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PRELIMINARY ANNUAL PLAN OF OPERATIONS

NATIONAL PETROLEUM RESERVE IN ALASKA

1979-1980 SEASON

DEPARTMENT OF THE INTERIOR

U.S. GEOLOGICAL SURVEY

31 December 1978

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PRELIMINARY ANNUAL PLAN OF OPERATIONS

(1979-80)

I. Introduction

The Department of the Interior plans to continue the assessment and evaluation of the petroleum potential on the National Petroleum Reserve in Alaska (NPRA) during FY 1980 as mandated by Congress with passage of Public Law 94-258.

A Memorandum of Understanding (MOU) between the Geological Survey (GS) and the Bureau of Land Management (BLM), providing for cooperative procedures for petroleum exploration and the protection of environmental values within the NPRA, became effective on 18 January 1977. Among the many provisions of the MOU (see FEIS, Appendix C), cooperative procedures require the GS to prepare a Preliminary Annual Plan and a Draft Annual Plan, and for the GS and the BLM to jointly finalize the Annual Plan and to jointly prepare environmental analyses covering all aspects of the Annual Plan of Operations. In accordance with the MOU, any and all exploration activities which may be conducted during FY 80 will be accomplished following the guidelines and stipulations as set forth in the Final Environmental Impact Statement (FEIS) for "Continuing Exploration and Evaluation of Naval Petroleum Reserve No. 4" (now National Petroleum Reserve in Alaska), submitted to the President's Council on Environmental Quality on 27 May 1977.

The objective of the Preliminary Plan of Operations (PPO) is to make public the earliest information on the NPRA exploration plans

approximately one calendar year in advance of program implementation during the following fiscal year. Although tentative in its content, the intent is to provide such lead time to government agencies and other interested groups that they may initiate plans for such summer field studies, or other investigations in the NPRA, which they may deem necessary or appropriate to their interests and responsibilities. Both historically and currently the PPO proves to be only a general outline of program scope and a first approximation of the locations of exploration activities. Some eight and one-half months after the issuance of the PPO, a Draft Annual Plan of Operations (DAPO) is scheduled for distribution, in the present case by 15 July 1979. The DAPO is the second stage of a series of plans, is the first of the series to contain substantive detail on site-specific exploration, logistics, and environmental protection plans, and may exhibit marked departures from the preceding PPO. Such departures are primarily a consequence of the necessary refinement of exploration plans as progress is made in the continuous, intensive study of geophysical and geological data being obtained, and the determination of locations for drilling sites by the Petroleum Exploration Strategy Group of the Geological Survey. This is a process which continues during the period of public and governmental review of the DAPO and normally results in further changes before completion of the Annual Plan of Operations (APO), on or about the first of November. The latter is the third and final step of the planning series.

The primary objective of petroleum exploration within the NPRA has been to sample, through drilling test wells, a sufficient number of

different geologic structures and stratigraphic prospects, identifiable through acquisition and evaluation of geophysical and geological data, to provide a petroleum resource appraisal which will assist the Congress in determination of the best use of lands in the Reserve. This objective is in accordance with Public Law 94-258, the Naval Petroleum Reserve Production Act of 1976.

Added to the normal uncertainties in planning an exploration program a year in advance, this Preliminary Plan of Operations for FY 80 must address two alternative plans; the first entailing closeout of the exploration program, and the second providing for the drilling of followup wells and performing field geophysical surveys contingent upon discovery of potentially commercial oil or gas fields or trends in any wells drilled in FY 79. The Department of the Interior proposes to limit exploratory drilling to a total of 19 wells to be completed through FY 79 and, alternatively to drill as many as seven followup wells should discoveries warrant. The Congress has appropriated, the Office of Management and Budget has apportioned, and the Department of the Interior has approved expenditures of funds in FY 79 to procure and preposition in the NPRA the necessary supplies to conduct a drilling program in FY 80 should such a program be approved.

Either closeout or continued exploration will be accomplished by the U. S. Geological Survey, Department of the Interior, through contract with its Operator, Husky Oil NPR Operations, Inc. Husky's subcontractor for construction at the drilling sites, and for the associated airstrips and ice roads, will be Arctic Slope/Alaska General, Inc. Husky's

subcontractors for the drilling operations probably will be Brinkerhoff Drilling Company, Inc., Nabors Alaska Drilling, Inc., and Parco Inc. The subcontractor for the geophysical field surveys in previous years has been Geophysical Services, Inc. Numerous other subcontractors are involved in providing services, such as aircraft support, geophysical and geological well logging, and catering, to name only a few, for either the Operator or for one of the major subcontractors.

II. Exploration Program, Closeout - FY 80

A. Geophysical and Geological Investigations

No seismic or gravity field surveys or field geological investigations will be required or conducted following the completion of FY 79 wells.

B. Exploratory Drilling

No new exploratory wells will be started in FY 80; however, any wells started drilling in FY 79 and not completed will continue to target depths in FY 80 as follows:

1. Tunalik Test Well No. 1 was spudded on 10 November 1978 and drilling will continue through the summer with the expectation of completion in November 1979, about two months into the 1980 fiscal year.
2. Lisburne Test Well No. 1 is planned to spud in May 1979, will drill continuously through the summer, and is expected to reach its target depth of about 15,000 feet in January 1980, four months into the 1980 fiscal year.

