

PIT SLOPE MANUAL

supplement 10-1

RECLAMATION BY VEGETATION

VOL 2 - Mine Waste Inventory by Satellite Imagery

This supplement has been prepared as part of the

PIT SLOPE PROJECT

of the

Mining Research Laboratories
Canada Centre for Mineral and Energy Technology
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THE PIT SLOPE MANUAL

The Pit Slope Manual consists of ten chapters, published separately. Most chapters have supplements, also published separately. The ten chapters are:

1. Summary
2. Structural Geology
3. Mechanical Properties
4. Groundwater
5. Design
6. Mechanical Support
7. Perimeter Blasting
8. Monitoring
9. Waste Embankments
10. Environmental Planning

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SUMMARY

Reclamation of waste material is of increasing concern to mine operators, not only over the life of a mine, but also after closure. Establishing vegetation is one means of reclaiming waste to some state of acceptability. This supplement discusses considerations and problems associated with assessing the suitability of a particular waste material for supporting vegetation. The text is not designed to explain how to vegetate Canadian mine wastes, but rather how to assess the feasibility of vegetating them, how to know what to look for, and where to get information.

Factors Affecting Vegetation

Volume 1 of the supplement explains how the climate, waste properties, and microbial activity affect the establishment and growth of vegetation. Climatic factors of most concern are the length of the frost-free period and the distribution and quantity of precipitation. Climate varies not only across Canada as macro-climate, but also within a mining area as micro-climate that assists or hinders vegetation growth. The micro-climate can be altered to some degree by pre-planning of the waste area and by special surface treatment which will assist plant growth.

The most important physical properties of mine wastes are particle-size distribution and moisture availability. These properties can occasionally be altered, but more often must be understood and handled as well as possible to assist plant growth.

Chemical properties are numerous and vary between and within wastes. Mineralogy and acidity have the greatest affect on the establishment of vegetation. Weathering will affect both the physical texture of the waste as well as the solubility of nutrients and the reactivity of the mineral components. The ones which present the greatest problems are the iron sulphide compounds.

Microbial activity may not be present in wastes when deposited, but is an essential component of healthy soil development and plant growth. Frequently, adequate airborne microbes are available, but in many cases it is necessary to artificially introduce by inoculating the soil to ensure adequate activity.

These factors affecting vegetation are not a complete list, but are those which most frequently influence the establishment of vegetation on Canadian mine wastes.

Types of Mine Wastes

Three types of mine waste occur in Canada

- overburden, rock, and tailings. These three types indicate three groups of growth problems that result from the nature of the material and their method of disposal.

Overburden may consist of a variety of different materials resulting from stripping in open pit and other surface operations. The common problem in Eastern Canada with this form of waste is acidity, whereas in the prairies it is salinity and moisture stress. Mountain regions present a topographic and climatic problem in obtaining a suitable vegetation cover. Good growth can be obtained where selective removal and placement of the topsoil and subsoil have been carried out. The present practice of disposing of overburden demonstrates the need to bury difficult materials and preserve a suitable soil cover.

Rock wastes are devoid of organic matter and very little soil size material exists. This leads to severe moisture stress, except in high rainfall areas. Rock dump surfaces that have some soil size fractions because of vehicle movement have been vegetated with reasonable success. Sloped embankments, however, have remained a problem. In some areas, redesigning the rock dump has reduced the impact of the steep slopes of coarse rock, but this is difficult in mountainous regions.

The size characteristics of tailings often closely resemble a sandy soil. With these, erosion, flooding, and dehydration are very common, but the most difficult problems are chemical and occur when sulphide minerals are present. Establishment of vegetation has been successful on many non-sulphide tailings and on some low-sulphide tailings. Three methods have been used - covering the tailings with topsoil or glacial till with little or no treatment; direct seeding of the tailings after making the necessary soil amendments all in one year; direct seeding of treated tailings with continued maintenance treatment for 5 to 10 years to ensure a strongly established cover. All three methods have worked well in specific situations, but they are not always en-

tirely applicable to all tailings.

Procedure for Vegetating

A procedure is described for examining a mine waste and determining its suitability to support a vegetative cover by using the information in this supplement. This involves first collecting data pertinent to plant growth which will assist in discussions with agriculturalists and biologists experienced in reclamation. The second stage is a technical evaluation of the collected data by personnel experienced in reclamation or biological sciences. This involves understanding the subtle implications and interactions that could occur between the waste, the environment, and the plants. Field trials of vegetation on the waste would give additional indications of the potential for vegetation and available alternatives. The third stage involves assessing the economic advantages and suitability of vegetation as a means of reclamation.

Case Histories

The case histories included in this supplement illustrate what has been tried in reclamation and the problems that have been encountered. Using a common data sheet, the mine wastes are compared as to characteristics and the means of establishing vegetation. Industrial and consulting or academic contacts are presented to assist in obtaining more information about particular case histories.

Satellite Imagery and Cross-Referencing Index

A survey of Canadian mine wastes was conducted using LANDSAT satellite imagery. Over 700 mine sites were examined and the results are included in Volume 2 of this supplement. The wastes are classified as overburden, rock, and tailings. The degree of vegetation cover on each site is estimated. This allows a more general view of conditions for reclamation by vegetation. It assists in locating areas not covered in the case histories, where contacts might be beneficial.

ACKNOWLEDGEMENTS

D. Murray was responsible for the supplement on Reclamation by Vegetation; address enquiries to him at P.O. Box 100, Elliot Lake, Ontario, P5A 2J6.

The supplement has been written largely by D. Murray with extensive assistance from W. Fraser, J. Gadsby and L. Lavkulich.

Particular credit should go to D. Coates and R. Sage for their support throughout the project and during preparation.

Contractors involved in the research and development were:

Gregory Geoscience, for satellite imagery and waste inventory;
Hudson Bay Mining and Smelting Co. Ltd., Flin Flon, for case histories;

R.M. Hardy and Associates Ltd., for case histories;

Montreal Engineering Co., Ltd., for case histories;

Quebec Asbestos Mining Association and McGill University for case histories;

New Brunswick Research and Productivity Council, for case histories and bibliography of reclamation work;

University of British Columbia, Department of Soil Science, for case histories and correlation of collected data;

University of Saskatchewan, Institute of Pedology, for case histories;

University of Sherbrooke, Centre for Technology of the Environment, for case histories.

The sixty mines that provided access to their wastes for characterization and background information related to vegetation establishment are included as case histories and their assistance has made this inventory possible.

Special thanks should go to Hudson Bay Mining and Smelting Co. Ltd., Flin Flon, for detailed comments on the arrangement of information for effective use within industry.

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SATELLITE IMAGERY

LANDSAT DATA

1. The most widely available and cost-effective method of remote sensing over a region is multispectral scanning by NASA's Earth Resources Technology Satellites (ERTS, now called LANDSAT). Cloud cover permitting, LANDSAT I provided images of many parts of the world on an 18-day cycle from July, 1972 to January 1978. LANDSAT II is in a similar orbit offset by 9 days. Thus, together the satellites have in the past provided data on a 9-day cycle.

2. Data from the satellites are relayed in real time to a ground station in digital form and are recorded on magnetic tape. Two methods of access to these data are available to the Canadian user. In the first, data are transferred onto 230 mm square negatives which can be either separate black and white images or false colour composites. The second option is to transfer the data onto computer compatible tape and then process it in digital form. Both photographic prints and magnetic tapes can be obtained from Integrated Satellite Information Services (ISIS), P.O. Box 1630 Prince Albert, Sask. LANDSAT I and II have acquired data systematically along pre-selected paths at fixed intervals. Hence, the data are not always acquired under optimal conditions as is the case for most aerial photography. Further,

seasonal aspects of climate, weather and illumination provide different views that may preclude, hinder, or assist the interpretation. Thus, it is preferable to visually select images for each interpretation, taking into consideration such factors as: coverage, scene quality, seasonal aspects, waveband, type of image and delivery schedule.

3. Most systematic interpretations of LANDSAT images for the mineral industry now employ pattern recognition using standard photointerpretive techniques in selected wavebands. Applications of spectral discrimination and automated processing are still largely experimental. Scene resolution in a LANDSAT image is commonly about 80 m for average contrast and may be finer for high contrast, eg, roads, cleared land and tailings ponds.

METHODOLOGY OF INVENTORY

4. The visual interpretation of LANDSAT images for classifying and mapping mine wastes has been based on the projection of selected transparencies onto a topographic base map at a scale of 1:50,000. The common data base consisted of false colour composites at a scale of 1:10⁶ in 230 mm square format. In the few cases where such composites were not available, black and white

transparencies in the four multi-spectral scanning (MSS) bands at a similar scale were used. For parts of Eastern Canada, it was necessary to use 70 mm black and white transparencies at a scale of 1:3.6x10⁶ because other transparencies were not available.

5. A complete search of Canadian LANDSAT data for mine wastes was not attempted. Rather, 718 mine sites - identified as having estimated ore reserves plus ore production to date greater than 10⁶ tons - were chosen from published maps (GSC 1252A, EMR 900A) and the corresponding LANDSAT images were analyzed. The inventory covers mines which had significant production before 1974, and some recent developments in selected areas.

6. Boundaries were located from projections onto the base map. Classification of waste was based on several sources of information, eg, calibration data from field investigations at representative waste sites, previous experience, and supplementary maps and reports that are commonly available.

LIMITATIONS OF INVENTORY

Images

7. Accuracy of the classification and maps of mine wastes is affected by the quality and availability of the relevant LANDSAT data and topographic maps, by the physical and spectral contrasts between the waste and its physical surroundings and by the geometric limitations inherent in both the LANDSAT data and the interpretive methodology. Collectively, these techniques limit the inventory to waste sites that have an area larger than about 1 ha and a detectable contrast relative to background. Also, the smallest area that could be mapped was 10 ha. Thus only mines with total ore production plus reserves greater than 10⁶ tons and with waste dumps greater than 10 ha are recorded in the inventory. Topographic maps were not available at 1:50,000 scale for about a dozen sites in each of Ontario and Quebec. In such cases, base maps were prepared from the 1:50,000 projection of the LANDSAT image.

8. Image quality is important in detectability. For this reason, the optimal images were

selected for each site although all selected images were not of equally high quality.

Contrast

9. All materials including water, tailings, waste rock, vegetated waste, spoil banks, and natural vegetation have different spectral signatures, eg, different brightness levels in each of the four LANDSAT bands. If two signatures are distinctly different, ie, have high contrast, the materials are separable; if they are similar, ie, have low contrast, they may be difficult to distinguish. Water and green vegetation, for example, have signatures that are readily recognized and separate from each other and from mine wastes because of their high contrast and spectral characteristics. On the other hand, there may be little or no contrast between outcrop and waste rock of the same type.

Detectability of Waste Sites

10. The smallest unit of detectability is called a pixel which is approx. 0.5 ha. The detection of such a small unit would require high contrast between the unit and its surroundings. The brightness of a waste dump smaller in area than 0.5 ha is averaged in with the brightness of the surrounding background and hence may not be detected. On the other hand, if waste is covered with vegetation, it may not be possible to distinguish the dump from the vegetated background on the basis of brightness, regardless of area.

Measurement of Area

11. Accuracy of measurement is difficult to establish. For tailings disposal sites, accuracies appear to be about $\pm 10\%$ for areas between 8 and 20 ha and less than $\pm 5\%$ for larger areas. There appears to be a wide range of possible errors for areas less than 8 ha; this is commonly less than $\pm 5\%$ but may exceed $\pm 30\%$, especially for small areas approaching the minimum of about 1 ha. Tailings have a high contrast boundary and therefore can be measured with good accuracy.

WASTE TYPE CLASSIFICATION

12. Classes of waste are based initially on

the spectral signature and geometric pattern as presented on the LANDSAT image and as extended from calibration data for representative wastes. Confirmation is obtained from topographic maps and other published reports and maps. Occasionally, topographic maps erroneously identify waste material.

13. Experience has shown that tailings, slag, overburden, rock waste, water, and vegetation are usually distinguishable. There are, however, other materials of non-mining origin with which they may be confused. However, the absence of a close association with mining operations usually serves to separate those other materials.

14. Heavy vegetative cover commonly obscures underlying material, thus requiring more confirmatory evidence from other sources than the LANDSAT image. Overburden tends to be used as a general category including spoil banks of sand and gravel from alluvial dredging - sometimes mistakenly called tailings - as well as disturbed land which has been stripped of vegetation near a mine. Waste rock may include ore stockpiles and may be confused with rock outcrops. Confirmatory evidence from other sources is used to distinguish

waste rock from similar outcrops.

15. Experience suggests that the classes of material that can be determined by these methods correspond closely to actuality.

SURFICIAL CHARACTERISTICS

16. Configuration of the waste surface is difficult to assess with the data used in this inventory. More detailed information could be obtained from aerial photographs. The present methodology, in conjunction with the topographic base maps, can provide general information about the slope of the surface and the adjacent topography. Terracing of waste rock and overburden, however, is not usually detectable.

17. The overall colour of the waste - whether dark, light, or neutral - is estimated from the spectral brightness of the false colour composite or from the four separate bands. Plant cover is obvious but separation of natural vegetation from revegetation depends largely on patterns of cultivation or supplementary information. However, an estimate of the amount of vegetation on the wastes is feasible in two broad classes: heavy and light cover.

INVENTORY

CROSS-REFERENCE INDEX

18. Using the visual interpretation techniques of LANDSAT images, a complete inventory of detectable mine wastes was achieved. The identified classes of waste are:

- tailings
- waste rock
- overburden
- slag.

The mines at which these wastes occur are classified by commodity as:

- asbestos
- coal
- copper, lead, zinc, nickel
- gold, silver
- iron
- potash
- others, including uranium.

The inventory comprises:

- a. an index of mine wastes and selected characteristics of detectable sites
- b. maps at a scale of 1:50,000 for each waste site in excess of about 10 ha.

19. The cross-reference index summarizes information interpreted from the LANDSAT and ancillary data. The index is listed by waste type and commodity including additional descriptive information. By scanning the sheets, areas of similar

waste can rapidly be located and the degree of success in vegetation programs noted. Sources for further information are given. The sites reported as case histories in Vol 1, Appendix B, of this supplement are appropriately marked.

TERMINOLOGY

Canadian Climates

20. The most widely accepted system of climatic classification in Canada is that developed by W. Koppen in 1918 and subsequently modified. It is based primarily on annual and monthly mean values of temperature and precipitation. Five principal groups of world climate which correspond to five main vegetation categories are recognised. The five climatic groups are:

- A. tropical rainy climate with no cool season
- B. dry climate
- C. humid mesothermal climate
- D. humid microthermal climate
- E. polar climate with no warm season.

Each of these groups is divided into major climatic classes based on differences in temperature and precipitation and is further subdivided into climatic types on the basis of seasonal aspects. The classes and types are identified by symbols.

21. Brief descriptions of the main Canadian

climatic types follow; their distribution is shown in Fig 1.

A Climate

22. None in Canada.

B Climate

23. Dry with an excess of evaporation over precipitation.

24. Bsk: middle latitude steppe (semi-arid grassland); cool dry climate with mean annual temperature less than 18°C, but mean temperature of warmest month over 18°C; eg, Medicine Hat, Alta.

C Climate

25. Warm and rainy with mild winter; mean temperature of coldest month below 18°C but above -3°C; mean temperature of warmest month above 10°C.

26. Csb: Mediterranean or subtropical with dry cool summer; rainiest month of winter receives at least three times as much rain as driest month of summer; mean temperature of warmest month under 22°C but with at least four months over 10°C; eg, Victoria, B.C.

27. Cfb: marine west coast with no distinct dry season; eg, Prince Rupert, B.C.

D Climate

28. Cool and humid with rain and snow characterized by several months of snow cover and temporarily frozen ground; mean temperature of coldest month below -3°C and mean temperature of warmest month above 10°C.

29. Dfa: humid continental, hot summer; mean temperature of warmest month over 22°C; eg, Windsor, Ont.

30. Dfb: humid continental, cool summer with no dry season; mean temperature of warmest month under 22°C; eg, Ottawa, Ont.

31. Dsb: humid continental, cool summer with dry season; at least three times as much precipitation in wettest month of winter as in driest month of summer; mean temperature of warmest month under 22°C; eg, Lytton, B.C.

32. Dfc: sub-Arctic; short cool summer with

only one to three months with a mean temperature above 10°C; eg, Churchill, Man.

E Climate

33. Cold with average temperature of warmest month below 10°C.

34. ET: tundra with brief growing season; average temperature of warmest month below 10°C but above 0°C; eg, Resolute, N.W.T.

35. EF: perpetual frost; average temperature of all months below 0°C; eg, permanent ice caps.

Types of Disposal Sites

Natural

36. A natural topographic depression is used to contain waste material. A controlling structure may be required (eg, to close a valley to form a storage reservoir) but the waste is largely contained by natural boundaries.

Dam

37. The waste material, usually tailings, is largely contained by a man-made structure; usually required when there is no suitable topography for a natural system.

Lake

38. Waste is deposited into a natural body of water. The waste is often below water level and therefore may not be visible.

Ridged

39. A ridge is formed by deposition of dry waste by conveyor belt, dragline, or truck to form a structure which has one long and one short dimension in plan.

Flat

40. Surface of the ground is scraped clear or waste is spread so that the top surface is roughly level and the area extends reasonably far in all directions.

Raised

41. Waste is deposited similarly to flat sites but is thicker and the site is thus bounded by

slopes.

formed.

Conical

42. Dry waste deposited by conveyor belt at one location so that a large conical deposit is

Terraced

43. Flat deposit of waste on a hill side. Terraces may also occur on a large raised site.

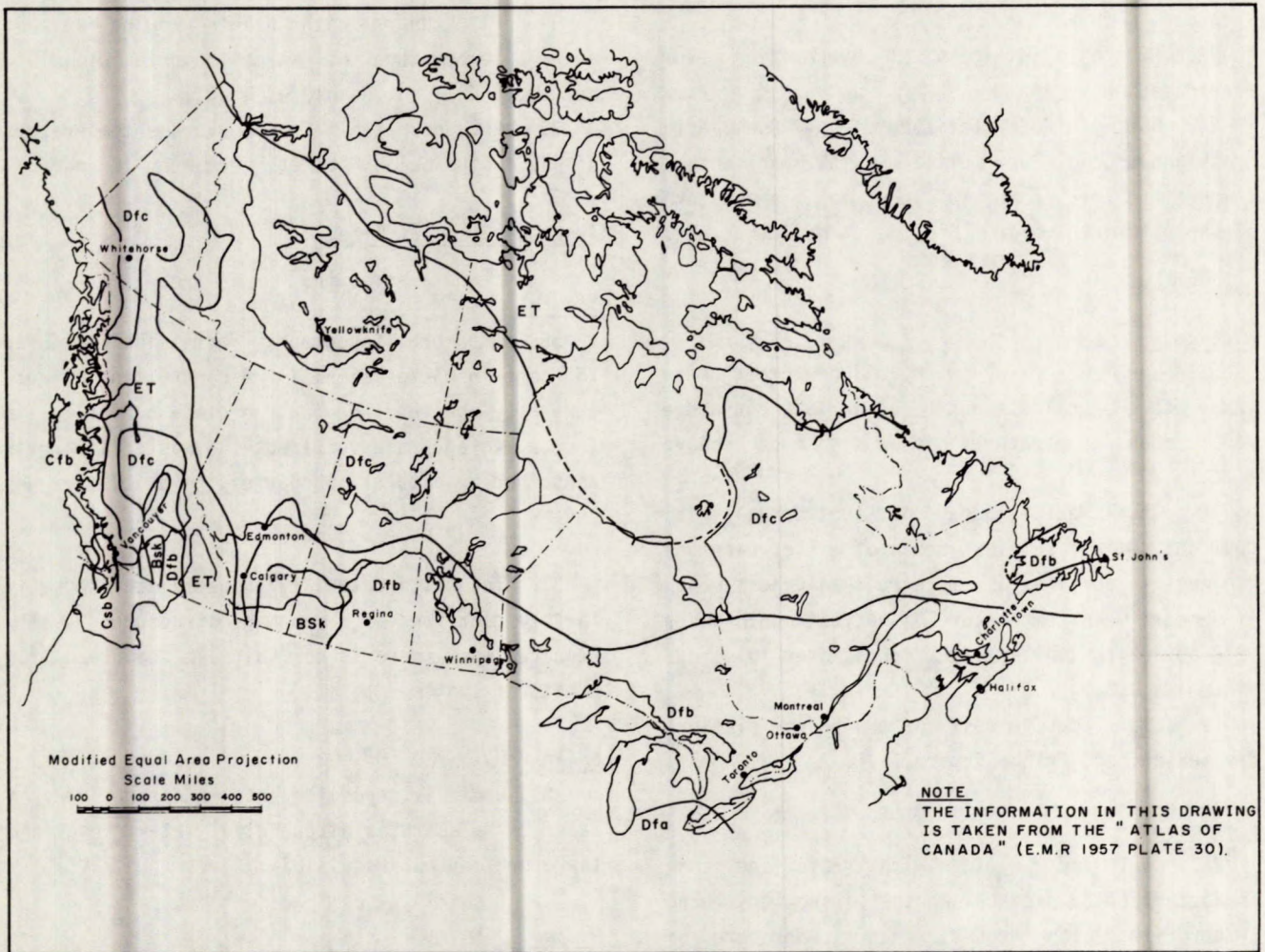
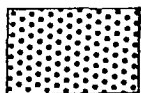
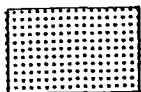


Fig 1 - Climatic regions of Canada.

CLASSES MAPPED IN NATIONAL INVENTORY OF MINE WASTES



1. Tailings: may contain several subclasses based on moisture content.



2. Waste Rock: including areas at mine site that have waste rock as surface cover.



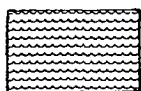
3. Slag



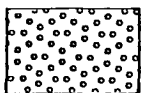
4. Heavy Vegetative Cover: residual natural cover and revegetation on reclaimed areas.



5. Moderate to Poor Vegetative Cover: grass and shrubs on reclaimed areas.



6. Clear Deep Water: reservoirs, ponds.



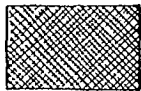
7. Silty or Shallow Water: slurry ponds.



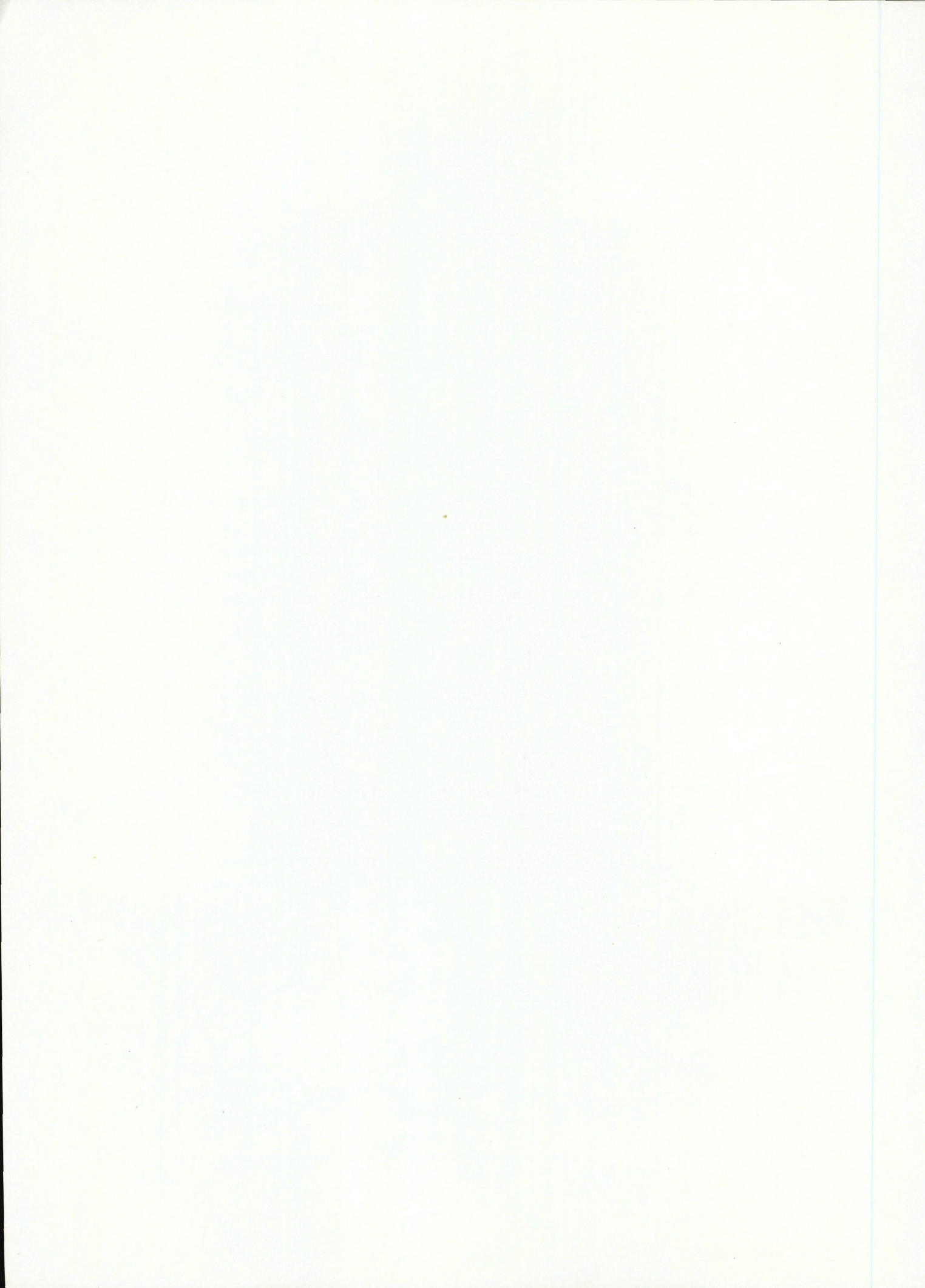
8. Open Pit: usually identified by shadow, therefore, all open pits have not been mapped, and the mapped outline may not conform to the actual pit.



9. Plant Site: shaft, mill, smelter, etc.



10. Exposed Overburden: artificial and natural exposures eg sand and gravel pits, spoil banks, unpaved roads, dams, dykes, etc.



APPENDIX A

INDEX

CROSS-REFERENCING TABLE OF CANADIAN MINE WASTES



WASTE TYPE	COMMODITY	STATUS	AREA TOTAL VEG.	DISPOSAL METHOD	PROVINCE	CLIMATE	MINE NAME	MAP NO.
OVERBURDEN	ASBESTOS	OPERATING	199 0	FLAT	NFD	DFC	ADVOCATE MINES LTD	7
OVERBURDEN	ASBESTOS	OPERATING	97 0	FLAT	QUE	ET-DFC	ASBESTOS CORP LTD ASBESTOS HILL	29
OVERBURDEN	ASBESTOS	OPERATING	68 0	FLAT	QUE	DFB	CAREY CANADIAN MINES LTD	64
OVERBURDEN	ASBESTOS	OPERATING	16 2	FLAT	QUE	DFB	CANADIAN JOHNS-MANVILLE CO LTD JEFFREY	60
OVERBURDEN	ASBESTOS	OPERATING	27 0	FLAT	QUE	DFB	LAKE ASBESTOS QUEREC LTD BLACK LAKE	62
OVERBURDEN	ASBESTOS	OPERATING	173 39	RAISED	YUK	DFC	CASSIAR ASBESTOS CORP LTD CLINTON CREEK	182
OVERBURDEN	BARITE	OPERATING	26 0	FLAT	NS	DFB	DRESSER INDUSTRIES LTD MAGNET COVE	12
OVERBURDEN	COAL	CLOSED	24 0	FLAT	ALB	DFC-ET	COALSPUR	137
OVERBURDEN	COAL	CLOSED	26 0	FLAT	ALB	DFC-ET	MOUNTAIN PARK	138
OVERBURDEN	COAL	CLOSED	106 0	RAISED	BC	ET	CROWSNEST INDUSTRIES LTD	153
OVERBURDEN	COAL	CLOSED	11 0	FLAT	NS	DFB	PICTON	16
OVERBURDEN	COAL	OPERATING	35 0	FLAT	ALB	ET	CANMORE MINES LTD	140
OVERBURDEN	COAL	OPERATING	199 0	FLAT	ALB	DFC-ET	CARDINAL RIVER COALS LTD	138
OVERBURDEN	COAL	OPERATING	371 174	FLAT	ALB	DFB	FORESTBURG COLLIERIES LTD	136
OVERBURDEN	COAL	OPERATING	371 0	FLAT	ALB	DFB	MANALTA COAL LTD HALKIRK	136
OVERBURDEN	COAL	OPERATING	145 50	FLAT	ALB	BSK	MANALTA COAL LTD SHEERNESS	139
OVERBURDEN	COAL	OPERATING	614 145	FLAT	ALB	DFC	MANALTA COAL LTD WABAMUN	134-135
OVERBURDEN	COAL	OPERATING	385 0	RAISED	BC	DFC-ET	FORDING COAL LTD	144
OVERBURDEN	COAL	OPERATING	1430 0	RAISED	BC	ET	KAISER RESOURCES LTD	145 *
OVERBURDEN	COAL	OPERATING	4291 1663	RIDGED	NBR	DFB	NB COAL LTD MINTO	24-28 *
OVERBURDEN	COAL	OPERATING	64 64	RIDGED	NS	DFB	CAPE BRETON DEVELOPMENT CORP.	18-19
OVERBURDEN	COAL	OPERATING	474 162	RIDGED	SAS	DFB	MANALTA COAL LTD BATTLE RIVER	123
OVERBURDEN	COAL	OPERATING	2199 1360	RIDGED	SAS	DFB	MAN + SASK COAL CO LTD BIENFAIT	124-125 *
OVERBURDEN	COAL	OPERATING	731 166	RIDGED	SAS	DFB	MANALTA COAL LTD UTILITY COAL	126
OVERBURDEN	CUPBZNNI	CLOSED	12 0	FLAT	BC	DFC-ET	COPPER MOUNTAIN	169
OVERBURDEN	CUPBZNNI	CLOSED	18 0	FLAT	BC	DFC	HIDDEN CREEK	154
OVERBURDEN	CUPBZNNI	CLOSED	13 0	FLAT	NFD	DFB	GULLBRIDGE	10
OVERBURDEN	CUPBZNNI	CLOSED	20 0	FLAT	NFD	DFB-C	LITTLE BAY	9
OVERBURDEN	CUPBZNNI	CLOSED	14 0	FLAT	NFD	DFB-C	WHALESBACK	9
OVERBURDEN	CUPBZNNI	CLOSED	13 0	FLAT	QUE	DFB	ALDERMAC	41
OVERBURDEN	CUPBZNNI	CLOSED	39 0	FLAT	QUE	DFB	CONIAGAS MINES LTD	34
OVERBURDEN	CUPBZNNI	CLOSED	16 0	FLAT	QUE	DFB	NEW CALUMET	55
OVERBURDEN	CUPBZNNI	CLOSED	9 2	FLAT	QUE	DFB	VAUZE	40
OVERBURDEN	CUPBZNNI	CLOSED	22 0	FLAT	YUK	DFC	BIG CHIEF-LITTLE CHIEF	191
OVERBURDEN	CUPBZNNI	OPERATING	85 0	FLAT	BC	DFC	NORANDA MINES LTD BELL COPPER	146

* AFTER THE MAP NUMBER INDICATES THAT FURTHER DETAILS ARE GIVEN IN THE CASE HISTORIES OF VOLUME 1

WASTE TYPE	COMMODITY	STATUS	AREA TOTAL VEG.		DISPOSAL METHOD	PROVINCE	CLIMATE	MINE NAME	MAP NO.
OVERBURDEN	CUPB7NNI	OPERATING	56	0	FLAT	BC	OFC-ET	BETHLEHEM COPPER CORP	151 *
OVERBURDEN	CUPBZNNI	OPERATING	73	0	FLAT	BC	OFC	BRENOA MINES LTD	152
OVERBURDEN	CUPB7NNI	OPERATING	112	0	FLAT	BC	OFC	CRAIGMONT MINES LTD	167
OVERBURDEN	CUPBZNNI	OPERATING	149	0	FLAT	BC	DFB	GIBRALTER MINES LTD	147-148
OVERBURDEN	CUPB7NNI	OPERATING	80	25	FLAT	BC	DFC-ET	SIMILKAMEEN MINING CO LTD INGERBELLE	169 *
OVERBURDEN	CUPBZNNI	OPERATING	505	468	FLAT	BC	OFC-ET	LORNEX MINING CORP LTD	151 *
OVERBURDEN	CUPBZNNI	OPERATING	28	0	FLAT	BC	CFB	WESTERN MINES LTD LYNX	164
OVERBURDEN	CUPBZNNI	OPERATING	1	1	FLAT	BC	CFB	COMINCO SUNRO	NO MAP
OVERBURDEN	CUPB7NNI	OPERATING	35	0	FLAT	MAN	DFC	SHERRITT GORDON MINES LTD LYNN LAKE	107
OVERBURDEN	CUPBZNNI	OPERATING	22	0	FLAT	MAN	DFC	SHERRITT GORDON MINES LTD FOX LAKE	115
OVERBURDEN	CUPBZNNI	OPERATING	100	0	FLAT	MAN	DFC	INCO LTD PIPE	108
OVERBURDEN	CUPBZNNI	OPERATING	25	0	FLAT	MAN	DFC	SHERRITT GORDON MINES LTD RUTTAN	116
OVERBURDEN	CUPBZNNI	OPERATING	48	0	FLAT	MAN	DFC	INCO LTD SOAB	111
OVERBURDEN	CUPBZNNI	OPERATING	27	0	FLAT	MAN	DFC	INCO LTD THOMPSON	113
OVERBURDEN	CUPBZNNI	OPERATING	50	0	FLAT	NBR	OFB	BRUNSWICK MINING & SMELTING BRUNSWICK 12	22
OVERBURDEN	CUPBZNNI	OPERATING	21	0	FLAT	NBR	DFB	BRUNSWICK MINING & SMELTING BRUNSWICK 6	22
OVERBURDEN	CUPB7NNI	OPERATING	54	0	FLAT	NBR	DFB	ANACONDA CANADA LTD CARIBOU	20 *
OVERBURDEN	CUPBZNNI	OPERATING	108	0	FLAT	NBR	DFB	HEATH STEELE MINES LTD	23
OVERBURDEN	CUPB7NNI	OPERATING	91	0	FLAT	NFD	DFB	AMERICAN SMELTING & REFINING BUCHANS	11
OVERBURDEN	CUPB7NNI	OPERATING	17	0	FLAT	NFD	DFC	CONSOLIDATED RAMBLER	8
OVERBURDEN	CUPBZNNI	OPERATING	315	0	FLAT	NWT	DFC	PINE POINT MINES LTD	180-181
OVERBURDEN	CUPBZNNI	OPERATING	82	0	FLAT	ONT	DFB	STURGEON LAKE MINES	75
OVERBURDEN	CUPBZNNI	OPERATING	38	0	FLAT	ONT	OFB	SELCO MINING CORP. LTD. SOUTH BAY	71
OVERBURDEN	CUPBZNNI	OPERATING	34	5	RAISED	ONT	OFB	TEXASGULF INC KIDD CREEK	85
OVERBURDEN	CUPBZNNI	OPERATING	45	0	RIDGED	ONT	DFB	INCO LTD CREIGHTON	98
OVERBURDEN	CUPBZNNI	OPERATING	62	0	FLAT	QUE	DFB-C	CAMPBELL CHIBDUGAMAU CAMPBELL, CHIB-KAYRAN	31
OVERBURDEN	CUPBZNNI	OPERATING	27	0	FLAT	QUE	DFB-C	PATINO MINES QUE LTD COPPER RAND	31
OVERBURDEN	CUPBZNNI	OPERATING	88	4	FLAT	QUE	DFB	GASPE COPPER MINES LTD	67 *
OVERBURDEN	CUPBZNNI	OPERATING	11	0	FLAT	QUE	DFB-C	CAMPBELL CHIBDUGAMAU MENDERSON	31
OVERBURDEN	CUPBZNNI	OPERATING	21	0	FLAT	QUE	DFC	ICON-SULLIVAN JOINT VENTURE	30
OVERBURDEN	CUPBZNNI	OPERATING	18	0	FLAT	QUE	DFB	KERR ADDISON MINES LTD NORMETAL	37
OVERBURDEN	CUPBZNNI	OPERATING	20	0	FLAT	QUE	DFB	ORCHAN MINES LTD	35
OVERBURDEN	CUPBZNNI	OPERATING	14	3	FLAT	QUE	DFB	RIO ALGOM MINES LTD POIRIER	36
OVERBURDEN	CUPBZNNI	OPERATING	169	64	FLAT	YUK	DFC-ET	ANVIL MINING CORP LTD	183
OVERBURDEN	GOLD-SILVR	CLDSE0	20	0	FLAT	BC	ET	HEDLEY MASCOT	171

* AFTER THE MAP NUMBER INDICATES THAT FURTHER DETAILS ARE GIVEN IN THE CASE HISTORIES OF VOLUME 1

WASTE TYPE	COMMODITY	STATUS	AREA TOTAL VEG.		DISPOSAL METHOD	PROVINCE	CLIMATE	MINE NAME	MAP NO.
OVERBURDEN	GOLD-SILVR	CLOSED	22	0	FLAT	BC	ET	NICKEL PLATE	171
OVERBURDEN	GOLD-SILVR	CLOSED	32	23	RIDGED	QUE	DFB	PLACER CHAUDIÈRE	65
OVERBURDEN	GOLD-SILVR	CLOSED	97	13	FLAT	YUK	DFC	CLEAR CREEK	187
OVERBURDEN	GOLD-SILVR	CLOSED	1833	124	FLAT	YUK	DFC	KLONDIKE	184-186
OVERBURDEN	GOLD-SILVR	CLOSED	25	0	FLAT	YUK	DFC	MAYO AREA	188
OVERBURDEN	GOLD-SILVR	OPERATING	25	0	FLAT	NWT	DFC	GIANT YELLOWKNIFE MINES LTD	178
OVERBURDEN	GOLD-SILVR	OPERATING	15	0	FLAT	QUE	DFB	AGNICO-EAGLE MINES LTD	36
OVERBURDEN	GOLD-SILVR	OPERATING	11	3	FLAT	YUK	DFC-ET	UNITED KENO HILL MINES LTD	189
OVERBURDEN	IRON	CLOSED	21	0	RAISED	BC	CFB	ARGONAUT (IRON HILL)	161
OVERBURDEN	IRON	CLOSED	33	0	FLAT	NFD	DFC	WISHART	3
OVERBURDEN	IRON	CLOSED	42	0	FLAT	QUE	DFC	IRON ORE CO CANADA FRENCH	2
OVERBURDEN	IRON	CLOSED	74	0	FLAT	QUE	DFC	IRON ORE CO CANADA GAGNON	2 *
OVERBURDEN	IRON	OPERATING	64	3	RAISED	BC	CSB	TEXADA MINES LTD	163 *
OVERBURDEN	IRON	OPERATING	22	0	RAISED	NFD	DFC	IRON ORE CO CANADA GILL	2
OVERBURDEN	IRON	OPERATING	699	19	RAISED	NFD	DFC	IRON ORE CO CANADA HUMPHREY SMALLWOOD	4-5
OVERBURDEN	IRON	OPERATING	65	0	RAISED	NFD	DFC	IRON ORE CO CANADA TIMMINS	1
OVERBURDEN	IRON	OPERATING	337	100	RIDGED	ONT	DFB	CALAND ORE CO LTD	76
OVERBURDEN	IRON	OPERATING	481	56	RIDGED	ONT	DFB	STEEP ROCK IRON MINE	76
OVERBURDEN	IRON	OPERATING	93	0	FLAT	QUE	DFC	IRON ORE CO CANADA BURNT CREEK	2
OVERBURDEN	IRON	OPERATING	36	0	FLAT	QUE	DFC	IRON ORE CO CANADA FERRIMAN	2
OVERBURDEN	IRON	OPERATING	15	0	FLAT	QUE	DFC	HILTON MINES LTD	56
OVERBURDEN	IRON	OPERATING	279	0	FLAT	QUE	DFC	QUEBEC CARTIER MINING CO LAC JEANNINE	69 *
OVERBURDEN	IRON	OPERATING	50	0	FLAT	QUE	DFC	IRON ORE CO CANADA RETTY	1
OVERBURDEN	IRON	OPERATING	20	0	FLAT	QUE	DFC	IRON ORE CO CANADA STAR CREEK	2
OVERBURDEN	OIL SANDS	OPERATING	855	247	FLAT	ALB	DFC	GREAT CANADIAN OIL SANDS LTD	143
OVERBURDEN	OIL SANDS	OPERATING	796	612	FLAT	ALB	DFC	SYNCRUDE CANADA LTD	141-142
OVERBURDEN	TITANIUM	OPERATING	30	0	FLAT	QUE	DFC	QUEBEC IRON & TITANIUM CORP LAC TIO	68
WASTE ROCK	ASBESTOS	CLOSED	18	0	FLAT	QUE	DFB	FLINTKOTE CANADA LTD	63
WASTE ROCK	ASBESTOS	CLOSED	13	8	FLAT	QUE	DFB	QUEBEC ASBESTOS	64
WASTE ROCK	ASBESTOS	OPERATING	44	0	RIDGED	ONT	DFB	CANADIAN JOHNS-MANVILLE CO LTD	NO MAP
WASTE ROCK	ASBESTOS	OPERATING	174	0	FLAT	QUE	DFB	ASBESTOS CORP LTD BRITISH CANADIAN	62
WASTE ROCK	ASBESTOS	OPERATING	42	1	FLAT	QUE	DFB	CAREY CANADIAN MINES	64
WASTE ROCK	ASBESTOS	OPERATING	158	22	FLAT	QUE	DFB	LAKE ASBESTOS OF QUEBEC BLACK LAKE	62
WASTE ROCK	ASBESTOS	OPERATING	31	0	FLAT	QUE	DFB	LAKE ASBESTOS OF QUE NATIONAL	63
WASTE ROCK	ASBESTOS	OPERATING	61	4	FLAT	QUE	DFB	ASBESTOS CORP LTD NORMANDIE-VIMY RIDGE	62

* AFTER THE MAP NUMBER INDICATES THAT FURTHER DETAILS ARE GIVEN IN THE CASE HISTORIES OF VOLUME 1

WASTE TYPE	COMMODITY	STATUS	AREA TOTAL VEG.		DISPOSAL METHOD	PROVINCE	CLIMATE	MINE NAME	MAP NO.
WASTE ROCK	ASBESTOS	OPERATING	123	8	FLAT	QUE	DFB	ASBESTOS CORP LTD KING+BELL+BEAVER	63
WASTE ROCK	ASBESTOS	OPERATING	250	43	FLAT	QUE	DFB	CANADIAN JOHNS-MANVILLE CO LTD JEFFREY	60
WASTE ROCK	COAL	CLOSED	34	0	RIDGED	ALB	DFC-ET	COALSPUR	137
WASTE ROCK	COAL	CLOSED	12	0	RAISED	NS	DFB	JOGGINS	14
WASTE ROCK	COAL	CLOSED	15	0	RAISED	NS	DFB	SPRINGHILL	15
WASTE ROCK	COAL	OPERATING	93	0	FLAT	ALB	DFC	MCINTYRE PORCUPINE MINE LTD GRANDE CACHE	133 *
WASTE ROCK	COAL	OPERATING	15	0	RAISED	ALB	ET	CANMORE MINES LTD	140
WASTE ROCK	COAL	OPERATING	190	0	FLAT	BC	DFC-ET	FORDING COAL LTD	144
WASTE ROCK	COAL	OPERATING	93	7	RAISED	NS	DFB	CAPE BRETON DEVELOPMENT CORP	18-19 *
WASTE ROCK	COLUMBIUM	OPERATING	17	0	FLAT	QUE	DFB	ST LAWRENCE COLUMBIUM METALS OKA	57
WASTE ROCK	CUPBZNNI	CLOSED	20	8	CONICAL	BC	CFB-ET	SIMILKAMEEN MINING CO LTD COPPER MOUNTAIN	169
WASTE ROCK	CUPBZNNI	CLOSED	20	0	FLAT	BC	DFB	MOTHER LODE	172
WASTE ROCK	CUPBZNNI	CLOSED	37	0	RAISED	BC	DFB	BRITANNIA	166
WASTE ROCK	CUPBZNNI	CLOSED	56	0	RAISED	BC	CSB	CORNELL	162
WASTE ROCK	CUPBZNNI	CLOSED	62	0	TERRACED	BC	CSB	VANANDA	163
WASTE ROCK	CUPBZNNI	CLOSED	97	0	FLAT	ONT	DFB	KAM-KOTIA	83
WASTE ROCK	CUPBZNNI	CLOSED	22	6	FLAT	QUE	DFB	MANITOU-BARVUE MINES LTD BARVUE	48
WASTE ROCK	CUPBZNNI	CLOSED	13	0	RAISED	YUK	DFC	BIG CHIEF-LITTLE CHIEF	191
WASTE ROCK	CUPBZNNI	OPERATING	112	0	RAISED	BC	DFC	NORANDA MINES LTD BELL COPPER	146
WASTE ROCK	CUPBZNNI	OPERATING	292	14	RAISED	BC	DFC-ET	BETHLEHEM COPPER CORP	150-151 *
WASTE ROCK	CUPBZNNI	OPERATING	95	3	RAISED	BC	DFC	BRENDA MINES LTD	152
WASTE ROCK	CUPBZNNI	OPERATING	168	0	RAISED	BC	DFB	GIBRALTAR MINES LTD	148
WASTE ROCK	CUPBZNNI	OPERATING	145	0	RAISED	BC	DFC	GRANISLE COPPER LTD	146
WASTE ROCK	CUPBZNNI	OPERATING	61	0	RAISED	BC	DFC-ET	SIMILKAMEEN MINING CO LTD INGERBELLE	169 *
WASTE ROCK	CUPBZNNI	OPERATING	369	0	RAISED	BC	DFC-ET	LORNEX MINING CORP LTD	151 *
WASTE ROCK	CUPBZNNI	OPERATING	192	0	RAISED	BC	CFB	UTAH MINES LTD	149
WASTE ROCK	CUPBZNNI	OPERATING	124	0	TERRACED	BC	DFC	CRAIGMONT MINES LTD	167
WASTE ROCK	CUPBZNNI	OPERATING	120	9	TERRACED	BC	DFB	GRANBY MINING CO KNOB HILL-IRONSIDES	172
WASTE ROCK	CUPBZNNI	OPERATING	58	0	TERRACED	BC	CFB	WESTERN MINES LTD LYNX	164
WASTE ROCK	CUPBZNNI	OPERATING	144	0	TERRACED	BC	DFC-ET	COMINCO LTD SULLIVAN	176
WASTE ROCK	CUPBZNNI	OPERATING	15	0	RAISED	MAN	DFC	INCO LTD BIRCHTREE	112
WASTE ROCK	CUPBZNNI	OPERATING	32	0	RAISED	MAN	DFC	INCO LTD PIPE	108
WASTE ROCK	CUPBZNNI	OPERATING	78	0	RAISED	MAN	DFC	SHERRITT GORDON MINES LTD RUTTAN	116
WASTE ROCK	CUPBZNNI	OPERATING	28	0	RAISED	NBR	DFB	BRUNSWICK MINING & SMELTING BRUNSWICK 6	22
WASTE ROCK	CUPBZNNI	OPERATING	265	0	RAISED	NWT	DFC	PINE POINT MINES LTD	180-181

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WASTE TYPE	COMMODITY	STATUS	AREA TOTAL VEG.	DISPOSAL METHOD	PROVINCE	CLIMATE	MINE NAME	MAP NO.
WASTE ROCK	CUPBZNNI	OPERATING	62 0	FLAT	ONT	DFB	MATTARI MINES LTD	75
WASTE ROCK	CUPBZNNI	OPERATING	29 0	RAISED	ONT	DFB	INCO LTD CLARABELLE	103
WASTE ROCK	CUPBZNNI	OPERATING	66 0	RAISED	ONT	DFB	INCO LTD FROOD-STORIE	102
WASTE ROCK	CUPBZNNI	OPERATING	40 0	RAISED	ONT	DFB	FALCONBRIDGE NICKEL MINES LTD HARDY	99
WASTE ROCK	CUPBZNNI	OPERATING	218 0	RAISED	ONT	DFB	TEXASGULF LTD KIDD CREEK	85
WASTE ROCK	CUPBZNNI	OPERATING	335 2	RAISED	QUE	DFB	GASPE COPPER MINES LTD	67 *
WASTE ROCK	CUPBZNNI	OPERATING	13 0	RIDGED	SAS	DFC	HUDSON BAY MINING SMELTING FLIN FLON	119
WASTE ROCK	CUPBZNNI	OPERATING	91 6	RAISED	YUK	DFC-ET	ANVIL MINING CORP LTD	183
WASTE ROCK	GOLD-SILVR	CLOSED	18 0	TERRACED	BC	DFC	CENTRE STAR GROUP	173
WASTE ROCK	IRON	CLOSED	62 0	RAISED	BC	CFB	JEDWAY	158
WASTE ROCK	IRON	CLOSED	30 1	TERRACED	BC	CFB	BRYNNOR	165
WASTE ROCK	IRON	CLOSED	100 94	RIDGED	ONT	DFB	CANADIAN CHARLESON	76
WASTE ROCK	IRON	CLOSED	13 0	RIDGED	ONT	DFB	ALGOMA STEEL CORP SIR JAMES	81
WASTE ROCK	IRON	CLOSED	47 0	FLAT	QUE	DFC	IRON ORE CO CANADA FRENCH	2
WASTE ROCK	IRON	CLOSED	128 2	FLAT	QUE	DFC	IRON ORE CO CANADA. GAGNON	2 *
WASTE ROCK	IRON	OPERATING	93 4	RAISED	BC	CSB	TEXADA MINES LTD	163 *
WASTE ROCK	IRON	OPERATING	95 4	TERRACED	BC	CFB	WESFROB MINES LTD TASU	157
WASTE ROCK	IRON	OPERATING	22 0	FLAT	NFD	DFC	IRON ORE CO CANADA HUMPHREY SMALLWOOD	5 *
WASTE ROCK	IRON	OPERATING	150 0	RAISED	NFD	DFC	IRON ORE CO CANADA SCULLY	6 *
WASTE ROCK	IRON	OPERATING	100 0	RAISED	ONT	DFB	MARMORATON MINING CO MARMORA	106
WASTE ROCK	IRON	OPERATING	97 0	RIDGED	ONT	DFB	CLIFFS OF CANADA ADAMS	91
WASTE ROCK	IRON	OPERATING	75 0	RIDGED	ONT	DFB	STEEL CO OF CANADA GRIFFITH	74
WASTE ROCK	IRON	OPERATING	8 6	RIDGED	ONT	DFB	ALGOMA STEEL CORP HELEN VICTORIA G MCL	81
WASTE ROCK	IRON	OPERATING	70 0	RIDGED	ONT	DFB	NATIONAL STEEL CORP MOOSE MOUNTAIN	100
WASTE ROCK	IRON	OPERATING	110 0	RIDGED	ONT	DFB	CLIFFS OF CANADA SHERMAN	104
WASTE ROCK	IRON	OPERATING	91 0	FLAT	QUE	DFC	IRON ORE CO CANADA BURNT CREEK	2
WASTE ROCK	IRON	OPERATING	109 0	FLAT	QUE	DFC	IRON ORE CO CANADA FERRIMAN	2
WASTE ROCK	IRON	OPERATING	137 60	FLAT	QUE	DFB	HILTON MINES LTD	56
WASTE ROCK	IRON	OPERATING	147 0	FLAT	QUE	DFC	QUEBEC CARTIER MINING CO LAC JEANNINE	69 *
WASTE ROCK	IRON	OPERATING	37 0	FLAT	QUE	DFC	IRON ORE CO CANADA RETTY	1
WASTE ROCK	MERCURY	OPERATING	13 0	RAISED	BC	DFC	COMINCO LTD PINCHI LAKE	156
WASTE ROCK	MOLYBDENUM	CLOSED	165 0	TERRACED	BC	ET	LIME CREEK	155
WASTE ROCK	MOLYBDENUM	OPERATING	300 0	RAISED	BC	DFC	PLACER DEVELOPMENT LTD ENDAKO	159 *
WASTE ROCK	MOLYBDENUM	OPERATING	23 0	TERRACED	BC	DFC-ET	NORANDA MINES LTD BOSS MOUNTAIN	160
WASTE ROCK	TITANIUM	OPERATING	19 0	FLAT	QUE	DFC	QUEBEC IRON & TITANIUM CORP LAC TIO	68

* AFTER THE MAP NUMBER INDICATES THAT FURTHER DETAILS ARE GIVEN IN THE CASE HISTORIES OF VOLUME 1

WASTE TYPE	COMMODITY	STATUS	AREA TOTAL VEG.		DISPOSAL METHOD	PROVINCE	CLIMATE	MINE NAME	MAP NO.
WASTE ROCK	URANIUM	CLOSED	40	0	RAISED	SAS	DFC	GUNNAR	118
TAILINGS	ASBESTOS	CLOSED	12	0	NATURAL	ONT	DFB	MUNRO	87
TAILINGS	ASBESTOS	CLOSED	13	0	CONICAL	QUE	DFB	NICOLET ASBESTOS	61
TAILINGS	ASBESTOS	CLOSED	18	1	CONICAL	QUE	DFB	QUEBEC ASBESTOS	64 *
TAILINGS	ASBESTOS	OPERATING	18	0	RIDGED	NFD	DFC	ADVOCATE MINES LTD	7
TAILINGS	ASBESTOS	OPERATING	17	0	NATURAL	ONT	DFB	CANADIAN JOHNS-MANVILLE CO LTD	NO MAP
TAILINGS	ASBESTOS	OPERATING	4	2	NATURAL	ONT	DFB	HEDMAN MINES LTD	87
TAILINGS	ASBESTOS	OPERATING	110	0	CONICAL	QUE	DFB	ASBESTOS CORP LTD BRITISH CANADIAN	62
TAILINGS	ASBESTOS	OPERATING	51	0	CONICAL	QUE	DFB	CAREY CANADIAN MINES LTD	64 *
TAILINGS	ASBESTOS	OPERATING	31	2	CONICAL	QUE	DFB	ASBESTOS CORP LTD KING, BELL, BEAVER	63
TAILINGS	ASBESTOS	OPERATING	64	0	CONICAL	QUE	DFB	LAKE ASBESTOS QUEBEC LTD BLACK LAKE	62 *
TAILINGS	ASBESTOS	OPERATING	20	0	CONICAL	QUE	DFB	LAKE ASBESTOS QUEBEC LTD NATIONAL	63
TAILINGS	ASBESTOS	OPERATING	268	100	CONICAL	QUE	DFB	ASBESTOS CORP LTD NORMANDIE, VIMY RIDGE	62
TAILINGS	ASBESTOS	OPERATING	151	0	FLAT	QUE	DFB	CANADIAN JOHNS-MANVILLE CO LTD JEFFREY MINE	60 *
TAILINGS	BARITE	OPERATING	23	0	NATURAL	NS	DFB	DRESSER INDUSTRIES LTD MAGNET COVE	12
TAILINGS	COAL	CLOSED	8	8	DAM	NS	DFB	PICTOU	17
TAILINGS	COAL	OPERATING	25	0	NATURAL	SAS	DFB	MANALTA COAL LTD UTILITY COAL	126
TAILINGS	COLUMBIUM	OPERATING	18	3	DAM	QUE	DFB	ST LAWRENCE COLUMBIUM METALS OKA	57
TAILINGS	CUPBZNNI	CLOSED	33	0	DAM	BC	DFB	BRITANNIA	166
TAILINGS	CUPBZNNI	CLOSED	129	31	DAM	BC	DFC-ET	SIMILKAMEEN MINING CO LTD COPPER MOUNTAIN	170
TAILINGS	CUPBZNNI	CLOSED	38	0	DAM	BC	DFC	CANADIAN EXPLORATION LTD JERSEY	174
TAILINGS	CUPBZNNI	CLOSED	16	0	DAM	BC	DFB	SILVER GIANT	175
TAILINGS	CUPBZNNI	CLOSED	14	0	NATURAL	BC	DFC	HIDDEN CREEK	154
TAILINGS	CUPBZNNI	CLOSED	44	0	NATURAL	MAN	DFC	SHERRIDON	109
TAILINGS	CUPBZNNI	CLOSED	24	0	NATURAL	NBR	DFB	NIGADOO	21
TAILINGS	CUPBZNNI	CLOSED	12	0	NATURAL	NFD	DFB-C	LITTLE BAY	9
TAILINGS	CUPBZNNI	CLOSED	33	0	NATURAL	NFD	DFB-C	WHALESBACK	9
TAILINGS	CUPBZNNI	CLOSED	39	26	NATURAL	NS	DFB	STIRLING	13
TAILINGS	CUPBZNNI	CLOSED	11	0	DAM	ONT	DFB	CANADIAN JAMIESON	83
TAILINGS	CUPBZNNI	CLOSED	67	0	DAM	ONT	DFB	KAM-KOTIA MINES LTD	83
TAILINGS	CUPBZNNI	CLOSED	41	1	DAM	ONT	DFB	MUNRO	87
TAILINGS	CUPBZNNI	CLOSED	16	0	NATURAL	ONT	DFB	FALCONBRIDGE NICKEL MINES LTD NICKEL RIM	NO MAP *
TAILINGS	CUPBZNNI	CLOSED	20	0	NATURAL	ONT	DFB	COPPERCORP LTD	94
TAILINGS	CUPBZNNI	CLOSED	16	0	NATURAL	ONT	DFB	KINGDON	NO MAP
TAILINGS	CUPBZNNI	CLOSED	15	0	NATURAL	QUE	DFB	ALDERMAC	41

* AFTER THE MAP NUMBER INDICATES THAT FURTHER DETAILS ARE GIVEN IN THE CASE HISTORIES OF VOLUME 1

WASTE TYPE	COMMODITY	STATUS	AREA TOTAL VEG.		DISPOSAL METHOD	PROVINCE	CLIMATE	MINE NAME	MAP NO.
TAILINGS	CUPB7NNI	CLOSED	33	6	NATURAL	QUE	DFB	NORANDA MINES LTD WHITE AMULET	40 *
TAILINGS	CUPB7NNI	CLOSED	38	16	NATURAL	QUE	DFB	MANITOU-BARVUE MINES LTD BARVUE	48 *
TAILINGS	CUPB7NNI	CLOSED	133	0	NATURAL	QUE	DFB	EAST SULLIVAN	51
TAILINGS	CUPB7NNI	CLOSED	9	2	NATURAL	QUE	DFB	HUNTINGDON	58
TAILINGS	CUPB7NNI	CLOSED	14	0	NATURAL	QUE	DFB	LORRAINE	54
TAILINGS	CUPB7NNI	CLOSED	54	2	NATURAL	YUK	DFC	BIG CHIEF-LITTLE CHIEF	191
TAILINGS	CUPB7NNI	CLOSED	10	2	NATURAL	YUK	DFC	PUEBLO	190
TAILINGS	CUPB7NNI	OPERATING	28	0	DAM	BC	DFB	GRANBY MINING CO KNOB HILL-IRONSIDES	172
TAILINGS	CUPB7NNI	OPERATING	16	0	LAKE	BC	CFB	UTAH MINES LTD	149
TAILINGS	CUPB7NNI	OPERATING	81	0	NATURAL	BC	DFC-ET	BETHLEHEM COPPER CORP	151 *
TAILINGS	CUPB7NNI	OPERATING	194	5	NATURAL	BC	DFC	BRENDA MINES LTD	152
TAILINGS	CUPB7NNI	OPERATING	143	0	NATURAL	BC	DFC	CRAIGMONT MINES LTD	167
TAILINGS	CUPB7NNI	OPERATING	480	164	NATURAL	BC	DFB	GIBRALTAR MINES LTD	147
TAILINGS	CUPB7NNI	OPERATING	62	0	NATURAL	BC	DFC	GRANISLE COPPER LTD	146
TAILINGS	CUPB7NNI	OPERATING	20	0	NATURAL	BC	DFC	COMINCO LTD HB	174
TAILINGS	CUPB7NNI	OPERATING	42	0	NATURAL	BC	DFC-ET	SIMILKAMEEN MINING CO LTD INGERHELLE	169 *
TAILINGS	CUPB7NNI	OPERATING	345	2	NATURAL	BC	DFC-ET	LORNEX MINING CORP LTD	150-151 *
TAILINGS	CUPB7NNI	OPERATING	50	0	NATURAL	BC	DFC	GIANT MASCOT MINES LTD	168
TAILINGS	CUPB7NNI	OPERATING	364	0	NATURAL	BC	DFC-ET	COMINCO LTD SULLIVAN	176 *
TAILINGS	CUPB7NNI	OPERATING	56	0	DAM	MAN	DFC	SHERRITT GORDON MINES LTD RUTTAN	116
TAILINGS	CUPB7NNI	OPERATING	144	0	NATURAL	MAN	DFC	SHERRITT GORDON MINES LTD LYNN LAKE	107
TAILINGS	CUPB7NNI	OPERATING	65	0	NATURAL	MAN	DFC	SHERRITT GORDON MINES LTD FOX LAKE	115
TAILINGS	CUPB7NNI	OPERATING	70	0	NATURAL	MAN	DFC	INCO LTD PIPE	108
TAILINGS	CUPB7NNI	OPERATING	155	0	NATURAL	MAN	DFC	INCO LTD THOMPSON	113
TAILINGS	CUPB7NNI	OPERATING	199	15	NATURAL	NBR	DFB	BRUNSWICK MINING & SMELTING BRUNSWICK 12	22 *
TAILINGS	CUPB7NNI	OPERATING	108	3	NATURAL	NBR	DFB	HEATH STEELE MINES	23 *
TAILINGS	CUPB7NNI	OPERATING	32	0	NATURAL	NFD	DFB	AMERICAN SMELTING BUCHANS	11
TAILINGS	CUPB7NNI	OPERATING	25	0	NATURAL	NFD	DFC	CONSOLIDATED RAMBLER	8
TAILINGS	CUPB7NNI	OPERATING	356	0	DAM	NWT	DFC	PINE POINT MINES LTD	180-181
TAILINGS	CUPB7NNI	OPERATING	971	250	DAM	ONT	DFB	INCO LTD COPPER CLIFF	103 *
TAILINGS	CUPB7NNI	OPERATING	53	27	DAM	ONT	DFB	FALCONBRIDGE NICKEL MINES LTD FALCONBRIDGE	101 *
TAILINGS	CUPB7NNI	OPERATING	271	0	DAM	ONT	DFB	TEXASGULF INC KIDD CREEK	86
TAILINGS	CUPB7NNI	OPERATING	25	0	NATURAL	ONT	DFB	FALCONBRIDGE NICKEL MINES LTD FECUNIS	99
TAILINGS	CUPB7NNI	OPERATING	25	0	NATURAL	ONT	DFB	INCO LTD FROOD-STORIE	102
TAILINGS	CUPB7NNI	OPERATING	112	1	NATURAL	ONT	DFC	NORANDA MINES LTD GECO	80

* AFTER THE MAP NUMBER INDICATES THAT FURTHER DETAILS ARE GIVEN IN THE CASE HISTORIES OF VOLUME 1

WASTE TYPE	COMMODITY	STATUS	AREA TOTAL VEG.		DISPOSAL METHOD	PROVINCE	CLIMATE	MINE NAME	MAP NO.
TAILINGS	CUPBZNNI	OPERATING	16	0	NATURAL	ONT	DFB	CONSOLIDATED CANADIAN FARADAY GORDON LAKE	NO MAP
TAILINGS	CUPBZNNI	OPERATING	12	0	NATURAL	ONT	DFB	FALCONBRIDGE NICKEL MINES LTD HARDY	99
TAILINGS	CUPBZNNI	OPERATING	34	0	NATURAL	ONT	DFB	INCO LTD LEVACK	99
TAILINGS	CUPBZNNI	OPERATING	112	0	NATURAL	ONT	DFB	MATTABI MINES LTD	75
TAILINGS	CUPBZNNI	OPERATING	25	0	NATURAL	ONT	DFB	FALCONBRIDGE NICKEL MINES LTD STRATHCONA	99
TAILINGS	CUPBZNNI	OPERATING	30	0	NATURAL	ONT	DFB	SELCO MINING CORP LTD SOUTH BAY	71
TAILINGS	CUPBZNNI	OPERATING	25	0	NATURAL	ONT	DFC	WILLROY MINES LTD WILLROY	80
TAILINGS	CUPBZNNI	OPERATING	348	5	DAM	QUE	DFB	GASPE COPPER MINES LTD	67 *
TAILINGS	CUPBZNNI	OPERATING	14	0	NATURAL	QUE	DFB-C	BOUZAN JOINT VENTURE	31
TAILINGS	CUPBZNNI	OPERATING	84	0	NATURAL	QUE	DFB-C	CAMPBELL CHIROUGAMAU MINES LTD CAMPBELL, CHIB-KAYRAN	31
TAILINGS	CUPBZNNI	OPERATING	15	0	NATURAL	QUE	DFB-C	PATINO MINES QUEBEC LTD COPPER RAND	31
TAILINGS	CUPBZNNI	OPERATING	127	4	NATURAL	QUE	DFB	MANITOU-HARVUE MINES LTD GOLDEN MANITOU	51 *
TAILINGS	CUPBZNNI	OPERATING	106	5	NATURAL	QUE	DFB	NORANDA MINES LTD HORNE	39 *
TAILINGS	CUPBZNNI	OPERATING	22	0	NATURAL	QUE	DFC	ICON SULLIVAN JOINT VENTURE	30
TAILINGS	CUPBZNNI	OPERATING	12	4	NATURAL	QUE	DFB	FALCONBRIDGE COPPER MINES LTD LAKE DUFAULT	40 *
TAILINGS	CUPBZNNI	OPERATING	19	0	NATURAL	QUE	DFB	MADELEINE MINES LTD	66
TAILINGS	CUPBZNNI	OPERATING	26	0	NATURAL	QUE	DFB	MATTAGAMI LAKE MINES LTD	35 *
TAILINGS	CUPBZNNI	OPERATING	43	0	NATURAL	QUE	DFB	KERR ADUISON MINES LTD NORMETAL	37 *
TAILINGS	CUPBZNNI	OPERATING	132	2	NATURAL	QUE	DFB-C	FALCONBRIDGE COPPER MINES LTD OPEMISKA	32
TAILINGS	CUPBZNNI	OPERATING	19	0	NATURAL	QUE	DFB	ORCHAN MINES LTD	35 *
TAILINGS	CUPBZNNI	OPERATING	65	1	NATURAL	QUE	DFB	RIO ALGUM LTD POIRIER	36
TAILINGS	CUPBZNNI	OPERATING	64	0	NATURAL	QUE	DFB	SULLIVAN MINING GROUP LTD SOLBEC	59
TAILINGS	CUPBZNNI	OPERATING	202	0	NATURAL	SAS	DFC	HUDSON BAY MINING SMELTING LTD FLIN FLON	49 *
TAILINGS	CUPBZNNI	OPERATING	46	0	NATURAL	YUK	DFC-ET	ANVIL MINING CORP LTD	183
TAILINGS	GOLD-SILVR	CLOSED	16	5	DAM	BC	ET	NICKEL PLATE	171
TAILINGS	GOLD-SILVR	CLOSED	22	0	NATURAL	BC	DFC	CENTRE STAR GROUP	173
TAILINGS	GOLD-SILVR	CLOSED	25	10	LAKE	MAN	DFB	SAN ANTONIO GOLD MINE LTD	114
TAILINGS	GOLD-SILVR	CLOSED	9	2	NATURAL	MAN	DFB	CENTRAL MANITOBA	NO MAP
TAILINGS	GOLD-SILVR	CLOSED	8	2	NATURAL	MAN	DFB	GUNNAR GOLD	NO MAP
TAILINGS	GOLD-SILVR	CLOSED	50	0	NATURAL	MAN	DFB	HUDSON BAY MINING SMELTING LTD NOR-ACME	110
TAILINGS	GOLD-SILVR	CLOSED	25	0	NATURAL	NWT	DFC	DISCOVERY	177
TAILINGS	GOLD-SILVR	CLOSED	12	0	NATURAL	NWT	DFC	NEGUS	179
TAILINGS	GOLD-SILVR	CLOSED	39	2	DAM	ONT	DFB	PAMOUR PORCUPINE MINES LTD AUNOR	84
TAILINGS	GOLD-SILVR	CLOSED	46	5	DAM	ONT	DFB	BUFFALO ANKERITE	84
TAILINGS	GOLD-SILVR	CLOSED	90	3	DAM	ONT	DFB	PAMOUR PORCUPINE MINES LTD HALLNOR	86

* AFTER THE MAP NUMBER INDICATES THAT FURTHER DETAILS ARE GIVEN IN THE CASE HISTORIES OF VOLUME 1

WASTE TYPE	COMMODITY	STATUS	AREA TOTAL VEG.		DISPOSAL METHOD	PROVINCE	CLIMATE	MINE NAME	MAP NO.
TAILINGS	GOLD-SILVR	CLOSED	220	62	DAM	ONT	DFB	HOLLINGER MINES LTD	84 *
TAILINGS	GOLD-SILVR	CLOSED	3	3	DAM	ONT	DFB	MORRIS KIRKLAND	90
TAILINGS	GOLD-SILVR	CLOSED	20	1	DAM	ONT	DFB	PAYMASTER	84
TAILINGS	GOLD-SILVR	CLOSED	53	12	DAM	ONT	DFB	PRESTON MINES LTD	84
TAILINGS	GOLD-SILVR	CLOSED	45	0	DAM	ONT	DFB	CONIAURUM	84
TAILINGS	GOLD-SILVR	CLOSED	26	0	DAM	ONT	DFB	DELNITE	84
TAILINGS	GOLD-SILVR	CLOSED	11	0	DAM	ONT	DFB	HOYLE	86
TAILINGS	GOLD-SILVR	CLOSED	296	20	NATURAL	ONT	DFB	PAMOUR PORCUPINE MINES LTD MCINTYRE PORCUPINE	84 *
TAILINGS	GOLD-SILVR	CLOSED	150	5	NATURAL	ONT	DFB	UPPER CANADA RESOURCES LTD	90 *
TAILINGS	GOLD-SILVR	CLOSED	36	0	NATURAL	ONT	DFC	CENTRAL PATRICIA GOLD MINES	70
TAILINGS	GOLD-SILVR	CLOSED	90	0	NATURAL	ONT	DFB	LAKE SHORE MINES LTD MOSHER+HARD ROCK	79
TAILINGS	GOLD-SILVR	CLOSED	32	0	NATURAL	ONT	DFB	LEITCH+SAND RIVER	78
TAILINGS	GOLD-SILVR	CLOSED	31	0	NATURAL	ONT	DFB	LITTLE LONG LAC GOLD MINES LTD	79
TAILINGS	GOLD-SILVR	CLOSED	12	0	NATURAL	ONT	DFB	LAKE SHORE MINES LTD MACKENZIE RED LAKE	72
TAILINGS	GOLD-SILVR	CLOSED	25	0	NATURAL	ONT	DFB	LAKE SHORE MINES LTD MACLEOD-COCKSHUTT	79
TAILINGS	GOLD-SILVR	CLOSED	24	0	NATURAL	ONT	DFB	MATACHEWAN CONSOLIDATED MINES	93
TAILINGS	GOLD-SILVR	CLOSED	13	0	NATURAL	ONT	DFB	NAYBOB	84
TAILINGS	GOLD-SILVR	CLOSED	53	0	NATURAL	ONT	DFC	PICKLE CROW	70
TAILINGS	GOLD-SILVR	CLOSED	57	0	NATURAL	ONT	DFB	YOUNG-DAVIDSON MINES LTD	93
TAILINGS	GOLD-SILVR	CLOSED	35	0	DAM	QUE	DFB	PERRON	52
TAILINGS	GOLD-SILVR	CLOSED	18	1	NATURAL	QUE	DFB-C	CHIBEX LTD ANACON	33
TAILINGS	GOLD-SILVR	CLOSED	10	7	NATURAL	QUE	DFB	ARNFIELD	41
TAILINGS	GOLD-SILVR	CLOSED	106	58	NATURAL	QUE	DFB	BEATTIE	38
TAILINGS	GOLD-SILVR	CLOSED	51	39	NATURAL	QUE	DFB	BELLETERRE	53
TAILINGS	GOLD-SILVR	CLOSED	20	0	NATURAL	QUE	DFB	BEVCON	52
TAILINGS	GOLD-SILVR	CLOSED	16	3	NATURAL	QUE	DFB	CENTRAL CADILLAC	44
TAILINGS	GOLD-SILVR	CLOSED	19	2	NATURAL	QUE	DFB	COURNOR	52
TAILINGS	GOLD-SILVR	CLOSED	11	5	NATURAL	QUE	DFB	DONALUA	39
TAILINGS	GOLD-SILVR	CLOSED	7	6	NATURAL	QUE	DFB	FRANCOEUR	41
TAILINGS	GOLD-SILVR	CLOSED	6	3	NATURAL	QUE	DFB	GRANADA	39
TAILINGS	GOLD-SILVR	CLOSED	4	4	NATURAL	QUE	DFB	SULLIVAN MINING GROUP LTD GREENE-STABELL	49
TAILINGS	GOLD-SILVR	CLOSED	106	0	NATURAL	QUE	DFB	MALARTIC GOLDFIELDS	50
TAILINGS	GOLD-SILVR	CLOSED	25	10	NATURAL	QUE	DFB	MICMAC	42
TAILINGS	GOLD-SILVR	CLOSED	7	2	NATURAL	QUE	DFB	O'BRIEN GOLD MINES LTD	44
TAILINGS	GOLD-SILVR	CLOSED	7	4	NATURAL	QUE	DFB	POWELL-ROUYN	39

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WASTE TYPE	COMMODITY	STATUS	AREA TOTAL VEG.		DISPOSAL METHOD	PROVINCE	CLIMATE	MINE NAME	MAP NO.
TAILINGS	GOLD-SILVR	CLOSED	25	11	NATURAL	QUE	DFB	SENATOR-ROUYN	39
TAILINGS	GOLD-SILVR	CLOSED	25	2	NATURAL	QUE	DFB	SISCOE	49
TAILINGS	GOLD-SILVR	CLOSED	30	9	NATURAL	QUE	DFB	STADACONA	39
TAILINGS	GOLD-SILVR	CLOSED	46	0	NATURAL	QUE	DFB	SULLIVAN CONSOLIDATED	49
TAILINGS	GOLD-SILVR	CLOSED	35	20	NATURAL	QUE	DFB	WASAMAC	41
TAILINGS	GOLD-SILVR	CLOSED	15	4	NATURAL	QUE	DFB	WEST MALARTIC	45
TAILINGS	GOLD-SILVR	OPERATING	89	6	NATURAL	NWT	DFC	COMINCO LTD RYCON	179
TAILINGS	GOLD-SILVR	OPERATING	36	4	NATURAL	NWT	DFC	GIANT YELLOWKNIFE MINES LTD	178
TAILINGS	GOLD-SILVR	OPERATING	180	50	DAM	ONT	DFB	DOVE MINES LTD DOVE	84 *
TAILINGS	GOLD-SILVR	OPERATING	96	0	DAM	ONT	DFB	PAMOUR PORCUPINE MINES LTD PAMOUR	86 *
TAILINGS	GOLD-SILVR	OPERATING	35	3	DAM	ONT	DFB	HOLLINGER MINES LTD ROSS	88
TAILINGS	GOLD-SILVR	OPERATING	80	0	NATURAL	ONT	DFB	ANGLO-EAGLE MINES LTD	105
TAILINGS	GOLD-SILVR	OPERATING	60	2	NATURAL	ONT	DFB	CAMPBELL RED LAKE MINES LTD	72
TAILINGS	GOLD-SILVR	OPERATING	35	0	NATURAL	ONT	DFB	COCHENOUR WILLANS GOLD MINES	72
TAILINGS	GOLD-SILVR	OPERATING	30	0	NATURAL	ONT	DFB	DICKENSON MINES LTD	72
TAILINGS	GOLD-SILVR	OPERATING	108	15	NATURAL	ONT	DFB	KERR ADDISON MINES LTD	89
TAILINGS	GOLD-SILVR	OPERATING	482	80	NATURAL	ONT	DFB	KIRKLAND LAKE AREA	92
TAILINGS	GOLD-SILVR	OPERATING	48	0	NATURAL	ONT	DFB	BULORA CORP LTD MADSEN RED LAKE	73
TAILINGS	GOLD-SILVR	OPERATING	21	2	NATURAL	ONT	DFB	RENABIE	82
TAILINGS	GOLD-SILVR	OPERATING	76	19	DAM	QUE	DFB	CAMFLO MINES LTD	50 *
TAILINGS	GOLD-SILVR	OPERATING	13	1	NATURAL	QUE	DFB	AGNICO-EAGLE MINES LTD	36
TAILINGS	GOLD-SILVR	OPERATING	351	46	NATURAL	QUE	DFB	EAST MALARTIC MINES LTD	50
TAILINGS	GOLD-SILVR	OPERATING	226	0	NATURAL	QUE	DFB	LAMAQUE MINING CO LTD	49 *
TAILINGS	GOLD-SILVR	OPERATING	119	1	NATURAL	QUE	DFB	SIGMA MINES LTD	49 *
TAILINGS	GOLD-SILVR	OPERATING	56	3	NATURAL	YUK	DFC-ET	UNITED KENO HILL MINES LTD	189
TAILINGS	IRON	CLOSED	12	0	NATURAL	ONT	DFB	ALGOMA STEEL CORP SIR JAMES	81
TAILINGS	IRON	OPERATING	13	0	LAKE	BC	CSB	TEXADA MINES LTD	163 *
TAILINGS	IRON	OPERATING	194	0	NATURAL	NFD	DFC	IRON ORE CO CANADA HUMPHREY SMALLWOOD	4 *
TAILINGS	IRON	OPERATING	266	0	NATURAL	NFD	DFC	IRON ORE CO CANADA SCULLY	6 *
TAILINGS	IRON	OPERATING	111	0	NATURAL	ONT	DFB	CLIFFS OF CANADA ADAMS	91
TAILINGS	IRON	OPERATING	21	3	NATURAL	ONT	DFB	CALAND ORE OF CANADA ATIKOKAN	77
TAILINGS	IRON	OPERATING	30	0	NATURAL	ONT	DFB	CALAND ORE OF CANADA CALAND	76
TAILINGS	IRON	OPERATING	650	0	NATURAL	ONT	DFB	STEEL CO OF CANADA GRIFFITH	74
TAILINGS	IRON	OPERATING	75	0	NATURAL	ONT	DFB	MARMORATION MINING CO MARMORA	106
TAILINGS	IRON	OPERATING	81	0	NATURAL	ONT	DFB	NATIONAL STEEL CORP MOOSE MOUNTAIN	100

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WASTE TYPE	COMMODITY	STATUS	ARFA TOTAL VEG.	DISPOSAL METHOD	PROVINCE	CLIMATE	MINE NAME	MAP NO.
TAILINGS	IRON	OPERATING	65	0	NATURAL	ONT	CLIFFS OF CANADA SHERMAN	104
TAILINGS	IRON	OPERATING	60	0	DAM	QUE	HILTON MINES LTD	56
TAILINGS	IRON	OPERATING	310	0	NATURAL	QUE	QUEBEC CARTIER MINING CO. LTD. LAC JEANNINE	69 *
TAILINGS	LITHIUM	CLOSED	11	0	NATURAL	QUE	QUEBEC LITHIUM CORP	47
TAILINGS	MERCURY	OPERATING	25	0	NATURAL	BC	COMINCO LTD PINCHI LAKE	156
TAILINGS	MOLYBDENUM	CLOSED	37	0	NATURAL	BC	LIME CREEK	155
TAILINGS	MOLYBDENUM	CLOSED	17	0	NATURAL	QUE	PREISSAC MOLYBDENITE MINES LTD INDIAN	43
TAILINGS	MOLYBDENUM	CLOSED	67	0	NATURAL	QUE	ANGLO-AMERICAN CORP	43
TAILINGS	MOLYBDENUM	CLOSED	35	0	NATURAL	QUE	MOLYCORP INC	46
TAILINGS	MOLYBDENUM	OPERATING	80	0	NATURAL	BC	NORANDA MINES LTD BOSS MOUNTAIN	160
TAILINGS	MOLYBDENUM	OPERATING	365	0	NATURAL	BC	PLACER DEVELOPMENT LTD ENDAKO	159 *
TAILINGS	OIL SANDS	OPERATING	312	85	DAM	ALB	GREAT CANADIAN OIL SANDS LTD	143
TAILINGS	POTASH	OPERATING	95	0	DAM	SAS	APM OPERATORS LTD ALLAN	129
TAILINGS	POTASH	OPERATING	156	0	DAM	SAS	KALIUM CHEMICALS LTD BELLE PLAINE	120
TAILINGS	POTASH	OPERATING	194	0	DAM	SAS	DUVAL CORP CANADA	127
TAILINGS	POTASH	OPERATING	350	0	DAM	SAS	INTERNATIONAL MINERAL+CHEMICAL K1	122
TAILINGS	POTASH	OPERATING	150	0	DAM	SAS	INTERNATIONAL MINERAL+CHEMICAL K2	121
TAILINGS	POTASH	OPERATING	325	18	DAM	SAS	ALWINSOL POTASH CANADA LTD LANIGAN	131
TAILINGS	POTASH	OPERATING	87	0	DAM	SAS	HUDSON BAY MINING SMELTING LTD ROCANVILLE	132
TAILINGS	POTASH	OPERATING	120	0	DAM	SAS	COMINCO LTD VANSCOY	128
TAILINGS	POTASH	OPERATING	137	0	DAM	SAS	CENTRAL CANADA POTASH CO VISCOUNT	130
TAILINGS	URANIUM	CLOSED	75	0	DAM	ONT	DENISON MINES LTD STANROCK-CANMET	97
TAILINGS	URANIUM	CLOSED	101	30	DAM	ONT	RIO ALGOM LTD NORDIC	96 *
TAILINGS	URANIUM	CLOSED	45	1	LAKE	ONT	RIO ALGOM LTD STANLEIGH	96
TAILINGS	URANIUM	CLOSED	9	2	NATURAL	ONT	MADAWASKA MINES LTD FARADAY	NO MAP
TAILINGS	URANIUM	CLOSED	30	0	NATURAL	ONT	RIO ALGOM LTD LACKNOR (MILLIKEN)	96
TAILINGS	URANIUM	CLOSED	48	0	NATURAL	ONT	RIO ALGOM LTD PRONTO	95
TAILINGS	URANIUM	CLOSED	32	0	NATURAL	ONT	RIO ALGOM LTD PANEL	97
TAILINGS	URANIUM	CLOSED	32	0	NATURAL	SAS	GUNNAR	118
TAILINGS	URANIUM	OPERATING	26	0	LAKE	ONT	RIO ALGOM LTD GUIRKE	97
TAILINGS	URANIUM	OPERATING	146	0	NATURAL	ONT	DENISON MINES LTD DENISON	97
TAILINGS	URANIUM	OPERATING	116	0	NATURAL	SAS	ELDORADO NUCLEAR LTD	117
SLAG	CUP3ZNNI	OPERATING	243	0	RAISED	ONT	INCO LTD COPPER CLIFF	103
SLAG	CUP3ZNNI	OPERATING	18	0	RAISED	ONT	FALCONBRIDGE NICKEL MINES LTD FALCONBRIDGE	101
SLAG	CUP3ZNNI	OPERATING	12	0	FLAT	QUE	GASPE COPPER MINES LTD	67

* AFTER THE MAP NUMBER INDICATES THAT FURTHER DETAILS ARE GIVEN IN THE CASE HISTORIES OF VOLUME 1

APPENDIX B

INVENTORY MAPS

MAP SHEETS FOR INVENTORY OF MINE WASTES IN CANADA

CLASSES MAPPED IN NATIONAL INVENTORY OF MINE WASTES



1. Tailings: may contain several subclasses based on moisture content.



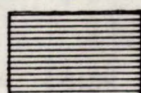
2. Waste Rock: including areas at mine site that have waste rock as surface cover.



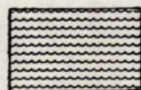
3. Slag



4. Heavy Vegetative Cover: residual natural cover and revegetation on reclaimed areas.



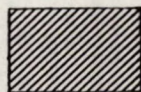
5. Moderate to Poor Vegetative Cover: grass and shrubs on reclaimed areas.



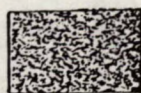
6. Clear Deep Water: reservoirs, ponds.



