ARCTIC INDUSTRIAL ACTIVITIES COMPILATION VOLUME 2
Sverdrup Basin: Hydrocarbon Exploration 1974 to 1984

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Sidney, B.C. V8L 4B2

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CANADIAN DATA REPORT OF HYDROGRAPHY AND OCEAN SCIENCES NO. 32

Fisheries and Oceans Pêches et Océans

Canada

Canadian Data Report Of Hydrography and Ocean Sciences

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Sackmann, T. and B. D. Smiley, 1985. Arctic Industrial Activities Compilation: Volume 2; Sverdrup Basin: Hydrocarbon Exploration 1974 to 1984. Can. Data Rep. Hydrogr. Ocean Sci. 32: (Vol. 2) 181p.

This volume is one of a group of catalogues designed to compile and summarize important descriptive details of selected industrial activities carried out in the offshore Canadian Arctic during the past two or three decades. For user convenience, the Arctic has been arbitrarily divided into seven geographical areas, incorporating where possible, major oceanographic regions. These seven areas coincide with those of a companion series, namely, the Arctic Data Compilation and Appraisal catalogues which describe historic oceanographic data (currents, hydrocarbons, whales -- to mention a few). The approach and format within and between these catalogues and series are intended to facilitate comparison among subjects and regions.

With such a large undertaking, it is not possible to provide all catalogues at once. Therefore, publications which are presently available in the series are indicated on the inside back cover of each volume.

Marine industrial development is ongoing, and further updates of these catalogue descriptions are planned. Readers are requested to submit corrections and additions by writing to the issuing establishment. Such revision will be incorporated into an interactive computer graphics and listing system, and custom reports and maps will be available upon request.

Key words: Canadian Arctic, marine industrial activities, catalogue, database.

RÉSUMÉ

Sackmann, T. and B. D. Smiley, 1985. Arctic Industrial Activities Compilation: Volume 2; Sverdrup Basin: Hydrocarbon Exploration 1974 to 1984. Can. Data Rep. Hydrogr. Ocean Sci. 32: (Vol. 2) 181p.

Le présent volume fait partie d'une série de répertoires conçus pour la compilation et le résumé des importants détails descriptifs d'activités industrielles choisies effectuees dans les eaux hauturières canadiennes de l'Arctique au cours des deux ou trois dernières décennies. Pour faciliter l'utilisation de l'ouvrage, les auteurs ont divisé arbitrairement l'Arctique en sept zones géographiques incorporant, si possible, de grandes régions océanographiques. Ces sept zones coïncident avec celles d'une série associée, les Arctic Data Compilation and Appraisal catalogues, qui décrit les données océanographiques historiques (courants, hydrocarbures, baleines, etc.). L'approche et la présentation de ces répertoires et séries visent une comparaison facile entre les sujets et les régions.

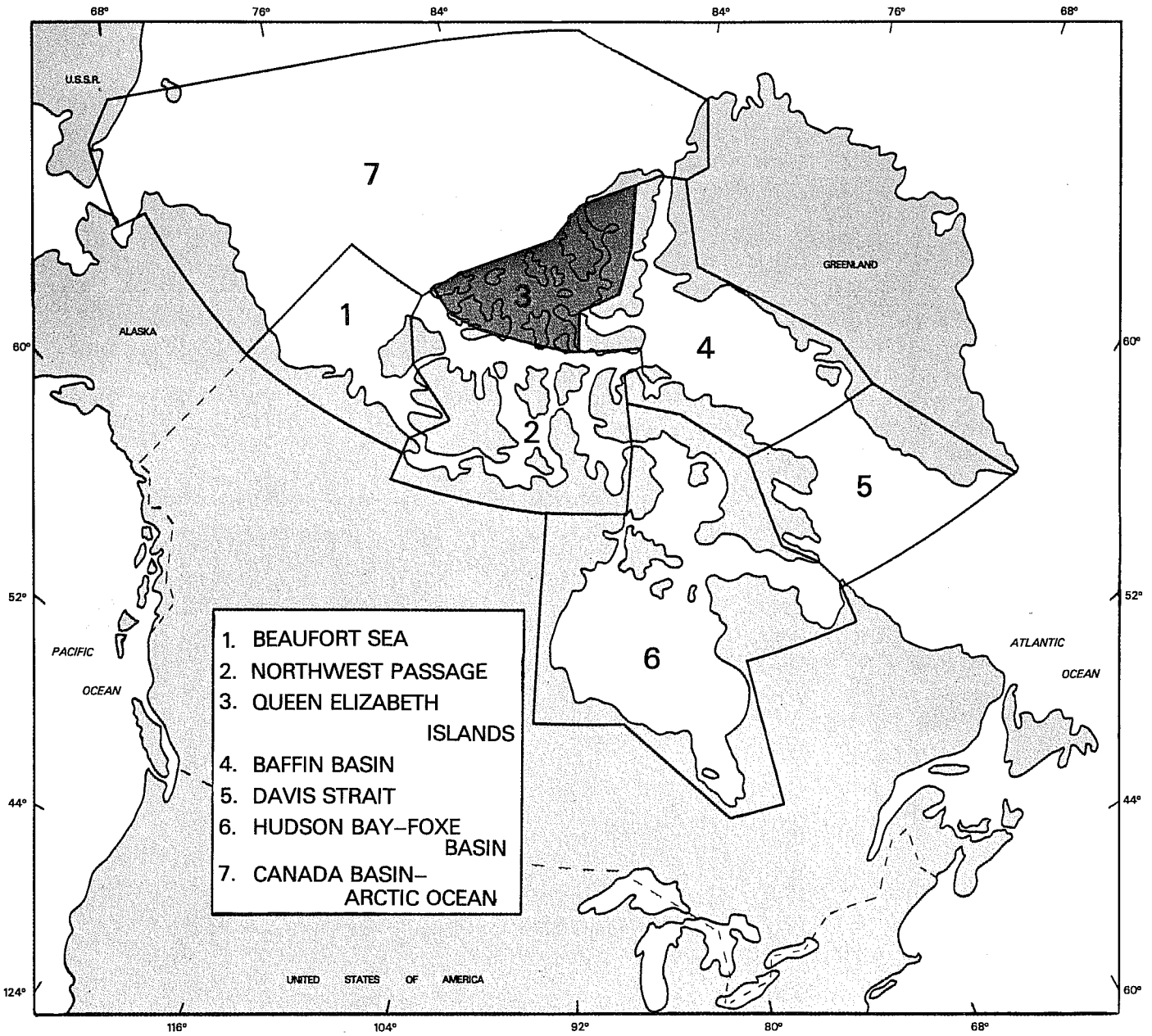
Il n'est pas possible de fournir tous les répertoires en même temps dans un

RÉSUMÉ
continued

travail de telle envergure. Les ouvrages de la série actuellement disponibles sont donc indiqués au plat du verso de chaque volume.

Le développement industriel du milieu marin est une activité permanente; on prévoit donc des mises à jour des répertoires. On demande aux lecteurs de faire parvenir leurs corrections et ajouts à l'établissement d'où provient la publication. De telles révisions seront ajoutées à un système interactif de listage et de traitement des données graphiques, des cartes et des rapports spéciaux seront disponibles sur demande.

Mots-clés: Arctique canadien, activités industrielles en milieu marin, répertoire, base de données.



This map shows the approximate study area covered by this volume, shown in relationship to other arbitrary areas in other volumes of this series, and also of the companion series, the Arctic Data Compilation and Appraisal catalogues for historic oceanographic measurements.

VOLUME ABSTRACT

This report presents a historical overview of seismic and hydrocarbon drilling activities in the Sverdrup Basin Region, NorthWest Territories. The review of seismic exploration activities includes a discussion of the vehicles, energy sources used in seismic surveys, timing of field operations, an outline of operator involvement in seismic exploration, and the areal and chronological distribution of these activities. The discussion text is supplemented with computer-drawn maps of seismic transects shot during individual programs.

Hydrocarbon exploration and delineation drilling activities are reviewed, including a discussion of the timing of well starts and drilling operations, rig movement and wellsite access, offshore ice drilling platforms, and the subsea blowout prevention system. An experimental offshore gas well completion at the Panarctic Drake Point F-76 well is outlined. Operator involvement in drilling activities is discussed, followed by a review of the areal and chronological distribution of drilling activities. The text is supplemented with maps showing drilling locations segregated according to the proponent and the year of operation.

The layout and activities at the Rea Point, Melville Island support base are reviewed, as are onshore and offshore drilling fluid disposal practices. Individual descriptions of seismic programs and wellsite activities, as well as tradenames and usages of common drilling fluid components and additives, are listed in the appendices.

Key words: Sverdrup Basin, Queen Elizabeth Islands, oil and gas exploration, seismic surveys, exploratory drilling, support activities, waste disposal, database.

ACKNOWLEDGEMENTS

The authors gratefully acknowledge the information and assistance given during the research and preparation of this report. We are particularly indebted to Warren Fenton of the Environmental Protection Service, Yellowknife for provision of field support during the search phase and his generous assistance and advice in accessing pertinent files and reports. Thanks are due to Floyd Adlem of Indian and Northern Affairs Canada (INAC) and Maurice Thomas of Canada Oil and Gas Lands Administration (COGLA) for their assistance in accessing agency files and maps. Lindsay Franklin and Bill Singletary of Panarctic Oils Limited, Calgary, Jim Hunder of Seiscom Delta United, Calgary, and S. Siegfried of Sonics Exploration Limited, Calgary were generous in providing details of company activities. We are grateful to Ildy Szabo for production of the base maps for this report and to Coralie Wallace of C.A. Graphics for the preparation of the figures and drawings. Special thanks must be given to George Floyd and Susan Ball for design of the database and production of the computer-drawn maps. The authors are obliged to Sharon Thomson and Ron Perkin of IOS for their editing and review of the manuscript. Finally, the typing services of Avril Peters, Judy Pitcher, and Irene Sipila are sincerely appreciated.

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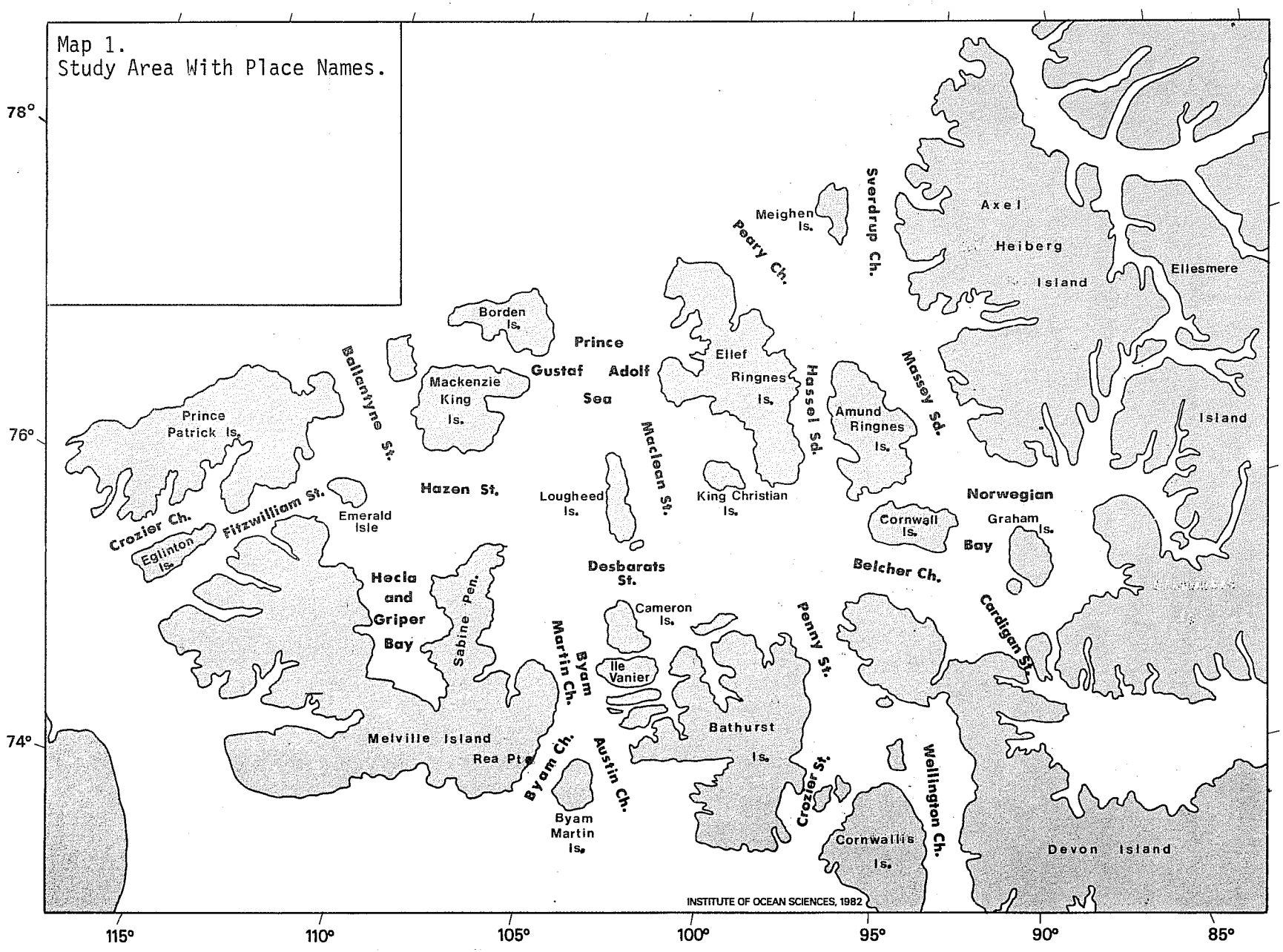
1. INTRODUCTION

The Sverdrup Basin, including the Queen Elizabeth Islands, has been the focus of wide scale, intensive seismic surveys, and well drilling in the ongoing search for oil and gas. From 1974 to June 1984, a total of 45 seismic surveys logged nearly 25,000 km of transects, most of which (75%) were shot offshore. In addition, 80 wells were drilled for wildcat exploration and discovery delineation; again, many (31%) were carried out offshore. The majority of these surveys and wells were the responsibility of Panarctic Oils Limited, the sole or lead sponsor of 32 seismic programs and 68 drilling operations. In support of this hydrocarbon search, thousands of tonnes of drilling wastes were disposed, thousands of flights for resupply were required, and numerous staging bases were constructed, some permanently such as the largest, Rea Point. Unfortunately, for purposes of regional planning, impact assessment or regulatory guidance, many basic details (who, where, when, how, what) of these offshore development activities exist, but in uncompiled records, files, and reports in several offices of government regulatory agencies and oil companies. Such status makes it difficult to gain any quick, overall appreciation (much less specifics about one particular operation) of where we have been when deciding where and how we should proceed.

The objective of this report is to compile thoroughly, synthesize simply, and depict clearly such details under one cover by using maps, figures, and tables. The actual documents and files were examined first-hand in most cases and are referenced with original record notations in the appendices to facilitate any future scrutiny.


Map 1.
Study Area With Place Names.
78°
76°
74°
115°
110°
105°
100°
95°
90°
85°
Meighen Is.
Peary Ch.
Sverdrup Ch.
Axel Heiberg Island
Ellesmere Island
Borden Is.
Prince Gustaf Adolf Sea
Ellef Ringnes Is.
Hassel Sd.
Massey Sd.
Amund Ringnes Is.
Mackenzie King Is.
Ballantyne St.
Prince Patrick Is.
Hazen St.
Maclean St.
Lougheed Is.
King Christian Is.
Crozier Ch.
Fitzwilliam St.
Emerald Isle
Eglinton Is.
Cornwall Is.
Graham Is.
Norwegian Bay
Belcher Ch.
Desbarats St.
Hecla and Griper Bay
Sabine Pen.
Cameron Is.
Penny St.
Cardigan St.
Byam Martin Ch.
Ile Vanier
Melville Island
Rea Pt.
Bathurst Is.
Austin Ch.
Byam Martin Is.
Crozier St.
Wellington Ch.
Cornwallis Is.
Devon Island
INSTITUTE OF OCEAN SCIENCES, 1982

2. STUDY AREA

The study area, as shown on Map 1, consists of the islands and waterways in the Sverdrup Basin Region of the Queen Elizabeth Islands, Northwest Territories. The study area includes the area north of the 75th parallel bounded by a line joining the northern headlands of the Prince Patrick, Borden, Ellef Ringnes, and Axel Heiberg islands. The eastern and western limits of the study area were defined as the 85th and 125th degrees of longitude respectively.

Topography of the Queen Elizabeth Islands in the Sverdrup Basin area is characterized by areas of rugged or rolling terrain reflecting the underlying Pre-cambrian granite or gneiss formations interspersed with flatter areas based on sedimentary formations. Glacial drift of varying depth covers much of the Region and often modifies the influence of the bedrock on topography. In the far north, Axel Heiberg Island features alpine peaks, generally ice-covered, at 1,800 m in elevation. To the south and southwest lie hills, plateaus, and rolling plains. Most of the Region is below 300 m, but occasional uplands exceed 600 m and on Melville Island reach 1,050 m. Along the margins of the Arctic Ocean lies the Arctic Coastal Plain, extending from Meighen Island through the western Queen Elizabeth Islands to western Banks Island. This feature is unusually flat and consists of fine, unconsolidated sediments containing massive ground ice.

Water depths in the area tend to decrease from north to south. Depths range from 500 m to 700 m in the Prince Gustaf Adolf Sea and Peary and Sverdrup channels. In the central portion of the study area, the relatively deep waters of 400 m or more are separated into distinct basins by zones of shallow water extending northward across Desbarats Strait to Lougheed Island and northward across Belcher Channel to Amund Ringnes Island. Depths of passages in the Cordigan, Penny, and Fitzwilliam straits, and Austin and Byam channels range from 100 m to 250 m.

An important factor affecting the location and timing of hydrocarbon exploration activities is the seasonal sea ice coverage in the area. During the winter months, the majority of the Sverdrup Basin Region is covered by a combination of first-year and multi-year sea ice floes. Since, in many channels, the horizontal displacement of the ice cover is limited to 15 m or less during the winter, sea ice provides a stable platform for offshore seismic surveys and drilling activities. However, during the spring and summer months, the deformation and thawing of the sea ice cover preclude over-ice movement of vehicles or the use of sea ice platforms for offshore drilling.

3. ACCURACY OF MEASUREMENTS

Throughout the preparation of this report, care has been taken to ensure the accurate transcription of temporal, quantitative, or geographical information from the original sources. It should be noted, however, that the precision of information contained within the original records or source documents was not uniformly high. As well, documentation of some individual activities was found to be unavailable, missing or incomplete at the time when information for this report was being compiled; thus, the descriptions of those activities in this report is similarly incomplete.

Specific areas of imprecision in the original information should be noted as follows:

(a) Timing and Location of Seismic Surveys: The exact period during which field operations are carried out is to some degree dependent on the condition of sea ice in the survey area; since these conditions cannot be accurately predicted well in advance, proponents' proposals for survey operations will only specify the general three- to four-month period during which these operations will be carried out. Information regarding the location of seismic transects is provided by the proponents to DIAND in the form of seismic lines plotted on 1:250,000 scale maps. This information is then re-plotted on similarly-scaled Historical Land Use Maps by DIAND staff. Transcription errors between the proponents' original documents and DIAND maps and between the DIAND maps and IOS plots may be cumulative. Therefore, a positional error of plus or minus 3 km should be applied to survey lines plotted in this review.

(b) Quantities of Drilling Mud Components: Mud records submitted by well operators to COGLA listed "rounded" quantities of mud components in Imperial units up to 1979 and in Metric units from 1980 to the present. To compensate for conversion and rounding errors, quantities of more than 1,000 kg should be considered as accurate within plus or minus 50 kg, while an error factor of plus or minus 10 kg should be applied to quantities under 1,000 kg.

Some government files pertaining to specific seismic or drilling operations were found to be missing or otherwise unavailable during the compilation of information for this report. Thus, the proponents and vehicles used in four 1974 seismic programs could not be identified, and only limited descriptions of the following wells were obtained:

(a) Panarctic Norcen AIEG et al Grassy I-34;
(b) Panarctic Drake F-76;
(c) Panarctic W. Bent Horn G-02.

Deficiencies in available files or documents are noted on the Appendices A and C.

4. GEOPHYSICAL EXPLORATION

4.1 Introduction

Beginning in 1974, the Sverdrup Basin Region has been a focus of extensive geophysical exploration, mostly sponsored by petroleum companies. As a result, the majority of islands and channels in the central Basin have been subjected to various seismic activities. In some areas, such as the Sabine Peninsula on Melville Island and offshore areas west of Lougheed Island, the cumulative seismic exploration activities over 10 years has been exceptionally high. Perhaps not unexpectedly, this is a function of oil and gas discoveries in this part of the Sverdrup Basin, in particular, within or in the vicinity of the Hecla and Drake gas fields near Sabine Peninsula, the Skate and Cisco oil and gas discoveries near Lougheed Island, and the Bent Horn oil discovery on Cameron Island. This direct relationship between high seismic exploration activity and actual hydrocarbon discoveries is derived from two factors. Firstly, detailed, intensive seismic surveys are normally undertaken when preliminary research indicates geological formations of interest to petroleum operators. Secondly, should an oil or gas body be discovered as a result of subsequent drilling, additional seismic surveys aid in the delineation of the discovery. Conversely, seismic coverage tends to be less intensive in areas removed from known or potential oil and gas bodies; here the emphasis is placed on general profiling of relatively unknown areal geology.

4.2 Field procedures

4.2.1 Timing of operations

Seismic surveys in the Sverdrup Basin are normally carried out in either or both of two distinct field seasons. Surveys confined to land masses may be scheduled for 15 September-15 December or 15 March-25 May, periods when the active layer is sufficiently frozen to permit the use of wheeled or tracked vehicles for overland travel. As well, daylight is available during some portion of these periods to assist survey crews. Fieldwork is normally not undertaken during the period 15 December-15 March because of darkness and extreme cold. Offshore surveys are normally scheduled for the period 15 March-25 May, when the sea ice is sufficiently thick and stable to support over-ice vehicle traffic. Operations are terminated by 25 May to ensure that seismic crews are off the sea ice prior to the onset of thawing temperatures and breakup (B. Singletary, pers. comm. 1984).

Between 1974 and 1976, there was a marked tendency for the majority of seismic programs to be carried out during the spring season (Figure 1). Although most seismic exploration included transects shot on land, 13 of 27 programs involved some amount of offshore exploration, and thus, were scheduled when sea ice was sufficiently frozen. In 1977, the only year in which fall seismic programs outnumbered spring programs, one offshore program was undertaken between mid July and late September near Little Cornwallis Island (EPS File NW 1710-Land Use Application). Although details of this program were not acquired for this report, the timing of the surveys (the open water is usually present during this period) and the reported use of airguns as an energy source suggest that a seismic vessel was used.

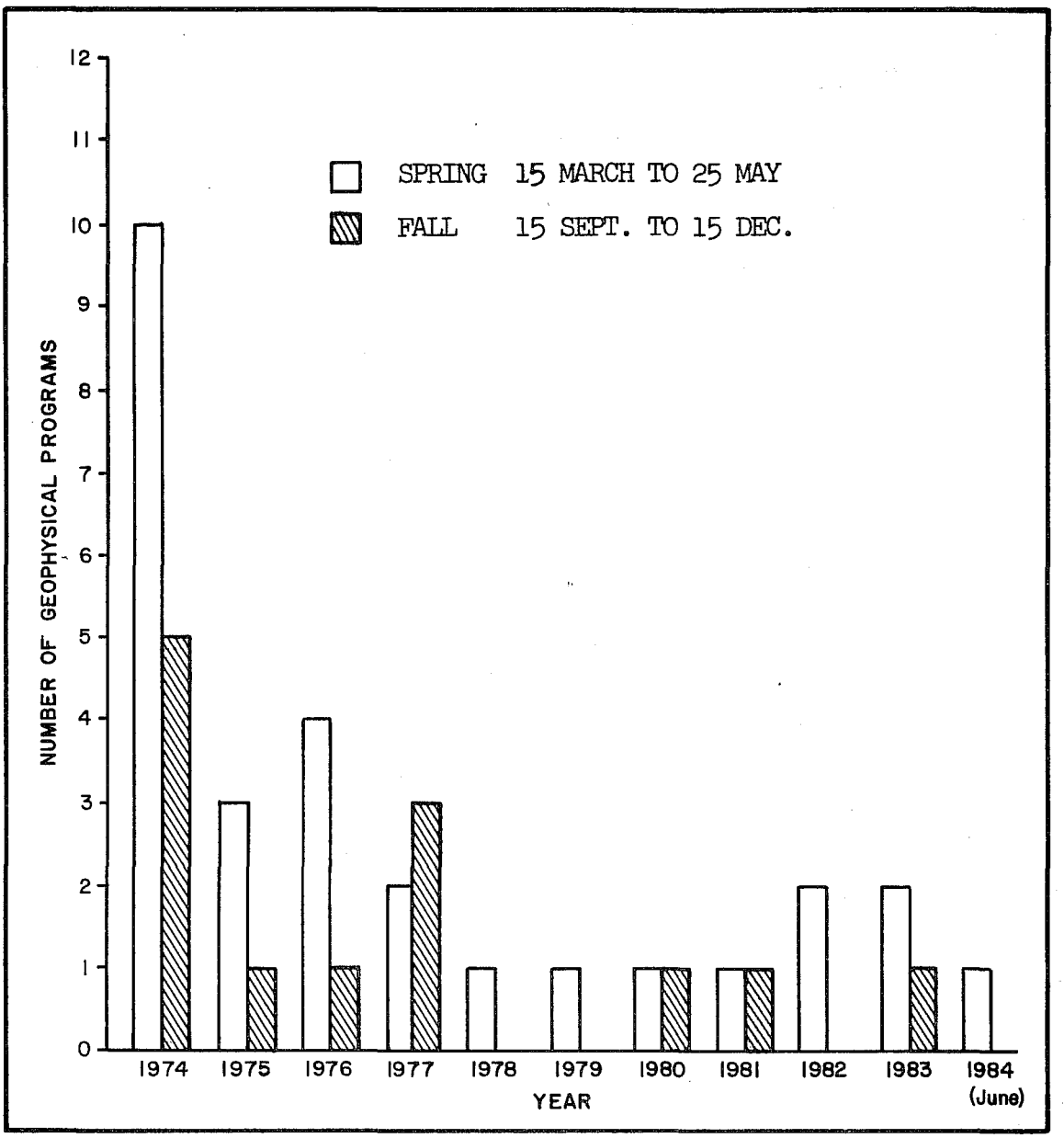


Figure 1. Geophysical Exploration Programs Undertaken During Spring and Fall Field Seasons, 1974 to 1984.
(N.B. The dates of four programs in 1974 and one program in 1981 were not recorded and, therefore, not included in these totals.)

Between 1978 and June 1984, the overall number of programs, especially in the fall declined from the period 1974 to 1977. This decline in fall programs coincided with increasing interest in offshore exploratory drilling. Consequently, more seismic exploration activities (10 of 13 programs) were directed to offshore areas and scheduled for the spring. Two of the offshore surveys occurred during the fall. The first survey was carried out between 30 August and 15 September 1976 near Cornwall Island (DIAND Land Use Permit file N151-B6), while the second occurred between 15 July and 30 September 1977 between Bathurst and Little Cornwallis islands (EPS Land Use Application File NW 1710). Although details of these operations were lacking, both surveys were presumably carried out using seismic vessels rather than on-ice field crews.

4.2.2 Vehicle use

Various types and numbers of vehicles are used for seismic survey operations in the Sverdrup Basin, depending on the expected terrain, the length of the survey and, to some degree, the preferences of the company contracted for the survey. A common characteristic of most vehicles is a wheel or track configuration which distributes the weight of the vehicle over a relatively large, surface contact area. The reduced ground pressures aid in avoiding disturbances to surficial soils and vegetation on land areas, and enhance the safety of the vehicle's passage over sea ice.

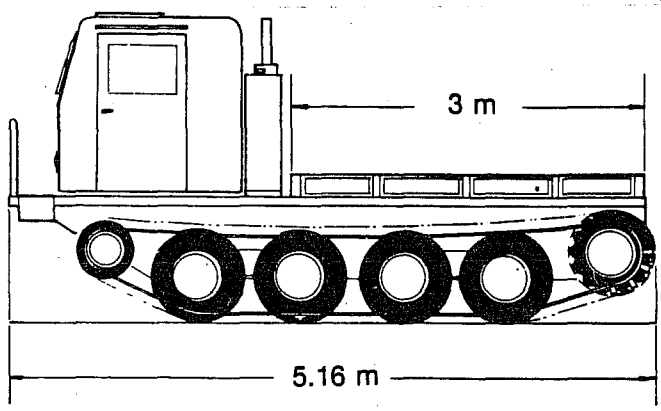
Early seismic parties utilized wheeled Kenworth or tracked Caterpillar tractor rigs as primary transporters of seismic equipment and crew support structures mounted on wheeled trailers or sledges. More recently, the Foremost FN60 and FN110 series of tracked vehicles (Figures 2 and 3) have come to be extensively used in a variety of roles including: geophysical equipment platforms, personnel transports, and chassis for mobile camp structures.

4.2.3 Energy sources and shot spacing

Two principal explosives are used depending on whether the seismic operation is on land or offshore. Geogel, a 60% nitroglycerine-based explosive, is employed for land shots in quantities ranging from 0.5 to 23.0 kg, depending on the charge hole depth and energy diffusion characteristics of geological formations surrounding the shot site. Charge sizes are increased in response to the increased charge hole depth or the decreased density (and hence greater diffusion of the explosive energy) of the surrounding material. Ice refraction studies carried out offshore generally use 40 grain Aquaflex, a linear energy source with an explosive equivalence of 0.008 kg of dynamite per metre of Aquaflex. At each shot site, a 7.5 m length of Aquaflex is suspended 15 m below the ice surface where the sea ice is less than 2.5 m thick or 20 m below where ice is more than 2.5 m thick (B. Singeltary, pers. comm., 1984).

Spacing of seismic shots on land ranges from four and 15 shots per metre depending on the charge size, hole depth, and surrounding formations. Fifteen shots per kilometre is the norm for offshore operations (J. Hunder, pers. comm. 1984; D. Siegfried, pers. comm., 1984).

Unlike offshore seismic operations in southern waters where the use of explosive energy sources is generally discouraged by the Department of Fisheries and Oceans (DFO), explosives are sanctioned for use in Sverdrup Basin offshore areas due to the relatively low densities of fish and mammalian

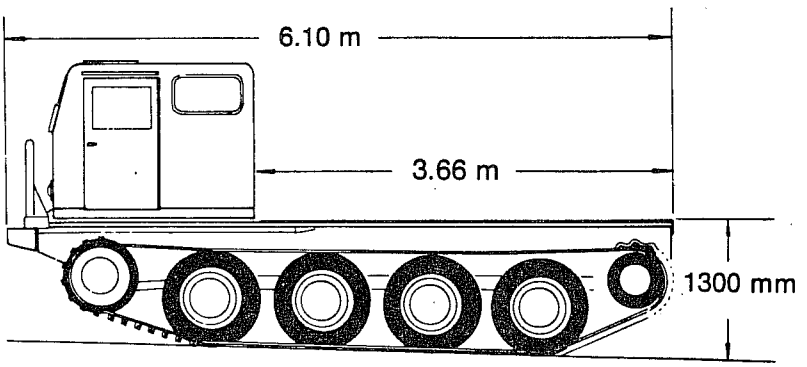


WEIGHTS		
Tare	10,500 lbs	4,770 kg
Payload	8,000 lbs	3,630 kg
G.V.W.	18,500 lbs	8,400 kg

GROUND PRESSURE*			
LOAD		PRESSURE	
Tons	Tonnes	PSI	kg/cm²
0	0	1.3	0.09
1.5	1.4	1.6	0.11
3.0	2.7	2.0	0.14
4.0	3.6	2.13	0.15

*6 in. (150 mm) penetration.

Figure 2. Foremost Nodwell FN60 Tracked Vehicle.
(Source: Canadian Foremost Ltd. portfolio, Calgary.)



WEIGHTS

Tare	21,500 lbs	9,760 kg
Payload	20,000 lbs	9,080 kg
G.V.W.	41,500 lbs	18,840 kg

GROUND PRESSURE*

LOAD		PRESSURE	
Tons	Tonnes	PSI	kg/cm²
0	0	1.9	.13
3	2.7	2.4	.17
6	5.4	2.9	.20
8	7.2	3.3	.23
10	9.1	3.6	.25

*6 in (150 mm) penetration

Figure 3. Foremost Nodwell FN110 Tracked Vehicle.
(Source: Canadian Foremost Ltd. portfolio, Calgary.)

species in the Region (D. Wright, pers. comm., 1984). The difficulty in placing or removing airguns through sea ice is another reason why explosives are preferred for offshore surveys (D. Siegfried, pers. comm., 1984). The only known uses of airguns in Sverdrup offshore areas were for the 1976 survey sponsored by Mobil Oil Limited in the vicinity of Cornwall Island (DIAND Land Use Permit file N151-B6) and a 1977 survey for the Polar Gas Project which investigated subsea geology between Bathurst and Little Cornwallis islands (EPS Land Use Application File NW1710). Again, since details were not available at the time of writing, the timing of the surveys suggest that the airguns were towed by a ship.

4.3 Exploration activities, 1974 to 1984

4.3.1 Operator sponsorship of seismic surveys

Forty-five geophysical survey programs were carried out in the Sverdrup Basin between 1974 and June 1984, 40 of these being sponsored by petroleum operators. Panarctic Oils Limited was most active with 32 programs carried out under its sponsorship. Five other petroleum operators sponsored a further seven programs between 1974 and 1977. One program each was carried out by the Geological Survey of Canada (1974) and the Polar Gas Project (1977). Four programs' sponsorship could not be determined from information available at the time of this compilation (Figure 4). Panarctic's geophysical exploration activities were most intense in 1974, when 11 of its 32 programs were carried out. In 1974 and 1975, the number of Panarctic programs declined, remaining relatively constant to 1983, with an average of two programs per calendar year. One program was carried out by Panarctic to June 1984.

Panarctic's sponsorship of seismic surveys overshadows the limited involvement of the other five oil companies in seismic explorations. Mobil Oil Canada Limited was the second most active sponsor in the Sverdrup Region (three programs) while Elf Oil Explorations Limited, Great Plains Oil and Gas Limited, Imperial Oil Limited, and Sun Oil Company Limited each sponsored a single seismic program. Of these five companies, only Mobil carried out more than one program in a single year. All programs of these five companies were completed prior to 1978. Panarctic has continued as the sole sponsor of seismic exploration from 1978 to the present.

Panarctic's surveys have concentrated in the central Sverdrup Basin. Specifically, seismic surveys focused on six areas: Melville Island (Sabine Peninsula), Cameron Island, Lougheed Island (including offshore areas to the west, Hazen Strait (east of Mackenzie King Island), Maclean Strait, and the Prince Gustaf Adolf Sea (northwest of Lougheed Island). Less intensive seismic exploration by Panarctic occurred on Bathurst, Byam Martin and Alexander islands, Emerald Isle, Hecla and Griper Bay on Melville Island, and Hazen Strait south of Mackenzie King Island.

In contrast to Panarctic's widespread programs throughout the central Basin, the seven programs of oil companies other than Panarctic were geographically restricted. Six surveys sponsored by Imperial, Great Plains Oil and Gas, and Elf were confined to the land masses and nearshore areas of Cornwall, Bathurst and Prince Patrick islands. An exception was Sun Oil's more extensive program designed, not for profiling subsea geology but, for determining late winter sea ice thicknesses in the Arctic Islands (APOA, 1977). Under the umbrella of Sun Oil sponsorship, seven distinct sub-surveys

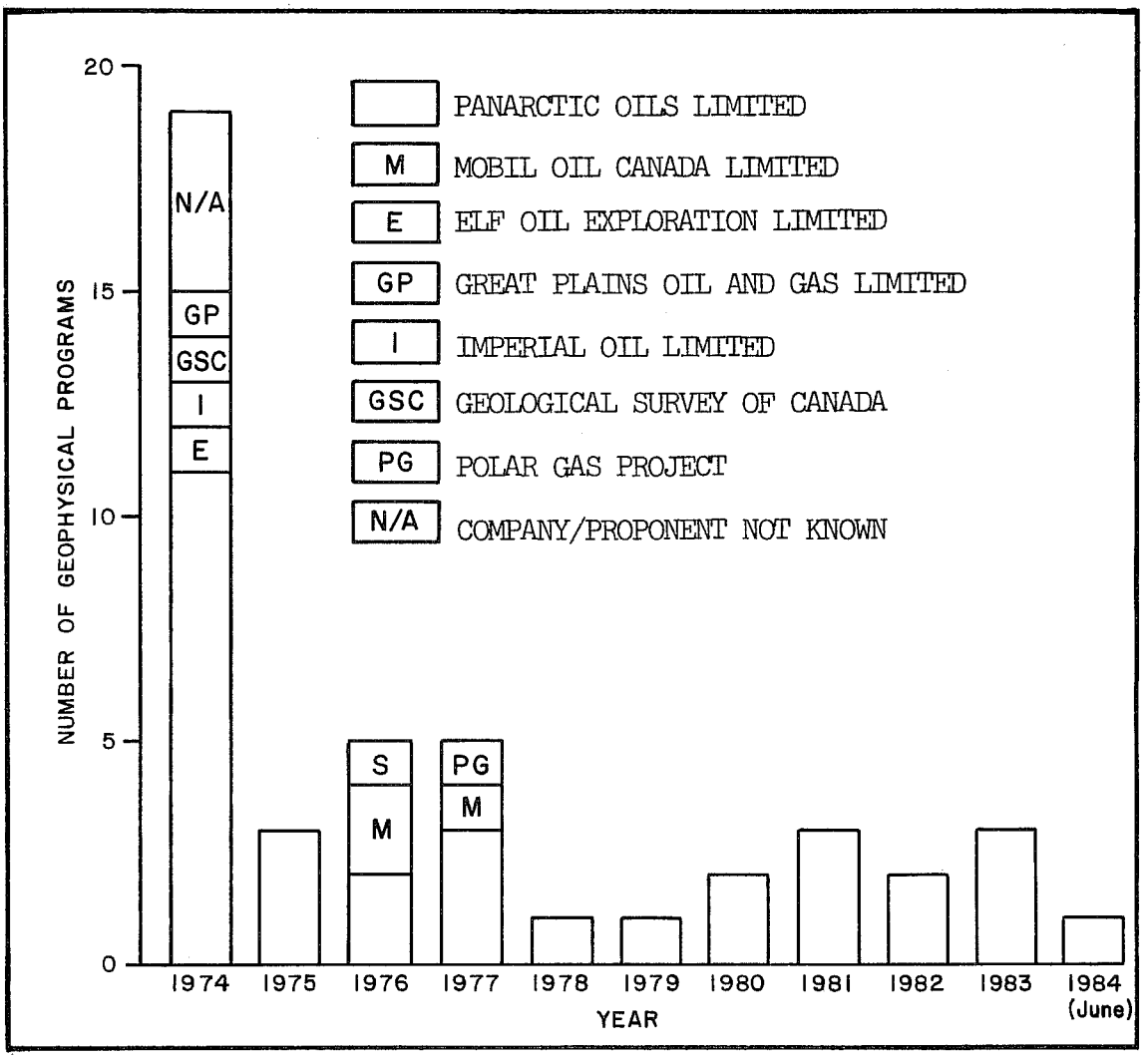


Figure 4. Geophysical Programs Carried Out by Companies/Proponents, 1974 to 1984.

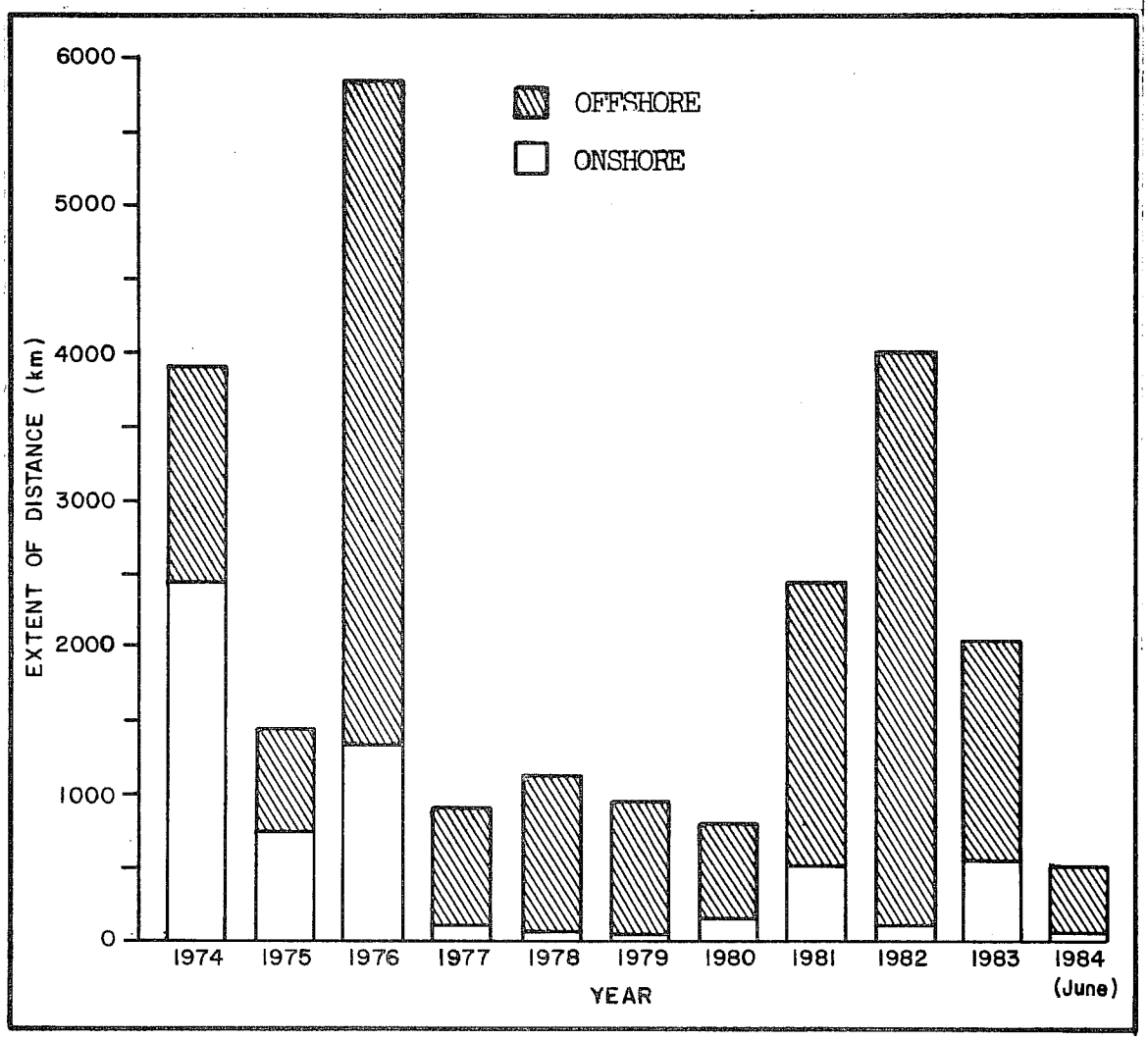
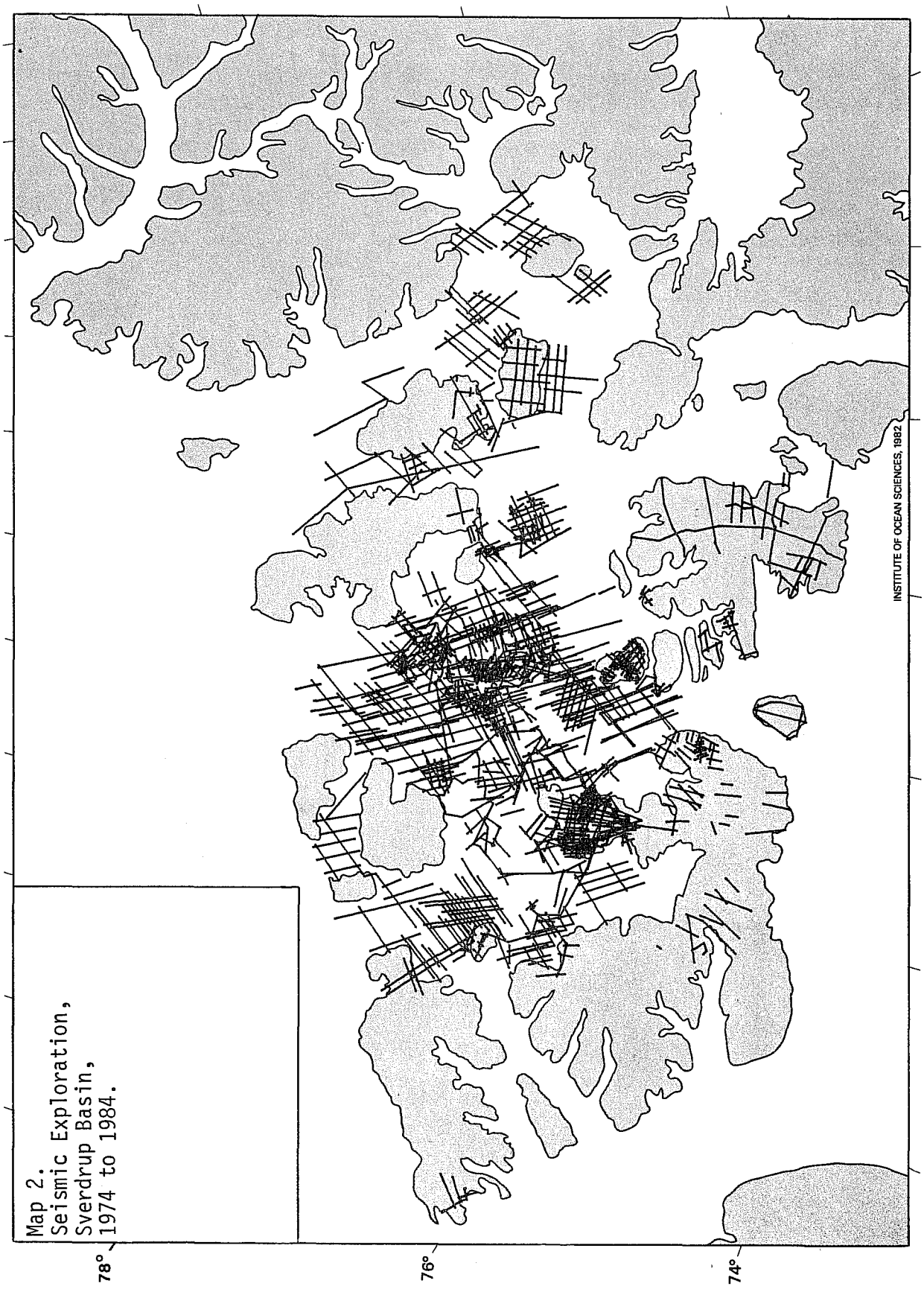


Figure 5. Total Kilometres of Onshore and Offshore Seismic Surveys, 1974 to 1984.



Map 2.
Seismic Exploration,
Sverdrup Basin,
1974 to 1984.

were shot in Massey and Hassel sounds, Byam Martin Channel, Prince Gustaf Adolf Sea, and Maclean, Wilkins and Ballantyne straits.

The seismic program of the Geological Survey of Canada in 1974 was the last in a three-year effort to determine the basic geological "architecture" of the Sverdrup Basin (Hobson, 1975). Located to the east of Amund Ringnes Island, it was intended to provide data for a north-south profile of the Basin. Another modest seismic survey under the auspices of the Polar Gas Project in Crozier Strait and between Bathurst and Little Cornwallis islands, was not related to oil and gas exploration, but was intended to determine subsea geology in the vicinity of proposed gas pipeline crossings.

4.3.2 Onshore and offshore seismic survey comparisons

Prior to 1974, technical limitations of existing offshore drilling rig equipment restricted drilling operations to onshore areas in the Sverdrup Basin Region. Consequently, industry-sponsored surveys tended to be confined to island land masses, although some very nearshore profiles were recorded to determine the seaward extent of geological formations observed during nearby onshore seismic and drilling operations. However, in 1974, the successful use of an artificial ice platform to support Panarctic's Hecla N-52 offshore well demonstrated the viability of offshore drilling in the Sverdrup Basin and, concomittantly, the necessity for more extensive, offshore geophysical exploration. Since then, the focus of seismic exploration has shifted away from onshore areas and toward offshore regions.

This offshore shift did not occur immediately after the successful test of the Hecla N-52 ice platform. Total kilometres of onshore and offshore seismic transects (Figure 5) indicate that the coverage of offshore areas was substantially lower than onshore areas in 1974, became roughly equal to onshore coverage in 1975, and was substantially greater than onshore coverage in 1976. The 1976 offshore total is somewhat misleading since the majority of that total (3,464 km) was shot by Sun Oil Company's survey for determining ice thickness. Given that this program is not directly comparable with surveys for the purposes of exploration drilling, subtraction of the Sun program total shows that offshore coverage is again less than onshore coverage in 1976.

From 1977 to June 1984, however, annual offshore coverage was three to 34 times greater than annual onshore coverage. The greatest annual offshore total (3,895 km) during this period was recorded in 1982, when Panarctic sponsored extensive investigations of the Norwegian Bay area, Hazen, Ballantyne and Maclean straits, and the southern portion of the Prince Gustaf Adolf Sea. In contrast, the greatest annual onshore total was only 565 km during Panarctic's 1983 surveys of Sabine Peninsula, Melville Island, and Lougheed Island.

4.3.3 Areal and chronological distribution of surveys

4.3.3.1 Seismic activities, 1974 to 1981

Between 1974 and 1981, 39 geophysical exploration programs were carried out in the Sverdrup Basin, all but one program sponsored by the oil and gas industry (excluding four programs whose sponsors could not be identified at the time of search). Seismic programs between 1974 and 1976 tended to concentrate on land and near shore at Melville (particularly on or near Sabine

Peninsula), Cameron, Bathurst and Byam Martin islands. Less intense land surveys were conducted on Lougheed, Cornwall, Prince Patrick, and Alexander islands, Isle Vanier, and Emerald Isle. Although some surveys included offshore transects, the majority were not devoted entirely to offshore exploration. The offshore exceptions included: surveys off the coasts of Ellef Ringnes Island (1974), Melville Island (1974), King Christian Island (1974), and Cornwall Island (1976), and an extensive 1976 survey of Massey and Hassel sounds, Maclean, Wilkins and Ballantyne straits, Prince Gustaf Adolf Sea, and Byam Martin Channel.

Later, between 1977 and 1981, the overall level of seismic exploration in terms of total kilometres shot declined, but shifted the survey focus from onshore to offshore regions. Seismic survey coverage centred on Maclean and Hazen straits, southern Prince Gustaf Adolf Sea, and the offshore areas to the west of Lougheed Island and to the east of Mackenzie King Island. Less intense survey activity occurred in Desbarats Strait and the offshore area south of Meteorologist Peninsula on Ellef Ringnes Island. Onshore programs extended or refined surveys of the previous three-year period on Bathurst, Melville and Cameron islands.

4.3.3.2 Seismic activities, 1982 to 1984

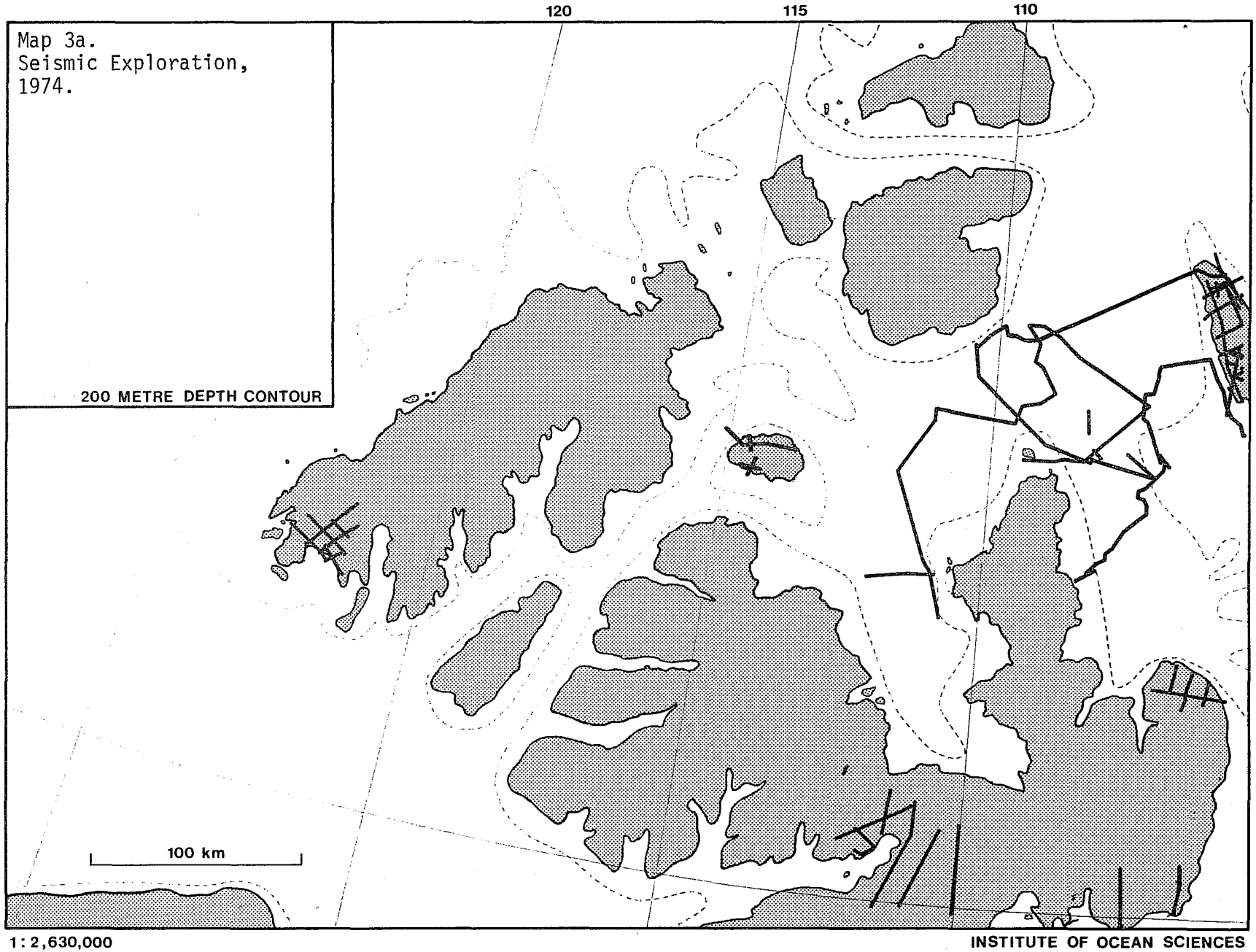
Between January 1982 and June 1984, Panarctic Oils sponsored six seismic programs in Hazen, Maclean and Ballantyne straits, in Prince Gustaf Adolf Sea, on Lougheed Island, and on Sabine Peninsula. Table 1 outlines seismic surveys undertaken during this period.

4.3.4 Projected seismic exploration

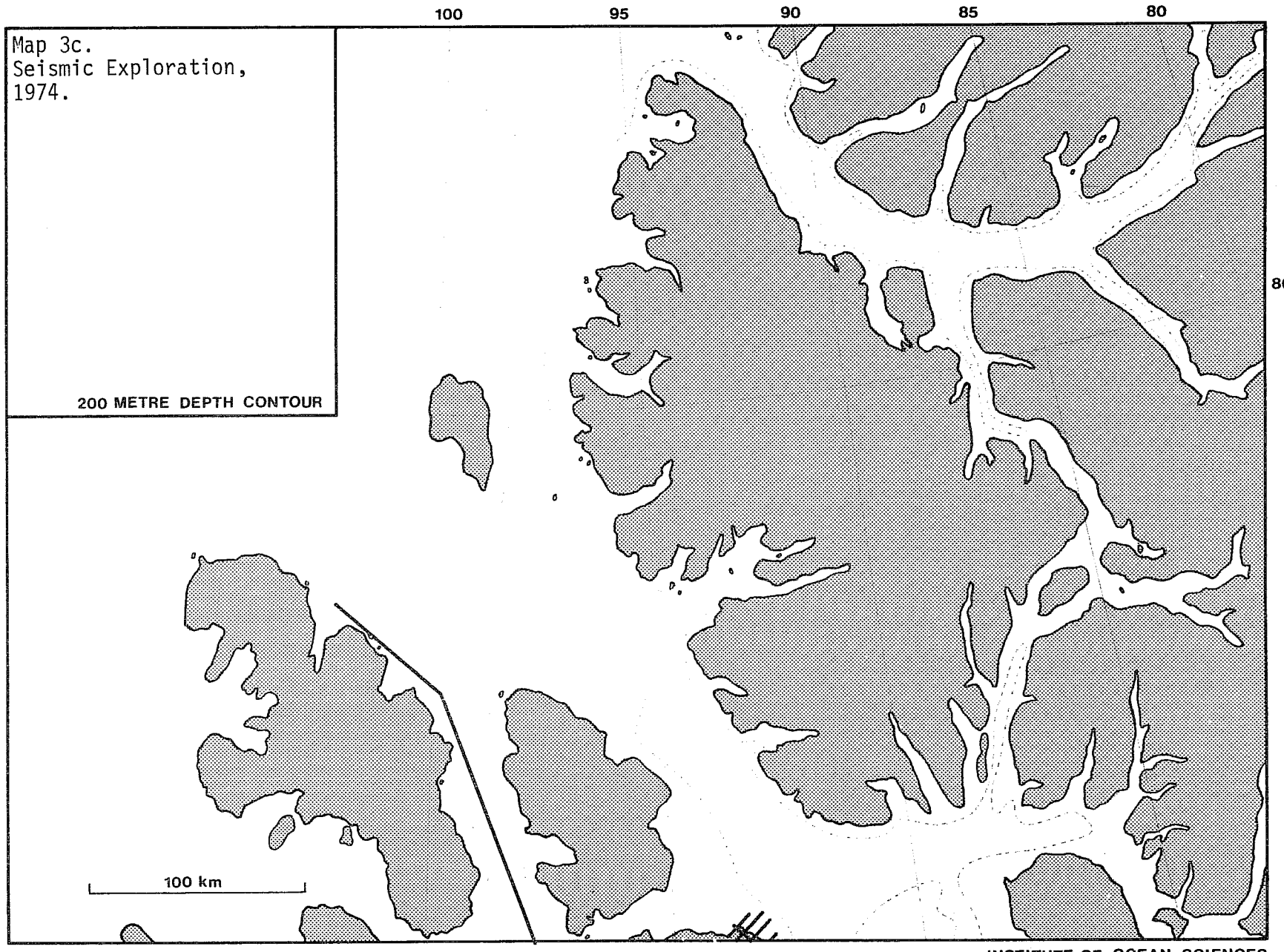
During the next two years (1985 and 1986), seismic survey operations will focus on the offshore areas adjacent to Lougheed Island (L. Franklin, pers. comm., 1985). Detailed surveys will very likely be carried out in the Maclean Strait Region, particularly, in the vicinity of the oil and gas discoveries at Panarctic's Skate B-80, Skate C-59, and Maclean I-72 wellsites. Seismic surveys may also examine the area surrounding Panarctic's gas discovery north of the Skate field at the Sculpin K-08 wellsite. Although the region off the west shore of Lougheed Island has already been extensively surveyed, additional localized surveys may be undertaken to aid in the delineation of the oil and gas reserves at the Cisco field.

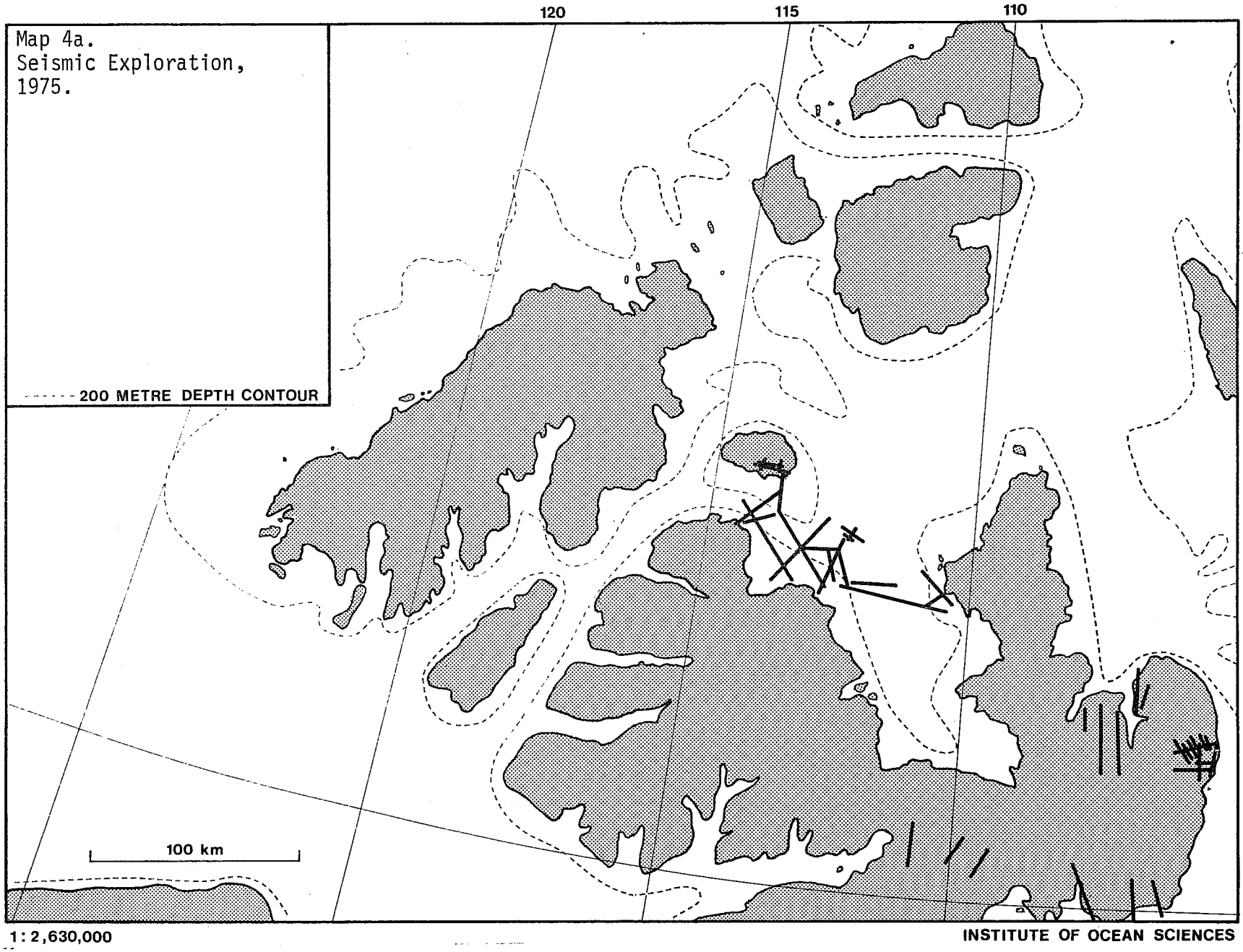
Table 1. Seismic Surveys Undertaken, 1982 to 1984.