3. Seabee Test Well No. 1 is planned to spud about 1 June 1979, but the actual date depends upon the completion of Inigok Test Well No. 1 and the availability of the drilling rig for movement to this site. Drilling throughout the summer, its target depth of about 15,000 feet is estimated to be reached in January 1980, four months into the 1980 fiscal year.

4. Ikpikpuk Test Well No. 1, spudded on 28 November, is estimated possibly to be completed by 15 May 1979. Any unforeseen delays common to drilling operations, such as time-consuming fishing operations, may delay completion beyond the approximate mid-May deterioration of the ice airstrip surface and force suspension of drilling for the summer. In this event, the well will be plugged and Arctic packed in preparation for re-entry for completion of drilling, and the drilling rig will be partially rigged down and left in place for the summer. Re-entry and resumption of drilling will take place about 15 November 1979, and the target depth of 16,000 feet is estimated to be reached by late January, four months into FY 80. There are many potential difficulties in re-entering open (uncased) hole of a well suspended for the summer and, as was true in the similar case of South Meade Test Well No. 1 in 1978, caving, slumping, and squeezing of formations may impose delays in completing the well.

In either case, whether the well is completed in May 1979 or in January 1980, it will be necessary to construct an ice

airstrip for Hercules C-130 aircraft and reestablish a weather facility and a runway lighting system. This construction will be identical with the 1978-1979 airstrip for this wellsite, as described in the Ikpikpuk Environmental Assessment Addendum. The drilling rig and camp will be demobilized by airlift out of the NPRA either as soon as aircraft landings are possible or, alternatively, after completion of any necessary drilling in early 1980.

C. Barrow Natural Gas Field Development

As part of the mandate to the Secretary of the Interior under Public Law 94-258, the U. S. Geological Survey will continue to operate the South Barrow Gas Fields in order to provide natural gas to the community of Barrow and to the nearby governmental agencies. By agreement with the Office of Naval Research, the actual operation of the producing field is accomplished by personnel employed by ITT Arctic Services, Inc., under contract to the Naval Arctic Research Laboratory. Any drilling of exploratory test wells or development wells in FY 80 will be dependent on the study of alternative fuel supply and distribution systems for the Barrow area, due to be completed on 31 January 1979, and to the Congressional evaluation of and reaction to the study.

D. Rehabilitation and Revegetation

Rehabilitation and, in some cases, revegetation are an integral part of the exploration program. Throughout the dark period in the winter, even with the most careful of operators, a considerable

amount of trash and debris collects and is buried under the snow. The following spring this accumulation becomes very much in evidence. It is impractical to attempt to police this part of the operations area until the snow is gone.

The first summer after drilling, and preferably after the drilling rig and camp have been moved off, a crew will return to clean up the accumulated debris. The crew will be transported to the site by helicopter. All wood, paper, and trash will be collected by hand and the combustibles burned in burn baskets. Noncombustible trash will be backhauled to Lonely or to Barrow for disposal. The wooden piling will be cut off as low as possible and the cut-off pieces burned in a pile on the pad, rather than in a burn basket.

The drilling rigs and camps, excepting at Ikpikpuk, will have been removed from the following wellsites after the indicated dates of completion of drilling:

Ikpikpuk Test Well No. 1	(late May 1979)
East Simpson Test Well No. 1	(early May 1979)
Inigok Test Well No. 1	(mid-May 1979)
Peard Bay Test Well No. 1	(mid-April 1979)
South Meade Test Well No. 1	(late January 1979)
Kugrua Test Well No. 1	(29 May 1978)
North Kalikpik Test Well No. 1	(14 April 1978)
Drew Point Test Well No. 1	(13 March 1978)

The three last-named wellsites were policed up during June/July 1978, but no major rehabilitation activities were possible at the time due to the lack of availability of equipment. The other five wellsites will either be cleaned up completely after the rigs and camps are moved off and snowmelt is complete or, in the case of Ikpikpuk, as completely as possible with the camp and rig stacked in place for the summer. In each case the surface material in the drilling pads will be ripped and the frozen material bulldozed into the reserve pits to cover the frozen mud. The entire pad and reserve pit area will be contoured. This will reduce the height of the pads, enhancing aesthetic appearance, while helping to facilitate revegetation by bringing the surface to be seeded closer to the water table. It is intended to have these pads in condition for fertilization and reseeded during the fall of 1979. This dormant seeding technique should allow for maximum vegetative growth during the 1980 summer season. Any debris found at the sites during the contouring process will be burned on site or, in the case of noncombustible items, retrograded to Lonely.

Summer stacking of the Ikpikpuk rig will definitely preclude recontouring activities there until the spring of 1980. The Inigok wellsite, although having a late spring 1979 completion date for drilling, will receive the pad recontouring process in summer 1979 since it is supported by an all-season airstrip. There will be no recontouring, however, of the Inigok airstrip. Seeding of this airstrip, drilling pad, and access road may be deferred until spring or autumn of 1980 when the Tunalik and Lisburne airstrips and pads

also will be available for seeding and advantage can be taken of special procedures in a single contract operation. There are no penalties to such a delay other than in aesthetics.

