ANWR-

ENVIRONMENTAL

ISSUES

EMBARGO

State of Alaska Critique of H.R. 3601

The State of Alaska appreciates the time and effort that the Chairman of the House Merchant and Fisheries Committee has devoted to the issue of oil and gas development in the Arctic National Wildlife Refuge. The State recognizes the value of this bill as a starting point for discussion, and in that spirit offers the following initial comments:

1. Separation of Exploration and Development Phases- The State of Alaska believes that the bill's separation of the exploration and development phases has the following major flaws: a. four exploratory wells are not enough to evaluate the area's hydrocarbon potential; the 1002 area could be prematurely and inaccurately condemned; b. under existing law the industry pays the cost of exploratory drilling, H.R. 3601 transfers a significant portion of these costs to the taxpayer; c. lack of competition at the exploration stage would not allow companies to test their different theories regarding the geology of the area. H.R. 3601 could reduce the amount of competition for leasing by excluding companies which did not participate in the exploration process from any subsequent involvement in ANWR development. In addition, because the exploration process could produce an inaccurate assessment of the area's potential, the mechanism established to authorize leasing in Section 302 could fail because it relies entirely on the information produced from the four wells. Moreover, this mechanism would be susceptible to litigation.

2. Protective Management Zone- The State concurs that much of the area which this bill designates as the protective management zone is important habitat; however, we believe that this habitat can be protected with less restrictive measures. We have recommended that leasing in the 242,000 core calving area be deferred pending further studies and that a coastal buffer be established within which only essential facilities are allowed. The State believes that the need for permanent closures in the area identified as the PMZ has not been established and would needlessly preclude exploration in a number of prospective areas.

3. Revenue Sharing- Under the Alaska Statehood Act, Alaska is entitled to 90 percent of the governmental revenues generated from leasing in ANWR. Section 309, which amends the National Wildlife Refuge Revenue Sharing Act and reduces the state's share of revenue from all units of the Wildlife Refuge System to 50 percent, is a unilateral abrogation of the compact formed between the people of Alaska and the United States when Alaska entered the Union. It should be noted that the state's share would actually be less than 50

percent because the bill would first use the revenues to fund the deficit in the Refuge Revenue Sharing fund. Revenues which remained would then be divided according to the formula.

4. Hunting and Fishing Regulation- Section 203 of the bill prohibits sport hunting and fishing within the coastal plain by personnel associated with oil and gas activities. The State of Alaska believes that it is unnecessary to deal with this issue in legislation because the same issue has been dealt with successfully in the context of the Trans-Alaska Pipeline and Prudhoe Bay development under existing authority.

5. Sand and Gravel Dispute Resolution- The State agrees that disputes over ownership of sand and gravel should not hinder development in ANWR. We believe, however, that the dispute settlement mechanism outlined in section 302 (e) is unnecessary. The courts have ample tools at their disposal for ensuring that development may proceed while questions of title are resolved.

6. Additional Studies/National Academy of Science- The State has recommended that a joint State-Federal study team conduct additional studies to provide a better understanding of the importance of the core calving area to the Porcupine Caribou herd. The State also recommends that Congress establish a federal/state team to handle all aspects of ANWR exploration and development. The state believes that the additional studies required by H.R. 3601 and the oversight role played by the National Academy of Sciences are unnecessary to assure the acquisition of additional information.

7. Secretarial Authority- The Secretary of the Department of the Interior, rather than the Director of the Fish and Wildlife Service, should have the principal authority for administering the management of the 1002 area. Exploration and development in the coastal plain would involve a complex array of disciplines some of which are beyond the expertise of the Fish and Wildlife Service. The Secretary would be able to assign the many tasks to the bureau with the relevant capabilities.

8. Rights-of-Way- The State believes that Title XI of ANILCA provides an appropriate and sufficient mechanism for establishing rights-of-way. For this reason, Section 304 of the bill is unnecessary. In addition, it is has not been necessary in the past to legislatively mandate that the State employ the same environmental and engineering design specifications for the portion of pipeline that is on state land.

9. Native Land Trades- The State believes that the proposed Native Land Trades are contrary to the National Interest. We are especially concerned that because the exchanges juxtapose known surface values against unknown, but highly prospective, subsurface values that the federal government has not properly valued the tracts. State concerns regarding the trades are discussed in greater detail in the Governor's recent letter to Secretary Hodel, and a Department of Natural Resources critique of the exchanges.

10. Miscellaneous Provisions- Without commenting on the merits of Section 403 and 404, the State believes as a general principal that legislation which is not directly related to the purposes of this bill should not be included.

11. Teshekpuk-Utikok Wildlife Refuge- The state has not yet developed a position on this provision.

12. Restricted Port Development- The state is still evaluating the desirability of including a limitation on the number of port sites in legislation.

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10/14/87

"SECTION-BY-SECTION SUMMARY"

NATIONAL FISH AND WILDLIFE ENHANCEMENT ACT OF 1987

TITLE I -- CONGRESSIONAL FINDINGS AND DEFINITIONS

SEC. 101. SHORT TITLE

SEC. 102. CONGRESSIONAL FINDINGS AND PURPOSES

Historic federal policy on national wildlife refuges holds that the revenues from the commercial sale or lease of natural resources on wildlife refuges should be expended in further support of the expansion of the National Wildlife Refuge System. This bill reaffirms that policy and states that it should be applied to revenues from both surface and subsurface resources from national wildlife refuges. Notes need to accelerate national wetland acquisition programs and to develop unique approach to oil and gas exploration and development for the coastal plain of the Arctic Refuge. Notes need for Congress to enhance other federal fish and wildlife conservation authorities.

SEC. 103. DEFINITIONS

"ANILCA", "Arctic Refuge", "Bureau", "coastal plain" "Director", "fish and wildlife", "mitigation", "national wildlife refuge" or "refuge", "on-structure exploratory drilling", "Refuge Administration Act", "related activities", "Secretary", "State", "Wildlife Refuge System".

TITLE II -- RESOURCE EXPLORATION WITHIN THE COASTAL PLAIN OF THE ARCTIC NATIONAL WILDLIFE REFUGE

SEC. 201. CONGRESSIONAL FINDINGS

(a) Description and purpose of Secretary's five-year natural resource assessment in ANWR under section 1002 of ANILCA. Unanswered questions remain regarding presence of commercial quantities of oil and gas. The coastal plain is considered the most outstanding prospect for a super giant oil field discovery in the U.S. Moreover, the Nation's oil production will soon begin declining in Prudhoe Bay and dependence on foreign oil is increasing. Section 7(d) of Export Administration Act would apply to any oil produced on coastal plain of ANWR. Land exchange proposals involving subsurface rights in ANWR will require future consideration by Congress. Informed decision on future of Arctic Refuge coastal plain requires development of better geological data through carefully controlled and limited exploratory drilling program.

SEC. 202. AUTHORIZATION FOR EXPLORATORY DRILLING IN THE COASTAL PLAIN

(a) Authorizes the Director, FWS, to permit the drilling of four on-structure exploratory test wells. One additional season of seismic exploration permitted, if necessary.

(b) Prohibits exploratory drilling and related activities within a specially designated 376,000 acre "Protective Management Zone" which includes sensitive calving area for the Porcupine Caribou Herd and easternmost coastline of 1002 area.

(c) Requires a private industry exploratory drilling program to satisfy environmental standard of "no significant adverse effect on fish and wildlife, their habitat and the environment". Director, FWS, with advice from Directors of Bureau of Land Management (BLM) and U.S. Geological Survey (USGS), to specify general areas to be drilled based on nominations from oil industry and recommendations from the National Academy of Sciences. Drilling allowed only from October 31 - May 1 each year. Access limited to helicopters, airplanes, ice airstrips, ice roads, vehicles traveling on ice roads and off-road vehicles only during periods of adequate snow cover and which do not significantly adversely affect the tundra. Must avoid unnecessary duplication through requirement of joint group participation among interested private parties (one permittee with joint shared support). Deduction of 50% of drilling costs as credit against future bonus bids, royalties or rentals for oil and gas leases on the coastal plain, on the OCS or other on-shore areas under jurisdiction of the Department of the Interior.

SEC. 203. EXPLORATORY DRILLING REGULATIONS

(a) Director, with assistance from BLM, shall issue exploratory drilling regulations. Regulatory environmental terms and conditions shall be developed in consultation with EPA, State of Alaska and Army Corps of Engineers.

(b) Director shall specify necessary and appropriate permit terms, conditions, and restrictions.

(c) Requires: application of best available technology from an engineering and technical standpoint; site-specific assessment of effects on fish and wildlife and their habitat; requires a mitigation plan, based on CEQ mitigation definition; requires protective stipulations for a variety of environmental issues or topics ranging from hazardous waste disposal to avoidance of wetlands and riparian habitats.

SEC. 204. REGULATORY PROCEDURES

(a) Within one year, Director required to establish exploratory drilling regulations required under section 203.

(b) Director shall periodcally review and revise the regulations based on new information.

(c) NEPA and section 810 of ANILCA are deemed satisfied pursuant to work previously prepared under 1002(c) and (h) of ANILCA and environmental stipulations prepared under section 203.

SEC. 205. EXPLORATORY DRILLING PLANS

(a) Any person, including the USGS, may submit a permit application and exploratory drilling plan. Drilling plan requirements described.

(b) Director shall publish notice and circulate proposed drilling plans. Two public hearings required. ANWR Scientific Advisory Panel established under section 206 shall review and comment on proposed drilling plans.

(c) Director has 120 days to approve or request modification of proposed drilling plans. Director may not approve a proposed exploratory drilling plan from USGS unless no other adequate plan was submitted by private sector. If competing proposed plans submitted, Director shall approve plan which best satisfies exploratory drilling regulations and provides best geologic data. Director may assess administrative costs to review plan and prepare special use permit. Director shall require periodic reports. All exploratory geological drilling data and information shall be submitted to BLM and held as confidential for two years following any lease sale.

(d) Director shall suspend, modify or cancel approved drilling plans or permits if, after consultation with permittee, he determines that significant adverse effects on fish and wildlife, their habitat or the environment will occur. Director may cancel such plans or permits if significant adverse effects cannot be avoided through remedial action and drilling plan modification, provided the permittee is compensated for 50% of his direct costs.

(e) Sets out enforcement penalties and actions applicable to violations of drilling plans or permits as set forth in section 306.

SEC. 206. ARCTIC REFUGE SCIENTIFIC ADVISORY PANEL

(a) Within 60 days of issuance of final exploratory drilling regulations, Director shalll establish an ANWR Scientific Advisory Panel to review all drilling plans, mitigation measures, research proposals, FWS reports and provide recommendations to the Director.

(b) Chaired by FWS and includes scientifically trained representatives of federal, state and local agencies, the oil industry, the Native community and environmental interests.

(c) Administrative and support services to be provided by Director.

(d) The Director shall fully consider the Panel's recommendations, but shall retain ultimate management responsibility over refuge. Panel's recommendations made available to general public.

SEC. 207. REVISED NATURAL RESOURCE ASSESSMENT REPORT

(a) Within one year after completion of exploratory drilling program, Director required to issue revised and updated draft 1002(h) report and proposed oil and gas leasing regulations capable of implementing a competitive oil and gas leasing program pursuant to sections 302 and 303 of this Act. The National Academy of Sciences' factual analysis contained in its independent study report prepared under section 208 and comments to the draft revised 1002 report shall be given great weight during the preparation of the final 1002 report.

(b) Revised 1002 report to contain: revised estimates of any likely oil and gas deposits in commercial quantities in the coastal plain; updated fish and wildlife data; an analysis of oil production requirements for the coastal plain (e.g. facilities, personnel) and potential for expansion of oil and gas activities elsewhere on the North Slope and Canada; and requisite environmental stipulations needed to develop the coastal plain without significant adverse effects.

(c) Draft EIS and public hearings shall accompany the revised draft 1002 report. Draft and Final EIS reviewed by CEQ and EPA for adequacy and revised in accordance with EPA's and CEQ's specific recommendations. Final EIS and final regulations capable of implementing a competitive oil and gas leasing program to be published eight months after publication of Draft EIS.

SEC. 208. NATIONAL ACADEMY OF SCIENCES INDEPENDENT STUDY

(a) National Academy of Sciences requested to conduct independent study of: relative importance of coastal plain to overall national energy needs through year 2007; whether commercial quantities of oil and gas are likely to exist on the coastal plain; other on- and offshore oil and gas potential and production in Alaska and Canada; and ability to develop oil in the coastal plain without significant adverse effects. Requested to submit interim report during exploratory drilling program, and to issue final summary report within 8 months after drilling completed.

(b) All geological/geophysical data provided in summary form to Academy to be kept confidential. Financial assistance to the Academy is authorized.

(c) Shall review and comment on draft revised section 1002 report prepared under section 207.

TITLE III -- OIL AND GAS LEASING ON NATIONAL WILDLIFE REFUGES

SEC. 301. OIL AND GAS RECEIPTS FROM NATIONAL WILDLIFE REFUGES

(a) All oil and gas revenues generated on reserved and acquired national wildlife refuges around the country shall be deposited into the Refuge Revenue Sharing Fund for fish and wildlife conservation purposes (Kenai National Wildlife Refuge exempted).

SEC. 302. OIL AND GAS LEASING, DEVELOPMENT AND PRODUCTION ON THE COASTAL PLAIN OF THE ARCTIC REFUGE

(a) Based upon the revised Section 1002 Report, Secretary shall recommend to the President that oil and gas leasing be initiated on the coastal plain, unless he finds that: 1) there is a very low likelihood of discovering commercially recoverable oil and gas deposits on the coastal plain; 2) the development of these deposits is not important to the nation's energy needs; or, that 3) significant adverse effects to the coastal plain could not be avoided despite rigid environmental controls. If the Secretary makes one or more of the above findings, he shall recommend to the President that oil and gas leasing not be initiated on the coastal plain. 30 day opportunity for public comment on Secretary's recommendations. President shall adopt recommendation of Secretary unless he determines that it is not in the paramount interest of the U.S. to do so. Except during time of war or a declared national emergency, President may not override Secretary's recommendation against leasing if the basis for Secretary's recommendation is that significant adverse environmental effects would occur on coastal plain. Upon Presidential authorization, Director to initiate a competitive oil and gas leasing program in the coastal plain, except within specially designated 376,000 acre "Protective Management Zone", which includes sensitive calving area for Porcupine Caribou Herd and coastal polar bear denning habitat. Surface occupancy and use for oil and gas development precluded within the Protective Management Zone.

(b) Upon authorization from President, the Director, with assistance from BLM, shall expeditiously initiate competitive oil and gas leasing program for coastal plain. Only participants in exploratory drilling program authorized under section 202 shall be deemed to be qualified bidders for participating in competitive leasing of the coastal plain. Maximum lease tracts of not more than 2,560 acres. BLM to manage the technical, financial and geologic aspects of the leasing program.

(c) Prior to commencement of work, lessee shall submit plan of operation, including an environmental analysis, to Director for approval. Plans of operation subject to public comment, and to review by the ANWR Scientific Advisory Panel. Director shall approve proposed plan of operations or modify the plan accordingly. Director may modify or suspend approved plan of operations if he determines, after consultation with lessee, that significant adverse effects on human life, fish and wildlife, their habitat or the environment will occur.

(d) Submission of all geological data from drilling operations required and shall be kept confidential by BLM.

(e) Failure to resolve conflicting State/Federal claims to sand and gravel deposits in stream beds of coastal plain could frustrate Federal oil and gas leasing program. No leases issued on coastal plain unless the State agrees to joint environmental stipulations with regard to extraction of disputed sand and gravel deposits. Allows Director to market sand and gravel from such beds (with proceeds placed in escrow pending final court decision regarding ownership).

(f) Leases shall be suspended if: Director has not approved or rejected proposed plan of operations within two years; if operations are interrupted by circumstances beyond control of lessee; or if threat exists of significant adverse effects to human life, fish and wildlife, their habitat or the environment.

(g) Leases conditioned upon payment by lessee: of accepted bonus bids; of royalties not less than 16 2/3%; and rentals of not less than $2.00 per acre for each year of lease. Payment required for fair market value of rights-of-way, sand, gravel, and other refuge resources utilized.

(h) Director may cancel any suspended lease due to inability to eliminate significant adverse effects described in subsection (i) above. Upon cancellation, lessee shall be compensated for lesser of either fair market value of lease or net cost of lease.

(i) The Federal Oil and Gas Royalty Management Act applies.

(j) Where necessary to encourage maximum production and recovery of oil and gas, BLM, with concurrence of Director, FWS, authorized to reduce rents and royalties.

(k) Judicial review of leasing NEPA compliance, impact analysis, permit or regulations barred, unless brought within 30 days after notice in Federal Register.

SEC. 303. ENVIRONMENTAL STIPULATIONS

(a) Requires leasing program: to satisfy best available technology from an engineering and technical standpoint; avoid unnecessary duplication; consolidate facilities; and satisfy environmental standard of no significant adverse effect on fish and wildlife, their habitat and the environment.

(b) Regulations shall address various environmental issues set out in section 203 and several additional limitations and restrictions designed to avoid significant adverse effects on key areas of the coastal plain (e.g. Sadlerochit Springs area protection; seasonal limitations to protect key breeding and migration areas; 2 mile coastal protective zone; strict pipeline and access road standards; total prohibition on public access to service roads; reclamation standards; reimbursement schedules; and other restrictions deemed necessary by the Director).

(c) Director shall reconvene ANWR Scientific Advisory Panel established in section 206 for exploratory drilling program to assist in implementation of coastal plain leasing program.

SEC. 304. RIGHTS-OF-WAY ACROSS THE COASTAL PLAIN

(a) Provides exclusive authority to grant rights-of-way across coastal plain for transportation or utility corridor. No such right-of-way may be authorized until coastal plain opened to oil and gas leasing. State and BLM to assist in development of pipeline specifications. Would apply to right-of-way needed for off-refuge development as well as for oil and gas leasing on coastal plain. Right-of-way across specially designated 376,000 acre "Protective Management Zone" precluded.

(b) No right-of-way shall be granted for pipeline across coastal plain unless State agrees to adopt same stringent engineering and environmental standards for pipeline across State land as required for part of pipeline on the refuge.

SEC. 305. CONSTRUCTION ACTIVITIES AFFECTING MARINE COASTAL WILDLIFE REFUGE RESOURCES

(a) Only one new port facility authorized along western/central coastline of coastal plain (between Staines River and Tapkaurak Point). Port facility and offshore causeway construction subject to mandatory FWS, NMFS and ADF&G terms and conditions.

(b) Director shall not authorize any port facilities or offshore causeways within 376,000 acre "Protective Management Zone" on eastern side of coastal plain between Tapkaurak Point and the Aichilik River.

SEC. 306. SUPPLEMENTAL ENFORCEMENT AUTHORITY

(a) Definitions: "damages", "discharges", "natural resources", "oil", "remove", "removal costs", "responsible party".

(b) Director may issue compliance orders for violations, assess civil penalties ranging from $10,000 to $25,000 per violation, bring criminal actions or seek injunctive relief, and hold responsible parties liable for hunting and fishing violations by their employees and agents.

(c) Compliance order shall contain reasonable specificity and time limits.

(d) Upon request of Director, the Attorney General shall commence action seeking injunctive relief.

(e) Responsible party is liable for all removal costs and damages from oil, hazardous or toxic substance pollution or substantial threat of such pollution. The Director may initiate removal at the expense of the responsible party.

SEC. 307. COMPREHENSIVE REFUGE PLANNING

The Director shall revise the ANWR comprehensive refuge management plan one year after authorization of leasing.

SEC. 308. CONSULTATION AND REPORTING

(a) Director shall consult with State, affected Native Corporations and Canada in developing leasing regulations.

(b) Director shall biannually report to Congress on status of leasing program.

SEC. 309. GENERAL AMENDMENTS TO THE NATIONAL WILDLIFE REFUGE REVENUE SHARING ACT (16 U.S.C. 715s et seq.)

(a) Requires Secretary to initially segregate in Refuge Revenue Sharing Fund all oil and gas leasing receipts, including receipts from related sale of sand or gravel, from Alaskan units of the Wildlife Refuge System. Provides for full funding of Refuge Revenue Sharing Fund to make up current deficit in Fund, with remaining oil and gas receipts distributed under the following apportionment:

State share - 50%:

Federal share - 50%:

(1) 25% distributed to the Migratory Bird Conservation Fund to be expended by the Migratory Bird Commission in accordance with section 311 of this Act.

(2) 25% distributed to endow initial principal of $150 million Fish and Wildlife Enhancement Trust Fund established under section 312 of this Act. Once $150 million principal endowment reached, then this 25% share is to be merged with other 25% share noted in (1), above, for inclusion into Migratory Bird Conservation Fund.

SEC. 310. GENERAL AMENDMENTS TO THE MIGRATORY BIRD HUNTING STAMP ACT (16 U.S.C. 718d et seq.)

Amends Duck Stamp Act to require Secretary to segregate "excess net" oil and gas leasing receipts, including the related sale of sand and gravel, from Alaska units of Refuge System into a separate subaccount within the Migratory Bird Conservation Fund for use to acquire suitable areas for national wildlife refuges for migratory birds and other species of fish and wildlife.

SEC. 311. GENERAL AMENDMENTS TO THE MIGRATORY BIRD CONSERVATION ACT (16 U.S.C. 715 (a) and (c))

(a) Expands Congressional membership on Migratory Bird Commission to 4 Senators and 4 Representatives. Authorizes Migratory Bird Conservation Commission to approve any Secretary of Interior acquisition recommendations in support of the North American Waterfowl Plan signed with Canada. Excess net oil and gas receipts put in Migratory Bird Conservation Fund from Alaska units of Wildlife Refuge system shall be expended by Commission according to the following formula:

1) 50% for acquisition of migration route and wintering habitat for migratory birds from Canada and Alaska.

2) 20% for acquisition of habitat in accordance with North American Waterfowl Plan with Canada.

3) 30% for acquisition of national wildlife refuges for species other than migratory birds. (One-half of this amount (15%) annually to be available for acquiring in-holdings in Alaska units of Wildlife Refuge System from willing sellers. If not enough willing sellers to commit entire 15%, then remainder available for acquisitions in Lower 48 states.)

(b) In acquiring lands, Secretary required to consult with affected governments concerned.

SEC. 312. FISH AND WILDLIFE ENHANCEMENT TRUST FUND

(a) Establishes $150 million Fish and Wildlife Enhancement Trust Fund. The Secretary of the Treasury shall serve as Trustee on behalf of the Director, FWS.

(b) Purpose of Fund to promote fish and wildlife conservation and enhancement. Five areas for funding: 1) fish and wildlife research in Alaska and Canada with special emphasis on shared migratory species and effects of development and pollution on North Slope of Alaska fish and wildlife populations; 2) State nongame grant-in-aid program; 3) matching grant program of the National Fish and Wildlife Foundation; 4) natural resource use conflict resolution programs; 5) fish and wildlife conservation education and training programs and facilities. No less than 10% and no more than 30% of Foundation's annual income can be allocated to any one of these 5 funding areas.

(c) Fund endowment principal of $150 million established from oil and gas revenues, including the related sale of sand and gravel, from Alaska units of Wildlife Refuge System in accordance with section 309 of the bill.

(d) Principal to be conservatively invested in government securities to generate an annual net income.

(e) No funds may be expended until principal of Trust Fund has reached minimum of $20 million.

(f) Director to prepare an annual report to Congress on expenditure of Trust Fund income.

SEC. 313. TESHEKPUK-UTUKOK NATIONAL WILDLIFE REFUGE

(a) Establishes new 23.5 million acre national wildlife refuge on North Slope of Alaska (old National Petroleum Reserve).

(b) Purpose of refuge to conserve fish and wildlife populations and habitats, fulfill international treaty obligations, provide for continued opportunity for subsistence uses, and ensure water quality and quantity.

(c) Requires preparation of a comprehensive refuge management conservation plan.

(d) Establishes limited moratorium on further oil and gas leasing on new refuge for a maximum period of five years. After expiration of moratorium, prohibits issuance of additional oil and gas leases in the Teshekpuk Lake Special Area within the Refuge. Subsequent oil and gas leasing on the Teshekpuk-Utukok Refuge shall be subject to the Refuge Administration Act and this Act. Existing oil and gas leases on the Teshekpuk-Utukok Refuge are not affected, provided significant adverse effects on fish and wildlife, their habitat and the environment are avoided. Existing leasehold terms and conditions shall continue to apply until Director, FWS, with assistance from BLM, publishes final regulations in accordance with those parts of sections 302, 303, 305 and 306 of this Act capable of application to this new Refuge. The State and Federal fish and wildlife agency authorities in section 305(b) shall apply to any port facility/causeway construction in coastal area of new refuge. Transportation/utility corridors are prohibited in the Teshekpuk Lake area unless there exists no economically reasonable and prudent alternative.

Creation of new refuge shall not affect Native corporation rights nor rights of State of Alaska to acquire lands within boundary of refuge.

SEC. 314. PROPERTY INTERESTS OF THE INUPIAT ESKIMO PEOPLE

Upon authorization of oil and gas leasing program on the coastal plain, the prohibitions in section 1003 of ANILCA against leasing and development which might apply to Native subsurface property interests within and adjacent to the coastal plain are lifted. No surface disturbance in support of oil and gas development is authorized on Native property until FWS publishes final environmental standards to control oil and gas development on coastal plain. As authorized in subsection 1431(o)(4) of ANILCA, such regulatory environmental terms and conditions shall apply to Eskimo subsurface interests within and adjacent to coastal plain.

TITLE IV -- MISCELLANEOUS PROVISIONS

SEC. 401. GENERAL ENFORCEMENT AMENDMENTS TO THE REFUGE ADMINISTRATION ACT (16 U.S.C. 668dd(e)) AND THE REFUGE RECREATION ACT (16 U.S.C. 460k-3)

(a) Refuge Administration Act: Maximum penalties for violation of Act increased from $500 to $5,000 and maximum sentences from six months to one year in jail.

(b) Refuge Recreation Act: Maximum penalties increased from $500 to $5,000 and maximum sentences from six months to one year in jail.

SEC. 402. MISCELLANEOUS PROPERTY INTERESTS WITHIN REFUGES

(a) Amends the Migratory Bird Conservation Act to clarify that reserved mineral interests on acquired wildlife refuge lands are subject to general refuge regulations regardless of whether lands are acquired directly by Secretary or by the head of another Federal agency as mitigation for Federal project. Strengthens fish and wildlife protection regarding development of reserved mineral interests on refuges.

(b) Amends Refuge Administration Act to clarify and reaffirm authority of Director, FWS, to impose economically reasonable terms and conditions and to require special use permits to protect wildlife refuge fish and wildlife resources and minimize adverse effects from development of reserved mineral interests on refuges.

SEC. 403. GENERAL AMENDMENTS TO THE FISH AND WILDLIFE IMPROVEMENT ACT OF 1978 (16 U.S.C. 712)

Section 3(h)(3) of the Act is amended as follows:

Secretary of the Interior, in cooperation with Secretary of State, authorized to implement the 1971 Convention on Wetlands of International Importance Especially for Waterfowl (RAMSAR). Authorizes appropriations to implement RAMSAR at $150,000/year through FY 1997.

Authorizes Secretary of Interior to implement the migratory bird habitat protection provisions of the Soviet Migratory Bird Treaty through designation of "areas of special importance" for migratory birds through informal rulemaking and public hearing. Designated habitat areas of special importance shall contain exceptionally high concentrations of migratory birds and be at least 1,700 contiguous acres in size (colonial nesting sites may be smaller). No Federal agency shall authorize, fund or carry out any activity which would adversely modify or destroy such designated habitats unless there are no feasible or prudent alternatives to the proposed activity which would avoid such adverse effects.

SEC. 404. MANAGEMENT PLANS ON NATIONAL WILDLIFE REFUGES

Refuge Administration Act is amended to clarify that aircraft and motor vehicles may be utilized in implementation of approved management plans on national wildlife refuges.

STATEMENT OF THE HONORABLE WALTER B. JONES, CHAIRMAN
COMMITTEE ON MERCHANT MARINE AND FISHERIES

OCTOBER 16, 1987

TODAY, CONGRESSMAN LINDSAY THOMAS AND I ARE ANNOUNCING THAT WE WILL INTRODUCE SOON THE FISH AND WILDLIFE ENHANCEMENT ACT OF 1987. WE ARE GIVING A DRAFT BILL TO INTERESTED PARTIES FOR COMMENT.

WE OFFER THIS AS A COMPROMISE TO THE CONTROVERSY OF OIL DEVELOPMENT ON THE COASTAL PLAIN OF THE ARCTIC NATIONAL WILDLIFE REFUGE.

UP UNTIL NOW, THERE HAVE BEEN 2 COMPETING BILLS ON THIS ISSUE. ONE CALLS FOR IMMEDIATE LEASING, THE OTHER DECLARES THE AREA TO BE WILDERNESS AND OFF LIMITS FOR ALL DEVELOPMENT.

I DON'T THINK EITHER BILL CAN PASS THIS CONGRESS. WE NEED AN APPROACH SOMEWHERE IN THE MIDDLE.

THERE ARE ELEMENTS IN OUR DRAFT THAT SHOULD ATTRACT PERSONS FROM ALL SIDES OF THIS CONTROVERSY.

OUR COMMITTEE ON MERCHANT MARINE AND FISHERIES IS RESPONSIBLE FOR THE NATIONAL WILDLIFE REFUGE SYSTEM. NO ANWR BILL IS GOING TO BE ENACTED WITHOUT OUR COMMITTEE'S BLESSING.

OUR NATION NEEDS THE OIL THOUGHT TO BE IN ANWR. IT IS BETTER TO HAVE A RATIONAL PROCESS FOR GETTING THAT OIL INSTEAD OF HAVING A FRENZIED RUSH FOR IT IN A CRISIS. THAT IS WHY CONGRESS SHOULD LEGISLATE NOW.

WE BELIEVE OIL DEVELOPMENT CAN CO-EXIST WITH THE WILDLIFE OF THE REFUGE, IF IT IS DONE UNDER STRICT ENVIRONMENTAL STANDARDS. WE

HAVE TOUGH STANDARDS IN OUR DRAFT BILL.

BEFORE EMBARKING ON A TRUE LEASING PROGRAM, WE NEED MORE INFORMATION ABOUT WHAT'S UNDER THE GROUND. THE ONLY WAY TO GET THAT IS BY DRILLING WELLS. SO WE PROPOSE A SHORT TERM EXPLORATION PROGRAM. IF IT YIELDS FAVORABLE INFORMATION, THE SECRETARY OF INTERIOR SHOULD RECOMMEND LEASING, AND THE PRESIDENT CAN THEN IMPLEMENT IT ON HIS OWN AUTHORITY WITHOUT ANOTHER VOTE IN CONGRESS.

TO BALANCE DRILLING IN A PRISTINE WILDLIFE REFUGE, THERE MUST BE MAJOR BENEFITS TO FISH AND WILDLIFE RESOURCES IN ALASKA AND THROUGHOUT THE WHOLE NATION. WE PROPOSE THAT THE FEDERAL REVENUES FROM OIL DEVELOPMENT BE DEVOTED ENTIRELY TO THE REFUGE SYSTEM AND TO FISH AND WILDLIFE CONSERVATION.

I'M PLEASED THAT CONGRESSMAN JOHN DINGELL IS JOINING US AS AN ORIGINAL COSPONSOR. I INVITE OTHER COLLEAGUES TO SIGN ON TO THE DRAFT.

OUR SUBCOMMITTEE ON FISH AND WILDLIFE, CHAIRED BY CONGRESSMAN STUDDS, IS IN THE MIDST OF A SERIES OF HEARINGS ON ANWR. INTRODUCTION OF OUR BILL WILL NOT INTERRUPT THOSE HEARINGS.

I NOW RECOGNIZE LINDSAY THOMAS OF GEORGIA, WHOSE INTEREST AND LEADERSHIP ON THIS TOPIC HAS BEEN, AND WILL BE, OUTSTANDING.

100th CONGRESS
1st SESSION

(Original signature of Member)

H.R. Staff

10-14-87

Insert title here ☞

DRAFT DRAFT DRAFT

IN THE HOUSE OF REPRESENTATIVES

_____, 19__

Insert sponsor's names here ☞

Mr. Jones of North Carolina (for himself, ~~and~~ Mr. Thomas of Georgia, and Mr. Dingell)

A BILL

Relating to the enhancement of the Nation's fish and wildlife resources, the National Wildlife Refuge System, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

NATIONAL FISH AND WILDLIFE

ENHANCEMENT ACT OF 1987

TITLE I--FINDINGS AND DEFINITIONS

SEC. 101. SHORT TITLE.

This Act may be cited as the "National Fish and Wildlife Enhancement Act of 1987".

SEC. 102. CONGRESSIONAL FINDINGS AND PURPOSES.

Congress finds and declares that--

(1) it has been the historic policy of the Federal Government since the passage of section 401 of the Act of June 15, 1935 (commonly known as the "Refuge Revenue Sharing Act", 16 U.S.C 715s), that the revenues and proceeds from the commercial sale or lease of natural resources on national wildlife refuges should be dedicated and expended in support of fish and wildlife conservation programs through the expansion of the National Wildlife Refuge System and the compensation of local jurisdictions for the the loss of taxable real property;

(2) this historic policy regarding the use of national wildlife refuge generated revenues to enhance the National Wildlife Refuge System should be reaffirmed and applied to the disposal, sale, or lease of any and all surface and subsurface natural resources located within a national wildlife refuge;

(3) the recent passage of the Emergency Wetlands Resources Act of 1986 (16 U.S.C. 3901 et seq.) reflects the deep concern that our nation's wetland resources are disappearing at an accelerating rate and that additional wetland acquisition

programs for inclusion in the National Wildlife Refuge System must be initiated immediately before our valuable wetland heritage is lost forever;

(4) while existing national wildlife refuge law allows for a limited commercial utilization of natural resources within the National Wildlife Refuge System under strict environmental controls, it is incumbent upon Congress to provide the Director of the United States Fish and Wildlife Service with adequate authority to regulate all aspects of such commercial activities and to impose stringent environmental controls for the protection of national wildlife refuge resources;

(5) given the outstanding natural values of the Arctic National Wildlife Refuge and the favorable prospects for discovering a supergiant field of oil and gas beneath the coastal plain of the Refuge, special approach to oil and gas exploration and development is warranted so as to avoid significant adverse effects on the fish and wildlife resources, their habitat and the environment within the Arctic Refuge and to provide for the long-term conservation of these resources; and

(6) in addition to management questions specifically related to the Arctic National Wildlife Refuge, there is a need for Congress to enhance and clarify other Federal fish and wildlife conservation authorities and programs which are crucial to the nation's fish and wildlife resources.

SEC. 103. DEFINITIONS

As used in this Act:

(1) The term "ANILCA" means the Alaska National Interest Lands Conservation Act of 1980 (16 U.S.C. 3101).

(2) The term "Arctic Refuge" means the national wildlife refuge expanded under section 303(2) of ANILCA.

(3) The term "Bureau" means the Bureau of Land Management.

(4) The term "coastal plain" means the lands and waters within the Arctic Refuge so identified in the map entitled "Arctic National Wildlife Refuge Coastal Plain", dated May 7, 1987.

(5) The term "Director" means the Director of the United States Fish and Wildlife Service or his designee.

(6) The term "fish and wildlife" means any member of the animal kingdom, including without limitation, any mammal, fish, bird (including any migratory, nonmigratory or endangered or threatened bird for which protection is also afforded by treaty or other international agreement), amphibian, reptile, mollusk, crustacean, arthropod or other invertebrate, and includes any part, product, egg, or offspring thereof, or the dead body or part thereof. The term also means any member of the plant kingdom, including seeds, roots and other parts thereof.

(7) The term "mitigation" means the environmental step-down mitigation planning process required by the Council on Environmental Quality pursuant to Section 102 of the National Environmental Policy Act of 1969 (42 U.S.C. 4332), and any resultant terms, conditions, prohibitions or restrictions to

offset or ameliorate the loss of habitat values, and natural abundance and distribution of populations of fish and wildlife.

(8) The term "national wildlife refuge" or "refuge" means a unit of the Wildlife Refuge System.

(9) The term "on-structure exploratory drilling" means the drilling of an exploratory stratigraphic test well directly into a geological structure identified as having characteristics favorable for the presence of hydrocarbons in economically recoverable quantities.

(10) The term "Refuge Administration Act" means the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee).

(11) The term "related activities" means--

(A) the construction, operation and maintenance of any road, structure, or other facility, whether at or beyond a well site, that is associated with any oil and gas exploration, development or production on the coastal plain;

(B) the transportation of personnel and supplies necessary to support the carrying out of oil and gas exploration, development or production on the coastal plain; and

(C) any other activity related to the carrying out of oil and gas exploration, development or production on the coastal plain that, in the judgment of the Director, should be covered by an approved drilling plan or plan of operations in accordance with the provisions of this Act.

(12) The term "Secretary" means the Secretary of the Department of the Interior.

(13) The term "State" means the State of Alaska.

(14) The term "Wildlife Refuge System" means the National Wildlife Refuge System established under the Refuge Administration Act.

TITLE II--RESOURCE EXPLORATION WITHIN THE COASTAL PLAIN OF THE ARCTIC NATIONAL WILDLIFE REFUGE

SEC. 201. CONGRESSIONAL FINDINGS.

The Congress finds and declares the following:

(1) Section 1002 of ANILCA directed that a five-year natural resource assessment program be conducted of the oil and gas production potential and fish and wildlife resource values of the coastal plain. In addition to conducting a comprehensive environmental baseline study of fish and wildlife populations and their habitat, the Secretary was authorized to establish an oil and gas exploration program consisting of surface geological and geophysical exploration. Exploratory drilling was specifically excluded from this exploration program.

(2) Section 1002(h) of ANILCA required the Secretary to prepare a comprehensive report to Congress upon completion of the environmental baseline study and oil and gas surface exploration program which would analyze the acquired biological, geological and geophysical data. This report was to contain--

(A) the identification of areas and estimate of volume of potential oil and gas reserves;

(B) a description of the fish and wildlife, their habitat and other resources on the coastal plain;

(C) an analysis of the adverse effects that further oil and gas exploration, development and production would have on the resources referred to in paragraph (1);

(D) a description of the facilities that would be utilized for transporting any oil and gas produced from the coastal plain;

(E) an evaluation of how such oil and gas would relate to the national need for additional domestic energy supplies; and

(F) recommendations from the Secretary as to whether further oil and gas exploration, development and production should be permitted on the coastal plain and, if so, what environmental prohibitions, restrictions, terms and conditions should apply in order to ensure that the adverse effects of such activities are avoided or minimized.

(3) While the Department of the Interior's final section 1002 report leaves unanswered various questions regarding environmental quality, in addition to the question of whether there are commercially recoverable deposits of oil and gas beneath the coastal plain, various Federal, State and private studies indicate that the coastal plain is the most outstanding prospect in the United States for a supergiant oil field

discovery. While potential hydrocarbon-bearing geological structures have been identified through seismic exploration, the actual presence of oil and gas reserves remains speculative, since the geological data obtained from the one well drilled on the coastal plain by the Arctic Slope Regional Corporation and the Kaktovik Inupiat Corporation has not been made available to the Federal government.

(4) The Nation's domestic crude oil production is in substantial decline and dependence upon unreliable foreign sources of oil is growing at an alarming rate.

(5) Production from the Prudhoe Bay oil fields on Alaska's North Slope, which now constitutes over 20 per centum of the Nation's total domestic crude oil production, could begin to decline as early as 1988.

(6) Any oil produced on the coastal plain of the Arctic National Wildlife Refuge is subject to section 7(d) of the Export Administration Act (50 App. 2406(d)).

(7) Ongoing negotiations between the Secretary of the Interior and Alaskan Native Corporations, pursuant to section 22(f) of the Alaska Native Claims Settlement Act (43 U.S.C. 1601) for the purpose of exchanging subsurface mineral interests within the coastal plain of the Arctic National Wildlife Refuge for inholdings in other units of the National Wildlife Refuge System in Alaska deserve further Congressional consideration.

(8) For an informed decision to be made regarding the future management of the Arctic Refuge, additional biological, geological and geophysical data should be developed through a carefully controlled and limited on-structure exploratory drilling program and a continuation of the environmental baseline studies authorized under section 1002(c) of ANILCA.

SEC. 202. AUTHORIZATION FOR EXPLORATORY DRILLING IN THE COASTAL PLAIN.

(a) IN GENERAL.--Notwithstanding any other provision of law, the Director is authorized to and shall permit the drilling of 4 on-structure stratigraphic oil and gas test wells within the coastal plain. Upon request, the Director may also permit one additional season of seismic exploration on the coastal plain if he concludes that the acquisition of additional geophysical data would enhance the current assessment and projection of the presence of oil and gas beneath the coastal plain. If an additional season of seismic exploration is permitted, it shall be conducted in accordance with the existing seismic exploration regulations issued by the Director under the authority of section 1002(d) of ANILCA.

(b) PROTECTIVE MANAGEMENT ZONE.--In identifying general areas available for on-structure exploratory drilling under subsection (c) of this section, no exploratory drilling and related activities shall be allowed to occur within the "Protective Management Zone" so identified on the map entitled

"Arctic National Wildlife Refuge Coastal Plain", dated May 7, 1987.

(c) ENVIRONMENTAL RESTRICTIONS APPLICABLE TO EXPLORATORY DRILLING AND RELATED ACTIVITIES.--In addition to the environmental guidelines established under section 203 of this title, the following environmental restrictions shall apply to any on-structure exploratory drilling program and related activities undertaken under the authority of this title:

(1) The carrying out of exploratory drilling and related activities shall be regulated so as to have no significant adverse effect on fish and wildlife, their habitat, and the environment.

(2) On-structure exploratory drilling and related activities shall be carried out on the coastal plain only within broad areas generally specified by the Director in exploratory drilling guidelines published pursuant to section 203 of this title. Prior to the selection of general areas available for the drilling of exploratory wells, the Director shall provide an opportunity for the oil and gas industry to nominate specific areas for conducting exploratory drilling. Any nominations received from the oil and gas industry shall be kept confidential in the same manner as required by subsection 302(d) of this Act. The Director shall also provide an opportunity for the National Academy of Sciences to provide recommendations on potential sites for on-structure exploratory drilling. The Director,

with the advice of the Directors of the Bureau of Land Management and the U.S. Geological Survey, shall designate those general areas available for exploratory drilling which are deemed most likely to contain commercially recoverable quantities of oil and gas.

(3) On-structure exploratory drilling shall be carried out only--

(A) in accordance with drilling plans approved under section 205;

(B) after October 31 in any year and before May 1 of the following year; and

(C) in a manner which restricts access to well sites to the use of helicopters, airplanes, ice roads and ice airstrips, and vehicles traveling on ice roads. Off-road vehicular access to well sites apart from ice rods shall be avoided to the maximum extent possible and shall only be allowed during periods of adequate snow cover so as to avoid any significant adverse effect to the surface vegetative mat or soil of the coastal plain.

(4) On-structure exploratory drilling and related activities shall be coordinated in a manner to avoid unnecessary duplication. The exploratory drilling guidelines shall require that any exploratory drilling permittee selected by the Director pursuant to section 205 of this title shall afford all other interested parties, through a signed agreement, an opportunity to jointly

participate in that permittee's exploratory drilling activities through a contribution of a proportionate share of the costs for the exploratory drilling program.

(5) Any permittee or participant in a joint exploratory drilling agreement authorized in paragraph (4) of this subsection shall be entitled to deduct fifty per centum of its pro rata costs of participation in the joint exploratory drilling program as a credit against the Federal share of any bonus bids, royalties, or rentals which it may owe in any subsequent oil and gas lease sale which may be authorized for areas within the coastal plain, the Outer Continental Shelf or other public lands under the jurisdiction of the Department of the Interior.

SEC. 203. EXPLORATORY DRILLING REGULATIONS.

(a) IN GENERAL.--The Director, with assistance and advice from the Directors of the Bureau of Land Management and the United States Geological Survey, shall issue regulations governing the on-structure exploratory drilling and related activities authorized and permitted under this title. In developing the environmental terms and conditions for exploratory drilling regulations, the Director shall also consult with and seek the advice of the State, the Environmental Protection Agency and the Army Corps of Engineers.

(b) GENERAL REGULATORY CONTENT.--The regulations established under subsection (a) of this section and section 204 of this

title shall specify those permit terms, conditions, prohibitions, and restrictions as the Director considers necessary or appropriate to ensure that on-structure exploratory drilling and related activities are carried out in a manner consistent with the provisions of this title and other applicable provisions of Federal and State environmental law. Permit terms and conditions may include, but are not limited to, any prohibition or restriction applied to seismic exploration under section 1002(d) of ANILCA that the Director considers appropriate with respect to on-structure exploratory drilling and related activities under this title.

(c) SPECIFIC REGULATORY CONTENT RELATING TO THE PROTECTION OF FISH AND WILDLIFE, THEIR HABITAT AND THE ENVIRONMENT.--The regulations established by the Director to implement the provisions set forth in section 202(c)(1) (prohibiting any significant adverse effect on fish and wildlife, their habitat and the environment) shall require the application of best available technology from an engineering and technical standpoint and shall--

(1) require, with respect to any proposed on-structure exploratory drilling and related activities, that--

(A) a site-specific assessment be made of the probable effects, if any, that the exploratory drilling or related activities will have on fish and wildlife, their habitat and the environment; and

(B) a mitigation plan, utilizing the mitigation

step-down process required by the Council on Environmental Quality pursuant to Section 102 of the National Environmental Policy Act (42 U.S.C. 4332), be developed and implemented to avoid, minimize or compensate any adverse effects assessed under subparagraph (A) of this paragraph;

(2) include protective environmental terms, conditions, prohibitions or restrictions on the following subjects involving on-structure exploratory drilling and related activities--

(A) access by all modes of transportation;

(B) sand and gravel extraction;

(C) consolidation of facility siting;

(D) use of explosives;

(E) avoidance of springs, streams, river systems to the maximum extent possible; the protection of natural surface drainage patterns, wetlands, riparian habitats and instream flows; and the regulation of methods or techniques for developing or transporting adequate supplies of water for exploratory drilling;

(F) reduction of air traffic-related disturbance to fish and wildlife;

(G) treatment and disposal of hazardous and toxic wastes, as well as solid wastes and domestic wastewater. All treatment and disposal standards shall be developed with the assistance and advice of the Administrator of

the Environmental Protection Agency and the State of Alaska. In addition to public health and safety standards, treatment and disposal standards may be based upon biological parameters designed to avoid significant adverse effects to fish and wildlife through the process of bioaccumulation;

(H) restrictions on sport hunting and fishing within the coastal plain by all personnel associated with the exploratory drilling program and related activities who either live in temporary quarters within the coastal plain or were not permanent residents of the Village of Kaktovik as of the date of enactment of this Act;

(I) construction of ice roads and ice airstrips, foam and timber drilling pads and impermeable reserve pits;

(J) chemical analysis and reduction of volume of reserve pit fluids, drilling muds and cuttings and the utilization of a reserve pit fluid disposal system which does not involve the disposal of reserve pit fluids on the surface area of the coastal plain;

(K) restrictions on exploratory drilling and related activities in significant wildlife calving, denning, nesting and staging areas, including temporary or permanent closure of these areas;

(L) fuel storage and oil spill contingency planning;

(M) research, monitoring and reporting requirements,

including reimbursement of associated U.S. Fish and Wildlife Service costs;

(N) field crew environmental briefings;

(O) reclamation and bonding requirements;

(P) avoidance of significant adverse effects upon subsistence hunting, fishing and trapping by rural residents;

(Q) restrictions on exploratory drilling and related activities in significant fish spawning, over-wintering, rearing and migration habitats;

(R) compliance with air and water quality standards;

(S) protective stipulations for cultural and archeological resources; and

(T) other restrictions as the Director deems necessary.

SEC. 204. REGULATORY PROCEDURES.

(a) INITIAL PROMULGATION.--Within one year after the date of enactment of this Act, the Director shall prescribe final regulations required under section 203 of this title.

(b) UPDATE.--The Director shall periodically review and revise the regulations issued under subsection (a) of this section to reflect any additional significant biological, environmental and engineering data which come to his attention.

(c) IMPACT ANALYSIS.--The detailed environmental baseline studies and exploratory drilling environmental impact analysis

prepared pursuant to subsections (c) and (h) of Section 1002 of ANILCA shall be deemed to have fulfilled the requirements of section 102(2)(C) of the National Environmental Policy Act of 1969 (42 U.S.C. 4321) with regard to the issuance of general regulatory environmental guidelines for an on-structure exploratory drilling program under this section. The issuance of protective environmental regulations under section 203(c) of this title and the opportunity for a public hearing in the Village of Kaktovik provided under section 205(b)(2) of this title, shall be deemed to have fulfilled the requirements of section 810 of Public Law 96-487 as applied to an on-structure exploratory drilling program on the coastal plain.

SEC. 205. EXPLORATORY DRILLING PLANS.

(a) SUBMISSION.--After on-structure exploratory drilling regulations are prescribed under section 204(a), any person, including the United States Geological Survey, may submit a permit application and one or more operational plans (hereinafter in this section referred to as "drilling plans") to the Director for approval. The Director shall not approve any drilling plan submitted by the United States Geological Survey unless he determines that no other person has submitted a complete drilling plan which meets the established regulations. A drilling plan must set forth such information as the Director may require to determine whether the exploratory drilling and related activities proposed in the plan are consistent with this title and the on-

structure exploratory drilling regulations. Drilling plans shall include, but not be limited to, a description of the site at which the drilling is proposed to be undertaken, and a description and schedule of--

(1) the equipment, facilities, means of access and related manpower that would be used in carrying out the proposed exploratory drilling operation;

(2) the related activities that would be carried out; and

(3) a statement of the anticipated adverse effects, if any, that the activity may have on fish and wildlife, their habitat and the environment, including the water, sand and gravel resources of the refuge, as well as the mitigative environmental measures that would be implemented to avoid, minimize or compensate for any adverse effects to fish and wildlife, their habitat and the environment.

