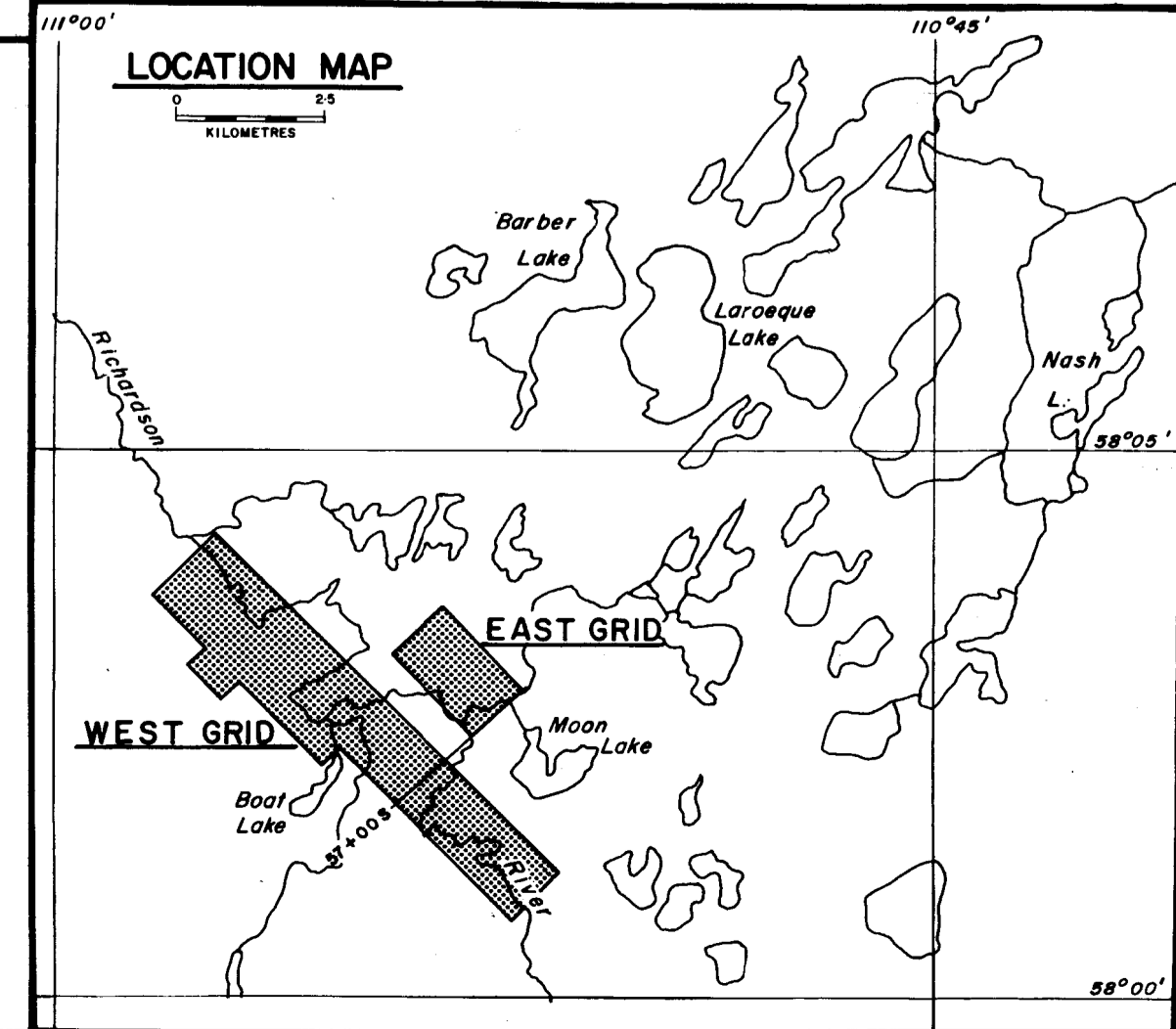
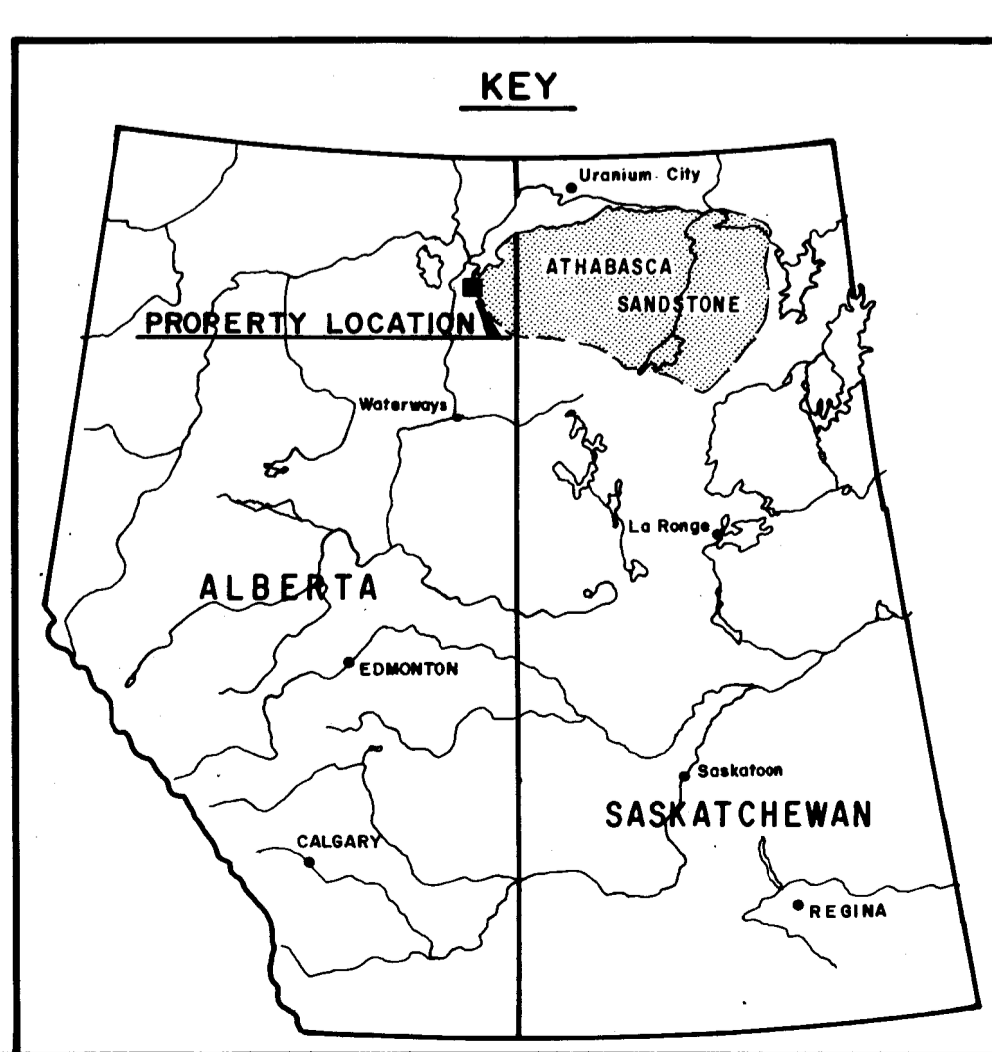
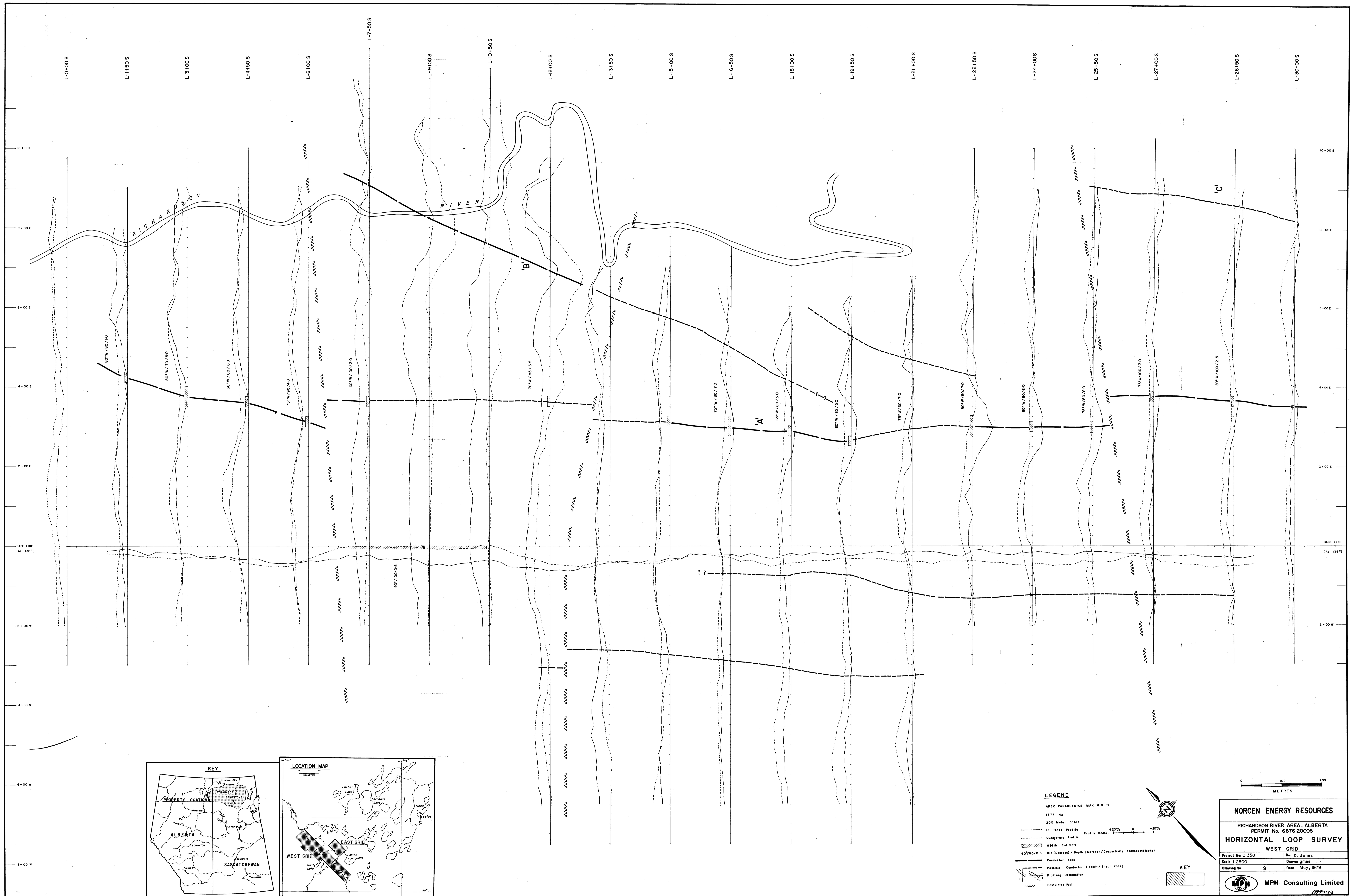