The material sites, used for constructing the drilling pads, will be visited after spring runoff has occurred and plans made for their rehabilitation as discussed in the FEIS (Navy, 1977).

Present plans for revegetation provide for dormant seeding in the fall of 1979, utilizing a seed mixture composed predominantly of Poa glauca (tundra bluegrass) to the extent seed can be obtained, Arctagrostis sp., and Arctic Red Fescue. Seed will be applied at the rate of at least 50 pounds per acre in the fall, to lie dormant through the winter. A standard commercial fertilizer (10-20-20 or 16-16-16) will be applied at the rate of 600 pounds per acre. These seed and fertilizer contents and ratios are modeled after the results of Alyeska research and from information obtained during earlier fertilizing experiments on naturally occurring vegetation near Barrow.

Also to be fertilized and/or seeded in the fall of 1979 are non-producing drilling sites in the South Barrow Gas Fields and camp sites used at Betty Lake and Wolf Creek. Additionally, wellsites, including drilling pads and borrow sites previously fertilized and seeded, will be checked in the summer of 1979 to determine the success of revegetation, and where necessary the seeding procedure will be repeated. These sites include the following:

Cape Halkett Test Well No. 1
 East Teshekpuk Test Well No. 1
 South Harrison Test Well No. 1
 W. T. Foran Test Well No. 1
 Atigaru Test Well No. 1
 West Fish Creek Test Well No. 1
 South Simpson Test Well No. 1
 Tunalik Test Well No. 1 (material sites only)

The following wells will be drilling throughout the summer of 1979 and are estimated to be completed by the dates indicated:

J. W. Dalton Test Well No. 1	(August 1979)
Tunalik Test Well No. 1	(November 1979)
Seabee Test Well No. 1	(January 1980)
Lisburne Test Well No. 1	(January 1980)

Upon completion of drilling and rig down, the rigs and camps will be moved out of the NPRA. The Dalton site will be immediately cleaned up, the drilling pad recontoured, and the area fertilized and seeded. The other three sites will be cleaned up to the extent possible and the pads recontoured, but the sites will require further and final cleanup in the spring of 1980. Revegetation will be accomplished by dormant seeding in the fall of 1980. At this time seeding will include the all-season airstrips at Tunalik, Lisburne, and Inigok, which is being deferred in 1979. In summary, if re-entry of the Ikpikuk well becomes necessary, there will be four wells drilling in the winter of 1979-80. These sites will

receive their first revegetation treatment in the fall of 1980. Any followup treatment will depend upon approval of funding for continued rehabilitation/cleanup work in FY 81.

E. On-Going Cleanup Program on the NPRA

The cleanup program for the old sites addresses an earlier era (1944-53) in the exploration effort on the NPRA. Exploration in those days was a pioneering effort, debris was discarded on the trail, and drummed fuel was the order of the day. The present exploration program is conducted with acute environmental awareness and stringent environmental monitoring, debris is burned or backhauled, and fuel arrives in tanker aircraft. The old oil drum, often referred to as the "Arctic flower" and which had many other uses once emptied, is a scarce commodity in a modern exploration program.

The cleanup program at the old wellsites from the 1944-1953 exploration program and at the deactivated DEWLine sites on the NPRA will be continued during the summer of 1980. Approximately \$8.5 million will have been spent on this program since 1971; the 1980 effort will approximate \$2 million. As in past years, the major effort will be to burn the combustible trash, to gather up the old fuel drums, to crush them to reduce the volume, and to concentrate them into areas where they may be disposed of in an environmentally acceptable manner or, in some cases, shipped out for recycling.

Previously, the cleanup effort tended to be concentrated in the coastal plain area and stockpiles, mostly of old crushed drums, have

been built up at the deactivated DEWLine sites, POW-A, POW-B, LIZ-C, and at Skull Cliff. These are reasonable areas to be reached by barges.

There are no certain plans at this time to retrograde from any of these coastal collection centers in 1979, since this would not be an economical procedure until the concentration of materials into these areas has been completed. However, about 1,500 tons of scrap metal, much of it discarded drill pipe, was retrograded from the Barrow area to Seattle in the fall of 1977. An additional 350 tons from Barrow and 80 tons from Lonely, including scrap metal and worn out equipment, was shipped to Seattle in the fall of 1978.

The inland sites remote from the coast offer greater problems in disposal since transportation becomes a very major cost, reducing both the effectiveness of the program and the number of sites that can be cleaned up in any one year. The 1979 program will be almost entirely concerned with inland sites, and it is probable that the noncombustible debris will be stacked at several inland concentration centers.

The ONPRA is presently working with the Alaska Department of Environmental Conservation to engineer environmentally acceptable burial techniques at several inland sites. The plan would be to burn the combustibles onsite and to bury the noncombustibles, as at a normal sanitary landfill, to then cover the landfill, and to revegetate the covering material. The areas chosen for burial would be small natural depressions (not ravines) which would not be

subject to erosion and which, once revegetated, would blend into the natural landscape. Disposal of debris, both at the inland and the coastal concentration areas, and revegetation of the inland burial sites will not be completed in the summer of 1979. In fact, the burial operation would be impossible then since, to be accomplished in an environmentally acceptable manner, the burial must be done during the winter when the ground is frozen. Completion of the task will require an additional year of effort and will be dependent on additional funding.