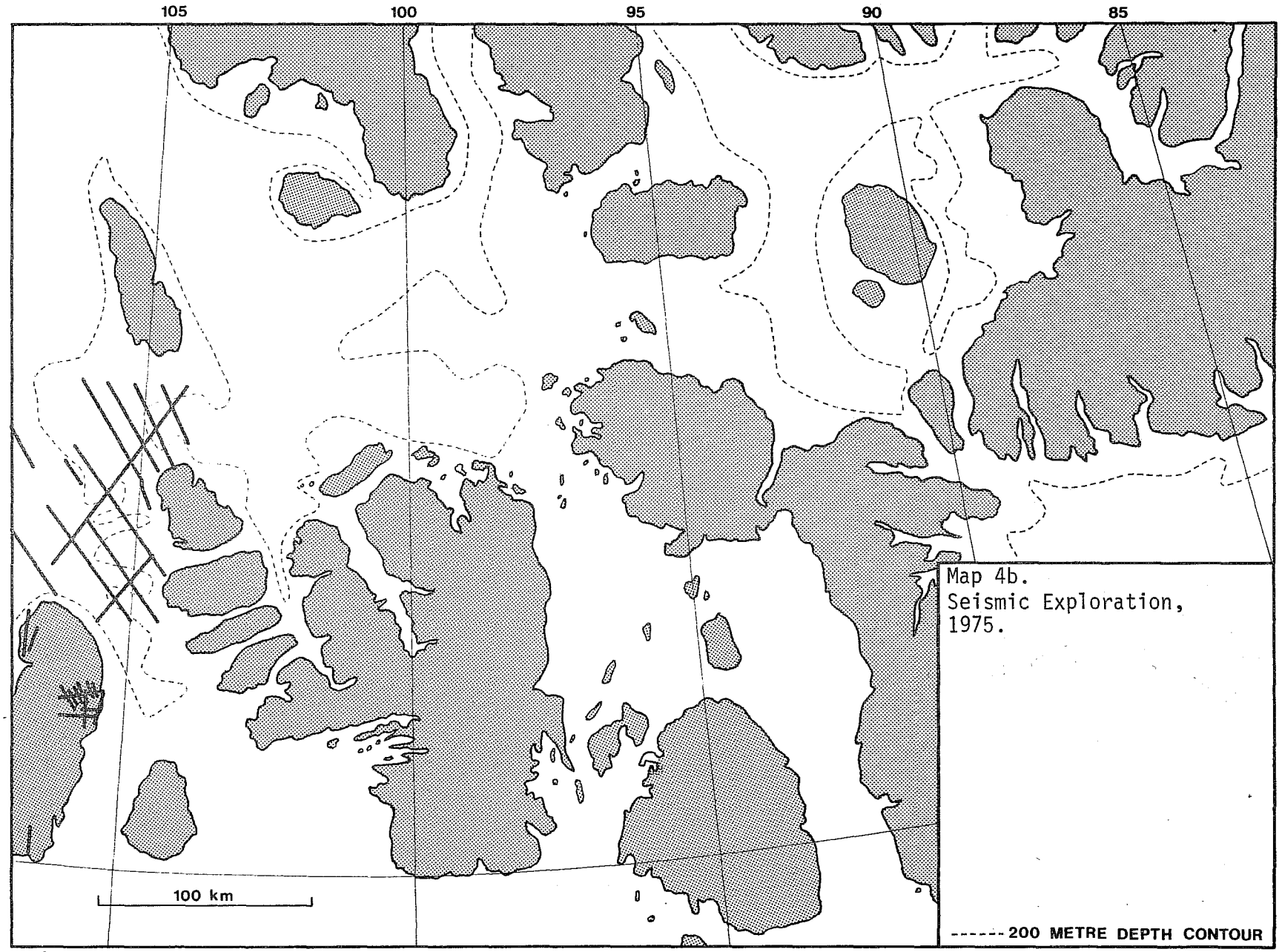
PERMIT NO.	SURVEY AREA	SURVEY PERIOD	ONSHORE ACCESS ROUTES (KM)	KMS. SHOT ONSHORE	KMS. SHOT OFFSHORE
EPS LU APPLICATION FILE NW9436	NORWEGIAN BAY, GRAHAM AND BUCKINGHAM ISLANDS	SPRING, 1982	66	60	830
DIAND LU PERMIT N81B645	HAZEN, MACLEAN AND BALLANTYNE STRAITS, PRINCE GUSTAF ADOLF SEA, NE LOUGHEED ISLAND	SPRING, 1982	85	53	3,066
DIAND LU PERMIT N83B848	MELVILLE ISLAND	SPRING, 1983	27	55	1,505
DIAND LU PERMIT N83B911	LOUGHEED ISLAND	SPRING, 1983	0	191	8
DIAND LU PERMIT N83B964	MELVILLE ISLAND	FALL, 1983	35	323	0
DIAND LU PERMIT N83B055	LOUGHEED ISLAND	SPRING, 1984	0	80	439

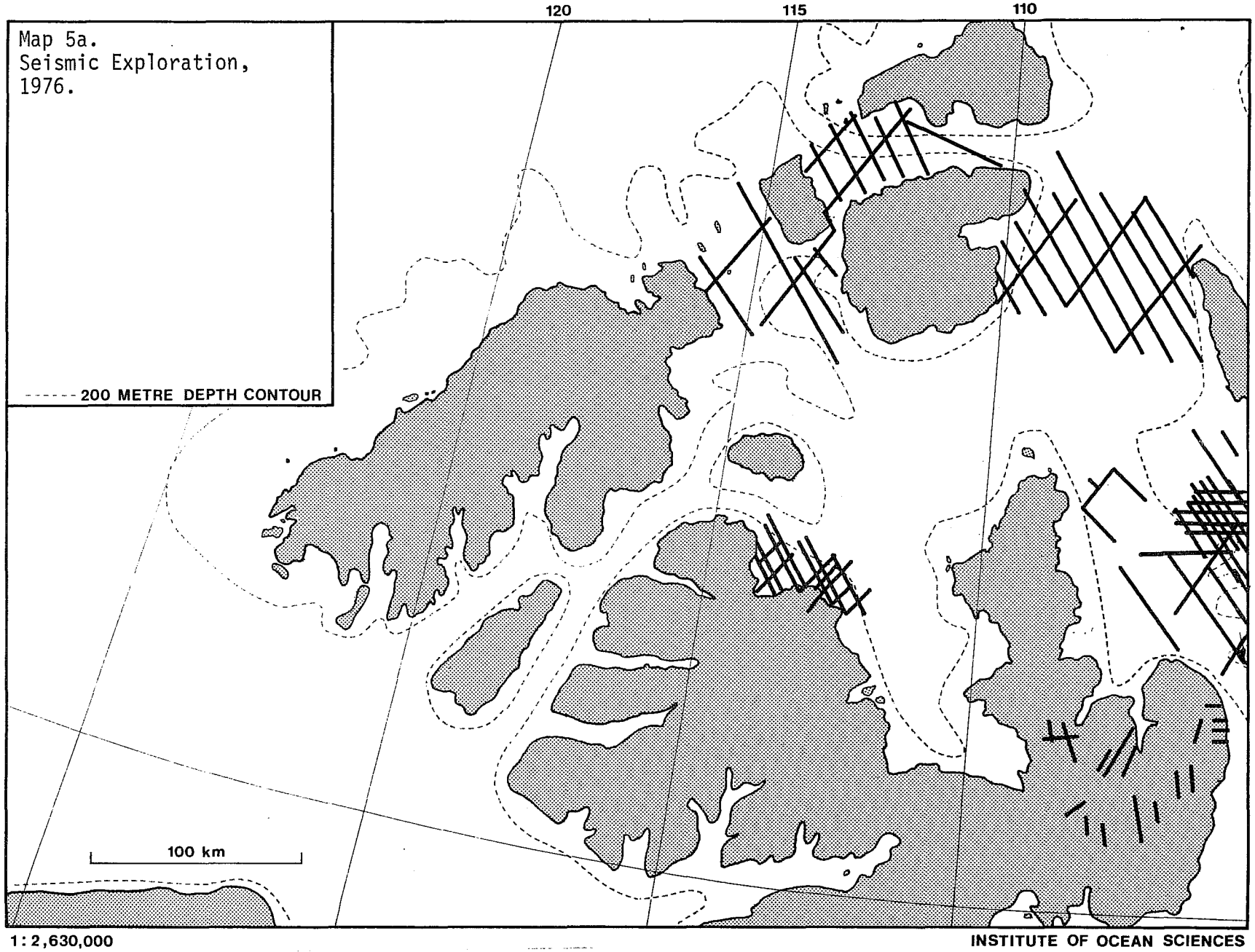

120
115
110
Map 3a.
Seismic Exploration,
1974.
200 METRE DEPTH CONTOUR
100 km
1:2,630,000
INSTITUTE OF OCEAN SCIENCES

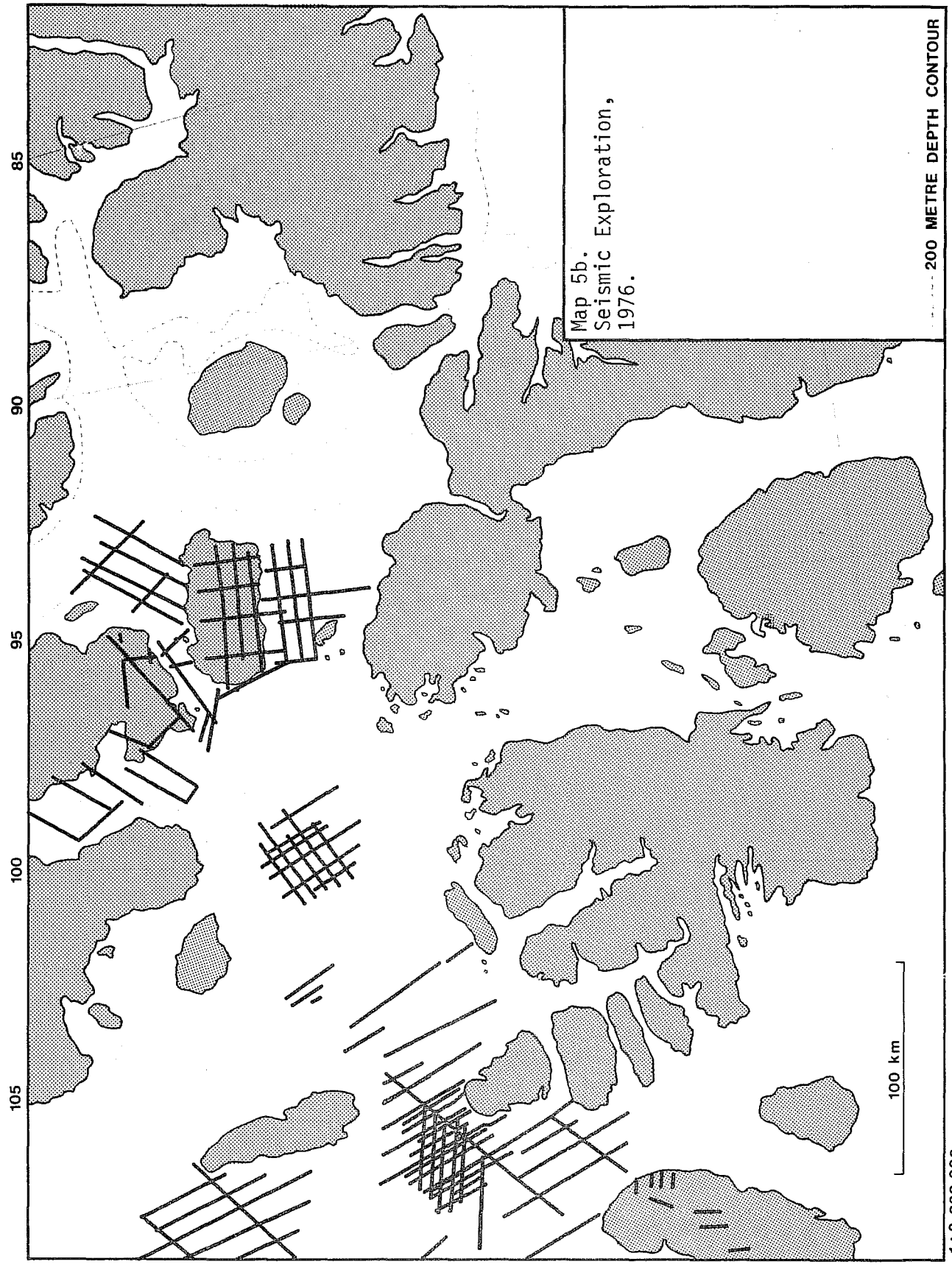

105
100
95
90
85
100 km
1:2,630,000
Map 3b.
Seismic Exploration,
1974.
------200 METRE DEPTH CONTOUR
INSTITUTE OF OCEAN SCIENCES

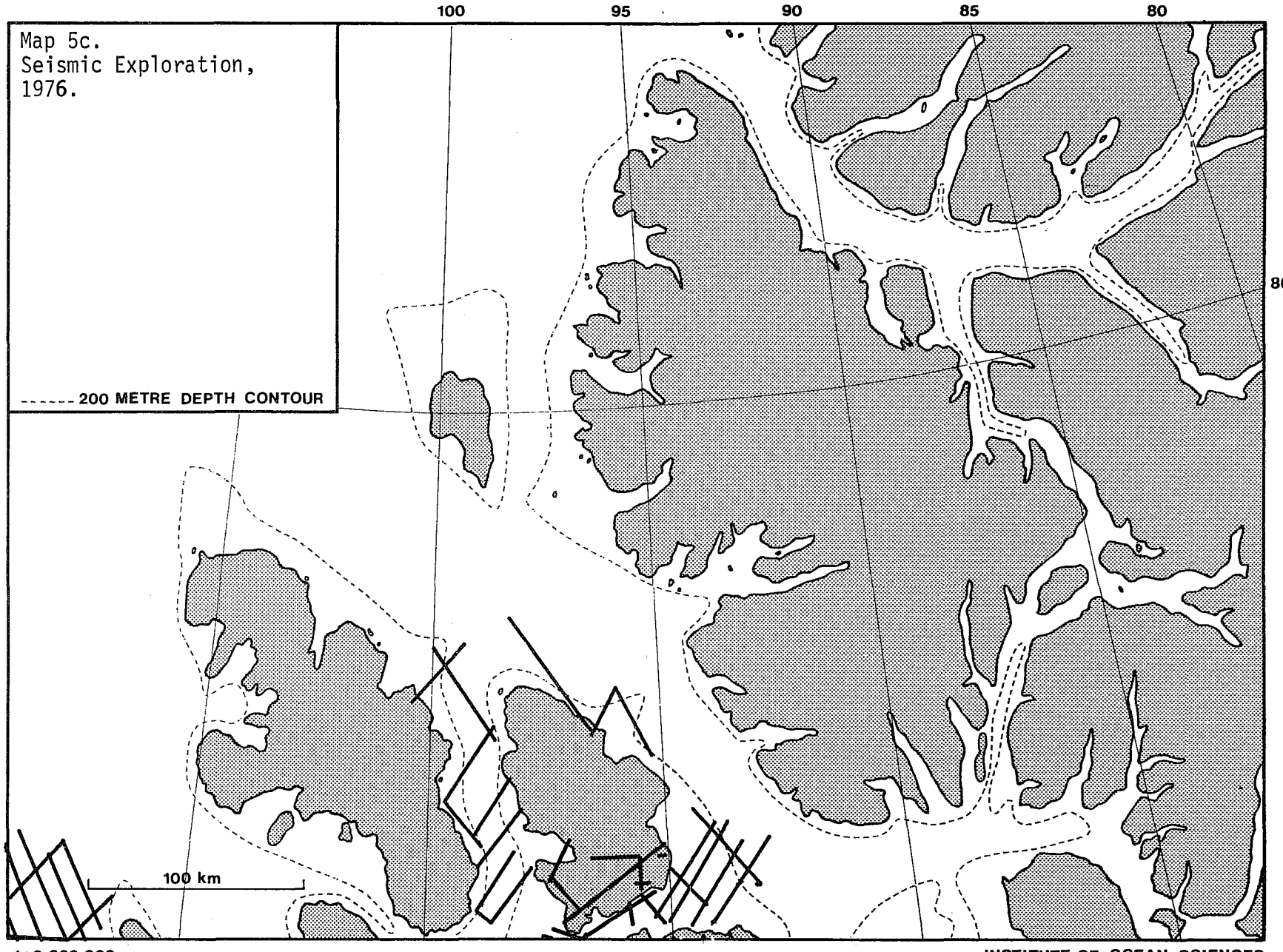

100
95
90
85
80
80
Map 3c.
Seismic Exploration,
1974.
200 METRE DEPTH CONTOUR
100 km
1:2,630,000
INSTITUTE OF OCEAN SCIENCES

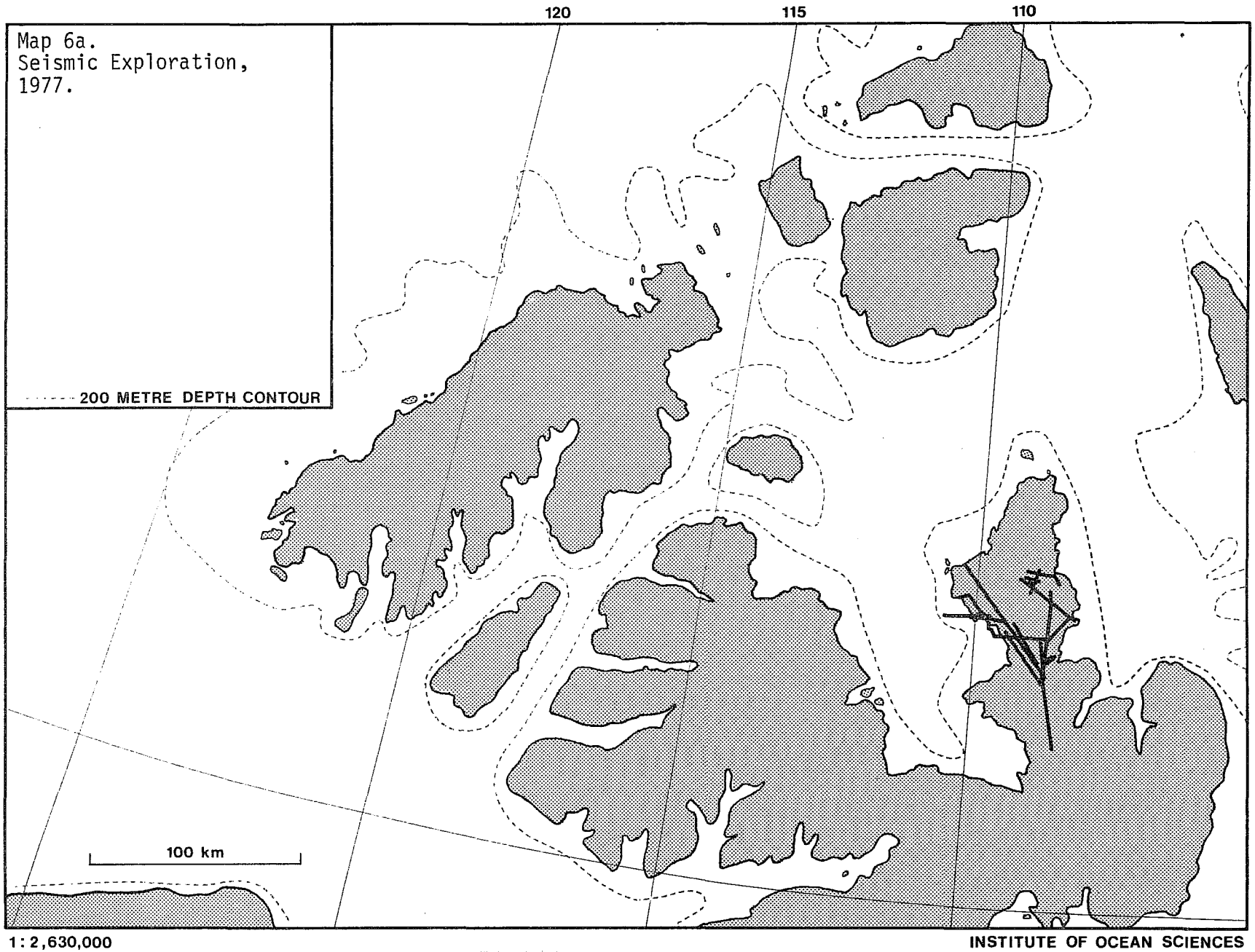

120
115
110
Map 4a.
Seismic Exploration,
1975.
200 METRE DEPTH CONTOUR
100 km
1: 2,630,000
INSTITUTE OF OCEAN SCIENCES


105
100
95
90
85
100 km
1 : 2,630,000
Map 4b.
Seismic Exploration,
1975.
------ 200 METRE DEPTH CONTOUR
INSTITUTE OF OCEAN SCIENCES


120
115
110
Map 5a.
Seismic Exploration,
1976.
200 METRE DEPTH CONTOUR
100 km
1:2,630,000
INSTITUTE OF OCEAN SCIENCES


85
90
95
100
105
Map 5b.
Seismic Exploration,
1976.
200 METRE DEPTH CONTOUR
INSTITUTE OF OCEAN SCIENCES
100 km
1:2,630,000


Map 5c.
Seismic Exploration,
1976.
200 METRE DEPTH CONTOUR
100
95
90
85
80
80
100 km
1:2,630,000
INSTITUTE OF OCEAN SCIENCES


Map 6a.
Seismic Exploration,
1977.
200 METRE DEPTH CONTOUR
120
115
110
100 km
1 : 2,630,000
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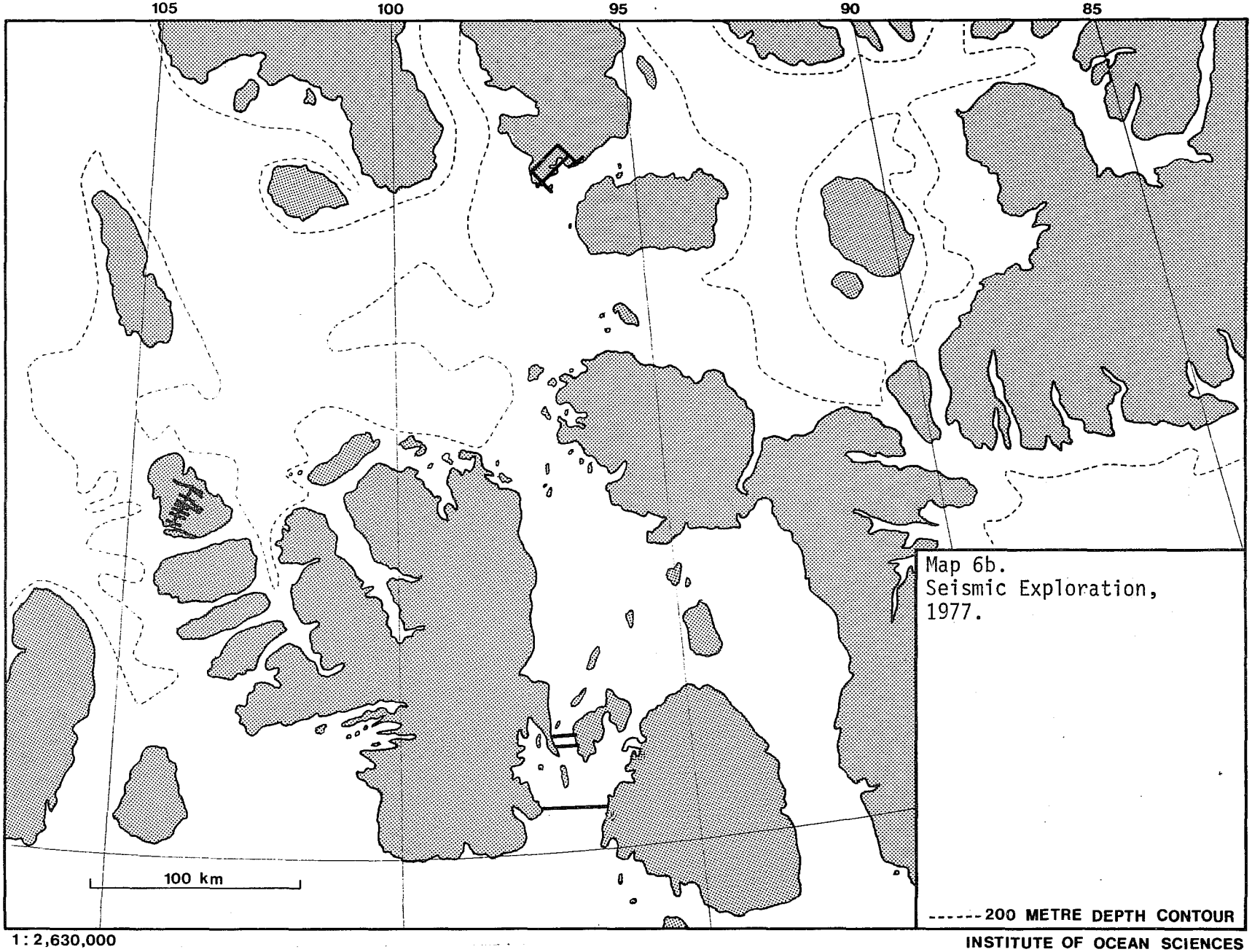

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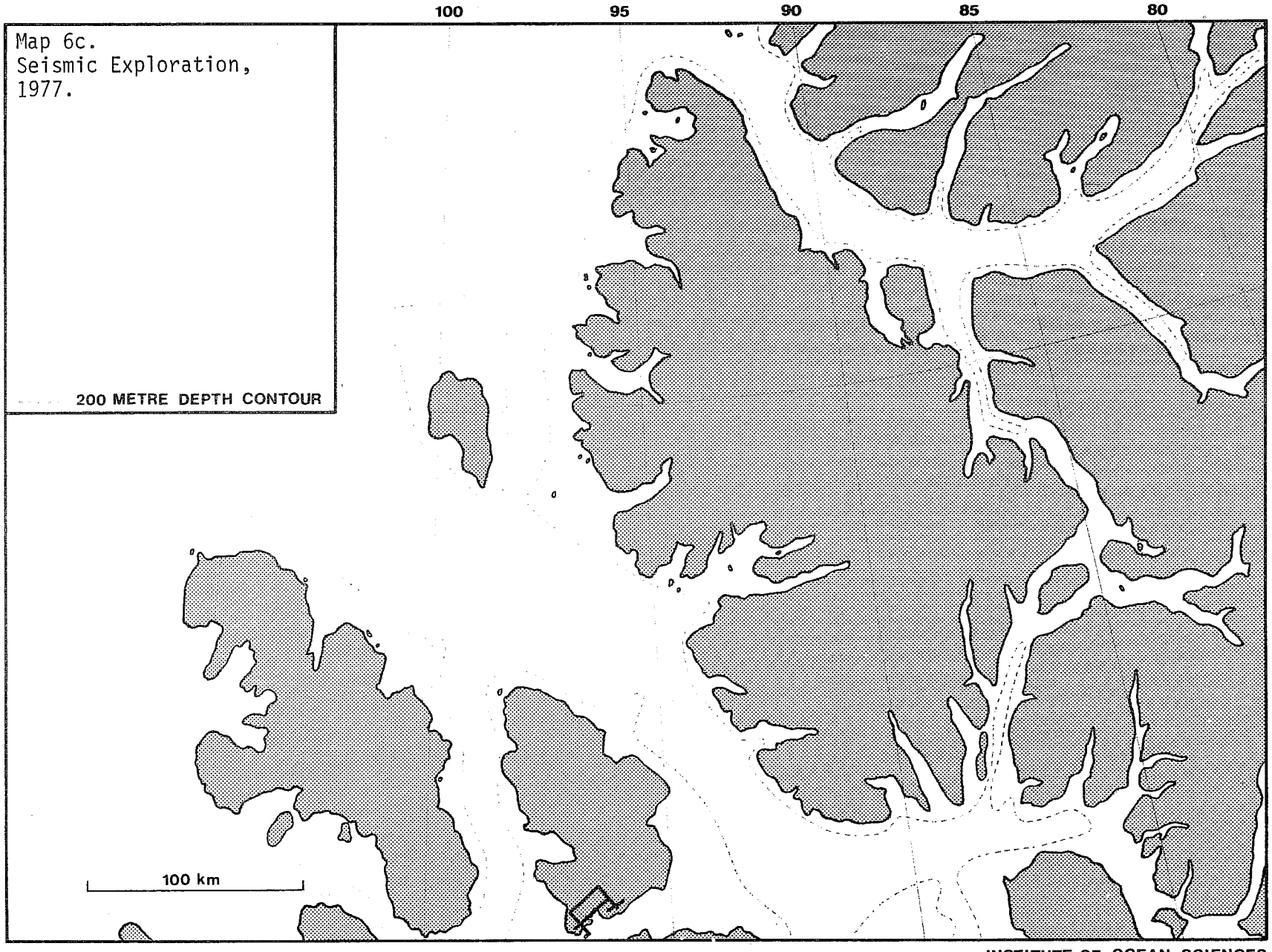

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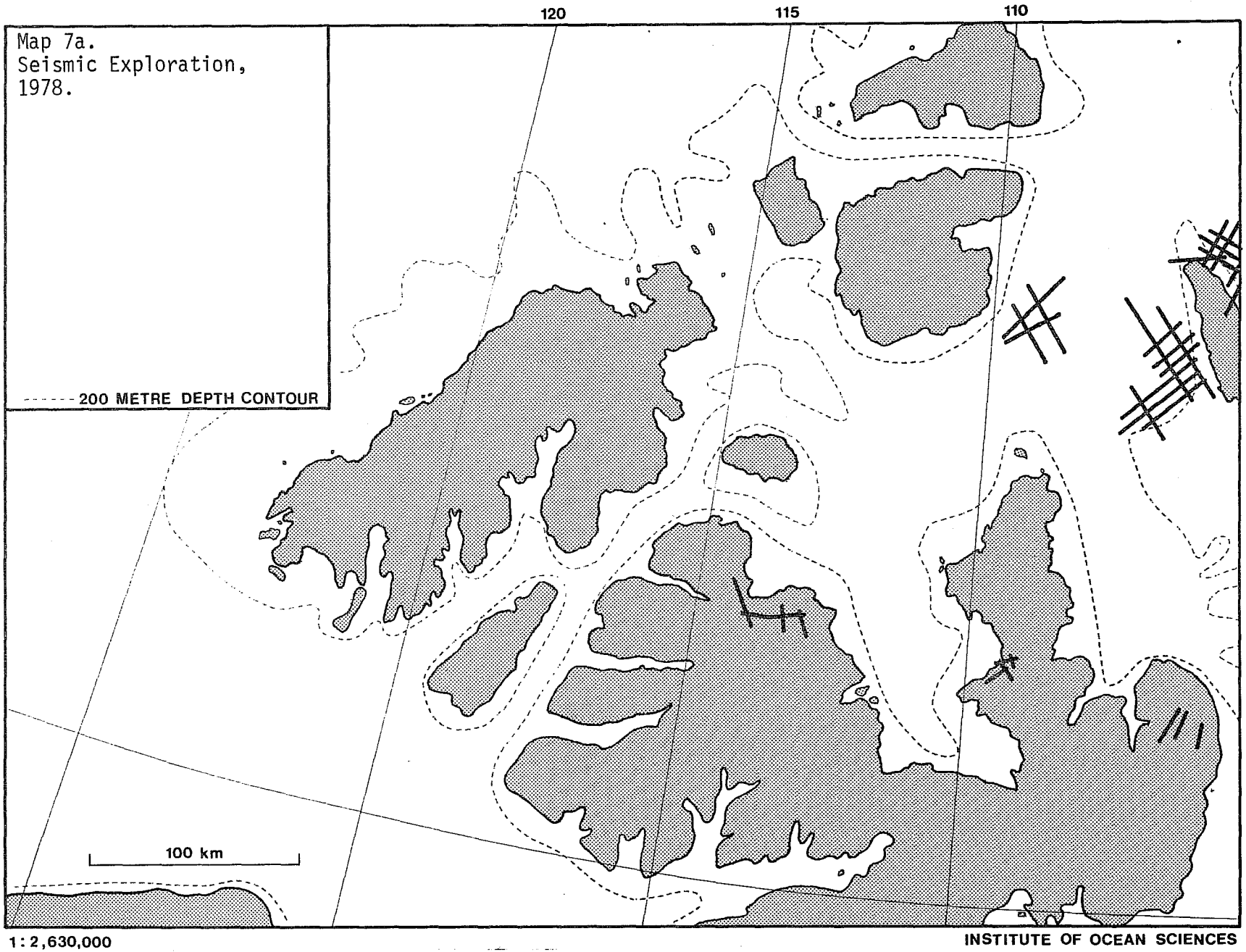
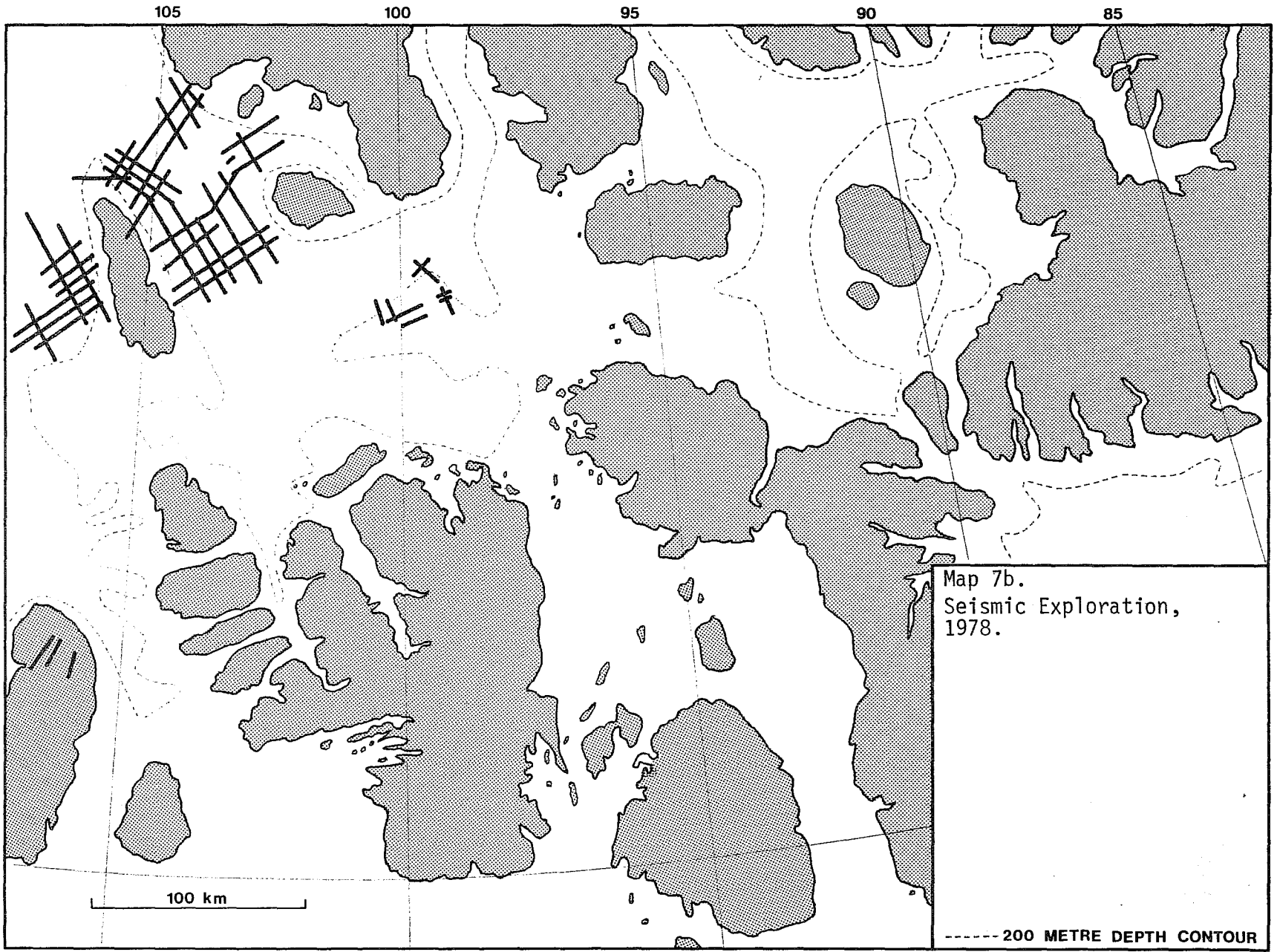
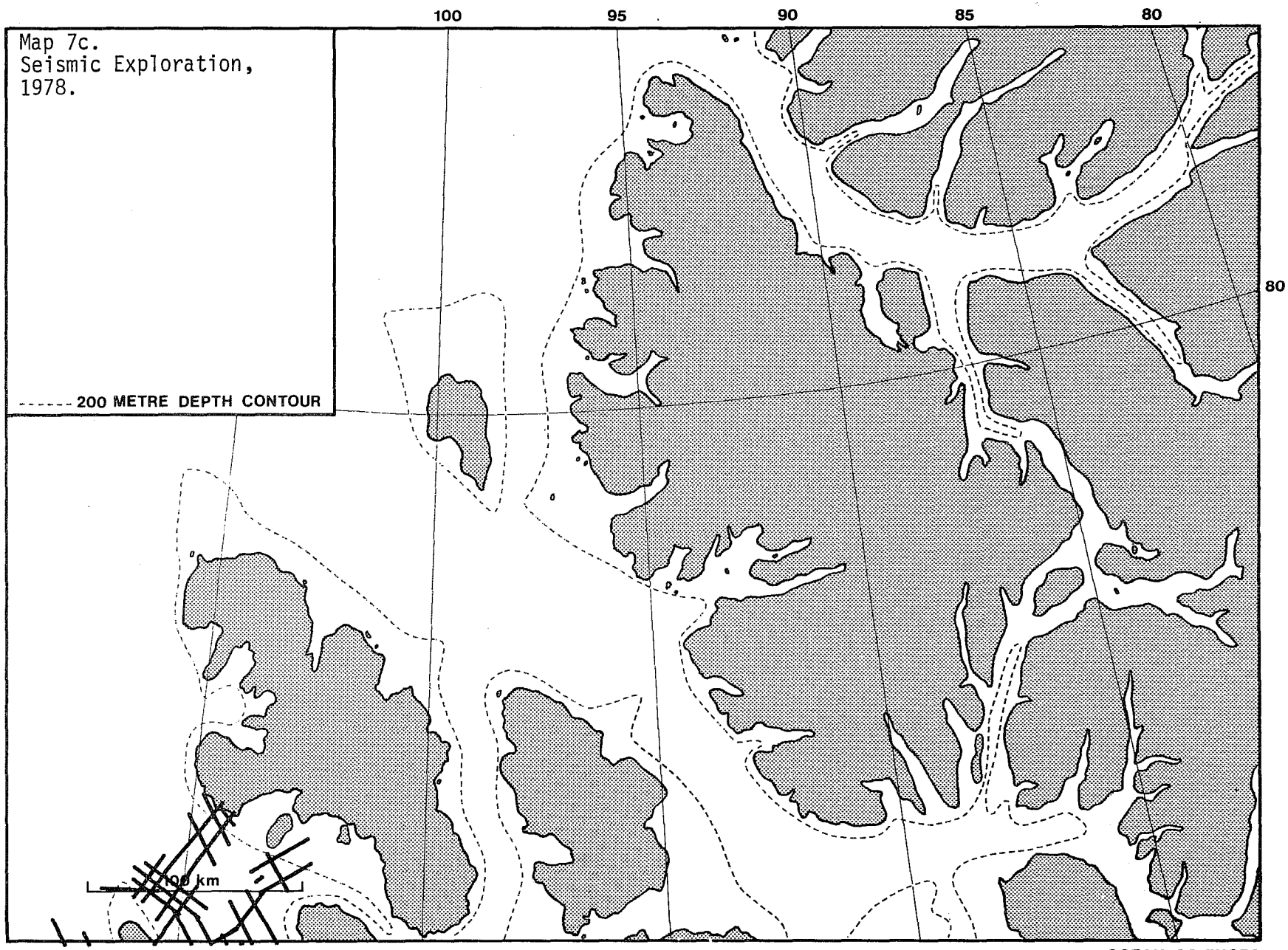
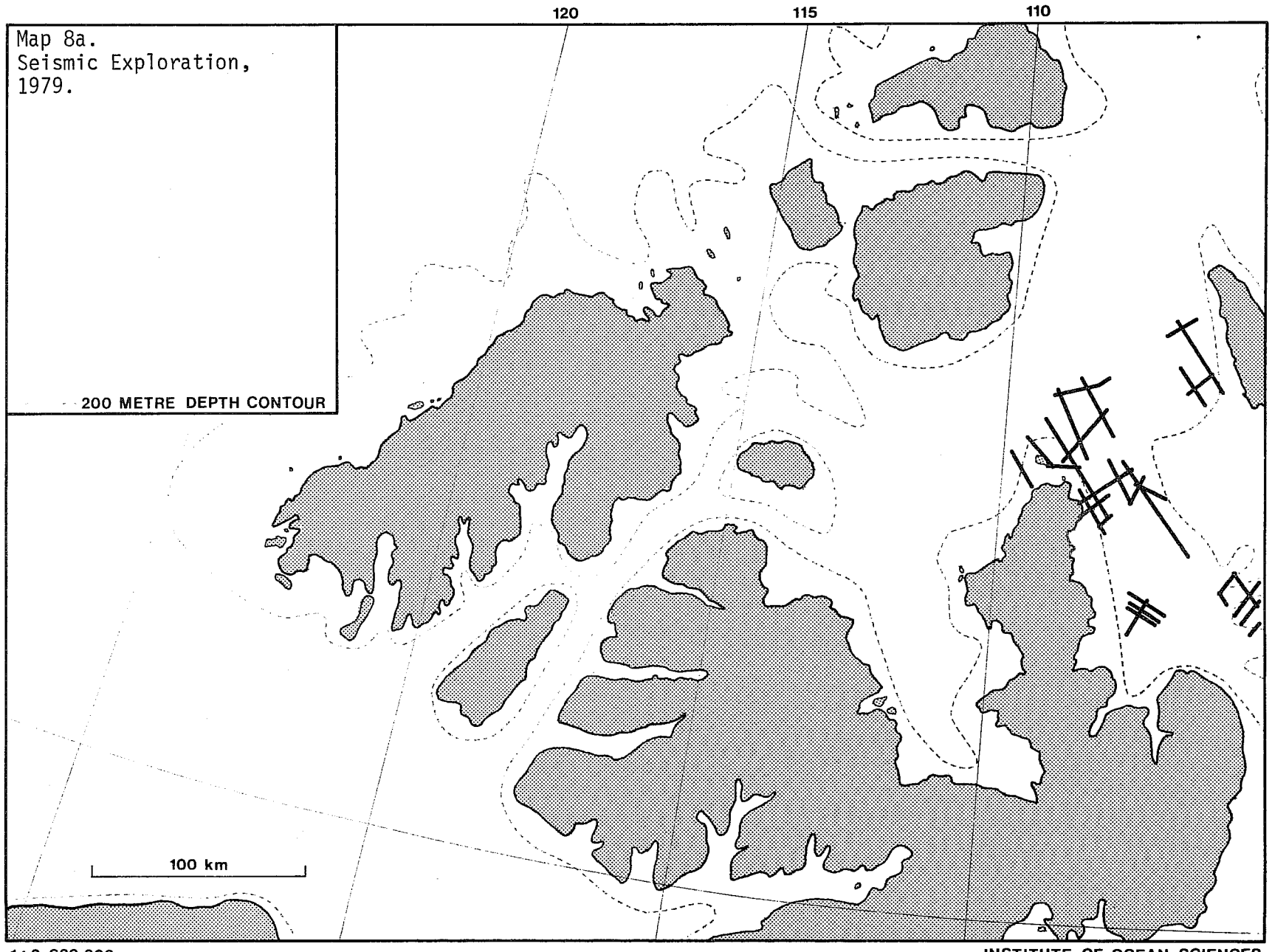
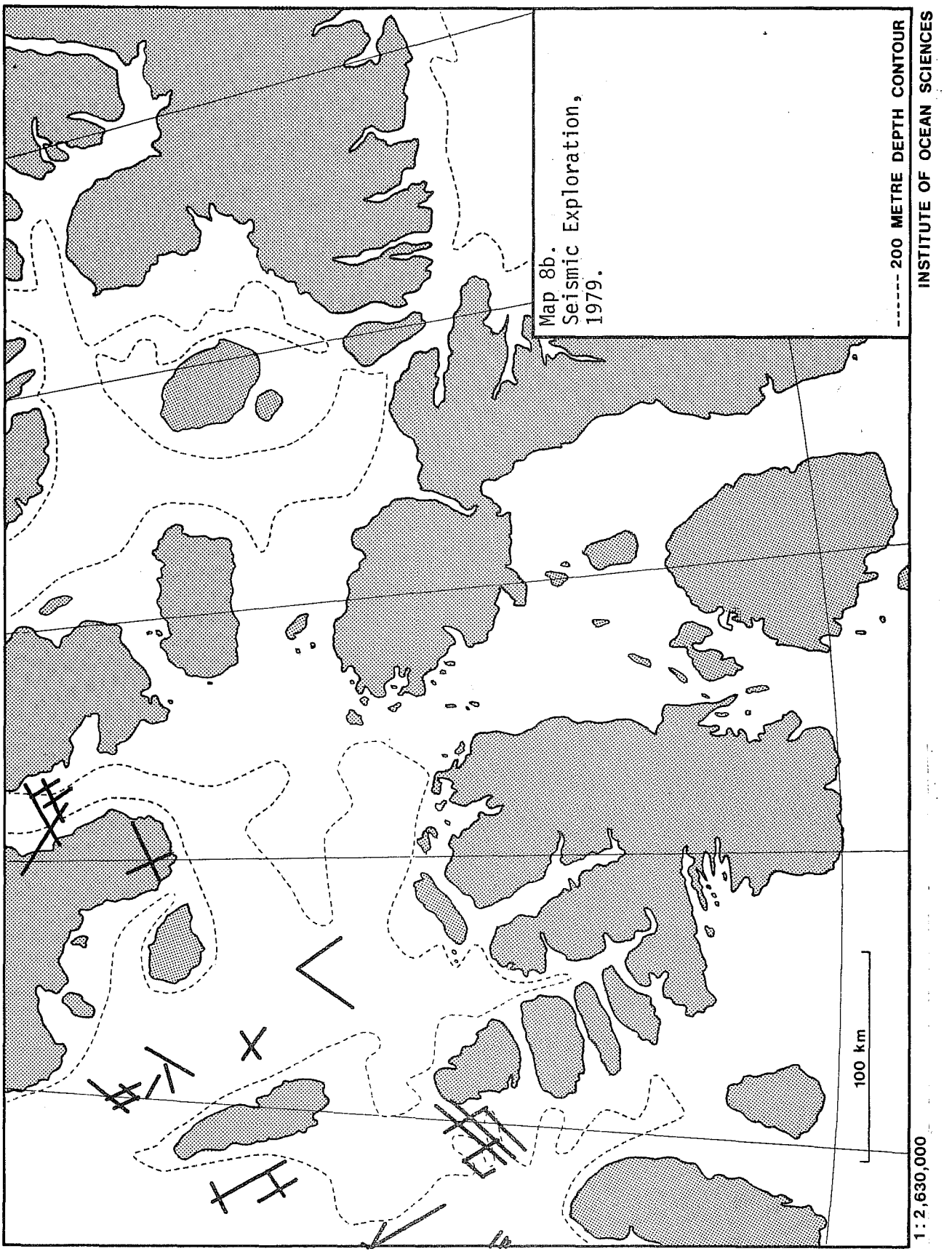
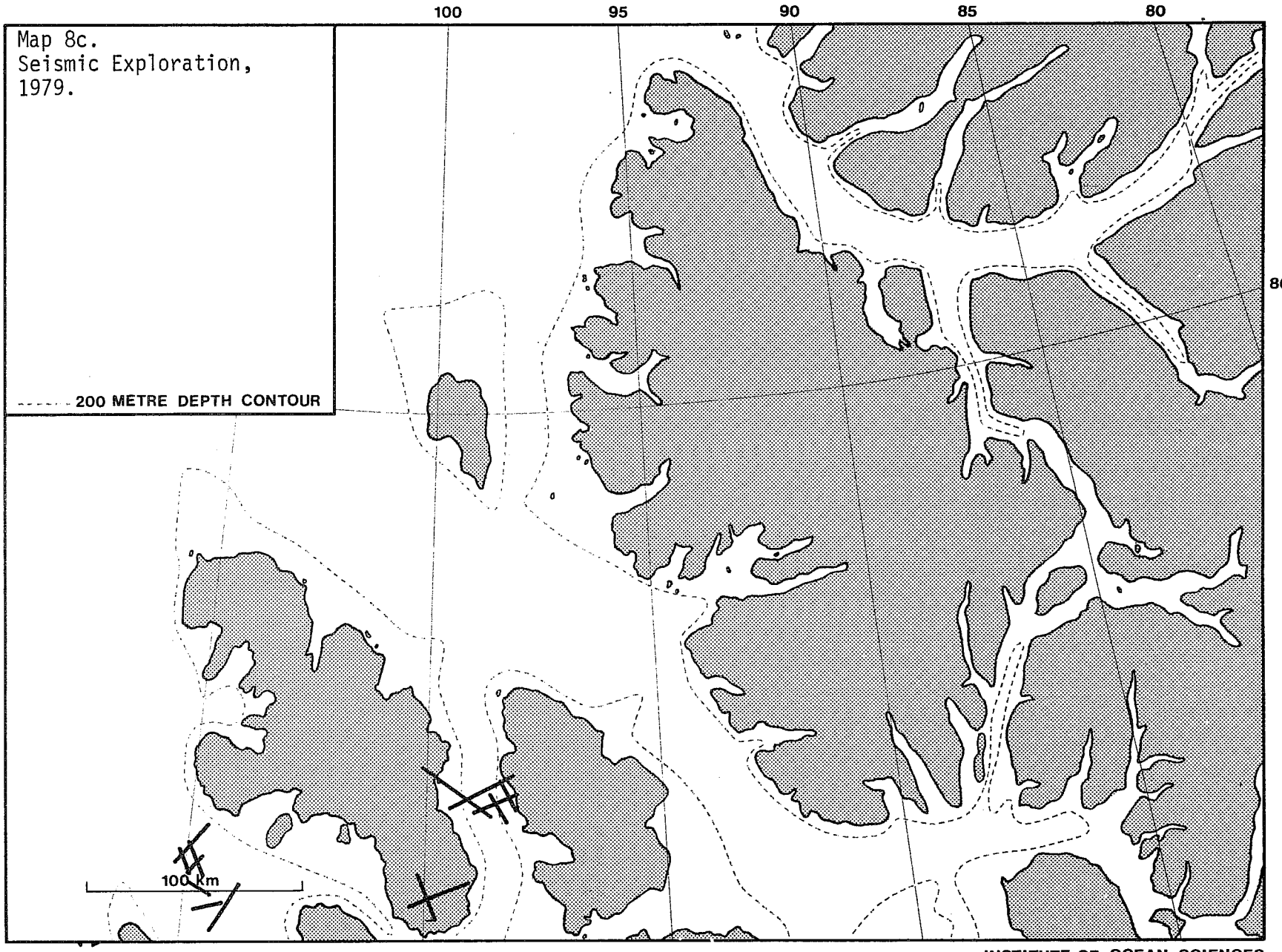

Map 7a.
Seismic Exploration,
1978.
200 METRE DEPTH CONTOUR
120
115
110
100 km
1:2,630,000
INSTITUTE OF OCEAN SCIENCES

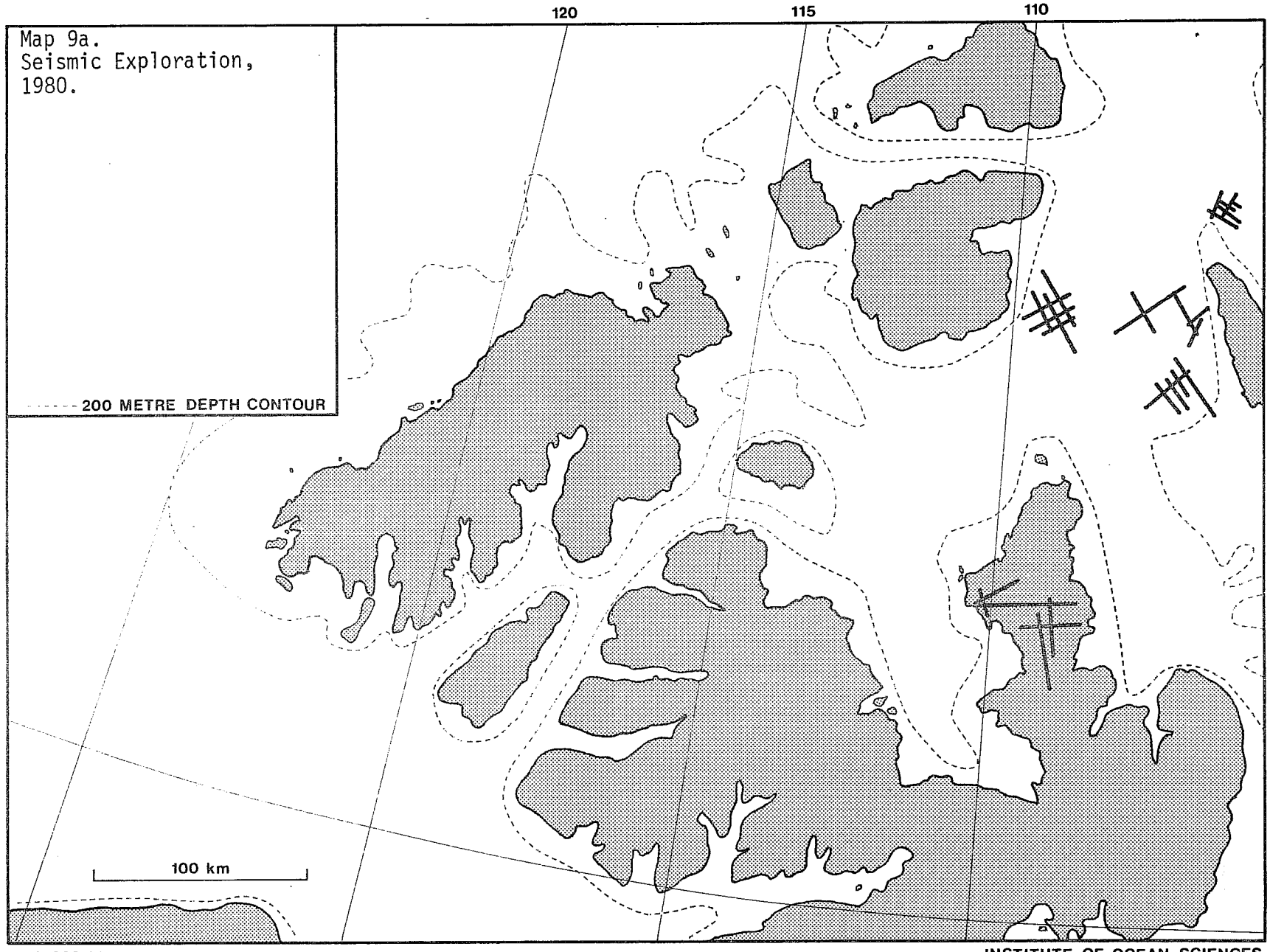

105
100
95
90
85
100 km
Map 7b.
Seismic Exploration,
1978.
------200 METRE DEPTH CONTOUR
1:2,630,000
INSTITUTE OF OCEAN SCIENCES

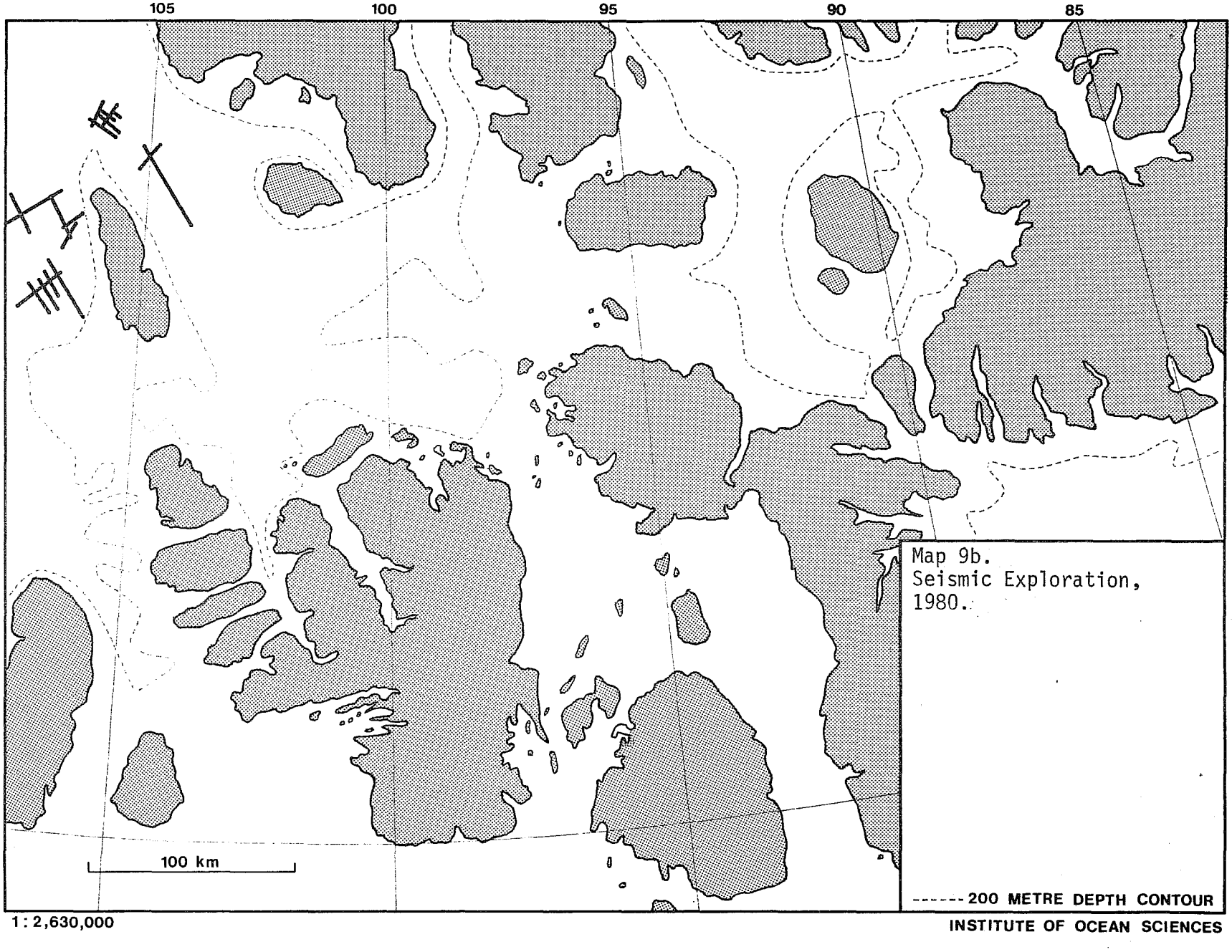

Map 7c.
Seismic Exploration,
1978.
200 METRE DEPTH CONTOUR
100
95
90
85
80
80
100 km
1:2,630,000
INSTITUTE OF OCEAN SCIENCES