NORCEN ENERGY RESOURCES

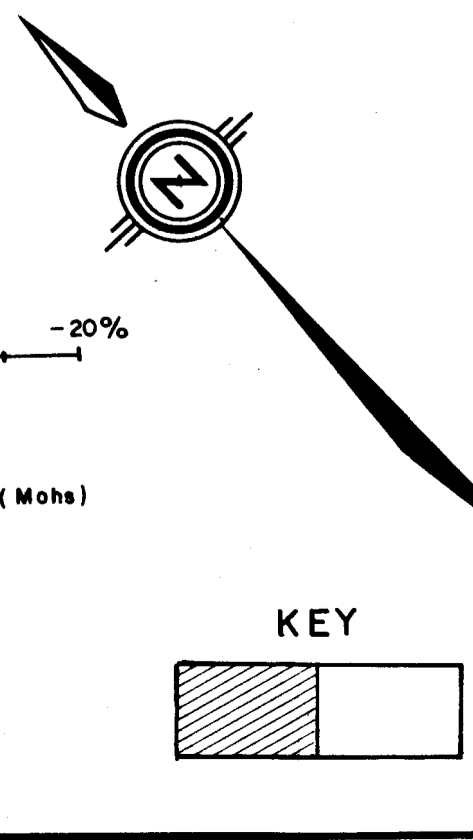
RICHARDSON RIVER AREA, ALBERTA
 PERMIT No. 6876120005
HORIZONTAL LOOP SURVEY
 WEST GRID

Project No: C 358	By: D. Jones
Scale: 1:2500	Drawn: gmes
Drawing No: 8	Date: May, 1979

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 19770023



- LEGEND**
- APEX PARAMETERS MAX MIN II
 - 1777 Hz
 - 200 Meter Cable
 - In Phase Profile Profile Scale: +20% 0 -20%
 - Out-of-phase Profile
 - Width Estimate
 - 60°/80/0-6 Dip (Degrees) / Depth (Meters) / Conductivity Thickness(Mohm)
 - Conductor Axis
 - Possible Conductor (Fault/Shear Zone)
 - Plotting Designation
 - Postulated Fault