7. Silty or Shallow Water: slurry ponds.



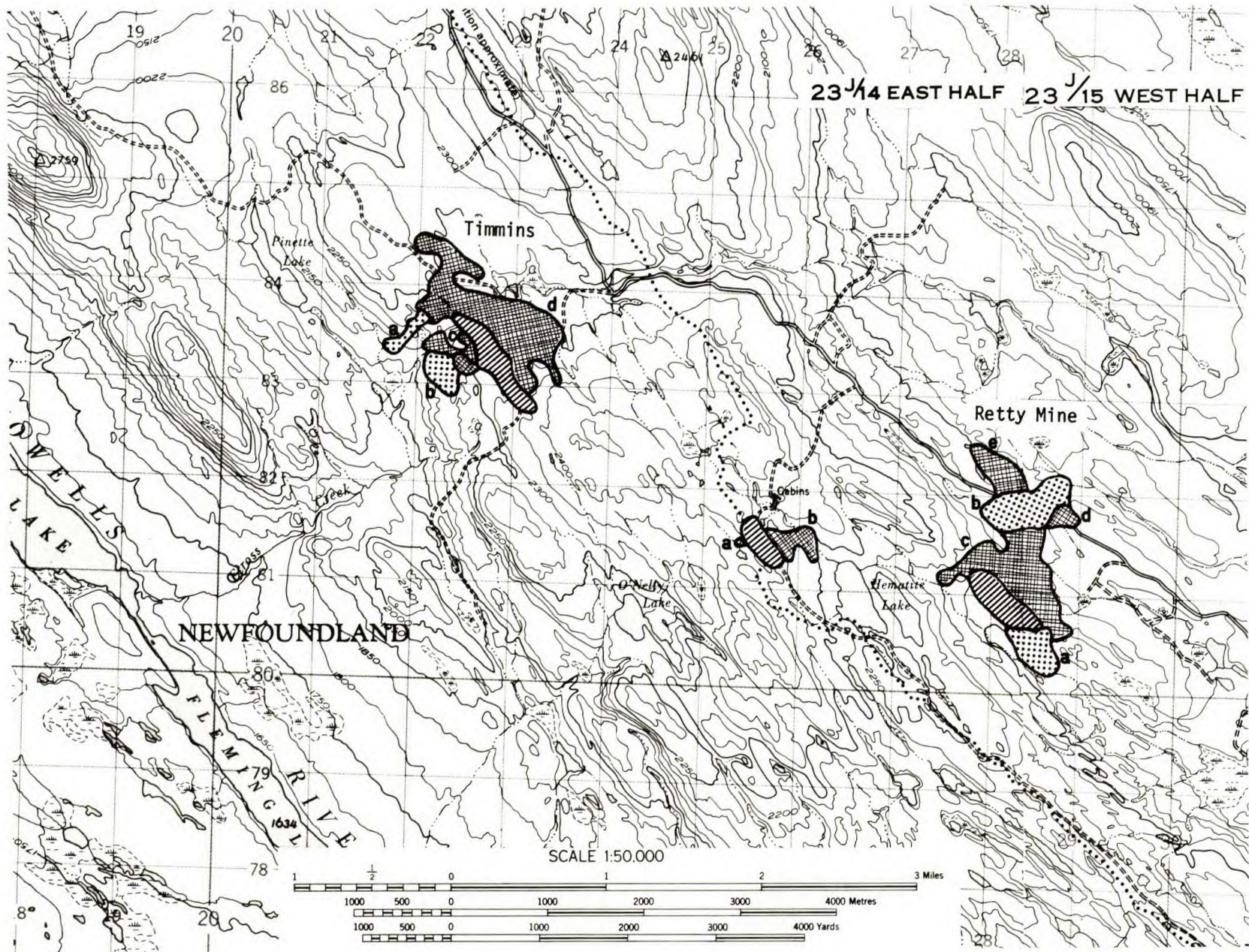
8. Open Pit: usually identified by shadow, therefore, all open pits have not been mapped, and the mapped outline may not conform to the actual pit.



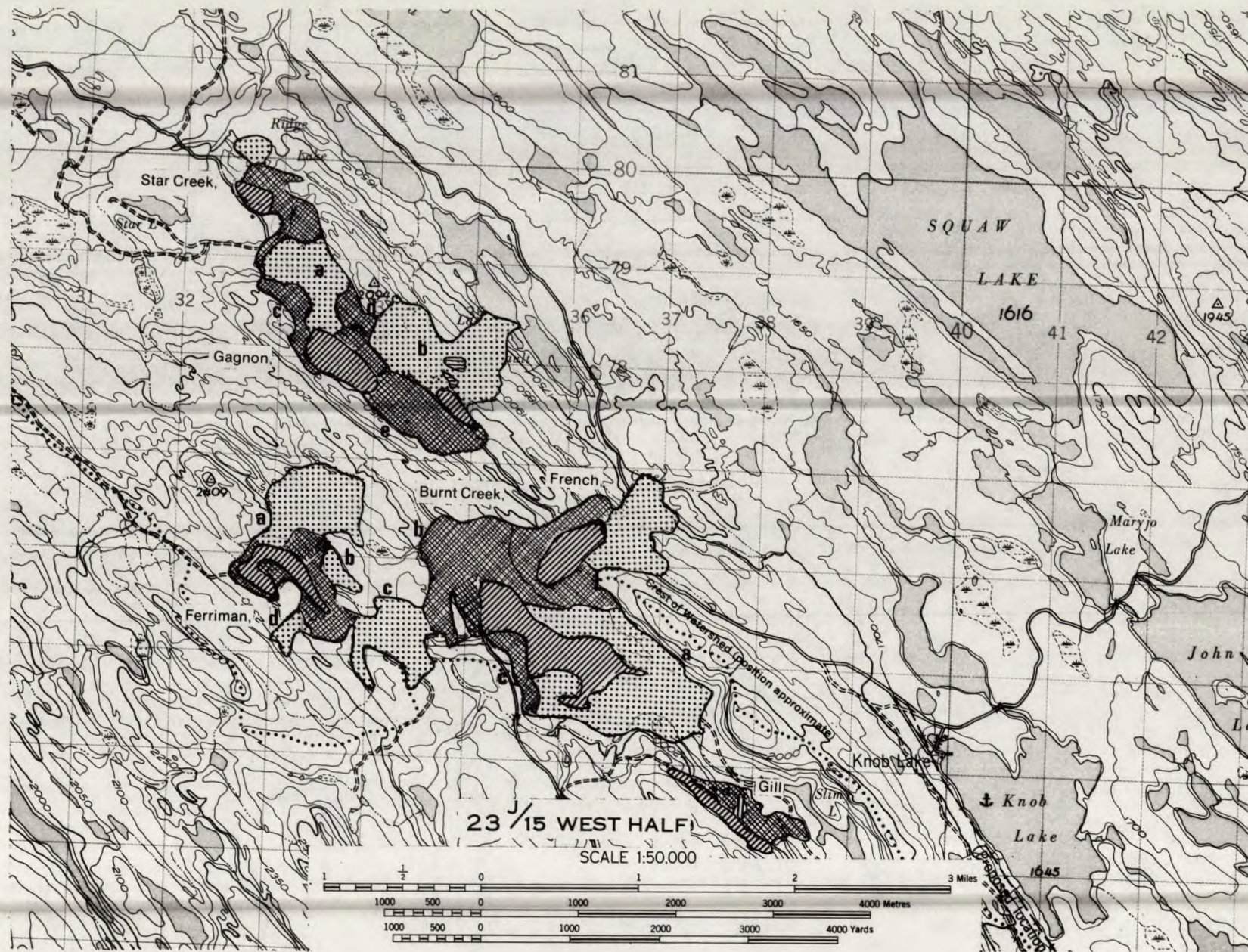
9. Plant Site: shaft, mill, smelter, etc.



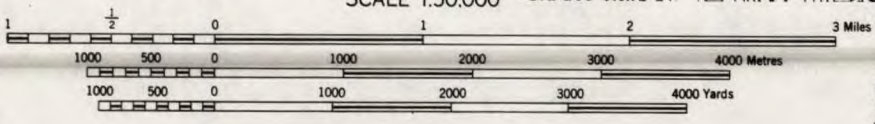
10. Exposed Overburden: artificial and natural exposures eg sand and gravel pits, spoil banks, unpaved roads, dams, dykes, etc.



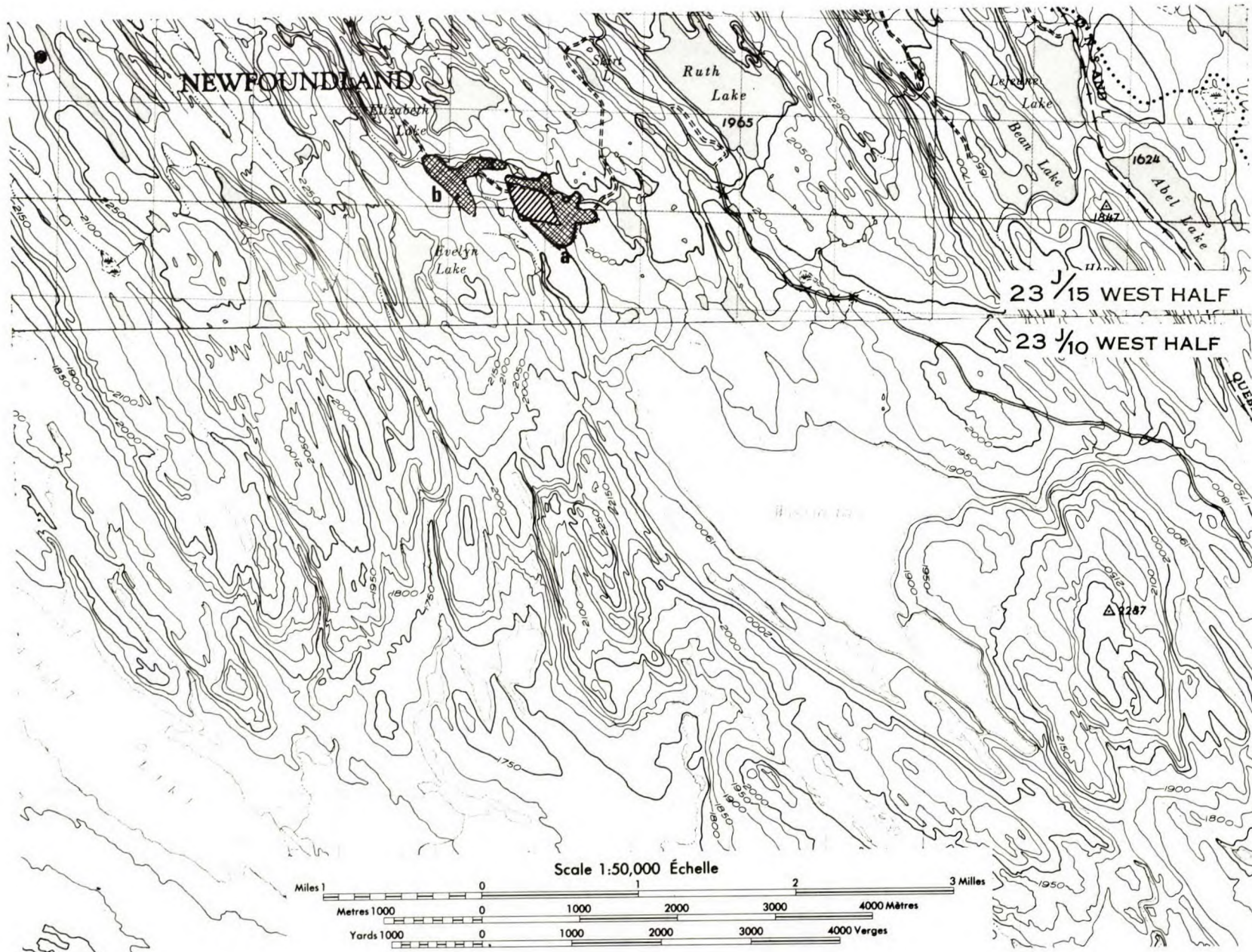
MAP NO. 1



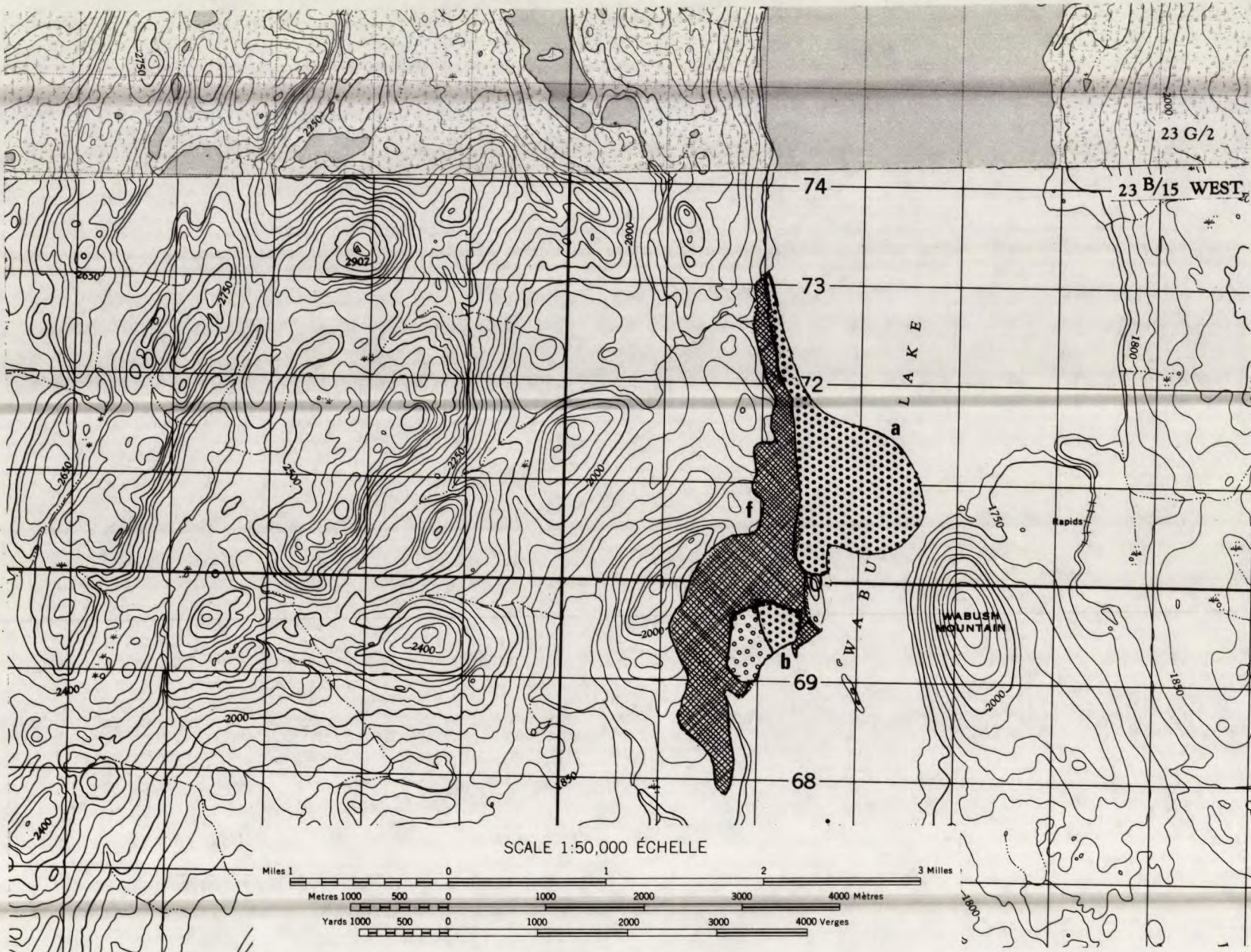
23 / 15 WEST HALF
 SCALE 1:50,000



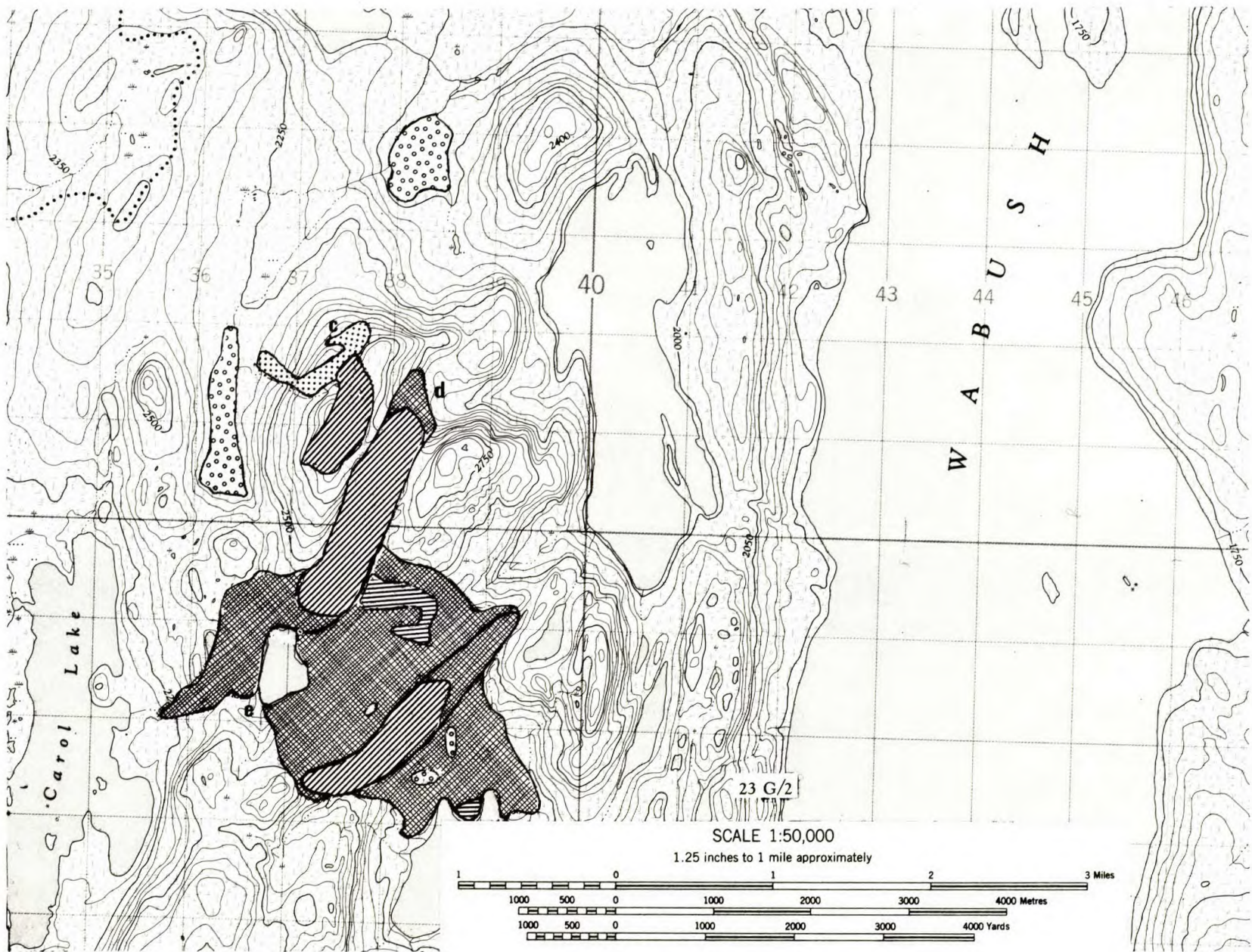
MAP NO. 2



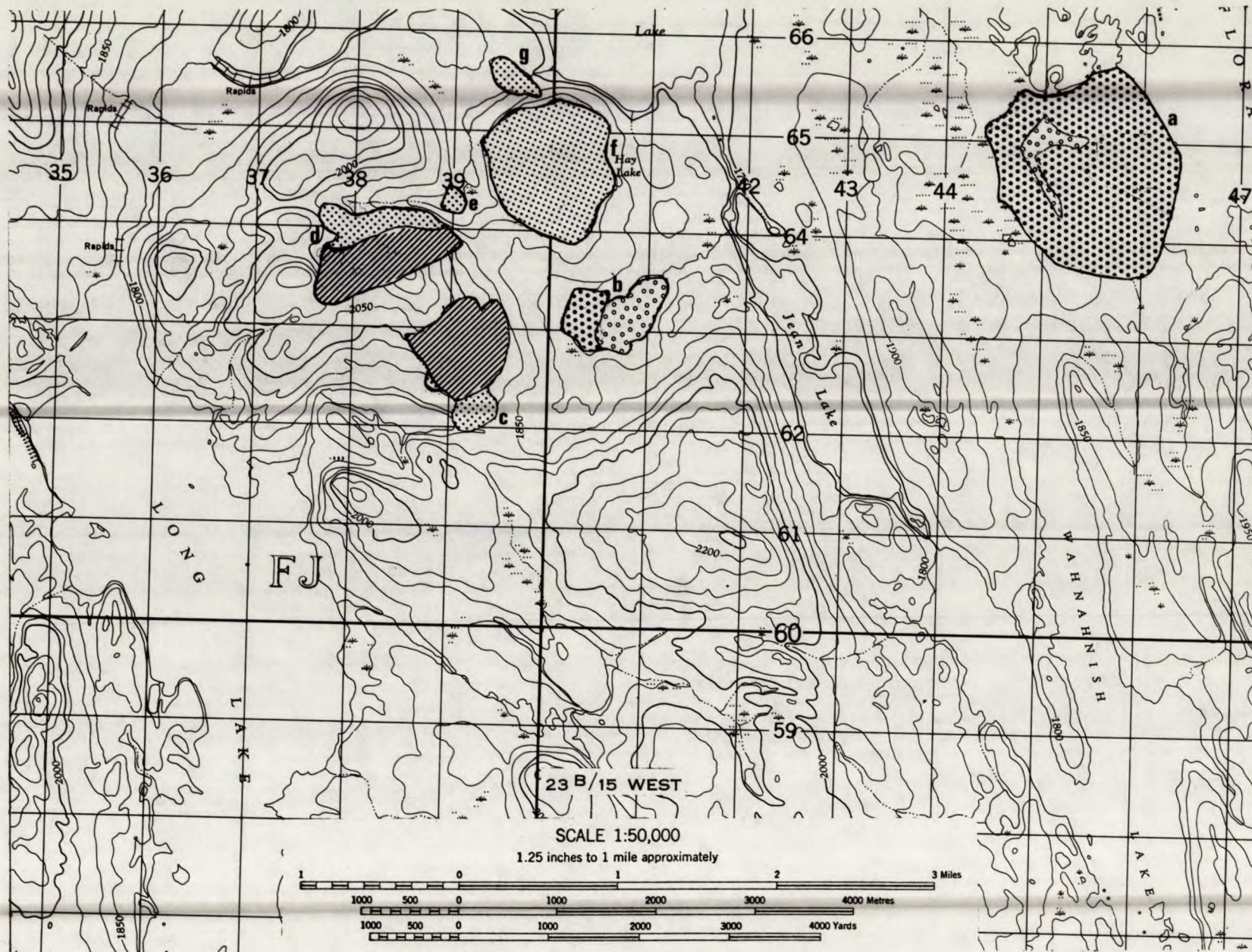
MAP NO. 3



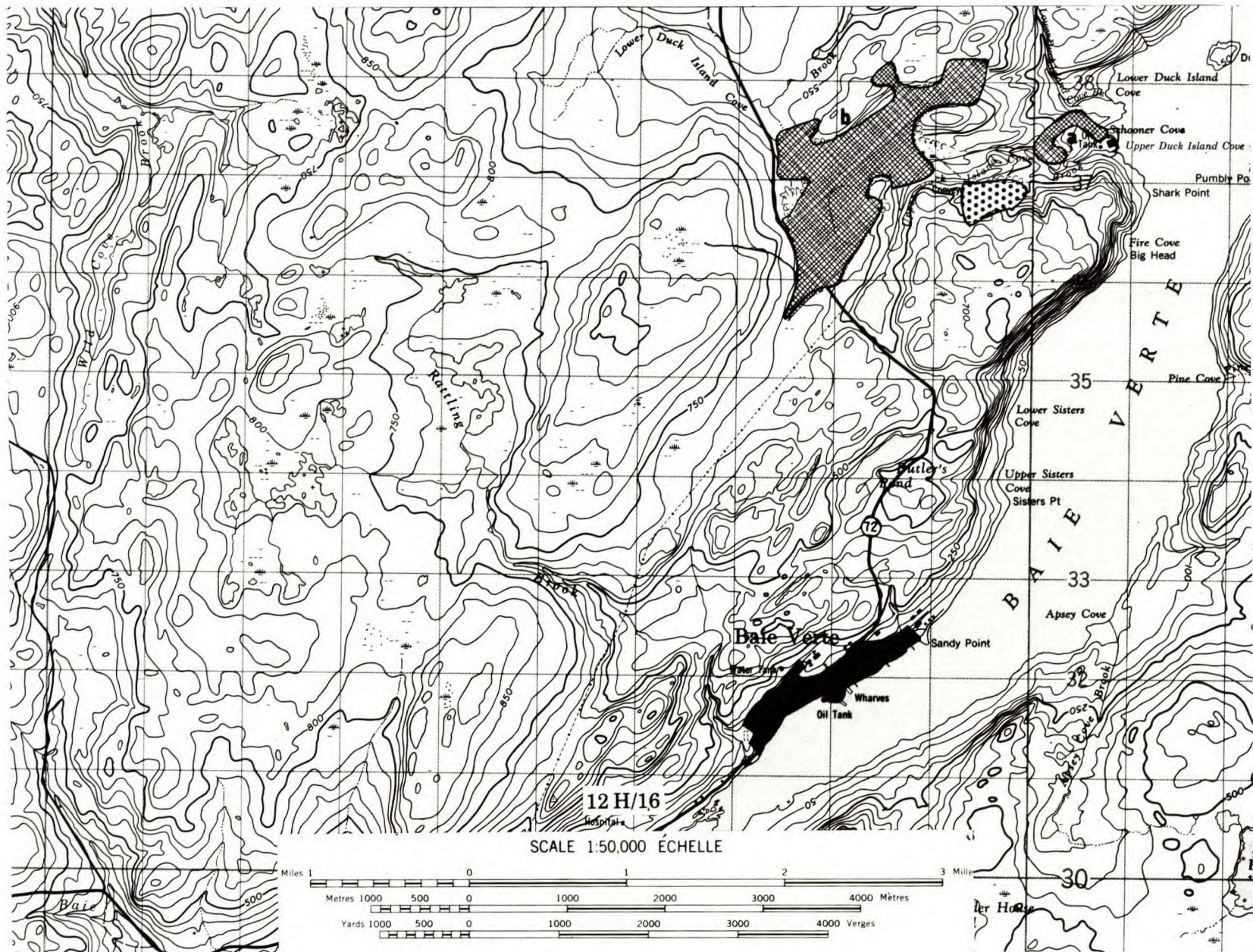
MAP NO. 4



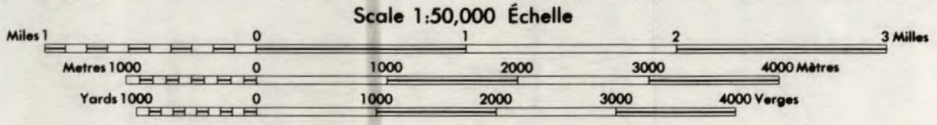
MAP NO. 5



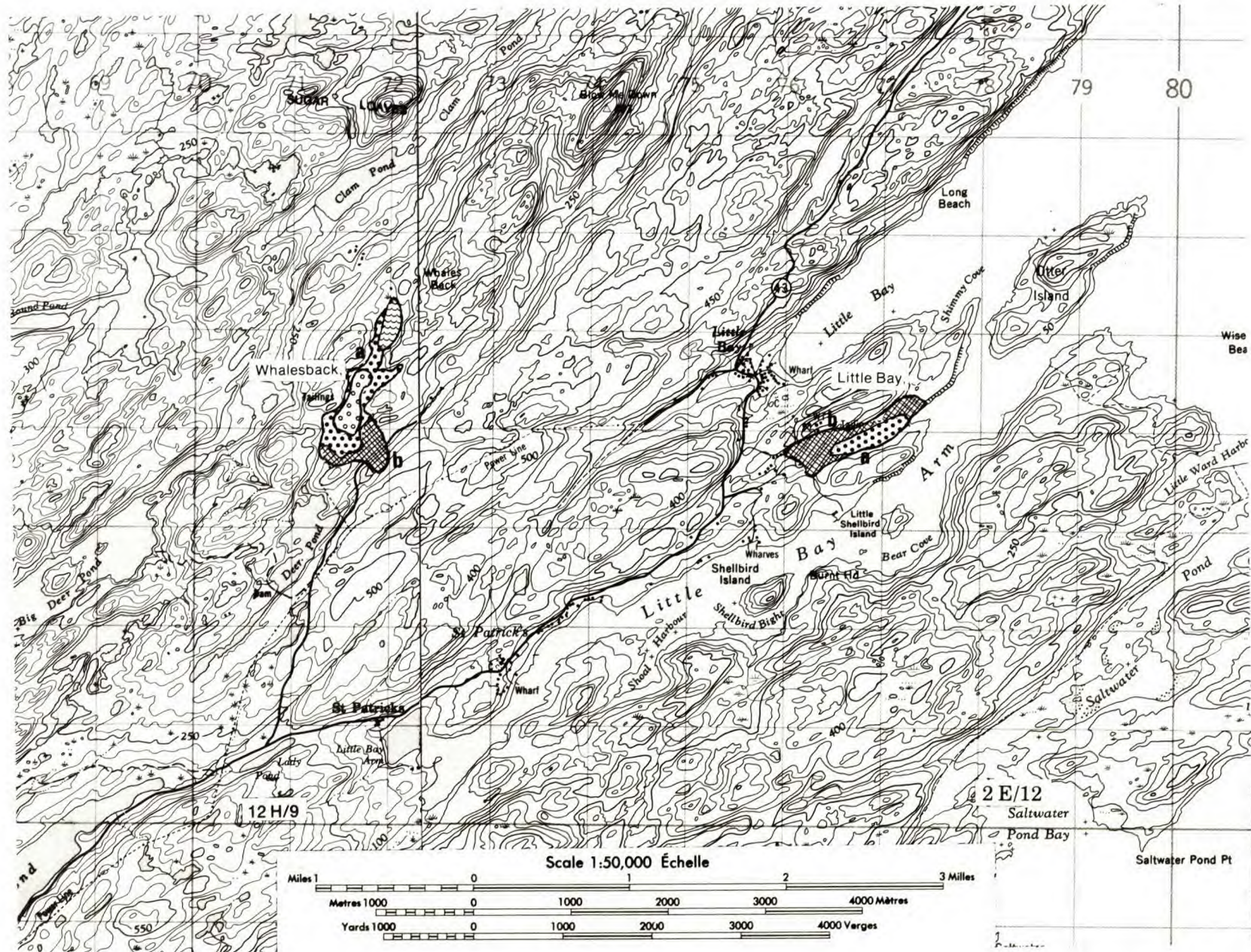
MAP NO. 6



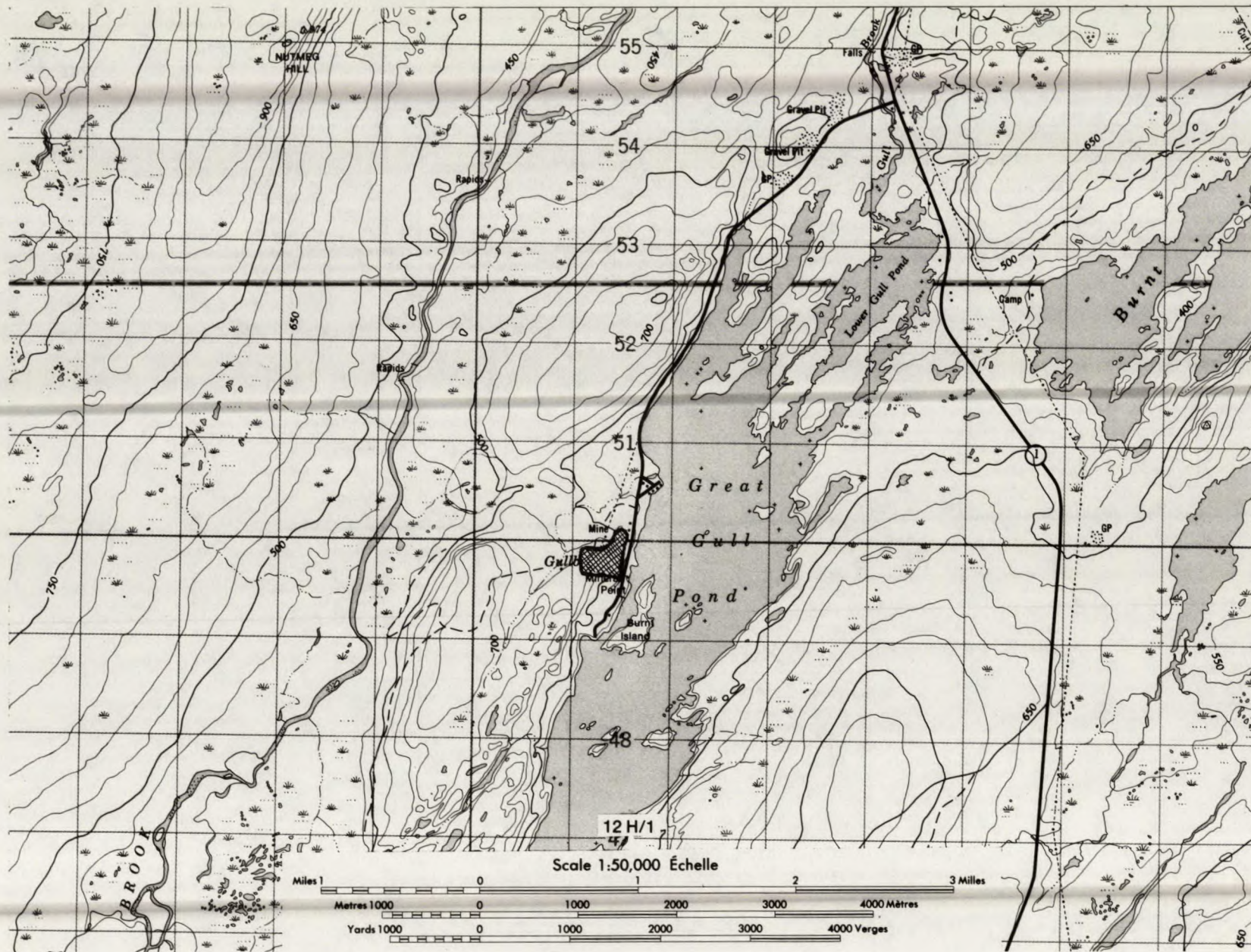
MAP NO. 7



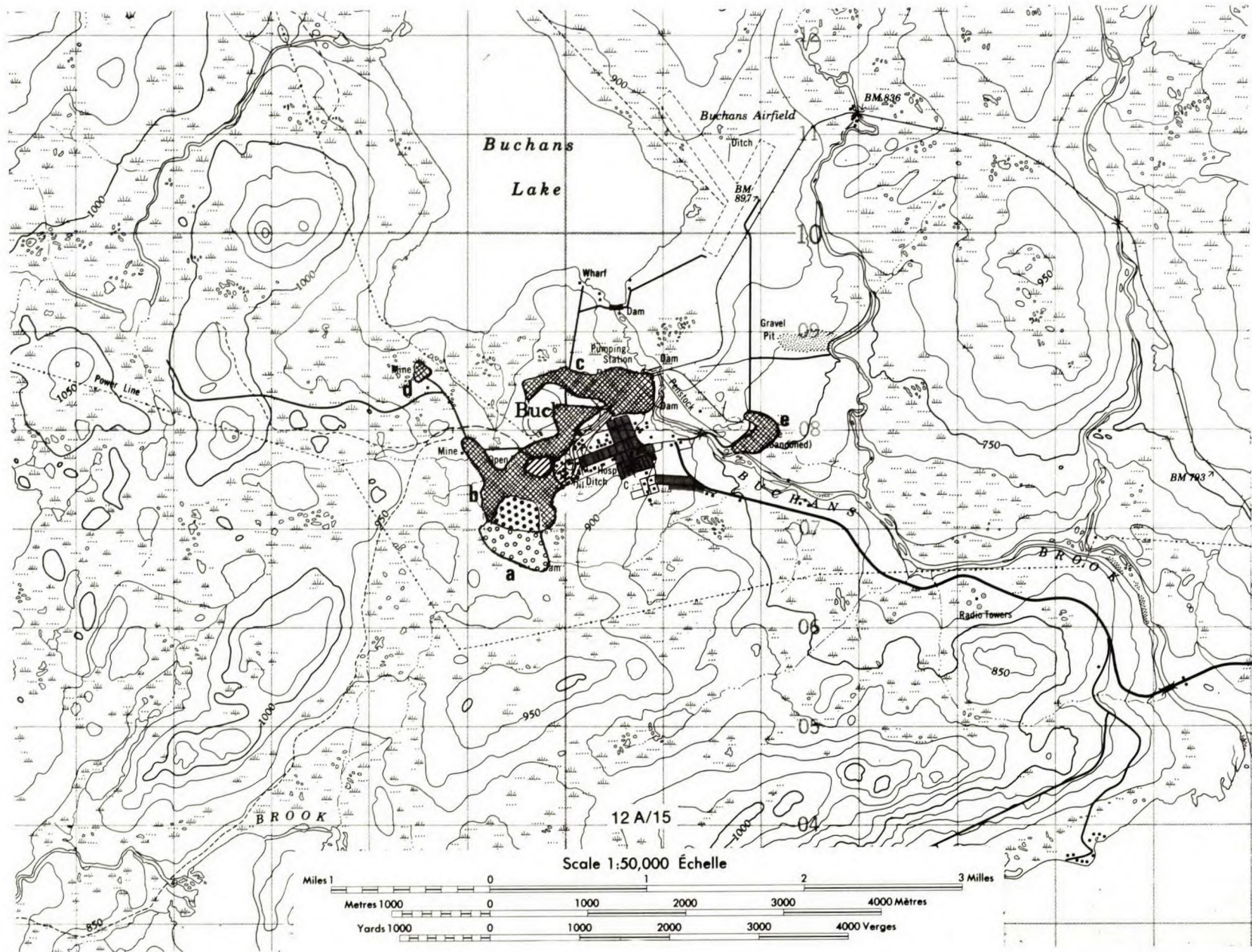
MAP NO. 8



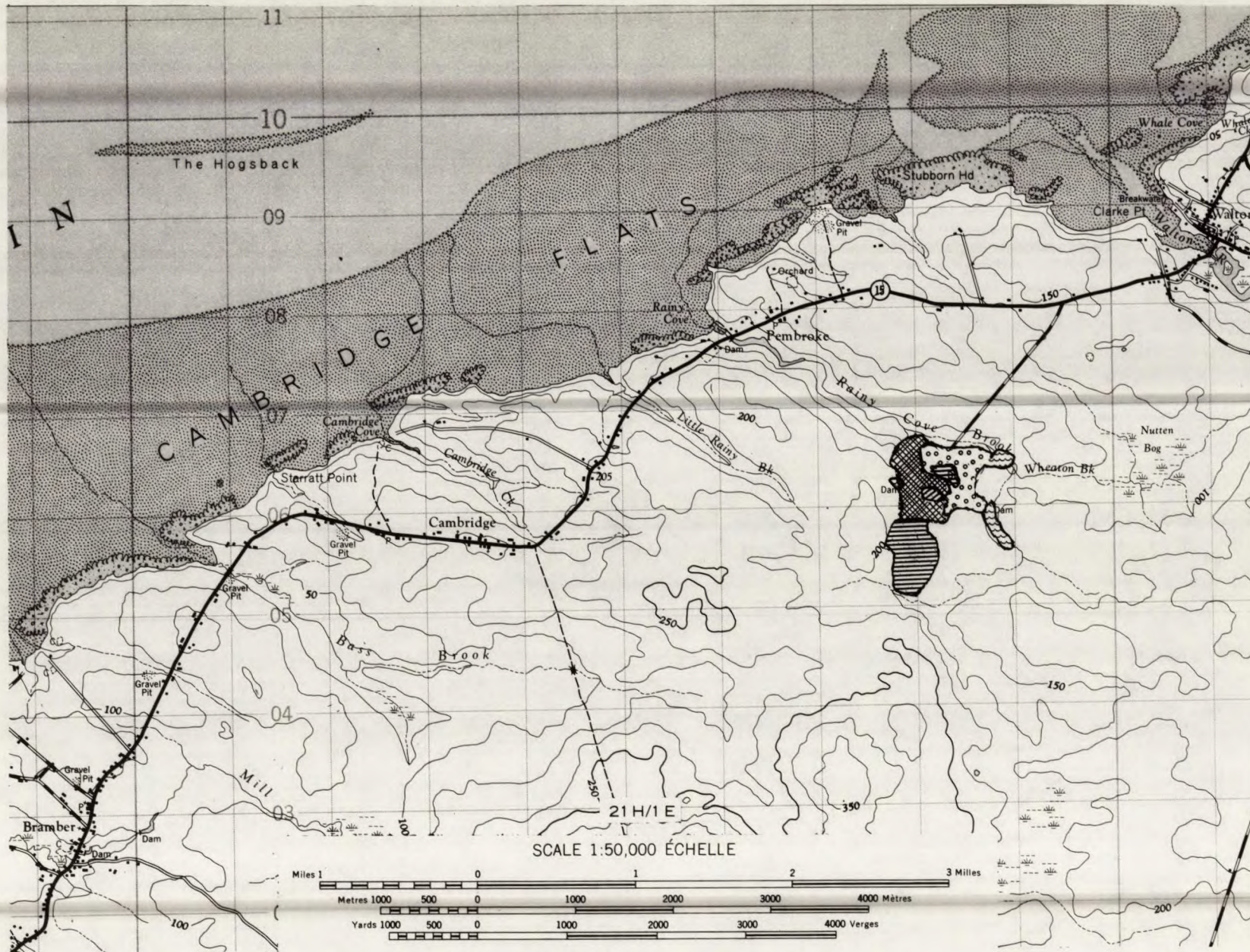
MAP NO. 9



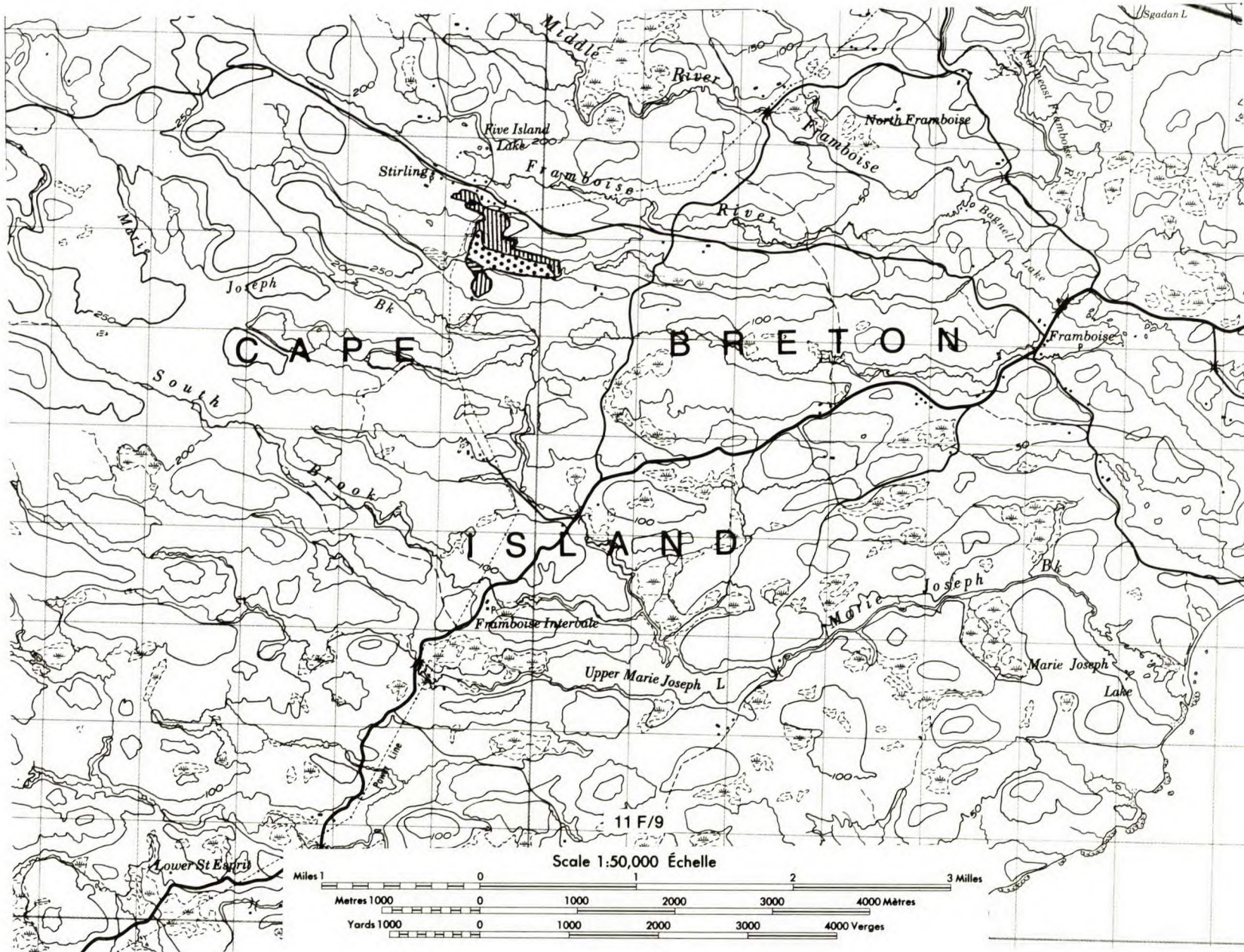
MAP NO. 10



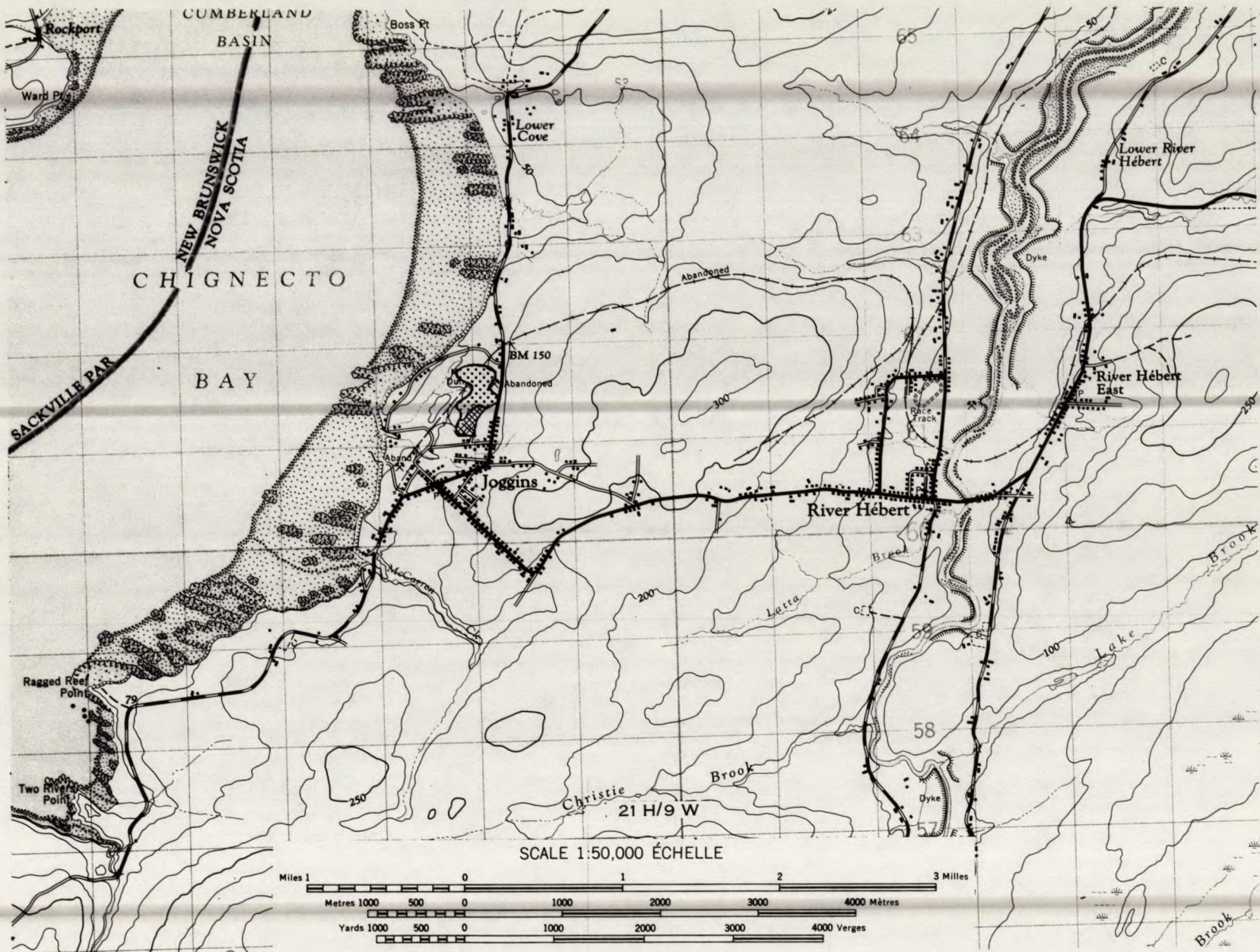
MAP NO. 11



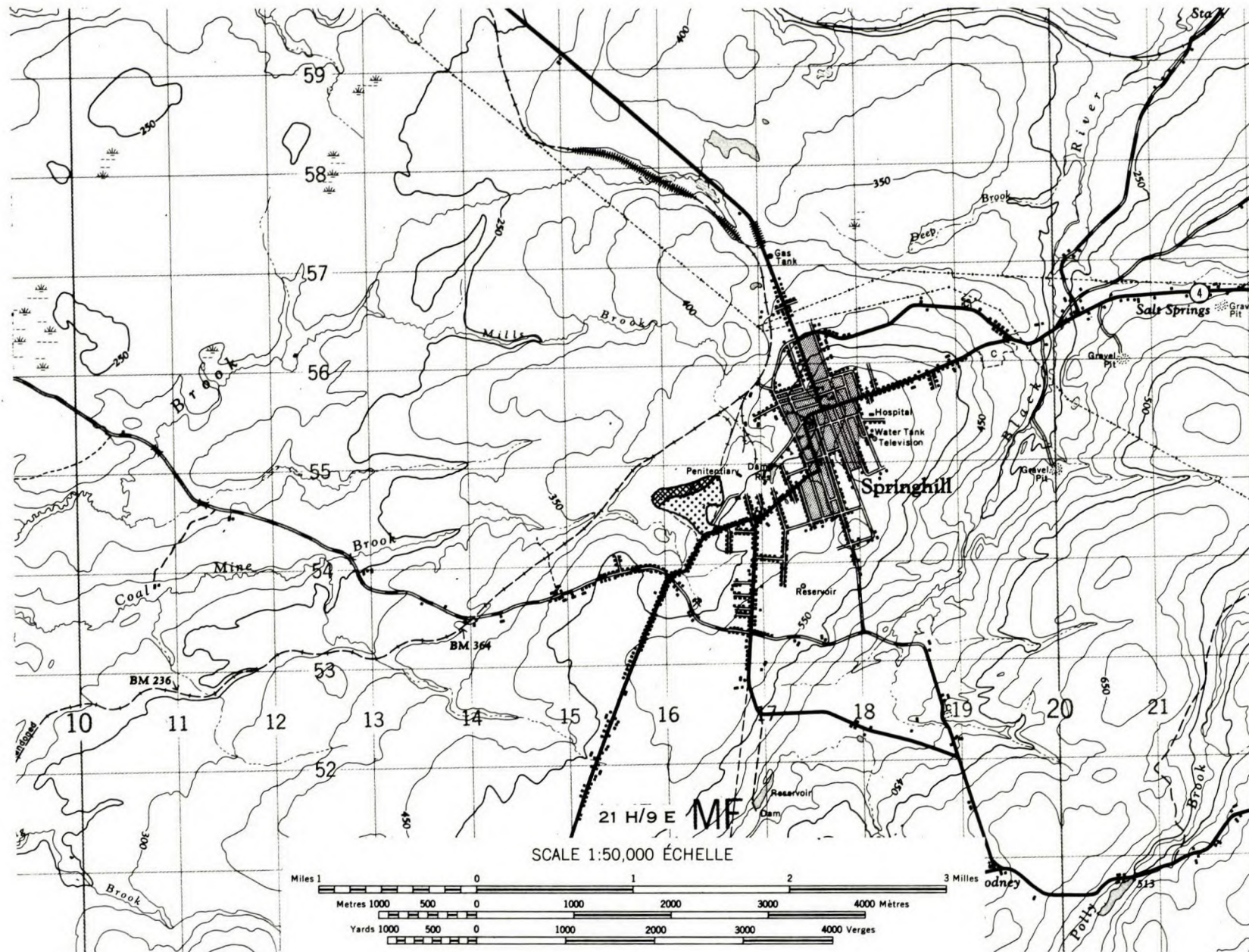
MAP NO. 12



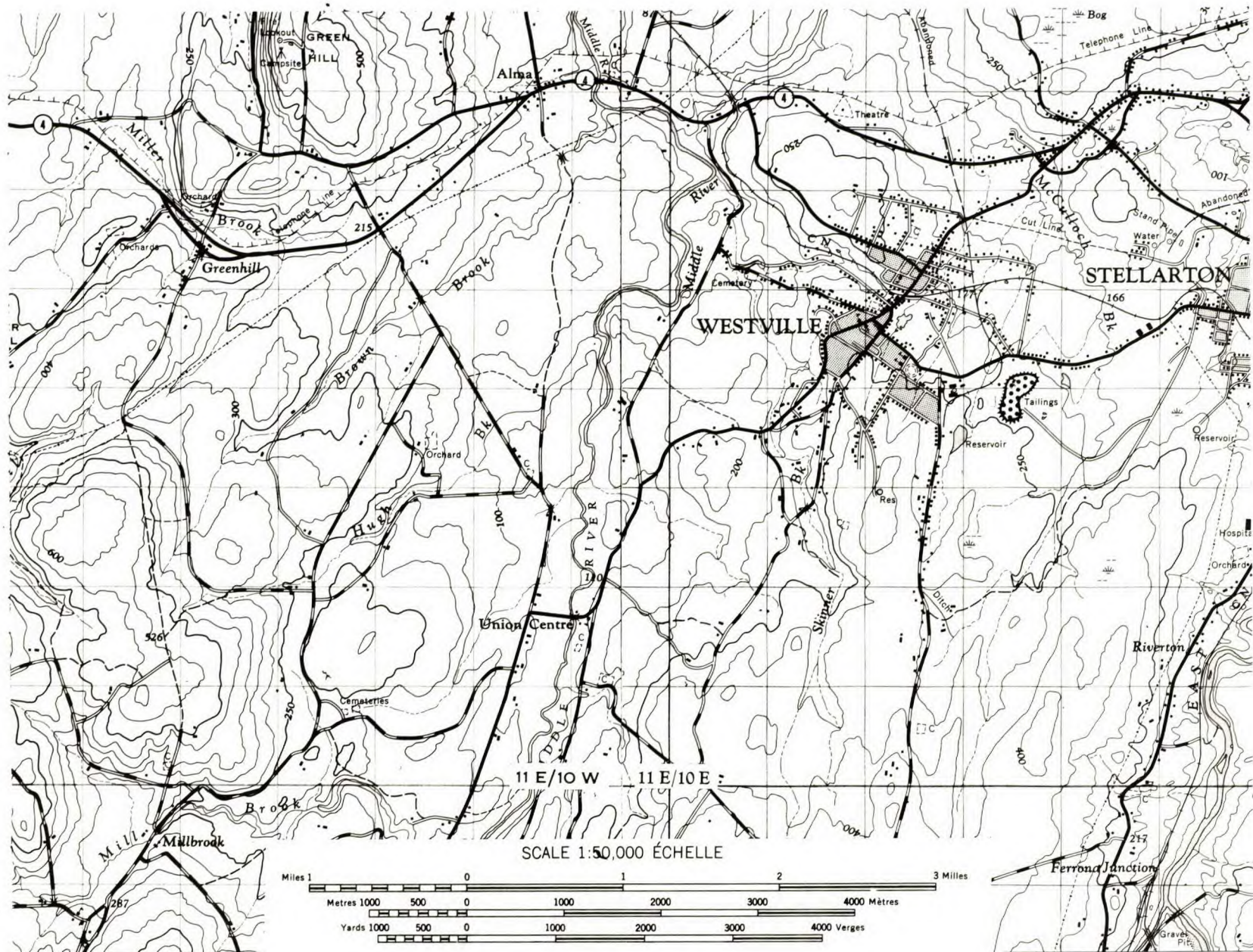
MAP NO. 13



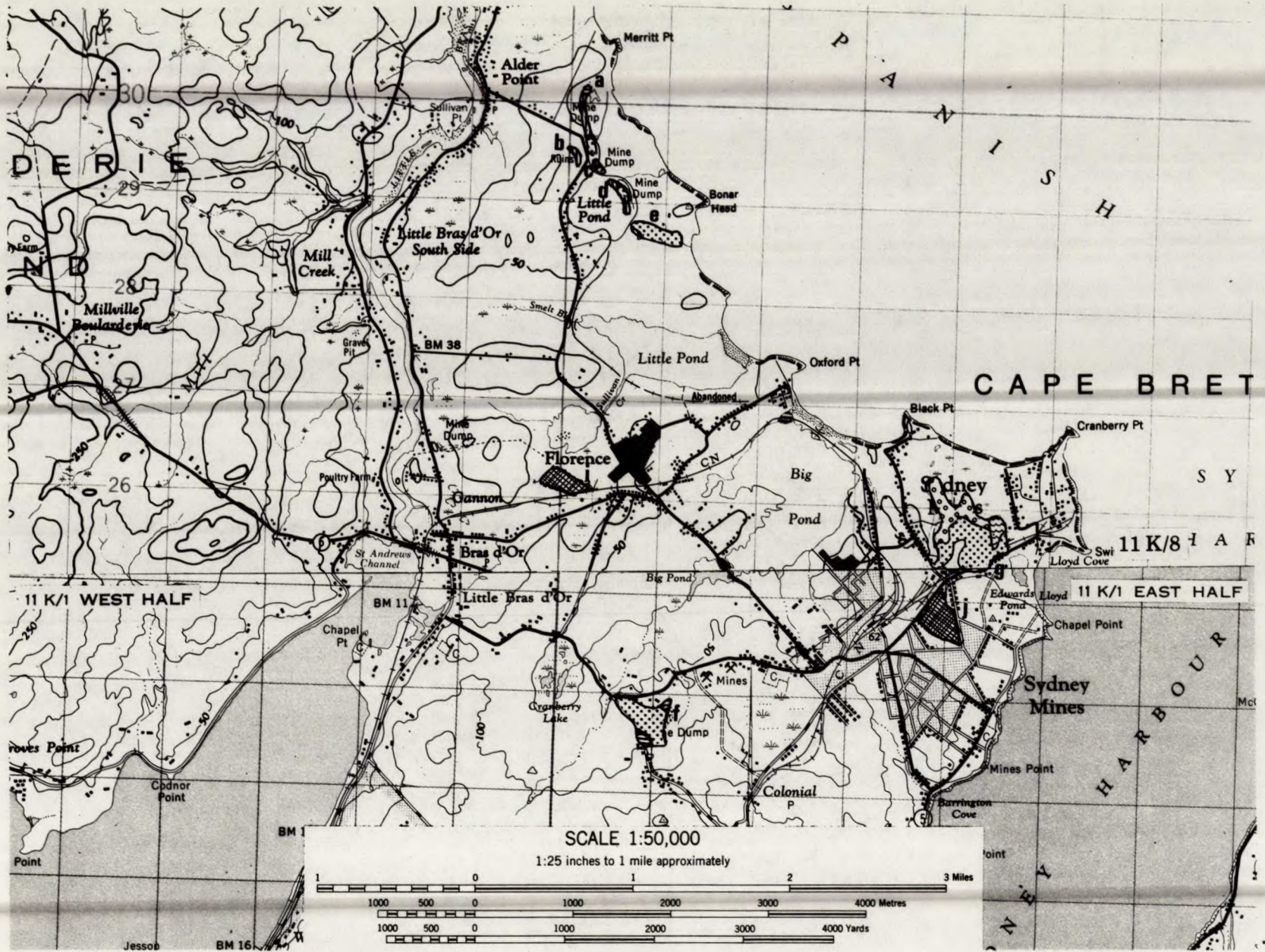
MAP NO. 14



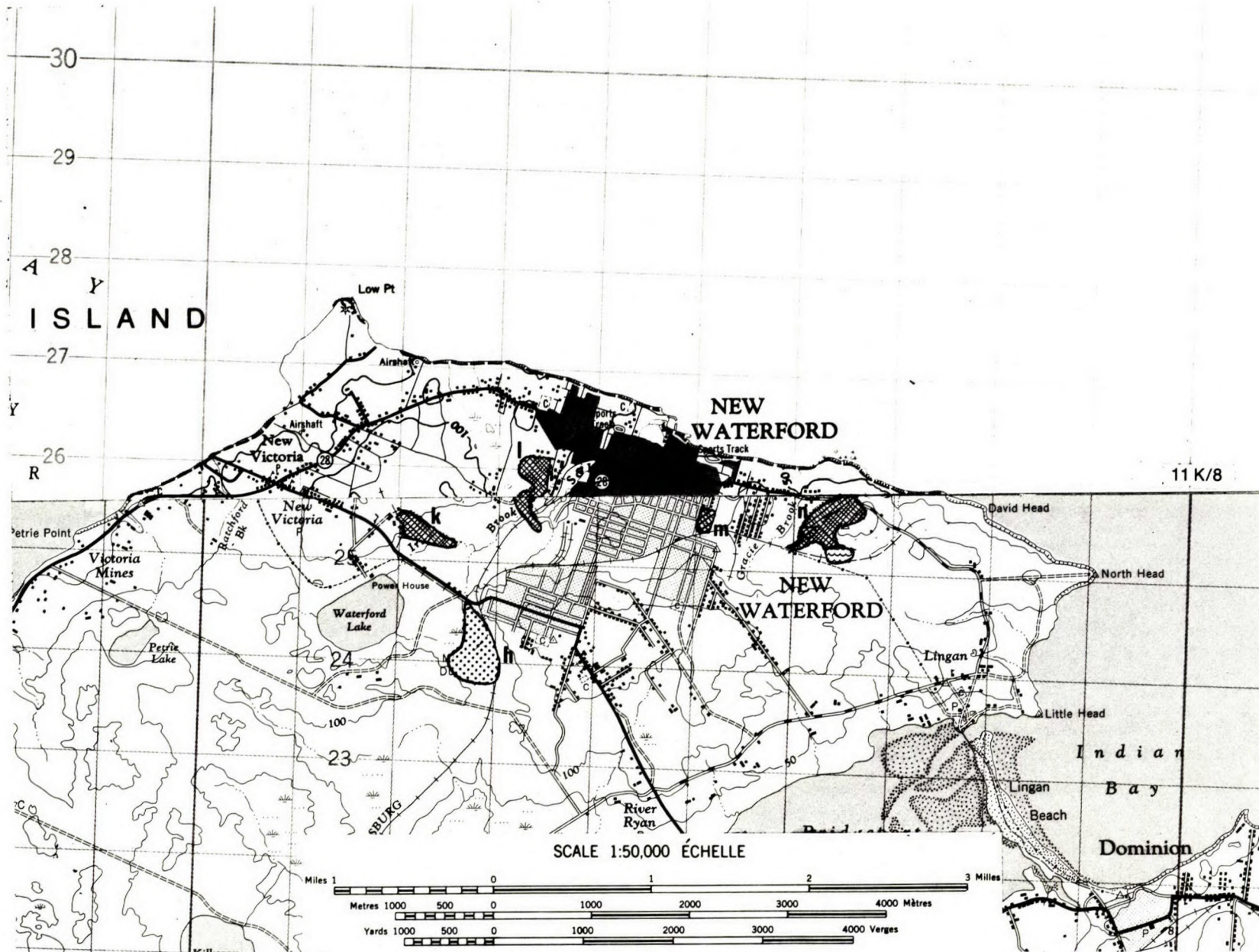
MAP NO. 15



MAP NO. 17



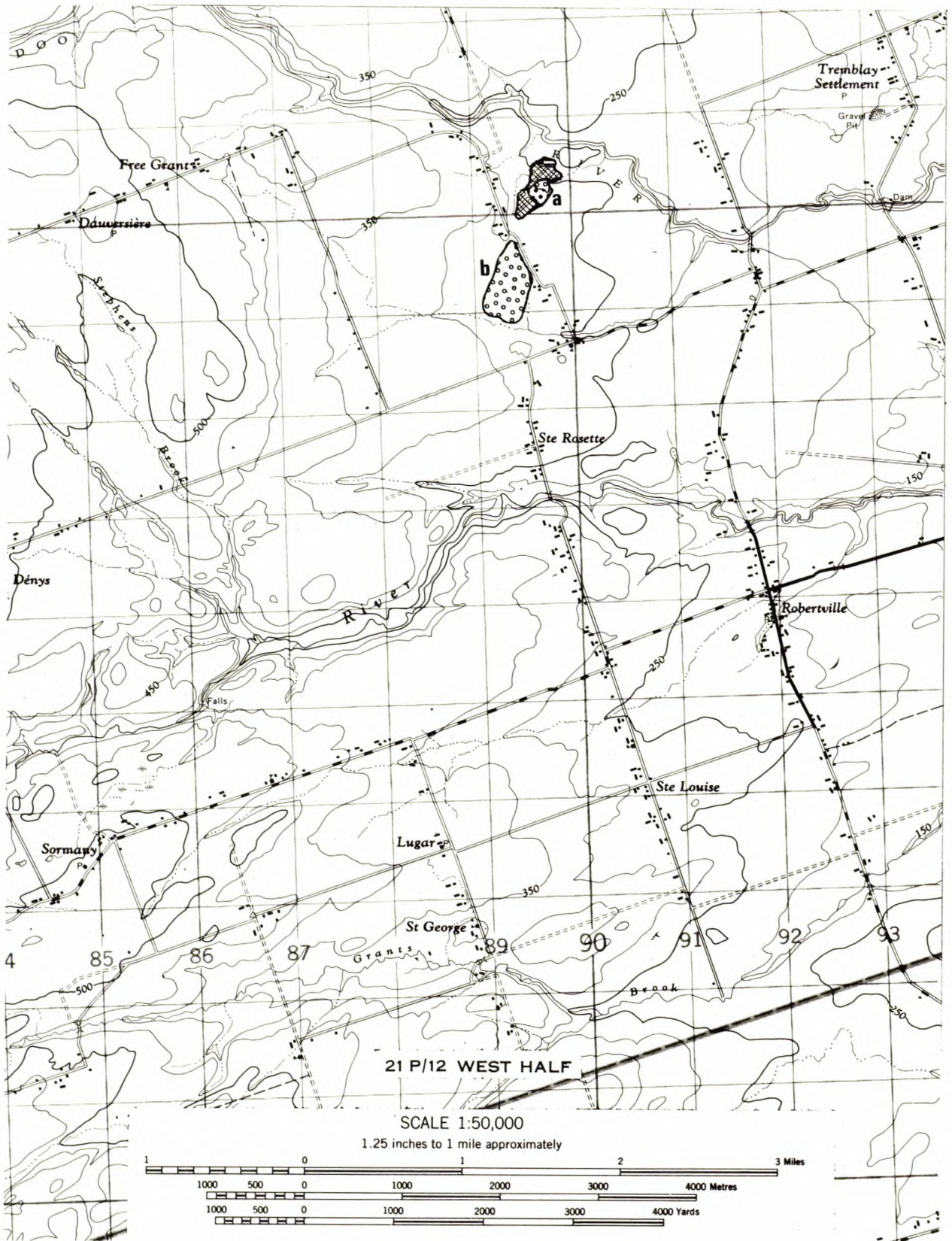
MAP NO. 18



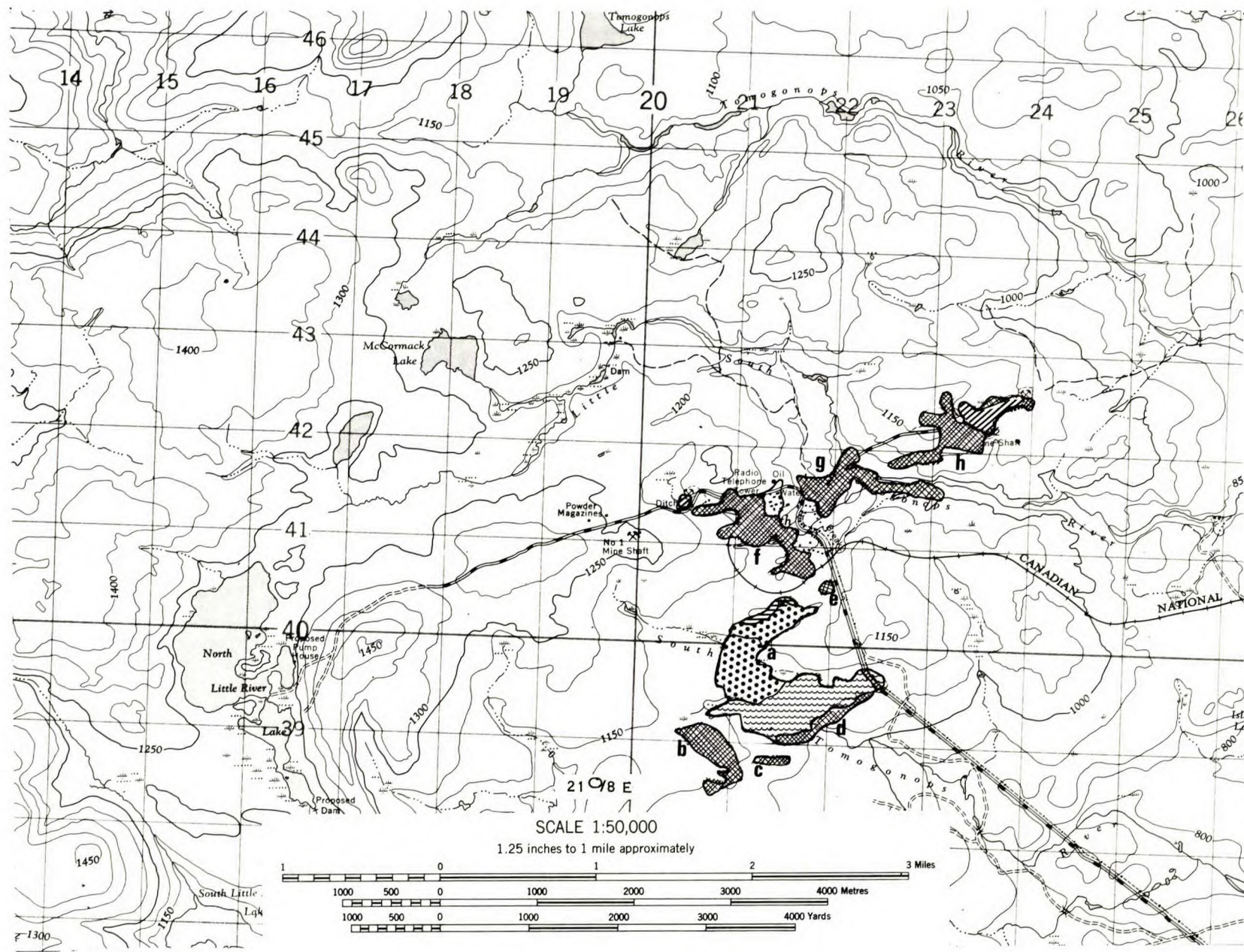
MAP NO. 19



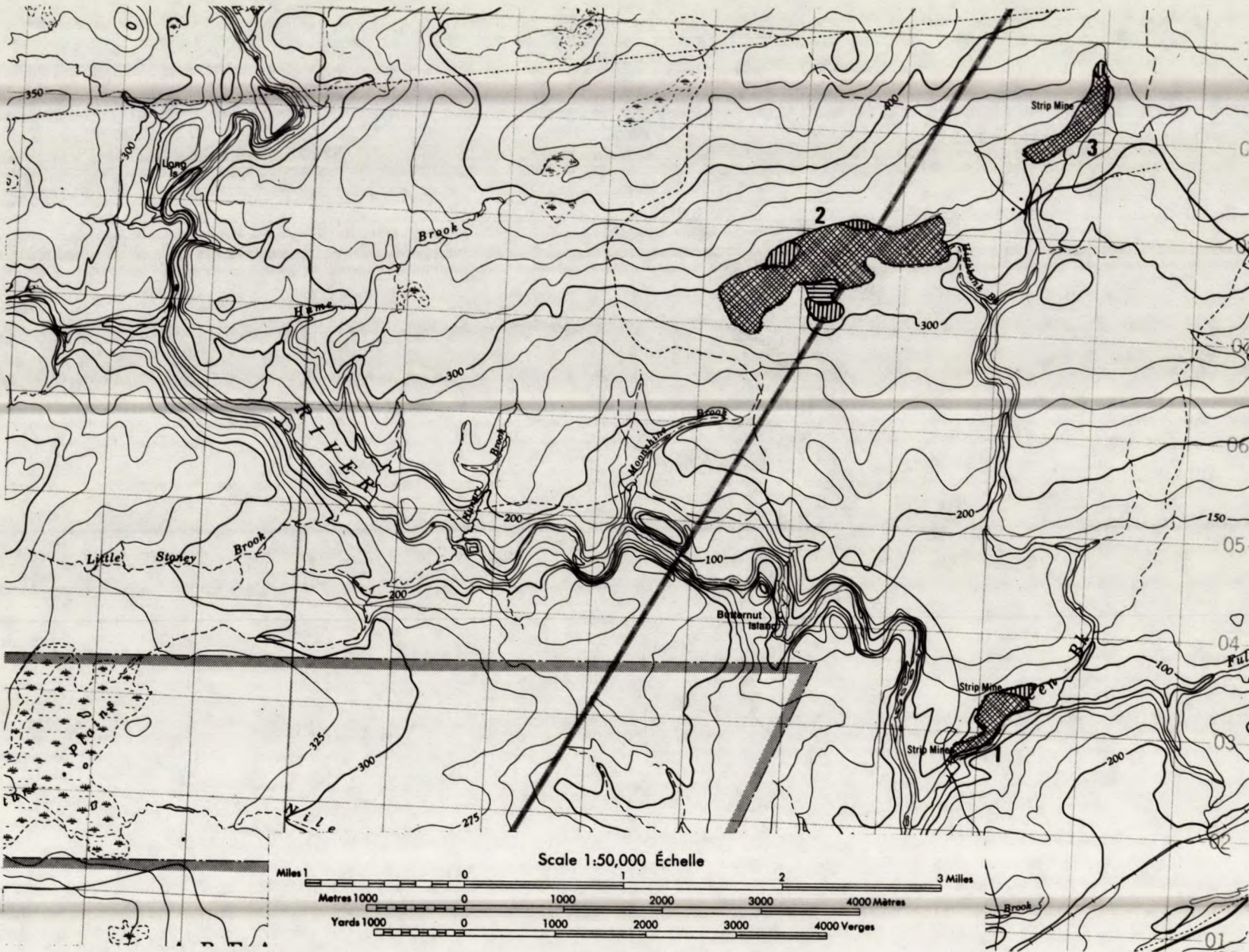
MAP NO. 20



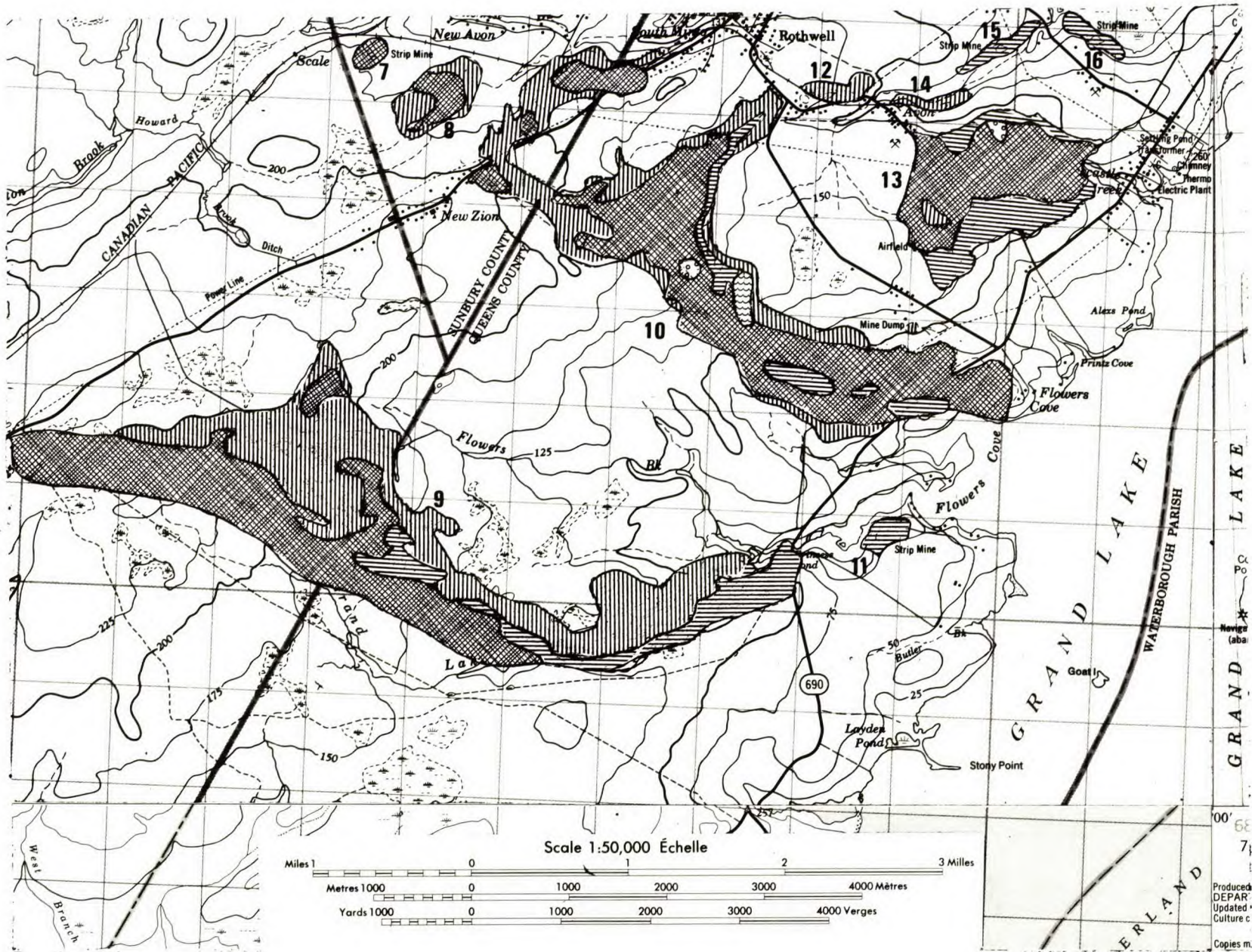
MAP NO. 21



MAP NO. 23

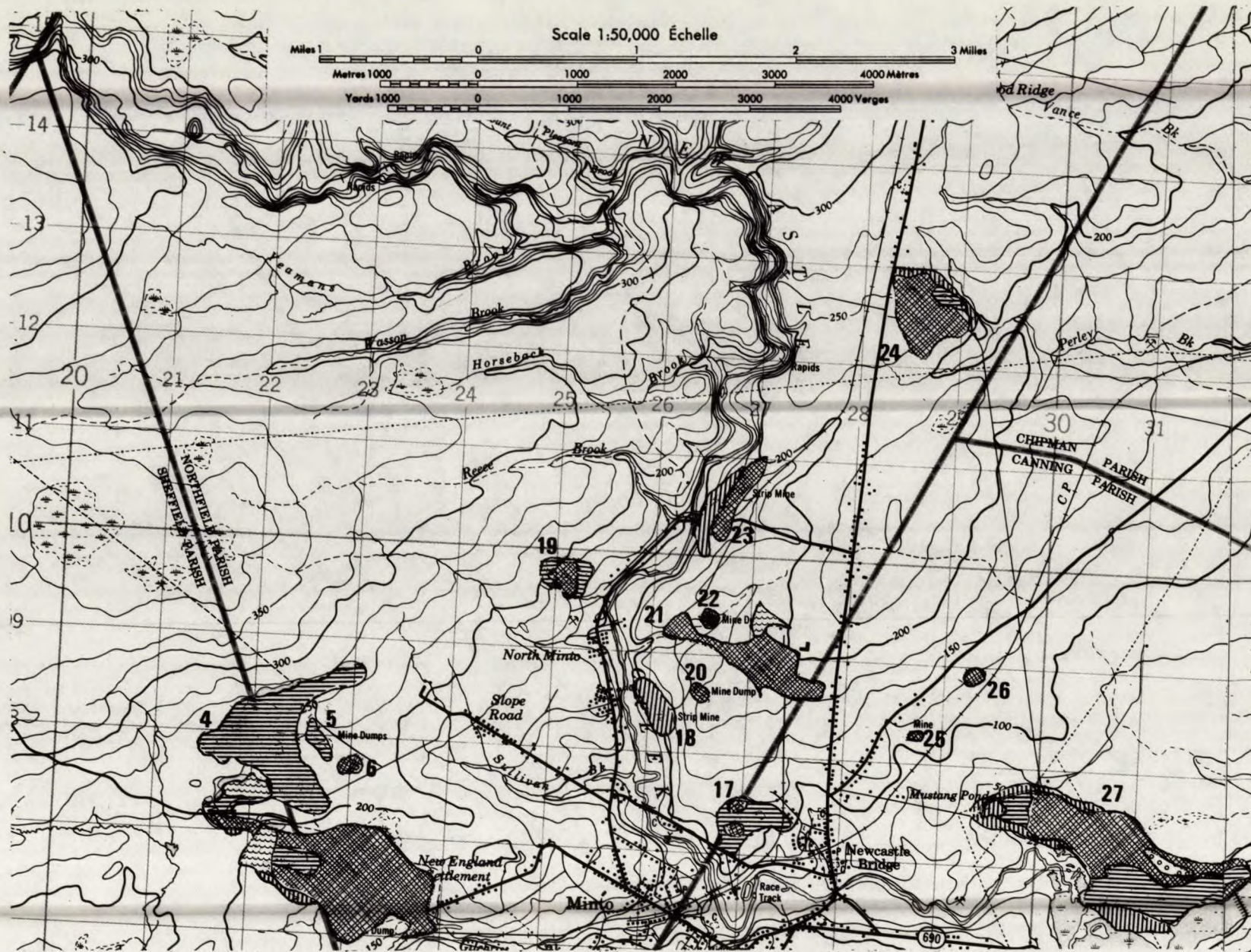


MAP NO. 24

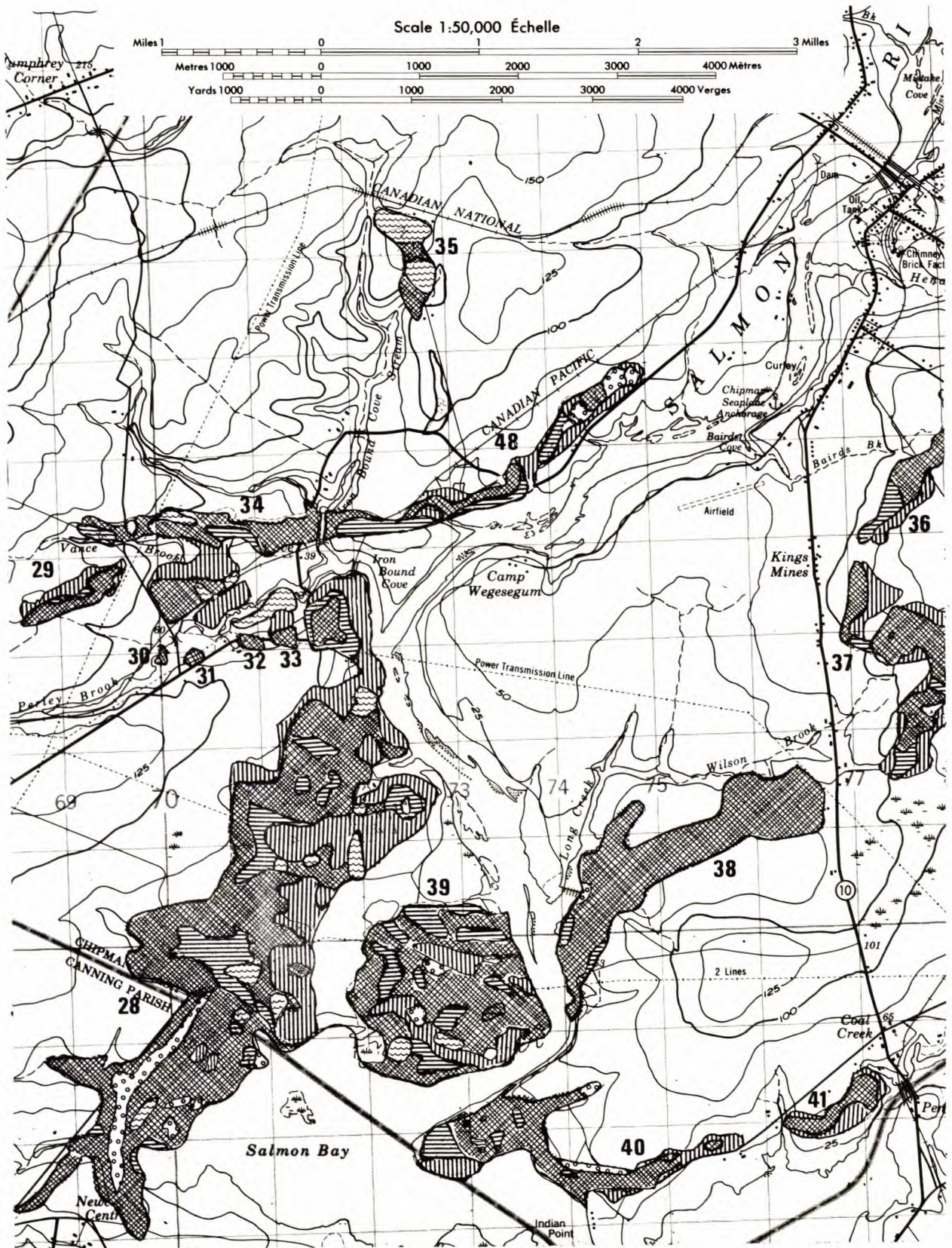


MAP NO. 25

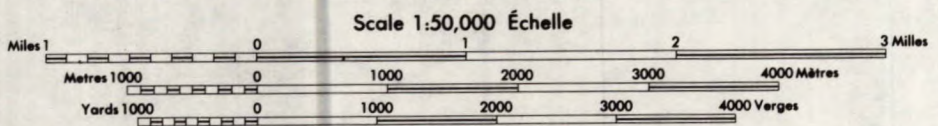
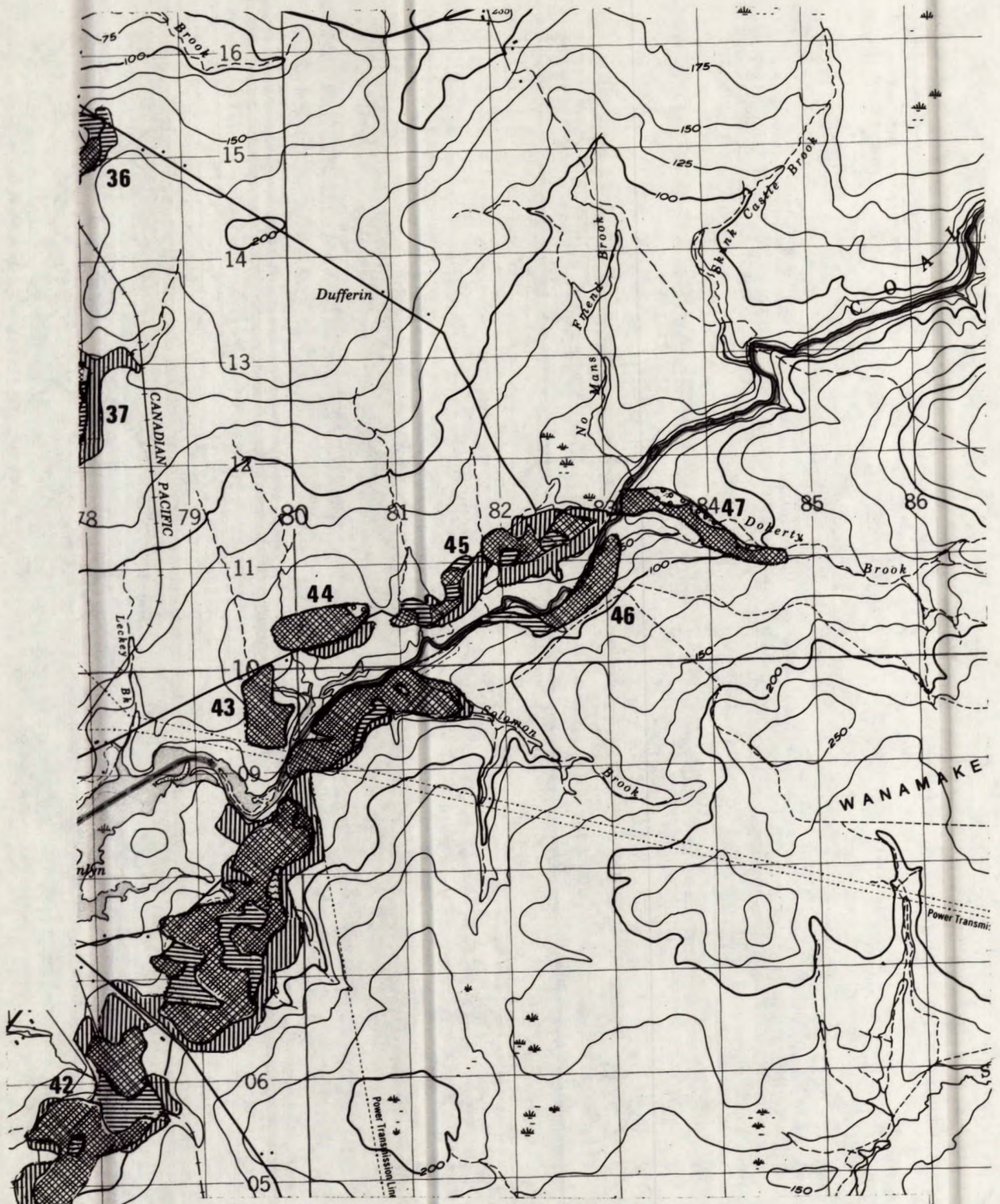
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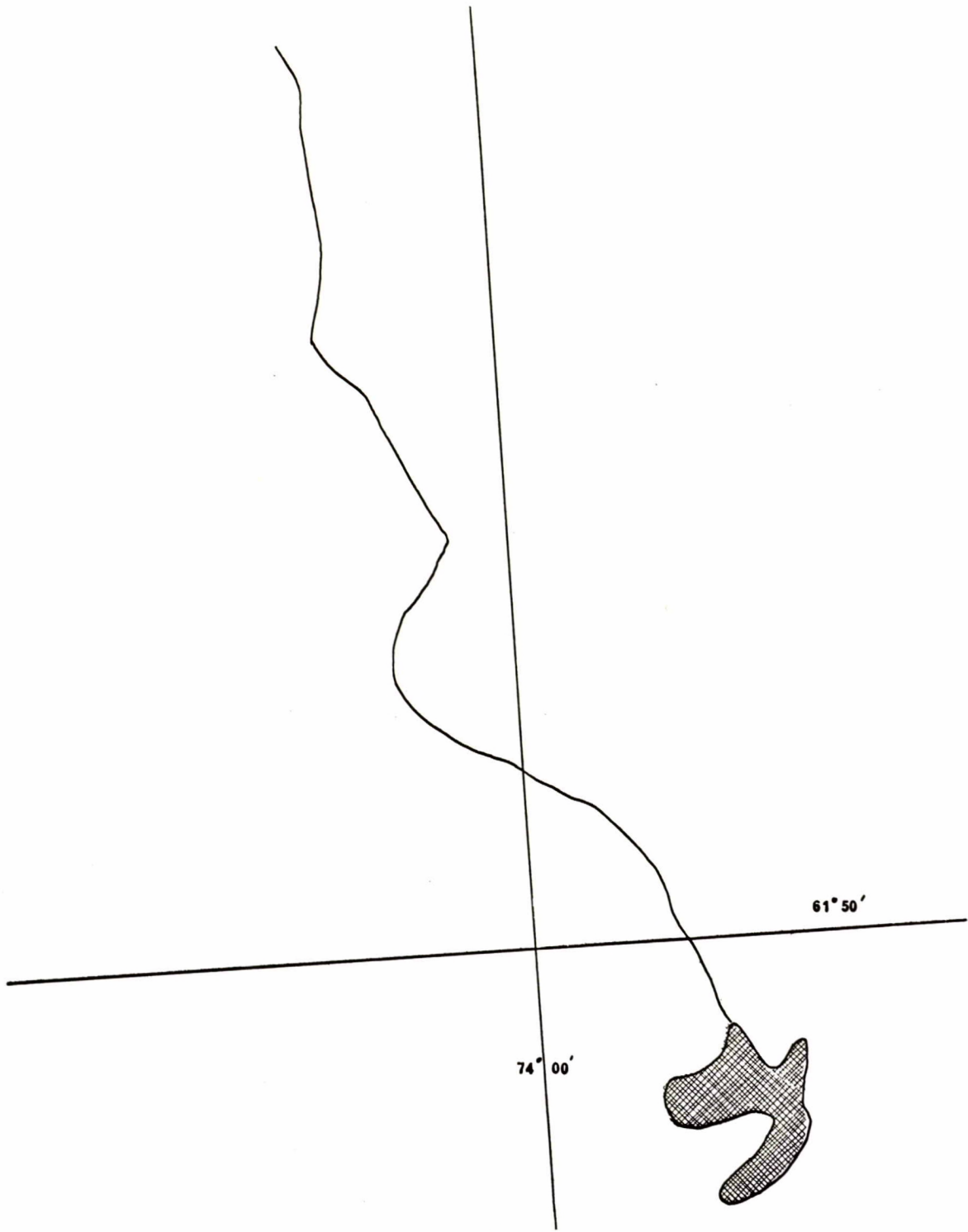
MAP NO 26