(b) NOTICE AND COMMENT.--After a drilling plan is submitted for approval, the Director shall--

(1) promptly publish notice of the submission and text of the plan in the Federal Register and a newspaper of general circulation in the State;

(2) consistent with the time limitation in subsection (c) of this section, hold a minimum of two public hearings in the State, including one in the Village of Kaktovik, for purposes of receiving public comments on the proposed plan; and

(3) promptly provide the drilling plan to the Scientific Advisory Panel established under section 206 of this title for review and comment.

(c) DETERMINATION.--Within 120 days after receiving a drilling plan under subsection (a), the Director shall determine, after taking into account any comment received under subsection (b) of this section, whether the on-structure exploratory drilling and related activities proposed in the plan are consistent with this title, the regulations established under section 203 and other applicable provisions of Federal and State environmental law. If that determination is in the affirmative, the Director shall approve the drilling plan and issue an exploratory drilling permit. If that determination is not in the affirmative, the Director shall return the drilling plan along with a statement of modifications necessary for its approval. In the event that the Director receives more than one proposed drilling plan, he shall approve the drilling plan which in his judgment would provide the best geological stratigraphic data while satisfying the environmental standards of the exploratory drilling regulations. The Director, as a condition of approving any drilling plan under this subsection--

(1) may require modifications to the drilling plan that he considers necessary or appropriate to make it consistent with this title and the exploratory drilling regulations. The Director shall assess reasonable fees or charges for the reimbursement of all necessary and reasonable research,

administrative, monitoring, enforcement and reporting costs associated with reviewing the plan, preparing an exploratory drilling permit and monitoring its implementation. To ensure adequate administrative support for implementing an exploratory drilling program, all cost reimbursements shall be allocated and expended in accordance with the provisions of section 303(b)(7) of this Act;

(2) shall require such periodic reports regarding the carrying out of the exploratory drilling and related activities as may be necessary or appropriate for purposes of determining the extent to which the drilling plan is being complied with and the effectiveness of the plan in ensuring that the exploratory drilling and related activities are consistent with this title, the on-structure exploratory drilling regulations and other applicable provisions of Federal and State environmental law; and

(3) shall require that all geological data and information (including processed, analyzed and interpreted information) obtained as a result of the on-structure exploratory drilling program be submitted to the Director of the Bureau of Land Management and be held as confidential for a period of not less than two years following any lease sale with respect to the area from which the information was obtained. The Director shall prohibit by regulation any person, who obtains access to this confidential data and information from the Department of the Interior or from any

person other than an exploratory drilling permittee, from participating in any lease sale which includes the areas from which the information was obtained, and from using the information for commercial purposes. The Director shall require that any permittee make available exploratory drilling data to any person at fair cost.

(d) MODIFICATION OF DRILLING PLANS.--If at any time while on-structure exploratory drilling and related activities are being carried out under a drilling plan approved under subsection (c), the Director, on the basis of available information, determines that the continuation of exploratory drilling or any particular related activity under the plan will have a significant adverse effect on fish or wildlife, their habitat or the environment, the Director, after consultation with the exploratory drilling permittee, shall--

(1) make modifications to part or all of the drilling plan or permit as necessary or appropriate to avoid the significant adverse effect;

(2) temporarily suspend part or all of the exploratory drilling or related activity under the drilling plan or permit for such time as the Director considers necessary or appropriate to avoid such significant adverse effect; or

(3) terminate and cancel the exploratory drilling plan and permit where actions under paragraphs (1) or (2) will not avoid the significant adverse effect. In the event that an exploratory drilling plan and permit are terminated and

canceled under the authority of this paragraph, the exploratory drilling permittee and any affected participants in a joint exploratory drilling agreement shall be entitled to a credit of fifty per centum of their direct expenditures made after the date of approval of the exploratory drilling plan and permit and in connection with the implementation of the plan (plus interest on such expenditures from date of payment to date of reimbursement). The fifty per centum credit may be applied as authorized in subsection 202(c)(5) of this Act but shall not be available to an exploratory drilling permittee or any affected participants in a joint exploratory drilling agreement if the cancellation of an exploratory drilling plan and permit is the result of the gross negligence of the permittee or participants or the willful violation of the terms of the plan or permit.

(e) ENFORCEMENT AUTHORITY.--In addition to remedies available under other applicable provisions of law, the violation of any provision of a drilling plan or permit approved and issued under subsection (c) of this section may result in such penalties or cause of actions as set forth in section 306 of this Act.

SEC. 206. ARCTIC REFUGE SCIENTIFIC ADVISORY PANEL.

(a) GENERAL RESPONSIBILITIES AND DUTIES.--To maximize the effectiveness and objectivity of environmental terms and conditions applied to any oil and gas on-structure exploratory drilling program on the coastal plain, the Director shall

establish a Scientific Advisory Panel for the Arctic Refuge. The Scientific Advisory Panel shall be established within 60 days after the date of publication of final exploratory drilling regulations under section 203 of this title and shall be retained until all exploratory drilling and reclamation activities are completed. The Scientific Advisory Panel shall provide advice to the Director in the implementation of a comprehensive regulatory program for the coastal plain that will ensure that exploratory drilling and related activities avoid any significant adverse effect on fish and wildlife, their habitat and the environment, and that they comply with other requirements of applicable Federal and State environmental law. All written recommendations from the Scientific Advisory Panel shall be made available to members of the general public. The responsibilities of the Advisory Panel shall include--

(1) reviewing and commenting on proposed drilling plans and site-specific environmental stipulations, mitigation measures and the adequacy of environmental analysis and documentation;

(2) developing additional recommendations for fish and wildlife research which would supplement ongoing research programs for the Arctic Refuge and adjacent areas;

(3) reviewing all reports submitted to, or prepared by, the United States Fish and Wildlife Service pursuant to sections 205(c)(2) or 207 of this title; and

(4) other responsibilities as the Director may deem

necessary.

(b) MEMBERSHIP OF ADVISORY PANEL.--The Scientific Advisory Panel shall be chaired by a non-voting representative of the United States Fish and Wildlife Service. The following agencies, governmental bodies or organizations shall be invited to designate one representative each for participation on the Advisory Panel: the Alaska Department of Fish and Game; the Alaska Department of Environmental Conservation; the Alaska Department of Natural Resources, the National Academy of Sciences; the Bureau of Land Management, the U.S. Geological Survey, the Environmental Protection Agency; the Corps of Engineers; the National Marine Fisheries Service; the North Slope Borough; the Village of Kaktovik; and any international commission established for the conservation of the Porcupine caribou herd. In addition to the above participants, the Director shall ask for nominations for Advisory Panel membership from the environmental community and the oil and gas industry. The Director shall submit the list of nominations received from these two groups to the representatives already on the Advisory Panel. The existing Advisory Panel members shall then select from the nomination list one representative each for the environmental community and the oil and gas industry. No person may serve on the Advisory Panel who is not professionally trained in the fields of biology, geology, engineering or chemistry; Provided; That the Advisory Panel representative from the Village of Kaktovik need not be professionally trained in these

particular fields of study but must possess detailed personal knowledge of the coastal plain and its fish and wildlife resources.

(c) COMPENSATION AND EXPENSES.--The Director shall provide administrative and support services to the Advisory Panel and shall cover all reasonable expenses associated with its work. The members of the Advisory Panel who are Federal employees shall receive no additional compensation for service on the Advisory Panel. While away from their homes or regular places of business in the performance of services for the Advisory Panel, members of the Panel who are Federal employees, or members of the general public, shall be allowed travel expenses, including per diem in lieu of subsistence, in the same manner as persons employed intermittently in Government service are allowed expenses under section 5703(b) of title 5, United States Code. Those members of the Advisory Panel who are State or North Slope Borough employees shall be compensated in accordance with applicable State or Borough law. The provisions of the Act of October 6, 1972, (5 App. I U.S.C. 1-15) shall not apply to the Scientific Advisory Panel established under this section.

(d) ULTIMATE ADMINISTRATIVE AUTHORITY OF THE DIRECTOR.--While the recommendations from the Advisory Panel shall be given careful and due consideration by the Director, they shall not diminish or affect the ultimate administrative authority and responsibility of the Director for the management of the Arctic Refuge. If the Director disagrees with any

substantive comment or recommendation received from at least nine members of the Advisory Panel, the Director shall set forth in writing his rationale for rejecting the Advisory Panel's advice, together with an explanation of how his alternative course of action will avoid all significant adverse effects on fish and wildlife, their habitat and the environment. All written responses from the Director to the Advisory Panel shall be made available upon request to members of the general public.

SEC. 207. REVISED NATURAL RESOURCE ASSESSMENT REPORT.

(a) Upon enactment of this Act, the Director shall reinitiate the baseline studies required under section 1002(c) of ANILCA. Within one year after completion of the on-structure exploratory drilling program authorized under this title, the Director shall revise and publish for public comment a draft update of the report required under section 1002(h) of ANILCA. This draft revised section 1002 report shall take into account any additional biological, ecological, technological or non-proprietory geological information then available to the Director, including data obtained from the exploratory drilling program authorized under section 202 of this title. Proposed regulations capable of implementing a competitive oil and gas leasing program for the coastal plain pursuant to sections 302 and 303 of this Act shall also accompany the draft revised section 1002 report and be published in the Federal Register. The Director shall seek the advice and assistance of the

Directors of the Bureau of Land Management and the United States Geological Survey in developing the draft competitive oil and gas leasing regulations. In revising the section 1002 report pursuant to this section, the Director shall give great weight and deference to the factual analysis and assumptions of the National Academy of Sciences contained in the final summary report prepared by the Academy pursuant to section 208(a) of this title, as well as to any comments received from the Academy on the draft revised section 1002 report during the public comment period.

(b) In preparing a revised section 1002 report, the Director shall provide--

(1) an updated range of estimates of the likelihood of commercially recoverable oil or gas deposits within the coastal plain, including the identification of each prospect assessed as having a moderate to high potential for containing commercially recoverable deposits of oil or gas;

(2) an analysis of the oil and gas potential and production of other offshore and onshore areas on the North Slope of Alaska and Canada, and the degree to which commercially viable enhanced production on these other areas could offset a decline in production and shipment of oil from the Prudhoe Bay area;

(3) a specification of the facilities, transportation systems, equipment, related manpower and best available technology from an engineering and technical standpoint that

would be required for oil or gas development and production and related activities within the coastal plain;

(4) a description of the fish and wildlife, their habitat and its relative abundance and other resources that are within the coastal plain;

(5) an evaluation of the effects that development and production of oil or gas and related activities within the coastal plain may have on the resources referred to in paragraph (4); and

(6) a description of the oil and gas development and production environmental stipulations required to avoid significant adverse environmental effects to fish and wildlife, their habitat and the environment, and an assessment of their efficacy.

(c) The revised section 1002 report shall be accompanied by a draft and final Environmental Impact Statement (EIS) prepared pursuant to Section 102(2)(C) of the National Environmental Policy Act of 1969 (42 U.S.C. 4332). A minimum of two public hearings shall be held in the State on the draft EIS and revised section 1002 report, including a hearing in the Village of Kaktovik. The draft EIS shall include an analysis of the direct, indirect, and cumulative impacts associated with the first site-specific oil and gas lease sale which the Director would propose to hold for the coastal plain upon authorization of leasing pursuant to section 302(a) of this Act. Prior to the publication of a draft and final EIS, the Director shall submit copies of

these documents to the Environmental Protection Agency (EPA) and the Council on Environmental Quality (Council) for review. Within 30 days of receipt of the documents, EPA and the Council shall advise the Director of their views concerning the legal and factual sufficiency of the draft and final EISs. The Director shall modify the draft and final EISs in accordance with the recommendations and guidance from EPA and the Council and shall publish a final revised section 1002 report, including accompanying final competitive oil and gas leasing regulations, and final EIS within eight months of the date of publication of the draft revised section 1002 report.

SEC. 208. NATIONAL ACADEMY OF SCIENCES INDEPENDENT STUDY.

(a) The Director shall contract with the National Academy of Sciences to conduct an independent study of all available ecological, geological and geophysical data regarding the oil and gas potential of the coastal plain. This study should be initiated within one year of the date of enactment of this Act and should be conducted simultaneously with the exploratory drilling program authorized under section 202 of this title. The Academy should prepare an interim report halfway through the completion of the exploratory drilling program, in addition to a final summary report prepared within eight months after completion of the exploratory drilling program. In developing this independent study, the National Academy of Sciences should assess--

(1) the relative importance of the coastal plain's potential oil and gas reserves to the nation's overall domestic energy needs through the year 2007;

(2) whether there is a likelihood of commercially recoverable deposits of oil or gas within the coastal plain including the identification of each prospect assessed as having a moderate to high potential for containing commercially recoverable deposits of oil or gas;

(3) the oil and gas potential and production of other offshore and onshore areas on the North Slope of Alaska and Canada, and the degree to which commercially viable enhanced production on these other areas can offset a decline in production and shipment of oil from the Prudhoe Bay area; and

(4) whether the consolidation of facilities, transportation systems, and equipment, together with the application of stringent environmental controls and best available technology from an engineering and technical standpoint could result in the development and production of oil or gas within the coastal plain which avoids significant adverse effects upon fish and wildlife, their habitat and the environment.

(b) The Director shall make available to the National Academy of Sciences Committee and its panels on an ongoing basis a summary of relevant data and information obtained as a result of the exploratory drilling program. Unauthorized disclosure of

confidential data or information shall be punishable in accordance with Section 1905 of title 18, United States Code. The Director is authorized to provide to the National Academy of Sciences technical and financial assistance as may be necessary to conduct the independent study authorized by this section.

(c) In addition to its independent study prepared under subsection (a) of this section, the National Academy of Sciences panel shall also review and comment on the draft revised section 1002 report prepared by the Director under section 207 of this title.

TITLE III--OIL AND GAS LEASING ON NATIONAL WILDLIFE REFUGES

SEC. 301. OIL AND GAS RECEIPTS FROM NATIONAL WILDLIFE REFUGES.

Notwithstanding any other provision of law, all rents, royalties, bonus bids and other revenues and receipts generated by oil and gas leasing and related activities, including the sale of sand or gravel, on reserved or acquired units of the National Wildlife Refuge System shall be deposited into the Refuge Revenue Sharing Fund established in the United States Treasury pursuant to section 401 of the Act of June 15, 1935, (commonly known as the "Refuge Revenue Sharing Act", 16 U.S.C. 715s). The provisions of this section shall not apply to Federal income taxes generated by such oil and gas leasing activity, nor to oil and gas leases within the Kenai National Wildlife Refuge.

SEC. 302. OIL AND GAS LEASING, DEVELOPMENT AND PRODUCTION ON THE COASTAL PLAIN OF THE ARCTIC REFUGE.

(a) AUTHORITY FOR LEASING.--Based upon the revised section 1002 report prepared pursuant to section 207 of this Act, the Secretary shall make a written recommendation to the President that oil and gas leasing be initiated on the coastal plain unless he finds that--

(1) there is a very low likelihood of commercially recoverable deposits of oil or gas within the coastal plain;

(2) the development of any oil or gas reserves in the coastal plain in commercially recoverable quantities is not important to our nation's overall energy needs; or

(3) best available technology from an engineering and technical standpoint, together with stringent environmental controls and stipulations, would not result in exploration, development and production of oil or gas on the coastal plain which avoids significant adverse effects to fish and wildlife, their habitat and the environment.

If the Secretary makes one or more of the findings in paragraphs (1) through (3) of this subsection (a), he shall recommend to the President that oil and gas leasing not be initiated on the coastal plain. The Secretary shall immediately notify the appropriate Committees of Congress of the nature of his recommendation to the President. Notice of the Secretary's written recommendation to the President shall also be published in the Federal Register with a 30 day opportunity for public

comment. After consideration of any public comments received, the President shall adopt the recommendation of the Secretary regarding the coastal plain unless the President determines that the Secretary's recommendation is not in the paramount interest of the United States. Except during time of war or a declared national emergency, the President may not override a Secretary's recommendation against initiating oil and gas leasing on the coastal plain if the basis for the Secretary's recommendation was that leasing would not avoid significant adverse effects to fish and wildlife, their habitat and the environment. If the President authorizes the Director to initiate an oil and gas leasing program for the coastal plain pursuant to the provisions of this subsection (a), no lease or permit shall be issued which would allow surface occupancy or use for purposes of oil and gas exploration, development and production and related activities within the "Protective Management Zone" so identified on the map entitled "Arctic National Wildlife Refuge Coastal Plain" dated May 7, 1987.

(b) COMPETITIVE OIL AND GAS LEASING--GENERAL PROVISIONS.--Upon authorization from the President pursuant to subsection (a) of this section, the Director shall initiate expeditiously an oil and gas leasing program for the coastal plain in accordance with the provisions of this Act and other applicable provisions of Federal and State environmental law. The Director shall require that areas be leased to the highest responsible qualified bidder by competitive bidding. No bidder

shall be considered qualified unless the person or company, or its assigns or successors in interest, participated as a permittee in the joint exploratory drilling program authorized under section 202(c)(4) of this Act. Leasing shall be in units of not more than 2,560 acres, which shall be as nearly compact in form as possible while taking into account such natural features as topography and hydrography. The Director shall enter into a cooperative agreement with the Bureau of Land Management regarding the implementation of the oil and gas leasing program in the coastal plain. In coordination with the Director, the Bureau shall be responsible for managing the day-to-day technical, financial and geological aspects of an oil and gas leasing program on the coastal plain which are unrelated to the establishment and enforcement of environmental stipulations, terms and conditions or the approval and enforcement of a plan of operations.

(c) PLAN OF OPERATIONS.--

(1) IN GENERAL.--Oil and gas lessees shall prepare and submit to the Director for approval separate plans of operation for exploration, development and production. No construction, operation or related activities shall take place prior to the Director's approval of a proposed plan of operations. A proposed plan of operations must set forth such information as the Director may require to determine whether the proposed activities contained in the plan are consistent with this title and oil and gas leasing

regulations issued thereunder, as well as with other applicable Federal and State environmental laws. Plans of operations shall include, but not be limited to, a description of the sites where proposed exploration, development, production and related activities would take place and a description and schedule of the equipment, facilities, means of access and related manpower that would be used in carrying out the proposed activities.

(2) ENVIRONMENTAL ANALYSIS.--An environmental analysis shall accompany the proposed plan of operations which shall assess the quality, quantity and relative abundance of habitat types that will be affected by the exploration, development, production and related activities set forth in the plan of operations. The environmental analysis shall also assess the anticipated effects that such activities will have on fish and wildlife, their habitat and the environment, including the water, sand and gravel resources of the coastal plain, and shall include a mitigation plan utilizing the mitigation step-down process required by the Council on Environmental Quality pursuant to Section 102 of the National Environmental Policy Act of 1969 (42 U.S.C. 4332), to be implemented to avoid, minimize or compensate for any adverse effects to fish and wildlife, their habitat and the environment.

(3) NOTICE AND COMMENT.--After a proposed plan of operations is submitted for approval, the Director shall--

(A) within 30 days publish notice of the submission and text of the plan in the Federal Register and newspapers of general circulation in the State;

(B) hold a minimum of two public hearings in the State, including one in the Village of Kaktovik, for purposes of receiving the comments of the public on the proposed plan; and

(C) within 30 days provide the proposed plan of operations to the Scientific Advisory Panel reconvened under section 303(c) for review and comment.

(4) DETERMINATION.--The Director, after taking into account any comment received under paragraph (3) of this subsection, shall determine whether the proposed plan of operations is consistent with this title, its implementing regulations, and other applicable provisions of Federal and State environmental law. If that determination is in the affirmative, he shall approve the plan and issue a special use permit for the activities contained in the particular plan. If that determination is not in the affirmative, the Director shall return the plan along with a statement of modifications necessary for its approval. The Director, as a condition of approving any proposed plan of operations under this paragraph--

(A) may require that modifications be made to the plan as necessary or appropriate to make it consistent with this title, its implementing regulations, and other

applicable provisions of Federal and State environmental law;

(B) shall require periodic reports regarding the carrying out of the exploration, development or production activities covered in the plan for purposes of determining the extent to which the plan is being complied with; and

(C) shall require that all data and information (including processed, analyzed and interpreted information) obtained as a result of the authorized activities be submitted to the Director of the Bureau of Land Management who shall maintain its confidentiality in accordance with provisions of existing law.

(5) MODIFICATION OF PLAN OF OPERATIONS.--If at any time while authorized activities are being carried out under a plan of operations approved under paragraph (4) of this subsection, the Director, on the basis of available information, determines that the continuation of the exploration, development, production or related activities under the plan has produced the threat of a significant adverse effect upon human life, fish and wildlife, their habitat or the environment, the Director may, after consultation with the lessee, take either or both of the following actions--

(A) make modifications to the plan of operations or special use permit as the Director considers necessary

or appropriate to avoid the significant adverse effect; or

(B) temporarily suspend the lease, pursuant to subsection (i) of this section, and the carrying out of the particular activity under the plan or special use permit for such time as the Director considers necessary or appropriate to avoid such significant adverse effect.

(d) CONFIDENTIALITY OF GEOLOGICAL AND GEOPHYSICAL DATA.--The Director of the Bureau of Land Management shall require each lessee to submit periodic reports which contain all geological data and information (including processed, analyzed and interpreted information) obtained as a result of drilling and other developmental activities pursuant to an oil and gas lease. The data and information shall be kept confidential in accordance with existing provisions of Federal law. Unauthorized disclosure of confidential processed, analyzed and interpreted information shall be punishable in accordance with section 1905 of title 18, United States Code.

(e) SAND AND GRAVEL OWNERSHIP IN BEDS OF BODIES OF WATER WITHIN THE COASTAL PLAIN.--

(1) CONGRESSIONAL FINDINGS.-- Congress finds that--

(A) large quantities of sand and gravel shall be required for exploration, development and production activities under a Federal oil and gas leasing program for the coastal plain;

(B) the State asserts various claims of ownership to

the sand and gravel deposits within and beneath the beds of many rivers and bodies of water within the coastal plain;

(C) the Department of the Interior does not concur with the State's claim to ownership of such sand and gravel deposits within the coastal plain, but rather asserts that the deposits are owned by the Federal government and could be available for use by a Federal oil and gas lessee, subject to stringent environmental controls and limitations; and

(D) the failure to resolve these conflicting claims of ownership and regulatory control prior to the issuance of Federal oil and gas leases for the coastal plain could frustrate the purposes of a leasing program.

(2) RESOLUTION OF CLAIMS.--The Director shall not issue any oil and gas lease for the coastal plain unless and until the State formally agrees to adopt, for purposes of mining disputed deposits of sand and gravel, joint environmental controls and stipulations, including the ascertainment of fair market value, on sand and gravel extraction developed by the Director, with the assistance and advice of the State, pursuant to section 303 of this title. The State shall also agree to allow the Director to market disputed deposits of sand and gravel, provided that the proceeds from any sale are placed in an interest bearing escrow account, which shall be distributed to either the State or the

Director in accordance with a final court opinion for which no appeal was filed and which resolved all disputed claims of ownership to the affected deposits of sand and gravel.

Use of an escrow account by the Director or the State shall not be deemed to be prejudicial to any claim that either the State or the Federal government might have to subsurface property interests beneath the beds of navigable river. and other bodies of water within the leasehold area.

(f) SUSPENSION OF LEASE.--A lease shall be suspended, including all rent or minimum royalty payments thereunder if--

(1) within two years of submission of a complete plan of operations for exploration, development or production, as required by subsection (c) of this section, the Director has neither approved nor rejected the proposed plan;

(2) exploration, development or production are interrupted by circumstances beyond the control of the lessee which were not reasonably foreseeable, exclusive of economic market conditions; or

(3) the Director determines that there is a threat of a significant adverse effect upon human life, fish and wildlife, their habitat or the environment;

No rent or minimum royalty payments shall be suspended as the result of gross negligence or the willful violation of the lease or special use permit, or of the regulations issued with respect to the lease or permit. No lease shall expire if suspended pursuant to this subsection. The term of any suspended lease

shall be extended by the period of suspension, but in no case shall a suspended lease be extended for a period of more than five years.

(g) FINANCIAL TERMS.--All leases issued under this section shall be conditioned upon payment by the lessee of bonuses or bonus bids as may be accepted by the Director of the Bureau of Land Management, of royalty as may be fixed in the lease (which shall be not less than 16 2/3 per centum in amount or value of the production removed or sold from the lease), and of a rental of not less than two dollars per acre for each year of the lease. Each year's lease rental shall be paid in advance. A minimum royalty of three dollars per acre in lieu of rental shall be payable at the expiration of each lease year beginning on o. after a discovery of oil or gas in paying quantities on the lands leased. Lessees shall also be required by regulation to pay current fair market value, as determined by the Director, for rights-of-way, as well as for sand, gravel and other coastal plain natural resources used by the lessee pursuant to a special use permit in the course of oil and gas exploration, development or production.

(h) CANCELLATION OF LEASE DUE TO ENVIRONMENTAL HAZARDS.--

(1) The Director may cancel any lease or special use permit if, after an administrative hearing, he determines that--

(A) continued activity pursuant to the lease or permit would reasonably have a significant adverse

effect upon human life, fish and wildlife, their habitat or the environment; and

(B) the threat of significant adverse effects will not diminish or cease to an acceptable extent within a reasonable period of time.

(2) Cancellation shall not occur unless and until operations under the lease or permit have been under suspension, or temporary prohibition, by the Director, with due extension of any lease or permit te. continuously for a period of five years, or for a lesser period upon request of the lessee.

(3) Cancellation of a lease pursuant to this section shall entitle the lessee to receive such compensation as he shows to the Director to be equal to the lesser of--

(A) the fair market value of the canceled rights as of the date of cancellation, taking account of both anticipated revenues from the lease and anticipated costs, including the costs of compliance with all applicable regulations and operating orders, liability for cleanup costs or damages, or both, in the case of an oil spill or spill of other hazardous or toxic materials, and all other costs reasonably anticipated on the lease; or

(B) the excess, if any, over the lessee's revenues from the lease (plus interest thereon from the date of receipt to date of reimbursement) of all consideration

paid for the lease and all direct expenditures made by the lessee after the date of issuance of such lease and in connection with exploration or development, or both, pursuant to the lease (plus interest on such consideration and such expenditures from date of payment to date of reimbursement).

In the case of joint leases which are canceled due to the failure of one or more partners to exercise due diligence, the innocent parties shall have the right to seek damages for their loss from the responsible party or parties.

(i) ROYALTY MANAGEMENT.--The provisions of the Federal Oil and Gas Royalty Management Act of 1982 (30 U.S.C. 1701) shall apply to royalties generated from oil and gas leasing on the coastal plain.

(j) REDUCTION OF RENTS OR ROYALTIES TO PROMOTE PRODUCTION.-- For the purpose of encouraging the greatest ultimate recovery of oil and gas, and in the interest of conservation of natural resources, the Director of the Bureau of Land Management, with the concurrence of the Director, may reduce the rental, or minimum royalty, or reduce the royalty of an entire leasehold, or on any tract or portion thereof segregated for royalty purposes, whenever in his judgment it is necessary to promote development or production, or whenever in his judgment the leases cannot be successfully operated under the terms provided therein. The Director of the Bureau of Land Management shall notify the appropriate Committees of Congress on an annual basis of the

reduction of any rents or royalties pursuant to this subsection.

(k) JUDICIAL REVIEW.--It is the intent of Congress that judicial review of any administrative action pursuant to titles II or III of this Act, including compliance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321), shall be expedited to the maximum extent possible. Any action seeking judicial review of the adequacy of any environmental documentation under the National Environmental Policy Act of 1969, impact analysis, permit, or regulation concerning oil and gas leasing on the coastal plain shall be barred unless brought in the appropriate District Court within 30 days after notice of its availability is published in the Federal Register.

SEC. 303. ENVIRONMENTAL STIPULATIONS.

(a) IN GENERAL.--In addition to the general provisions set forth in section 302 of this title, the comprehensive oil and gas leasing regulations issued by the Director shall include environmental stipulations, terms and conditions as are required by this section. These environmental regulations shall require the application of best available technology from an engineering and technical standpoint to all phases of oil and gas exploration, development and production on the coastal plain and shall ensure that oil and gas operations and related activities avoid significant adverse effect on fish and wildlife, their habitat and the environment. To avoid unnecessary duplication and minimize surface occupancy or use, oil and gas operations and

related activities shall be coordinated and consolidated to the maximum extent possible.

(b) SPECIFIC ENVIRONMENTAL STIPULATIONS.--The environmental regulations issued by the Director shall include protective stipulations, terms and conditions regarding the subjects set forth in section 203(c)(2) of this title; Provided, That all references to "exploratory drilling" in section 203(c)(2) shall, for purposes of regulations issued pursuant to this section, be interpreted to mean "exploratory drilling performed under lease, developmental drilling, development and production". The environmental regulations shall also include provisions regarding the establishment of--

(1) seasonal limitations on exploration, development and related activities, where necessary, to avoid significant adverse effects during periods of concentrated fish and wildlife breeding, denning, nesting, spawning and migration;

(2) a special no-surface-occupancy-and-use protective zone prohibiting oil and gas exploration, development and production and related activities within one-half mile of the source of the Sadlerochit Spring or within one-quarter mile on either side of Sadlerochit Spring Creek for a distance of five miles downstream from the spring;

(3) with the sole exception of any port facility or offshore causeway authorized pursuant to section 305 of this title, a special no-surface-occupancy-and-use protective zone prohibiting oil and gas exploration, development and

production and related activities. This zone shall comprise an area which runs two miles inland along the coastline of lands within the Arctic National Wildlife Refuge between the westernmost bank of the mouth of the Staines River to the common line of range 31 east and range 32 east in township 8 north;

(4) design safety and construction standards for all pipelines and access roads which--

(A) minimize adverse effects upon the passage of migratory species such as caribou to the maximum extent possible; and

(B) minimize adverse effects upon the flow of surface water by requiring the use of culverts, bridges and other structural devices;

(5) total prohibitions on public access and use on all pipeline access and service roads;

(6) stringent reclamation and rehabilitation standards regarding the removal from the coastal plain of all oil and gas development and production facilities, structures and equipment upon completion of oil and gas production operations; Provided, That the Director may exempt from the requirements of this subsection those facilities, structures or equipment which he determines would assist in the management of the Arctic Refuge and which are donated to the United States Fish and Wildlife Service for that purpose;

(7) reasonable reimbursement schedules to recover from

the lessees on an annual basis those costs incurred by the Director in implementing an oil and gas leasing program on the coastal plain, including all research, administrative, monitoring, enforcement and reporting costs associated with leasing. All reimbursements for costs collected pursuant to this paragraph by the Director shall be deposited into a special account for the United States Fish and Wildlife Service established in the Treasury of the United States. Notwithstanding any other provision of law, amounts deposited into this special account for reimbursement of costs during each fiscal year shall be available for obligation or expenditure by the Director during the next fiscal year, without further appropriation, to cover all additional research, administrative, monitoring, enforcement and reporting costs associated with implementing an oil and gas leasing program on the coastal plain; and

(8) all other protective environmental stipulations, restrictions, terms and conditions deemed necessary by the Director.

(c) ARCTIC REFUGE SCIENTIFIC ADVISORY PANEL.--Within two months of the date of authorization of oil and gas leasing pursuant to section 302(a) of this title, the Director shall reconvene the Arctic Refuge Scientific Advisory Panel established under section 206 of this Act. Once reconvened, the Scientific Advisory Panel shall remain in existence until two years after the date of the first production of oil or gas on the coastal

plain. The responsibilities of the Advisory panel shall include--

(1) reviewing and commenting on proposed plans of operation and site-specific environmental stipulations, mitigation measures and environmental documentation required by this title;

(2) developing additional recommendations for fish and wildlife research which would supplement on-going research programs for the Arctic Refuge and adjacent areas;

(3) reviewing all reports submitted to, or prepared by, the United States Fish and Wildlife Service pursuant to this title exclusive of section 302(d); and

(4) other responsibilities as the Director may propose.

All other provisions of section 206 consistent with this section shall apply to the actions of the Scientific Advisory Panel in advising the Director on the oil and gas leasing program for the Arctic Refuge.

SEC. 304. RIGHTS-OF-WAY ACROSS THE COASTAL PLAIN.

(a) REGULATORY AUTHORITY.--Notwithstanding any other provision of Federal law, this title shall contain the sole and exclusive authority of the Director to grant a right-of-way across the coastal plain or other parts of the Arctic Refuge for purposes of a transportation or utility system corridor. No right-of-way shall be granted until the Director is authorized to open the coastal plain of the Arctic Refuge to competitive oil

and gas leasing pursuant to section 302(a) of this title. Comprehensive oil and gas leasing and development regulations issued pursuant to sections 302 and 303 of this title shall include provisions regarding the granting of rights-of-way across the coastal plain. Any construction specifications regarding the transportation of oil or gas shall be developed in consultation with the Director of the Bureau of Land Management and the State of Alaska. Right-of-way regulations shall be consistent with all environmental stipulations and restrictions set forth in this title. The Director shall not be authorized to grant any right-of-way through or within the "Protective Management Zone" identified as such on the map entitled "Arctic National Wildlife Refuge Coastal Plain" dated May 7, 1987. These regulations shall apply to any right-of-way request regardless of whether or not the request is associated with an authorized Federal oil and gas leasing program on the coastal plain.

(b) CONSISTENCY OF RIGHT-OF-WAY STANDARDS.--No right-of-way shall be granted for the construction of a segment of an oil or gas pipeline across the coastal plain unless the Director finds that the environmental and engineering design specifications adopted for the construction of the remainder of the pipeline outside of the Arctic Refuge are at least as protective and sound from an environmental and engineering point of view as those set forth in the regulations issued under this title.

SEC. 305. CONSTRUCTION ACTIVITIES AFFECTING ARCTIC WILDLIFE

REFUGE MARINE COASTAL RESOURCES.

(a) To protect the marine coastal resources of the Arctic National Wildlife Refuge, no more than one new port facility shall be permitted by the Director and other administrative authorities to be constructed along the coastal area east of the westernmost bank of the mouth of the Staines River to the common line of range 36 east and range 37 east in township 8 north as the result of any oil or gas development and production directly or indirectly affecting the Arctic Refuge.

(b) No Federal authorization or permit regarding the construction or expansion of a port facility or offshore causeway within the above-described coastal area shall be granted without prior consultation with the United States Fish and Wildlife Service, the National Marine Fisheries Service and the Alaska Department of Fish and Game. Notwithstanding any other provision of law, any permit authorizing port facility or offshore causeway construction or expansion within the above-designated coastal area shall include such prescribed mandatory terms and conditions as these Federal and State fish and wildlife agencies determine to be necessary to avoid significant adverse effects to the marine coastal resources of the Arctic Refuge.

(c) Consistent with the designation of a "Protective Management Zone" set forth in subsection 302(a) of this title, the Director shall not authorize or permit the construction of any port facilities or causeways along the coastline of any lands within the Arctic National Wildlife Refuge between the common

line of range 36 east and range 37 east in township 8 north to the easternmost bank of the mouth of the Aichilik River.

SEC. 306. SUPPLEMENTAL ENFORCEMENT AUTHORITY.

(a) DEFINITIONS.--As used in this section--

(1) "damages" means damages for injury to, destruction of, or loss of natural resources and damages for economic loss specified in paragraph (e)(3) of this section;

(2) "discharges" means any emission, intentional or unintentional, and includes, but is not limited to spilling, leaking, pumping, pouring, emitting, emptying, or dumping;

(3) "natural resources" includes land, fish, wildlife, biota, air, water, groundwater, drinking water supplies, and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the United States or the State;

(4) "oil" means petroleum, including crude oil or any fraction or residue therefrom;

(5) "remove" or "removal" refers to removal of oil or hazardous or toxic substances from the land or water within the coastal plain or the taking of other actions as may be necessary to prevent, minimize, compensate, or otherwise mitigate damage to the natural resources of the coastal plain and to public health or welfare;

(6) "removal costs" means all costs of removal taken after a discharge of oil or hazardous or toxic substances

has occurred, including all costs of completing removal, and all costs to prevent, minimize, compensate, or otherwise mitigate oil or hazardous or toxic substance pollution where there was a substantial threat of a discharge of oil or hazardous or toxic substances; and

(7) "responsible party" means any person issued a permit under section 205 of this Act, or granted a lease under section 302 of this Act. The term shall include all employees, operators and agents of such responsible parties.

(b) CIVIL AND CRIMINAL ACTIONS.--In addition to remedies available under other applicable provisions of law, whenever the Director determines that any person involved in oil and gas exploration, development or production or related activities on the coastal plain is in violation of any applicable provision of Federal law administered or enforceable by rule, regulation, or order, including any term or condition of any right-of-way, permit, lease, or other authorization, issued or granted by the Director, the Director may--

(1) issue a compliance order requiring the person to take immediate action to comply with such provision or any rule, regulation, or order thereunder;

(2) assess a civil penalty, not to exceed $10,000 for each violation, in accordance with the procedures set forth in section 1002(g) of ANILCA. For purposes of imposing a civil penalty in connection with the violation of any right-of-way term or condition involving the construction,

operation or maintenance of an oil or gas pipeline, the maximum amount of the civil penalty authorized under this subsection may not exceed $25,000 for each violation. Each day of a continuing violation shall constitute a continuing offense;

(3) bring a civil action in accordance with subsections (d) and (e) of this section;

(4) bring a criminal action in accordance with section 4 of the Refuge Administration Act as amended by section 401 of this Act; or

(5) hold, in the case of any sport hunting or fishing violation which occurs within the coastal plain, a responsible party jointly, severally or strictly liable for any civil or criminal penalty assessed against an agent, operator, or employee of the responsible party.

(c) SPECIFICITY OF COMPLIANCE ORDER.--Any order issued under subsection (b)(1) of this section shall state with reasonable specificity the nature of the violation and shall, except in emergency situations, establish a time limit for compliance, not to exceed 30 days, which the Director determines is reasonable, taking into account the seriousness of the violation and any good faith efforts to comply with the applicable provisions of law.

(d) INJUNCTIVE AND OTHER CIVIL RELIEF.--Upon request of the Director, the Attorney General shall commence a civil action for appropriate civil relief, including but not limited to damages or removal costs established under subsection (e) of this section,

specific performance or a permanent or temporary injunction for any violation set forth in subsection (b) of this section. Any action under this subsection may be brought in the district court of the United States for the State, the District of Columbia, or the district court in which the defendant is located, resides or is conducting business. Any such court shall have jurisdiction to restrain such violation, require compliance, or give ancillary relief.

(e) REMOVAL COSTS AND LIABILITY FOR DAMAGES.--Notwithstanding any other provision of law, if any area of the coastal plain is polluted by discharges of oil or hazardous or toxic substances from any exploratory or development drilling, or development or production of oil or gas or related activities conducted by, or on behalf of, a responsible party, and the pollution damages fish and wildlife, their habitat, or the environment of the coastal plain, or where there is a substantial threat of damaging those natural resources, the responsible party shall be jointly, severally and strictly liable for the removal costs and damages specified in this subsection that arise directly out of or directly result from such pollution or threat. Upon failure of the responsible party to adequately control and remove the pollutant or threat, the Director, in cooperation with other Federal, State, or local agencies, or in cooperation with the responsible party, or both, shall have the right to accomplish the control and removal at the expense of the responsible party. The removal costs and damages referred to in

this subsection are the following--

(1) all necessary removal costs as determined by the Director;

(2) damages for injury to, destruction of, loss of, and replacement for natural resources, including the reasonable costs of assessing such injury, destruction, loss or replacement; and

(3) damages for economic loss resulting from injury to, or destruction of, real or personal property or natural resources, and loss of subsistence use of natural resources by local rural residents.

SEC. 307. COMPREHENSIVE REFUGE PLANNING.

The Director shall revise the comprehensive conservation plan prepared for the Arctic Refuge pursuant to section 304(g) of ANILCA within one year after the authorization of oil and gas leasing for the coastal plain pursuant to subsection 302(a) of this Act. The revised comprehensive conservation plan shall include the coastal plain of the Arctic Refuge and shall reflect the management authorities and limitations then applicable to the Arctic Refuge.

SEC. 308. CONSULTATION AND REPORTING.

(a) CONSULTATION RESPONSIBILITIES.--In developing oil and gas leasing regulations and related environmental stipulations, terms and conditions pursuant to the provisions of this title,

the Director shall work closely with the State and affected Native Village and Regional Corporations in evaluating the impact of oil and gas exploration, development, production and related activities on the fish and wildlife resources, their habitat and the environment of the coastal plain. In addition, and prior to publication of draft oil and gas leasing regulations, the Director shall consult with the appropriate agencies of the Government of Canada in evaluating such impacts, particularly with respect to the Porcupine caribou herd and other shared migratory resources.

(b) Upon authorization of an oil and gas leasing program on the coastal plain pursuant to subsection 302(a) of this Act, the Director shall biannually report to the appropriate Committees of Congress on the status of the program. The report shall describe: the areas which have been leased; the level of exploration, development and production on those areas; violations, if any, of the environmental stipulations, terms and conditions of oil and gas leases and the Director's response to those violations; the population status of the Porcupine and Central Arctic caribou herds, the Beaufort Sea population of polar bear, muskoxen and lesser snow geese; and significant adverse effects, if any, of leasing activities upon populations of fish and wildlife, their habitat and the environment.

SEC. 309. GENERAL AMENDMENTS TO THE NATIONAL WILDLIFE REFUGE REVENUE SHARING ACT.

Section 401 of the Act of June 15, 1935 (commonly known as the "Refuge Revenue Sharing Act", 16 U.S.C. 715s) is amended by adding a new subsection (h) as follows:

"(h) OIL AND GAS RECEIPTS FROM ALASKAN UNITS OF THE NATIONAL WILDLIFE REFUGE SYSTEM.

(1) Notwithstanding the provisions of subsections (c) and (e) of this section, the Secretary shall segregate by refuge and from all other revenues deposited into the Refuge Revenue Sharing Fund established under subsection (a) of this section, all rents, royalties, bonus bids or other revenues and receipts generated from oil and gas leasing and related activities, including the sale of sand or gravel, on Alaskan units of the National Wildlife Refuge System. The provisions of this section shall not apply to Federal income taxes generated by such oil and gas leasing and related activities. Notwithstanding the provisions of subsection (c)(2) of this section, this subsection shall contain the sole and exclusive provisions regarding the distribution of refuge revenue sharing funds attributable to oil and gas leasing and related activities, including the sale of sand or gravel, within Alaskan units of the National Wildlife Refuge System. All segregated revenues and receipts shall be disposed of in accordance with the provisions of this subsection and shall not be taken into account by the Director when projecting the level of entitlements otherwise owed under the provisions of subsection (c)(2) of this

section.

(2) At the end of each fiscal year, the Secretary shall disburse any revenues and receipts segregated under subsection (h)(1) by first deducting and keeping in the Refuge Revenue Sharing Fund for distribution to affected counties an amount equal to the amount necessary to ensure full funding of the payments required under subsection (c) of this section.

(3) Those segregated revenues and receipts which remain after the deduction authorized under subsection (h)(2) of this section shall be distributed under the following apportionments--

(A) State of Alaska--

(i) Fifty per centum to the State of Alaska;

(B) Federal Fish and Wildlife Conservation--

(i) Twenty-five per centum as initial principal to the Fish and Wildlife Enhancement Trust Fund established under section 312 of this Act. Annual distributions to the Fish and Wildlife Enhancement Trust Fund under this clause shall cease once the initial principal of the Trust Fund reaches 150 million dollars. Upon termination of distributions to the Trust Fund pursuant to the provisions of this clause, the per centum of revenues otherwise apportioned under this clause shall be reallocated for distribution pursuant to clause (ii) of subparagraph (B) of this paragraph.

(ii) Twenty-five per centum to be considered as "excess net receipts" for purposes of subsection (e) of this section and to be distributed as such in accordance with the provisions of that subsection and section 4 of the Act of March 16, 1934 (commonly known as the Migratory Bird Hunting Stamp Act, 16 U.S.C. 718d), as amended by section 310 of this Act."

SEC. 310. GENERAL AMENDMENTS TO THE MIGRATORY BIRD HUNTING STAMP ACT (16 U.S.C. 718d).

Section 4 of the Act of March 16, 1934 (commonly known as the Migratory Bird Hunting Stamp Act, 16 U.S.C. 718d) is amended by inserting after the last sentence the following:

"(d) ACQUISITIONS WITH ALASKAN OIL AND GAS LEASING REVENUES.--The Secretary shall segregate from all other monies within the Migratory Bird Conservation Fund those revenues and receipts attributable to oil and gas leasing and related activities, including the sale of sand or gravel, on Alaskan units of the National Wildlife Refuge System which were considered excess net receipts for purposes of the Act of June 15, 1935 (commonly known as the "Refuge Revenue Sharing Act", 16 U.S.C. 715s(e)) as amended by section 309 of this Act. Revenues and receipts so segregated shall be available for the location, ascertainment and acquisition of suitable areas for national wildlife refuges for migratory birds and other species of fish and wildlife pursuant to the provisions of the Migratory Bird

Conservation Act (16 U.S.C. 715a), as amended by section 311(a)(4) of this Act. All administrative acquisition costs incurred under this program shall be deducted from the revenues and receipts segregated under this subsection." .

SEC. 311. GENERAL AMENDMENTS TO THE MIGRATORY BIRD CONSERVATION ACT.

(a) MIGRATORY BIRD CONSERVATION COMMISSION.--Section 2 of the Migratory Bird Conservation Act (16 U.S.C. 715a) is amended by--

(1) inserting "(a)" in front of the first sentence;

(2) striking out "two" each place that it appears and inserting in lieu thereof "four";

(3) inserting after the first sentence the following: "The commission is also authorized to consider and approve any acquisition recommendation made by the Secretary of the Interior which is pursuant to and in support of any provision of the North American Waterfowl Plan with Canada signed by the Secretary in May of 1986, or any subsequent amendments thereto, and which provides for appropriate public access and use and the preservation and conservation of such waterfowl habitat in perpetuity."; and

(4) inserting after the last sentence the following: "(b) In addition to its authorities under subsection (a), the commission is authorized to consider and pass upon recommendations by the Secretary of the Interior for the

acquisition of land, water and interests therein out of those revenues and receipts generated from oil and gas leasing and related activities, including the sale of sand or gravel, on Alaskan Units of the National Wildlife Refuge System which were segregated in the Migratory Bird Conservation Fund pursuant to section 4 of the Act of March 16, 1934, as amended by section 310 of this Act, (commonly known as the Migratory Bird Hunting Stamp Act, 16 U.S.C. 718d). In exercising its acquisition authority under this subsection, the commission shall ensure, to the maximum extent possible, that in any given fiscal year, the segregated funds are expended in accordance with the following allocation--

(A) fifty per centum for the acquisition of major wintering and migration route habitat for migratory birds originating in Alaska or Canada;

(B) twenty per centum for the acquisition of migratory bird habitat in accordance with the provisions of the North American Waterfowl Plan with Canada; and

(C) thirty per centum for the acquisition of national wildlife refuges for species of fish and wildlife other than migratory birds. Half of this thirty per centum shall be directed towards the priority acquisition of inholdings within Alaskan units of the National Wildlife Refuge System and a portion of this fifteen per centum shall be available for the

acquisition of habitat outside of Alaska only when the number of willing sellers of inholdings in Alaskan units of the National Wildlife Refuge System is insufficient to commit the entire amount."

(b) AUTHORITY OF THE SECRETARY OF INTERIOR.--Section 4 of the Migratory Bird Conservation Act (16 U.S.C. 715c) is amended by striking out the semicolon and all that follows and inserting in lieu thereof the following--

"or is to be acquired in accordance with the provisions of section 2 of the Migratory Bird Conservation Act (16 U.S.C. 715a), as amended by section 311(a)(4) of this Act; and (2) has consulted with the county or other unit of local government in which such area is located and, where applicable, with the Governor of any State concerned or the appropriate State agency."

SEC. 312. FISH AND WILDLIFE ENHANCEMENT TRUST FUND.

(a) CREATION OF TRUST FUND.--There is hereby established at the United States Treasury the Fish and Wildlife Enhancement Trust Fund. The Secretary of the Treasury shall serve as the Trustee for the Fish and Wildlife Enhancement Trust Fund and shall manage the Trust Fund on behalf of the Director in accordance with the provisions of this section.

(b) PURPOSE OF TRUST FUND.--The purpose of the Fish and Wildlife Enhancement Trust Fund shall be to promote fish and wildlife conservation and enhancement by enabling the Director to

fund projects and programs in the following areas--

(1) fish and wildlife research in Alaska and Canada with a special emphasis on shared migratory species, the analysis of effects of development and pollution on the fish and wildlife populations of the North Slope of Alaska, and the identification of measures to avoid, minimize, compensate, or otherwise mitigate any adverse effects from the development and pollution;

(2) State nongame programs under the grant-in-aid program under the Fish and Wildlife Conservation Act (16 U.S.C. 2901);

(3) funding proposals under the matching grant program of the National Fish and Wildlife Foundation;

(4) natural resource use conflict resolution, including the facilitation of endangered and threatened species habitat conservation planning pursuant to section 10(a)(2) of the Act of December 28, 1973 (commonly known as the Endangered Species Act, 16 U.S.C. 1539(a)(2)); and

(5) education and training programs and facilities regarding--

(A) fish and wildlife ecology;

(B) environmental pollution and its effects upon fish and wildlife populations and their habitat; and

(C) conservation education programs on individual units of the National Wildlife Refuge System.

(c) INITIAL PRINCIPAL OF TRUST FUND.--An initial endowment

shall be provided to the Fish and Wildlife Enhancement Trust Fund from revenues and receipts from oil and gas leasing and related activities, including the sale of sand or gravel, on Alaskan units of the National Wildlife Refuge System pursuant to section 309 of this Act. No further revenues and receipts shall be placed in the Trust Fund pursuant to section 309 of this Act once the initial principal of the Trust Fund reaches 150 million dollars.

(d) INVESTMENT OF PRINCIPAL OF TRUST FUND.--It shall be the duty of the Secretary of the Treasury to invest the principal of the Trust Fund in public debt securities with maturities suitable for the needs of such Fund and bearing interest at rates determined by the Secretary, taking into consideration current market yields on outstanding marketable obligations of the United States of comparable maturities.