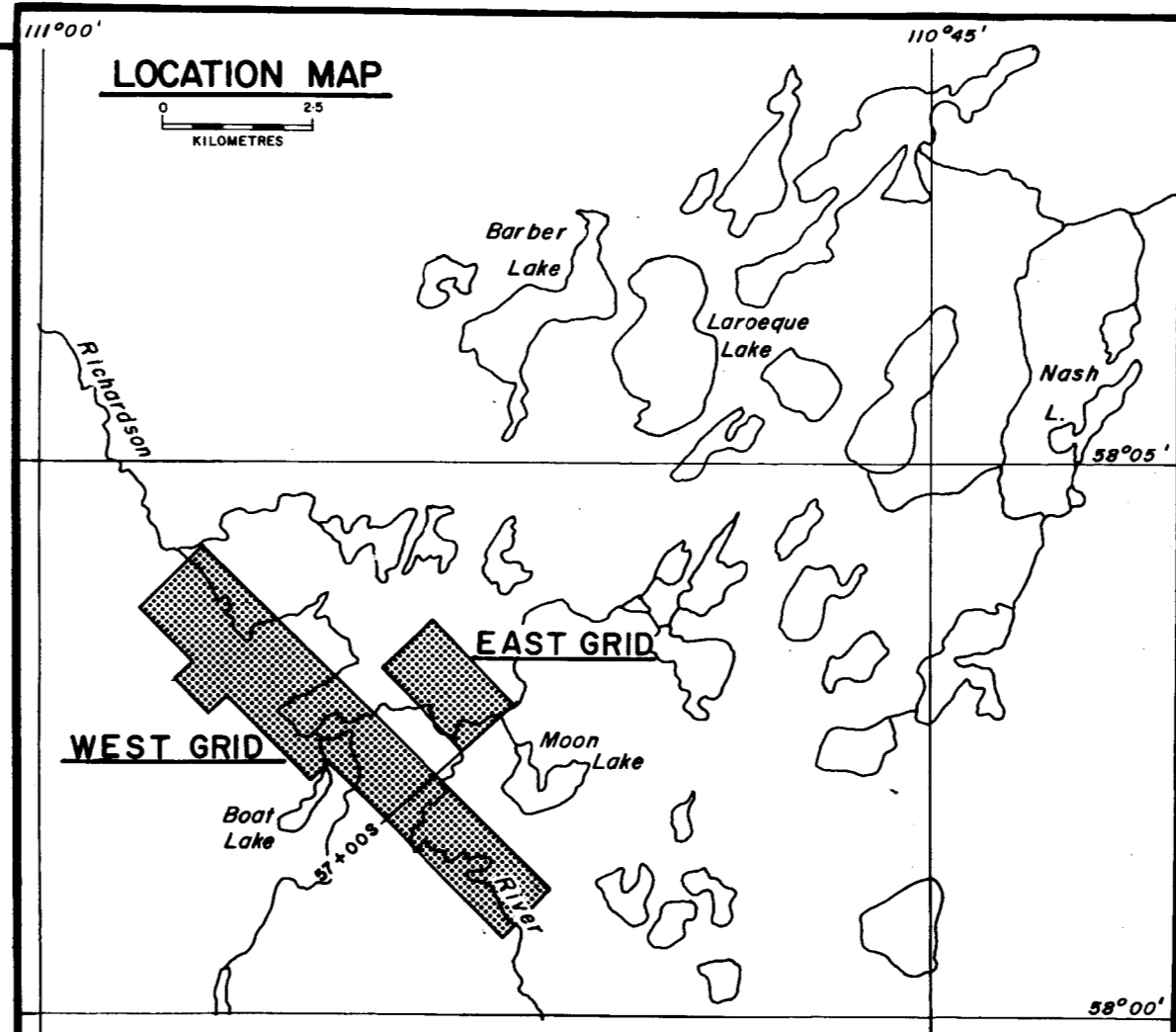
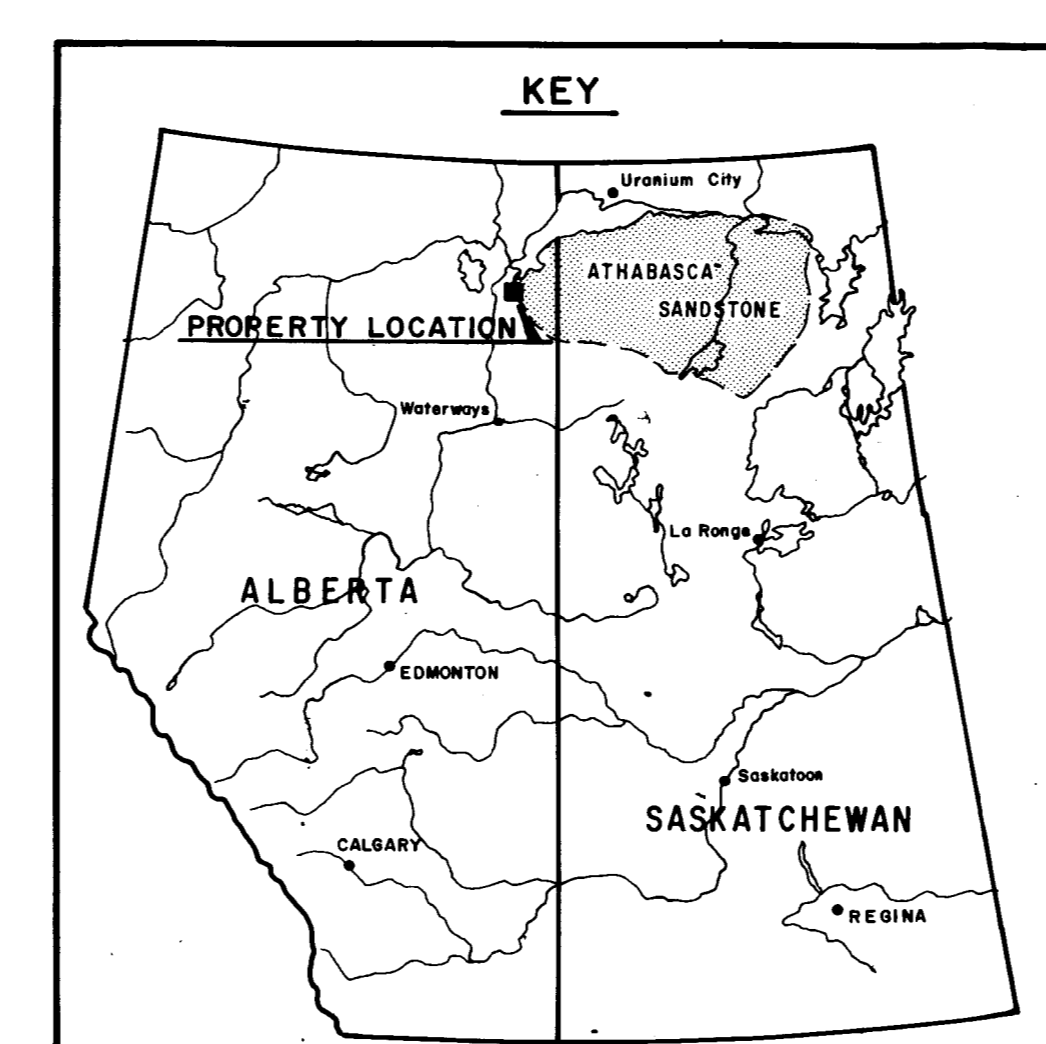
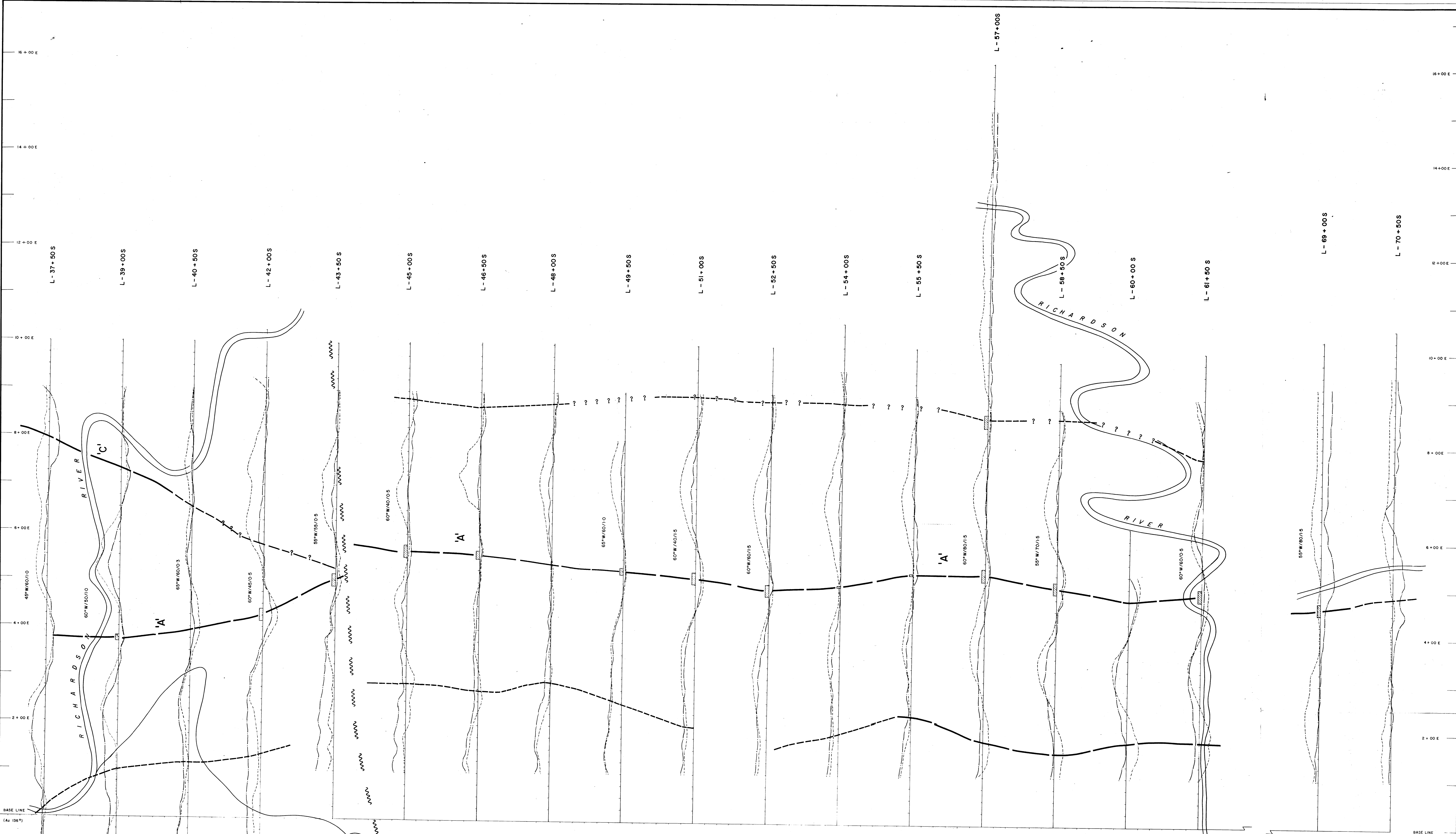
NORCEN ENERGY RESOURCES