MAP NO. 27

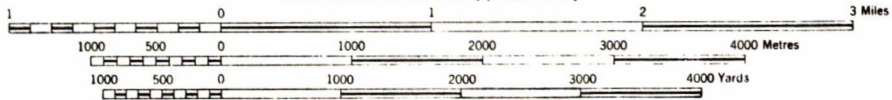


MAP NO. 28

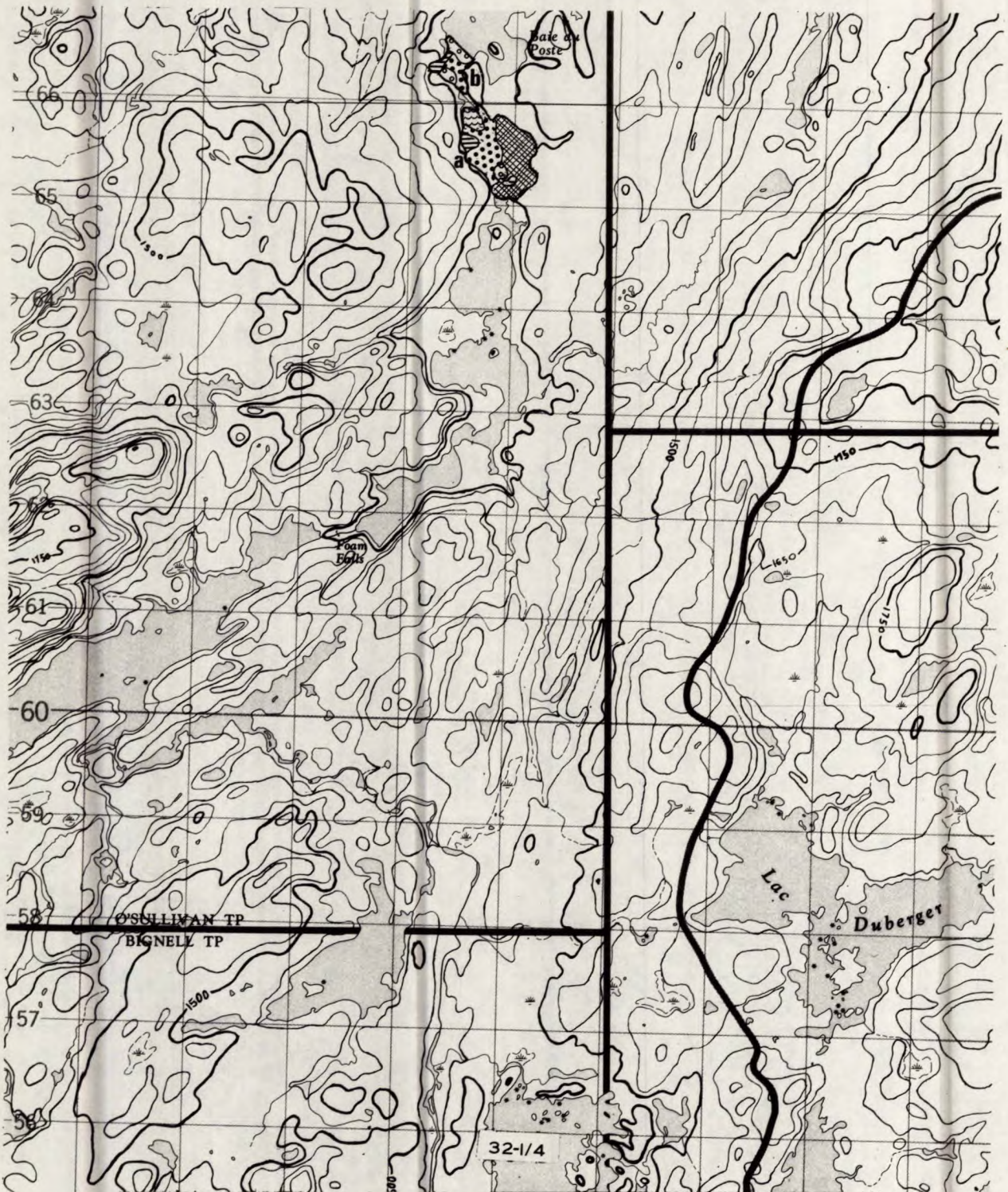


SCALE 1:50,000

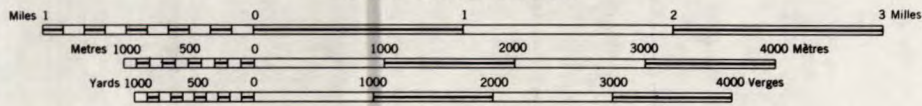
1.25 inches to 1 mile approximately

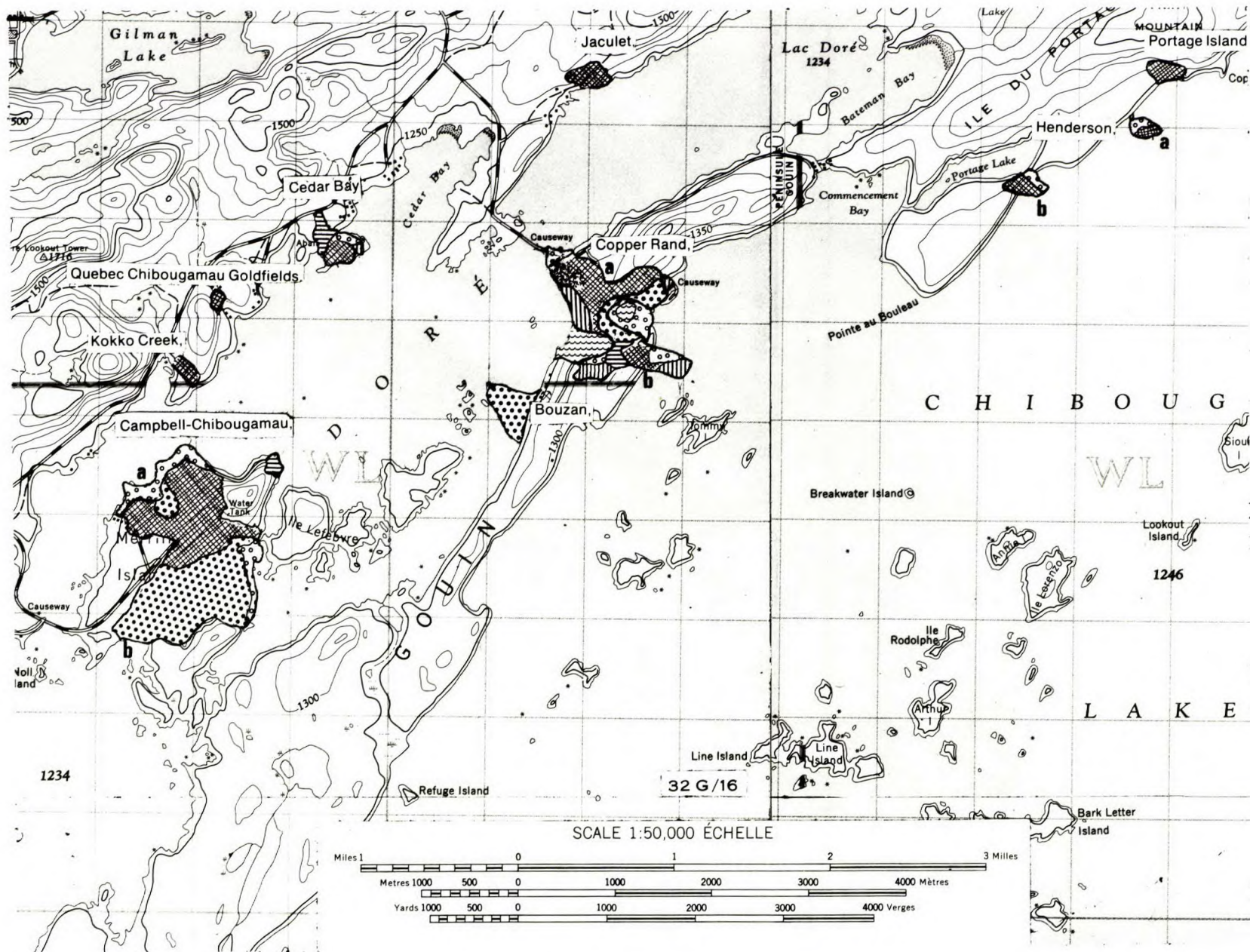


MAP NO. 29

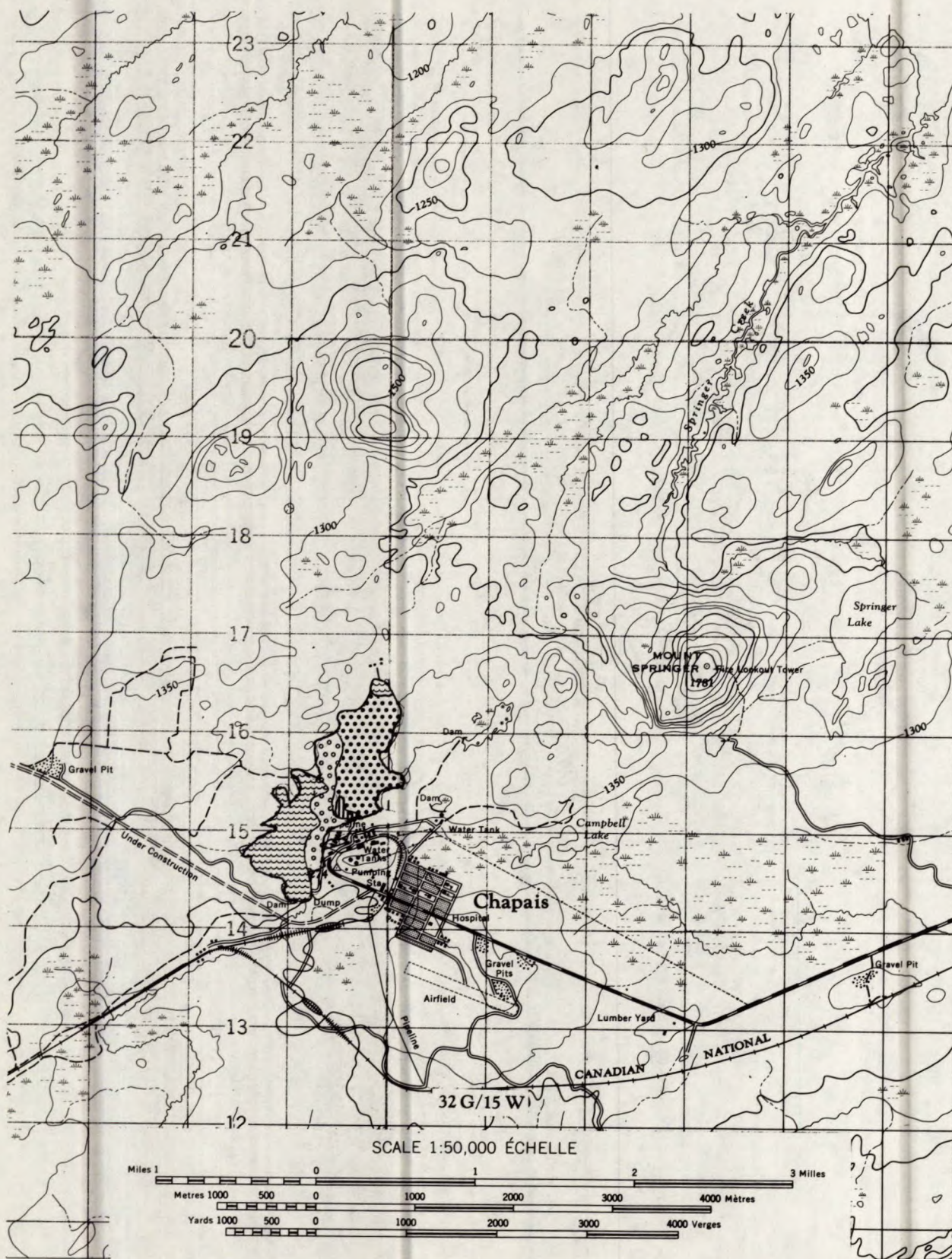


SCALE 1:50,000 ÉCHELLE

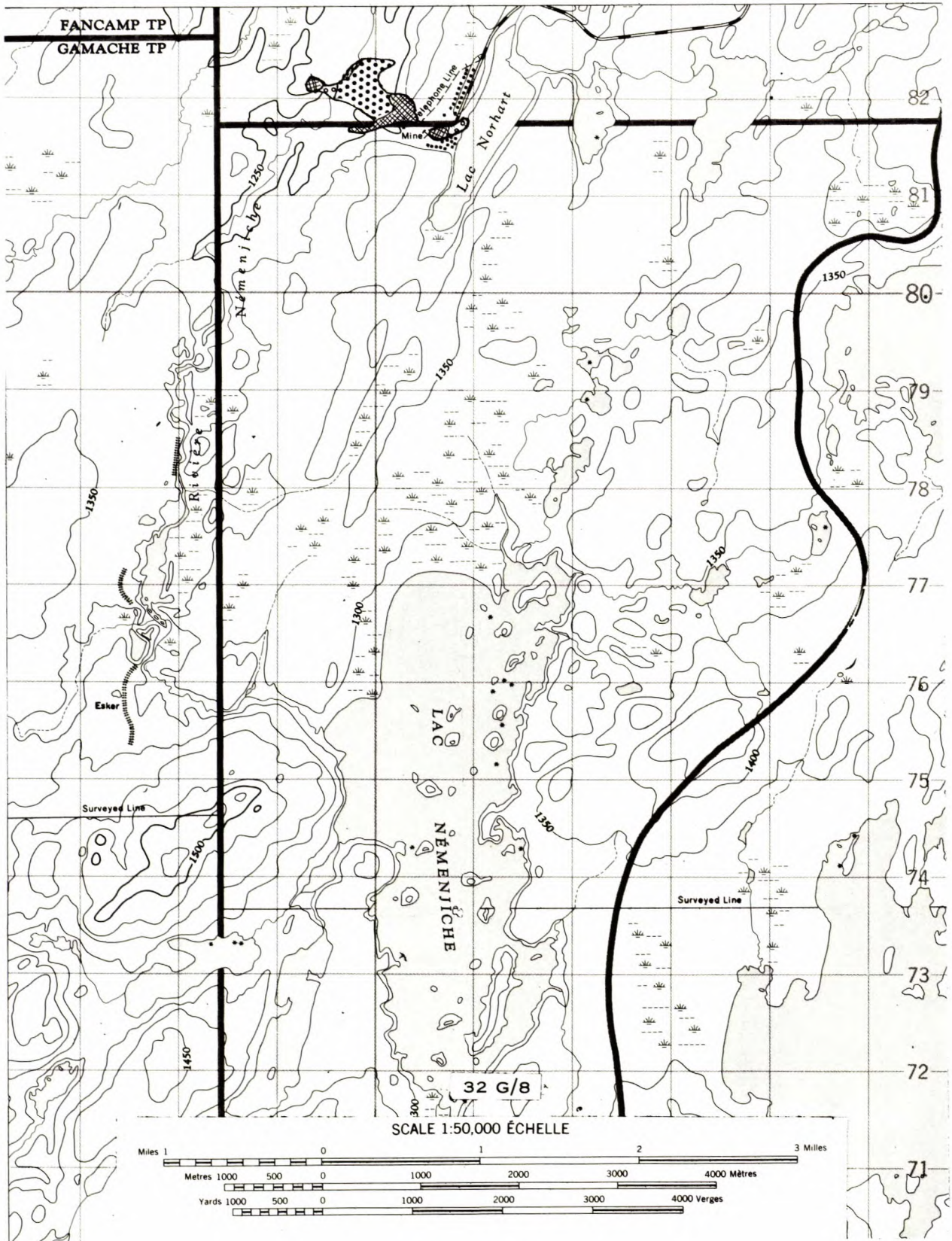




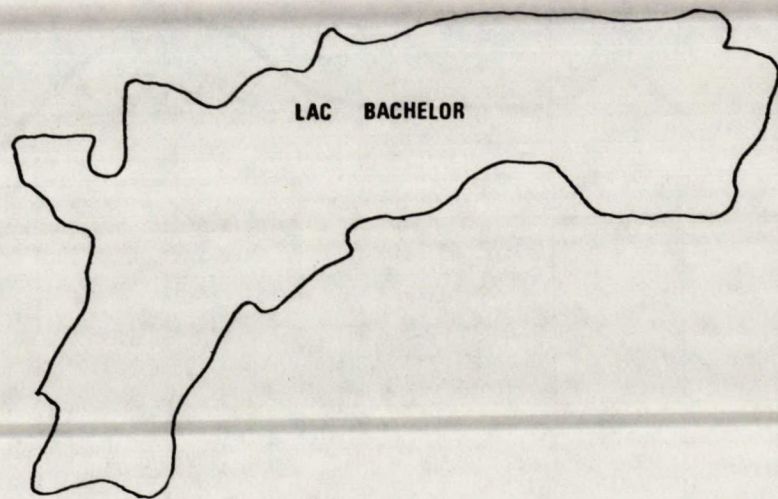
MAP NO. 31



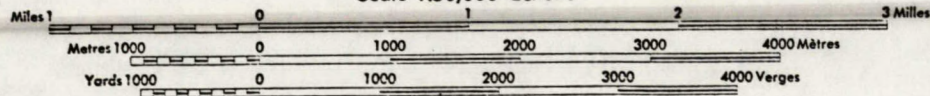
MAP NO. 32



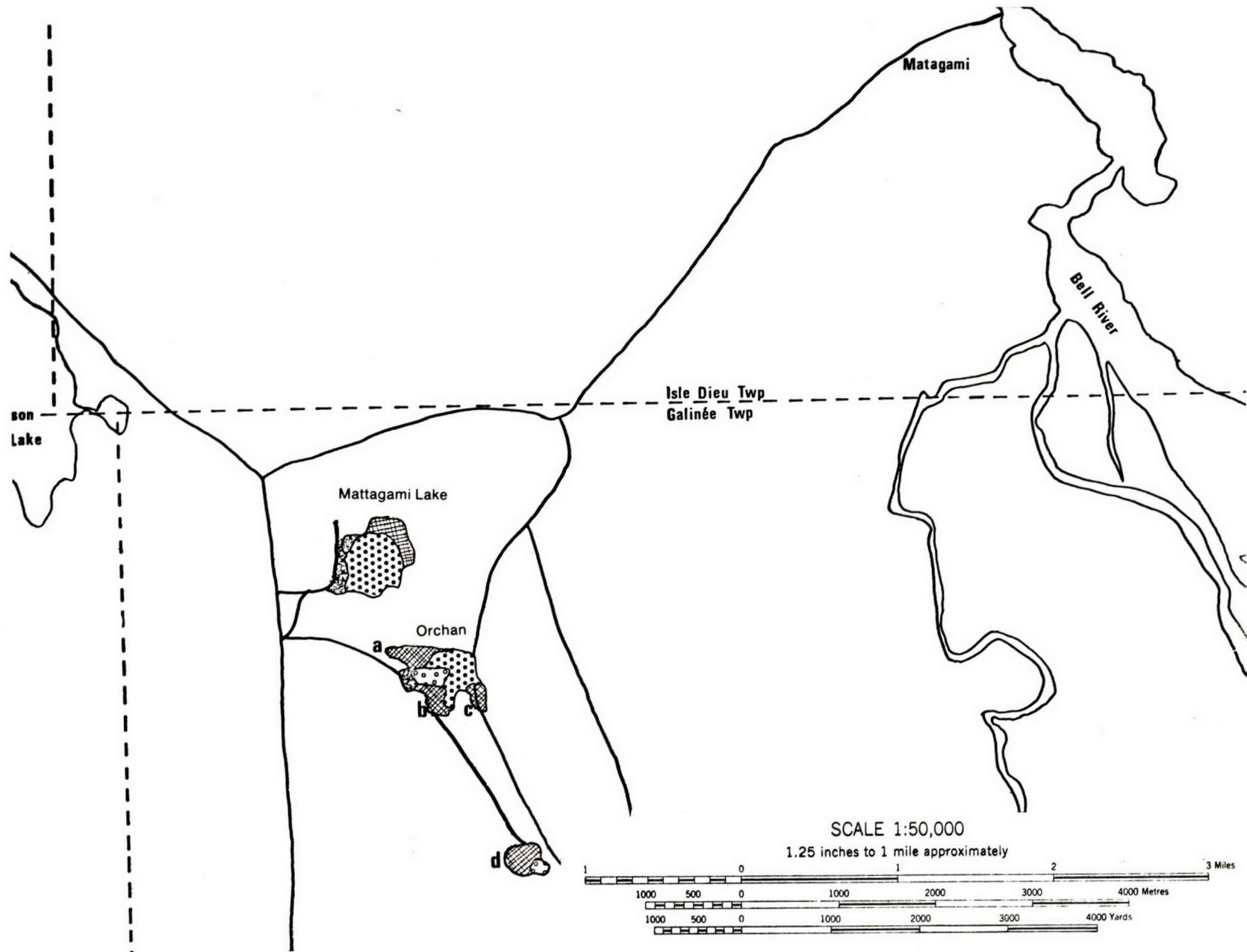
MAP NO. 33



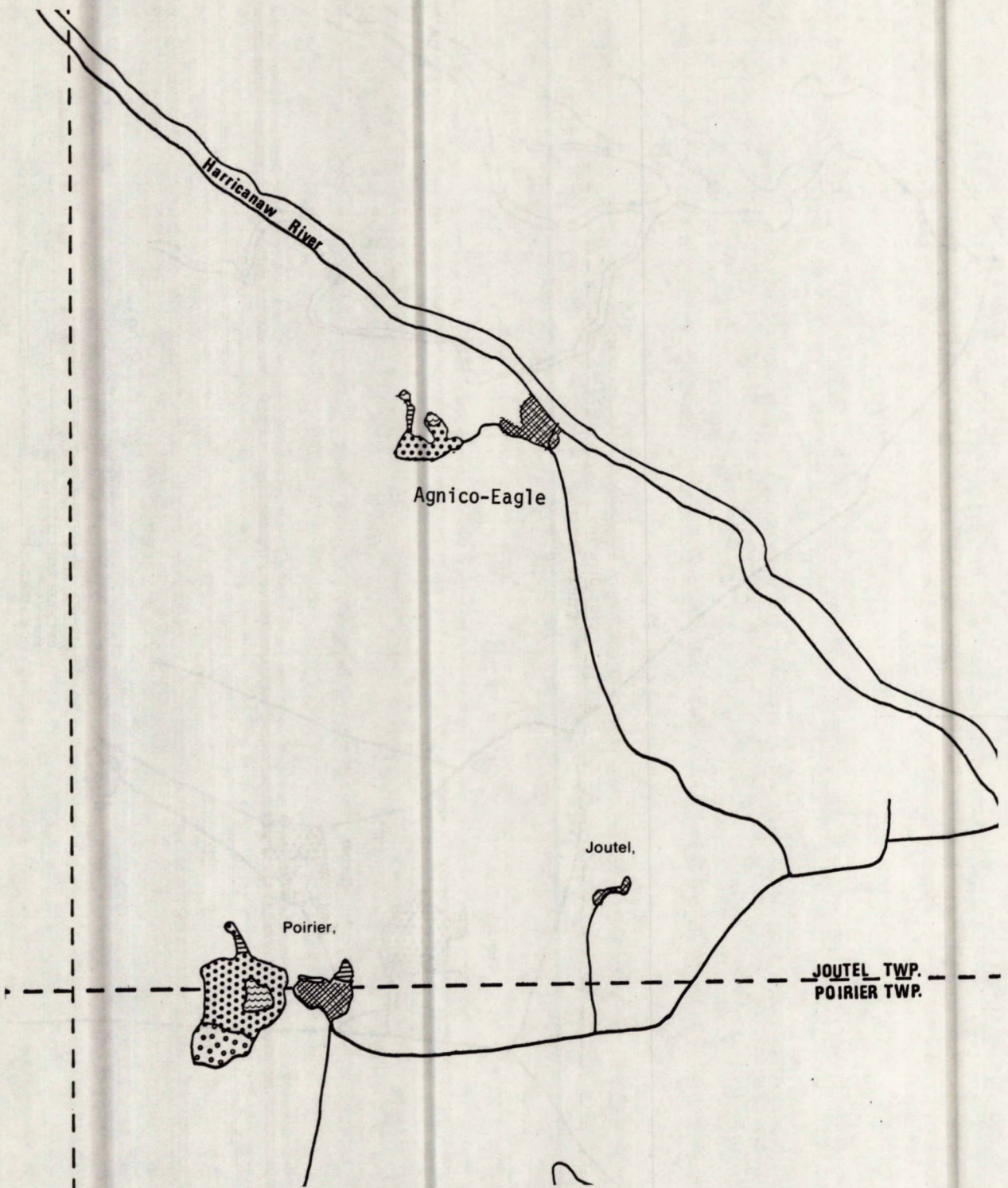
32 F/9
Scale 1:50,000 Échelle



MAP NO. 34



MAP NO. 35



Agnico-Eagle

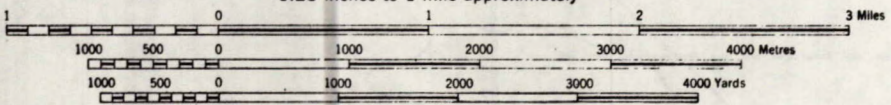
Joutel,

Poirier,

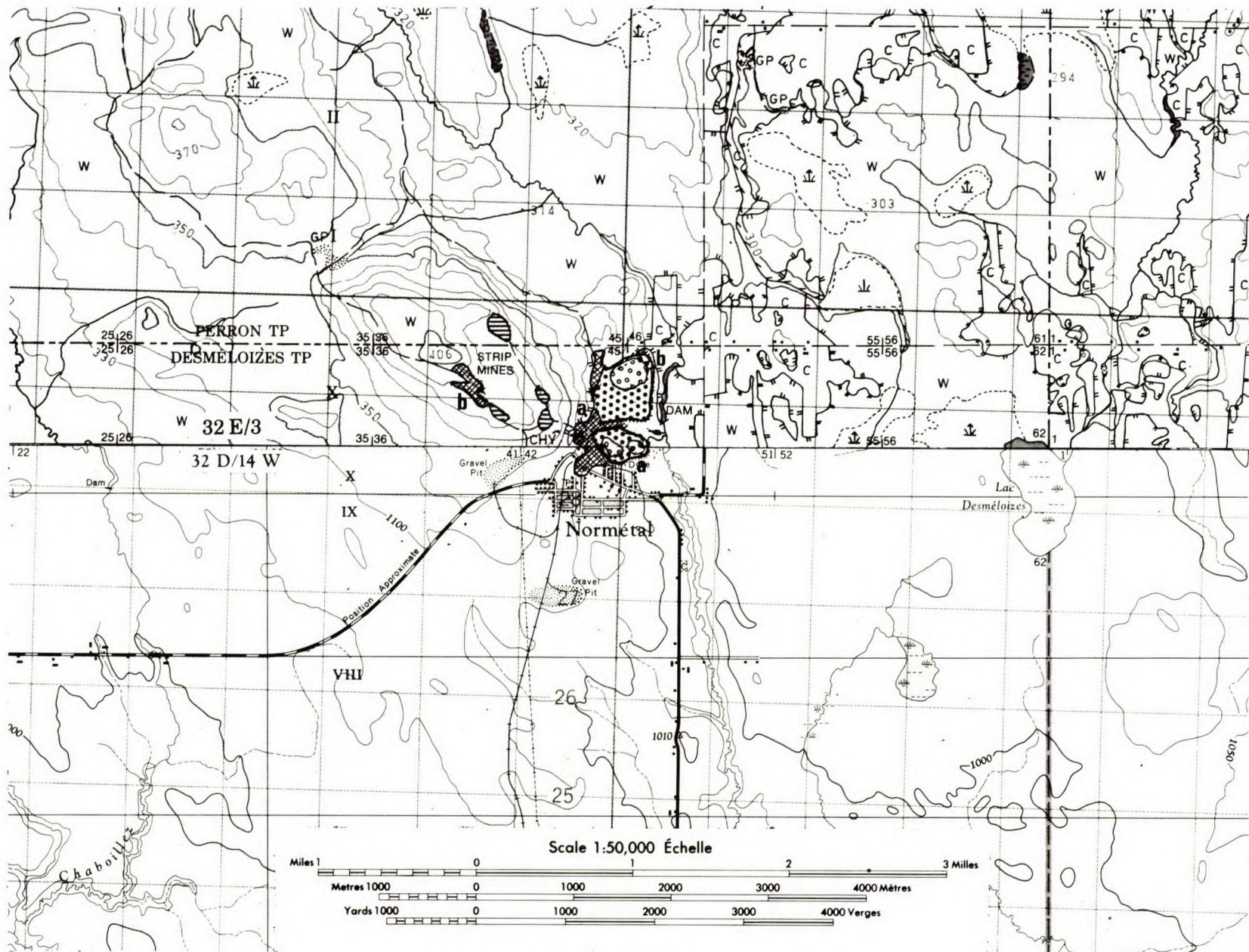
JOUTEL TWP.
POIRIER TWP.