(e) EXPENDITURE OF FUNDS.--The Secretary shall not make funds available to the Director to expend until the principal of the Trust Fund has reached a minimum of 20 million dollars. The Director shall expend during each fiscal year all available annual net income, and, if he deems it advisable, up to a maximum of two per centum of the principal of the Trust Fund. None of the principal of the Trust Fund may be expended until such time as the principal endowment reaches 150 million dollars and at no time may the expenditure of principal pursuant to the provisions of this subsection result in a remaining balance of principal of less than 120 million dollars. For purposes of this subsection,

the term "annual net income" means all income from investment authorized under subsection (d) of this section. To provide for diversity in funding, the Director shall ensure that in any given fiscal year, no less than ten per centum and no more than thirty per centum of the funds available for distribution shall be allocated to any one of the five program or project areas set forth in subsection (b) of this section.

(f) ANNUAL REPORTS.--The Director shall prepare an annual report summarizing the expenditures of the Trust Fund during the preceding 12-month period. Annual reports shall be submitted to the appropriate Committees of Congress.

SEC. 313. TESHEKPUK-UTUKOK NATIONAL WILDLIFE REFUGE.

(a) Effective on the date of the enactment of this Act, the area depicted as the "Teshekpuk-Utukok National Wildlife Refuge" on a map so identified dated May 7, 1987, is established as a National Wildlife Refuge and as a unit of the National Wildlife Refuge System. Except as provided in subsection (d) of this section, this wildlife refuge shall be administered in accordance with the Refuge Administration Act, ANILCA and other existing provisions of Federal fish and wildlife conservation law.

(b) PURPOSES OF REFUGE.--The purposes for which the wildlife refuge is established and shall be managed include--

(1) to conserve fish and wildlife populations and habitats in their natural diversity, including but not limited to migratory waterfowl, raptors and other migratory

birds, barren-ground caribou, moose, polar bears, brown bears, wolves, fish and marine mammals;

(2) to fulfill the international treaty obligations of the United States with respect to fish and wildlife and their natural habitats;

(3) to provide, in a manner consistent with the purposes set forth in paragraphs (1) and (2), the opportunity for continued subsistence uses by local residents; and

(4) to ensure, to the maximum extent practicable and in a manner consistent with the purposes set forth in paragraph (1) of this subsection, water quality and necessary water quantity within the wildlife refuge.

(c) COMPREHENSIVE CONSERVATION PLAN.--The Director shall prepare a comprehensive conservation plan for the wildlife refuge in the manner provided in section 304(g) of ANILCA. Notwithstanding paragraph (6)(C) of such section, the plan shall be prepared before the end of the 3-year period beginning on the date of the enactment of this Act.

(d) COORDINATION WITH OTHER LAWS.--

(1) OIL AND GAS EXPLORATION AND LEASING.--

(A) The Director, in exercising his existing management authorities under section 4(d) of the Refuge Administration Act, shall not authorize any further oil or gas leasing within the area designated as the Teshekpuk-Utukok National Wildlife Refuge prior to either the expiration of a period of five years from the

date of enactment of this Act or the issuance of final oil and gas leasing regulations pursuant to paragraph (d)(1)(B) of this section, whichever is earlier. Notwithstanding the expiration of this limited moratorium, the Director shall not issue any additional oil and gas leases within the Teshekpuk Lake Special Area boundaries defined by the Secretary of the Interior on June 3, 1977 (42 Federal Register 28723). Any subsequent oil and gas leasing in Teshekpuk-Utukok National Wildlife Refuge by the Director shall be pursuant to the provisions of section (4)(d) of the Refuge Administration Act and this Act.

(B) The enactment of this Act shall not affect the validity of any existing oil or gas lease within the area designated as the Teshekpuk-Utukok National Wildlife Refuge. Oil and gas exploration, development, production and related activities under existing leases shall avoid significant adverse effects upon fish and wildlife, their habitat, and the environment. In the case of termination or cancellation of any lease which would cause significant adverse effects to fish and wildlife, their habitat or the environment, the Director shall provide compensation to the lessee for the termination or cancellation of any such activity in accordance with the provisions of section 302(h) of this Act. Oil and gas exploration, development and

production and related activities shall continue, subject to the administrative control of the Director, under existing leasehold terms and conditions until such time as the Director publishes final regulations regarding the exploration, development and production of oil and gas on the Teshekpuk-Utukok National Wildlife Refuge in accordance with those provisions of sections 302, 303, 305 and 306 of this title which are capable of application to the Teshekpuk-Utukok National Wildlife Refuge. The Director of the Bureau of Land Management shall assist the Director in managing any oil and gas leasing program within the Teshekpuk-Utukok National Wildlife Refuge in the same manner as provided for in section 302 of this Act for the Arctic National Wildlife Refuge. The authority of the Federal and State fish and wildlife agencies described in subsection 305(b) of this title shall apply to port facility or offshore causeway construction along the coastline of the Teshekpuk-Utukok National Wildlife Refuge. Notwithstanding any other provision of law, no transportation or utility corridor may be authorized or permitted which traverses a line from the line of mean high water at the easternmost point of Antigaru Point in Harrison Bay, thence due west to the western shoreline of Teshekpuk Lake unless the Director has concluded that there is no economically reasonable and prudent alternative.

(2) NATIVE ALASKAN RIGHTS AND STATE OF ALASKA LAND ENTITLEMENT CLAIMS.--The enactment of this Act shall not affect any right of--

(A) any Native, Native group, Native village, Native Corporation, or Regional Corporation (within the meaning given each term by section 3 of the Alaska Native Claims Settlement Act (16 U.S.C. {1601)) under the Alaska Native Claims Settlement Act or ANILCA; or

(B) the State or any political subdivision of such State, under the Act entitled "An Act to provide for the admission of the State of Alaska into the Union" and approved July 7, 1958 (48 U.S.C. prec. 21) or ANILCA,

to select or acquire any land.

SEC. 314. PROPERTY INTERESTS OF THE INUPIAT ESKIMO PEOPLE.

Upon the authorization of an oil and gas leasing program on the coastal plain pursuant to section 302(a) of this title or pursuant to a subsequent Act of Congress, the prohibitions and limitations contained in Section 1003 of ANILCA, insofar as they have application to the subsurface property interests owned by the Inupiat Eskimo people within and adjacent to the coastal plain, are repealed. Consistent with the provisions of section 1431(o)(4) of ANILCA, no surface disturbance in support of oil or gas exploration, development or production involving such subsurface property interests shall be authorized prior to publication of final regulations issued pursuant to subsection

302(b) of this title which establish environmental stipulations, terms and conditions for an oil and gas leasing program for the coastal plain. Such regulatory environmental stipulations, terms and conditions shall apply to the development of all subsurface property interests owned by the Inupiat Eskimo people within and adjacent to the coastal plain.

TITLE IV--MISCELLANEOUS PROVISIONS

SEC. 401. GENERAL ENFORCEMENT AMENDMENTS TO THE REFUGE ADMINISTRATION ACT AND THE REFUGE RECREATION ACT.

(a) Section 4(e) of the Refuge Administration Act is amended by--

(1) striking out "$500" where it appears and inserting in lieu thereof "$5,000"; and

(2) striking out "six months" where it appears and inserting in lieu thereof "one year".

(b) Section 4 of the Act of September 28, 1962 (commonly known as the Refuge Recreation Act, 16 U.S.C. 460k-3) is amended by--

(1) striking out "$500" where it appears and inserting in lieu thereof "$5,000"; and

(2) striking out "six months" where it appears and inserting in lieu thereof "one year".

SEC. 402. MISCELLANEOUS PROPERTY INTERESTS WITHIN REFUGES.

(a) IN GENERAL.--Section 6 of the Migratory Bird Conservation Act (16 U.S.C. 715e) is amended--

(1) by inserting "(a)" before "The Secretary";

(2) by inserting ",or by the head of any other Federal department or agency for the Secretary," after "Secretary of Interior" the third place it appears therein;

(3) by inserting "either (1)" after "subordinate to and subject to";

(4) by striking out "or if deemed necessary" and all that follows thereafter and inserting the following: ", or (2) such rules and regulations as the Secretary of the Interior may from time to time prescribe."; and

(5) by adding at the end thereof the following: "(b) The rules and regulations set out in any deed or lease under subsection (a)(1) shall, at a minimum, address the same fish and wildlife conservation matters, and provide the same degree of resource and habitat protection, as are addressed and provided for at the time by general regulations applicable to the access to, and development of, reserved non-Federal mineral interests in areas within the National Wildlife Refuge System.".

(b) CONFORMING AMENDMENT.--Section 4(d) of the Refuge Administration Act is amended by adding at the end thereof the following new paragraph:

"(3) The Secretary shall permit by regulation limited access to, and the development of, reserved non-Federal mineral

interests within the National Wildlife Refuge System. Any such access and development shall be carried out only in accordance with a permit which contains such economically reasonable terms and conditions as deemed necessary--

"(A) to protect the fish and wildlife resources of, and their habitat in, the affected refuge from any significant adverse effects; and

"(B) to minimize, to the maximum extent possible, any adverse effects upon such resources and their habitat. Notwithstanding any provision of this section, any term or condition imposed by the Secretary under this paragraph is in addition to any other requirement that is imposed under other applicable Federal or State law.".

SEC. 403. GENERAL AMENDMENTS TO THE FISH AND WILDLIFE IMPROVEMENT ACT OF 1978.

Section 3(h)(3) of The Fish and Wildlife Improvement Act of 1978 (16 U.S.C. 712(2)) is amended by inserting after the last sentence the following:

"(3) The Secretary, through the Director of the United States Fish and Wildlife Service and in cooperation with the Secretary of State, is authorized to take action as may be necessary to implement the provisions of the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (RAMSAR) (11 I.L.M. 963). There are authorized to be appropriated not to exceed $150,000 for each fiscal year through

fiscal year 1997 to enable the Secretary to carry out such responsibilities and functions as may exist in implementing the RAMSAR Convention.

"(4)(a) GENERAL AUTHORITY.--In accordance with the provisions of Article IV, Paragraph (2)(c) of the Convention between the United States and the Union of Soviet Socialist Republics for the Conservation of Migratory Birds and Their Environment, the Secretary, through the Director of the United States Fish and Wildlife Service, is authorized to designate significant areas of breeding, wintering, feeding and moulting habitat which are of special importance to the conservation of migratory birds. Such identification may also include migratory bird habitat areas which require special protection because of their ecological diversity or scientific value.

"(b) DESIGNATION AND RESPONSE.--After consultation with the appropriate State Fish and Wildlife Agency or Department of the affected State, significant habitat areas of special importance for migratory birds shall be designated by informal rulemaking accompanied by the publication of a map of adequate scale in the Federal Register. Not less than 90 days for public comment shall be allowed on any proposed designation and a copy of the proposed designation shall be published in a newspaper of general circulation in the affected area. A public hearing on the proposed designation shall also be held in the affected area if requested. In addition to the criteria set forth in subsection (a) of this section, no area shall be designated a significant

habitat area of special importance for migratory birds unless the Secretary finds that it contains significantly high concentrations of migratory birds during some portion of the year and is at least 1,700 contiguous acres in size; Provided, That colonial nesting sites of smaller contiguous acreage may be designated if the Secretary finds that they are otherwise significant habitat areas of special importance for migratory birds. No Federal agency shall authorize, fund or carry out any activity which would adversely modify or destroy a significant habitat area of special importance for migratory birds designated pursuant to this section unless, after consultation with the Secretary, the Federal agency concludes that there is no feasible and prudent alternative to the proposed activity which would avoid such adverse effects."

SEC. 404. MANAGEMENT PLANS ON NATIONAL WILDLIFE REFUGES.

Section 4(c) of the Refuge Administration Act is amended by adding at the end thereof the following: "Nothing in 18 U.S.C. Section 47 shall preclude the use of aircraft and motor vehicles in implementation of approved management plans on national wildlife refuges."

10/14/87

KEY CONCEPTS OF NATIONAL FISH AND WILDLIFE ENHANCEMENT ACT OF 1987

1. Exploratory drilling/conditional leasing authority (provide leasing authority now but require completion of exploratory drilling program and Presidential decision in favor of leasing prior to actual leasing -- no further Act of Congress required.

2. Number of exploratory wells - 4 wells.

3. Private industry to run exploratory program with chance to designate areas to drill - USGS as backup only.

4. Industry recovers 50% of its costs for conducting exploratory program by off-setting costs as a credit against future ANWR leasing, OCS leasing or BLM on-shore leasing. If company doesn't participate in exploration program, it would be barred from participating in subsequent leasing program.

5. Establish 376,000 acre "Protective Management Zone" (PMZ) out of 1,550,000 acre coastal plain. Would include core calving area and eastern coastal area of coastal plain - no exploratory drilling or surface occupancy for oil and gas leasing allowed in the PMZ.

6. Use "no significant adverse effect" environmental standard for regulating exploratory program and oil and gas leasing program.

7. Ask National Academy of Sciences (NAS) to conduct independent assessment of results of exploratory drilling program and to advise Director FWS of overall energy needs of Nation.

8. Upon completion of exploratory drilling program, require Director FWS to issue revised and updated Section 1002 report including NAS advice where adopted.

9. Upon issuance of revised Section 1002 report, Secretary of Interior shall recommend oil and gas leasing to the President unless he makes one of three findings against leasing. President to adopt Secretary's recommendations on leasing unless President finds it not in Nation's paramount interest to do so - President can authorize leasing without further Act of Congress unless significant adverse environmental effects would occur.

10. Put Director, USFWS, in charge of environmental controls and overall exploration and leasing programs on ANWR while having the Bureau of Land Management run the technical, geological and financial parts of oil and gas leasing program.

11. Set up an ANWR Scientific Advisory Panel comprised of Federal, State and local agency representatives and oil industry and environmental community to assist FWS in implementing exploratory program and any oil and gas leasing program.

12. Leasing revenues - overturn Supreme Court Kenai Borough case and put all ANWR oil and gas leasing revenues into Refuge Revenue Sharing Fund. First allocate amount of revenues necessary to eliminate current large deficit in Refuge Fund and provide for full funding of Fund, then divide royalties and revenues 50/50 with State of Alaska.

13. 50/50 split of royalties/revenues

    State share (50%)

    Federal share (50%)

    25% - to endow $150 million Fish and Wildlife Enhancement Trust Fund managed by the Secretary of the Treasury for the Director, FWS, (once $150 million endowment reached, then this 25% of revenues merged with other 25% for Migratory Bird Conservation Fund). Enhancement Trust Fund to provide Director with revenues to fund five categories of activities: State non-game programs; Arctic wildlife research; National Fish and Wildlife Foundation matching grant program; natural resource conflict resolution; and wildlife conservation education and training programs.

    25% - to Migratory Bird Conservation Fund - Migratory Bird Commission to spend ANWR oil revenues as follows:

        50% - migration route/wintering habitat for migratory birds from Alaska and Canada

        20% - in support of North American Waterfowl Plan with Canada

        30% - for acquisition of wildlife refuges for species other than migratory birds (Half of this amount (15%) to be made available each year on priority basis for acquiring inholdings in Alaska refuges from willing sellers. If not enough willing sellers in any given year to use entire 15%, then remainder of money available for Lower 48 State acquisitions also.)

14. To protect coastal marine environment of ANWR, grant Directors of FWS and NMFS new authority to impose mandatory terms and conditions on Section 404 permits for port facilities and off-shore causeways (would follow existing Section 18 and Section 30(c) approach of Federal Power Act) - prohibit any port facilities on eastern coastline of coastal plain and allow only one port on western/central part of coastal plain.

15. Create new 23.5 million acre national wildlife refuge on North Slope out of National Petroleum Reserve-Alaska (NPRA) currently managed by BLM. Impose moratorium on further leasing in NPRA for up to 5 years. Any resumption of leasing in NPRA subject to requirements of Refuge Administration Act and no oil and gas leases to be issued in Teshekpuk Lake area. Bar transportation/utility corridor around right side of Teshekpuk Lake unless no economically reasonable and prudent alternative.

16. Enhance enforcement authorities of Director FWS and increase penalties for violation of leasing or exploratory drilling rules. $10,000 maximum civil penalty generally, with $25,000 civil penalty for pipeline violation. $5,000 criminal penalty and one year in jail. Use oil spill approach in H.R. 1632 for clean up authority for pollution/spills on refuge.

17. Strictly prohibit public access on pipeline service roads and restrict sport hunting and fishing in coastal plain by oil field work crews. Oil lessees liable for civil or criminal penalties for hunting and fishing violations by their employees.

18. Establish exclusive authority for granting rights-of-way across coastal plain. (Title XI of ANILCA would not apply.) No right-of-way for pipeline to be granted until coastal plain opened to leasing. Applies to requests for rights-of-way from lands off-refuge - no rights-of-way granted through designated 376,000 acre Protective Management Zone. In order to ensure safety and consistency, requires State to duplicate Refuge oil pipeline standards for part of pipeline on State lands.

19. Authorizes FWS to assess and recover its administration, research and monitoring costs from oil lessees and exploratory drilling permittees.

20. Would prevent Arctic Slope Regional Corporation (ASRC) from developing its mineral interests in adjacent land obtained through the Chandler Lake land exchange until coastal plain opened to leasing (the Chandler Lake Exchange provided that ASRC would be bound by any terms and conditions included in ANWR legislation) - also would prevent ASRC from authorizing surface disturbance on ASRC lands in connection with leasing until FWS issues its oil/gas development and production regulations.

21. Requires State and FWS to reach agreement on ownership of sand/gravel in beds of bodies of water in coastal plain or put proceeds into escrow account until ownership dispute settled.

22. Increase maximum penalties under Refuge Administration Act and Refuge Recreation Act from $500 to $5,000 per violation and from six months to one year in jail per violation.

23. Reaffirms authority of Director FWS to regulate and impose economically reasonable environmental terms and conditions on private oil and gas activities within national wildlife refuges.

24. Implements migratory bird habitat protection provisions of Soviet Migratory Bird Treaty - Director FWS may designate areas of 1,700 contiguous acres or more with exceptional concentrations of migratory birds. Limitation on Federal agencies authorizing, funding or carrying out activities in these designated areas if they have serious adverse effects unless there is no feasible and prudent alternative to the project as proposed.

10/14/87

ENVIRONMENTAL BENEFITS RESULTING FROM THE NATIONAL FISH AND WILDLIFE ENHANCEMENT ACT OF 1987

Although enactment of this legislation would provide a vehicle for cautious development of the Arctic Refuge coastal plain, the positive conservation aspects of the bill are numerous. The legislation substantially enhances the nation's fish and wildlife resources and contributes to international conservation efforts in the following ways:

1. ALASKAN REFUGE OIL AND GAS ROYALTIES DEDICATED TO FISH AND WILDLIFE CONSERVATION PURPOSES.

   - Greatly enhances wetland conservation efforts by dedicating hundreds of millions of dollars of Federal oil revenues from the Arctic Wildlife Refuge to the Migratory Bird Conservation Fund to be used for land acquisition for the Wildlife Refuge System; specifically, acquisition of bird migration and wintering habitat; refuge acquisitions for species other than migratory birds, as well as for Alaskan Native inholdings in Alaskan refuges; and land acquisitions in support of the North American Waterfowl Management Plan with Canada.

   - Establishes the Fish and Wildlife Enhancement Trust Fund of $150,000,000 to be used for funding diverse wildlife conservation programs such as additional fish and wildlife research in Alaska and Canada, conservation education and training programs, State non-game programs, natural resource conflict resolution efforts, and the matching grant program of the National Fish and Wildlife Foundation.

   - Makes possible full funding levels for the Refuge Revenue Sharing Fund, thus providing additional payments-in-lieu of taxes compensation for counties and local jurisdictions containing units of the National Wildlife Refuge System. Fiscal year 1988 projections show deficit in Fund to run at $.56 on the dollar. Full funding will make new additions to the Refuge System more attractive to local governments.

2. NEW 23,500,000 ACRE NATIONAL WILDLIFE REFUGE ON THE NORTH SLOPE OF ALASKA.

   - Establishes the Teshekpuk-Utukok National Wildlife Refuge encompassing that area currently known as the National Petroleum Reserve - Alaska (NPR-A).

   - Protects areas of premiere wildlife values, such as the Teshekpuk Lake Special Area for molting Pacific brant and the Utukok highlands for calving of the 250,000 Western Arctic caribou herd.

- Severely restricts transportation/utility corridors in the Teshekpuk Lake Special Area, thus providing added protection for wildlife.

- Authorizes State and Federal wildlife resource agencies to impose mandatory terms and conditions on section 404 permits for any port facility/causeway constructed in the coastal area of the new refuge.

- Establishes a five-year moratorium on further oil and gas leasing on the new refuge and imposes new environmental standards on current leases. After expiration of moratorium, prohibits additional oil and gas leases in the Teshekpuk Lake Special Area and only allows leasing elsewhere in refuge where compatible with refuge purposes.

- Requires that a comprehensive refuge management conservation plan be prepared.

3. ESTABLISHMENT OF A "PROTECTIVE MANAGEMENT ZONE" ON THE COASTAL PLAIN OF THE ARCTIC NATIONAL WILDLIFE REFUGE.

- This 376,000-acre special management area would protect significant fish and wildlife resources on the Arctic Refuge, including the sensitive Porcupine caribou core calving grounds and coastal polar bear denning habitat, by precluding surface occupancy and use for oil and gas exploration, development and related activities within its boundaries.

- Establishes an eight- to ten-mile no surface occupancy zone between already designated wilderness areas of Arctic Refuge and areas open for development.

- Protects coastal lagoon and barrier island habitats, caribou insect relief habitat, and associated waterfowl nesting and feeding areas on the eastern shore of the coastal plain in a continuous three-mile wide coastal strip.

- Protects the concentrated Porcupine caribou calving area in the Jago Uplands and provides an undeveloped "insect relief corridor" for caribou access to the northeast coast.

- Protects the entire 4,000-acre Sadlerochit Spring Special Area as well as the headwaters and riparian zones of at least ten major drainages of the coastal plain.

- Protects known high use areas for polar bear, muskoxen, brown bear, snow geese, caribou, moose, various raptors and significant wetland habitat.

4. PHASED EXPLORATION AND DEVELOPMENT PROGRAM PROVIDES MAXIMUM PROTECTION.

- Four on-structure exploratory wells are authorized, as well as possible additional season of seismic exploration, with leasing decisions made only after the exploration program is completed. No leasing would occur if there would be significant adverse environmental effects from development.

- The environmental standard during exploration and development would be "no significant adverse effect on fish and wildlife, their habitat and the environment" and would require the application of best available technology from an engineering and technical point of view.

- A comprehensive list of environmental subject matters must be addressed in regulations providing protective environmental terms, conditions, prohibitions or restrictions. All regulations require impact disclosure and mitigation planning pursuant to CEQ guidelines.

- Exploratory drilling performed only in the winter months, with equipment brought in on ice roads or flown in to ice airstrips or, in exceptional cases, overland during periods of adequate snow cover.

- A Scientific Advisory Panel will assist the Fish and Wildlife Service in implementing the exploratory drilling and leasing programs by reviewing exploration and development plans and recommending appropriate wildlife research activities to ensure that significant adverse effects are avoided.

- The National Academy of Sciences will provide independent scientific review throughout the exploration phase and will act as a source of objective information for moving into a leasing phase. The Academy will also review national energy needs, likelihood of commercially recoverable deposits of oil and gas on the coastal plain, and whether the coastal plain could be developed without significant adverse effects on fish and wildlife, their habitat or the environment. The Academy will also review and comment on the revised Section 1002 report.

5. COASTAL MARINE ENVIRONMENT PROTECTED.

- Director, FWS, shall establish a 2-mile wide coastal protection zone along western and central part of coastal plain coastline where no surface occupancy would be allowed for oil and gas development and related activities.

- Only one new port facility authorized on western and central coast of refuge - no port site allowed at key polar bear denning area at Pokok Lagoon on eastern side of coastal plain.

- Directors of FWS, NMFS and State of Alaska Department of Fish and Game given new authority to impose mandatory terms and conditions on federal permits for port facility and offshore causeways to protect coastal marine environment of Arctic Refuge, specifically migratory fish.

6. WILDLIFE LAW ENFORCEMENT CAPABILITIES BOLSTERED BY THE BILL.

- Enhances Fish and Wildlife Service law enforcement powers to ensure compliance with Arctic Refuge environmental controls: civil penalties ranging from $10,000 to $25,000 per day; criminal penalties up to $5,000 per violation; injunctive powers; oil lessee liable for civil and criminal penalties for hunting violations of their employees, and liable for damages to natural resources from pollution, and cleanup costs.

- Upgrades penalties for violations of the Refuge Administration Act and Refuge Recreation Act from $500/six months in jail to a maximum of $5,000/one year in jail.

7. SEVERAL PAST COURT CASES OVERTURNED TO FAVOR FISH AND WILDLIFE CONSERVATION.

- Overturns a Federal district court opinion which held that the Director, FWS, had no authority to impose reasonable environmental controls over private oil and gas activities within national wildlife refuges.

- Overturns a Supreme Court decision that diverts royalties from oil and gas leasing on national wildlife refuges away from fish and wildlife conservation programs. Current Federal law in Alaska would give the State 90% of the Federal royalties from oil development in the Arctic Refuge and 10% to the U.S. General Treasury -- not one penny goes to fish and wildlife conservation. This bill would split royalties with the State 50/50 and dedicate the use of Federal revenues from oil leasing on wildlife refuges to fish and wildlife conservation purposes.

8. INTERNATIONAL CONSERVATION FEATURES.

- The bill provides implementing legislation for the International Convention on Wetlands Conservation (RAMSAR), a treaty designed to enhance the protection for nationally and internationally significant wetlands.

- The bill provides implementing legislation for the migratory bird habitat protection provisions of the Soviet Migratory Bird Treaty by authorizing the designation of significant areas of migratory bird habitat which require special protection due to their ecological diversity or scientific value.

COASTAL PLAIN
PROTECTIVE MANAGEMENT ZONE

INTRODUCTION

The Protective Management Zone is an estimated 376,000-acre area on the coastal plain of the Arctic National Wildlife Refuge where oil and gas exploration, development, production and related activities are precluded due to the high habitat value and sensitivity of the area for fish and wildlife resources. This management area protects important habitats and other unique natural features for the majority of the Arctic Refuge's most significant wildlife resources, while allowing for potential oil and gas development on approximately 1.2 million acres on the coastal plain.

ENVIRONMENTAL BENEFITS

Porcupine caribou herd: 1) Affords protection to the entire 84,000-acre "concentrated calving area" and much of the post-calving aggragation area; 2) provides for an unrestricted "insect relief corridor" to the northwest coastal area; 3) leaves undisturbed approximately 15 miles of coastline as insect relief habitat.

Muskoxen: Protects about 1/2 of the Niguanak-Okerokovik-Angun muskoxen subpopulation's high-use habitat. This subpopulation is isolated from the rest of the Arctic Refuge muskoxen herd and is considered by FWS to be the most vunerable to disruption.

Polar bear: Protects the Pokok Lagoon bluff area (including documented den sites), considered by FWS to be the most important and consistent denning habitat for polar bears on the Arctic Refuge.

Brown bear: Protects about 1/2 of the largest and most important brown bear high-use areas (50 to 70 adult bears and cubs from May to September) located in the caribou concentrated calving grounds.

Snow geese: Protects a significant portion of the documented snow goose preferred staging habitat in the upper Aichilik, Okpilak and Jago River area.

Bowhead whale: Protects endangered bowhead whale nearshore feeding area by precluding marine port development along eastern shoreline of coastal plain.

Raptors: Protects several documented raptor nest sites located in cliffs on the upper Jago River. These are unique areas, as there is limited cliff habitat such as this on the coastal plain.

Moose: Protects all of the year-round moose habitat and about 1/2 of the seasonal-use habitat on the coastal plain.

Sadlerochit Springs: Protects the entire 4,000-acre Sadlerochit Spring Special Area and major outflow, nominated as a National Natural Landmark in 1981.

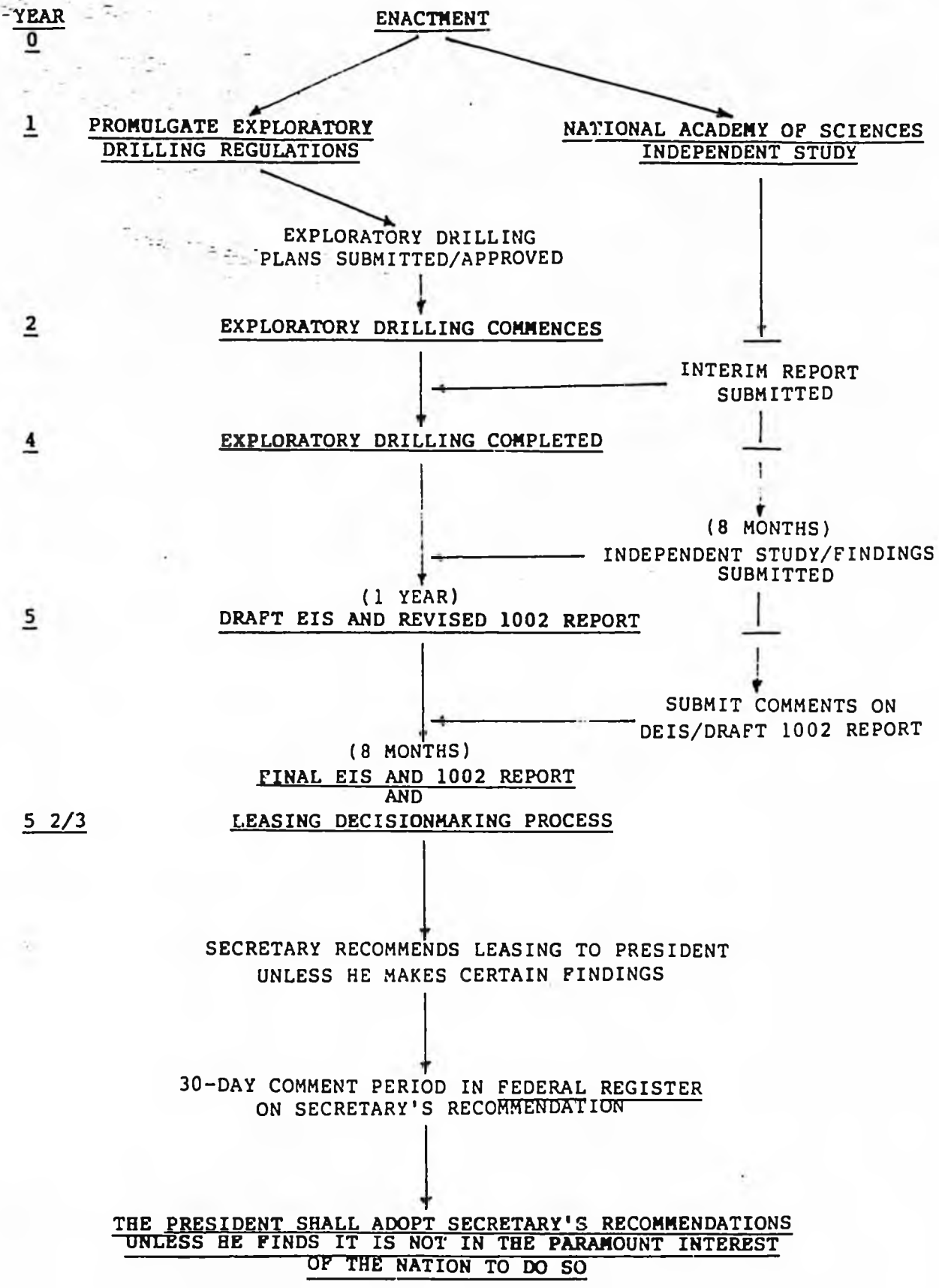
Drainages: Protects the headwaters and riparian habitats of at least 10 of the main drainage systems on the coastal plain.

Wilderness buffer: Establishes an 8 to 10-mile no-surface-occupancy zone between industrial development and the adjacent designated wilderness areas of the southeastern portions of the Arctic Refuge.

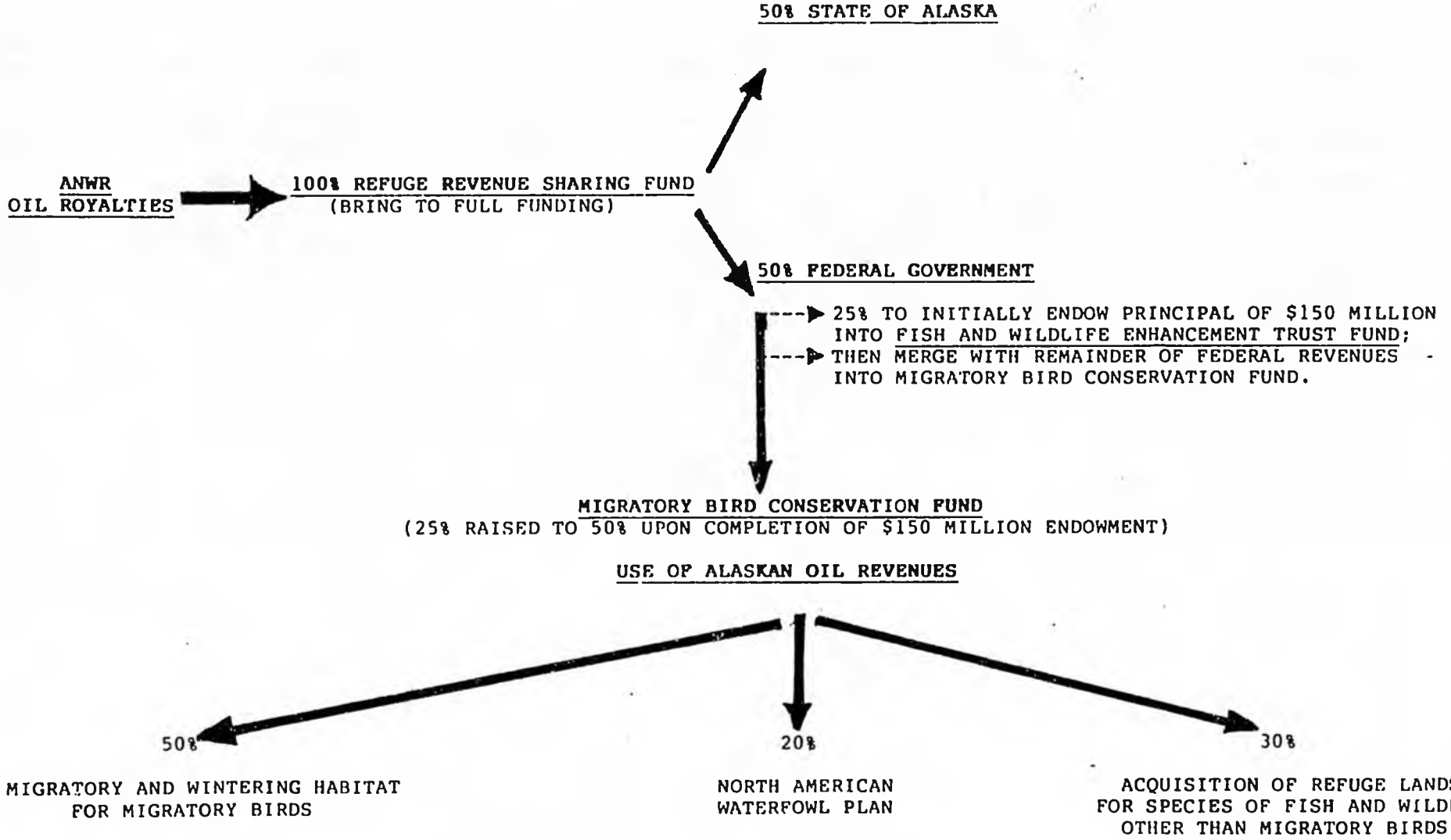
Coastal habitat: Protects approximately 15 miles of coastal lagoon/barrier island habitats (Beaufort and Angun Lagoons and Pokok Bay) and associated waterbird nesting and feeding habitats on the eastern shoreline of the coastal plain.

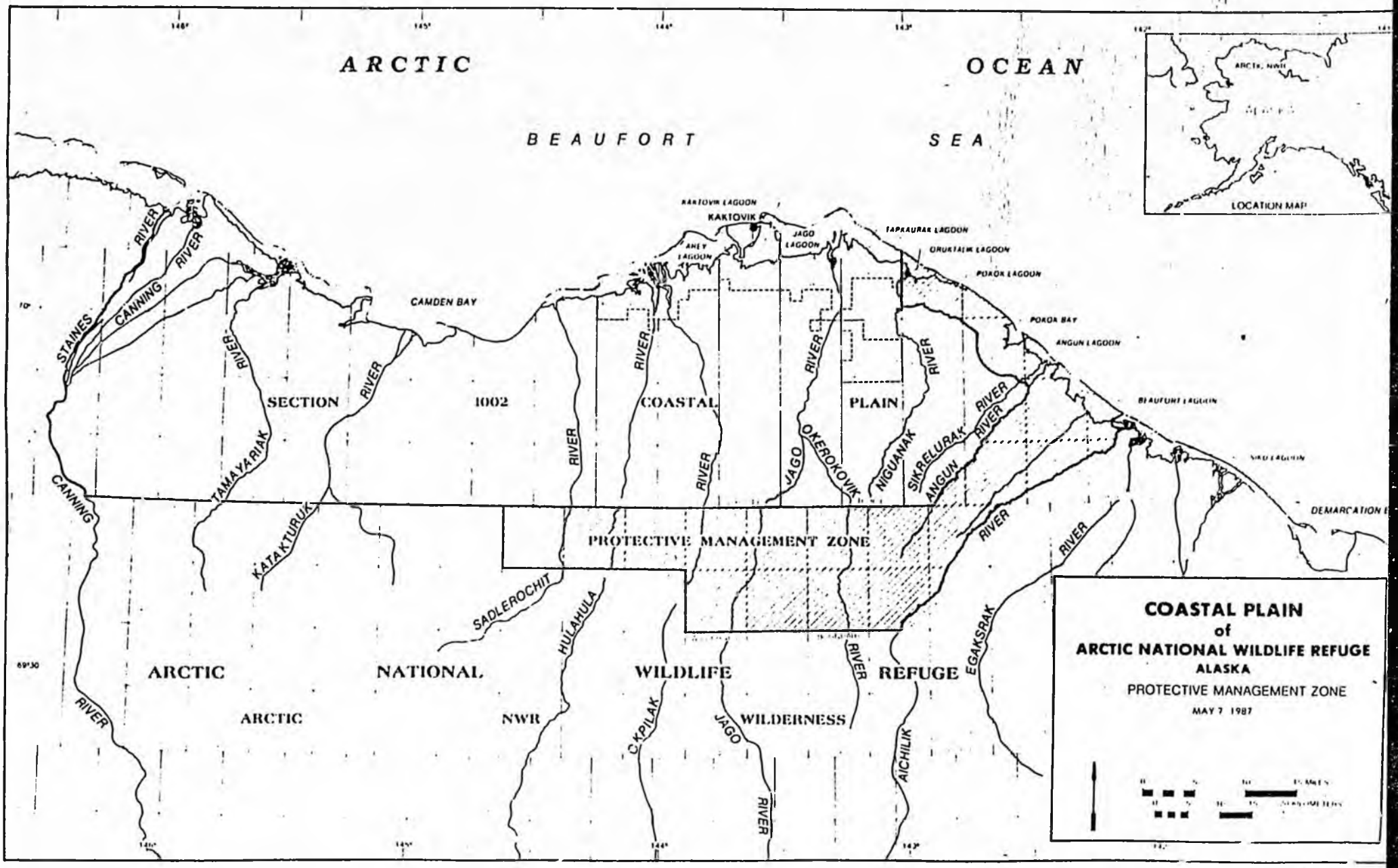
FLOW CHART
NATIONAL FISH AND WILDLIFE ENHANCEMENT ACT OF 1987

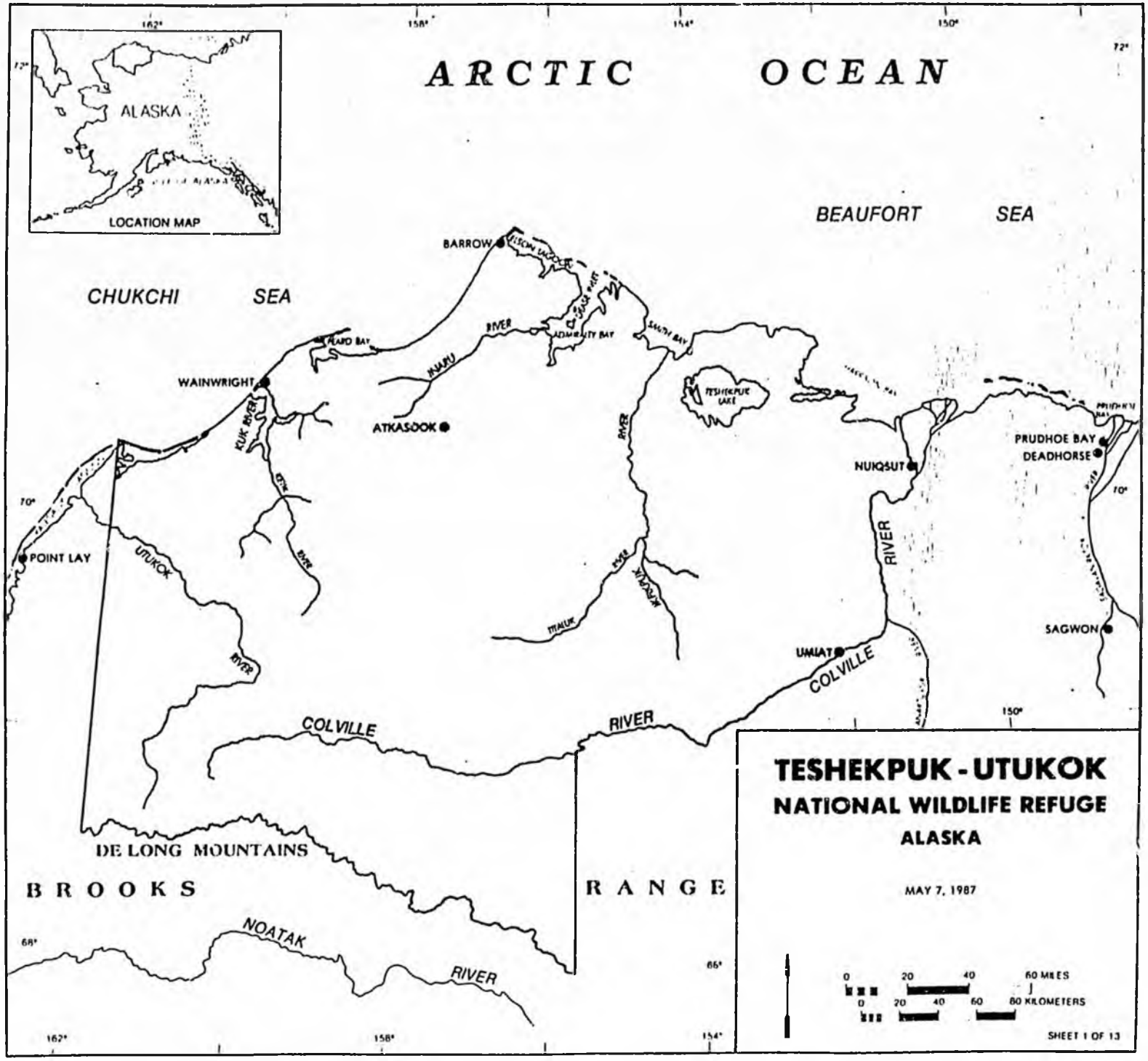
10/14/87



NATIONAL FISH AND WILDLIFE ENHANCEMENT ACT OF 1987
ALASKA OIL AND GAS ROYALTIES/REVENUES DISTRIBUTION




ARCTIC OCEAN
BEAUFORT SEA
LOCATION MAP
KAKTOVIK
KAKTOVIK LAGOON
JAGO LAGOON
TAPKAURAK LAGOON
ORUKTALIK LAGOON
POKOK LAGOON
POKOK BAY
ANGUN LAGOON
CAMDEN BAY
STAINES RIVER
CANNING RIVER
TAMAYA RIAK
KATAKTURUK RIVER
SECTION 1002
COASTAL PLAIN
JAGO RIVER
OKEROKOVIK RIVER
NIGUANAK RIVER
SIKRELURAK RIVER
ANGUN RIVER
PROTECTIVE MANAGEMENT ZONE
SADLEROCHIT RIVER
HULAHULA RIVER
CKPILAK RIVER
JAGO RIVER
AICHILIK RIVER
EGAKSRAK RIVER
ARCTIC NATIONAL WILDLIFE REFUGE
ARCTIC NWR WILDERNESS
COASTAL PLAIN
of
ARCTIC NATIONAL WILDLIFE REFUGE
ALASKA
PROTECTIVE MANAGEMENT ZONE
MAY 7 1987


ARCTIC OCEAN
BEAUFORT SEA
CHUKCHI SEA
ALASKA
LOCATION MAP
BARROW
WAINWRIGHT
ATKASOOK
POINT LAY
NUIQSUT
PRUDHOE BAY
DEADHORSE
SAGWON
UMIAT
COLVILLE RIVER
DE LONG MOUNTAINS
BROOKS RANGE
NOATAK RIVER
TESHEKPUK - UTUKOK
NATIONAL WILDLIFE REFUGE
ALASKA
MAY 7, 1987
0 20 40 60 MILES
0 20 40 60 80 KILOMETERS
SHEET 1 OF 13

TESTIMONY OF DENNIS D. KELSO
BEFORE THE HOUSE SUBCOMMITTEE ON
WATER AND POWER RESOURCES
October 8, 1987

Mr. Chairman and Members of the Subcommittee:

My name is Dennis Kelso. I am Commissioner of the Alaska Department of Environmental Conservation. With me today is Larry Dietrick, Director of our Division of Environmental Quality.

The Department of Environmental Conservation is responsible for protecting public health and the environment. We enforce regulations governing air quality, water pollution control, solid waste management, hazardous waste management, and oil spill prevention and response. We write permits specifying emission levels and disposal methods, monitor activities under permits, and take enforcement actions when needed. The Department has considerable experience with the effects of oil and gas related activities.

On Alaska's North Slope, the Department has developed stipulations for oil and gas lease sales, helped with siting of disposal facilities, and carried out the full range of environmental protection activities. We also participate in the design and review of environmental studies, collect monitoring data, and maintain a field office at Prudhoe Bay in Deadhorse.

Effective waste stream management for oil and gas activities in the Arctic National Wildlife Refuge (ANWR) requires the following steps:

1. Evaluation of past practices and operating procedures at other fields on the North Slope.

2. Advance planning for effective waste disposal facilities and practices.

3. Development and application of specific, effective requirements for industry as lease stipulations and permit conditions.

4. Coordination of efforts among agencies with authority to regulate oil and gas exploration and development.

5. Monitoring of impacts and compliance with environmental requirements.

I will briefly discuss each of these steps and will illustrate them with examples drawn from our experience with solid waste management. In addition to solid waste, key areas for adequate environmental protection measures include air quality, liquid wastes, hazardous wastes, spill prevention and response, and area of impact. I have included an overview of these issues as an attachment to my written testimony.

REVIEW OF WASTE MANAGEMENT PRACTICES IN ALASKA'S NORTH SLOPE OIL FIELDS

Decisions on the exploration and development of ANWR should reflect the experience and information gained by the State and the industry during operations at the National Petroleum Reserve in Alaska (where exploration began in the mid 1940's), Prudhoe Bay (where exploration confirmed the field in the late 1960's), Milne Point, Lisburne, Endicott, and the Kuparuk River oil fields. The technology and operating

methods used in oil and gas development have evolved considerably since the early days of Prudhoe Bay. Both the industry and the agencies have learned a great deal in the process. Operations in the newer fields at Endicott and Kuparuk differ substantially from those at Prudhoe. Some waste disposal practices have proven effective while others can and should be improved.

The Department is currently reviewing North Slope waste disposal practices. A technical accounting of these practices, a description of their evolution, and an assessment of potential impacts will help identify the most appropriate management regime for each waste stream for ANWR.

Moreover, there is a role for Congress in designing the waste stream management regime for ANWR by setting the standards to be met. If Congress concludes that some areas of ANWR warrant a particularly high degree of environmental protection, it may be appropriate, for example, to require removal of wastes from those areas. The level of protection deemed necessary by Congress can best be met through lease stipulations or permit conditions, evaluation of the effectiveness of these measures, and modification of the requirements if field experience warrants.

The State's waste stream management requirements have evolved in response to the North Slope oil development experience. During the past year the State developed new regulations for handling solid waste, particularly drilling muds. Those regulations are now in effect. They establish requirements for disposal of drilling muds and for water quality monitoring to ensure that the disposal techniques used will protect the environment.

PLANNING FOR ADEQUATE WASTE STREAM MANAGEMENT

Planning before start-up is essential for proper management of waste streams in ANWR. Inadequate planning before start-up was a major reason why some North Slope development occurred without the best technology. Similarly, inadequate planning led to the absence of sufficient waste disposal facilities for the oil field support industry, which does not have access to the same disposal facilities as the field operators. This has contributed to the abandonment of drums and dumping of other waste materials on vacant sites in the Deadhorse area.

Solid waste management provides numerous examples of the advantages of careful planning for disposal facilities and methods. Major sources of solid waste are garbage, drilling wastes, scrap metal, oily wastes, construction debris, drums, junked vehicles, tires and a host of other materials. Comprehensive waste material management plans could minimize the amount of waste and incorporate salvaging, reusing, and recycling as waste management tools. Backhauling scrap metal and crushed drums is an additional technique which could make most landfills in ANWR unnecessary. Ash and residue from incinerator operation could easily be consolidated into a single facility.

Comprehensive planning could also lead to regional disposal facilities. This would prevent unnecessary proliferation of landfills while enabling the support service industry to have access to proper disposal facilities. Ultimate disposal of pipelines, flow stations, camps, and related facilites should also be addressed at the outset of ANWR planning so that a financial mechanism is in place to provide for proper disposal upon completion of use.