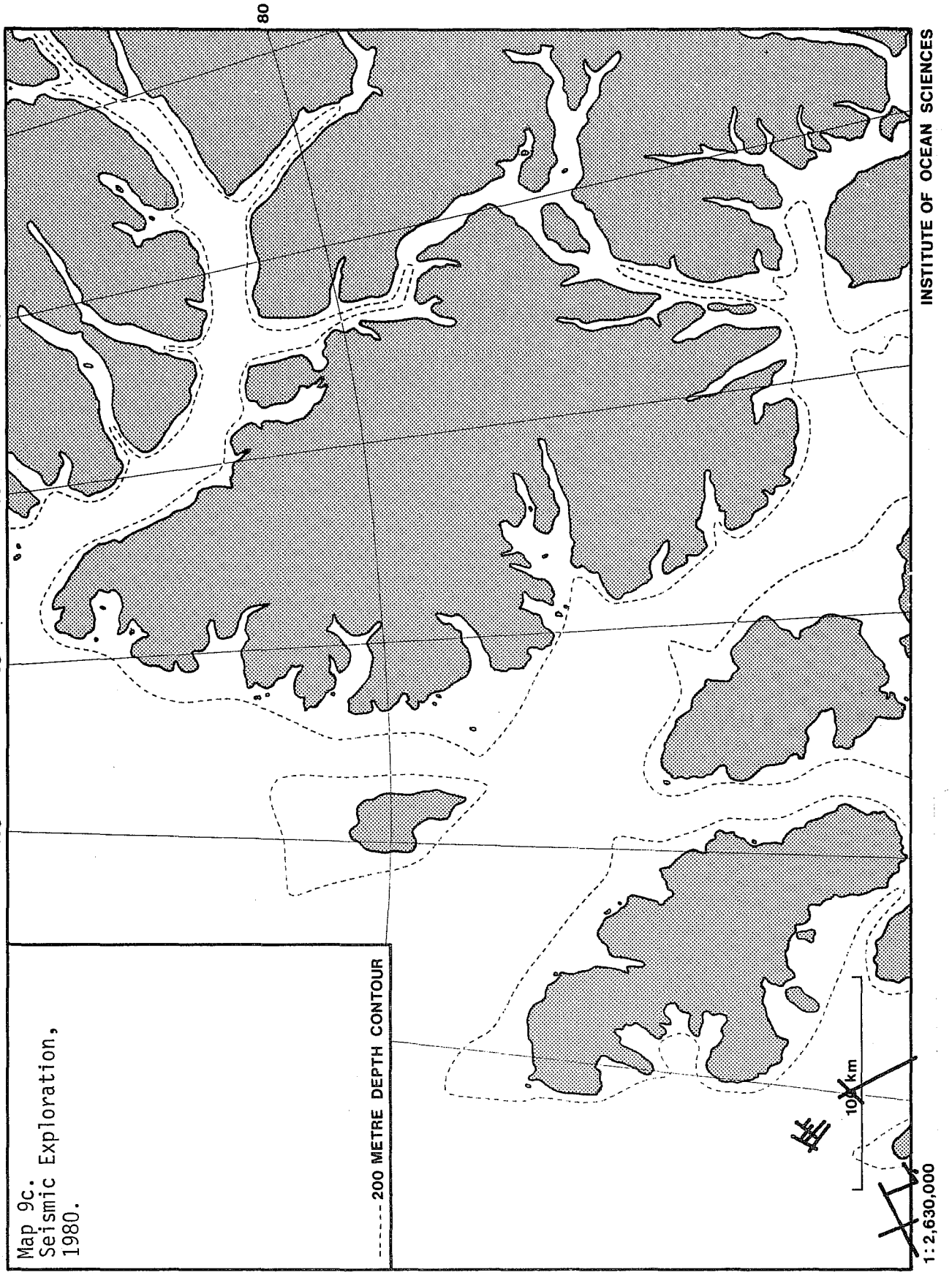

120
115
110
Map 8a.
Seismic Exploration,
1979.
200 METRE DEPTH CONTOUR
100 km
1:2,630,000
INSTITUTE OF OCEAN SCIENCES

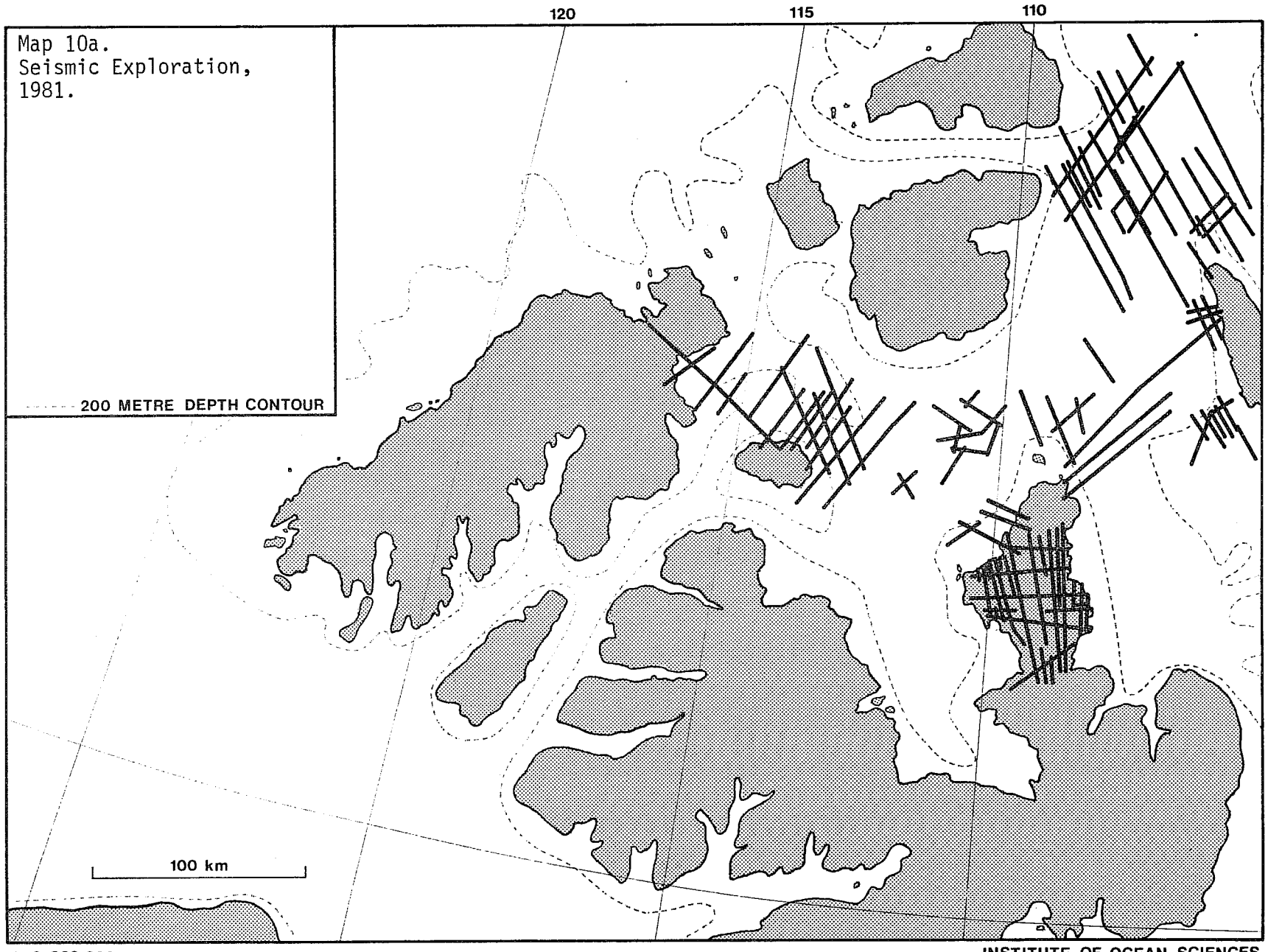

85
90
95
100
105
Map 8b.
Seismic Exploration,
1979.
------ 200 METRE DEPTH CONTOUR
INSTITUTE OF OCEAN SCIENCES
100 km
1:2,630,000

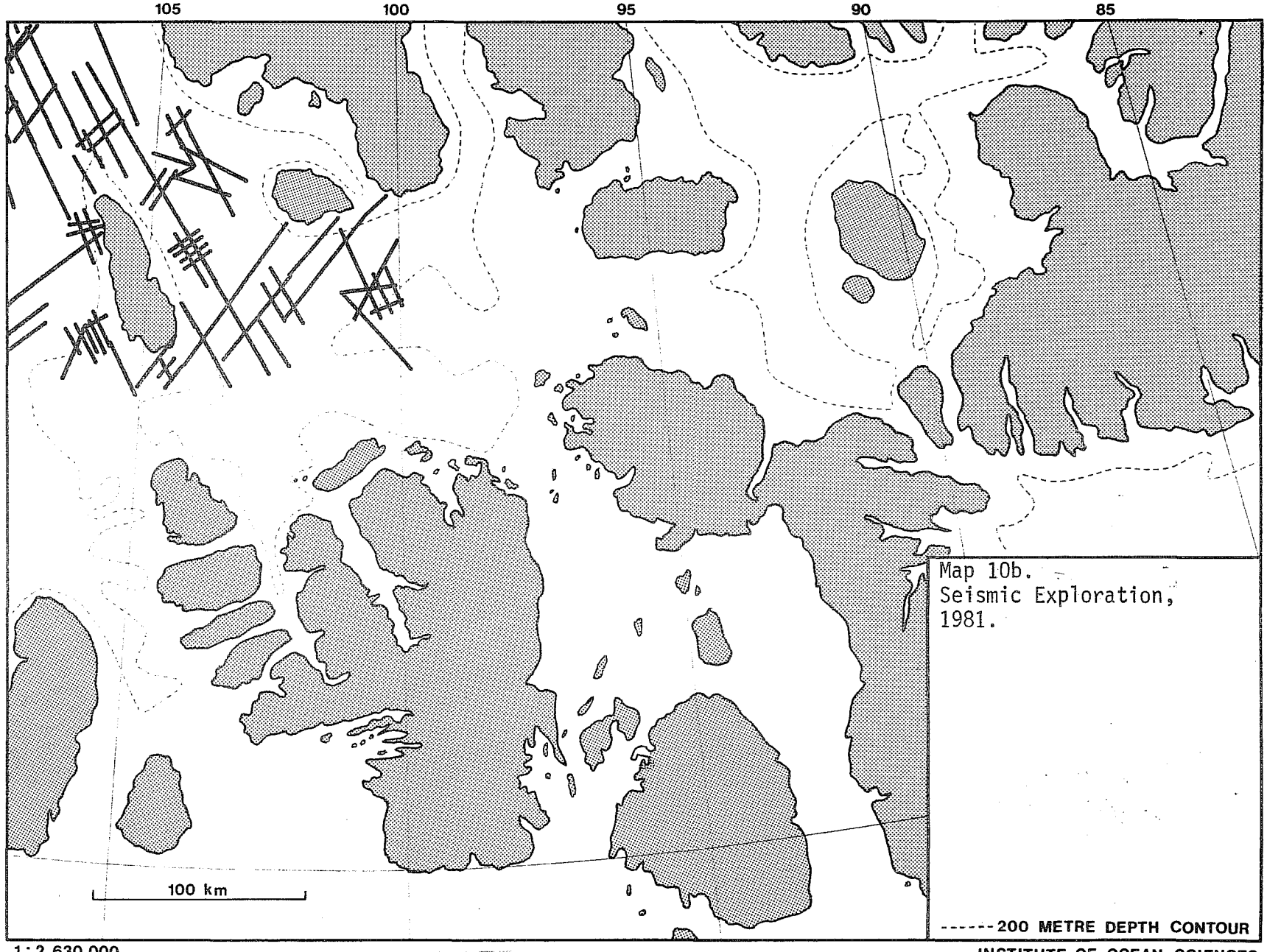

Map 8c.
Seismic Exploration,
1979.
200 METRE DEPTH CONTOUR
100
95
90
85
80
80
100 km
1:2,630,000
INSTITUTE OF OCEAN SCIENCES


120
115
110
Map 9a.
Seismic Exploration,
1980.
200 METRE DEPTH CONTOUR
100 km
1:2,630,000
INSTITUTE OF OCEAN SCIENCES


105
100
95
90
85
100 km
1 : 2,630,000
Map 9b.
Seismic Exploration,
1980.
------ 200 METRE DEPTH CONTOUR
INSTITUTE OF OCEAN SCIENCES


80
80
85
90
95
100
Map 9c.
Seismic Exploration,
1980.
200 METRE DEPTH CONTOUR
10 km
1:2,630,000
INSTITUTE OF OCEAN SCIENCES


120
115
110
Map 10a.
Seismic Exploration,
1981.
200 METRE DEPTH CONTOUR
100 km
1:2,630,000
INSTITUTE OF OCEAN SCIENCES



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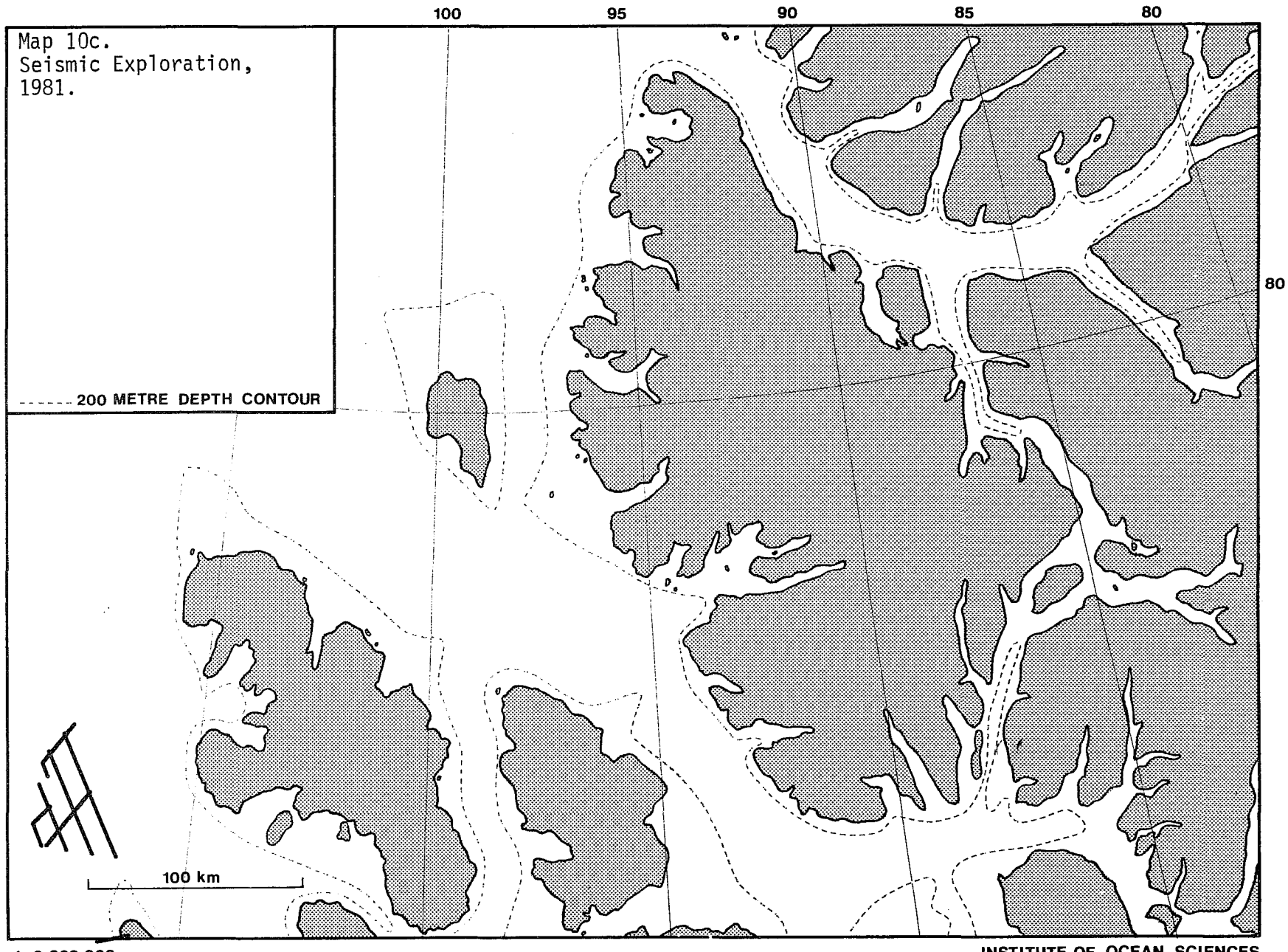
Map 10c.
Seismic Exploration,
1981.
200 METRE DEPTH CONTOUR
100
95
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100 km
1:2.630.000
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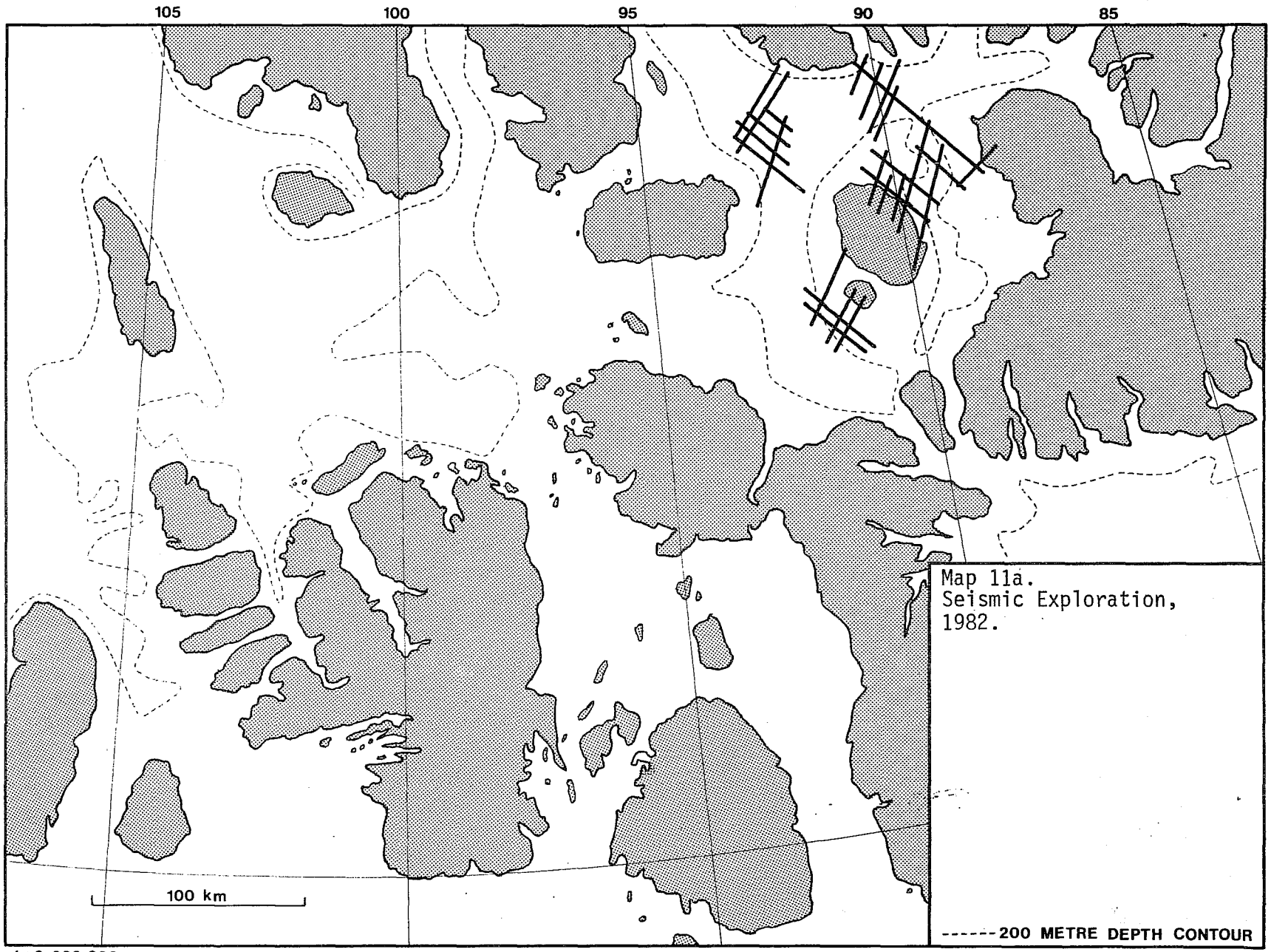
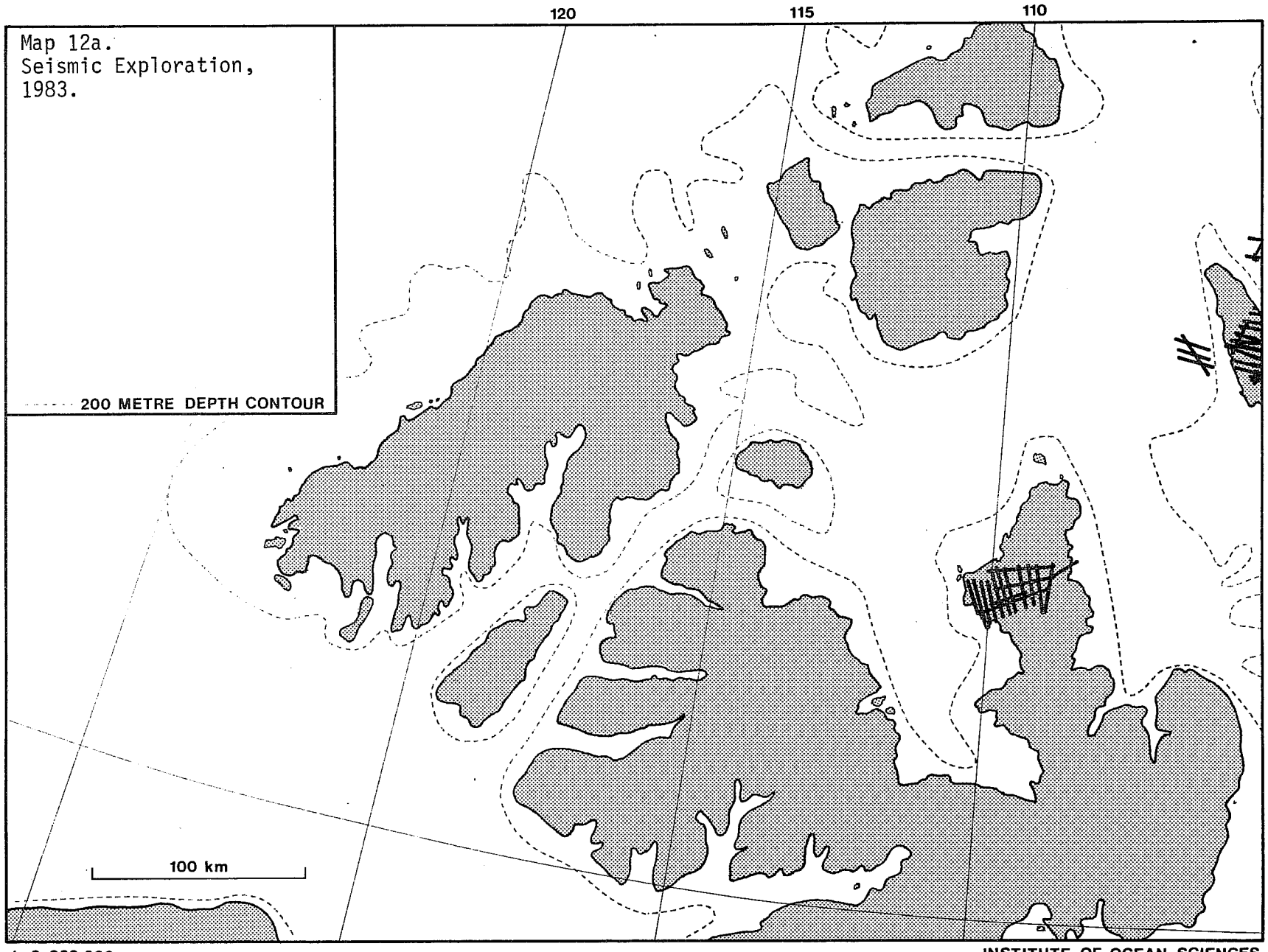
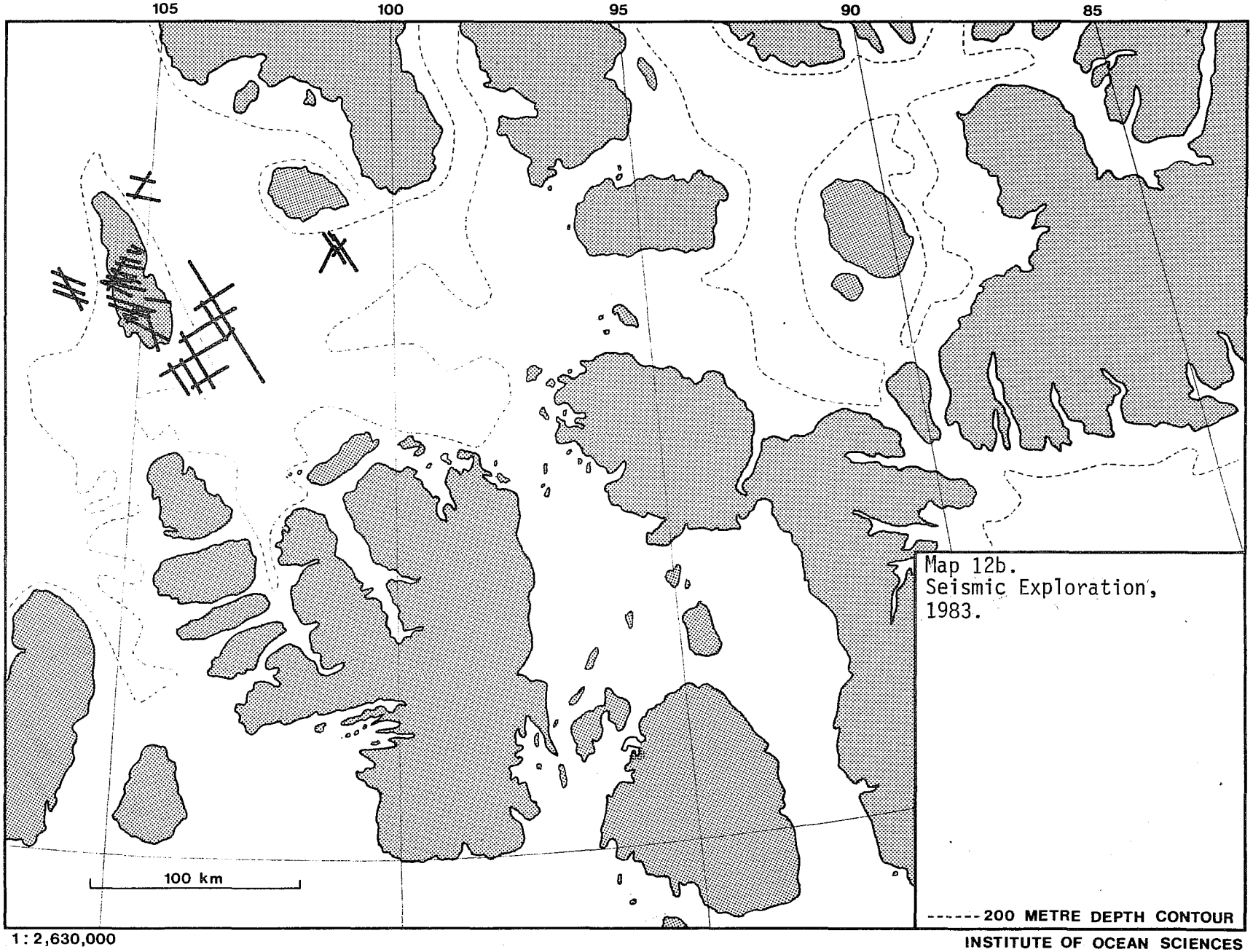

105
100
95
90
85
100 km
1:2,630,000
Map 11a.
Seismic Exploration,
1982.
------200 METRE DEPTH CONTOUR
INSTITUTE OF OCEAN SCIENCES

1:2,630,000

INSTITUTE OF OCEAN SCIENCES


Map 12a.
Seismic Exploration,
1983.
200 METRE DEPTH CONTOUR
120
115
110
100 km
1:2,630,000
INSTITUTE OF OCEAN SCIENCES


105
100
95
90
85
100 km
Map 12b.
Seismic Exploration,
1983.
------200 METRE DEPTH CONTOUR
1 : 2,630,000
INSTITUTE OF OCEAN SCIENCES

5. HYDROCARBON EXPLORATION AND DELINEATION DRILLING

5.1 Introduction

Exploration and delineation drilling in the Sverdrup Basin began in 1961 when Dome Petroleum drilled the first well near Winter Harbour, Melville Island. Since then, 136 wells have been drilled north of the 75th parallel, 80 of these being completed between January 1974 and June 1984. Drilling during this past decade can claim a measure of success with the discovery of potentially-commercial oil and gas reserves at Cameron Island and the offshore Cisco location, oil or gas discoveries of undetermined size at eight other locations, and the successful extension of the Hecla and Drake gas fields in the vicinity of Sabine Peninsula, Melville Island. As well, significant advances in logistics, drilling techniques, and production equipment have been made in response to uniquely-difficult working conditions. The development of air-transportable drilling rigs and artificially-strengthened ice platforms, for example, allowed exploration and delineation drilling at offshore locations, while refinements to a bottom-founded, subsea-blowout prevention stack and the successful testing of an experimental subsea gas production system at Drake Point F-76 wellsite, gave evidence of the potential for producing natural gas from offshore Sverdrup Basin wells.

Despite the promise of these achievements, the intensity of drilling activities and the number of petroleum operators have declined, in part, due to high risks and operating costs and the uncertain prospects for delivery of commercial oil and gas reserves to southern markets. It is uncertain whether or not future drilling activity will continue at present levels in light of the expenditures involved and the indeterminate future of commercial oil and gas production.

5.2 Field procedures

5.2.1 Timing of well starts and operations

The timing of well starts and drilling operations reflects the onset and duration of freezeup in the Sverdrup Basin. Movement of rig components, rig set-up, and resupply of operating rigs can only be carried out when land and sea ice surfaces are sufficiently frozen to support surface vehicle traffic and heavy aircraft landings or, in the case of offshore ice platforms, the weight of the rig and associated structures. Overland vehicular movement of a drilling rig is slowed or made more difficult by the thawing of the active layer. Airlift of rig components or supplies to an onshore site can be curtailed by the instability of a thawed airstrip surface. Even with these constraints, some onshore rigs continue operations through the summer. However, offshore rigs situated on ice platforms are not afforded that option. The stability of an ice platform is dependent on the thickness and structural integrity of the built-up (water-flooded) ice. Offshore operations are restricted to those periods when melting and subsequent cracking or deformation of the ice platform will not occur. Thus, offshore operations do not commence until well after the onset of freezing temperatures and are terminated in advance of the expected thawing period.

5.2.1.1 Well starts

Onshore wells are started frequently in May, prior to the onset of the summer thaw, or in October, after land surfaces have refrozen (Figure 6). No onshore wells start in the summer months of July and August when the active tundra layer has normally thawed. Of note was the steady decline in the number of well starts between December and March, perhaps reflecting operators' avoidance of the darkest and coldest season.

Offshore well drilling from built-up ice platforms is spudded almost exclusively during the months of January, February, and March. There is a dearth of offshore well starts between the onset of sea ice freezing in late September of each year and the first three months of the subsequent new year. Two factors explain this: 1) approximately 30 to 45 days are required from the onset of freeze-up for sea ice to become sufficiently stable to support surface vehicle movement to the wellsite and to allow vehicle use during ice platform construction; and 2) six to 10 weeks are necessary to construct the ice platform and set up the rig before drilling can commence. Offshore wells are usually not spudded after March to allow the well to be tested and completed and the rig dismantled before the onset of thawing temperatures. The sole exception was the relatively shallow Panarctic et al. S.W. Hecla C-58 well which was started and completed during April 1977.

5.2.1.2 Drilling operations

The overall number of operating wells shows a marked seasonal pattern, steadily increasing from October to a maximum in March and April, and thereafter, decreasing to a minimum in September (Figure 7). The preponderance of offshore drilling occurs in the first four months of the year due to the constraints posed by the time required for construction of the ice platforms and to remove a rig from an offshore location prior to sea ice thawing. In contrast, onshore drilling occurs throughout the year, although the greatest number of wells were drilled in May and December. This bi-modal pattern reflects, in part, the tendency by operators to begin onshore drilling after tundra freeze-up in late September and to continue drilling into December or January, after which time the rig is dismantled and moved to a second location to drill from April to July. Unlike offshore drilling from ice platforms, onshore drilling rigs can operate throughout the summer even after the active layer has thawed. However, the logistic difficulties brought about by the thawing of airstrips or overland resupply routes has encouraged operators to schedule drilling for the cold months between October and July.

5.2.2 Rig movement and wellsite access

Drill rigs and related equipment are transported from staging areas to new well locations using surface vehicles, fixed-wing aircraft, and/or helicopters. The choice of transport depends on the distance between the staging area and the wellsite and, if the wellsite is offshore, the ruggedness of the intervening ice cover. Surface movements are favored if the distance between the staging area and the wellsite is less than 250 km. If the wellsite is offshore, over-ice transport is only undertaken if relatively smooth, multi-year ice is present to permit easy travel of the vehicles (B. Dales, Panarctic, pers. comm., 1984). For distances greater than 250 km or

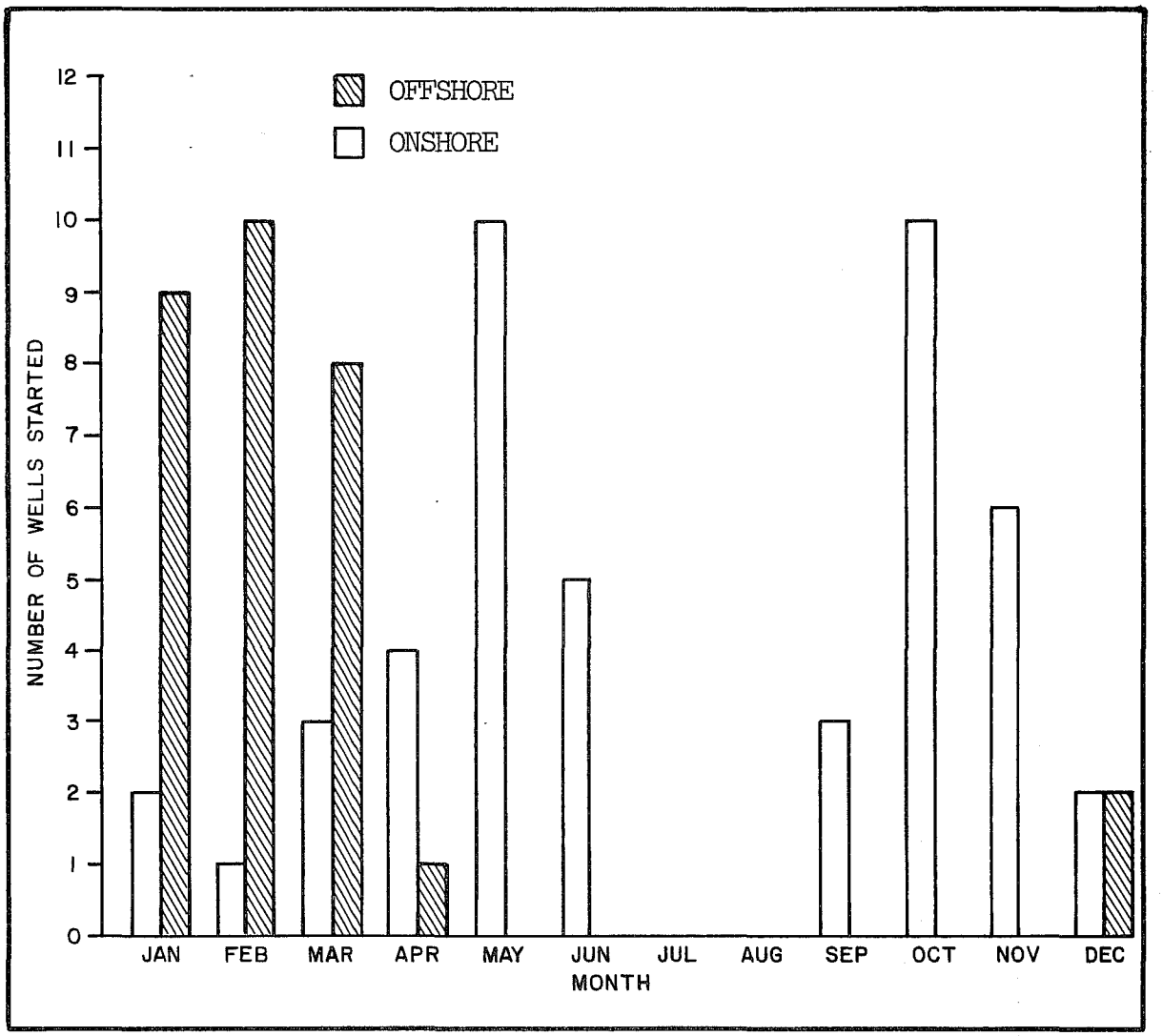


Figure 6. Onshore and Offshore Well Starts by Month Between January 1974 and June 1984.

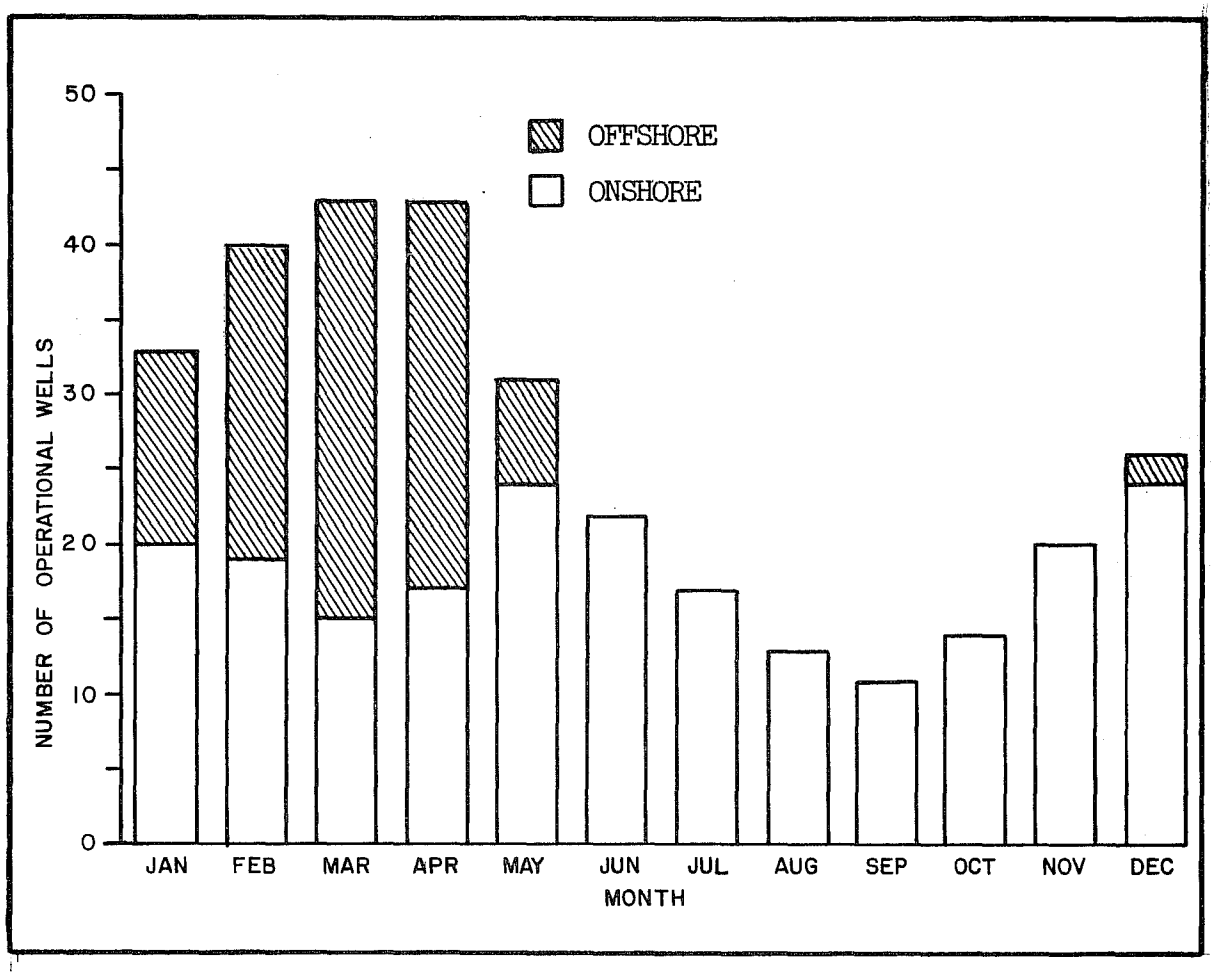


Figure 7. Sverdrup Basin Exploratory and Delineation Wells Drilled by Month from January 1974 to June 1984.

when sea ice conditions will not permit over-ice travel, drilling rigs and equipment are transported by aircraft.

Both air and ground transport of rigs, equipment, and supplies is carried out from October to May when sea and land are frozen. During summer months, potential terrain disturbances and broken ice preclude surface vehicle movement, and the thawing of onshore airstrips limits air transport to light aircraft or helicopters. Offshore wellsites are normally completed and evacuated in April or May.

For offshore wellsites, heavy-lift helicopters are used to transport camp units, D-4 Caterpillar tractors, pumps, and other support equipment to the location prior to either surface or air transport of actual rig components.

Surface transport of modular rig components is usually accomplished using a single train of two to four, 27 tonne Foremost Delta and Kenworth oilfield trucks. D-6 and D-7 Caterpillar tractors may be employed to haul equipment on sledges. In contrast, air transport of similar rig components and sufficient equipment and supplies to commence operations requires 130 to 170 Hercules aircraft loads delivered over a period of 25 to 30 days. An additional 100 to 150 flights of heavy aircraft are necessary during drilling operations; these consist of a weekly visit by a Boeing 737 for crew changes and food deliveries and a Hercules flight every second day with fuel and other consumable items for drilling. Heavy aircraft flights are supplemented with one or more daily Twin Otter flights carrying crew and light equipment. During summer months when onshore airstrips have thawed, equipment and supplies are transported to the wellsite by STOL Twin Otter and heavy-lift helicopter (Franklin, 1982).

5.3 Offshore drilling systems

Although exploration and delineation has occurred in the Sverdrup Basin since 1961, offshore drilling commenced in 1973 when four stratigraphic test wells were drilled at Kristoffer Bay, Ellef Ringnes Island. This 12-year delay in instituting offshore drilling was due primarily to the inability of conventional drilling platforms to operate from the thick, persistent sea ice found in the Region. After the first operational test of the concept at Kristoffer Bay, an artificially-thickened ice platform was used the following year to support a heavier, conventional exploration drilling rig at the Hecla N-52 wellsite. This established the feasibility of ice platform use for offshore drilling operations. Since that time, 30 offshore exploration and delineation wells were drilled from such ice platforms. In addition, one experimental, natural gas well completion was carried out at the offshore Drake F-76 wellsite. These successes suggest that similar systems will continue to be used in future offshore drilling and well completions.

5.3.1 Ice platform construction

Initial site preparation begins in late October or early November, as soon as the sea ice is thick enough to support platform construction equipment. After establishing a work camp at the wellsite, D-4 Caterpillar tractors equipped with drill towers, hydraulic pumps, and scraper blades are airlifted by heavy-lift helicopter and begin to prepare the airstrip and ice platform. Both sites are scraped smooth and further smoothed by some flooding with sea water pumped from beneath the sea ice.

Before actual platform construction begins, the platform site is surveyed

to determine locations of rig equipment and workshops, placement of strain gauges, freeboard meters, oceanographic recording equipment, and orientation of overall rig loads (Figure 8). Ice thickness along the perpendicular axes of the platform site is measured to determine the amount of built-up ice required to meet stresses in or deflection of the ice during drilling operations. Usual platform design specifications call for ice thickness of 5.0 to 6.6 m.

Airstrip and ice platform flooding begins in late November when four electric pumps, each with a pumping capacity of 2,650 litres/min., are frozen into holes drilled through the ice. Seawater is sprayed onto the sea ice surface in thin layers, building up the ice at a rate of 5 to 10 cm/day. Flooding rates greater than 5 to 10 cm/day can produce unfrozen pockets of soft water which become more saline than the surrounding ice. These saline pockets do not freeze if insulated by surrounding ice from the atmospheric temperatures, and this weakens the airstrip or ice platform. By allowing water to flow freely, the ice layers become thinner near the edges of an ice platform. As a result, a tapered cross-section is achieved with the maximum thickness at the moonpool (the point of greatest stress) and a gradual reduction to natural ice thickness about 200 m from rig centre (Figure 9).

A short distance from the wellsite, a second ice platform or "relief pad" is built at the same time as the main platform is constructed. In the event that a blowout cannot be controlled by the main rig, a second rig would be moved to the relief pad to allow emergency drilling of a relief well.

Special urethane foam blocks were used at two wellsites as an experimental means of reducing the amount of built-up ice needed to maintain freeboard. Approximately 271 m^3 of foam was incorporated into the relief pad at the Char G-07 well while 550 m^3 was used in the Maclean I-72 main ice platform (Figure 10). Results indicate the foam was indeed effective in reducing requirements for built-up ice, and hence, reduced the time needed for platform construction. However, foam blocks have not been used in subsequent platforms.

Ice temperature control is essential to maintaining the tensile properties of the ice platform. During construction, thermistor banks are placed adjacent to the moonpool and at the platform centre to ensure that the ice temperature does not rise above -5.0°C (although in practice, the temperature seldom rises beyond -10.0°C). To prevent platform thawing during drilling operations, the ice surface is insulated from the rig's heated areas by a 15 cm wooden rig matting, four sheets of polyethylene, and 5 cm of high-density polyurethene.

5.3.2 Rig configuration

The general configuration of Panarctic's offshore rigs provides a wide distribution of weight across the ice platform surface (Figure 11). The mud tanks containing a slurry of drilling muds and water are the heaviest components of the rig. Any rig layout, therefore, ensures that the mud tanks are separated from the rig substructure to minimize the weight near the moonpool, the weakest point of the ice platform. The proper distribution of weight resulting from the careful rig configuration reduces the thickness of built-up ice required and, in turn, reduces the time needed for ice platform construction. The rig layout also allows the rig substructure to be skidded in any direction to compensate for limited horizontal movements of the ice sheet beneath.

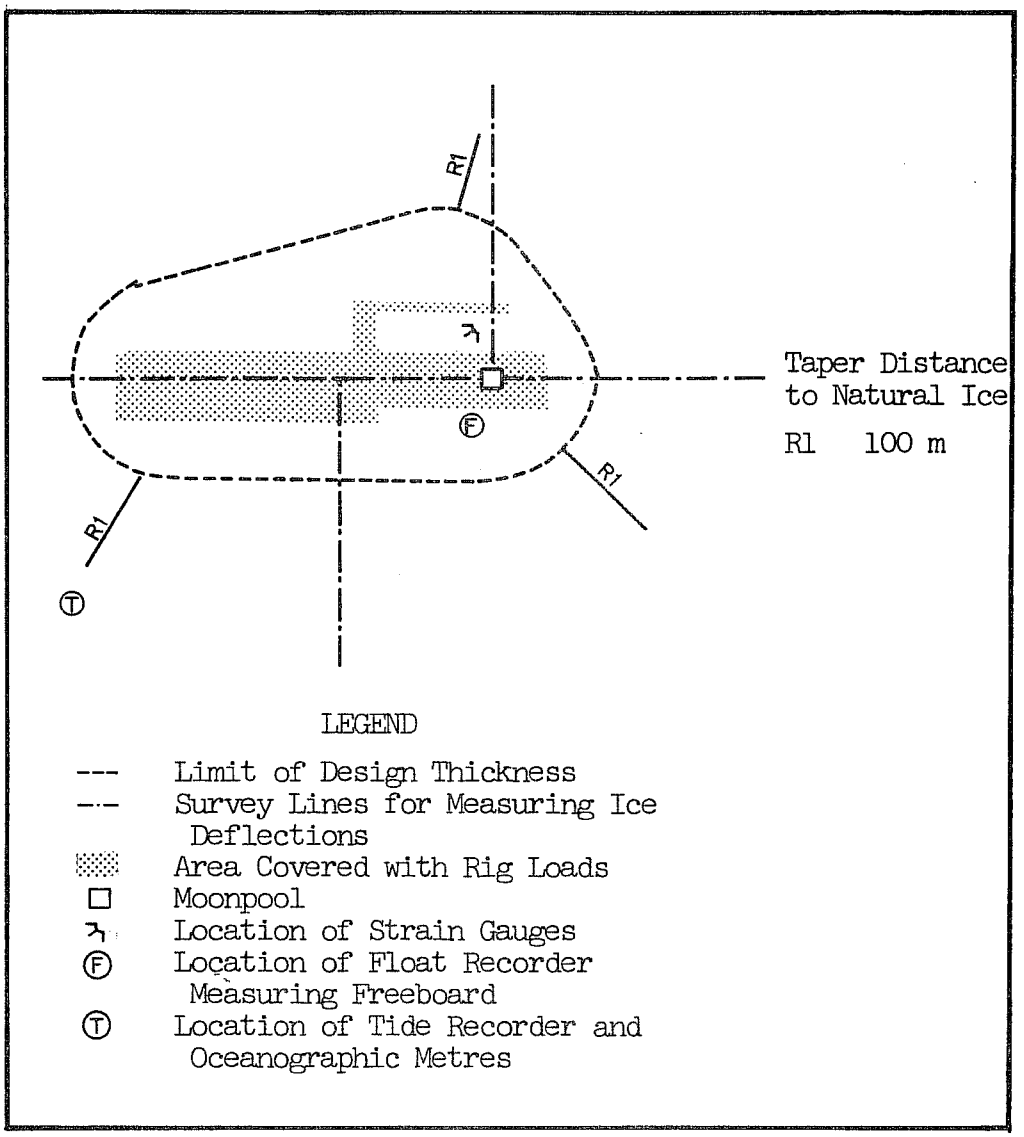


Figure 8. Ice Platform Layout for Rig B.
(Adapted from Panarctic Oils Limited, 1982b)

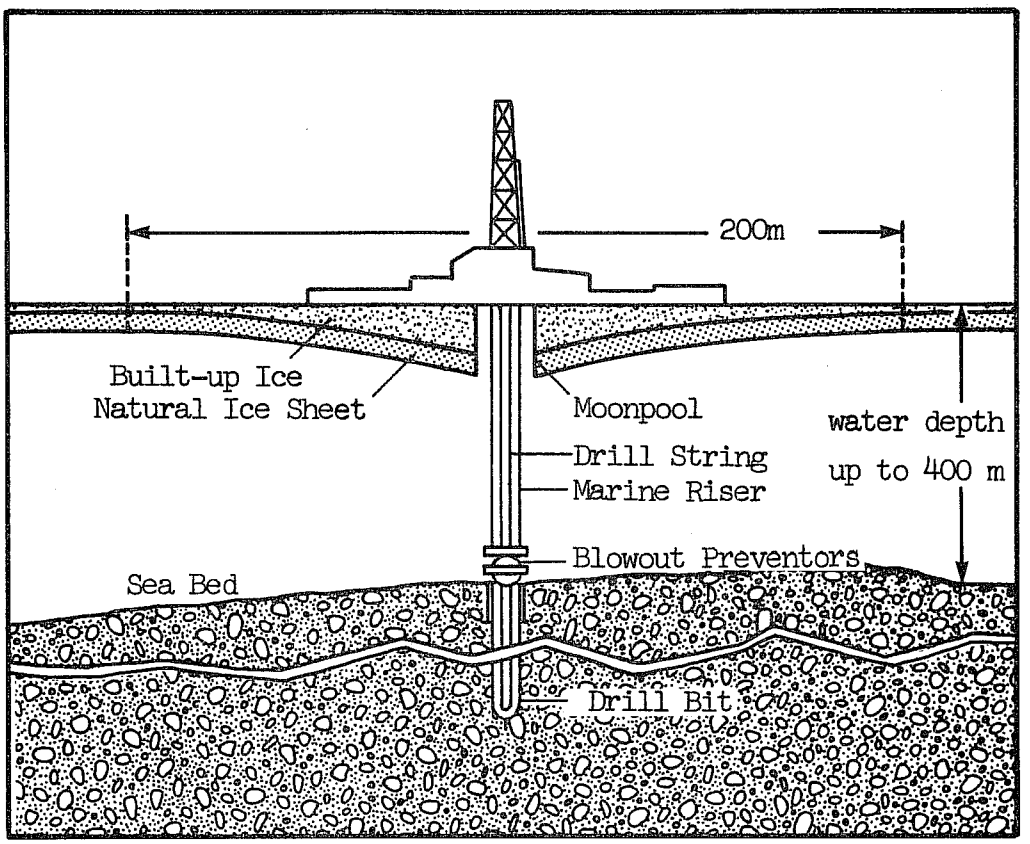


Figure 9. Section View of Ice Platform Drilling.
(Adapted from Davies, 1983/84)

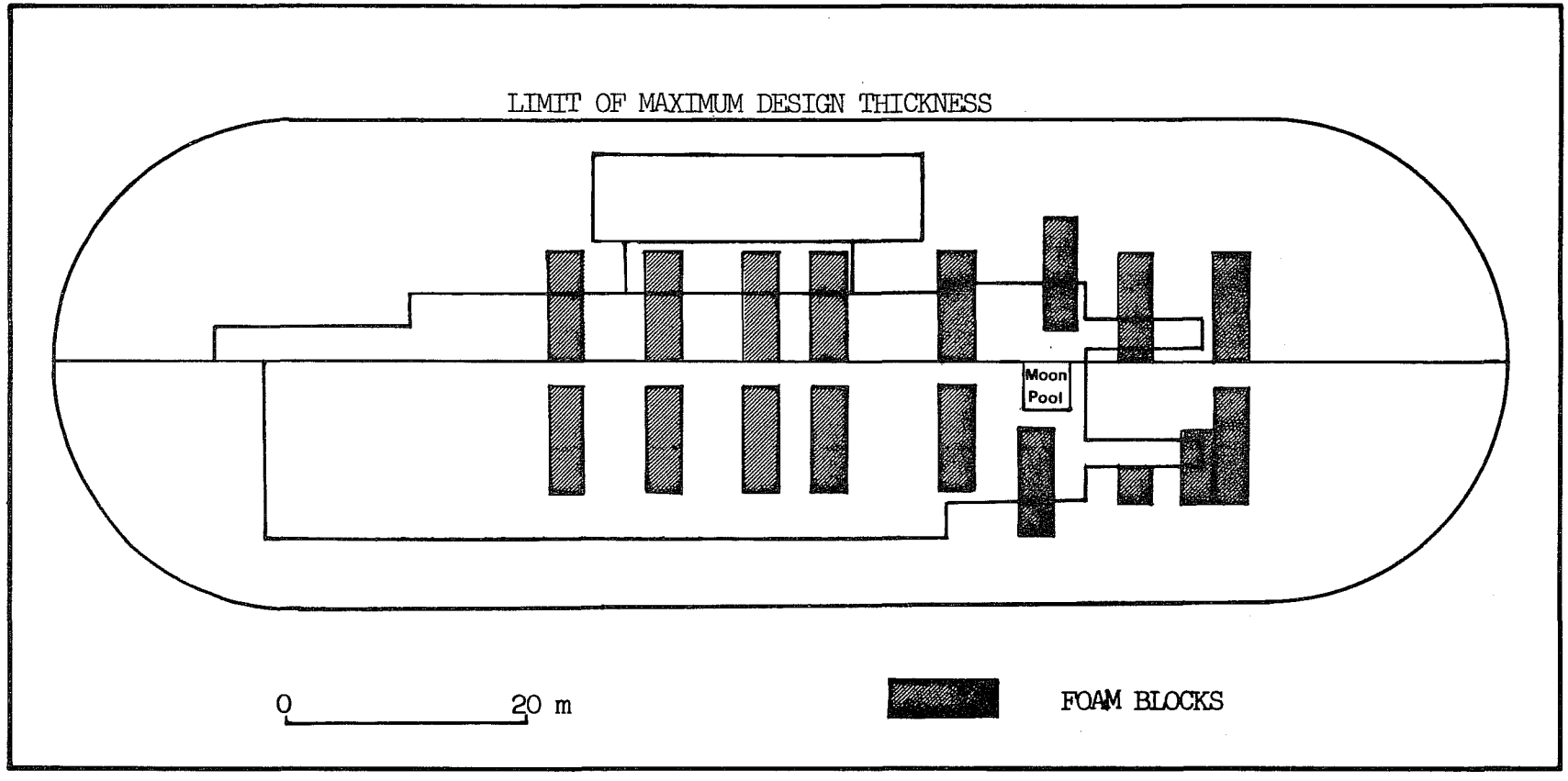
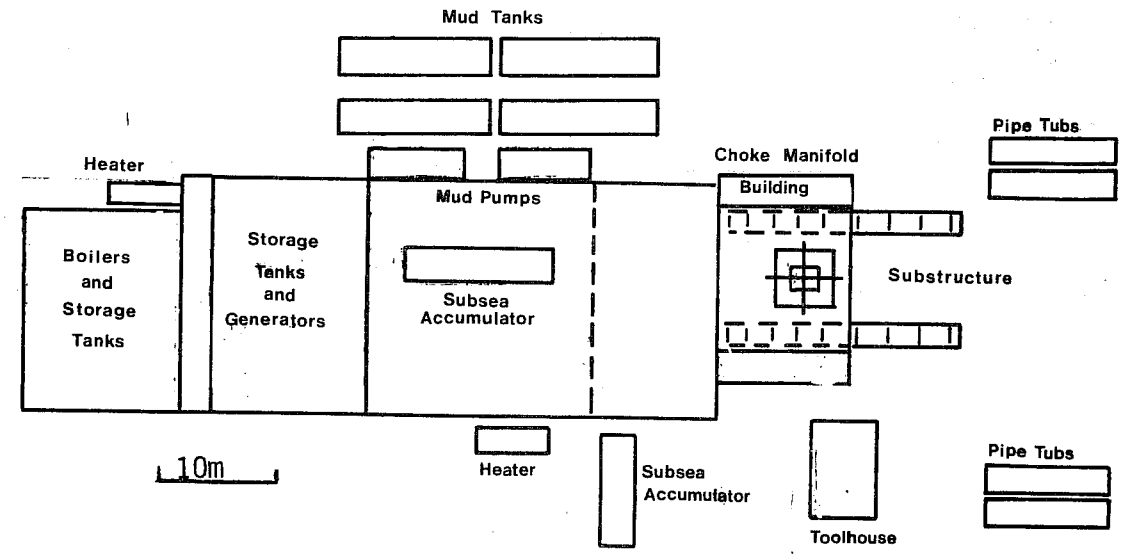
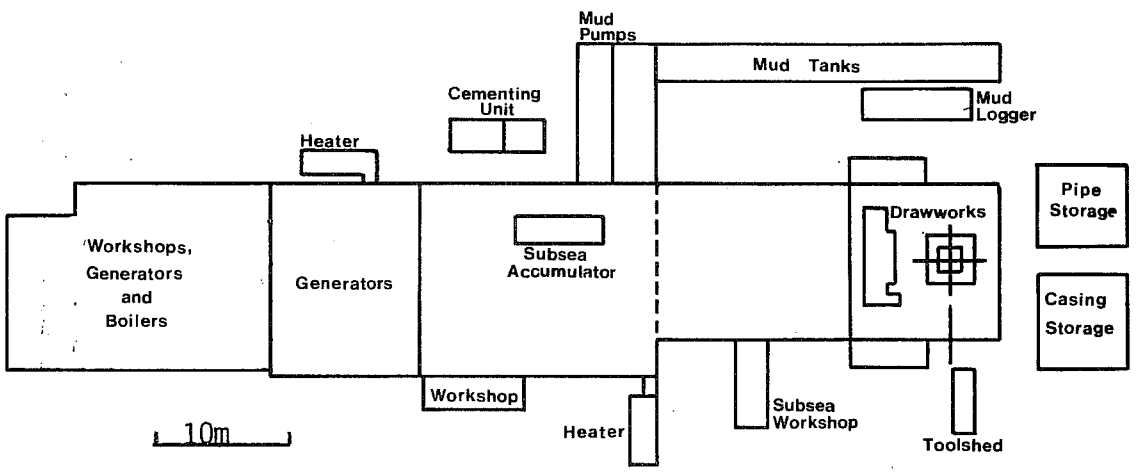


Figure 10. Foam Block Layout at Panarctic et al Maclean I-72, Pad A. (Adapted from Panarctic Oils Limited, 1980a.)



PANARCTIC RIGS "A" AND "C". (Source: Panarctic Oils Limited, 1982c).



PANARCTIC RIG "B". (Source: Panarctic Oils Limited, 1982b).

Figure 11. General Configurations of Offshore Drill Rigs.

5.3.3 Subsea blowout prevention system

Panarctic's underwater drilling system allows the use of conventional land rigs situated on ice platforms for drilling expendable exploratory wells in up to 500 m of water. A very compact subsea blowout preventer (BOP) stack was designed for use with the rig (Figure 12) to minimize the size of the moonpool and, thus, maintain buoyancy of the ice platform. Two 346 mm, 34,500 kPa pipe rams and one 346 mm, 34,500 kPa shear ram allows emergency closure of the well on the ocean floor, while excessive pressure within the annulus can be controlled with a 346 mm, 34,500 kPa annular preventer valve. Additional protection is afforded by 70 mm, 34,500 kPa fail-safe choke and kill valves within the marine riser. The BOP stack is joined to the wellhead and marine riser by two 346 mm, 34,500 kPa hydraulic connectors, which can be released by means of an acoustic control system should the main hydraulic system fail.

The BOP stack and surface rig are linked by a flexible 406 mm marine riser attached to ball joints above the annular preventer and within the diverter housing. The ball joints allow the ice platform to move horizontally to a maximum distance of seven percent of water depth without deforming the riser. Abandonment procedures are initiated if the distance exceeds seven percent.

During vertical movements of the ice platform with diurnal tides, tension is maintained on the riser by means of hydraulic cylinders suspended from the drill floor and attached to a telescoping joint. A typical 1.2 m maximum tide can be easily accommodated by the 4.6 m stroke of the joint.