SCALE 1:50,000

1.25 inches to 1 mile approximately



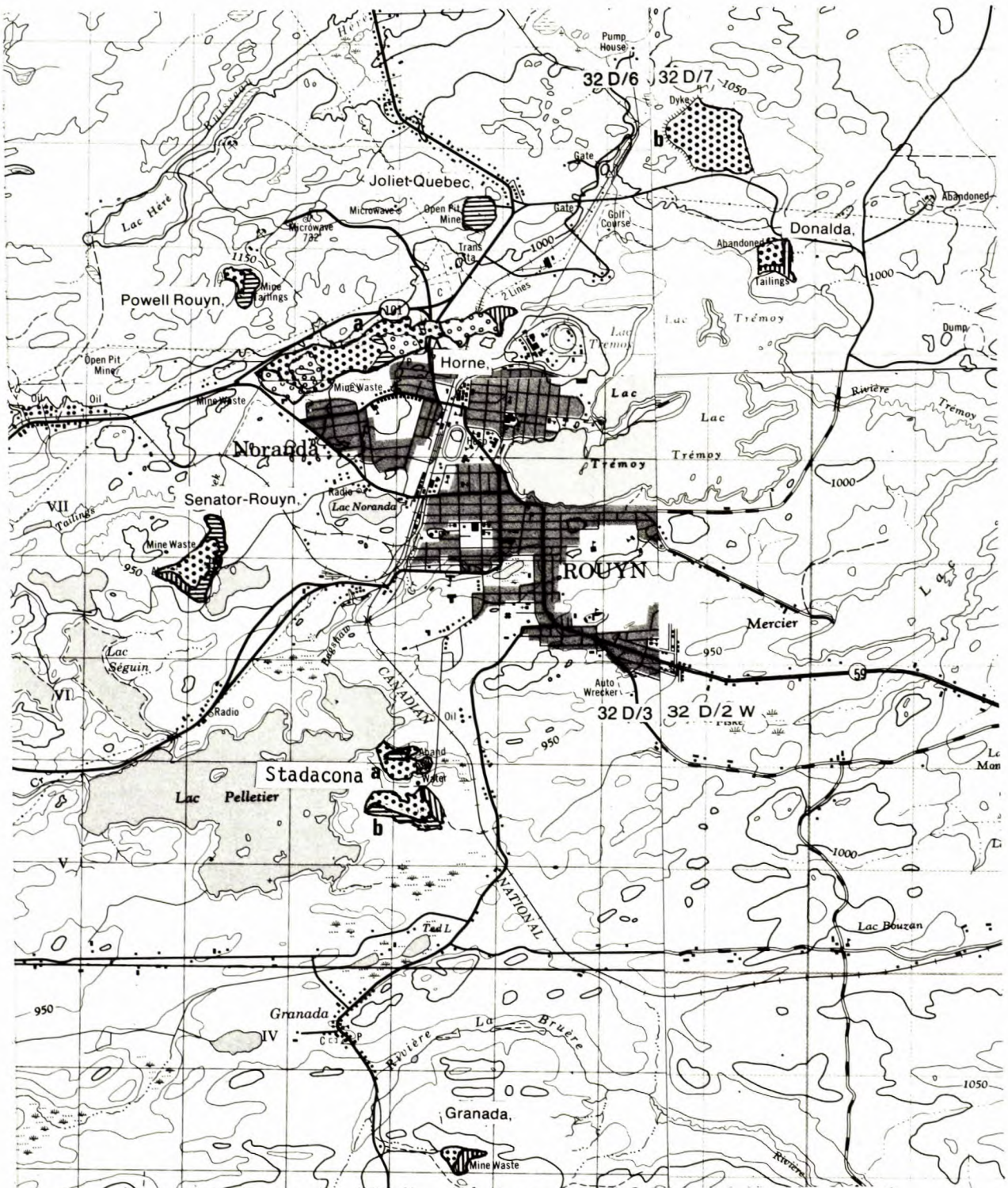
MAP NO. 36



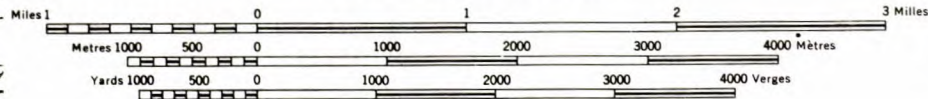
MAP NO. 37



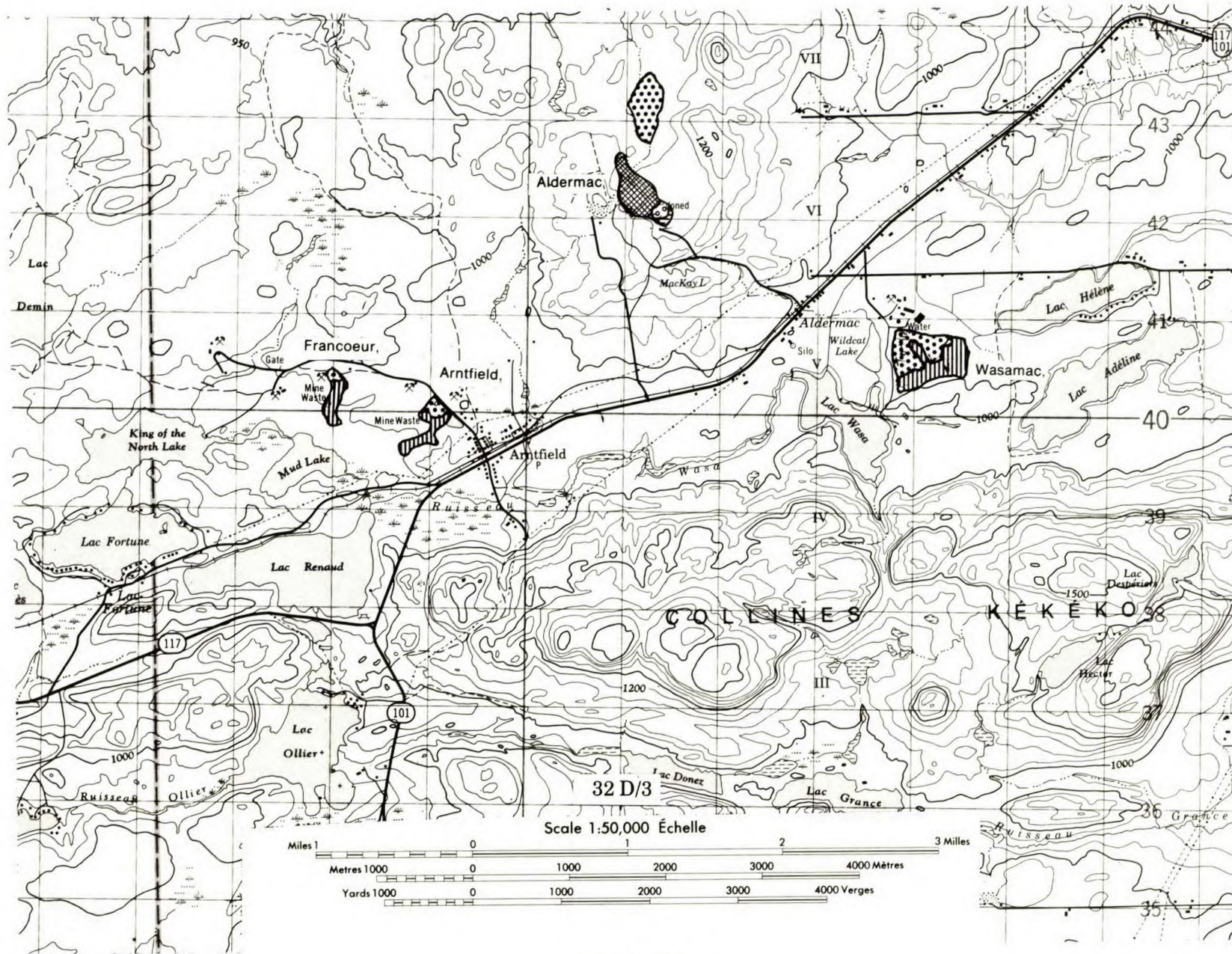
MAP NO. 38



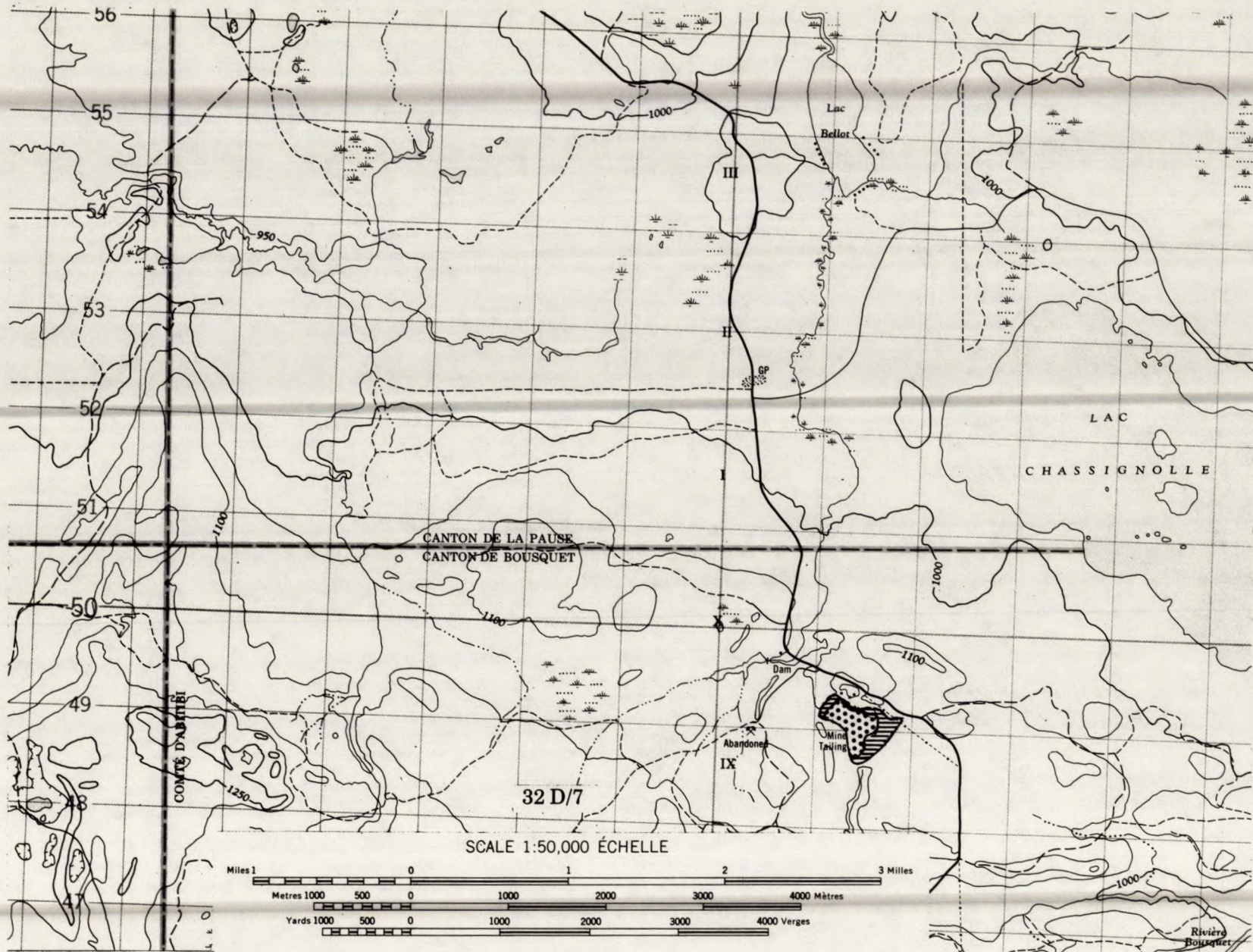
SCALE 1:50,000 ÉCHELLE



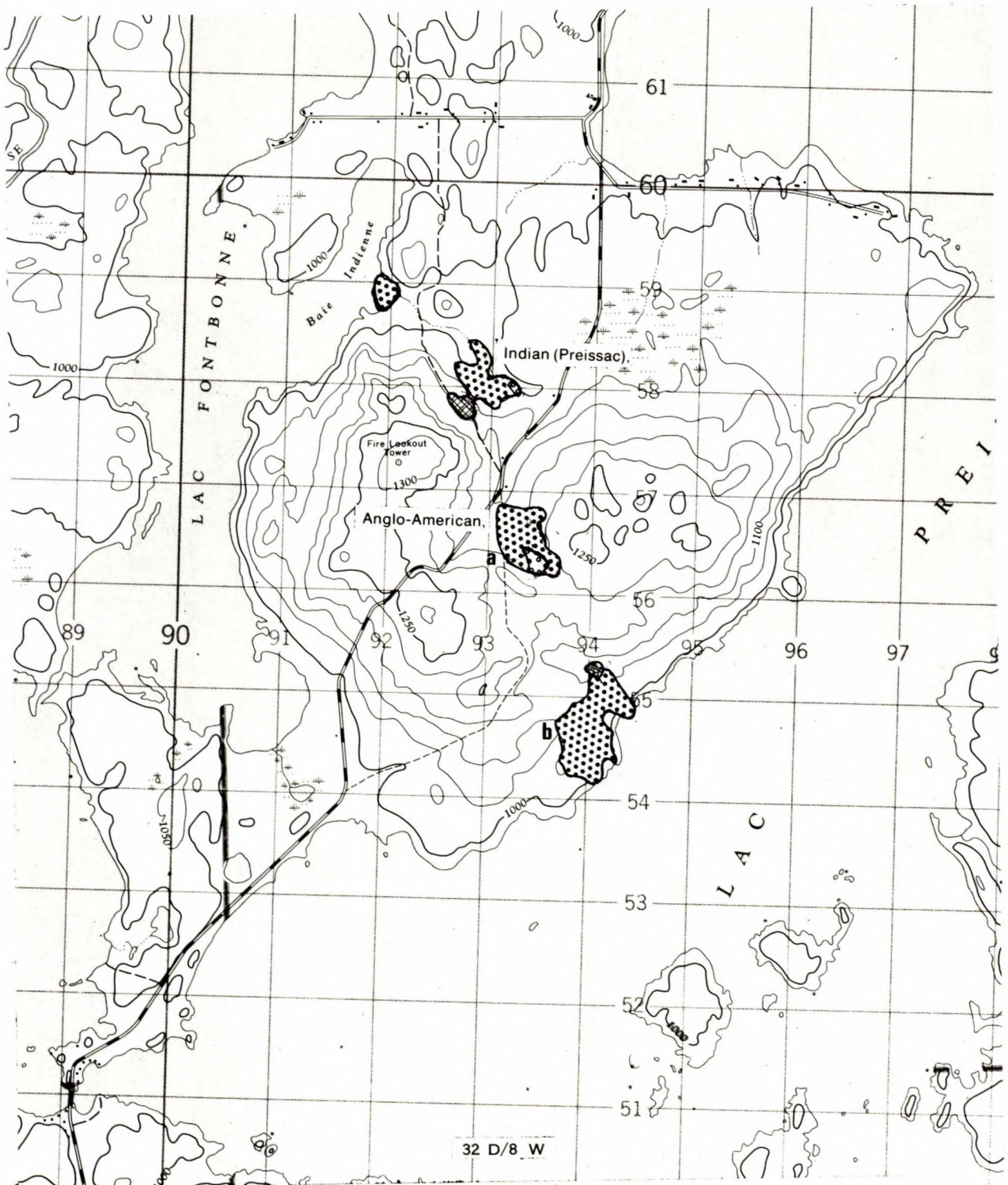
MAP NO. 39



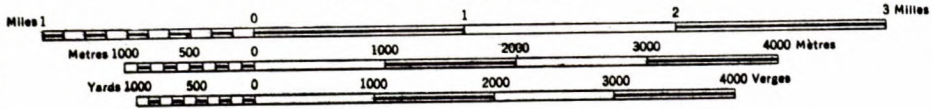
MAP NO. 41

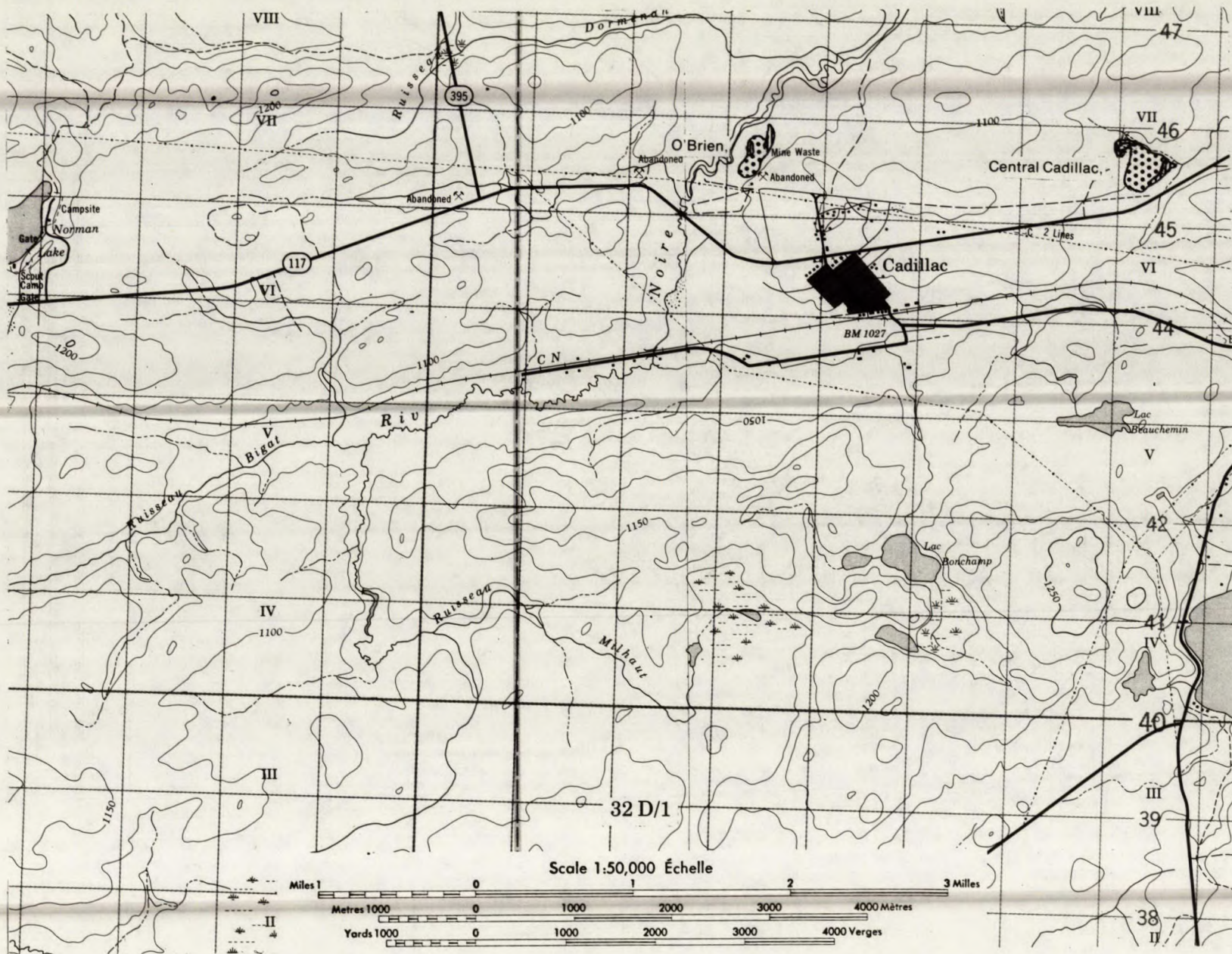


MAP NO. 42

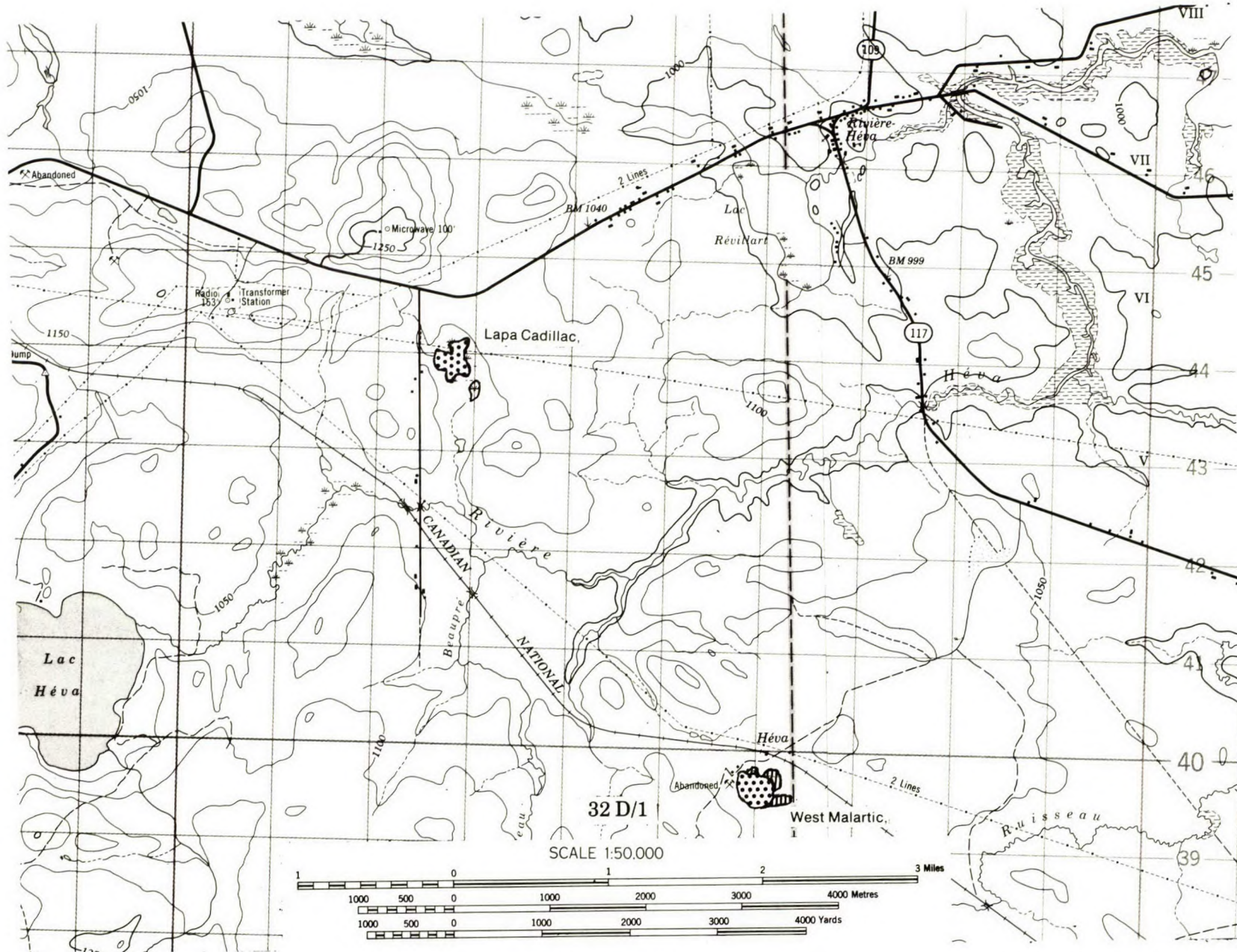


SCALE 1:50,000 ÉCHELLE

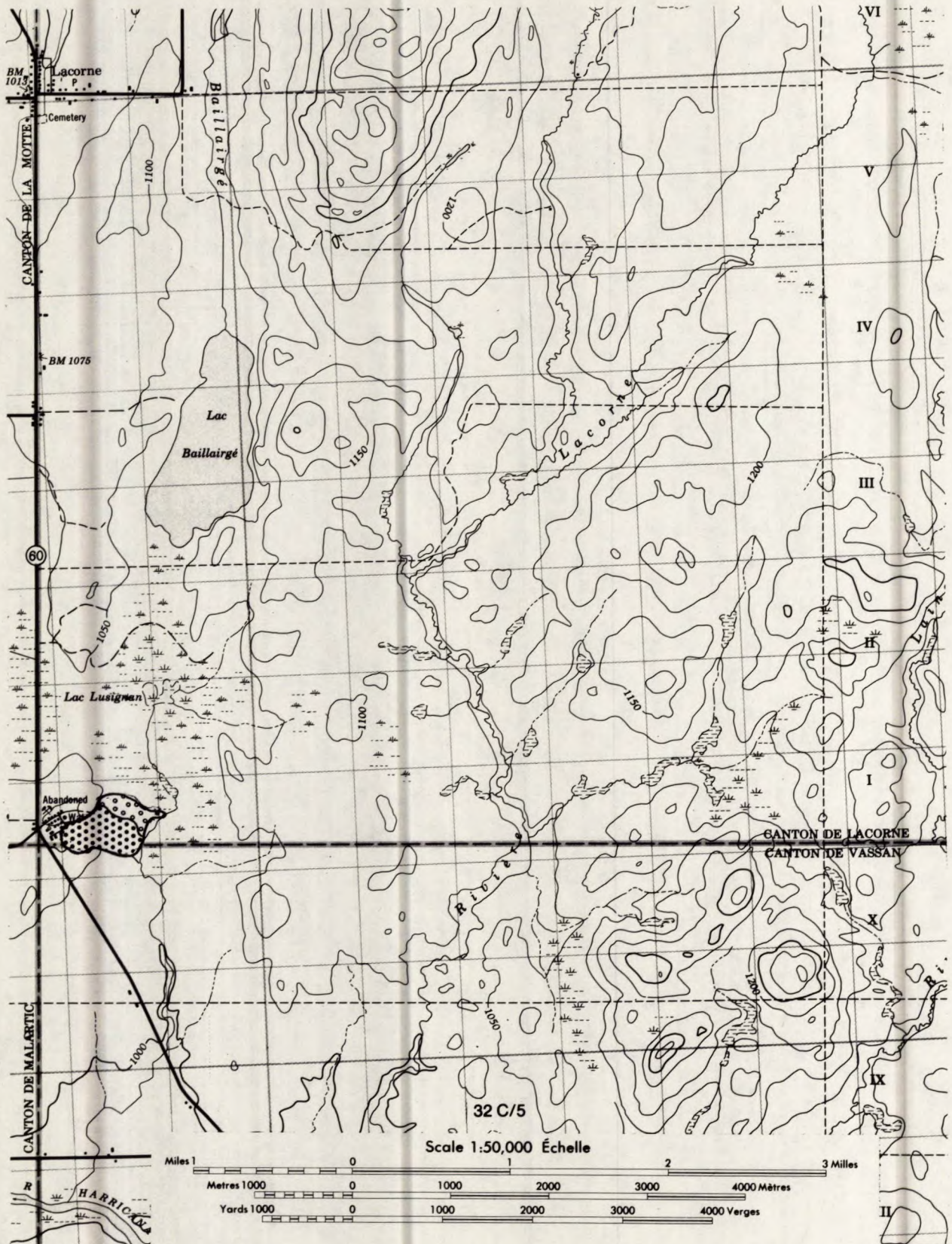




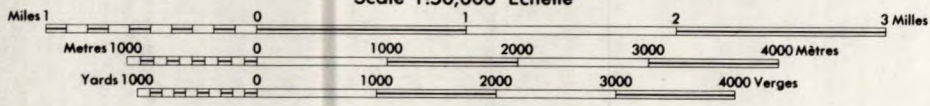
MAP NO. 44



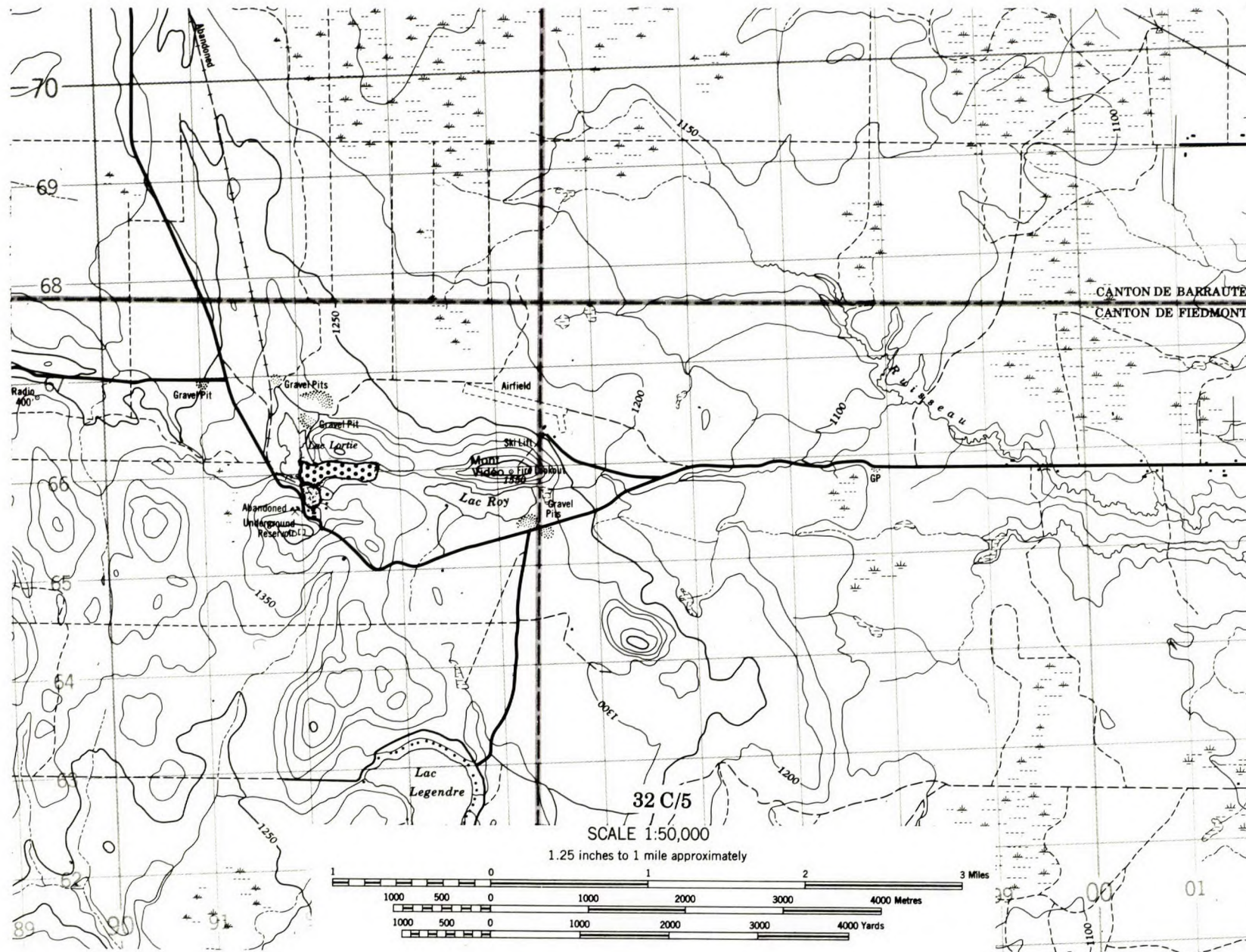
MAP NO. 45



Scale 1:50,000 Échelle



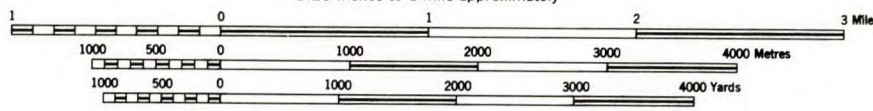
MAP NO. 46



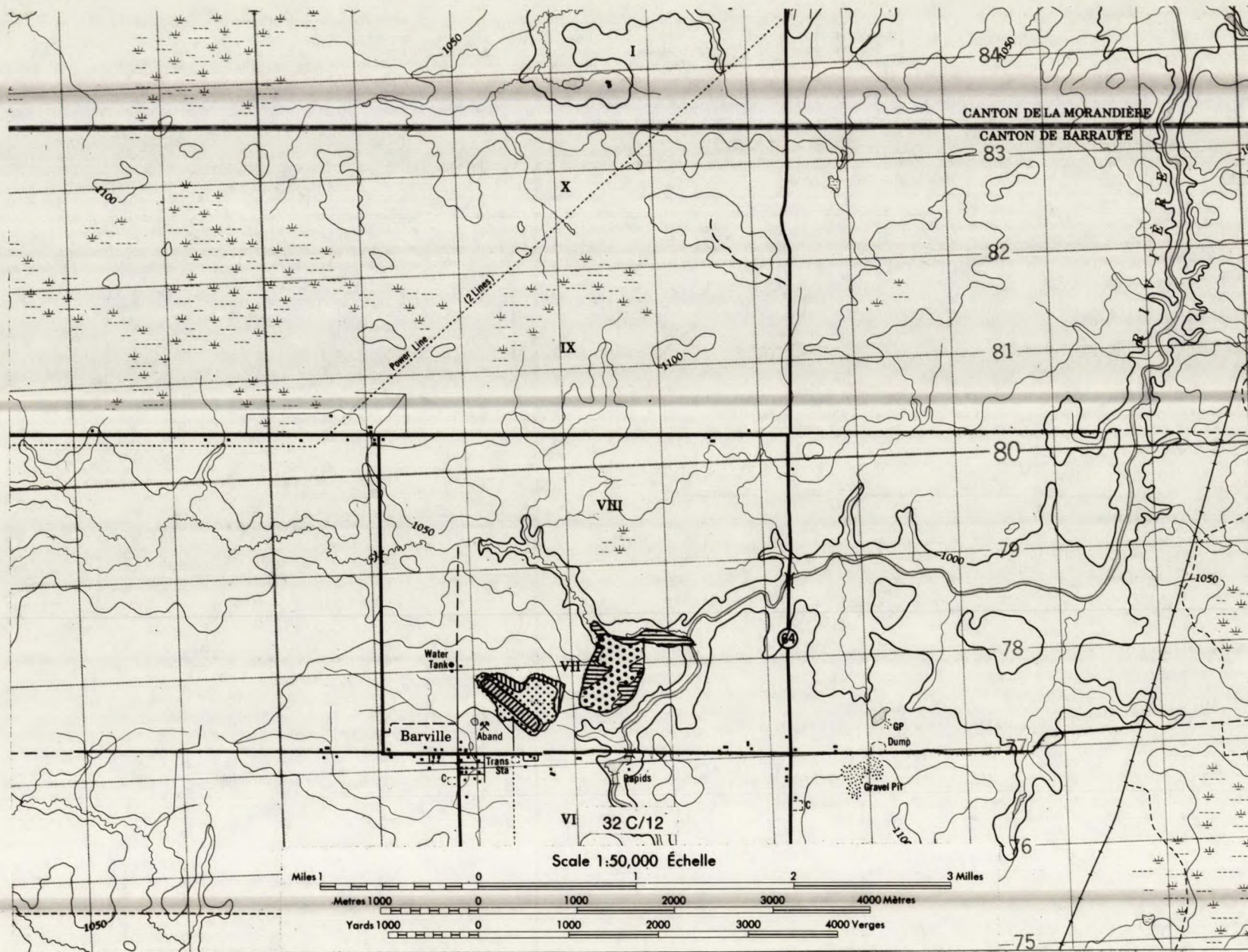
32 C/5

SCALE 1:50,000

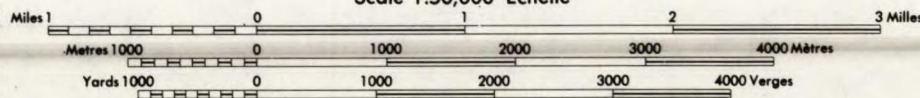
1.25 inches to 1 mile approximately



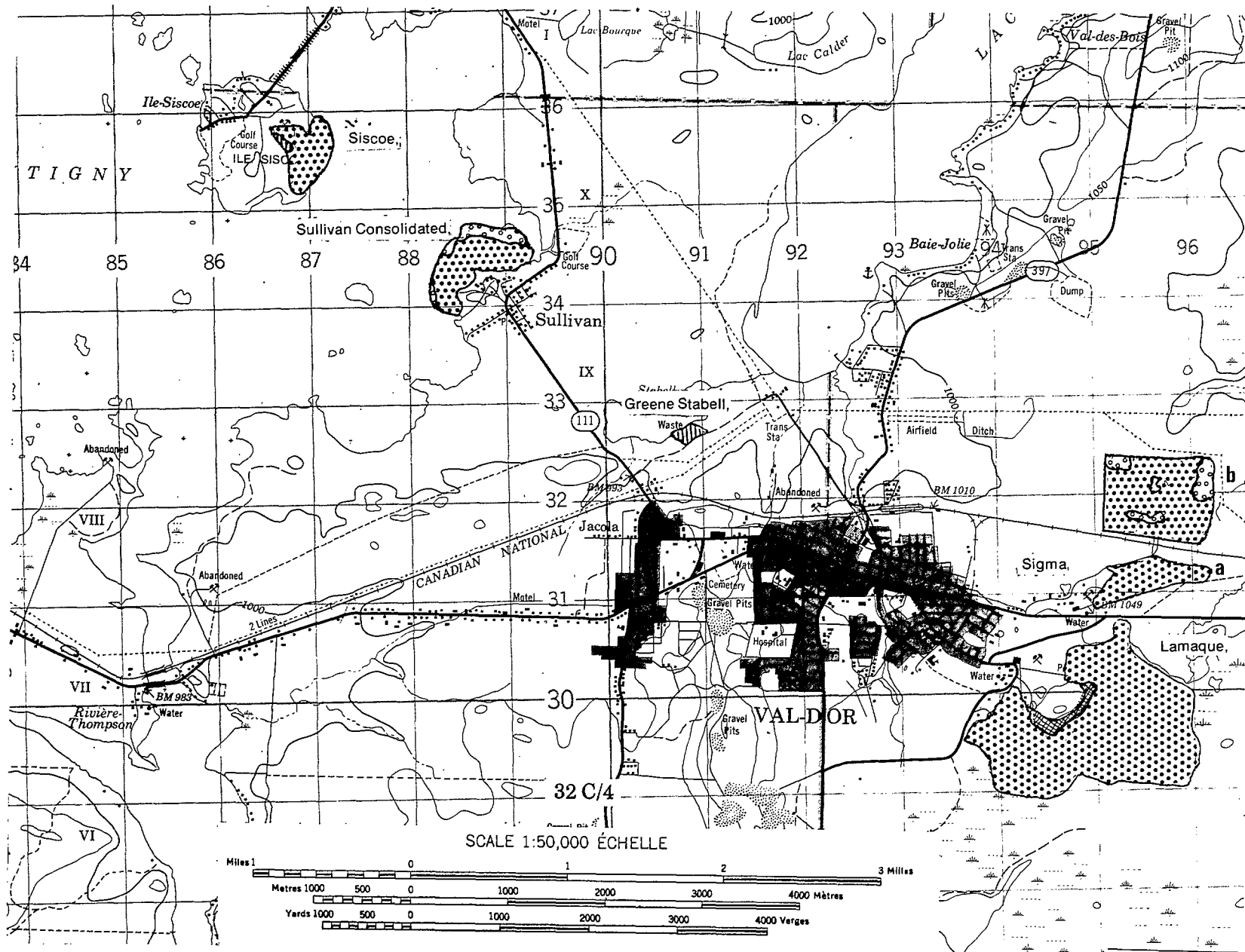
MAP NO. 47



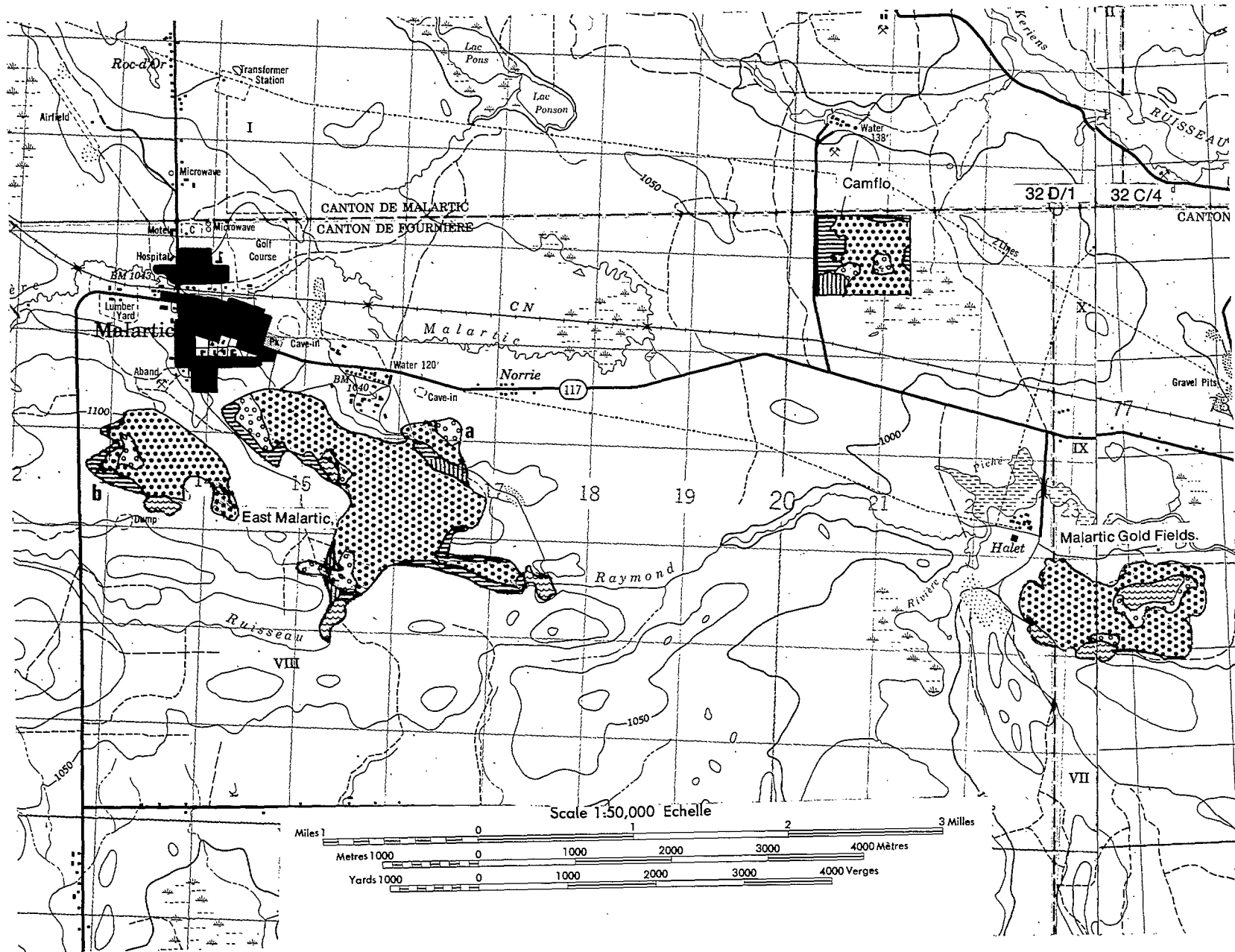
Scale 1:50,000 Échelle



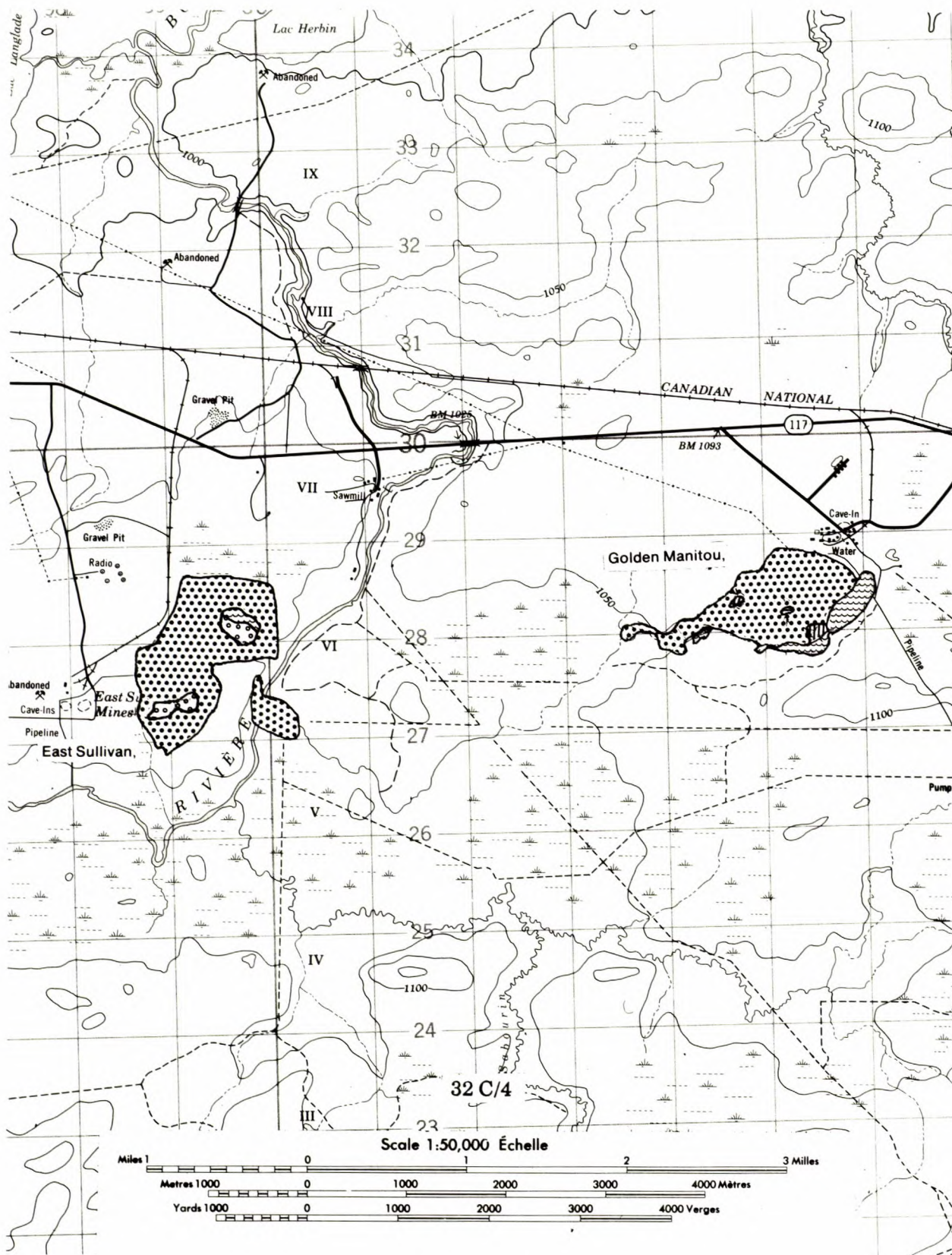
MAP NO. 48



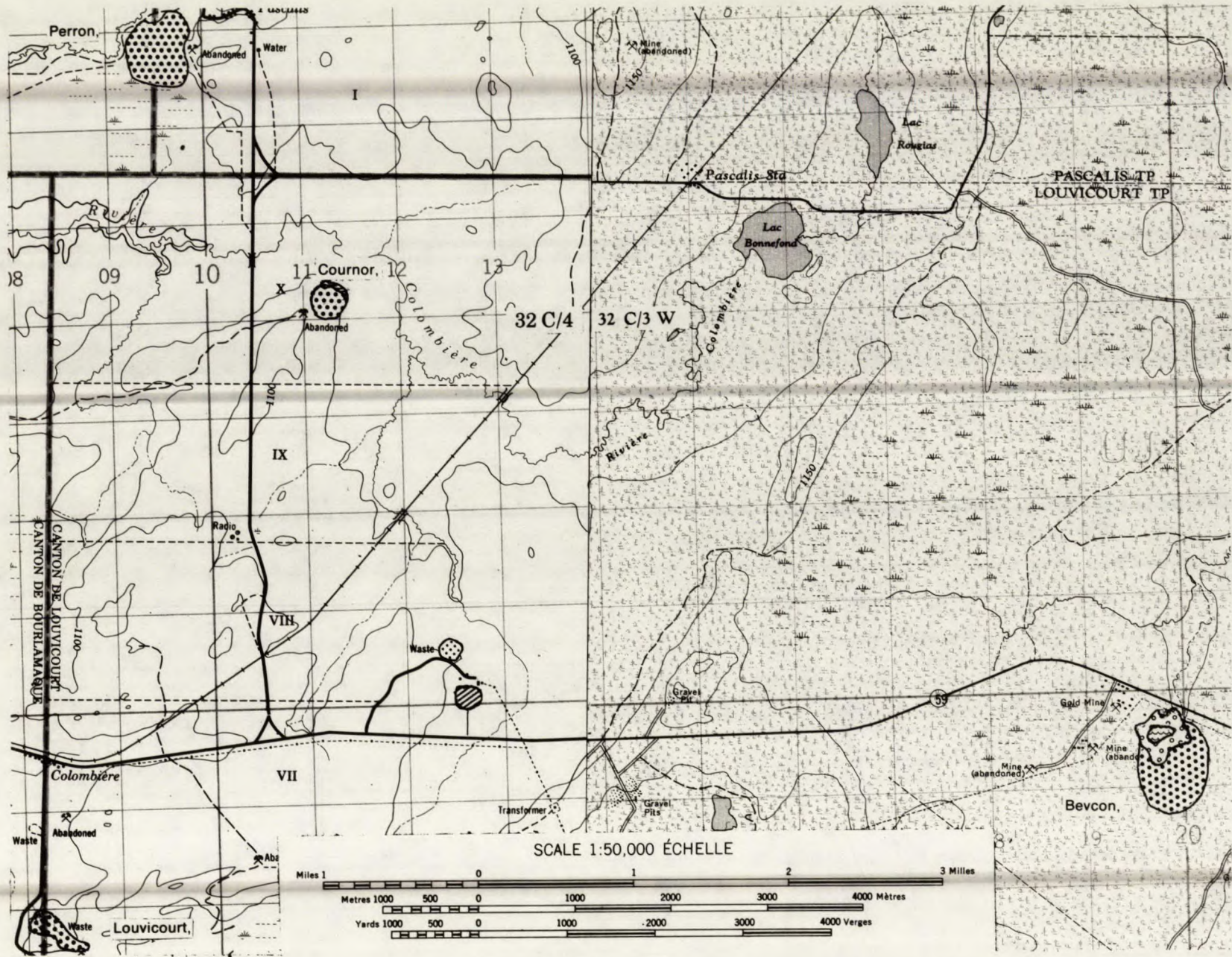
MAP NO. 49



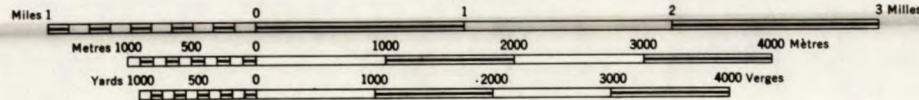
MAP NO. 50



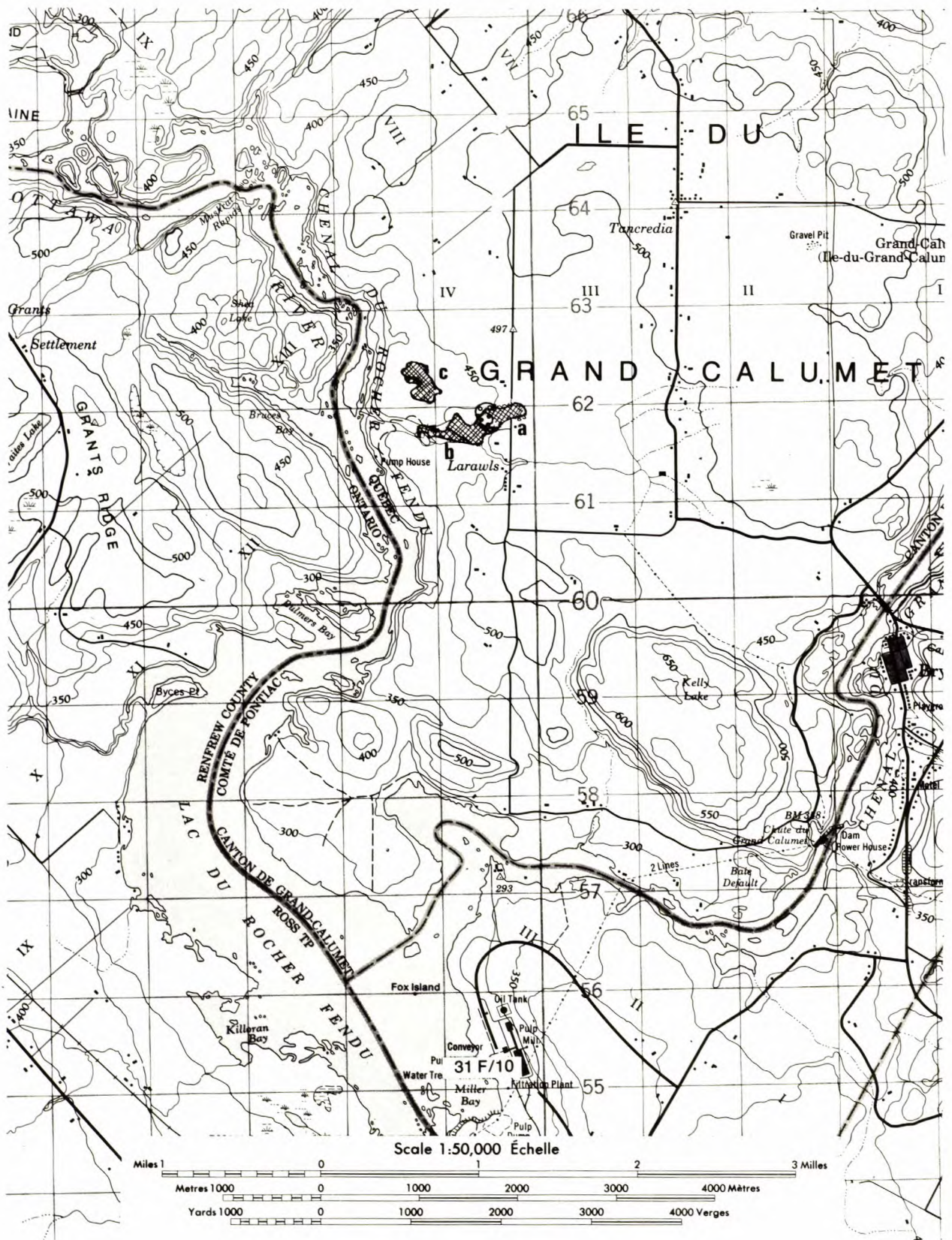
MAP NO. 51



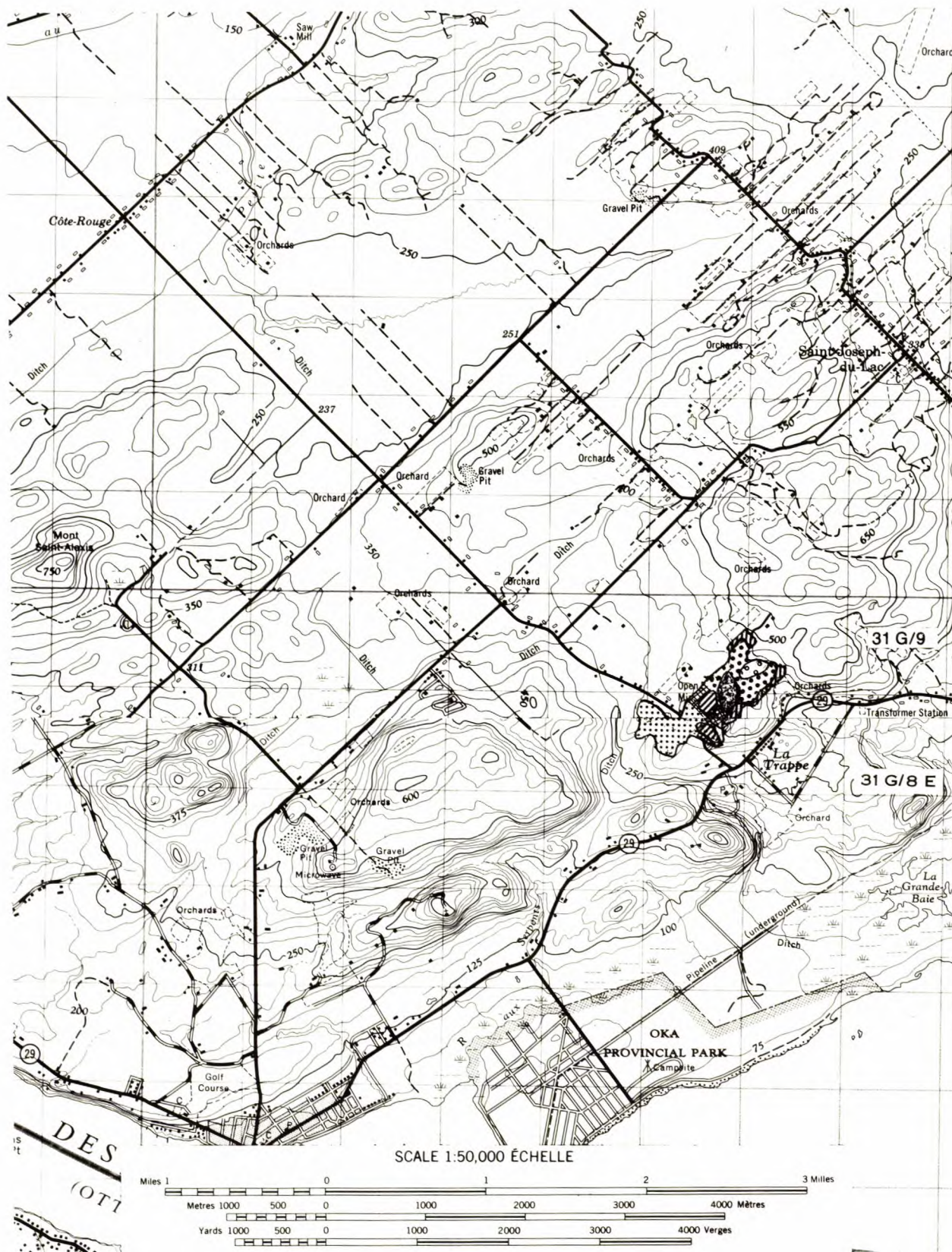
SCALE 1:50,000 ÉCHELLE



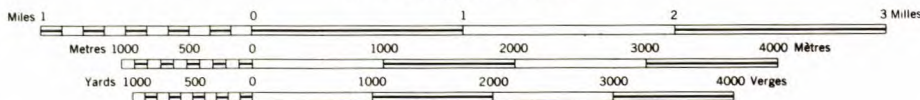
MAP NO. 52

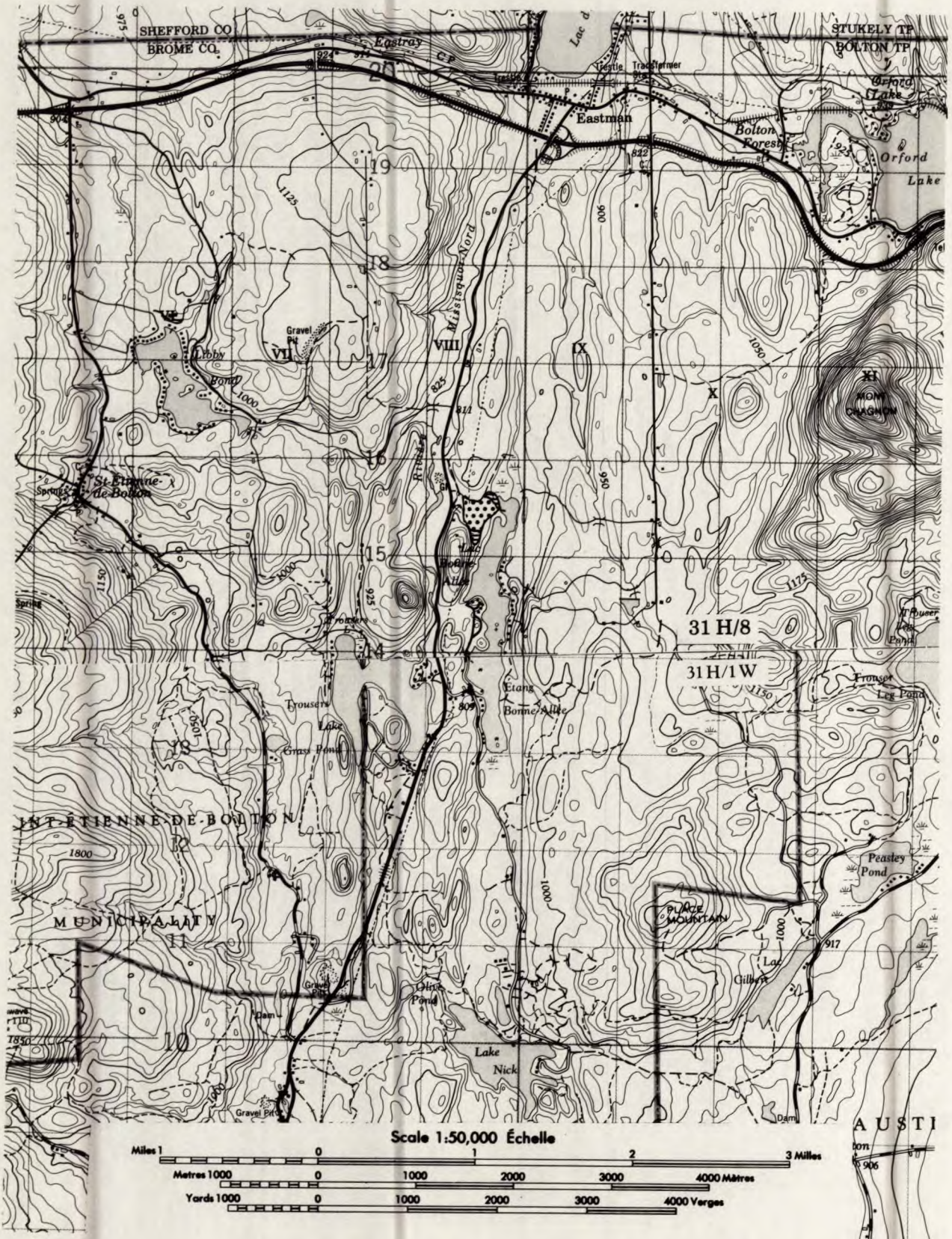


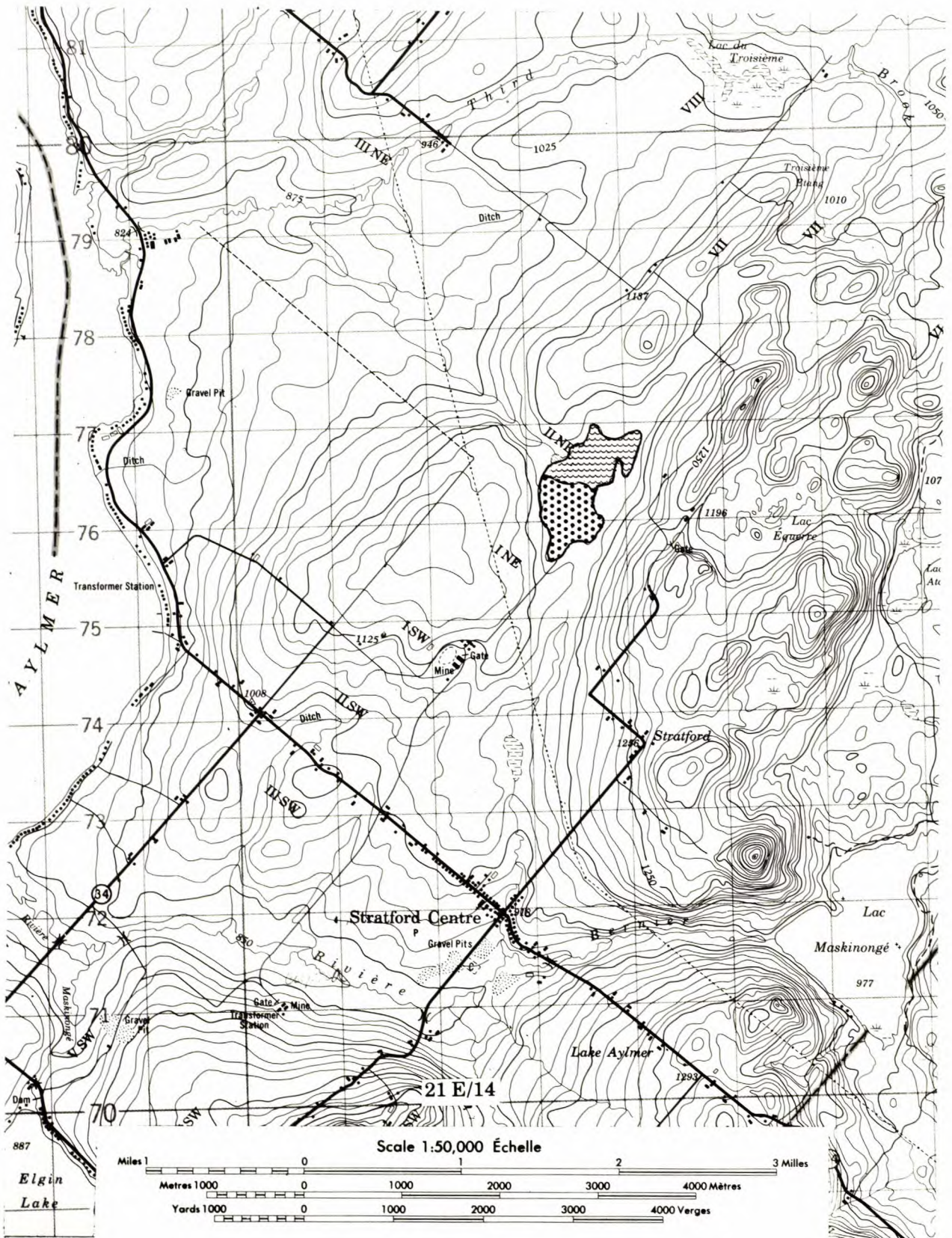
MAP NO. 55



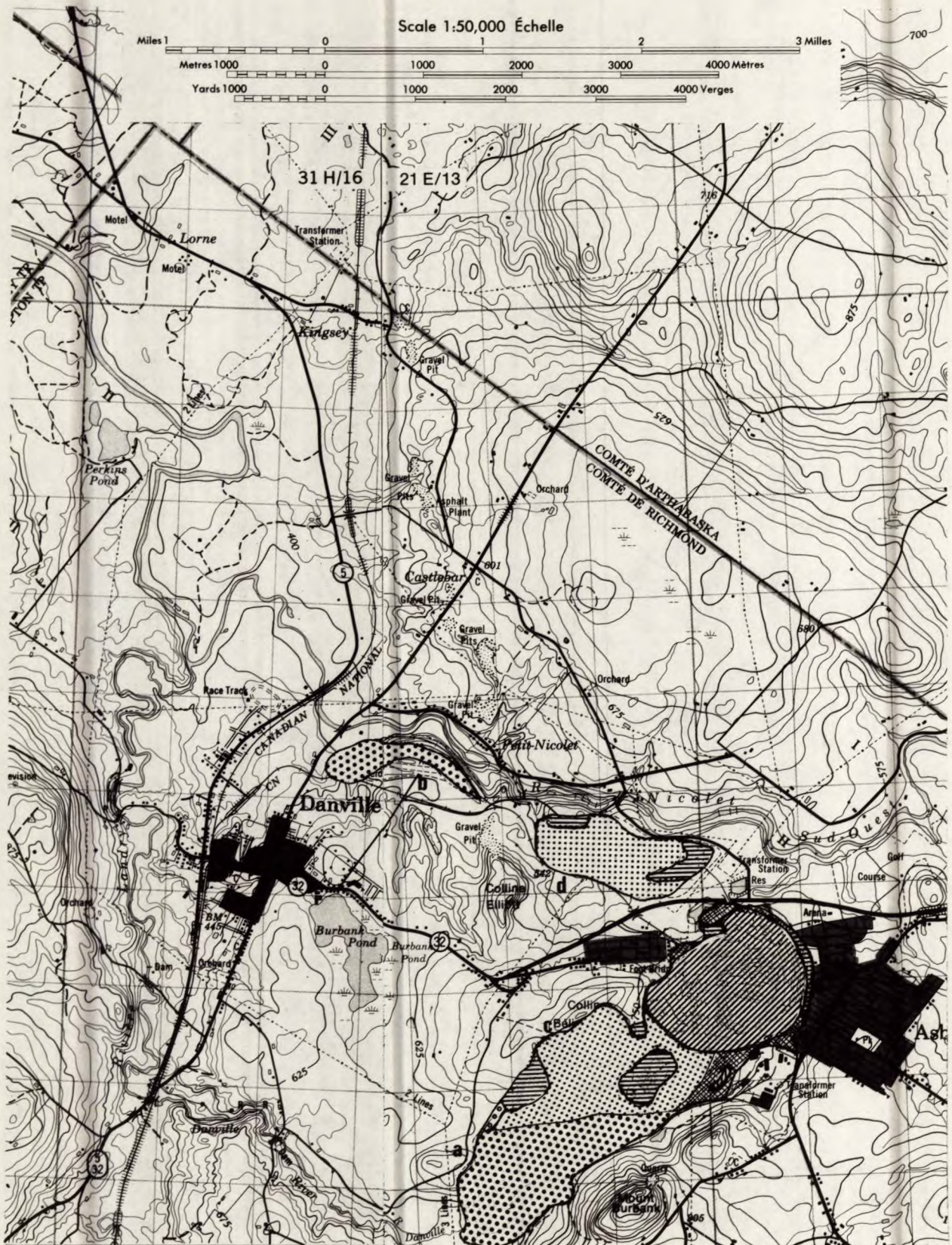
SCALE 1:50,000 ÉCHELLE



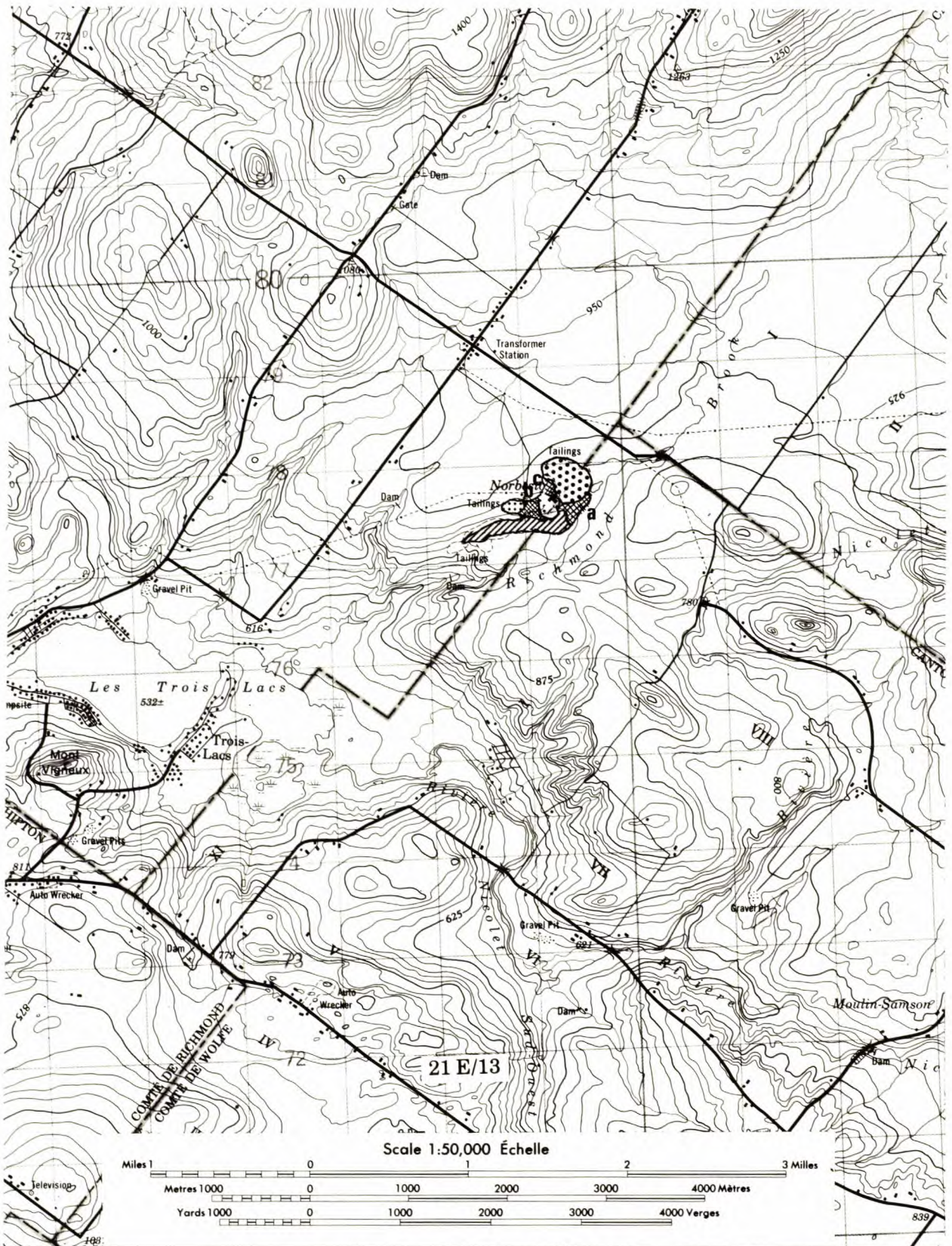




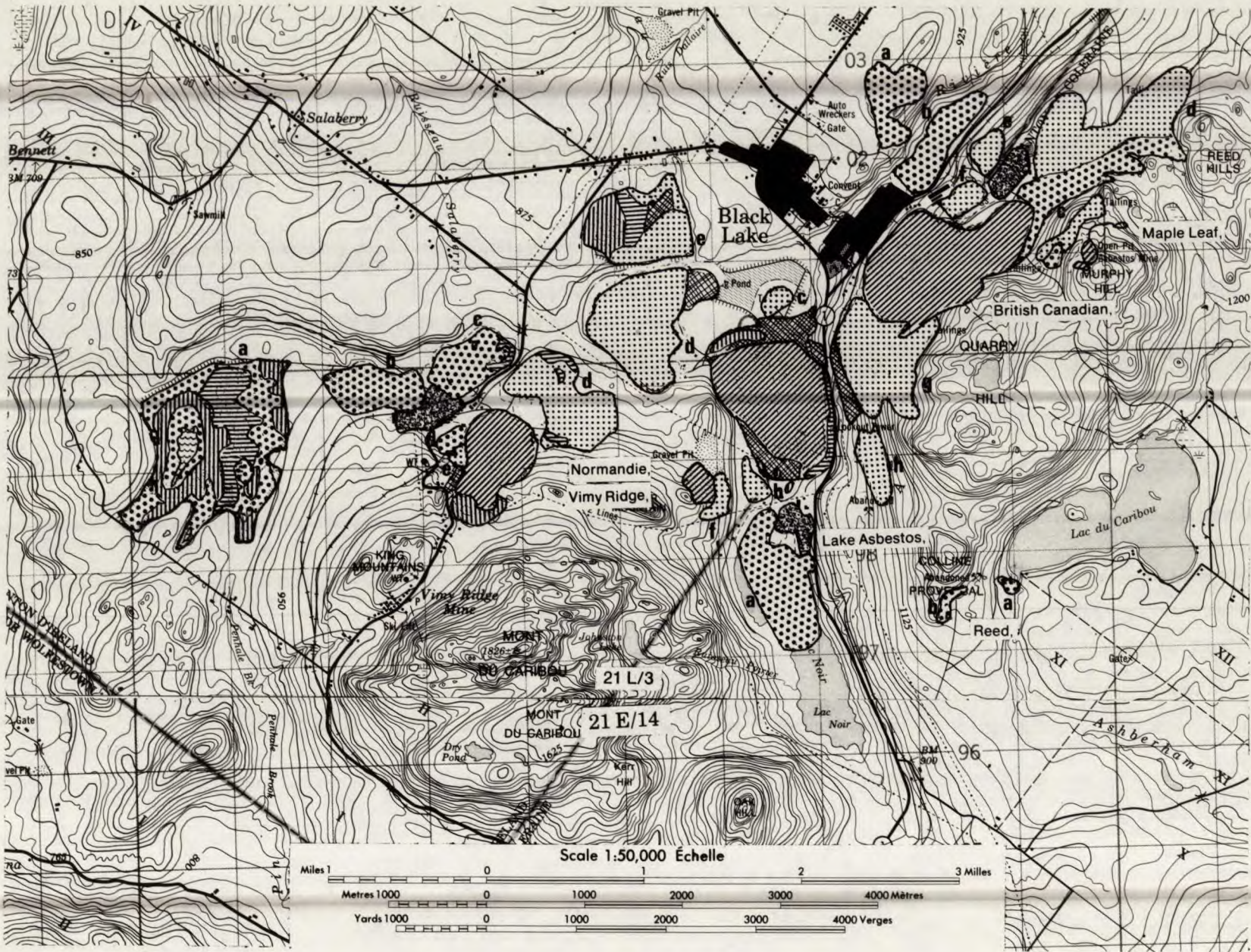
MAP NO. 59



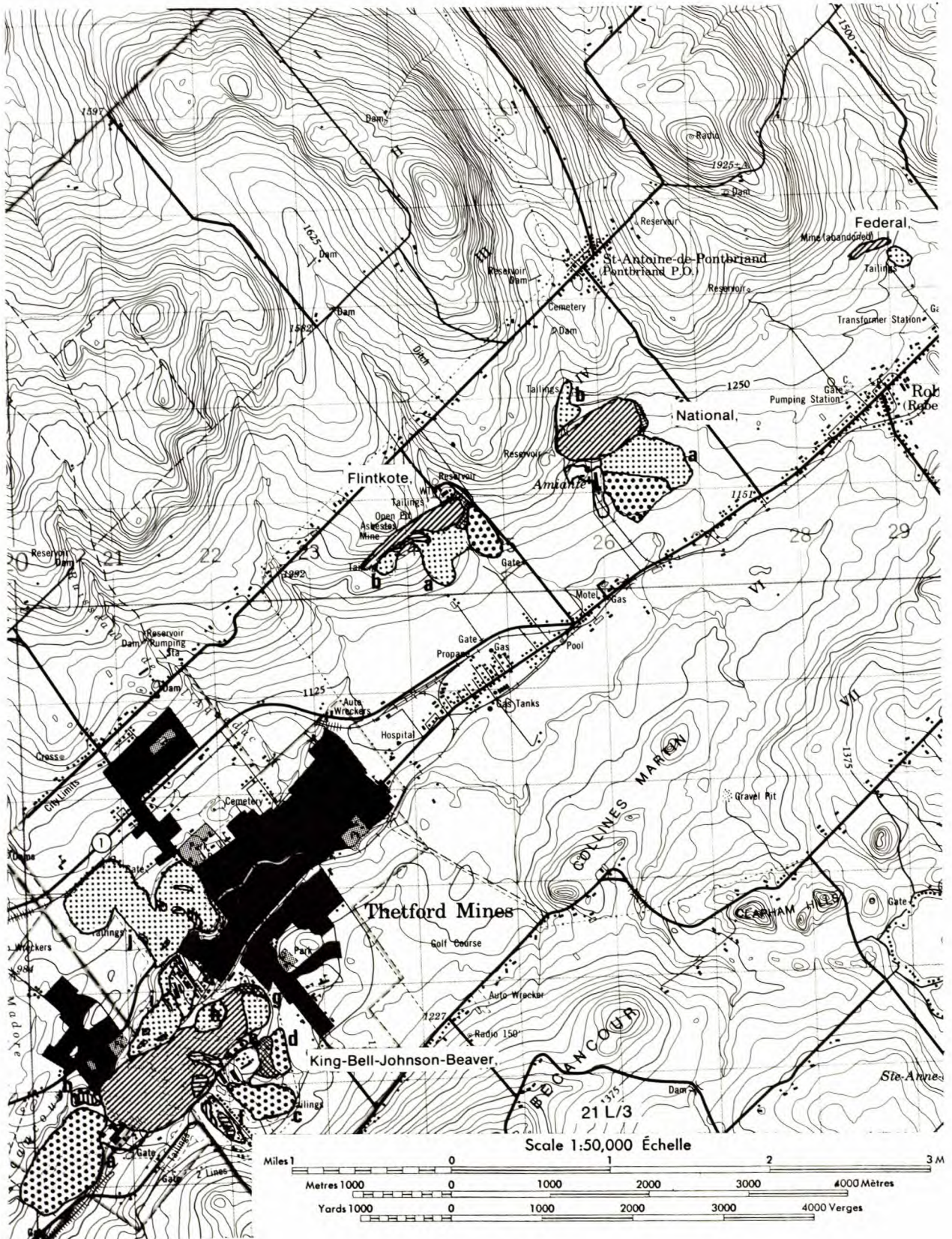
MAP NO. 60



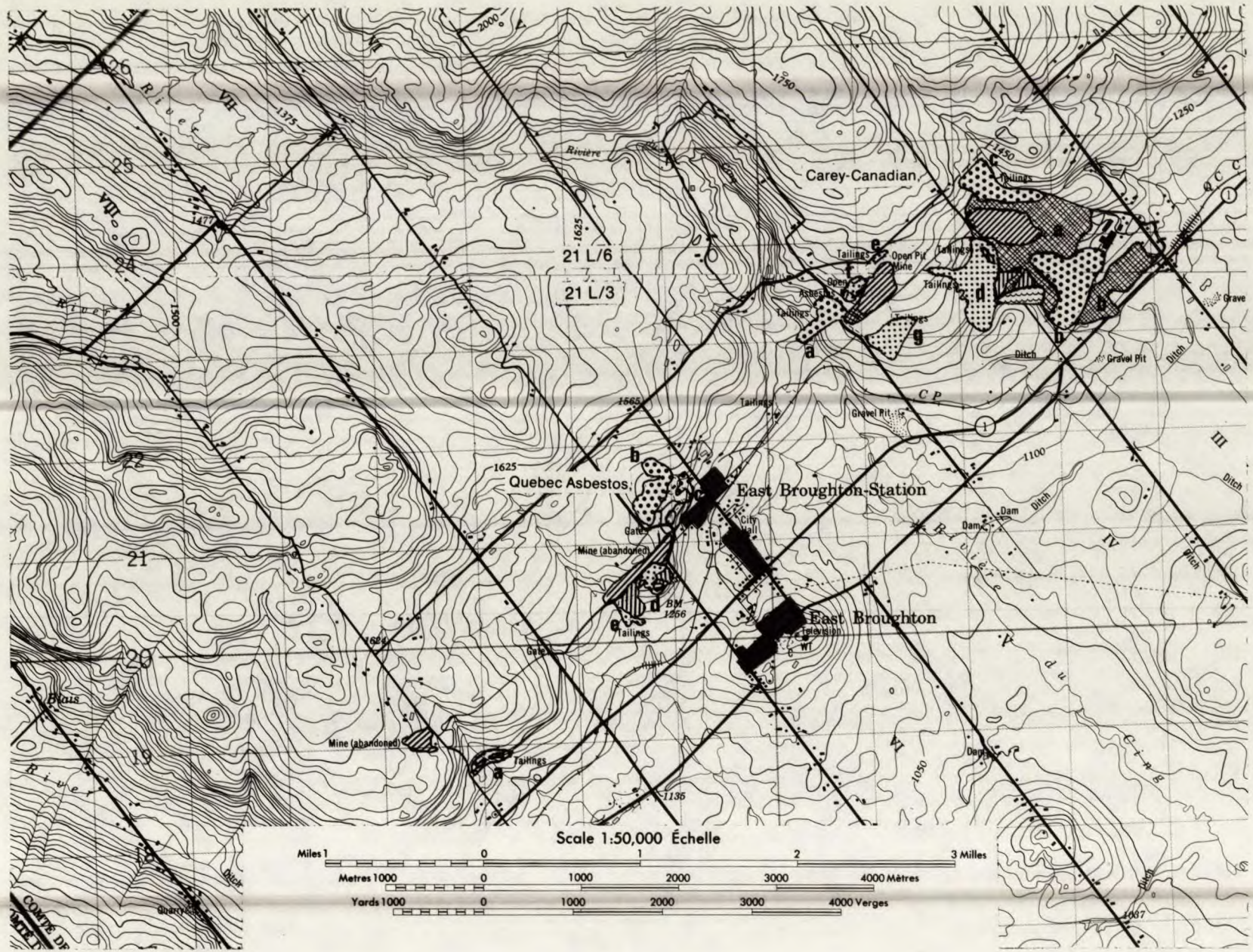
MAP NO. 61



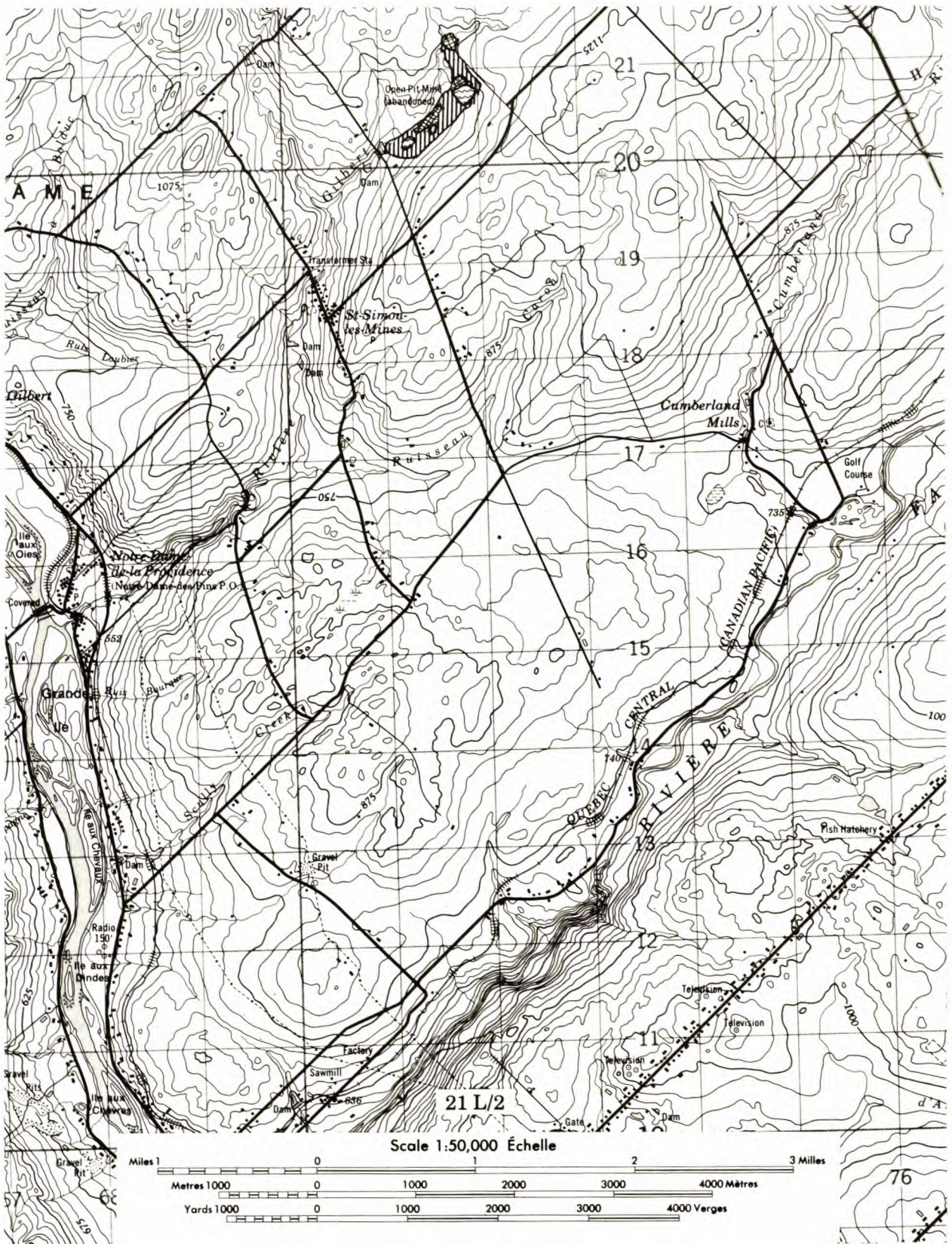
MAP NO. 62



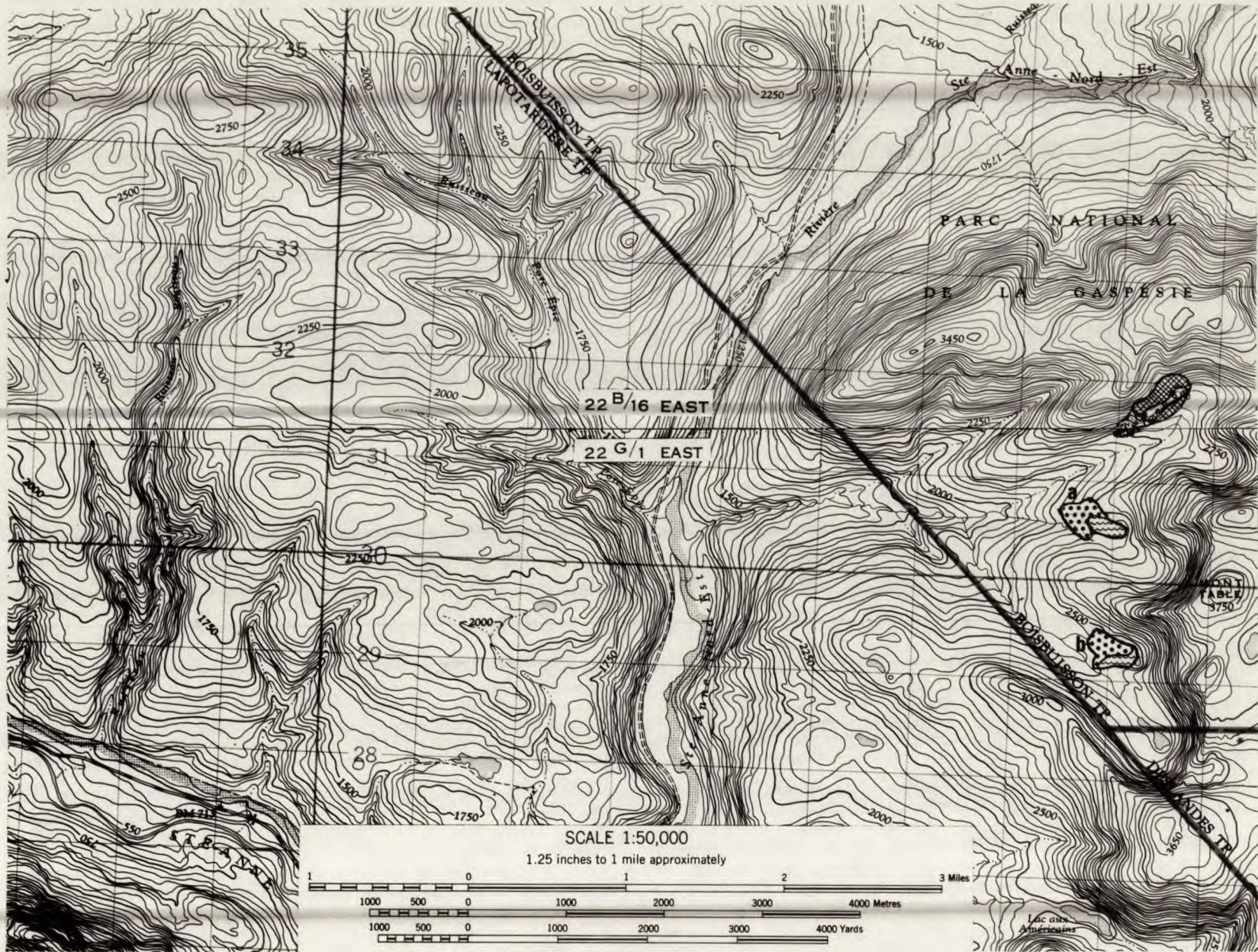
MAP NO. 63



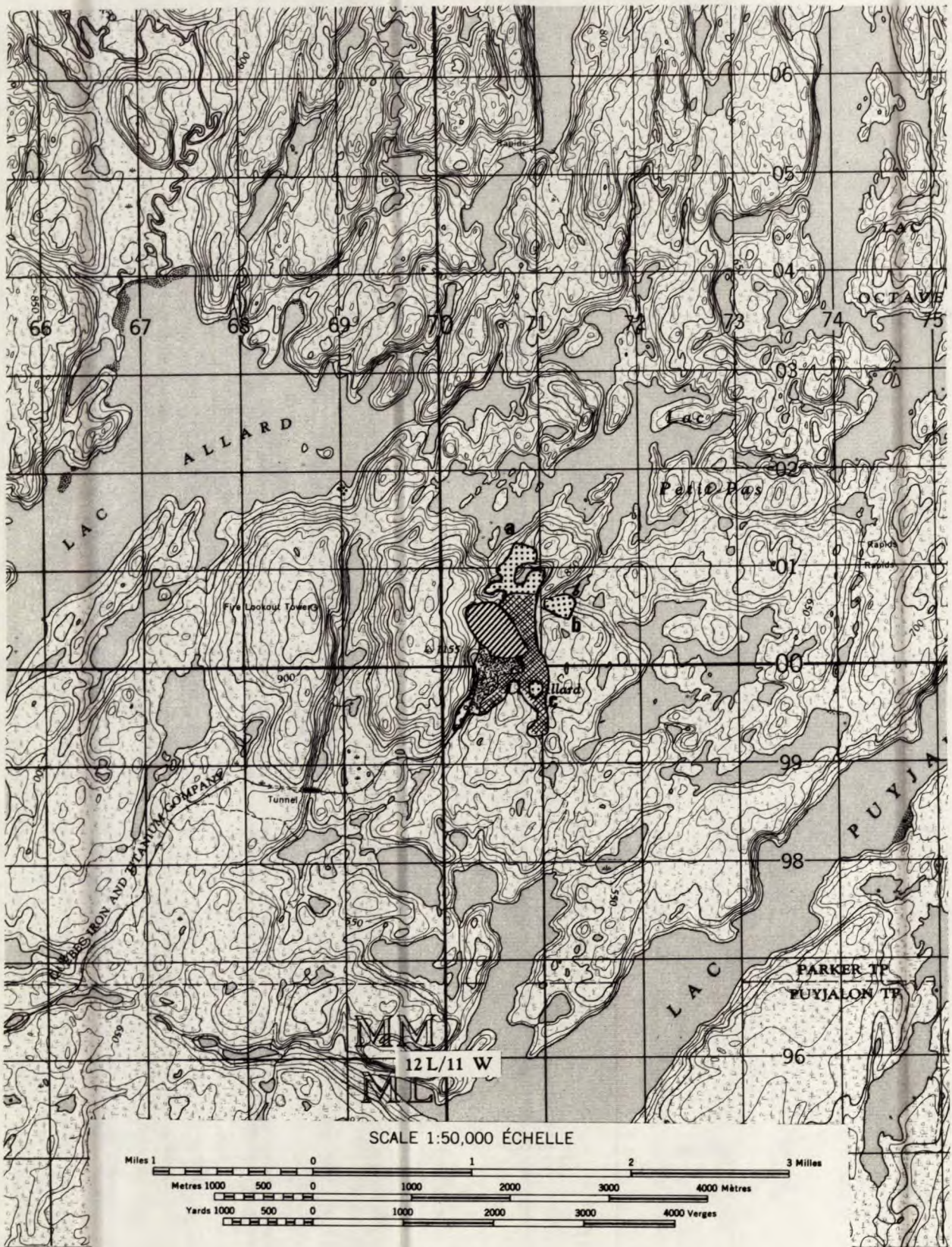
MAP NO. 64



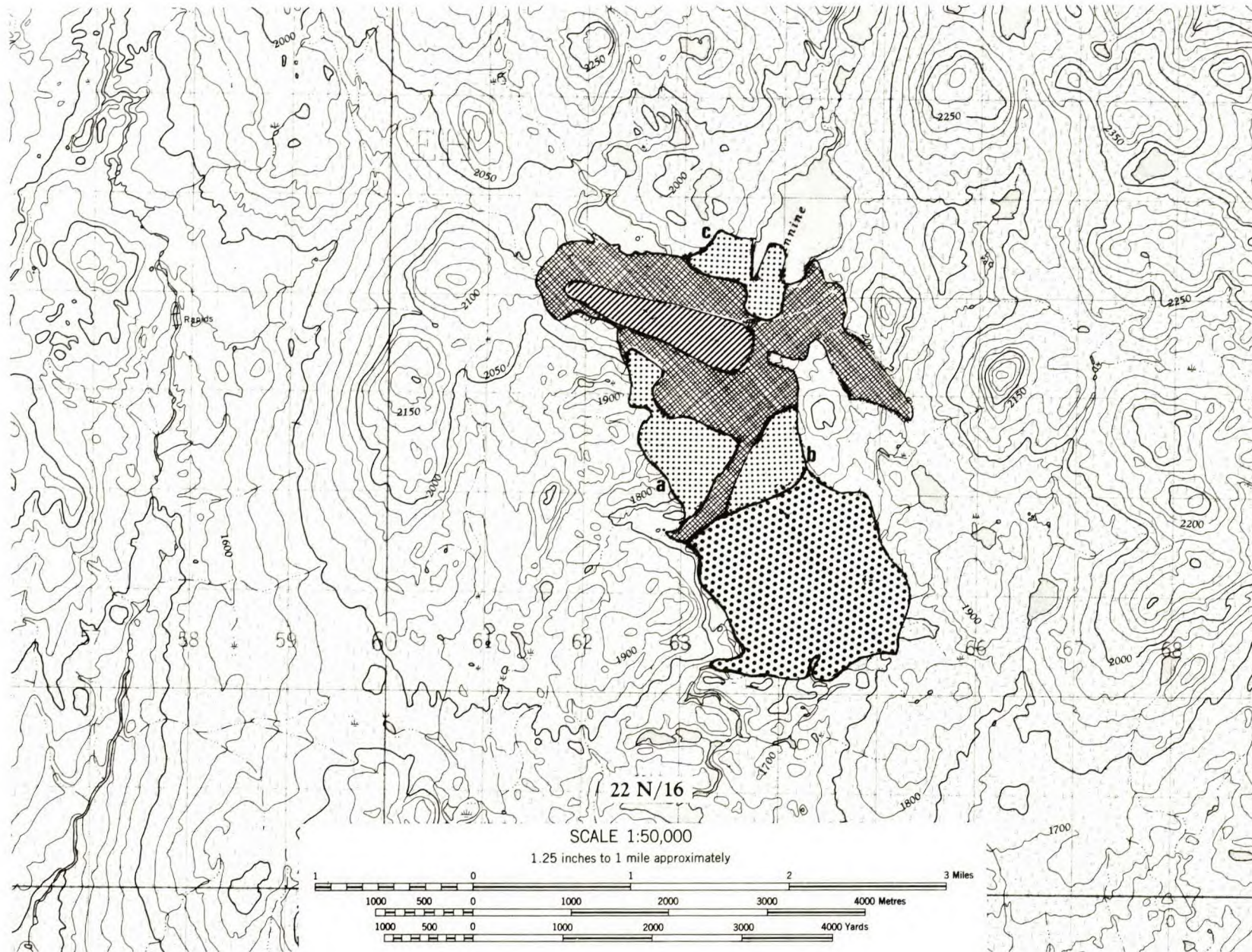
MAP NO. 65



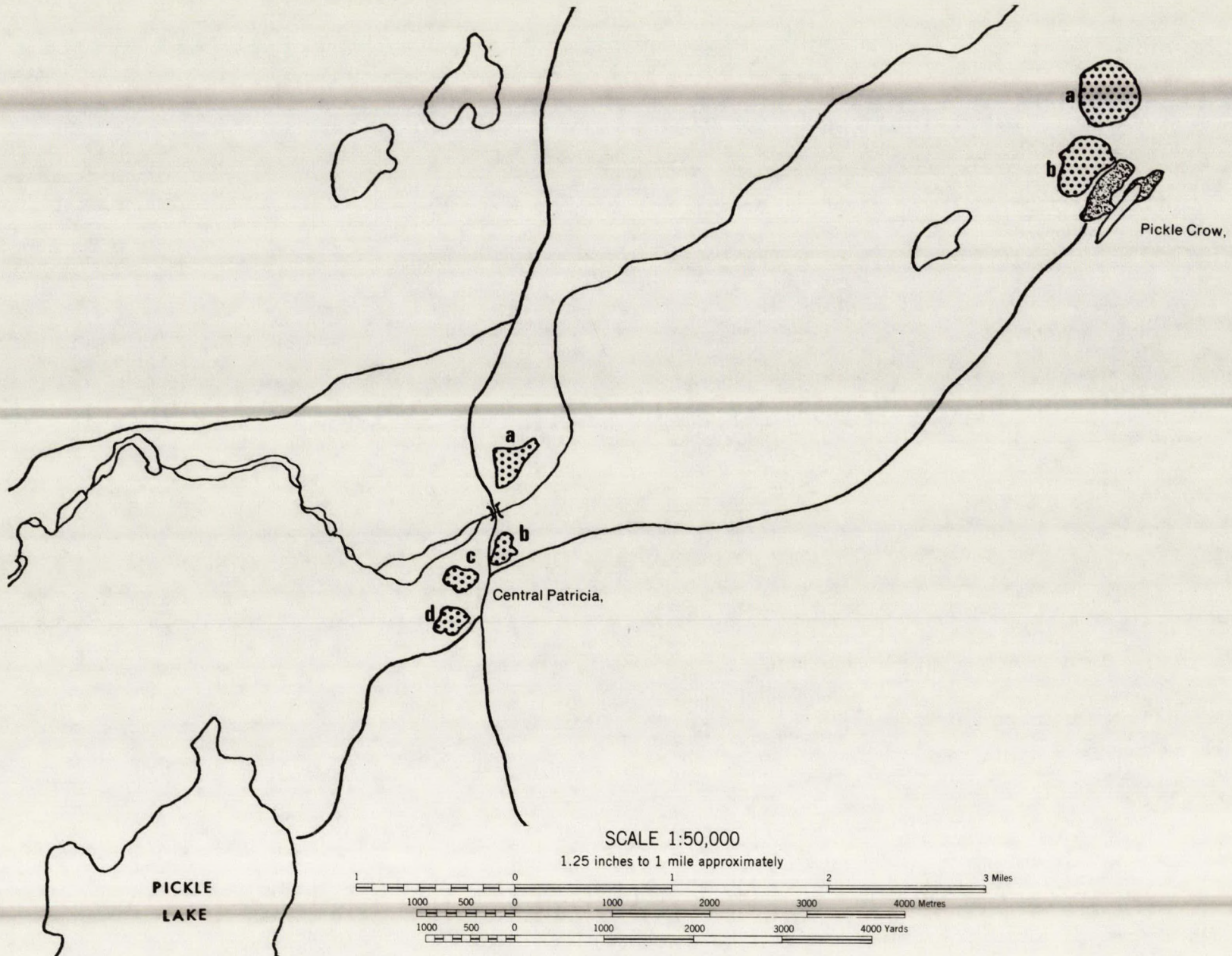
MAP NO. 66



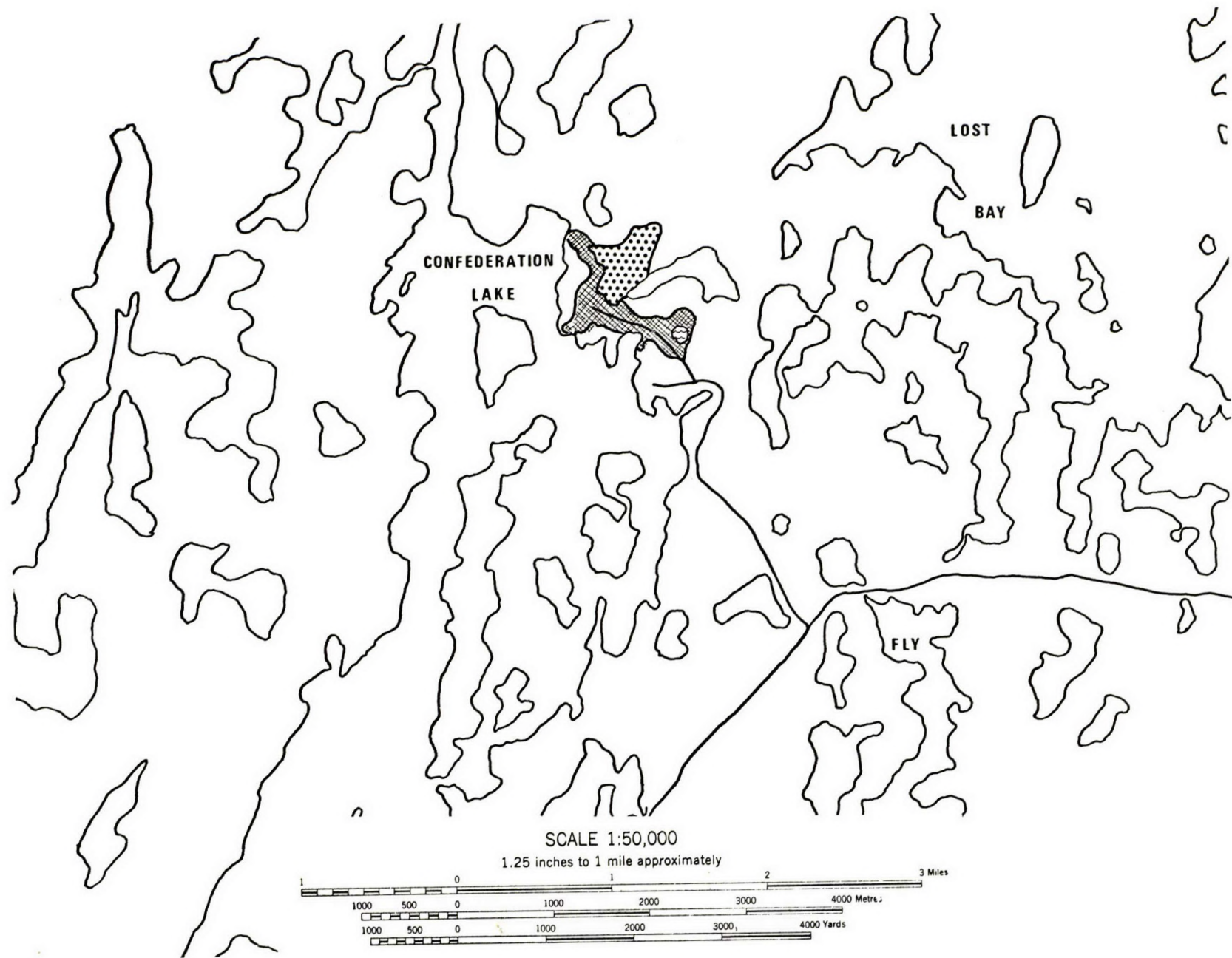
MAP NO. 68



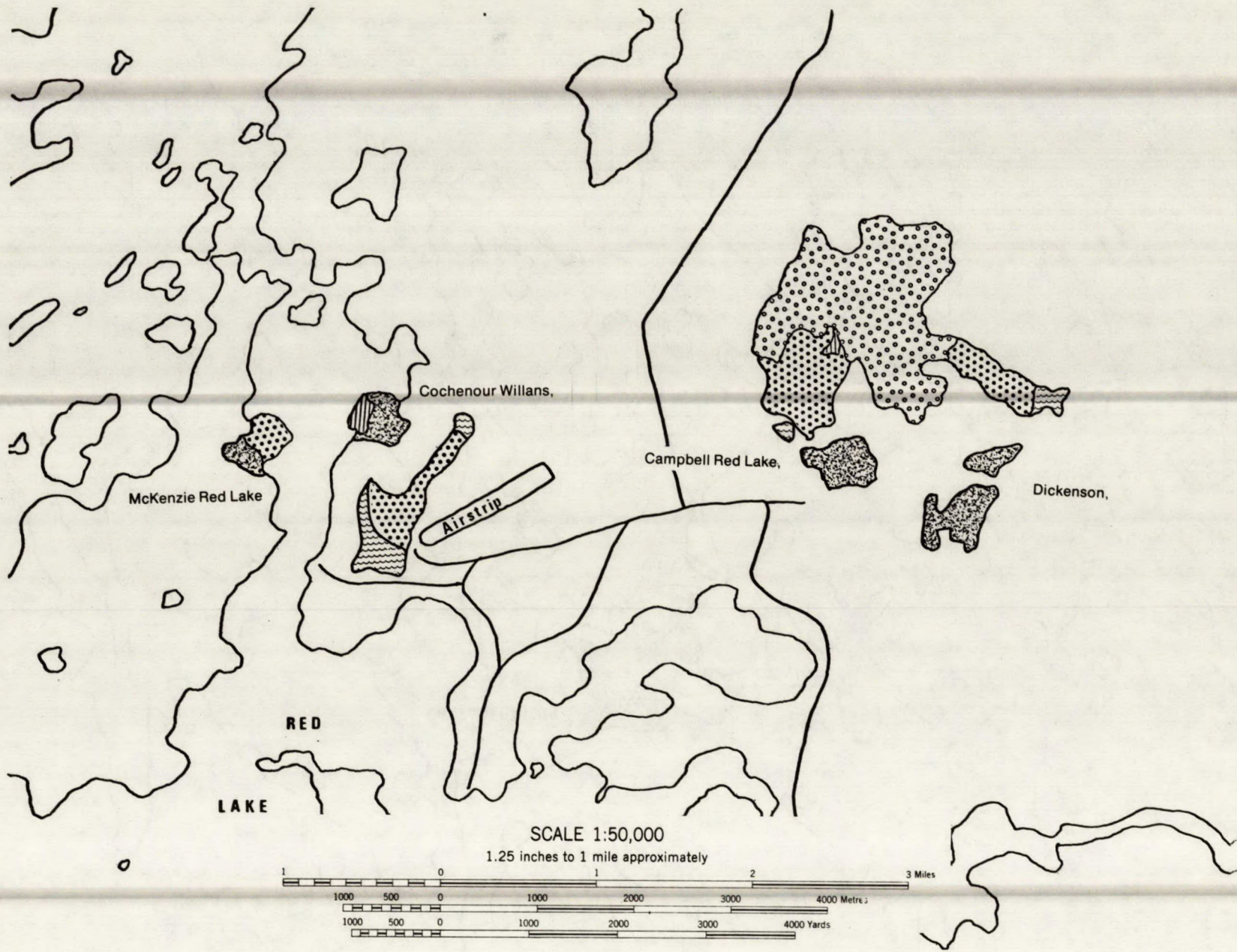
MAP NO. 69



MAP NO. 70



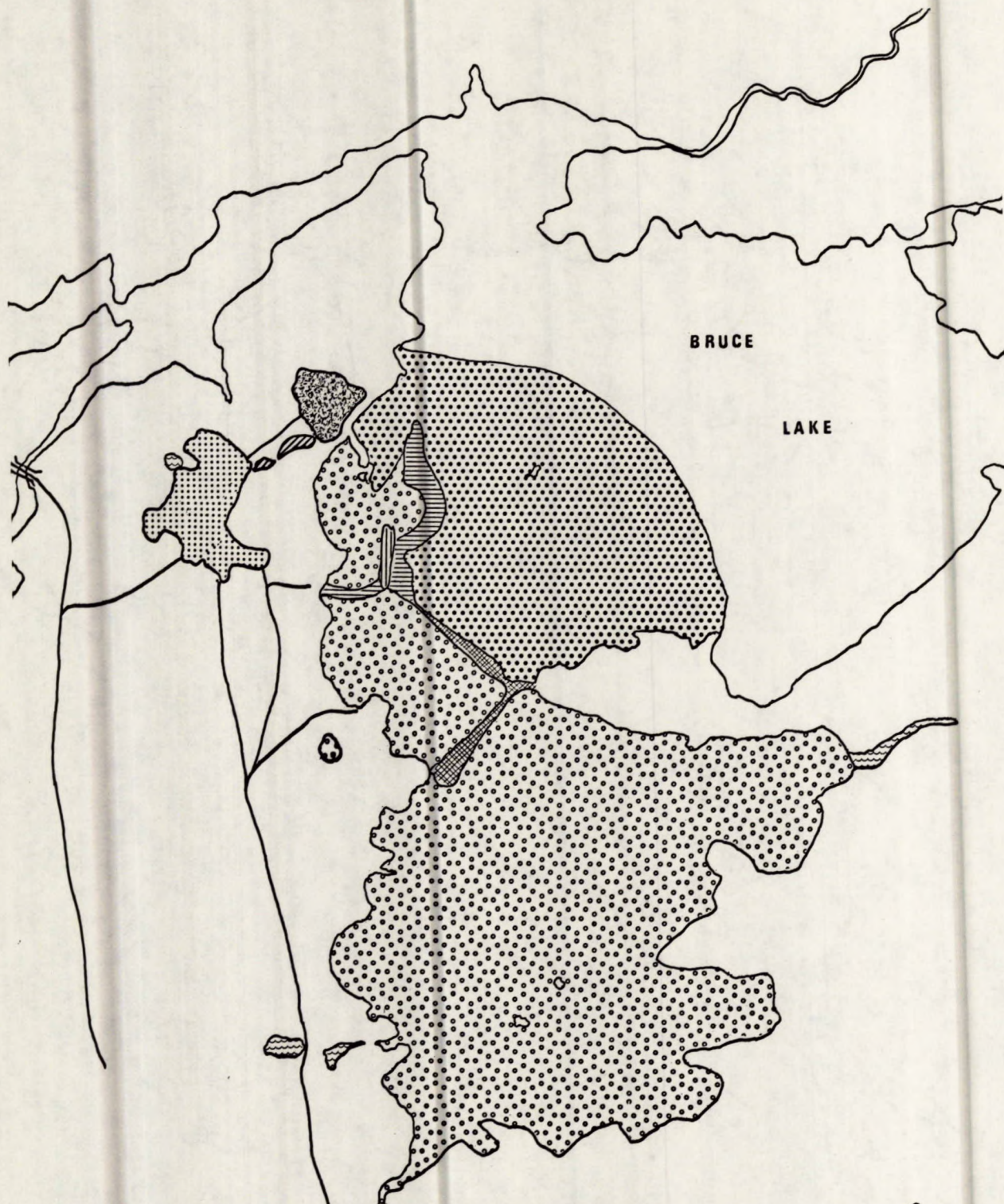
MAP NO. 71



MAP NO. 72



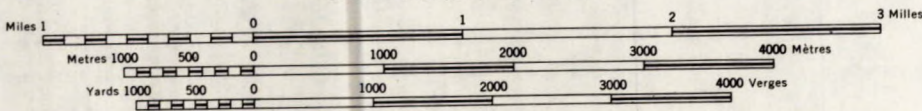
MAP NO. 73



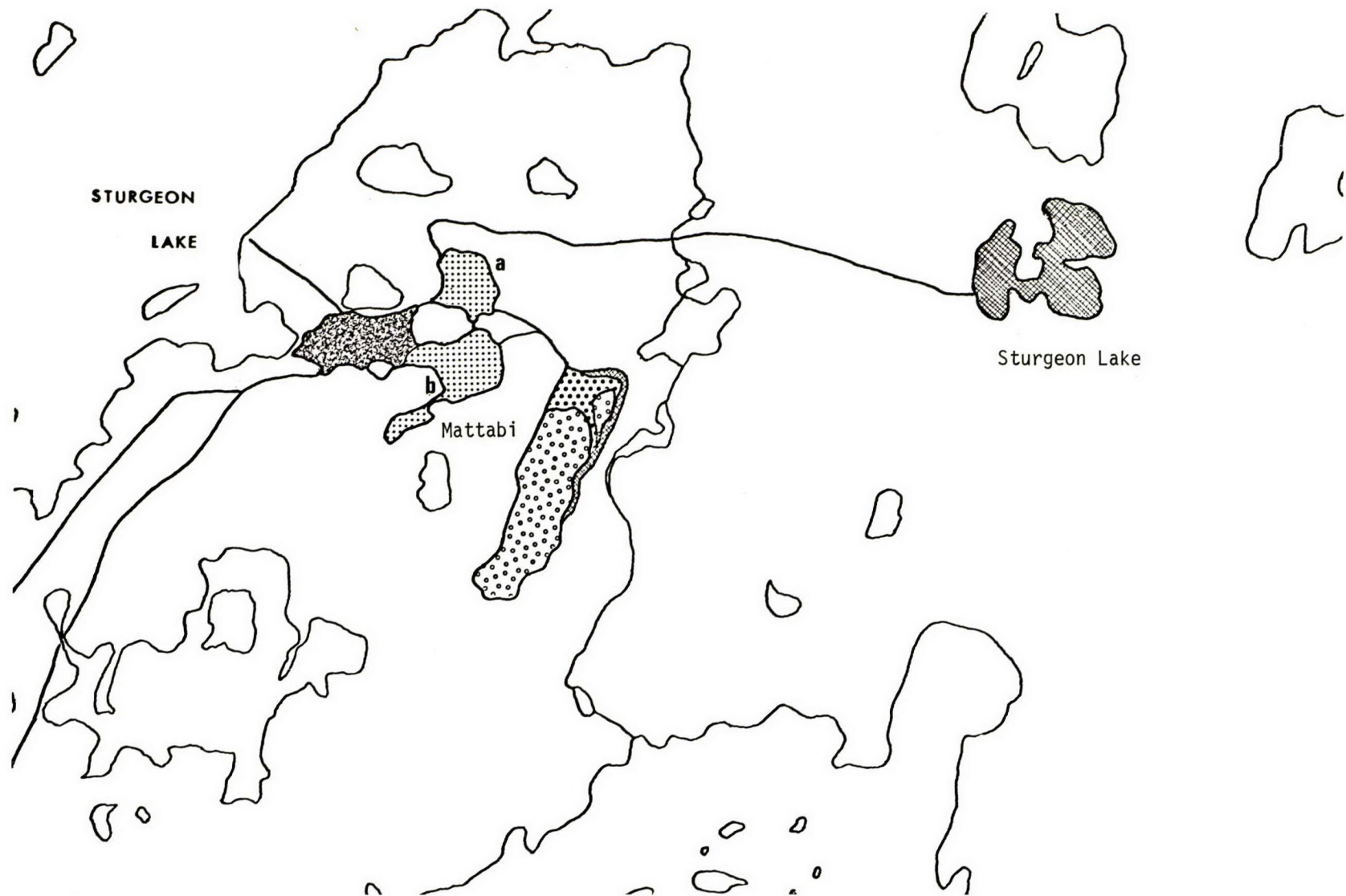
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LAKE