Plans for management of drums should be required as a condition of operation. They should include inventory and tracking, cleaning, crushing, backhaul, and disposal of waste liquids or residues from cleaning.

PERMIT CONDITIONS AND LEASE STIPULATIONS

Stipulations placed in leases and conditions written into permits provide a means to address site-specific factors. Lease stipulations apply to the tracts to be explored and developed; they should be tailored to the conditions found there. An example of a solid waste issue that could be addressed by stipulation is the collection of litter and other debris.

Litter, including construction materials and other debris, can be a persistent problem near the arctic coast where flat terrain and strong winds combine to carry these materials considerable distances. Once "offsite", it is often difficult to determine their source. Consequently, it may be desirable to implement a "no fault" requirement in stipulations applied to successful tract bidders, so that litter and other debris are routinely collected regardless of their origin.

Permits are written to govern specific activities of the permit applicant, often in a particular location. They are useful in fine tuning the waste stream management system and in preventing undesirable side effects of disposal. For example, solid waste disposal facilities such as landfills require a permit from the Alaska Department of Environmental Conservation. By taking account of the site configuration and other circumstances, conditions written into the permit can help prevent air and water pollution which might otherwise result from an improperly placed or operated landfill. However, the site-specific characteristics of most permits also limit their ability to deal with area-wide problems involving many different activities. Waste management problems often affect large areas and several operators or industries. Consequently, permits are no substitute for area-wide planning for disposal needs.

Effective use of lease stipulations and permit conditions requires flexibility. Otherwise, new circumstances may undercut their appropriateness. Changes in available technology, legal requirements, or new scientific data may dictate corresponding changes in the way a particular waste is managed. In order to determine whether stipulations or permit conditions are having the intended effect, it is also necessary to monitor on a continuing basis.

COORDINATION AND REVIEW

To achieve the optimum level of environmental protection, State and Federal agencies and industry must coordinate their efforts. They must share data in order to ensure that the best available information is brought to bear on ANWR waste management issues. Agency requirements should also be consistent and flexible enough to respond to changing circumstances. Congress should establish a formal consultation process involving these parties. If developed properly, this would also allow the opportunity for the participating agencies to clarify their respective authorities and to avoid duplication.

Among the issues which this process would address are the timing of the various phases of development; the need for studies; and the coordination of permitting, operating plan reviews, field monitoring, and field approvals. In all aspects of this process, it is essential that State and Federal regulatory agencies maintain their own oversight responsibilities.

MONITORING

Monitoring provides data to evaluate the effectiveness of permit conditions and lease stipulations. It may demonstrate the need to modify environmental requirements or operating methods and may help identify areas where additional study is needed. Monitoring also allows a determination of whether operations are in compliance with these requirements and with other environmental standards. For example, data from water quality monitoring under the new drilling mud disposal regulations will show whether contamination is occurring. If it is, the regulations require corrective measures.

CONCLUSION

Governor Cowper has taken a firm position that ANWR exploration and development must be done right, that the environment and the special values of ANWR must be protected. I have outlined some of the steps that can be taken to achieve this goal. These are just highlights, of course. Oil and gas development in the Arctic is a complicated business and I have only touched on the major environmental issues to be addressed.

Mr. Chairman, the Department of Environmental Conservation is available to the members and staff to discuss the details of environmental matters affecting your decision about ANWR. Thank you for the opportunity to testify. We look forward to working with you.

Attachment

SUMMARY OF WASTE STREAM MANAGEMENT AND OTHER ENVIRONMENTAL PROTECTION ISSUES RELEVANT TO OIL AND GAS DEVELOPMENT IN THE ARCTIC NATIONAL WILDLIFE REFUGE

AIR QUALITY

The principal air pollutants discharged during oil and gas development are sulphur dioxide, suspended particulate matter, carbon monoxide, and nitrogen oxides. Concentrations of these four types of emissions depend, in large part, on the type and volume of fuel burned in the turbines, generators, and other internal combustion engines, the and the amount of flaring in the area.

Flaring is a significant contributor to visibility impairment. Flaring during exploratory flow testing and operational phases is potentially a major source of emission of soot -- primarily unburned hydrocarbons -- and other materials. Technology exists to prevent such problems in future developments.

The primary source of NOx at Prudhoe Bay is the more than 100 gas turbines, each rated at more than 10,000 horsepower. This may be the greatest concentration of large turbines in the world. Approximately 20 air quality permits have been issued, and three are pending. The cumulative annual discharge allowed under these permits is more than 90,000 tons of NOx. Actual emissions are approximately 70 to 90 percent of the permitted values. Modeling has been used to predict the ground level concentrations of NOx and ground level monitoring is now underway to verify the modeling effort and measure ambient levels.

LIQUID WASTE MANAGEMENT

Liquid waste discharges include domestic wastewater, reserve pit fluids, brine discharges, hydrostatic test discharges, vessel rinsates, radiographic wastes, excavation discharges, oily wastewater streams, equipment washing runoff, workover fluids, waste oil solvents, and a wide range of other wastewater streams. Each needs to be identified with a provision made for proper disposal.

Zero discharge of non-domestic (industrial) wastewater streams, with the possible exception of excavation dewatering, should be carefully considered for ANWR. Based upon current experience on the North Slope, alternatives to dewatering of reserve pits should be used in ANWR. The management regime selected for drilling wastes could eliminate the need to discharge to the tundra or roads. Conventional dust control measures or water should be used instead of wastewater. The planning stage should identify specific disposal methods for liquid waste streams classified under the Federal Resource Conservation and Recovery Act (RCRA) and non-RCRA liquid oily-waste streams. Rinsates from tank, vessel and truck cleaning also must be disposed properly. Consequently, both the oil field operators, and the oil field support service industry must have access to appropriate facilities. Underground injection, potentially an acceptable disposal solution for many of these waste streams, should be considered. Produced water disposal should be limited to subsurface techniques.

Unlined gravel impoundments have been used in other North Slope oil and gas developments to contain various wastewater streams. This technique may not be appropriate in ANWR because of its limited effectiveness and its requirement for large amounts of gravel.

Comprehensive planning is needed to ensure that liquid waste disposal solutions are available for all users. This would allow all liquid waste streams to be accurately identified, characterized, and quantified along with an acceptable method for disposal. For example, subsurface disposal options should be available for use by the support service industry.

SOLID WASTE MANAGEMENT

Major sources of solid waste are drilling wastes, scrap metal, oily wastes, construction debris, drums, junked vehicles, tires and a host of other materials. It is critical that proper management of all these wastes be addressed from the beginning. Drilling wastes are of particular concern. The State's new regulations governing drilling waste disposal provide an appropriate starting point.

Disposal of solid waste is another area for which careful planning can lead to development of proper facilities at the outset. Provisions for picking up "off-site" litter and other debris should be addressed by stipulation placed on successful tract bidders. Because it is often difficult to determine the source of off-site litter or debris, it may be desirable to implement a "no fault" policy by which litter and debris are routinely collected regardless of origin.

Plans for management of drums should be required as condition of operation. They should include inventory and tracking, cleaning, crushing, backhaul and disposal of waste liquids or residues from cleaning.

Garbage and other wastes which may attract wildlife should be incinerated. Collection and storage of such wastes must also avoid attracting wildlife. Plans for collection of these wastes and for central incineration should be prepared and adopted as a condition of field exploration and development.

Disposal methods for solid oily wastes from tank bottoms, sludges, hydrocarbon waxes, oil contaminated muds and cuttings and spill debris require very careful evaluation. At Prudhoe, the North Slope Borough operates one of two permitted non-RCRA solid oily waste disposal sites in Alaska. Results from the operation of this site are mixed.

Additional work and technology review are needed to develop acceptable solutions for this very difficult waste stream management issue. Incineration would provide the most reliable and complete solution to the problem. However, this is also more costly to the operators.

Comprehensive waste material management plans could minimize the amount of waste to be disposed and could incorporate salvaging, reusing, and recycling materials. Backhaul of scrap metal and crushed drums are additional tools which could make most landfills in ANWR unnecessary. Ash and residue from incinerator operation could easily be consolidated into a single facility.

Comprehensive planning to develop solutions for solid waste disposal must also enable the support service industry to have access to proper disposal options. Regional disposal facilities can also help prevent unnecessary proliferation of landfills. Ultimate disposal of pipelines, flow stations, camps and related facilities should be addressed at the outset of ANWR planning so that a financial mechanism is in place to provide for proper disposal upon completion of use.

HAZARDOUS WASTE MANAGEMENT

Hazardous waste management is governed by stringent requirements under the Federal Resource Conservation and Recovery Act (RCRA). Transportation of hazardous substances is regulated by the Federal Department of Transportation. The State has adopted hazardous waste regulations and is currently in the process of implementing them through a cooperative agreement with the Environmental Protection Agency.

As with other waste streams, it is essential that acceptable disposal methods be available both to the oil field operators and to the support service industry. Comprehensive planning is needed to develop appropriate management facilities at the outset.

OIL SPILL PREVENTION AND RESPONSE

Coordinated response capability should be required. Adequate oil spill contingency plans and secondary containment requirements for drums and small facilities are also important. Buffer zones should be established to isolate these facilities from sensitive areas.

If field gas or refining capacity is available to supply fuels it should be made available to the support service industry. This will significantly reduce the occurrence of spills by eliminating fuel storage and piping for space heating and electrical generation. Local availability of refined products to all users would eliminate haul road tanker spills.

AREA OF IMPACT

Many of the tools developed in other North Slope fields are directly applicable to minimize the "footprint" of individual drill sites and of the overall production effort. Appropriate facility siting criteria and buffer distances will also help maintain adequate levels of environmental protection.

Development plans should include the following: a design to minimize the number of drill sites and production facilities while optimizing the layout of roads and pipelines; provisions for a limited number of intensive use material sites; and plans to centralize and consolidate support facilities. Consolidation of the service industry at Kuparuk provides an example of centralized support services in planning for ANWR.

Ice pads should be considered for all exploratory drilling. Ice pads may also be used for temporary stockpiling of overburden and muds and cuttings.

Restoration of the site at each stage from exploration through production can reduce the cumulative impact of development activities. Adequate drainage must be provided for all facilities to prevent impoundments.

TESTIMONY OF DR. ALVIN G. OTT
BEFORE THE HOUSE SUBCOMMITTEE
ON WATER AND POWER RESOURCES
October 22, 1987

MR. CHAIRMAN AND MEMBERS OF THE SUBCOMMITTEE:

MY NAME IS DR. ALVIN G. OTT. I AM THE REGIONAL SUPERVISOR OF THE HABITAT DIVISION WITH THE ALASKA DEPARTMENT OF FISH AND GAME IN FAIRBANKS, ALASKA.

THE TESTIMONY PRESENTED TODAY FOCUSES ON OIL AND GAS EXPLORATION AND PRODUCTION IN THE 1002 AREA OF THE ARCTIC NATIONAL WILDLIFE REFUGE (ANWR), AND SPECIFICALLY HOW ENVIRONMENTAL IMPACTS FROM LARGE SCALE DEVELOPMENT PROJECTS CAN BE MITIGATED BASED ON EXPERIENCES WITH OIL AND GAS PRODUCTION ON THE NORTH SLOPE OF ALASKA. THE STATE OF ALASKA HAS CONSIDERABLE EXPERTISE, PARTICULARLY THE ALASKA DEPARTMENT OF FISH AND GAME (ADF&G), IN TERMS OF POTENTIAL IMPACTS TO FISH AND WILDLIFE RESOURCES AND ACCEPTABLE MITIGATION WITH RESPECT TO OIL AND GAS EXPLORATION AND PRODUCTION.

IT IS IMPORTANT TO RECOGNIZE THE SCOPE AND MAGNITUDE OF OIL PRODUCTION, AS CONTRASTED WITH EXPLORATION. THE STATE OF ALASKA'S COMMENTS ARE BASED ON THE ASSUMPTION THAT IF AN AREA IS LEASED, PRODUCTION OF OIL AND GAS MAY OCCUR. ENCLOSURE #1 OF THIS TESTIMONY DEPICTS OIL PRODUCING FACILITIES IN PLACE IN 1973 AND 1985 IN THE PRUDHOE BAY AND ADJACENT AREAS. AS CAN BE CLEARLY SEEN BY THE SIGNIFICANT INCREASE IN NUMBER OF FACILITIES BETWEEN 1973 AND 1985, OIL

PRODUCTION IS AN ONGOING ACTIVITY WITH FACILITIES BEING ADDED CONTINUALLY. FOR EXAMPLE, ARCO ALASKA, INC. RECENTLY SUBMITTED PRELIMINARY APPLICATIONS FOR ANOTHER SEVENTEEN DRILL PADS IN THE KUPARUK DEVELOPMENT AREA.

IN ORDER TO EFFECTIVELY MITIGATE POTENTIAL ADVERSE ENVIRONMENTAL EFFECTS OF OIL AND GAS ACTIVITIES, WE HAVE TAKEN THE FOLLOWING STEPS:

(1) A SIGNIFICANT AMOUNT OF INFORMATION HAS BEEN GATHERED BY THE U.S. FISH AND WILDLIFE SERVICE (USFWS) AND THE ADF&G OVER THE PAST FIVE YEARS ON THE DISTRIBUTION AND ABUNDANCE OF FISH AND WILDLIFE RESOURCES IN THE ANWR. THESE DATA HAVE BEEN REVIEWED AND ANALYZED IN ORDER TO IDENTIFY HABITATS OF SPECIAL CONCERN TO SELECTED SPECIES OF FISH AND WILDLIFE;

(2) DATA GAPS HAVE BEEN IDENTIFIED AND STUDIES RECOMMENDED TO FILL THESE DATA GAPS;

(3) EXISTING OIL AND GAS ACTIVITIES ON THE NORTH SLOPE HAVE BEEN EXAMINED TO DETERMINE THE TYPE AND NUMBER OF FACILITIES REQUIRED FOR THE PRODUCTION OF OIL AND GAS IN COMMERCIAL QUANTITIES AND THE IMPACTS OF THESE FACILITIES ON FISH AND WILDLIFE HABITATS;

(4) GENERAL MITIGATIVE MEASURES (FOR EXAMPLE, ENVIRONMENTALLY SOUND STANDARDS FOR FACILITY SITING) THAT WE HAVE FOUND NECESSARY TO ENSURE ADEQUATE PROTECTION OF KEY FISH AND WILDLIFE HABITATS HAVE BEEN RECOMMENDED TO THE DEPARTMENT OF THE INTERIOR (DOI); AND

(5) RECOMMENDATIONS HAVE BEEN MADE TO THE DOI TO ENSURE THAT A PROPER LEGAL FRAMEWORK IS IN PLACE FOR A SOUND REGULATORY BASIS FOR THE IMPLEMENTION AND ENFORCEMENT OF REQUIRED MITIGATION.

IT ALSO WILL BE NECESSARY TO REFINE AND MODIFY MITIGATIVE MEASURES BASED ON FUTURE RESEARCH AND NEW INFORMATION.

FURTHERMORE, IF AREAS WITHIN ANWR ARE LEASED, SITE SPECIFIC MITIGATION WILL BE NEEDED FOR EACH EXPLORATION AND PRODUCTION PLAN. FIELD MONITORING AND COMPLIANCE ALSO WILL BE REQUIRED TO ENSURE, TO THE EXTENT PRACTICABLE, THAT MITIGATIVE MEASURES ARE WORKABLE AND THAT COMPLIANCE IS ACHIEVED DURING FIELD ACTIVITIES.

THE STATE OF ALASKA'S RECOMMENDED STRATEGY FOR MITIGATING ADVERSE IMPACTS OF OIL AND GAS EXPLORATION AND PRODUCTION IN THE 1002 AREA OF THE ANWR IS BASED ON A CLEAR AND DISTINCT SEPARATION OF THE EXPLORATION PHASE FOR OIL AND GAS AND THE PRODUCTION PHASE OF AN OIL OR GAS FIELD OF COMMERCIAL SIZE. OUR RECOMMENDATIONS FOLLOW:

(1) WE HAVE REQUESTED THAT THE DOI PREPARE SEPARATE TERMS AND CONDITIONS FOR THE EXPLORATION AND PRODUCTION PHASES. WE BELIEVE THAT WITH SEASONAL CONSTRAINTS ON EXPLORATION ACTIVITIES (E.G., WINTER DRILLING WITH SOME ALL-SEASON ACTIVITY) MOST OF THE POTENTIAL ADVERSE EFFECTS OF OIL AND GAS EXPLORATION CAN BE MITIGATED EFFECTIVELY.

IN CONTRAST, IF OIL AND GAS ARE FOUND IN QUANTITIES SUFFICIENT FOR PRODUCTION, THE POTENTIAL FOR IMPACTS TO FISH AND WILDLIFE AND THEIR HABITATS ARE ORDERS OF MAGNITUDE GREATER. PRODUCTION OF OIL AND GAS WILL THEREFORE REQUIRE A SUBSTANTIAL NUMBER OF ADDITIONAL STEPS TO ENSURE ADEQUATE ENVIRONMENTAL PROTECTION.

(2) OUR STRATEGY FOR ENSURING EFFECTIVE MITIGATION OF ADVERSE IMPACTS TO FISH AND WILDLIFE RESOURCES INVOLVES TWO BASIC CONCEPTS. FIRST, THE ESTABLISHMENT OF A JOINT STATE/FEDERAL PROGRAM COVERING THE FOLLOWING PHASES OF OIL AND GAS EXPLORATION AND PRODUCTION IS REQUIRED:

(a) PROJECT PLANNING INCLUDING NECESSARY FIELD STUDIES;
(b) A TECHNICAL ANALYSIS OF PROPOSED DESIGNS, PLANS, AND PROCEDURES (I.E., DESIGN REVIEW);
(c) PERMITTING;
(d) FIELD MONITORING; AND
(e) COMPLIANCE.

SECOND, DEVELOPMENT OF EFFECTIVE ENVIRONMENTAL MITIGATION FOR THE PRODUCTION PHASE OF OIL AND GAS DEVELOPMENT IS NEEDED.

IN ORDER TO WORK EFFECTIVELY WITH THE OIL AND GAS INDUSTRY, A JOINT STATE/FEDERAL INTERDISCIPLINARY TEAM WOULD OVERSEE AND PARTICIPATE IN PROJECT PLANNING, PROJECT DESIGN REVIEW, PERMIT ACTIONS, FIELD MONITORING, AND COMPLIANCE. IN ALL ASPECTS OF THIS PROCESS, IT IS ESSENTIAL THAT STATE AND FEDERAL REGULATORY AGENCIES MAINTAIN THEIR OVERSIGHT RESPONSIBILITY WHILE WORKING COOPERATIVELY AND CLOSELY WITH THOSE PARTIES RESPONSIBLE FOR OIL- AND GAS-RELATED ACTIVITIES. AS RESEARCH RESULTS BECOME AVAILABLE IN THE FUTURE, THIS GROUP WOULD INCORPORATE APPROPRIATE CONCLUSIONS IN PROJECT PLANNING AND APPROVALS. PROGRAMS FOR ENSURING PROTECTION OF FISH AND WILDLIFE RESOURCES AND HABITATS EXIST AND HAVE BEEN USED SUCCESSFULLY IN ALASKA FOR LARGE SCALE DEVELOPMENT PROJECTS SUCH AS THE TRANS-ALASKA PIPELINE SYSTEM AND THE PRECONSTRUCTION PHASE OF THE ALASKA NATURAL GAS TRANSPORTATION SYSTEM.

DEVELOPMENT OF EFFECTIVE MITIGATION METHODS AND PROCEDURES IS A PROCESS THAT WILL CONTINUE AS LONG AS THERE IS OIL AND GAS ACTIVITY. A NUMBER OF GENERAL RECOMMENDATIONS ALREADY HAVE BEEN MADE BY THE STATE OF ALASKA BASED ON ADF&G'S MITIGATION POLICY AND EXPERIENCES WITH NORTH SLOPE OIL AND GAS EXPLORATION AND PRODUCTION IN SUCH AREAS AS THE NATIONAL PETROLEUM

RESERVE-ALASKA AND IN OIL PRODUCING FIELDS SUCH AS PRUDHOE BAY, MILNE POINT, ENDICOTT, KUPARUK, AND LISBURNE.

THE ADF&G HAS BEEN INVOLVED IN GATHERING BIOLOGICAL INFORMATION IN ANWR FOR THE LAST SIX YEARS. OUR GAME BIOLOGISTS HAVE WORKED COOPERATIVELY WITH THE USFWS SINCE 1981 ON BASELINE BIOLOGICAL STUDIES. PERSONNEL FROM THE DIVISION OF SUBSISTENCE HAVE CONDUCTED RESEARCH IN THE KAKTOVIK AND ARCTIC VILLAGE AREAS DOCUMENTING RESOURCE USE PATTERNS OF INDIVIDUALS LIVING IN THESE AREAS. THESE EFFORTS ON THE PART OF ADF&G PERSONNEL CONTINUE TODAY IN THE ANWR 1002 AREA, AND OUR HABITAT BIOLOGISTS HAVE BEEN INVOLVED WITH LARGE SCALE CONSTRUCTION PROJECTS THROUGHOUT ALASKA INCLUDING THE PRUDHOE AND KUPARUK OIL FIELD COMPLEXES. WE HAVE ANALYZED THE INFORMATION ON FISH AND WILDLIFE RESOURCES IN THE ANWR, IDENTIFIED SIGNIFICANT DATA GAPS, AND RECOMMENDED MITIGATIVE MEASURES IN LIGHT OF OUR EXPERIENCES WITH NORTH SLOPE OIL AND GAS PRODUCTION AND OTHER OIL-RELATED DEVELOPMENTS WITHIN THE STATE.

IN THE SPRING OF 1986, THE ADF&G EVALUATED THE AVAILABLE RESOURCE INFORMATION FOR THE 1002 AREA AND IDENTIFIED HABITATS OF SPECIAL CONCERN. SPECIFIC EMPHASIS WAS PLACED ON KEY SPECIES IN THE 1002 AREA SUCH AS CARIBOU, MUSKOXEN, ARCTIC CHAR, SNOW GEESE, AND POLAR BEARS. BASED ON THIS EVALUATION, RECOMMENDATIONS WERE MADE TO THE DOI FOR THE MITIGATION OF POTENTIAL ADVERSE IMPACTS TO FISH AND WILDLIFE RESOURCES, THEIR HABITATS, AND USES OF THESE RESOURCES FOR SUBSISTENCE PURPOSES. NOTABLE AREAS OF CONCERN INCLUDED THE FOLLOWING:

(1) THE "CORE CALVING AREA" OF THE PORCUPINE CARIBOU HERD;

(2) A THREE MILE BUFFER ZONE ALONG THE COAST USED BY VARIOUS SPECIES OF WATERFOWL, CARIBOU, AND POLAR BEARS;

(3) FRESH WATER SPRING AREAS SUPPORTING OVERWINTERING FISH;

(4) THE NEARSHORE MARINE ENVIRONMENT USED BY ANADROMOUS FISH AND WATERFOWL DURING THE SUMMER MONTHS; AND

(5) RIPARIAN HABITATS ALONG MAJOR STREAM SYSTEMS.

MITIGATIVE MEASURES FOR THESE HABITATS WERE RECOMMENDED TO ENSURE THE PROPER PROTECTION OF THE VARIOUS FISH AND WILDLIFE SPECIES THAT USE THESE HABITAT TYPES. UTILIZING THIS INFORMATION, WE RECOMMENDED GENERAL APPROACHES TO EFFECTIVE MITIGATION, AS WE DEEMED IT PREMATURE TO PROVIDE RECOMMENDATIONS ON A SITE-SPECIFIC BASIS. IN RECOMMENDING THESE MITIGATIVE MEASURES, WE GAVE DUE CONSIDERATION TO THE FACT THAT CERTAIN ACTIVITIES AND FACILITIES ASSOCIATED WITH PRODUCTION WOULD BE NEEDED IN SOME OF THESE IMPORTANT HABITATS. IN THESE PARTICULAR CASES, THE RECOMMENDATIONS MADE WERE BALANCED WITH KNOWN REQUIREMENTS OF OIL AND GAS EXPLORATION AND PRODUCTION. ALTHOUGH THESE MEASURES WOULD MITIGATE MANY OF THE EFFECTS OF EXPLORATION AND DEVELOPMENT, IT SHOULD BE NOTED THAT SOME EFFECTS CANNOT BE FULLY MITIGATED.

TO ILLUSTRATE HOW THE PROCESS MIGHT WORK IN THE 1002 AREA OF THE ANWR, WE WILL DISCUSS A HABITAT OF SPECIAL CONCERN - STREAM SYSTEMS AND ASSOCIATED RIPARIAN HABITATS - COUPLED WITH AN EXPLORATION AND PRODUCTION ISSUE - INDUSTRIAL REQUIREMENTS FOR TREMENDOUS QUANTITIES OF GRAVEL AND WATER. THIS IS BUT ONE OF THE ENVIRONMENTAL ISSUES THAT WILL HAVE TO BE ADDRESSED IF PORTIONS OF THE 1002 AREA OF ANWR ARE LEASED - EXAMPLES OF SOME OTHER ISSUES ARE DISCUSSED BRIEFLY IN ENCLOSURE II.

BASED ON RESOURCE INFORMATION CURRENTLY AVAILABLE FOR THE 1002 AREA, THE ADF&G DETERMINED THAT STREAM SYSTEMS AND

THEIR ASSOCIATED RIPARIAN HABITATS WERE OF MAJOR IMPORTANCE TO MANY FISH AND WILDLIFE SPECIES. MOOSE ON THE NORTH SLOPE OCCUR ALMOST EXCLUSIVELY IN RIPARIAN HABITATS, POLAR BEAR DENS FREQUENTLY ARE LOCATED IN AREAS OF DRIFTED SNOW SUCH AS CUTBANKS ALONG LOWER PORTIONS OF THE RIVERS, MAJOR NORTH/SOUTH MOVEMENT CORRIDORS FOR CARIBOU AND MUSKOXEN OCCUR ALONG RIPARIAN HABITATS, SHOREBIRD AND PASSERINE DENSITIES AND DIVERSITIES ARE HIGHEST IN STREAM SYSTEMS AND ASSOCIATED RIPARIAN HABITATS, AND FISHERIES RESOURCES (E.G., ARCTIC CHAR, ARCTIC GRAYLING, WHITEFISH) ARE DEPENDENT ON THESE SYSTEMS. BASED ON THESE RESOURCE VALUES WE RECOMMENDED THAT THESE AREAS BE AFFORDED THE NECESSARY DEGREE OF PROTECTION AND THAT ALL OIL AND GAS FACILITIES WHICH CAN BE MOVED BE PLACED OUTSIDE OF A 3/4 MILE BUFFER ADJACENT TO THE MAJOR RIVER SYSTEMS.

CONSTRUCTION OF FACILITIES WITHIN ANWR OR BETWEEN ANWR AND THE TRANS-ALASKA PIPELINE SYSTEM WOULD OCCUR OVER PERMAFROST SOILS. CURRENT CONSTRUCTION TECHNIQUES REQUIRE THAT ALL STRUCTURES BE PLACED ON GRAVEL PADS WITH A NOMINAL THICKNESS OF FIVE FEET TO PROVIDE ADEQUATE INSULATION, THEREBY PREVENTING THAW DEGREDATION OF UNSTABLE SOILS. ROADS CONNECTING ALL MAJOR OIL AND GAS FACILITIES AND CAUSEWAYS IN THE NEARSHORE ENVIRONMENT ALSO REQUIRE SIGNIFICANT VOLUMES OF MINERAL MATERIAL. WATER REQUIREMENTS ASSOCIATED WITH ICE ROAD AND PAD CONSTRUCTION, HYDROTESTING OF PIPELINES, DRILLING, SAFETY, AND DOMESTIC WATER REQUIREMENTS ARE SIGNIFICANT, AND GREATLY EXCEED THE AMOUNT OF FREE WATER AVAILABLE IN THE ANWR 1002 AREA DURING THE WINTER MONTHS. THE VOLUME OF WATER IN RIVER SYSTEMS PEAKS DURING SPRING RUNOFF AND AFTER SUMMER STORMS BUT DIMINISHES TO ZERO DURING THE LONG WINTER MONTHS WITH THE EXCEPTION OF SPRING AREAS FED BY GROUNDWATER. ISOLATED DEEP POOLS MAY OCCUR WITHIN SOME OF THE MAJOR RIVER SYSTEMS SUCH AS THE CANNING RIVER. INADEQUATE WATER RESERVES EXIST WITHIN ANWR TO SUPPORT LARGE SCALE EXPLORATION OR PRODUCTION ACTIVITIES.

AT THE PRESENT TIME IN THE OILFIELD AROUND PRUDHOE BAY, GRAVEL IS OBTAINED FROM LARGE MINE SITES (SURFACE AREA OF 40 TO 100 ACRES WITH A MINING DEPTH OF 35 TO 70 FEET) LOCATED BOTH WITHIN AND ADJACENT TO STREAM SYSTEMS. DURING THE LAST SEVEN YEARS, GRAVEL REMOVAL DIRECTLY FROM ACTIVE FLOODPLAIN AREAS HAS BEEN DISCOURAGED BY RESOURCE AGENCIES DUE TO A LACK OF FIELD SURVEILLANCE AND COMPLIANCE AND THE NEED TO ESTABLISH WATER RESERVOIRS. NEW GRAVEL SITES HAVE BEEN LOCATED IN WETLAND AREAS ADJACENT TO STREAM SYSTEMS. FOLLOWING COMPLETION OF MINING AT SPECIFIC GRAVEL SITES, THE MINED-OUT SITES HAVE BEEN FLOODED WITH WATER DURING THE BREAKUP PERIOD AND HAVE BEEN CONVERTED INTO WATER RESERVOIRS. RECENT WORK BY THE ADF&G AT SEVERAL OF THESE INUNDATED GRAVEL SITES INDICATES THAT WITH PROPER SITE RESTORATION AND CONTROL OF WATER USE, SOME NET BENEFIT TO SELECTED FISH AND WILDLIFE SPECIES MAY BE ATTAINABLE. TO DATE, HOWEVER, NO MATERIAL SITES IN THE PRUDHOE BAY AREA HAVE BEEN RESTORED IN SUCH A MANNER THAT THEY PROVIDE SUITABLE HABITAT FOR FISH AND WILDLIFE.

THE STATE OF ALASKA RECOGNIZED, AS DID DOI, THAT PIPELINES AND ROADS WOULD HAVE TO CROSS THESE MAJOR STREAMS AND RIPARIAN HABITATS. PERFORMANCE STANDARDS ON CROSS DRAINAGE WERE DEVELOPED AND PROVIDED TO THE DOI. THESE PERFORMANCE STANDARDS WERE BASED ON EXPERIENCE GAINED DURING THE PAST DECADE OF WORK WITH OIL AND GAS ON THE NORTH SLOPE. THEREFORE, WE RECOMMENDED THAT A COMPREHENSIVE PROGRAM BE INITIATED TO FULLY ASSESS GRAVEL AND WATER AVAILABILITY IN THE ANWR 1002 AREA, INCLUDING AVAILABILITY OF GRAVEL IN FLOODPLAIN AND RIPARIAN HABITATS. DECISIONS ON LOCATIONS OF GRAVEL SITES SHOULD NOT BE MADE WITHOUT AN ADEQUATE DATA BASE ON THE GRAVEL RESOURCES AVAILABLE IN THE VARIOUS HABITAT TYPES, THE MATERIAL REQUIREMENTS FOR EACH EXPLORATION OR PRODUCTION SCENARIO, AND THE IMPACTS OF THE VARIOUS MINE SITE ALTERNATIVES ON FISH AND WILDLIFE HABITAT.

IN THE ANWR AREA, HOWEVER, IT APPEARS THAT THE BEST LOCATION FOR AT LEAST SOME GRAVEL SITES MAY INDEED BE IN RIVER SYSTEMS. THIS SHIFT IN APPROACH IS BASED ON INFORMATION COLLECTED BY THE ADF&G ON THE NORTH SLOPE THAT INDICATES THAT SOME OF THE GRAVEL SITES THAT HAVE BEEN CONVERTED TO WATER RESERVOIRS MAY ALSO PROVIDE USABLE HABITAT FOR FISH AND OTHER WILDLIFE SPECIES. HOWEVER, TO DEVELOP GRAVEL SITES IN FLOODPLAIN ENVIRONMENTS AND CONVERT THEM TO USABLE WATER RESERVOIRS WHILE STILL PROVIDING SOME LONG TERM BENEFIT TO FISH AND WILDLIFE, WILL REQUIRE A FULL COMMITMENT ON THE PART OF INDUSTRY AND REGULATORY AGENCIES TO RESOLVE THIS ISSUE. ADVANCE PLANNING, APPROPRIATE DATA COLLECTION, AND ASSESSMENT OF THE OPTIMAL GRAVEL SITES IN TERMS OF SITE LOCATION, MINING PLANS, OPERATIONS, AND REHABILITATION WILL BE REQUIRED.

THEREFORE, WE RECOMMENDED TO THE DOI THAT ALTERNATIVE SOURCES OF WATER BE CONSIDERED, AND THAT GRAVEL SITES BE SITED, DEVELOPED, AND RESTORED IN A MANNER SUCH THAT OVERALL IMPACTS TO WATER QUALITY AND FISH AND WILDLIFE RESOURCES ARE MITIGATED. A POSSIBLE APPROACH TO SUCH A RESOLUTION FOLLOWS.

> A JOINT STATE/FEDERAL INTERDISCIPLINARY TEAM WORKING WITH INDUSTRY SHOULD IDENTIFY ALTERNATIVE APPROACHES FOR THE ACQUISITION OF LARGE QUANTITIES OF WATER AND GRAVEL, INCLUDING NEEDED FIELD STUDIES. SUBSURFACE GEOTECHNICAL STUDIES TO IDENTIFY GRAVEL RESOURCES (QUANTITIES, QUALITY, AND LOCATION) IN VARIOUS HABITAT TYPES SHOULD BE REQUIRED PRIOR TO SUBMITTAL OF INDIVIDUAL PERMIT APPLICATIONS. WORK SHOULD BE INITIATED TO DEVELOP DESIGN CRITERIA AND STANDARDS FOR THE DEVELOPMENT OF MINING PLANS INCLUDING RESTORATION OF GRAVEL SITES CONCURRENT WITH MINING OPERATIONS. MINING PLANS SHOULD BE PREPARED TO INCLUDE CONSIDERATION FOR FISH AND WILDLIFE USE FOLLOWING COMPLETION OF MINING. ALL AREAS, INCLUDING STREAM AND ASSOCIATED RIPARIAN SYSTEMS SHOULD BE CONSIDERED WITH THE OBJECTIVE OF PROVIDING GRAVEL, SUBSEQUENT WATER SITES FOR SUPPORT OF INDUSTRIAL ACTIVITIES, AND FISH AND WILDLIFE HABITAT. ASSUMING THESE ACTIONS ARE TAKEN, WE BELIEVE THAT THE ISSUE OF GRAVEL AND WATER AVAILABILITY AND MITIGATION OF EFFECTS TO FISH AND WILDLIFE RESOURCES CAN BE RESOLVED WITHOUT SIGNIFICANT ADVERSE EFFECTS TO FISH AND WILDLIFE IN THE 1002 AREA OF ANWR. WE ALSO BELIEVE THAT THE POTENTIAL EXISTS FOR PROVIDING HABITAT TO SELECTED SPECIES AS WAS DEMONSTRATED IN THE FIVE YEAR GRAVEL STUDY CONDUCTED BY A CONSULTING FIRM FOR THE USFWS.

WE HAVE FOCUSED ON AN OVERALL APPROACH TO MITIGATION OF ADVERSE IMPACTS TO FISH AND WILDLIFE RESOURCES USING WATER AND GRAVEL TO ILLUSTRATE AN EXAMPLE IN WHICH IMPACTS OF OIL AND GAS PRODUCTION COULD BE MITIGATED IF THE PROPER PROCEDURES WERE FOLLOWED. WE KNOW THAT THERE WILL BE TREMENDOUS DEMANDS FOR WATER AND GRAVEL IF EXPLORATION AND PRODUCTION OCCUR, AND WE KNOW THAT GRAVEL AND WATER SOURCES WILL HAVE TO BE DEVELOPED. WE KNOW THAT WATER IS NOT READILY AVAILABLE IN ANWR. WE ALSO KNOW THAT STREAMS AND ASSOCIATED RIPARIAN HABITATS MUST BE AFFORDED A HIGH DEGREE OF PROTECTION. USING THESE KNOWN FACTORS AS WELL AS OUR EXPERIENCES WITH OIL AND GAS DEVELOPMENT ELSEWHERE ON THE NORTH SLOPE, WE HAVE RECOMMENDED A WORKABLE APPROACH TO RESOLUTION OF THIS PROBLEM WHILE AT THE SAME TIME ENSURING AN ACCEPTABLE LEVEL OF PROTECTION FOR FISH AND WILDLIFE RESOURCES.

UNLIKE THE GRAVEL AND WATER EXAMPLE, WE DO NOT CURRENTLY BELIEVE THAT SUFFICIENT INFORMATION NOR EFFECTIVE MITIGATIVE MEASURES EXIST TO PREVENT ADVERSE IMPACTS TO THE PORCUPINE CARIBOU HERD WITHIN THE CORE CALVING AREA. AT THIS TIME, MR. KEN WHITTEN (ADF&G) WILL DISCUSS THE PORCUPINE CARIBOU HERD WITH EMPHASIS ON CARIBOU CALVING IN THE 1002 AREA.

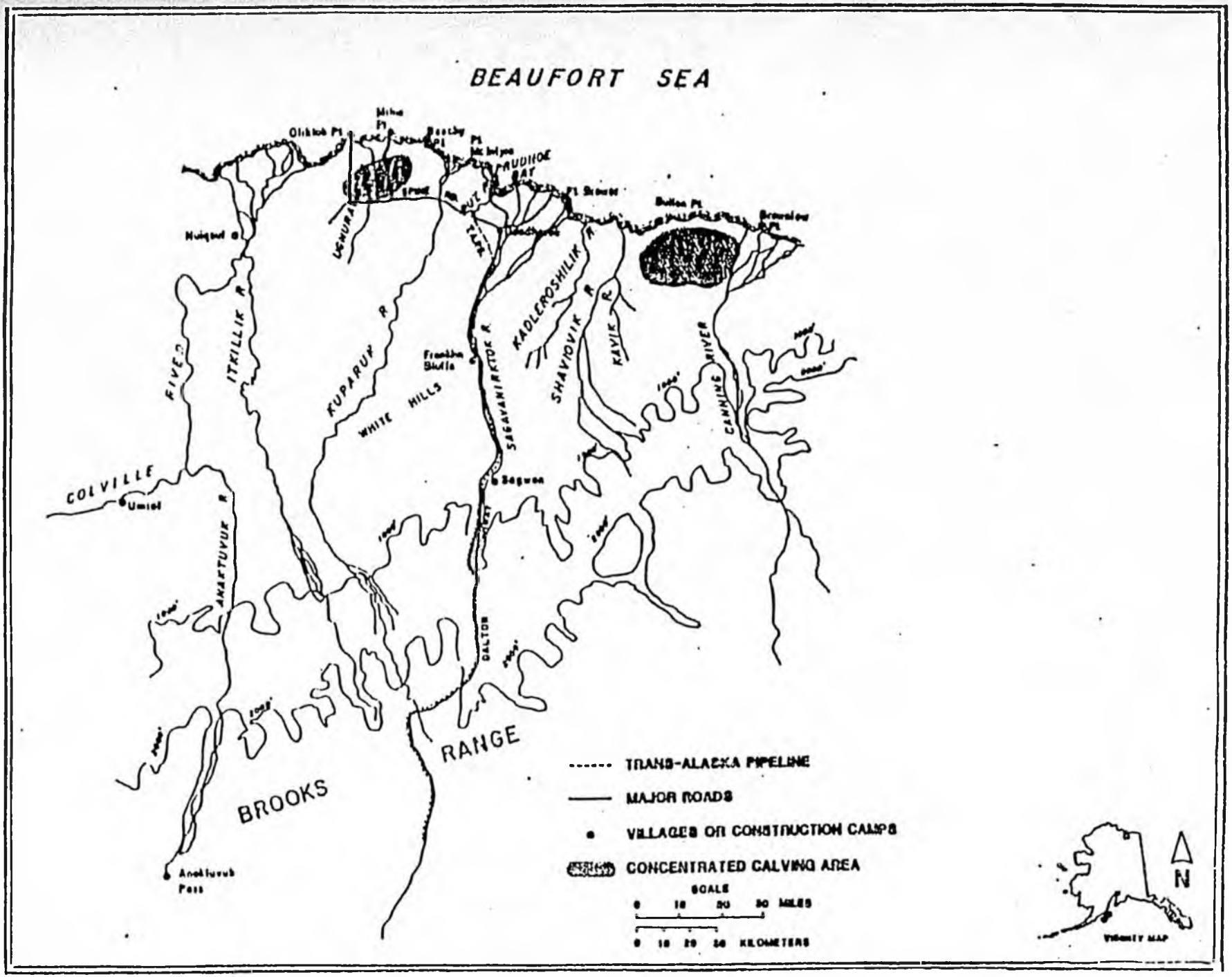
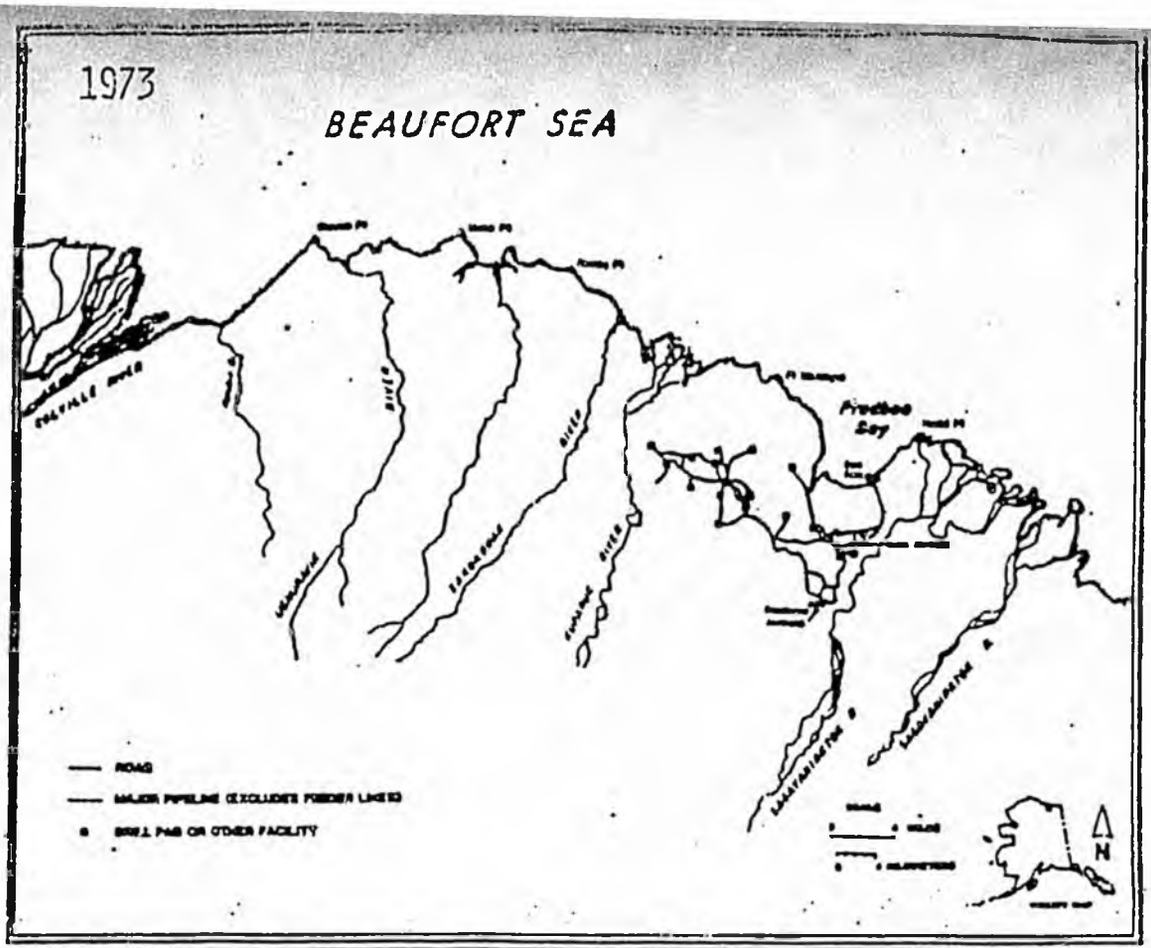

BEAUFORT SEA
Oliktok Pt
Mikkelsen Pt
Barter Island
Pt McIntyre
PRUDHOE BAY
Pt Storkersen
Bullen Pt
Brownlow Pt
Nuiqsut
LAKURAK
ITKILLIK R
FIVE
KUPARUK R
White Hills
Franklin Bluffs
SAGAVANIRKTOK R
KADLEROSHILIK R
SHAVIOVIK R
KAVIK R
CANNING RIVER
COLVILLE
Umiat
Sagwon
AKARTUVUK R
DALTON
BROOKS RANGE
Anaktuvuk Pass
TRANS-ALASKA PIPELINE
MAJOR ROADS
VILLAGES OR CONSTRUCTION CAMPS
CONCENTRATED CALVING AREA
SCALE
0 10 20 30 MILES
0 10 20 30 KILOMETERS
N
VICINITY MAP

FIGURE 1.


1973
BEAUFORT SEA
Prudhoe Bay
ROAD
MAJOR PIPELINE (EXCLUDES FEEDER LINES)
DRILL PAD OR OTHER FACILITY

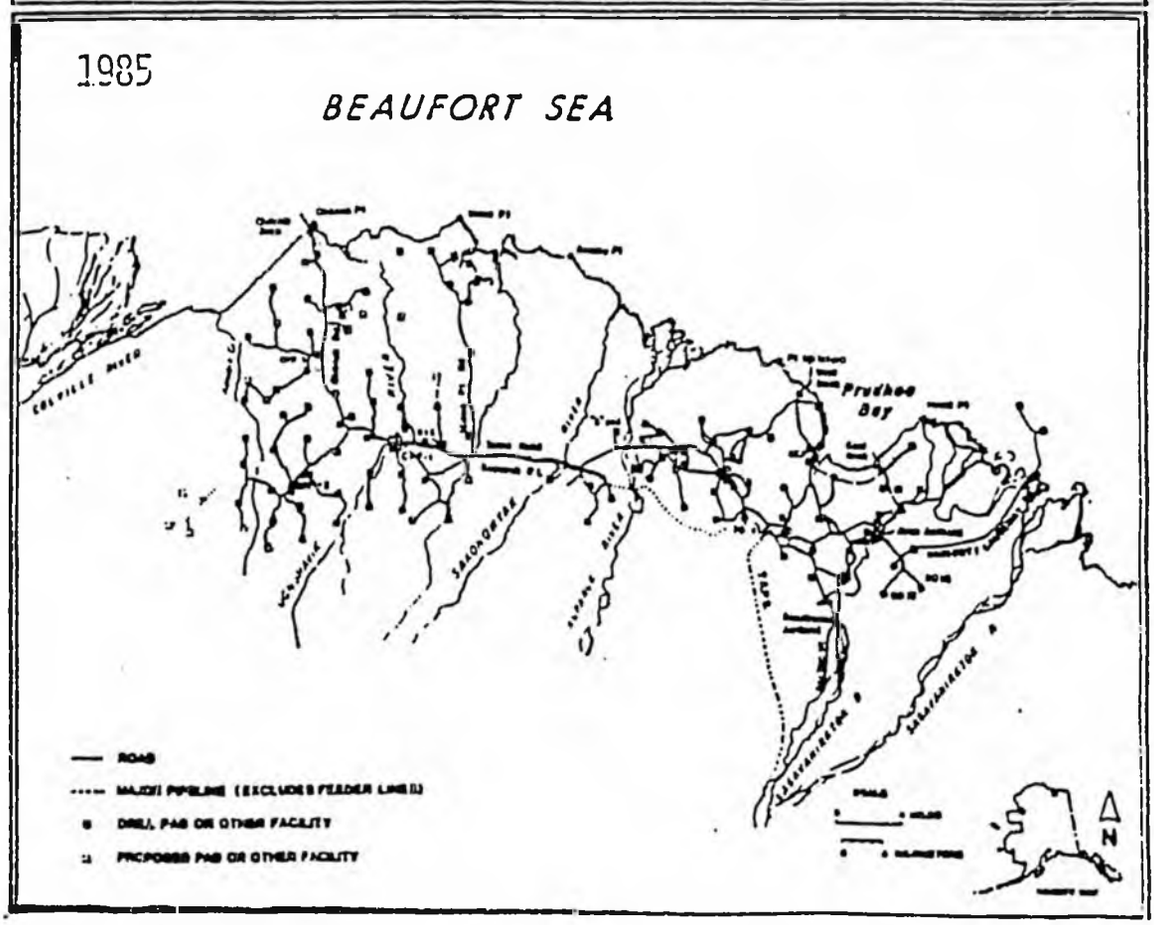

1985
BEAUFORT SEA
Prudhoe Bay
ROAD
MAJOR PIPELINE (EXCLUDES FEEDER LINES)
DRILL PAD OR OTHER FACILITY
PROPOSED PAD OR OTHER FACILITY

FIGURE 2.