F. Demobilization

Following completion of the four wells drilling in the winter of 1979 and prior to 30 September 1980, the NPRA exploratory program will be closed out as follows:

1. All contractor-owned equipment and supplies, including drilling rigs and camps, will be demobilized from the NPRA.
2. All Government-owned equipment and residual supplies will be concentrated at one or more but preferably a single point, probably Lonely or perhaps Barrow, for removal from the NPRA or for sale.
3. All Government-owned equipment and facilities in the Barrow and Lonely Base Camp areas will be demobilized, excepting those items which are required for operation and maintenance of the South Barrow Gas Field production systems. Government-owned

equipment and facilities not sold will be prepared for either of two alternative disposal plans:

- a. Capital equipment, facilities, and supplies will be disassembled and prepared for shipment by barge to either of two destinations, Anchorage or Seattle.
- b. Capital equipment, facilities, and supplies will be secured and prepared for onsite storage for eventual transfer of ownership to another Government agency or procuring organization.

III. Continuation of Exploratory Program Alternative - FY 80

The Department of the Interior plans to limit exploratory drilling to a total of 19 wells and to close out the program in FY 80, as previously discussed, unless potentially commercial petroleum resources are discovered among the nine wells drilling or to be drilled in FY 79. The exploration program, if continued in FY 80, will include the drilling of up to seven followup wells to delineate the size and shape of the potential hydrocarbon reservoirs discovered; determine specific reservoir characteristics; evaluate amounts of in-place and recoverable oil and/or natural gas; and make possible extensions on followup of trends indicated by significant new discoveries. Additionally, the followup program will provide supplemental geophysical and geological information important to the overall appraisal of the hydrocarbon potential of the Reserve.

In order to maintain the capability to drill seven followup wells, necessary equipment and supplies are being procured and prepositioned in the NPRA during the winter of 1978-79.

A. Geophysical and Geological Investigations

Geophysical investigations are presently being conducted on the NPRA, during the winter months, under the exploration program and will be continued during FY 80. These investigations are described in the "Environmental Analysis Report Concerning the Proposed Continuation of the Existing Seismic and Related Geophysical Surveys of Naval Petroleum Reserve No. 4" (Navy, 1975), and are not covered in this Preliminary Plan of Operations but will be updated in the Draft Annual Plan of Operations.

Approximately 800 line miles of common-depth-point seismic field surveys are scheduled to be accomplished during the period mid-January to mid-May 1980. Of this total, approximately 200 miles will be additional fill-in reconnaissance, the remaining 600 miles fill-in surveys for site detail for followup wells. Gravity measurements, which entail no additional environmental impact, will be obtained concurrently along the same survey lines.

The locations of seismic lines are not known at this time, but the surveys will utilize two seismic crews, one operating in the foothills and the other in coastal areas of the Coastal Plain Province.