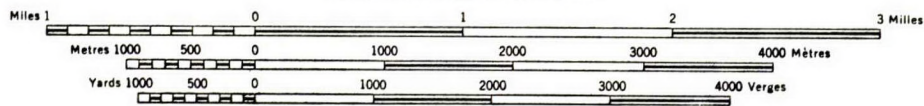
SCALE 1:50,000 ÉCHELLE



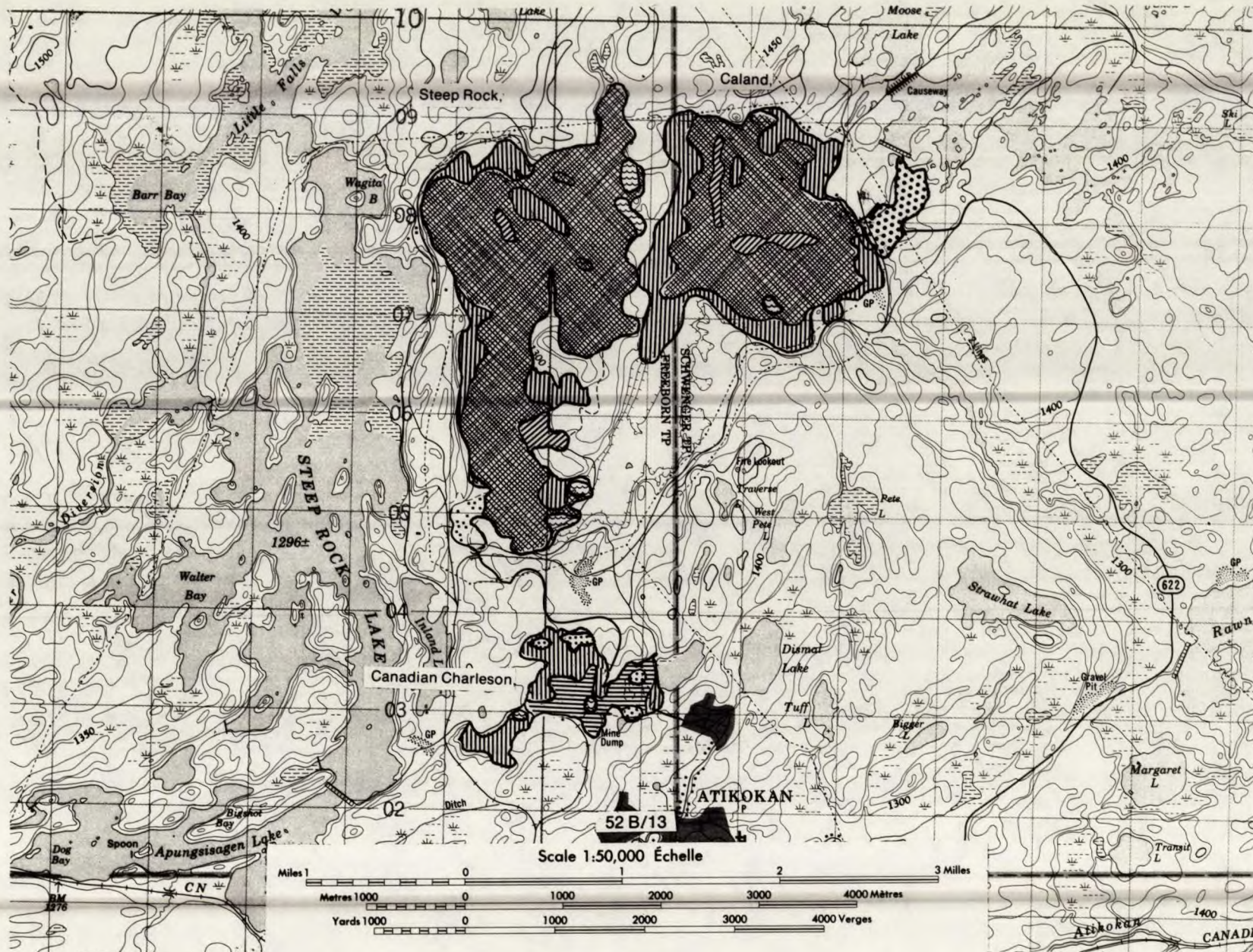
MAP NO. 74



SCALE 1:50,000 ÉCHELLE

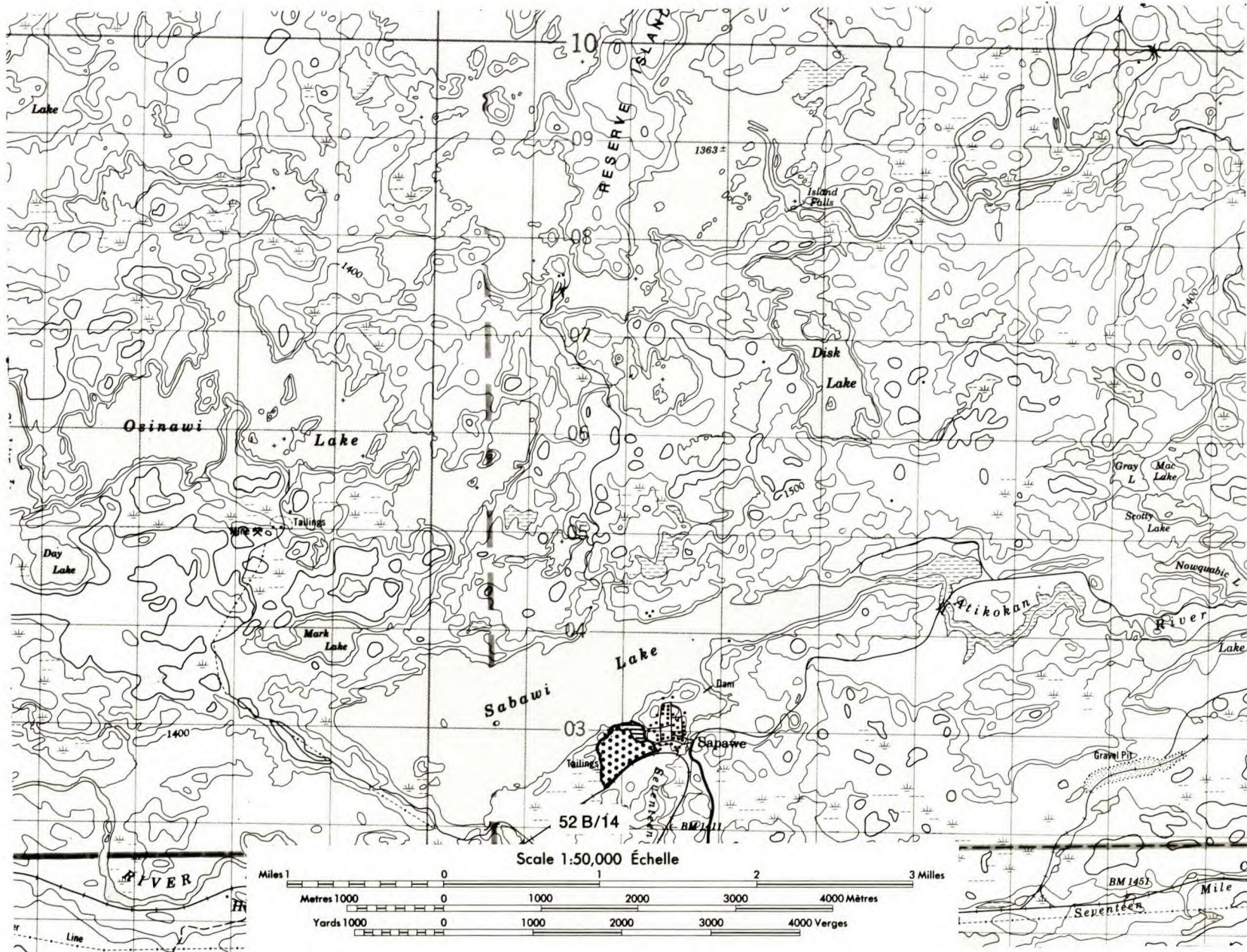


MAP NO. 75

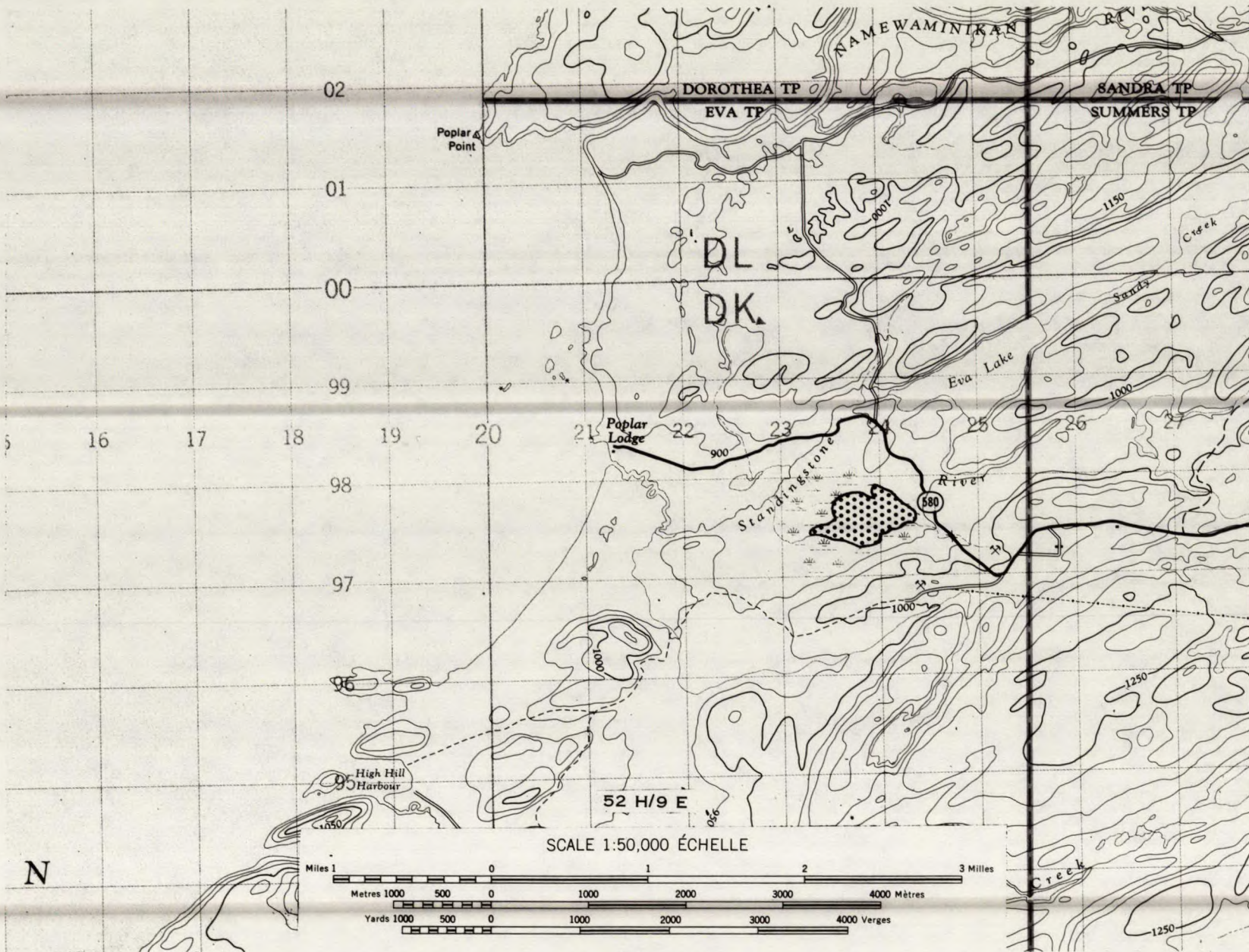


100

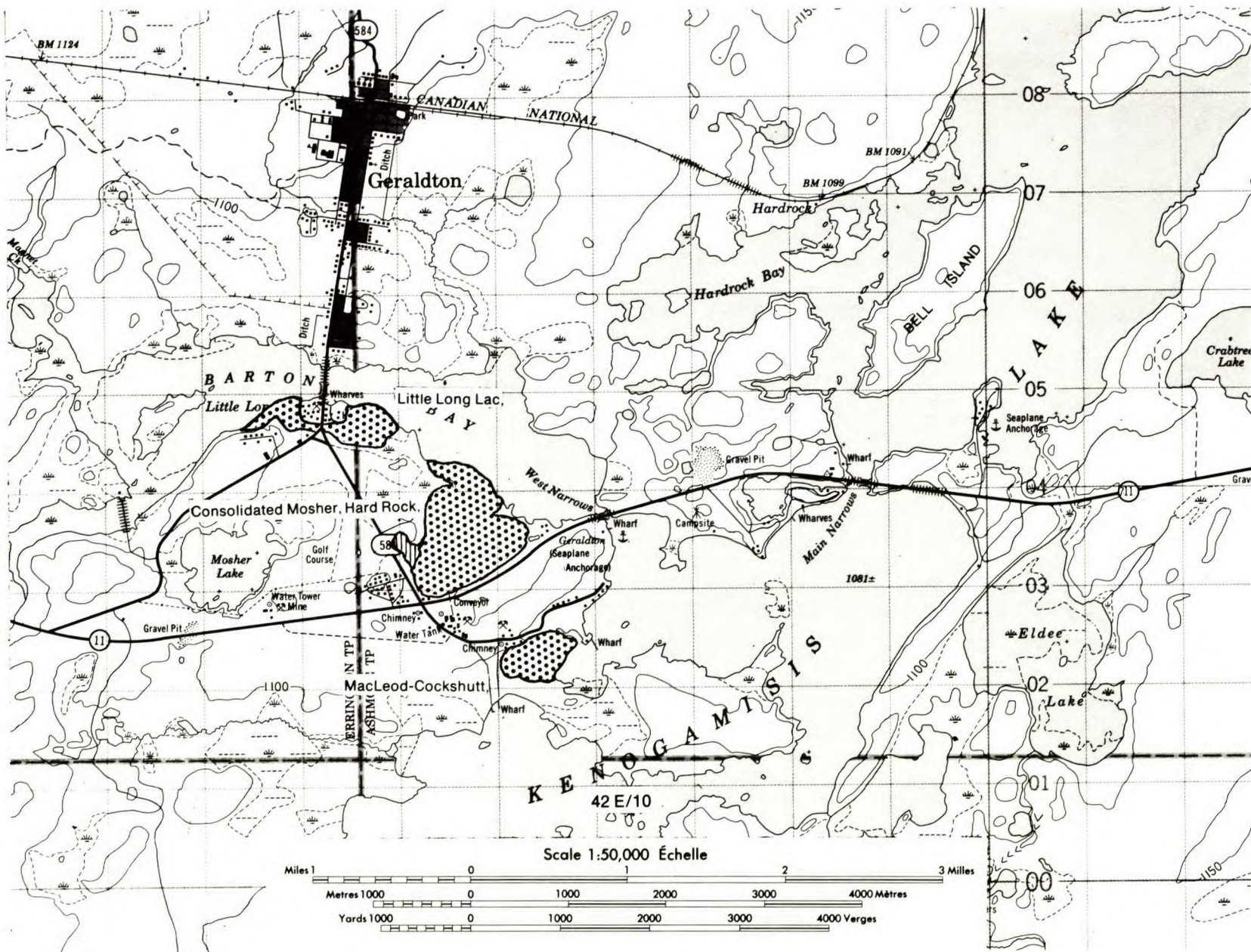
MAP NO. 76



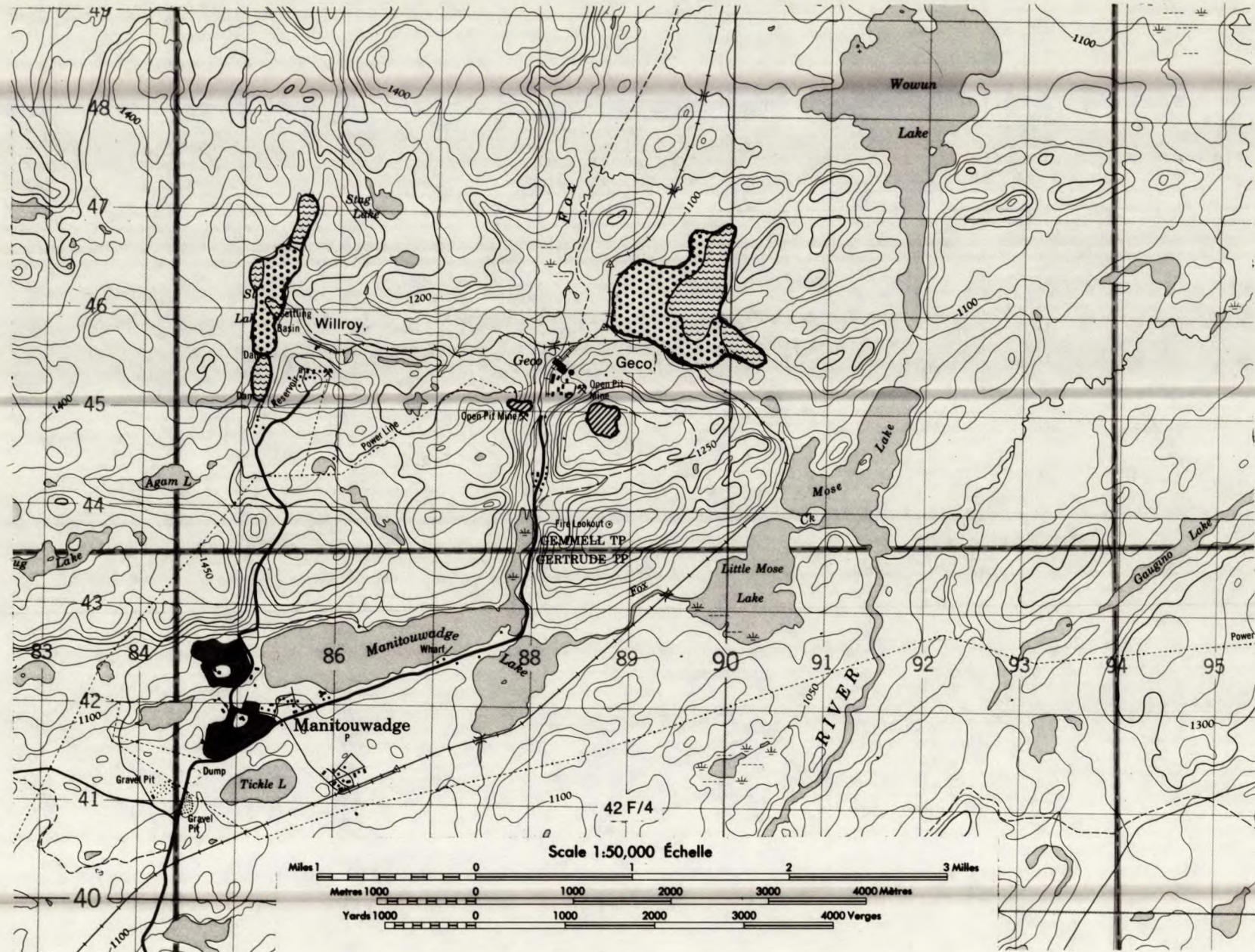
MAP NO. 77



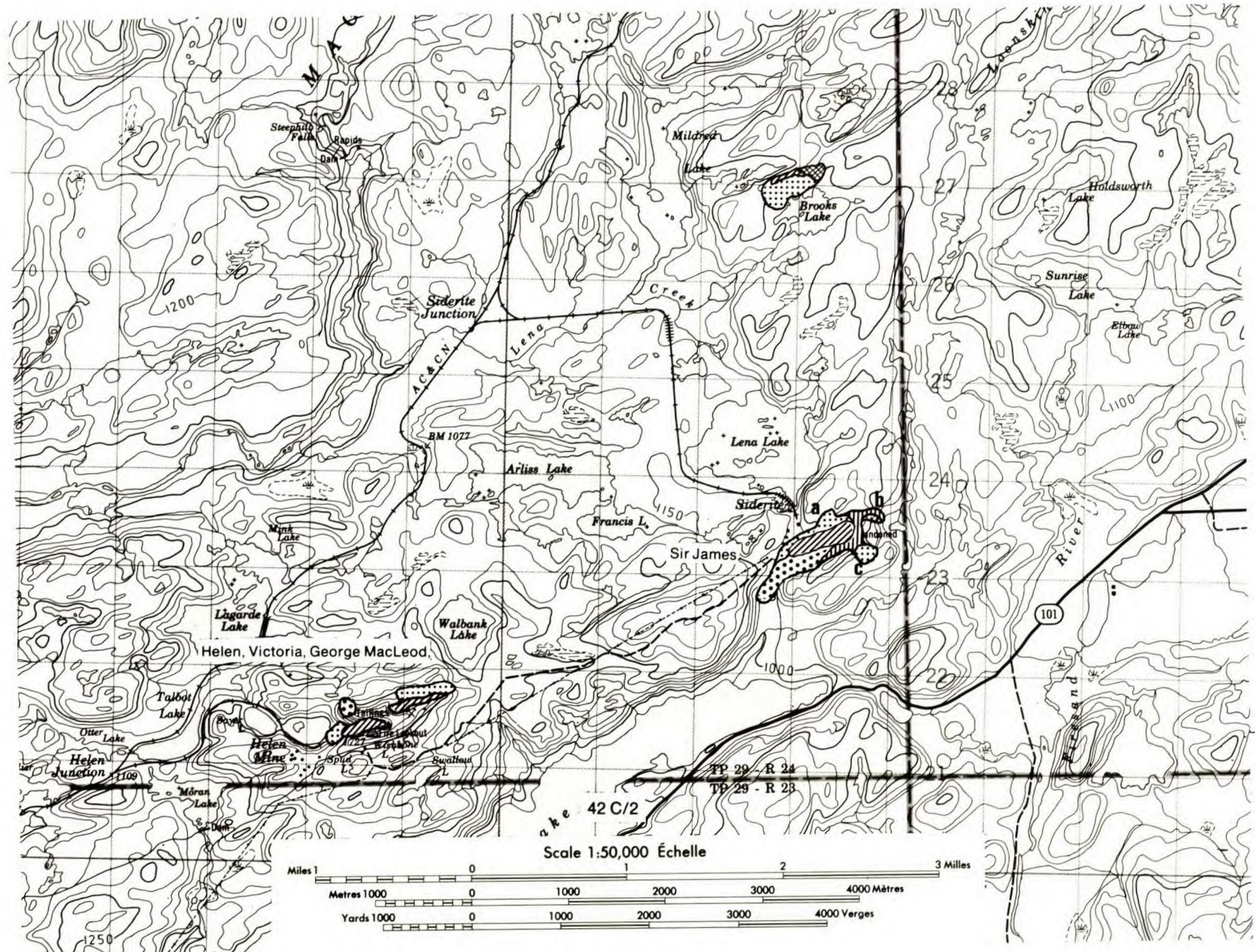
MAP NO. 78



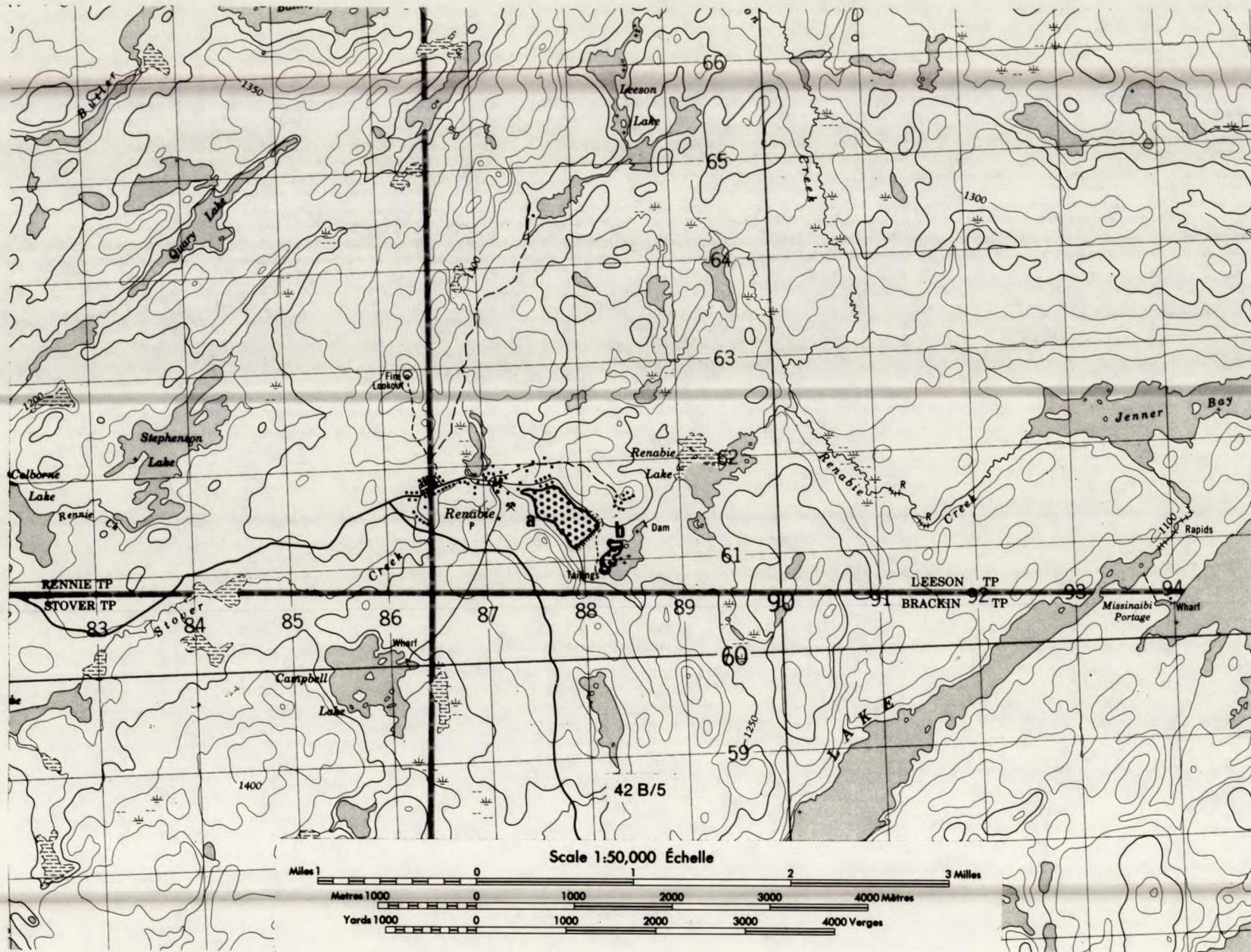
MAP NO. 79



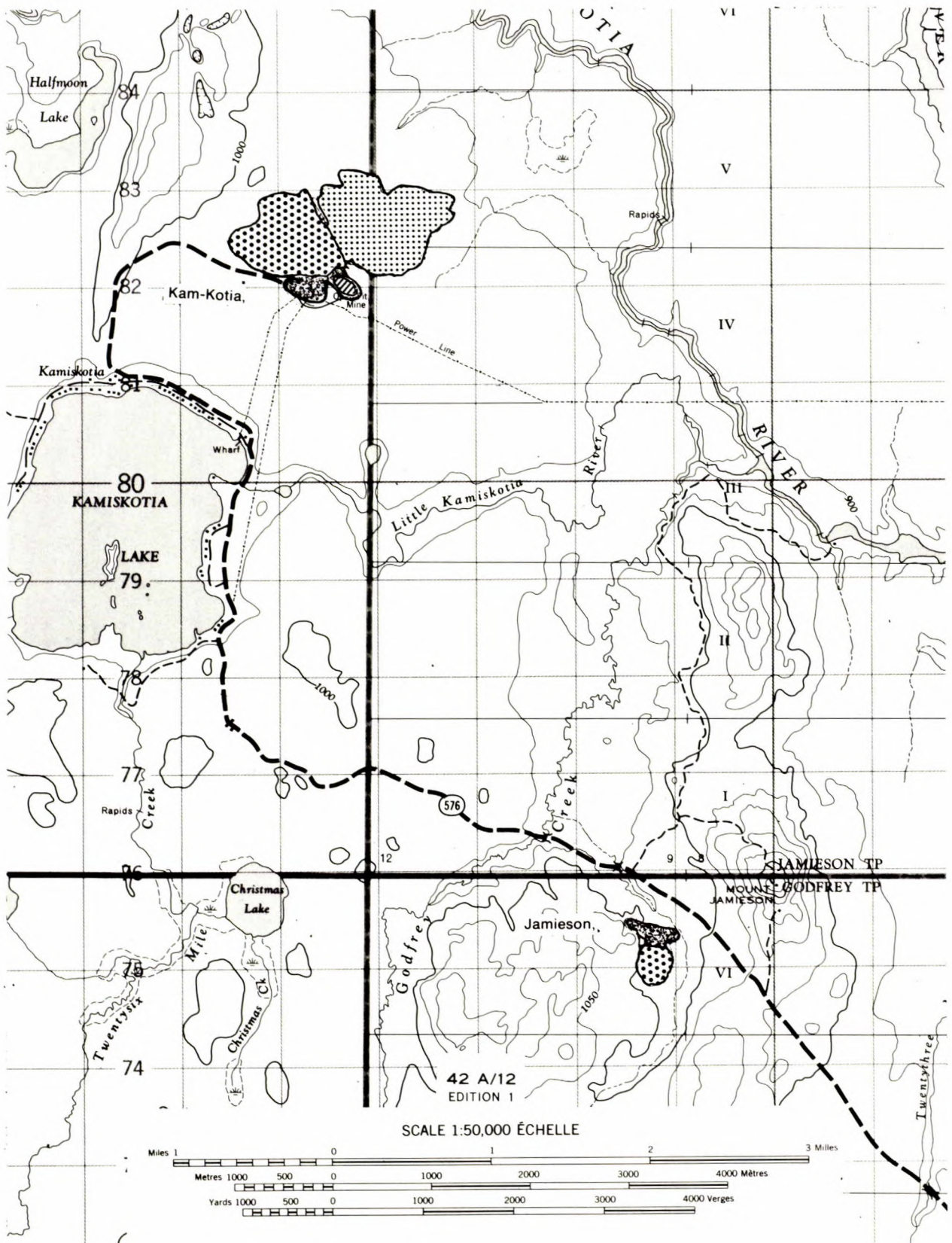
MAP NO. 80



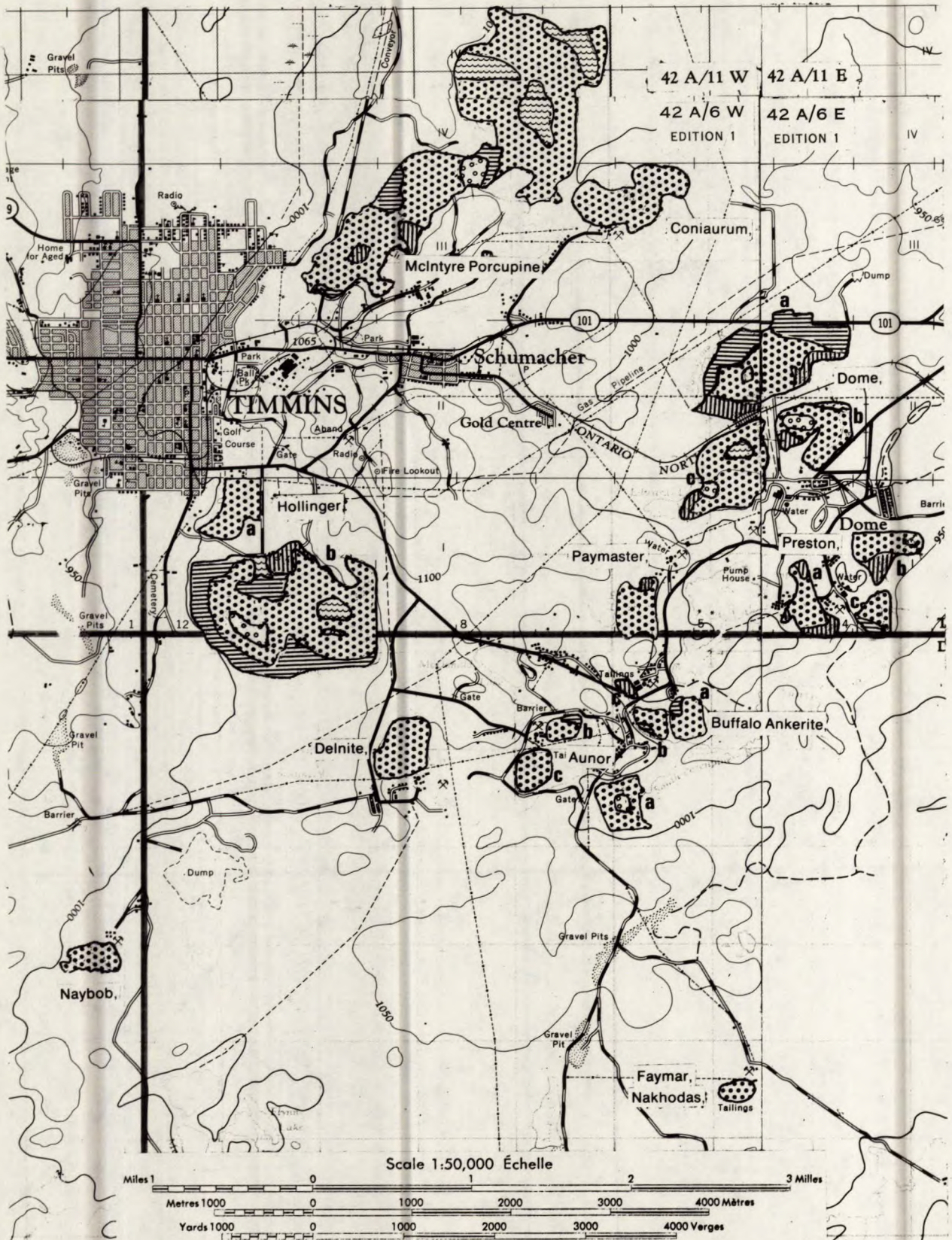
MAP NO. 81



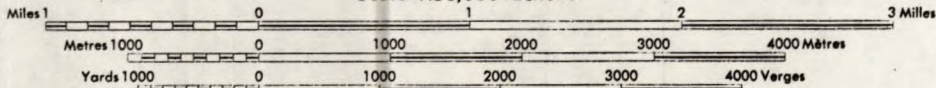
MAP NO. 82



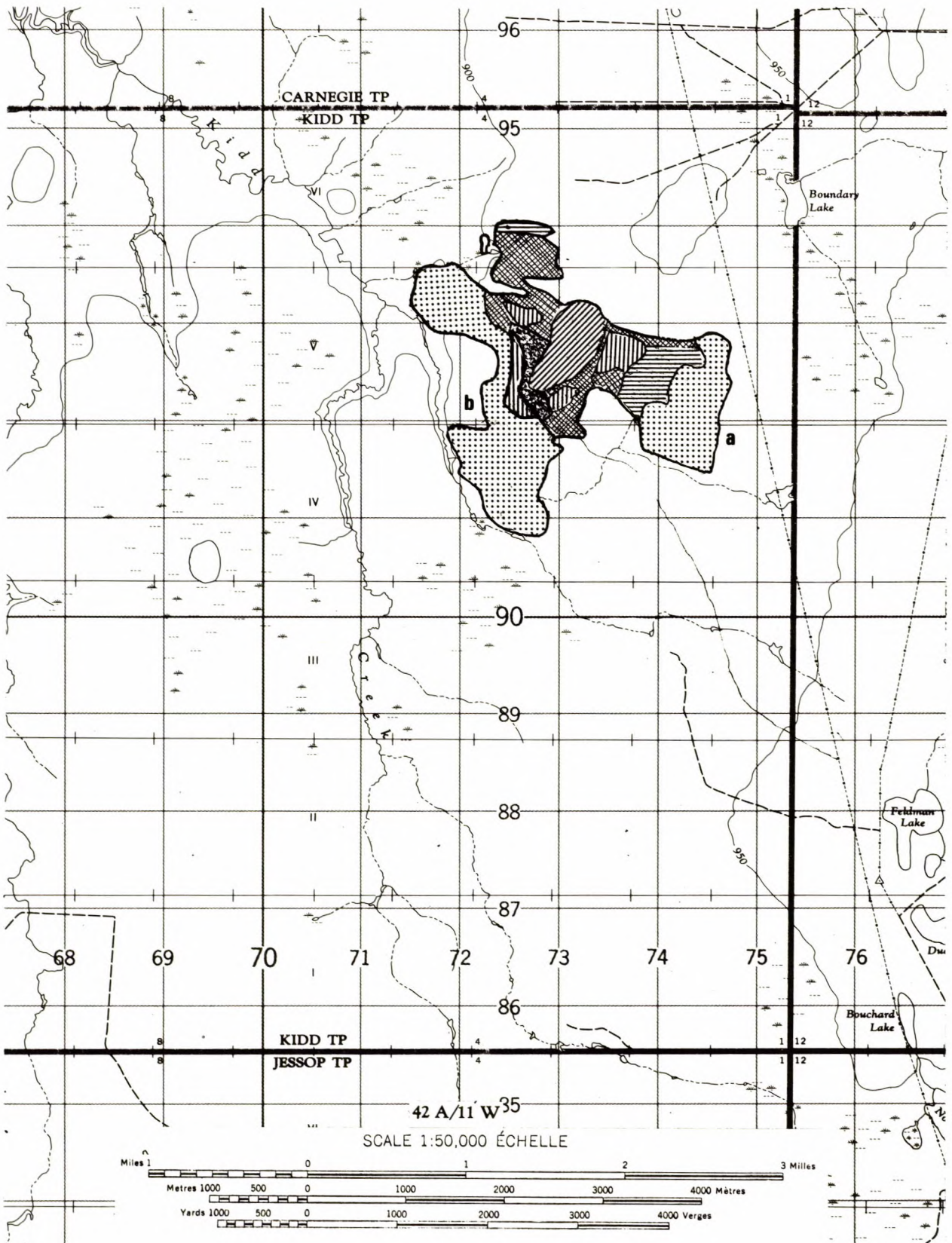
MAP NO. 83



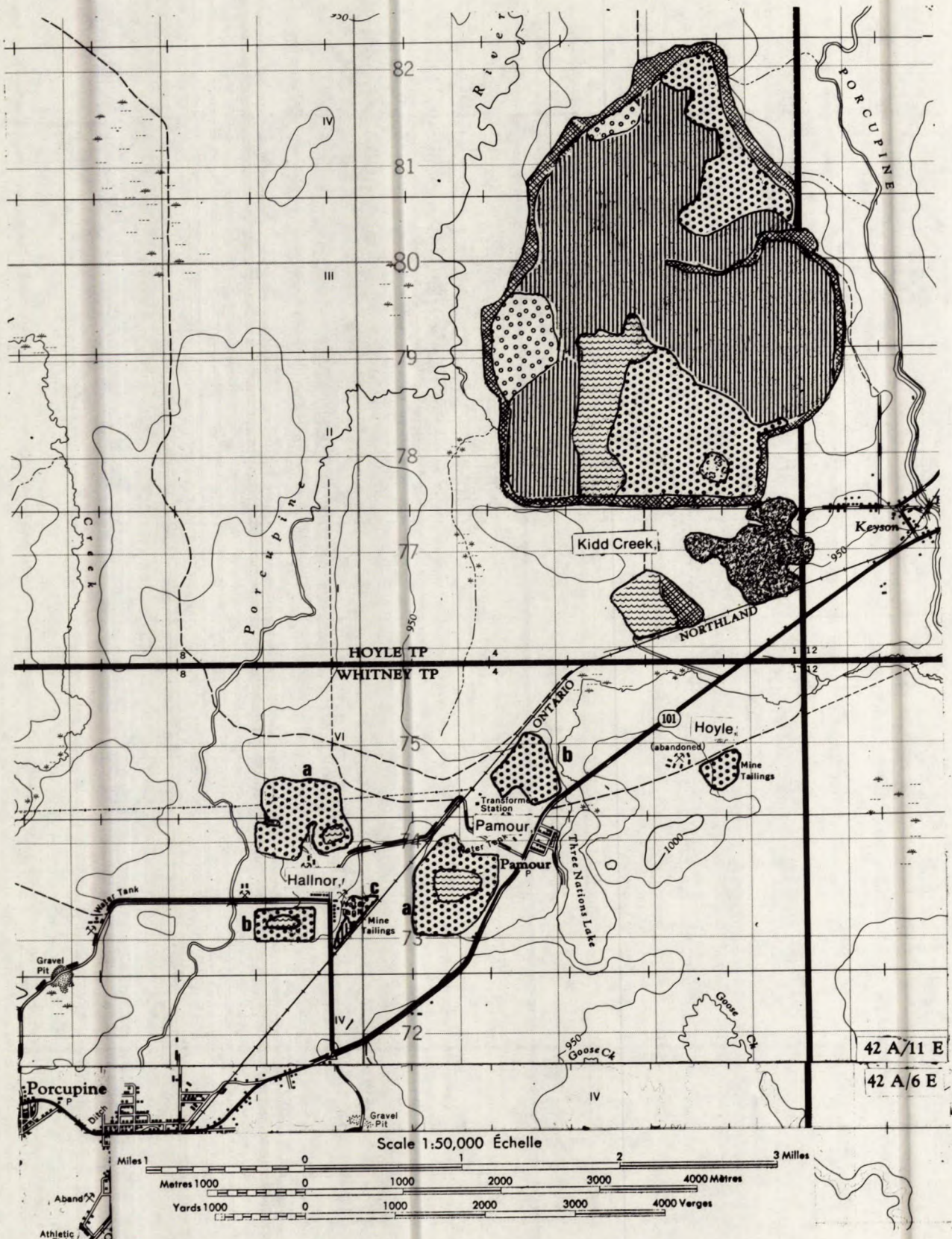
Scale 1:50,000 Échelle

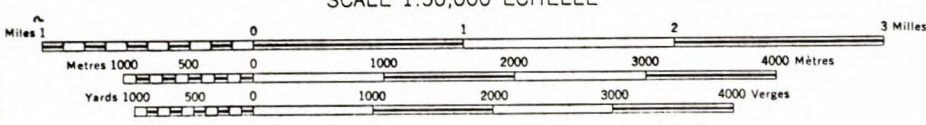
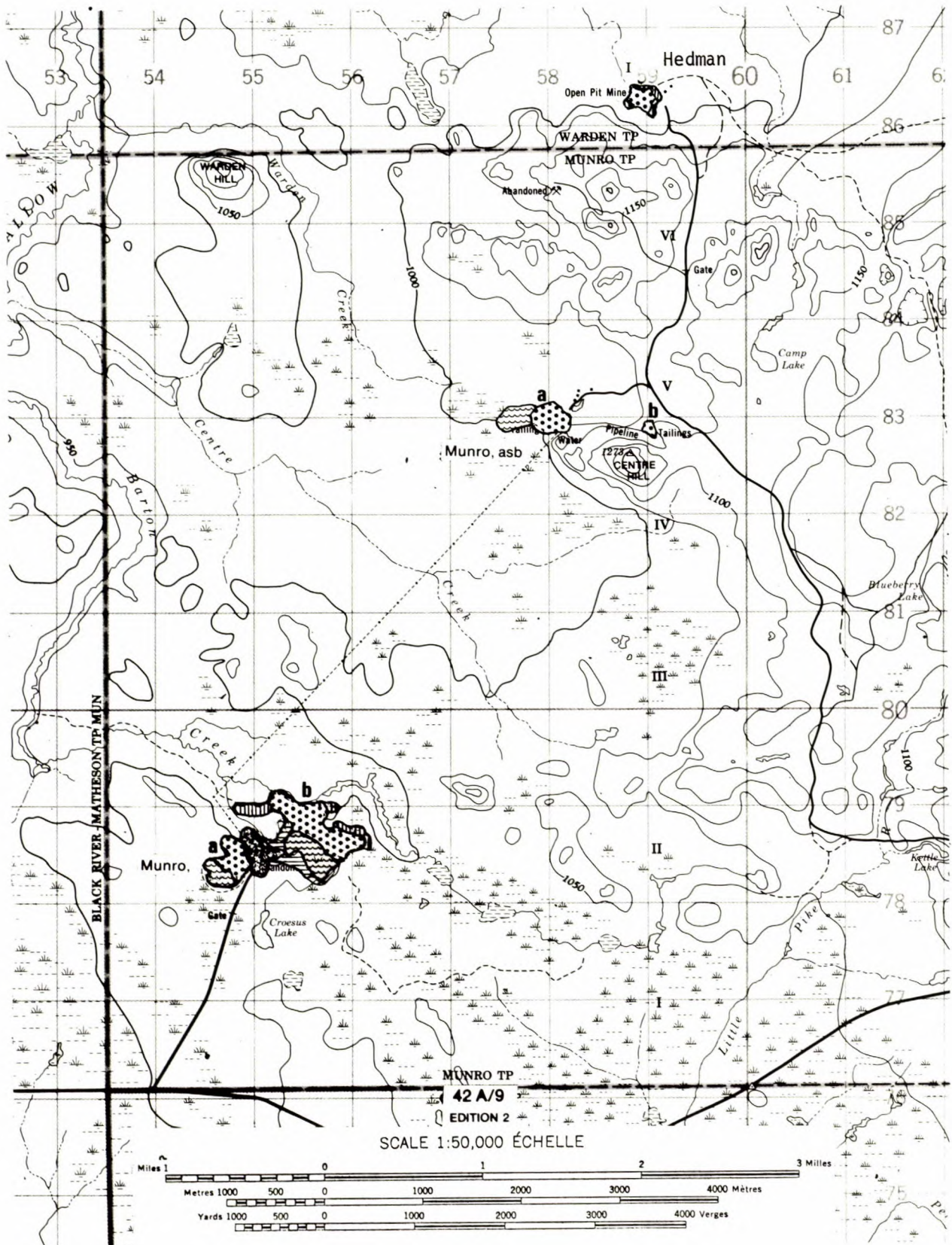


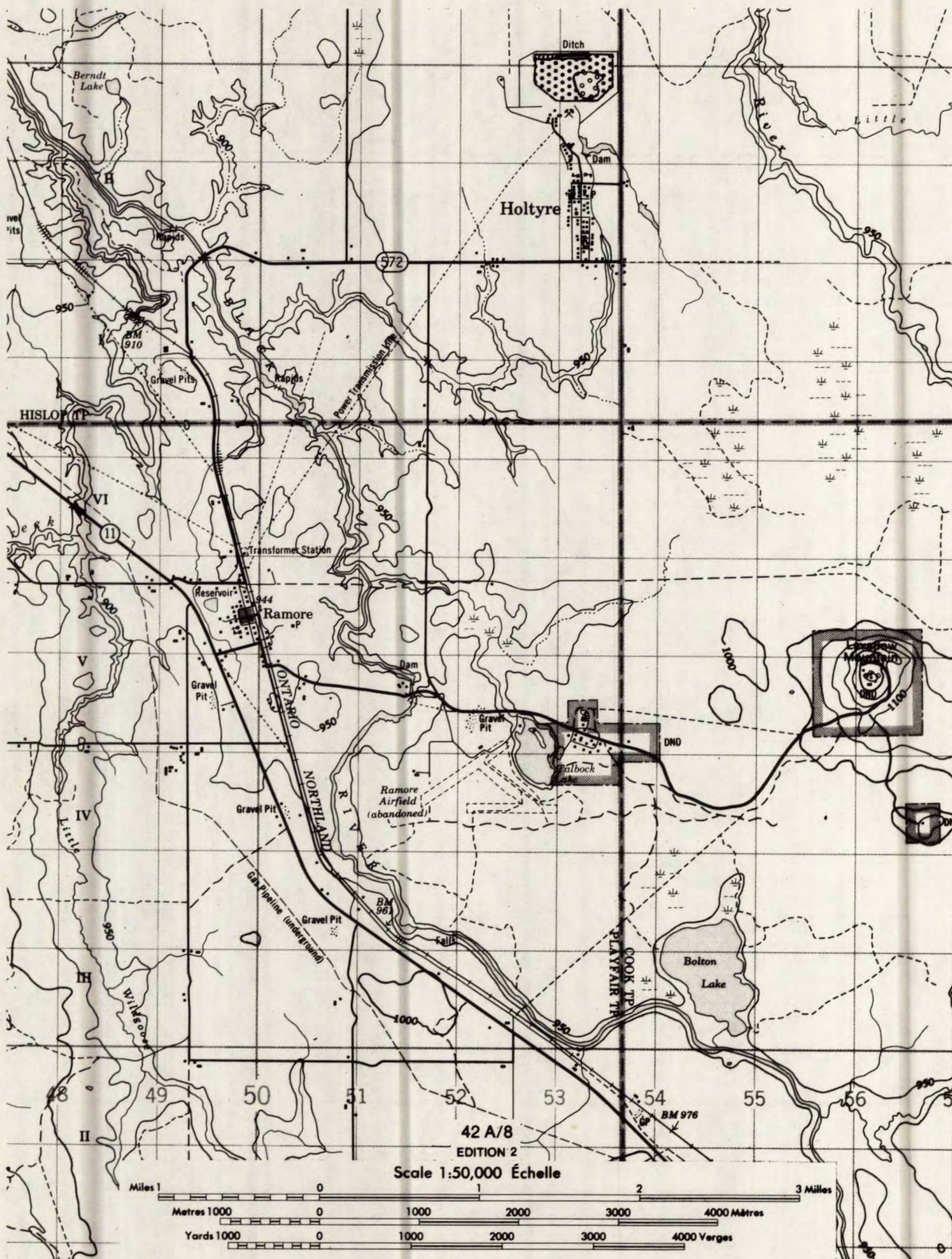
MAP NO. 84



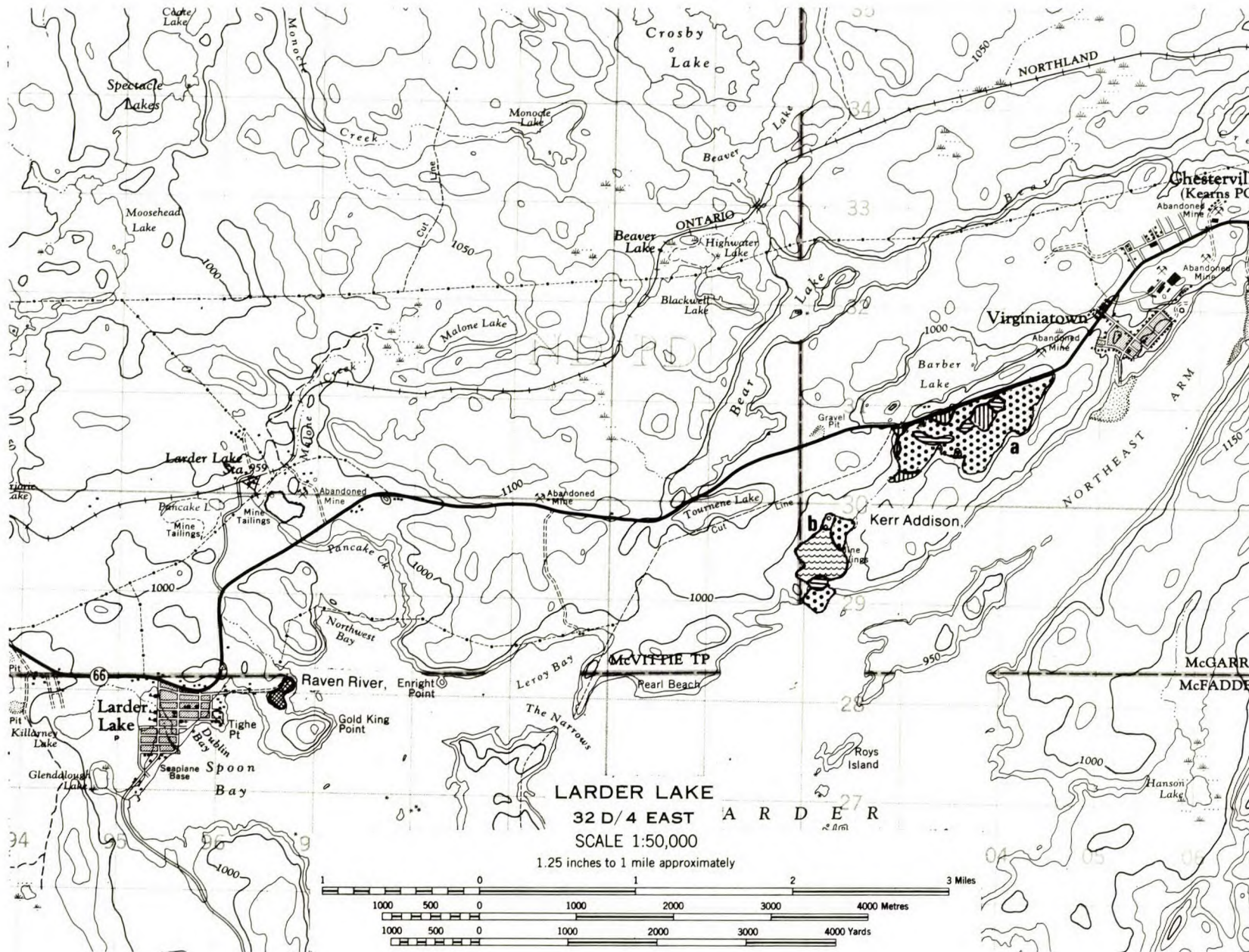
MAP NO. 85

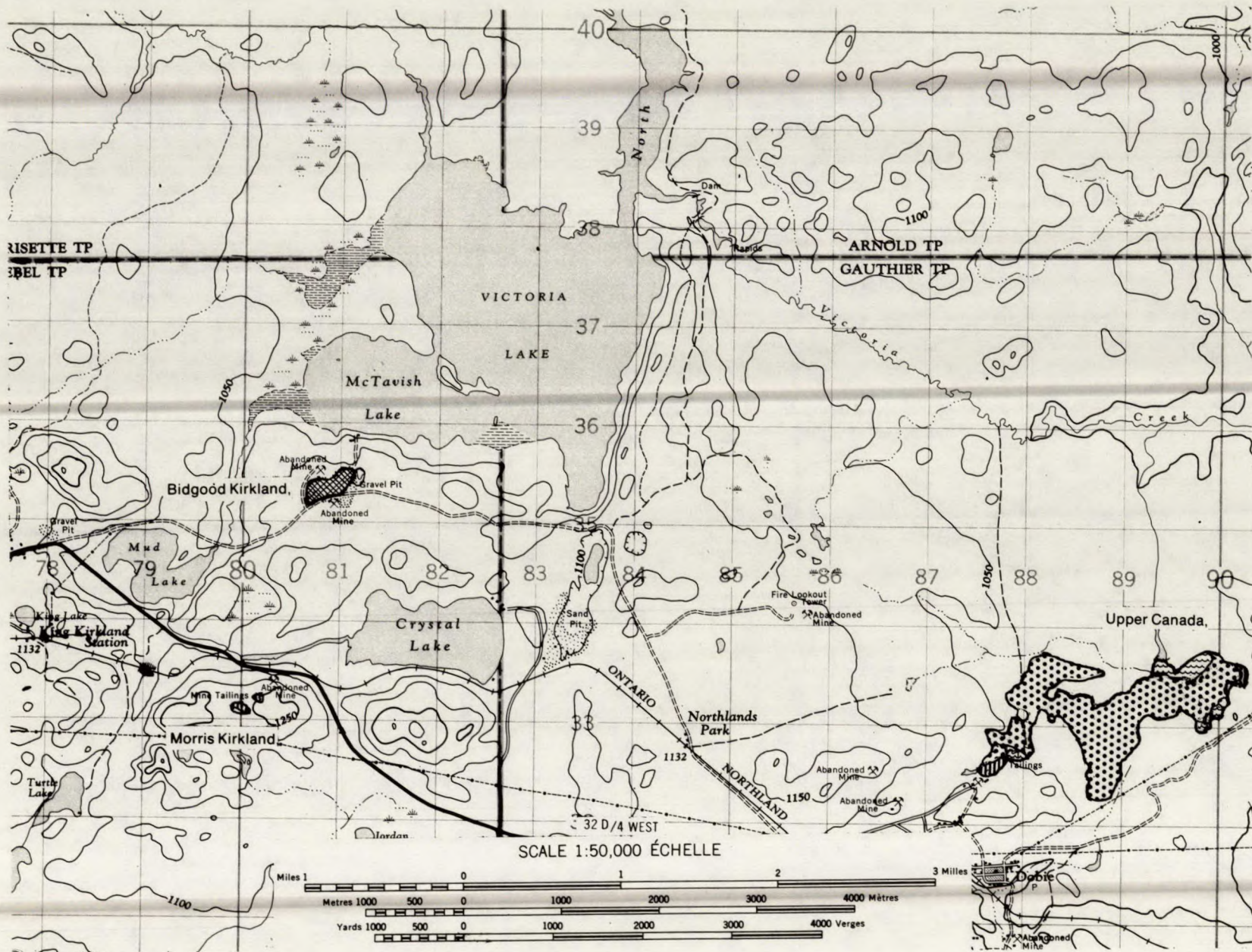




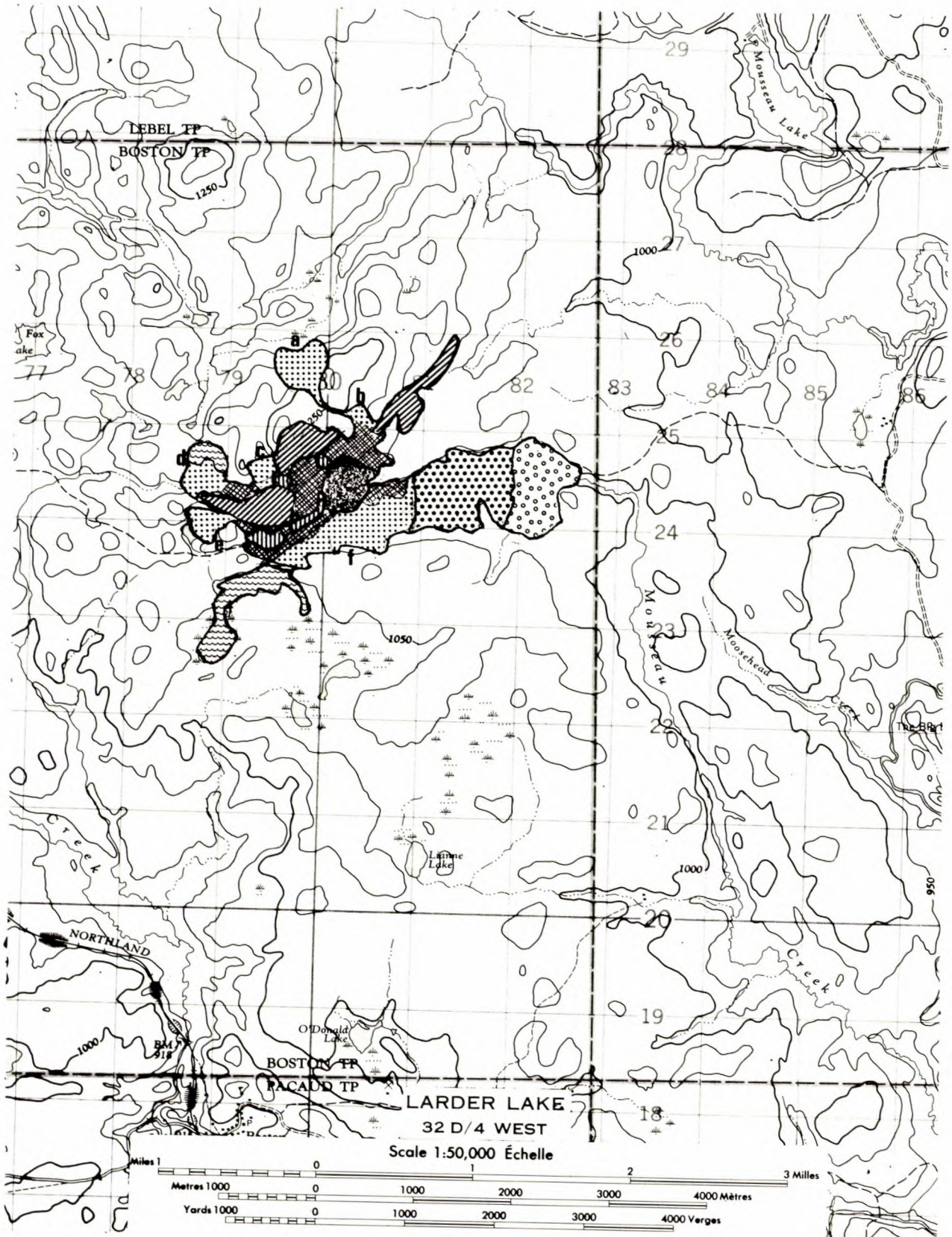


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EDITION 2
Scale 1:50,000 Échelle

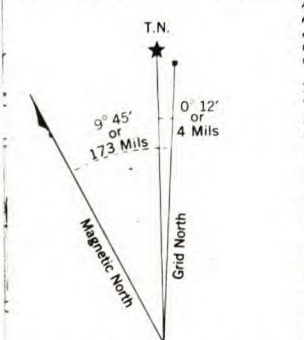
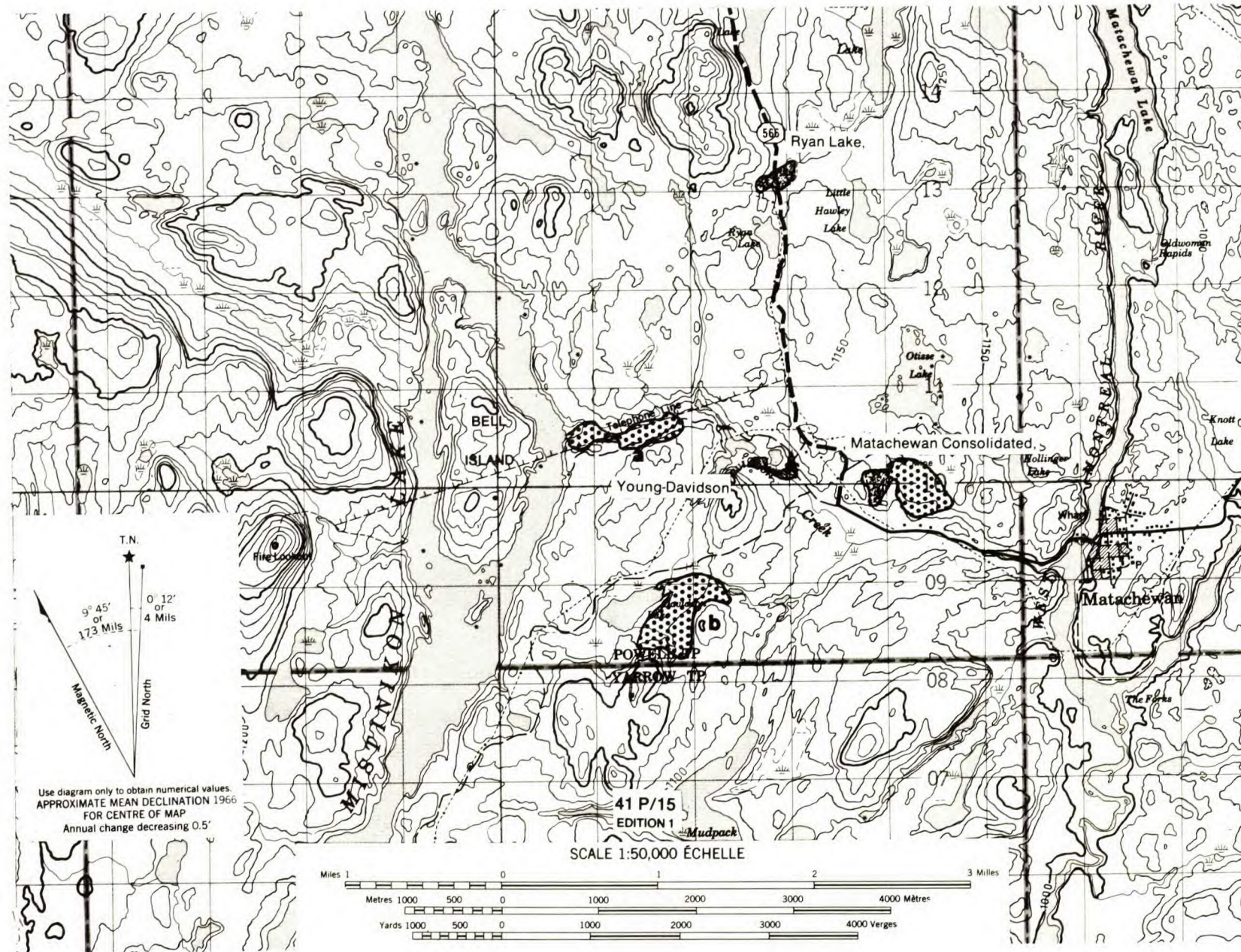




MAP NO. 90

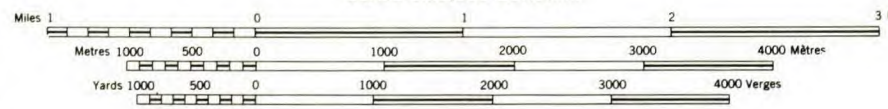


MAP NO. 91

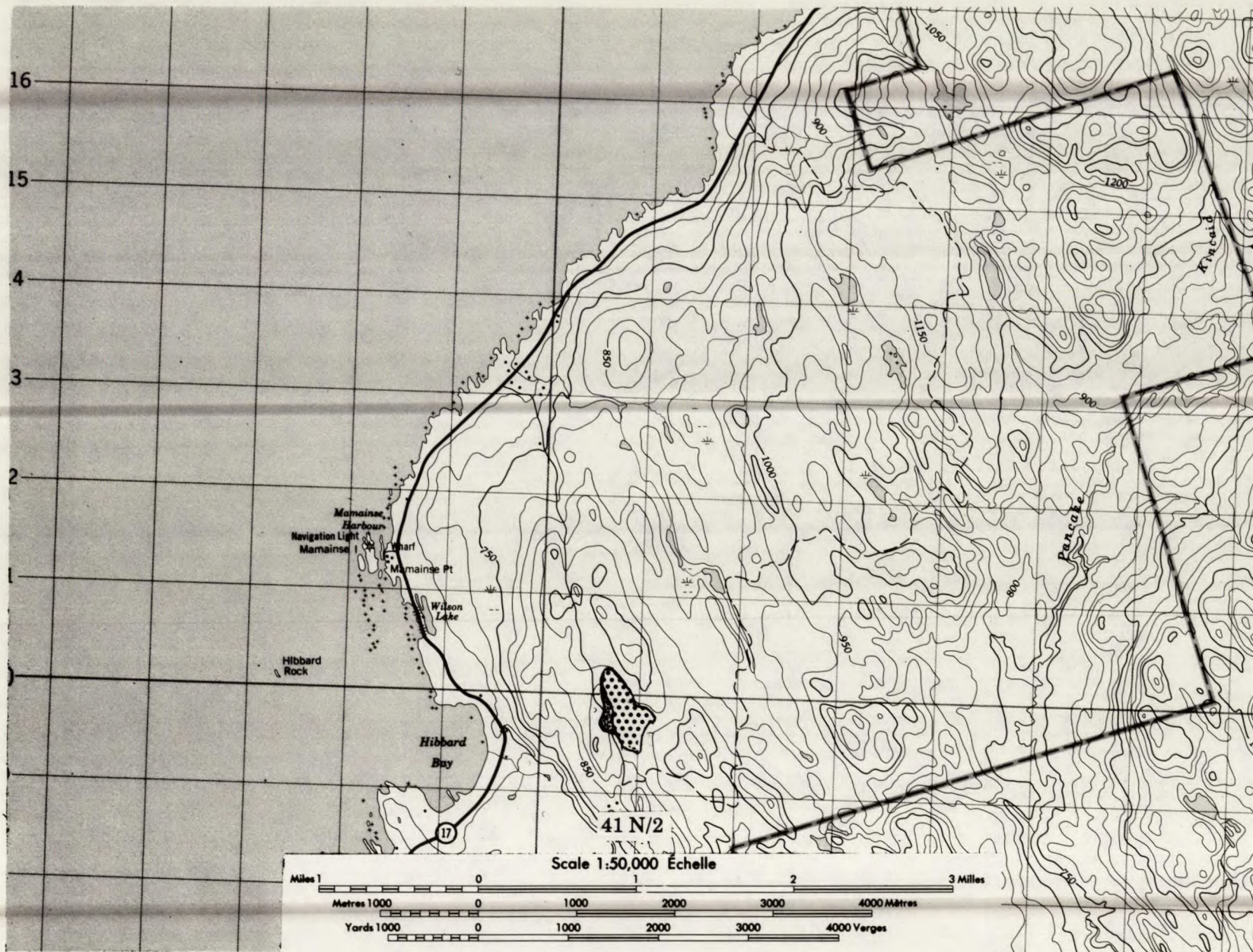


Use diagram only to obtain numerical values.
 APPROXIMATE MEAN DECLINATION 1966
 FOR CENTRE OF MAP
 Annual change decreasing 0.5"

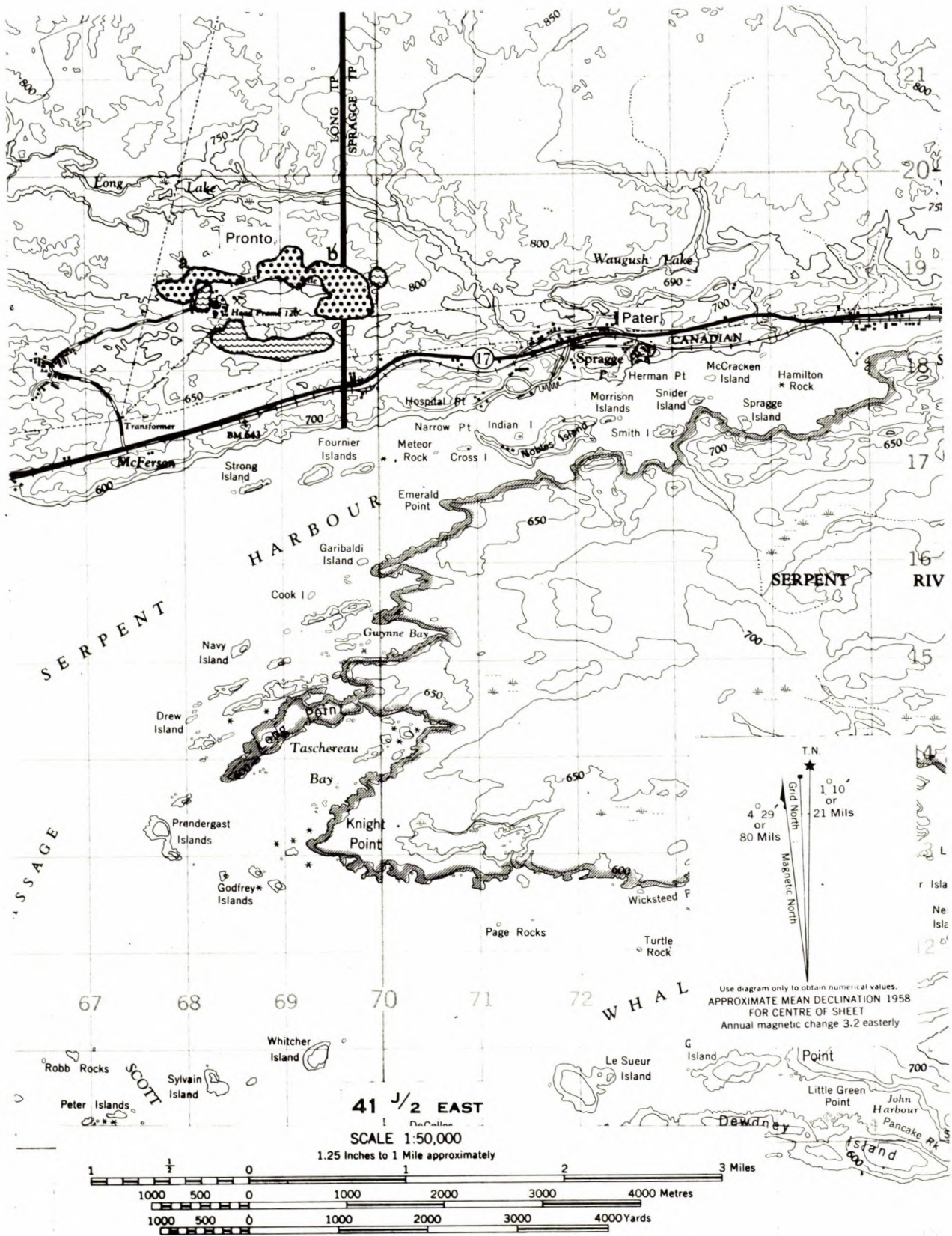
41 P/15
 EDITION 1
 SCALE 1:50,000 ÉCHELLE



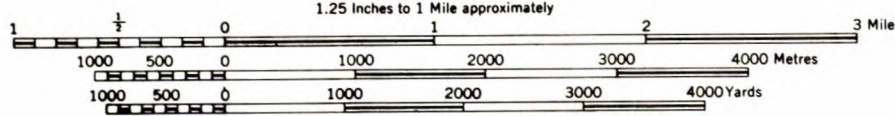
MAP NO. 93



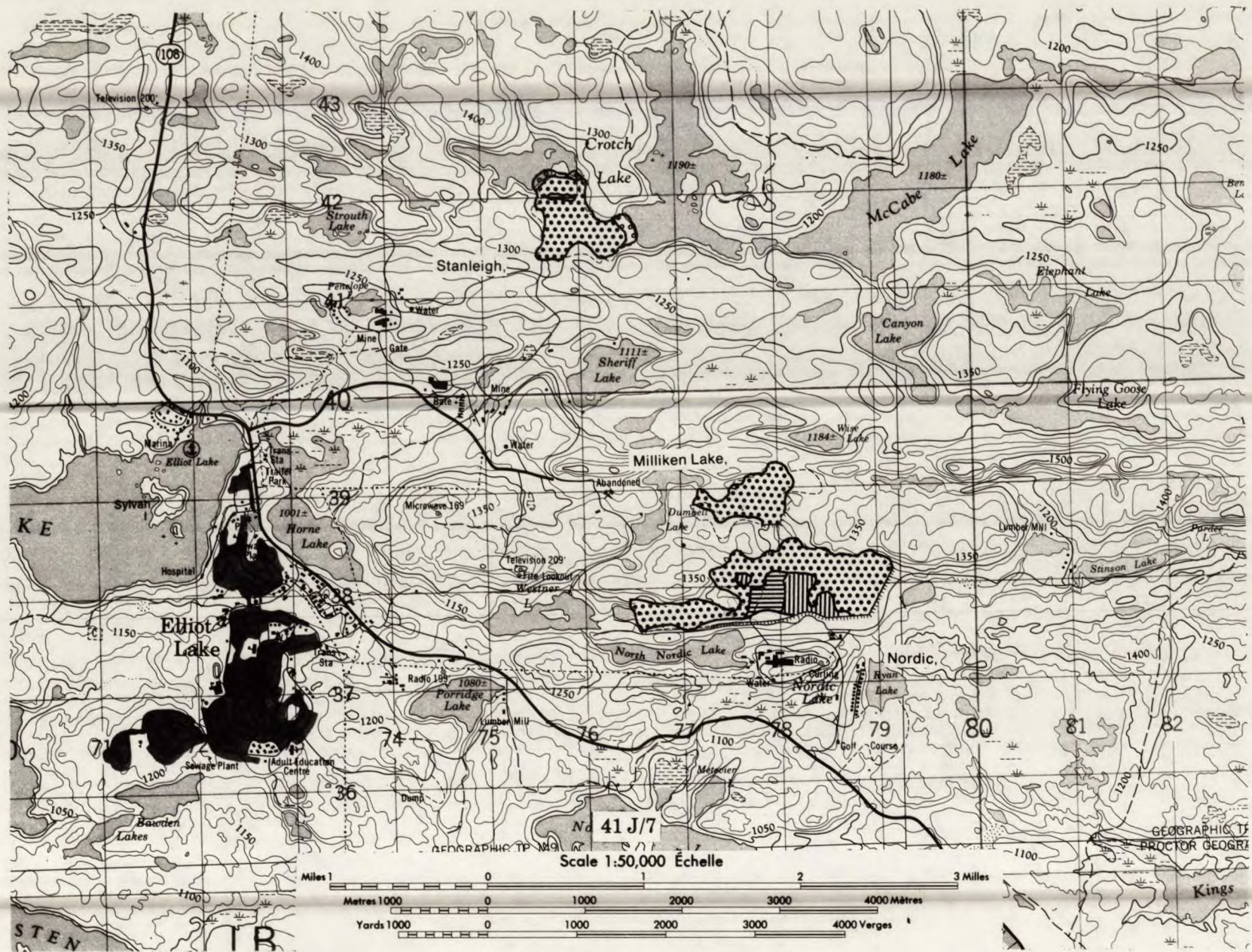
MAP NO. 94

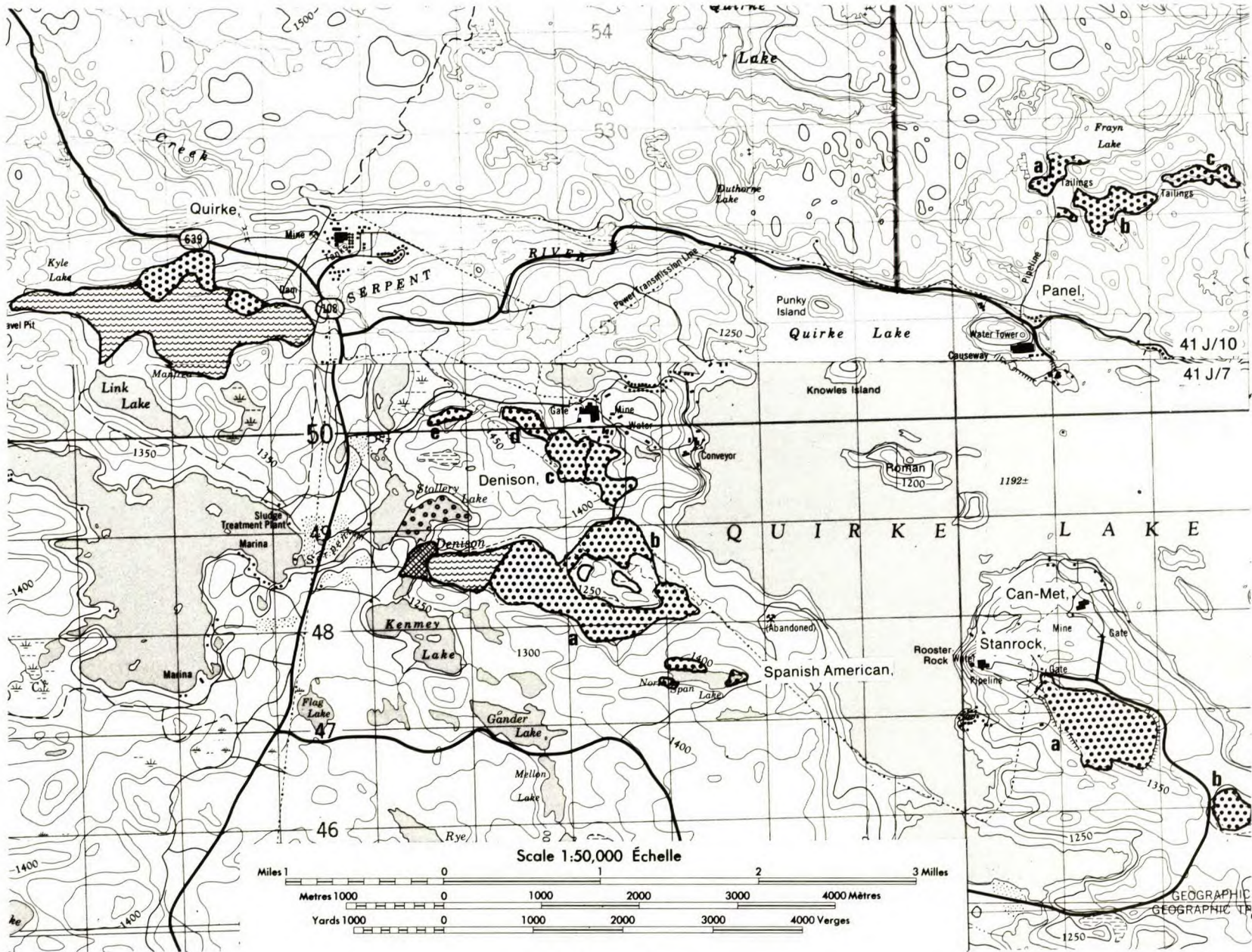


41 1/2 EAST
 SCALE 1:50,000
 1.25 Inches to 1 Mile approximately



Use diagram only to obtain numerical values.
 APPROXIMATE MEAN DECLINATION 1958
 FOR CENTRE OF SHEET
 Annual magnetic change 3.2 easterly

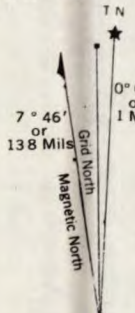
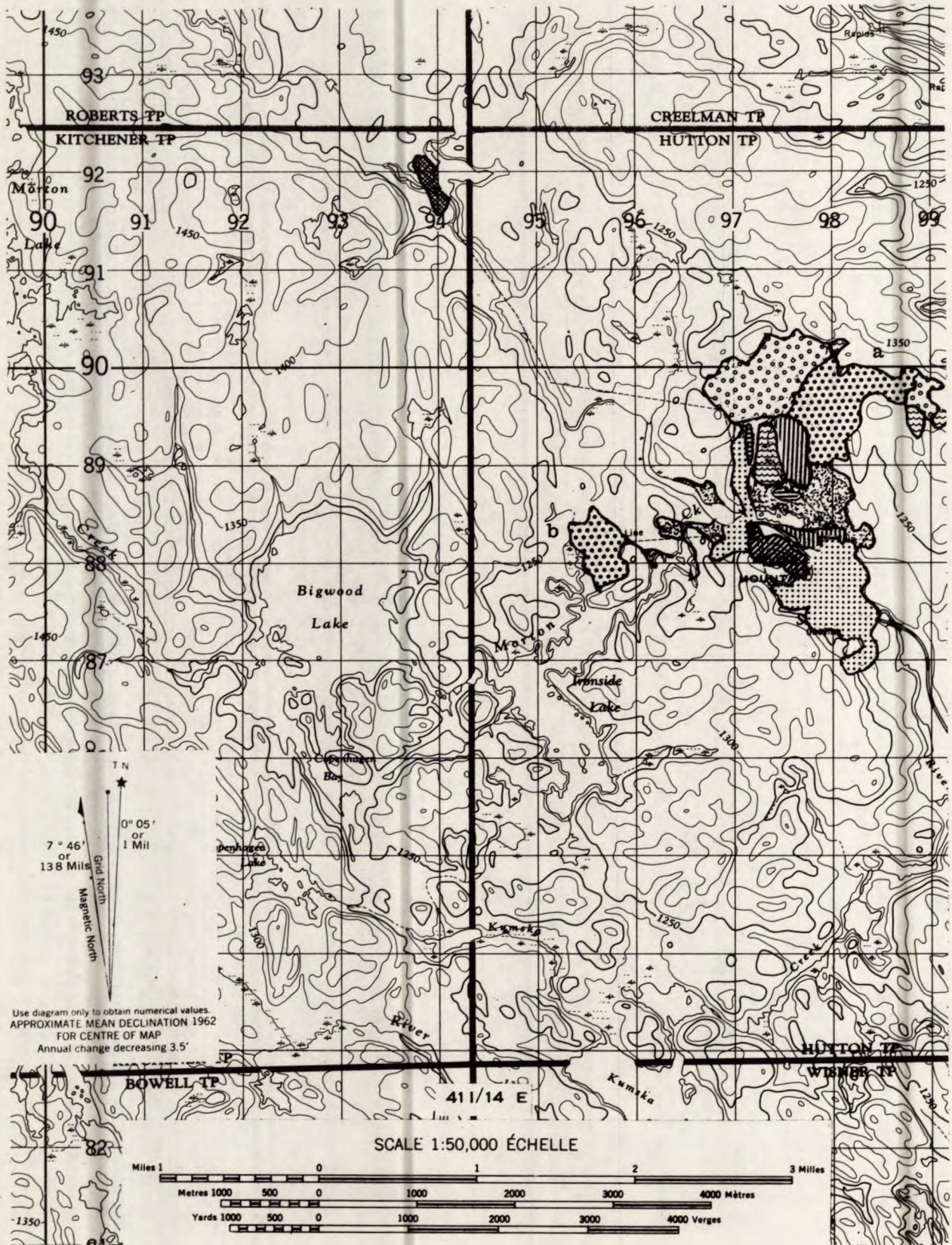




MAP NO. 97

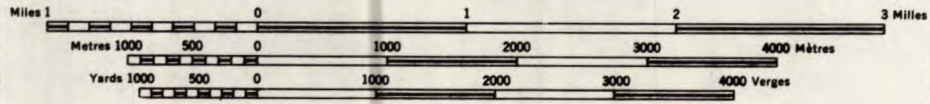


MAP NO. 98



Use diagram only to obtain numerical values.
 APPROXIMATE MEAN DECLINATION 1962
 FOR CENTRE OF MAP
 Annual change decreasing 3.5'