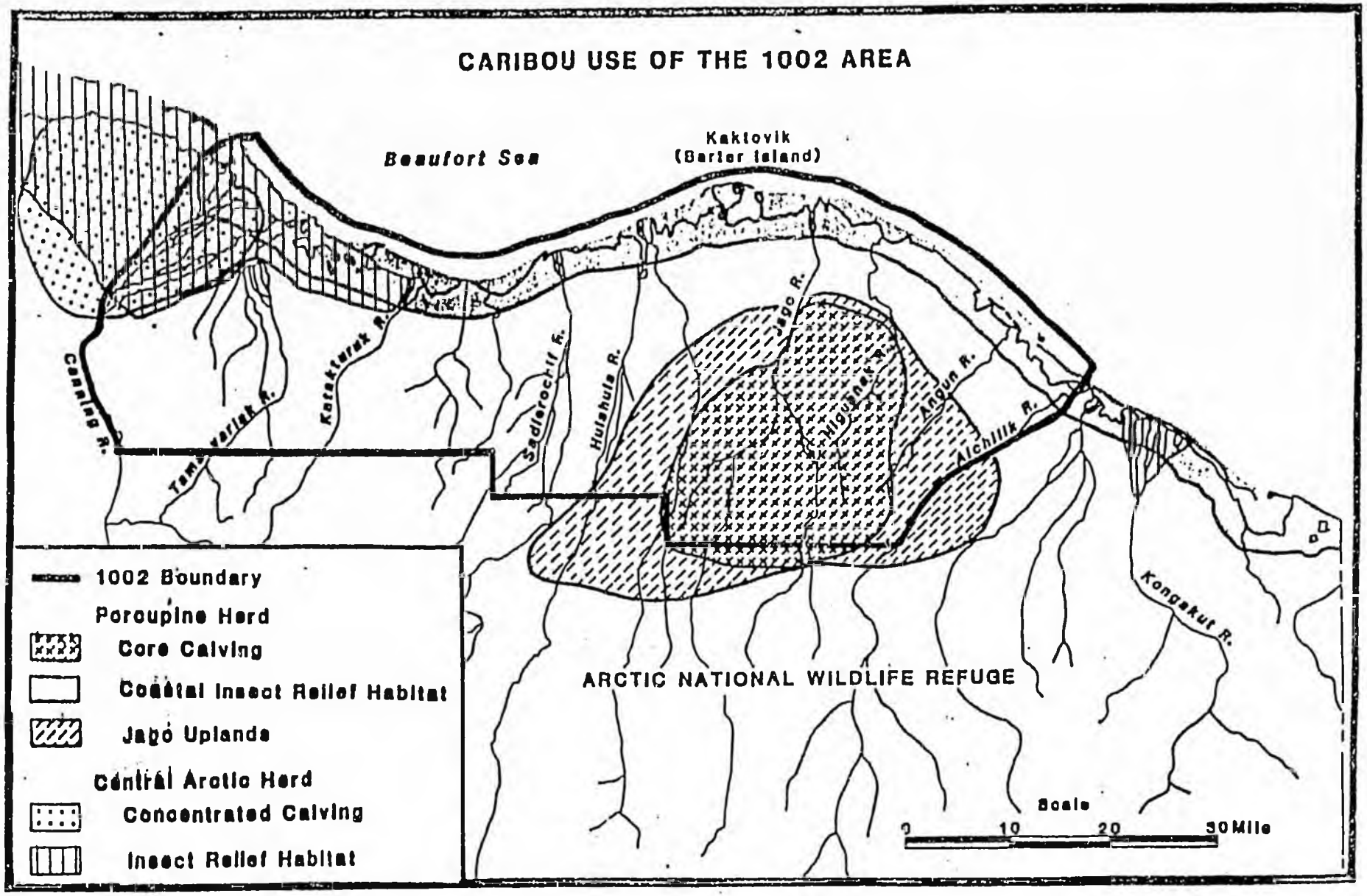

CARIBOU USE OF THE 1002 AREA
Beaufort Sea
Kaktovik
(Barter Island)
Canning R.
Tamayariak R.
Katakturuk R.
Sadlerochit R.
Hulahula R.
Jago R.
Niguanak R.
Angun R.
Aichillik R.
Kongakut R.
ARCTIC NATIONAL WILDLIFE REFUGE
1002 Boundary
Porcupine Herd
Core Calving
Coastal Insect Relief Habitat
Jago Uplands
Central Arctic Herd
Concentrated Calving
Insect Relief Habitat
Scale
0
10
20
30 Mile

FIGURE 3.

TABLE 1. YEAR-BY-YEAR ANALYSIS OF CALVING DISTRIBUTION OF THE PORCUPINE CARIBOU HERD.

Year	Jago Uplands[1] Used?	Jago Uplands[1] Most Used?	Confidence Rating	Survey Methods	Investigators
1972	Yes	--	Low		RRCS[2], ADF&G
1973	Yes	Yes	Low		RRCS
1974	Yes	No	Low	Nonsystematic aerial surveys, infrequent flights; no radio collars	RRCS
1975	Yes	Yes	Low-medium		RRCS
1976	Yes	--	Low-medium		RRCS
1977	Yes	--	Low-medium		RRCS
1978	Yes	Yes	Medium	Systematic aerial transect surveys including density estimates; few radio collars (12); infrequent relocations	YGB[3]
1979	Yes	Yes	Medium		YGB
1980	Yes	No	Medium		YGB
1981	Yes	Yes	Medium		YGB
1982	No	No	High	Daily aerial surveys with frequent relocations of many (20-80) radio-collared cows	ADF&G, USFWS
1983	Yes	Yes	High		ADF&G, USFWS
1984	Yes	Yes	High		ADF&G, USFWS
1985	Yes	Yes	High		ADF&G, USFWS
1986	Yes	No	High		ADF&G, USFWS
1987	Yes	No	High		ADF&G, USFWS

CONCLUSIONS: The Jago Uplands were used as a concentrated calving area over 90% of the time. The Jago Uplands area was the most heavily used area for calving within the Porcupine Caribou Herd range over 60% of the time.

[1]Coastal plain/foothill area between Hulahula and Aichilik Rivers; the "core calving area", as defined in the draft 1002 report, falls within this area.

[2]Renewable Resources Consulting Services

[3]Yukon Game Branch

TESTIMONY OF KEN WHITTEN
BEFORE THE HOUSE SUBCOMMITTEE
ON WATER AND POWER RESOURCES
October 22, 1987

Mr. Chairman and members of the SubCommittee:

My name is Ken Whitten. I am a game biologist for Interior Alaska for the Alaska Department of Fish and Game.

INTRODUCTION

The Porcupine Caribou Herd (PCH) is a significant international resource. Its lengthy migrations are an impressive ecological event and an important link in the Northern Alaska and Yukon wildlife and human ecosystem. Several Indian and Eskimo communities on both sides of the border rely heavily on the PCH for subsistence.

During their annual cycle, pregnant cows of the PCH migrate to the coastal plain in Alaska and northwestern Canada to calve. Although some calving likely occurs over most of the coastal plain, calving concentrations are readily apparent in some areas. The concentration area which has been most frequently and heavily used has been called the "core" calving area.

The PCH also forms huge post-calving aggregations. These huge aggregations move extensively within the coastal plain and foothills to gain relief from mosquitoes and other insect pests. Biologists believe that unrestricted access to these relief areas is important to the herd's well-being.

The State of Alaska is concerned that oil and gas development in the 1002 area of the Arctic National Wildlife Refuge (ANWR) could adversely affect use of calving areas. We have recommended that approximately 15% of the 1002 area, that portion delineated in the draft 1002 report as the "core" calving area, be deferred from leasing for ten years. During this moratorium, a seven-year research program would be undertaken to improve our understanding of the importance of this core calving area, to assess the effects that oil development may have on use of the area, and to develop appropriate mitigative measures.

In addition, in order to mitigate the effect of development on the use of early summer habitat we have recommended that, within three miles of the coast, only those facilities that cannot be sited elsewhere be allowed. We have also recommended that a study be undertaken to evaluate the responses of large aggregations to a road/pipeline simulation and to develop measures that would assure free passage of these aggregations.

The objective of the approach described here is to ensure the viability of the Porcupine Caribou herd. I want to emphasize, however, that there may be other ways to achieve this objective. We remain open to hearing other ideas which may accomplish this end. The State would like to work with the Interior Committee to develop an approach which will foster exploration and development of the oil and gas potential of the Coastal Plain while protecting the Porcupine Caribou herd.

THE CENTRAL ARCTIC HERD EXPERIENCE

Before considering the distribution of the PCH within the ANWR coastal plain, we will review the status of knowledge on the responses of the Central Arctic Herd (CAH) to petroleum development in the Prudhoe Bay area and comment on the relevance of those observations to the ANWR issue. We will discuss the effect of development on habitat use and

population size sequentially. As the principal concerns for both herds currently apply only to calving and midsummer, the discussion will be restricted to those two periods.

Habitat Use

Results of aerial surveys over the past ten years indicate that the majority of the CAH, like other arctic herds in North America, calves predictably in certain specific areas--primarily near Milne Point and the Canning Delta (Fig. 1), but also in the adjacent uplands to the south. When spring snowmelt is late, relatively more calving occurs in inland areas than in coastal regions. In the "average" year, however, most parturient cows are found in coastal concentrations.

Estimates of caribou density have also been made during the calving period for various regions between the Colville and Canning Rivers. The results show that densities within the area encompassing the Prudhoe Bay oilfield complex are less than one-half of the next lowest density area and less than one-tenth of the highest density area. While there is little reason to believe that the immediate Prudhoe Bay area previously supported particularly high densities of calving caribou (i.e., on the order of those near Milne Point or the Canning Delta), we believe that reduced calving in that area is due to the presence of a major oilfield complex.

Additional abnormalities in calving distribution have been observed in the vicinity of the Milne Point oilfield complex, west of Prudhoe Bay. A comparison of caribou distribution during the four years prior to construction with that during the four years after road placement indicates that only half as many cows and calves used the area within two miles of the road right-of-way after the road was build. The logical implication of these results is that an extensive, dense network of transportation corridors may well result in widespread loss of calving habitat. In hindsight, we believe that this occurred in the Prudhoe Bay complex as it grew from a minor oilfield with minimal support facilities in the early 1970's, to a large development center. Additional losses of calving habitat within the traditional concentration area west of Prudhoe Bay may be forthcoming as the Kuparuk and Milne Point oilfields continue to expand to their full recovery potential. Figure 2 depicts the regional growth of oil-related development that has occurred in only 12 years.

The second of our major concerns involves a decline in the use of developed areas during midsummer. During this period, caribou must maximize nutrient intake to promote growth and fattening, and, in the case of maternal females, to meet the metabolic demands of lactation. It is generally believed that failure to attain a minimum standard of body condition by autumn may result in reduced reproductive performance of females and predispose calves to higher rates of mortality.

The summer grazing process is complicated considerably by the frequent appearance of insect pests, which become active during warm, calm periods. Caribou of the CAH respond to insect attack by aggregating and moving rapidly to coastal areas where lower temperatures and higher winds discourage insect activity. With an abatement of insect attack, caribou disperse and drift inland to preferred feeding areas. Thus, numerous movements may occur between coastal insect relief habitat, where energy expenditure can be minimized, and inland foraging areas, where energy intake can be maximized. The result, in theory, is a net increase in energy retention. We therefore believe that unrestricted summer movements are of considerable importance.

Unfortunately, our experience in the Prudhoe Bay area over the past decade suggests that maintaining the functional integrity of caribou summer range might not be possible, given the widespread surface use requirements for oil and gas development. Overall caribou density within the oilfield complex is considerably lower than in adjacent areas, and cows and calves are not present in normal numbers. Apparently, industrial growth of the area has also greatly restricted the east-west summer movements of caribou. In the late 1960's and early 1970's, several authors reported the passage of large groups (i.e., in the thousands) through what is now the main oilfield complex. Since the late 1970's, however, there has been little movement of caribou through this complex. The known movements of numerous radio-collared caribou confirm this observation.

Recent observations suggest that CAH caribou are experiencing difficulty gaining access to various components of summer range within the Kuparuk and Milne Point oilfields. As oil development in the region continues to expand and intensify, large portions of habitat may become inaccessible. Thus far, however, caribou have continued to occupy the general region in moderate numbers, despite localized abnormalities in distribution and the impediments to movement posed by an increasingly complex system of roads and pipelines. But the future is uncertain with respect to continual use of this portion of CAH summer range.

Population size

The CAH has undergone rapid growth during the period of oil development in the Prudhoe Bay area--from 6,000 in 1978 to an estimated 16,000 at present, in spite of the affects on habitat use discussed above. The following factors may account for the increase in herd size:

1. Only a small percentage of the total calving and summer range has been affected to date, and it appears that suitable alternative areas remain available.

2. Wolves, a major predator of caribou, were sharply reduced in the region in the late 1970's.

3. Hunter harvest has been generally low.

4. Winter weather has been generally favorable.

5. Summer insect activity has been low-to-moderate--at least in recent years.

6. Mitigative measures have been incorporated into the Kuparuk and Milne Point oilfields in the form of modified pipeline configurations, special crossing structures, and some restrictions on traffic.

Favorable environmental factors, some of which are short-term, make it impossible to determine what affect development has had on the long-term health of the Central Arctic Herd.

Experiences with the CAH provide the primary basis for predicting the responses of PCH caribou to oil development. However, we believe that the two herds are not entirely comparable in terms of susceptibility to disturbance, owing to differences in herd size and the distribution of seasonal habitats. In contrast to the apparently numerous habitat options available to the CAH, the PCH has relatively few. Quite simply, with a narrower coastal plain within ANWR, less calving habitat is available to the PCH--an effect that

is compounded further by its greater size. The net result is less flexibility in the use of calving areas. Also, the PCH typically forms huge aggregations in midsummer. These are frequently on the order of 50,000-80,000 animals, far larger than those of the CAH, which tend to number only 3,000-4,000 at maximum. Recent work on the CAH indicates that large groups have considerably more difficulty negotiating roads and pipelines than small groups, but it is impossible to predict at this time how large aggregations of the PCH would react to production facilities, roads and pipelines, and human activity characteristic of oilfields, much less the long-term consequences to the population of serious perturbations in distribution and movements that might occur as a result. Also, the PCH would contact industrial development on the coastal plain for only a brief period each year (i.e., less than 2 months), and might therefore react more strongly to disturbance stimuli than CAH caribou. That is, the PCH may be relatively "naive," and predictions based on CAH responses may underestimate the impacts on caribou within ANWR.

On the other hand, much of the knowledge gained on the CAH over the past ten years should apply rather well to the PCH. For example, there is little reason to expect that the qualitative responses of PCH females during calving will be markedly different from those documented for CAH females; we can anticipate similar avoidance responses to linear structures placed within calving areas. And we now know from work on the CAH that heavy traffic on roads, in close proximity to elevated pipelines, reduces caribou crossing success. Mitigation strategies, such as buried pipelines, road/pipeline separations, and strict traffic restrictions could be effective on both herds.

THE PORCUPINE CARIBOU HERD

The PCH occupies three fairly distinct wintering areas in Alaska and western Canada: The vicinity of Arctic Village and Venetie, the Richardson Mountains, and the Ogilvie Mountains/upper Peel River. In spring, pregnant females move northward along three principal routes, known as the Old Crow, Richardson, and Chandalar routes. The onset of spring migration, the particular route selected, and rate of travel are highly dependent on regional snow conditions and the wintering area occupied. Movements appear to be highly "purposeful," in that cows delayed by adverse snow conditions compensate by subsequently traveling faster (often 20-30 km/day) when conditions improve. The initial destination appears to be a "staging area" along the lower Firth River in Canada, which is often snow-free earlier than other areas to the west. If snow conditions are generally favorable on the coastal plain, cows will continue westward to the main calving area south of Barter Island. Some calving occurs elsewhere on the coastal plain, creating the false impression of a broad continuum of calving activity; but in the overwhelming majority of years for which adequate records are available, a large calving concentration was clearly apparent between the Hulahula and Aichilik Rivers.

After calving, the bulls and yearlings, which had slowly followed the northward progression of snow-melt and "green-up," join the cows and newborn calves. Large mixed aggregations (in the tens of thousands) form on or near the main calving area and move extensively within the coastal plain, frequently under the influence of insect harassment. By mid-July most of these aggregations have moved eastward along the coast into Canada, although variable numbers of caribou move directly through the mountains, thence to midsummer ranges in Canada or on the south slopes of the eastern Brooks Range. In late summer, caribou begin a drift toward wintering areas, completing the annual cycle of movement.

The central issue here is the location and use of a discrete calving area by the PCH. It should be emphasized that the concept of traditional calving areas is not new. Since the 1960's, caribou herds have been identified on the basis of their use of a common calving ground. Such areas have been described for most Alaskan and Canadian herds, and several herds in the Soviet Union as well. The available data on many herds indicate that there are areas of concentrated calving within traditional calving grounds. Those concentration areas occupied most frequently in high density are known as "core" calving areas.

The survey methodologies employed over the years have been extremely variable in terms of timing, overall effort, type and number of aircraft used, and the availability of radio-collared caribou. Also, many early surveys yielded data that are of marginal usefulness in addressing the present issue. Surveys since 1982 were designed for the express purpose of closely monitoring movements, determining actual calving sites, and delineating calving concentrations. We now routinely employ satellite-tracking technology and conventional radio-telemetry techniques as integral components of our field program.

In spite of recent improvements in our surveillance capabilities, virtually all data on PCH calving distribution are principally qualitative and descriptive. Some progress has been made in quantifying the occurrence of caribou in various areas, but precise density figures are still lacking, and boundaries are based largely on subjective judgment.

A second problem lies in the dynamics of the calving process itself, in that a changing situation is extremely difficult to describe using point-in-time measurements. Calving occurs continuously over roughly a two-week period, during which an individual female caribou may be both highly mobile and nearly sedentary. Thus, at any given time during the calving period, some pregnant females are enroute to actual calving sites, others with new calves are relatively stationary, and still others with older calves may be undergoing moderate movements characteristic of the post-calving phase. For this reason, survey results obtained early in the calving period may be more a reflection of movements into calving areas than the distribution of caribou during calving per se; similar errors are likely if surveys are conducted too late in the calving period.

Such problems in the design and timing of surveys, together with other unknowns regarding the completeness and quality of coverage, place severe limitations on reinterpreting much of the early information on calving distribution of the PCH. In fact, considerable care must be taken to avoid refining the analyses beyond the inherent precision of the original data. These and other restrictions preclude a totally precise delineation of calving concentrations for any given year.

Nevertheless, consistencies in calving distribution do emerge when 16 years' data are superimposed graphically. Even the most cursory examination reveals a clear pattern of recurrent--albeit not exclusive--use of the Jago Uplands, between the Hulahula and Aichilik Rivers (Fig. 3). In more than 90% of the annual observations, this area included a calving concentration. Furthermore, in more than 60% of the years for which estimates of relative caribou abundance were reported, the Jago Uplands supported more calving caribou than any other area within the PCH range (Table 1).

The "core" calving area, as defined in the draft 1002 report, lies within the Jago Uplands. The core area

describes the zone of heaviest use for calving, based on a thorough examination of all available data. In addition, participants at a 1985 caribou workshop sponsored by USFWS agreed that this core area best describes a common zone of concentrated calving activity, and that it is of sufficient size to accommodate the majority of calving caribou in the herd.

Recurrent, heavy use of certain calving areas implies a strong preference, and the persistence of such a tradition implies a net benefit to the herd in terms of calf production and survival. Among the possible attributes of calving concentration areas are:

1. A relative scarcity of predators.

2. Early snow ablation with locally advanced forage availability.

3. Proximity to insect relief habitat.

Most likely, several factors are instrumental in sustaining an affinity for certain specific calving areas, and all may not be important in a given year. It is conceivable that, from an evolutionary point of view, the tradition is retained primarily to offset the effects of exceptionally adverse conditions, perhaps in the form of heavy predation or deep snow during the previous winter; the periodic advantages derived from certain habitats would therefore tend to buffer fluctuations in the herd. The overall benefits to the PCH may be extremely subtle, but nonetheless important to the long-term well-being of the population.

INFORMATION NEEDS

The State has recommended that leasing in the core calving area be deferred for a ten-year period. During this moratorium, a research program would be undertaken that consists of four main components:

1. To evaluate the physical and biological characteristics of core and peripheral calving areas; features such as the vegetation, topography, meteorology, predator abundance, predation rates, and caribou use would be compared between core and peripheral areas.

2. To evaluate the effects of oil development on caribou calving distribution; because oil development would not occur within the core calving area of the PCH, this evaluation would rely on the continuation of the long-term study of the CAH, and especially the responses of calving caribou to continued development in the Kuparuk oilfield.

3. To evaluate the effects of oil development on insect-induced movements, particularly movements of the extremely large groups that commonly occur in the PCH; this component would focus on the responses of such large groups to a simulated transportation system, as well as analyzing the bioenergetics of such movements.

4. To characterize the caribou harvest in villages within the range of the PCH, principally Kaktovik and Arctic Village; this baseline information would be used in evaluating the effects of oil development on subsistence use of caribou.

We believe that the results of this research program would improve our understanding of the importance of the core

calving area to the PCH, and would improve our ability to predict the potential effects of oil development on the herd, thereby providing a more informed basis for recommending mitigative measures.

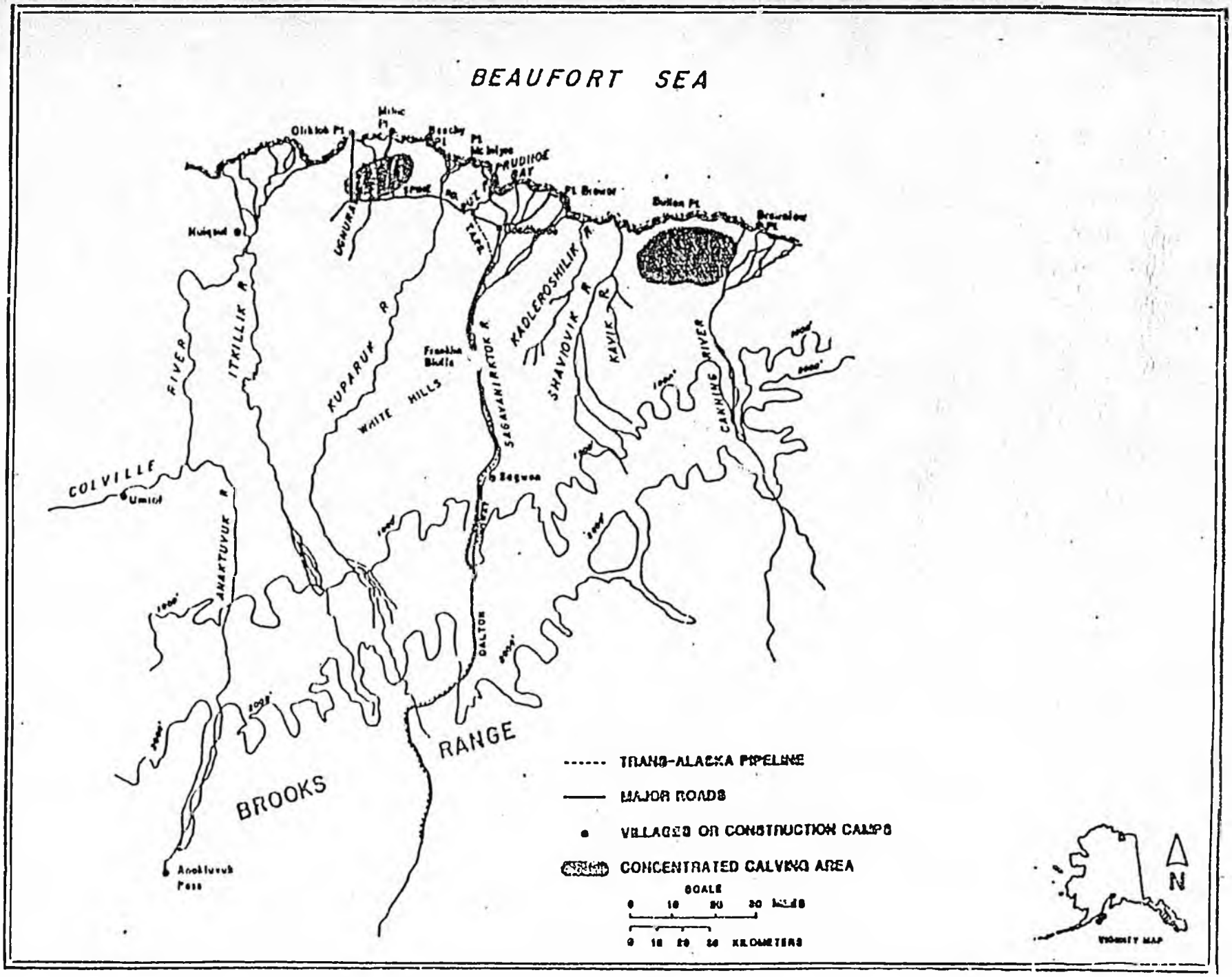
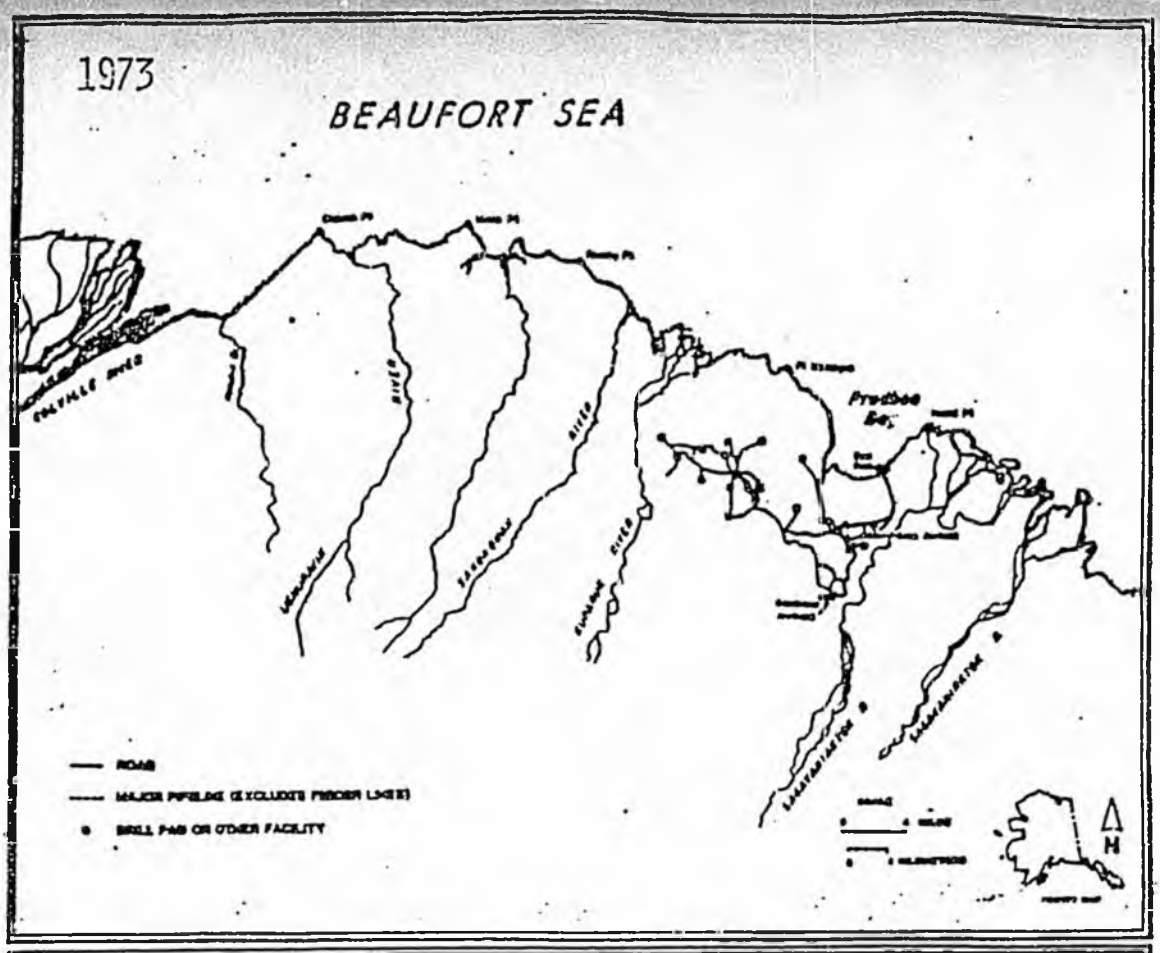

BEAUFORT SEA
Oliktok Pt.
Milne Pt.
Beechy Pt.
Pt. McIntyre
PRUDHOE BAY
Pt. Brower
Barrow
Nuiqsut
UGNURAK
TAPE
KADLEROSHILIK R.
SHAVIOVIK R.
KAVIK R.
CANNING RIVER
KUPARUK R.
WHITE HILLS
SAGAVANIRKTOK R.
Franklin Bluffs
Sagwon
COLVILLE
Umiat
ANAKTUVUK R.
ITKILLIK R.
FIVER
DALTON
BROOKS RANGE
Anaktuvuk Pass
TRANS-ALASKA PIPELINE
MAJOR ROADS
VILLAGES OR CONSTRUCTION CAMPS
CONCENTRATED CALVING AREA
SCALE
0 10 20 30 MILES
0 10 20 30 KILOMETERS
N
VICINITY MAP

FIGURE 1.


1973
BEAUFORT SEA
Prudhoe Bay
ROAD
MAJOR PIPELINE (EXCLUDES FEEDER LINES)
DRILL PAD OR OTHER FACILITY

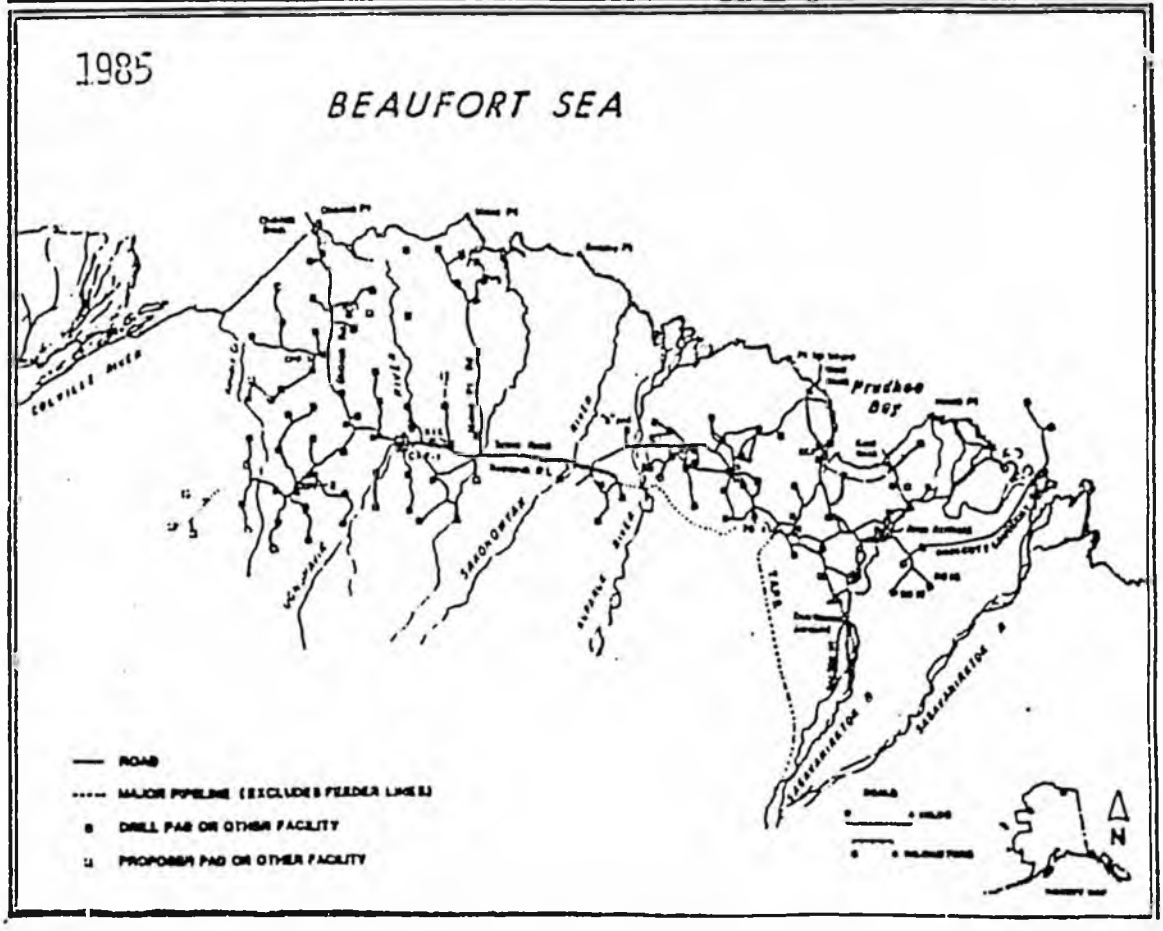

1985
BEAUFORT SEA
Prudhoe Bay
ROAD
MAJOR PIPELINE (EXCLUDES FEEDER LINES)
DRILL PAD OR OTHER FACILITY
PROPOSED PAD OR OTHER FACILITY

FIGURE 2.

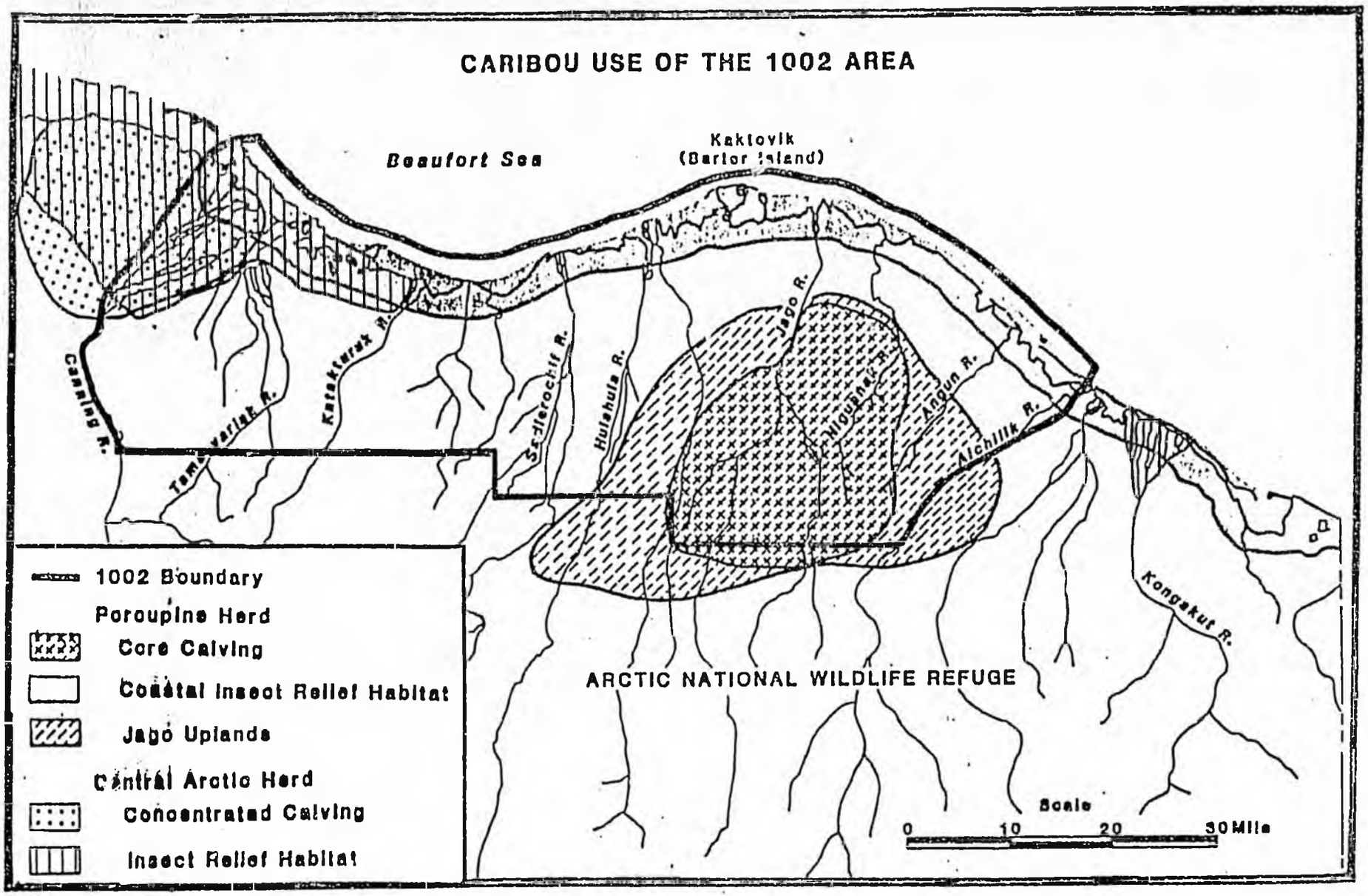

CARIBOU USE OF THE 1002 AREA
Beaufort Sea
Kaktovik
(Barter Island)
Canning R.
Tamayariak R.
Katakturuk R.
Sadlerochit R.
Hulahula R.
Jago R.
Niguanak R.
Angun R.
Aichillik R.
Kongakut R.
ARCTIC NATIONAL WILDLIFE REFUGE
1002 Boundary
Porcupine Herd
Core Calving
Coastal Insect Relief Habitat
Jago Uplands
Central Arctic Herd
Concentrated Calving
Insect Relief Habitat
Scale
0
10
20
30 Mile

FIGURE 3.

TABLE 1. YEAR-BY-YEAR ANALYSIS OF CALVING DISTRIBUTION OF THE PORCUPINE CARIBOU HERD.

Year	Jago Uplands[1] Used?	Jago Uplands[1] Most Used?	Confidence Rating	Survey Methods	Investigators
1972	Yes	--	Low		RRCS[2], ADF&G
1973	Yes	Yes	Low		RRCS
1974	Yes	No	Low	Nonsystematic aerial surveys; infrequent flights; no radio collars	RRCS
1975	Yes	Yes	Low-medium		RRCS
1976	Yes	--	Low-medium		RRCS
1977	Yes	--	Low-medium		RRCS
1978	Yes	Yes	Medium	Systematic aerial transect surveys including density estimates; few radio collars (12); infrequent relocations	YGB[3]
1979	Yes	Yes	Medium		YGB
1980	Yes	No	Medium		YGB
1981	Yes	Yes	Medium		YGB
1982	No	No	High		ADF&G, USFWS
1983	Yes	Yes	High	Daily aerial surveys with frequent relocations of many (20-80) radio-collared cows	ADF&G, USFWS
1984	Yes	Yes	High		ADF&G, USFWS
1985	Yes	Yes	High		ADF&G, USFWS
1986	Yes	No	High		ADF&G, USFWS
1987	Yes	No	High		ADF&G, USFWS

CONCLUSIONS: The Jago Uplands were used as a concentrated calving area over 90% of the time. The Jago Uplands area was the most heavily used area for calving within the Porcupine Caribou Herd range over 60% of the time.

[1]Coastal plain/foothill area between Hulahula and Aichilik Rivers; the "core calving area", as defined in the draft 1002 report, falls within this area.

[2]Renewable Resources Consulting Services

[3]Yukon Game Branch

TESTIMONY OF LARRY DIETRICK
BEFORE THE SENATE COMMITTEE ON
ENERGY AND NATURAL RESOURCES
October 13, 1987

Mr. Chairman and Members of the Committee:

My name is Larry Dietrick. I am Director of the Alaska Division of Environmental Quality of the Alaska Department of Environmental Conservation.

The Department of Environmental Conservation is responsible for protecting public health and the environment. We enforce regulations governing air quality, water pollution control, solid waste management, hazardous waste management, and oil spill prevention and response. We write permits specifying emission levels and disposal methods, monitor activities under permits, and take enforcement actions when needed. The Department has considerable experience with the effects of oil and gas related activities.

On Alaska's North Slope, the Department has developed stipulations for oil and gas lease sales, helped with siting of disposal facilities, and carried out the full range of environmental protection activities. We also participate in the design and review of environmental studies, collect monitoring data, and maintain a field office at Prudhoe Bay in Deadhorse.

Effective waste stream management for oil and gas activities in the Arctic National Wildlife Refuge (ANWR) requires the following steps:

1. Evaluation of past practices and operating procedures at other fields on the North Slope.

2. Advance planning for effective waste disposal facilities and practices.

3. Development and application of specific, effective requirements for industry as lease stipulations and permit conditions.

4. Coordination of efforts among agencies with authority to regulate oil and gas exploration and development.

5. Monitoring of impacts and compliance with environmental requirements.

I will briefly discuss each of these steps and will illustrate them with examples drawn from our experience with solid waste management. In addition to solid waste, key areas for adequate environmental protection measures include air quality, liquid wastes, hazardous wastes, spill prevention and response, and area of impact. I have included an overview of these issues as an attachment to my written testimony.

REVIEW OF WASTE MANAGEMENT PRACTICES IN ALASKA'S NORTH SLOPE OIL FIELDS

Decisions on the exploration and development of ANWR should reflect the experience and information gained by the State and the industry during operations at the National Petroleum Reserve in Alaska (where exploration began in the mid 1940's), Prudhoe Bay (where exploration confirmed the field in the late 1960's), Milne Point, Lisburne, Endicott, and the Kuparuk River oil fields. The technology and operating

methods used in oil and gas development have evolved considerably since the early days of Prudhoe Bay. Both the industry and the agencies have learned a great deal in the process. Operations in the newer fields at Endicott and Kuparuk differ substantially from those at Prudhoe. Some waste disposal practices have proven effective while others can and should be improved.

The Department is currently reviewing North Slope waste disposal practices. A technical accounting of these practices, a description of their evolution, and an assessment of potential impacts will help identify the most appropriate management regime for each waste stream for ANWR.

Moreover, there is a role for Congress in designing the waste stream management regime for ANWR by setting the standards to be met. If Congress concludes that some areas of ANWR warrant a particularly high degree of environmental protection, it may be appropriate, for example, to require removal of wastes from those areas. The level of protection deemed necessary by Congress can best be met through lease stipulations or permit conditions, evaluation of the effectiveness of these measures, and modification of the requirements if field experience warrants.

The State's waste stream management requirements have evolved in response to the North Slope oil development experience. During the past year the State developed new regulations for handling solid waste, particularly drilling muds. Those regulations are now in effect. They establish requirements for disposal of drilling muds and for water quality monitoring to ensure that the disposal techniques used will protect the environment.

PLANNING FOR ADEQUATE WASTE STREAM MANAGEMENT

Planning before start-up is essential for proper management of waste streams in ANWR. Inadequate planning before start-up was a major reason why some North Slope development occurred without the best technology. Similarly, inadequate planning led to the absence of sufficient waste disposal facilities for the oil field support industry, which does not have access to the same disposal facilities as the field operators. This has contributed to the abandonment of drums and dumping of other waste materials on vacant sites in the Deadhorse area.

Solid waste management provides numerous examples of the advantages of careful planning for disposal facilities and methods. Major sources of solid waste are garbage, drilling wastes, scrap metal, oily wastes, construction debris, drums, junked vehicles, tires and a host of other materials. Comprehensive waste material management plans could minimize the amount of waste and incorporate salvaging, reusing, and recycling as waste management tools. Backhauling scrap metal and crushed drums is an additional technique which could make most landfills in ANWR unnecessary. Ash and residue from incinerator operation could easily be consolidated into a single facility.

Comprehensive planning could also lead to regional disposal facilities. This would prevent unnecessary proliferation of landfills while enabling the support service industry to have access to proper disposal facilities. Ultimate disposal of pipelines, flow stations, camps, and related facilites should also be addressed at the outset of ANWR planning so that a financial mechanism is in place to provide for proper disposal upon completion of use.

Plans for management of drums should be required as a condition of operation. They should include inventory and tracking, cleaning, crushing, backhaul, and disposal of waste liquids or residues from cleaning.

PERMIT CONDITIONS AND LEASE STIPULATIONS

Stipulations placed in leases and conditions written into permits provide a means to address site-specific factors. Lease stipulations apply to the tracts to be explored and developed; they should be tailored to the conditions found there. An example of a solid waste issue that could be addressed by stipulation is the collection of litter and other debris.

Litter, including construction materials and other debris, can be a persistent problem near the arctic coast where flat terrain and strong winds combine to carry these materials considerable distances. Once "offsite", it is often difficult to determine their source. Consequently, it may be desirable to implement a "no fault" requirement in stipulations applied to successful tract bidders, so that litter and other debris are routinely collected regardless of their origin.

Permits are written to govern specific activities of the permit applicant, often in a particular location. They are useful in fine tuning the waste stream management system and in preventing undesirable side effects of disposal. For example, solid waste disposal facilities such as landfills require a permit from the Alaska Department of Environmental Conservation. By taking account of the site configuration and other circumstances, conditions written into the permit can help prevent air and water pollution which might otherwise result from an improperly placed or operated landfill. However, the site-specific characteristics of most permits also limit their ability to deal with area-wide problems involving many different activities. Waste management problems often affect large areas and several operators or industries. Consequently, permits are no substitute for area-wide planning for disposal needs.

Effective use of lease stipulations and permit conditions requires flexibility. Otherwise, new circumstances may undercut their appropriateness. Changes in available technology, legal requirements, or new scientific data may dictate corresponding changes in the way a particular waste is managed. In order to determine whether stipulations or permit conditions are having the intended effect, it is also necessary to monitor on a continuing basis.

COORDINATION AND REVIEW

To achieve the optimum level of environmental protection, State and Federal agencies and industry must coordinate their efforts. They must share data in order to ensure that the best available information is brought to bear on ANWR waste management issues. Agency requirements should also be consistent and flexible enough to respond to changing circumstances. Congress should establish a formal consultation process involving these parties. If developed properly, this would also allow the opportunity for the participating agencies to clarify their respective authorities and to avoid duplication.

Among the issues which this process would address are the timing of the various phases of development; the need for studies; and the coordination of permitting, operating plan reviews, field monitoring, and field approvals. In all aspects of this process, it is essential that State and Federal regulatory agencies maintain their own oversight responsibilities.

MONITORING

Monitoring provides data to evaluate the effectiveness of permit conditions and lease stipulations. It may demonstrate the need to modify environmental requirements or operating methods and may help identify areas where additional study is needed. Monitoring also allows a determination of whether operations are in compliance with these requirements and with other environmental standards. For example, data from water quality monitoring under the new drilling mud disposal regulations will show whether contamination is occurring. If it is, the regulations require corrective measures.

CONCLUSION

Governor Cowper has taken a firm position that ANWR exploration and development must be done right, that the environment and the special values of ANWR must be protected. I have outlined some of the steps that can be taken to achieve this goal. These are just highlights, of course. Oil and gas development in the Arctic is a complicated business and I have only touched on the major environmental issues to be addressed.

Mr. Chairman, the Department of Environmental Conservation is available to the members and staff to discuss the details of environmental matters affecting your decision about ANWR. Thank you for the opportunity to testify. We look forward to working with you.

Attachment

SUMMARY OF WASTE STREAM MANAGEMENT AND OTHER ENVIRONMENTAL PROTECTION ISSUES RELEVANT TO OIL AND GAS DEVELOPMENT IN THE ARCTIC NATIONAL WILDLIFE REFUGE

AIR QUALITY

The principal air pollutants discharged during oil and gas development are sulphur dioxide, suspended particulate matter, carbon monoxide, and nitrogen oxides. Concentrations of these four types of emissions depend, in large part, on the type and volume of fuel burned in the turbines, generators, and other internal combustion engines, the and the amount of flaring in the area.

Flaring is a significant contributor to visibility impairment. Flaring during exploratory flow testing and operational phases is potentially a major source of emission of soot -- primarily unburned hydrocarbons -- and other materials. Technology exists to prevent such problems in future developments.

The primary source of NOx at Prudhoe Bay is the more than 100 gas turbines, each rated at more than 10,000 horsepower. This may be the greatest concentration of large turbines in the world. Approximately 20 air quality permits have been issued, and three are pending. The cumulative annual discharge allowed under these permits is more than 90,000 tons of NOx. Actual emissions are approximately 70 to 90 percent of the permitted values. Modeling has been used to predict the ground level concentrations of NOx and ground level monitoring is now underway to verify the modeling effort and measure ambient levels.

LIQUID WASTE MANAGEMENT

Liquid waste discharges include domestic wastewater, reserve pit fluids, brine discharges, hydrostatic test discharges, vessel rinsates, radiographic wastes, excavation discharges, oily wastewater streams, equipment washing runoff, workover fluids, waste oil solvents, and a wide range of other wastewater streams. Each needs to be identified with a provision made for proper disposal.

Zero discharge of non-domestic (industrial) wastewater streams, with the possible exception of excavation dewatering, should be carefully considered for ANWR. Based upon current experience on the North Slope, alternatives to dewatering of reserve pits should be used in ANWR. The management regime selected for drilling wastes could eliminate the need to discharge to the tundra or roads. Conventional dust control measures or water should be used instead of wastewater. The planning stage should identify specific disposal methods for liquid waste streams classified under the Federal Resource Conservation and Recovery Act (RCRA) and non-RCRA liquid oily-waste streams. Rinsates from tank, vessel and truck cleaning also must be disposed properly. Consequently, both the oil field operators, and the oil field support service industry must have access to appropriate facilities. Underground injection, potentially an acceptable disposal solution for many of these waste streams, should be considered. Produced water disposal should be limited to subsurface techniques.

Unlined gravel impoundments have been used in other North Slope oil and gas developments to contain various wastewater streams. This technique may not be appropriate in ANWR because of its limited effectiveness and its requirement for large amounts of gravel.

Comprehensive planning is needed to ensure that liquid waste disposal solutions are available for all users. This would allow all liquid waste streams to be accurately identified, characterized, and quantified along with an acceptable method for disposal. For example, subsurface disposal options should be available for use by the support service industry.

SOLID WASTE MANAGEMENT

Major sources of solid waste are drilling wastes, scrap metal, oily wastes, construction debris, drums, junked vehicles, tires and a host of other materials. It is critical that proper management of all these wastes be addressed from the beginning. Drilling wastes are of particular concern. The State's new regulations governing drilling waste disposal provide an appropriate starting point.

Disposal of solid waste is another area for which careful planning can lead to development of proper facilities at the outset. Provisions for picking up "off-site" litter and other debris should be addressed by stipulation placed on successful tract bidders. Because it is often difficult to determine the source of off-site litter or debris, it may be desirable to implement a "no fault" policy by which litter and debris are routinely collected regardless of origin.