B. Exploratory Drilling

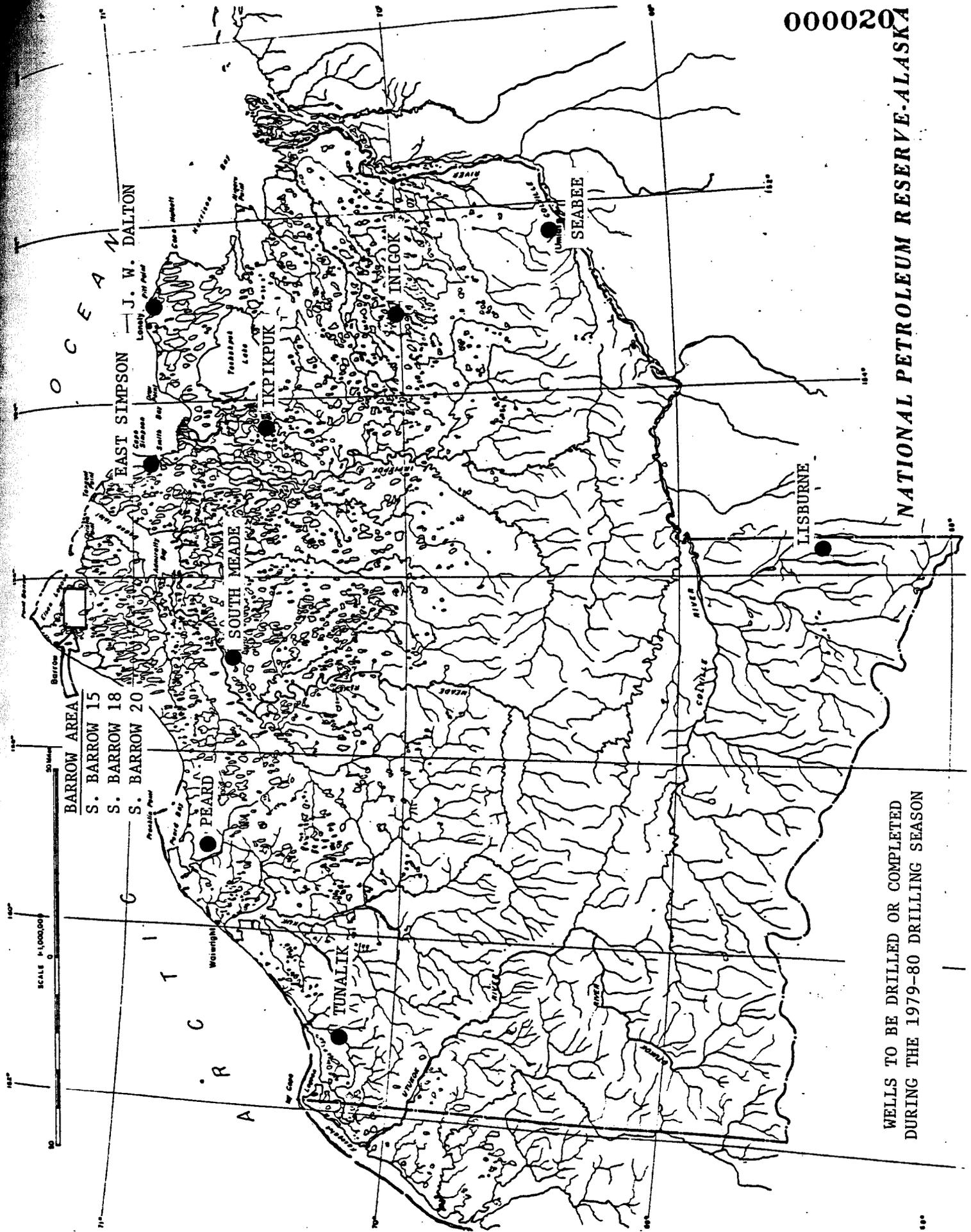
1. Completion of FY 79 Wells

Tunalik Test Well No. 1, Lisburne Test Well No. 1, Seabee Test Well No. 1, and probably Ikpikpuk Test Well No. 1 will be completed in FY 80, as previously discussed (II.B.).

2. Drilling of Followup Wells

Since new exploratory wells in FY 80 are contingent upon oil and/or gas discoveries among certain FY 78 and the FY 79 wells, selection of drilling targets can only await the discoveries. At this time the potential for discovery is limited to the following nine wells (Figure 1) which will be completed or drilled in the 1979-80 drilling season and all of which are expected to be completed by late January 1980:

<u>Well Name</u>	<u>Depth (in Feet)</u>
East Simpson Test Well No. 1	7,400
J. W. Dalton Test Well No. 1	8,600
South Meade Test Well No. 1	10,300
Peard Test Well No. 1	10,800
Ikpikpuk Test Well No. 1	16,000
Seabee Test Well No. 1	15,000
Lisburne Test Well No. 1	15,000
Inigok Test Well No. 1	20,000
Tunalik Test Well No. 1	21,000



NATIONAL PETROLEUM RESERVE-ALASKA

WELLS TO BE DRILLED OR COMPLETED DURING THE 1979-80 DRILLING SEASON

The assumption is made that followup wells would be in the general area of the appropriate discovery test well, or wells, and that they would be drilled to similar depths. The followup well is scheduled to bear the name of the discovery well and be designated "Test Well No. 2" or, in the event that more than one followup well should be drilled in the area of a single discovery, they will be designated serially. It is planned to drill up to, but no more than, a total of seven exploratory wells. Medium-depth wells would be completed during one winter drilling season but deep wells, requiring year round drilling, could not be completed until FY 81.

Bases of operation would be identical and general operational, construction, and drilling procedures would be similar to those described for the named wells in the Annual Plan of Operations for 1977-78 and for 1978-79. The regional environmental descriptions and concerns would be similar to those discussed in the Environmental Assessments for each named well. Site-specific details can only await completion of the current wells, evaluation of geology based upon information obtained from the discovery wells, analysis of geophysical data obtained in the 1978-79 and 1979-80 winters, and, finally, the selection of drilling sites.

C. Barrow Natural Gas Field Development

1. The South Barrow Gas Field will be operated as previously described (II.C.).

2. Drilling of Exploratory/Development Wells

During the FY 79 Congressional hearings on the planned program and budget for the NPRA, the House Committee on Appropriations directed the Department of the Interior to conduct a study of alternative fuel sources and distribution systems for the Barrow area to assure that proceeding with the program for gas field development is the best way of supplying fuel and utility services. Should this study, which will be completed by 31 January 1979, determine that natural gas is the best way to supply energy to the Barrow area and that gas field development should be continued, the following wells (Figure 1) would be drilled in FY 80:

<u>NAME</u>	<u>LOCATION</u>
South Barrow No. 15	SE 1/4, NW 1/4 Section 23, T22N, R17W
South Barrow No. 18	SE 1/4, SE 1/4 Section 24, T22N, R17W
South Barrow No. 20	SE 1/4, NW 1/4 Section 26, T22N, R17W

All of these wells will be about 2,400 feet in depth and will be drilled in a manner similar to that for the previous wells described in the Annual Plan of Operations, 1977-78.

D. Rehabilitation and Revegetation

Under the alternative plan for continued drilling, rehabilitation and revegetation plans would include the same sites, procedures, and scheduling previously described (II.D.) under the closeout alternative. Additionally, up to seven new sites could require treatment. The three wells in the South Barrow Gas Field

that would be completed in the winter of 1979-80 would be producing wells and, although all debris would be removed, the pads would remain as working and operating pads.