RICHARDSON RIVER AREA, ALBERTA
 PERMIT No. 6876120005

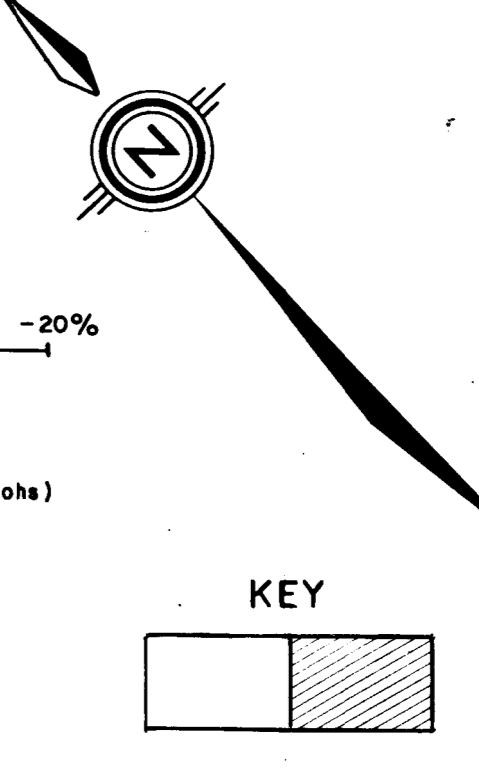
HORIZONTAL LOOP SURVEY
 WEST GRID

Project No: C 358	By: D. Jones
Scale: 1:2500	Drawn: gmes
Drawing No: 9	Date: May, 1979

MPH Consulting Limited



- LEGEND**
- APEX PARAMETRICS MAX MIN II
 - 1777 Hz
 - 200 Meter Cable
 - In Phase Profile
 - Quadrature Profile
 - Width Estimate
 - 60°W/60°/0 E Dip (Degrees) / Depth (Meters) / Conductivity Thickness (Meters)
 - Conductor Axis
 - Possible Conductor (Fault/Shear Zone)
 - Plotting Designation
 - Postulated Fault