5.3.4 Experimental offshore well completion, Panarctic et al. Drake F-76

As mentioned before, Panarctic Oils completed an experimental subsea natural gas production system at its Drake F-76 well in 1978. The wellsite was an ice platorm located 1,220 m off the western shore of Sabine Peninsula, Melville Island with the wellhead 55 m below ice surface (Figure 13). Ice platform construction techniques and the underwater drilling system used at Drake F-76 were similar to those used previously at other ice platforms (Palmer et al, 1979; Watts and Masterson, 1979). The production system consisted of a "Christmas tree" assembly, control system, and flowline bundle connecting the subsea wellhead to an onshore facility. The 34,500 kPa Christmas tree was made up of a production block containing two 130 mm master valves and an annulus block containing a 52 mm master valve. A 152 mm, 34,500 kPa crossover valve located beside the production block allowed "pigging" (pipe inspection) from shore down one flowline and returning through the other flowline.

The hydraulic control system consisted of two 25 mm hydraulic lines connecting a shore-based power unit and control panel with a production control pod capping the Christmas tree assembly. One line provided a pressure signal to the shore control while the second line supplied a hydraulic operating signal to the tree valves. A third 25 mm line allowed alcohol to be injected into the flowlines to prevent gas hydrate formation when flow-testing the wells.

The flowline consisted of a bundle of seven lines (Figure 14):

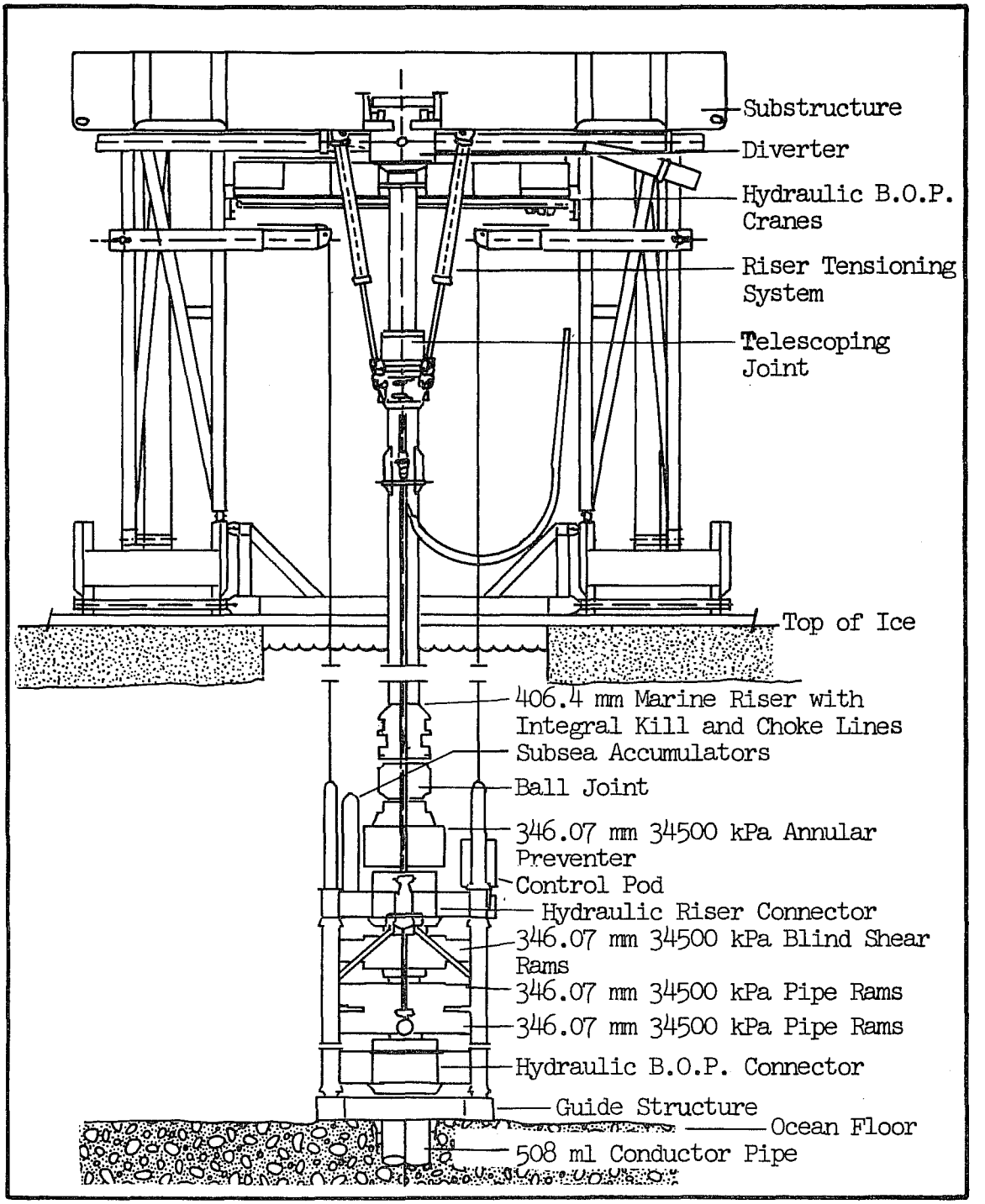


Figure 12. Subsea Blowout Preventer System.
(Source: Watts and Masterson, 1979)

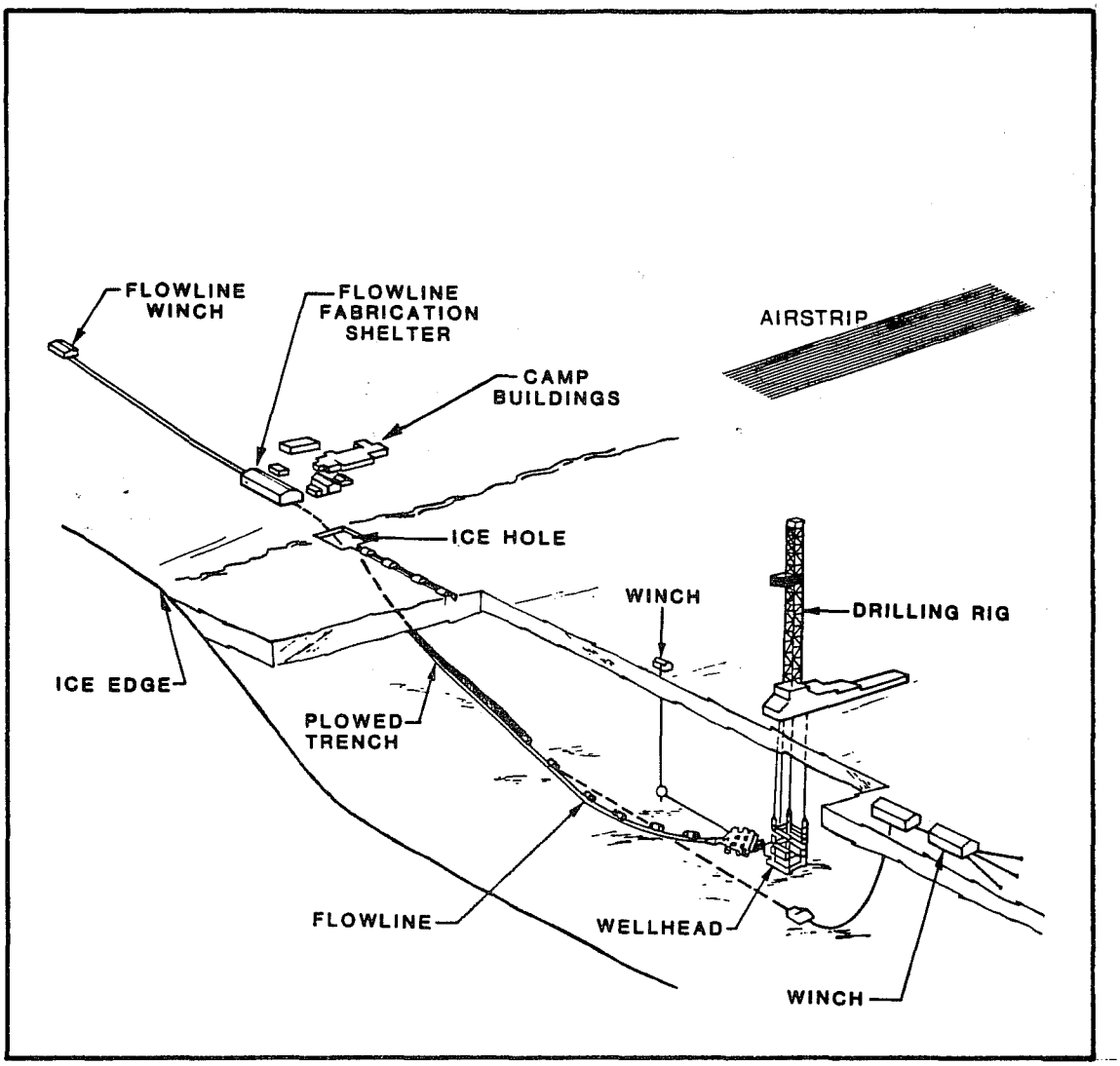
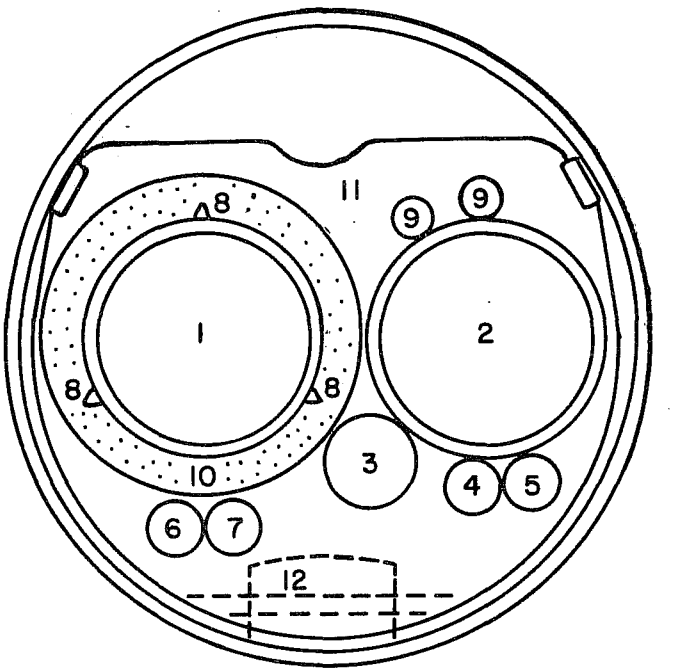


Figure 13. Panarctic Drake F-76 Experimental Subsea Natural Gas Production System.
(Source: Davies, 1983/84.)



1,2	6-inch flowlines
3	2-inch annulus line
4,5,6,7	1-inch methanol and hydraulic control lines
8	Thermon heat tracing cables
9	SECT heat tracing
10	insulation
11	spacer
12	roller

Figure 14. Flowline bundle.
(Source: Palmer et al, 1979)

a) one 152 mm insulated gas flowline with three Thermon heat tracer systems;
b) one 152 mm uninsulated gas flowline with two SECT heat tracer systems;
c) one 25 mm alcohol injection line;
d) two 25 mm hydraulic control lines;
e) one 51 mm annulus monitoring line;
f) one 25 mm spare line.

The 1,300 m bundle was fabricated and tested on shore before being loaded onto an onshore launchway in preparation for winching to the wellhead.

With the flowline completed, a continuous slot 0.3 m wide was cut through the ice from shore to the drilling platform using a chain-saw ditcher mounted on a crawler tractor. A cable from the ice platform winch was lowered into the slot and a trenching plow was attached to the winch cable. After ploughing a shallow trench, the flowline was pulled to a position adjacent to the subsea wellhead using the same winch. A coolant circulated through the flowline froze underlying sediments to enhance the stability of the flowline bed while the flowline trench was backfilled to provide some protection from possible ice scouring (Figure 15).

The completion phase of the well began with the retrieval of the marine riser and BOP stack and the placement of a protective cap on the casing head. Pull-in and flowline frames were assembled and backed together on the surface, then lowered by means of guide lines supported by the drilling rig to a well-head guide frame above the wellhead. The flowline was then pulled and locked to the flowline frame and, after confirming, by means of an underwater television monitor, that the locking mechanisms were engaged, the pull-in frame was unlocked from the flowline frame and pulled to the surface. The flowline frame, with the flowline secured to it, remained locked to the wellhead.

Having established the flowline connection between the shore and the wellhead, the protective cover was removed from the casing head. The Christmas tree valve assembly was lowered and attached to the casing head with a hydraulic connector. Connectors from the Christmas tree were hydraulically extended to join with control lines within the flowline bundle. All lines were then pressure tested preparatory to the well completion testing.

After flow-testing the well, control of the well was transferred to a shore-based hydraulic control unit. Once the hydraulic control functions were confirmed as being operative, the rig was released and dismantled. A series of production tests was conducted to determine hydrate formation characteristics, evaluate the performance of the insulated and uninsulated flowlines, and determine the effects of injecting alcohol at various rates and locations on hydrate control within the flowline. Production testing was completed on 14 May 1978, but the well continued to produce fuel gas for use at the onshore test facility and camp. The well was finally shut down on 28 November 1978 (Palmer et al. 1979; Watts and Masterson, 1979).

5.4 Exploration-related activities

5.4.1 Rea Point operations base

Rea Point, located on the east coast of Melville Island, is the main base of operations for Panarctic's activities in the Sverdrup Basin. Permanent

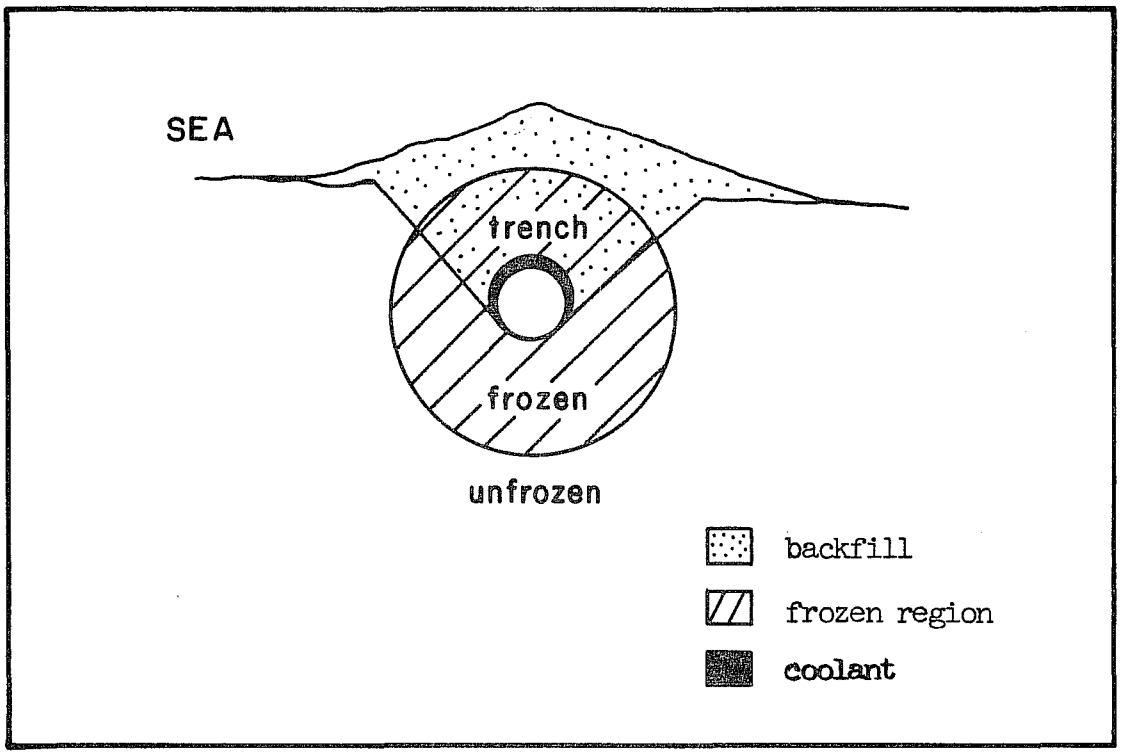


Figure 15. Cross-section of flowline bundle in trench in shallow water, with artificial permafrost protection against ice.
(Source: Palmer et al, 1979)

facilities at Rea Point include a sand-surfaced 1850 x 60 m airstrip suitable for both Hercules and Boeing 737 landings, a hangar for Panarctic's Twin Otter aircraft, a 1,675 m^2 warehouse, shop buildings, workers' quarters accommodating up to 140 persons, an oil-fired power plant, and steel fuel storage tanks with a combined capacity of 23 million litres (Davies, 1983/84).

Rea Point is resupplied by an annual sealift involving up to three dry cargo or fuel transport ships arriving within a four-week period beginning in the third week of August (B. Rhynold, pers. comm., 1984). One type of fuel carrier frequently chartered by Panarctic is the Finnish Lunni class icebreaking tanker (Figure 16), currently proposed as a future transport for Bent Horn oil (Panarctic, 1984). Since no docking facility is available for offloading dry goods at Rea Point, cargo carriers are positioned alongside the beach and an earthen ramp to the ship is constructed from beach material. Dry goods are then offloaded by means of forklifts and trucks. Offloading of fuel oil, on the other hand, is accomplished by means of two 152.4 mm by 180 m floating marine hoses connected to onshore flowlines leading to the storage tanks. Each sealift delivers 1,100 to 3,400 tonnes of dry goods and about 16 million litres of fuel oil. An additional 2 to 4 million litres of fuel oil is sometimes purchased from Esso in Resolute during the course of a season, while additional equipment or supplies are airlifted from Yellowknife or Edmonton.

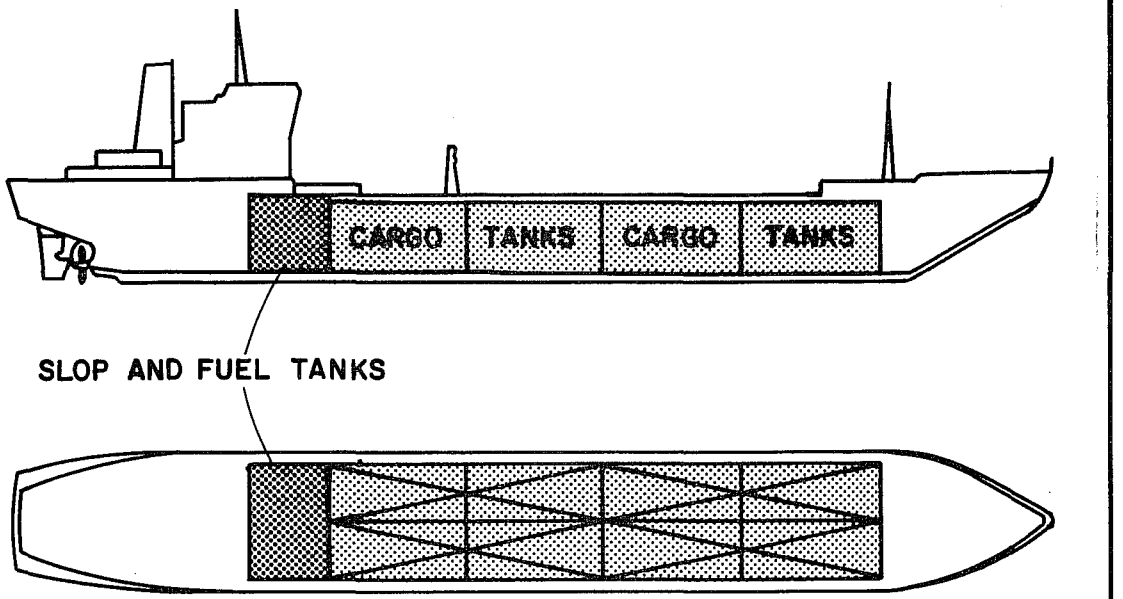
As the principal base of operations, Rea Point is involved in the staging and/or supply of all onshore or offshore drilling operations and many of the seismic programs in the region. Demobilized rigs are stored at Rea Point between drilling seasons and subsequently airlifted or moved by surface vehicle to new wellsites. Rig components are moved by surface transport if the new wellsite is within 250 km of Rea Point; beyond that distance, rig components and related equipment are airlifted by Hercules aircraft to the wellsite. Since the majority of new wells over the past five years have been located beyond a 250 km radius, most rigs were moved by airlift. Basic transport of rigs and camp components from Rea Point to the wellsite requires about 130 Hercules flights per rig, with an additional 40 to 50 flights required to transport fuels and drilling supplies during drilling operations. Hercules flights are made on an "as-need" basis to transport seismic vehicles from Rea Point or other staging areas to exploration locations. During the drilling season, up to four Boeing 737 flights leave Rea Point each week to exchange crews and supply fresh produce to outlying rigs. These flights are supplemented as needed by Twin Otter transporting light equipment and/or personnel.

Rea Point is also the main storage area for Panarctic's oil spill containment and cleanup equipment (Table 2), which are quickly airlifted to well locations when needed.

5.4.2 Drilling fluid disposal

5.4.2.1 Introduction

Exploration and delineation wells generate large quantities of waste drilling fluid during normal operations. For example, mud records, for 58 of 82 wells completed during the past decade, indicate that for each 100 m of well depth, each onshore and offshore well used an average of 10.2 and 12.2 tonnes of drilling mud respectively. Recorded totals indicate that over



Length,	164.45 m
Breadth moulded (main deck)	22.20 m
Draft, summer	9.50 m
Deadweight	15,955 tonnes
Speed	14.5 knots
Hull and Bulkheads	Doubled bottom and sides; 1.83 m between hull plates and cargo tanks
Cargo tanks	8
Cargo tank capacity	2,000 m^3

Figure 16. MT LUNNI cargo/fuel Transport.
(Source: Panarctic Oils Limited, 1984b)

Table 2. Oil Spill Containment and Cleanup Equipment Stored at Rea Point, Melville Island.
(Source: Panarctic Oils Limited, 1984)

Watercraft/Aircraft

2 Dehavilland DHC-6 Twin Otter Aircraft
1 Twin Otter Nose Ski

Skimmers/Pumps/Fittings

2 Roper Pumps, Gear Driven
1 Commercial Pump, Model PH15
1 Johnson Vertical Pump
1 Union Pump, Model TD25
1 Gardner-Denver Pump, Model PQ-2
6 3 Inch Yellowdog Pumps
2 4 Inch Yellowdog Pumps
2 2 Inch Skimmer Pumps
3 4 Inch Skimmer Pumps

Hoses/Connections/Portable Tanks

26 Tanks, Various sizes fromm 500 Gallons to 17,000 Gallons

Special Vehicles

14 Trailer Lo-Boys
5 Trailer Hi-Boys
12 Dolly Convertors
19 Kenworth Trucks
2 Hayes Trucks
19 Pick-up Trucks
6 Cranes
18 Forklifts
2 Skidoos
5 3-Wheeled Hondas
4 Foremost-Delta 3
2 Foremost-Commanders

Communications Equipment

5 CH25 SSB Transceivers, 100 Watt Pep, 115 VAC, 6 Channel, Canadian Marconi Co., Freq. on Request
2 CH 150 Transceivers, 150 Watt, 20 Channel for TTY operation as well
2 DT 56 VHF Mobile (FM) Units; Channels 165.52, 165.62, 165.72, 165.82, 165.92
2 TRITON 20 Motorola HF Transceiver, 20 Channel, 100 Watts, (may be operated 12 V DC) c/w antenna tuners
1 Non-Directional Beacon, Wilcox 785 D, 50 Watts, Identifier and Freq. on Request
1 Remote NDB Terminal c/w NDB Radar Transponder and helipad plating system (self-contained power source for up to 30 days duration without support)
1 Transportable VOR/DME Wilcox Electric model 485 B VOR model 596 B DME (self-contained power source)
2 Air to ground Edo-aire model 551 c/w dual altimeter (12 volt DC or 110 AC operation)
2 complete 6000' runway lights c/w markers

Sorbents/Chem. Treating Agents/Application Equip.

50 Conwed Utility Sorbent Pillows
1500 Sacks Sawdust (38000 kg)
1500 Bags Floor Dri

Table 2. Oil Spill Containment and Cleanup Equipment Stored at Rea Point, Melville Island.

continued

Generators/Lights

1 8 KW Generator
1 8.5 KW Generator
3 13 KW Generators
2 20 KW Generators
1 24 KW Generator
9 30 KW Generators
5 50 KW Generators
8 75 KW Generators
1 100 KW Generator
11 125 KW Generators
6 Maxi-lites

Earth Movers/Heavy Equipment

1 D4 Crawler Tractor
4 D3 Crawler Tractors
9 D6C Crawler Tractors
6 D7F Crawler Tractors
1 814 Wheeled Tractor
1 Scraper
8 Graders
7 Bombardier Skidozers
1 750 John Deere Caterpillar c/w Dozer and 12 ft. Ditcher
1 Rolligon
3 Nodwell Tracked Carriers

Other Equipment and Materials/Local Resources

50 Rolls Plastic Sheeting
2000 Empty Drums
36 Shovels
18 Power Saws
6 Thiokol Imps c/w Track Mounted Ice Augers

Disposal Facilities

4 Waste Oil Incinerator 450 Gallon
2 Cyclonator CY-100 Incinerators (Skid-Mounted)
4 Incinerator (Skid-Mounted)

Explosives

85,800 kg (total): Unigel, Vibrogel, Geogel, Forcite, Amex 2
(on November 31, 1983)

14,160 tonnes of drilling mud were used and discarded. In addition, unknown volumes of produced (formation) water and water used as the drilling mud medium were released.

The term "drilling fluid" in this section refers to a solution of solids and dissolved materials suspended in a water or oil medium. The term "drilling mud" represents the combination of solid materials carried by the liquid, while "drill cuttings" are formation cuttings circulated through the well to the platform surface.

Drilling fluid is a viscous slurry circulated through the well bore during drilling. The primary functions of drilling fluids include:

- transport of drill cuttings to the surface;
- cooling and lubrication of bit and drill string;
- maintenance of borehole stability;
- control of formation pressures;
- support for drill pipe and casing;
- transmission of hydraulic energy to the drill bit.

Components of fluid circulation systems may vary, but most rigs share the same overall scheme. Drilling fluid is pumped down the centre of the drill string to the drill bit, where fluid is mixed with cuttings and returned up the annulus to the surface. Mechanical devices such as shakers, desanders, and desilters remove cuttings from the fluid, thus allowing reuse of the drill mud components.

5.4.2.2 Classification of drilling fluids

Drilling fluids can be classified by either the liquid phase (water or oil) used to carry solid constituents, or the major constituents (polymer - gel, lignosulfonate or potassium chloride) added to control mud properties (Petrazzuolo, 1981). Water-base fluids are more commonly used, since oil-based fluids are restricted to applications where water-based fluids do not perform adequately or are likely to cause formation damage during completion (Northern Technical Services, 1981). Either fresh or saline water forms the continuous phase of water-based fluids, and diesel oil for oil-based fluids.

In water-based fluids, potassium chloride (KCl) muds are commonly used to prevent borehole sticking associated with excessive sloughing in soft formations. In Arctic operations, KCl muds are used to drill through permafrost to over 600 m in depths. KCl acts to depress the freezing point of the drilling mud, thus preventing borehole damage caused by the thawing of the surrounding permafrost. XC-polymer, prehydrated bentonite, guar gum, and hydroxyethyl cellulose are used as viscosifiers in KCl muds. Drispac or CMC may be used to reduce filtration, and caustic soda controls the pH of the fluid.

Polymer-gel muds are used in the intermediate stages of drilling at depths usually greater than 900 m. The primary advantage of these muds is more rapid penetration of the formation because of their low solids content. Other benefits include reducing the possibility of lost circulation, improved hydraulics, and reduced wear on the drill bit and pumping equipment (Northern Technical Services, 1981). Barite is commonly added to increase mud weight in order to prevent a "blowback" in formation pressure. X-C polymers, bentonite, and caustic soda are the other main constituents.

Lignosulfonate muds are primarily used when a formation pressure zone is encountered. Higher concentrations of lignosulfonate and lignite control fluid loss, induce temperature stability, and increase borehole stability. Barite, bentonite, and caustic soda are other major constituents.

Other less common water-based drilling fluids are described by McGlathlen (1980).

5.4.2.3 Drilling mud additives

Chemical additives are used to impart specific properties or enhance existing qualities of drilling muds. Some of the more common additives and the major functions of additive compounds are listed in Appendix B. Drilling conditions differ from well to well, and the composition of drilling muds is changed to suit borehole pressures and formation characteristics encountered while drilling. The rates of additive usage observed at Panarctic's operations illustrates the range and varying amounts which might be employed (Table 3). Barite, bentonite, caustic soda, and X-C polymers are the four drilling mud components used most often at all locations. Attapulgite clay is often used at offshore locations and contributes significantly to the total weight of solids used at offshore wellsites (Table 4).

Chemical composition of the drilling fluid changes with depth as bentonite and caustic soda used near the surface are replaced by barite, lignosulphonate, and lignin at greater depths. The major source of heavy metals in whole drilling muds are barite and lignosulphonate compounds. Table 5 outlines heavy metal concentrations in drilling muds used at the surface, intermediate, and bottom depths of one onshore and five offshore wells drilled between 1979 and 1981. Trace metal concentrations in various whole muds and specific components can be found in Neff (1982).

5.4.2.4 Oil contamination of drilling fluids

In the course of normal operations, drilling fluids are contaminated by oil in one of three ways:

1) penetration of oil-bearing formation;
2) use of a spotting fluid to free a stuck drill string;
3) use of an oil-based compound as a lubricant between the drill string and hole wall.

When an oil-bearing formation is penetrated, oil enters the drill fluid system through flushing of the drill cuttings. Oil also enters the drilling fluid systems if a diesel-spotting fluid is added to free drilling pipe that is sticking to the hole wall. Fluid is spotted around the point at which the drill string is stuck and the pipe is allowed to soak until free of the hole wall. In most cases, the pipe must soak for several hours during which time the diesel fluid percolates through the drilling fluid. As it percolates, the oil becomes emulsified and cannot be separated from the drilling fluid. Oil is also added to drilling fluid to act as a lubricant between the drill string and hole wall while drilling or tripping.

Table 3. Common Drill Fluid Components and Rates of Use at Panarctic's Sverdrup Basin Wells. (Source: Panarctic Oils Limited correspondence ARR-356-422.911.10, 15 Dec. 1981)

PRODUCT	DESCRIPTION	RATE OF USE	LC-50	PURPOSE
Barite	Barite	0-1140 Kg/m [3]	50,000ppm 1981 [1] ** 1982	for increasing mud weight
Salt gel	Attapulgite	0-70 Kg/m [3]	23,500ppm [3]	Viscosifier in salt water muds
Gel Bentonite	Bentonite	0-70 Kg/m [3]	750,000ppm [3]	Viscosity and filtration control in water base muds
Kelzan Duovis	XC Polymer	1-10 Kg/m [3]	1900ppm [3] **	Viscosifier and fluid loss control additive
Caustic Soda	Caustic Soda	0-10 Kg/m [3]	105ppm [2]	to maintain PH at 9.5
Bicarbonate of Soda	Sodium Bicarbonate	0-1.5 Kg/m [3]	7500ppm [2]	to control PH value
KCL. Potassium Cloride	Potassium Cloride	0-35 Kg/m [3]	10,000ppm [2]	shale control inhibitor
Tannathin	Lignite	0-10 Kg/m [3]	6500ppm [3]	dispursant
Spersene	Chrome Lignosulphonate	0-10 Kg/m [3]	3750ppm [3]	dispursant and fluid loss control for water base muds
C.M.C.	Sodium Carboxmethyl Cellulose	0-1 Kg/m [3]	3000ppm [2]	filtrate reducer
Kwik Seal	Kwik Seal	0-2 Kg/m [3]	Random	to prevent lost circulation
Inco Plug, Walnut Hulls, Nut Plug	Walnut Hulls	0-2 Kg/m [3]	2800ppm stirred [2] 5500ppm settled	to prevent lost circulation
Salt	Salt	0-30 Kg/m [3]	10,000ppm [3]	For saturated salt muds and resistivity control.
Chrome Alum	Chrome Alum	0-.1 Kg/m [3]	730ppm [3]	For use in cross linking XC, systems.
B-Free	Spotting Fluid for stuck pipe	not normally used	7.5 microlitres/ litre [1]	diesel fuel mix to be used only to free a drill string due to differential sticking.
Skot-Free	Surfacant mixed with diesel	not normally used	14.5mg/l [1]	
Pipe Lax	Surfacant Mixed with diesel	not normally used	1700ppm [3]	
Aluminum Stearate	Aluminum Stearate Powder	up to 50 kg/well	1100ppm [2]	Defoamer
SAPP	Sodium Acid Pyrophosphate	up to 25 kg/well	1700ppm [2]	for treating cement contamination
Mica	Mica	0-2 Kg/m [3]	random [2]	to prevent lost circulation
Sawdust	Sawdust	0-2 Kg/m [3]	random [2]	to prevent lost circulation
Peltex Q Broxin	Ferrochrome Lignosulphonate	0-10 Kg/m [3]	3000ppm [3] 1750ppm [3]	dispursant and fluid loss control additive for water base muds

Table 3. Common Drill Fluid Components and Rates of Use at Panarctic's Sverdrup Basin Wells. continued

PRODUCT	DESCRIPTION	RATE OF USE	LC-50	PURPOSE
Lime	Lime	0-10 Kg/m [3]	50ppm [3]	source of calcium for formulating lime muds
Sureflo W-300	Propriatory surface active agent	.001-.002 Kg/m [3]	50 mg/l [1]	reduce or eliminate foaming in drilling mud
LD-8	Propriatory surfuctant	.001-.002 Kg/m [3]	.67 g/l [1]	nonhydrocarbon defoamer
Staflo	Poylanionic Cellulose Powder	0-4 Kg/m [3]	4.2 g/l [1]	fluid loss reducer
Coat 888	Sodium Sulphide	.3-.5 Kg/m [3]	7 g/l [1]	oxygen scavenger
Soda Ash	Sodium Carbonate	.75-1.5 Kg/m [3]	75 mg/l [1]	treat out calcium from mud system
Coat 129	**	.2-.4 Kg/m [3]	**	Oxygen scavenger and scale inhibitor
Nickel Sulfate	Nickel Sulfate	.04-.08 Kg/m [3]	**	Catalyst for use with Coat 888
Torque-less	specific size glass beads	0-12 Kg/m [3]	**	lubricant to decrease torque load on drill string
Value 100	Detergent	variable	**	rig wash
Alchem Chem	**	up to 12 balls/24 hrs.	**	boiler additive
Arctic Blend	**	up kto 3.1 oz./24 hrs.	**	boiler additive
Alchem Liquid High PH	**	variable	**	boiler additive
Ultraglide 100		variable	500ppm [1]	Premixed B.O.P. hydraulic fluid
L.O.C.	Detergent	variable	45ppm [1]	rig wash
Industrial Clean	Detergent	variable	240ppm [1]	rig wash
Diesel	Diesel	not normally used	1ppm [3]	mixed with B-Free, Skot-Free or Pipe-lax to free a drill string stuck due to diffential sticking

** - information to be forthcoming.

1 - Panarctic Files

2 - Industry/Government Working Group "A" under the auspices of the Arctic Petroleum Operators Assoc. and Environment Canada, Volume #1 - Summary report of Industry/Government Research on Pollution From Drilling Wastes, January, 1976.

3 - Other Sources.

Table 4. Range and Mean Use of Common Drilling Mud Components for each 100 m Well Depth. (Source: Ladouceur, E., Environmental Review of Panarctic Oils Limited Offshore Drilling Operations in the High Arctic, 1979 and 1980 Seasons.)

	ONSHORE WELLS (n=36)			OFFSHORE WELLS (n=22)		
	RANGE (kg/100 m)	MEAN (kg/100 m)	n OF WELLS USING COMPONENT	RANGE (kg/100 m)	MEAN (kg/100 m)	n OF WELLS USING COMPONENT
Attapulgite Clay	0-981	475	6	0-2,225	668	19
Barite	166-37,274	4,289	36	3,426-19,609	9,151	22
Bentonite Clay	15-6,135	1,257	36	0-3,191	1,199	20
Caustic Soda	0-370	163	34	16-390	148	22
Chrome Alum	0-99	48	29	0-50	16	4
Chrome Lignosulphonate	0-369	69	13	0-77	38	5
Lignite	0-95	31	7	0-111	31	11
Potassium Chloride	0-1,201	644	4	0-3,592	2,595	3
X-C Polymer	60-545	272	36	66-567	220	22

Table 5. Analysis of Dissolved Metals in Drilling Fluids Used at Three Drilling Depth Ranges. (Source: COGLA Well History Microfiche Drilling Authorities. See Appendix C.)

WELL DEPTH	METALS	WHITEFISH H-63	HAZEN ST. F-54	HOODOO N-52	WHITEFISH 2H-63	CHAR G-07	BALAENA D-58
		CONCENTRATION (mg/l)	(mg/l)	(mg/l)	CONCENTRATION (mg/kg)	(mg/kg)	(mg/kg)
0-800m	Cu	0.02	not available	0.09	3.1	28.8	1.9
	Pb	0.15	0.59	0.11	4.4	81.1	6.0
	Cr	<0.05	not available	0.08	8.8	25.4	2.0
	Cd	0.04	0.15	<0.01	2.2	7.6	0.61
	Ni	0.15	0.39	0.08	4.2	23.9	1.3
	Zn	<0.02	0.04	0.12	14.8	423.0	65.0
	Hg	0.25*	<0.02*	0.82*	0.20**	0.36**	4.9**
800-1,600m	Cu	0.03	0.04	0.04	12.2	5.2	6.1
	Pb	0.19	0.24	0.22	26.0	13.0	29.3
	Cr	1.16	<0.05	0.03	11.0	6.2	12.6
	Cd	0.05	0.10	<0.01	5.6	1.5	0.30
	Ni	0.23	0.70	0.08	7.8	3.6	5.8
	Zn	0.06	0.10	0.16	188.0	81.0	83.5
	Hg	<0.02*	0.57*	0.10*	1.3**	1.7**	3.2**
1,600m +	Cu	0.02	0.03	0.08	10.9	16.1	8.3
	Pb	0.22	0.19	<0.02	81.0	37.0	86.1
	Cr	0.20	0.52	<0.01	16.3	7.6	27.6
	Cd	0.07	0.05	<0.01	3.8	0.50	4.2
	Ni	0.28	0.26	0.08	6.2	10.8	9.9
	Zn	0.02	0.03	0.78	229.0	437.0	137.0
	Hg	<0.02*	0.08*	1.20*	8.2**	4.2**	2.6**

* Hg concentration measured in µg/l.

** Hg concentration measured in mg/l.

5.4.2.5 Onshore disposal practices

At onshore drilling locations, waste drill fluid and cuttings are discharged into a sump adjacent to the drill rig. The sump is generally blasted out with explosives and the loosened material removed and heaped to one side with bulldozers. The dimensions of these sumps vary according to the anticipated volume of drill fluids and cuttings which, in turn, is dependent on the composition of the drilled strata. To accommodate the average of 10.2 tonnes of drilling fluids used for every 100 m of drilling depths, the sump typically has dimensions of about 50 by 30 by 4 m or a volume of about 6,000 m^3. Just over two-thirds of this volume is available for disposal however, since DIAND operating conditions for onshore wells require a minimum of 1.2 m of freeboard to be left upon completion of the well. Drill fluids which have impinged or may potentially encroach upon this freeboard are required to be discharged into an additional sump.

Backfilling of the sump is usually not carried out until mid or late winter when frozen ground reduces surficial terrain disturbances by heavy vehicles and sump fluids are sufficiently frozen to support the weight of overburden. Excavated sump material is mounded over the frozen fluids (Figure 17) partly to insulate and prevent thawing of disposed fluids and partly to compensate for subsidence.

The costs of sump construction and backfilling and the relatively low levels of biological activity at some wellsites has prompted industry to assess the feasibility of discharging drilling fluids directly to the ground surface. A study of one surface disposal method was undertaken at the Panarctic Dome *et al.* Hoodoo N-52 wellsite between 29 September and 10 November 1981. A total of 950 m^3 of drilling fluid was spread to an average thickness of 1.5 to 2.0 m over a 150 m^2 area enclosed by snow berms (French Arctic Consultants, 1982a). Experimental study of vegetation and water quality parameters indicate short-term effects of surface disposal to be relatively localized, although these results are viewed as inconclusive by Environmental Protection Service personnel (W. Fenton, pers. comm., 1984).

5.4.2.6 Offshore disposal practices

Drill fluids and cuttings from each well are normally discharged into Arctic waters in accordance with sections of the Canada Oil and Gas Drilling Regulations administered by the Canada Oil and Gas Lands Administration (COGLA) and Environmental Operating Conditions administered by the Arctic Waters Advisory Committee (AWAC). No treatment is required for conductor hole cuttings and seawater used as a drilling fluid, which are discharged directly onto the sea floor. Drilling fluids (including muds) and cuttings generated by drilling below conductor hole depth are returned to the surface where separate treatments are given to oil-contaminated and oil-free material. The Environmental Operating Conditions contain a general requirement for oil-free drilling fluids to be diluted prior to discharge. In practice, drilling fluids are diluted to achieve a 25 to 1 ratio of water to fluid, after which the diluted mixture is discharged to ocean waters from a point 10 m below the sea ice bottom. Oil-contaminated drilling fluids are treated and disposed of according to practices outlined in Panarctic's "Oil-Contaminated Drilling Waste Contingency Plan" (Panarctic, 1981). Drilled cuttings containing free oil are collected at the rig surface and placed in containers for disposal at

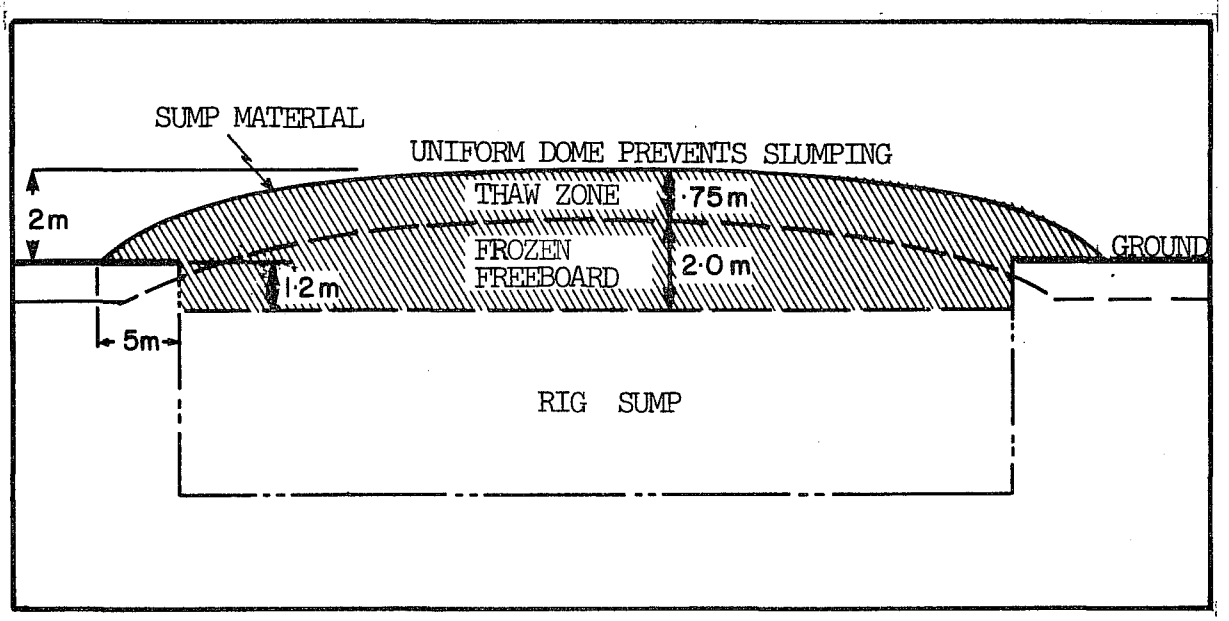


Figure 17. Schematic of Disposal Sump After Backfilling. (Adapted from French, 1978)

an onshore disposal site. Drilling fluids containing emulsified oil are diluted to the extent that the oil constitutes less than 0.5 percent of the diluted volume. Like uncontaminated drill fluids, the diluted mixture is discharged into ocean waters at a point 10 m below the ice bottom.

To date, the only recorded use of oil-based drilling fluids has been at the Panarctic et al. Cisco M-22 well completed in April 1984. Contaminated drilling fluids were segregated at the well surface and transported to Lougheed Island for incineration and burial.

Combustible garbage and debris are incinerated daily in a oil-fired incincerator. The residue and non-combustible debris are transported to an onshore garbage pit and buried or is packed in containers for transport to Rea Point and subsequent burial.

5.5 Hydrocarbon drilling activities, 1974 to 1984

5.5.1 Operator involvement in drilling

Since 1974, the majority of exploration and delineation drilling in the Sverdrup Basin has been carried out under the auspices of Panarctic Oils Limited. To illustrate, 68 of the 80 wells drilled in the Region between January 1974 and June 1984 were sponsored by Panarctic with the remaining 12 wells divided among eight other oil companies (Figure 18). Panarctic's drilling activities were most intense from 1974 to 1978, when 44 of its 68 wells were drilled at an average of about nine wells per year. Between January 1979 and June 1984, Panarctic's efforts were nearly halved as 24 wells were drilled for an average of less than five wells per year. Panarctic's drilling activities in both of these periods far outpaced those of the other companies active in the Region. In terms of wells drilled, Dome Petroleum Limited was a distant second to Panarctic with just four wells to its credit, while Elf Oil Exploration Limited was third with two wells. Only Panarctic and Dome completed more than a single well in one year. All wells drilled by companies other than Panarctic were completed prior to 1981. Panarctic has continued as the lead operator in the Region since 1981.

Despite the overall intensity of its drilling activities, Panarctic has tended to confine exploratory and delineation drilling to the central portion of the Sverdrup Basin, roughly bounded by Ellef Ringnes and Cameron islands and Sabine Peninsula on Melville Island. Drilling has focused on six areas: Sabine Peninsula and the offshore regions east and west of the Peninsula, Cameron Island, Danish Strait, the southern half of Ellef Ringnes Island, Maclean Strait, and offshore areas west of Lougheed Island. Isolated Panarctic wells can be found near Hecla and Griper Bay on Melville Island, the northwest tip of Melville Island, Eglinton Island, northern Ellef Ringnes Island, and Bathurst Island. Panarctic's recent (1982 to present) drilling activities have primarily focused on offshore locations in Maclean Strait, Danish Strait, west of Lougheed Island and Hazen Strait, east of Mackenzie King Island, and onshore locations on Sabine Peninsula.

In contrast, wells drilled by the remaining eight companies were more isolated or widely located throughout the Sverdrup Basin Region. Dome Petroleum's wells, for example, were located on Meighen Island, King Christian Island, Sabine Peninsula, and southern Ellef Ringnes Island. Elf Oil Exploration Limited (Elfex) confined its activities to Prince Patrick Island, drilling two wells on the southern and western portions of the Island. Single

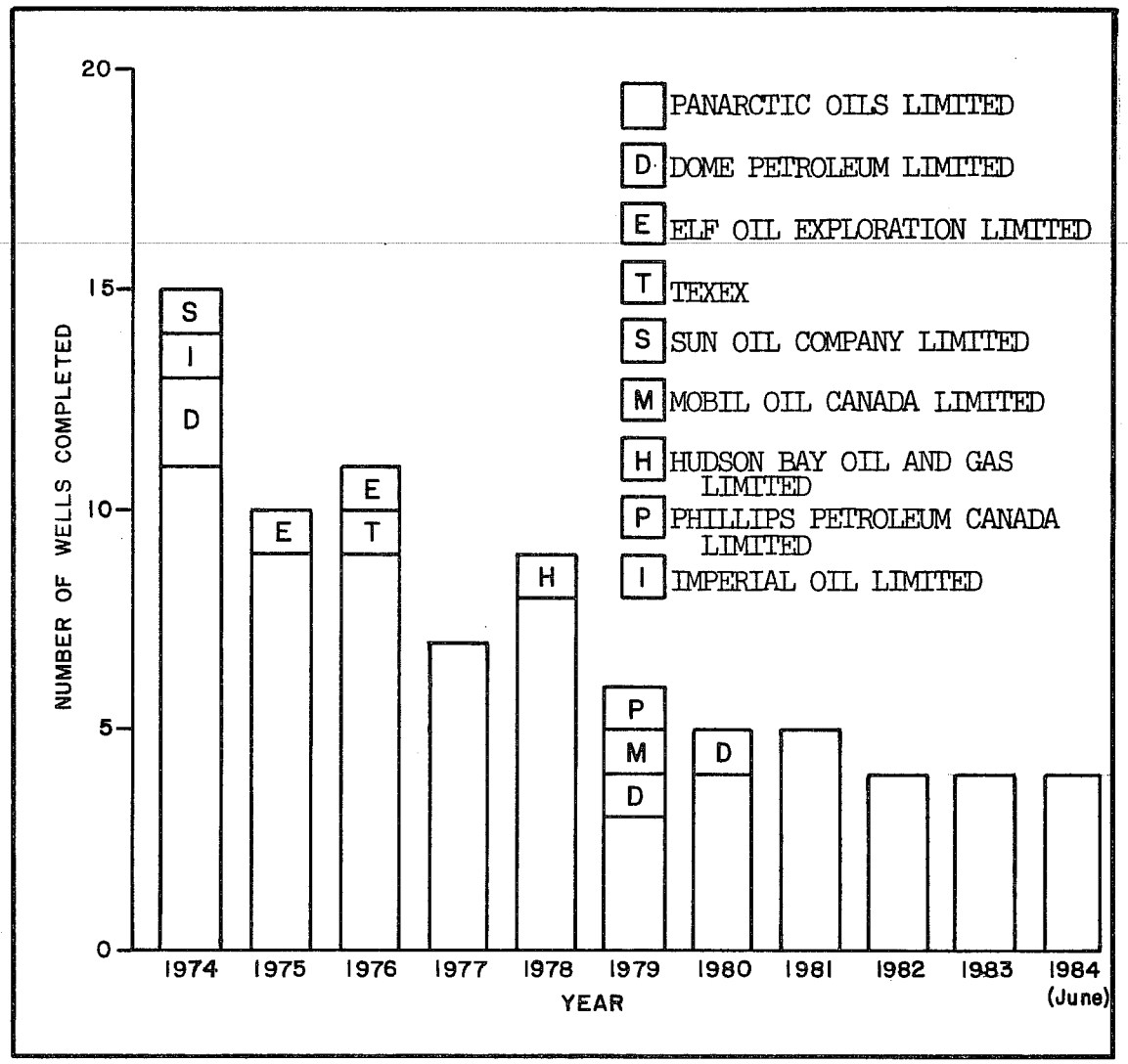
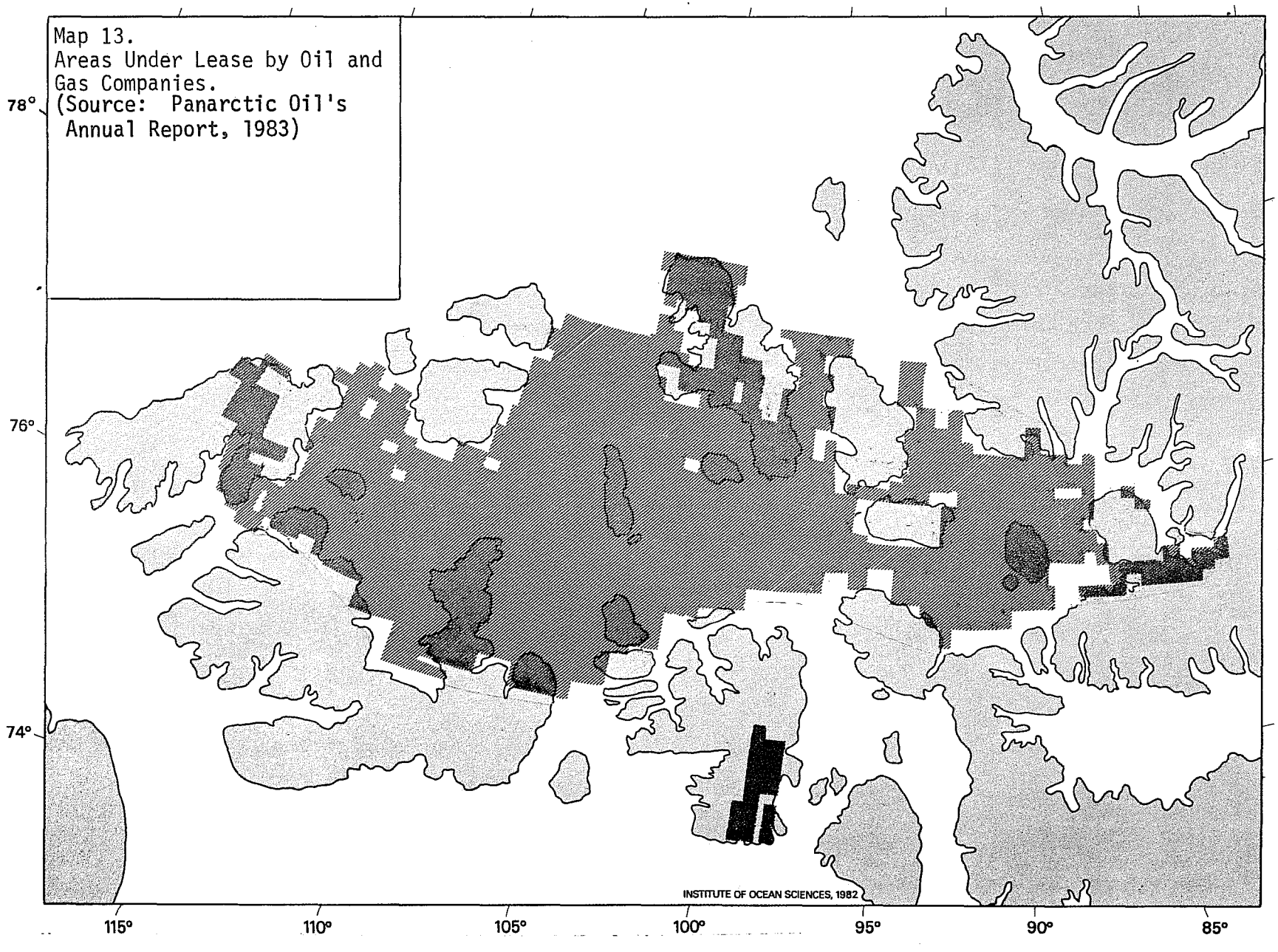
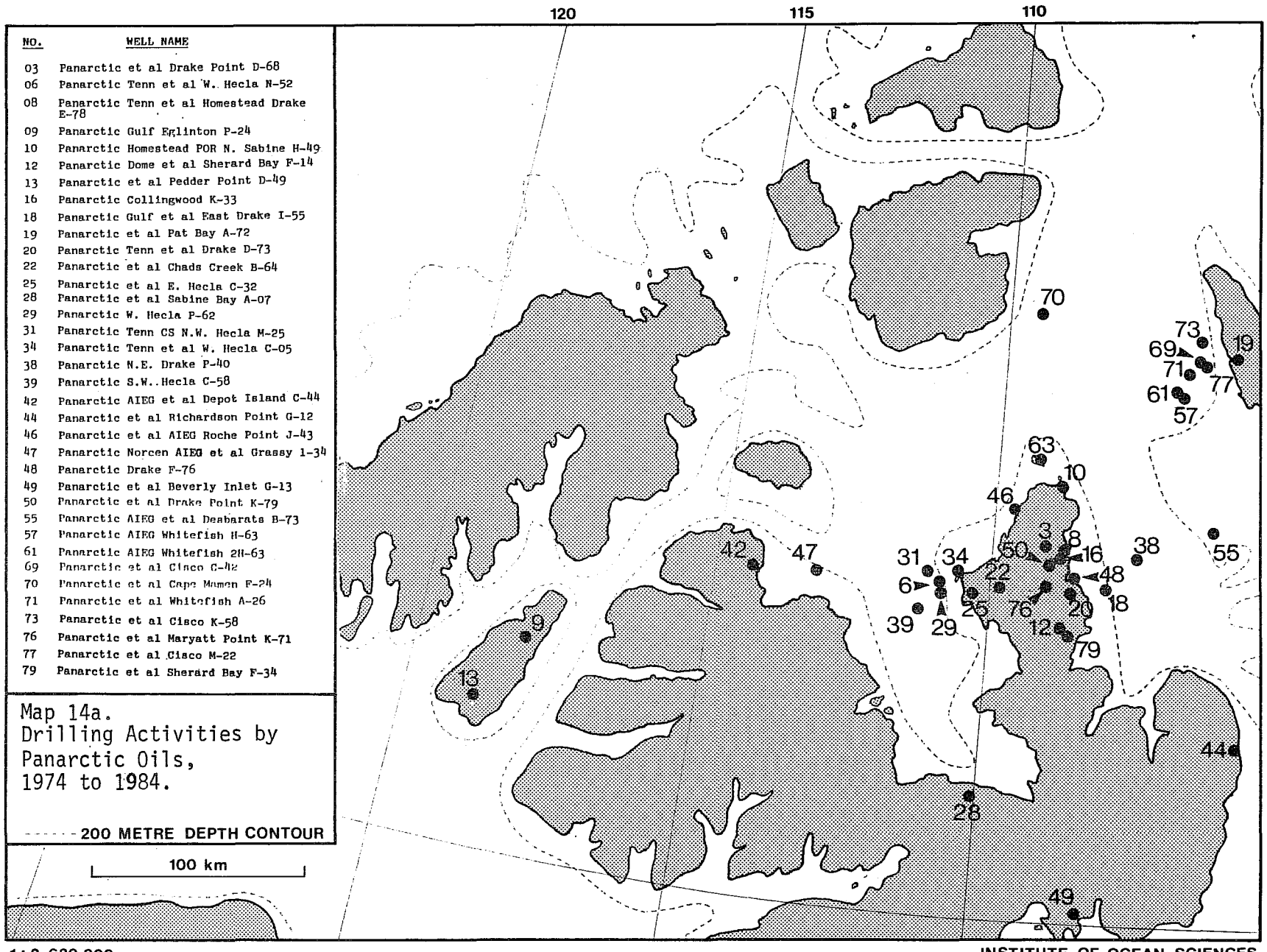


Figure 18. Sverdrup Basin Wells Completed by Company, 1974 to 1984.


Map 13.
Areas Under Lease by Oil and Gas Companies.
(Source: Panarctic Oil's Annual Report, 1983)
78°
76°
74°
115°
110°
105°
100°
95°
90°
85°
INSTITUTE OF OCEAN SCIENCES, 1982


120
115
110
NO. WELL NAME
03 Panarctic et al Drake Point D-68
06 Panarctic Tenn et al W. Hecla N-52
08 Panarctic Tenn et al Homestead Drake E-78
09 Panarctic Gulf Eglinton P-24
10 Panarctic Homestead POR N. Sabine H-49
12 Panarctic Dome et al Sherard Bay F-14
13 Panarctic et al Pedder Point D-49
16 Panarctic Collingwood K-33
18 Panarctic Gulf et al East Drake I-55
19 Panarctic et al Pat Bay A-72
20 Panarctic Tenn et al Drake D-73
22 Panarctic et al Chads Creek B-64
25 Panarctic et al E. Hecla C-32
28 Panarctic et al Sabine Bay A-07
29 Panarctic W. Hecla P-62
31 Panarctic Tenn CS N.W. Hecla M-25
34 Panarctic Tenn et al W. Hecla C-05
38 Panarctic N.E. Drake P-40
39 Panarctic S.W..Hecla C-58
42 Panarctic AIEG et al Depot Island C-44
44 Panarctic et al Richardson Point G-12
46 Panarctic et al AIEG Roche Point J-43
47 Panarctic Norcen AIEG et al Grassy 1-34
48 Panarctic Drake F-76
49 Panarctic et al Beverly Inlet G-13
50 Panarctic et al Drake Point K-79
55 Panarctic AIEG et al Deabarats B-73
57 Panarctic AIEG Whitefish H-63
61 Panarctic AIEG Whitefish 2H-63
69 Panarctic et al Cisco C-42
70 Panarctic et al Cape Mamen F-24
71 Panarctic et al Whitefish A-26
73 Panarctic et al Cisco K-58
76 Panarctic et al Maryatt Point K-71
77 Panarctic et al Cisco M-22
79 Panarctic et al Sherard Bay F-34
Map 14a.
Drilling Activities by
Panarctic Oils,
1974 to 1984.
200 METRE DEPTH CONTOUR
100 km
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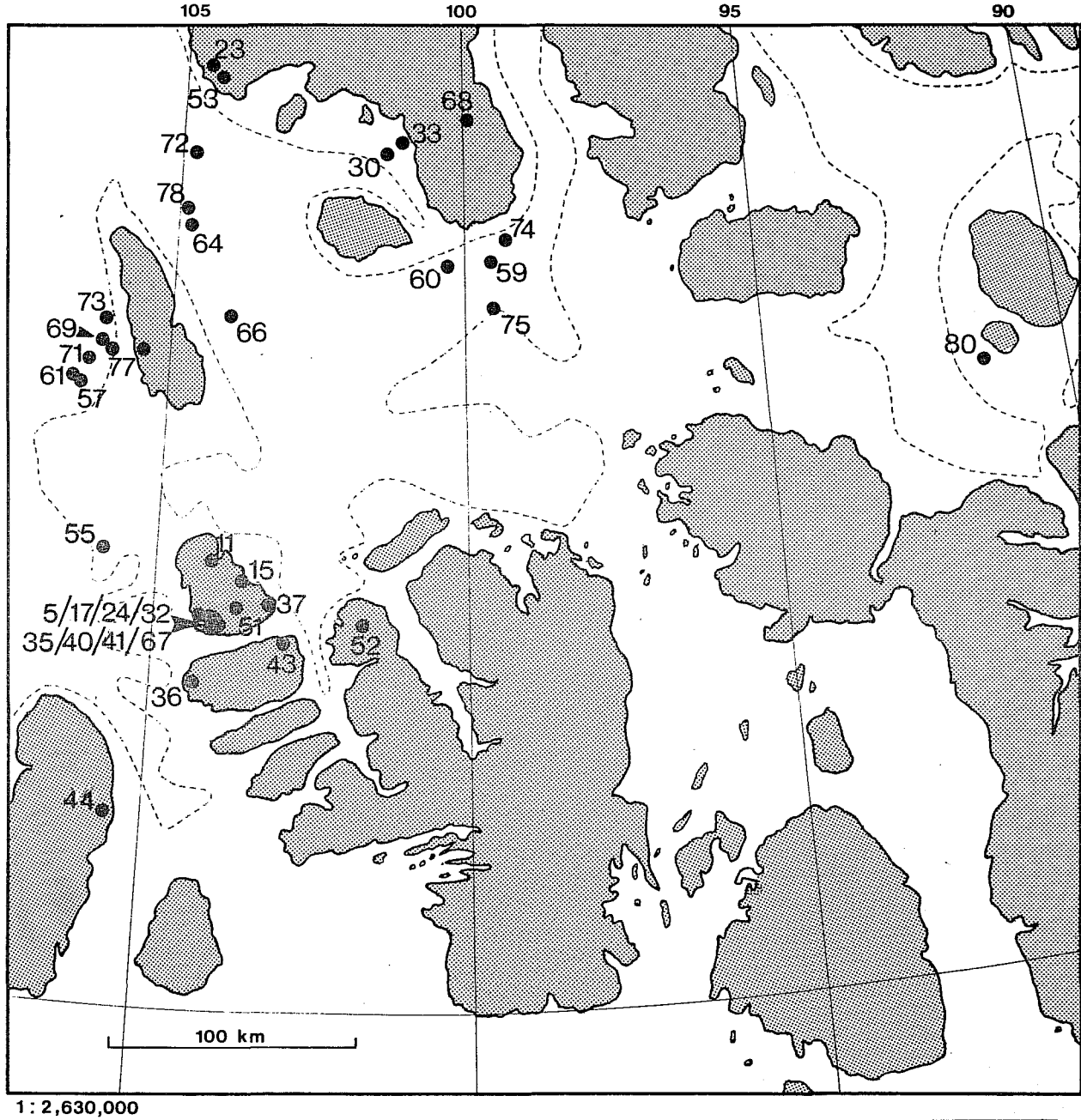

Map 14b.
Drilling Activities by
Panarctic Oils,
1974 to 1984.