It is impossible at this time to determine the scheduling for rehabilitation and revegetation for any followup exploratory wells that might be drilled. If drilled to medium depths in a single winter and the drilling rigs moved off before spring breakup, the sites could be cleaned up and seeded in the spring/summer of 1980, but any deep wells, entailing year round drilling, would not be completed in time to permit accomplishment of seeding and fertilization until the spring or autumn of 1981. To properly accomplish the revegetation program, it would be essential to be funded for an additional year to permit checking of all sites for success of revegetation and to provide any additional fertilizing and reseedling which might be needed.

E. On-Going Cleanup Program on the NPRA

This program would be accomplished in 1980 as previously described (II.E.). Disposal of stacked debris at inland sites, probably by burial, and from coastal concentration points, by methods to be determined, should be completed by the fall of 1980.

STIPULATIONS CONCERNING WINTER SEISMIC AND RELATED GEOPHYSICAL
OPERATIONS WITHIN NATIONAL PETROLEUM RESERVE IN ALASKA

The conditions listed below are those which successful bidders will be required to follow in order to minimize damage to the surface of the land, to the surface waters, and to the fish and wildlife on NPRA.

1. Seismic survey operations are to begin only after the seasonal frost in the tundra and underlying mineral soils over the route has reached a depth of 12 inches; the average snow cover a depth of 6 inches. Normally this condition will not prevail until about 15 October, occasionally not until 1 November.

2. Seismic operations will cease when the spring melt of snow begins; approximately 5 May in the foothill areas exceeding 300 feet in elevation; approximately 15 May in the northern coastal areas. The cutoff date will be as determined by the Chief, Operations, ONPRA.

3. No bulldozing of tundra areas, trails or seismic lines will be allowed. This prohibition against the bulldozing of tundra areas includes the organic ridges outlining low-centered polygonal areas. This stipulation, however, does not prohibit the clearing of drifted snow along a trail or seismic line nor in a camp, to the extent that the tundra mat is not disturbed. Also, it does not prohibit the clearing of snow on a lake or river ice surface in order to prepare an aircraft runway.

4. Camps will be situated on gravel bars, sand or other durable lands where feasible. Where leveling for trailers or modules is required and the

surface has a vegetative mat, leveling will be accomplished with blocking rather than leveling with a bulldozer.

5. Camps may be located on lake or river ice which is determined to be frozen to the bottom provided that no sewage effluent, filtered waste water, toxic or hazardous materials, petroleum products or solid wastes are allowed to be dumped onto the ice.

6. Exploration activities will employ low-ground-pressure vehicles of the Rolligon, ARDCO, Trackmaster, Flextrac, Nodwell or of a similar type. The limited use of tractors, equipped with wide tracks, will be allowed for the plowing of snow or to pull the camp trailers. When plowing, the dozer blades must be kept sufficiently high so that they do not "clip" the tops of tussocks or polygonal ridges.

7. All operations will be conducted with due regard for good resource management and in such a manner so as to not block any streams, or drainage system, or change the character or course of a stream, or cause the pollution or siltation of any stream or lake.

8. Crossing of waterway courses will be made using a low angle approach in order not to disrupt the naturally occurring stream or lake banks. There will be no bulldozing or cutting of stream or lake banks.

9. All operations will be conducted in such a manner as to not cause damage or disturbance to any fish or wildlife resource. This includes, but is not limited to, the following:

- a. No seismic shooting or vehicle operations within one-half mile of any known denning barren ground grizzly (in the upland area) or of any known denning polar bear (near the sea coast or in the lower reaches of major rivers or estuaries).
 - b. No chasing by vehicles or buzzing by aircraft of any wildlife. Particular attention will be given to not disturbing caribou.
 - c. Shot holes must be a minimum of 300 feet from any designated hot springs, deeper lakes that do not freeze to bottom, or designated anadromous streams except where these waters, at the time of seismic shooting, may be frozen to bottom and the underlying gravels or sands also are frozen. Where required for the completion of critical surveys or tie-ins, variances may be requested, through the Chief, Operations, ONPRA from the appropriate regulatory authority.
 - d. Operators shall prohibit their employees, agents, contractors, subcontractors and their employees, while on duty or living at any camp, mobile camp, or field party on NPRA, from feeding wild animals or birds or from leaving garbage or other potentially edible items which would attract wild animals or birds. Garbage will be kept in covered containers while waiting incineration.
10. No hunting will be allowed within a radius of five miles from a geophysical camp, explosives cache, fuel cache, or seismic operation.

11. All oil spills will be reported to the Chief, Operations, ONPRA, at the time of the first solid radio contact or other communication occurring after the oil spill incident. The Chief of Operations, ONPRA, will inform the respective agencies having cognizant jurisdiction in such matters. Additional fuel handling requirements are:

- a. All fuel spills will be cleaned up immediately, taking precedence over all other matters, except the health and safety of personnel.
- b. Oil spills will be incinerated in approved receptacles but not on lake or river ice.
- c. Although fuels may be offloaded from aircraft on the ice, there will be no storage of fuels on lake or river ice.
- d. Oil spill cleanup materials (sorbents) will be stored and carried by each seismic crew.