NORCEN ENERGY RESOURCES

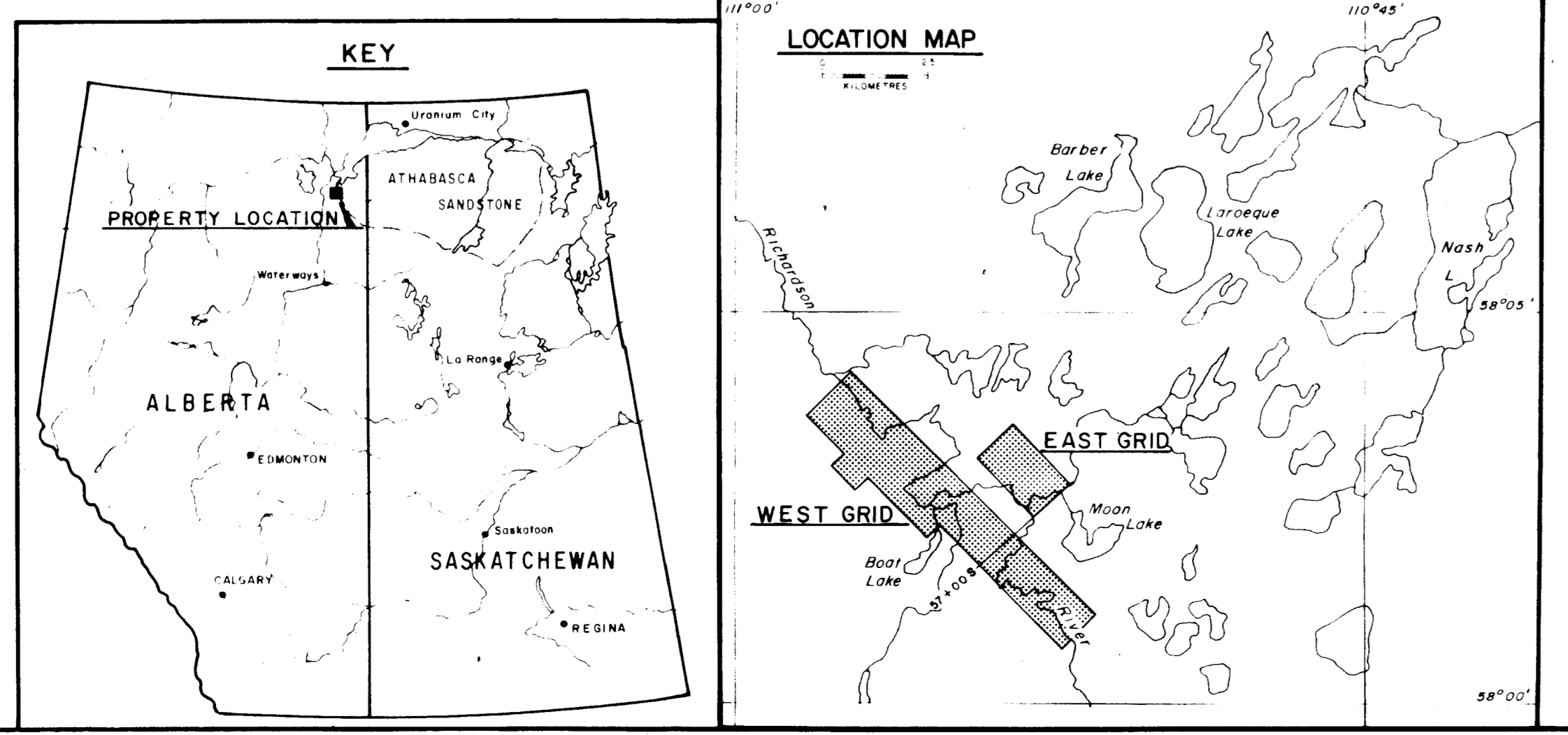
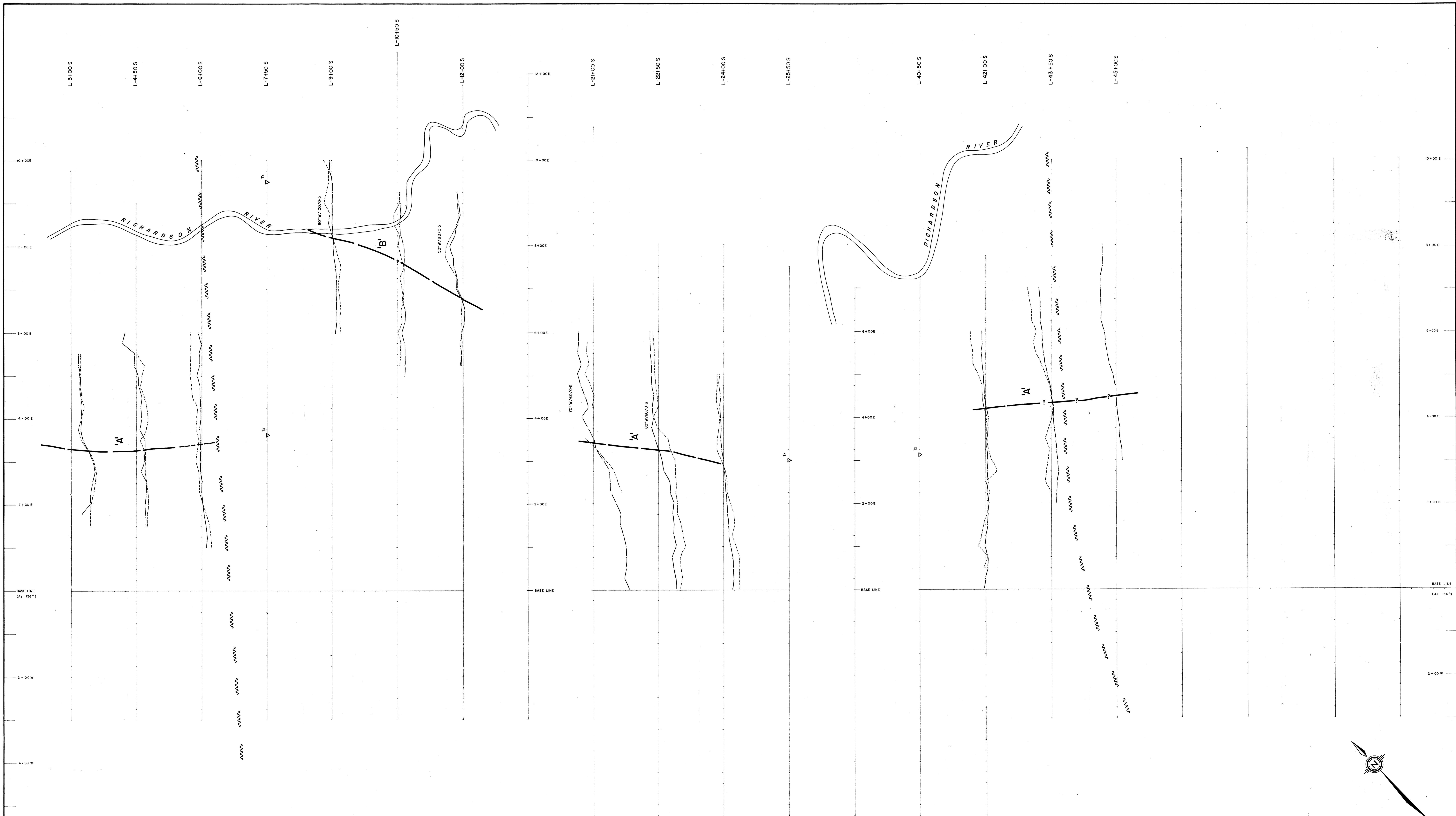
RICHARDSON RIVER AREA, ALBERTA
 PERMIT No. 687620005