SCALE 1:50,000 ÉCHELLE

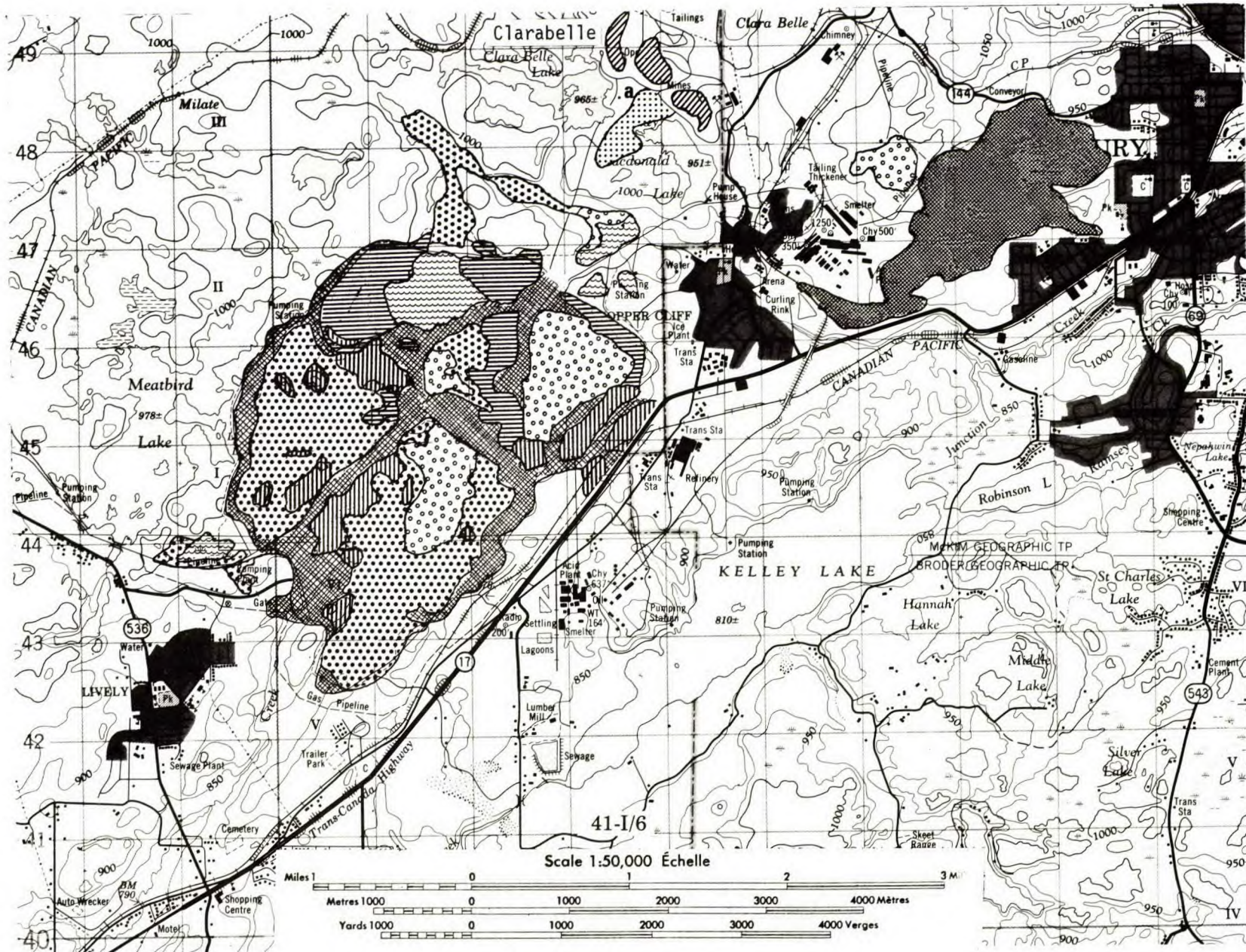




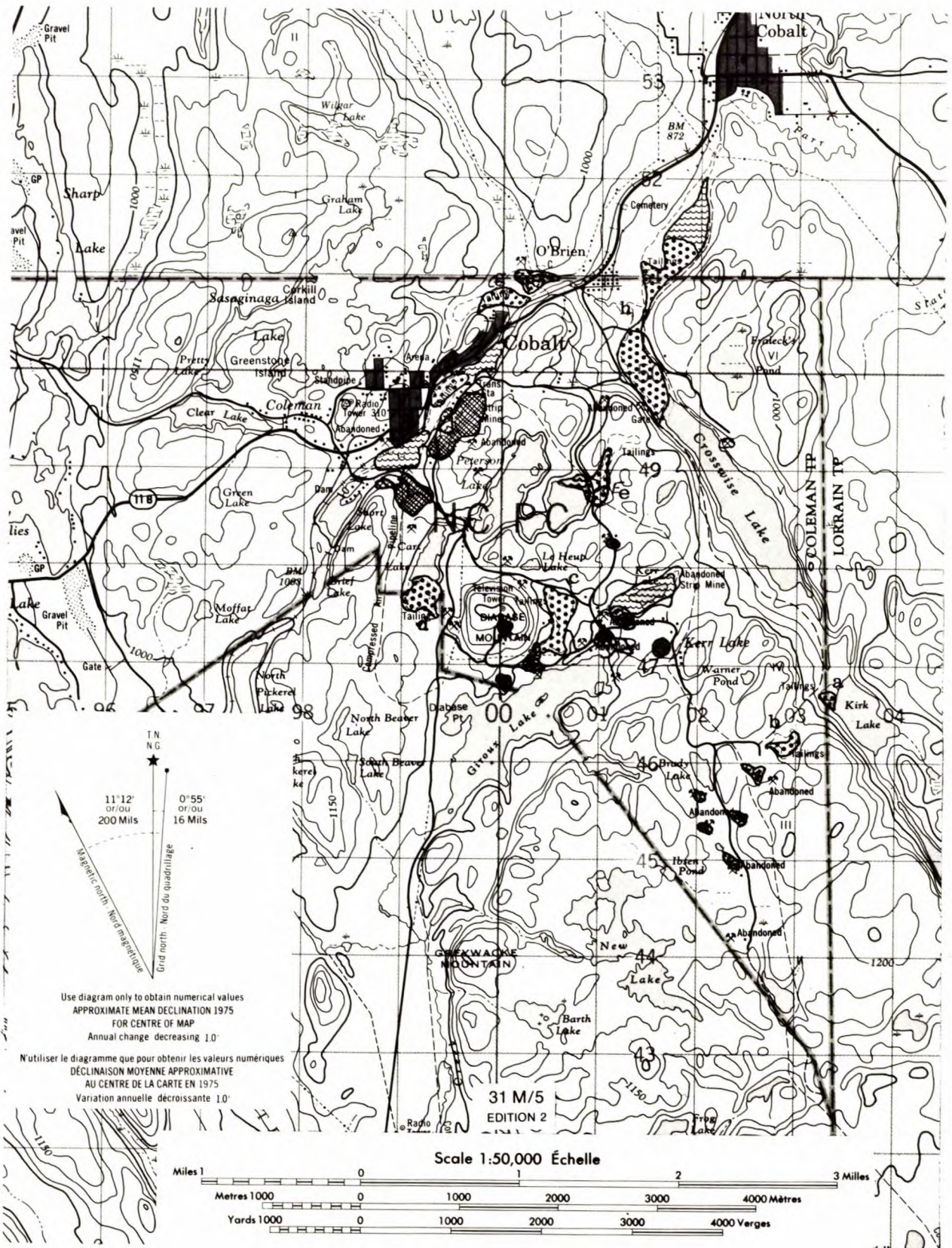
MAP NO. 101



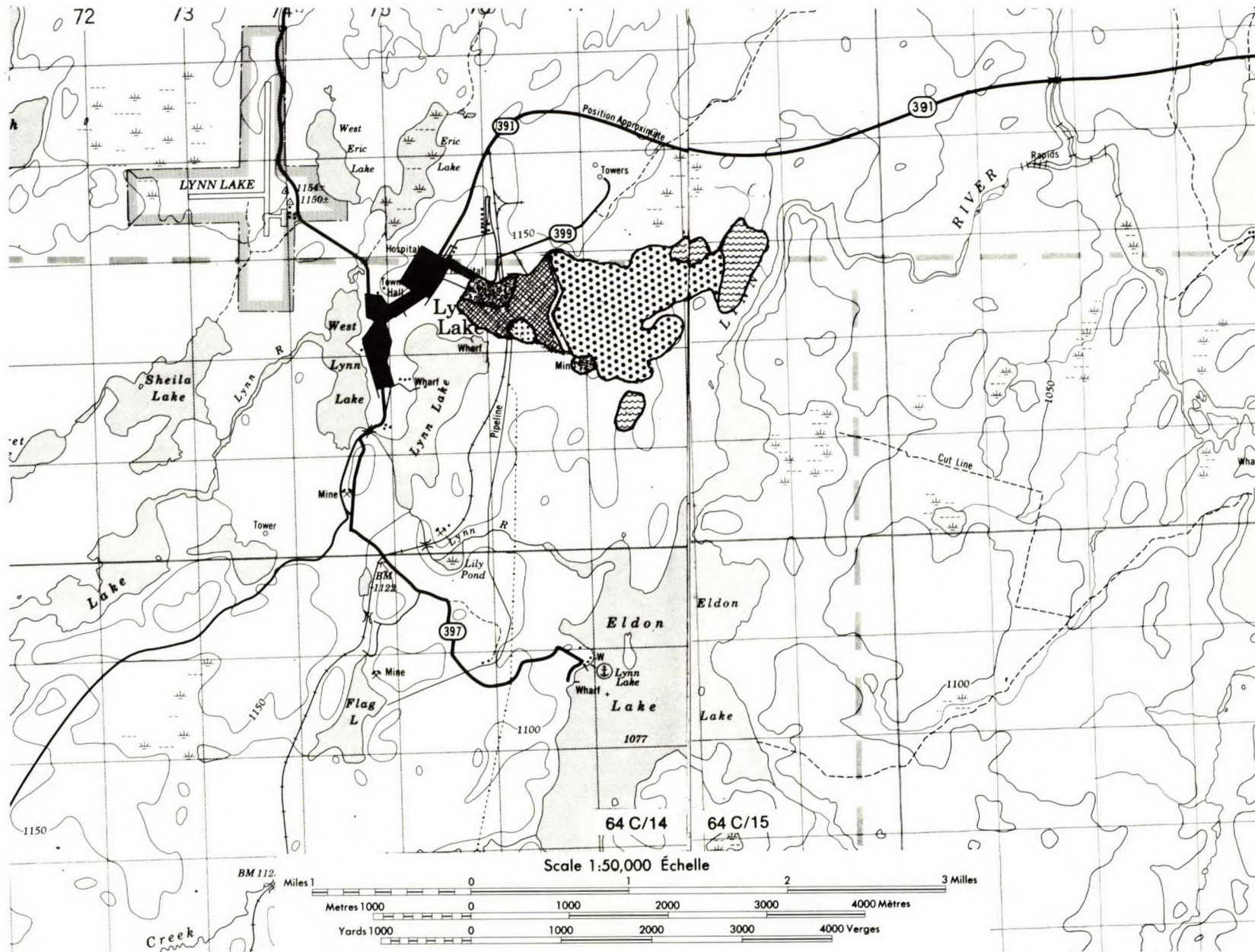
MAP NO. 102



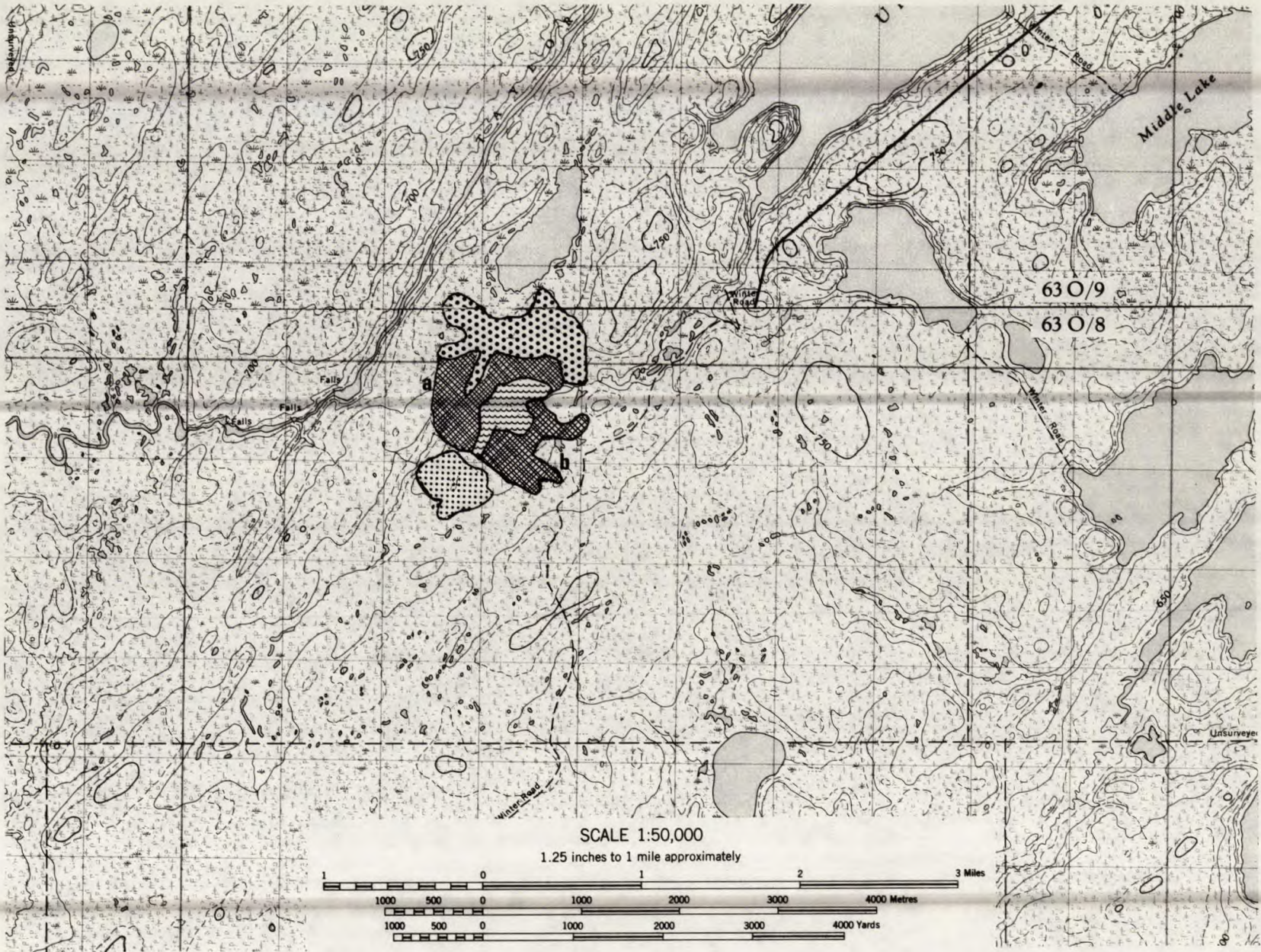
MAP NO. 103



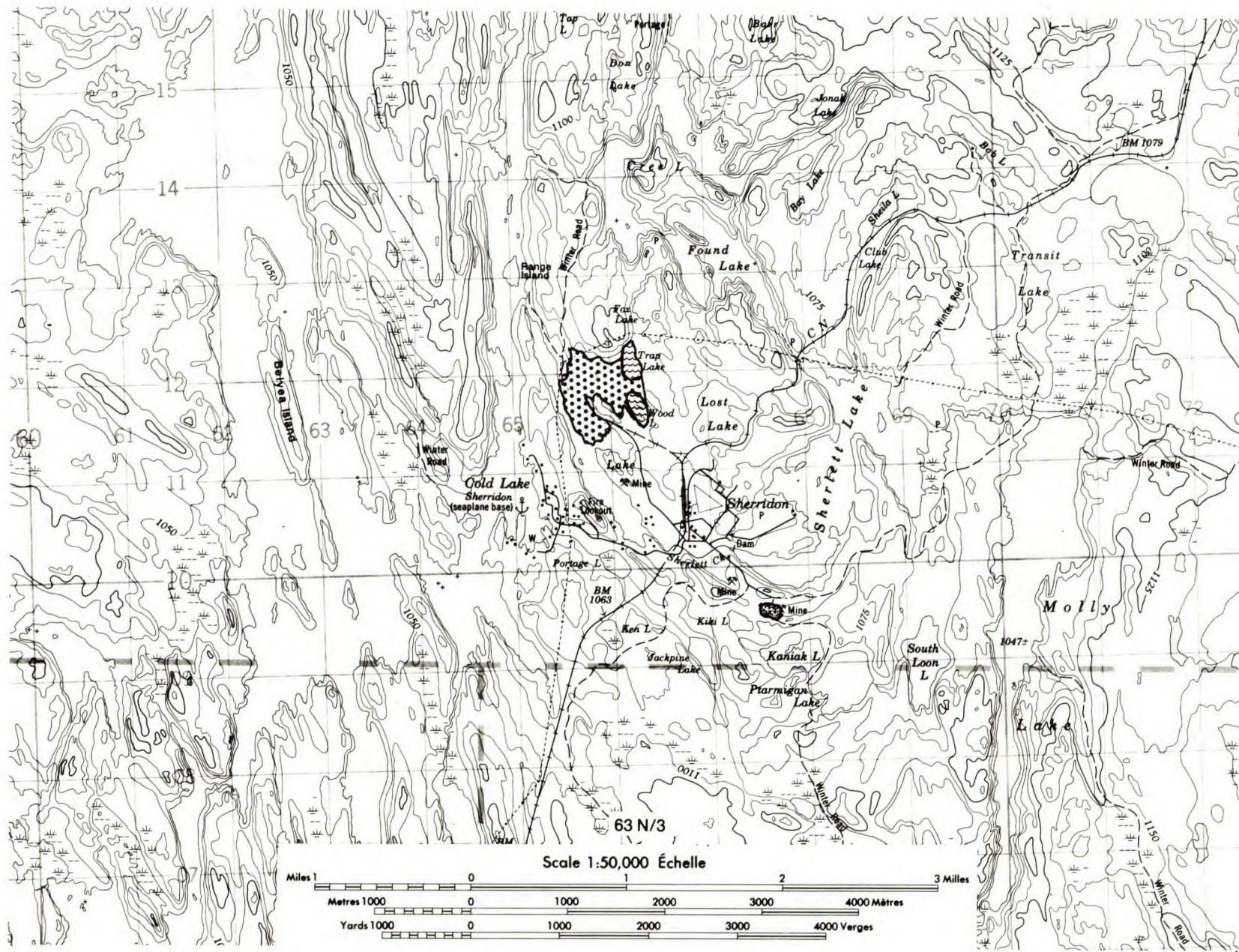
MAP NO. 105



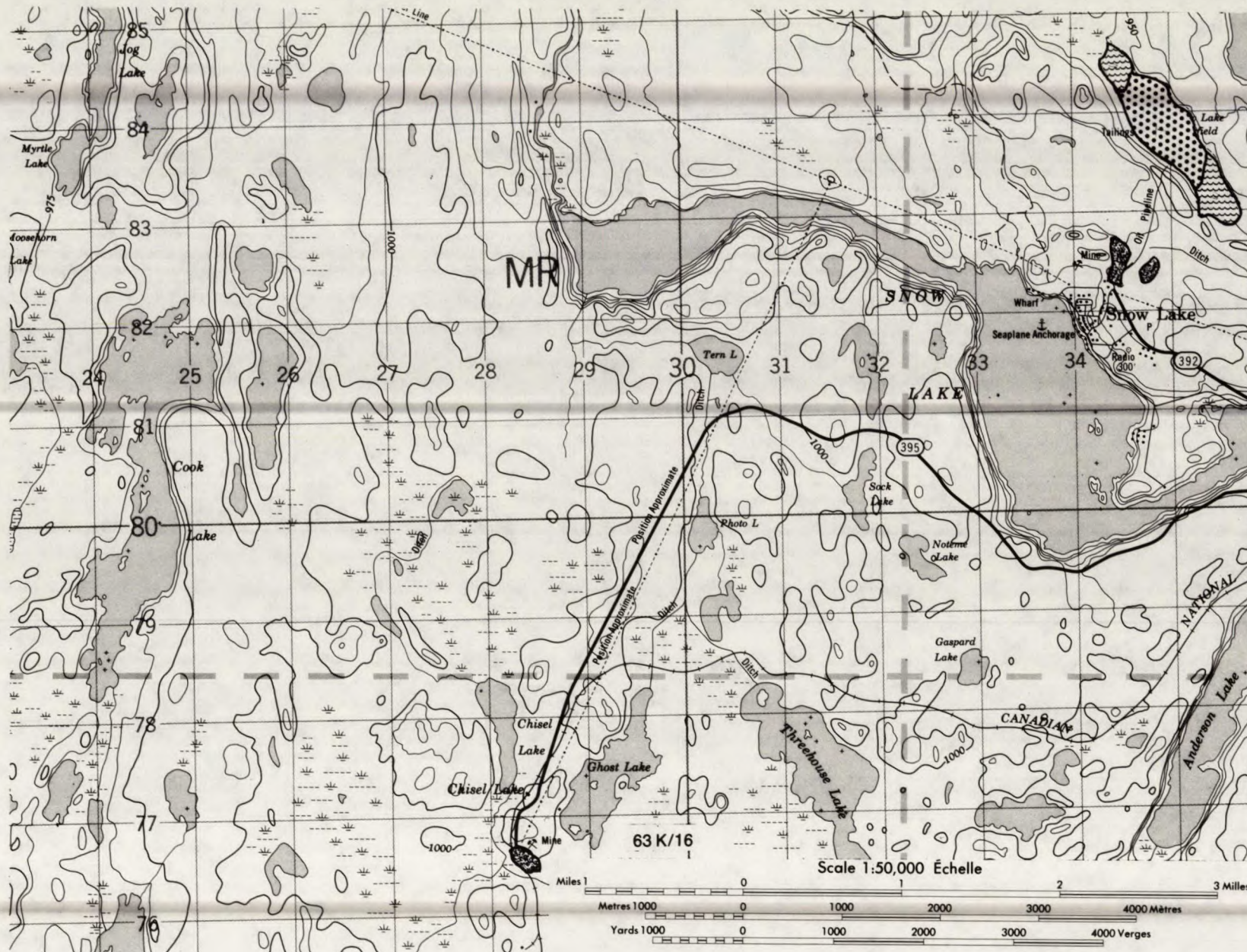
MAP NO. 107



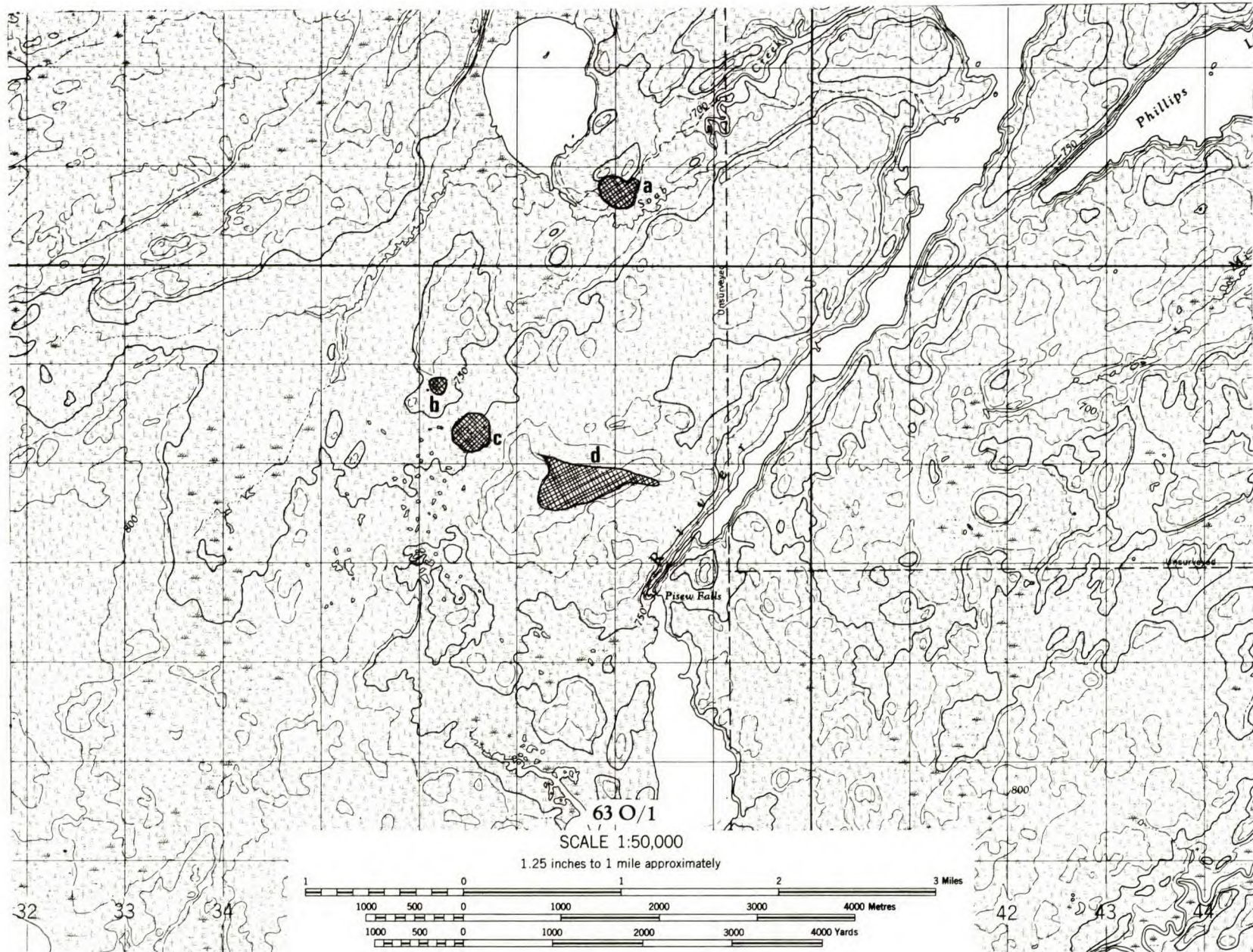
MAP NO. 108



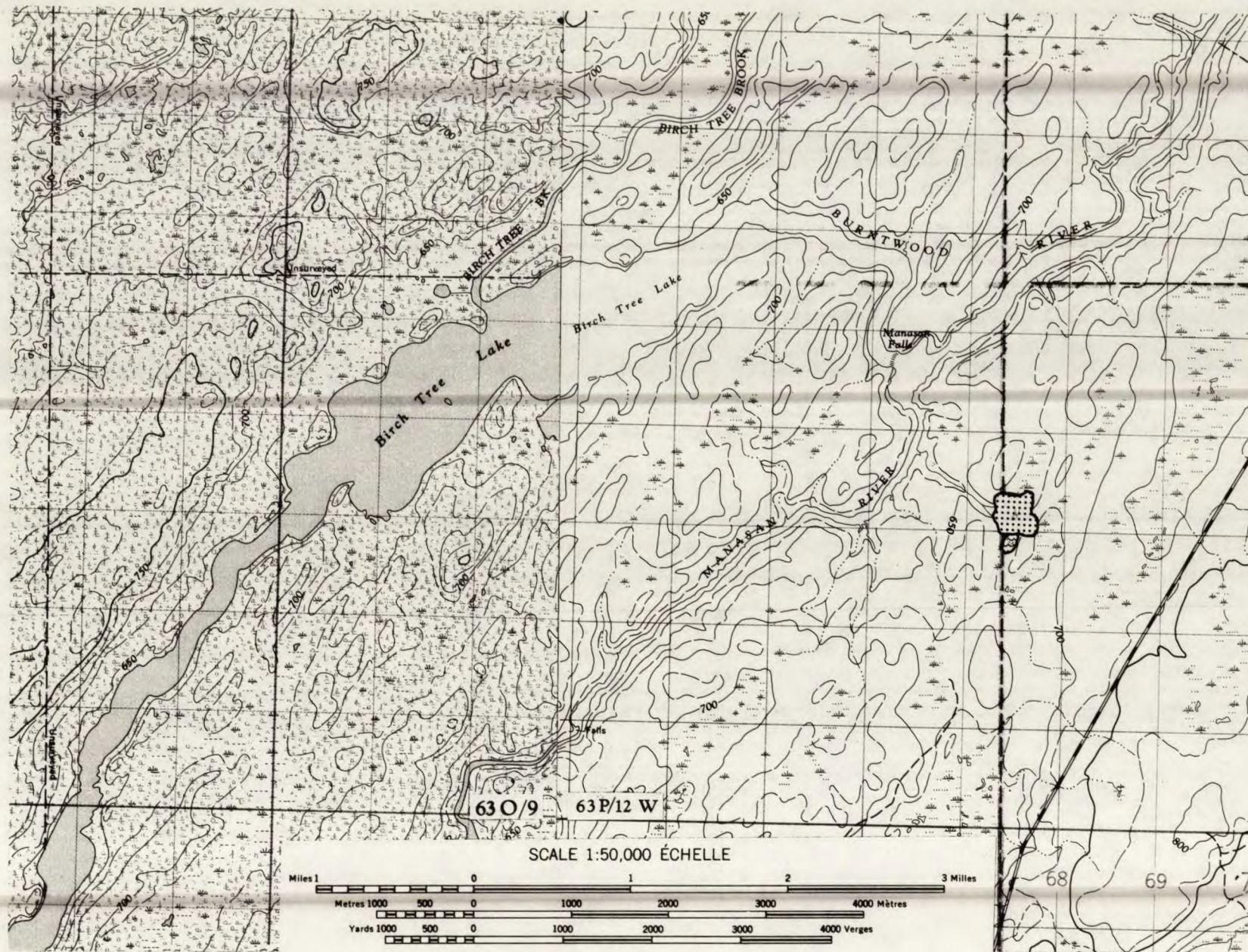
MAP NO. 109



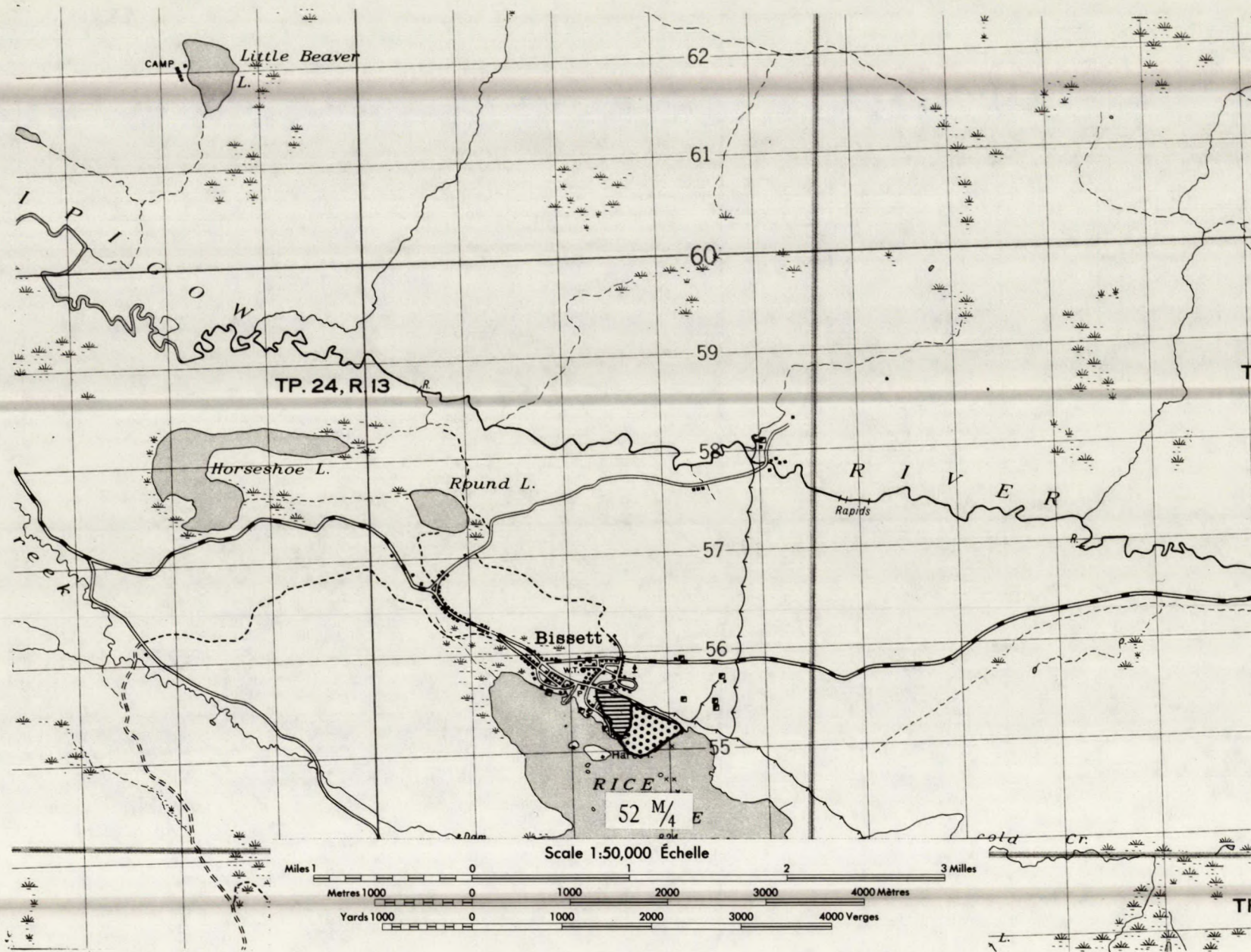
MAP NO. 110



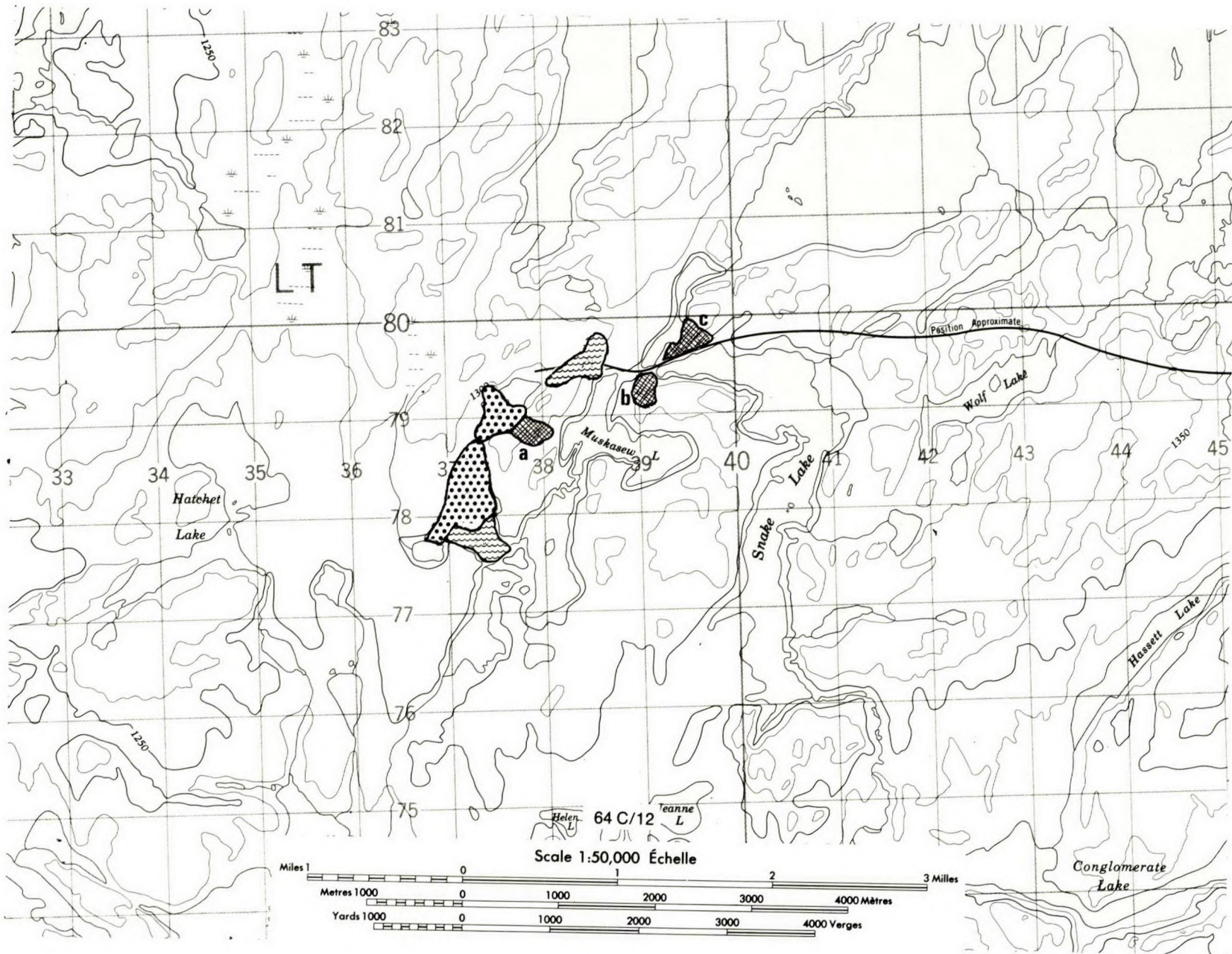
MAP NO. 111



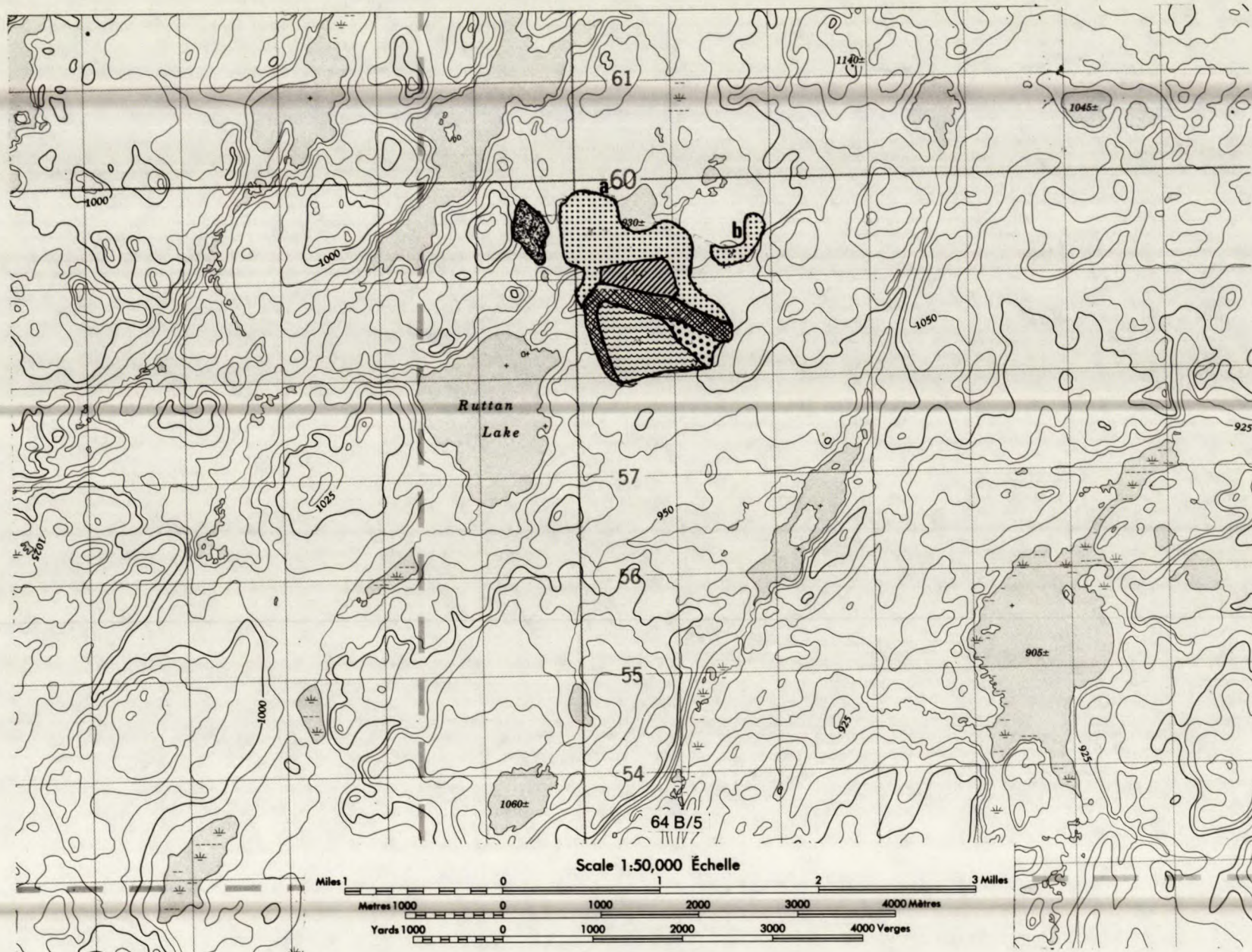
MAP NO. 112



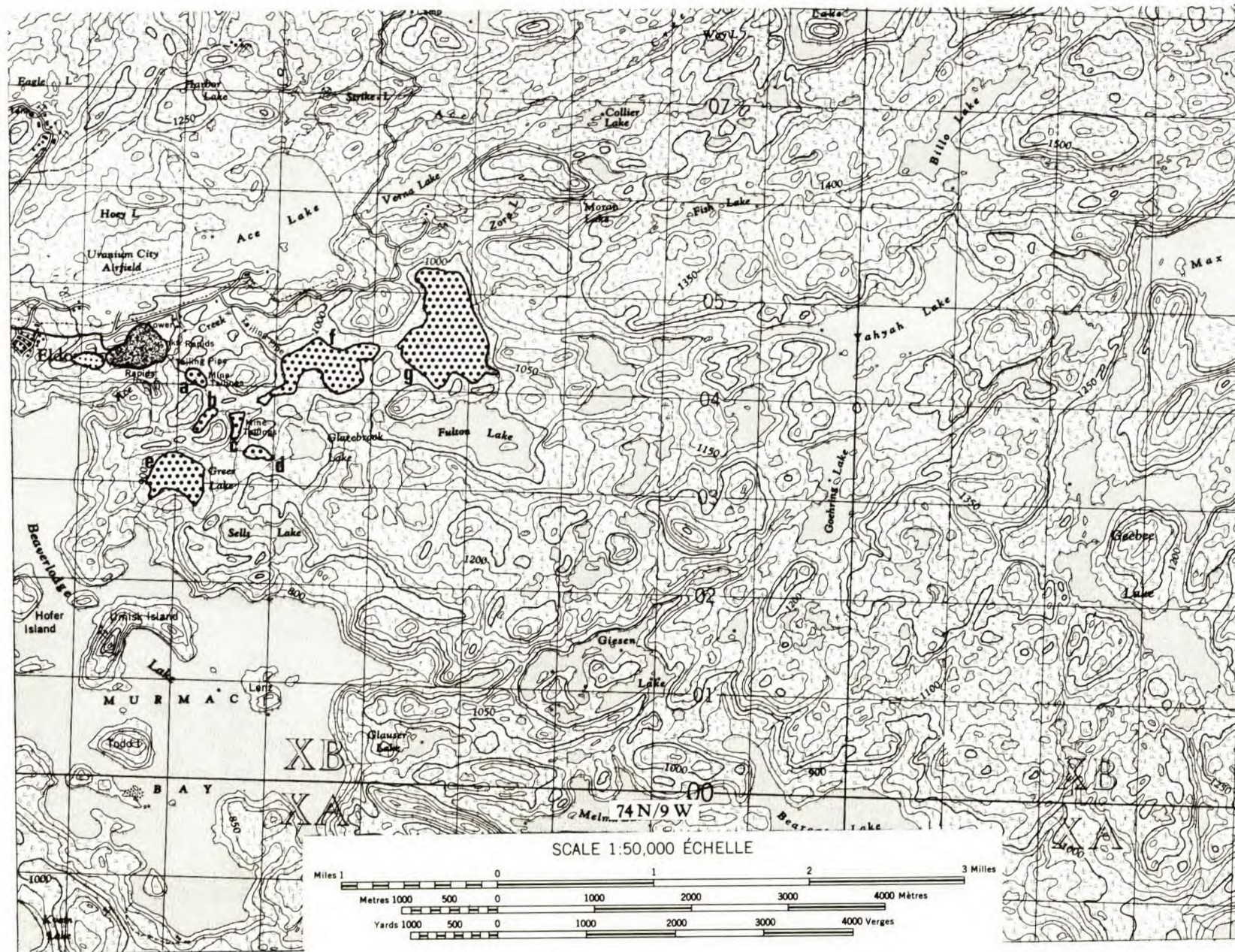
MAP NO. 114



MAP NO. 115



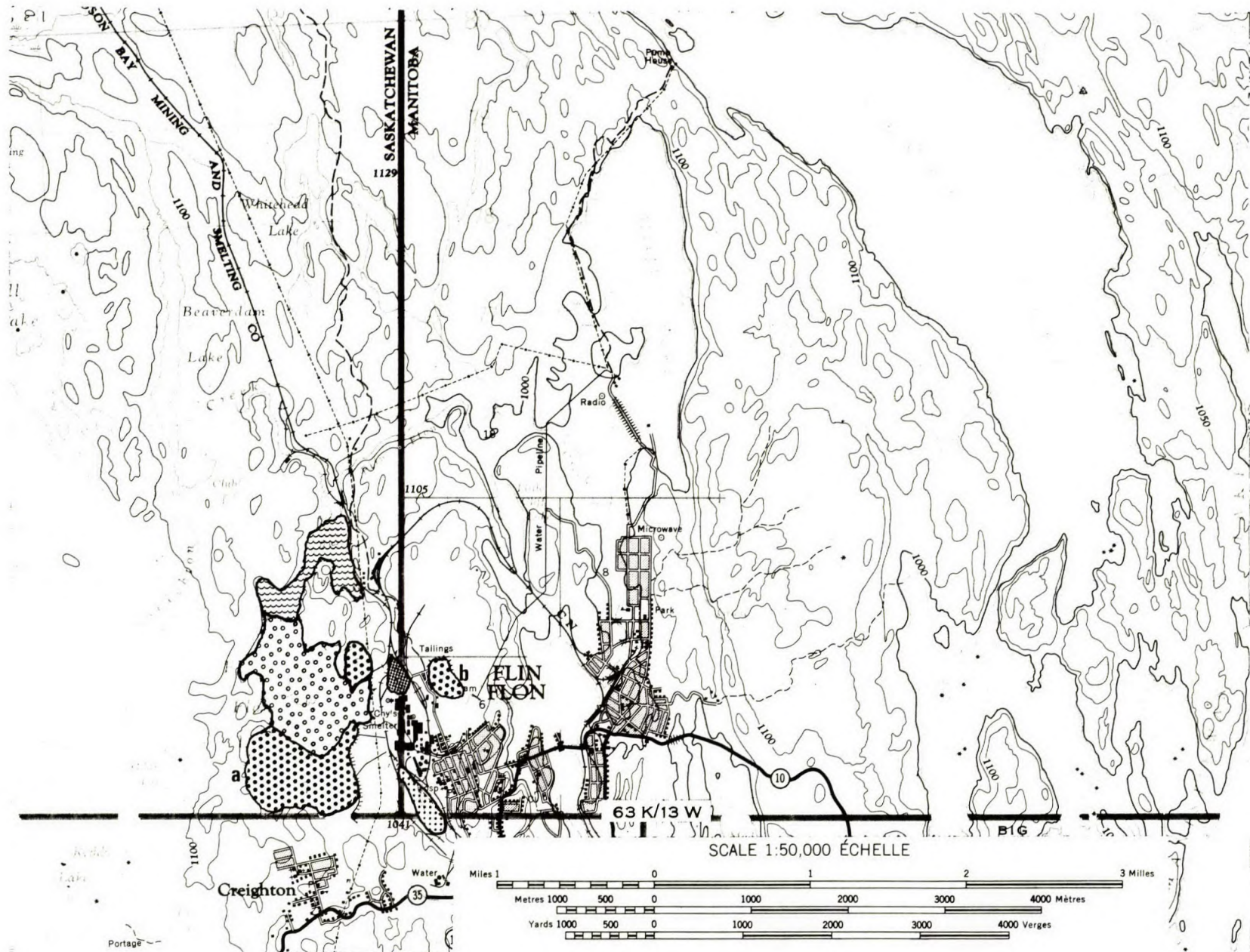
MAP NO. 116



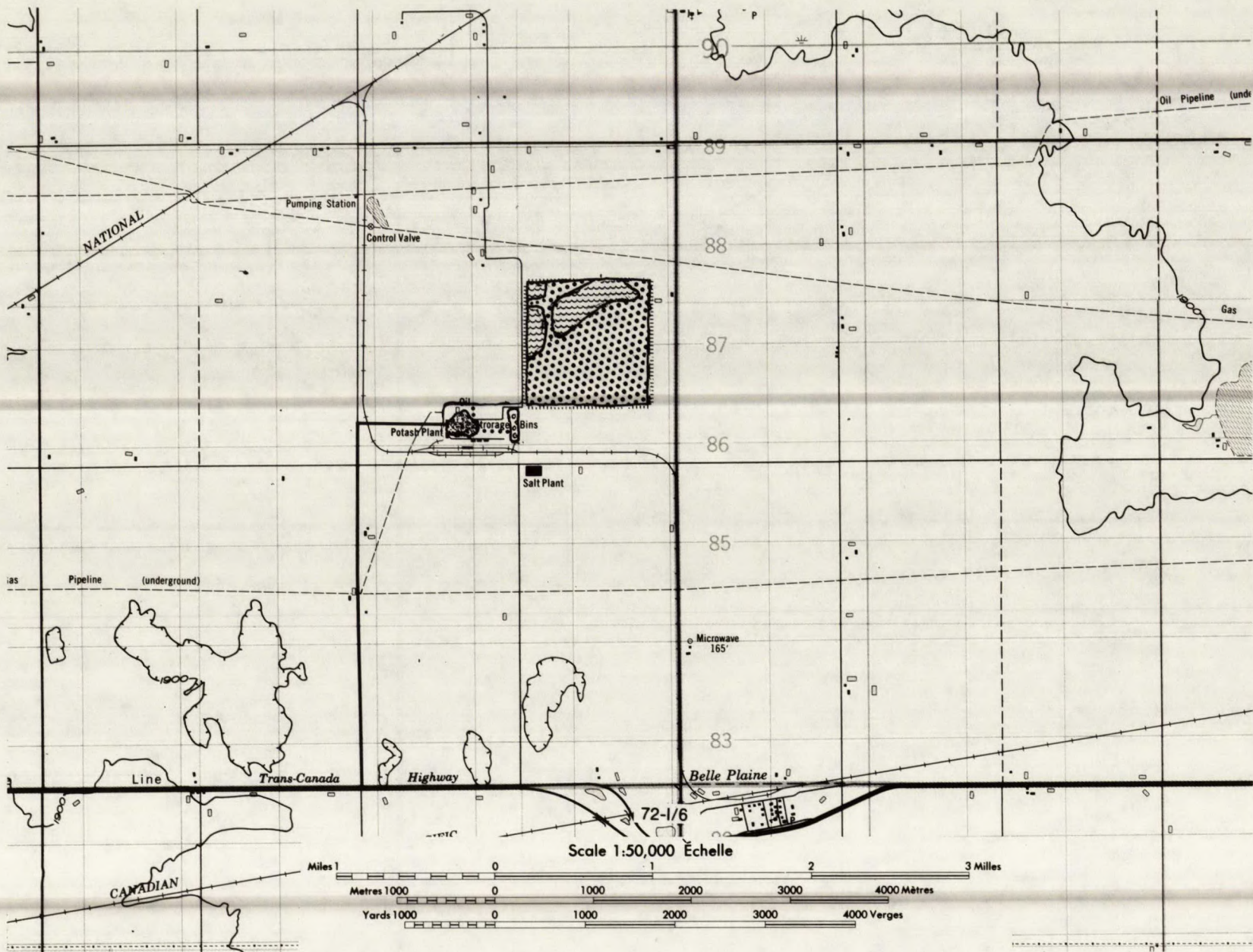
MAP NO. 117



MAP NO. 118

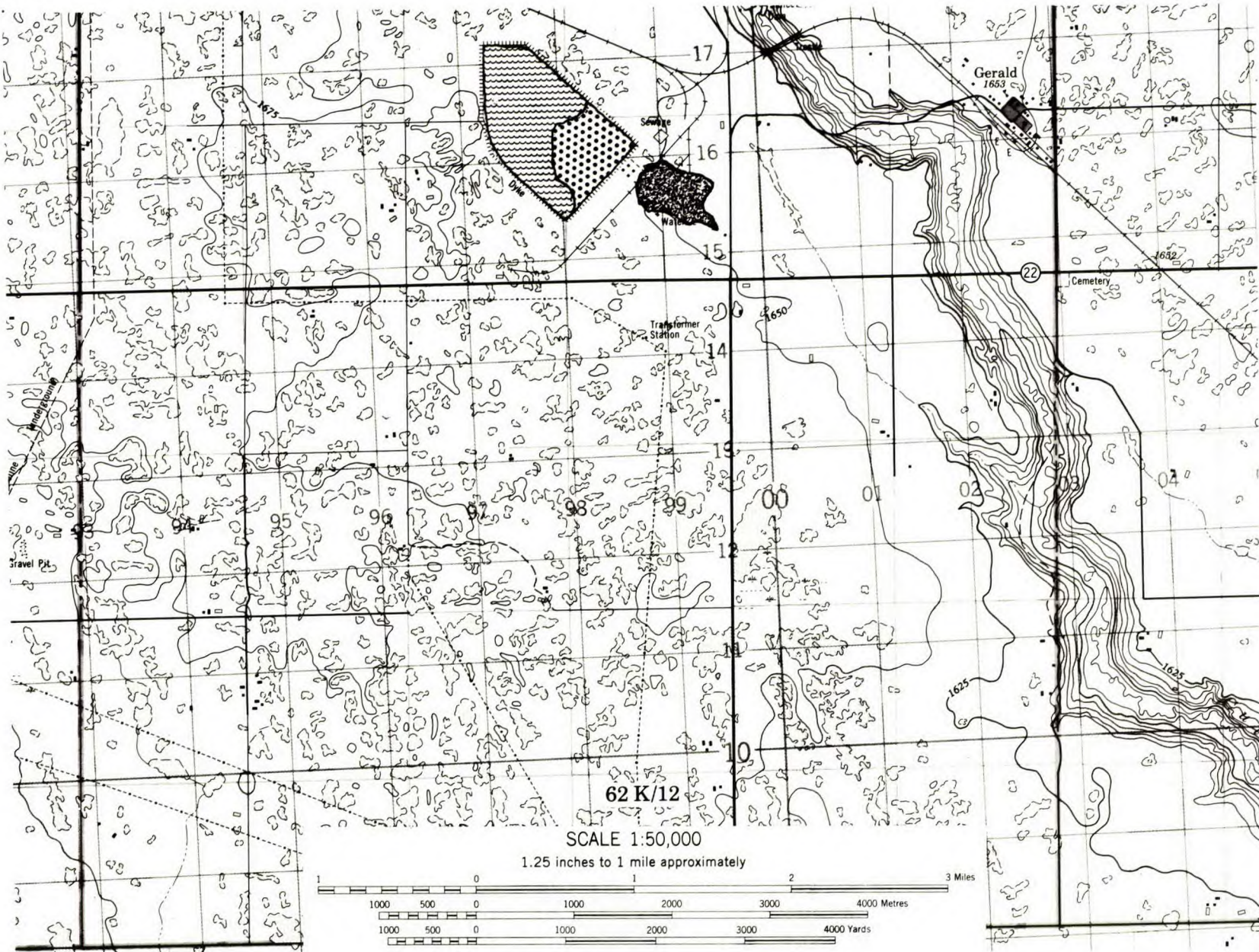


MAP NO. 119



144

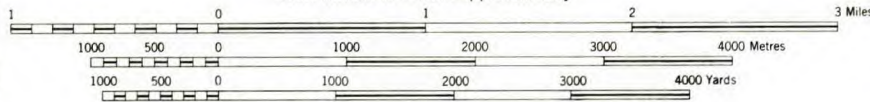
MAP NO. 120



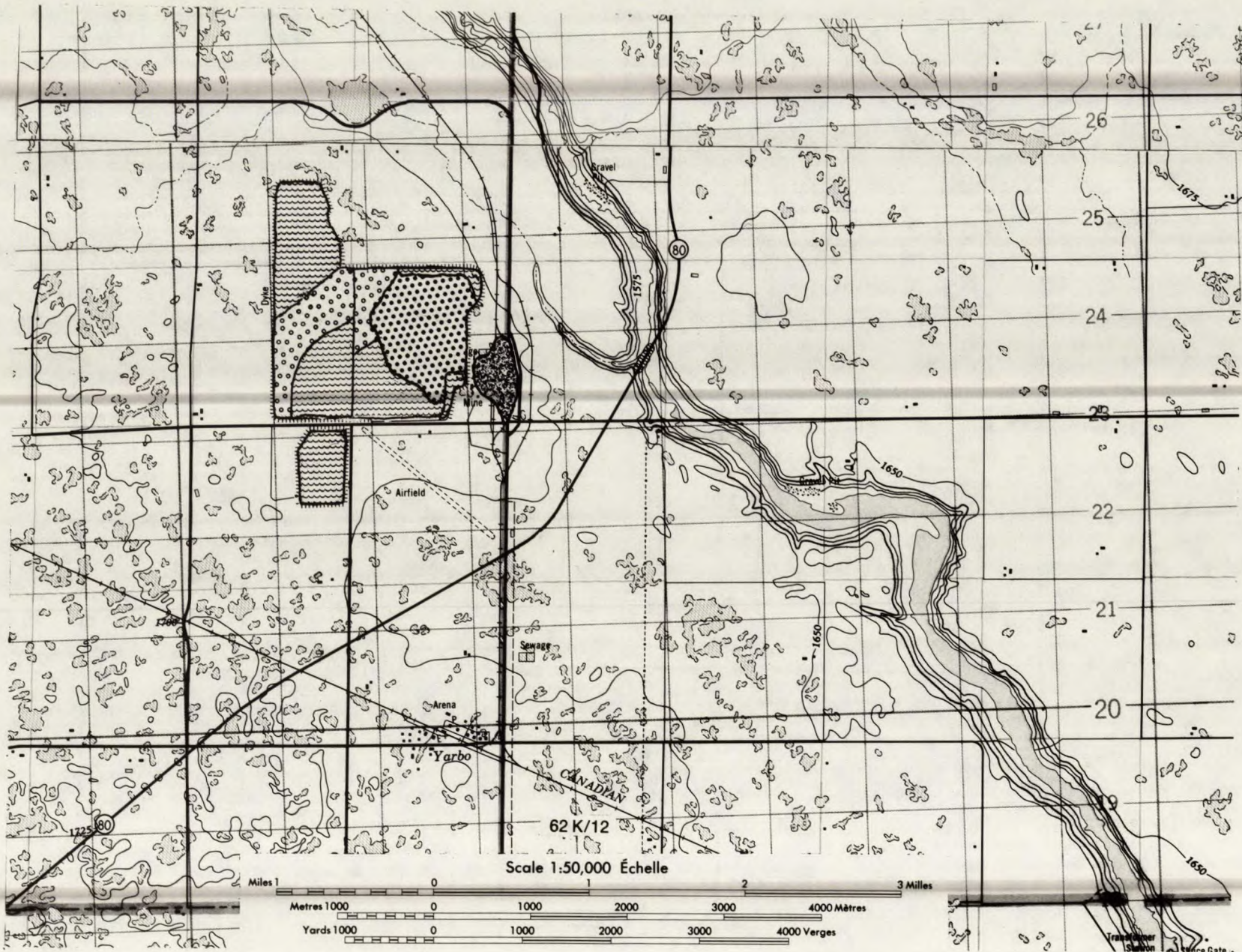
62 K/12

SCALE 1:50,000

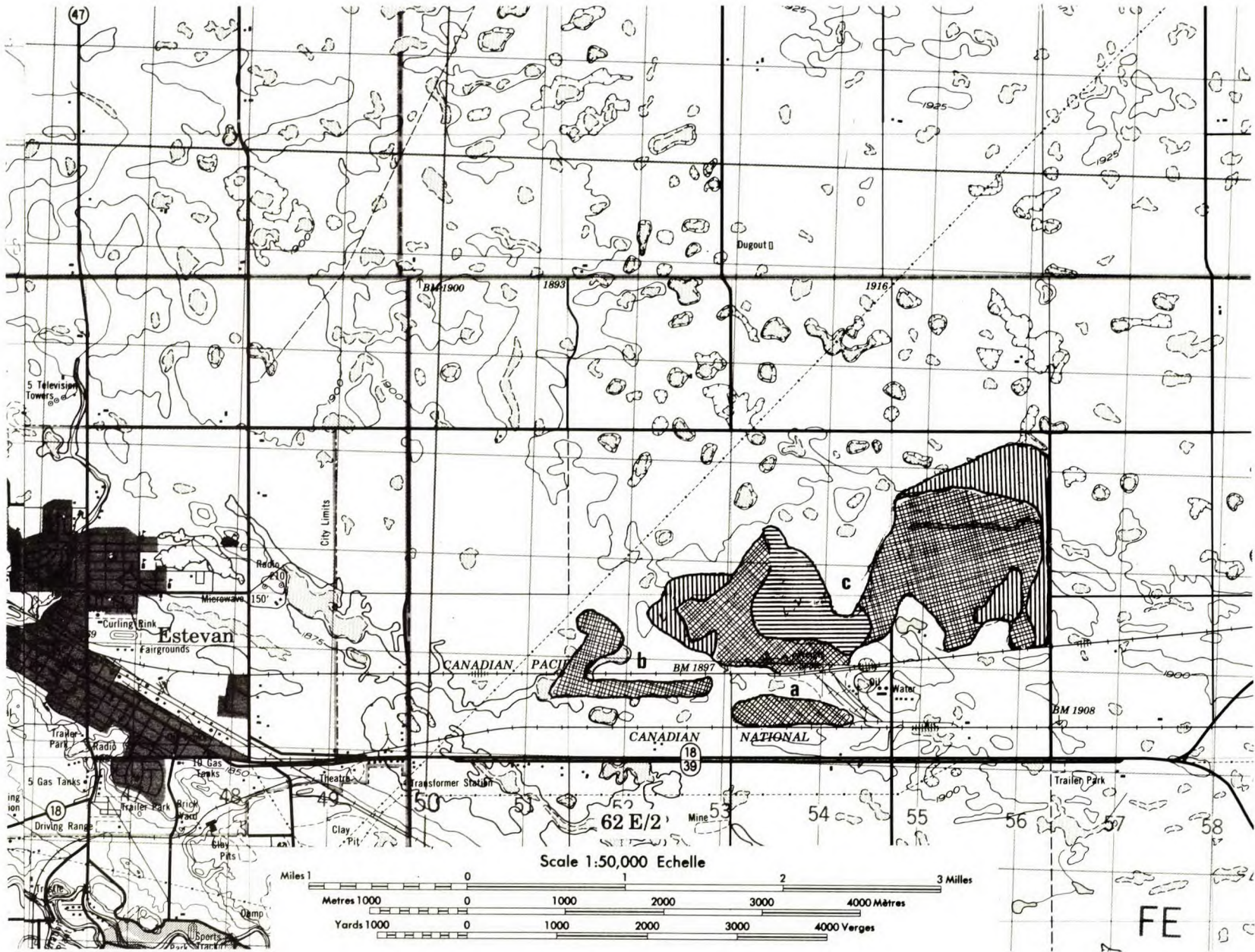
1.25 inches to 1 mile approximately



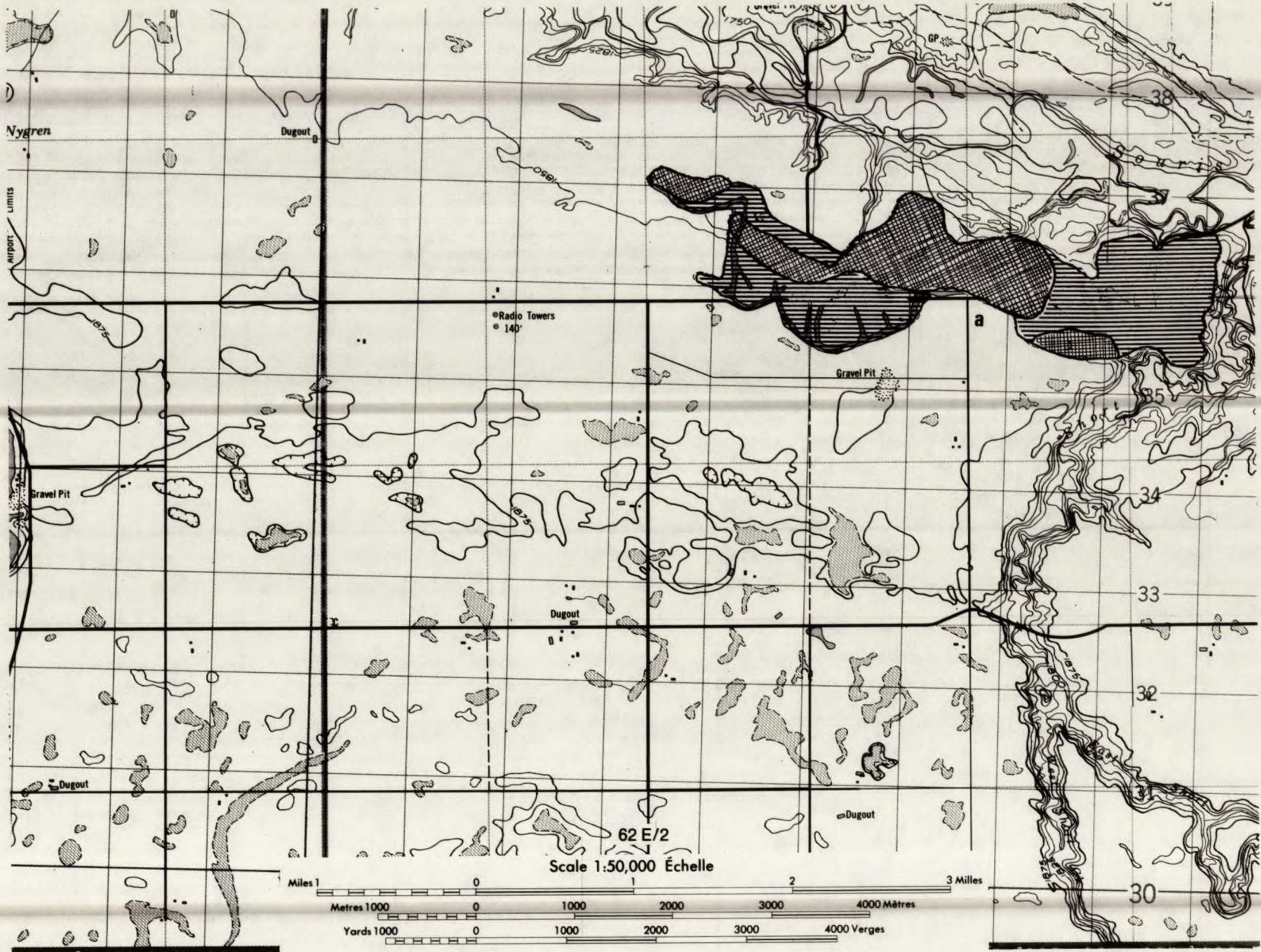
MAP NO. 121



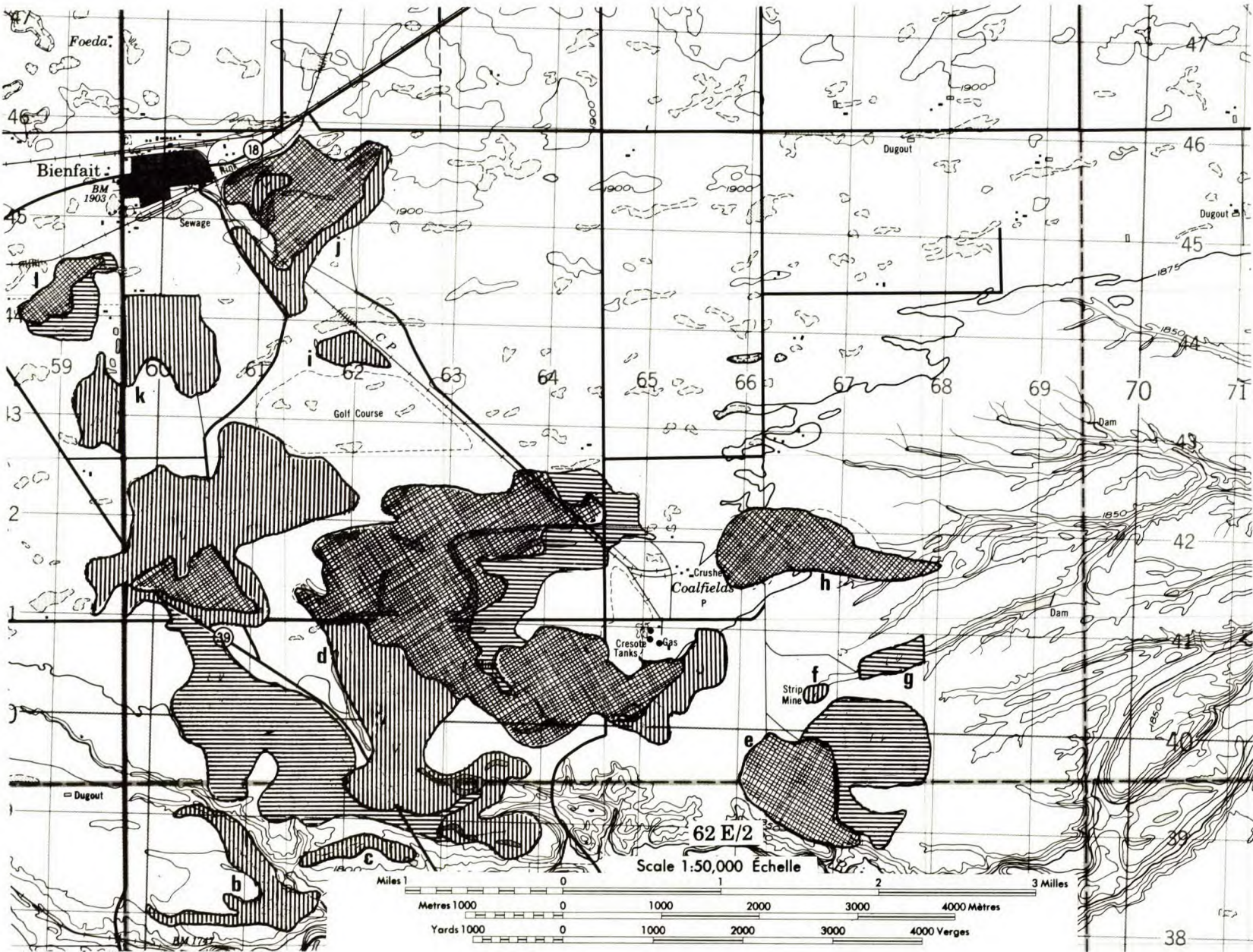
MAP NO. 122



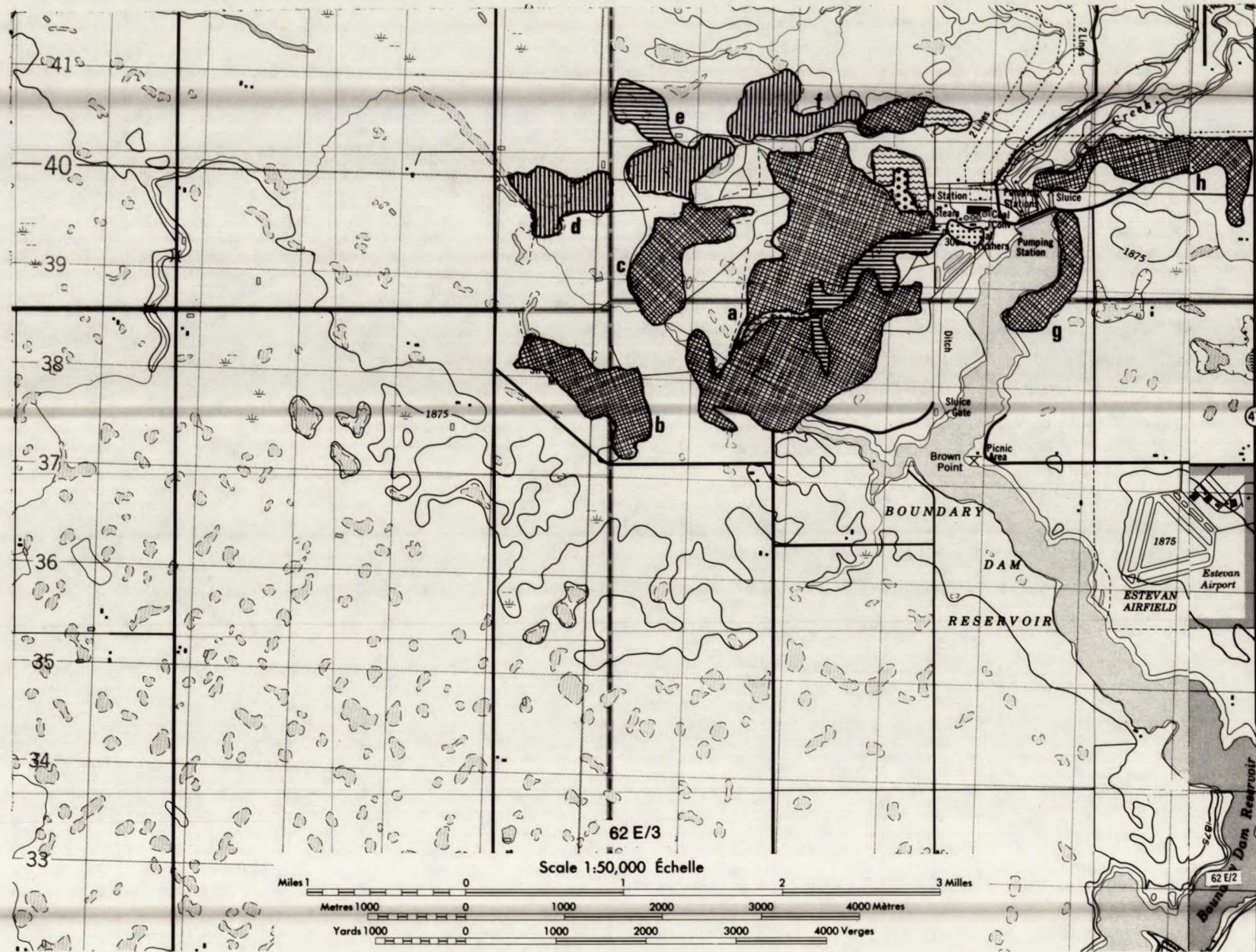
MAP NO. 123



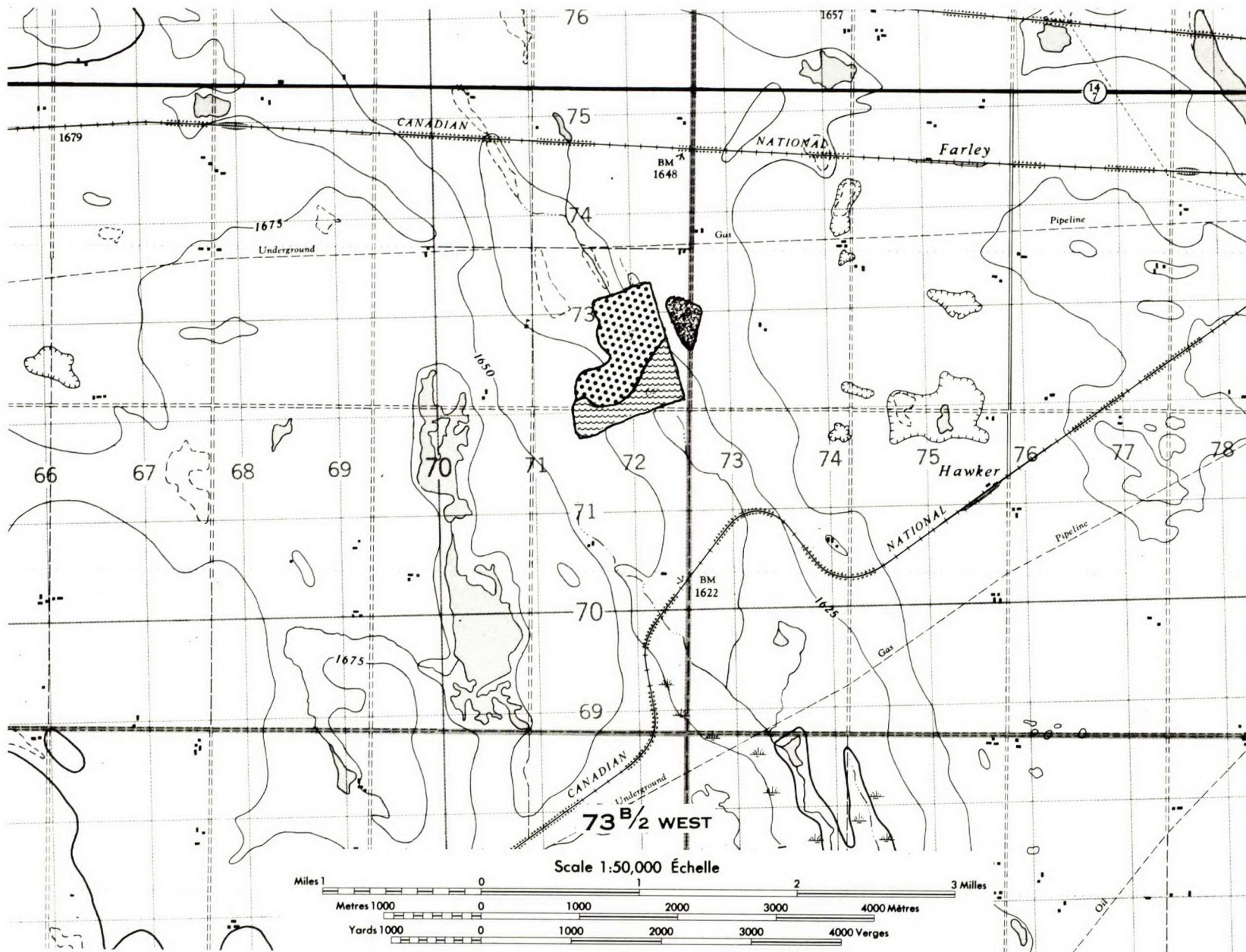
MAP NO. 124



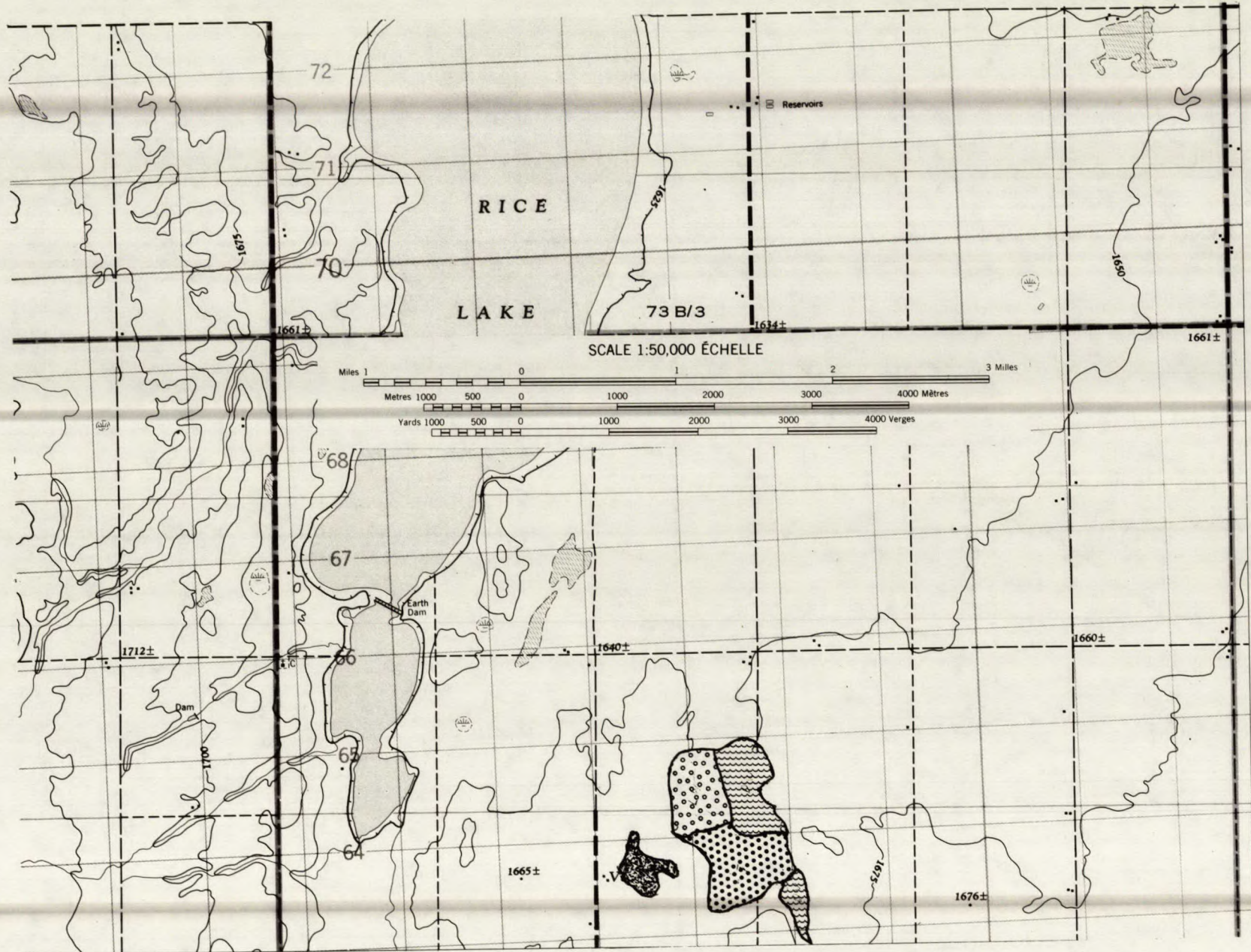
MAP NO. 125



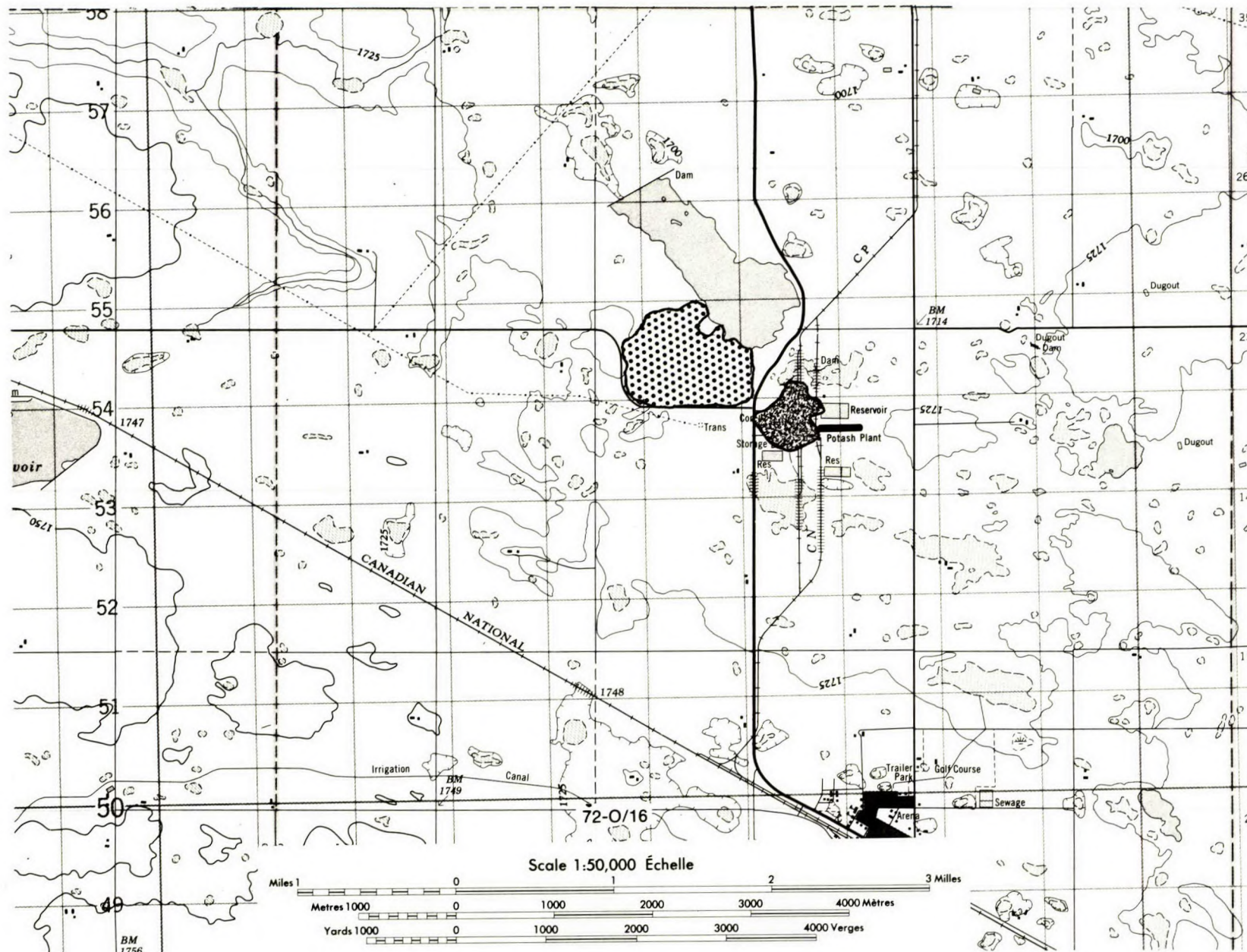
MAP NO. 126



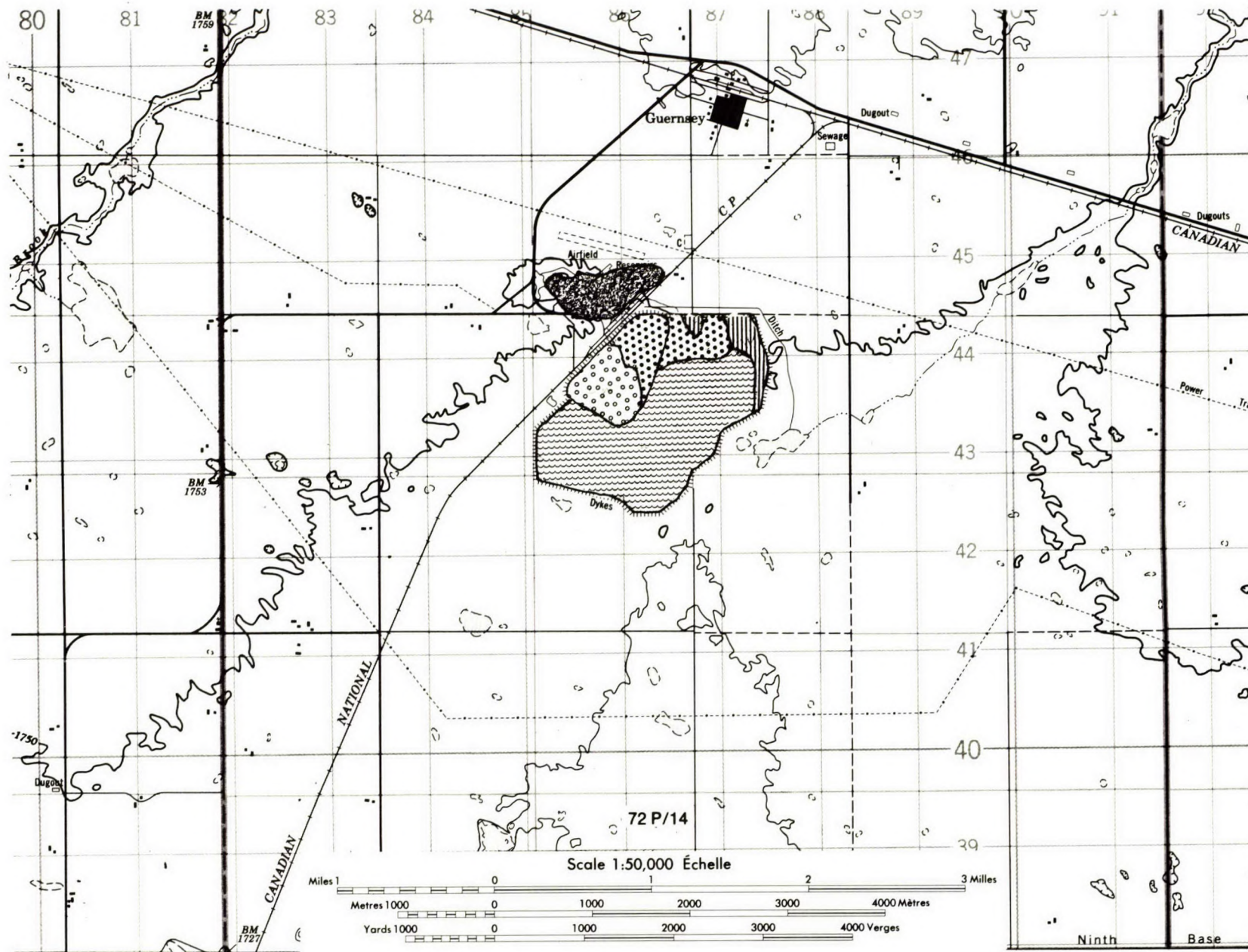
MAP NO. 127



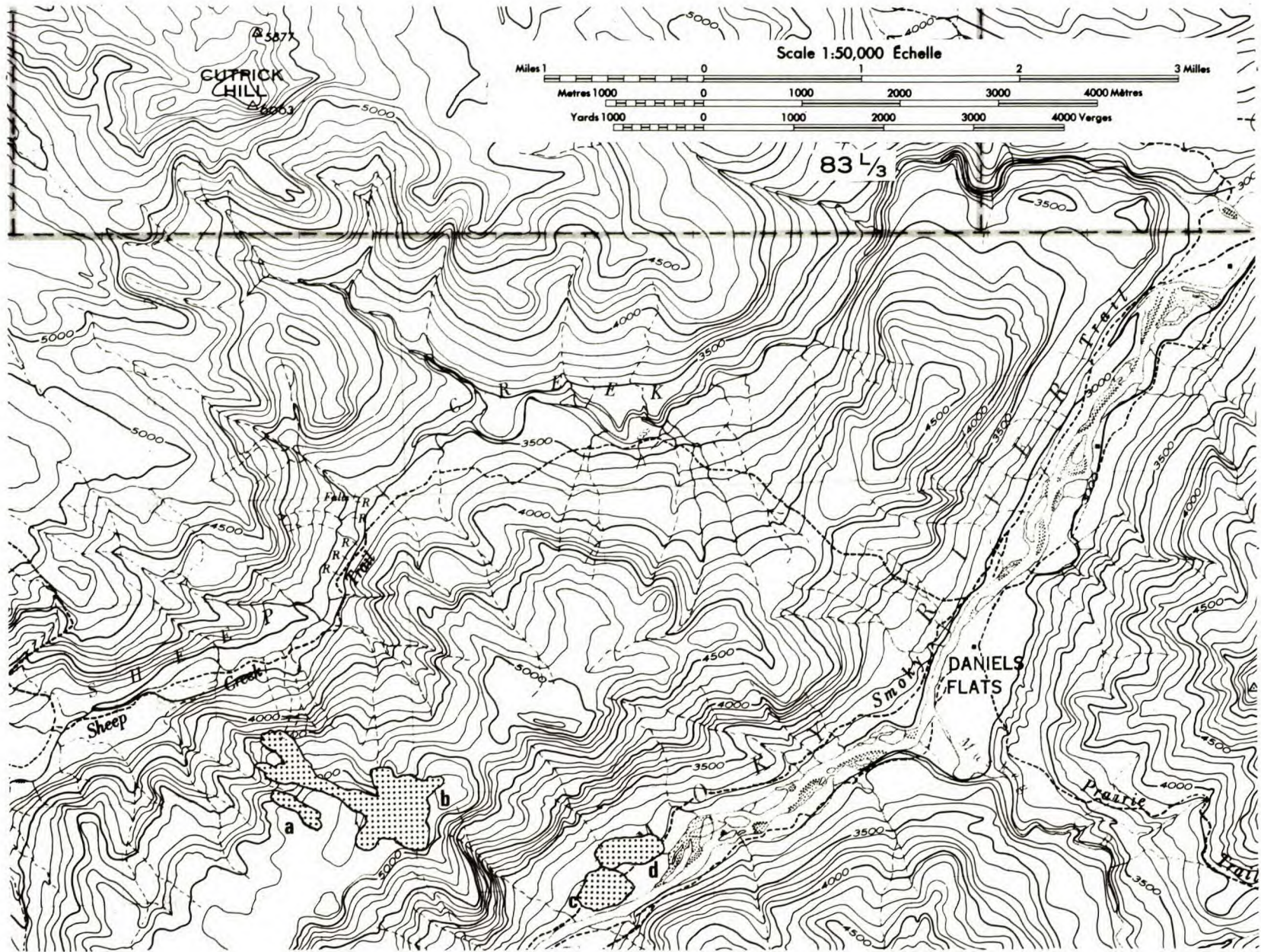
MAP NO. 128



MAP NO. 129



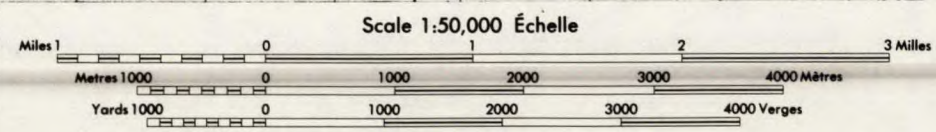
MAP NO. 131



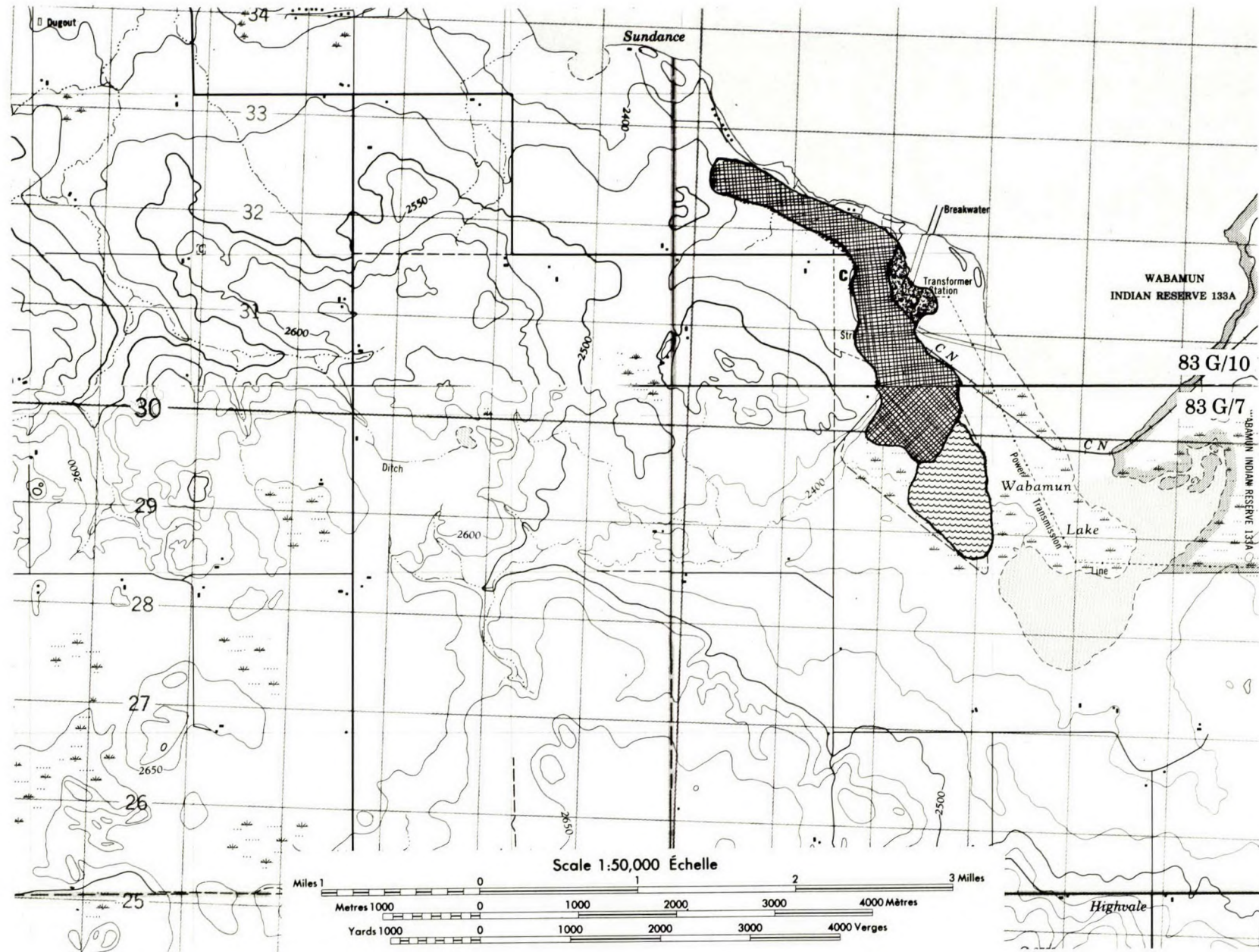
MAP NO. 133



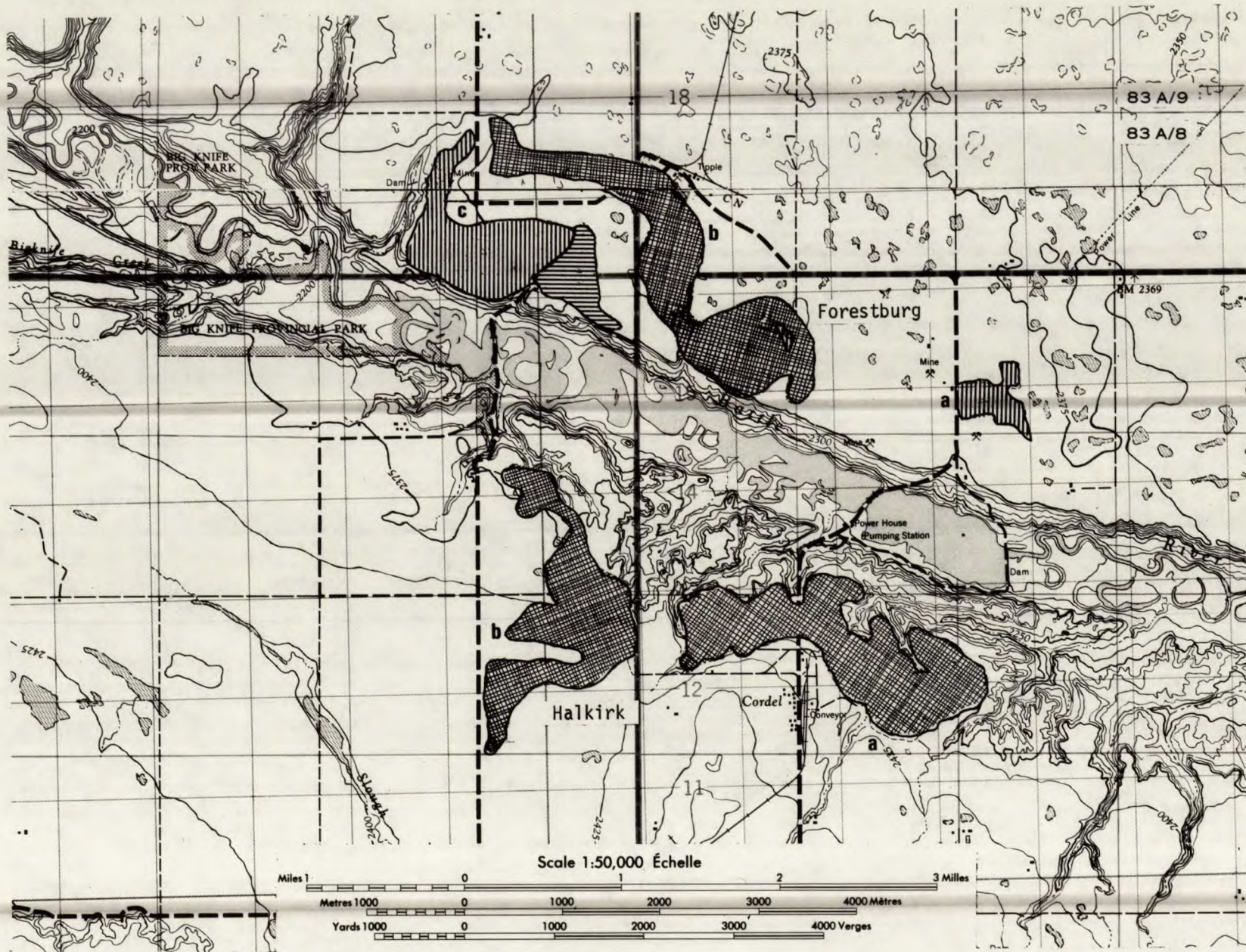
83 G/10 83 G/9



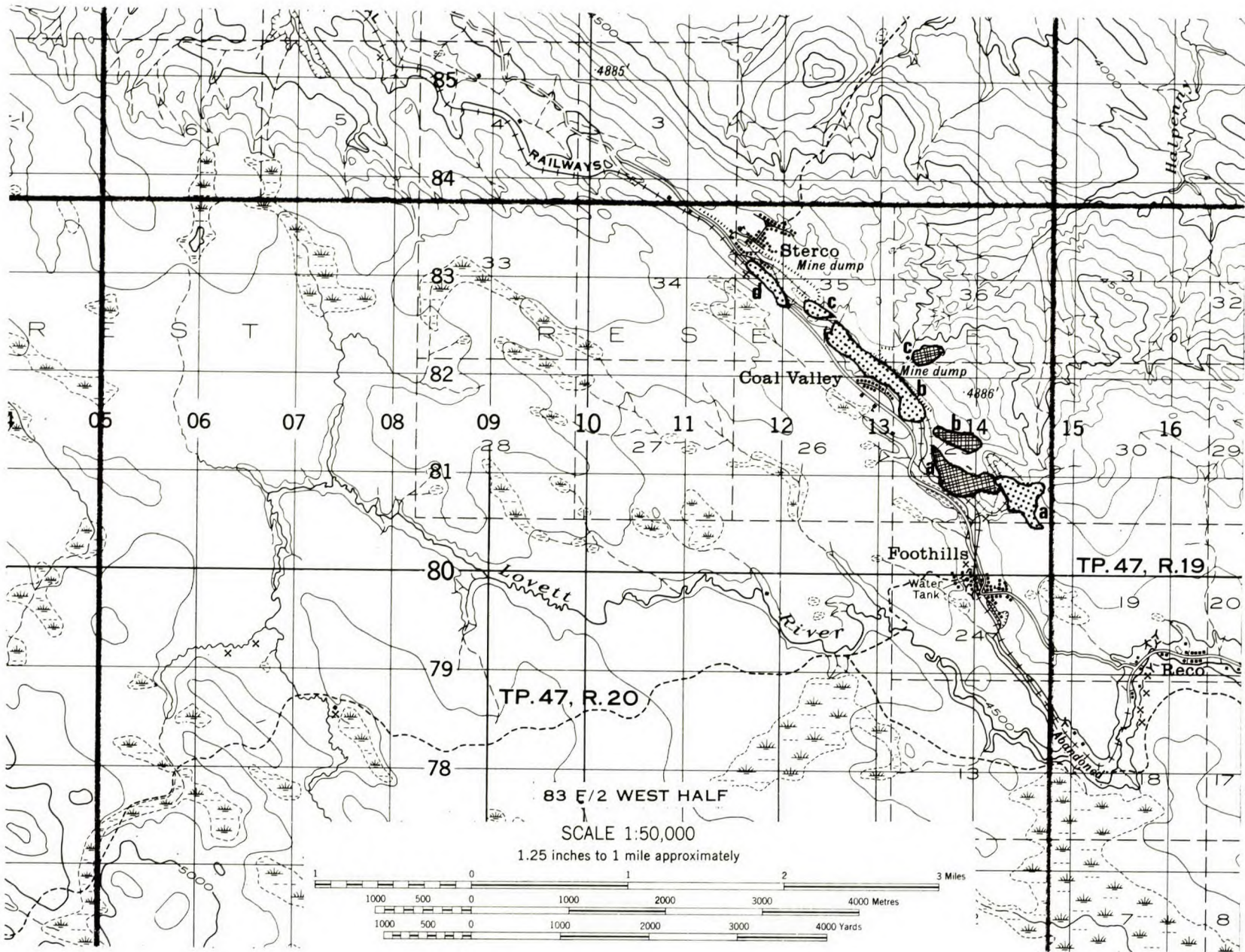
MAP NO. 134



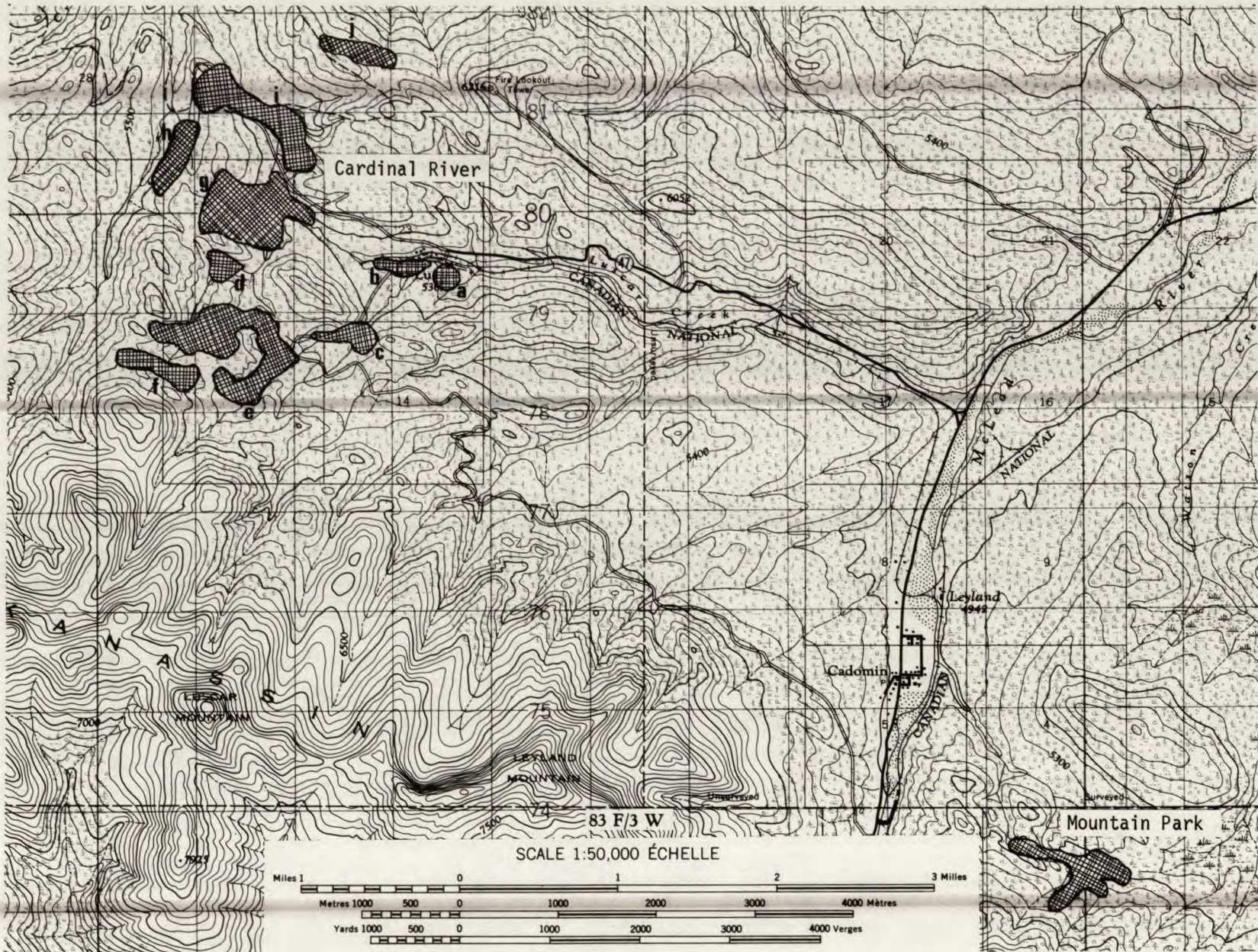
MAP NO. 135



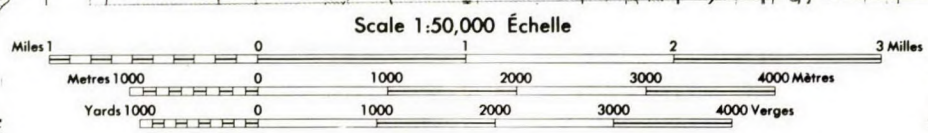
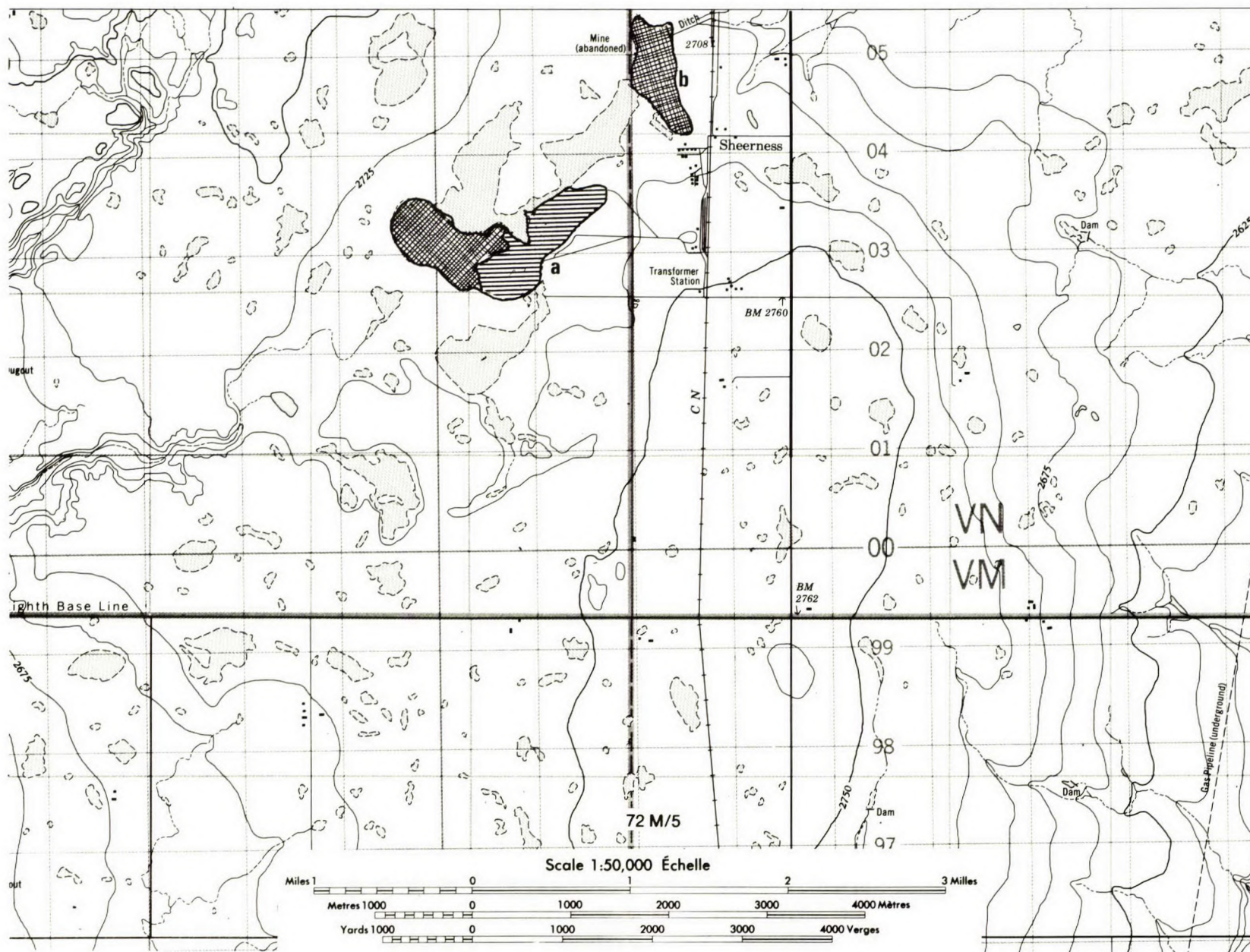
MAP NO. 136