NO.	WELL NAME
05	Panarctic Tenn et al Bent Horn N-72
11	Panarctic Tenn Robert Harbour K-07
15	Panarctic Cape Fleetwood M-21
17	Panarctic et al W. Bent Horn C-44
23	Panarctic Mocklin Point D-23
24	Panarctic Bent Horn F-72
30	Panarctic et al Jackson Bay G-16
32	Panarctic W. Bent Horn E-43
33	Panarctic et al Jackson Bay G-16A
35	Panarctic et al West Bent Horn A-02
36	Panarctic et al Key Point O-51
37	Panarctic Charles Point G-07
40	Panarctic et al West Bent Horn I-01A
41	Panarctic West Bent Horn M-12
43	Panarctic Sophie Point G-19
44	Panarctic et al Richardson Point G-12
51	Panarctic et al Bent Horn A-57
52	Panarctic et al Stoken Range J-11
53	Panarctic et al Noice D-41
55	Panarctic AIEG et al Desbarats B-73
57	Panarctic AIEG Whitefish H-63
59	Panarctic AIEG Dome PPC Char G-07
60	Panarctic AIEG PPC Balaena D-58
61	Panarctic AIEG Whitefish 2H-63
64	Panarctic AIEG PPC Dome Skate B-80
66	Panarctic AIEG PPC Dome Maclean I-72
67	Panarctic W. Bent Horn G-02
68	Panarctic Dome et al Hoodoo N-52
69	Panarctic et al Cisco C-42
71	Panarctic et al Whitefish A-26
72	Panarctic et al Sculpin K-08
73	Panarctic et al Cisco K-58
74	Panarctic et al Cape Macmillan 2K-15
75	Panarctic et al Grenadier A-26
77	Panarctic et al Cisco M-22
78	Panarctic et al Skate C-59
80	Panarctic et al Buckingham O-68

------200 METRE DEPTH CONTOUR

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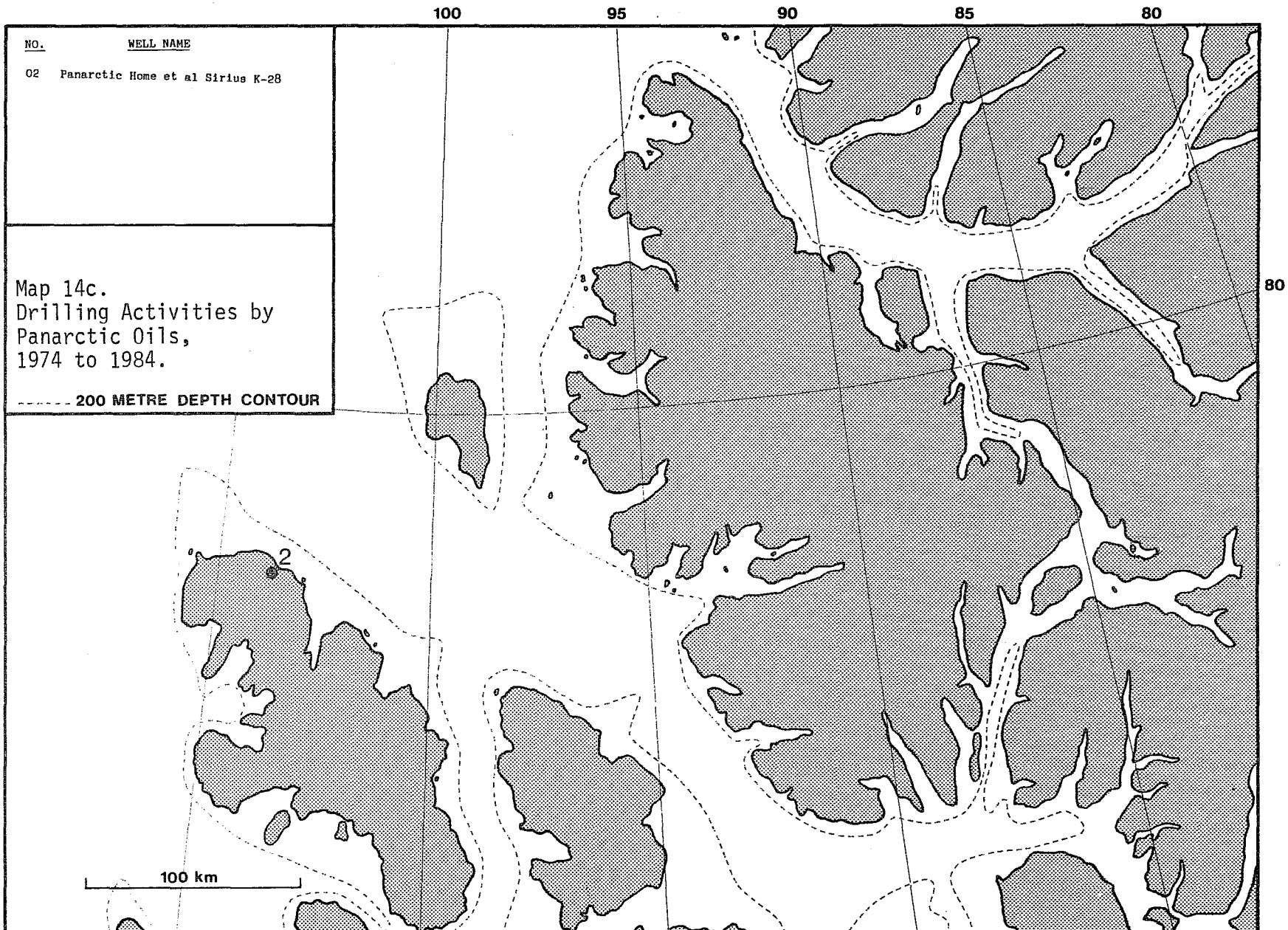

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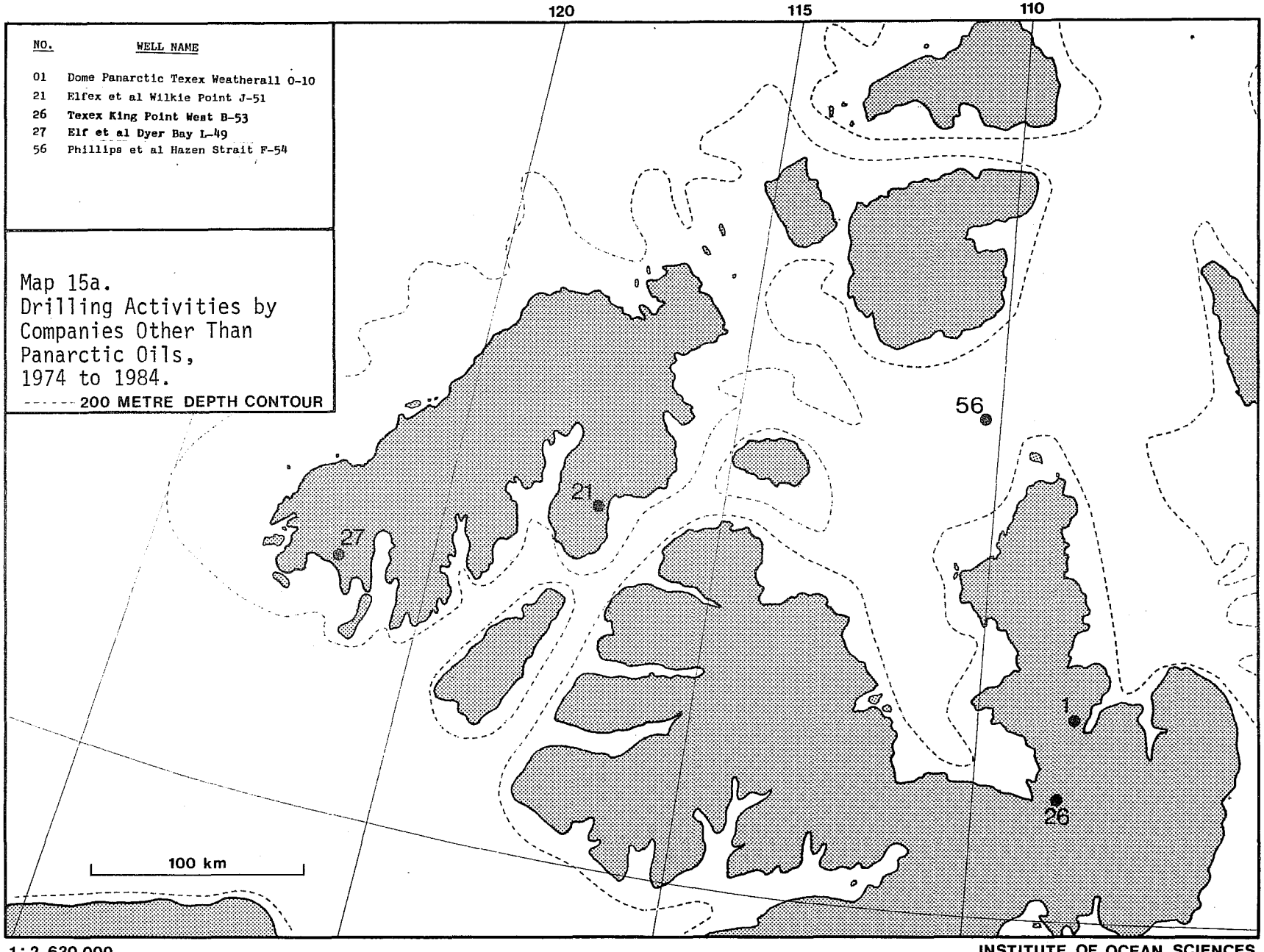
120
115
110
NO.
WELL NAME
01 Dome Panarctic Texex Weatherall O-10
21 Elfex et al Wilkie Point J-51
26 Texex King Point West B-53
27 Elf et al Dyer Bay L-49
56 Phillips et al Hazen Strait F-54
Map 15a.
Drilling Activities by
Companies Other Than
Panarctic Oils,
1974 to 1984.
200 METRE DEPTH CONTOUR
56
21
27
1
26
100 km
1:2,630,000
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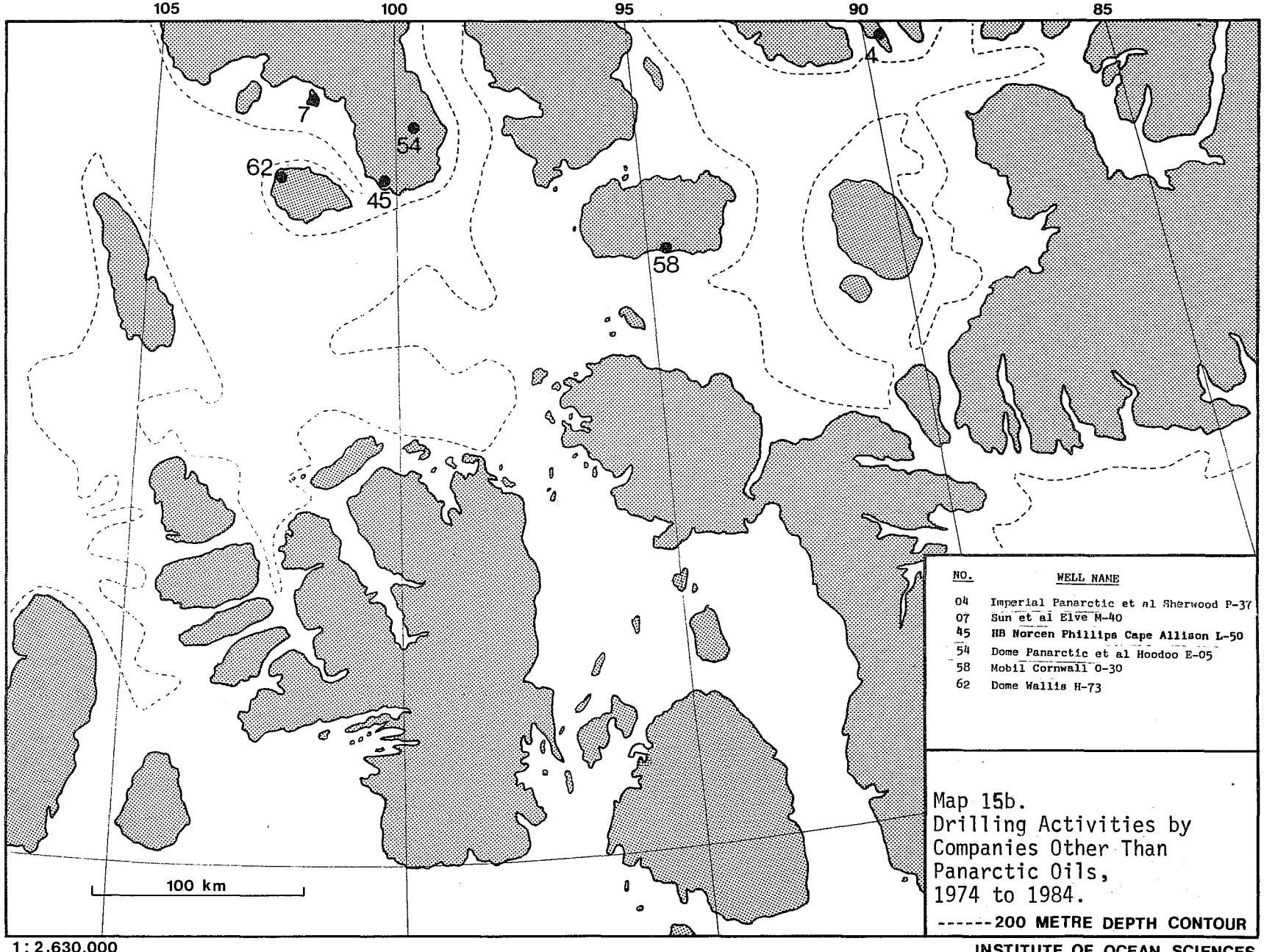
105
100
95
90
85
4
7
54
62
45
58
100 km
NO.
WELL NAME
04 Imperial Panarctic et al Sherwood P-37
07 Sun et al Elve M-40
45 HB Norcen Phillips Cape Allison L-50
54 Dome Panarctic et al Hoodoo E-05
58 Mobil Cornwall O-30
62 Dome Wallis H-73
Map 15b.
Drilling Activities by Companies Other Than Panarctic Oils, 1974 to 1984.
------200 METRE DEPTH CONTOUR
1 : 2,630,000
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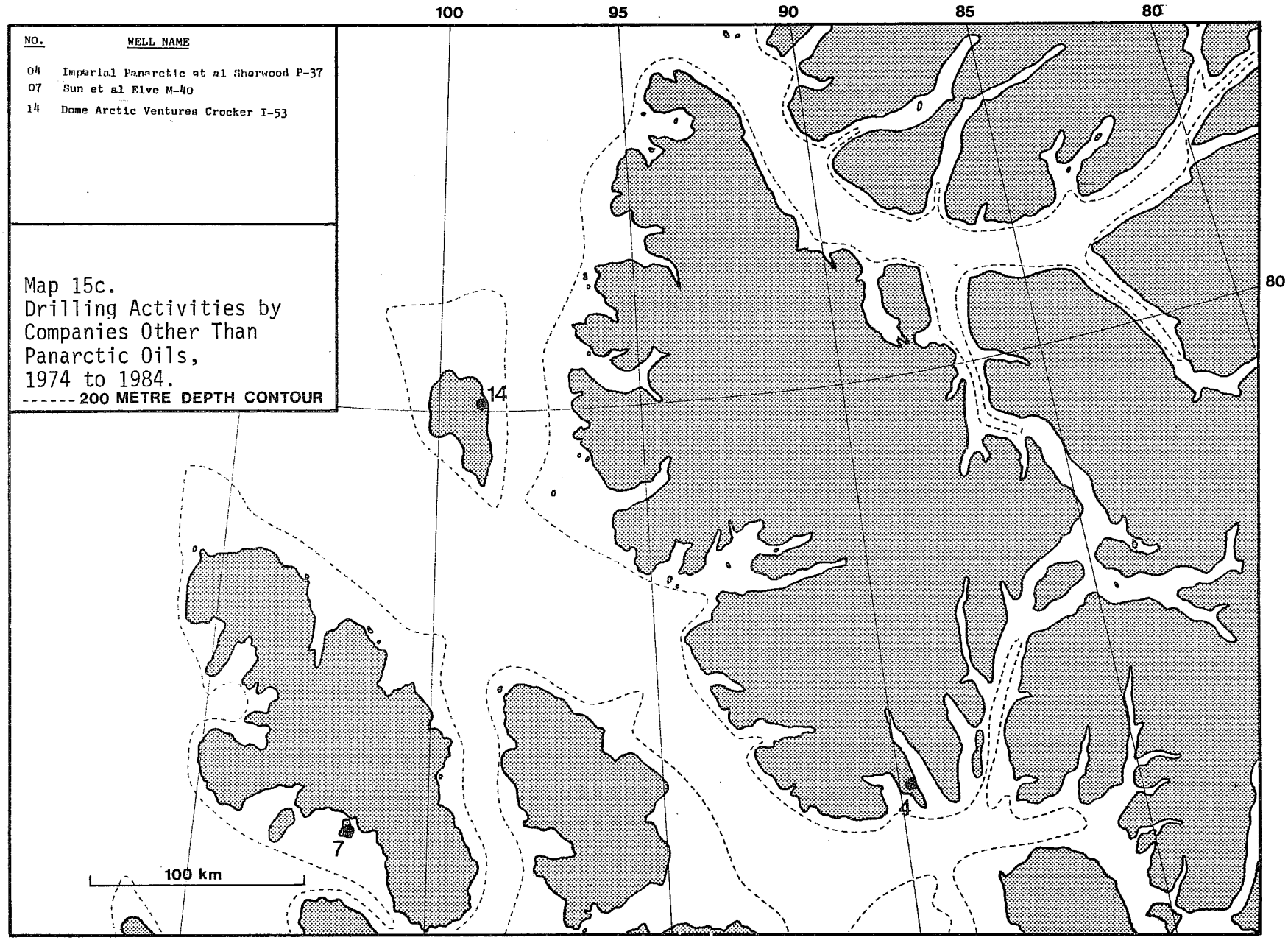

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wells by Mobil Oil Canada Limited, Hudson Bay Oil and Gas Limited, Phillips Petroleum Canada Limited, Sun Oil Company Limited (Sunoco), Imperial Oil Limited, and Texaco Canada Limited were drilled on Cornwall Island, southern Ellef Ringnes Island, Hazen Strait, Ellef Ringnes Island, southern Axel Heiberg Island, and Hecla and Griper Bay respectively.

5.5.2 Onshore and offshore drilling comparison

Exploration and delineation drilling in the Sverdrup Basin showed a marked shift in emphasis from onshore to offshore locations between 1974 and 1984 (Figure 19). Initially, from 1974 to 1978, the majority of wells (approximately 80%) were drilled at onshore locations. However, by 1979, drilling was evenly divided between onshore and offshore locations. More recently (1980 to June, 1984), onshore wells comprised less than 25% of drilling locations. This decline was not due to a corresponding increase in the annual number of offshore wells drilled during this period. As Figure 19 indicates, the number of offshore wells drilled from 1976 to 1984 ranged from two and four wells per year with a mean of just over three offshore wells per year. Since 1976 (the first year of extensive use of artificially-strengthened ice platforms), the relative number of offshore wells drilled each year has remained somewhat constant, while the relative numbers of onshore wells declined dramatically. Thus, the increasing share of drilling activities contributed by offshore wells reflects a declining interest in onshore drilling as opposed to increased interest in offshore locations.

5.5.3 Areal and chronological distribution of exploration drilling

5.5.3.1 Drilling activities, 1974 to 1978

Exploratory wells completed between 1974 and 1978 were concentrated to Melville, Cameron and Ellef Ringnes islands and in offshore areas adjacent to Sabine Peninsula. Of 53 wells, 42 were drilled on land masses and 11 were completed offshore. Melville Island served as the focus for nearly half of these wells, as 26 wells were drilled on the land mass and adjacent waters of the Island. Prior gas discoveries at the Hecla and Drake fields (1969 to 1973) led to the further drilling of 10 wells on Sabine Peninsula, nine by Panarctic and one by Dome Petroleum. Five wells were drilled on the Peninsula in 1974 with two (Panarctic et al. Drake E-78 and Panarctic Drake Point D-68) completed as gas wells. In 1975, two additional onshore gas well completions were made at the Panarctic et al. Drake D-73 and Panarctic et al. East Hecla C-32 wellsites, while two other wells on the Peninsula were abandoned. Between 1976 and 1978, another seven wells were drilled and abandoned on Melville Island including two wells on the Sabine Peninsula, two in the vicinity of Hecla and Griper Bay, and one well on each of the east, south, and northwestern coasts. One well was drilled on a small island off the west coast of Sabine Peninsula.

Cameron Island was the second most intensively-explored area, with 11 onshore wells completed from 1974 to 1978. The Bent Horn area, the Island's southwest corner, received the most attention, with seven wells drilled (paired wells, such as the W. Bent Horn I-01, I-01A wells and Bent Horn F-72, F-72A wells, are counted as single wells); an additional four wells were drilled in the north and east regions of the island. One of the early Bent

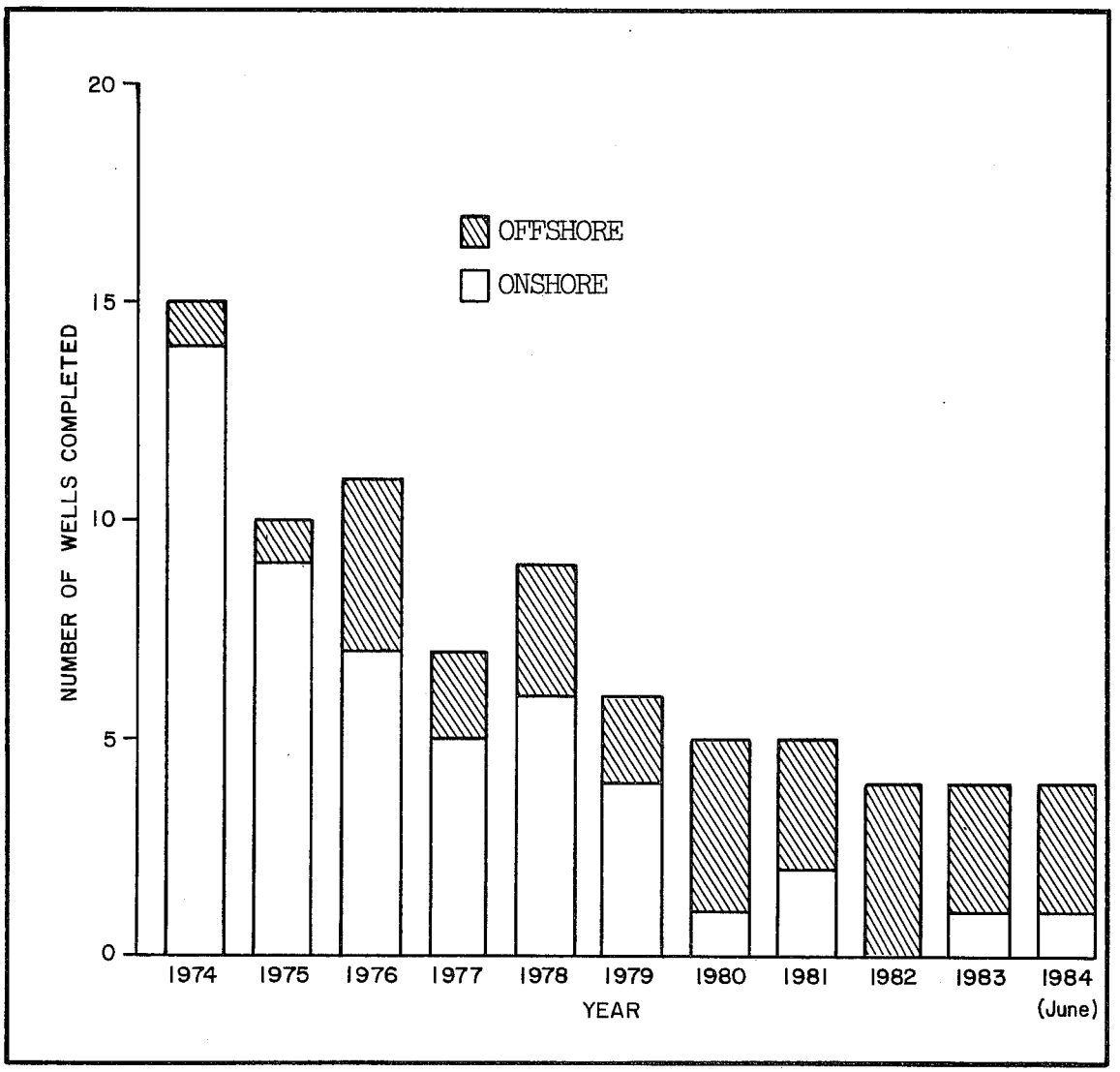
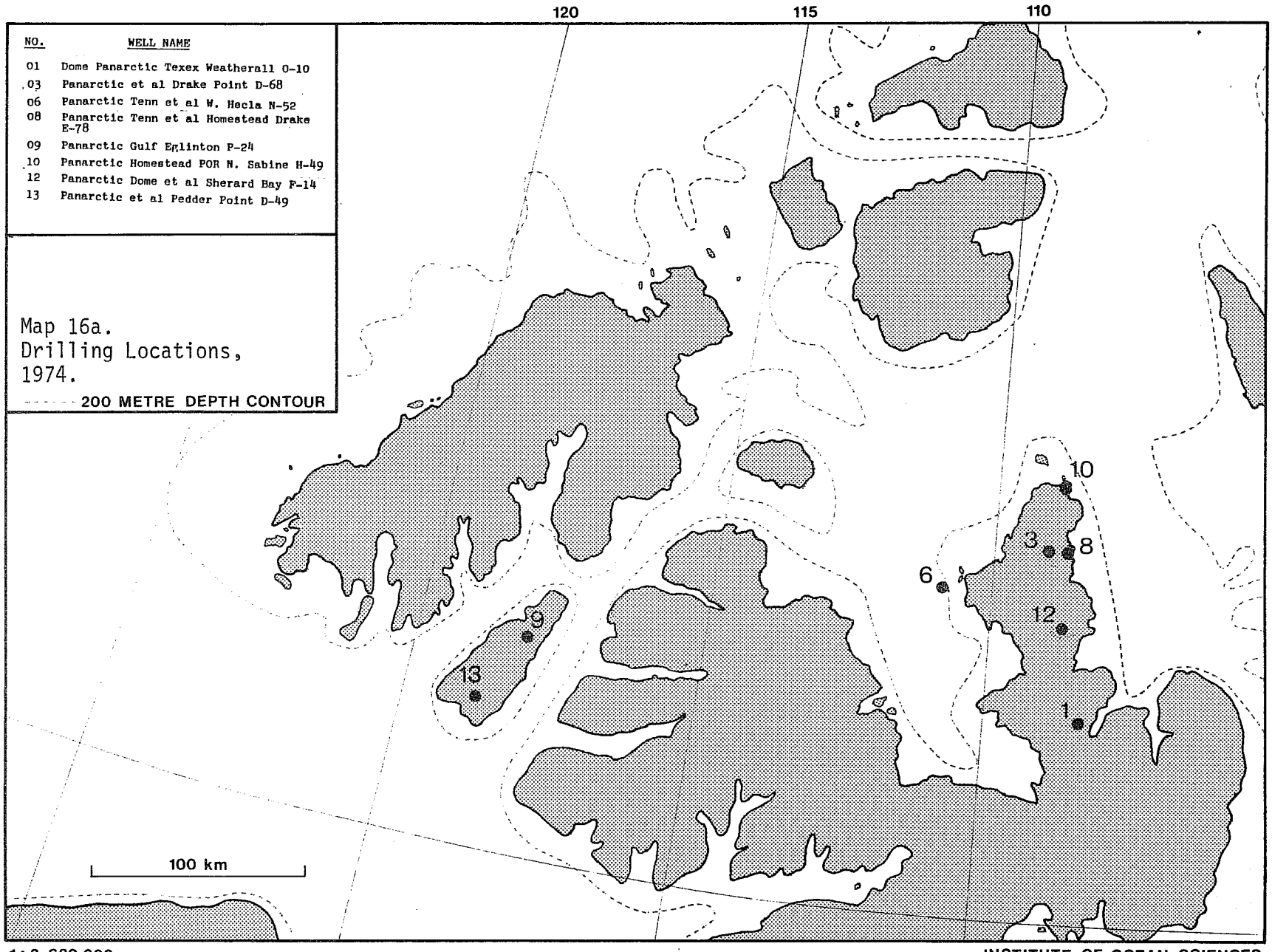


Figure 19. Annual Exploratory Drilling Activity by All Companies, 1974 to 1984.



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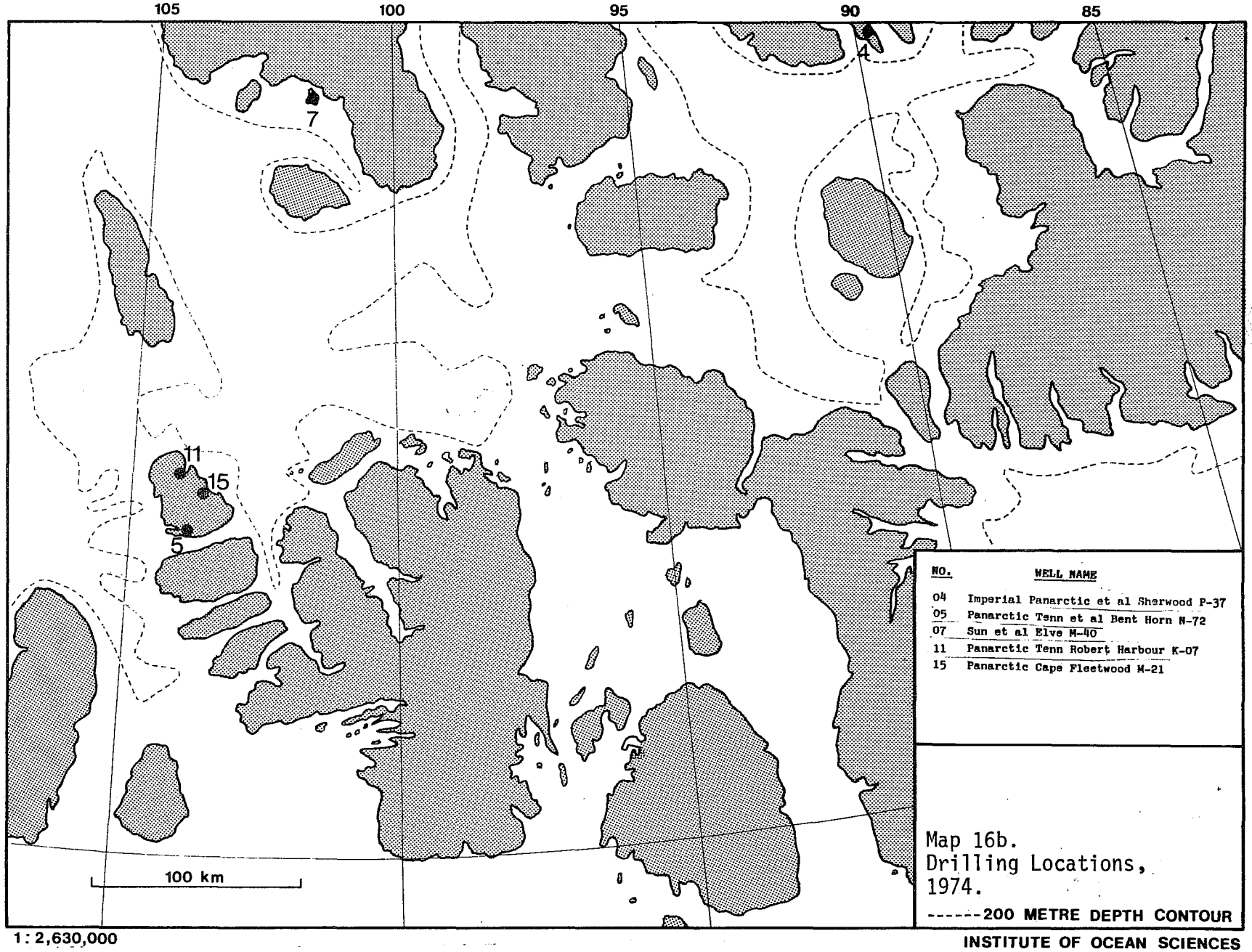
105
100
95
90
85
7
4
11
15
5
100 km
NO.
WELL NAME
04 Imperial Panarctic et al Sherwood P-37
05 Panarctic Tenn et al Bent Horn N-72
07 Sun et al Elve M-40
11 Panarctic Tenn Robert Harbour K-07
15 Panarctic Cape Fleetwood M-21
Map 16b.
Drilling Locations,
1974.
------200 METRE DEPTH CONTOUR
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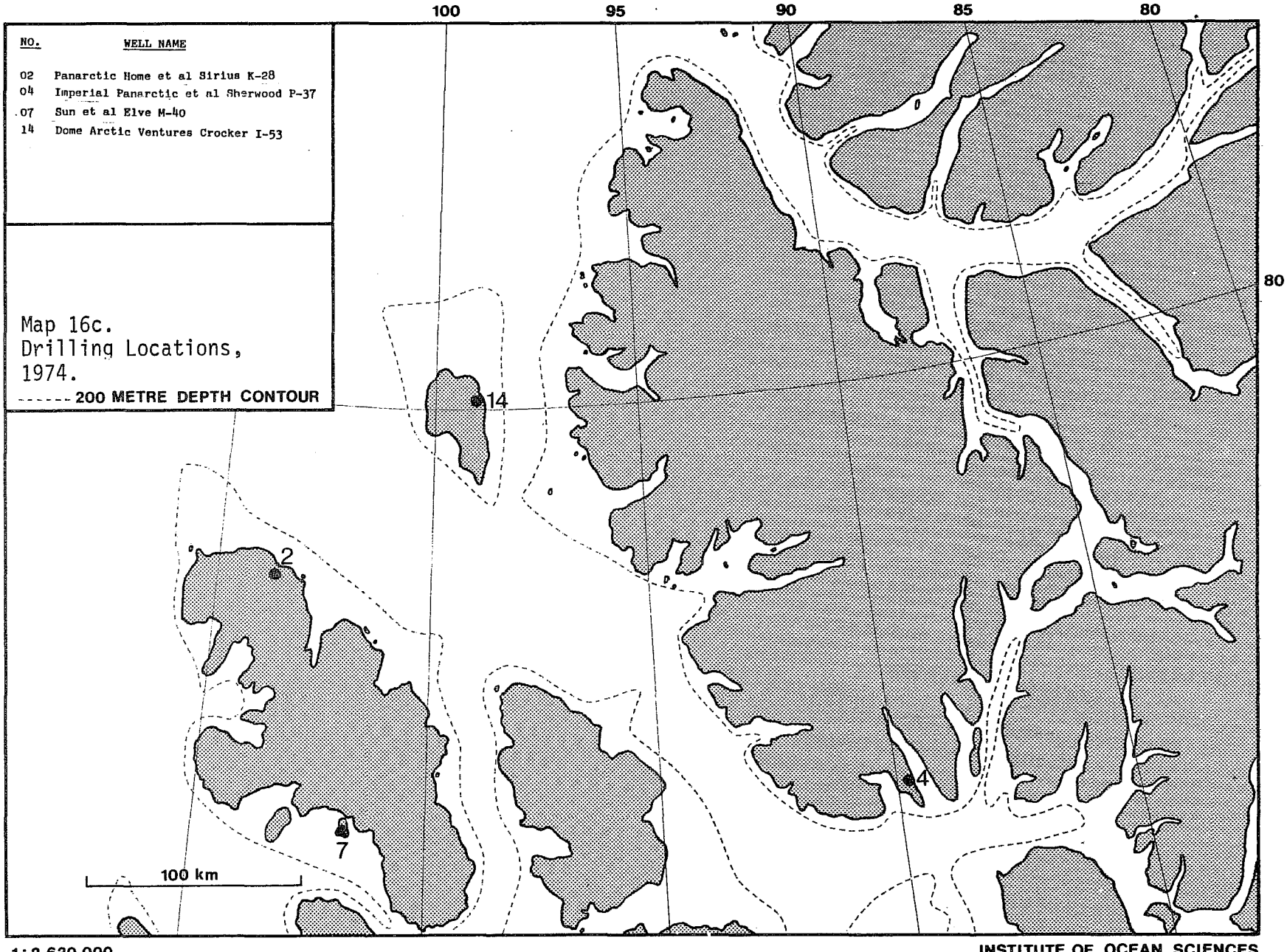

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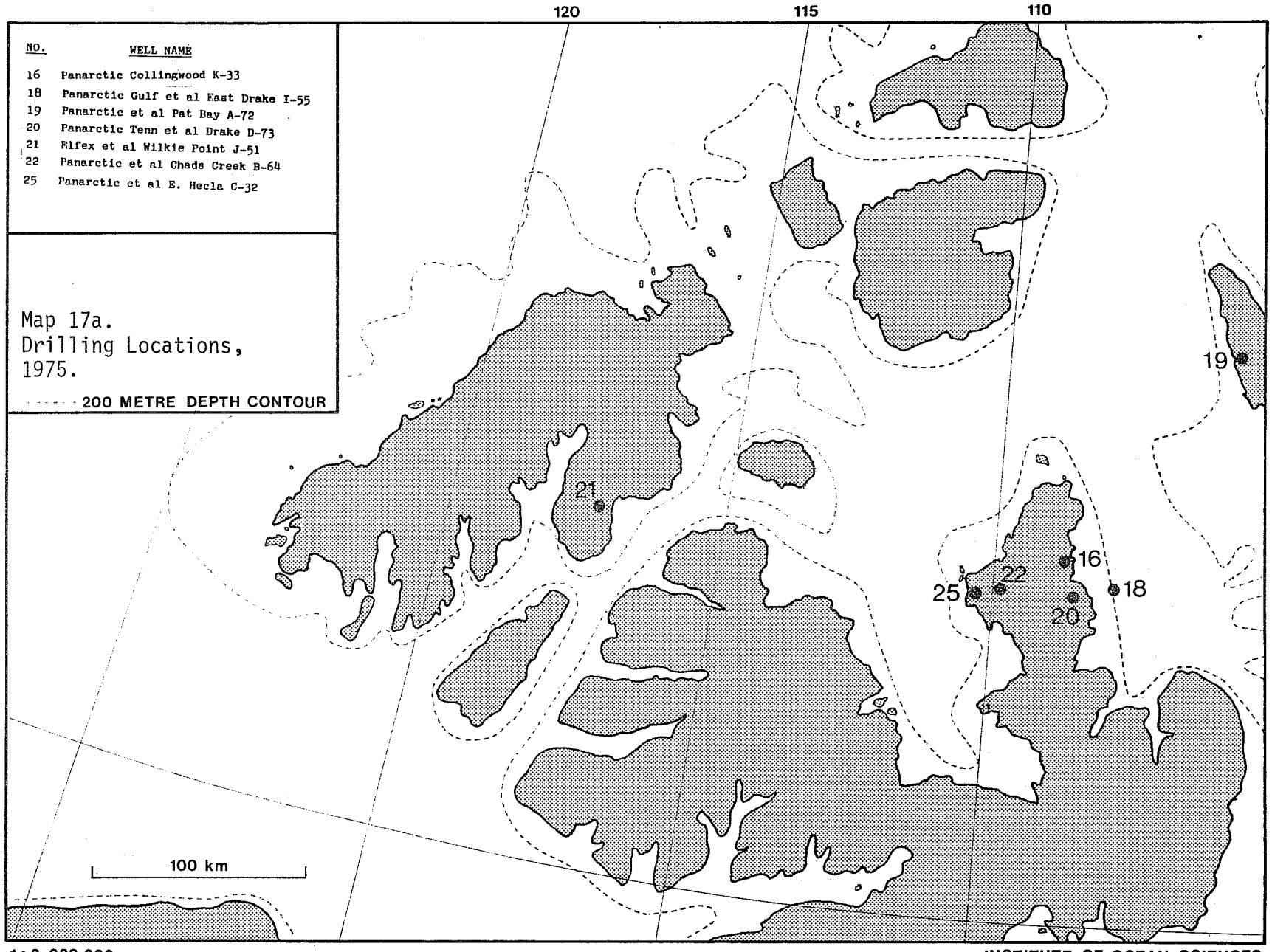

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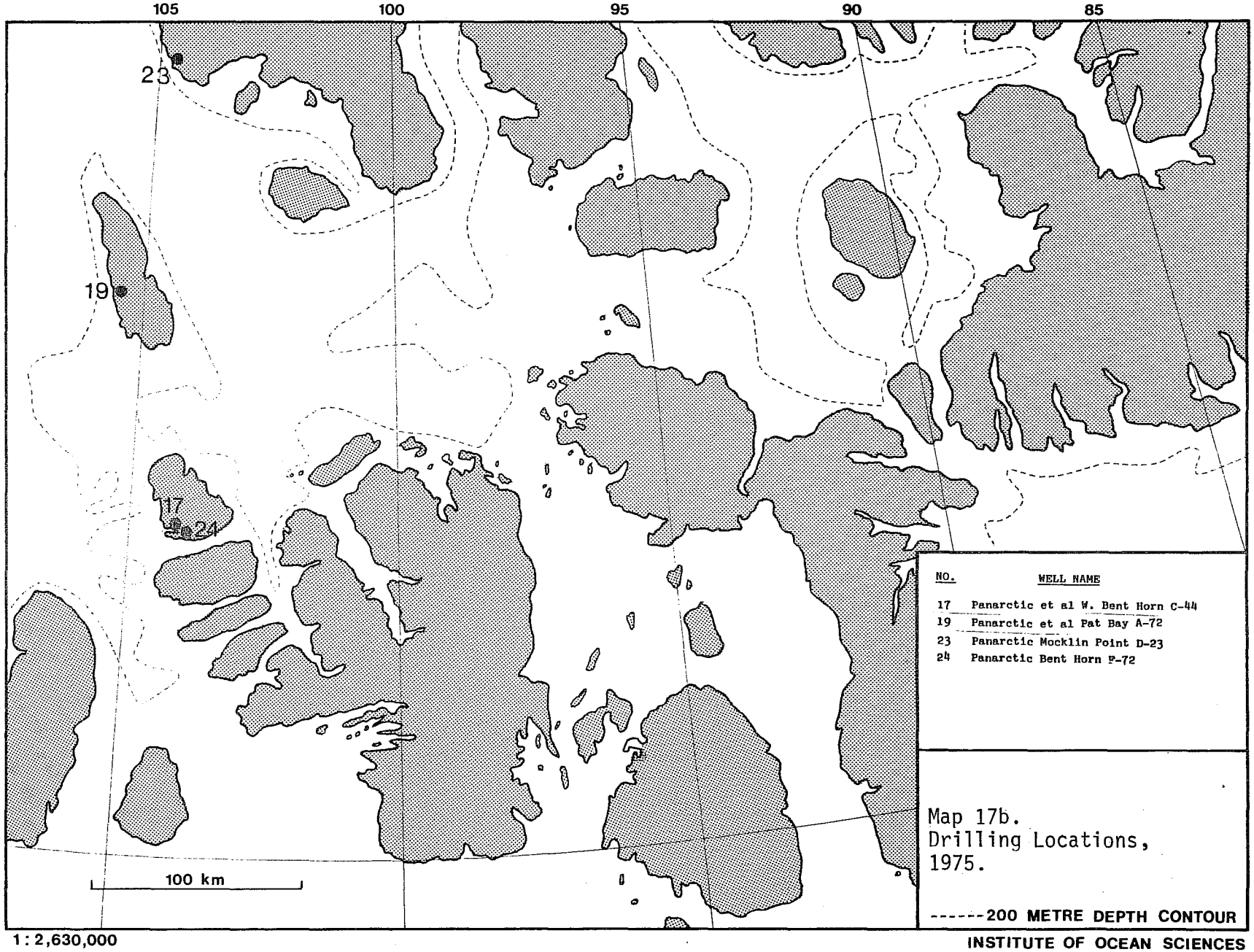
105
100
95
90
85
23
19
17
24
100 km
NO. WELL NAME
17 Panarctic et al W. Bent Horn C-44
19 Panarctic et al Pat Bay A-72
23 Panarctic Mocklin Point D-23
24 Panarctic Bent Horn P-72
Map 17b.
Drilling Locations,
1975.
------200 METRE DEPTH CONTOUR
1:2,630,000
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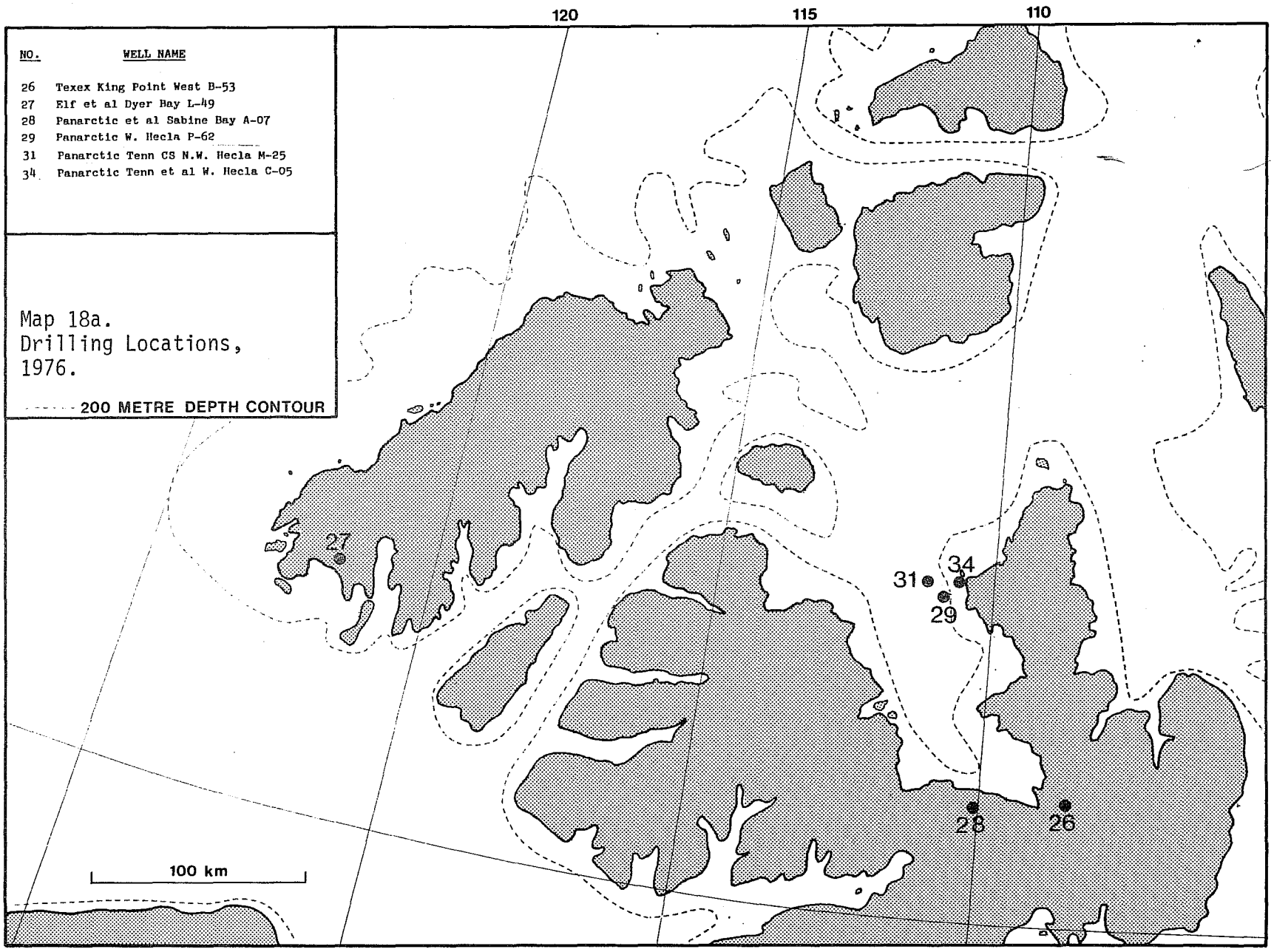
120
115
110
NO. WELL NAME
26 Texex King Point West B-53
27 Elf et al Dyer Bay L-49
28 Panarctic et al Sabine Bay A-07
29 Panarctic W. Hecla P-62
31 Panarctic Tenn CS N.W. Hecla M-25
34 Panarctic Tenn et al W. Hecla C-05
Map 18a.
Drilling Locations,
1976.
200 METRE DEPTH CONTOUR
27
31
34
29
28
26
100 km
1:2,630,000
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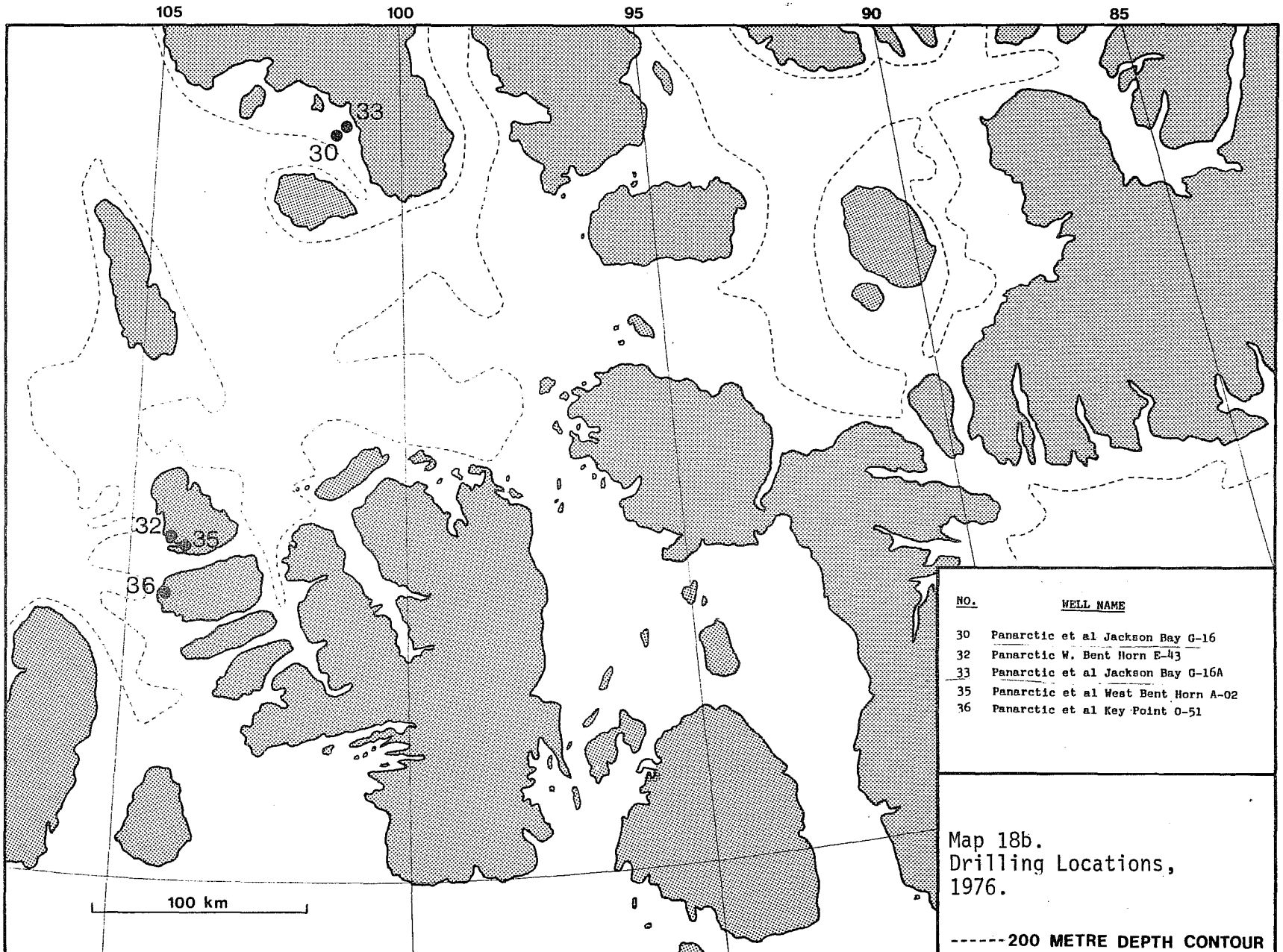
105
100
95
90
85
33
30
32
35
36
100 km
NO.
WELL NAME
30 Panarctic et al Jackson Bay G-16
32 Panarctic W. Bent Horn E-43
33 Panarctic et al Jackson Bay G-16A
35 Panarctic et al West Bent Horn A-02
36 Panarctic et al Key Point O-51
Map 18b.
Drilling Locations,
1976.
------200 METRE DEPTH CONTOUR
1:2,630,000
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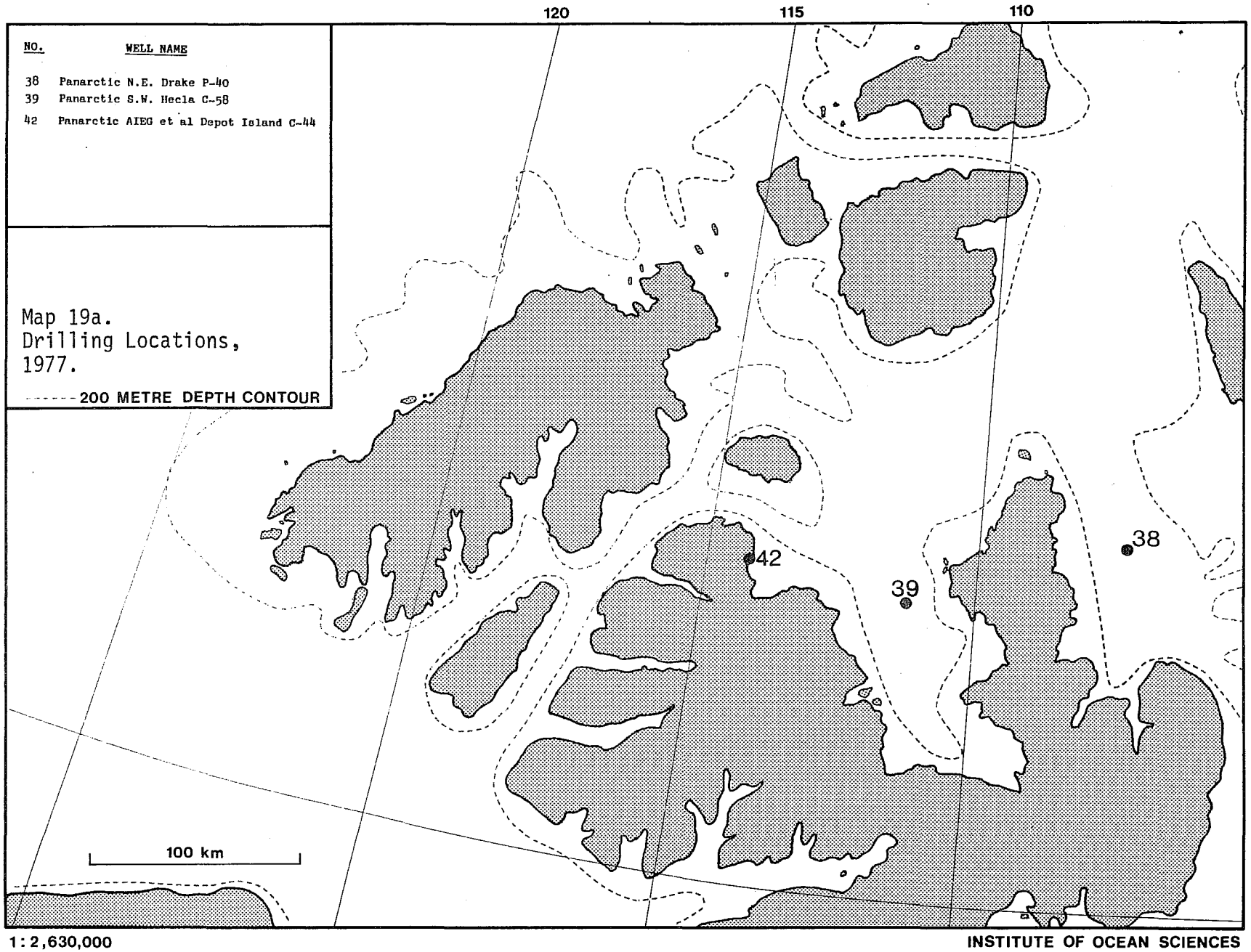
120
115
110
NO.
WELL NAME
38 Panarctic N.E. Drake P-40
39 Panarctic S.W. Hecla C-58
42 Panarctic AIEG et al Depot Island C-44
Map 19a.
Drilling Locations,
1977.
200 METRE DEPTH CONTOUR
42
39
38
100 km
1:2,630,000
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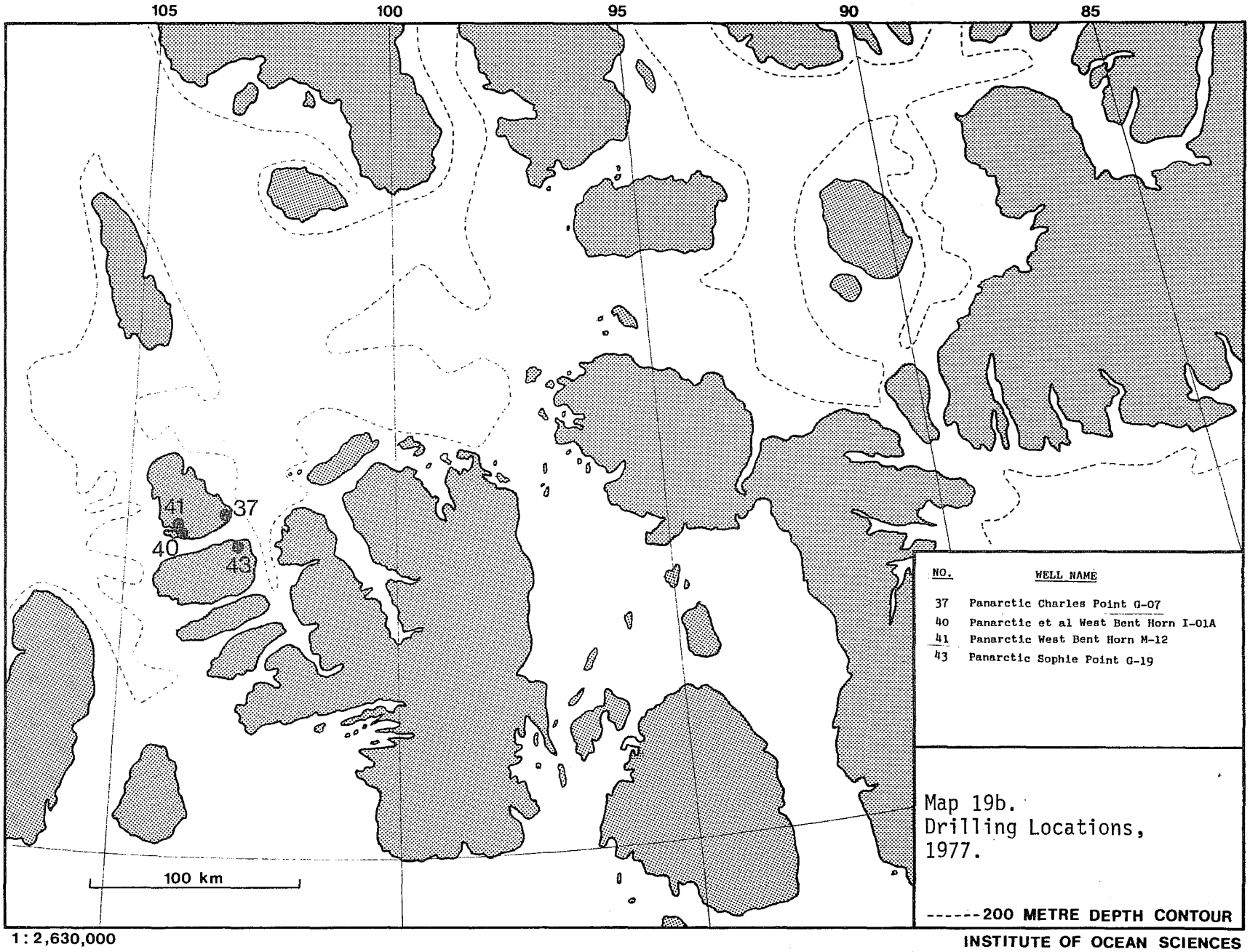
105
100
95
90
85
41
37
40
43
100 km
NO.
WELL NAME
37 Panarctic Charles Point G-07
40 Panarctic et al West Bent Horn I-01A
41 Panarctic West Bent Horn M-12
43 Panarctic Sophie Point G-19
Map 19b.
Drilling Locations,
1977.
------200 METRE DEPTH CONTOUR
1:2,630,000
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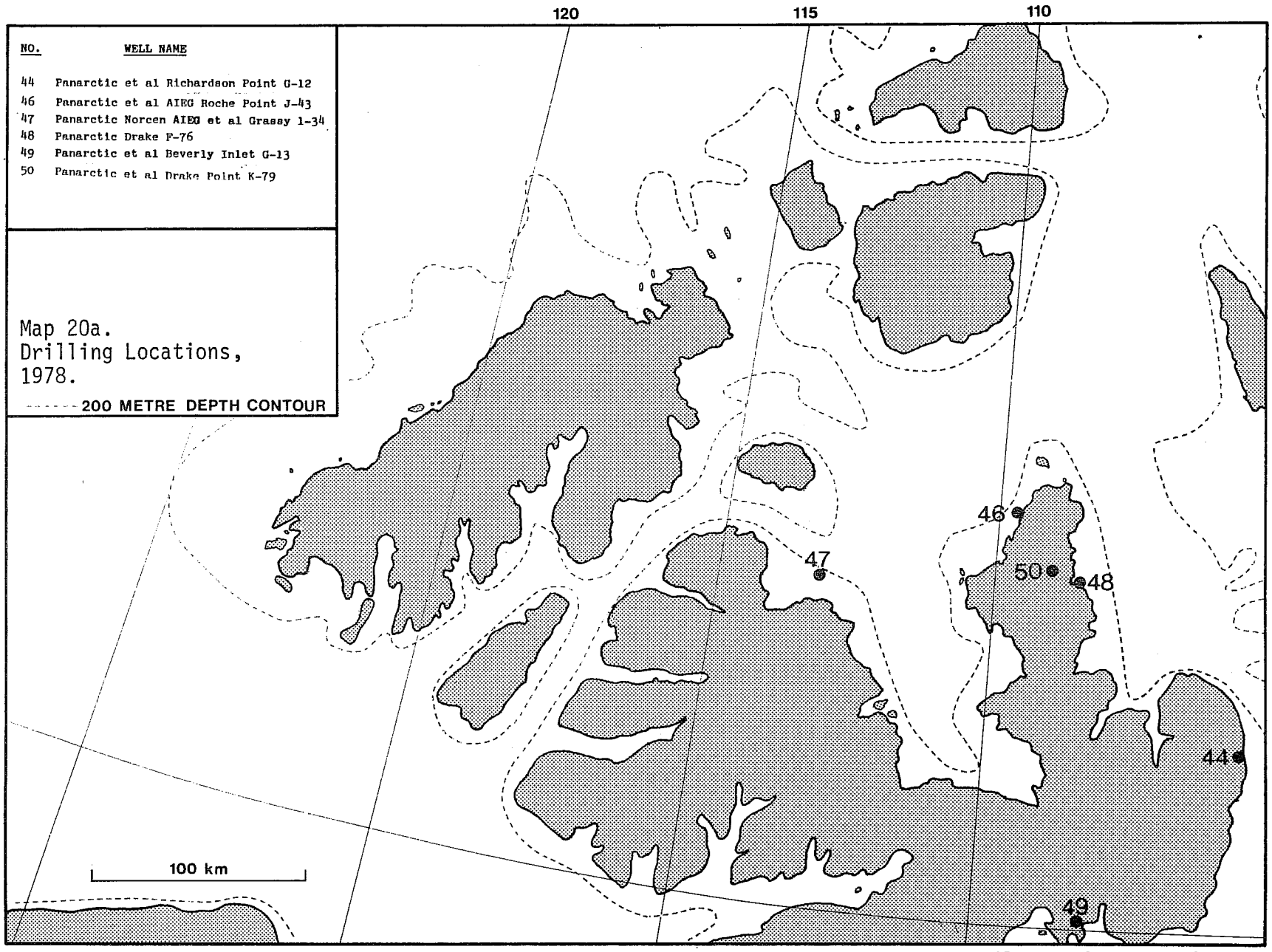
120
115
110
NO.
WELL NAME
44 Panarctic et al Richardson Point G-12
46 Panarctic et al AIEG Roche Point J-43
47 Panarctic Norcen AIEG et al Grassy 1-34
48 Panarctic Drake F-76
49 Panarctic et al Beverly Inlet G-13
50 Panarctic et al Drake Point K-79
Map 20a.
Drilling Locations,
1978.
200 METRE DEPTH CONTOUR
46
47
50
48
44
49
100 km
1:2,630,000
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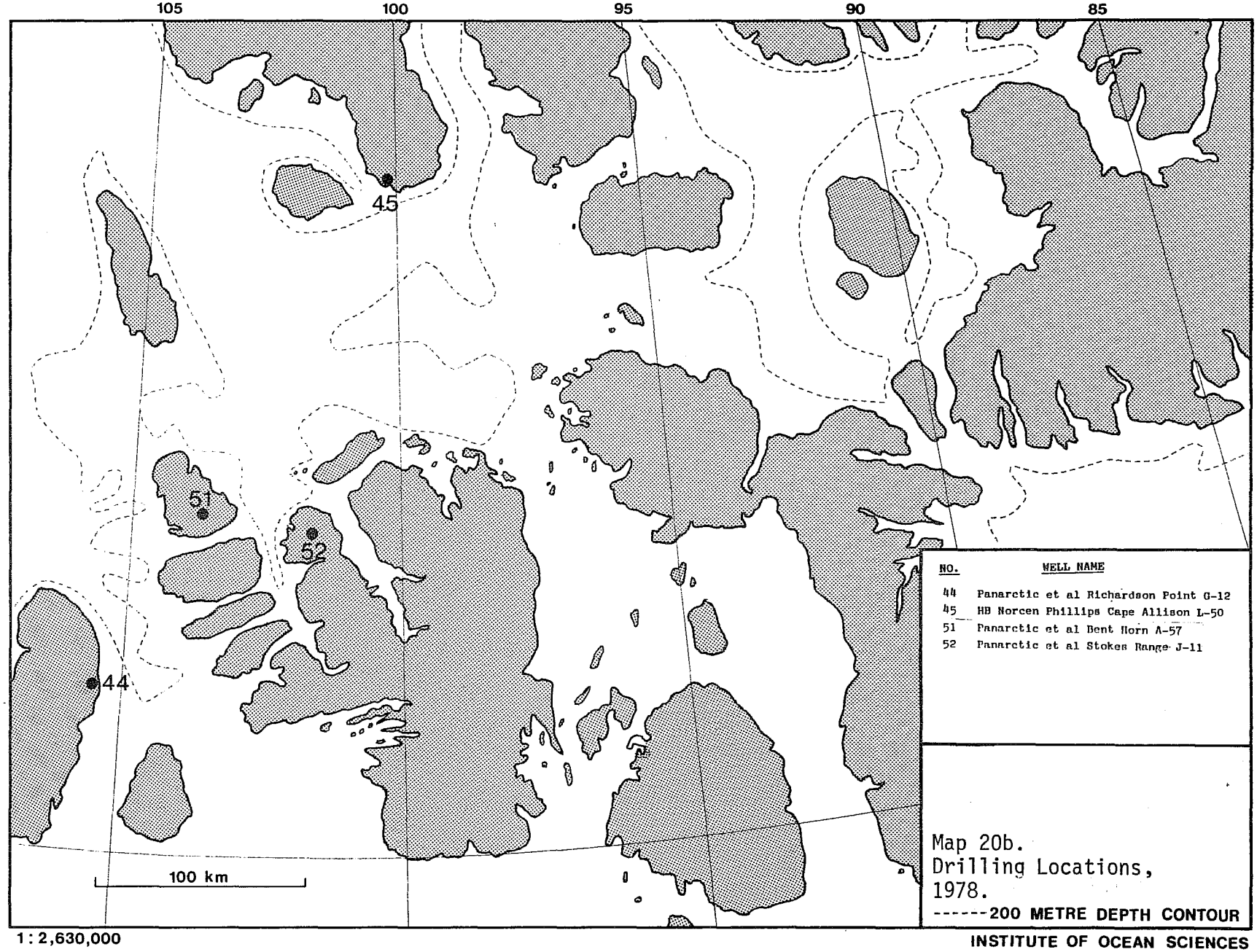
105
100
95
90
85
45
51
52
44
100 km
NO.
WELL NAME
44 Panarctic et al Richardson Point G-12
45 HB Norcen Phillips Cape Allison L-50
51 Panarctic et al Bent Horn A-57
52 Panarctic et al Stokes Range J-11
Map 20b.
Drilling Locations,
1978.
------200 METRE DEPTH CONTOUR
1 : 2,630,000
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Horn wells (Panarctic Tenneco et al. Bent Horn N-72) was the Sverdrup Basin's first oil discovery, with a tested flow rate of 80 m^3 per day in 1974. Spurred by this discovery, two wells were drilled at Bent Horn the following year, one of which (Panarctic Bent Horn F-72A) was completed as an oil well. In 1976, two more wells were drilled at Bent Horn, and one well (Panarctic et al. W. Bent Horn A-02) was completed with a tested oil flow rate of 950 m^3 per day. The other well (Panarctic W. Bent Horn E-43) recovered high gravity oil, but was abandoned. Following these initial successes, four more wells were drilled on Cameron Island in 1977 and 1978, three at Bent Horn, and one on the east side of the Island; however, all were plugged and abandoned.