HORIZONTAL LOOP SURVEY

WEST GRID

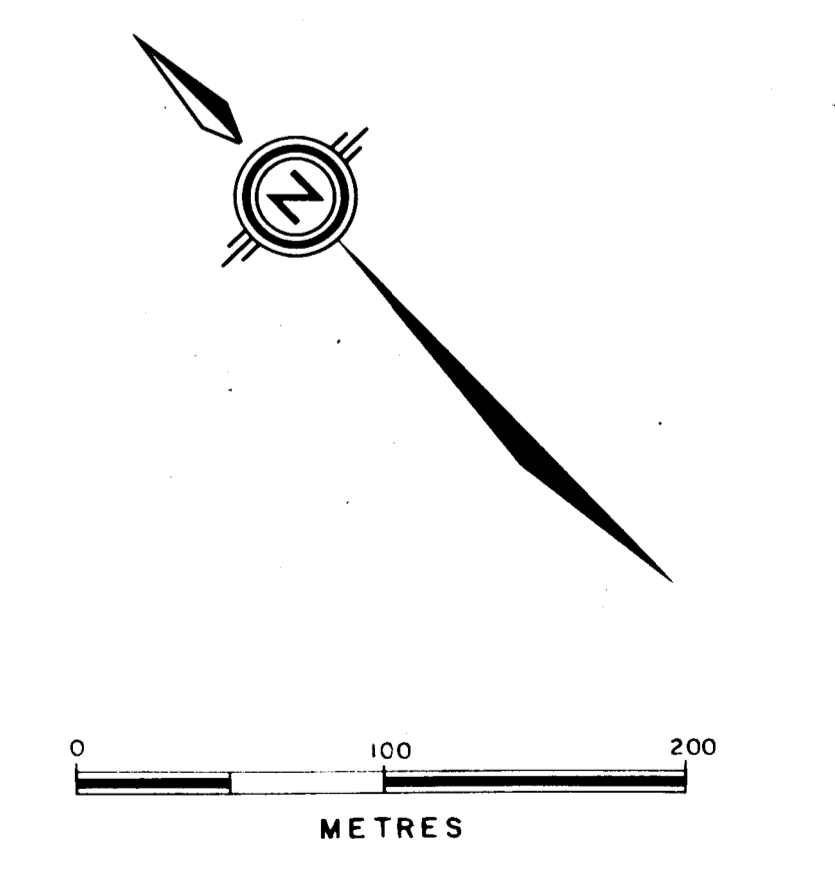
Project No: C 358	By: D. Jones
Scale: 1:2500	Drawn: gms
Drawing No: 10	Date: May, 1979

MPH Consulting Limited
 17770228



LEGEND

- VERTICAL LOOP FIXED TRANSMITTER
- MPHAR 5515
- Low Frequency 1000 Hz
- High Frequency 5000 Hz
- Conductor Ais
- Transmitter Location
- 60°/80°/0.6 Dia (Degrees) / Depth (Meters) / Conductivity Thickness (Moh)
- Postulated Fault
- Profile Scale