12. All fuel containers used, including barrels, must be marked with the contractor's name and date, i.e., 1977 or 1978.

13. All combustible solid waste, including seismic cartons, drilling mud sacks, if any, and used lubricating oils, will be incinerated or returned to the base of operations for approved disposal. All noncombustible solid waste, including fuel drums, will be returned to the base of operations for approved disposal. An exception would be incinerated ash which may be deposited in a land-drilled hole. There will be no burial of garbage or the dozing up of any area for the burial of any matter of thing.

14. All retrievable shot hole wire will be picked up and returned to the base of operations for approved disposal. Records shall be kept of the amount of shot hole wire used and of that returned for disposal.

15. Shot lines shall be left clean of all foreign debris. This shall include, but is not limited to, cuttings, which shall be returned to the shot hole, shot wire, explosive boxes, and flagging, but not corner markers which are to be left in place for reference.

16. A snow melter system shall be present with each mobile camp to provide potable water at dry camp sites. In addition, a tank or tanks capable of storing 1,000 gallons of potable water for camp use shall be a part of each camp's equipment, together with necessary hoses, fittings and water pump.

17. Waste water shall receive treatment conforming to Federal requirements for secondary treatment if Arctic tested package treatment facilities are used. If electric toilets or if chemical recirculating sewage facilities are employed, they shall be kept separate from the gray wash and the kitchen waste water. The chemical effluent from the chemical recirculating facilities may be drained into a land-drilled hole, but not to the land surface or to any ice surface. The liquid level should not be less than five feet from the surface of the ground and, after freezing, shall be filled with cuttings or other clean fill to the surface. Gray wash water and kitchen waste water will be filtered to remove the solids and the liquid may be discharged to the land surface. All solids and sludges will be incinerated.

18. The contractor shall protect all survey monuments, witness corners and reference monuments against destruction, obliteration or damage. He shall, at his expense, re-establish damaged, destroyed, or obliterated monuments and corners in their original exact position. A record of the re-establishment shall be submitted to the Chief, Operations, ONPRA, who in turn will provide copies to the Bureau of Land Management.

19. The Antiquities Act of 8 June, 1906 (34 Stat. 225; 16 U.S.C. 431-433) prohibits the appropriation, excavation, injury, or destruction of any historic or prehistoric ruin or monument, or any other object of antiquity, situated on lands owned or controlled by the United States. No historic site, archeological site, or camp, either active or abandoned, shall be disturbed in any manner nor shall any item be removed therefrom. Should such sites be discovered during the course of field operations, the Chief, Operations, ONPRA, will be promptly notified and he will in turn notify the Bureau of Land Management of such discovery.

20. The contractor shall report the location and depths and enter on the appropriate seismic log any occurrences of water or of coal found in seismic drill holes.

21. The foregoing provisions do not relieve the contractor or his subcontractors of any responsibilities or provisions required by any applicable laws or regulations.

22. A copy of these stipulations shall be posted in a conspicuous place in each camp site and at all base camps established for the purpose of geophysical exploration within the National Petroleum Reserve in Alaska.

15 November 1977

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STIPULATIONS CONCERNING WINTER ROAD AND TRAIL CONSTRUCTION
AND USE WITHIN THE NATIONAL PETROLEUM RESERVE IN ALASKA

The conditions listed below are those which contractors or subcontractors, at any tier, will be required to follow in order to minimize damage to the surface of the land, to the surface waters, and to the fish and wildlife on the National Petroleum Reserve in Alaska (NPRA).

1. Winter road or trail construction and use, involving heavy equipment, are to begin only after the seasonal frost in the tundra and in the underlying mineral soils over the route has reached a depth of 12 inches; the average snow cover a thickness of 6 inches. Normally this condition will not prevail until about October 15, occasionally not until November 1. These requirements may be modified by the Chief of Operations, ONPRA, for the use of light weight equipment specialized for use in tundra environments. Such modification, for specific uses, shall be in writing with a copy provided to the contractor or subcontractor and to the Bureau of Land Management.

2. Winter road or trail use, involving heavy equipment, will cease when the daytime spring melt of snow begins; approximately May 5 in the foothill areas exceeding 300 feet in elevation; approximately May 15 in the northern coastal areas.

3. No bulldozing of tundra areas for roads or trails will be allowed. This prohibition against the bulldozing of tundra areas includes the organic ridges outlining lowcentered polygonal areas. This stipulation, however, does not prohibit the clearing of drifted snow along a trail or road nor in a camp, to the extent that the tundra mat is not disturbed. Also, it does not

prohibit the clearing of snow on a lake or on a river ice surface, or on an unvegetated gravel bar or beach, in order to prepare an aircraft runway.

4. Camps used for road construction will be situated on gravel bars, sand or other durable lands. Where leveling for trailers or modules is required and the surface has a vegetative mat, leveling will be accomplished with blocking rather than by leveling with a bulldozer.

5. Camps may be located on pond or lake ice which is determined to be frozen to the bottom provided that no sewage effluent, filtered waste water, toxic or hazardous materials, petroleum products or solid wastes are allowed to be dumped onto the ice. Such locations will be specifically approved in writing by the Chief of Operations, ONPRA, with a copy of the approval provided to the contractor or subcontractor and to the Bureau of Land Management.