Plans for management of drums should be required as condition of operation. They should include inventory and tracking, cleaning, crushing, backhaul and disposal of waste liquids or residues from cleaning.

Garbage and other wastes which may attract wildlife should be incinerated. Collection and storage of such wastes must also avoid attracting wildlife. Plans for collection of these wastes and for central incineration should be prepared and adopted as a condition of field exploration and development.

Disposal methods for solid oily wastes from tank bottoms, sludges, hydrocarbon waxes, oil contaminated muds and cuttings and spill debris require very careful evaluation. At Prudhoe, the North Slope Borough operates one of two permitted non-RCRA solid oily waste disposal sites in Alaska. Results from the operation of this site are mixed.

Additional work and technology review are needed to develop acceptable solutions for this very difficult waste stream management issue. Incineration would provide the most reliable and complete solution to the problem. However, this is also more costly to the operators.

Comprehensive waste material management plans could minimize the amount of waste to be disposed and could incorporate salvaging, reusing, and recycling materials. Backhaul of scrap metal and crushed drums are additional tools which could make most landfills in ANWR unnecessary. Ash and residue from incinerator operation could easily be consolidated into a single facility.

Comprehensive planning to develop solutions for solid waste disposal must also enable the support service industry to have access to proper disposal options. Regional disposal facilities can also help prevent unnecessary proliferation of landfills. Ultimate disposal of pipelines, flow stations, camps and related facilities should be addressed at the outset of ANWR planning so that a financial mechanism is in place to provide for proper disposal upon completion of use.

HAZARDOUS WASTE MANAGEMENT

Hazardous waste management is governed by stringent requirements under the Federal Resource Conservation and Recovery Act (RCRA). Transportation of hazardous substances is regulated by the Federal Department of Transportation. The State has adopted hazardous waste regulations and is currently in the process of implementing them through a cooperative agreement with the Environmental Protection Agency.

As with other waste streams, it is essential that acceptable disposal methods be available both to the oil field operators and to the support service industry. Comprehensive planning is needed to develop appropriate management facilities at the outset.

OIL SPILL PREVENTION AND RESPONSE

Coordinated response capability should be required. Adequate oil spill contingency plans and secondary containment requirements for drums and small facilities are also important. Buffer zones should be established to isolate these facilities from sensitive areas.

If field gas or refining capacity is available to supply fuels it should be made available to the support service industry. This will significantly reduce the occurrence of spills by eliminating fuel storage and piping for space heating and electrical generation. Local availability of refined products to all users would eliminate haul road tanker spills.

AREA OF IMPACT

Many of the tools developed in other North Slope fields are directly applicable to minimize the "footprint" of individual drill sites and of the overall production effort. Appropriate facility siting criteria and buffer distances will also help maintain adequate levels of environmental protection.

Development plans should include the following: a design to minimize the number of drill sites and production facilities while optimizing the layout of roads and pipelines; provisions for a limited number of intensive use material sites; and plans to centralize and consolidate support facilities. Consolidation of the service industry at Kuparuk provides an example of centralized support services in planning for ANWR.

Ice pads should be considered for all exploratory drilling. Ice pads may also be used for temporary stockpiling of overburden and muds and cuttings.

Restoration of the site at each stage from exploration through production can reduce the cumulative impact of development activities. Adequate drainage must be provided for all facilities to prevent impoundments.

TESTIMONY OF MARGARET A. MORAN
BEFORE THE HOUSE COMMITTEE ON
MERCHANT MARINE AND FISHERIES
October 6, 1987

Mr. Chairman and members of the Committee:

My name is Margaret A. Moran. I am the special assistant for the Arctic National Wildlife Refuge (ANWR) to Governor Steve Cowper of Alaska. I want to thank you for providing the State the opportunity to comment on the Department of the Interior's final 1002 Report.

Based on our review of the final 1002 report, we strongly support the conclusion that oil and gas exploration and development be allowed in the ANWR, consistent with appropriate environmental stipulations. Our review of the 1002 report focused on its treatment of ANWR's potential petroleum resources, fish and wildlife, and other environmental attributes.

The State concurs with the 1002 report findings that the coastal plain area represents the most outstanding oil and gas frontier remaining in the United States. It has been clearly demonstrated by federal, state and independent investigators that the coastal plain (or 1002) area could yield Prudhoe Bay-sized quantities of petroleum.

The estimates are that if oil is discovered beneath the coastal plain, there is a five percent probability of finding between 26.5 and 29.4 billion barrels of oil. This compares favorably with the 23.5 billion barrels initially in-place at Prudhoe Bay. For perspective, it is noteworthy that prior to drilling, some industry officials estimated that there was only a 2 percent probability that the Prudhoe area contained as much as 2 billion barrels of oil. Today that area accounts for more than 20% of our domestic production.

All of the key geologic elements necessary for major hydrocarbon accumulations exist beneath the 1002 area. Oil seeps, oil-stained reservoir rocks and excellent quality petroleum source rocks are present. Large subsurface structures and traps have been mapped from seismic data. The federal 1002 report documents 26 of these large, prospective structures beneath the surface of the coastal plain. In addition, the 1002 area lies between the huge discoveries at the Prudhoe and Kuparuk oil fields to the west, and the Canadian Mackenzie Delta field to the east.

In our opinion, development of ANWR's petroleum potential is in the national interest. We have just recently produced the five billionth barrel of Prudhoe Bay oil. This means that one-half the total proven 10 billion barrels of recoverable oil have been produced and that the largest field in North America, will begin a precipitous production decline in the near future. By the year 2000, Alaska's yearly production will have dropped to approximately 386 million barrels per year from today's rate of 685 million barrels per year.

Production from the ANWR coastal plain could help to significantly offset the expected decline. Industry experts place the range of potential U.S. domestic production by the year 2000 at between 4.5 million and 6.4 million barrels per day, substantially less than the current 8.3 million barrels per day. These quantities would satisfy between 24 percent and 37 percent of projected domestic consumption.

In addition to the hydrocarbon potential of the area, the other intrinsic feature of ANWR is the fish and wildlife

resources. Wildlife resources include caribou of the Central Arctic and Porcupine herds, polar bears, muskoxen, and snow geese and other waterfowl. Fish resources include migratory Arctic char and whitefish.

These fish and wildlife resources are an important component of the economy and culture of local communities in Alaska and Canada. The State has a great interest in seeing that development is done properly with respect to such resources, since we must live with the results. We believe that the impacts on fish and wildlife resources can and should be minimized, though some cannot be totally mitigated, during the production of oil and gas in the area.

Perhaps the environmental issue which has received the most attention to date is the potential effect of development on the Porcupine Caribou Herd. The population of the Porcupine Herd is estimated to be 180,000 animals. The herd migrates annually between the United States and Canada, and gives birth to its young in the coastal plain of both countries. However, the herd has traditionally favored a particular portion of the 1002 area for bearing its young. This area has been depicted differently in the Department of the Interior's draft and final 1002 reports. The State has reviewed these reports and believes the draft 1002 report correctly outlines the core calving area. This area contains about 242,000 acres. We believe that within this area lies about 19% of the highest oil and gas potential of ANWR.

The State believes the herd's use of the core calving area could be disrupted if oil and gas is developed there. This disruption could affect the population, although it is not possible to predict the magnitude of such an impact. This conclusion is based upon the professional judgment of State and other caribou biologists rather than on definitive scientific evidence. The State recommends that leasing in this area be deferred.

In both the draft and final 1002 reports, the Department of the Interior (DOI) indicated its intent to coordinate federal and state agencies in the planning and permitting process. Consistent with this federal intent, we feel it is essential that DOI be directed to establish a formal consultation process with the State and other parties in order to clearly establish at what points in the process and at what levels of detail, different issues and authorities will be addressed. This process would also allow the opportunity for the parties to clarify their respective authorities, permitting, and field procedures to avoid duplication or conflicting efforts. Experiences associated with the development of the Trans-Alaska Pipeline System (TAPS) and the proposed Alaska Natural Gas Transportation System (ANGTS) from Prudhoe Bay to the Canadian border could provide useful models for cooperative management programs.

Overall, the State believes that DOI did a reasonable job in compiling and summarizing a large amount of relevant data. However, the report lacks detailed information regarding waste stream management issues -- control of air, water, and solid waste pollutants . We assume the 1002 report was not intended to be an all-inclusive document. However, on this issue, further information would have been helpful. Congress should not confuse the absence of information in the 1002 report with a lack of answers to the many important waste management issues associated with oil and gas development in an arctic environment.

The State has 20 years of experience in dealing with oil exploration and development in the Arctic. Our resource agencies have accumulated expertise and information that the Committee may find useful. We feel strongly that the

lessons of the past should serve as guidelines for the future. In our opinion, Congress can be confident that the necessary information exists to direct that the appropriate regulatory tools and technology be used to develop ANWR in an environmentally sound manner.

The State's comments to the Secretary of the Interior on the Draft 1002 report contain additional recommendations that the Committee may find helpful. Our comments suggest ways to mitigate development impacts on the Porcupine Caribou Herd. They also recommend a responsible approach for conserving other wildlife and fisheries resources in and adjacent to ANWR. And finally, they look at waste stream management issues and suggest mitigation measures. With the Chairman's permission, I will submit these comments to the committee.

In summary, the coastal plain has the tremendous potential to contribute to this Nation's economic strength and energy security. If we begin now, legislation can be passed that will open the area to exploration, development and production. At the same time, Congress can provide for the environmental measures necessary to protect and preserve the natural resources in the area. The State of Alaska strongly supports the opening of the 1002 area. We look forward to working with you and your staffs as you consider this important issue.

TESTIMONY OF DR. ALVIN G. OTT
BEFORE THE SENATE COMMITTEE
ON ENERGY AND NATURAL RESOURCES
October 13, 1987

Mr. Chairman and members of the Committee:

My name is Dr. Alvin G. Ott. I am the Regional Supervisor of the Habitat Division with the Alaska Department of Fish and Game in Fairbanks, Alaska.

INTRODUCTION

The Porcupine Caribou Herd (PCH) is a significant international resource. Its lengthy migrations are an impressive ecological event and an important link in the northern Alaska and Yukon wildlife and human ecosystem. Several Indian and Eskimo communities on both sides of the border rely heavily on the PCH for subsistence.

During their annual cycle, pregnant cows of the PCH migrate to the coastal plain in Alaska and northwestern Canada to calve. Although some calving likely occurs over most of the coastal plain, calving concentrations are readily apparent in some areas. The concentration area which has been most frequently and heavily used has been called the "core" calving area.

The PCH also forms huge post-calving aggregations. These huge aggregations move extensively within the coastal plain and foothills to gain relief from mosquitoes and other insect pests. Biologists believe that unrestricted access to these relief areas is important to the herd's well-being.

The State of Alaska is concerned that oil and gas development in the 1002 area of the Arctic National Wildlife Refuge (ANWR) could adversely affect use of calving areas. We have recommended that approximately 15% of the 1002 area, that portion delineated in the draft 1002 report as the "core" calving area, be deferred from leasing for ten years. During this moratorium, a seven-year research program would be undertaken to improve our understanding of the importance of this core calving area, to assess the effects that oil development may have on use of the area, and to develop appropriate mitigative measures.

The objective of the approach described here is to ensure the viability of the Porcupine Caribou herd. I want to emphasize, however, that there may be other ways to achieve this objective. We remain open to hearing other ideas which may accomplish this end. The State would like to work with the Energy Committee to develop an approach which will foster exploration and development of the oil and gas potential of the Coastal Plain while protecting the Porcupine Caribou herd.

In addition, in order to mitigate the effect of development on the use of early summer habitat we have recommended that, within three miles of the coast, only those facilities that cannot be sited elsewhere be allowed. We have also recommended that a study be undertaken to evaluate the responses of large aggregations to a road/pipeline simulation and to develop measures that would assure free passage of these aggregations.

THE CENTRAL ARCTIC HERD EXPERIENCE

Before considering the distribution of the PCH within the ANWR coastal plain, we will review the status of knowledge on the responses of the Central Arctic Herd (CAH) to petroleum development in the Prudhoe Bay area and comment on the relevance of those observations to the ANWR issue. We will discuss the effect of development on habitat use and

population size sequentially. As the principal concerns for both herds currently apply only to calving and midsummer, the discussion will be restricted to those two periods.

Habitat Use

Results of aerial surveys over the past ten years indicate that the majority of the CAH, like other arctic herds in North America, calves predictably in certain specific areas--primarily near Milne Point and the Canning Delta (Fig. 1), but also in the adjacent uplands to the south. When spring snowmelt is late, relatively more calving occurs in inland areas than in coastal regions. In the "average" year, however, most parturient cows are found in coastal concentrations.

Estimates of caribou density have also been made during the calving period for various regions between the Colville and Canning Rivers. The results show that densities within the area encompassing the Prudhoe Bay oilfield complex are less than one-half of the next lowest density area and less than one-tenth of the highest density area. While there is little reason to believe that the immediate Prudhoe Bay area previously supported particularly high densities of calving caribou (i.e., on the order of those near Milne Point or the Canning Delta), we believe that reduced calving in that area is due to the presence of a major oilfield complex.

Additional abnormalities in calving distribution have been observed in the vicinity of the Milne Point oilfield complex, west of Prudhoe Bay. A comparison of caribou distribution during the four years prior to construction with that during the four years after road placement indicates that only half as many cows and calves used the area within two miles of the road right-of-way after the road was build. The logical implication of these results is that an extensive, dense network of transportation corridors may well result in widespread loss of calving habitat. In hindsight, we believe that this occurred in the Prudhoe Bay complex as it grew from a minor oilfield with minimal support facilities in the early 1970's, to a large development center. Additional losses of calving habitat within the traditional concentration area west of Prudhoe Bay may be forthcoming as the Kuparuk and Milne Point oilfields continue to expand to their full recovery potential. Figure 2 depicts the regional growth of oil-related development that has occurred in only 12 years.

The second of our major concerns involves a decline in the use of developed areas during midsummer. During this period, caribou must maximize nutrient intake to promote growth and fattening, and, in the case of maternal females, to meet the metabolic demands of lactation. It is generally believed that failure to attain a minimum standard of body condition by autumn may result in reduced reproductive performance of females and predispose calves to higher rates of mortality.

The summer grazing process is complicated considerably by the frequent appearance of insect pests, which become active during warm, calm periods. Caribou of the CAH respond to insect attack by aggregating and moving rapidly to coastal areas where lower temperatures and higher winds discourage insect activity. With an abatement of insect attack, caribou disperse and drift inland to preferred feeding areas. Thus, numerous movements may occur between coastal insect relief habitat, where energy expenditure can be minimized, and inland foraging areas, where energy intake can be maximized. The result, in theory, is a net increase in energy retention. We therefore believe that unrestricted summer movements are of considerable importance.

Unfortunately, our experience in the Prudhoe Bay area over the past decade suggests that maintaining the functional integrity of caribou summer range might not be possible, given the widespread surface use requirements for oil and gas development. Overall caribou density within the oilfield complex is considerably lower than in adjacent areas, and cows and calves are not present in normal numbers. Apparently, industrial growth of the area has also greatly restricted the east-west summer movements of caribou. In the late 1960's and early 1970's, several authors reported the passage of large groups (i.e., in the thousands) through what is now the main oilfield complex. Since the late 1970's, however, there has been little movement of caribou through this complex. The known movements of numerous radio-collared caribou confirm this observation.

Recent observations suggest that CAH caribou are experiencing difficulty gaining access to various components of summer range within the Kuparuk and Milne Point oilfields. As oil development in the region continues to expand and intensify, large portions of habitat may become inaccessible. Thus far, however, caribou have continued to occupy the general region in moderate numbers, despite localized abnormalities in distribution and the impediments to movement posed by an increasingly complex system of roads and pipelines. But the future is uncertain with respect to continual use of this portion of CAH summer range.

Population size

The CAH has undergone rapid growth during the period of oil development in the Prudhoe Bay area--from 6,000 in 1978 to an estimated 16,000 at present, in spite of the affects on habitat use discussed above. The following factors may account for the increase in herd size:

1. Only a small percentage of the total calving and summer range has been affected to date, and it appears that suitable alternative areas remain available.

2. Wolves, a major predator of caribou, were sharply reduced in the region in the late 1970's.

3. Hunter harvest has been generally low.

4. Winter weather has been generally favorable.

5. Summer insect activity has been low-to-moderate--at least in recent years.

6. Mitigative measures have been incorporated into the Kuparuk and Milne Point oilfields in the form of modified pipeline configurations, special crossing structures, and some restrictions on traffic.

Favorable environmental factors, some of which are short-term, make it impossible to determine what affect development has had on the long-term health of the Central Arctic Herd.

Experiences with the CAH provide the primary basis for predicting the responses of PCH caribou to oil development. However, we believe that the two herds are not entirely comparable in terms of susceptibility to disturbance, owing to differences in herd size and the distribution of seasonal habitats. In contrast to the apparently numerous habitat options available to the CAH, the PCH has relatively few. Quite simply, with a narrower coastal plain within ANWR, less calving habitat is available to the PCH--an effect that

is compounded further by its greater size. The net result is less flexibility in the use of calving areas. Also, the PCH typically forms huge aggregations in midsummer. These are frequently on the order of 50,000-80,000 animals, far larger than those of the CAH, which tend to number only 3,000-4,000 at maximum. Recent work on the CAH indicates that large groups have considerably more difficulty negotiating roads and pipelines than small groups, but it is impossible to predict at this time how large aggregations of the PCH would react to production facilities, roads and pipelines, and human activity characteristic of oilfields, much less the long-term consequences to the population of serious perturbations in distribution and movements that might occur as a result. Also, the PCH would contact industrial development on the coastal plain for only a brief period each year (i.e., less than 2 months), and might therefore react more strongly to disturbance stimuli than CAH caribou. That is, the PCH may be relatively "naive," and predictions based on CAH responses may underestimate the impacts on caribou within ANWR.

On the other hand, much of the knowledge gained on the CAH over the past ten years should apply rather well to the PCH. For example, there is little reason to expect that the qualitative responses of PCH females during calving will be markedly different from those documented for CAH females; we can anticipate similar avoidance responses to linear structures placed within calving areas. And we now know from work on the CAH that heavy traffic on roads, in close proximity to elevated pipelines, reduces caribou crossing success. Mitigation strategies, such as buried pipelines, road/pipeline separations, and strict traffic restrictions could be effective on both herds.

THE PORCUPINE CARIBOU HERD

The PCH occupies three fairly distinct wintering areas in Alaska and western Canada: The vicinity of Arctic Village and Venetie, the Richardson Mountains, and the Ogilvie Mountains/upper Peel River. In spring, pregnant females move northward along three principal routes, known as the Old Crow, Richardson, and Chandalar routes. The onset of spring migration, the particular route selected, and rate of travel are highly dependent on regional snow conditions and the wintering area occupied. Movements appear to be highly "purposeful," in that cows delayed by adverse snow conditions compensate by subsequently traveling faster (often 20-30 km/day) when conditions improve. The initial destination appears to be a "staging area" along the lower Firth River in Canada, which is often snow-free earlier than other areas to the west. If snow conditions are generally favorable on the coastal plain, cows will continue westward to the main calving area south of Barter Island. Some calving occurs elsewhere on the coastal plain, creating the false impression of a broad continuum of calving activity; but in the overwhelming majority of years for which adequate records are available, a large calving concentration was clearly apparent between the Hulahula and Aichilik Rivers.

After calving, the bulls and yearlings, which had slowly followed the northward progression of snow-melt and "green-up," join the cows and newborn calves. Large mixed aggregations (in the tens of thousands) form on or near the main calving area and move extensively within the coastal plain, frequently under the influence of insect harassment. By mid-July most of these aggregations have moved eastward along the coast into Canada, although variable numbers of caribou move directly through the mountains, thence to midsummer ranges in Canada or on the south slopes of the eastern Brooks Range. In late summer, caribou begin a drift toward wintering areas, completing the annual cycle of movement.

The central issue here is the location and use of a discrete calving area by the PCH. It should be emphasized that the concept of traditional calving areas is not new. Since the 1960's, caribou herds have been identified on the basis of their use of a common calving ground. Such areas have been described for most Alaskan and Canadian herds, and several herds in the Soviet Union as well. The available data on many herds indicate that there are areas of concentrated calving within traditional calving grounds. Those concentration areas occupied most frequently in high density are known as "core" calving areas.

The survey methodologies employed over the years have been extremely variable in terms of timing, overall effort, type and number of aircraft used, and the availability of radio-collared caribou. Also, many early surveys yielded data that are of marginal usefulness in addressing the present issue. Surveys since 1982 were designed for the express purpose of closely monitoring movements, determining actual calving sites, and delineating calving concentrations. We now routinely employ satellite-tracking technology and conventional radio-telemetry techniques as integral components of our field program.

In spite of recent improvements in our surveillance capabilities, virtually all data on PCH calving distribution are principally qualitative and descriptive. Some progress has been made in quantifying the occurrence of caribou in various areas, but precise density figures are still lacking, and boundaries are based largely on subjective judgment.

A second problem lies in the dynamics of the calving process itself, in that a changing situation is extremely difficult to describe using point-in-time measurements. Calving occurs continuously over roughly a two-week period, during which an individual female caribou may be both highly mobile and nearly sedentary. Thus, at any given time during the calving period, some pregnant females are enroute to actual calving sites, others with new calves are relatively stationary, and still others with older calves may be undergoing moderate movements characteristic of the post-calving phase. For this reason, survey results obtained early in the calving period may be more a reflection of movements into calving areas than the distribution of caribou during calving per se; similar errors are likely if surveys are conducted too late in the calving period.

Such problems in the design and timing of surveys, together with other unknowns regarding the completeness and quality of coverage, place severe limitations on reinterpreting much of the early information on calving distribution of the PCH. In fact, considerable care must be taken to avoid refining the analyses beyond the inherent precision of the original data. These and other restrictions preclude a totally precise delineation of calving concentrations for any given year.

Nevertheless, consistencies in calving distribution do emerge when 16 years' data are superimposed graphically. Even the most cursory examination reveals a clear pattern of recurrent--albeit not exclusive--use of the Jago Uplands, between the Hulahula and Aichilik Rivers (Fig. 3). In more than 90% of the annual observations, this area included a calving concentration. Furthermore, in more than 60% of the years for which estimates of relative caribou abundance were reported, the Jago Uplands supported more calving caribou than any other area within the PCH range (Table 1).

The "core" calving area, as defined in the draft 1002 report, lies within the Jago Uplands. The core area

describes the zone of heaviest use for calving, based on a thorough examination of all available data. In addition, participants at a 1985 caribou workshop sponsored by USFWS agreed that this core area best describes a common zone of concentrated calving activity, and that it is of sufficient size to accommodate the majority of calving caribou in the herd.

Recurrent, heavy use of certain calving areas implies a strong preference, and the persistence of such a tradition implies a net benefit to the herd in terms of calf production and survival. Among the possible attributes of calving concentration areas are:

1. A relative scarcity of predators.

2. Early snow ablation with locally advanced forage availability.

3. Proximity to insect relief habitat.

Most likely, several factors are instrumental in sustaining an affinity for certain specific calving areas, and all may not be important in a given year. It is conceivable that, from an evolutionary point of view, the tradition is retained primarily to offset the effects of exceptionally adverse conditions, perhaps in the form of heavy predation or deep snow during the previous winter; the periodic advantages derived from certain habitats would therefore tend to buffer fluctuations in the herd. The overall benefits to the PCH may be extremely subtle, but nonetheless important to the long-term well-being of the population.

INFORMATION NEEDS

The State has recommended that leasing in the core calving area be deferred for a ten-year period. During this moratorium, a research program would be undertaken that consists of four main components:

1. To evaluate the physical and biological characteristics of core and peripheral calving areas; features such as the vegetation, topography, meteorology, predator abundance, predation rates, and caribou use would be compared between core and peripheral areas.

2. To evaluate the effects of oil development on caribou calving distribution; because oil development would not occur within the core calving area of the PCH, this evaluation would rely on the continuation of the long-term study of the CAH, and especially the responses of calving caribou to continued development in the Kuparuk oilfield.

3. To evaluate the effects of oil development on insect-induced movements, particularly movements of the extremely large groups that commonly occur in the PCH; this component would focus on the responses of such large groups to a simulated transportation system, as well as analyzing the bioenergetics of such movements.

4. To characterize the caribou harvest in villages within the range of the PCH, principally Kaktovik and Arctic Village; this baseline information would be used in evaluating the effects of oil development on subsistence use of caribou.

We believe that the results of this research program would improve our understanding of the importance of the core

calving area to the PCH, and would improve our ability to predict the potential effects of oil development on the herd, thereby providing a more informed basis for recommending mitigative measures.

TESTIMONY OF DR. ALVIN G. OTT
BEFORE THE SENATE COMMITTEE
ON ENERGY AND NATURAL RESOURCES
October 13, 1987

MR. CHAIRMAN AND MEMBERS OF THE COMMITTEE:

MY NAME IS DR. ALVIN G. OTT. I AM THE REGIONAL SUPERVISOR OF THE HABITAT DIVISION WITH THE ALASKA DEPARTMENT OF FISH AND GAME IN FAIRBANKS, ALASKA.

THE TESTIMONY PRESENTED TODAY FOCUSES ON OIL AND GAS EXPLORATION AND PRODUCTION IN THE 1002 AREA OF THE ARCTIC NATIONAL WILDLIFE REFUGE (ANWR), AND SPECIFICALLY HOW ENVIRONMENTAL IMPACTS FROM LARGE SCALE DEVELOPMENT PROJECTS CAN BE MITIGATED BASED ON EXPERIENCES WITH OIL AND GAS PRODUCTION ON THE NORTH SLOPE OF ALASKA. THE STATE OF ALASKA HAS CONSIDERABLE EXPERTISE, PARTICULARLY THE ALASKA DEPARTMENT OF FISH AND GAME (ADF&G), IN TERMS OF POTENTIAL IMPACTS TO FISH AND WILDLIFE RESOURCES AND ACCEPTABLE MITIGATION WITH RESPECT TO OIL AND GAS EXPLORATION AND PRODUCTION.

IT IS IMPORTANT TO RECOGNIZE THE SCOPE AND MAGNITUDE OF OIL PRODUCTION, AS CONTRASTED WITH EXPLORATION. THE STATE OF ALASKA'S COMMENTS ARE BASED ON THE ASSUMPTION THAT IF AN AREA IS LEASED, PRODUCTION OF OIL AND GAS MAY OCCUR. ENCLOSURE #1 OF THIS TESTIMONY DEPICTS OIL PRODUCING FACILITIES IN PLACE IN 1973 AND 1985 IN THE PRUDHOE BAY AND ADJACENT AREAS. AS CAN BE CLEARLY SEEN BY THE SIGNIFICANT INCREASE IN NUMBER OF FACILITIES BETWEEN 1973 AND 1985, OIL

PRODUCTION IS AN ONGOING ACTIVITY WITH FACILITIES BEING ADDED CONTINUALLY. FOR EXAMPLE, ARCO ALASKA, INC. RECENTLY SUBMITTED PRELIMINARY APPLICATIONS FOR ANOTHER SEVENTEEN DRILL PADS IN THE KUPARUK DEVELOPMENT AREA.

IN ORDER TO EFFECTIVELY MITIGATE POTENTIAL ADVERSE ENVIRONMENTAL EFFECTS OF OIL AND GAS ACTIVITIES, WE HAVE TAKEN THE FOLLOWING STEPS:

(1) A SIGNIFICANT AMOUNT OF INFORMATION HAS BEEN GATHERED BY THE U.S. FISH AND WILDLIFE SERVICE (USFWS) AND THE ADF&G OVER THE PAST FIVE YEARS ON THE DISTRIBUTION AND ABUNDANCE OF FISH AND WILDLIFE RESOURCES IN THE ANWR. THESE DATA HAVE BEEN REVIEWED AND ANALYZED IN ORDER TO IDENTIFY HABITATS OF SPECIAL CONCERN TO SELECTED SPECIES OF FISH AND WILDLIFE;

(2) DATA GAPS HAVE BEEN IDENTIFIED AND STUDIES RECOMMENDED TO FILL THESE DATA GAPS;

(3) EXISTING OIL AND GAS ACTIVITIES ON THE NORTH SLOPE HAVE BEEN EXAMINED TO DETERMINE THE TYPE AND NUMBER OF FACILITIES REQUIRED FOR THE PRODUCTION OF OIL AND GAS IN COMMERCIAL QUANTITIES AND THE IMPACTS OF THESE FACILITIES ON FISH AND WILDLIFE HABITATS;

(4) GENERAL MITIGATIVE MEASURES (FOR EXAMPLE, ENVIRONMENTALLY SOUND STANDARDS FOR FACILITY SITING) THAT WE HAVE FOUND NECESSARY TO ENSURE ADEQUATE PROTECTION OF KEY FISH AND WILDLIFE HABITATS HAVE BEEN RECOMMENDED TO THE DEPARTMENT OF THE INTERIOR (DOI); AND

(5) RECOMMENDATIONS HAVE BEEN MADE TO THE DOI TO ENSURE THAT A PROPER LEGAL FRAMEWORK IS IN PLACE FOR A SOUND REGULATORY BASIS FOR THE IMPLEMENTION AND ENFORCEMENT OF REQUIRED MITIGATION.

IT ALSO WILL BE NECESSARY TO REFINE AND MODIFY MITIGATIVE MEASURES BASED ON FUTURE RESEARCH AND NEW INFORMATION.

FURTHERMORE, IF AREAS WITHIN ANWR ARE LEASED, SITE SPECIFIC MITIGATION WILL BE NEEDED FOR EACH EXPLORATION AND PRODUCTION PLAN. FIELD MONITORING AND COMPLIANCE ALSO WILL BE REQUIRED TO ENSURE, TO THE EXTENT PRACTICABLE, THAT MITIGATIVE MEASURES ARE WORKABLE AND THAT COMPLIANCE IS ACHIEVED DURING FIELD ACTIVITIES.

THE STATE OF ALASKA'S RECOMMENDED STRATEGY FOR MITIGATING ADVERSE IMPACTS OF OIL AND GAS EXPLORATION AND PRODUCTION IN THE 1002 AREA OF THE ANWR IS BASED ON A CLEAR AND DISTINCT SEPARATION OF THE EXPLORATION PHASE FOR OIL AND GAS AND THE PRODUCTION PHASE OF AN OIL OR GAS FIELD OF COMMERCIAL SIZE. OUR RECOMMENDATIONS FOLLOW:

(1) WE HAVE REQUESTED THAT THE DOI PREPARE SEPARATE TERMS AND CONDITIONS FOR THE EXPLORATION AND PRODUCTION PHASES. WE BELIEVE THAT WITH SEASONAL CONSTRAINTS ON EXPLORATION ACTIVITIES (E.G., WINTER DRILLING WITH SOME ALL-SEASON ACTIVITY) MOST OF THE POTENTIAL ADVERSE EFFECTS OF OIL AND GAS EXPLORATION CAN BE MITIGATED EFFECTIVELY.

IN CONTRAST, IF OIL AND GAS ARE FOUND IN QUANTITIES SUFFICIENT FOR PRODUCTION, THE POTENTIAL FOR IMPACTS TO FISH AND WILDLIFE AND THEIR HABITATS ARE ORDERS OF MAGNITUDE GREATER. PRODUCTION OF OIL AND GAS WILL THEREFORE REQUIRE A SUBSTANTIAL NUMBER OF ADDITIONAL STEPS TO ENSURE ADEQUATE ENVIRONMENTAL PROTECTION.

(2) OUR STRATEGY FOR ENSURING EFFECTIVE MITIGATION OF ADVERSE IMPACTS TO FISH AND WILDLIFE RESOURCES INVOLVES TWO BASIC CONCEPTS. FIRST, THE ESTABLISHMENT OF A JOINT STATE/FEDERAL PROGRAM COVERING THE FOLLOWING PHASES OF OIL AND GAS EXPLORATION AND PRODUCTION IS REQUIRED:
   (a) PROJECT PLANNING INCLUDING NECESSARY FIELD STUDIES;
   (b) A TECHNICAL ANALYSIS OF PROPOSED DESIGNS, PLANS, AND PROCEDURES (I.E., DESIGN REVIEW);
   (c) PERMITTING;
   (d) FIELD MONITORING; AND
   (e) COMPLIANCE.

SECOND, DEVELOPMENT OF EFFECTIVE ENVIRONMENTAL MITIGATION FOR THE PRODUCTION PHASE OF OIL AND GAS DEVELOPMENT IS NEEDED.

IN ORDER TO WORK EFFECTIVELY WITH THE OIL AND GAS INDUSTRY, A JOINT STATE/FEDERAL INTERDISCIPLINARY TEAM WOULD OVERSEE AND PARTICIPATE IN PROJECT PLANNING, PROJECT DESIGN REVIEW, PERMIT ACTIONS, FIELD MONITORING, AND COMPLIANCE. IN ALL ASPECTS OF THIS PROCESS, IT IS ESSENTIAL THAT STATE AND FEDERAL REGULATORY AGENCIES MAINTAIN THEIR OVERSIGHT RESPONSIBILITY WHILE WORKING COOPERATIVELY AND CLOSELY WITH THOSE PARTIES RESPONSIBLE FOR OIL- AND GAS-RELATED ACTIVITIES. AS RESEARCH RESULTS BECOME AVAILABLE IN THE FUTURE, THIS GROUP WOULD INCORPORATE APPROPRIATE CONCLUSIONS IN PROJECT PLANNING AND APPROVALS. PROGRAMS FOR ENSURING PROTECTION OF FISH AND WILDLIFE RESOURCES AND HABITATS EXIST AND HAVE BEEN USED SUCCESSFULLY IN ALASKA FOR LARGE SCALE DEVELOPMENT PROJECTS SUCH AS THE TRANS-ALASKA PIPELINE SYSTEM AND THE PRECONSTRUCTION PHASE OF THE ALASKA NATURAL GAS TRANSPORTATION SYSTEM.

DEVELOPMENT OF EFFECTIVE MITIGATION METHODS AND PROCEDURES IS A PROCESS THAT WILL CONTINUE AS LONG AS THERE IS OIL AND GAS ACTIVITY. A NUMBER OF GENERAL RECOMMENDATIONS ALREADY HAVE BEEN MADE BY THE STATE OF ALASKA BASED ON ADF&G'S MITIGATION POLICY AND EXPERIENCES WITH NORTH SLOPE OIL AND GAS EXPLORATION AND PRODUCTION IN SUCH AREAS AS THE NATIONAL PETROLEUM

RESERVE-ALASKA AND IN OIL PRODUCING FIELDS SUCH AS PRUDHOE BAY, MILNE POINT, ENDICOTT, KUPARUK, AND LISBURNE.

THE ADF&G HAS BEEN INVOLVED IN GATHERING BIOLOGICAL INFORMATION IN ANWR FOR THE LAST SIX YEARS. OUR GAME BIOLOGISTS HAVE WORKED COOPERATIVELY WITH THE USFWS SINCE 1981 ON BASELINE BIOLOGICAL STUDIES. PERSONNEL FROM THE DIVISION OF SUBSISTENCE HAVE CONDUCTED RESEARCH IN THE KAKTOVIK AND ARCTIC VILLAGE AREAS DOCUMENTING RESOURCE USE PATTERNS OF INDIVIDUALS LIVING IN THESE AREAS. THESE EFFORTS ON THE PART OF ADF&G PERSONNEL CONTINUE TODAY IN THE ANWR 1002 AREA, AND OUR HABITAT BIOLOGISTS HAVE BEEN INVOLVED WITH LARGE SCALE CONSTRUCTION PROJECTS THROUGHOUT ALASKA INCLUDING THE PRUDHOE AND KUPARUK OIL FIELD COMPLEXES. WE HAVE ANALYZED THE INFORMATION ON FISH AND WILDLIFE RESOURCES IN THE ANWR, IDENTIFIED SIGNIFICANT DATA GAPS, AND RECOMMENDED MITIGATIVE MEASURES IN LIGHT OF OUR EXPERIENCES WITH NORTH SLOPE OIL AND GAS PRODUCTION AND OTHER OIL-RELATED DEVELOPMENTS WITHIN THE STATE.

IN THE SPRING OF 1986, THE ADF&G EVALUATED THE AVAILABLE RESOURCE INFORMATION FOR THE 1002 AREA AND IDENTIFIED HABITATS OF SPECIAL CONCERN. SPECIFIC EMPHASIS WAS PLACED ON KEY SPECIES IN THE 1002 AREA SUCH AS CARIBOU, MUSKOXEN, ARCTIC CHAR, SNOW GEESE, AND POLAR BEARS. BASED ON THIS EVALUATION, RECOMMENDATIONS WERE MADE TO THE DOI FOR THE MITIGATION OF POTENTIAL ADVERSE IMPACTS TO FISH AND WILDLIFE RESOURCES, THEIR HABITATS, AND USES OF THESE RESOURCES FOR SUBSISTENCE PURPOSES. NOTABLE AREAS OF CONCERN INCLUDED THE FOLLOWING:

(1) THE "CORE CALVING AREA" OF THE PORCUPINE CARIBOU HERD;

(2) A THREE MILE BUFFER ZONE ALONG THE COAST USED BY VARIOUS SPECIES OF WATERFOWL, CARIBOU, AND POLAR BEARS;

(3) FRESH WATER SPRING AREAS SUPPORTING OVERWINTERING FISH;

(4) THE NEARSHORE MARINE ENVIRONMENT USED BY ANADROMOUS FISH AND WATERFOWL DURING THE SUMMER MONTHS; AND

(5) RIPARIAN HABITATS ALONG MAJOR STREAM SYSTEMS.

MITIGATIVE MEASURES FOR THESE HABITATS WERE RECOMMENDED TO ENSURE THE PROPER PROTECTION OF THE VARIOUS FISH AND WILDLIFE SPECIES THAT USE THESE HABITAT TYPES. UTILIZING THIS INFORMATION, WE RECOMMENDED GENERAL APPROACHES TO EFFECTIVE MITIGATION, AS WE DEEMED IT PREMATURE TO PROVIDE RECOMMENDATIONS ON A SITE-SPECIFIC BASIS. IN RECOMMENDING THESE MITIGATIVE MEASURES, WE GAVE DUE CONSIDERATION TO THE FACT THAT CERTAIN ACTIVITIES AND FACILITIES ASSOCIATED WITH PRODUCTION WOULD BE NEEDED IN SOME OF THESE IMPORTANT HABITATS. IN THESE PARTICULAR CASES, THE RECOMMENDATIONS MADE WERE BALANCED WITH KNOWN REQUIREMENTS OF OIL AND GAS EXPLORATION AND PRODUCTION. ALTHOUGH THESE MEASURES WOULD MITIGATE MANY OF THE EFFECTS OF EXPLORATION AND DEVELOPMENT, IT SHOULD BE NOTED THAT SOME EFFECTS CANNOT BE FULLY MITIGATED.

TO ILLUSTRATE HOW THE PROCESS MIGHT WORK IN THE 1002 AREA OF THE ANWR, WE WILL DISCUSS A HABITAT OF SPECIAL CONCERN - STREAM SYSTEMS AND ASSOCIATED RIPARIAN HABITATS - COUPLED WITH AN EXPLORATION AND PRODUCTION ISSUE - INDUSTRIAL REQUIREMENTS FOR TREMENDOUS QUANTITIES OF GRAVEL AND WATER. THIS IS BUT ONE OF THE ENVIRONMENTAL ISSUES THAT WILL HAVE TO BE ADDRESSED IF PORTIONS OF THE 1002 AREA OF ANWR ARE LEASED - EXAMPLES OF SOME OTHER ISSUES ARE DISCUSSED BRIEFLY IN ENCLOSURE II.

BASED ON RESOURCE INFORMATION CURRENTLY AVAILABLE FOR THE 1002 AREA, THE ADF&G DETERMINED THAT STREAM SYSTEMS AND

THEIR ASSOCIATED RIPARIAN HABITATS WERE OF MAJOR IMPORTANCE TO MANY FISH AND WILDLIFE SPECIES. MOOSE ON THE NORTH SLOPE OCCUR ALMOST EXCLUSIVELY IN RIPARIAN HABITATS, POLAR BEAR DENS FREQUENTLY ARE LOCATED IN AREAS OF DRIFTED SNOW SUCH AS CUTBANKS ALONG LOWER PORTIONS OF THE RIVERS, MAJOR NORTH/SOUTH MOVEMENT CORRIDORS FOR CARIBOU AND MUSKOXEN OCCUR ALONG RIPARIAN HABITATS, SHOREBIRD AND PASSERINE DENSITIES AND DIVERSITIES ARE HIGHEST IN STREAM SYSTEMS AND ASSOCIATED RIPARIAN HABITATS, AND FISHERIES RESOURCES (E.G., ARCTIC CHAR, ARCTIC GRAYLING, WHITEFISH) ARE DEPENDENT ON THESE SYSTEMS. BASED ON THESE RESOURCE VALUES WE RECOMMENDED THAT THESE AREAS BE AFFORDED THE NECESSARY DEGREE OF PROTECTION AND THAT ALL OIL AND GAS FACILITIES WHICH CAN BE MOVED BE PLACED OUTSIDE OF A 3/4 MILE BUFFER ADJACENT TO THE MAJOR RIVER SYSTEMS.

CONSTRUCTION OF FACILITIES WITHIN ANWR OR BETWEEN ANWR AND THE TRANS-ALASKA PIPELINE SYSTEM WOULD OCCUR OVER PERMAFROST SOILS. CURRENT CONSTRUCTION TECHNIQUES REQUIRE THAT ALL STRUCTURES BE PLACED ON GRAVEL PADS WITH A NOMINAL THICKNESS OF FIVE FEET TO PROVIDE ADEQUATE INSULATION, THEREBY PREVENTING THAW DEGREDATION OF UNSTABLE SOILS. ROADS CONNECTING ALL MAJOR OIL AND GAS FACILITIES AND CAUSEWAYS IN THE NEARSHORE ENVIRONMENT ALSO REQUIRE SIGNIFICANT VOLUMES OF MINERAL MATERIAL. WATER REQUIREMENTS ASSOCIATED WITH ICE ROAD AND PAD CONSTRUCTION, HYDROTESTING OF PIPELINES, DRILLING, SAFETY, AND DOMESTIC WATER REQUIREMENTS ARE SIGNIFICANT, AND GREATLY EXCEED THE AMOUNT OF FREE WATER AVAILABLE IN THE ANWR 1002 AREA DURING THE WINTER MONTHS. THE VOLUME OF WATER IN RIVER SYSTEMS PEAKS DURING SPRING RUNOFF AND AFTER SUMMER STORMS BUT DIMINISHES TO ZERO DURING THE LONG WINTER MONTHS WITH THE EXCEPTION OF SPRING AREAS FED BY GROUNDWATER. ISOLATED DEEP POOLS MAY OCCUR WITHIN SOME OF THE MAJOR RIVER SYSTEMS SUCH AS THE CANNING RIVER. INADEQUATE WATER RESERVES EXIST WITHIN ANWR TO SUPPORT LARGE SCALE EXPLORATION OR PRODUCTION ACTIVITIES.

AT THE PRESENT TIME IN THE OILFIELD AROUND PRUDHOE BAY, GRAVEL IS OBTAINED FROM LARGE MINE SITES (SURFACE AREA OF 40 TO 100 ACRES WITH A MINING DEPTH OF 35 TO 70 FEET) LOCATED BOTH WITHIN AND ADJACENT TO STREAM SYSTEMS. DURING THE LAST SEVEN YEARS, GRAVEL REMOVAL DIRECTLY FROM ACTIVE FLOODPLAIN AREAS HAS BEEN DISCOURAGED BY RESOURCE AGENCIES DUE TO A LACK OF FIELD SURVEILLANCE AND COMPLIANCE AND THE NEED TO ESTABLISH WATER RESERVOIRS. NEW GRAVEL SITES HAVE BEEN LOCATED IN WETLAND AREAS ADJACENT TO STREAM SYSTEMS. FOLLOWING COMPLETION OF MINING AT SPECIFIC GRAVEL SITES, THE MINED-OUT SITES HAVE BEEN FLOODED WITH WATER DURING THE BREAKUP PERIOD AND HAVE BEEN CONVERTED INTO WATER RESERVOIRS. RECENT WORK BY THE ADF&G AT SEVERAL OF THESE INUNDATED GRAVEL SITES INDICATES THAT WITH PROPER SITE RESTORATION AND CONTROL OF WATER USE, SOME NET BENEFIT TO SELECTED FISH AND WILDLIFE SPECIES MAY BE ATTAINABLE. TO DATE, HOWEVER, NO MATERIAL SITES IN THE PRUDHOE BAY AREA HAVE BEEN RESTORED IN SUCH A MANNER THAT THEY PROVIDE SUITABLE HABITAT FOR FISH AND WILDLIFE.

THE STATE OF ALASKA RECOGNIZED, AS DID DOI, THAT PIPELINES AND ROADS WOULD HAVE TO CROSS THESE MAJOR STREAMS AND RIPARIAN HABITATS. PERFORMANCE STANDARDS ON CROSS DRAINAGE WERE DEVELOPED AND PROVIDED TO THE DOI. THESE PERFORMANCE STANDARDS WERE BASED ON EXPERIENCE GAINED DURING THE PAST DECADE OF WORK WITH OIL AND GAS ON THE NORTH SLOPE. THEREFORE, WE RECOMMENDED THAT A COMPREHENSIVE PROGRAM BE INITIATED TO FULLY ASSESS GRAVEL AND WATER AVAILABILITY IN THE ANWR 1002 AREA, INCLUDING AVAILABILITY OF GRAVEL IN FLOODPLAIN AND RIPARIAN HABITATS. DECISIONS ON LOCATIONS OF GRAVEL SITES SHOULD NOT BE MADE WITHOUT AN ADEQUATE DATA BASE ON THE GRAVEL RESOURCES AVAILABLE IN THE VARIOUS HABITAT TYPES, THE MATERIAL REQUIREMENTS FOR EACH EXPLORATION OR PRODUCTION SCENARIO, AND THE IMPACTS OF THE VARIOUS MINE SITE ALTERNATIVES ON FISH AND WILDLIFE HABITAT.

IN THE ANWR AREA, HOWEVER, IT APPEARS THAT THE BEST LOCATION FOR AT LEAST SOME GRAVEL SITES MAY INDEED BE IN RIVER SYSTEMS. THIS SHIFT IN APPROACH IS BASED ON INFORMATION COLLECTED BY THE ADF&G ON THE NORTH SLOPE THAT INDICATES THAT SOME OF THE GRAVEL SITES THAT HAVE BEEN CONVERTED TO WATER RESERVOIRS MAY ALSO PROVIDE USABLE HABITAT FOR FISH AND OTHER WILDLIFE SPECIES. HOWEVER, TO DEVELOP GRAVEL SITES IN FLOODPLAIN ENVIRONMENTS AND CONVERT THEM TO USABLE WATER RESERVOIRS WHILE STILL PROVIDING SOME LONG TERM BENEFIT TO FISH AND WILDLIFE, WILL REQUIRE A FULL COMMITMENT ON THE PART OF INDUSTRY AND REGULATORY AGENCIES TO RESOLVE THIS ISSUE. ADVANCE PLANNING, APPROPRIATE DATA COLLECTION, AND ASSESSMENT OF THE OPTIMAL GRAVEL SITES IN TERMS OF SITE LOCATION, MINING PLANS, OPERATIONS, AND REHABILITATION WILL BE REQUIRED.

THEREFORE, WE RECOMMENDED TO THE DOI THAT ALTERNATIVE SOURCES OF WATER BE CONSIDERED, AND THAT GRAVEL SITES BE SITED, DEVELOPED, AND RESTORED IN A MANNER SUCH THAT OVERALL IMPACTS TO WATER QUALITY AND FISH AND WILDLIFE RESOURCES ARE MITIGATED. A POSSIBLE APPROACH TO SUCH A RESOLUTION FOLLOWS.

> A JOINT STATE/FEDERAL INTERDISCIPLINARY TEAM WORKING WITH INDUSTRY SHOULD IDENTIFY ALTERNATIVE APPROACHES FOR THE ACQUISITION OF LARGE QUANTITIES OF WATER AND GRAVEL, INCLUDING NEEDED FIELD STUDIES. SUBSURFACE GEOTECHNICAL STUDIES TO IDENTIFY GRAVEL RESOURCES (QUANTITIES, QUALITY, AND LOCATION) IN VARIOUS HABITAT TYPES SHOULD BE REQUIRED PRIOR TO SUBMITTAL OF INDIVIDUAL PERMIT APPLICATIONS. WORK SHOULD BE INITIATED TO DEVELOP DESIGN CRITERIA AND STANDARDS FOR THE DEVELOPMENT OF MINING PLANS INCLUDING RESTORATION OF GRAVEL SITES CONCURRENT WITH MINING OPERATIONS. MINING PLANS SHOULD BE PREPARED TO INCLUDE CONSIDERATION FOR FISH AND WILDLIFE USE FOLLOWING COMPLETION OF MINING. ALL AREAS, INCLUDING STREAM AND ASSOCIATED RIPARIAN SYSTEMS SHOULD BE CONSIDERED WITH THE OBJECTIVE OF PROVIDING GRAVEL, SUBSEQUENT WATER SITES FOR SUPPORT OF INDUSTRIAL ACTIVITIES, AND FISH AND WILDLIFE HABITAT. ASSUMING THESE ACTIONS ARE TAKEN, WE BELIEVE THAT THE ISSUE OF GRAVEL AND WATER AVAILABILITY AND MITIGATION OF EFFECTS TO FISH AND WILDLIFE RESOURCES CAN BE RESOLVED WITHOUT SIGNIFICANT ADVERSE EFFECTS TO FISH AND WILDLIFE IN THE 1002 AREA OF ANWR. WE ALSO BELIEVE THAT THE POTENTIAL EXISTS FOR PROVIDING HABITAT TO SELECTED SPECIES AS WAS DEMONSTRATED IN THE FIVE YEAR GRAVEL STUDY CONDUCTED BY A CONSULTING FIRM FOR THE USFWS.