NORCEN ENERGY RESOURCES

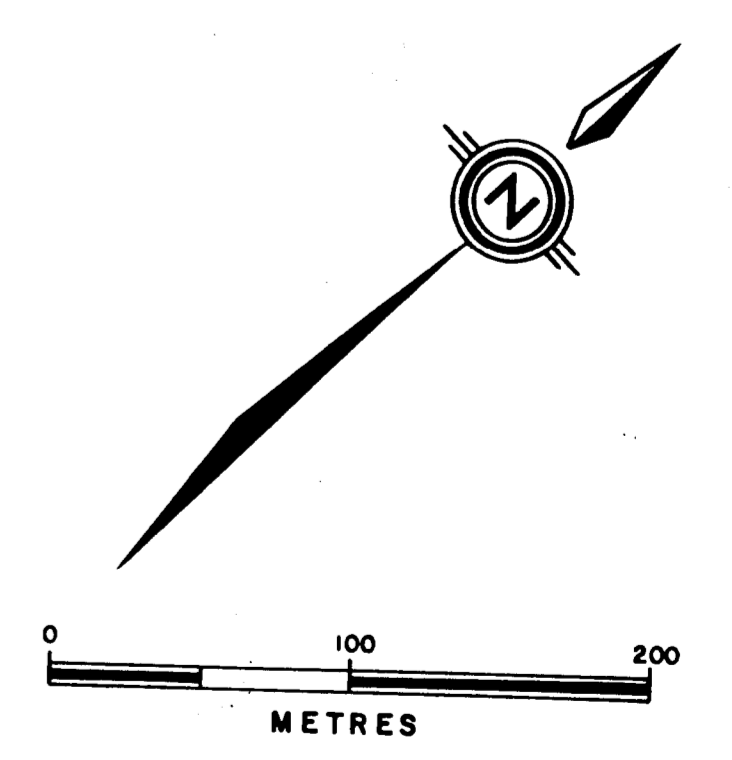
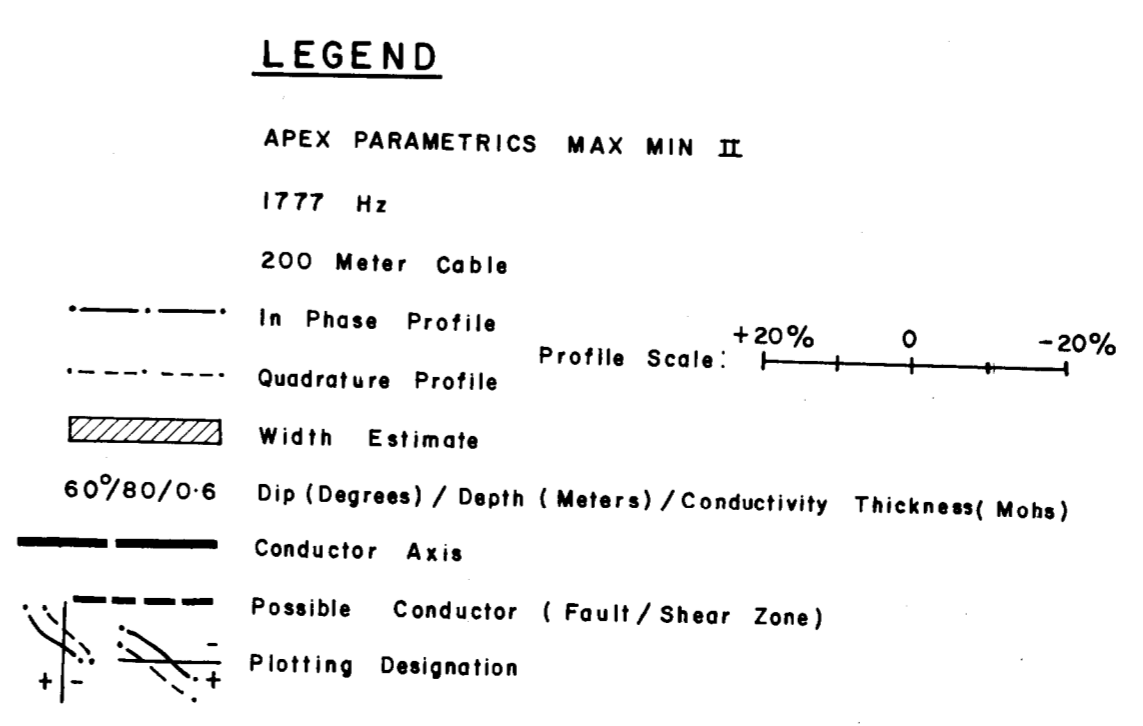
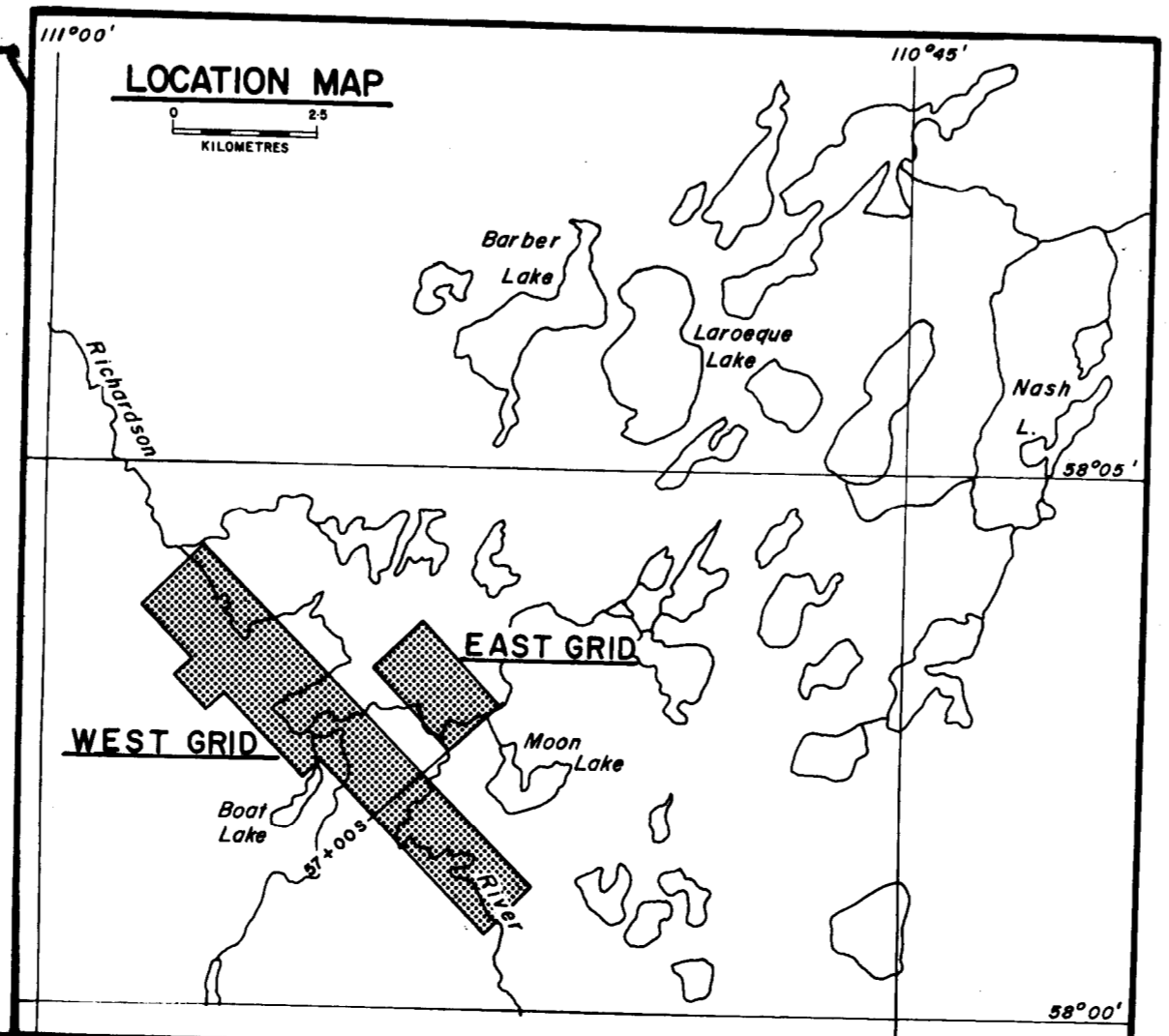
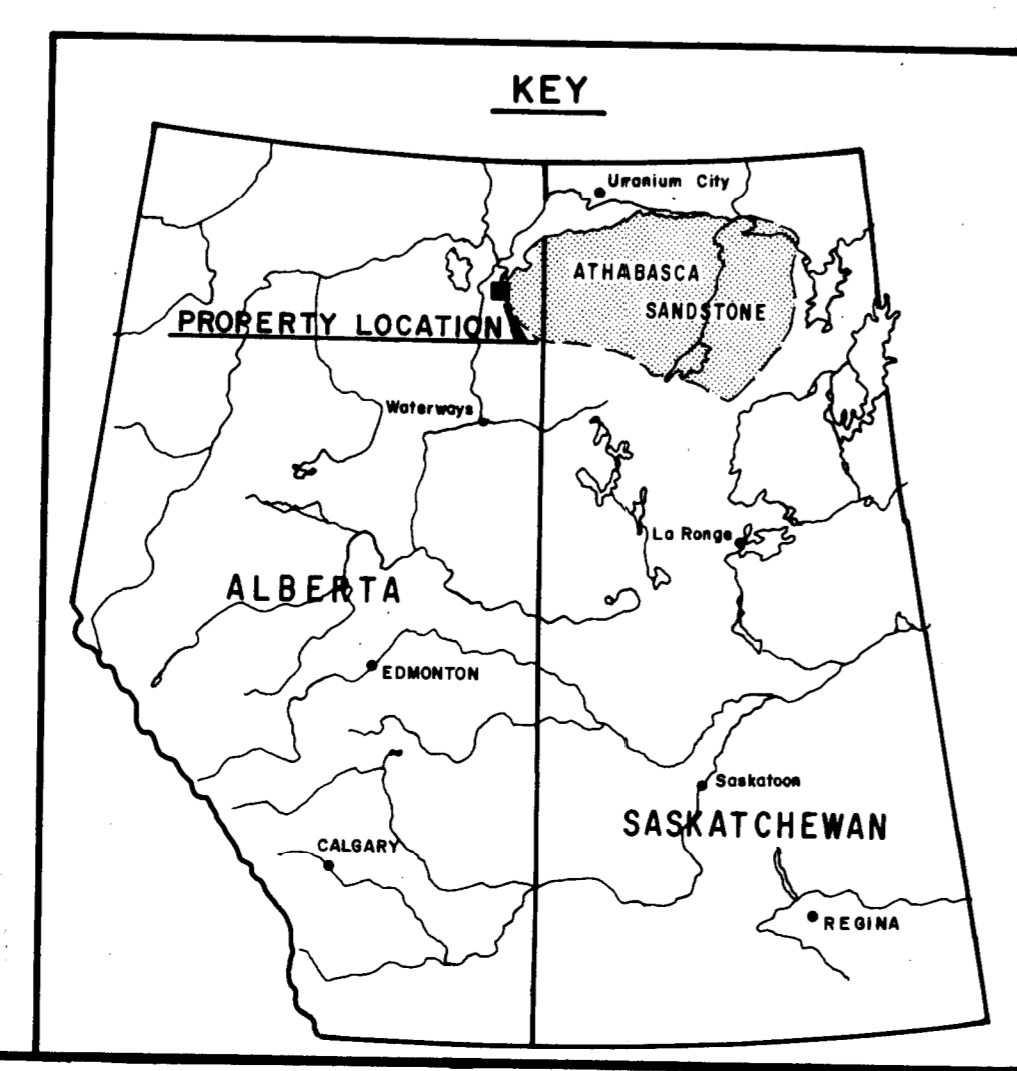
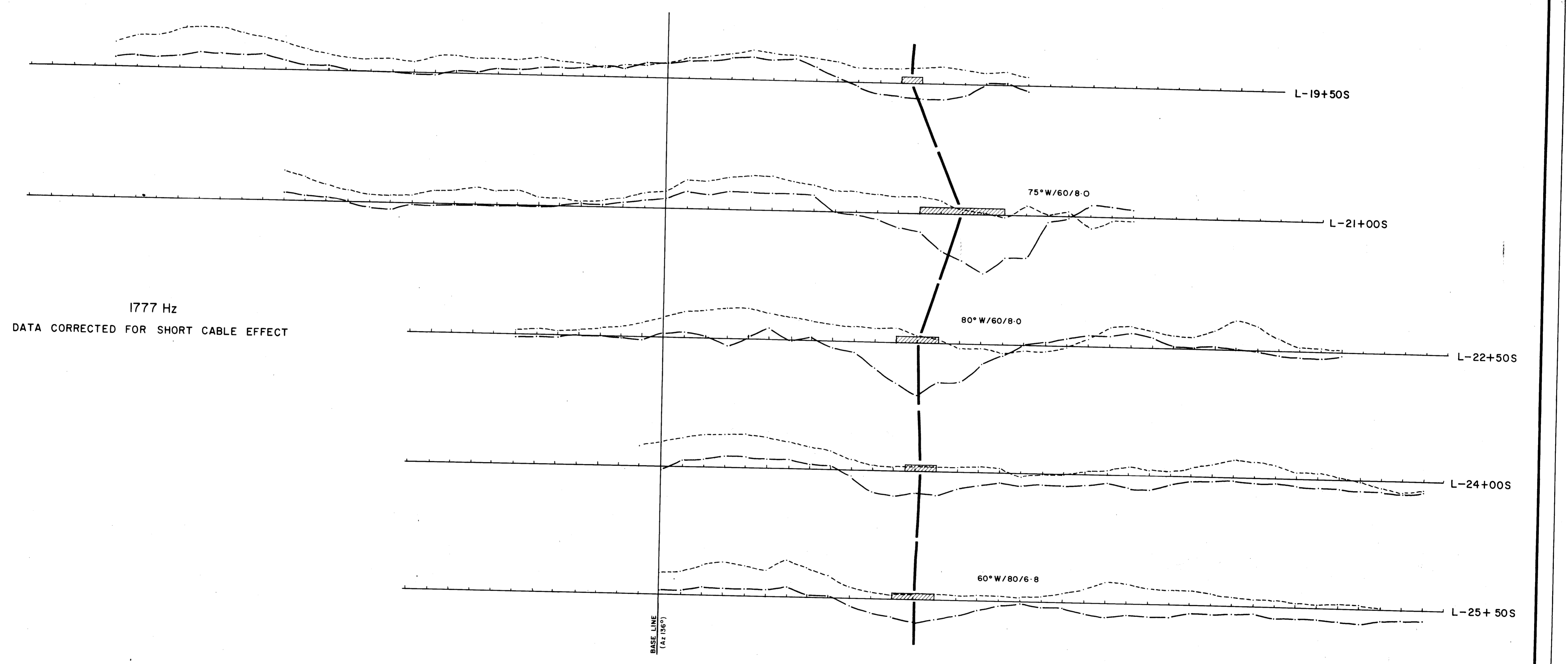
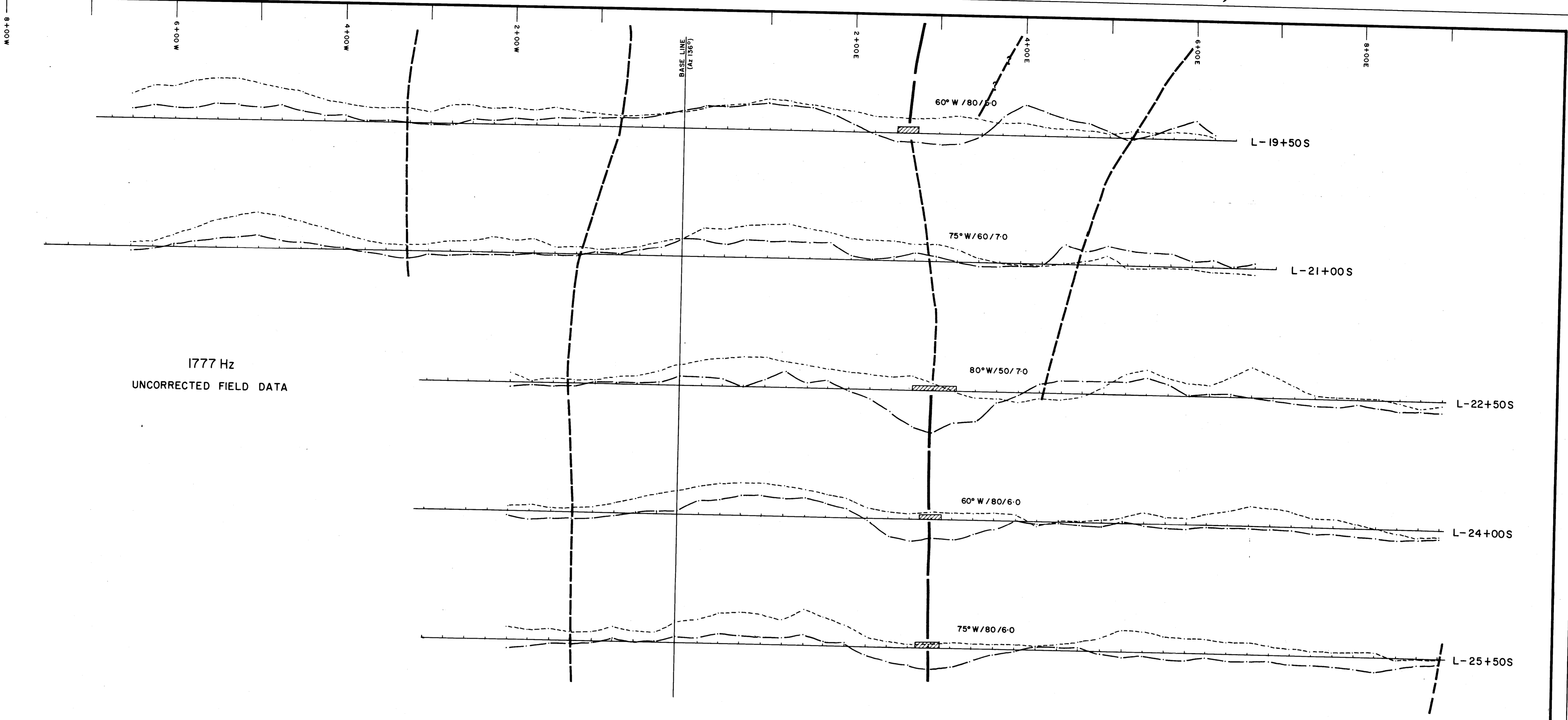
RICHARDSON RIVER AREA, ALBERTA
 PERMIT No. 6876120005

VERTICAL LOOP SURVEY

WEST GRID

Project No. C 358 By: D. Jones
 Scale: 1:2500 Drawn: GMS
 Drawing No. 11 Date: May, 1979

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NORCEN ENERGY RESOURCES

RICHARDSON RIVER AREA, ALBERTA
 PERMIT No. 6876120005
 COMPARISON OF CORRECTED & UNCORRECTED
 HORIZONTAL LOOP SURVEYS
 WEST GRID

Project No: C 358	By: D. Jones
Scale: 1:2500	Drawn: gmes
Drawing No: 14	Date: May, 1979

MPH Consulting Limited