6. Exploration activities will employ low ground pressure vehicles of the Rolligon, ARDCO, Trackmaster, Nodwell, Flextrac, or of a similar type. The limited use of tractors, equipped with wide snow tracks, will be allowed for the plowing of snow or to pull heavy camp equipment and drilling rigs. Blades may be used to plow unusually deep snow, but, when used, must be kept sufficiently high so that they do not "clip" the tops of tussocks or polygonal ridges. Blade "shoes" or similar elevation-guide type blade attachments are not required. Experience has shown that such "guides" concentrate pressures on the tundra and tend to "clip" off tussock tops, especially in the drier tundra-type areas. Any exceptions to this stipulation, which could result in damage to the tundra, will require the written approval of the Chief of Operations, ONPRA. Should true "ice" roads be used, their construction shall

be sufficiently substantial, for the specific use intended, that there is no breaking through the ice, by wheel or track, to the underlying tundra surface.

7. All operations shall be conducted with due regard for good resource management and in such a manner so as to not block any stream, or drainage system, or change the character or course of a stream, or cause the pollution or siltation of any stream or lake.

8. Crossing of waterway courses shall be made using a low angle approach in order not to disrupt the naturally occurring stream or lake banks. There will be no bulldozing of stream or lake banks.

9. All operations shall be conducted in such a manner as to not cause damage or disturbance to any fish or wildlife resource. This includes, but is not limited to the following:

- a. No vehicle operations within one-half mile of any denning barren ground grizzly (in the upland area) or of any denning polar bear (near the sea coast or in the lower reaches of major rivers or estuaries).
- b. No chasing by vehicles or buzzing by aircraft of any wildlife. Particular attention will be given to not disturbing caribou. In this regard, it is assumed, and experience has shown, that small groups of caribou, which habitually hang around airstrips and airstrip approaches, are not unduly disturbed by normal aircraft operations.

c. There will be no feeding of wildlife. Camps will be so managed that no garbage is left uncovered while waiting incineration.

10. No hunting will be allowed within a radius of five miles from a mobile construction camp, fuel cache, drilling operation, or from a road or trail under construction or use.

11. All oil spills will be reported to the Chief of Operations, ONPRA, at the time of the first solid radio contact or other communication occurring after the oil spill incident. The Chief of Operations, ONPRA, will inform the respective agencies having cognizant jurisdiction in such matters. Additional fuel handling requirements are:

- a. All fuel spills will be cleaned up immediately, taking precedence over all other matters, except the health and safety of personnel.
- b. Oil spills will be incinerated in approved receptacles but not on lake or river ice.
- c. Although fuels may be off-loaded from aircraft on the ice, there will be no storage of fuels on lake or river ice, even on a temporary basis.

12. All fuel containers used, including drums, shall be marked with the contractor's name and date, i.e., 1977 or 1978.

13. All combustible solid waste, including cartons, dunnage, drilling mud sacks, if any, and used lubricating oils, will be incinerated or returned to the base of operations for approved disposal. All noncombustible solid waste, including fuel drums, will be returned to the base of operations for

approved disposal. An exception would be incinerated ash which may be deposited as part of a drilling pad or gravel road. There will be no burial of garbage or the dozing up of any area for the burial of any matter of thing.

14. Waste water from any mobile camp used during road construction will receive treatment conforming to federal requirements for secondary treatment if Arctic-tested package treatment facilities are used. If chemical recirculating sewage facilities are employed, they will be kept separate from the gray wash and kitchen waste water. The chemical effluent will be carried until an approved waste disposal facility is reached. Gray wash water and kitchen waste water will be filtered to remove the solids and grease after which the liquid may be discharged to the land surface. All solids and sludges will be incinerated.

15. The contractor will protect all survey monuments, witness corners and reference monuments against destruction, obliteration or damage. He will, at his expense, re-establish damaged, destroyed, or obliterated monuments and corners in their original exact position. A record of the re-establishment will be submitted to the Chief of Operations, ONPRA, who in turn will inform the respective agencies having cognizant jurisdiction.

16. The antiquities Act of June 8, 1906, (34 Stat. 225; 16 U.S.C. 431-433) prohibits the appropriation, excavation, injury, or destruction of any historic or prehistoric ruin or monument, or any other object of antiquity, situated on lands owned or controlled by the United States. No historic site, archeological site, or camp, either active or abandoned, shall be disturbed in any manner nor shall any item be removed therefrom. Should such sites be discovered during the course of field operations, the Chief of

Operations, ONPRA, will be promptly notified. The Chief of Operations, ONPRA, in turn will promptly notify the BLM of such discovery.

17. Should gravel borrow be required for the construction of a winter road or trail, or for any portion thereof, a plan for both the borrow of the gravel and for the subsequent rehabilitation of the borrow area, with a time schedule for the rehabilitation, shall be submitted to the Chief of Operations, ONPRA.

18. The foregoing provisions do not relieve the contractor or his subcontractors of any responsibilities or provisions required by any applicable laws or regulations.

19. A copy of these stipulations shall be posted in a conspicuous place in any mobile site established for the purpose of winter road construction and at all base camps within the National Petroleum Reserve in Alaska.

October 28, 1977