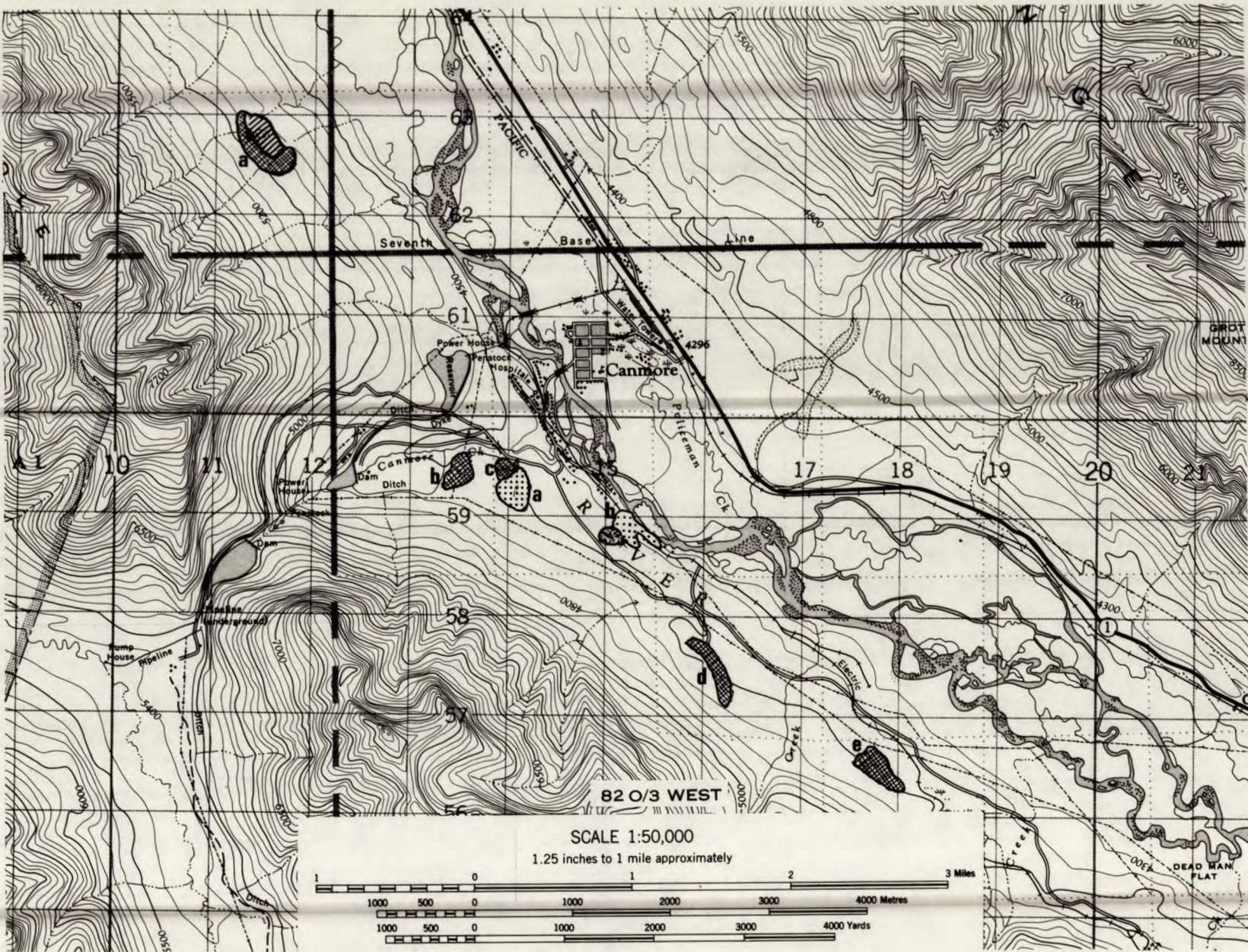
MAP NO. 137



MAP NO. 138

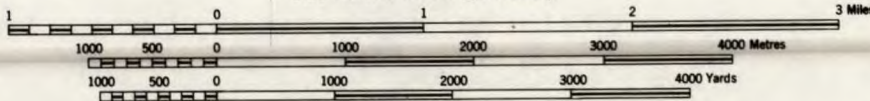


MAP NO. 139

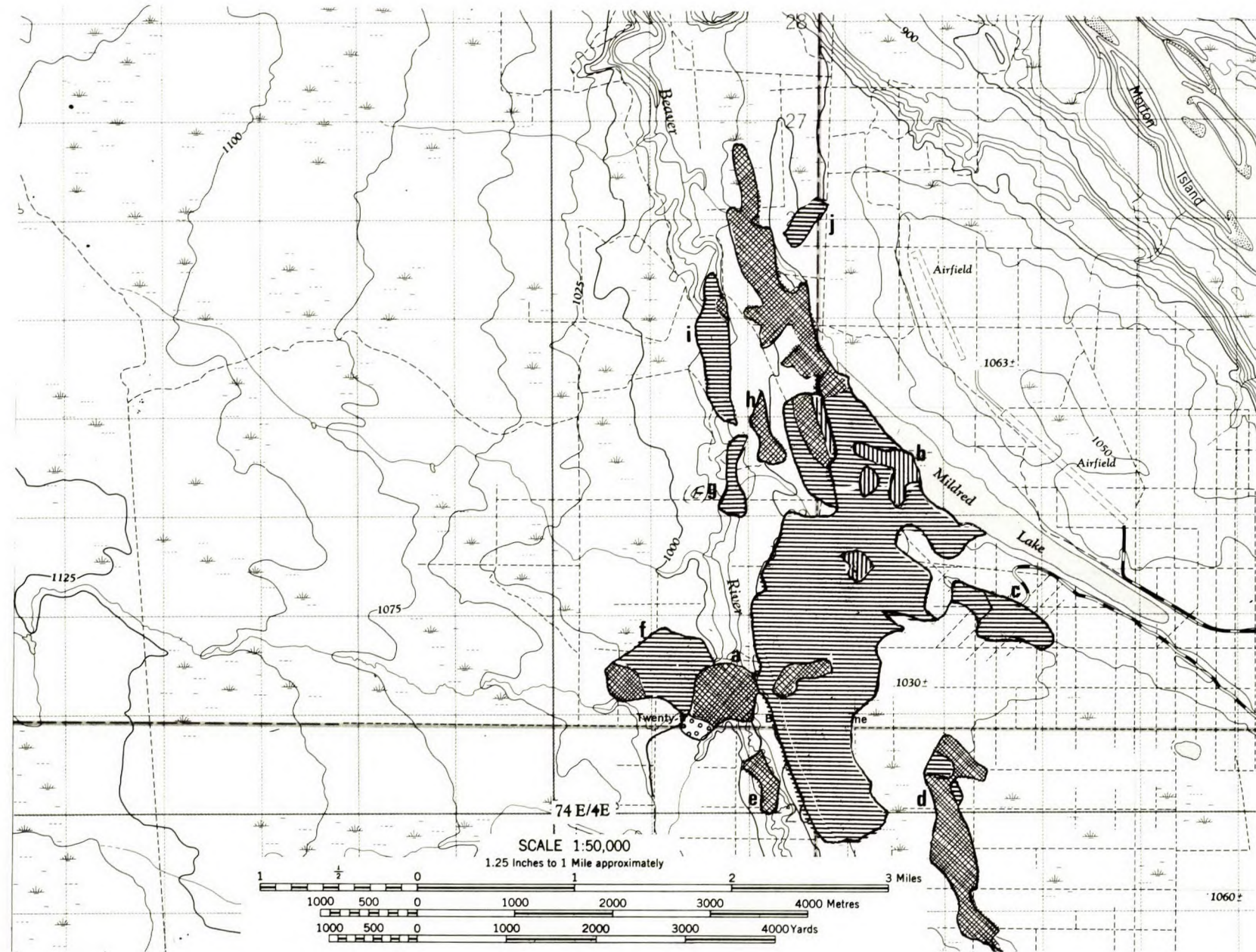


82 O/3 WEST

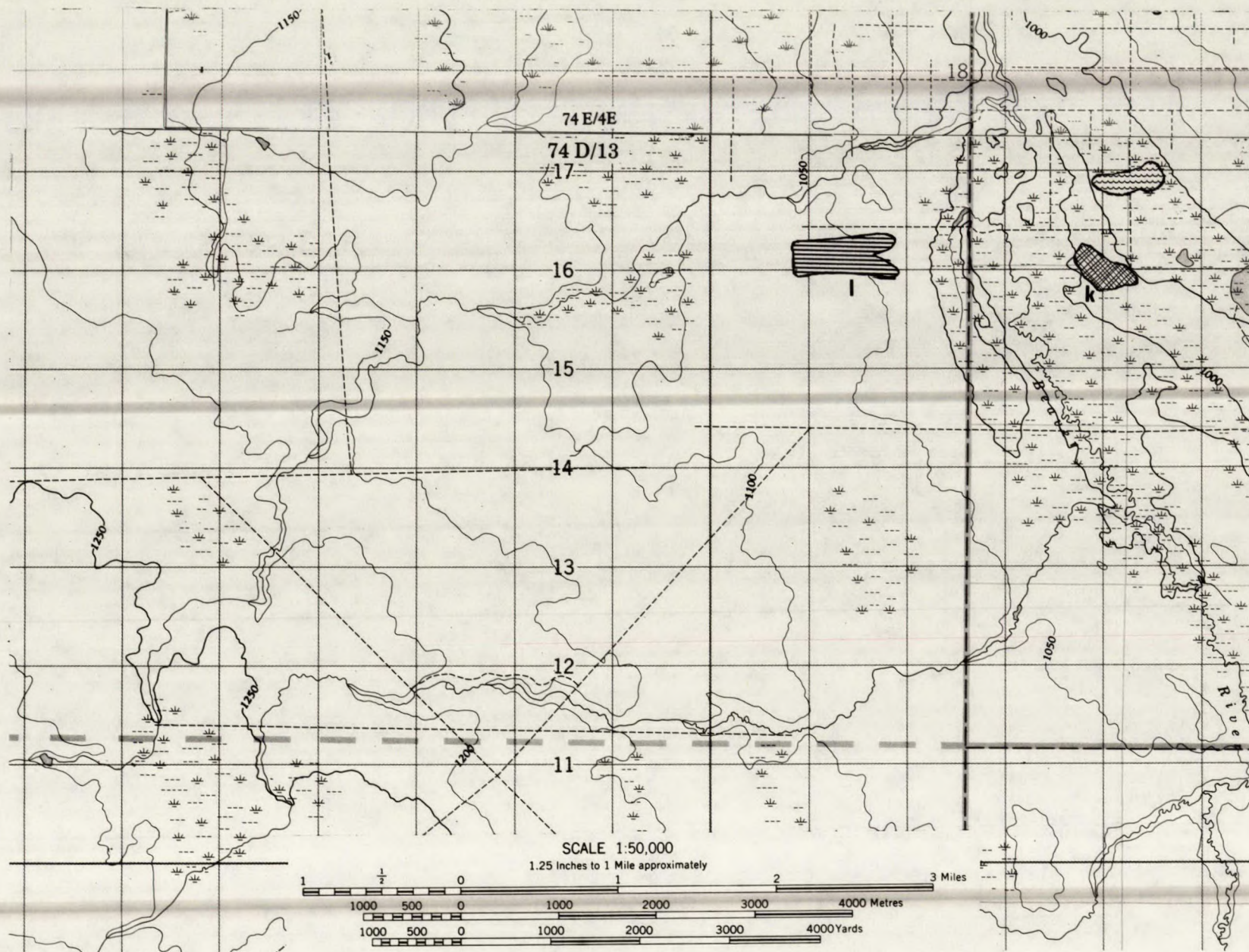
SCALE 1:50,000
1.25 inches to 1 mile approximately



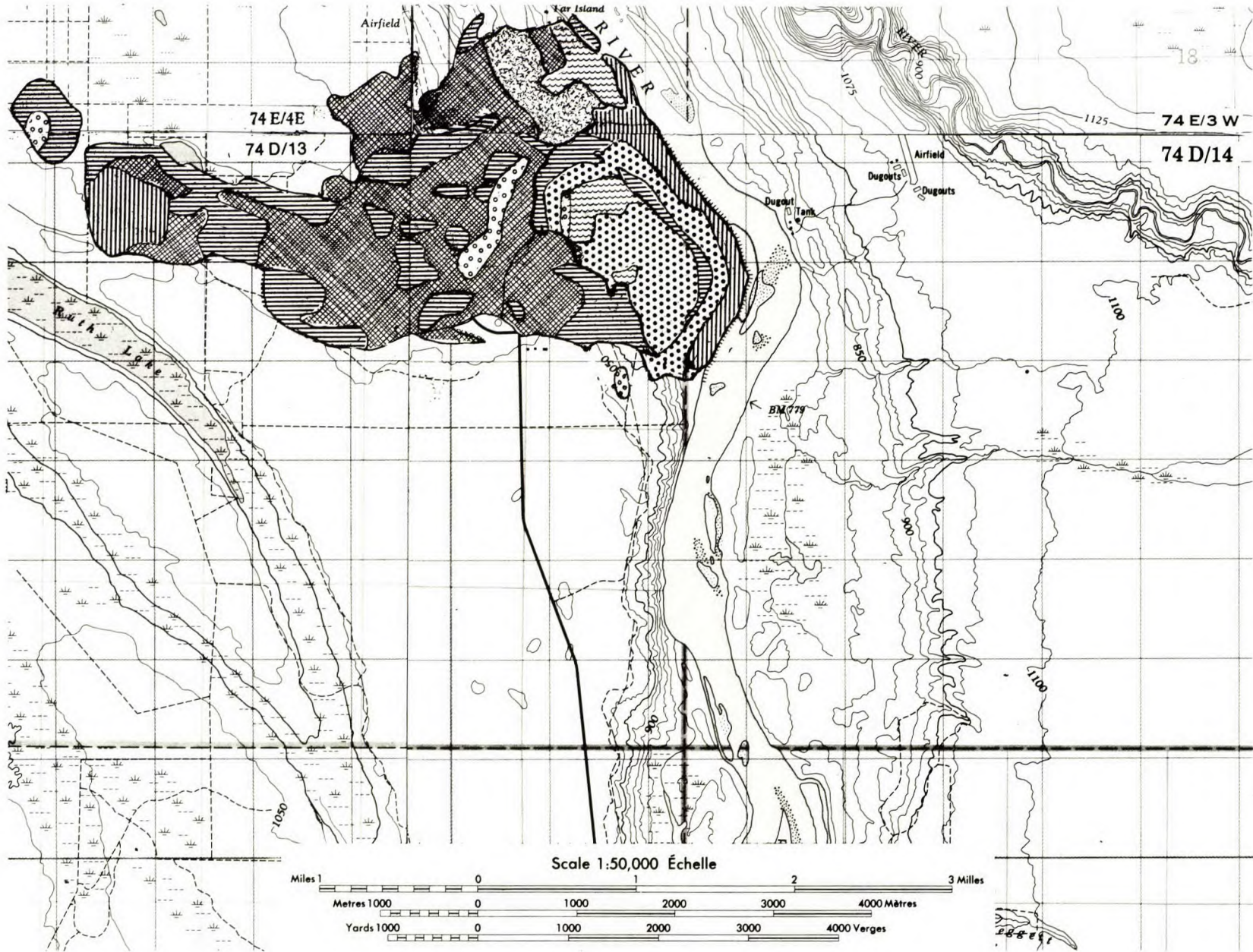
MAP NO. 140



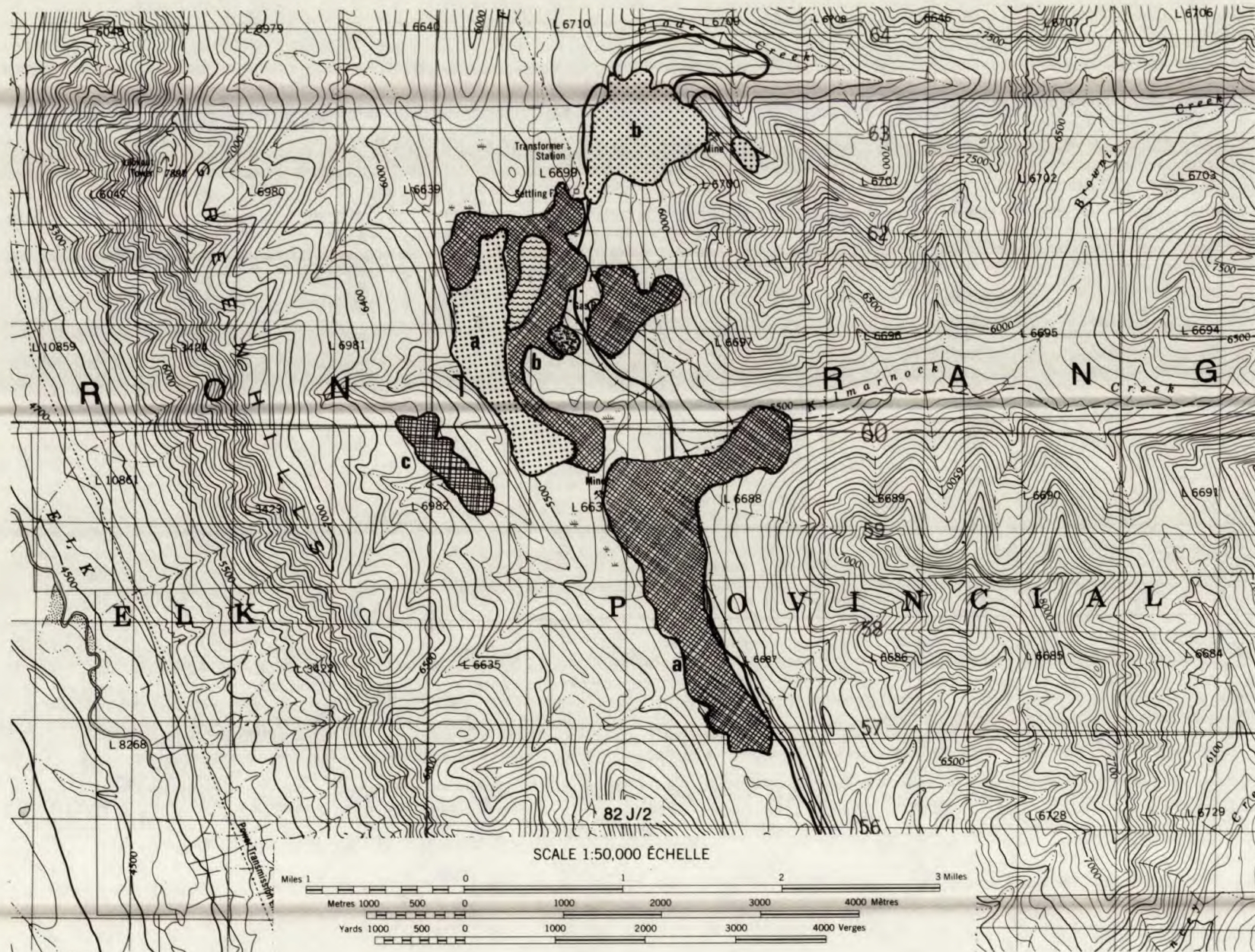
MAP NO. 141



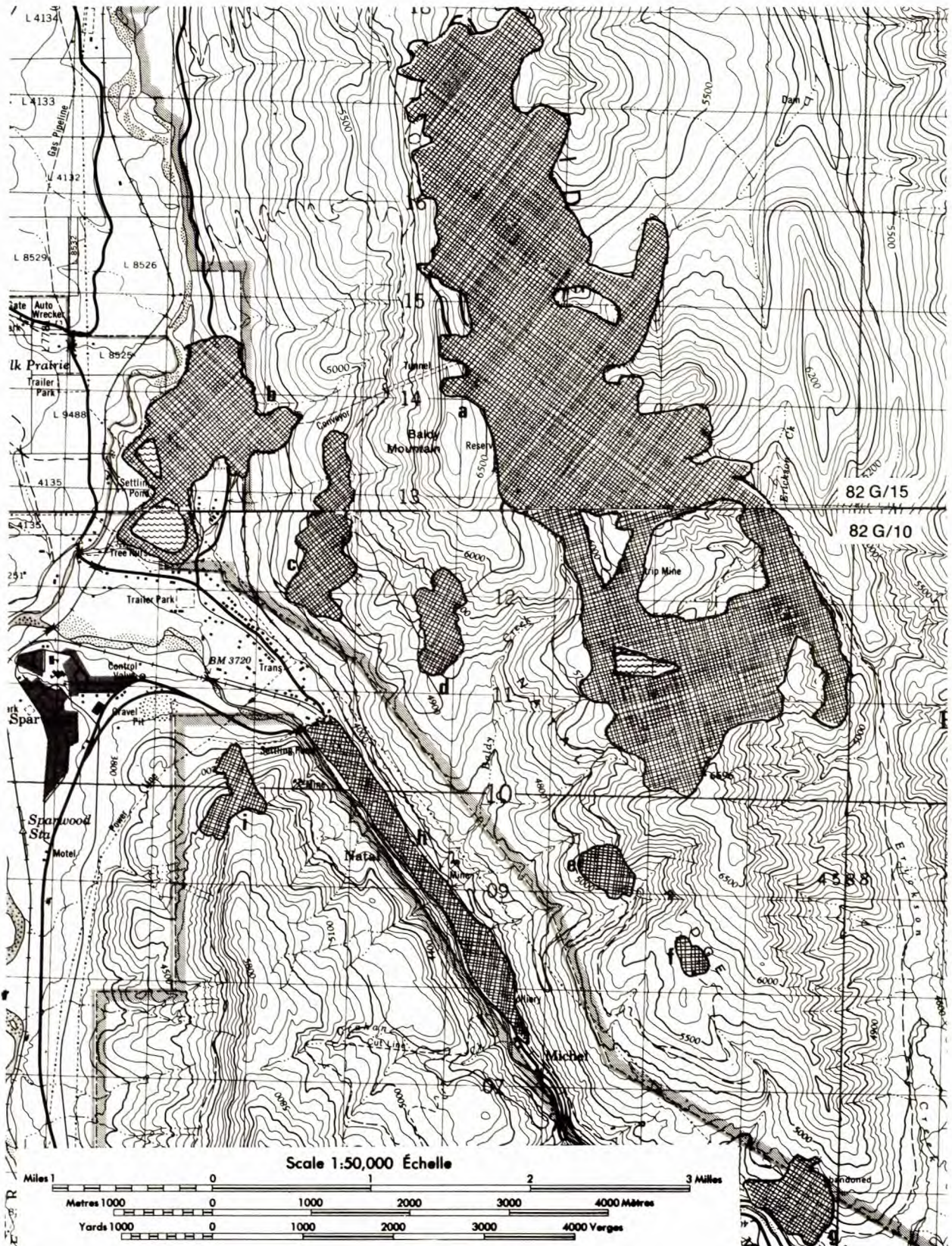
MAP NO. 142



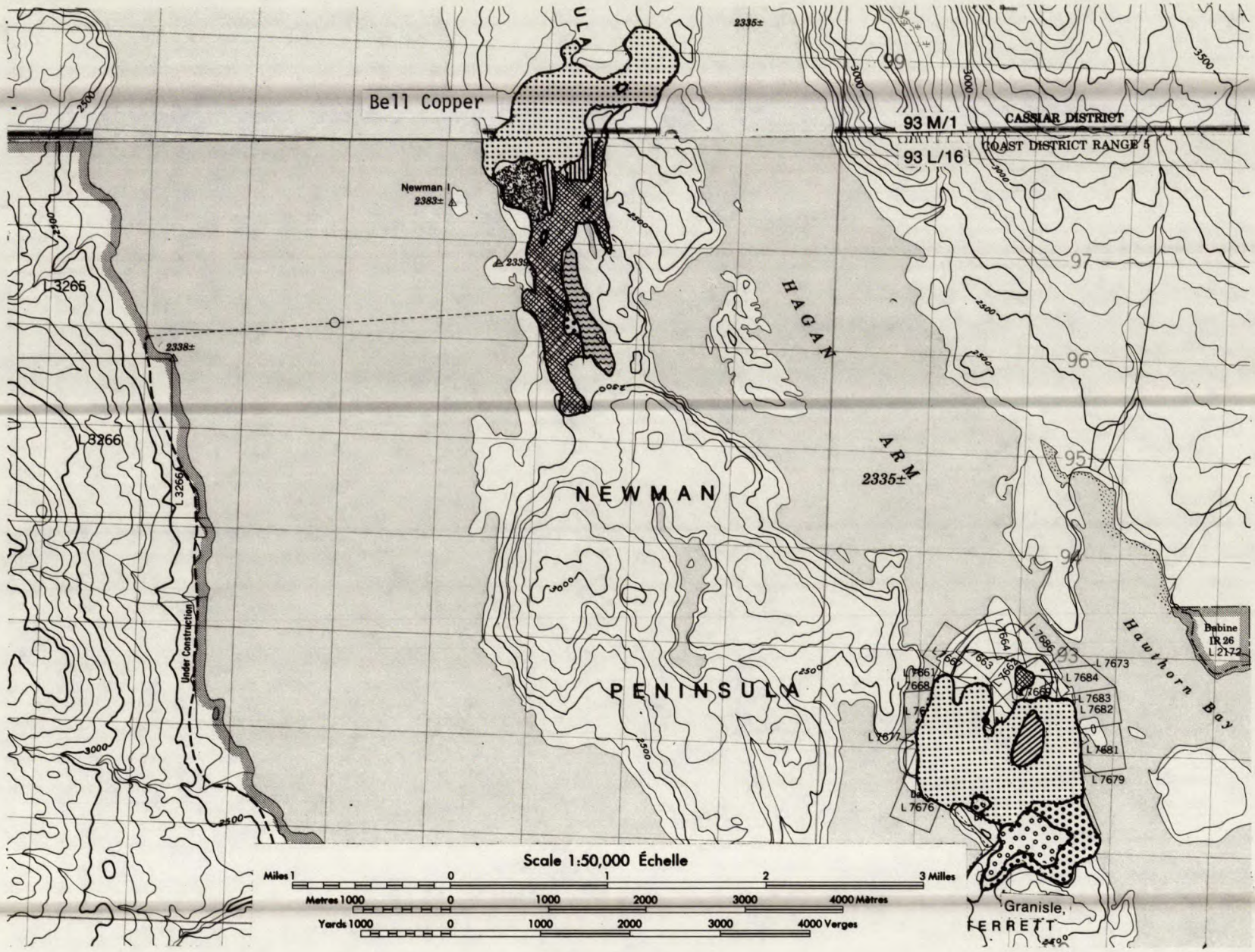
MAP NO. 143



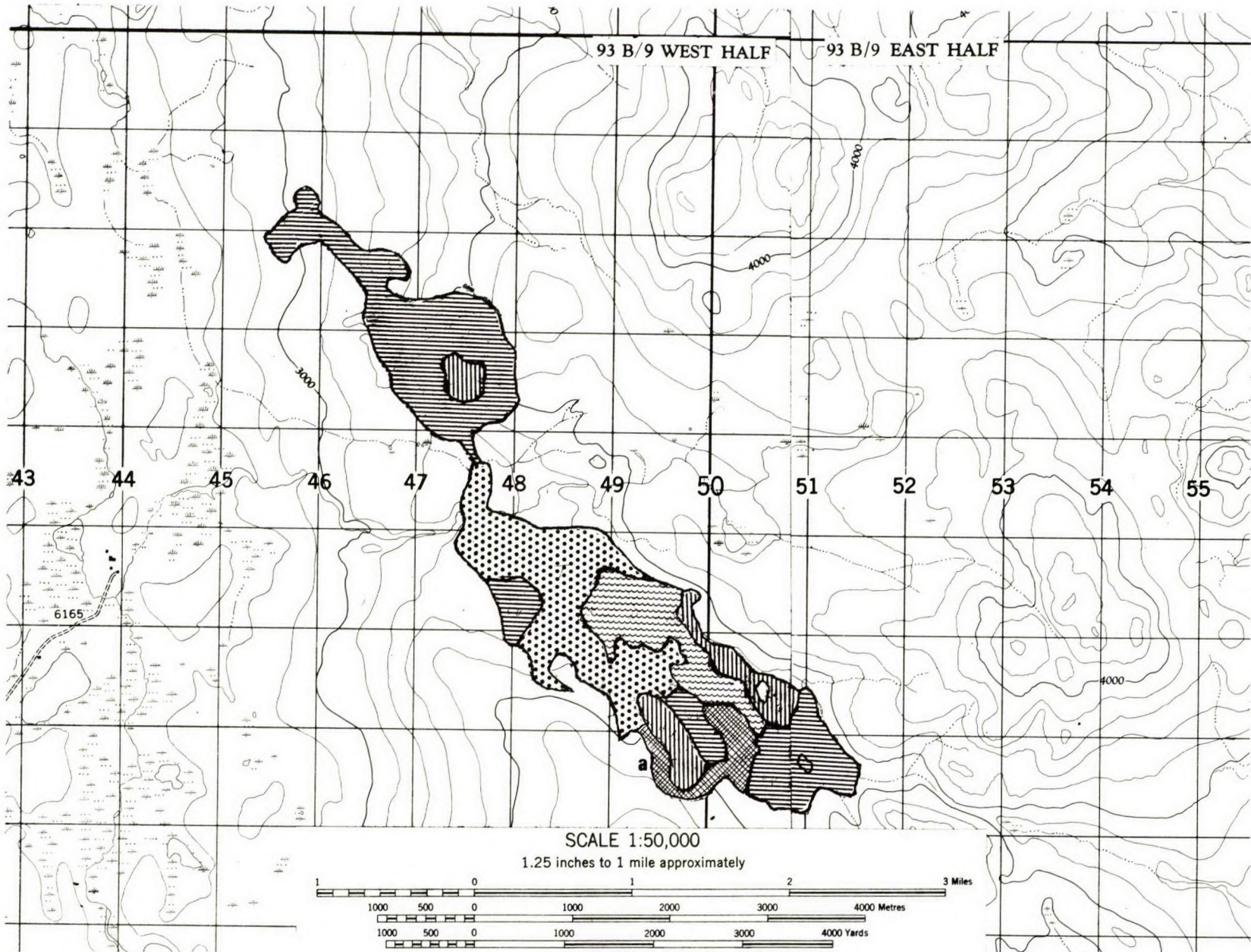
MAP NO. 144



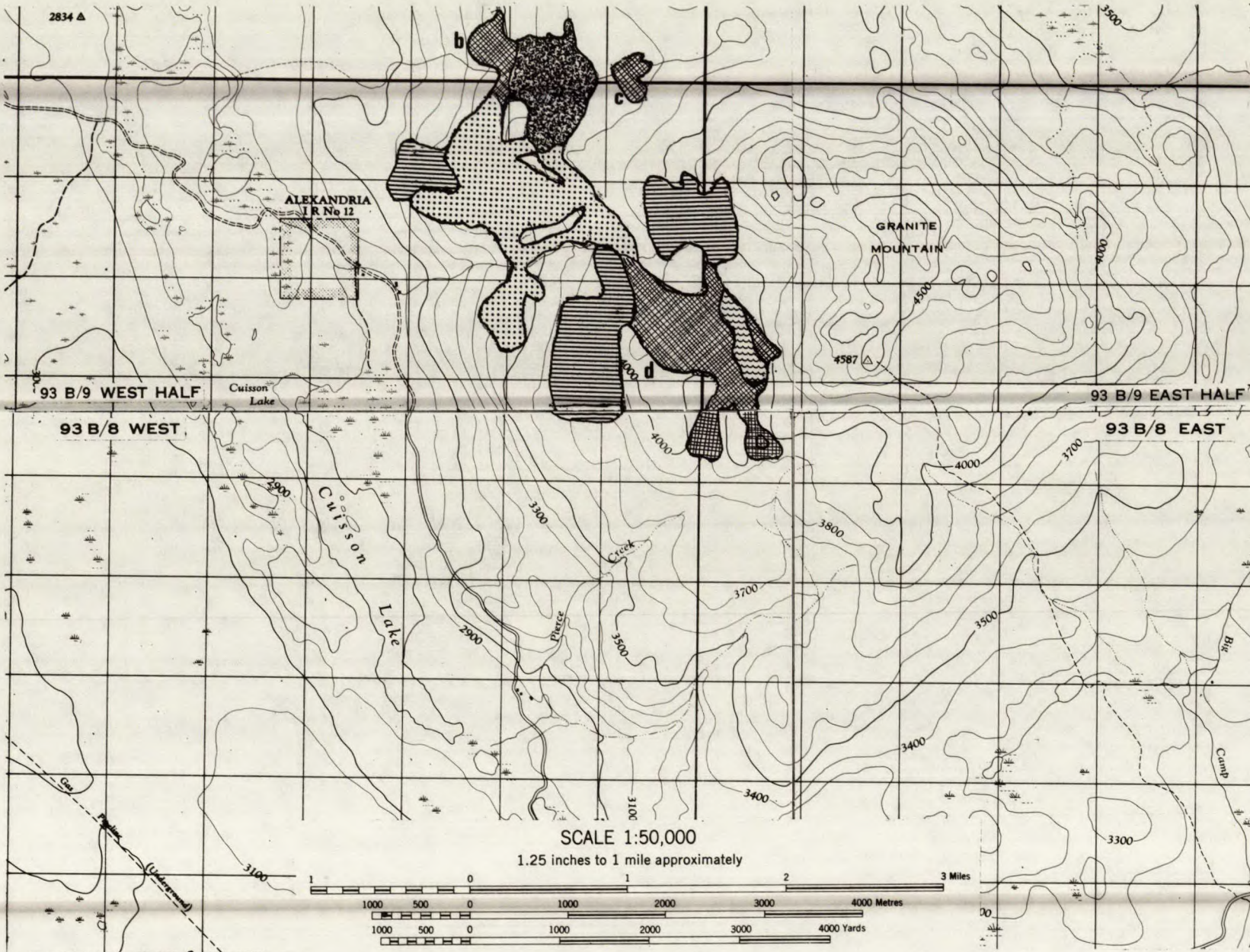
MAP NO. 145



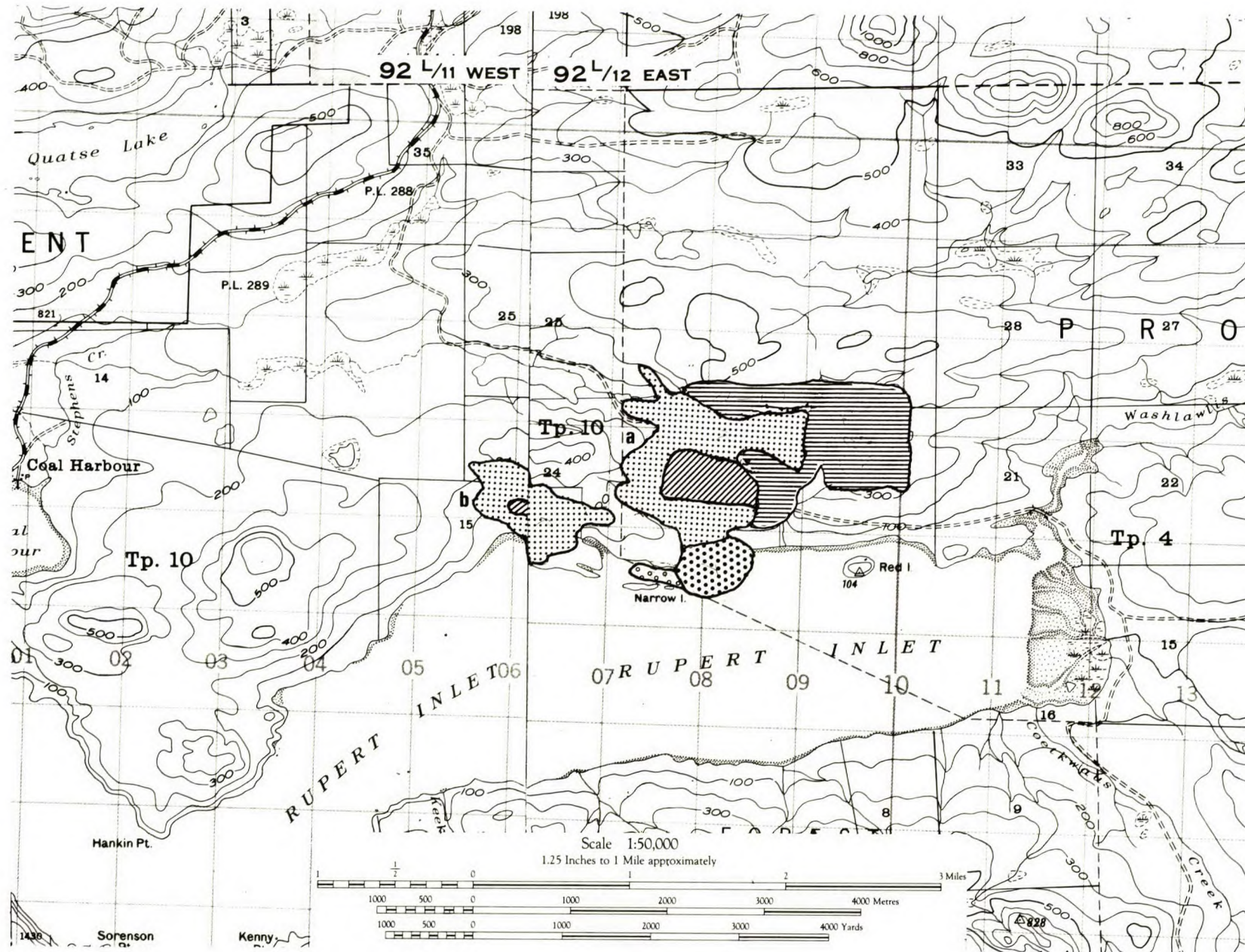
MAP NO. 146



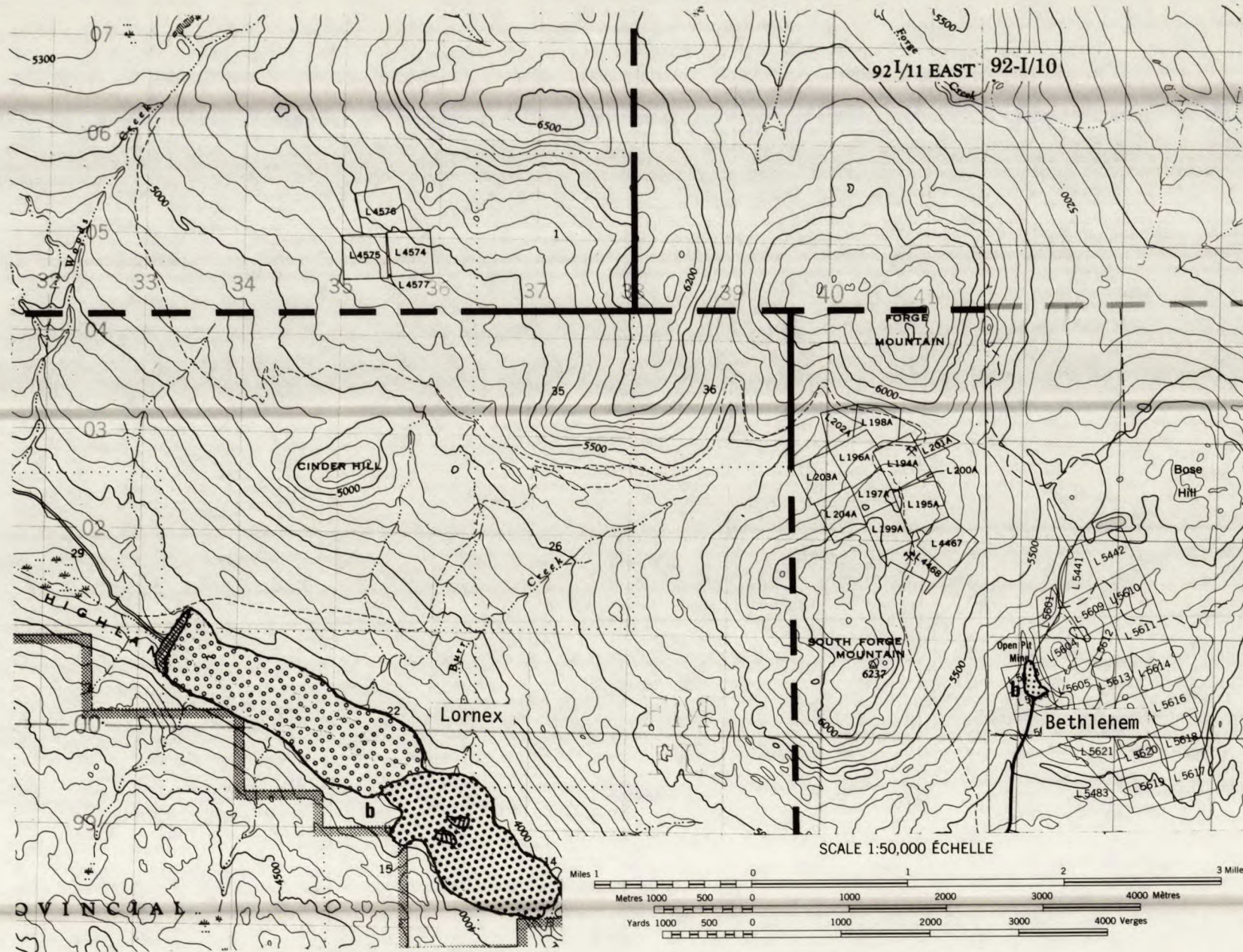
MAP NO. 147



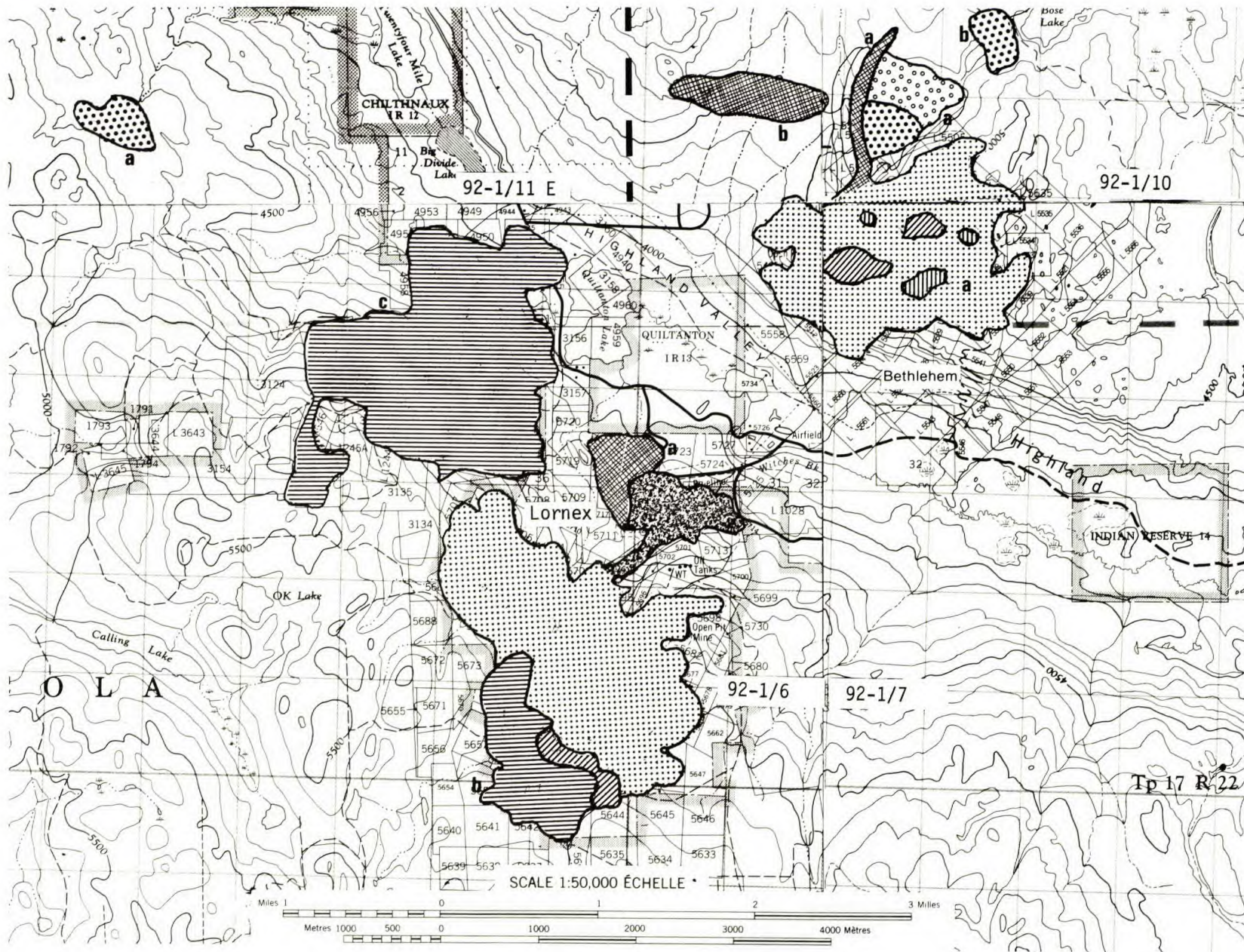
MAP NO. 148



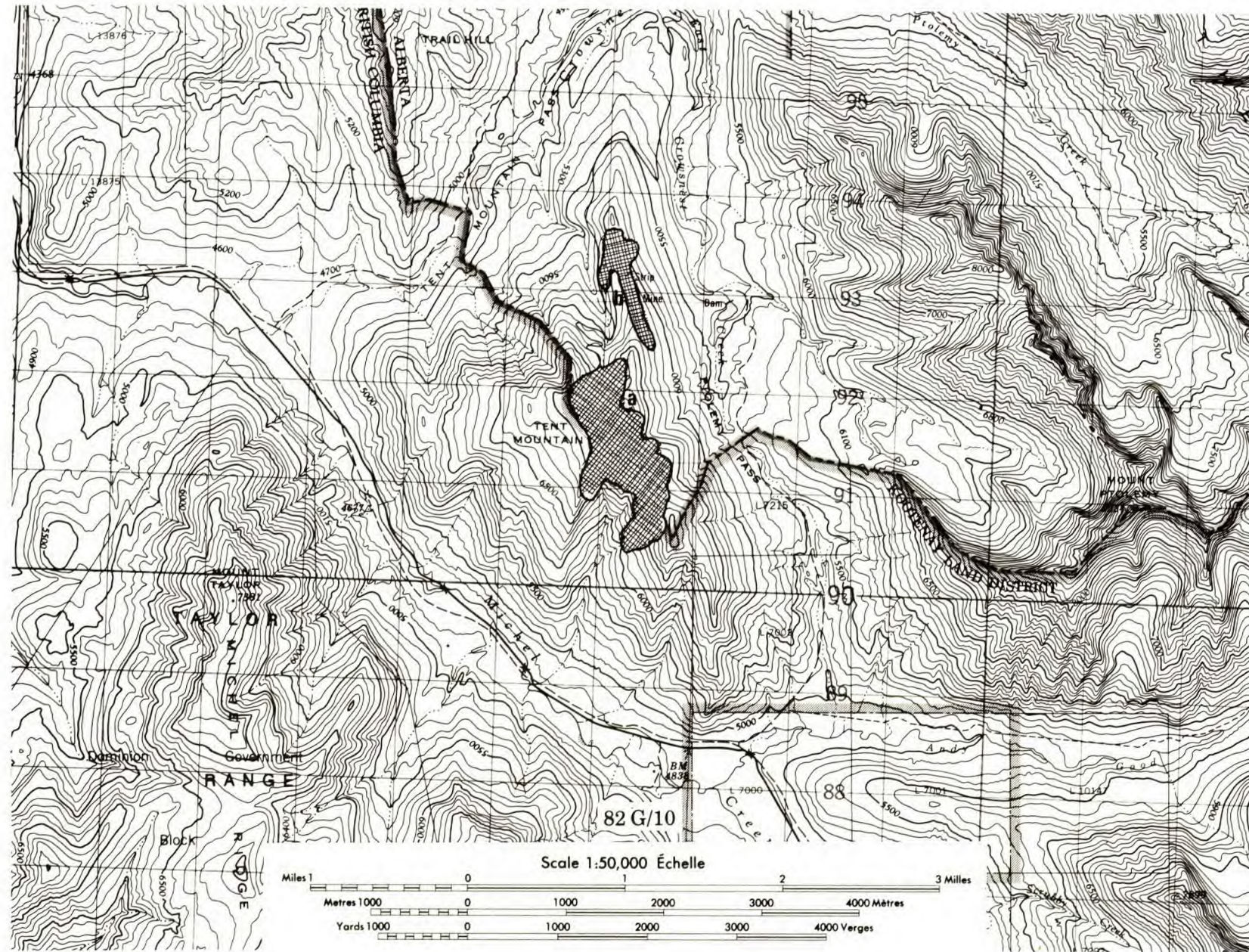
MAP NO. 149



MAP NO. 150



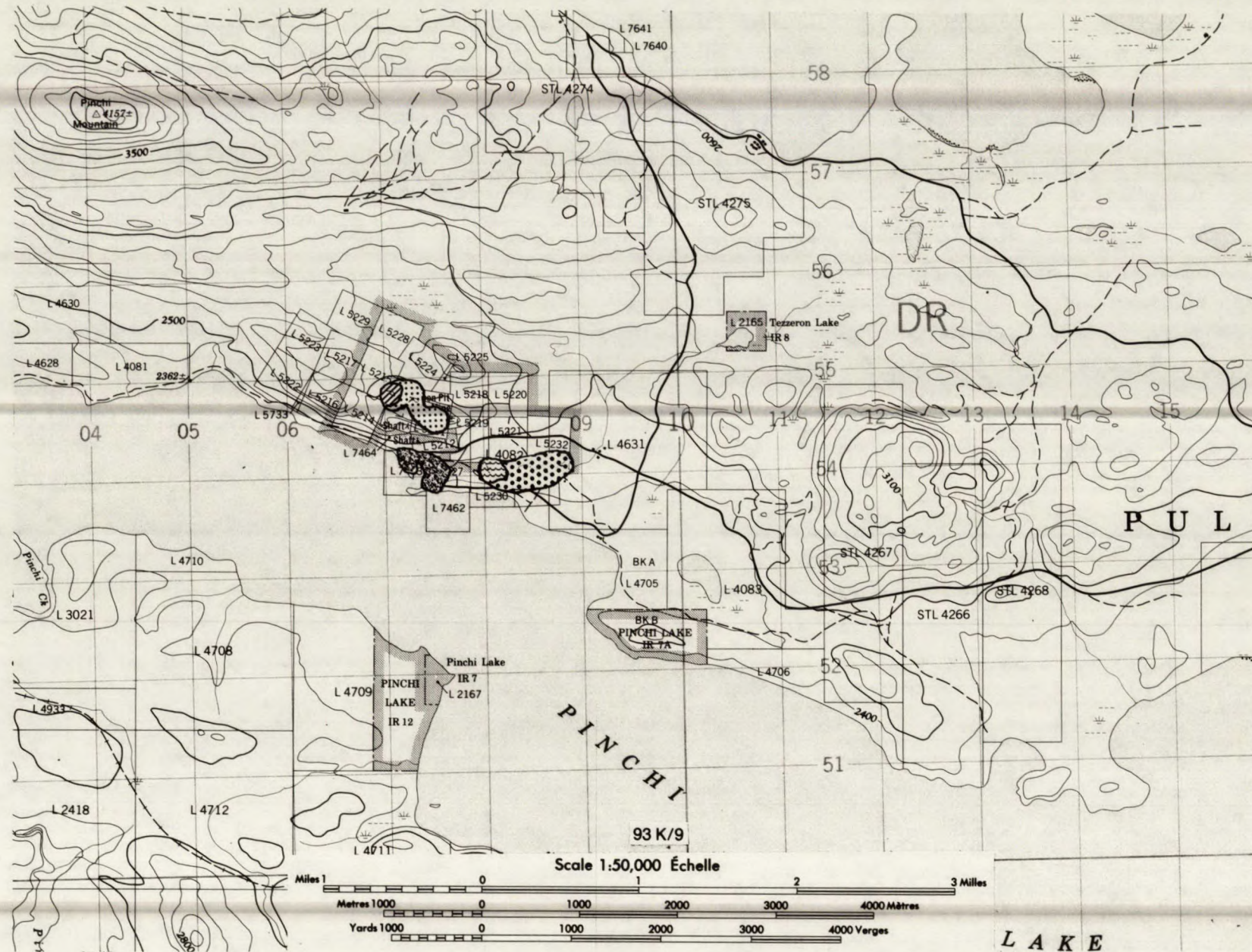
MAP NO. 151



MAP NO. 153



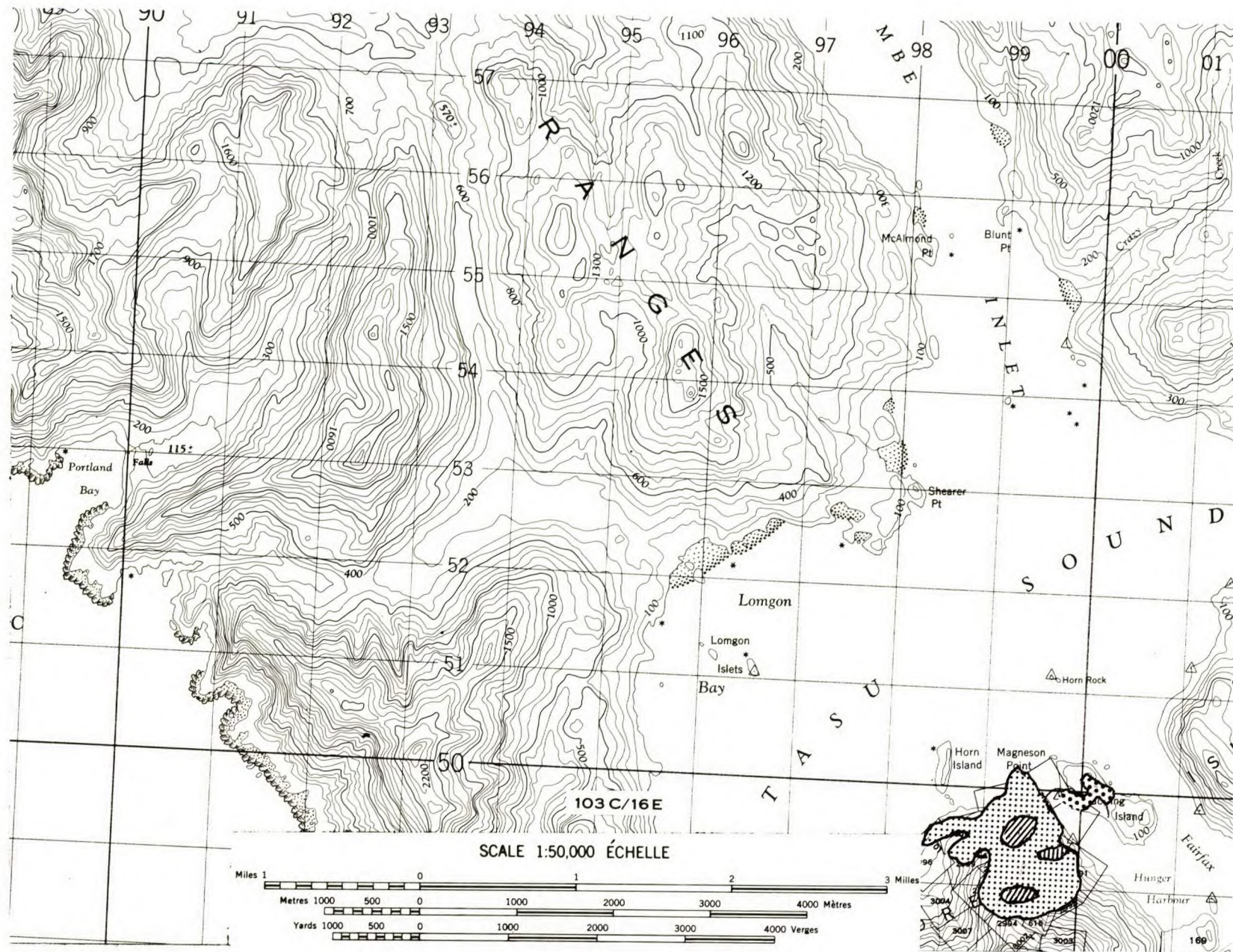
MAP NO. 154



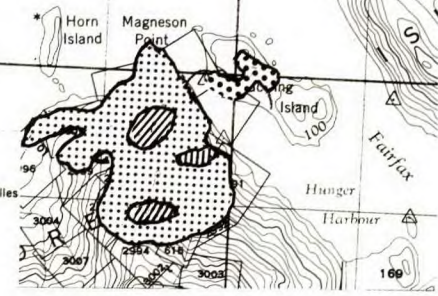
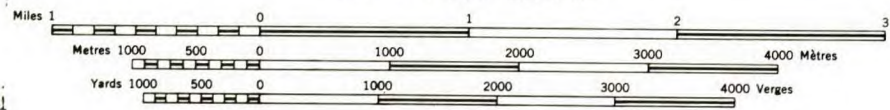
180