Some attention was given to Ellef Ringnes Island during this period, where two wells were drilled by Panarctic and one each by Sunoco and Hudson Bay Oil and Gas. Two wells were drilled in 1974 by Panarctic and Sunoco on the northern and southern tips of the Island, while two wells were drilled on the western peninsula of the Island in 1975 and 1978 by Panarctic and Hudson Bay Oil and Gas respectively. Other onshore areas explored include: Axel Heiberg Island (one well by Imperial Oil in 1974); King Christian Island (one well by Dome Petroleum in 1974); Eglinton Island (two wells by Panarctic in 1974); Prince Patrick Island (two wells by Elfex Canada in 1975 and 1976); Lougheed Island (one well by Panarctic in 1975); Vanier Island (two wells by Panarctic in 1976 and 1977); and Bathurst Island (one well by Panarctic in 1978).

The successful use of a built-up ice platform at the Hecla N-52 wellsite enabled Panarctic to undertake offshore delineation drilling in the vicinity of onshore oil and gas fields and to begin offshore "wildcat" drilling. Nine offshore wells were drilled by Panarctic to the east and west of Sabine Peninsula to delineate the Drake and Hecla gas fields, respectively. The first two offshore wells drilled by Panarctic (Panarctic W. Hecla N-52 in 1974 and Panarctic East Drake I-55 in 1975) resulted in gas discoveries and extended the Hecla and Drake fields to the west and east of the Sabine Peninsula. Two offshore wells were drilled in the Hecla area in 1976, with both wells (Panarctic W. Hecla P-62 and N.W. Hecla M-25) successfully delineating the field to the north and northeast. The following year, a fifth gas discovery was made at an offshore well drilled in the Hecla field (Panarctic S.W. Hecla C-58), while a second offshore well in the Drake area was abandoned. In 1978, Panarctic completed an experimental subsea natural gas production system at its Drake F-76 wellsite (see Section 5.3.4). A second offshore well, east of the Sabine Peninsula, was abandoned.

Only three offshore wells were drilled outside of the Sabine Peninsula area during this period. Two wells were drilled in Jackson Bay, Ellef Ringnes Island in 1976 with one well (Panarctic et al. Jackson Bay G-16) resulting in a gas discovery. The other offshore well, drilled in 1978 near Cape Grassy on northwestern Melville Island, was abandoned.

5.5.3.2 Drilling activities, 1979 to 1984

Since 1978, the focus of drilling operations has been directed to offshore exploration in the central Sverdrup Basin. Twenty-one of 28 wells completed between January 1979 and June 1984 were offshore wells concentrating on the areas to the west of Lougheed Island and within Maclean and Danish straits, with isolated wells in the Desbarats and Hazen straits. Onshore exploration drilling during this period included: wells on Ellef Ringnes,

Table 6. Exploration and Delineation Drilling Activities, 1979 to 1984.

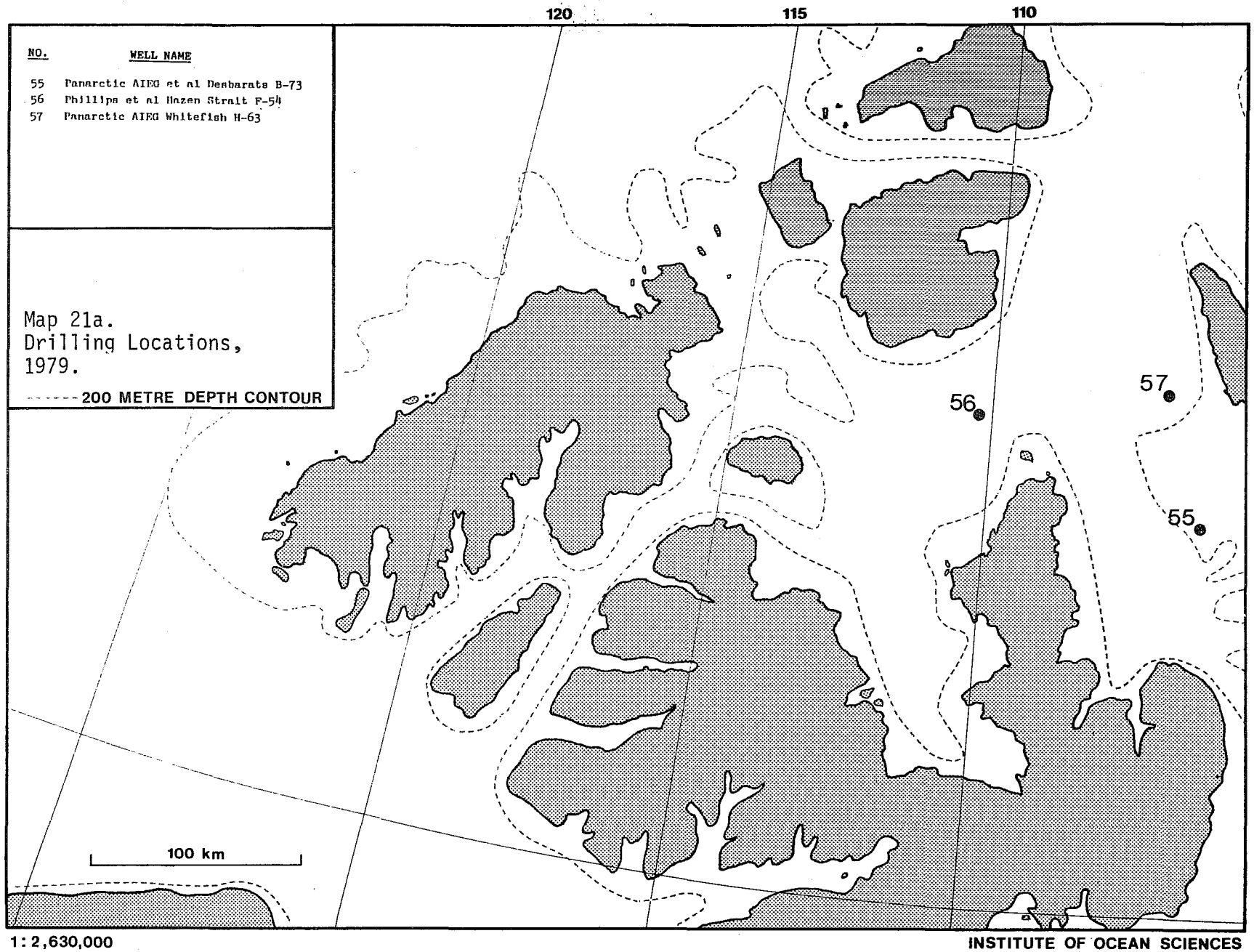
WELL NAME	AREA	DRILLING PERIOD	STATUS
Panarctic et al Noice D-41	Ellef Ringnes Island	04 Nov. 1978 - 02 Jan. 1979	Abandoned
Dome Panarctic et al Hoodoo E-05	Ellef Ringnes Island	08 Nov. 1978 - 03 Jan. 1979	Abandoned
Panarctic AIEG et al Desbarats B-73	Byam Martin Channel	17 Feb. 1979 - 27 Mar. 1979	Abandoned
Phillips et al Hazen Strait F-54	Hazen Strait	11 Feb. 1979 - 12 May 1979	Abandoned
Panarctic AIEG Whitefish H-63	West of Lougheed Island	18 Oct. 1978 - 17 May 1979	Gas Discovery
Mobil Cornwall O-30	Cornwall Island	05 June 1979 - 14 Oct. 1979	Abandoned
Panarctic AIEG Dome PPC Char G-07	Danish Strait	05 Feb. 1979 - 22 Apr. 1980	Oil and Gas Discovery
Panarctic AIEG PPC Balaena D-58	Danish Strait	06 Feb. 1980 - 27 Apr. 1980	Non-commercial Oil Discovery
Panarctic AIEG Whitefish 2H-63	West of Lougheed Island	03 Dec. 1979 - 15 May 1980	Gas Well
Dome Wallis H-73	King Christian Island	16 Mar. 1980 - 23 Aug. 1980	Abandoned
Panarctic AIEG Vesey A-27	Vesey Hamilton Island	08 June 1980 - 09 Sept. 1980	Abandoned
Panarctic AIEG PPC Dome Skate B-80	Maclean Strait	20 Feb. 1981 - 04 Apr. 1981	Oil and Gas Discovery
Panarctic AIEG Phillips Cisco B-66	West of Lougheed Island	01 Feb. 1981 - 04 May 1981	Oil and Gas Discovery

Table 6. Exploration and Delineation Drilling Activities, 1979 to 1984. continued

WELL NAME	AREA	DRILLING PERIOD	STATUS
Panarctic AIEG PPC Dome Maclean I-72	West of Lougheed Island	27 Jan. 1981 - 04 May 1981	Oil and Gas Discovery
Panarctic W. Bent Horn G-02	Cameron Island	29 May 1981 - 04 Sept. 1981	Abandoned
Panarctic Dome et al Hoodoo N-52	Ellef Ringnes Island	29 Sept 1981 - 11 Nov. 1981	Abandoned
Panarctic et al Cisco C-42	West of Lougheed Island	02 Mar. 1982 - 20 Apr. 1982	Oil Well
Panarctic et al Cape Mamen F-24	SE of Mackenzie King Island	15 Jan. 1982 - 28 Apr. 1982	Abandoned
Panarctic et al Whitefish A-26	West of Lougheed Island	15 Jan. 1982 - 30 Apr. 1982	Abandoned
Panarctic et al Sculpin K-08	Maclean Strait	29 Jan. 1982 - 03 May 1982	Gas Discovery
Panarctic et al Cisco K-58	West of Lougheed Island	12 Dec. 1982 - 01 Feb. 1983	Oil Well
Panarctic et al Cape Macmillan 2K-15	South of Ellef Ringnes Island	03 Feb. 1983 - 12 Apr. 1983	Oil and Gas Discovery
Panarctic et al Grenadier A-26	South of Ellef Ringnes Island	11 Jan. 1983 - 17 Apr. 1983	Abandoned
Panarctic et al Maryatt Point K-71	Sabine Peninsula (Melville Island)	14 Oct. 1982 - 17 July 1983	Abandoned
Panarctic et al Cisco M-22	West of Lougheed Island	22 Jan. 1984 - 12 Apr. 1984	Abandoned
Panarctic et al Skate C-59	Maclean Strait	15 Jan. 1984 - 13 Apr. 1984	Gas Well

Table 6. Exploration and Delineation Drilling Activities, 1979 to 1984. continued

WELL NAME	AREA	DRILLING PERIOD	STATUS
Panarctic et al Sherard Bay F-34	Sabine Peninsula (Melville Island)	08 Oct. 1983 - 01 May 1984	Abandoned
Panarctic et al Buckingham O-68	Norwegian Bay	17 Feb. 1984 - 14 May 1984	Abandoned


120
115
110
NO.
WELL NAME
55 Panarctic AIEG et al Desbarats B-73
56 Phillips et al Hazen Strait F-54
57 Panarctic AIEG Whitefish H-63
Map 21a.
Drilling Locations,
1979.
200 METRE DEPTH CONTOUR
56
57
55
100 km
1:2,630,000
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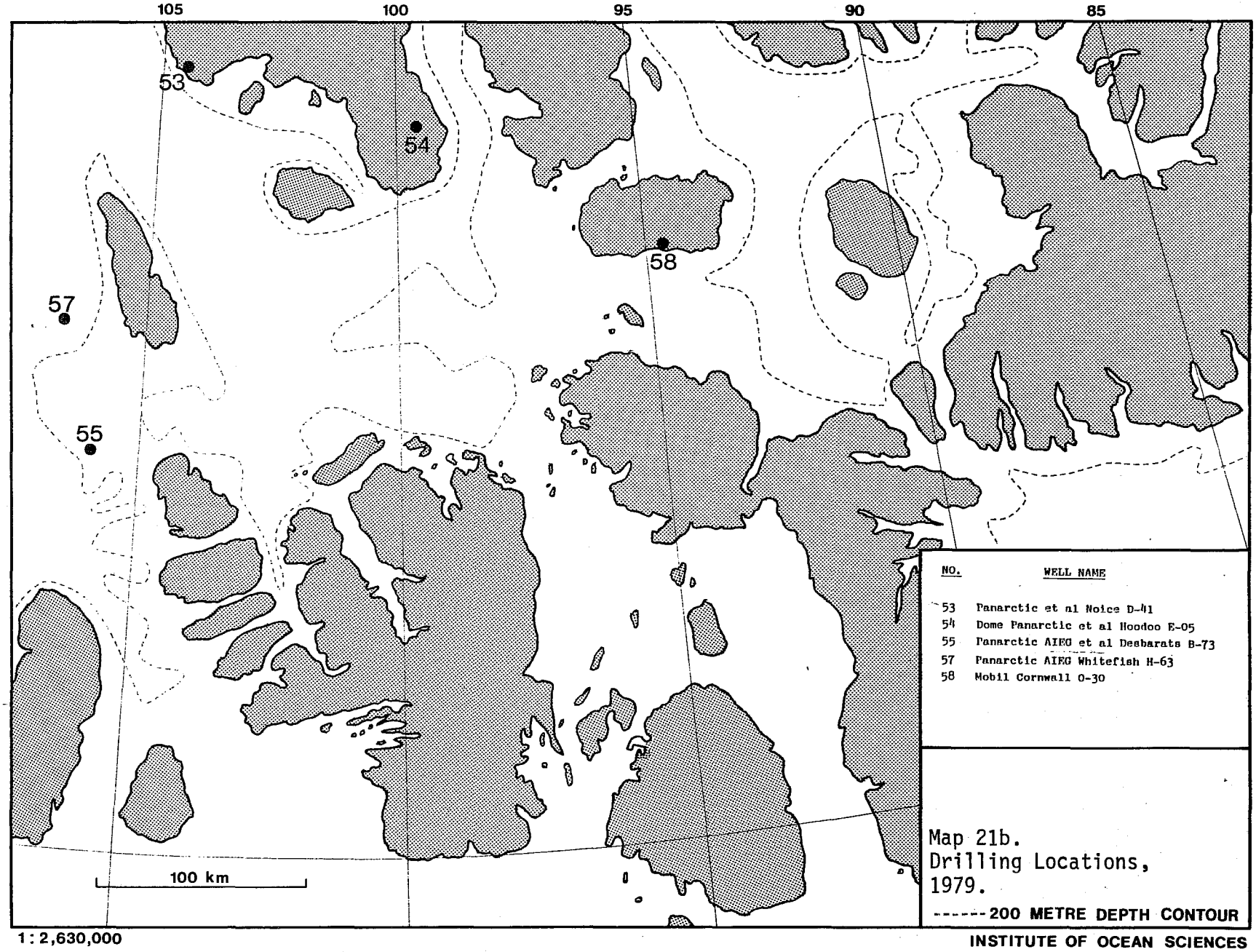
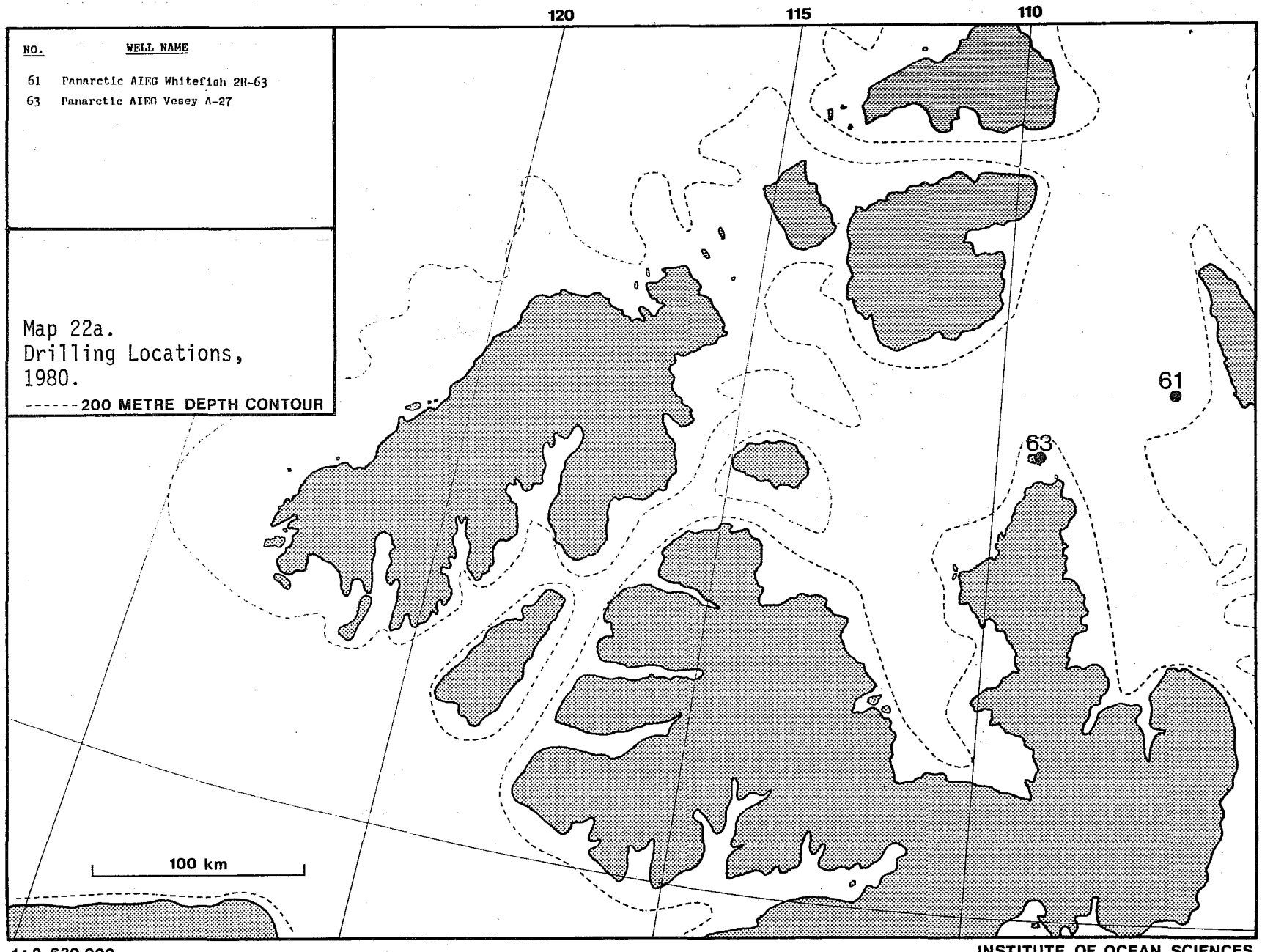
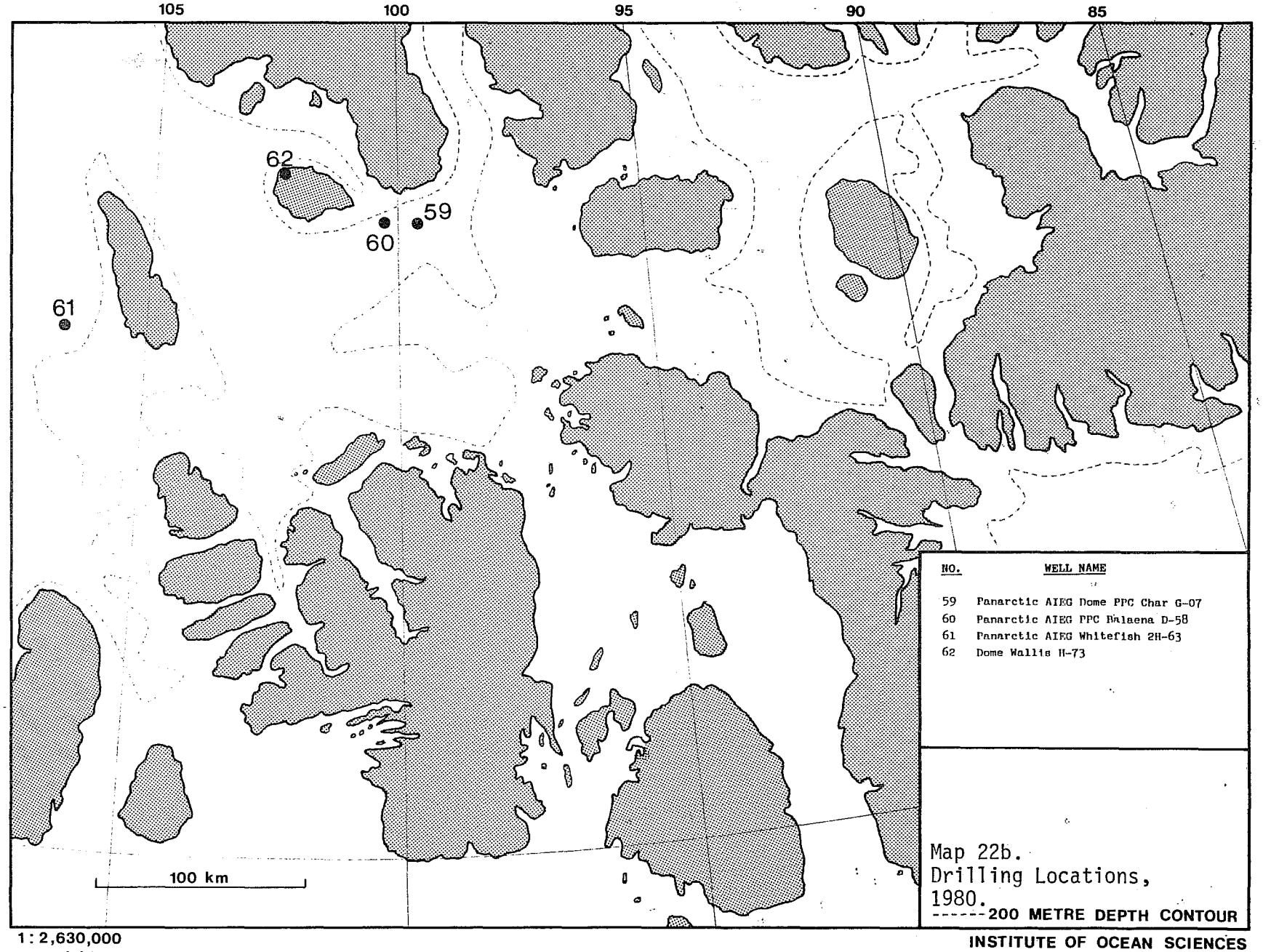
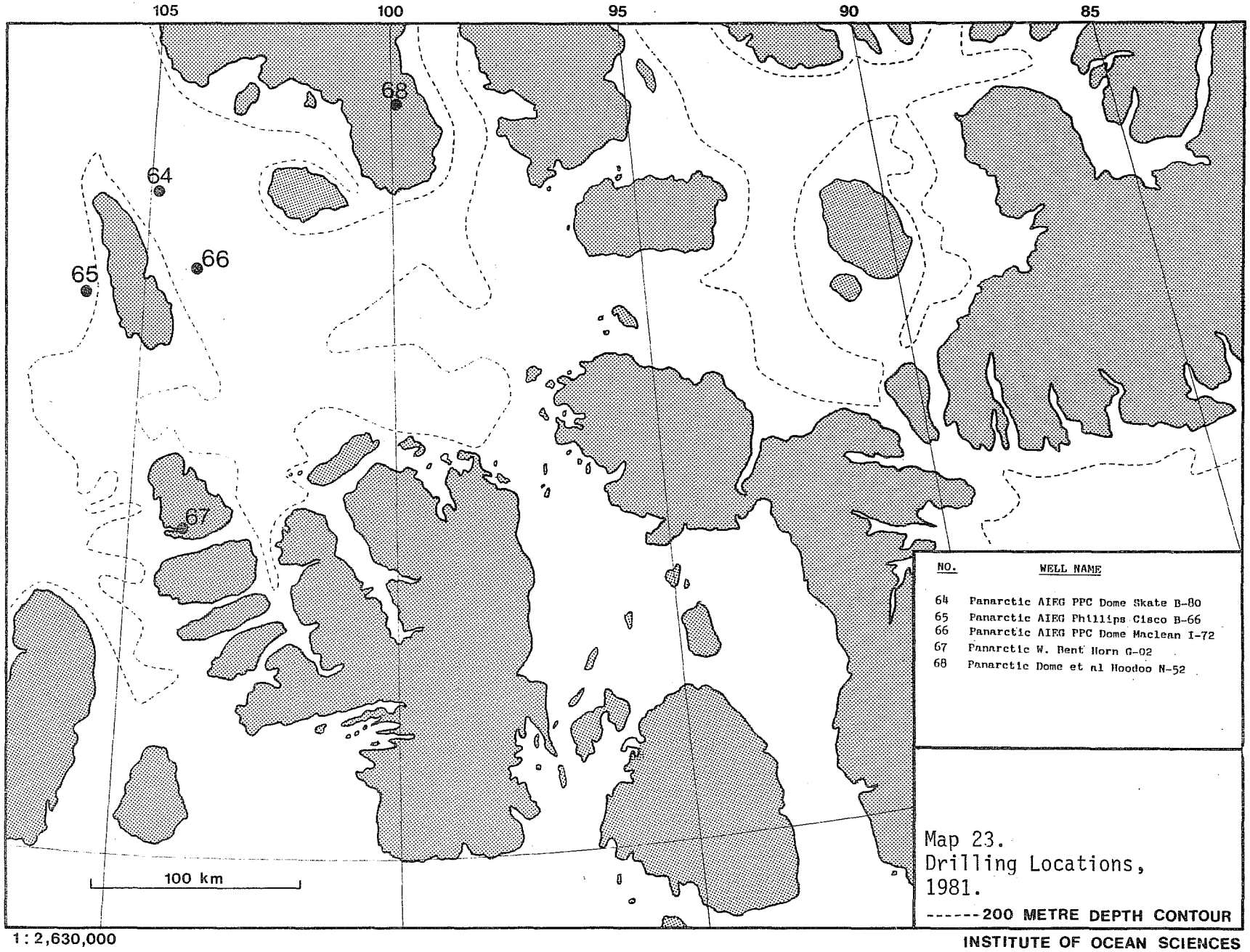

105
100
95
90
85
53
54
58
57
55
100 km
NO.
WELL NAME
53 Panarctic et al Noice D-41
54 Dome Panarctic et al Hoodoo E-05
55 Panarctic AIEG et al Desbarats B-73
57 Panarctic AIEG Whitefish H-63
58 Mobil Cornwall O-30
Map 21b.
Drilling Locations,
1979.
------200 METRE DEPTH CONTOUR
1:2,630,000
INSTITUTE OF OCEAN SCIENCES


120
115
110
NO.
WELL NAME
61 Panarctic AIEG Whitefish 2H-63
63 Panarctic AIEG Vesey A-27
Map 22a.
Drilling Locations,
1980.
------200 METRE DEPTH CONTOUR
61
63
100 km
1:2,630,000
INSTITUTE OF OCEAN SCIENCES


105
100
95
90
85
62
59
60
61
100 km
NO.
WELL NAME
59 Panarctic AIEG Dome PPC Char G-07
60 Panarctic AIEG PPC Balaena D-58
61 Panarctic AIEG Whitefish 2H-63
62 Dome Wallis H-73
Map 22b.
Drilling Locations,
1980.
------200 METRE DEPTH CONTOUR
1:2,630,000
INSTITUTE OF OCEAN SCIENCES


105
100
95
90
85
68
64
66
65
67
100 km
NO.
WELL NAME
64 Panarctic AIEG PPC Dome Skate B-80
65 Panarctic AIEG Phillips Cisco B-66
66 Panarctic AIEG PPC Dome Maclean I-72
67 Panarctic W. Bent Horn G-02
68 Panarctic Dome et al Hoodoo N-52
Map 23.
Drilling Locations,
1981.
------200 METRE DEPTH CONTOUR
1:2,630,000
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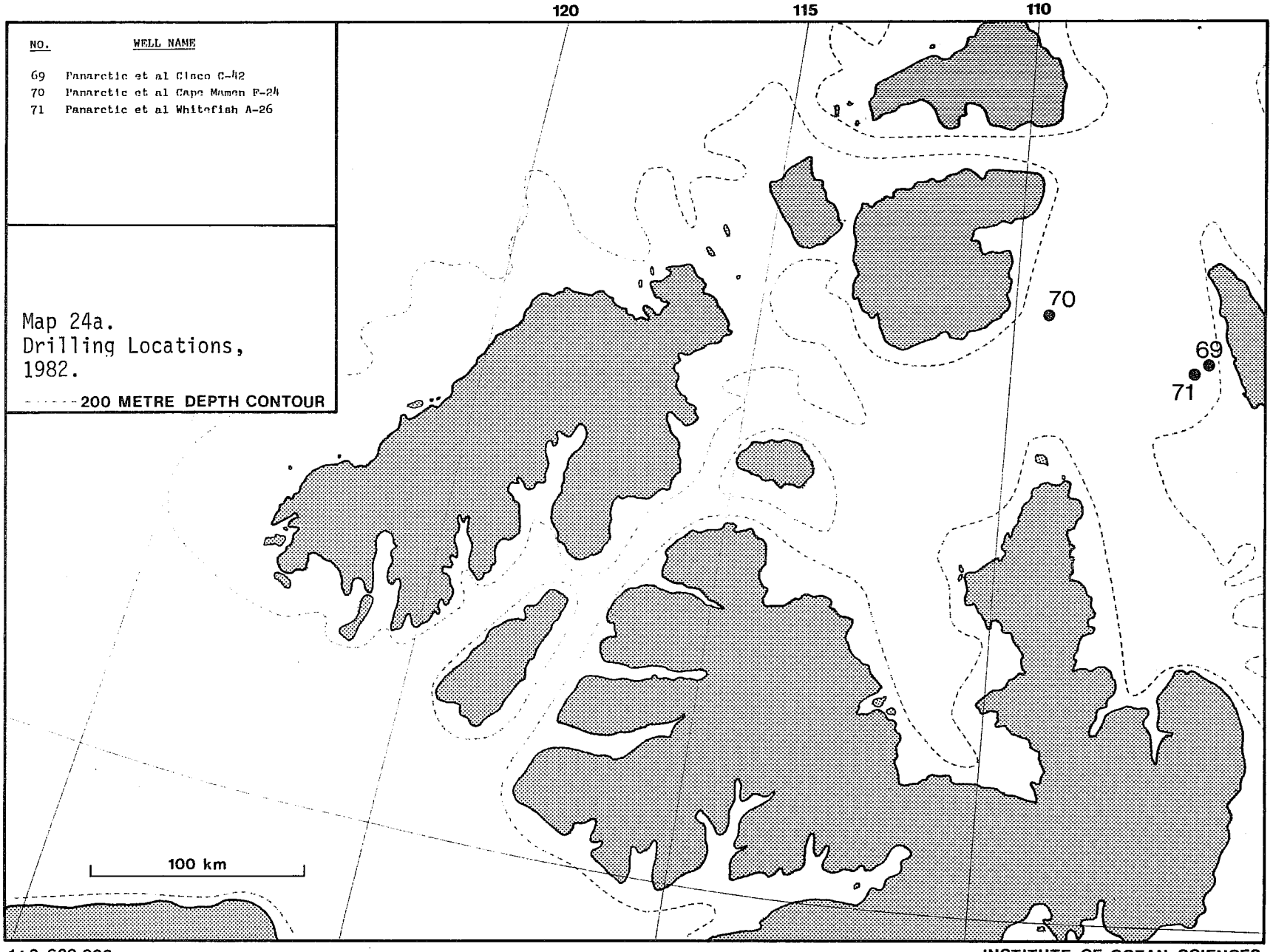
120
115
110
NO.
WELL NAME
69 Panarctic et al Cisco C-42
70 Panarctic et al Cape Mumen F-24
71 Panarctic et al Whitefish A-26
Map 24a.
Drilling Locations,
1982.
200 METRE DEPTH CONTOUR
70
69
71
100 km
1:2,630,000
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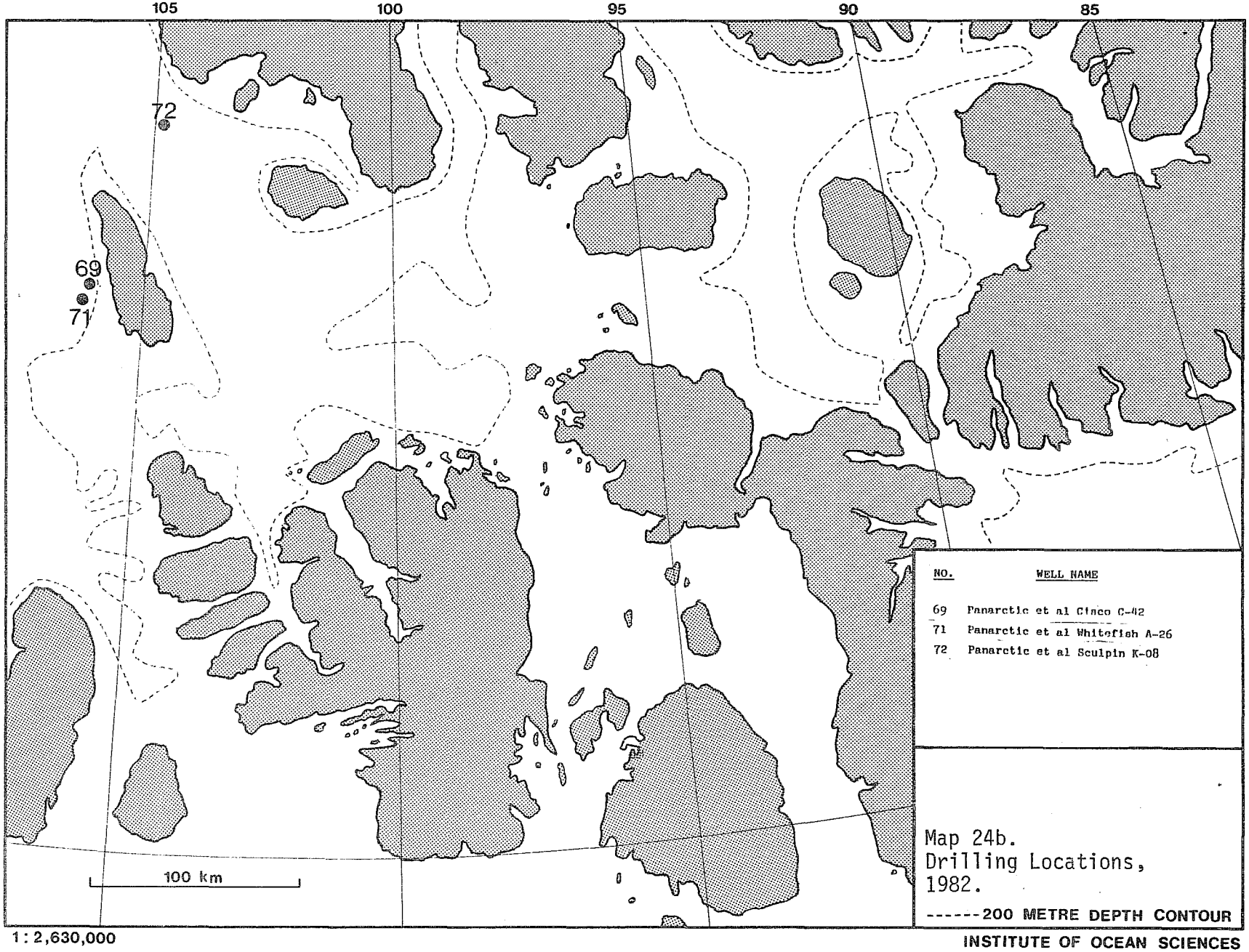
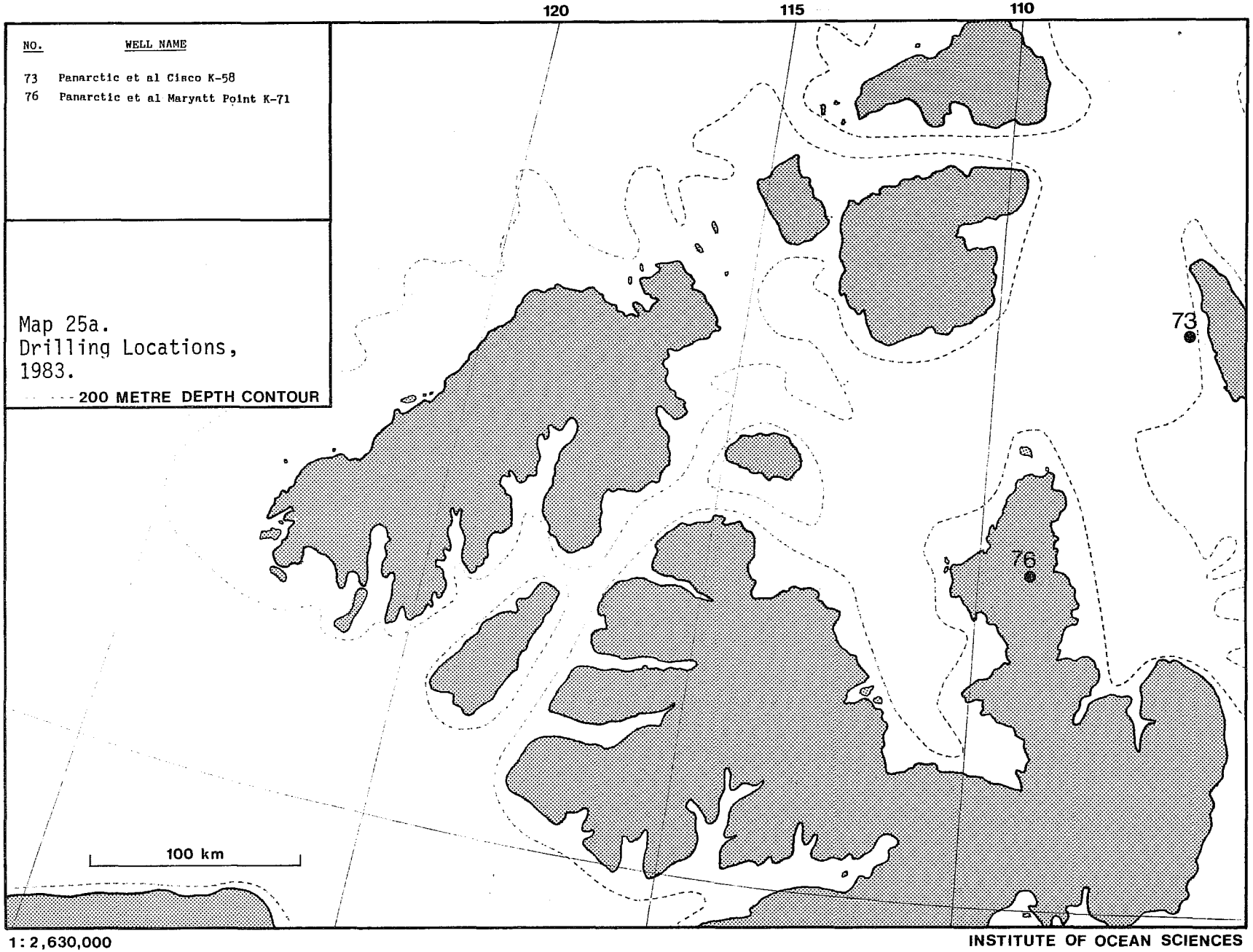
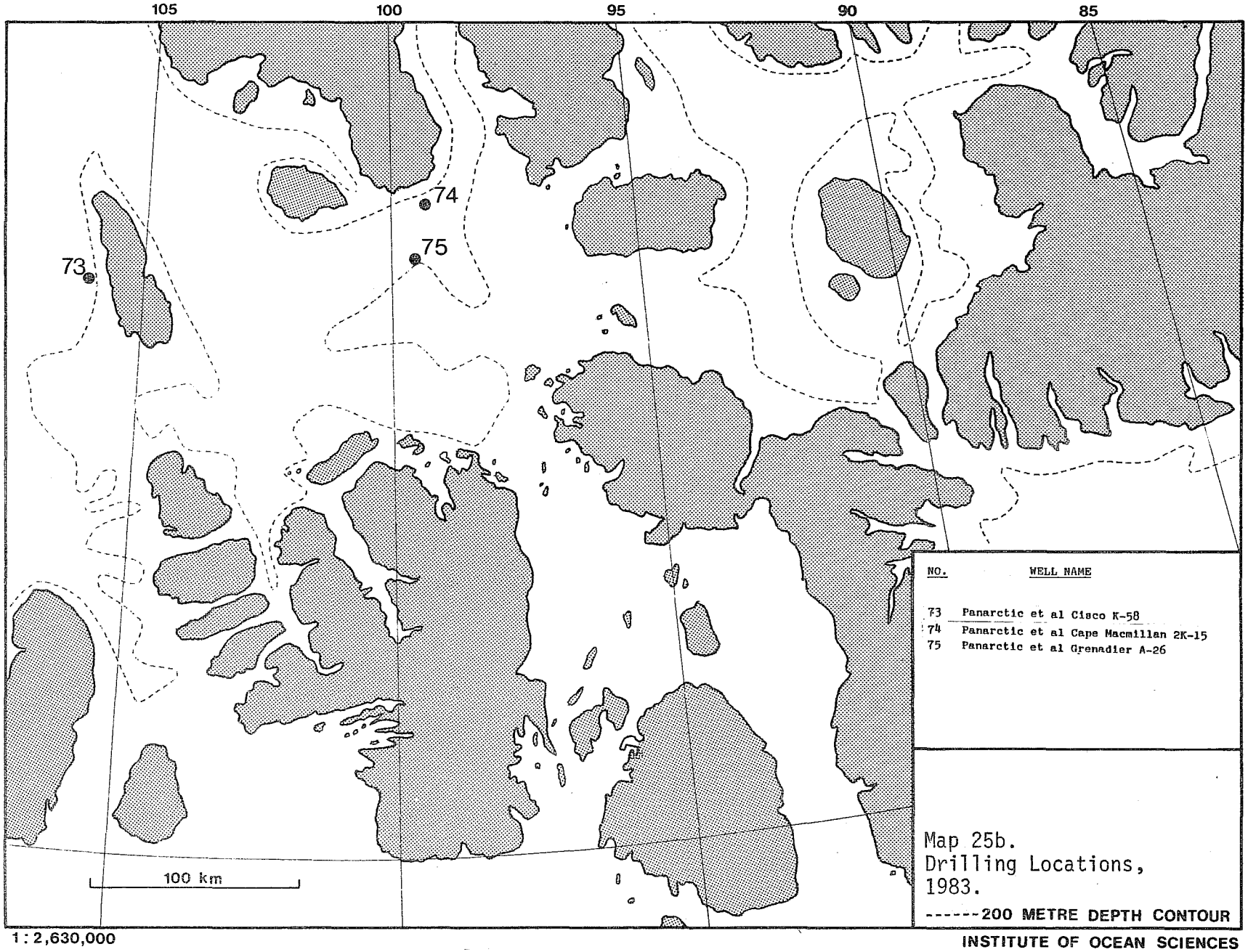

105
100
95
90
85
72
69
71
100 km
NO.
WELL NAME
69 Panarctic et al Cisco C-42
71 Panarctic et al Whitefish A-26
72 Panarctic et al Sculpin K-08
Map 24b.
Drilling Locations,
1982.
------200 METRE DEPTH CONTOUR
1:2,630,000
INSTITUTE OF OCEAN SCIENCES


120
115
110
NO.
WELL NAME
73 Panarctic et al Cisco K-58
76 Panarctic et al Maryatt Point K-71
Map 25a.
Drilling Locations,
1983.
200 METRE DEPTH CONTOUR
73
76
100 km
1:2,630,000
INSTITUTE OF OCEAN SCIENCES


105
100
95
90
85
74
75
73
100 km
NO.
WELL NAME
73 Panarctic et al Cisco K-58
74 Panarctic et al Cape Macmillan 2K-15
75 Panarctic et al Grenadier A-26
Map 25b.
Drilling Locations,
1983.
------200 METRE DEPTH CONTOUR
1:2,630,000
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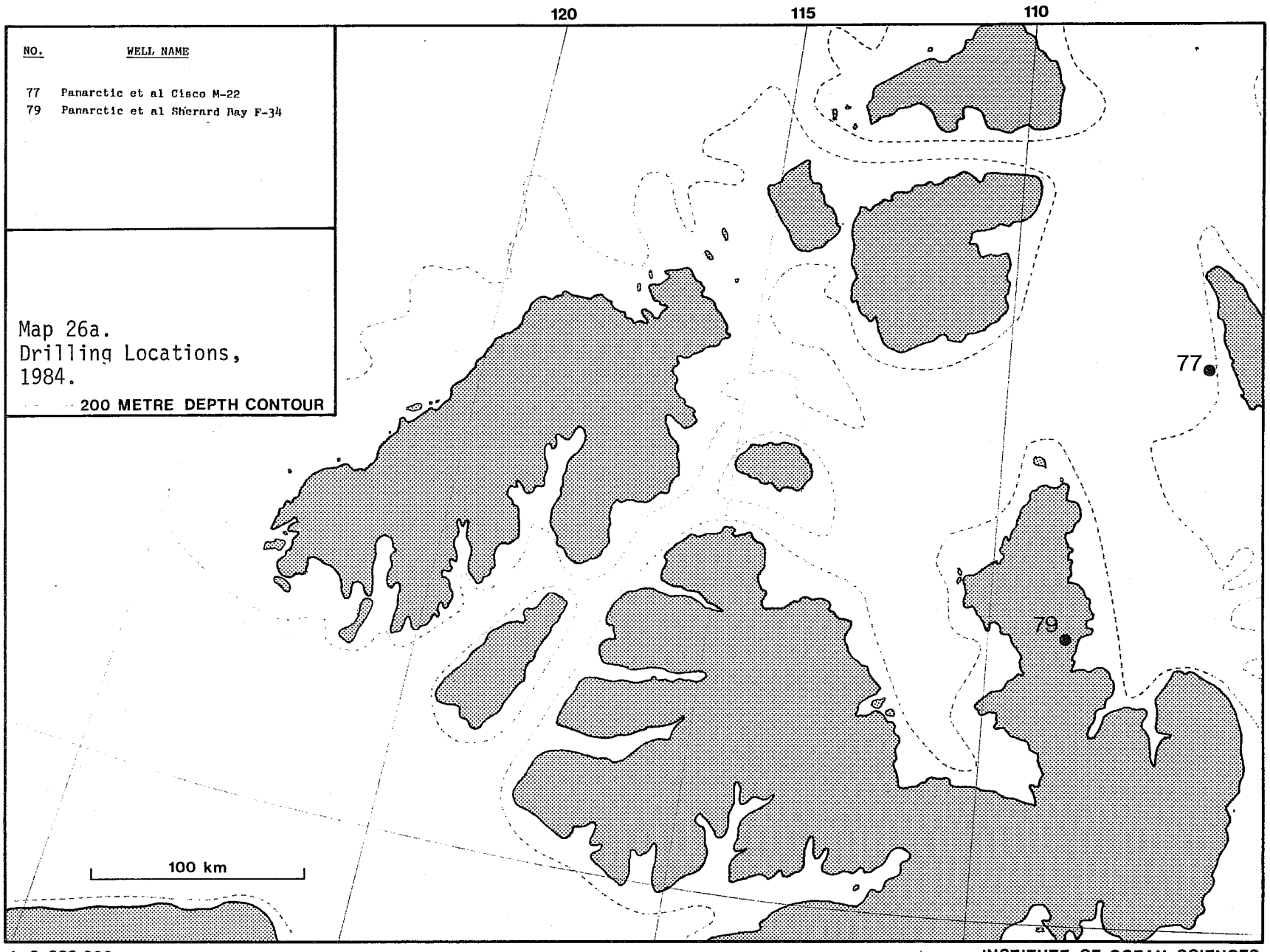
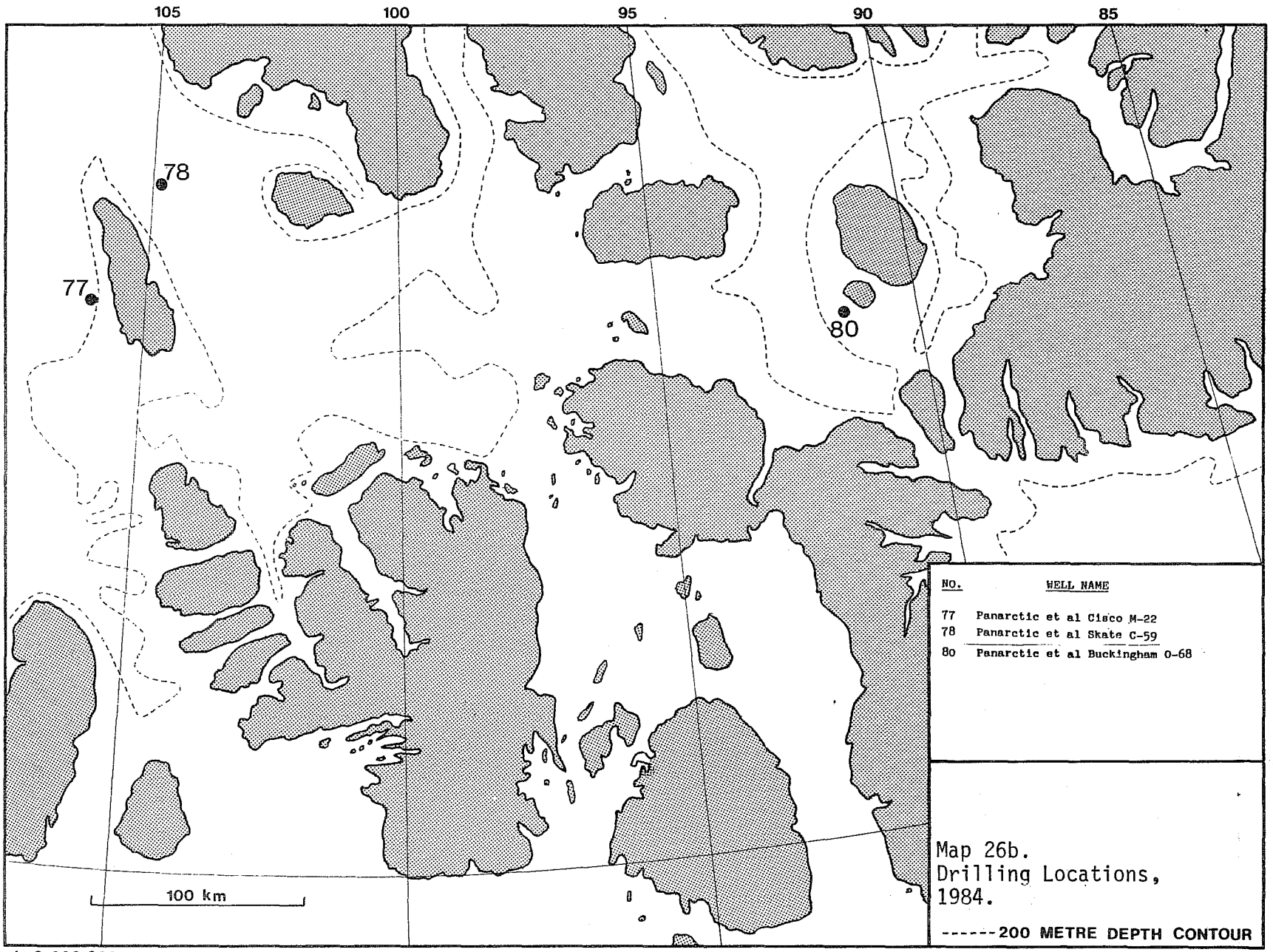

120
115
110
NO.
WELL NAME
77 Panarctic et al Cisco M-22
79 Panarctic et al Sherard Bay F-34
Map 26a.
Drilling Locations,
1984.
200 METRE DEPTH CONTOUR
77
79
100 km
1:2,630,000
INSTITUTE OF OCEAN SCIENCES


105
100
95
90
85
78
77
80
100 km
NO.
WELL NAME
77 Panarctic et al Cisco M-22
78 Panarctic et al Skate C-59
80 Panarctic et al Buckingham O-68
Map 26b.
Drilling Locations,
1984.
------200 METRE DEPTH CONTOUR
1:2,630,000
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Cornwall, Cameron, Vesey Hamilton, King Christian and Melville islands. Table 6. outlines the drilling activities undertaken by all companies during this period.