WE HAVE FOCUSED ON AN OVERALL APPROACH TO MITIGATION OF ADVERSE IMPACTS TO FISH AND WILDLIFE RESOURCES USING WATER AND GRAVEL TO ILLUSTRATE AN EXAMPLE IN WHICH IMPACTS OF OIL AND GAS PRODUCTION COULD BE MITIGATED IF THE PROPER PROCEDURES WERE FOLLOWED. WE KNOW THAT THERE WILL BE TREMENDOUS DEMANDS FOR WATER AND GRAVEL IF EXPLORATION AND PRODUCTION OCCUR, AND WE KNOW THAT GRAVEL AND WATER SOURCES WILL HAVE TO BE DEVELOPED. WE KNOW THAT WATER IS NOT READILY AVAILABLE IN ANWR. WE ALSO KNOW THAT STREAMS AND ASSOCIATED RIPARIAN HABITATS MUST BE AFFORDED A HIGH DEGREE OF PROTECTION. USING THESE KNOWN FACTORS AS WELL AS OUR EXPERIENCES WITH OIL AND GAS DEVELOPMENT ELSEWHERE ON THE NORTH SLOPE, WE HAVE RECOMMENDED A WORKABLE APPROACH TO RESOLUTION OF THIS PROBLEM WHILE AT THE SAME TIME ENSURING AN ACCEPTABLE LEVEL OF PROTECTION FOR FISH AND WILDLIFE RESOURCES.

UNLIKE THE GRAVEL AND WATER EXAMPLE, WE DO NOT CURRENTLY BELIEVE THAT SUFFICIENT INFORMATION NOR EFFECTIVE MITIGATIVE MEASURES EXIST TO PREVENT ADVERSE IMPACTS TO THE PORCUPINE CARIBOU HERD WITHIN THE CORE CALVING AREA. AT THIS TIME, MR. KEN WHITTEN (ADF&G) WILL DISCUSS THE PORCUPINE CARIBOU HERD WITH EMPHASIS ON CARIBOU CALVING IN THE 1002 AREA.

TESTIMONY OF
WILLIAM D. VAN DYKE
BEFORE THE
SENATE COMMITTEE ON ENERGY AND NATURAL RESOURCES
October 13, 1987

Mr. Chairman, and members of the Committee:

My name is William D. Van Dyke. I am a petroleum engineer with nine years of experience in Alaska. I serve as Petroleum Manager for the Division of Oil and Gas in the Department of Natural Resources. I am actively involved in the permitting of oil and gas activities on State lands, unitization of State oil and gas leases, and design of the terms and conditions attached to State oil and gas leases at the time of sale. I also have been very involved in developing the State position concerning proposed leasing of the coastal plain of the Arctic National Wildlife Refuge (ANWR).

Before discussing the details of possible ANWR development strategies and specific mitigation measures, I would like to stress four very important points. First, oil and gas leasing in Alaska is extremely important to both the State and the nation. Second, from the information I have seen, I am convinced that the coastal plain of ANWR is the most prospective unexplored petroleum province remaining in North America. Third, given what we have learned from our years of experience at Prudhoe Bay and along the TAPS line, I believe that oil and gas development can take place in ANWR with a minimal degree of impact to the environment. And fourth, an exploration-only policy should not be considered for ANWR.

The manner in which State North Slope oil and gas lessees conduct their business has certainly evolved since what might be termed the "early years" at Prudhoe Bay. Government agencies' understanding of North Slope oil field operations and of the arctic environment have likewise matured. Summertime cat trains over the tundra and long gravel airstrips at each and every exploratory well site are now only stories of the past. Large balloon-tired vehicles, ice roads and comprehensive planning reflect the technologies and tools of today.

We do not know everything that there is to know about the environment and the ecology of the coastal plain. Year by year our understanding of these matters is growing, and we are developing better and more effective mitigation techniques. Certainly that trend will continue in the future. We have seen a progression from the first development at Prudhoe Bay and TAPS construction in the 1970's to the more recent developments at the Kuparuk, Milne Point, Lisburne and Endicott fields. The improvements reflect the incremental knowledge and experience gained. What has been learned at these fields can be applied to future activities on the coastal plain.

Let me cite a few examples of the advances that have been made:

1. Typically, on the North Slope, numerous development wells are drilled from a single gravel pad. At Prudhoe Bay, the original development wells were about 120 feet apart from each other. At the Kuparuk Field and at Lisburne the wells are about 60 feet apart. At the new offshore Endicott field, those wells are only 10 feet apart, but this requires a specially modified drill rig. Overall, this closer well spacing means that drill sites can be much smaller for a

given number of wells; overall utilization of gravel is reduced and fewer square feet of tundra are covered.

2. Significant advances have also been made in 3-D seismic interpretation, directional drilling technology, and Measurement While Drilling (MWD) technology. Again, fewer drill sites may be needed, and the sites can be optimally located. Having some flexibility in being able to move the drill site allows sensitive habitats to be avoided, while at the same time the subsurface reservoirs can be properly developed and produced.

3. Development and operation of giant oil fields requires wide-ranging support activities. Drilling mud and cement companies, construction contractors, well service operators, and the like, are all a necessary part of the day-to-day operation. As with the actual in-field operations, we are now much more experienced in planning for the needs of the service companies. The Kuparuk River Oil Field, with its associated Kuparuk Industrial Center, is a contemporary example of how to plan and permit these types of activities. We made some early mistakes at Prudhoe Bay, but we learned from those mistakes.

Certainly development of oil and gas on the coastal plain will require some trade-offs. However, relative to what might have been required even just 10 years ago, the magnitude of those trade-offs has been significantly diminished and in some cases even eliminated. Through a combination of innovative thinking, close observation of the actual effects caused by development, and pure scientific study, we are in a position today to say oil exploration and development can proceed in ANWR without significant adverse impact.

I believe an exploration-only policy in ANWR would be a big mistake for this country.

An exploration-only policy would cost the Federal government a lot of money. These costs would take several forms. The operation of an exploratory program would result in sizeable out-of-pocket government expenditures. Secondly, the government would forego lease and bonus revenues. And thirdly, such a program could effectively condemn adjacent acreage, and the attendant revenues that could flow from that property.

The National Petroleum Reserve (NPRA) is a prime example of a government-sponsored exploration program and the problems inherent in such a program. Between 1923 and 1953 the United States Navy drilled 37 test wells and found three oil accumulations and six gas accumulations within the NPRA. Only two of these discoveries were considered sizeable. This 30-year exploration effort cost the Federal government between $50 and $60 million.

In 1974, exploration began again in the NPRA, this time under the direction of the U.S. Geological Survey. Between 1974 and 1981 twenty-seven exploratory wells were drilled within the NPRA at a cost to the Federal government just over a half billion dollars. After the Federal exploration program ended, Congress authorized competitive leasing in NPRA, and three sales were held. The first two of these sales received minimal interest, and the third received no bids.

If the NPRA had been leased under a traditional competitive leasing program not only would it likely have generated millions of dollars of bonus revenues, but the exploration costs would have been borne by the oil industry.

Additionally, an exploration-only policy raises a number of technical issues. One issue is how many wells are necessary to confirm (or condemn) the region's resource potential. In the ANWR coastal plain, where the subsurface geology is extremely complex, it will require a very large number of exploratory wells (each at a high cost) to evaluate all the geologic plays which have the potential to yield commercial deposits. The drilling of six to 12 unsuccessful exploratory wells will not establish, with a high degree of confidence, that no commercial oil deposits exist in the 1002 area. The problem, as I see it, is that exploratory wells reveal more about the subsurface geology and oftentimes indicate additional plays and stratigraphic intervals that warrant evaluation. More questions are created than are answered. With a limited exploratory well program, the possibility exists that the area will be falsely condemned without the complete and thorough evaluation a more traditional leasing and exploration program would provide.

A traditional competitive leasing program results in many companies participating in the evaluation of different plays. One entity (the USGS, the State, or an individual company) cannot generate as many different interpretations from these data (or novel ideas for potential deposits) as a group of companies. Thus, the exploration-only proposal limits not only the number, but the types of plays that will be evaluated, further increasing the possibility that deposits could be missed.

In the case of a well (or wells) that is successful, various land management decisions and conflicts will arise related to the dispensation of the unleased lands. In most cases it requires a number of delineation wells to determine the size of a discovery--who will incur the cost of the delineation wells? How will leasing of partially known deposits be managed? These are problems that are not present with a competitive leasing regime.

With respect to the design of mitigation measures, both our leasing and permitting systems use a formal tri-agency review procedure to assure that lease sale proposals and permit applications receive a broad and a thorough review. The Alaska Department of Fish and Game (ADF&G), the Alaska Department of Environmental Conservation (ADEC), and the Alaska Department of Natural Resources (ADNR) each provide comments on the proposal. No single State agency has veto power, and conflicts between agencies are elevated--when necessary--to agency directors or commissioners for final resolution. We also solicit input from the Federal resource agencies, the oil industry and the people living in the sale area.

Given the scope and complexity of oil field operations and the broad range of environmental concerns at hand, I cannot imagine any one State or Federal agency possessing the expertise that is needed to properly review and approve all the terms of sale that might be used for the leasing of the coastal plain or. for approval of a proposal to develop a major new oil field in the coastal plain.

In my view, joint State-Federal multiagency review is a necessity at both the lease sale planning stage and during the actual permitting process. The State has also recommended joint State-Federal monitoring and enforcement teams be created. This will be essential in ANWR where Federal, State and fee ownership of subsurface mineral rights is a certainty, and permitting jurisdictions overlap.

Our terms of sale are a mixture of general performance standards and very site-specific requirements. We have taken this approach for a number of reasons. First, it is impractical to go out into the field ahead of time and gather the enormous amount of site-specific baseline data

that would be needed to write detailed all-encompassing stipulations for each and every square foot of proposed lease sale area. Second, in our lease sale areas, we are not absolutely certain where the oil and gas is located and what volumes might be there. We therefore cannot anticipate ahead of time the exact location or optimum layout of roads, pipelines, well sites, etc. Because of these two factors it is best to let the potential lessees know at the time of sale the parameters within which they will be expected to operate, while we retain the flexibility later in the process to fine-tune the proposals as they are developed.

In those areas where we have more detailed information (such as along the major North Slope river systems) or for those concerns that are well recognized (such as seasonal protection of caribou calving areas), we do draft very detailed site-specific measures. If you have the studies and the data in hand, it is only fair to let the lessees know that very specific restrictions will apply in certain areas or during certain times of the year.

But in those instances where the data are sketchy or nonconclusive or if there is a choice of possible mitigation measures, I believe it is a mistake at the lease sale stage to lock in rigid stipulations that later may turn out to be ineffective or unnecessary.

Recent exploration on the Federal OCS in Alaska and on State lands has been very disappointing. Our aggregate North Slope oil reserves are about half gone, and Cook Inlet production is well past its zenith. In reality, very few giant oil fields are ever discovered, but the ones that are found account for about two-thirds of all the oil produced. Because of the development at the Prudhoe Bay, Kuparuk, Milne Point, Lisburne, and Endicott fields, we have safe, proven technology. In terms of being able to plan and design for protection of biological resources, we are over the major hurdles that a major development proposal might present.

Prudhoe Bay currently provides over 20% of this Nation's domestic production. As that area moves into decline, ANWR represents this country's best opportunity to supplement those reserves. With the 10-15 year lead time necessary for exploration and development in the Arctic, this is the ideal time to begin a competitive ANWR leasing program. The State of Alaska stands ready and willing to work with the committee as it considers this important legislation.

We will be happy to provide the specific information you need on our current North Slope leasing and permitting practices, and our ideas on specific mitigation measures for ANWR.

For the record, along with my written testimony, I have submitted copies of three of our recent State notices of sale which list sale terms and conditions representative of those used to lease State acreage adjacent to ANWR. Sale 51 was an onshore sale. Sale 50 was an offshore sale. Sale 54 is an onshore sale proposed for January 1988. The notices for sales 50 and 51 contain the complete set of sale terms and conditions the State applied. The notice for Sale 54 is still in the preliminary stage, but you can see where we are headed in terms of mitigating measures for that area. There is no need to go through those notices page by page. Rather, I believe it is important for you to understand how we arrived at the final product, and the rationale behind those sale terms.

We are submitting the first stage of a lease sale stipulation review and analysis study that the State has undertaken. The study is being done to reassess the costs

and the benefits of each stipulation given the advances that have been made over the past few years.

Additionally, a summary of the different leasing methods the State currently has the authority to use is included.

Thank you for the opportunity to testify today and I will be happy to answer any questions.

INITIAL AGENCY RESPONSES FOR ONGOING REVIEW OF OIL AND GAS

LEASING STIPULATIONS AND MITIGATING MEASURES

(Compiled October 6, 1987)

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

MEMORANDUM

State of Alaska

P.O. Box 0

Juneau, Alaska 99811

TO: Elizabeth Benson
Division of Governmental
Coordination - Fairbanks
Office of Management and Budget

DATE: August 7, 1987

FILE NO:

TELEPHONE NO: 465-2653

FROM: Doug Redburn, Chief
Water Quality Management
Division of Environmental Quality

SUBJECT: AOGA Stipulation
Study Agency Response

By: Michael E. Wheeler, Coordinator M.W.
Oil and Gas Development Program

In accordance with the agency assignments for addressing the AOGA Oil and Gas Lease Sale Stipulation Study, the Department of Environmental Conservation has prepared comments on the three mitigating measures which fall under the regulatory purview and statutory authority of this department. These comments (Attachment 1) are presented in the format specified in your June 19, 1987 memorandum. If you have any questions on this material, please contact Michael E. Wheeler (563-6529) at our Anchorage office.

MEW:by

cc w/attach: Larry Dietrick, NRO
Al Ott, DFG, Fairbanks
Jerry Brossia, DNR, Fairbanks
Kurt Fredriksson, DGC, Juneau
Bill Van Dyke, DNR, Anchorage
Lance Trasky, DFG, Anchorage

Attachment 1. DEC-Assigned Stipulations Response

1. Stipulation 2. Prohibition on the dumping of drilling muds and cuttings.

a. Type of Stipulation: Actually a term of sale, the prohibition of offshore disposal of drilling muds and cuttings applies only under certain conditions. These include: restrictions in shallow water areas of low mixing energy (e.g. within the 2 m isobath); restrictions in areas of high biological sensitivity (e.g. river mouths, clam beds); and when the discharged drilling muds and cuttings are oil based or oil-contaminated as defined by an elutriate oil and grease concentration greater than 50 mg/l.

b. Purpose of Term of Sale: This term is designed to ensure compliance with the regulations of the Department of Environmental Conservation. Specifically, the discharge of drilling muds and cuttings is regulated by water quality criteria (18 AAC70. 020), which would preclude the offshore discharge of oil-contaminated wastes into State waters when such discharges will "cause a film, sheen or discoloration on the surface or floor of the water body." The discharge of non-contaminated muds and cuttings in the offshore marine environment in State waters is generally acceptable where it is demonstrated that such discharges will not likely cause deleterious effects to aquatic life or result in the accumulation of solids along the shoreline or in the nearshore environment (18 AAC 70. 020).

The term of sale dealing with drilling muds disposal is designed to meet regulatory requirements and clearly state how those requirements would be applied. In this sense, the term of sale provides advance notice to industry of operating conditions that may be expected for potential lease sale tracts. Furthermore, the term is not discretionary, and equivalent conditions are specified within NPDES discharge permits.

c. Effectiveness: The effectiveness of this term as an additional tool is that it provides prospective bidders information on what permit restrictions and operating conditions would apply to specific tracts within a proposed sale area. This advanced notice is to industry's benefit in planning operations costs and figuring such costs into the bidding process.

Its effectiveness in protecting water quality has been demonstrated through field monitoring of marine disposal areas for heavy metals and petroleum hydrocarbons, and monitoring hydrocarbon tissue burdens in key species. Study results have indicated only localized degradation of water quality and sediment quality, and no reported accumulation of hydrocarbons in marine species.

2. Stipulation 6. Discharge of Produced Water.

a. Type of Stipulation: This condition is also a term of sale to be applied to ensure compliance with DNR plan of operation approvals. Like the drilling wastes term, this term is area- and depth-specific and is applied to ensure compliance with state water quality standards. Typically, in seasonally ice-covered nearshore areas of the arctic (Beaufort Sea, Chukchi Sea and Norton Sound), discharge of produced waters is prohibited only within the 10 m isobath (depth contour). This prohibition is uniformly applied in both state and federal lease requirements applicable to these areas. No prohibition applies outside the 10 meter depth contour. It has been demonstrated in several national studies that mixing and dilution is insufficient seasonally or annually in such shallow areas to mitigate the adverse environmental effects of this type of continuous discharge of wastes containing low levels of aromatic hydrocarbons, and which are high in salinity and low in oxygen or anoxic. In areas of greater depth and tidal mixing, conditions are not as stringent (e.g. Cook Inlet) since dispersion is enhanced. In onshore situations and in some offshore development projects, it is common practice to reinject produced waters into shallow formations or to commingle them with fluid streams used for water flooding.

b. Purpose of the Term of Sale: The purpose of this term is to minimize deleterious effects, minimize violations of water quality, and provide a clear statement of the manner in which state regulatory requirements for water quality standards would be applied to this specific category of wastewater. Statutory authority rest in AS 46.03.010, AS 46.03.020, AS 46.03.070, AS 46.03.080, AS 46.03.100 and AS 46.03.110; while regulatory authority may be found in the state water quality criteria (18 AAC 70.020) dealing with the water quality parameter of petroleum hydrocarbons and the marine water use of growth and propagation of fish, shellfish, aquatic life and wildlife.

c. Effectiveness: This term prevents the adverse impacts of low levels of water-soluble oil components which have been shown by several studies to have deleterious effects on benthic organisms chronically exposed over long periods of time. Reduced numbers of benthic individuals and species have been demonstrated a considerable distance (greater than 300 meters) from the discharge point of produced waters. This reduction of benthic individuals and species is highly correlated with increases in sediment hydrocarbon concentrations. The movement of polluted sediments out of the originally affected area represents an additional concern. The term of sale also address this concern as well by serving to to minimize the area of potential impact.

Additionally, this term provides prospective bidders information on what permit restrictions and operating conditions would apply to specifc tracts within a proposed sale area. This advanced notice is to industry's benefit in planning operations costs and figuring such costs into the bidding process.

3. Stipulation 12. State Discharge Monitoring Requirements that Exceed NPDES General Permit Regulations

   a. Type of Stipulation: The AOGA comments on this requirement refer to a permit condition which is included in general and individual NPDES permits which requires that drilling muds and cuttings discharged into State waters meet a 50 mg/l test criterion for elutsiate oil and grease contamination. Muds and cuttings which fail this test are considered oil-contaminated. The test requirement is not a state oil and gas lease stipulation and it is not a proposed term of sale for the plan of operations. Thus, review of this requirement is not within the framework of the state oil and gas leasing process.

   b. Purpose of this Requirement: This permit requirement provides the state with an objective, quantitative measure of the oil and grease concentration of used drilling muds and cuttings. This information is necessary in order to ensure compliance with water quality standards dealing with petroleum hydrocarbons, oils and grease. The statutory authorities and regulatory references are the same as cited for the previous term.

   c. Effectiveness: This monitoring requirement is currently under review in the Cook Inlet for comparison to EPA's visible sheen test. Results of a comparative study will be used to analyze effectiveness and cost considerations.

MEMORANDUM

State of Alaska

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL AND GAS

TO: Elizabeth Benson
DGC/OMB

DATE: September 3, 1987

FILE NO:

TELEPHONE NO: 561-2020

FROM: Bill Van Dyke
Petroleum Engineer

SUBJECT: AOGA Stipulation Study

Attached are our comments for the lease stipulations which were assigned to the department for review under the AOGA stipulation study. If you have any questions concerning these comments, please contact me at 762-2550, Dave Johnston at 762-2592, or Kristina O'Connor at 762-2548 (PROFS account NROCKOC).

cc w/attach: Kurt Fredriksson - DGC
Jerry Brossia - DNR
Al Ott - DFG
Lance Trasky - DFG

0960J/p5

1. Requirement for archeological and historical surveys prior to construction and drilling operations.

a. Type of stipulation: The requirement for archeological and historical surveys prior to construction and drilling operations is a term of sale. The term requires lessees to perform an inventory of archeological and historical sites within the area of the proposed activity before the activity occurs. The inventory requires site surveys, consideration of local history (written and oral sources) and consultation with the Alaska Heritage Resources Survey and the National Register of Historic Places.

This term of sale should be viewed in association with a separate lease stipulation which addresses the discovery of historic or archeologic objects. That stipulation insures protection to any structure or object of historic or archeologic significance that is discovered during operations on the leased area. The stipulation requires the lessee to report such findings to the Department, and to make every reasonable effort to preserve and protect such site, structure, or object from damage.

b. Purpose: The purpose of the term of sale and the stipulation is to ensure compliance with the Alaska Historic Preservation Act (AS 41.35). Under the Act, the state establishes its policy to preserve and protect the historic, prehistoric and archeological resources of the state from loss, desecration and destruction so that the scientific, historic and cultural heritage embodied in those resources may pass undiminished to future generations. Further, the Act makes it unlawful to appropriate, excavate, remove, injure or destroy any historic, prehistoric or archeological resources of the state.

c. Effectiveness: The term of sale and stipulation are adopted for all state oil and gas lease sales, both onshore and offshore, to protect archeological and historical resources. Onshore, the term and stipulation provide effective protection for those resources. Generally, the level of investigation is related directly to the likelihood of discovery. Offshore, the term and stipulation appear to be ineffective and somewhat impractical because of the difficulty of conducting investigations in that environment (especially in Cook Inlet and the Beaufort Sea). For this reason, the requirement to conduct an inventory in offshore areas is usually waved at the plan of operation stage, depending on the likelihood of a possible discovery.

The department believes that requiring lessees to conduct archeological inventory is appropriate and constitutes wise land use management. The best means, and certainly the most economical way, to mitigate possible disturbance of archeological sites is to avoid the site in the first place. This can be accomplished most readily by requiring lessees to perform an archeological inventory prior to exploration and construction activities.

2. Requirement for environmental training of all personnel involved in drilling program.

a. Type of stipulation: The requirement for environmental and cultural training for drilling personnel is a term of sale. Under the term, lessees must develop an environmental training program for all personnel involved in exploration or development activities (including personnel of the lessee's contractors and subcontractors). The program must be designed to inform employees working on the project about specific types of environmental, social, and cultural concerns which relate to each employee's job. The program must be formulated and implemented by qualified instructors experienced in each pertinent field of study and must employ effective methods to ensure that personnel understand and use techniques necessary to preserve archeological, geological, and biological resources. The program must also be designed to increase the sensitivity and understanding of personnel to community values, customs, and lifestyles in areas in which such personnel will be operating.

b. Purpose: The purpose of the term is to enhance the sensitivity of oil field workers to the unique environment and social structure which exists within Alaska. Although no specific statutory authority exists to require environmental and cultural training, the department believes it is appropriate since, at least in the past, many oil field workers were new arrivals in the state. The department believes that the program reduces social tension and creates more respect and understanding for Alaska's unique environment and its indigenous people.

c. Effectiveness: The determination of the term's effectiveness is subjective. The benefits of environmental and cultural training, which is designed to enhance worker sensitivity to Alaska's environment and Native people, can not be reduced to economic terms, nor can specific examples be provided showing that environmental damage or social disruption was avoided or reduced by requiring that training. Nevertheless, the department believes that benefits (ie. reduced problems) are obtained by requiring those programs. The state's support for environmental and cultural training contributes to local community preception that the state's is committed to sound resource development. From industry's viewpoint, the environmental and cultural training of its employees enhances the public image of the corporation.

Although the state derives certain intangible benefits from environmental and cultural training programs, those programs are not essential to the absolute economic success of oil and gas development within the state. For this reason, the training requirement could be dropped. However, the department does not believe that environmental and cultural training is a costly requirement. The training programs are rather generic, and are readily adaptable for use throughout Alaska. Once produced, the company's environmental and cultural training program can be used to educate its employees prior to conducting activities on any of its current and future oil and gas leases.

3. Removal of drilling sites, roads, buildings, airstrips, or other facilities and rehabilitation of the site.

a. Type of stipulation: The requirement to remove all facilities and rehabilitate the site is a term of sale. Generally, upon abandonment of drilling sites, the lessee must remove all roads, buildings, airstrips or other facilities, and rehabilitate the area unless the department determines that such removal and rehabilitation is not in the state's best interest.

b. Purpose: No specific statutory authority exists to require facility removal and site rehabilitation. The department's authority to require facility removal and site rehabilitation falls under its broad discretionary powers (Title 38) for land use management. AS 38.05.180 provides that it is in the state's best interest to "minimize the adverse impact of exploration, development, production, and transportation activity." The lease contract includes the specific rehabilitation and abandonment language. Title 11 of the department's regulations requires that a rehabilitation and abandonment plan be submitted for approval. Although facility removal and site rehabilitation are not specifically provided for under state statute, the department believes that such a requirement is a useful mitigation tool, which reduces the environmental issues associated with oil and gas development. The state's leasing strategy calls for protection of "the integrity of affected cultures, the environment, and fish and wildlife resources through the terms of the plans of operations, lease and permit stipulations, and monitoring of lease operations.

c. Effectiveness: To date, the state has had limited experience upon which to judge the effectiveness of this term. Most North Slope and Cook Inlet fields are still active. Only a few drilling sites have been abandoned and only minor amounts of rehabilitation work has been done. Basically, facilities on those abandoned sites have been removed and the underlying gravel used for other purposes. Rehabilitation on the North Slope is still experimental; only a few very short roads and other impacted areas have been reclaimed. In the Beaufort Sea, a number of drilling islands have been abandoned. On those islands, all facilities and slope protection have been removed, and the island left to erode away.

The effectiveness of the term perhaps is best exemplified by the site rehabilitation work conducted on an oil and gas lease on the Alaska Peninsula. In 1984, the state permitted construction of a drilling site and airstrip on an Amoco lease near Becharof Lake. As a condition of that permit, the lessee was required to remove all facilities, decommission the airstrip, and rehabilitate the area upon abandonment of the site. Although no concerted effort has been made by the state to specifically document results, the restoration work appears to have been successful.

4. Documentation of Alaska hire

The department no longer requires documentation of Alaska hire. Instead, the department only encourages lessees to hire and employ local and Alaska residents and companies to the extent they are available and qualified for work performed on the leased area.

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The following lists contain the standard stipulations the Division of Land and Water Management would normally attach to an industry request for a permit to construct a development drill site and an exploratory drill site (winter operation). Please note that there are often special stipulations attached to these type of permits that are "tuned" specifically for that operation and setting. These types of stipulations are usually aimed at unusual access, terrain, timing, environment, and construction.

STANDARD STIPULATIONS FOR DEVELOPMENT DRILL SITES

1. Vehicles shall be operated in a manner such that the vegetative mat of the tundra is not disturbed and blading or removal of tundra vegetative cover is prohibited except as approved by the Director of the Division of Land and Water Management or his designee. This stipulation is intended to protect the vegetative mat from being removed from the underlying substrate exposing soils to thermal degradation or hydraulic erosion. (6 AAC 80.040, 6 AAC 80.130, 6 AAC 80.140)

2. On-tundra travel shall be subject to termination within 72 hours of notification by the Director of the Division of Land and Water Management or his designee for protection of surface vegetation from being removed from the underlying substrate exposing soils to thermal degradation or hydraulic erosion. (6 AAC 80.040, 6 AAC 80.130, 6 AAC 80.140)

3. Ice roads and/or ice pads may be constructed in the work areas as long as they are thick enough to prevent damage to the tundra and underlying substrate. No other ice roads are authorized under this permit. (6 AAC 80.130, 6 AAC 80.140)

4. Tundra travel shall be limited to that area to be impacted with gravel placement. This stipulation is to protect the tundra surface outside the area of construction. (6 AAC 80.130)

5. The crossing (e.g., installation of a drainage structure, placement of an obstruction, diversion, etc.) of any fish stream (e.g., resident or anadromous fish species) requires a Title 16 (A.S. 16.05.840) permit from the Alaska Department of Fish and Game (479-0882). This stipulation is to allow for the free passage of resident or anadromous fish and to protect bank habitat, prevent soils erosion, and maintain natural drainage patterns. (AS 16.05.870, 6 AAC 80.130, 6 AAC 80.040)

6. Adequate culverting shall be installed to maintain surface drainage patterns and to prevent ponding. This stipulation is necessary to protect surface habitats and prevent erosion. (6 AAC 80.070, 6 AAC 80.130)

7. Fuel storage facilities shall not be placed within 100 feet of water bodies and must be within an impermeable diked area of 110 percent capacity of the largest independent fuel container. Manifolded tanks, day tanks, or bladders must be considered as a container. This stipulation is to protect the state's lands, waters, and habitats from potential fuel leaks and spills. (6 AAC 80.070, 6 AAC 80.130)

8. The reserve and fuel pits shall be rendered impermeable. This stipulation is intended to stop the leaching of hydrocarbons through the pit walls and into the lands and waters of the state. (6 AAC 80.070, 6 AAC 80.130)

9. All oil and hazardous material spills shall be cleaned up and reported per 18 AAC 75.080. Phone 1-800-478-9300 to report spills. This stipulation is intended to insure the proper reporting, clean-up, and handling of hazardous material spills as well as protect the tundra environment from such spill. (6 AAC 80.140, 6 AAC 80.130)

10. Relief pits and flare pits are not required to be rendered impermeable as long as they are only utilized for their designed purpose. Any other uses (e.g., mud storage, etc.) are prohibited. If emergency uses are required, they must be reported to the Northern Regional Office of the Department of Environmental Conservation and cleanup operations started within 72 hours after the emergency has come under control. This stipulation is intended to insure that all potential hazardous materials are removed from unlined pits to protect adjacent habitat and waters from possible leaching of materials into these areas. (6 AAC 80.070, 6 AAC 80.130)

11. All flow test holding facilities shall be lined and diked to 110% of the containment tanks. This stipulation is to insure containment of hydrocarbons within a specified area around the portable testing facilities in the event of a leak or break thereby protecting the state's lands, waters and habitat from potential contamination and loss. (6 AAC 80.070, 6 AAC 80.130)

12. Amendments or modifications to this permit must be approved in writing by the Director of the Division of Land and Water Management or his designee.

13. Gravel will be removed from state approved sources at which blasting may be required to complete gravel operations. Approval of this lease operation authorizes such blasting. Accounting for all utilized fill material will be pursuant to the existing material sales contract.

14. The Director of the Division of Land and Water Management shall be informed in writing of all ongoing, approved, development phases involving the placement of additional material on the tundra.

15. The Director of the Division of Land and Water Management may require that his authorized representative be on-site during any operations conducted under this permit.

16. The permittee shall inform and ensure compliance with these stipulations by its agents, employees, and contractors (including subcontractors at any level).

17. Flowline routing and placement shall be approved by the Director of the Division of Land and Water Management prior to installation.

18. As stated in Director's Policy File FY 80-20, a certified as-built survey of permanent improvements will be supplied to the Division of Technical Services within 120 days after completion of gravel placement.

STANDARD STIPULATIONS FOR EXPLORATORY DRILL SITES

1. Vehicles shall be operated in a manner such that the vegetative mat of the tundra is not disturbed and blading or removal of tundra or vegetative cover is prohibited except as approved by the Director of the Division of Land and Water Management or his designee. Filling of low spots and smoothing by the use of snow and ice is allowed. Ice or snow bridges constructed at stream crossings shall not contain extraneous material (i.e., soil, rock, brush, or vegetation) and shall be removed immediately after use or prior to break up. Where necessary, river ice slotting shall take place to facilitate water flow during break-up. This stipulation is intended to protect the vegetation mat from being removed from the underlying substrate exposing soils to thermal degradation or hydraulic erosion. (6 AAC 80.040, 6 AAC 80.130, 6 AAC 80.140)

2. On-tundra travel shall be subject to termination within 72 hours of notification by the Director of the Division of Land and Water Management or his designee for protection of surface vegetation from being removed from the underlying substrate exposing soils to thermal degradation or hydraulic erosion. (6 AAC 80.040, 6 AAC 80.130, 6 AAC 80.140)

3. Summer on-tundra travel shall require specific approval from an authorized field representative of the Division of Land and Water Management and shall be limited to vehicle types and time periods approved by this division. This stipulation is intended to protect the vegetative mat from destruction and exposure of the substrate soils and subjecting the areas to thermal degradation or hydraulic erosion. (6 AAC 80.040, 6 AAC 80.130, 6 AAC 80.080, 6 AAC 80.140)

4. The winter operation of ground contact vehicles for off-road travel must be limited to those areas which have adequate ground frost and snow cover to prevent damage to the ground surface from the destruction of the surface vegetation and subsequent exposure of substrate soils which can lead to thermal degradation or hydraulic erosion. (6 AAC 80.140, 6 AAC 80.130, 6 AAC 80.080)

5. Winter on-tundra travel may begin when adequate snow cover and frost depth conditions exist to protect the tundra vegetative mat from disturbance from the activities intended. Tundra opening is determined by an authorized field representative of the Division of Land and Water Management. With prior approval certain on-tundra activities may begin sooner than others depending on the impact or magnitude of the operations. (6 AAC 80.130, 6 AAC 80.140, 6 AAC 80.080)

6. Movement of equipment through willow (Salix) stands shall be avoided where possible. This stipulation is intended to protect the areas willow stands which are a limited habitat, valuable for browse and erosion control. (6 AAC 80.130, 6 AAC 80.140)

7. Incinerator residue shall be backhauled to a solid waste disposal site approved by the Department of Environmental Conservation. This stipulation is intended to protect state lands, habitats, and water from unauthorized solid waste disposal. (6 AAC 80.130, 6 AAC 80.140)

8. Ice or snow roads shall be thick enough to prevent damage to the tundra vegetation. This stipulation is intended to protect the vegetative mat from being removed from the underlying substrate exposing soils to thermal degradation or hydraulic erosion. (6 AAC 80.130, 6 AAC 80.140)

9. Trash, survey lath, roadway markers, and other debris that has accumulated along the ice road or cross country tundra routes shall be cleared and picked up prior to freeze-up of the following winter. This stipulation is intended to prevent accumulation of solid waste on the tundra and to prevent the loss of and contamination of habitat. (6 AAC 80.130, 6 AAC 80.140)

10. Vehicle maintenance, campsites, and/or storage and stockpiling of material on the surface ice of lakes, ponds, or rivers is prohibited. This stipulation is intended to protect the surface waters and habitat, and adjacent state lands from possible contamination through the loss of hydrocarbons or any other hazardous substance. (6 AAC 80.130, 6 AAC 80.140)

11. All drilling muds and cuttings must be disposed of in a manner approved of by the Department of Environmental Conservation. This stipulation is intended to prevent surface contamination and subsequent habitat loss and insure proper disposal of contaminated fluids. (6 AAC 80.130, 6 AAC 80.140)

12. Fuel storage facilities shall not be placed within 100 feet of water bodies and must be within an impermeable diked area of 110 percent capacity of the largest independent fuel container. Manifolded tanks, day tanks, or bladders must be considered as a container. This stipulation is to protect the state's lands, waters, and habitats from potential fuel leaks and spills. (6 AAC 80.070, 6 AAC 80.130)

13. The reserve and fuel pits shall be rendered impermeable. This stipulation is intended to stop the leaching of hydrocarbons through the pit walls and into the lands and waters of the state. (6 AAC 80.070, 6 AAC 80.130)

14. All oil and hazardous material spills shall be cleaned up and reported per 18 AAC 75.080. Phone 1-800-478-9300 to report spills. This stipulation is intended to insure the proper reporting, clean-up, and handling of hazardous material spills as well as protect the tundra environment from such spills. (6 AAC 80.140, 6 AAC 80.130)

15. All flow test holding facilities shall be lined and diked to 110% of the containment tanks. This stipulation is to insure containment of hydrocarbons within a specified area around the portable testing facilities in the event of a leak or break thereby protecting the state's lands, waters and habitat from potential contamination and loss. (6 AAC 80.070, 6 AAC 80.130)

16. The Alaskan Historic Preservation Act (A.S. 41.35.000) prohibits the appropriation, excavation, removal, injury, or destruction of any historic, prehistoric or archeological site, or camp, either active or abandoned, shall be disturbed in any manner nor shall any item be removed therefrom. Should any sites be discovered during the course of field operations, the Commissioner of the Department of Natural Resources shall be promptly notified. (6 AAC 80.150)

17. Amendments or modifications to this permit must be approved in writing by the Director of the Division of Land and Water Management or his designee.

18. Gravel will be removed from state approved sources at which blasting may be required to complete gravel operations. Approval of this lease operation authorizes such blasting. Accounting for all utilized fill material will be pursuant to the existing material sales contract.

19. The Director of the Division of Land and Water Management may require that his authorized representative be on-site during any operations conducted under this permit.

20. The permittee shall inform and ensure compliance with these stipulations by its agents, employees, and contractors (including subcontractors at any level).

21. This permit applies only to those lands under the jurisdiction of the State of Alaska.

22. Water appropriation is not authorized under this permit.

23. Gravel road construction is not authorized under this permit.

24. Approval of this permit does not relieve the permittee of the responsibility of securing other permits, state, federal or local.

MEMORANDUM

State of Alaska

DEPARTMENT OF FISH AND GAME

TO: Robert L. Grogan
Director
Division of Governmental Coordination
Office of Management and Budget

DATE: September 17, 1987

FILE NO.:

TELEPHONE NO.: 465-4105

SUBJECT: State Oil and Gas Stipulation Review

RECEIVED
SEP 22 1987
DIVISION OF OIL & GAS
STATE OF ALASKA

FROM: Bruce H. Baker
Acting Director
Habitat Division
Department of Fish and Game

Following are the Department of Fish and Game's (ADF&G) responses to comments raised by the Alaska Oil and Gas Association (AOGA) in their April 3 letter regarding state oil and gas stipulations and permit requirements. With the exception of Item 4 regarding environmental training programs, we have limited our responses to the comments specifically assigned to ADF&G. As previously agreed, a summary of the ADF&G statutes and regulations referenced in our material is enclosed.

Prior to responding to individual comments, the department would like to discuss three general items relevant to the stipulation review. We request that these general comments be included in the introduction of the final report to the Cabinet.

GENERAL COMMENTS

First, it is important to note that all of the state's oil and gas lease sale terms include a feasibility and prudence clause. In both formulating and implementing lease terms, the state recognizes that it must bear in mind available technologies and cost considerations, as well as sociocultural and environmental factors. These are carefully considered when the state applies stipulations to industry activities.

Second, it should be noted that the best interest findings prepared for each lease sale describe all of the information utilized by the state in reaching a sale decision. This includes relevant scientific research and the state's rational for adopting specific mitigation measures. Because these measures are frequently based on a large body of information, the stipulation review does not attempt to reiterate everything considered in their formulation. Rather, the review focuses on the statutory and regulatory basis for the measures, and whether scientific evidence indicates that they are effective.

Third, specific mention should be made of the relationship between state oil and gas mitigation measures and the Alaska Coastal Management Program (ACMP). All state lease

sales that are located within the coastal zone are carefully reviewed to ensure consistency with the ACMP. In many instances, compliance with state mitigation measures is necessary to conform with specific guidelines in ACMP district plans.

SPECIFIC COMMENTS

1. Stipulation 4: Requirement for Environmental Training of All Personnel Involved in Drilling Programs

The Department of Natural Resources (ADNR) was assigned lead responsibility for addressing this comment in conjunction with the other agencies. Our department recommends that the following information be incorporated into ADNR's response. First, environmental training programs are not necessarily required for each individual sale area, and we have not seen any evidence that industry has prepared sale-specific programs. The state's term of sale is worded such that a single program could be used for multiple sale areas, provided that it is applicable. Second, experiences with the Alyeska Oil Pipeline, Prudhoe Bay and Kuparuk oil fields, Northwest Alaskan Pipeline preconstruction activities, and exploration in the Arctic National Wildlife Refuge clearly demonstrate that environmental training of personnel is one of the most effective ways to ensure compliance with permit terms and conditions. Third, the value of environmental training programs is also recognized by federal leasing agencies (i.e., the Minerals Management Service and Bureau of Land Management), as evidenced by a similar training stipulation in federal lease sale documents.

2. Stipulation 7: Pipelines Constructed to Allow Safe Passage of Caribou

a. Type of Stipulation: In sale areas that encompass caribou habitat, the state requires that pipelines be designed, sited, and constructed to allow free passage of caribou. Common techniques include adequate elevation, ramping, burial of pipelines, and separation of pipelines and roads to dilute visual and audio stimuli.

b. Purpose of Stipulation: Linear developments, particularly road and pipeline complexes, can disrupt caribou movements and distribution patterns (e.g., Cameron and Whitten 1980, Curatolo and Murphy 1983). Pursuant to AS 16.05.020, it is necessary to minimize disruption of big game movements among seasonally important habitats.

c. Effectiveness: This stipulation has been moderately effective in maintaining caribou access to important habitats. A good example is the Kuparuk oilfield, where this stipulation was applied, in comparison with the Prudhoe Bay oilfield, where the stipulation was not applied until after most of the infrastructure was in place. Although there has been minor to moderate disruption of caribou movement through the Kuparuk oilfield, caribou movement through the Prudhoe Bay oilfield have all but ceased since development began there in the early 1970s. The combination of heavy traffic, high density of facilities, and batteries of aboveground feeder lines with inadequate ground clearance have all contributed to the reduction of caribou movement through the Prudhoe Bay oilfield. Although traffic remains a problem that has not been sufficiently addressed in the Kuparuk oilfield, measures for providing caribou passage have been incorporated into flowline design there. Without a caribou passage stipulation in place, there would have been no incentive for industry to research, design, and evaluate the effectiveness of various passage techniques.

3. Stipulation 8: Additional Biological Surveys Required at the Discretion of the Permitting Agency

a. Type of Stipulation: The state rarely implements lease stipulations that require lessees to conduct biological research. State unit agreement and permit approvals may occasionally include survey provisions. More frequently, federally permitted projects (e.g., Endicott), for which the state serves in an advisory capacity, contain survey requirements.

b. Purpose of Stipulation: Because there is a relative paucity of data about fish and wildlife resources and habitat use, and the effects of development activities on such resources, many of the decisions made by resource agencies are of necessity based on scientific professional judgment rather than strictly on statistical analysis. In those instances in which virtually no information is available or industry does not agree with the professional judgment of agency biologists, further studies may be required to fill data gaps and to resolve disagreements. The responsibility for conducting studies is often placed on the company requesting the permit or other action, because it is their project that will potentially impact biological resources.

Various authorities are involved when permitting agencies such as ADNR or the U.S. Army Corps of Engineers (COE) require biological surveys (e.g., 11 AAC 83.343 and 33 U.S.C. 1344; 86 Stat. 884).

c. Effectiveness: Effective mitigation of potential impacts to fish and wildlife requires several general types of information: (1) the species present and their use of habitat in the proposed project area; (2) the anticipated impacts of the proposed project on the species and their habitat use; and (3) the measures that should be taken to avoid or minimize these impacts. The first type of information is equivalent to baseline studies that, under ideal conditions, should be conducted prior to the project so that the impacts of the project can be evaluated by comparing species and habitat use with the project in place. Unfortunately, this type of information is limited for most areas of Alaska. Because oil and gas development proceeds at an accelerated pace relative to the timeframe for gathering baseline information, many such studies are conducted concurrently with development. Therefore, extrapolation of the post-development condition to pre-development condition is required, rather than a direct comparison. This extrapolation requires scientific judgments which are then subject to disagreement between the agencies and industry. An example of this is the Endicott monitoring study required by the COE to document potential changes in fish use of the nearshore marine environment as a result of the Endicott causeway.

The effectiveness of this stipulation is variable. When the agencies are significantly involved in determining the scope and evaluating the design of the studies to ensure that they actually answer the questions posed by the agencies, the effectiveness of this stipulation is usually good. For example, Northwest Alaska Pipeline Company's study of recommendations to minimize human/carnivore interactions along the gas pipeline was a successful study involving agency participation. However, when the agencies are not involved in such a manner, or when the agencies do not agree among themselves on the scope and design, the effectiveness of this stipulation is poor.

In some cases the effectiveness of this stipulation cannot be immediately evaluated. Often, the results of studies may not directly benefit the project for which the study was required, but may benefit similar projects in the future. In this case, it is tempting

to view the overall stipulation as ineffective in providing answers for questions about impacts and mitigation, when in fact the lessons learned may provide more effective mitigation in future projects. Because there are so many data gaps about impacts of oil and gas development on Alaska fish and wildlife, most of our information base is expanding as we are developing oil and gas infrastructure, and lessons learned in earlier studies must be applied as additional development occurs.

4. Stipulation 11: Prohibition of Use of Stream Water in Winter Operations

a. Type of Stipulation: The state routinely imposes a stipulation on North Slope leases that prohibits winter water removal from fish-bearing waterbodies unless approved by ADNR or ADF&G, depending on which agency has jurisdiction.

b. Purpose of Stipulation: Overwintering habitat is thought to be one of the main limiting factors on North Slope anadromous and freshwater fish populations. Consequently, this stipulation has been applied to prevent drawdown of water in fish overwintering areas. For activities in streams under ADF&G jurisdiction, this stipulation is necessary to ensure compliance with AS 16.05.020, AS 16.05.840 and AS 16.05.870

c. Effectiveness: This stipulation is very effective in minimizing the loss of overwintering habitat. Prior to implementation of this stipulation on the North Slope, winter water withdrawals during oil and gas operations resulted in documented fish mortality. Since this stipulation was implemented, alternatives to winter water withdrawal from fish-bearing streams have been used. Examples include flooded gravel pits and natural lakes that do not support overwintering fish. Use of these alternatives has eliminated fish mortality resulting from dewatering of overwintering habitat.

5. Stipulation 14: Trade-offs Required to Compensate for Habitat Disturbance from Gravel Removal

a. Type of Stipulation: There are several measures routinely applied to state leases which restrict gravel removal from active floodplains. In essence, these measures encourage the use of existing material sites, abandoned gravel structures, and upland sites.

b. Purpose of Stipulation: These measures are necessary to minimize potential impacts of gravel extraction on fish resources and to ensure compliance with AS 16.05.020, AS 16.05.840, and AS 16.05.870.

c. Effectiveness: These measures have proven effective in accomplishing the above objectives. In the 1970s, shallow gravel scraping operations in the Sagavanirktok River caused channel diversions, impoundments, and fish entrapment. In some instances, these impacts coupled with those of water removal, resulted in the dewatering of fish overwintering areas. In an attempt to minimize problems arising from in-stream gravel mining and inadequate natural water supplies, the state began encouraging the use of gravel pits. After these sources have been exhausted, the pits can then be used as water reservoirs.

There are now approximately 17 gravel pits in the Prudhoe Bay and Kuparuk oilfields. These pits range in size up to 100 acres, such as the Duck Island site used to build the Endicott causeway. Use of these pits has unquestionably reduced impacts to North Slope rivers and fish resources through simple avoidance of floodplain gravel mining (refer to Item 5, Habitat Area Avoidance). However, because of the increasing number and size of gravel pits, the state has recently begun evaluating appropriate restoration approaches. Current thinking is that these pits could potentially provide waterfowl and fish habitat by leaving some shallow water areas and islands in the pits when gravel is extracted and, once exhausted, connecting them to natural fish-bearing streams.

To date, approximately half of the North Slope gravel pits have been filled with water. Fish sampling at these sites has confirmed that gravel pits can provide fish habitat. Although these pits were not designed to promote fish use; a total of six species of fish have been caught at these sites, with the greatest diversity (i.e., four species) found at Sag. Site C. Thus far, only one of the North Slope gravel pits has included design features specific to creating waterfowl habitat. This effort was just initiated and insufficient time has elapsed to evaluate its effectiveness.

It should also be noted that the state's gravel removal restrictions do not absolutely prohibit mining in active floodplains. River sources could potentially be used in conformance with the previously referenced statutes, provided that appropriate design and restoration features are incorporated into floodplain mining plans.

6. Sale 45A (North Slope), Stipulation 5: Habitat Area Avoidance

a. Type of Stipulation: There are nine Sale 45A measures that conditionally require habitat area avoidance: (1) a general provision requiring avoidance of sensitive fish and wildlife habitats; (2) permanent facility setbacks from fish-bearing waterbodies; (3) restrictions on development in particularly productive wetland habitats; (4) restrictions on gravel mining in active floodplains; (5) measures governing aircraft operations over high density waterfowl and caribou use areas; (6) limitations on certain activities in preferred polar bear denning habitat; (7) restrictions in the immediate vicinity of arctic peregrine falcon nest sites; (8) a facility prohibition within critical tundra swan staging habitat; and (9) possible restrictions in high density caribou calving grounds.

b. Purpose of Stipulation: All of these measures are necessary to minimize potential impacts on fish and wildlife resources, and to comply with AS 16.05.020. This statutory mandate applies to all "fish, game and aquatic plant resources," not just endangered species. Mitigation measures designed to minimize potential development-related impacts to peregrine falcons are necessary to ensure compliance with AS 16.20.185 and the federal Endangered Species Act of 1973. Measures applicable to polar bears are necessary to ensure compliance with the Marine Mammal Protection Act of 1972.

c. Effectiveness: Numerous studies have documented that low-level aircraft overflights can adversely affect wildlife. Examples of impacts include: inducement of escape behavior in waterfowl (e.g., Barry and Spencer 1976; Owens 1977; Derksen at al. 1979); loss of eggs due to predation (Barry and Spencer 1976); reduced waterfowl nesting success and production of young (USDI 1976); and inducement of escape response in caribou (Calef et al. 1976, Davis and Valkenburg 1979). Considering this, and the routine use of aircraft to support oil and gas activities, restrictions on low level overflights above high density waterfowl and caribou use areas are both justifiable and prudent.

The restriction on activities in the immediate vicinity of arctic peregrine falcon nests used by the state are the same measures recommended by the National Peregrine Falcon Recovery team. These setbacks and timing

restrictions are judged to be effective in minimizing impacts to nesting peregrines. Similarly, lease terms limiting some activities in preferred polar bear denning habitat, swan nesting areas, and active flood plains have been developed by the acknowledged Alaskan authorities on those species and habitats. These terms have been carefully crafted and balanced to allow for the widest range of lease related activities, while still minimizing detrimental effects to important wildlife resources.