MAP NO. 156

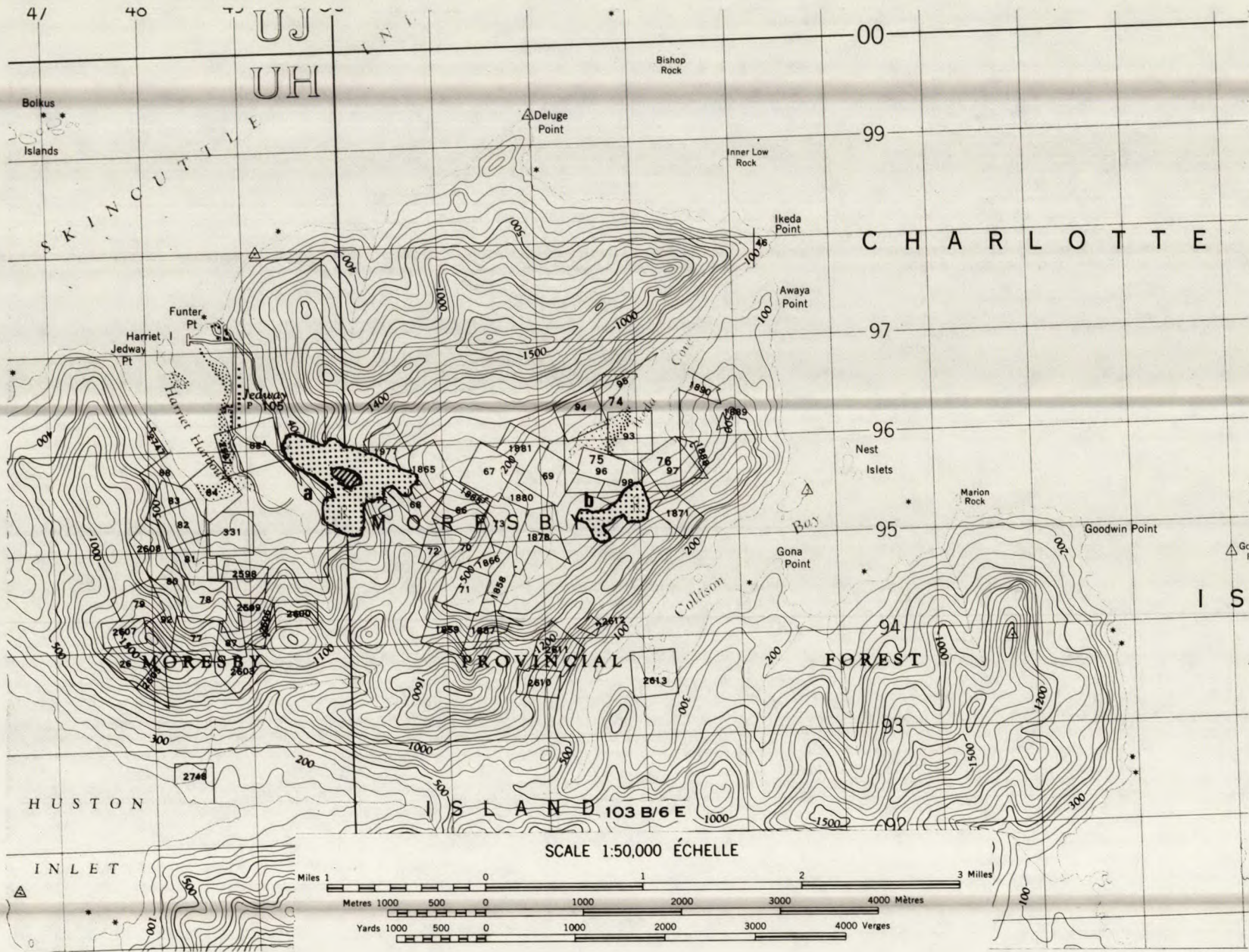
L A K E



SCALE 1:50,000 ÉCHELLE

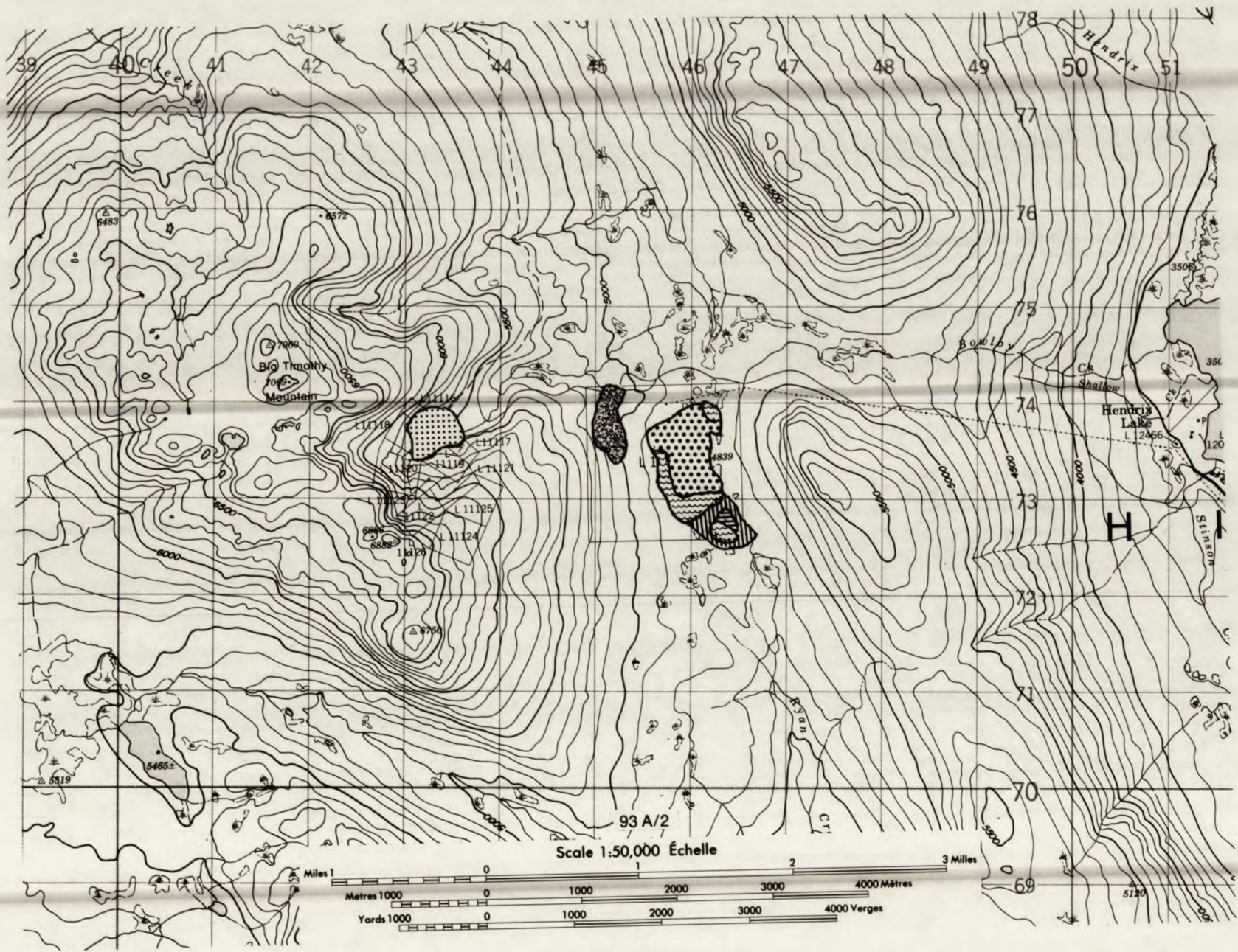


MAP NO. 157

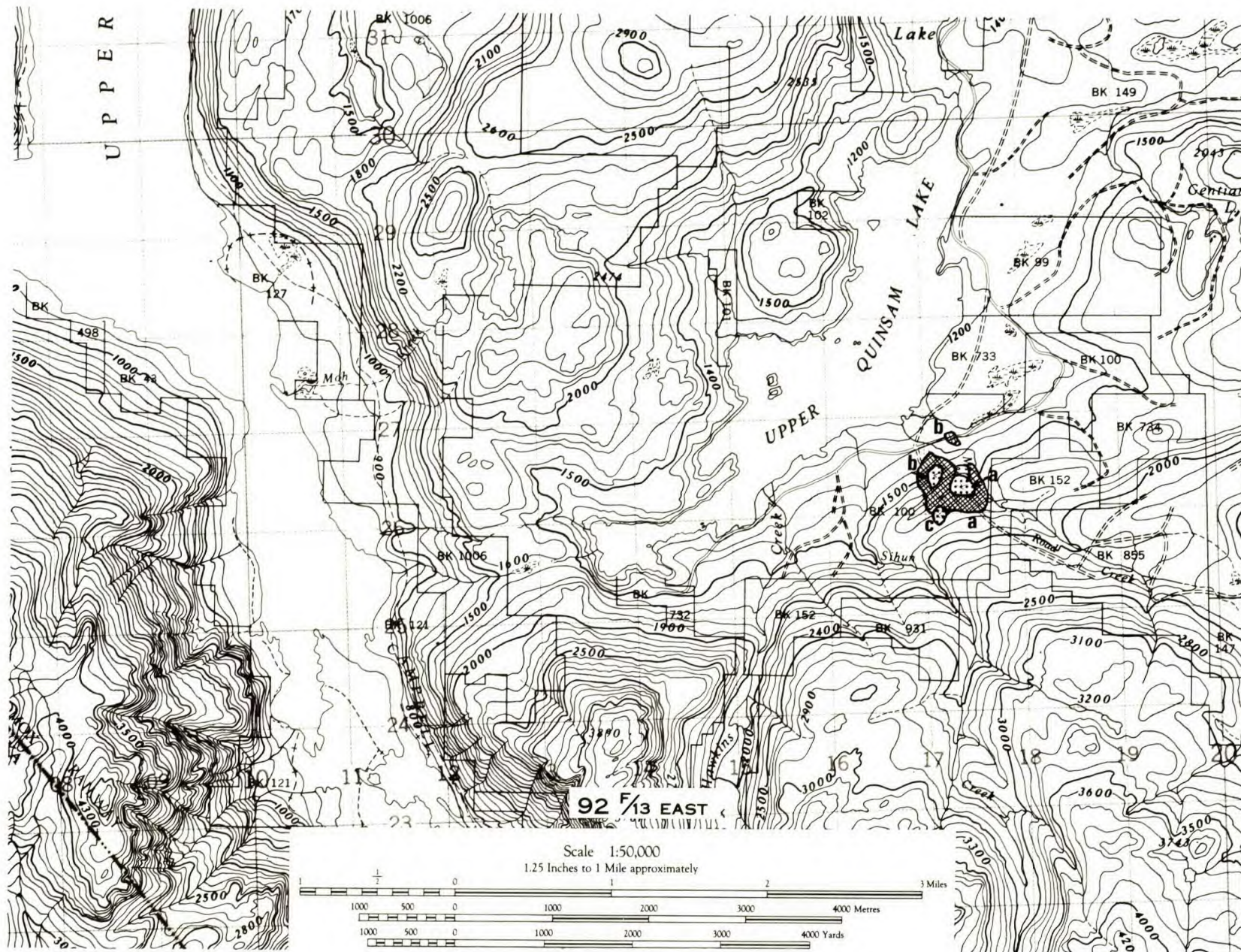


182

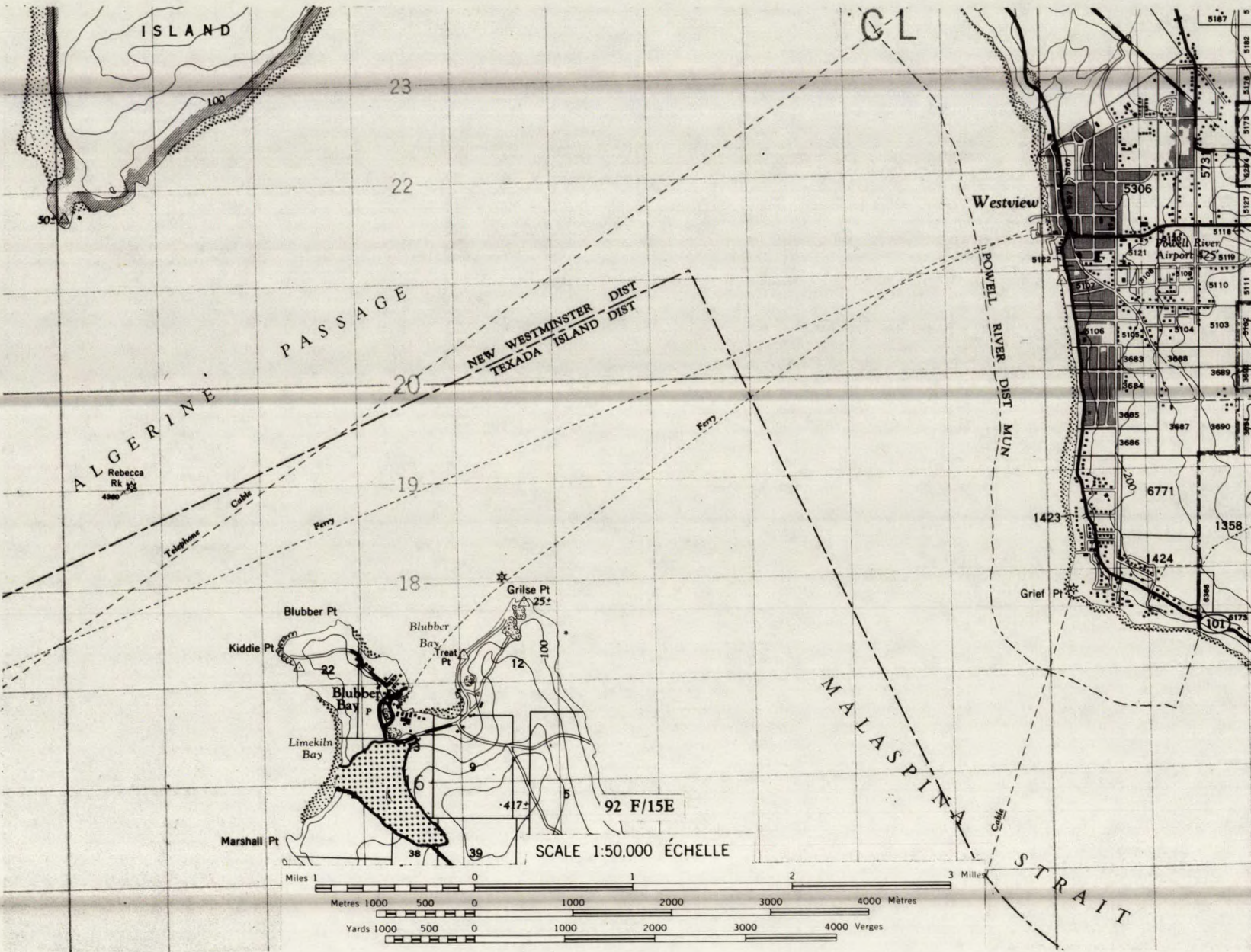
MAP NO. 158



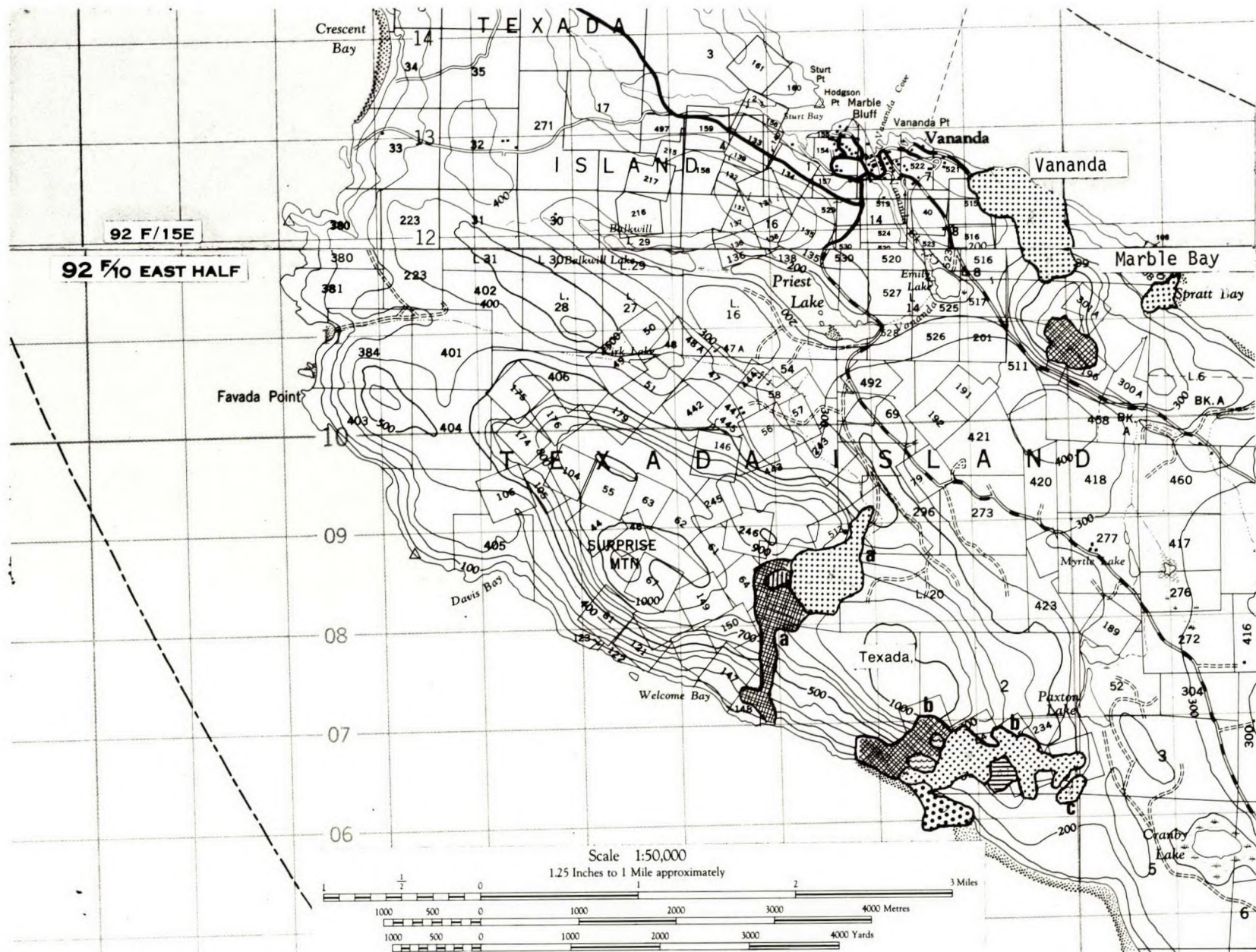
MAP NO. 160



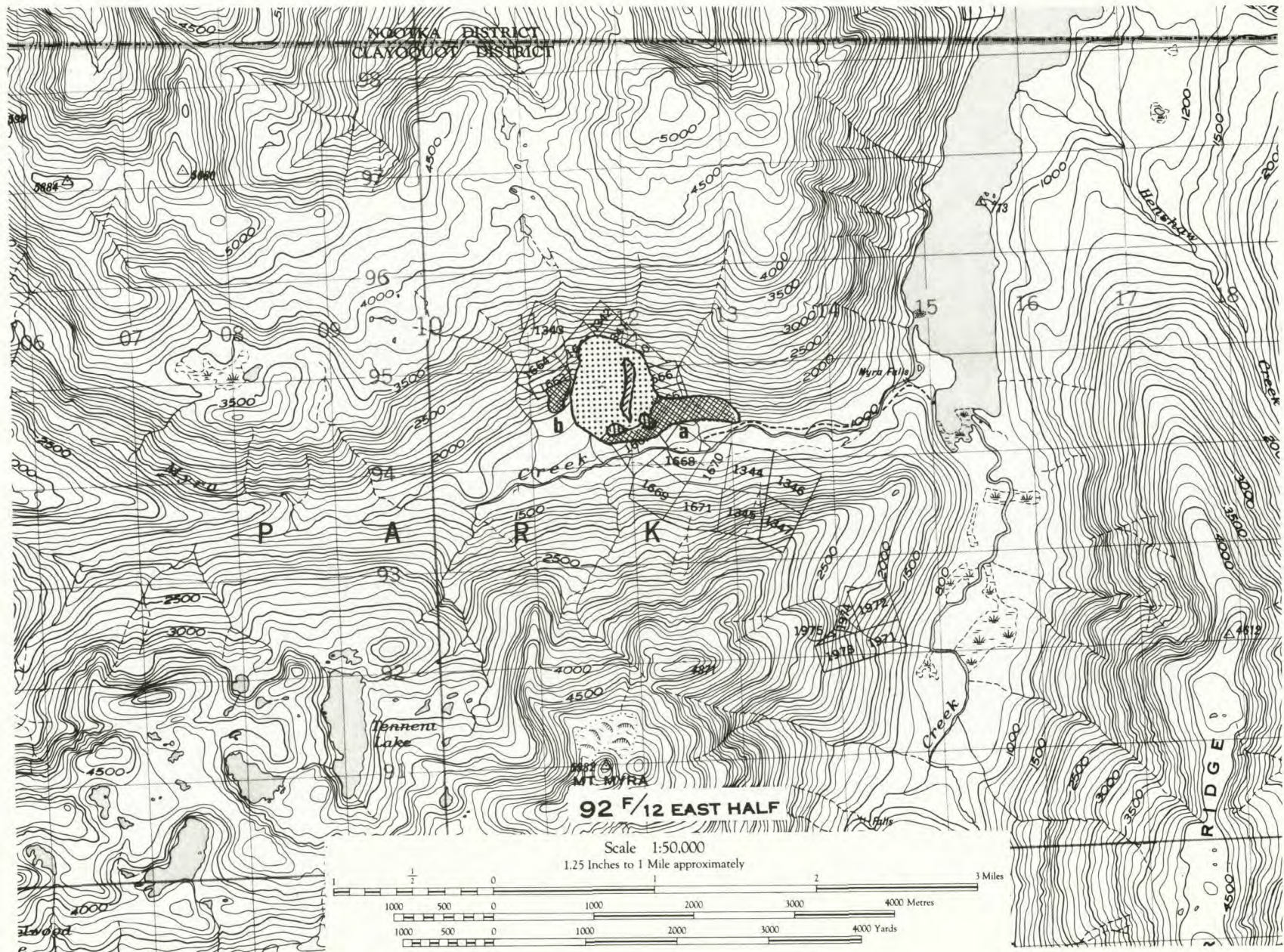
MAP NO. 161



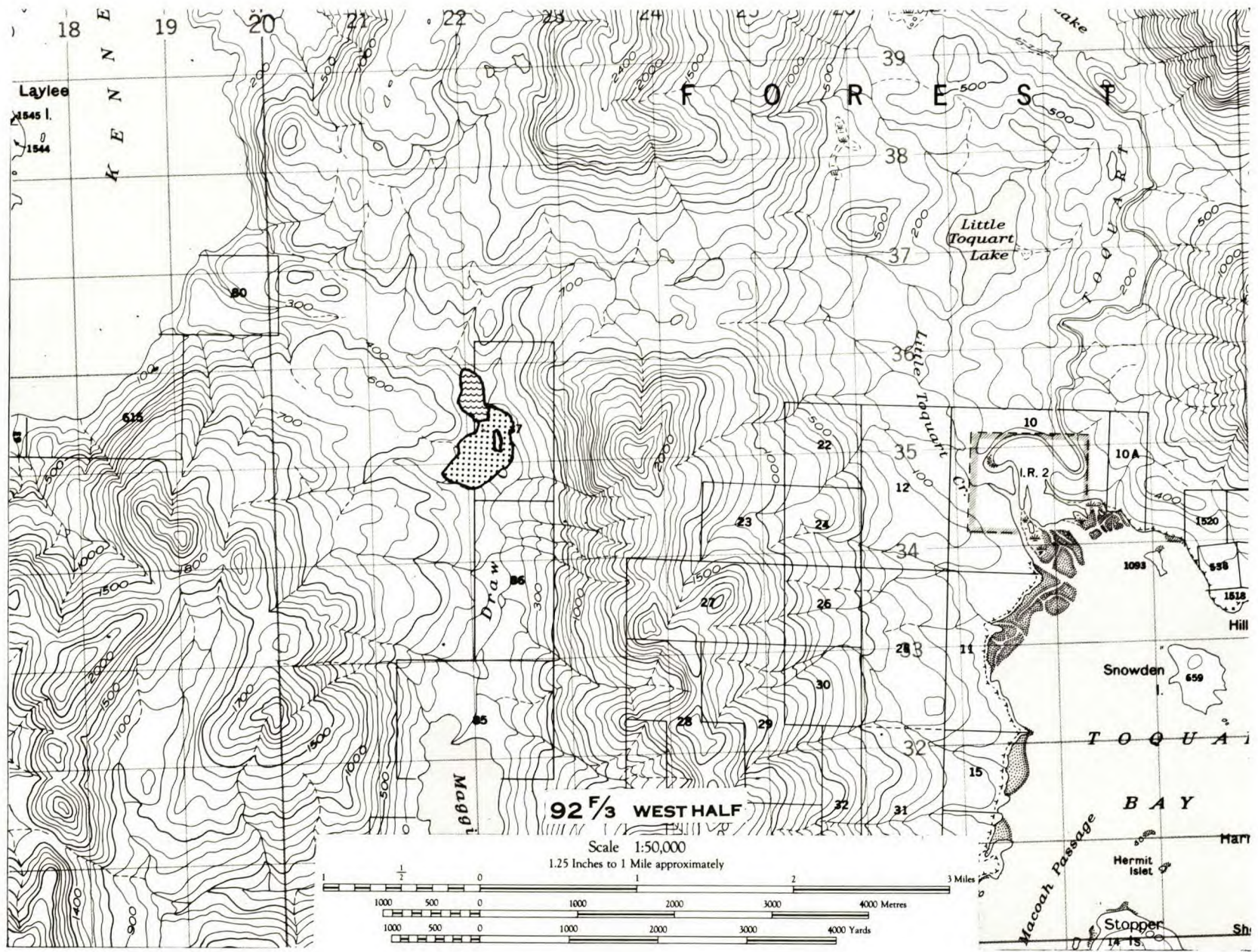
MAP NO. 162



MAP NO. 163



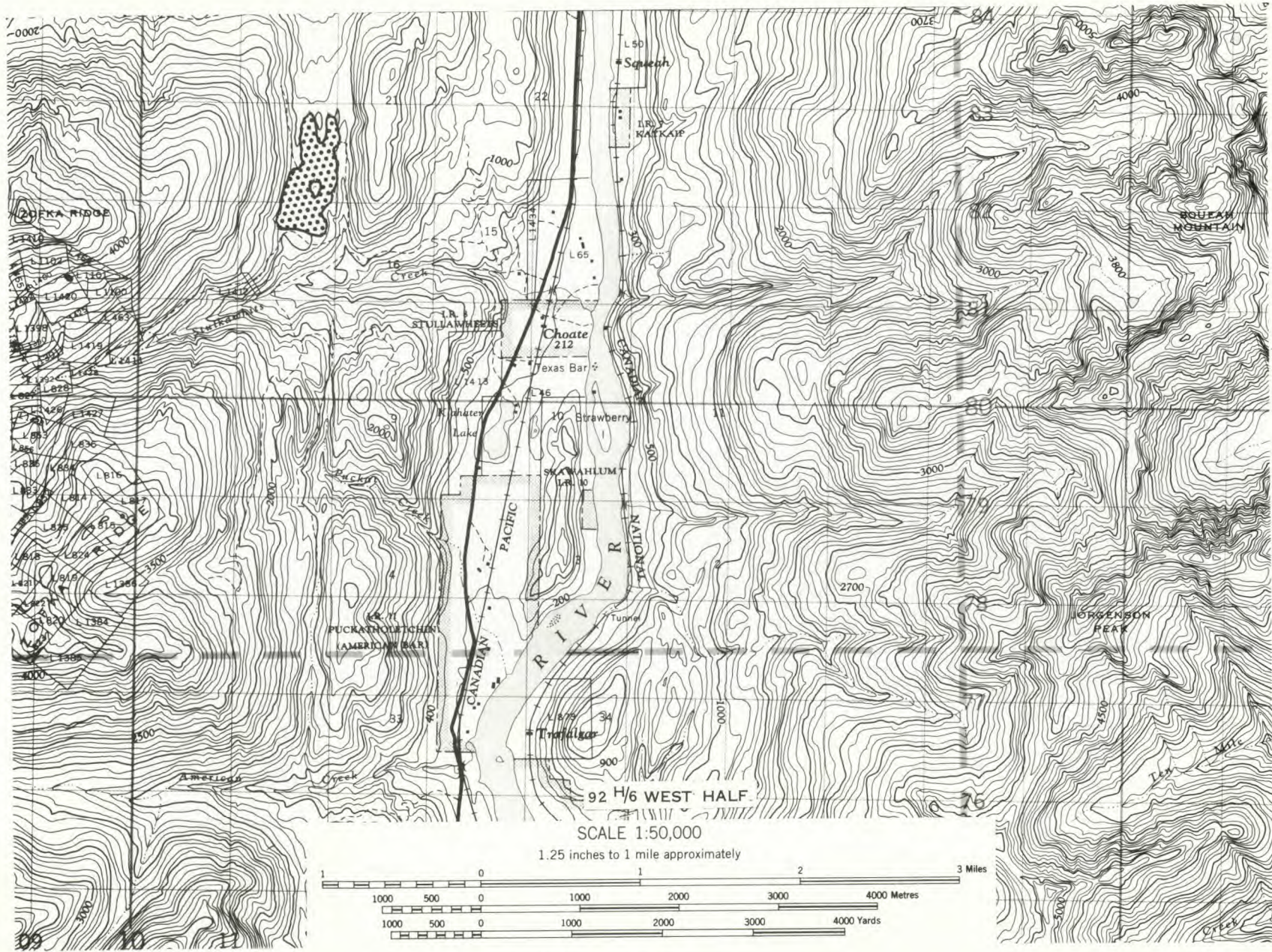
MAP NO. 164



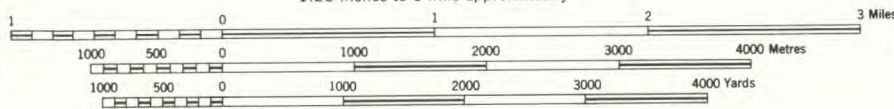
MAP NO. 165



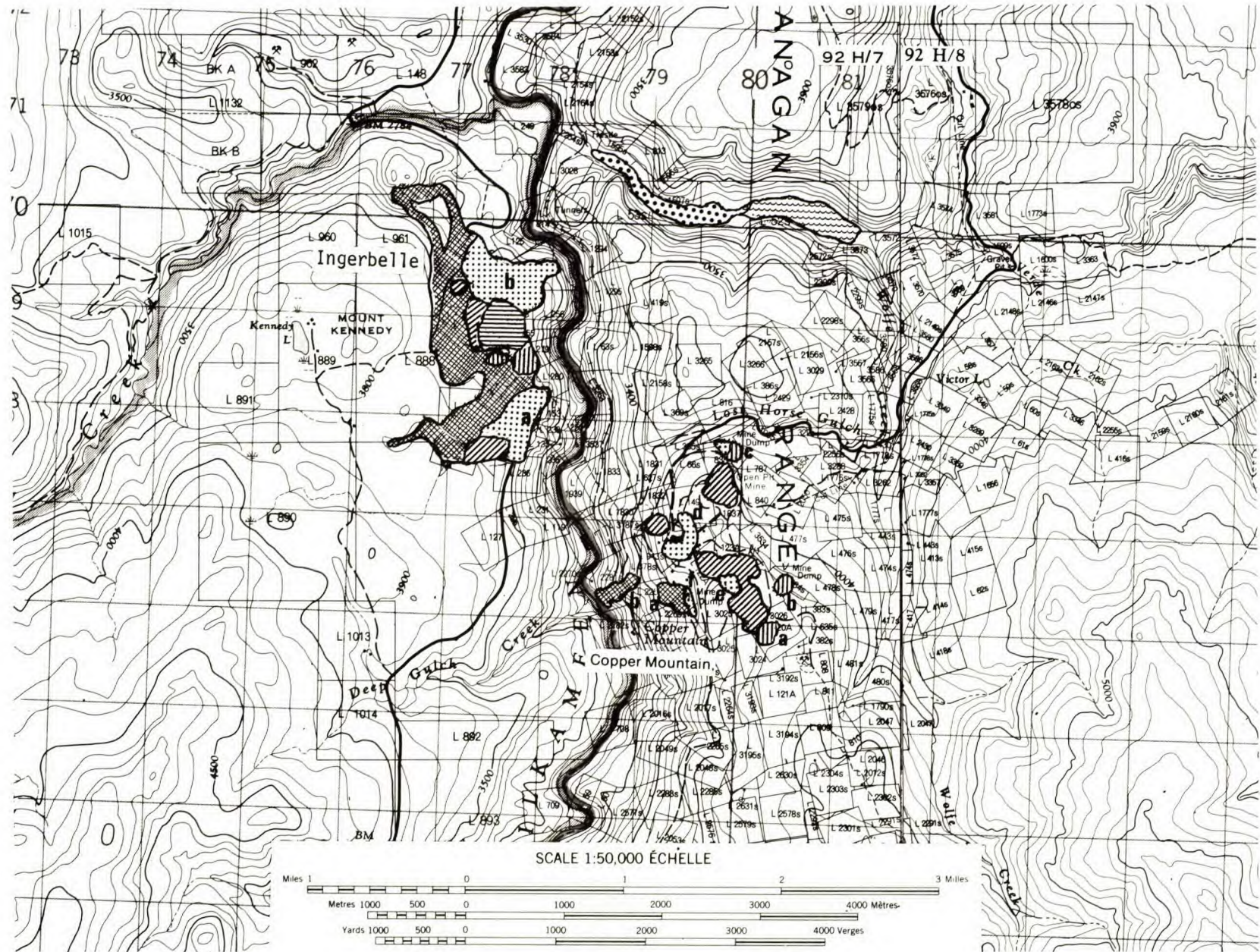
MAP NO. 166



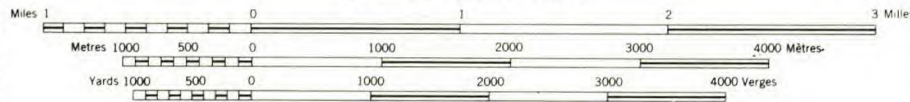
92 H/6 WEST HALF
 SCALE 1:50,000
 1.25 inches to 1 mile approximately



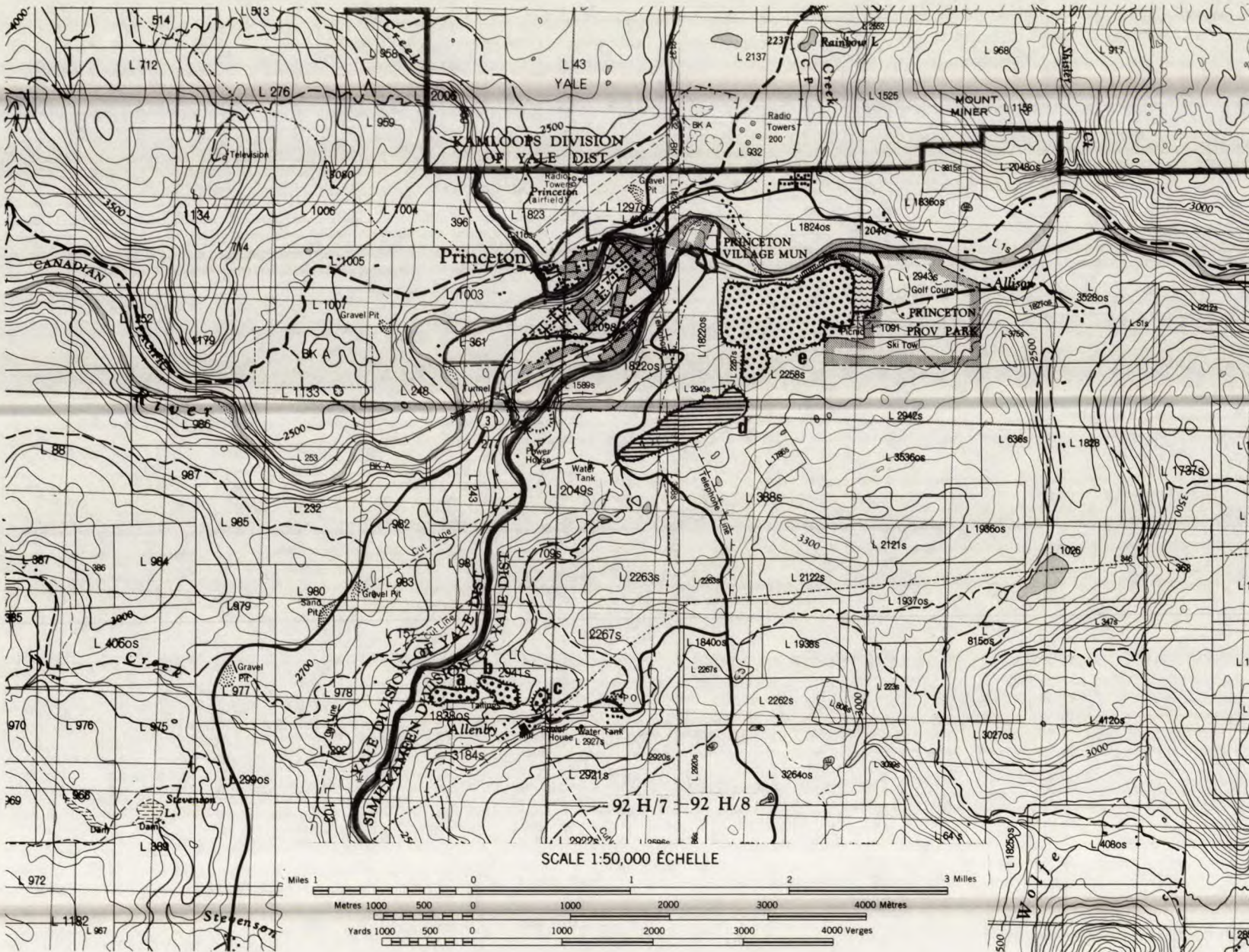
MAP NO. 168



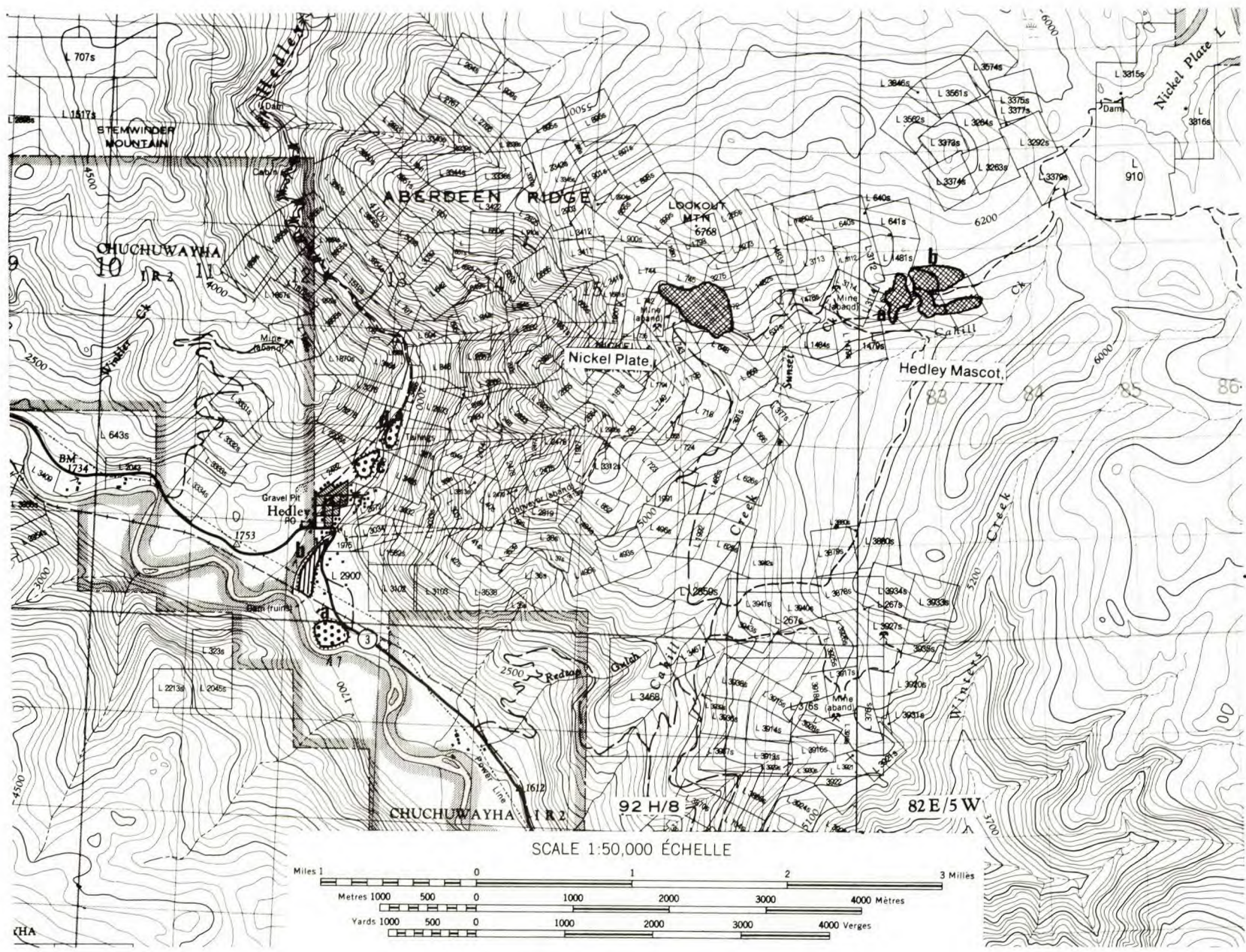
SCALE 1:50,000 ÉCHELLE



MAP NO. 169



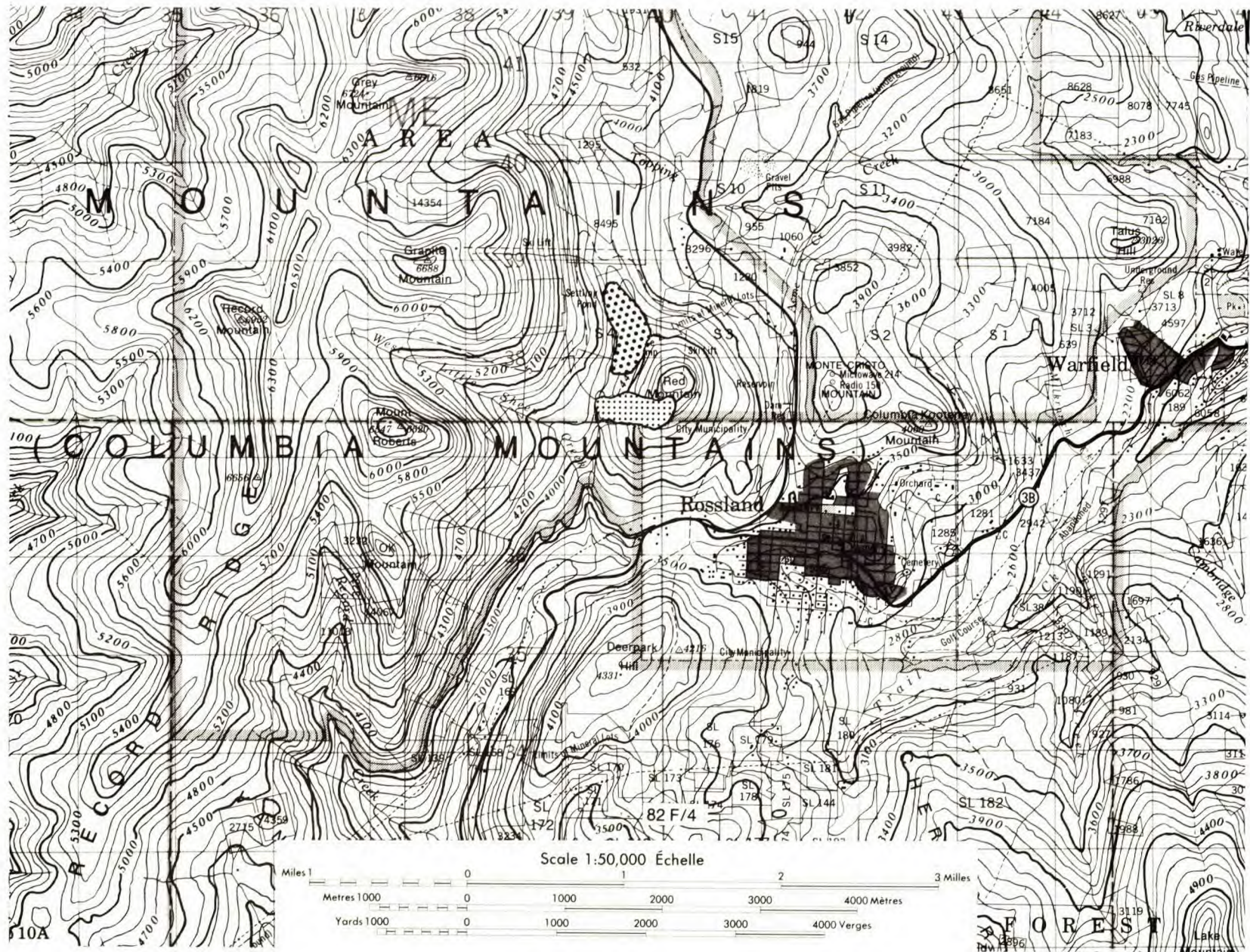
MAP NO. 170



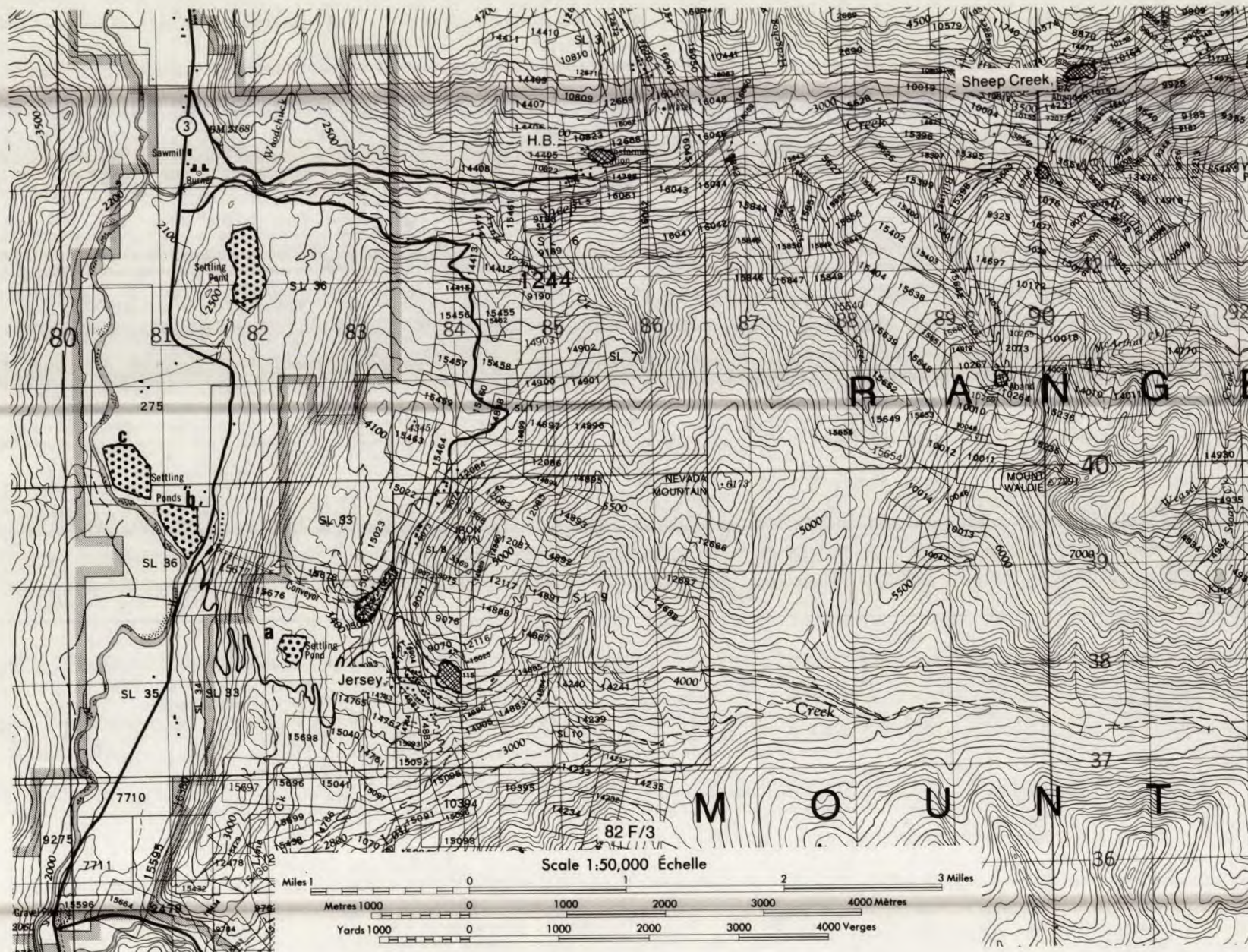
MAP NO. 171



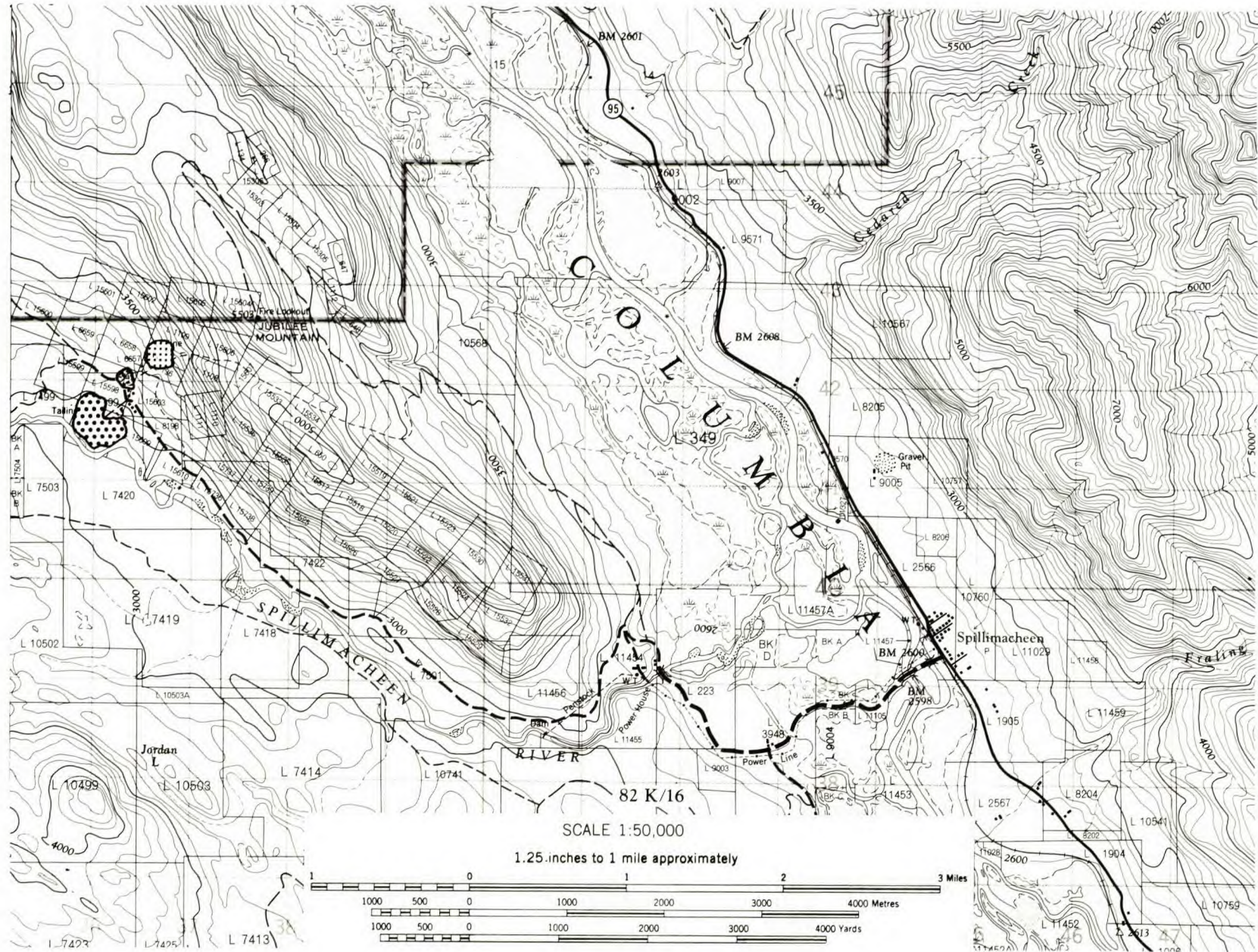
MAP NO. 172



MAP NO. 173



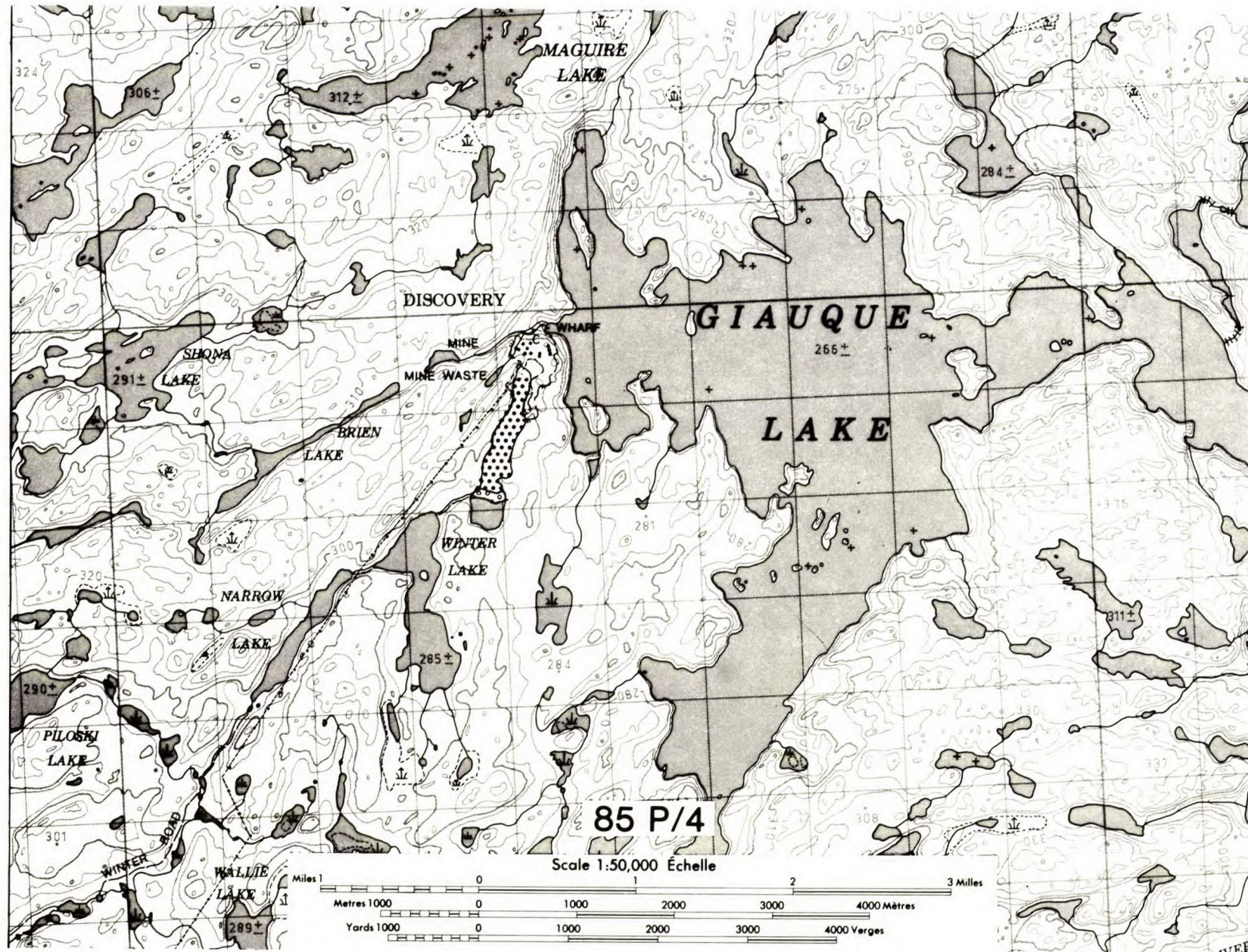
MAP NO. 174



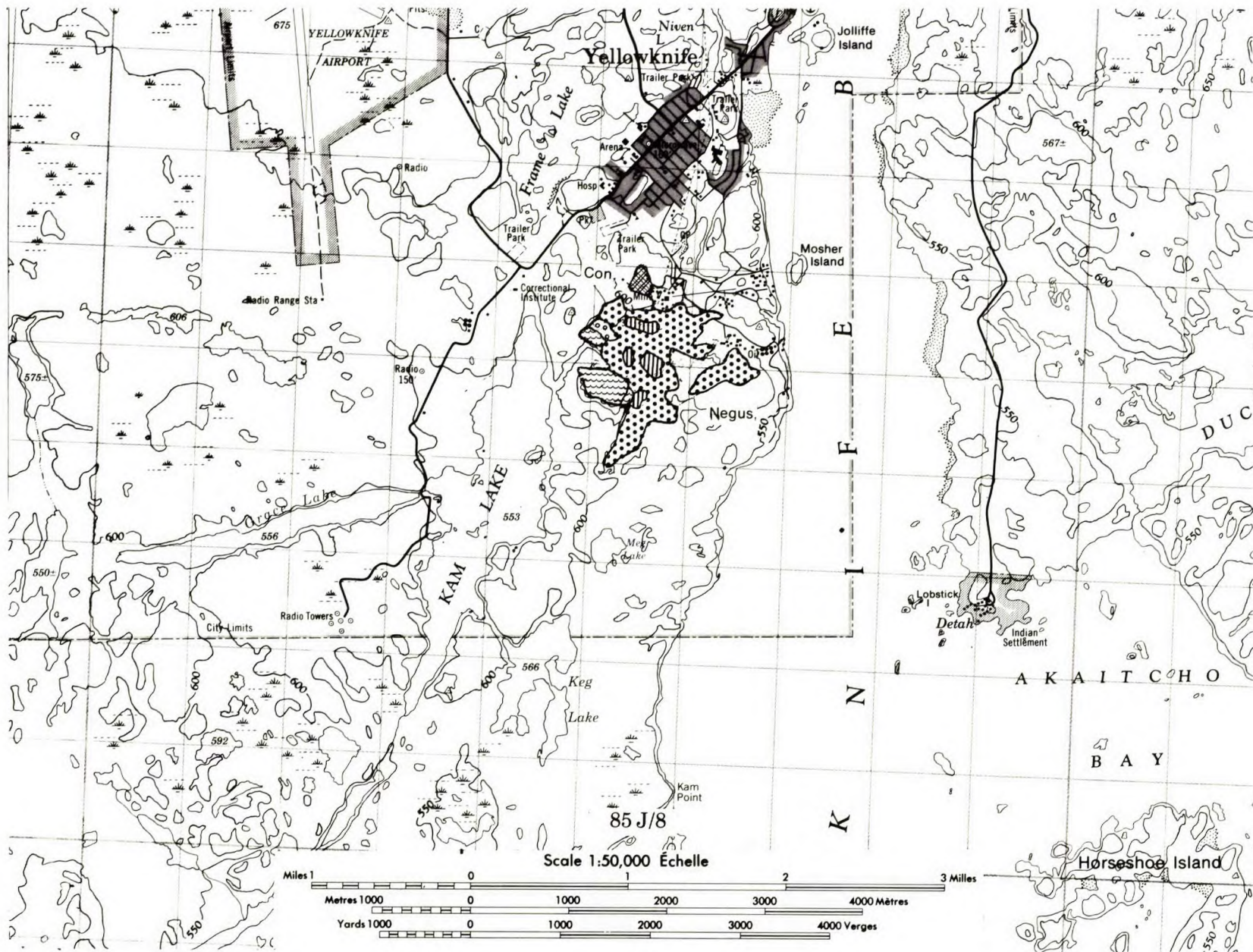
MAP NO. 175



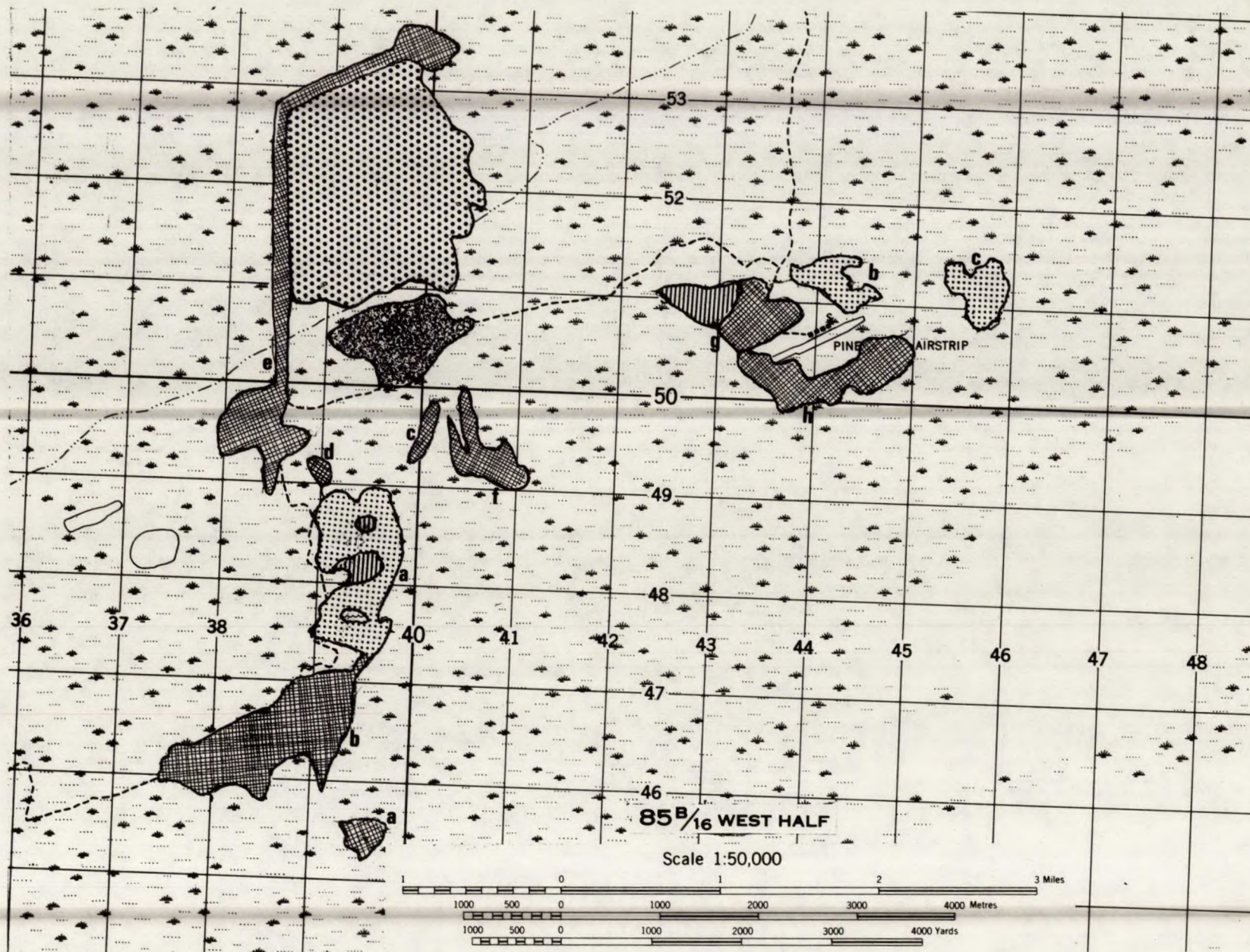
MAP NO. 176



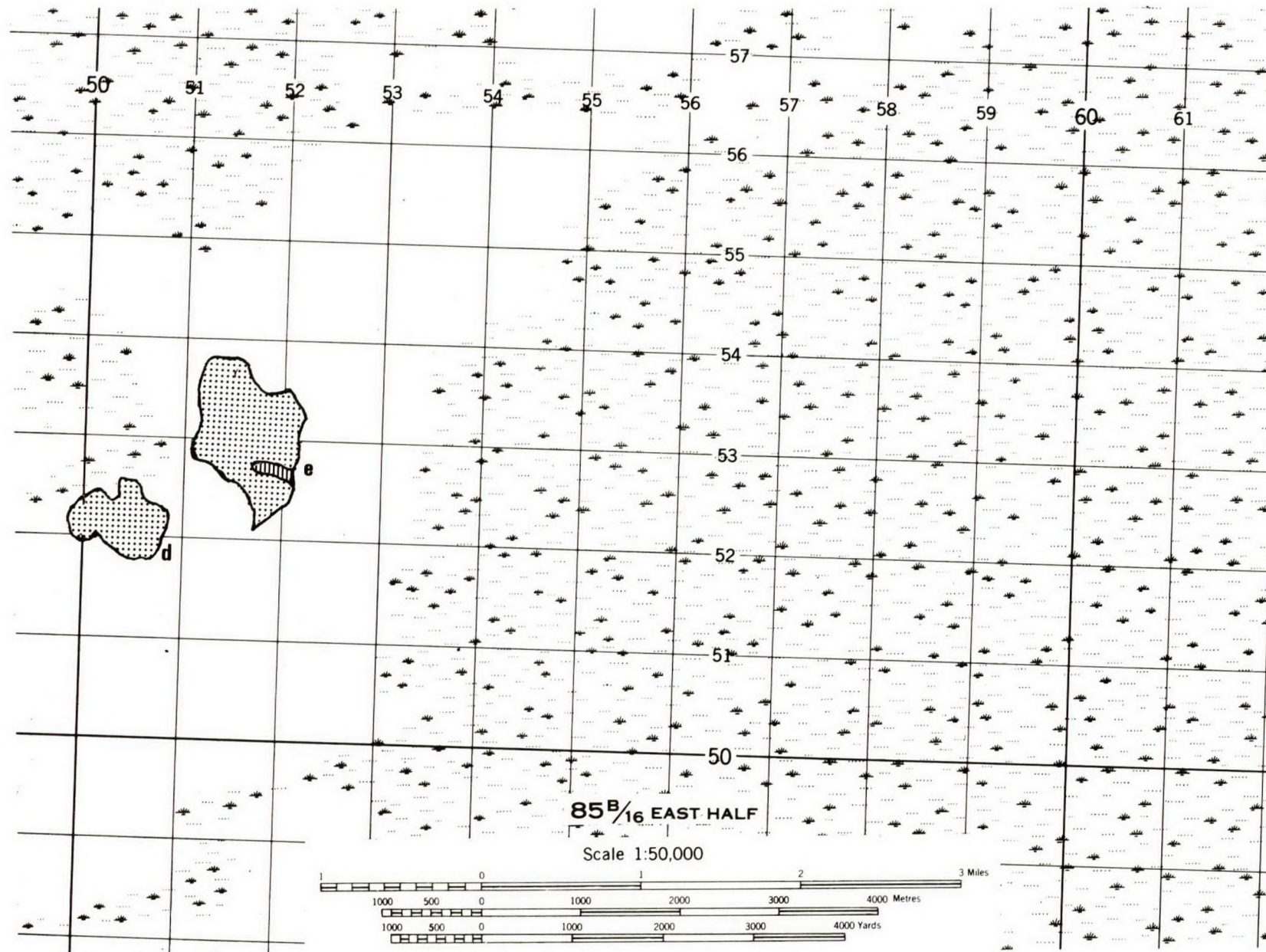
MAP NO. 177



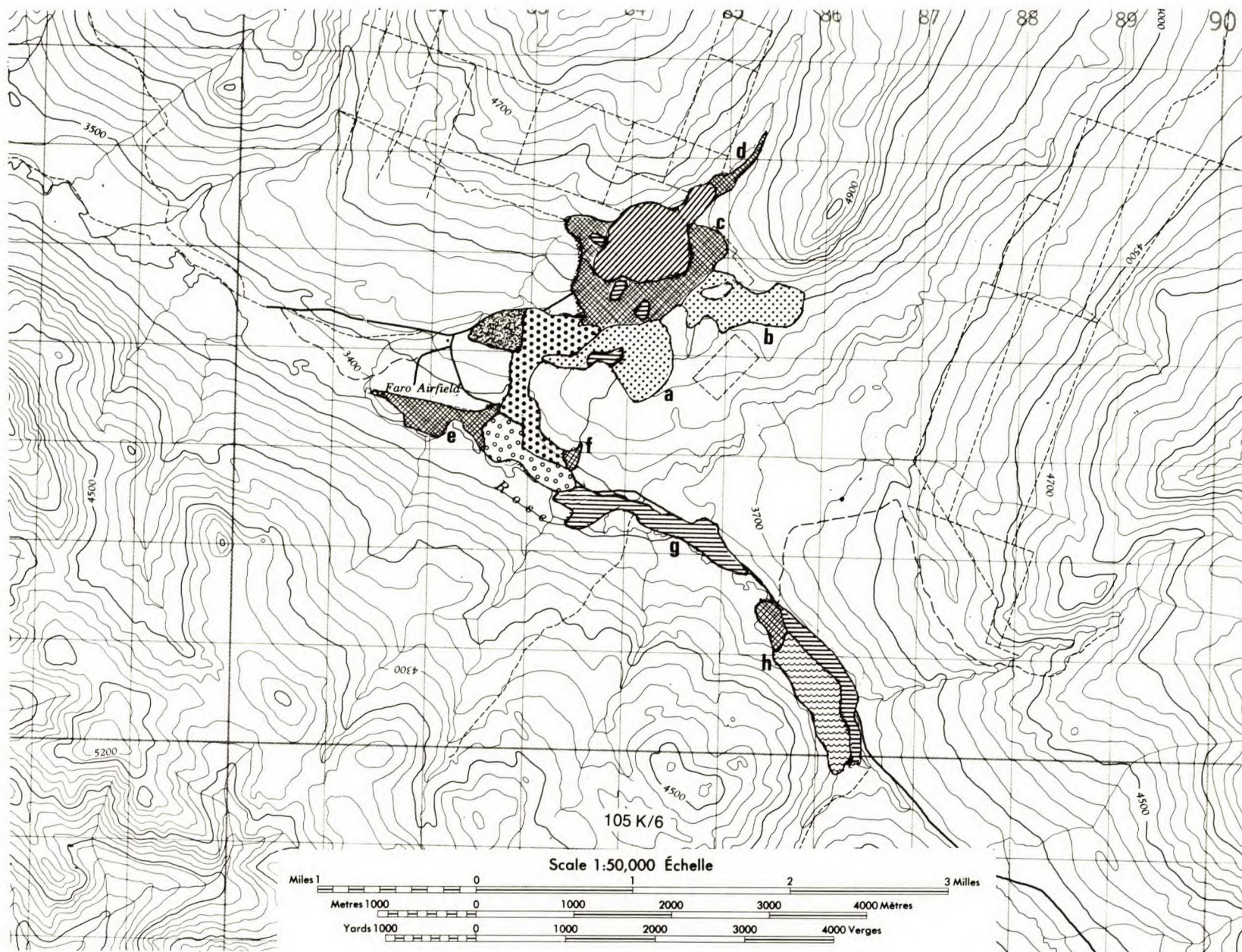
MAP NO. 179



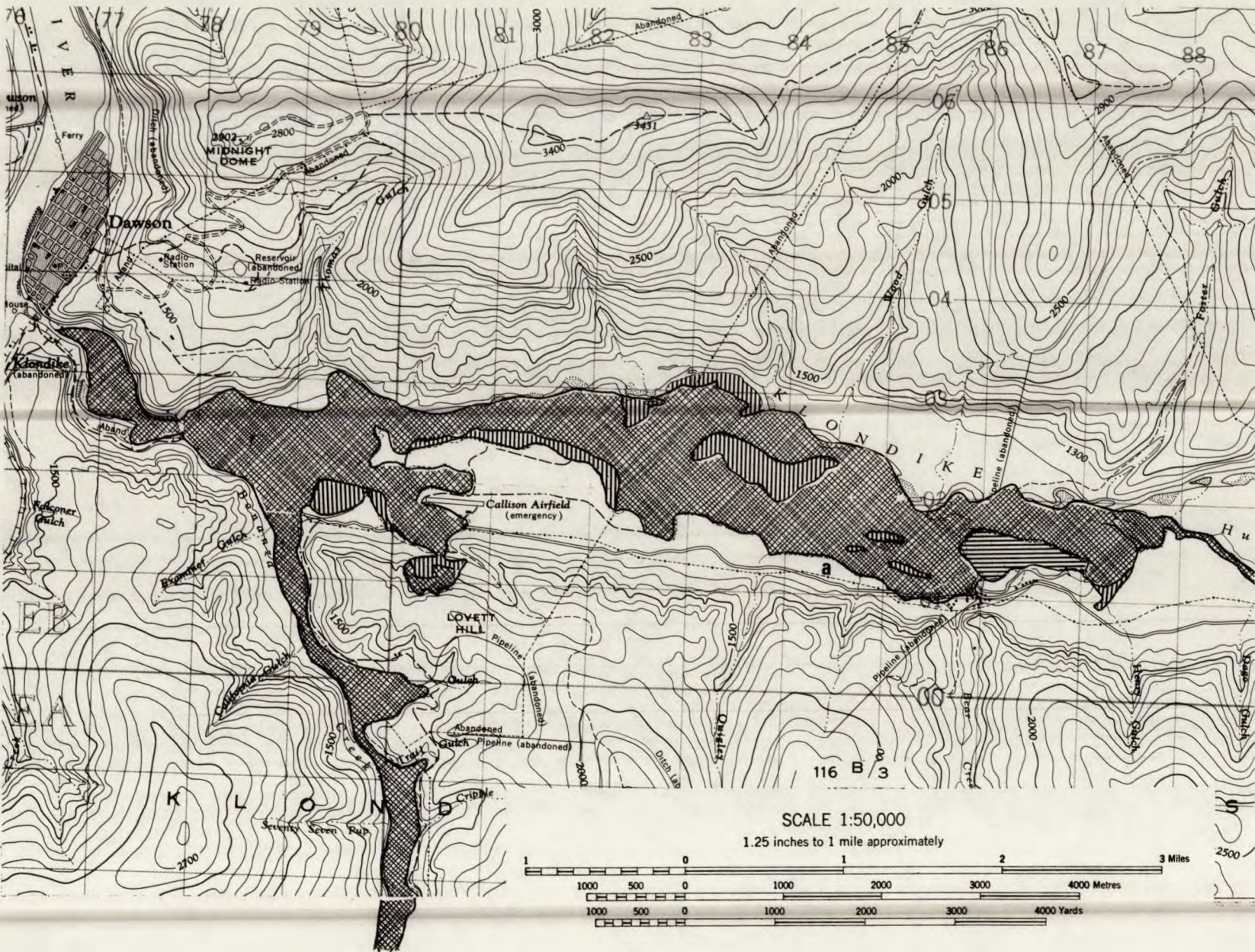
MAP NO. 180



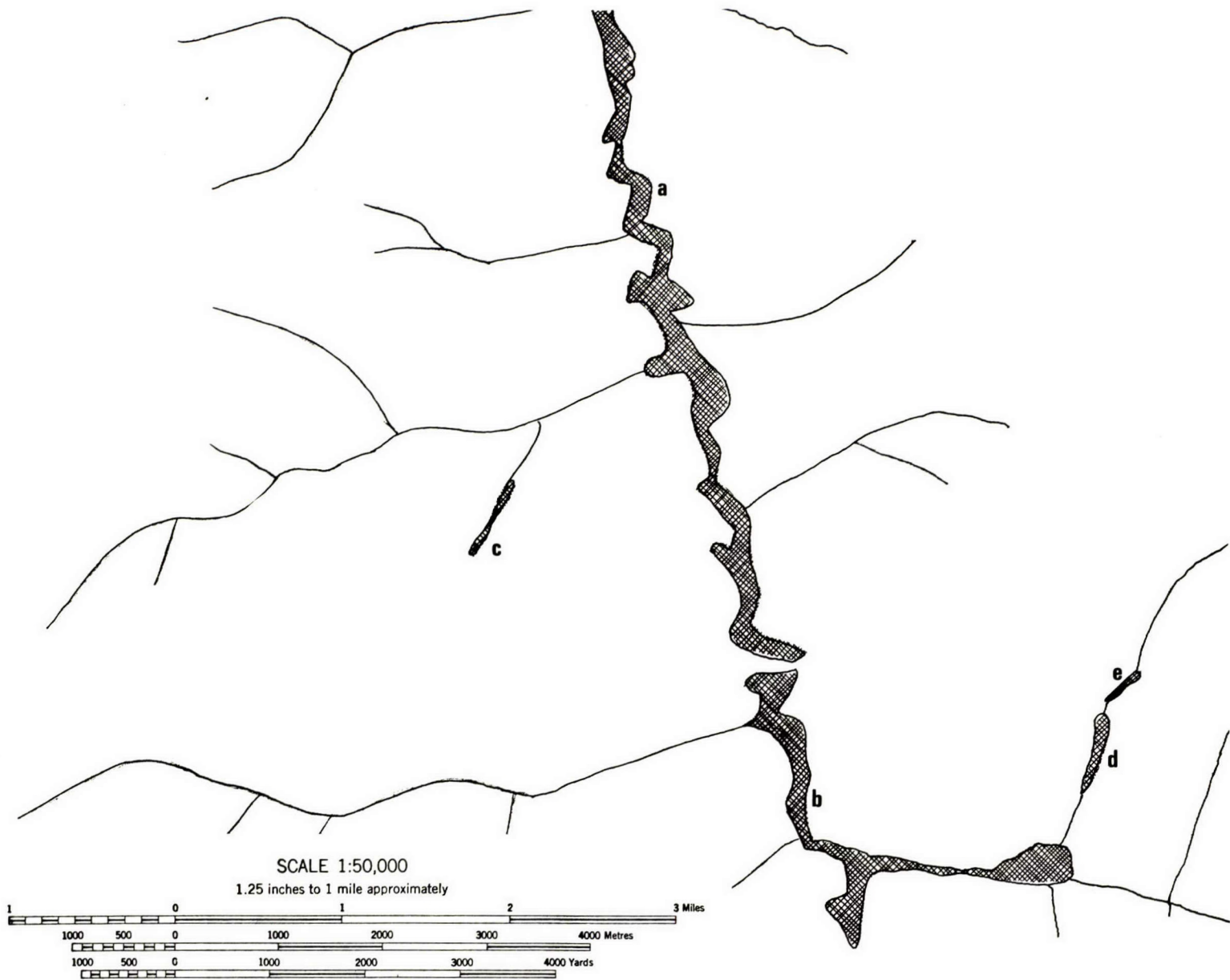
MAP NO. 181



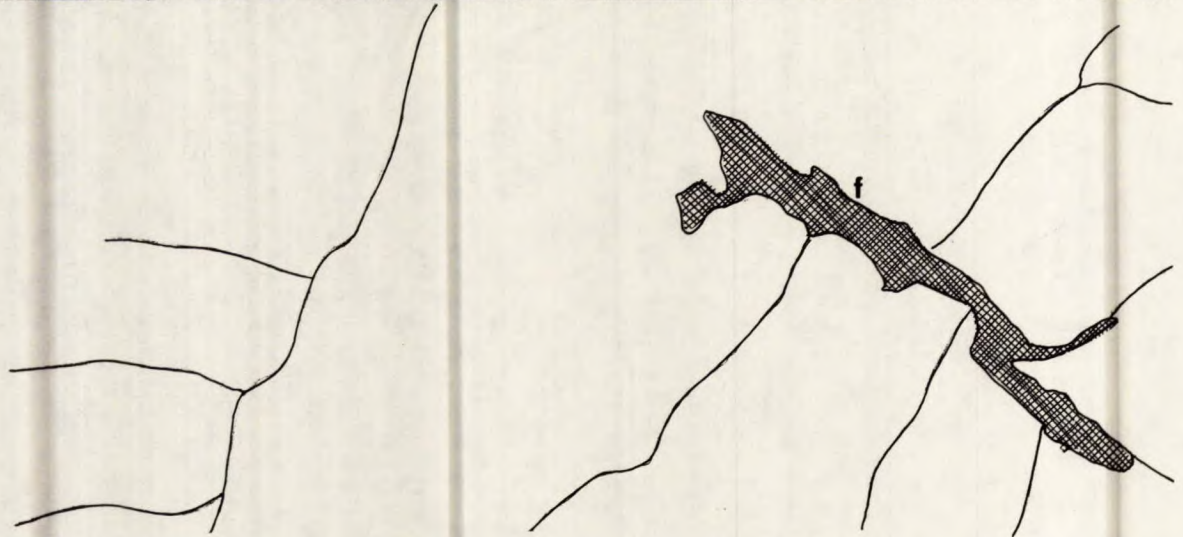
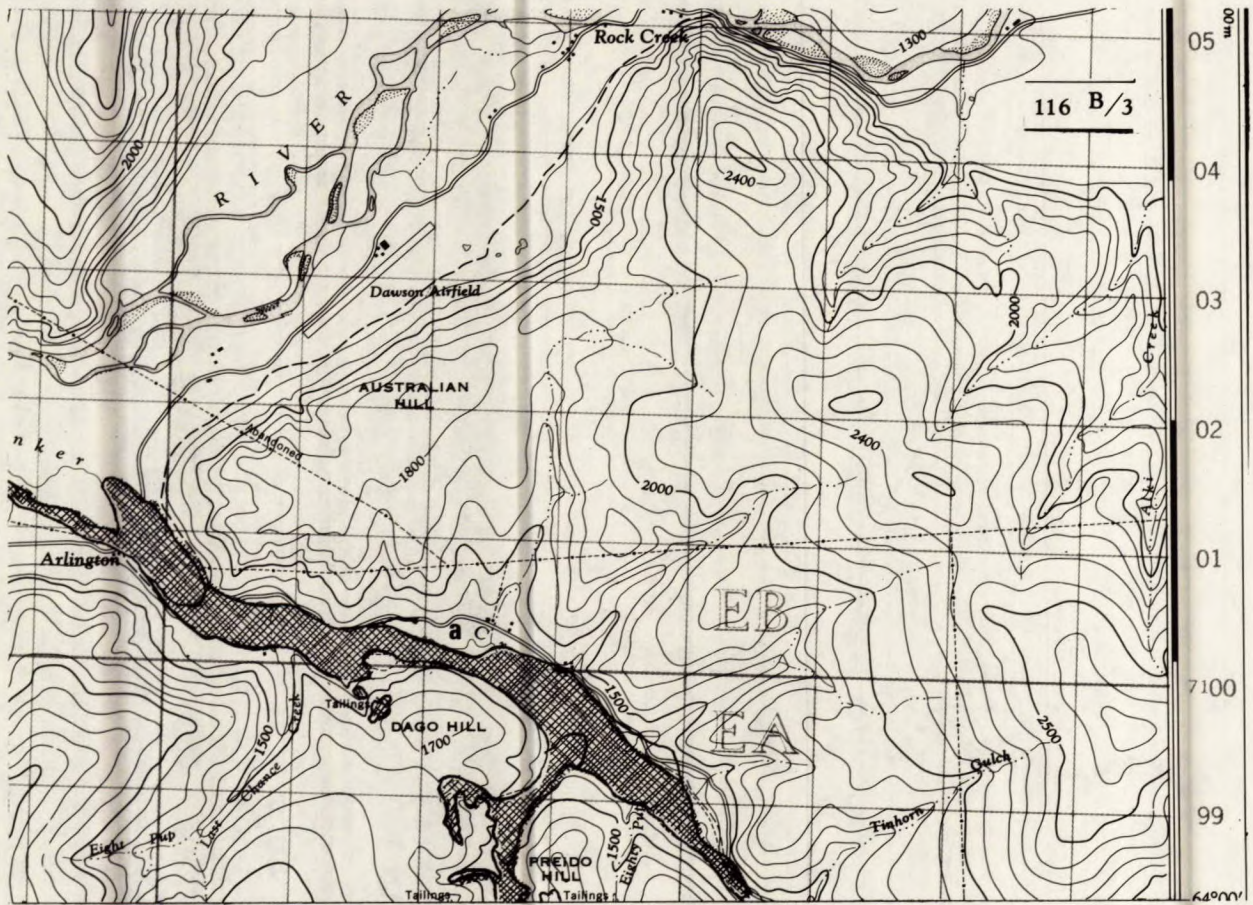
MAP NO. 183



MAP NO. 184

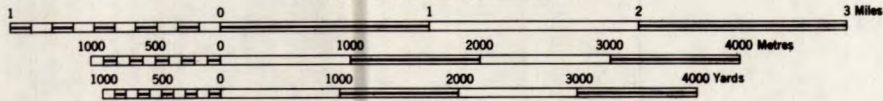


MAP NO. 185

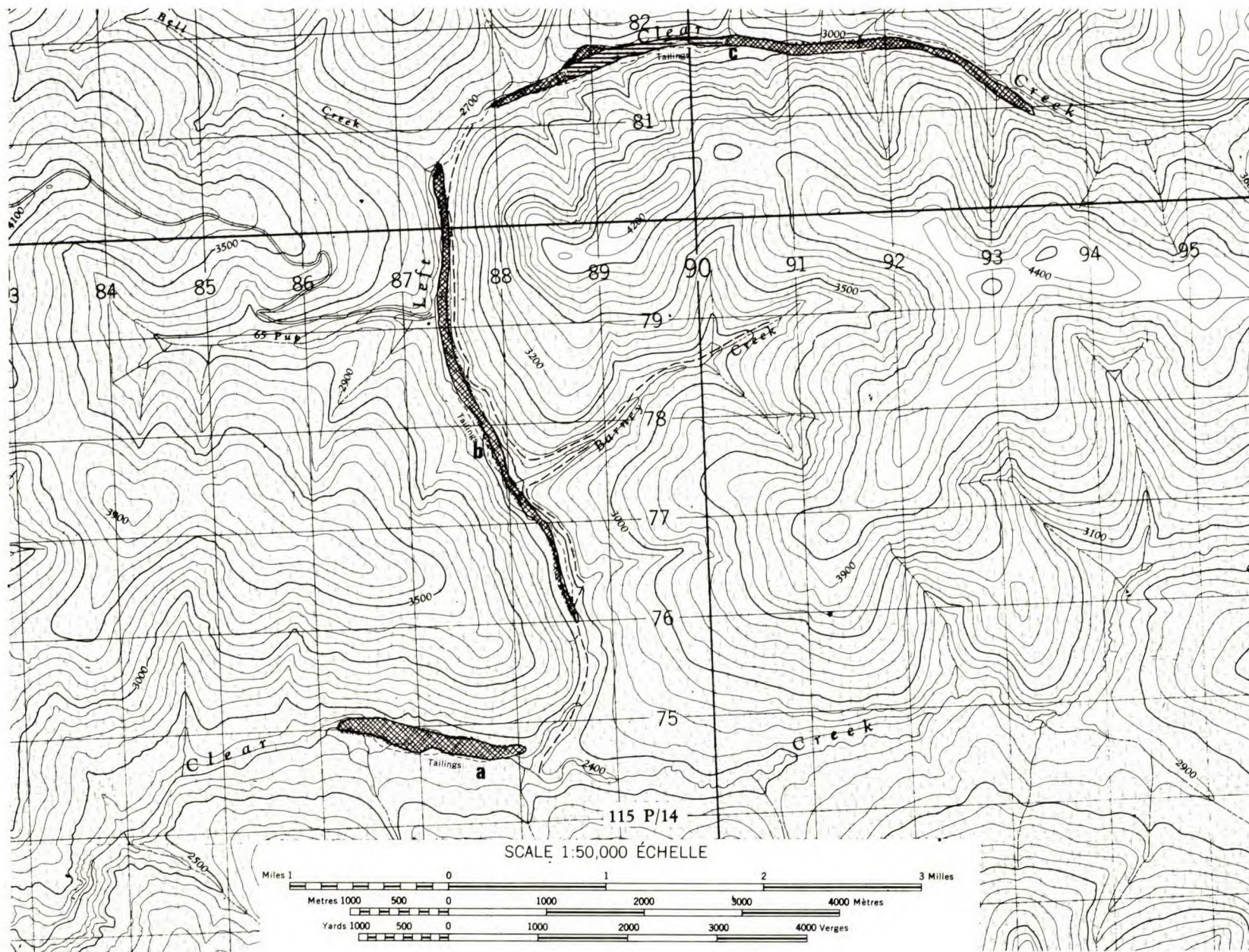


SCALE 1:50,000

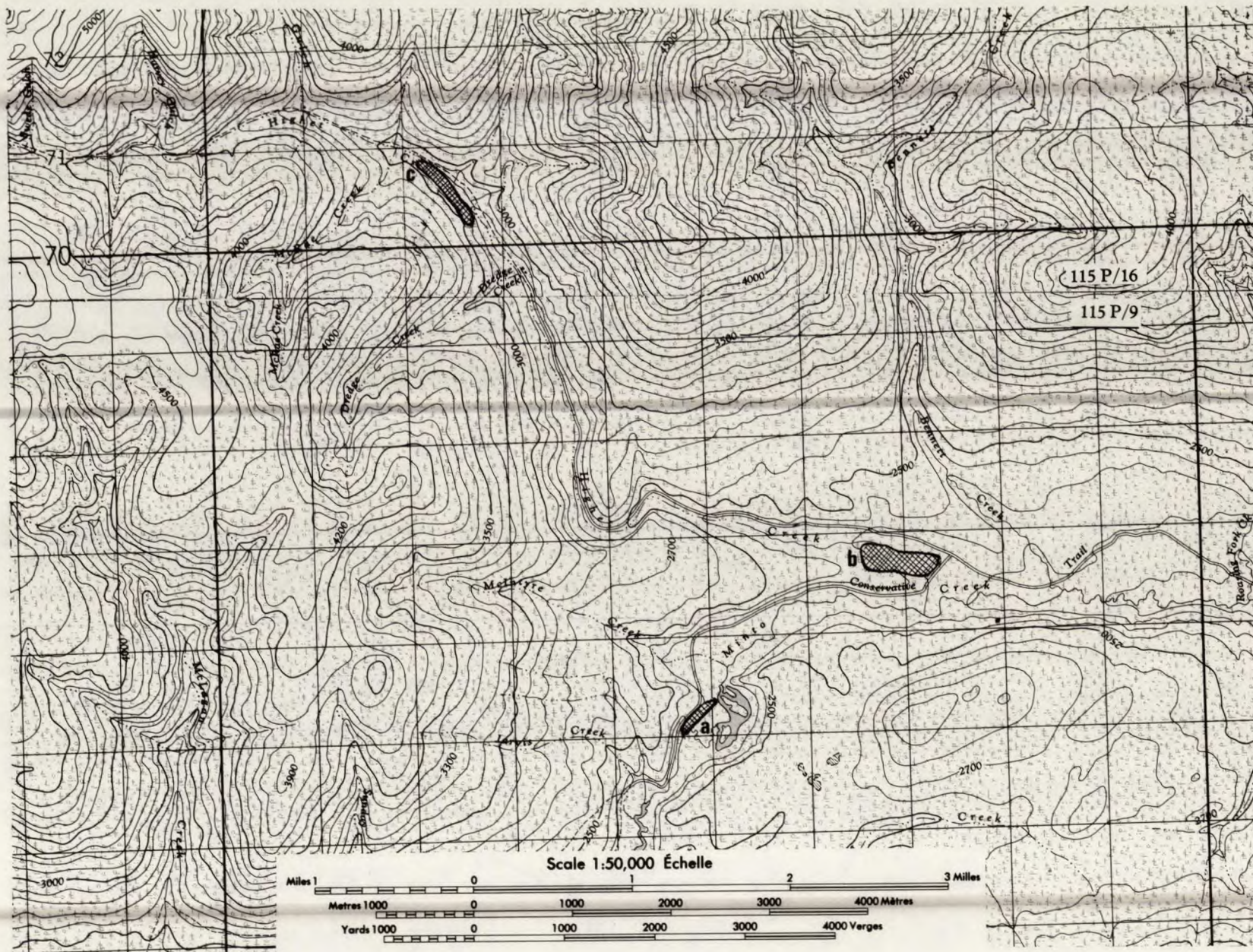
1.25 inches to 1 mile approximately



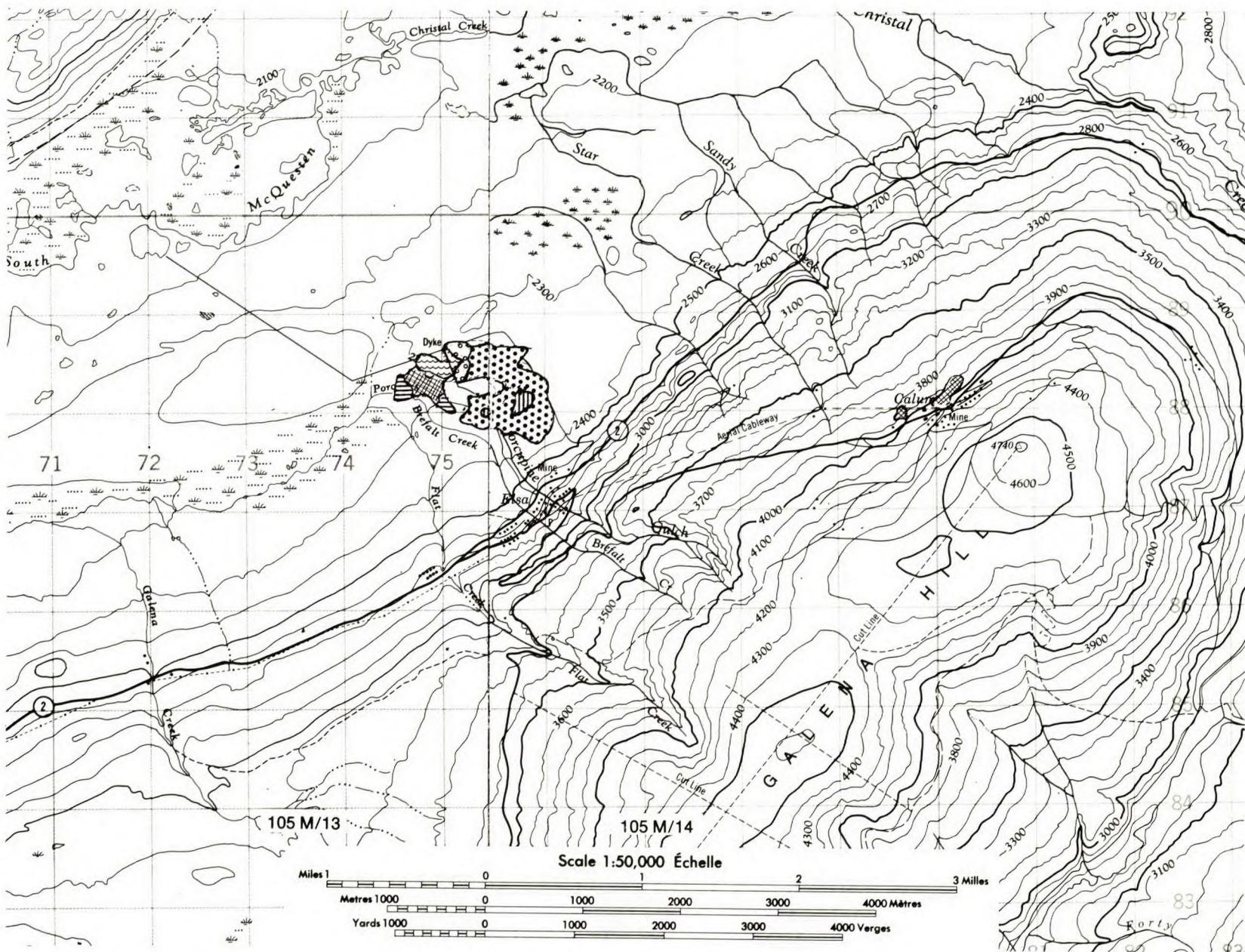
MAP NO. 186



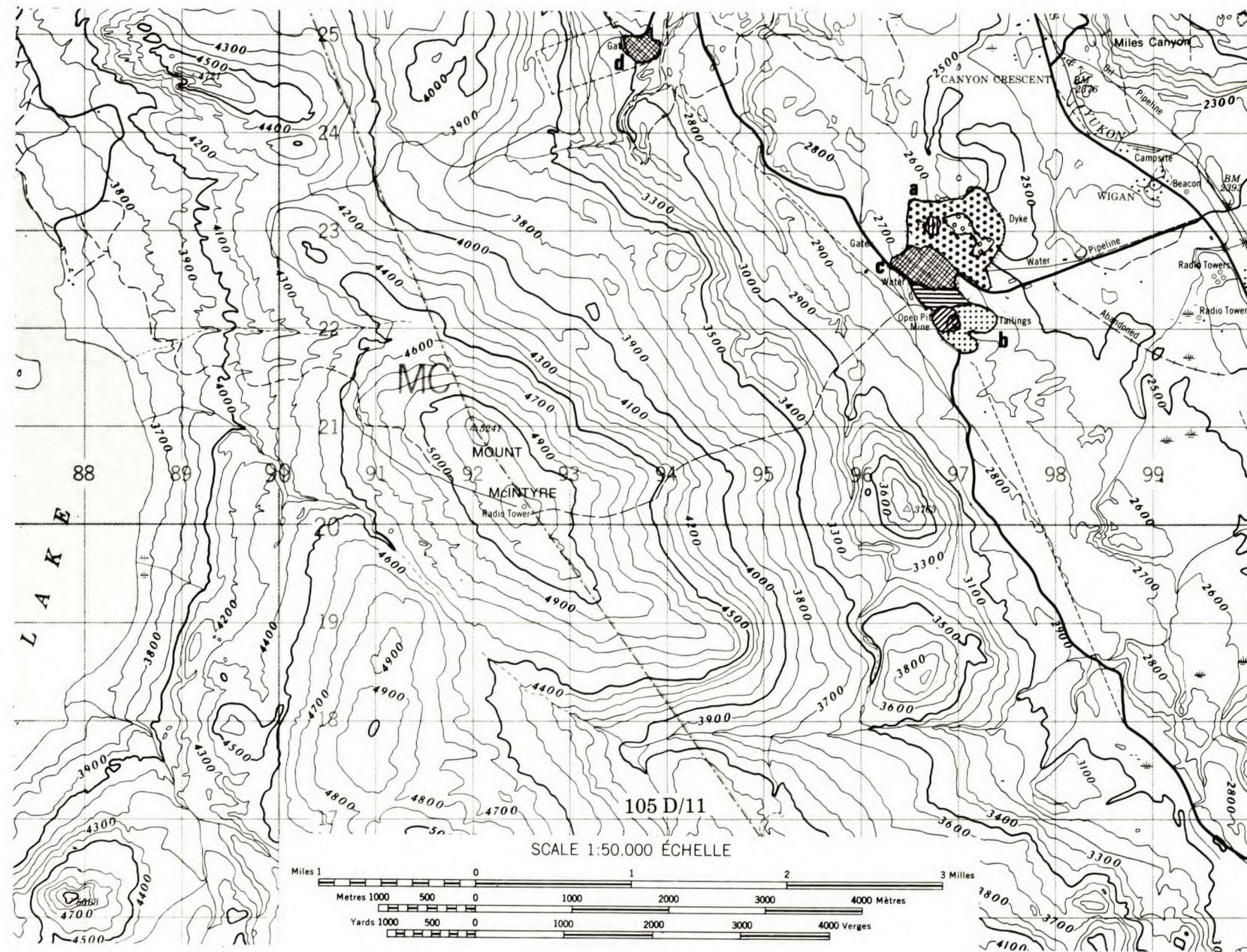
MAP NO. 187



MAP NO. 188

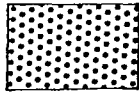


MAP NO. 189

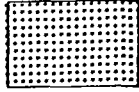


MAP NO. 191

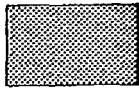
CLASSES MAPPED IN NATIONAL INVENTORY OF MINE WASTES



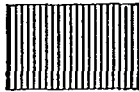
1. Tailings: may contain several subclasses based on moisture content.



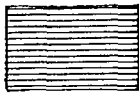
2. Waste Rock: including areas at mine site that have waste rock as surface cover.



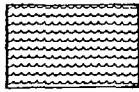
3. Slag



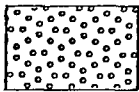
4. Heavy Vegetative Cover: residual natural cover and revegetation on reclaimed areas.



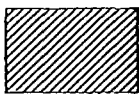
5. Moderate to Poor Vegetative Cover: grass and shrubs on reclaimed areas.



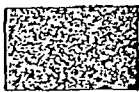
6. Clear Deep Water: reservoirs, ponds.



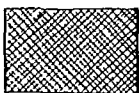
7. Silty or Shallow Water: slurry ponds.



8. Open Pit: usually identified by shadow, therefore, all open pits have not been mapped, and the mapped outline may not conform to the actual pit.



9. Plant Site: shaft, mill, smelter, etc.



10. Exposed Overburden: artificial and natural exposures eg sand and gravel pits, spoil banks, unpaved roads, dams, dykes, etc.