5.5.4 Projected drilling activities

The principal areas of interest for exploration or delineation drilling in the next two years will be the Bent Horn oil field on Cameron Island and offshore regions adjacent to Lougheed Island (L. Franklin, pers. comm., 1985). Some drilling activity will be directed to further exploration of Maclean Strait northeast of Lougheed Island, while delineation wells may be drilled in the hopes of extending the Cisco and Skate fields off the west coast of the Island. Further delineation drilling can also be expected at Bent Horn, with the level of drilling activity perhaps increasing should the oil field come into production.

In general, approximately three-quarters of the wells drilled during the next two years will be located in offshore areas (L. Franklin, pers. comm., 1985). This projection was based on two factors. Firstly, the majority of unexplored area in the Sverdrup Basin lies in offshore areas, and this alone will result in the greater share of exploratory drilling being directed to offshore regions. Secondly, with the exception of gas discoveries on Sabine Peninsula, Melville Island and the oil field located at Bent Horn, Cameron Island, onshore drilling has yielded little in the way of hydrocarbon discoveries deserving further exploration. Conversely, offshore drilling in the vicinity of Lougheed Island and Sabine Peninsula has resulted in major hydrocarbon discoveries at the Whitefish, Cisco, Skate, Hecla and Drake fields with some promise of further discoveries in Maclean Strait. The primary focus of drilling activities in the near future will, therefore, centre on exploration in the vicinity of Maclean Strait and further delineation of existing offshore hydrocarbon fields. However, since the costs associated with onshore wells are significantly less than those for offshore wells, even relatively small onshore oil or gas discoveries may be viably comparable to larger offshore discoveries. Thus, while the majority of drilling activities will be directed to offshore areas, some exploratory drilling will continue on land masses in the Sverdrup Basin.

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8. APPENDICES:

Appendix A: Individual Seismic Survey Descriptions (chronologically-ordered)

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 15 Jan-30 May 1974

SURVEY VEHICLES: Six Foremost FN60 vehicles, 5 Foremost FN110 vehicles, 1 Foremost Yukon ATV, 1 each D-6 and D-7 Caterpiller tractors, portable camp mounted on 5 FN60 undercarriages

KILOMETRES SHOT: 340 KMS ONSHORE ONSHORE ACCESS ROUTES: 118 KMS

0 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N74B958

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 1 Feb-31 May 1974

SURVEY VEHICLES: Seven Foremost FN60 vehicles, 2 Foremost FN110 vehicles, 1 Yukon Delta 3 ATV, 1 D-7 Caterpiller tractor, 1 977 series front-end loader

KILOMETRES SHOT: 265 KMS ONSHORE ONSHORE ACCESS ROUTES: 34 KMS

200 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N74B661

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 1 Feb-31 May 1974

SURVEY VEHICLES: Six Foremost FN60 Vehicles, 2 RN110 tracked vehicles, 1 TN120 tracked vehicle, 2 Foremost FN110 vehicles, 1 each D-6 and D-7 Caterpiller tractors, portable facilities mounted on 6 TN90 undercarriages (south Bathurst Island); 15 Foremost FN110 vehicles, 1 each D-6 and D-7 Caterpiller tractors, 1 Delta 3 ATV (north Bathurst Island and Byam Martin Is.)

KILOMETRES SHOT: 770 KMS ONSHORE ONSHORE ACCESS ROUTES: 42 KMS

0 KMS OFFSHORE

MISCELLANEOUS: Two survey parties: South Bathurst Island and combined north Bathurst Island and Byam Martin Island

REFERENCES: DIAND Land Use Permit File N74B662

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 7 Mar-31 May 1974

SURVEY VEHICLES: Six Foremost FN60 vehicles, 2 Foremost FN110 vehicles, 1 TN120 tracked vehicle, 6 TN90 tracked vehicles, 1 each D-6 and D-7 Caterpiller tractors

KILOMETRES SHOT: 242 KMS ONSHORE ONSHORE ACCESS ROUTES: 3 KMS

0 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N74B716

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 20 Mar-31 May 1974

SURVEY VEHICLES: Eleven Foremost FN60 vehicles, 5 Foremost FN110 vehicles, 2 Foremost FN160 vehicles, 1 Foremost Yukon ATV, 1 each D-6 and D-7 Caterpiller tractors,

KILOMETRES SHOT: 50 KMS ONSHORE ONSHORE ACCESS ROUTES: 5 KMS

11 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N74B726

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 15 May-30 May 1974

SURVEY VEHICLES: Sixteen Playcat tracked vehicles

KILOMETRES SHOT: 0 KMS ONSHORE ONSHORE ACCESS ROUTES: 0 KMS

454 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N74B681

SURVEY PROPONENT: Geological Survey of Canada

SURVEY PERIOD: 15 Mar-30 May 1974

SURVEY VEHICLES: Four skidoos, 205 and 206 helicopters used to transport personnel and equipment

KILOMETRES SHOT: 0 KMS ONSHORE ONSHORE ACCESS ROUTES: 0 KMS

250 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N74B709

SURVEY PROPONENT: Imperial Oil Limited

SURVEY PERIOD: 10 May-5 June 1974

SURVEY VEHICLES: Two D-7 Caterpiller tractors, 3 terratire 200 vehicles, 5 Terratire 100 vehicles, portable facilities mounted on 3 Terratire chassis

KILOMETRES SHOT: 55 KMS ONSHORE ONSHORE ACCESS ROUTES: 0 KMS

23 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N74B762

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 15 Mar-5 June 1974

SURVEY VEHICLES: One each D-6 and D-7 Caterpiller tractors, 5 Foremost FN110 vehicles

KILOMETRES SHOT: 0 KMS ONSHORE ONSHORE ACCESS ROUTES: 0 KMS

431 KMS OFFSHORE

MISCELLANEOUS: Airstrip located at 76° 57′ N, 109° 10′ W.

REFERENCES: DIAND Land Use Permit File N74B720

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 1 Oct-15 Dec 1974

SURVEY VEHICLES: Eleven Foremost FN60 vehicles, 5 Foremost FN110 vehicles, 2 Foremost FN160 vehicles, 1 Foremost Yukon fuel unit, 1 each D-6 and D-7 Caterpiller tractors

KILOMETRES SHOT: 110 KMS ONSHORE ONSHORE ACCESS ROUTES: 4 KMS

0 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N74B866

SURVEY PROPONENT: Great Plains Oil and Gas Limited

SURVEY PERIOD: 1 Sept-31 Dec 1974

SURVEY VEHICLES: Seven Foremost FN110 vehicles, 4 D-7 Caterpiller tractors, 1 Rolligon 660 vehicle, 4 Rolligon 4460 vehicles, 3 Rolligon 4450 vehicles, 1 Rolligon 4600 vehicle, portable camp facilities mounted on 7 sleighs and 8 tracked undercarriages

KILOMETRES SHOT: 112 KMS ONSHORE ONSHORE ACCESS ROUTES: 51 KMS

0 KMS OFFSHORE

MISCELLANEOUS: Two Hercules strips, 1575 x 50m
Four DC3 strips, 955 x 30m

REFERENCES: DIAND Land Use Permit File N74B733

SURVEY PROPONENT: Elf Oil Exploration and Production Canada Limited

SURVEY PERIOD: 15 Sept-31 Dec 1974

SURVEY VEHICLES: Three D-7 and D-8 Caterpiller tractors, 16 Foremost FN 110 vehicles, 12 rubber-tired wagons, 6 sleds

KILOMETRES SHOT: 141 KMS ONSHORE ONSHORE ACCESS ROUTES: 83 KMS

0 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N74B834

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 15 Oct-31 Dec 1974

SURVEY VEHICLES: Not given in source

KILOMETRES SHOT: 59 KMS ONSHORE ONSHORE ACCESS ROUTES: 31 KMS

0 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N74B890

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 15 Oct-31 Dec 1974

SURVEY VEHICLES: Fifteen Foremost FN110 vehicles, 1 each D-6 and D-7 Caterpiller tractors, 1 Delta 3 vehicle

KILOMETRES SHOT: 219 KMS ONSHORE ONSHORE ACCESS ROUTES: 158 KMS

0 KMS OFFSHORE

MISCELLANEOUS: Main field base 76° 20' N, 98° 39' W.

REFERENCES: DIAND Land Use Permit File N74B861

SURVEY PROPONENT: N/A

SURVEY PERIOD: 1974

SURVEY VEHICLES: N/A

KILOMETRES SHOT: 100 KMS ONSHORE ONSHORE ACCESS ROUTES: 0 KMS

0 KMS OFFSHORE

MISCELLANEOUS: DIAND Land Use Permit file unavailable at time of compilation

REFERENCES: DIAND Land Use Permit File N74B867

SURVEY PROPONENT: N/A

SURVEY PERIOD: 1974

SURVEY VEHICLES: N/A

KILOMETRES SHOT: 148 KMS ONSHORE ONSHORE ACCESS ROUTES: 0 KMS

0 KMS OFFSHORE

MISCELLANEOUS: DIAND Land Use Permit file missing at time of compilation

REFERENCES: DIAND Land Use Permit File N74B960

SURVEY PROPONENT: N/A

SURVEY PERIOD: 1974

SURVEY VEHICLES: N/A

KILOMETRES SHOT: 148 KMS ONSHORE ONSHORE ACCESS ROUTES: 0 KMS

0 KMS OFFSHORE

MISCELLANEOUS: DIAND Land Use Permit File missing at time of compilation

REFERENCES: DIAND Land Use Permit File N74B753

SURVEY PROPONENT: N/A

SURVEY PERIOD: 1974

SURVEY VEHICLES: N/A

KILOMETRES SHOT: 0 KMS ONSHORE ONSHORE ACCESS ROUTES: 0 KMS

64 KMS OFFSHORE

MISCELLANEOUS: DIAND Land Use Permit File unavailable at time of compilation

REFERENCES: DIAND Land Use Permit File N74B678

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 15 Jan-30 May 1975

SURVEY VEHICLES: Ten Foremost FN110 vehicles, 1 each D-6 and D-7 Caterpiller tractors, 1 Delta 3 ATV, portable camp mounted on 5 FN110 undercarriages

KILOMETRES SHOT: 159 KMS ONSHORE ONSHORE ACCESS ROUTES: 122 KMS

0 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N74B961

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 28 Jan-30 June 1975

SURVEY VEHICLES: Six Foremost FN60 vehicles, 7 Foremost FN110 vehicles, 2 Foremost FN160 vehicles, 1 Foremost Yukon fuel unit, 1 each D-6 and D-7 Caterpiller tractors, portable camp mounted on 6 FN60 undercarriages

KILOMETRES SHOT: 475 KMS ONSHORE ONSHORE ACCESS ROUTES: 382 KMS

0 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N75B187

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 1 May-30 June 1975

SURVEY VEHICLES: Ten Foremost FN110 vehicles, 1 Delta 3 ATV, 1 each D-6 and D-7 Caterpiller tractors, portable camp mounted on 5 FN110 undercarriages

KILOMETRES SHOT: 0 KMS ONSHORE ONSHORE ACCESS ROUTES: 13 KMS

723 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N75B014

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 24 Oct-31 Dec 1975

SURVEY VEHICLES: Seven Foremost FN60, 4 Foremost FN110 vehicles

KILOMETRES SHOT: 18 KMS ONSHORE ONSHORE ACCESS ROUTES: 0 KMS

0 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N75B140

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 1 Mar-30 May 1976

SURVEY VEHICLES: One Foremost FN110 vehicle, 1 each D-5 and D-7 Caterpiller tractors, 1 Bell 206 helicopter

KILOMETRES SHOT: 53 KMS ONSHORE ONSHORE ACCESS ROUTES: 6 KMS

444 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N75B188

SURVEY PROPONENT: Sun Oil Company Limited

SURVEY PERIOD: 3 Mar-8 June 1976

SURVEY VEHICLES: Not given in source

KILOMETRES SHOT: 0 KMS ONSHORE ONSHORE ACCESS ROUTES: 0 KMS

3464 KMS OFFSHORE

MISCELLANEOUS: Seven sub-surveys carried out in Massey Sound, Hassel Sound, Maclean Strait, Prince Gustaf Adolph Sea, Byam Martin Channel, Wilkins Strait, and Ballantyne Strait to measure sea ice thickness

REFERENCES:

Sun Oil Company Limited. "Statistical Study of Late Winter Ice Thickness Distribution in the Arctic Islands." Report prepared for Arctic Petroleum Operators Association (APOA), Report No. 117-1. 1977.

SURVEY PROPONENT: Mobil Oil Canada Limited

SURVEY PERIOD: 10 Mar-15 June 1976

SURVEY VEHICLES: Six Foremost FN60 vehicles, 7 Foremost FN110 vehicles, 1 Parkall vehicle, 2 D-7 Caterpiller tractors, 1 1500-gal. tracked fuel sloop, portable camp mounted on 5 FNT90 tracked undercarriages

KILOMETRES SHOT: 445 KMS ONSHORE ONSHORE ACCESS ROUTES: 70 KMS

18 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N76B208

SURVEY PROPONENT: Mobil Oil Canada Limited

SURVEY PERIOD: 30 Aug-15 Sept 1976

SURVEY VEHICLES: Not used

KILOMETRES SHOT: 0 KMS ONSHORE ONSHORE ACCESS ROUTES: 0 KMS

470 KMS OFFSHORE

MISCELLANEOUS: Airgun used as energy source

REFERENCES: DIAND Land Use Permit File N151-B6

SURVEY PROPONENT: Mobil Oil of Canada Limited

SURVEY PERIOD: 1 Feb-15 Mar 1977

SURVEY VEHICLES: Five Foremost FN60 vehicles, 7 Foremost FN110 vehicles, 5 Foremost FNT90 tracked trailers, 1 Parkall vehicles, 1 tracked explosives carrier, 1 977 and 2 D-7 Caterpiller tractors

KILOMETRES SHOT: 69 KMS ONSHORE ONSHORE ACCESS ROUTES: 13 KMS

7 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N77B457

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 7 Feb-30 June 1977

SURVEY VEHICLES: Not given in source

KILOMETRES SHOT: 320 KMS ONSHORE ONSHORE ACCESS ROUTES: 0 KMS

733 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N76B423

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 28 Jun-30 June 1977

SURVEY VEHICLES: Twelve Foremost FN110 vehicles, 1 each D-6 and D-7 Caterpiller tractors, portable camp mounted on 5 FN110 undercarriages

KILOMETRES SHOT: 374 KMS ONSHORE ONSHORE ACCESS ROUTES: 104 KMS

85 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N77B189

SURVEY PROPONENT: Polar Gas Project

SURVEY PERIOD: 15 July-30 Sept 1977

SURVEY VEHICLES: Not used

KILOMETRES SHOT: 0 KMS ONSHORE ONSHORE ACCESS ROUTES: 0 KMS

54 KMS OFFSHORE

MISCELLANEOUS: Airguns used as energy source; survey of proposed sites for Polar Gas pipeline crossings

REFERENCES: EPS Land Use Application File NW 1710

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 20 Sept-31 Dec 1977

SURVEY VEHICLES: Twelve Foremost FN110 vehicles, 1 each D-6 and D-7 Caterpiller tractors, portable camp mounted on 5 FN110 undercarriages

KILOMETRES SHOT: 229 KMS ONSHORE ONSHORE ACCESS ROUTES: 42 KMS

0 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N77B107

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 1 Oct-31 Dec 1977

SURVEY VEHICLES: Fifteen Foremost FN110 vehicles, 1 D-6 and 2 D-7 Caterpiller tractors, portable camp mounted on 5 FN110 undercarriages

KILOMETRES SHOT: 61 KMS ONSHORE ONSHORE ACCESS ROUTES: 27 KMS

0 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N77B692

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 15 Feb-31 Mar 1978

SURVEY VEHICLES: Two D-6 Caterpiller tractors, 1 Foremost FN10 and 3 FN20 vehicles, 3 Bombardier snowmobiles and 2 skidoos

KILOMETRES SHOT: 4 KMS ONSHORE ONSHORE ACCESS ROUTES: 0 KMS

1074 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N78B763

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 15 Feb-25 May 1978

SURVEY VEHICLES: Thirteen Foremost FN110 vehicles, 1 Foremost Yukon fuel unit, 1 each D-6 and D-7 Caterpiller tractors, portable camp mounted on 5 FN110 undercarriages

KILOMETRES SHOT: 83 KMS ONSHORE ONSHORE ACCESS ROUTES: 48 KMS

0 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N78B763

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 15 Mar-31 May 1979

SURVEY VEHICLES: Seven Bombardier Muskeg carriers, 1 FN110 fuel carrier, 1 Bombardier 9-passenger snowmobile, 7 FNT90 tracked vehicles, 1 977 and 2 D-7 Caterpiller tractors (Noice Peninsula area); 15 Foremost FN110 vehicles, 2 D-7 Caterpiller tractors, 1 Foremost Yukon fuel unit, portable camp mounted on 7 FN110 undercarriages (Melville Island area)

KILOMETRES SHOT: 50 KMS ONSHORE ONSHORE ACCESS ROUTES: 325 KMS

925 KMS OFFSHORE

MISCELLANEOUS: Two sub-programs under one land use permit

REFERENCES: DIAND Land Use Permit File N79B987

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 15 Mar-31 May 1980

SURVEY VEHICLES: Twelve Foremost FN110 vehicles, 1 977 and 3 D-7 Caterpiller tractors, portable camp mounted on 10 FN110 undercarriages

KILOMETRES SHOT: 0 KMS ONSHORE ONSHORE ACCESS ROUTES: 135 KMS

643 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N80B213

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 15 Sept-30 Dec 1980

SURVEY VEHICLES: Fifteen Foremost FN110 vehicles

KILOMETRES SHOT: 170 KMS ONSHORE ONSHORE ACCESS ROUTES: 0 KMS

0 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N80B351

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 1 Mar-1 May 1981

SURVEY VEHICLES: Not given in source

KILOMETRES SHOT: 8 KMS ONSHORE ONSHORE ACCESS ROUTES: 0 KMS

862 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N81B645

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 7 Sept-31 Dec 1981

SURVEY VEHICLES: Ten Foremost FN110 vehicles

KILOMETRES SHOT: 507 KMS ONSHORE ONSHORE ACCESS ROUTES: 4 KMS

0 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N81B584

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 1981 (Survey period not available)

SURVEY VEHICLES: N/A

KILOMETRES SHOT: 0 KMS ONSHORE ONSHORE ACCESS ROUTES: 13 KMS

556 KMS OFFSHORE

MISCELLANEOUS: DIAND Land Use Permit file not available at time of compilation

REFERENCES: DIAND Land Use Permit File N81B438

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 1 Mar-31 May 1982

SURVEY VEHICLES: Five DMC 1450 vehicles, 5 DMC 1200 vehicles, 1 Foremost FM110 vehicle, 2 Foremost FN60 vehicles, 1 977 and 3 D-7 Caterpiller tractors, portable camp mounted on sleighs

KILOMETRES SHOT: 60 KMS ONSHORE ONSHORE ACCESS ROUTES: 66 KMS

830 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: EPS Land Use Application File NW 9436

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 1 Mar-31 May 1982

SURVEY VEHICLES: Four DMC 1450 and 5 DMC 1200 vehicles, 3 Foremost FN110 vehicles, 1 977 and 3 D-7 Caterpiller tractors portable camp mounted on 2 FN160 undercarriages and 7 sleighs (Maclean Strait); 12 FN110 tracked vehicles, 1 977 and 3 D-7 Caterpiller tractors, 1 Bombardier snowmobile, portable camp mounted on 8 FN110 undercarriages (Prince Gustaf Adolph Sea); 12 FN110 vehicles, 1 977 and 3 D-7 Caterpiller tractors, 1 Bombardier 252G Skidozer, portable camp mounted on 15 FN110 undercarriages (Hazen and Ballantyne Straits)

KILOMETRES SHOT: 53 KMS ONSHORE ONSHORE ACCESS ROUTES: 86 KMS

3065 KMS OFFSHORE

MISCELLANEOUS: Three sub-programs carried out under one permit

REFERENCES: DIAND Land Use Permit File N81B645

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 1 Mar-21 May 1983

SURVEY VEHICLES: Twelve Foremost FN110 vehicles, 1 977 and 3 D-7 Caterpiller tractors, 1 Bombardier 252G Skidozer, portable camp mounted on 12 FN110 undercarriages

KILOMETRES SHOT: 191 KMS ONSHORE ONSHORE ACCESS ROUTES: 0 KMS

8 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N83B911

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 1 Mar-24 May 1983

SURVEY VEHICLES: Twelve Foremost FN110 vehicles, 1 977 and 3 D-7 Caterpiller tractors, 1 Bombardier 252G Skidozer, portable camp mounted on 9 FN110 undercarriages

KILOMETRES SHOT: 55 KMS ONSHORE ONSHORE ACCESS ROUTES: 29 KMS

1505 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N83B848

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 13 Sept-19 Dec 1983

SURVEY VEHICLES: Fourteen Foremost FN110 vehicles, 1 977 and 3 D-7 Caterpiller tractors, 2 Bombardier 252G Skidozers, portable camp mounted on 13 FN110 undercarriages

KILOMETRES SHOT: 323 KMS ONSHORE ONSHORE ACCESS ROUTES: 35 KMS

0 KMS OFFSHORE

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N83B964

SURVEY PROPONENT: Panarctic Oils Limited

SURVEY PERIOD: 1 Mar-10 May 1984

SURVEY VEHICLES: Seven DMC 1200 and 4 DMC 1450 vehicles, 3 Foremost FN110 and 2 FN60 vehicles, 1 977 and 3 D-7 Caterpiller tractors, portable camp mounted on 2 FN160 tracked undercarriages and 10 sleighs.

KILOMETRES SHOT: 80 KMS ONSHORE

439 KMS OFFSHORE

ONSHORE ACCESS ROUTES: 0 KMS

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit File N83B055

Appendix B: Common Drilling Fluid Components and Additives by Tradename

Appendix B. Common Drilling Fluid Components and Additives by Tradename. (Source: Neff, 1982)

MILCHEM	BAROID	MAGCOBAR	IMCO	DESCRIPTION
Weight Materials and Viscosifiers				
Flosal	Flosal	Visquick	IMCO Shurlift	Asbestos Fibers
Galena	Galena	Super-Wate	Galena	Pulverized Lead Ore
Green Band	Baroco	High Yield	IMCO Klay	Sub Bentonite
Mil-Bar	Baroid	Magcobar	IMCO Bar	Barite
Milgel	Aquagel	Magcogel	IMCO Gel	Bentonite Clay
Mil-Polymer 302				Polysaccharide Polymer
Salt Water Gel	Zeogel	Salt Gel	IMCO Brinegel	Attapulgite Clay
Super-Col	Quik-Gel	Kwik-Thik	IMCQ HYB	Extended Bentonite
W.O. 30		Lo Wate	IMCO Wate	Calcium Carbonate
XC Polymer	XC Polymer	Duovis	XC Polymer	Xanthum Gum Polymer
Deflocculants-Thinner				
Chemtrol 3 CLS				Chrome Lignosulfonate
Desco	Desco	Desco	Desco	Organic Mud Thinner
Mil Flo				Polyflavinoid Compound
Mil Quebracho	Tannex	MC Quebracho	IMCO QBT	Quebracho-Lignite Blend
Ohfos	Barafos	Magco-Phos	IMCO Phos	Sodium Tetraphosphate
Rayflo	Rayflo	Rayflo	Rayflo	Hemlock Extract
SAPP	SAPP	SAPP	SAPP	Sodium Acid Pyrophosphate
Uni-Cal	Q-Broxin	Spersene	IMCO VC-10	Chrome Lignosulfonate
Filtration Control Materials				
Chemtrol-X		Resinex	IMCO Poly Rx	Polymer Blend
Cypan	Cypan	Cypan	Cypan	Sodium Polyacrylate
Drispac	Drispac	Drispac	Drispac	Polyanionic Cellulose Polymer
Drispac Lo-Vis	Drispac LV		Drispac Super-Lo	Polyanionic Cellulose Polymer Low Viscosity
Ligco	Carbonox	Tann-A-Thin	IMCO Lig	Mined Lignite
Ligcon	CC-16	Caustalig	IMCO Thin	Causticized Lignite
Lo Loss	Lo Loss	Lo Loss	Lo Loss	Chem Treated Guar Gum
Milchem CMC-Med	Cellex-Reg	Magco CMC-Reg	IMCO CMC-Reg	Carboxymethylcellulose
Milchem CMC-HV	Cellex-HV	Magco CMC-HV	IMCO CMC-HV	Carboxymethylcellulose
Mil Con		XP-20		Heavy Metal Modified Lignite
Milstarch	Impermex	My-Lo-Jel	IMCO Loid	Pregelatinized Starch
Preservative	Aldacide	My-Lo-Jel Preservative	Preservaloid	Paraformaidehyde
Perma-Lose				Non-Fermenting Organic Polymer
Starlose	Dextrid	Pemstarch	IMCO Permaloid	Non-Fermenting Organic Polymer
SPA	SPA	SPA	SPA	Sodium Polyacrylate
WL-100	WL-100	WL-100	WL-100	Sodium Polyacrylate
Loss of Circulation Additives				
Diaseal M	Diaseal M	Diaseal M	Diaseal M	Mixture of Filter Aid Materials
Kwik-Seal	Kwik-Seal	Kwik-Seal	Kwik-Seal	Combination of Granules, Flakes and Fibers
Mil-Cedar Plug	Plug-Git	Chip-Seal		Shredded Cedar Fibers
Mil-Fiber	Fibertex	Mud Fiber	IMCO Fyber	Processed Cane Fibers
Milflake	Jelflake	Cell-O-Seal	IMCO Flakes	Shredded Cellophane Flakes
Milmica	Micatex	Magco Mica	IMCO Myca	Flake Mica
Mil-Plug	Wall-Nut	Nut Plug	IMCO Plug	Ground Nut Hulls
Specialty Additives				
Alum Stearate	Alum Stearate	Alum Stearate	Alum Stearate	Aluminum Stearate Defoamer
Ami-TEC	Coat 415	Magco Inhibitor 202	IMCO PT-102	Oil Soluble, Water Dispersible Amine Corrosion Inhibitor
Ampli-Foam	Quik-Foam	Magco Foamer 66		Gen Purpose Foaming Agent for Brackish or Salt Water
Aquanul 803	Surflo B11			Anionic Microbiocide
Aquatec	Coat 122	Magco Inhibitor 101		Amine Corrosion Inhibitor for Water, Air-Mist Drilling
Atlosol	Trimulso	Magconate		Anionic Non-Ionic Emulsifier

Appendix B. Common Drilling Fluid Components and Additives by Tradename. continued

MILCHEM	BAROID	MAGCOBAR	IMCO	DESCRIPTION
Specialty Additives (continued)				
Atlosol-S	Seamul	Salinex	IMCO SWS	Salt Water Emulsifier
Ben-Ex	Ben-Ex	Ben-Ex	Ben-Ex	Copolymer, Flocculant and Clay Extender
C-88				Oxalic Acid
Caltrol	Shale-Ban	T-8	IMCO SCR	Shale Control Reagent
DME		Surfak E	DME	Non-Ionic Emulsifier
DMS	Aktoflo S	Surfak M	DMS	Non-Ionic Surfactant
Drillaid 405	Drillaid 405	Drillaid 405	Drillaid 405	Non-Fluorescent Lubricant
Gel-Air				Gen Purpose Foaming Agent for Fresh Water-Stiff Foam
IPI (W.D.)	Baroid Asphalt	Stabil-Hole	IMCO Holecoat	Powdered, Water Dispersible Asphalt
LD-8		Magconol	IMCO Foamban	Non-Hydrocarbon Defoamer
Lo-Sol	X-Tend	Rapidrill	IMCO Gelex	Liquid Bentonite Extender
Lubri-Film	E P Mudlube	Bit Lube	IMCO E P Lube	Extreme Pressure Lubricant
Lubri-Sal				Biodegradable Bore Hold Lubricant for Brackish Water
Mil-Clean				Biodegradable Detergent
Milchem MD	Condet	DD	IMCO MD	Mud Detergent
Mil-Emulsifier				Oil Soluble Emulsifier
Mil-Free	Skot Free	Pipe Lax	IMCO Freepipe	Surfactant to be Mixed with Diesel to Free Stuck Pipe
Mil-Gard	Coat 45		IMCO Sulf-X	Sulfide Scavenger
Mil-Graphite	Graphite	Flake Graphite	Graphite	Graphite
Mil-Plate	Torq-Trim	DOS-3	Lubrikleen	Biodegradable Bore Hole Lubricant for Fresh Water
Mil-Temp				High Temp Stabilizer for Water Base Mud
Noxygen	Coat 888	OS-1		Oxygen Scavenger
Noxygen L	Coat 777	OS-1L	IMCOX-02	OXygen Scavenger-Liquid
Scale-Ban	SURFLO H35	SI 1000		Scale inhibitor
Select Floc	Drillaid 421	Floxit		Drilled Solids Flocculant
Separan	Separan	Separan	Separan	Clay Flocculant
Super Shale-Trol 202				Additive for Gumbo Shale Drilling
Soltex	Soltex	Soltex	Soltex	Sulfonated Residuum
XKB-Lig	K-Lig		IMCO Inpac	Potassium Lignite
XKB-Thin	K-Flo		IMCO Inpac	Iron-Complexed Lignosulfate
Oil Base Mud Additives				
CARBO-FREE	E Z Spot		IMCO Spot	Variable Density Oil Phase Spotting Fluid Conc for Oil Mud
CARBO-GEL	Geltone	VG-69	IMCO Ken Gel	Organophilic Colloid
CARBO-MIX	Invermul	Vertoil	IMCO Ken X	Basic Oil Mud Emulsifier
CARBO-MUL	E Z Mul	SE-11		Quick Emulsification & Rapid Oil Wetting of Solids
CARBO-SEAL		Oil Seal		Granular Hydrocarbon
CARBO-TEC			IMCO Ken X-3	Emulsifier for High Temp Systems
CARBO-TROL	Duratone	DV-22	IMCO Ken X-2	Filtration Control at High Temp
SURF-COTE	OMC	DV-33	IMCO Ken-Thin	Oil Wetting Agent
Workover Additives				
W. O. TM20	Workover One	Polybrine	IMCO Safe-Vis	Polymeric Viscosifier & Fluid Loss Control Agent
W. O. TM21			IMCO Safe-Visx	High Yielding Polymeric Viscosifier
W. O. TM30		Mixical	Safe-Seal	Graded Calcium Carbonate
W. O. TM50		Ceastop	Safe-Perfseal	One Package Additive for Preparing Viscous Pill
W. O. TM60				Acid-Soluble Polymeric Viscosifier
W. O. TMDEFOAM		Magconol	Foamban	Alcohol Base Defoamer

Chemicals (Commercial Chemicals Widely Used in Drilling Muds)

Bicarbonate of Soda	Dowcide G	Potassium Chloride
Calcium Chloride	Gypsum	Soda Ash
Caustic Soda	Lime	Sodium Bichromate
Chrome Alum	Salt	Sodium Chromate
Chromic Chloride		

Appendix C: Individual Well Descriptions

(ordered by year and cross-referenced by unique numbers)

INDEX NUMBERS AND WELL SUMMARIES

NO.	WELL NAME	WELL DEPTH	STATUS	RIG RELEASE DATE
01	Dome Panarctic Texex Weatherall O-10	2,287 m	abandoned	19 Jan. 1974
02	Panarctic Home et al Sirius K-28	2,871 m	abandoned	26 Feb. 1974
03	Panarctic et al Drake Point D-68	5,416 m	gas well	25 Mar. 1974
04	Imperial Panarctic et al Sherwood P-37	3,136 m	abandoned	05 Apr. 1974
05	Panarctic Tenn et al Bent Horn N-72	4,384 m	oil discovery	05 Apr. 1974
06	Panarctic Tenn et al W. Hecla N-52	939 m	gas well	15 Apr. 1974
07	Sun et al Elve M-40	1,875 m	abandoned	19 May 1974
08	Panarctic Tenn et al Homestead Drake E-78	1,357 m	gas well	27 May 1974
09	Panarctic Gulf Eglinton P-24	1,838 m	abandoned	03 July 1974
10	Panarctic Homestead POR N. Sabine H-49	3,810 m	abandoned	08 July 1974
11	Panarctic Tenn Robert Harbour K-07	3,805 m	abandoned	17 Aug. 1974
12	Panarctic Dome et al Sherard Bay F-14	1,343 m	abandoned	31 Oct. 1974
13	Panarctic et al Pedder Point D-49	1,875 m	abandoned	10 Nov. 1974
14	Dome Arctic Ventures Crocker I-53	3,584 m	abandoned	05 Dec. 1974
15	Panarctic Cape Fleetwood M-21	3,514 m	abandoned	07 Dec. 1974
16	Panarctic Collingwood K-33	2,046 m	abandoned	18 Feb. 1975
17	Panarctic et al W. Bent Horn C-44	3,563 m	abandoned	06 Apr. 1975
18	Panarctic Gulf et al East Drake I-55	1,189 m	gas discovery	16 Apr. 1975
19	Panarctic et al Pat Bay A-72	3,230 m	abandoned	06 May 1975
20	Panarctic Tenn et al Drake D-73	1,361 m	gas well	10 May 1975
21	Elfex et al Wilkie Point J-51	2,347 m	abandoned	21 May 1975
22	Panarctic et al Chads Creek B-64	5,036 m	abandoned	27 June 1975
23	Panarctic Mocklin Point D-23	2,802 m	abandoned	20 July 1975
24	Panarctic Bent Horn F-72	3,216 m	abandoned	24 Aug. 1975

INDEX NUMBERS AND WELL SUMMARIES
continued

NO.	WELL NAME	WELL DEPTH	STATUS	RIG RELEASE DATE
25	Panarctic et al E. Hecla C-32	1,341 m	gas well	10 Dec. 1975
26	Texex King Point West B-53	2,137 m	abandoned	02 Jan. 1976
27	Elf et al Dyer Bay L-49	3,171 m	abandoned	20 Feb. 1976
28	Panarctic et al Sabine Bay A-07	5,193 m	abandoned	24 Feb. 1976
29	Panarctic W. Hecla P-62	1,128 m	gas discovery	26 Feb. 1976
30	Panarctic et al Jackson Bay G-16	1,201 m	abandoned	15 Mar. 1976
31	Panarctic Tenn CS N.W. Hecla M-25	1,207 m	gas well	18 Apr. 1976
32	Panarctic W. Bent Horn E-43	3,371 m	abandoned	19 Apr. 1976
33	Panarctic et al Jackson Bay G-16A	1,600 m	gas discovery	30 Apr. 1976
34	Panarctic Tenn et al W. Hecla C-05	1,237 m	abandoned	16 May 1976
35	Panarctic et al West Bent Horn A-02	3,361 m	oil discovery	01 Aug. 1976
36	Panarctic et al Key Point O-51	3,482 m	abandoned	06 Sept. 1976
37	Panarctic Charles Point G-07	3,864 m	abandoned	07 Feb. 1977
38	Panarctic N.E. Drake P-40	1,295 m	abandoned	12 Mar. 1977
39	Panarctic S.W. Hecla C-58	1,219 m	gas well	29 Apr. 1977
40	Panarctic et al West Bent Horn I-01A	3,280 m	abandoned	18 May 1977
41	Panarctic West Bent Horn M-12	3,231 m	abandoned	03 June 1977
42	Panarctic AIEG et al Depot Island C-44	2,669 m	abandoned	10 June 1977
43	Panarctic Sophie Point G-19	3,792 m	abandoned	30 Sept. 1977
44	Panarctic et al Richardson Point G-12	3,356 m	abandoned	25 Jan. 1978
45	HB Norcen Phillips Cape Allison L-50	2,122 m	abandoned	04 Mar. 1978
46	Panarctic et al AIEG Roche Point J-43	2,882 m	gas discovery	18 Apr. 1978
47	Panarctic Norcen AIEG et al Grassy 1-34	975 m	abandoned	22 Apr. 1978
48	Panarctic Drake F-76	1,128 m	gas well	28 Apr. 1978
49	Panarctic et al Beverly Inlet G-13	4,061 m	abandoned	23 June 1978

INDEX NUMBERS AND WELL SUMMARIES
continued

NO.	WELL NAME	WELL DEPTH	STATUS	RIG RELEASE DATE
50	Panarctic et al Drake Point K-79	1,725 m	abandoned	23 June 1978
51	Panarctic et al Bent Horn A-57	3,627 m	abandoned	29 Aug. 1978
52	Panarctic et al Stokes Range J-11	3,340 m	abandoned	17 Sept. 1978
53	Panarctic et al Noice D-41	2,347 m	abandoned	02 Jan. 1979
54	Dome Panarctic et al Hoodoo E-05	2,476 m	abandoned	03 Jan. 1979
55	Panarctic AIEG et al Desbarats B-73	1,085 m	abandoned	27 Mar. 1979
56	Phillips et al Hazen Strait F-54	3,064 m	abandoned	12 May 1979
57	Panarctic AIEG Whitefish H-63	2,126 m	gas discovery	17 May 1979
58	Mobil Cornwall O-30	3,584 m	abandoned	14 Oct. 1979
59	Panarctic AIEG Dome PPC Char G-07	2,179 m	oil and gas discovery	22 Apr. 1980
60	Panarctic AIEG PPC Balaena D-58	1,874 m	oil trace	27 Apr. 1980
61	Panarctic AIEG Whitefish 2H-63	3,003 m	gas well	15 May 1980
62	Dome Wallis H-73	2,827 m	abandoned	23 Aug. 1980
63	Panarctic AIEG Vesey A-27	2,922 m	abandoned	09 Sept. 1980
64	Panarctic AIEG PPC Dome Skate B-80	1,655 m	oil and gas discovery	04 Apr. 1981
65	Panarctic AIEG Phillips Cisco B-66	2,412 m	oil and gas discovery	04 May 1981
66	Panarctic AIEG PPC Dome Maclean I-72	2,475 m	oil and gas discovery	04 May 1981
67	Panarctic W. Bent Horn G-02	3,220 m	abandoned	04 Sept. 1981
68	Panarctic Dome et al Hoodoo N-52	1,650 m	abandoned	11 Nov. 1981
69	Panarctic et al Cisco C-42	1,750 m	oil well	20 Apr. 1982
70	Panarctic et al Cape Mamen F-24	2,925 m	abandoned	28 Apr. 1982
71	Panarctic et al Whitefish A-26	2,817 m	abandoned	30 Apr. 1982

INDEX NUMBERS AND WELL SUMMARIES
continued

NO.	WELL NAME	WELL DEPTH	STATUS	RIG RELEASE DATE
72	Panarctic et al Sculpin K-08	1,850 m	gas discovery	03 May 1982
73	Panarctic et al Cisco K-58	2,240 m	oil well	01 Feb. 1983
74	Panarctic et al Cape Macmillan 2K-15	2,090 m	oil and gas discovery	12 Apr. 1983
75	Panarctic et al Grenadier A-26	2,766 m	abandoned	17 Apr. 1983
76	Panarctic et al Maryatt Point K-71	5,300 m	abandoned	17 July 1983
77	Panarctic et al Cisco M-22	2,367 m	abandoned	12 Apr. 1984
78	Panarctic et al Skate C-59	2,300 m	gas well	13 Apr. 1984
79	Panarctic et al Sherard Bay F-34	5,437 m	abandoned	01 May 1984
80	Panarctic et al Buckingham O-68	2,772 m	abandoned	14 May 1984

01

WELL NAME: Dome Panarctic Texex Weatherall O-10

LATITUDE: 75° 49′ 51″ LONGITUDE: 108° 31′ 50″ STATUS: Abandoned

SPUD DATE: 6 Dec 1973 RIG RELEASE DATE: 19 Jan 1974 WELL DEPTH: 2287m

DRILL CAMP DIMENSIONS: 330 x 165m DRILLING WASTE SUMP DIMENSIONS: **Not given**

AIRSTRIP DIMENSIONS: Herc strip 1525 x 60m ACCESS ROADS: **Not given in source**

WELL SITE VEHICLES: Two D-7 Caterpiller tractors, two 30-ton oilfield trucks, one forklift, one .5-ton truck

MUD COMPONENTS:				
Caustic soda	2091 kg	Aluminum stearite	24 kg
Drilaid	196 kg	Barite	59364 kg
Sodium bicarbonate	1773 kg	C.M.C.	1273 kg
Gel	43273 kg	Calcium chloride	1818 kg
Soda ash	1727 kg	Spersene	1136 kg
Q-Broxin	2136 kg	Walnut hulls	909 kg

MISCELLANEOUS:

REFERENCES: COGLA Well History Microfiche D.A. 733

DIAND Land Use Permit N73A540

02

WELL NAME: Panarctic Home et al Sirius K-28

LATITUDE: 79° 18′ 35″ LONGITUDE: 103° 41′ 43″ STATUS: Abandoned

SPUD DATE: 26 Nov 1973 RIG RELEASE DATE: 26 Feb 1974 WELL DEPTH: 2871m

DRILL CAMP DIMENSIONS: 120 x 60m DRILLING WASTE SUMP DIMENSIONS: 30 x 20 x 2m

AIRSTRIP DIMENSIONS: Herc strip 1525 x 60m ACCESS ROADS: 42.4 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, three 30-ton oilfield trucks, two forklifts, two .5-ton tricks, one snowmobile.

MUD COMPONENTS:				
Barite	191591 kg	Palcoseal	45 kg
Bentonite	39318 kg	Kwik Seal	73 kg
Caustic soda	4228 kg	Walnut hulls	727 kg
Chrome alum	1037 kg	Wood fibers	227 kg
XC-Polymer	4841 kg	Sawdust	3636 kg
Sodium bicarbonate	1318 kg	Visbestos	958 kg
Dowicide B	164 kg	C.M.C.	96 kg
Fine mica	2727 kg	Soda ash	21 kg
Peltex	2182 kg	Chevron Foam	5 bbls

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 730

DIAND Land Use Permit N73A559

WELL NAME: Panarctic et al Drake Point D-68 03

LATITUDE: 76° 27' 05" LONGITUDE: 108° 55' 42" STATUS: Gas Well

SPUD DATE: 7 June 1973 RIG RELEASE DATE: 25 Mar 1974 WELL DEPTH: 5416m

DRILL CAMP DIMENSIONS: 330 x 330m DRILLING WASTE SUMP DIMENSIONS: Not given in source

AIRSTRIP DIMENSIONS: Twin Otter strip 457 x 30m ACCESS ROADS: 14.4 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, two Kenworth oilfield trucks, two forklifts, one .5-ton truck, one Bombardier snow-mobile

MUD COMPONENTS:

Bentonite	189863 kg	Gel	91 kg
Caustic soda	19954 kg	Soda ash	3954 kg
XC-Polymer	25909 kg	Mica	3865 kg
Barite	2009227 kg	Alcohol	197 l
Chromic chloride	129 kg	Sodium chromate	5295 kg
Chrome alum	1147 kg	Sodium bichromate	3454 kg
Sodium bicarbonate	5727 kg	S.A.P.P.	318 kg
Sawdust	23172 kg	Flo-sal	522 kg
Plaster	136 kg	Walnut hulls	340 kg
Kwik Seal	2322 kg	Lignite	454 kg
Cello flakes	254 kg	Pipelax	1.5 bbls
Aluminum Stearate	116 kg	Diesal oil	45 bbls
Peltex	14681 kg	CMC	136 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 702

DIAND Land Use Permit N73A422

WELL NAME: Imperial Panarctic et al Sherwood P-37 04

LATITUDE: 78° 16' 47" LONGITUDE: 89° 45' 26" STATUS: Abandoned

SPUD DATE: 9 Dec 1973 RIG RELEASE DATE: 5 Apr 1974 WELL DEPTH: 3136m

DRILL CAMP DIMENSIONS: DRILLING WASTE SUMP DIMENSIONS: 60 x 45 x 4m and 18 x 55 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m
T. Otter strip 457 x 30m ACCESS ROADS: Not given in source

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Gel	191454 kg
Sodium bicarbonate	3045 kg
Caustic soda	4772 kg
Barite	85409 kg
Sawdust	4636 kg
XC-Polymer	

MISCELLANEOUS: Dock and storage area at 78° 13' N, 89° 44' W.

REFERENCES: COGLA. Well History Microfiche D.A. 727

DIAND Land Use Permit N73A477

WELL NAME: Panarctic Tenn et al Bent Horn N-72 05

LATITUDE: 76° 21' 50" LONGITUDE: 103° 58' 11" STATUS: Oil Discovery

SPUD DATE: 24 Nov 1973 RIG RELEASE DATE: 5 Apr 1974 WELL DEPTH: 4384m

DRILL CAMP DIMENSIONS: 305 x 60m DRILLING WASTE SUMP DIMENSIONS: 41 x 30 x 3m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m ACCESS ROADS: 4 km

WELL SITE VEHICLES: Two D-6 Caterpiller tractors, two 30-ton oilfield trucks, two forklifts, one Foremost Delta 3 vehicle, one .5-ton truck

MUD COMPONENTS: Not given in source

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit N73A500

WELL NAME: Panarctic Tenn et al W. Hecla N-52 06

LATITUDE: 76° 21' 53" LONGITUDE: 110° 50' 52" STATUS: Gas Well

SPUD DATE: 5 Mar 1974 RIG RELEASE DATE: 15 Apr 1974 WELL DEPTH: 939m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Herc ice strip, 1530 x 60m ACCESS ROADS: None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Barite	72863 kg
Bentonite	11954 kg
Gel	6909 kg
Attapulgite	1545 kg
XC-Polymer	786 kg
Peltex	409 kg
Caustic soda	151 kg
Sodium bicarbonate	500 kg
CMC	68 kg
Chrome Alum	31 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 738

07

WELL NAME: Sun et al Elve M-40

LATITUDE: 78° 09' 58" LONGITUDE: 101° 49' 40" STATUS: Abandoned

SPUD DATE: 21 Mar 1974 RIG RELEASE DATE: 19 May 1974 WELL DEPTH: 1875m

DRILL CAMP DIMENSIONS: 305 x 153m DRILLING WASTE SUMP DIMENSIONS: 30 x 30 x 2m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m ACCESS ROADS: 30 km

WELL SITE VEHICLES: One each D-4, D-6 and D-7 Caterpiller tractors, three 30-ton oilfield trucks, two .5-ton trucks, two Otaco sleighs, one forklift, one grader, one Foremost Husky ATV, one Bombardier snowmobile

MUD COMPONENTS:

XC-Polymer	2090 kg
Bentonite	272 kg
Chrome alum	415 kg
Caustic soda	315 kg
Sodium bicarbonate	545 kg
Barite	8545 kg
Calcium chloride	31 kg
Lime	193 kg
Sawdust	1854 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 750

DIAND Land Use Permit n74A707

08

WELL NAME: Panarctic Tenn et al Homestead Drake E-78

LATITUDE: 76° 27' 19" LONGITUDE: 108° 29' 25" STATUS: Gas Well

SPUD DATE: 2 May 1974 RIG RELEASE DATE: 27 May 1974 WELL DEPTH: 1357m

DRILL CAMP DIMENSIONS: 213 x 123m DRILLING WASTE SUMP DIMENSIONS: Not given in source

AIRSTRIP DIMENSIONS: None ACCESS ROADS: Not given in source

WELL SITE VEHICLES: One each D-6 and D-8 Caterpiller tractors, three 30-ton oilfield trucks, two forklifts, one 5-ton Foremost Yukon ATV, one grader, on .5-ton truck

MUD COMPONENTS: Not given in source

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit N73A399

09

WELL NAME: Panarctic Gulf Eglinton P-24

LATITUDE: 75° 53' 52" LONGITUDE: 118° 07' 39" STATUS: Abandoned

SPUD DATE: 6 June 1974 RIG RELEASE DATE: 3 July 1974 WELL DEPTH: 1838m

DRILL CAMP DIMENSIONS: 120 x 130m DRILLING WASTE SUMP DIMENSIONS: 30 x 20 x 3

AIRSTRIP DIMENSIONS: T. Otter strip 450 x 30m ACCESS ROADS: 10.8 km

WELL SITE VEHICLES: One each D-6 and D-8 Caterpiller tractors, three 30-ton oilfield trucks, two forklifts, one 5-ton Foremost Yukon ATV, one grader, on .5-ton truck

MUD COMPONENTS:

Caustic soda	2111 kg
XC-Polymer	2045 kg
Chrome alum	413 kg
Barite	7227 kg
Gel	5954 kg
Sodium bicarbonate	91 kg
Sawdust	313 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 766

DIAND Land Use Microfiche N74A771

10

WELL NAME: Panarctic Homestead POR N. Sabine H-49

LATITUDE: 76° 49' 18" LONGITUDE: 108° 39' 27" STATUS: Abandoned

SPUD DATE: 3 May 1974 RIG RELEASE DATE: 8 July 1974 WELL DEPTH: 3810m

DRILL CAMP DIMENSIONS: 330 x 220m DRILLING WASTE SUMP DIMENSIONS: 33 x 33 x 3m

AIRSTRIP DIMENSIONS: Herc strip 1525 x 60m ACCESS ROADS: 43.4 km

WELL SITE VEHICLES: One each D-7 and D-8 Caterpiller tractors, two Kenworth oilfield trucks, two forklifts, one Bombardier snowmobile, one .5-ton truck

MUD COMPONENTS:

Bentonite	37227 kg	Sodium bicarbonate	409 kg
XC-Polymer	5613 kg	Sawdust	20600 kg
Chrome alum	909 kg	Lime	50 kg
Barite	38409 kg	Peltex	159 kg
Detergent	3 bbls	Soda ash	91 kg
Calgon	45 kg	Visbestos	772 kg
Caustic soda	3806 kg	Sodium bichromate	1227 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 758

DIAND Land Use Permit N73A541

11

WELL NAME: Panarctic Tenn Robert Harbour K-07

LATITUDE: 76° 36' 32" LONGITUDE: 104° 02' 14" STATUS: Abandoned

SPUD DATE: 26 Apr 1974 RIG RELEASE DATE: 17 Aug 1974 WELL DEPTH: 3805 m

DRILL CAMP DIMENSIONS: 180 x 150m DRILLING WASTE SUMP DIMENSIONS: 41 x 33 x 3m

AIRSTRIP DIMENSIONS: Herc strip 1525 x 60m ACCESS ROADS: 32 km

WELL SITE VEHICLES: One D-6 Caterpiller tractor, two 30-ton oilfield trucks, one .5-ton truck, two forklifts, one Foremost Delta 3 ATV

MUD COMPONENTS:

Aluminum stearate	129 kg	Lime	386 kg
Barite	225227 kg	Magobar	94 l
Bentonite	59090 kg	Plaster	1409 kg
Sodium bicarbonate	272 kg	Peltex	750 kg
Caustic soda	875 kg	Gel	5863 kg
Chrome alum	2077 kg	Sparto Ep	3 bbls
CMC	272 kg	Diesel oil	88 bbls
Dowicide B	161 kg	Crude oil	34 bbls
Gypsum	645 kg	Pipe Lax	246 l
XC-Polymer	12818 kg		

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 760

DIAND Land Use Permit N73A550

12

WELL NAME: Panarctic Dome et al Sherard Bay F-14

LATITUDE: 76° 13' 19" LONGITUDE: 108° 35' 51" STATUS: Abandoned

SPUD DATE: 7 Oct 1974 RIG RELEASE DATE: 31 Oct 1974 WELL DEPTH: 1343m

DRILL CAMP DIMENSIONS: 213 x 122m DRILLING WASTE SUMP DIMENSIONS: Not given

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m
T. Otter strip 457 x 122m ACCESS ROADS: 25.7 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, two Foremost Delta 3 ATVs, two 30-ton oilfield trucks, two forklifts, one grader, one .5-ton truck

MUD COMPONENTS:

Gel	26090 kg	CMC	11 kg
Kelzan	2159 kg	Sawdust	1136 kg
Caustic soda	1329 kg	Walnut shells	272 kg
Chrome alum	572 kg	Spersene	284 kg
Sodium bicarbonate	1231 kg	Dowicide B	79 kg
XC-Polymer	806 kg	Aluminum stearate	11 kg
Barite	4727 kg	Ado-Foam	15 bbls
Sodium bichromate	363 kg	Haga-treat	113 kg
Paraformaldehyde	168 kg	Calgon	272 kg
Preservative	238 kg	Quickseal	454 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 773

DIAND Land Use Permit N74A838

13

WELL NAME: Panarctic et al Pedder Point D-49

LATITUDE: 75° 38' 09" LONGITUDE: 118° 48' 15" STATUS: Abandoned

SPUD DATE: 12 Oct 1974 RIG RELEASE DATE: 10 Nov 1974 WELL DEPTH: 1875m

DRILL CAMP DIMENSIONS: 304 x 152m DRILLING WASTE SUMP DIMENSIONS: 33 x 33 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m ACCESS ROADS: 54.7 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, two Foremost Delta 3 ATVs, two 30-ton oilfield trucks, one grader, two forklifts, one .5-ton truck

MUD COMPONENTS:

XC-Polymer	2113 kg	Sawdust	454 kg
Bentonite	6136 kg	Mica	272 kg
Caustic soda	1545 kg	Walnut hulls	113 kg
Chrome alum	386 kg	Kwik Seal	272 kg
Sodium bicarbonate	272 kg	Diesel oil	10976 l
Barite	3090 kg		

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 774

DIAND Land Use Permit N74A853

14

WELL NAME: Dome Arctic Ventures Crocker I-53

LATITUDE: 80° 02 44 LONGITUDE: 98° 55' 20" STATUS: Abandoned

SPUD DATE: 12 June 1974 RIG RELEASE DATE: 5 Dec 1974 WELL DEPTH: 3584m

DRILL CAMP DIMENSIONS: 366 x 183m DRILLING WASTE SUMP DIMENSIONS: 36 x 27 x 5m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m ACCESS ROADS: 24 km

WELL SITE VEHICLES: Two D-7 Caterpiller tractors, three 30-ton trucks, two forklifts, one grader, one .5-ton truck

MUD COMPONENTS: Not given in source

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit N73A527

15

WELL NAME: Panarctic Cape Fleetwood M-21

LATITUDE: 76° 30' 47" LONGITUDE: 103° 40' 37" STATUS: Abandoned

SPUD DATE: 23 Sept 1974 RIG RELEASE DATE: 7 Dec 1974 WELL DEPTH: 3514m

DRILL CAMP DIMENSIONS: 304 x 152m DRILLING WASTE SUMP DIMENSIONS: 45 x 45 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m ACCESS ROADS: 14.4 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, one Foremost Delta 3 ATV, three 30-ton oilfield trucks, two .5-ton trucks, one grader, two forklifts

MUD COMPONENTS:

Gel	12181 kg
Kelzan	7681 kg
Chrome alum	977 kg
Caustic soda	2318 kg
Sawdust	2263 kg
Lime	588 kg
Barium carbonate	45363 kg
Mica	750 kg
Sodium bicarbonate	727 kg
Sodium bichromate	840 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 771

DIAND Land Use Permit N74A852

16

WELL NAME: Panarctic Collingwood K-33

LATITUDE: 76° 32 44" LONGITUDE: 108° 43' 27" STATUS: Abandoned

SPUD DATE: 28 Dec 1974 RIG RELEASE DATE: 18 Feb 1975 WELL DEPTH: 2046m

DRILL CAMP DIMENSIONS: 213 x 122m DRILLING WASTE SUMP DIMENSIONS: 30 x 30 x 4

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m ACCESS ROADS: 1.6 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, two Foremost Delta 3 ATVs, two 30-ton oilfield trucks, two forklifts, one grader, one .5-ton truck

MUD COMPONENTS:

XC-Polymer	2250 kg
Caustic soda	781 kg
Chrome alum	359 kg
Sodium bicarbonate	181 kg
Gel	17100 kg
Lime	318 kg
Peltex	409 kg
Barite	29363 kg
Dowicide B	34 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 794

DIAND Land Use Permit N74A845

17

WELL NAME: Panarctic et al W. Bent Horn C-44

LATITUDE: 76° 22' 10" LONGITUDE: 104° 19' 33" STATUS: Abandoned

SPUD DATE: 9 Jan 1975 RIG RELEASE DATE: 6 Apr 1975 WELL DEPTH: 3563m

DRILL CAMP DIMENSIONS: 305 x 152m DRILLING WASTE SUMP DIMENSIONS: 45 x 45 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m ACCESS ROADS: 21.7 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, one Foremost Delta 3 ATV, three 30-ton oilfield trucks, two .5-ton trucks, one grader, two forklifts

MUD COMPONENTS:

Kelzan	9363 kg	Gel	22954 kg
Chrome alum	1641 kg	Barite	32727 kg
Lime	41 kg	Protomagic	182 kg
Sawdust	1430 kg	Sodium bichromate	227 kg
Caustic soda	2395 kg	Soda ash	1227 kg
Sodium bicarbonate	1302 kg	Walnut hulls	1182 kg
Dowcide B	273 kg		

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 796

18

WELL NAME: Panarctic Gulf et al East Drake I-55

LATITUDE: 76° 24' 39" LONGITUDE: 107° 48' 54" STATUS: Gas Discovery

SPUD DATE: 6 Mar 1975 RIG RELEASE DATE: 16 Apr 1975 WELL DEPTH: 1189m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore Disposal

AIRSTRIP DIMENSIONS: Not given in source ACCESS ROADS: Not given in source

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS: Not given in source

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 805

19

WELL NAME: Panarctic et al Pat Bay A-72

LATITUDE: 77° 21' 01" LONGITUDE: 105° 26' 57" STATUS: Abandoned

SPUD DATE: 28 Feb 1975 RIG RELEASE DATE: 6 May 1975 WELL DEPTH: 3230m

DRILL CAMP DIMENSIONS: 305 x 210m DRILLING WASTE SUMP DIMENSIONS: 45 x 45 x 4m

AIRSTRIP DIMENSIONS: 1530 x 60m ACCESS ROADS: Not given in source

WELL SITE VEHICLES: Three 30-tone oilfield trucks, two D-7 Caterpiller tractors, two forklifts, one grader, one .5-ton truck, one Foremost Delta 3 ATV

MUD COMPONENTS:

Barite	35863 kg	XC-Polymer	7445 kg
Bentonite	44909 kg	Kwik Seal	568 kg
Barium carbonate	272 kg	Lime	45 kg
Sodium bicarbonate	1136 kg	Mica	682 kg
Caustic soda	2922 kg	SAPP	68 kg
Chrome alum	1307 kg	Sawdust	2272 kg
Dowicide B	204 kg	Spersene	1250 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 797

DIAND Land Use Permit N74A833

20

WELL NAME: Panarctic Tenn et al Drake D-73

LATITUDE: 76° 22' 06" LONGITUDE: 108° 29' 29" STATUS: Gas Well

SPUD DATE: 23 Apr 1975 RIG RELEASE DATE: 10 May 1975 WELL DEPTH: 1361m

DRILL CAMP DIMENSIONS: 305 x 150m DRILLING WASTE SUMP DIMENSIONS: 30 x 23 x 4m

AIRSTRIP DIMENSIONS: T. Otter strip 457 x 30m ACCESS ROADS: 6.4 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, two Foremost Delta 3 ATV, two 30-ton oilfield trucks, two forklifts, one grader, one .5-ton truck

MUD COMPONENTS: Not given in source

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 812

DIAND Land Use Permit N75A986

WELL NAME: Elfex et al Wilkie Point J-51 21

LATITUDE: 76° 30' 31" LONGITUDE: 117° 19' 48" STATUS: Abandoned

SPUD DATE: 17 Mar 1975 RIG RELEASE DATE: 21 May 1975 WELL DEPTH: 2347m

DRILL CAMP DIMENSIONS: 180 x 180 m DRILLING WASTE SUMP DIMENSIONS: 45 x 54 x 4 m

AIRSTRIP DIMENSIONS: Herc strip 1830 x 60m ACCESS ROADS: 66.3 km

WELL SITE VEHICLES: Three D-7 Caterpiller tractors, three 30-ton oilfield trucks, two forklifts, one 3-ton truck, two .5-ton trucks, one FN-60 vehicle

MUD COMPONENTS:

Gel	39113 kg	Dowicide B	35 kg
Pottasium chloride	1272 kg	Sawdust	2045 kg
Caustic soda	4454 kg	Bentonite	3636 kg
Kelzan	8011 kg	Supercol	5136 kg
Sodium bicarbonate	45 kg	Kwik Seal	2763 kg
Barite	52563 kg	Baroid	4818 kg
CMC	2590 kg	Biecide	19 l
Hydro-gel	681 kg		

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 803

DIAND Land Use Permit N74A920

WELL NAME: Panarctic et al Chads Creek B-64 22

LATITUDE: 76° 23' 08" LONGITUDE: 109° 54' 21" STATUS: Abandoned

SPUD DATE: 6 Dec 1974 RIG RELEASE DATE: 27 June 1975 WELL DEPTH: 5036m

DRILL CAMP DIMENSIONS: 304 x 152m DRILLING WASTE SUMP DIMENSIONS: 45 x 45 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m ACCESS ROADS: 42.6 km

WELL SITE VEHICLES: Three 30-ton oilfield trucks, two D-7 Caterpiller tractors, two forklifts, one grader, one Foremost Delta 3 ATV, one .5-ton truck

MUD COMPONENTS:

Bentonite	47545 kg	Kwikseal	6290 kg
Barite	941979 kg	Lignite	3386 kg
Calcium chloride	363 kg	Visbestos	5431 kg
Cello Flake	500 kg	Pipelax	1 bbl
Peltex	18477 kg	Sawdust	9750 kg
Walnut hulls	2431 kg	Lime	2181 kg
Sodium bicarbonate	3090 kg	Dowicide B	45 kg
Soda ash	635 kg	SAPP	470 kg
XC-Polymer	10840 kg	LD-7	303 l
Caustic soda	13727 kg	LD-8	38 l
Mica	4409 kg	Diesel oil	4719 l

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 788

DIAND Land Use Permit N74A850

23

WELL NAME: Panarctic Mocklin Point D-23

LATITUDE: 78° 22′ 08″ LONGITUDE: 104° 44′ 50″ STATUS: Abandoned

SPUD DATE: 5 June 1975 RIG RELEASE DATE: 20 July 1975 WELL DEPTH: 2802m

DRILL CAMP DIMENSIONS: 305 x 150m DRILLING WASTE SUMP DIMENSIONS: 38 x 38 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m
T. Otter strip 470 x 30m ACCESS ROADS: 14.4 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, two 30-ton oilfield trucks, one 513T mobile crane, one 30T Foremost tracked vehicle, one AA70 Bombardier, two forklifts, one .5-ton truck, one Foremost Delta 3 ATV

MUD COMPONENTS:

Barite	139227 kg	Kwik Seal	600 kg
Bentonite	54318 kg	Lime	218 kg
Sodium bicarbonate	568 kg	Mica	591 kg
Caustic soda	2916 kg	Sodium bichromate	454 kg
Chrome alum	1493 kg	Sawdust	3981 kg
CMC	45 kg	Tannathin	227 kg
Dowicide B	113 kg	Visbestos	750 kg
Kelzan	6772 kg		

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 816

DIAND Land Use Permit N75A042

24

WELL NAME: Panarctic Bent Horn F-72

LATITUDE: 76° 21′ 27″ LONGITUDE: 103° 58′ 15″ STATUS: Abandoned

SPUD DATE: 21 May 1975 RIG RELEASE DATE: 24 Aug 1975 WELL DEPTH: 3216m

DRILL CAMP DIMENSIONS: Not given in source DRILLING WASTE SUMP DIMENSIONS: 45 x 45 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m
T.Otter strip 470 x 30m ACCESS ROADS: 4.8 km 7.2 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, one Foremost Delta 3 ATV, three 30-ton oilfield trucks, two .5-ton trucks, one grader, two forklifts

MUD COMPONENTS:

Barite	91772 kg
Bentonite	4091 kg
XC-Polymer	6954 kg
Caustic soda	2154 kg
Chrome alum	1272 kg
Sodium bicarbonate	909 kg
Lime	523 kg
Sodium bichromate	1114 kg
Sawdust	1609 kg
Dowicide B	23 kg
Sodium acid pyrophosphate	90 kg
Paraformaldehyde	23 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 813

DIAND Land Use Permit N75A049

25

WELL NAME: Panarctic et al E. Hecla C-32

LATITUDE: 76° 20′ LONGITUDE: 110° 06′ STATUS: Gas Well

SPUD DATE: 7 Nov 1975 RIG RELEASE DATE: 10 Dec 1975 WELL DEPTH: 1341m

DRILL CAMP DIMENSIONS: 213 x 120m DRILLING WASTE SUMP DIMENSIONS: 30 x 23 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m
T. Otter strip 470 x 30m
ACCESS ROADS: 4.8 km 8.0 km
8.0 km

WELL SITE VEHICLES: One each D-6 and D-8 Caterpiller tractors, three 30-ton oilfield trucks, one 5-ton Foremost Yukon ATV, two forklifts, one .5-ton one grader

MUD COMPONENTS: Not given in source

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit N75A111

26

WELL NAME: Texex King Point West B-53

LATITUDE: 75° 32′ 03″ LONGITUDE: 108° 20′ 27″ STATUS: Abandoned

SPUD DATE: 29 Sept 1975 RIG RELEASE DATE: 2 Jan 1976 WELL DEPTH: 2137m

DRILL CAMP DIMENSIONS: 250 x 180m DRILLING WASTE SUMP DIMENSIONS: 50 x 50 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m
T. Otter strip 550 x 45m
ACCESS ROADS: 182.1 km

WELL SITE VEHICLES: Two D-7 Caterpiller tractors, one caterpiller grader, one D-4 Caterpiller tractor, one Foremost 511 tracked vehicle, one skidoo, two front-end loaders, two 30-ton oilfield trucks

MUD COMPONENTS:

Kelzan	8659 kg
Caustic soda	3568 kg
Soda ash	1727 kg
Sodium bicarbonate	1954 kg
Aquagel	26318 kg
Q-Broxin	68 kg
Baroid	36863 kg
Kwik Seal	3018 kg
Sawdust	3545 kg
Surflow W 300	22 kg
Mica-Tex	1136 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 811

DIAND Land Use Permit N74A864

27

WELL NAME: Elf et al Dyer Bay L-49

LATITUDE: 76° 08′ 35″ LONGITUDE: 121° 48′ 36″ STATUS: Abandoned

SPUD DATE: 1 Nov 1975 RIG RELEASE DATE: 20 Feb 1976 WELL DEPTH: 3171m

DRILL CAMP DIMENSIONS: 180 x 180m DRILLING WASTE SUMP DIMENSIONS: 45 x 75 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m ACCESS ROADS: Not given in source

WELL SITE VEHICLES: Three 30-ton oilfield trucks, two forklifts, one 3-ton truck, two .5-trucks, one each D-7 and D-8 Caterpiller tractors

MUD COMPONENTS:				
Caustic soda	4954 kg	Sodium bicarbonate	818 kg
Barite	139045 kg	Aluminum stearate	204 kg
Gel	58988 kg	Alcohol	227 l
Kelzan	7386 kg	Pottasium chloride	8045 kg
CMC	409 kg	X-Pel-G	4095 kg
Kwik Seal	6300 kg	Calgon	113 kg
Sawdust	3381 kg	Haga Treat	900 kg
Supercol	2022 kg	ADA foam	6 bbls
Peltex	45 kg	Soap	35 bbls

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 824

DIAND Land Use Permit N75A005

28

WELL NAME: Panarctic et al Sabine Bay A-07

LATITUDE: 75° 26′ 06″ LONGITUDE: 110° 00′ 49″ STATUS: Abandoned

SPUD DATE: 23 Oct 1975 RIG RELEASE DATE: 24 Feb 1976 WELL DEPTH: 5193m

DRILL CAMP DIMENSIONS: 213 x 120m DRILLING WASTE SUMP DIMENSIONS: 30 x 20 x 3m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m ACCESS ROADS: 9.6 km

WELL SITE VEHICLES: Three 30-ton oilfield trucks, two D-7 Caterpiller tractors, two forklifts, one .5-ton truck, one grader, one Foremost Delta 3 ATV

MUD COMPONENTS:				
Bentonite	42136 kg	Fine mica	1181 kg
XC-Polymer	17386 kg	Paraformaldehyde	386 kg
Chrome alum	2613 kg	LD-8 defoamer	227 l
Caustic soda	11495 kg	Aluminum stearate	98 kg
Salt ge	28445 kg	Salt	18709 kg
Sodium bicarbonate	1000 kg	Pipelax	2 bbls
Sawdust	818 kg	Kwik Seal	109 kg
Barite	240636 kg	Hydrochloric acid	473 l
Lignite	7040 kg	Corban	19 l
Lime	227 kg	Triecone	814 l
Walnut hulls	12863 kg	Drispac	340 kg
Sodium chromate	2840 kg	K-91	386 kg
Dowicide B	227 kg	Lube oil	2 bbls
Peltex	4590 kg	Diesel oil	4296 l

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 808

DIAND Land Use Permit n75A099

29

WELL NAME: Panarctic W. Hecla P-62

LATITUDE: 76° 21′ 51″ LONGITUDE: 110° 52′ 34″ STATUS: Gas Discovery

SPUD DATE: 7 Jan 1976 RIG RELEASE DATE: 26 Feb 1976 WELL DEPTH: 1128m

DRILL CAMP DIMENSIONS: 213 x 122m DRILLING WASTE SUMP DIMENSIONS: 45 x 23 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 30m ACCESS ROADS: 8 km
T. Otter strip 457 x 30m 4.8 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, three Kenworth 30-ton oilfield trucks, one 5-ton Foremost Yukon ATV, one grader, one .5-ton truck

MUD COMPONENTS:

Gel	6363 kg
XC-Polymer	1181 kg
Caustic soda	454 kg
Barite	136636 kg
Chrome alum	113 kg
Peltex	863 kg
Sodium bicarbonate	136 kg
Lignite	545 kg
Bentonite	545 kg
Salt	45 kg

MISCELLANEOUS: Campsite near airstrip, dimensions: 150 x 150m

REFERENCES: COGLA. Well History Microfiche D.A. 822

DIAND Land Use Permit N75A111

30

WELL NAME: Panarctic et al Jackson Bay G-16

LATITUDE: 78° 05′ 21″ LONGITUDE: 101° 06′ 50″ STATUS: Abandoned

SPUD DATE: 5 Feb 1976 RIG RELEASE DATE: 15 Mar 1976 WELL DEPTH: 1201m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Not given in source ACCESS ROADS: Not given in source

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Barite	213090 kg
Bentonite	35318 kg
Gel	1363 kg
Kelzan	1704 kg
Caustic soda	840 kg
Peltex	409 kg
Tannathin	1409 kg
Lignite	113 kg
Walnut hulls	545 kg
Sawdust	563 kg
Mica	500 kg
CMC	34 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 828

31

WELL NAME: Panarctic Tenn CS N.W. Hecla M-25

LATITUDE: 76° 27′ 45″ LONGITUDE: 111° 19′ 14″ STATUS: Gas Well

SPUD DATE: 14 Mar 1976 RIG RELEASE DATE: 18 Apr 1976 WELL DEPTH: 1207m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: 1530 x 60 m ice strip ACCESS ROADS: None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Barite	42727 kg
Bentonite	1681 kg
Caustic soda	522 kg
XC-Polymer	1113 kg
Gel	3772 kg
Sawdust	545 kg
SAPP	136 kg

MISCELLANEOUS:

REFERENCES: Panarctic Oils Limited. A Submission in Support of an Application for a Drilling Authority to Drill Panarctic N.W. Hecla P-58 Offshore Melville Island Northwest Territories. 1975.

32

WELL NAME: Panarctic W. Bent Horn E-43

LATITUDE: 76° 22′ 15″ LONGITUDE: 104° 18′ 44″ STATUS: Abandoned

SPUD DATE: 16 Jan 1976 RIG RELEASE DATE: 19 Apr 1976 WELL DEPTH: 3371m

DRILL CAMP DIMENSIONS: 300 x 150m DRILLING WASTE SUMP DIMENSIONS: 49 x 49 x 4m

AIRSTRIP DIMENSIONS: Not given in source ACCESS ROADS: 1.6 km
4.8 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, one Foremost Delta 3 vehicle, three 3-ton oilfield trucks, one grader, two .5-ton trucks, two forklifts

MUD COMPONENTS:

Barite	57090 kg	Calcium chloride	340 kg
Bentonite	28863 kg	Paraformaldehyde	227 kg
XC-Polymer	18000 kg	Kwik Seal	718 kg
Chrome alum	3313 kg	Fine mica	409 kg
Caustic soda	5795 kg	Aluminum stearate	23 kg
Sodium bicarbonate	363 kg		

MISCELLANEOUS:

REFERENCES: COGLA. Well history Microfiche D.A. 836

DIAND Land Use Permit N75A154

WELL NAME: Panarctic et al Jackson Bay G-16A

33

LATITUDE: 78° 05 21″ LONGITUDE: 101° 06′ 50″ STATUS: Gas Discovery

SPUD DATE: 16 Mar 1976 RIG RELEASE DATE: 30 Apr 1976 WELL DEPTH: 1600m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Not given in source ACCESS ROADS: None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Barite	311772 kg	Soda ash	2954 kg
Bentonite	11954 kg	Protecto Magic	908 kg
Kelzan	3204 kg	Drispac	318 kg
Caustic soda	977 kg	Salt	454 kg
Gel	4954 kg	Lignite	1272 kg
Lime	1113 kg	Mica	386 kg
CMC	932 kg	Walnut hulls	636 kg
Peltex	522 kg	K-91 (O_2 scavenger)	90 kg
Sodium bicarbonate	1909 kg		

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 841

34

WELL NAME: Panarctic Tenn et al W. Hecla C-05

LATITUDE: 76° 24′ 08″ LONGITUDE: 110° 31′ 54″ STATUS: Abandoned

SPUD DATE: 28 Apr 1976 RIG RELEASE DATE: 16 May 1976 WELL DEPTH: 1237m

DRILL CAMP DIMENSIONS: 305 x 150m DRILLING WASTE SUMP DIMENSIONS: 30 x 23 x 4m

AIRSTRIP DIMENSIONS: None ACCESS ROADS: None

WELL SITE VEHICLES: One each D-6 and D-8 Caterpiller tractors, three 30-ton oilfield trucks, two forklifts, one Foremost Yukon ATV, one grader, one .5-ton truck

MUD COMPONENTS: Not given in source

MISCELLANEOUS: Staging of rig and camp components at Hecla F-62 airstrip

REFERENCES: EPS Land Use Application File NW 1287

35

WELL NAME: Panarctic et al West Bent Horn A-02

LATITUDE: 76° 21′ 05″ LONGITUDE: 104° 00′ 53″ STATUS: Oil Discovery

SPUD DATE: 26 May 1976 RIG RELEASE DATE: 1 Aug 1976 WELL DEPTH: 3361m

DRILL CAMP DIMENSIONS: 457 x 152m DRILLING WASTE SUMP DIMENSIONS: 49 x 49 x 4m

AIRSTRIP DIMENSIONS: Not given in source ACCESS ROADS: .8 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, one Foremost Delta 3 ATV, three 30-ton oilfield trucks, two .75-ton trucks, one grader, two forklifts

MUD COMPONENTS:

Barite	126727 kg	Sodium bicarbonate	1363 kg
Bentonite	50636 kg	Plaster of Paris	898 kg
XC-Polymer	13954 kg	CMC	1226 kg
Chrome alum	2061 kg	Peltex	113 kg
Caustic soda	4204 kg	Spersene	272 kg
Paraformaldehyde	727 kg	Sodium chromate	227 kg
Lime	1552 kg		

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 844

DIAND Land Use Permit N75A145

36

WELL NAME: Panarctic et al Key Point O-51

LATITUDE: 76° 10′ 54″ LONGITUDE: 104° 20′ 04″ STATUS: Abandoned

SPUD DATE: 25 May 1976 RIG RELEASE DATE: 6 Sept 1976 WELL DEPTH: 3482m

DRILL CAMP DIMENSIONS: 304 x 152m DRILLING WASTE SUMP DIMENSIONS: 45 x 45 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m
T. Otter strip 457 x 152m

ACCESS ROADS: 8.8 km 10.3 km
.5 km

WELL SITE VEHICLES: Two 30-ton oilfield trucks, one AA70 Bombardier snowmobile, two forklifts, one .75-ton truck, one Foremost 30T tracked vehicle, one Foremost Delta 3 ATV, one 513T mobile crane

MUD COMPONENTS:

Barite	145681 kg	K-91 lubricant	250 kg
Bentonite	24295 kg	XC-Polymer	9129 kg
Bunker C	7 bbls	Pipelax	4 bbls
Aluminum stearate	118 kg	Paraformaldehyde	227 kg
Chrome alum	1550 kg	SAPP	727 kg
Caustic soda	9150 kg	Sodium bichromate	272 kg
Diesel oil	99 bbls	Soda ash	45 kg
Drispac	136 kg	Salt	4000 kg
LD-8 defoamer	72 l	Sodium bichromate	958 kg
Imcolig	932 kg	Sawdust	3581 kg
Lime	22 kg	Visbestos	500 kg
Lube oil 10-20	18 bbls	Walnut hulls	614 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 845

DIAND Land Use Permit N75A146

37

WELL NAME: Panarctic Charles Point G-07

LATITUDE: 76° 26' 20" LONGITUDE: 103° 00' 33" STATUS: Abandoned

SPUD DATE: 10 Oct 1976 RIG RELEASE DATE: 7 Feb 1977 WELL DEPTH: 3864m

DRILL CAMP DIMENSIONS: 304 x 152m DRILLING WASTE SUMP DIMENSIONS: 45 x 45 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m ACCESS ROADS: 29 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, Foremost Delta 3 ATV, three 3-ton oilfield trucks, two .75-ton trucks, one grader, two forklifts

MUD COMPONENTS:

Kelzan	13022 kg	Sodium Bicarbonate	772 kg
Chrome alum	2963 kg	Walnut hulls	3645 kg
Caustic soda	9943 kg	Paraformaldehyde	500 kg
Barite	73181 kg	Peltex	500 kg
Bentonite	13181 kg	SAPP	91 kg
CMC	91 kg	Adafoam	170 l
Sodium chromate	500 kg	Will-do	549 l

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 852

EPS Land Use Application File NW1405

38

WELL NAME: Panarctic N.E. Drake P-40

LATITUDE: 76° 29' 55" LONGITUDE: 107° 11' 53" STATUS: Abandoned

SPUD DATE: 1 Feb 1977 RIG RELEASE DATE: 12 Mar 1977 WELL DEPTH: 1295m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: None ACCESS ROADS: Not given in source

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Bentonite	9181 kg
XC-Polymer	1863 kg
Caustic soda	977 kg
Salt	5090 kg
Barite	73272 kg
Lignite	91 kg
Sawdust	1454 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 859

39

WELL NAME: Panarctic S.W. Hecla C-58

LATITUDE: 76° 17' 04" LONGITUDE: 111° 20' 52" STATUS: Gas Well

SPUD DATE: 3 Apr 1977 RIG RELEASE DATE: 29 Apr 1977 WELL DEPTH: 1219m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Ice Herc strip ACCESS ROADS: None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Bentonite	5318 kg
XC-Polymer	795 kg
Caustic soda	591 kg
Salt	1318 kg
Barite	33000 kg
Sawdust	364 kg
Salt gel	909 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 858

Panarctic Oils Limited. A Submission in Support of an Application for a Drilling Authority to Drill Panarctic S.W. Hecla C-58 Offshore Melville Island Northwest Territories. 1976.

40

WELL NAME: Panarctic et al West Bent Horn I-01A

LATITUDE: 76° 20' 53" LONGITUDE: 104° 02' 13" STATUS: Abandoned

SPUD DATE: 30 Nov 1976 RIG RELEASE DATE: 18 May 1977 WELL DEPTH: 3280m

DRILL CAMP DIMENSIONS: 304 x 152m DRILLING WASTE SUMP DIMENSIONS: 45 x 45 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1530 x 60m ACCESS ROADS: 3.2 km
1.6 km

WELL SITE VEHICLES: One D-6 and D-7 Caterpiller tractors, one Foremost Delta 3 ATV, three 30-ton oilfield trucks, two .75-ton trucks, one grader, two forklifts

MUD COMPONENTS: Not given in source

MISCELLANEOUS:

REFERENCES: EPS Land Use Application File NW1408

41

WELL NAME: Panarctic West Bent Horn M-12

LATITUDE: 76° 21' 56" LONGITUDE: 104° 06' 52" STATUS: Abandoned

SPUD DATE: 4 Mar 1977 RIG RELEASE DATE: 3 June 1977 WELL DEPTH: 3231m

DRILL CAMP DIMENSIONS: 304 x 152m DRILLING WASTE SUMP DIMENSIONS: 45 x 45 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1830 x 60m ACCESS ROADS: 3.2 km

WELL SITE VEHICLES: **Not given in source**

MUD COMPONENTS: **Not given in source**

MISCELLANEOUS:

REFERENCES: EPS Land Use Application File NW1508

42

WELL NAME: Panarctic AIEG et al Depot Island C-44

LATITUDE: 76° 23' 14" LONGITUDE: 114° 17' 44" STATUS: Abandoned

SPUD DATE: 19 Apr 1977 RIG RELEASE DATE: 10 June 1977 WELL DEPTH: 2669m

DRILL CAMP DIMENSIONS: 304 x 152m DRILLING WASTE SUMP DIMENSIONS: 38 x 38 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1830 x 60m ACCESS ROADS: 3.8 km
T. Otter strip 457 x 152 m

WELL SITE VEHICLES: Three 30-ton oilfield trucks; two D-7 Caterpiller tractors, two forklifts, one .75-ton truck, one grader, one Foremost Delta 3 ATV

MUD COMPONENTS:

Barite	39590 kg
Bentonite	17954 kg
XC-Polymer	6977 kg
Chrome alum	1200 kg
Caustic soda	3363 kg
Sodium bicarbonate	91 kg
Peltex	136 kg
SAPP	409 kg
Sawdust	9680 kg
Paraformaldehyde	1182 kg
Lime	23 kg
Adafoam	265 l

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 874

EPS Land Use Application File NW1498

43

WELL NAME: Panarctic Sophie Point G-19

LATITUDE: 76° 18′ 24″ LONGITUDE: 103° 04′ 59″ STATUS: Abandoned

SPUD DATE: 29 May 1977 RIG RELEASE DATE: 30 Sept 1977 WELL DEPTH: 3792m

DRILL CAMP DIMENSIONS: 304 x 152m DRILLING WASTE SUMP DIMENSIONS: 45 x 45 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1830 x 60m ACCESS ROADS: 5.0 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractor, two 30-ton oilfield trucks, one mobile crane unit, one 30T Foremost tracked vehicle, one AA70 Bombardier snomobile, one 920 loader/forklift, one .75-ton truck, one forklift, one Delta 3 ATV

MUD COMPONENTS:

Kelzan	10318 kg	Trican	114 l
Chrome alum	1890 kg	Mica	91 kg
Caustic soda	8625 kg	Sawdust	7045 kg
Bentonite	67209 kg	Sodium bicarbonate	182 kg
Barite	139681 kg	Protecto Magic	3181 kg
Walnut Hulls	9250 kg	Lignite	182 kg
Paraformaldehyde	431 kg	CMC	45 kg
LD-8 defoamer	397 l	Barium carbonate	1659 kg
LD-7 defoamer	19 l	Oil	103 bbls
Will-do	511 l	Diesel oil	51 bbls
CMC	136 kg		

MISCELLANEOUS: 30 x 30 x 4m hole excavated to catch runoff water

REFERENCES: COGLA. Well History Microfiche D.A. 881

EPS Land Use Application File NW1584

44

WELL NAME: Panarctic et al Richardson Point G-12

LATITUDE: 75° 40′ 03″ LONGITUDE: 105° 39′ 46″ STATUS: Abandoned

SPUD DATE: 23 Oct 1977 RIG RELEASE DATE: 25 Jan 1978 WELL DEPTH: 3356m

DRILL CAMP DIMENSIONS: 304 x 152m DRILLING WASTE SUMP DIMENSIONS: 38 x 38 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1830 x 60m
T. Otter strip 457 x 30m ACCESS ROADS: 35.4 km

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Kelzan	12250 kg	D3-30	6 bbls
Chrome alum	2204 kg	Paraformaldehyde	204 kg
Barite	59682 kg	Salt	2408 kg
Caustic	5636 kg	LD-7 defoamer	27 l
Bentonite	10818 kg	Sodium bicarbonate	1272 kg
Ursa LA-3 oil	10 bbls	Walnut hulls	136 kg
Nabob oil	29 bbls	Sparton oil	2500 kg
Pipelax	8 bbls	SAPP	98 kg
Diesel oil	205 bbls	Gel	2545 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 896

EPS Land Use Application File NW1594

45

WELL NAME: HB Norcen Phillips Cape Allison L-50

LATITUDE: 77° 49' 28" LONGITUDE: 100° 17' 57" STATUS: Abandoned

SPUD DATE: 8 Nov 1977 RIG RELEASE DATE: 4 Mar 1978 WELL DEPTH: 2122m

DRILL CAMP DIMENSIONS: 275 x 180m DRILLING WASTE SUMP DIMENSIONS: 49 x 73 x 3m

AIRSTRIP DIMENSIONS: Herc strip 1950 x 90m ACCESS ROADS: .4 km
.8 km

WELL SITE VEHICLES: Three 30-ton oilfield trucks, one D-6 and two D-7 Caterpiller tractors two 950 caterpiller loaders, one grader, two .5-ton trucks

MUD COMPONENTS:

Bentonite	38250 kg	SAPP	363 kg
Gel	28545 kg	Sodium bicarbonate	545 kg
Kelzan	13772 kg	Walnut hulls	17738 kg
Chrome alum	1672 kg	Wil-do	435 kg
Caustic soda	9556 kg	Protecto-majic	11772 kg
Barite	165818 kg	Pipelax	416 l
Lignite	2772 kg	Diesel oil	7973 l
Spersene	591 kg	Ada-foam	265 l

MISCELLANEOUS:

REFERENCES: COGLA. Well history Microfiche D.A. 891

EPS Land Use Application File NW1615

46

WELL NAME: Panarctic et al AIEG Roche Point J-43

LATITUDE: 76° 42' 45" LONGITUDE: 109° 46' 22" STATUS: Gas Discovery

SPUD DATE: 18 Jan 1978 RIG RELEASE DATE: 18 Apr 1978 WELL DEPTH: 2882 m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip 1830 x 60m ACCESS ROADS: None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Salt gel	27545 kg
Kelzan	6872 kg
Caustic	5977 kg
Sodium bicarbonate	272 kg
Salt	12863 kg
Barite	167681 kg
Gel	41409 kg
CMC	545 kg
Lignite	465 kg
Mica	1227 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 892

Panarctic Oils Limited. A Submission in Support of an Application for a Drilling Authority to Drill Panarctic Roche Point I-43 Offshore Melville Island Northwest Territories. 1977.

47

WELL NAME: Panarctic Norcen AIEG et al Grassy 1-34

LATITUDE: 76° 23' 43" LONGITUDE: 113° 11' 22" STATUS: Abandoned

SPUD DATE: 3 Mar 1978 RIG RELEASE DATE: 22 Apr 1978 WELL DEPTH: 975m

DRILL CAMP DIMENSIONS: Not given in source DRILLING WASTE SUMP DIMENSIONS: Not given in source

AIRSTRIP DIMENSIONS: Not given in source ACCESS ROADS: Not given in source

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:		
	Kelzan	1590 kg
	Salt	7772 kg
	Bentonite	7409 kg
	Barite	62227 kg
	Caustic	227 kg
	Sodium bicarbonate	91 kg
	CMC	22 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 848

48

WELL NAME: Panarctic Drake F-76

LATITUDE: 76° 25 22" LONGITUDE: 108° 28' 47" STATUS: Gas Well

SPUD DATE: 2 Mar 1978 RIG RELEASE DATE: 28 Apr 1978 WELL DEPTH: 1128m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Not given in source ACCESS ROADS: Not given in source

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:		
	Pottasium chloride	7363 kg
	Salt gel	11727 kg
	Chrome alum	559 kg
	Kelzan	2750 kg
	Barite	123227 kg
	Caustic soda	3545 kg

MISCELLANEOUS: Ice platform; experimental offshore well completion (see Section 2.3.4 of text)

REFERENCES: COGLA. Well History Microfiche D.A. 890

49

WELL NAME: Panarctic et al Beverly Inlet G-13

LATITUDE: 75° 02 20" LONGITUDE: 108° 05' 23" STATUS: Abandoned

SPUD DATE: 20 Nov 1977 RIG RELEASE DATE: 23 June 1978 WELL DEPTH: 4061m

DRILL CAMP DIMENSIONS: 300 x 150m DRILLING WASTE SUMP DIMENSIONS: 38 x 38 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1830 x 60m ACCESS ROADS: 370 km
T. Otter strip 455 x 30 m

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, one Foremost Delta 3 ATV, three 30-ton oilfield trucks, two .75-ton trucks, one grader, two forklifts

MUD COMPONENTS:

Bentonite	50000 kg	Soda ash	45 kg
Kelzan	15352 kg	Skot Free	265 l
Caustic soda	7420 kg	Wildo	624 l
Chrome alum	3159 kg	Gear oil	9198 l
Barite	341681 kg	Walnut hulls	2977 kg
Protecto Magic	6681 kg	Lubroclide	1602 kg
Diesel oil	21555 l	Defoamer	208 l
Peltex	318 kg	Aluminum stearate	80 kg
Paraformaldehyde	318 kg	Used oil	340 l
Sodium bicarbonate	1318 kg	Surflo	246 l
SAPP	772 kg	Q-Broxin	363 kg
Dowicide B	159 kg		

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 894

DIAND Land Use Permit N77A673

50

WELL NAME: Panarctic et al Drake Point K-79

LATITUDE: 76° 28' 35" LONGITUDE: 108° 58' 48" STATUS: Abandoned

SPUD DATE: 18 May 1978 RIG RELEASE DATE: 23 June 1978 WELL DEPTH: 1725 m

DRILL CAMP DIMENSIONS: 300 x 150m DRILLING WASTE SUMP DIMENSIONS: 30 x 30 x 4m

AIRSTRIP DIMENSIONS: Not given in source ACCESS ROADS: 16.0 km

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Bentonite	9818 kg	Salt gel	1090 kg
Kelzan	3136 kg	Sawdust	1818 kg
Caustic soda	1454 kg	CMC	5022 kg
Potassium chloride	18272 kg	Lignite	136 kg
Chrome alum	295 kg	Sodium bicarbonate	363 kg
Barite	19954 kg	Formaldehyde	45 kg
Drispac	272 kg		

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 904

EPS Land Use Application File NW 1969

51

WELL NAME: Panarctic et al Bent Horn A-57

LATITUDE: 76° 26 00 LONGITUDE: 103° 49' 19" STATUS: Abandoned

SPUD DATE: 23 May 1978 RIG RELEASE DATE: 29 Aug 1978 WELL DEPTH: 3627m

DRILL CAMP DIMENSIONS: 300 x 150 m DRILLING WASTE SUMP DIMENSIONS: Not given in source

AIRSTRIP DIMENSIONS: Not given in source ACCESS ROADS: 10.5 km 14.5 km

WELL SITE VEHICLES: Three 30-tom oilfield trucks, two D-7 Caterpiller tractors, one grader, two forklifts, .75-ton truck Foremost Delta 3 ATV

MUD COMPONENTS:				
Barite	51909 kg	Paraformaldehyde	1013 kg
Bentonite	80409 kg	Bennex	3 kg
XC-Polymer	15465 kg	LD8	227 l
Chrome alum	2836 kg	Kwik Seal	809 kg
Caustic soda	5125 kg	Sawdust	2863 kg
Lime	45 kg	Diesel oil	303 l
Sodium bicarbonate	3909 kg		

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 903

EPS Land Use Application File NW 1953

52

WELL NAME: Panarctic et al Stokes Range J-11

LATITUDE: 76° 20' 34" LONGITUDE: 101° 35' 03" STATUS: Abandoned

SPUD DATE: 31 May 1978 RIG RELEASE DATE: 17 Sept 1978 WELL DEPTH: 3340m

DRILL CAMP DIMENSIONS: 300 x 150m DRILLING WASTE SUMP DIMENSIONS: 45 x 45 x 4m

AIRSTRIP DIMENSIONS: 1830 x 60m ACCESS ROADS: 58 km 3.2 km 2 km
3.2 km 6.4 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, Foremost Delta 3 ATV, two 30-ton oilfield trucks, one .75-ton truck, one grader, one forklift, one mobile crane, one each 920 and 930 loader/forklift, one skidozer

MUD COMPONENTS:				
Barite	263208 kg	Pit Plug	113 kg
Bentonite	60631 kg	Bennex	21 kg
XC-Polymer	10368 kg	Sawdust	6340 kg
Chrome alum	2027 kg	ADO Foam	840 l
Caustic soda	4043 kg	Calgon	216 l
Lime	3590 kg	Corban	76 l
Alum stearate	838 kg	Mica	704 kg
Sodium bicarbonate	954 kg	Protecto Magic	279 kg
Paraformaldehyde	227 kg	Kwik Seal	363 kg
Lignite	352 kg	CMC	45 kg
SAPP	227 kg	Diesel oil	757 l

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 902

EPS Land Use Application File NW 1777

53

WELL NAME: Panarctic et al Noice D-41

LATITUDE: 78° 20′ 01″ LONGITUDE: 104° 24′ 32″ STATUS: Abandoned

SPUD DATE: 4 Nov 1978 RIG RELEASE DATE: 2 Jan 1979 WELL DEPTH: 2347m

DRILL CAMP DIMENSIONS: 305 x 152m DRILLING WASTE SUMP DIMENSIONS: 61 x 30 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1830 x 60m ACCESS ROADS: 10 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, one grader, one .75-ton truck, one mobile crane, one Delta 3 ATV

MUD COMPONENTS:			
Bentonite	7204 kg	Kwik Seal	295 kg
Barite	39250 kg	Sawdust	568 kg
Kelzan	6409 kg	Salt gel	3931 kg
Chrome alum	1068 kg	Sodium bicarbonate	568 kg
Caustic soda	5113 kg	SAPP	431 kg
Aluminum stearate	68 kg	Calcium chloride	340 kg
Mica	181 kg	Paraformaldehyde	750 kg

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 917

54

WELL NAME: Dome Panarctic et al Hoodoo E-05

LATITUDE: 78° 04′ 16″ LONGITUDE: 99° 33′ 47″ STATUS: Abandoned

SPUD DATE: 8 Nov 1978 RIG RELEASE DATE: 3 Jan 1979 WELL DEPTH: 2476m

DRILL CAMP DIMENSIONS: 300 x 150m DRILLING WASTE SUMP DIMENSIONS: 45 x 30 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1830 x 60m
T. Otter strip 450 x 30m ACCESS ROADS: 6.4 km

WELL SITE VEHICLES: One each D-4 and D-7 Caterpiller tractors, one grader, two LW924 trucks, two loaders, one Foremost Delta 3 ATV, one .75-ton truck

MUD COMPONENTS:			
XC-Polymer	3068 kg	Aluminum stearate	45 kg
Chrome alum	227 kg	Coat 888	1454 kg
Caustic soda	3000 kg	Alcomer 120	590 kg
Bentonite	10363 kg	Nickle sulfate	68 kg
Barite	30704 kg	Spersene	568 kg
Sodium bicarbonate	727 kg	Drispac	136 kg
Kwik Seal	204 kg	Walnut hulls	1432 kg
Potassium chloride	14886 kg	Torqueless	886 kg
Sawdust	1590 kg		

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 923

EPS Land Use Application File NW 6094

WELL NAME: Panarctic AIEG et al Desbarats B-73 55

LATITUDE: 76° 42′ 13″ LONGITUDE: 105° 57′ 15″ STATUS: Abandoned

SPUD DATE: 17 Feb 1979 RIG RELEASE DATE: 27 Mar 1979 WELL DEPTH: 1085m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip ACCESS ROADS: None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

XC-Polymer	1021 kg
Bentonite	10080 kg
Caustic soda	635 kg
Salt gel	4265 kg
Barite	38375 kg
Spersene	136 kg
Sodium chloride	998 kg
Lignite	113 kg

MISCELLANEOUS: Second ice platform constructed for relief well rig

REFERENCES: COGLA. Well History Microfiche D.A. 919

"Environmental Review of Panarctic Oils Limited Offshore Drilling Operations in the High Arctic 1979 Season." Prepared by E. Ladouceur, DIAND, Yellowknife, NWT. 1979.

Panarctic Oils Limited. "A Submission in Support of an Application to Drill Panarctic AIEG et al Desbarats O-57 Offshore Desbarats Strait Northwest Territories." 1977.

WELL NAME: Phillips et al Hazen Strait F-54 56

LATITUDE: 77° 03′ 30″ LONGITUDE: 110° 24′ 11″ STATUS: Abandoned

SPUD DATE: 11 Feb 1979 RIG RELEASE DATE: 12 May 1979 WELL DEPTH: 3064m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip ACCESS ROADS: None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Bentonite	56227 kg	Aluminum stearate	68 kg
Kelzen	7738 kg	Kwik Seal	290 kg
Barite	145721 kg	CMC	3035 kg
Caustic soda	11319 kg	Lime	2423 kg
Salt gel	2610 kg	Lignite	3399 kg
Salt	2721 kg	Walnut hulls	608 kg
Mica	1293 kg	Sodium bicarbonate	90 kg

MISCELLANEOUS: Second ice platform constructed for relief well rig

REFERENCES: COGLA. Well History Microfiche D.A. 912

"Environmental Review of Panarctic Oils Limited Offshore Drilling Operations in the High Arctic 1979 Season". Prepared by E. Ladouceur, DIAND, Yellowknife NWY. 1979.

Tri Ocean Engineering Limited. "A Submission in Support of a Drilling Authority to Drill Phillips et al Hazen Strait F-64 Offshore Mackenzie King Island Northwest Territories. Prepared for Phillips Petroleum Canada Limited, 1978.

57

WELL NAME: Panarctic AIEG Whitefish H-63

LATITUDE: 77° 11' 49" LONGITUDE: 106° 44' 24" STATUS: Gas Discovery

SPUD DATE: 18 Oct 1978 RIG RELEASE DATE: 17 May 1979 WELL DEPTH: 2126m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Ice stfip ACCESS ROADS: None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Barite	141250 kg
Bentonite	28803 kg
Caustic soda	3175 kg
Kelzan	1724 kg
Drispac	862 kg
Spersene	930 kg
Peltex	45 kg
Sodium bicarbonate	45 kg

MISCELLANEOUS: Second ice platform constructed for relief well rig

REFERENCES: COGLA. Well History Microfiche D.A. 911

"Environmental Review of Panarctic Oils Limited Offshore Drilling Operations in the High Arctic 1979 Season". Prepared by E. Ladouceur, DIAND, Yellowknife, NWT. 1979

Tri Ocean Engineering Limited. "A Submission in Support of an Application for a Drilling Authority to Drill Panarctic AIEG Whitefish M-32 Offshore Melville Island Northwest Territories." Prepared for Panarctic Oils Limited, 1978.

58

WELL NAME: Mobil Cornwall O-30

LATITUDE: 77°29' 46" LONGITUDE: 94° 39' 08" STATUS: Abandoned

SPUD DATE: 5 June 1979 RIG RELEASE DATE: 14 Oct 1979 WELL DEPTH: 3584m

DRILL CAMP DIMENSIONS: 305 x 150m DRILLING WASTE SUMP DIMENSIONS: 91 x 30 x 4m

AIRSTRIP DIMENSIONS: 1830 x 60m ACCESS ROADS: 2.4 km

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS: Not given in source

MISCELLANEOUS:

REFERENCES: EPS Land Use Application File NW 6296

WELL NAME: Panarctic AIEG Dome PPC Char G-07 59

LATITUDE: 77° 36 25" LONGITUDE: 99° 31' 08" STATUS: Oil & Gas Discovery

SPUD DATE: 5 Feb 1980 RIG RELEASE DATE: 22 April 1980 WELL DEPTH: 2179m

DRILL CAMP DIMENSIONS: Ice Platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip ACCESS ROADS: None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:	
Barite	158409 kg
Bentonite	22454 kg
Salt gel	1091 kg
Kelzan	4182 kg
Caustic soda	3250 kg
Sodium bicarbonate	727 kg
Salt	454 kg

MISCELLANEOUS:
-Second ice platform constructed for relief well rig
-271m^3 urethane foam blocks incorporated into main ice platform; blocks disposed of by burning on rig site
-567 kg chrome lignosulphonate spread on ice surface to accelerate melting around foam blocks prior to burning

REFERENCES: "Review of Environmental Operating Conditions for Panarctic Oils Limited Offshore Drilling Operations High Arctic 1980 Season." Prepared by E. Ladouceur, DIAND Yellowknife, NWT. 1980

WELL NAME: Panarctic AIEG PPC Balaena D-58 60

LATITUDE: 77° 37' 11" LONGITUDE: 100° 22' 24" STATUS: Oil trace

SPUD DATE: 6 Feb 1980 RIG RELEASE DATE: 27 Apr 1980 WELL DEPTH: 1874m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip ACCESS ROADS: None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:	
Kelzan	2340 kg
Bentonite	3182 kg
Caustic soda	2000 kg
Salt gel	18909 kg
Barite	127454 kg
Salt	7590 kg
Sawdust	3409 kg
Staflo	954 kg
Mica	364 kg
Sodium bicarbonate	227 kg
Diesel oil	1910 l
B-Free	320 l

MISCELLANEOUS:

REFERENCES: "Review of Environmental Operating Conditions for Panarctic Oils Limited Offshore Drilling Operations High Arctic 1980 Season." Prepared by E. Ladouceur, DIAND Yellowknife, NWT. 1980.

61

WELL NAME: Panarctic AIEG Whitefish 2H-63

LATITUDE: 77° 12 24" LONGITUDE: 106° 53' 25" STATUS: Gas Well

SPUD DATE: 3 Dec 1979 RIG RELEASE DATE: 15 May 1980 WELL DEPTH: 3003m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip ACCESS ROADS: None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Barite	576018 kg	Walnut hulls	
Bentonite	41731 kg	Salt	
Caustic Soda	7601 kg	Mica	
Kelzan	9934 kg	Lignite	
Drispac	444 kg	Staflo	
Spersene	885 kg	Chrom alum	
Sodium bicarbonate	409 kg	B-Free	
Salt gel	18066 kg	Scot-Free	
Kwik Seal	6296 kg		

MISCELLANEOUS: -Second ice platform constructed for relief well rig
-Alleged unauthorized dumping of unknown quantities of incinerator waste and scrap metal, several hundred barrels of petroleum products, several thousand pounds of barite and cement, unknown quantities of drilling mud additives; infractions alleged to have taken place 10-17 May, 1980.

REFERENCES: EPS File 4700-5, Memorandum 16 Dec 1980 (Alleged Dumping Infraction)

"Review of Environmental Operating Conditions for Panarctic Oils Limited Offshore Drilling Operations High Arctic 1980 Season." Prepared by E. Ladouceur, DIAND Yellowknife N.W.T. 1980

62

WELL NAME: Dome Wallis H-73

LATITUDE: 77° 52 23" LONGITUDE: 102° 27' 09" STATUS: Abandoned

SPUD DATE: 16 Mar 1980 RIG RELEASE DATE: 23 Aug 1980 WELL DEPTH: 2827m

DRILL CAMP DIMENSIONS: 300 x 150m DRILLING WASTE SUMP DIMENSIONS: 90 x 25 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1580 x 60m
T. Otter strip 610 x 30m ACCESS ROADS: 2.1 km 4 km

WELL SITE VEHICLES: One each D-6 and D-7 Caterpiller tractors, three 30-ton oilfield trucks, one forklift, one grader, two .75-ton trucks

MUD COMPONENTS: Not given in source

MISCELLANEOUS:

REFERENCES: DIAND Land Use Permit N80A238

63

WELL NAME: Panarctic AIEG Vesey A-27

LATITUDE: 76° 51′ 07″ LONGITUDE: 109° 09′ 10″ STATUS: Abandoned

SPUD DATE: 8 June 1980 RIG RELEASE DATE: 9 Sept 1980 WELL DEPTH: 2922m

DRILL CAMP DIMENSIONS: 150 x 150m DRILLING WASTE SUMP DIMENSIONS: 91 x 30 x .4m

AIRSTRIP DIMENSIONS: Herc strip 1830 x 60m ACCESS ROADS: 53 km 4.8 km

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Barite	139333 kg	Soda ash	340 kg
Bentonite	18800 kg	Walnut hulls	182 kg
Kelzan	6833 kg	Sodium bicarbonate	91 kg
Caustic soda	4200 kg	SAPP	68 kg
X-Pel G	2066 kg	Q-Broxin	45 kg
Chrome alum	953 kg	LD-8	45 kg
Protectomagic	772 kg	Aluminum stearate	23 kg
Paraformaldehyde	500 kg	Diesel oil	29391 l
Spersene	477 kg	B-Free	2250 l
Sta Flo	386 kg		

MISCELLANEOUS:

REFERENCES: COGLA. Well History Microfiche D.A. 960

EPS Land Use Application File NW 6739

64

WELL NAME: Panarctic AIEG PPC Dome Skate B-80

LATITUDE: 77° 49′ 13″ LONGITUDE: 104° 57′ 18″ STATUS: Oil & Gas Discovery

SPUD DATE: 20 Feb 1981 RIG RELEASE DATE: 4 Apr 1981 WELL DEPTH: 1655m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip ACCESS ROADS: None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:

Barite	288776 kg
Attapulgite	15682 kg
Bentonite	48364 kg
XC-Polymer	3725 kg
Caustic soda	1408 kg
Kwik-Seal	4765 kg
Walnut hulls	1661 kg
Salt	4682 kg
Mica	3659 kg
Sawdust	600 kg
Spersene	1090 kg
Nut Plug	296 kg

MISCELLANEOUS: Second ice platform constructed for relief well rig

REFERENCES: Panarctic Oils Limited. "A Submission in Support of an Application for a Drilling Authority to Drill Panarctic AIEG PPC Dome Skate B-80 Offshore Lougheed Island Northwest Territories." 1980.

65

WELL NAME: Panarctic AIEG Phillips Cisco B-66

LATITUDE: 77° 24' 18" LONGITUDE: 106° 26' 02" STATUS: Oil & Gas Discovery

SPUD DATE: 1 Feb 1981 RIG RELEASE DATE: 4 May 1981 WELL DEPTH: 2412m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip ACCESS ROADS: None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:				
Barite	212945 kg	Carboxymethyl cellulose	1150 kg	
Attapulgite	23545 kg	SAPP	920 kg	
Bentonite	1045 kg	Mica	240 kg	
XC-Polymer	7427 kg	Sawdust	2700 kg	
Caustic soda	4765 kg	B-Free	3812 l	
Sodium bicarbonate	2265 kg	Sta-Flo	3740 l	
Potassium chloride	76870 kg	Soda ash	120 kg	
Lignite	800 kg	Spersene	730 kg	

MISCELLANEOUS: Second ice platform constructed for relief well rig

REFERENCES: Panarctic Oils Limited. "A Submission in Support of an Application for an Application for a Drilling Authority to Drill Panarctic AIEG Phillips Cisco E-65 Offshore Lougheed Island Northwest Territories. 1980.

66

WELL NAME: Panarctic AIEG PPC Dome Maclean 1-72

LATITUDE: 77° 31' 39" LONGITUDE: 103° 56' 22" STATUS: Oil & Gas Discovery

SPUD DATE: 27 Jan 1981 RIG RELEASE DATE: 4 May 1981 WELL DEPTH: 2475m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip ACCESS ROADS: Not given in source

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:				
Barite	224439 kg	Mica	1023 kg	
Attapulgite	9759 kg	Sawdust	364 kg	
Bentonite	53738 kg	Lime	181 kg	
XC-Polymer	8875 kg	B-Free	182 l	
Caustic soda	5061 kg	Staflo	2650 kg	
Sodium bicarbonate	636 kg	Soda ash	1409 kg	
Lignite	45 kg	Spersene	2409 kg	
Walnut hulls	2455 kg	Diesel oil	10300 l	
Salt	4636 kg			

MISCELLANEOUS: --Second ice platform constructed for relief well rig
--550m^3 urethane foam blocks used in ice platform; disposed of by burning at well site

REFERENCES: "Environmental Review of Panarctic Oils Limited Offshore Drilling Operations in the High Arctic 1981 Season." Prepared by S.Liebou and E. Ladouceur, DIAND, Yellowknife N.W.T. 1982.

Panarctic Oils Limited. "A Submission in Support of an Application for a Drilling Authority to Drill Panarctic AIEG PPC Dome Maclean 1-72 Offshore Lougheed Island Northwest Territories." 1980.

67

WELL NAME: Panarctic W. Bent Horn G-02

LATITUDE: 76° 21′ 21″ LONGITUDE: 104° 01′ 14″ STATUS: Abandoned

SPUD DATE: 29 May 1981 RIG RELEASE DATE: 4 Sept 1981 WELL DEPTH: 3220m

DRILL CAMP DIMENSIONS: 150 x 150m DRILLING WASTE SUMP DIMENSIONS: 91 x 30 x 4m

AIRSTRIP DIMENSIONS: Not given in source ACCESS ROADS: 2 km

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS: Not given in source

MISCELLANEOUS: Excessive ground disturbance noted at wellsite during spring and summer (1982) inspections by EPS staff

REFERENCES: EPS Land Use Application File Nw 9220

EPS File NW 9476 (Inspection Report)

68

See overleaf for Panarctic Dome et al

Hoodoo N-52 well description

68 (cont'd)

WELL NAME: Panarctic Dome et al Hoodoo N-52

LATITUDE: 78° 11' 59" LONGITUDE: 99° 58' 22" STATUS: Abandoned

SPUD DATE: 29 Sept 1981 RIG RELEASE DATE: 11 Nov 1981 WELL DEPTH: 1650m

DRILL CAMP DIMENSIONS: 300 x 300m DRILLING WASTE SUMP DIMENSIONS: 61 x 30 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1830 x 60m ACCESS ROADS: 24 km
3 km

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS: See below

Chemical analyses and total solids breakdown of waste drilling fluid samples, Hoodoo N-52 well.

Sample Number		Sample #1 3847	Sample #2 6705	Sample #3 6709	Sample #4 6710	Sample #5 6734	Sample #6 6742
Depth (m)		350	650	850	1050	1330	1650
Total Mercury	µg/L	2.0	6.85	94.6	51.0	86	63
Total Copper	mg/L	0.71	2.53	3.17	1.64	9.32	7.08
Total Lead	mg/L	1.32	6.22	15.98	1.74	46.5	15.35
Total Chromium	mg/L	0.24	6.83	1.73	0.17	7.64	2.68
Total Cadmium	mg/L	0.27	0.37	0.29	0.10	1.25	0.55
Total Nickel	mg/L	9.17	16.28	29.46	9.42	26.5	28.15
Total Zinc	mg/L	18.2	6.09	9.80	22.6	50.9	26.06
Dissolved Mercury	µg/L	1.1	0.82	1.52	0.87	<0.1	1.2
Dissolved Copper	mg/L	<0.005	0.09	0.07	0.07	0.04	0.08
Dissolved Lead	mg/L	<0.02	0.11	0.15	0.12	0.22	<0.02
Dissolved Chromium	mg/L	<0.01	0.08	0.05	0.09	0.03	<0.01
Dissolved Cadmium	mg/L	0.25	<0.01	0.01	0.01	<0.01	<0.01
Dissolved Nickel	mg/L	0.13	0.08	0.04	0.04	0.10	0.26
Dissolved Zinc	mg/L	0.21	0.12	0.08	0.05	0.16	0.78
Dissolved Potassium	mg/L	111	56,880	49,720	26,220	14,400	26,600
pH		6.22	8.66	9.89	7.84	11.16	10.73
Conductivity	mS/cm	4.18	92.61	123.5	68.36	58.76	86.04
Density		1.7504	1.1321	1.1586	1.3006	1.270	1.121
Chloride	mg/L	493	21,750	30,250	20,750	36,000	46,000
Total Solids	mg/L	487,380	196,620	235,760	233,660	450,160	228,575
Suspended Solids	mg/L	309,100	112,312	129,676	201,540	399,100	162,400
Chemical Oxygen Demand	mg/L	5,200	1,680	3,880	4,080	6,720	15,760
Oil and Grease	mg/L	43	23	34	42	115	119

MISCELLANEOUS: $950m^3$ of drilling fluid spread on land 29 Sept-10 Nov 1981 to examine the feasibility of surficial drill fluid disposal. Effluent was enclosed w/i snow berms; fluids were evenly spread over .15 km^2 area at average thickness of 1.5-2.0m. After thaw, some effluent entered Hoodoo Creek and Hoodoo River.

REFERENCES: EPS Land Use Application File NW 9193

EPS File 4663-4-2 (Surface disposal of drilling fluids)

"Surface Disposal Experiment of Waste Drilling Fluids, Hoodoo N-52 Well, Ellef Ringnes Island, N.W.T. Initial Report Phase One." Prepared for Panarctic Oils Limited., Calgary, by French Arctic Consultants Limited. March 1982.

"Surface Disposal Experiment of Waste Drilling Fluids, Hoodoo N-52 Well, Ellef Ringnes Island, N.W.T. Phase Two Report." Prepared for Panarctic Oils Limited, Calgary, by French Arctic Consultants Limited. December, 1982.

69

WELL NAME: Panarctic et al Cisco C-42

LATITUDE: 77° 21′ 13″ LONGITUDE: 106° 17′ 13″ STATUS: Oil Well

SPUD DATE: 2 March 1982 RIG RELEASE DATE: 20 April 1982 WELL DEPTH: 1750 m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip ACCESS ROADS: None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS: Not given in source

MISCELLANEOUS: Second ice platform constructed for relief well rig

REFERENCES: Panarctic Oils Limited. "A Submission in Support of an Application for a Drilling Authority to Drill Pnarctic et al Cisco F-42 Offshore Lougheed Island Northwest Territories." 1981.

WELL NAME: Panarctic et al Cape Mamen F-24 70

LATITUDE: 77° 33′ 15″ LONGITUDE: 109° 07′ 29″ STATUS:Abandoned

SPUD DATE: 15 Jan 1982 RIG RELEASE DATE: 28 Apr 1982 WELL DEPTH: 2925m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS:Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip ACCESS ROADS: None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:				
Attapulgite	65080 kg	SAPP	181 kg
Bentonite	93343 kg	Nut Plug	8054 kg
Barite	100200 kg	Staflo	4017 kg
Kelzan	16593 kg	Sodium bicarbonate	181 kg
Salt	15753 kg	Spersene	1203 kg
Caustic soda	11395 kg	Kwik Seal	21376 kg
Sawdust	30855 kg	Mica	5084 kg
Lime	272 kg	Lignite	90 kg

MISCELLANEOUS: Second ice platform constructed for relief well rig

REFERENCES: COGLA. Well History Microfiche D.A. 987

Panarctic Oils Limited. "A Submission in Support of an Application for a Drilling Authority to Drill Panarctic et al Cape Mamen F-24 Offshore Mackenzie King Island Northwest Territories." 1981.

WELL NAME: Panarctic et al Whitefish A-26 71

LATITUDE: 77° 15′ 09″ LONGITUDE: 106° 38′ 13″ STATUS: Abandoned

SPUD DATE: 15 Jan 1982 RIG RELEASE DATE: 30 Apr 1982 WELL DEPTH: 2817m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS:Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip ACCESS ROADS: None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:	
Kelzan	10125 kg
Attapulgite	14659 kg
Caustic	10850 kg
Barite	305494 kg
Staflo	4675 kg
CMC	2045 kg
Spersene	2340 kg
Salt	3363 kg
Mica	2800 kg
Kwik Seal	4200 kg
Walnut hulls	2795 kg
Sawdust	11862 kg
Sodium bicarbonate	1363 kg

MISCELLANEOUS: Second ice platform constructed for relief well rig

REFERENCES: Panarctic Oils Limited. "A Submission in Support of an Application for a Drilling Authority to Drill Panarctic et al Whitefish P-25 Offshore Lougheed Island Northwest Territories." 1981.

Panarctic Oils Limited. "Well History Report Panarctic et al Whitefish A-26." 1982.

72

WELL NAME: Panarctic et al Sculpin K-08

LATITUDE: 78° 07′ 19″ LONGITUDE: 104° 33′ 55″ STATUS: Gas Discovery

SPUD DATE: 29 Jan 1982 RIG RELEASE DATE: 3 May 1982 WELL DEPTH: 1850m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip ACCESS ROADS: None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS:				
Barite	294680 kg	Walnut hulls	749 kg	
Pottasium chloride	106125 kg	SAPP	749 kg	
Attapulgite	54253 kg	Sodium bicarbonate	636 kg	
Kelzan	12775 kg	Torqueless	250 kg	
Bentonite	12303 kg	Imco Fibre	146 kg	
Caustic soda	6878 kg	Nickel sulfate	136 kg	
Kwik Seal	5242 kg	Lime	45 kg	
Staflo	4125 kg	Diesel oil	14450 l	
Salt	3405 kg	Motor oil	1636 l	
Sawdust	2088 kg	Coat 129	860 l	
Spersene	2066 kg	Methyl alcohol	400 l	
Coat 888	1589 kg	B-Free	349 l	
Mica	1453 kg	Surflo H-35	240 l	

MISCELLANEOUS: Second ice platform constructed for relief well rig

REFERENCES: COGLA. Well History Microfiche D.A. 986

Panarctic Oils Limited. "A Submission in Support of an Application for a Drilling Authority to Drill Panarctic et al Sculpin E-08 Offshore Ellef Ringnes Island Northwest Territories." 1981.

73

WELL NAME: Panrctic et al Cisco K-58

LATITUDE: 77° 27′ 33″ LONGITUDE: 106° 21′ 14″ STATUS: Oil Well

SPUD DATE: 12 Dec 1982 RIG RELEASE DATE: 1 Feb 1983 WELL DEPTH: 2240m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip ACCESS ROADS: None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS: Not given in source

MISCELLANEOUS: Second ice platform constructed for relief well rig

REFERENCES: Panarctic Oils Limited. "A Submission in Support of an Application for a Drilling Authority to Drill Panarctic et al Cisco K-58 Offshore Lougheed Island Northwest Territories." 1982.

74

WELL NAME: Panarctic et al Cape Macmillan 2K-15

LATITUDE: 77° 44' 45" LONGITUDE: 99° 06' 58" STATUS: Oil & Gas Discovery

SPUD DATE: 3 Feb 1983 RIG RELEASE DATE: 12 Apr 1983 WELL DEPTH: 2090m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip ACCESS ROADS: None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS: Not given in source

MISCELLANEOUS: Second ice platform constructed for relief well rig

REFERENCES: Panarctic Oils Limited. "A Submission in Support of an Application for a Drilling Authority to Drill Panarctic et al Cape Macmillan M-15 Offshore Ellef Ringnes Island Northwest Territories." 1982.

75

WELL NAME: Panarctic et al Grenadier A-26

LATITUDE: 77° 24' 04" LONGITUDE: 99° 34' 55" STATUS: Abandoned

SPUD DATE: 11 Jan 1983 RIG RELEASE DATE: 17 Apr 1983 WELL DEPTH: 2766 m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip ACCESS ROADS: None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS: Not given in source

MISCELLANEOUS: Second ice platform constructed for relief well rig

REFERENCES: Panarctic Oils Limited. "A Submission in Support of an Application for a Drilling Authority to Drill Panarctic et al Grenadier B-15 Offshore Ellef Ringnes Island Northwest Territories." 1982.

76

WELL NAME: Panarctic et al Maryatt Point K-71

LATITUDE: 76° 20' 37" LONGITUDE: 108° 58' 25" STATUS: Abandoned

SPUD DATE: 14 Oct 1982 RIG RELEASE DATE: 17 July 1983 WELL DEPTH: 5300m

DRILL CAMP DIMENSIONS: 500 x 500m DRILLING WASTE SUMP DIMENSIONS: 122 x 30 x 4m

AIRSTRIP DIMENSIONS: 1830 x 60m ACCESS ROADS: 14.5 km 4 km
47.5 km

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS: Not given in source

MISCELLANEOUS: Temporary gas line (3600m of 61mm tubing and 11,525m of 38mm tubing) installed on ground surface to transport methane from Drake F-16 well (76 25 15, 108 35 38) to Maryatt K-71 wellsite; methane used as camp fuel

REFERENCES: EPS Land Use Application File NW 9599

77

WELL NAME: Panarctic et al Cisco M-22

LATITUDE: 77° 22' 00" LONGITUDE: 106° 11' 11" STATUS: Abandoned

SPUD DATE: 22 Jan 1984 RIG RELEASE DATE: 12 Apr 1984 WELL DEPTH: 2367m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip ACCESS ROADS: None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS: Not available at time of research

MISCELLANEOUS: Second ice platform constructed for relief well rig

REFERENCES: Panarctic Oils Limited. "A Submission in Support of an Application for Drilling Program Approval to Drill Panarctic et al Cisco D-23 Offshore Lougheed Island Northwest Territories." 1983.

78

WELL NAME: Panarctic et al Skate C-59

LATITUDE: 77° 48' 14" LONGITUDE: 104° 51' 36" STATUS: Gas Well

SPUD DATE: 15 Jan 1984 RIG RELEASE DATE: 13 Apr 1984 WELL DEPTH: 2300m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip ACCESS ROADS: None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS: Not available at time of research

MISCELLANEOUS: Second ice platform constructed for relief well rig

REFERENCES: Panarctic Oils Limited. "A Submission in Support of an Application for a Drilling Program Approval to Drill Panarctic et al Skate D-59 Offshore Lougheed Island Northwest Territories." 1983.

79

WELL NAME: Panarctic et al Sherard Bay F-34

LATITUDE: 76° 13' 24" LONGITUDE: 108° 43' 47" STATUS: Abandoned

SPUD DATE: 8 Oct 1983 RIG RELEASE DATE: 1 May 1984 WELL DEPTH: 5437m

DRILL CAMP DIMENSIONS: 500 x 500m DRILLING WASTE SUMP DIMENSIONS: 122 x 30 x 4m

AIRSTRIP DIMENSIONS: Herc strip 1830 x 60m ACCESS ROADS: 22 km

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS: Not available at time of research

MISCELLANEOUS:

REFERENCES: EPS Land Use Application File NW 9761

80

WELL NAME: Panarctic et al Buckingham O-68

LATITUDE: 77° 08' 01" LONGITUDE: 91° 23' 38" STATUS: Abandoned

SPUD DATE: 17 Feb 1984 RIG RELEASE DATE: 14 May 1984 WELL DEPTH: 2772m

DRILL CAMP DIMENSIONS: Ice platform DRILLING WASTE SUMP DIMENSIONS: Offshore disposal

AIRSTRIP DIMENSIONS: Ice strip ACCESS ROADS: None

WELL SITE VEHICLES: Not given in source

MUD COMPONENTS: Not available at time of research

MISCELLANEOUS: Second ice platform constructed for relief well rig

REFERENCES: Panarctic Oils Limited. "A Submission in Support of an Application for Drilling Program Approval to Drill Panarctic et al Buckingham B-69 Offshore Buckingham Island Northwest Territories." 1983.