7. Sale 49 (Cook Inlet), Stipulations 1 and 2: Wetlands Designation/ Restrictions and Critical Habitat Areas/Waterfowl Corridors

a. Type of Stipulation: Both of these comments apparently refer to Sale 49 Terms 32 and 38, rather than Term 33 as indicated in AOGA's letter. These terms primarily address mitigation measures applied to leases located in legislatively designated state game refuges (SGR) and critical habitat areas (CHA). Consequently, it is appropriate to respond to both items collectively.

Term 32, in part, includes a prohibition on surface entry in the Clam Gulch CHA and on tidelands and wetlands in the Kalgin Island CHA and Goose Bay SGR. Exploration, development, and major maintenance activities in primary waterfowl areas within the Susitna Flats and Trading Bay SGRs are also restricted to the period between November 1 and March 31 (i.e., winter operations). Term 38 includes a prohibition on surface entry in high density tule goose and trumpeter swan nesting and molting areas in the Trading Bay SGR and Redoubt Bay vicinity. It also includes the above noted November 1 through March 31 restriction for adjacent habitats important to these species.

b. Purpose of Stipulation: These measures are necessary to ensure compliance with AS 16.05.020, AS 16.20.036, AS 16.20.038, and AS 16.20.220-270, and are consistent with 5AAC95. As discussed in the enclosure, legislation creating the vast majority of Cook Inlet SGRs and CHAs specifically mandates that land use activities in these areas must be compatible with protection of fish and wildlife populations and habitats. Activities within the Susitna Flats and Trading Bay SGRs must also be compatible with public use of these resources. The mitigation measures imposed in these areas are necessary to ensure compatibility.

c. Effectiveness: With respect to the surface entry prohibitions, the biological benefits derived from avoiding habitat alteration have been previously noted in the response to AOGA's comments on Sale 45A, Stipulation 5. The state implements this prohibition on the least amount of acreage required to ensure compliance with legislative mandates. Consequently, the state has been able to offer these areas with the covenant that any underlying hydrocarbon resources be extracted through directional drilling.

The necessity for a seasonal restriction in other important waterfowl areas is supported by scientific studies documenting that oil and gas activities can adversely affect waterfowl. Examples of documented impacts resulting from low level aircraft overflights are provided in the response to AOGA's general comments, Stipulation 14. Activities such as drilling and the operation of gas compressors have also been shown to cause waterfowl avoidance of these activities (e.g., USDI 1976, Gollop and Davis 1974). In two studies, waterfowl avoided drill rigs within a radius of 1.5 and 2.75 miles (Barry and Spencer 1976, Gollop and Davis 1974).

That concludes the department's contribution to the state oil and gas stipulation review. If your staff has any questions or requires further information, please have them contact Claudia Slater in our Anchorage office (267-2346).

Enclosure

cc w/Enclosure:
Kurt Fredricksson, DGC, Juneau
Elizabeth Benson, DGC, Fairbanks
Alvin Ott, ADF&G, Fairbanks
Lance Trasky, ADF&G, Anchorage
Larry Dietrick, ADEC, Fairbanks
Michael Wheeler, ADEC, Anchorage
Jerry Brossia, ADNR, Fairbanks
Bill Van Dyke, ADNR, Anchorage

ENCLOSURE

ADF&G STATUTES AND REGULATIONS RELEVANT TO
STATE OIL AND GAS MITIGATION MEASURES

AS 16.05.020: This statute describes the functions of the Commissioner of ADF&G. Among other responsibilities, the Commissioner is to manage, protect, maintain, improve, and extend the fish, game, and aquatic plant resources of the state in the interest of the economy and general well-being of the state.

AS 16.05.840: The purpose of this statute is to ensure fish passage in all fish-bearing streams. If the Commissioner of ADF&G considers it necessary, dams and other obstructions across fish streams must include a fishway and/or device which allows for efficient passage of downstream migrating fish.

AS 16.05.870: This statute gives the Commissioner of ADF&G jurisdiction over activities affecting waterbodies specified as important for the spawning, rearing, or migration of anadromous fish. The Commissioner is authorized to regulate hydraulic projects and any other activities that use, divert, obstruct, pollute, or change the natural flow or bed of a specified waterbody or to use wheeled, tracted, or excavating equipment or log-dragging equipment in the bed of a specified waterbody.

AS 16.20.030(c): This statute established the Goose Bay State Game Refuge (SGR) in conformance with AS 16.20.020, which states that the purpose of the refuge is to protect and preserve the area's natural habitat and game populations.

AS 16.20.036: The Susitna Flats State Game Refuge (SGR) was established through this statute. The two primary purposes of the refuge are to protect: 1) fish and wildlife habitats and populations; and 2) public uses of fish and wildlife and their habitat. Among other species, waterfowl are specifically mentioned. This statute further states that entry onto the refuge for purposes of oil and gas exploration and development shall be permitted when compatible with the primary purposes of the refuge.

AS 16.20.038: This statute established the Trading Bay SGR, which was created for the same purposes, and is subject to the same compatibility requirements, as noted above for the Susitna Flats SGR.

AS 16.20.185: The purpose of this statute is to protect the habitat of endangered species. On lands under their respective jurisdictions, the Commissioners' of ADF&G and

ADNR must take measures to preserve the natural habitat of species or subspecies of fish and wildlife threatened with extinction.

AS 16.20.220-270: Eleven Critical Habitat Areas were established under these statutes. The purpose of these statutes is to protect and preserve habitat areas especially crucial to the perpetuation of fish and wildlife, and to restrict all other uses not compatible with the primary purpose.

5AAC 92.800: This administrative code identifies fish and wildlife species on the state endangered species list. There are currently five species of birds and three species of whales designated by the state as endangered.

5AAC 95: This administrative code, in part, gives the Commissioner of ADF&G authority to include conditions on Special Area permits to ensure compliance with AS 16.20.030(c), AS 16.20.036, AS 16.20.038, and AS 16.20.220-270. Permit conditions may include, but are not limited to, restrictions on the duration of a proposed activity, seasonal restrictions, limitations on the areal extent of an activity, specific mitigation measures, and reporting and monitoring requirements. Additionally, this code states that each permittee shall mitigate any anticipated or actual adverse effects upon fish, wildlife, or their habitat which result from the permittee's activities.

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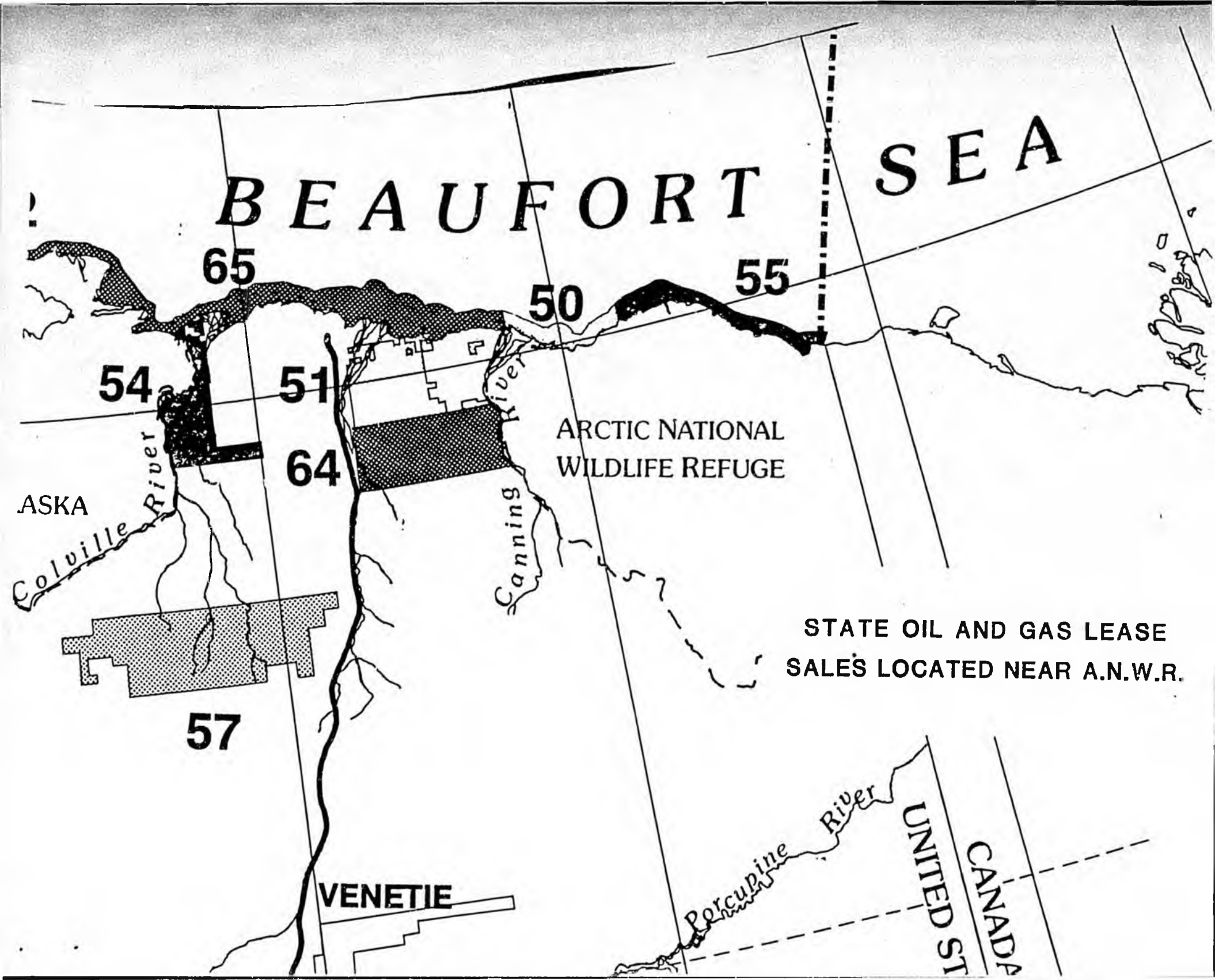
INFORMATION PACKET FOR STATE OF ALASKA
OIL AND GAS LEASE SALES 50, 51 AND 54

This packet contains information about State of Alaska oil and gas lease sales 50 and 51 and proposed lease sale 54. Sales 50 and 51 share a common boundary with the Arctic National Wildlife Refuge (ANWR). Sales 50 lies immediately offshore of ANWR in Camden Bay. It was held in June 1987. Sale 51 lies west of ANWR in an area known as the Prudhoe Bay Uplands. It was held in January 1987.

Sale 54 is a proposed lease sale scheduled for January 1988. The proposed Sale 54 area lies adjacent to the National Petroleum Reserve Alaska (NPRA).

The packet of information includes the Notice of Sale for sales 50 and 51 and the Notice of Final Finding for proposed sale 54. Each notice of sale contains sale-specific information provided to bidders, including the bidding methods, lease term, and mitigation measures. The Sale 54 notice advises potential bidders of the state's intention to make a final finding and decision regarding the sale. Attached to the Notice of Final Finding is a list of proposed mitigation measures for the Sale 54 area. Each notice includes a map of the respective sale area.


BEAUFORT SEA
65
55
50
54
51
64
ARCTIC NATIONAL
WILDLIFE REFUGE
Canning River
Colville River
ASKA
57
STATE OIL AND GAS LEASE
SALES LOCATED NEAR A.N.W.R.
VENETIE
Porcupine River
UNITED ST
CANADA

STATE OF ALASKA

STEVE COWPER, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF OIL AND GAS

PO. BOX 7034
ANCHORAGE, ALASKA 99510-7034

Phone: 762-4277

April 30, 1987

NOTICE
OF
SALE

STATE OF ALASKA
COMPETITIVE OIL AND GAS LEASE SALE 50 (CAMDEN BAY)

The Department of Natural Resources, Division of Oil and Gas (DO&G), gives formal notice under AS. 38.05.945(a)(4) of its intention to offer lands for competitive oil and gas lease. Sale 50 includes 35 tracts with a total area of approximately 118,147 acres. The sale area consists of state owned offshore acreage located in the Beaufort Sea, lying between Flaxman Island and the Hulahula River. The Arctic National Wildlife Refuge (ANWR) lies immediately south of the Sale 50 area. The entire sale area is within the North Slope Borough. The North Slope communities of Deadhorse/Prudhoe Bay, Nuiqsut, Barrow, and Kaktovik may be affected by the sale.

The location of Alaska's Territorial Sea Boundary and the seaward boundary of ANWR are the subjects of a dispute between the United States of America and the State of Alaska. This dispute is pending before the U.S. Supreme Court. At issue is the ownership of a significant amount of tide and submerged land along these borders. The seaward and landward boundaries of the Sale 50 area have been established through negotiation with the U.S. Minerals Management Service and the U.S. Fish and Wildlife Service to ensure that no lands encompassed by this dispute were included in Sale 50. These boundaries are intended only to delineate the limits of Sale 50, and do not represent the official position of either the State of Alaska or the United States of America regarding the final location of the borders of ANWR or the Alaska Territorial Sea.

Bidding Method

The bidding method for all tracts will be cash bonus bidding with a minimum bid of $5.00 per acre. All tracts will have a fixed royalty rate of 16-2/3 percent.

Length of Lease

All leases issued as a result of Sale 50 will have an initial primary term of 10 years.

Lease Form

All leases issued as a result of Sale 50 will be executed on Form DNR-10-4037 (COMPETITIVE OIL AND GAS LEASE) which was revised in November 1986.

Rental

Annual rental will be $1.00 per acre for the first year, $1.50 per acre for the second year, $2.00 per acre for the third year, $2.50 per acre for the fourth year, and $3.00 per acre for the fifth and following years.

Bids also will be accepted from 9:00 a.m. to 4:00 p.m. on June 29, 1987 in Room 1380 (Thirteenth Floor) of the Frontier Building, 3601 "C" Street, Anchorage, Alaska. Bids that are sent by mail must be sent to: Director, DO&G, P.O. Box 107034, Anchorage, Alaska 99510-7034, and must be received by 4:00 p.m., June 29, 1987. Bids that are sent by Federal Express, DHL, or any other delivery service must be received by 4:00 p.m., June 29, 1987, and should be addressed to: Director, DO&G, Room 1380, Frontier Building, 3601 "C" Street, Anchorage, Alaska. The envelope for each bid should be marked "State of Alaska Competitive Oil And Gas Lease Sale 50; not to be opened until 9:00 a.m., June 30, 1987; Tract #_____."

In order to bid at the sale, bidders must pre-qualify no later than 4:30 p.m., June 29, 1987. Potential bidders should consult DO&G for pre-qualification requirements and procedures.

Under 11 AAC 82.445, a bid will not be considered unless supported by the bid deposit and the information required, unless any omission is determined by the Commissioner or her designee to be immaterial or due to excusable inadvertence, and the omission is corrected within one week after receipt of a notice of deficiency.

Additional Information

In support of this lease sale, the Director of the Division of Oil and Gas has prepared a written final finding and decision under AS 38.05 035(e) which sets forth the facts and applicable laws upon which he has determined that the proposed action will best serve the interests of the state. The Director's written finding and decision are available at the Division of Oil and Gas, Frontier Building, 3601 "C" Street, Room 1398, in Anchorage or by writing DO&G at P.O. Box 107034, Anchorage, Alaska 99510-7034. Tract maps, Final Legal Descriptions and additional information on the sale are available upon request to bidders and the public at DO&G during regular office hours. The cost for each set of tract maps is $50.00. Please make checks for these items payable to: Department of Revenue, State of Alaska.

Acreage Deletions

The seaward boundary of Sale 50 has been adjusted since the Preliminary Notice was issued on November 20, 1986. This adjustment has resulted in the deletion of one tract and portions of other tracts which collectively removes a total of 4630 acres of submerged lands from the sale area. Tracts within the sale have been reconfigured and renumbered to reflect these changes.

The state reserves the right to delete tracts, and to revise tract acreage at any time up to and including the day of the sale.

James E. Eason
Director

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2. Corporations - Corporations must have the following documents on file at DO&G prior to 4:30 p.m., June 29, 1987:

   a. Copy of 1987 Certificate of Good Standing.

   b. The current address and phone number of the corporation.

   c. A list of current officers of the corporation that are authorized to sign a bid on behalf of the corporation.

   d. An original or certified copy of a notarized power-of-attorney authorizing any agent who is not a current officer but who has been designated by the corporation to sign a bid on behalf of the corporation.

   A Certificate of Good Standing can be obtained by sending 60 cents to State of Alaska, Department of Commerce and Economic Development, Corporation Section, P.O. Box D, Juneau, Alaska 99811, and requesting the certificate. The Certificate of Good Standing provides written proof that the corporation has paid all taxes, complied with all applicable laws, and is thus qualified to do business in the state. If information previously filed by corporations that have previously qualified to do business in Alaska is still current, this information may be incorporated together with a statement as to any material changes or amendments, since formerly qualifying.

3. Corporations That Have Not Previously Qualified To Do Business in Alaska - A corporation that has not previously qualified to do business in Alaska must submit the following documents to DO&G:

   a. If the corporation is a foreign corporation, it must submit a copy of its Certificate of Authority. If the corporation is a domestic corporation, it must submit a copy of its Certificate of Incorporation. A foreign corporation is one that has been incorporated outside the State of Alaska. A domestic corporation is one that has been incorporated within the State of Alaska.

   b. The current address and phone number of the corporation.

   c. A list of current officers of the corporation that are authorized to sign a bid on behalf of the corporation.

   d. An original or certified copy of a notarized power-of-attorney authorizing any agent who is not a current officer but who has been designated by the corporation to sign a bid on behalf of the corporation.

4. 10:30 a.m. - public reading of the bids will begin in Room 1 of Summit Hall.

D. Form for Submission of Bids

1. A separate bid must be submitted for each tract.

2. Each bid must be submitted separately in a single envelope. The envelope should be marked "State of Alaska Competitive Oil and Gas Lease Sale 50; not to be opened until 9:00 a.m., June 30, 1987; Tract #_____." No other statements, information, or identification should appear on the outside of the envelope.

   The following items must be contained in each envelope:

   a. An executed bid form DO&G 1-87 or an exact copy of that form. The bidder or the agent authorized to receive notices on behalf of all bidders should state his or her name, company (if applicable), address, and telephone number on the bid form. All lease-interest percentages must be represented by numbers with the fractional interest carried out to no more than five decimal places. No bids with the lease-interest represented by fractions will be accepted unless the fraction can be expressed in decimals of no more than five digits without rounding off. The sum of the lease-interest ownerships covered by this bid must be exactly 100.00000 percent.

   b. Bid Deposit: Check or money order made payable to the "Department of Revenue, State of Alaska." Bid deposits must be in U.S. dollars and must be tendered in cash or by money order, cashier's check, certified check, or treasurer's check in the total amount of 20% of the total cash bonus being offered for the tract. Note: Personal checks will not be accepted. No bid for less than a full tract will be considered.

3. Under 11 AAC 82.430, joint bids must disclose, and the bid form must be signed by or on behalf of, each person who has any working interest in the bid or who will receive any working interest in any lease issued in this sale by virtue of any agreement or understanding, oral or written. This requirement does not mean that persons who are interested in a bid only as stockholders in a corporation must sign the bid and lease form, and does not mean that the designated information must be furnished as to those persons. Joint bids must state the percentage of interest of each bidder and must designate one person who is authorized to receive notices on behalf of all the bidders.

E. Method of Handling Bid Deposits and Lease Awards

1. Bid deposits will be safeguarded against theft, misappropriation and loss. Receipt of a bid deposit by the state does not constitute and shall not be construed as acceptance of any bid on behalf of the state.

6. Upon acceptance of a bid by the Commissioner of Natural Resources, the successful bidder will be notified by postal Express Mail of the lease award and will be sent two copies of the lease for signature. Within 30 days of the date that the bidder receives notification of the lease award, the bidder must: 1) sign both copies of the lease; 2) return them to the Division of Oil and Gas for execution; 3) pay the balance of the cash bonus and accrued interest; and 4) pay for the first year annual rental. Interest of 5.66% per annum (which is the market interest rate for 90-day U.S. Treasury bills averaged for the week of March 27 - April 2, 1987) will be charged on the balance of the cash bonus accruing from the date following the successful bidder's receipt of the notification of the lease award up to and including the date of payment. Interest must be paid on the cash bonus only and not on the first year of rental. Payment of the balance of the cash bonus, accrued interest and rental must be accomplished in the following manner:

   The successful bidder will wire transfer federal funds in the amount of the balance of the cash bonus and accrued interest, and annual rental for the first year to: First Pennsylvania Bank of Philadelphia, ABA #031000024, for credit to State of Alaska, Account #07/089250/00, Attn: Catherine Hess. The wire transfer should specify on whose behalf the payment is being made. If possible, bidders should use only one wire transfer. Interest calculations should be based on a 360-day year times the actual number of days that interest is owed.

   In addition, the successful bidder must by 9:00 a.m. (Alaska Daylight Savings Time) the day before the wire transfer, telex (or facsimile transmit) the following information to the State of Alaska, Department of Revenue, Treasury Division, Attention: Vern Voss at Telex No. 099-45-333, Telecopy #465-2394, and the Department of Natural Resources, Division of Oil and Gas, Telex No. 090-25-360, Telecopy #563-6411:

   1. the Alaska Division of Lands (ADL) number assigned to each tract;

   2. amount of balance of cash bonus bid being paid per tract, interest on that balance, and annual rental;

   3. name(s) of the bidder(s) on whose behalf the funds are being wire transferred;

   4. originating bank of the wire transfer; and

   5. total amount of wire transfer.

   For further information regarding payment and computation of interest, please contact Vern Voss, Cash Manager, Treasury Division, Juneau, Alaska (907) 465-2360.

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b. Exploratory Drilling Operations from Floating Drilling Structures

Subject to conditions c and d below, exploratory drilling and other downhole operations above a predetermined threshold depth and testing through casing is allowed year-round from floating structures.

Exploratory drilling below the threshold is prohibited upon commencement of the fall bowhead whale migration until half of the whale population has passed the drillsite, as determined by the National Marine Fisheries Service (in consultation with the Alaska Eskimo Whaling Commission), or until October 1st, whichever occurs first.

c. Exploratory Drilling During the Fall Bowhead Whale Migration

When exploratory drilling activity is authorized and conducted at a location in the main migratory path of the bowhead whale during the whale migration, the operator must conduct a bowhead whale research program to determine the effects of noise from drilling activity and related support activities on bowhead whales and on the subsistence bowhead whale harvest. For exploratory locations between the barrier islands and the main migratory path, a decision on whether a research program is needed will be made on a case-by-case basis.

The general objectives of the research program shall be to determine if the following occurs as a result of noise and disturbance generated from drilling and support activities:

i. disruption of bowhead whales, or bowhead whale hunters, that makes the subsistence harvest more difficult;

ii. short-term displacement of bowhead whales from their migratory path, from subsistence harvest areas, or from feeding areas (Information must be collected on distribution, behavior and movement of bowhead whales in the vicinity of the drillsite and of support operations. This information will later be used to determine whether long-term displacement is occurring.); and

iii. separation of cows and calves.

To ensure that the research program will adequately address these objectives, the operator shall begin consultation with the State of Alaska by April 15. The state will coordinate with the North Slope Borough and appropriate federal agencies to assist the operator in the development and approval of a research program. Unless it is determined by the state that it is not feasible or necessary, the operator shall consult with the state before: (1) the objectives of the research proposal are finalized and sent out to the contractor for bid, (2) the contractor for the project is selected, and (3) the program is finalized. The applicant will retain the authority for final approval and selection of the contractor. The state must approve the research program after consultation is completed.

2. Lessees are advised that the North Slope Borough (NSB) Assembly has adopted a Comprehensive Plan and Land Management Regulations under Title 29 of the Alaska Statutes. The regulations require NSB approval for certain activities necessary for exploration and development of the lease. The state may not in all instances accept this assertion of jurisdiction.

3. During the conduct of all activities related to this lease, the lessee will be subject to the provisions of all valid coastal zone plans and ordinances. The Division of Oil and Gas will require, as a condition for consistency approval of lease operations, such modification or stipulations as may be necessary to ensure consistency with the Alaska Coastal Management Program, and with sound planning and management of coastal zone resources.

4. An application for water rights must be submitted to the Department of Natural Resources prior to diverting, impounding, or withdrawing water from any ground or surface source. The lessee will be responsible for ensuring that an adequate supply of water is available for winter use through development of such means as storage reservoirs and snow melting.

5. The following provisions will govern aircraft operations in and near the sale area:

   a. Aircraft must fly at altitudes of greater than 1,500 feet (457 m) or at a lateral distance of one mile around barrier islands, lagoons, river deltas, and wetlands within one mile of the Beaufort Sea coast (excluding take-offs and landings) from May 15 through September 30.

   b. From May 15 to June 20, aircraft flying within 30 miles of the coast between the Canning and Sagavanirktok Rivers must avoid Caribou and Muskoxen by an altitude of 1500 feet (457 m) or a lateral distance of one mile (excluding take-offs and landings).

   c. Human safety will take precedence over aircraft restrictions.

6. In conducting offshore geophysical surveys, neither lessees nor their agents will use explosives in open water areas. Offshore geophysical surveys will be restricted as necessary to comply with the provisions of the Marine Mammal Protection Act and with the provisions of the Endangered Species Act as they relate to the bowhead whale.

7. An Oil Discharge Contingency Plan will be required for offshore operations as specified under AS 46.04.030 and 18 AAC 75.

Facilities and Structures:

8. With the exception of approved pipelines, permanent facilities will be prohibited within 500 feet (152 m) of the Canning River. Permanent facilities will be prohibited within 100 feet (30 m) of all other fish-bearing streams unless the Director, Division of Oil and Gas, after consultation with the Department of Fish and Game, determines that such facilities placement will not significantly disturb critical wildlife habitats or that such a requirement is not feasible or prudent.

and anadromous fish. Causeways may not be located in river mouths, deltas or the kelp community northeast of Konganevik Point. Causeways may not cause a violation of the Alaska Water Quality Standards (18 AAC 70).

Local Hire:

16. The lessee is encouraged to hire and employ local and Alaska residents and companies, to the extent they are available and qualified, for work performed on the leased area.

Environmental Training:

17. The lessee must include in any exploration and/or development plans a proposed environmental training program for all personnel involved in exploration or development activities (including personnel of the lessee's contractors and subcontractors) for review and approval by the Director, Division of Oil and Gas. The program must be designed to inform each person working on the project of specific types of environmental, social, and cultural concerns which relate to the individual's job. The program must be formulated and implemented by qualified instructors experienced in each pertinent field of study and must employ effective methods to ensure that personnel understand and use techniques necessary to preserve archeological, geological, and biological resources. The program must also be designed to increase the sensitivity and understanding of personnel to community values, customs, and life styles in areas in which such personnel will be operating. The lessee must also submit for review and approval a continuing technical environmental briefing program for supervisory and managerial personnel of the lessee and its agents, contractors, and subcontractors.

Access:

18. No restriction of public access to, or use of, the leased area will be permitted as a consequence of oil and gas activities except in the immediate vicinity of drill sites, buildings and other related structures. Such areas where access is to be restricted must be identified in the plan of operations. No lease facilities or operations may be located where they would block public access to or along navigable and public waters as defined in AS 38.05.965(12) and (16). If lease facilities will be located in the vicinity of these public waters, an easement will be reserved under AS 38.05.127 and 11 AAC 53.330 to ensure the right of public access.

19. Surface use will be restricted, as necessary, to prevent unreasonable conflicts with local subsistence harvests.

Third Party Interests:

20. If only the subsurface estate is owned by the state, or if the surface is owned by the state but subject to third party interests, the lessee must not enter upon such land until the lessee makes a good faith effort to agree with the surface interest holder on settlement of damages that may be caused by lease activities. If an agreement cannot be reached, the

b. Disposal of oil-based or oil-contaminated drilling muds and cuttings in offshore waters and on sea ice is prohibited.

c. Offshore discharge of drilling muds and cuttings is prohibited within 1000 m of river mouths or deltas during unstable or broken ice or open water conditions.

d. During exploratory drilling, the disposal of drilling muds and cuttings within the two-meter isobath is prohibited during open water conditions. Drilling muds and cuttings free of hydrocarbon contamination may be discharged to open water outside of the two-meter isobath. However, the discharge must be diluted at a ratio of at least nine parts seawater to one part drilling fluid.

e. When exploratory drilling operations occur during periods of stable ice, uncontaminated drilling muds and cuttings may be disposed of on the sea ice surface in areas free of cracking or major stress fractures. Predilution is not required.

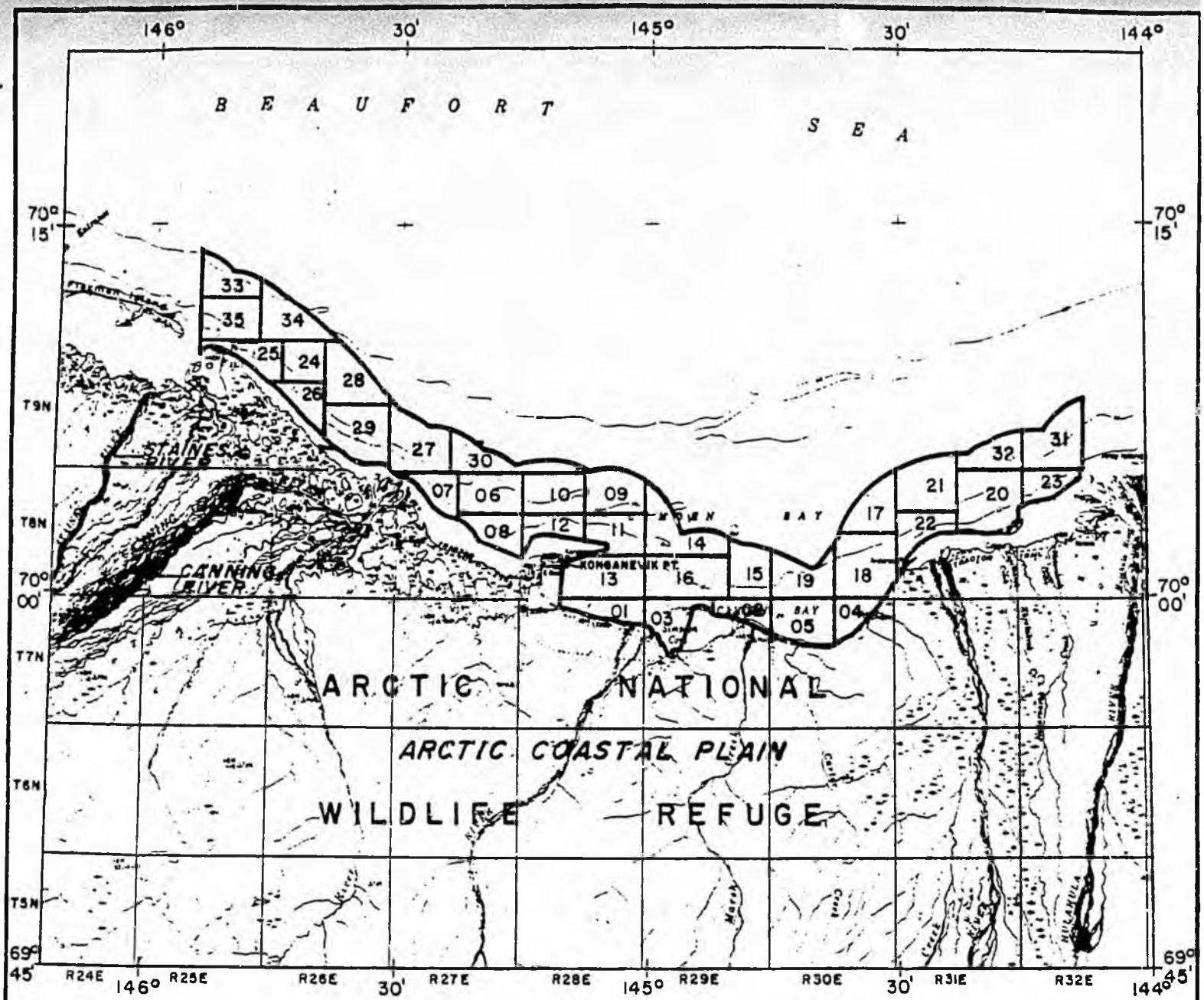
f. When exploratory drilling operations occur during periods of broken or unstable ice, uncontaminated drilling muds and cuttings may not be discharged unless it is not practicable to store them for disposal on stable sea ice or in open water; to dispose of them on land; to create an on-ice disposal site by pumping and artificial thickening of sea ice; or to handle the muds and cuttings in a manner that prevents below-ice discharge. If it is not practicable to meet these conditions, discharge is subject to approval by the Department of Environmental Conservation.

g. Offshore disposal of drilling muds and cuttings during development and production will be subject to the conditions of NPDES permits issued by the Environmental Protection Agency and those Alaska Coastal Management Program consistency requirements incorporated in or accompanying the NPDES permit. Injection of liquid wastes through well annuli or dedicated injection wells is the disposal method of choice. The lessees shall employ this method of disposal whenever it is technically feasible.

Gravel Mining:

26. In meeting gravel needs for exploration, development and production, gravel from nearby abandoned drilling sites and existing material sites must be used first unless the Director, Division of Land and Water Management, after consultation with the Director, Division of Oil and Gas, and the Department of Fish and Game, determines that the reuse of such sources is not feasible and prudent.

27. Gravel extraction from barrier islands is prohibited. Gravel extraction from lagoons and nearshore areas is prohibited unless the Director, Division of Land and Water Management, finds, in consultation with the Department of Fish and Game and the Department of Environmental Conservation, that, on the basis of scientific evidence, gravel extraction in these areas will not adversely affect the environment or that no alternative feasible and prudent source exists.



STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL & GAS

OIL AND GAS LEASE SALE 50
CAMDEN BAY TRACT MAP

SCALE 1:456,200 1 inch = 7.2 Miles Approx.

6 0 6 12 18 Miles

DIRECTOR, DIV. OF OIL & GAS JIM EASON	DRAWN O.D.S.	DATE APPROVED 4/21/87
LEASING MANAGER, PAMELA ROGERS	CHECKED BY:	BASE MAP: REDUCED FROM, UNIVERSAL TRANSVERSE MERCATOR PROJECTION BY U.S.G.S., "ORIGINAL SCALE" 1:250,000 1 INCH = 4 MILES

NOTE: THIS MAP IS NOT TO BE CONSTRUED AS AN OFFICIAL TRACT MAP. A SET OF 1:63,360 SCALE TRACT MAPS ARE AVAILABLE AT THE DEPT. OF NATURAL RESOURCES, DIVISION OF OIL AND GAS, 3601 C. ST., P.O. BOX 107034, ANCHORAGE, ALASKA 99510 PHONE (907) 762-4277 -7034

SALE AREA

STATE OF ALASKA

BILL SHEFFIELD, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF OIL AND GAS

PO. BOX 7034
ANCHORAGE, ALASKA 99510-7034

Phone: 762-4277

November 20, 1986

NOTICE
OF
SALE

STATE OF ALASKA
COMPETITIVE OIL AND GAS LEASE SALE 51 (PRUDHOE BAY UPLANDS)

The Department of Natural Resources, Division of Oil and Gas (DO&G), gives formal notice under AS. 38.05.945(a)(4) of its intention to offer lands for competitive oil and gas lease. Sale 51 includes 119 tracts with a total area of approximately 592,142 acres. The proposed sale area consists of onshore acreage located on the North Slope of Alaska, lying between the Canning River on the East and the Sagavanirktok River on the West. The entire sale area is within the North Slope Borough. The North Slope communities of Deadhorse/Prudhoe Bay, Nuiqsut, Barrow, and Kaktovik may be affected by the sale.

Included in this sale are 46 tracts that are being offered as "exempt" acreage under AS. 38.05.180(d)(1). Tracts 17-19, 44-47, 65-68, and 85-119 have been leased in previous state North Slope Oil and Gas lease Sales: Sale 14 (1965), Sale 31 (1980), and Sale 34 (1982).

Bidding Method
The bidding method for all tracts will be cash bonus bidding with a minimum bid of $2.00 per acre. All tracts will have a fixed royalty rate of 12.5 %.

Length of Lease
All leases issued as a result of sale 51 will have an initial primary term of 10 years.

Lease Form
All leases issued as a result of sale 51 will be executed on Form DO&G-01-86 (COMPETITIVE OIL AND GAS LEASE) which was revised in November 1986
The revision made in this lease form corrects an Alaska Statute citation in Paragraph 1, section (c) from AS 38.05.365(13) to AS 38.05.965(17).

Rental
Annual rental will be $1.00 per acre for the first year, $1.50 per acre for the second year, $2.00 per acre for the third year, $2.50 per acre for the fourth year, and $3.00 per acre for the fifth and following years.

Bids also be accepted from 9:00 a.m. to 4:00 p.m. on January 26, 1987 in Room 1380 (Thirteenth Floor) of the Frontier Building, 3601 "C" Street, Anchorage, Alaska. Bids that are sent by mail must be sent to: Director, DO&G, P.O. Box 7034, Anchorage, Alaska 99510-7034, and must be received by 4:00 p.m., January 26, 1987. Bids that are sent by Federal Express, DHL, or any other delivery service must be received by 4:00 p.m., January 26, 1987, and should be addressed to: Director, DO&G, Room 1380, Frontier Building, 3601 "C" Street, Anchorage, Alaska. The envelope for each bid should be marked "State of Alaska Competitive Oil And Gas Lease Sale 51; not to be opened until 9:00 a.m., January 27, 1987; Tract #_____."

In order to bid at the sale, bidders must pre-qualify no later than 4:30 p.m., January 26, 1987. Potential bidders should consult DO&G for pre-qualification requirements and procedures.

Under 11 AAC 82.445, a bid will not be considered unless supported by the bid deposit and the information required, unless any omission is determined by the Commissioner or his/her designee to be immaterial or due to excusable inadvertence, and the omission is corrected within one week after reciept of a notice of deficiency.

Additional Information

In support of this lease sale, the Director of the Division of Oil and Gas has prepared a written final finding and decision under AS 38.05 035(e) which sets forth the facts and applicable laws upon which he has determined that the proposed action will best serve the interests of the state. The Director's written finding and decision are availible at the Division of Oil and Gas, Frontier Building, 3601 "C" Street, Room 1398, in Anchorage or by writing DO&G at P.O. Box 7034, Anchorage, Alaska 99510-7034. Tract maps, Final Legal Descriptions and additional information on the proposed sale are available upon request to bidders and the public at DO&G during regular office hours. The cost for each set of tract maps is $50.00. Please make checks for these items payable to: Department of Revenue, State of Alaska.

The state reserves the right to delete tracts and to revise tract acreage at any time up to and including the day of the sale.

James E. Eason
Director

STATE OF ALASKA

BILL SHEFFIELD, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF OIL AND GAS

PO. BOX 7034
ANCHORAGE, ALASKA 99510-7034

November 20, 1986

Sale 51
Information to Bidders

A. Acceptance and Rejection of Bids

The state hereby expressly reserves the right to reject any bid on any tract. No bid for any tract will be accepted, and no lease for any tract will be awarded to any bidder unless the following conditions have been met:

1. The bidder has complied with this notice and applicable state regulations and statutes.

2. The bid is the highest valid cash bonus bid.

3. The amount of the bid has been determined to be adequate by the Commissioner of Natural Resources.

In addition, no bid containing or accompanied by any condition, qualification or material alteration will be considered.

B. Pre-Qualification of Bidders

In order to submit bids for this sale, bidders must be pre-qualified to bid no later than 4:30 p.m., January 26, 1987. Qualification procedures are as follows:

1. Individuals - An individual bidder must have a Statement of Qualifications on file at DO&G certifying that he or she is at least 18 years old and a citizen of the United States or is eligible for and has filed for citizenship, or is an alien person entitled to a similar lease by virtue of a treaty between the United States and the nation of which the alien person is a citizen. The statement must include the bidder's name, address, and telephone number and must be signed and dated. If an agent is signing the bid form on behalf of an individual, an original or certified copy of a notarized power-of-attorney document evidencing the authority of the agent to act on behalf of the individual must be on file at DO&G. If a guardian, trustee, or legal representative of an individual is signing on behalf of that individual, a certified copy of the court order authorizing him to act in that capacity and to fulfill the individual's obligations arising under any lease issued to the individual must be on file at DO&G. A signed statement as to the citizenship and age of the guardian, trustee, or legal representative of the individual must also be submitted to DO&G.

In order to receive a Certificate of Authority, foreign corporations must submit a packet of completed forms entitled "Instructions for qualifying a foreign corporation to do business in the State of Alaska" to the Department of Commerce and Economic Development, Corporation Section, P.O. Box D, Juneau, Alaska 99811. This form can be obtained by writing or telephoning DO&G, P.O. Box 7034, Anchorage, Alaska, 99510 (907-762-4202). In order to receive a Certificate of Incorporation, domestic corporations must submit Articles of Incorporation to the Department of Commerce and Economic Development. Upon proper application, the Department of Commerce and Economic Development will issue a Certificate of Authority or Certificate of Incorporation. Please allow two to three weeks for the processing of these certificates.

4. Partnerships or Other Unincorporated Associations - A partnership or unincorporated association must submit the following documents to DO&G prior to the lease sale:

   a. A statement describing the business relationships between members or partners.

   b. A statement of qualifications for each member stating that each member is at least 18 years of age and a citizen of the United States, or is eligible for and has filed for citizenship, or is an alien person entitled to a similar lease by virtue of a treaty between the United States and the nation of which the alien person is a citizen.

   c. If an agent is signing the bid form on behalf of the partnership or association, an original or certified copy of a notarized power-of-attorney defining the agent's authority to sign the bid on behalf of the partnership or association.

C. Bid Submission

Bids will be received by the Director of the Division of Oil and Gas or his authorized agent in Room 1380 (Thirteenth Floor) of the Frontier Building, 3601 "C" Street, Anchorage, Alaska, between the hours of 9:00 a.m. and 4:00 p.m. on January 26, 1987. Bids that are mailed to the Director, DO&G, P.O. Box 7034, Anchorage, Alaska 99510-7034 must be received no later than 4:00 p.m. January 26, 1987. Bids will also be received at the Division's temporary office in the Denali I Room at the Clarion Hotel, 4800 Spenard Road, in Anchorage between 8:00 a.m. and 9:00 a.m. on January 27, 1987. No bids will be received after 9:00 a.m., January 27, 1987.

Bids will be received and processed on January 27, 1987 in the following manner:

1. 8:00 a.m.- 9:00 a.m. - bids will be received in the "Denali I Room."

2. 9:00 a.m. - closing of bid submission.

3. 9:00 a.m.- 10:00 a.m. - opening of the bids by DO&G personnel. The opening of bids is for the sole purpose of publicly announcing and recording bids received. No bids will be accepted or rejected at this time.

E. Method of Handling Bid Deposits and Lease Awards

1. Bid deposits will be safeguarded against theft, misappropriation and loss. Receipt of a bid deposit by the state does not constitute and shall not be construed as acceptance of any bid on behalf of the state.

2. A bidder submitting a bid which is not the apparent high bid may pick up the bid deposit from 3:00 p.m. to 4:00 p.m., January 27, 1987, in Room 1398, (Thirteenth Floor) of the Frontier Building, 3601 "C" Street, Anchorage, Alaska. Bid deposits also will be returned from 9:00 a.m. to 3:00 p.m. on January 28, 1987, in Room 1398, (Thirteenth Floor) of the Frontier Building, 3601 "C" Street, Anchorage, Alaska. Bid deposits which have not been retrieved by 3:00 p.m., January 28, 1987 will be returned to the bidder by mail to the address shown on the bid form.

3. A bidder whose bid deposit for an apparent high bid is tendered by cashier's check, treasurer's check, or certified check drawn on a non-Alaska bank must wire transfer funds in the amount of such bid deposit on January 28, 1987, no later than noon Eastern Standard Time (8:00 a.m. Alaska Standard Time), to: First Pennsylvania Bank of Philadelphia, ABA # 031000024, for credit to State of Alaska, Account # 07/089250/00, Attn: Catherine Hess. It is not necessary that separate wire transfers be made if more than one bid deposit is being transferred to the account. Each apparent high bidder making a wire transfer to this account must Telex the following information to the Alaska Department of Revenue, Treasury Division (Telex No. 099-45-333) and the Department of Natural Resources, DO&G (Telex No. 090-25-360): the amount of each bid deposit comprising the wire transfer, the tract number to which each bid deposit applies, the originating bank of the wire transfer, and the name(s) of the bidder's partner(s), if any, on whose behalf a bid deposit is being wire transferred. Upon notification of receipt of a wire transfer, the cashier's check(s), treasurer's check(s) and certified check(s) for the bid deposit(s) corresponding to that wire transfer will be returned from 10:00 a.m. to 3:00 p.m., January 28, 1987 in Room 1380 (Thirteenth Floor) of the Frontier Building, 3601 "C" Street, Anchorage, Alaska.

4. If a bid deposit for an apparent high bid is tendered in cash, by money order, or is a certified, treasurer's, or cashier's check drawn on an Alaska bank, the bidder will not be required to wire transfer federal funds for that bid deposit. Such checks will be presented January 27, 1987, for payment in federal funds at the First National Bank of Anchorage.

5. Upon rejection by the State of Alaska of any apparent high bid, the amount of the bid deposit for that bid will be mailed to the bidder. A bidder who is unable to pick up a bid deposit in the manner described above may submit with the bid written instructions for return of the bid deposit.

MITIGATING MEASURES

AS 38.05.035(e) and the departmental delegation of authority provide the Director, Division of Oil and Gas, with the authority to impose conditions or limitations, in addition to those imposed by statute, to ensure that a resource disposal is in the state's best interests. Stipulations will be enforced throughout the term of the lease. Measures listed under "Plans of Operations and Other Terms of Sale" will be imposed through plans of operations and other permits to mitigate the social and environmental effects of lease activities. These measures were developed after considering stipulations and terms of sale proposed in the Sale 51 preliminary analysis and public and agency comment on them.

Lease Stipulations

1. Spill Prevention Control and Countermeasure Plan: Lessees are required to comply with federal guidelines (40 CFR 112.7; see Appendix 2) for the preparation and implementation of a spill prevention control and countermeasure plan.

2. Discovery of Historic or Archeologic Objects: In the event any site, structure, or object of historic or archeologic significance is discovered during operations on the leased area, the lessee must report immediately such findings to the Director, Division of Oil and Gas, and make every reasonable effort to preserve and protect such site, structure, or object from damage until the Director, Division of Oil and Gas, after consultation with the State Historic Preservation Officer, has given directions as to its preservation.

Plans of Operations and Other Terms of Sale

Lessees must submit a detailed plan of operations to the Division of Oil and Gas for approval before conducting any exploratory or development operations. Plans of operations must identify the specific measures, design criteria, and construction methods and standards that will be employed to meet the restrictions listed below. The lessee shall concurrently submit an informational copy of its plan of operations to the North Slope Borough. For those activities occurring on leases located in the coastal zone, review of plans of operations and other required permits will comply with coastal zone consistency review procedures established under 6 AAC 50. Except as indicated, the restrictions listed below do not apply to geophysical exploration on state lands; geophysical exploration activities are governed by 11 AAC 96. The following restrictions will be imposed on lands leased in this sale as a condition of the approval of plans of operations.

General:

1. Plans of operations for lease activities and specific permit applications which are subject to approval by the U.S. Corps of Engineers; which require a Certificate of Reasonable Assurance from the Department of Environmental Conservation; or which require other state agency authorizations must be submitted simultaneously for state agency review and approval at least 60 days prior to conducting the activities.

Facilities:

7. All permanent facilities, with the exception of approved road and pipeline crossings aligned perpendicular to watercourses, will be prohibited within 500 feet (152 m) of the active floodplain of the Sagavanirktok, Kadleroshilik, Shaviovik, Kavik, Staines, and Canning Rivers. Permanent facilities will be prohibited within 100 feet (30 m) of all other fishbearing streams and lakes unless the Director, Division of Oil and Gas, after consultation with the Department of Fish and Game, determines that such facilities placement will not significantly disturb sensitive wildlife habitats or that such a requirement is not feasible or prudent.

8. Measures will be required to minimize the impact of industrial development on key wetlands that are important to waterfowl and shorebirds. Key wetlands include shallow-Arctophilia (Class III), deep-Arctophilia (Class IV), and basin-complex wetlands (Class VI). Specific measures include the requirements that:

   a. Lessees must identify on a map or aerial photograph the largest surface area within which it is anticipated that a facility is to be sited, or an activity is to occur. The map or photograph must accompany the plan of operations submitted to the Division of Oil and Gas. The Division of Oil and Gas will consult with the Department of Fish and Game to identify the least environmentally sensitive area(s) within the industry-identified area of interest. The industry-identified surface area must be large enough to contain the facility and to accommodate planned expansion.

   b. Drill pads, roads, pipelines, and other facilities must be sited outside of key wetlands, unless the Director, Division of Oil and Gas, after consultation with the Department of Fish and Game, determines that there are no feasible or prudent alternatives.

   c. Where facilities must be sited within key wetlands, such facilities will be sited, designed, constructed, and maintained in a manner that will preserve natural hydrological patterns and prevent oil contamination.

   d. Draining or dewatering key wetlands is prohibited, unless no feasible or prudent alternative exists.

9. Impermeable lining and diking will be required for sewage ponds and oil storage facilities (with a storage capacity greater than 660 gallons). Buffer zones of not less than 100 feet (30 m) and up to 1,500 feet (457 m) will be required to separate oil storage facilities (with a capacity greater than 660 gallons) and sewage ponds from marine areas, freshwater supplies, streams, lakes, and Class III, IV, and VI wetlands unless the Director, Division of Oil and Gas, after consultation with the Department of Environmental Conservation, determines that such a requirement is not feasible or prudent. Sumps and reserve pits must be rendered impermeable and otherwise fully contained through diking or other means.

archeological, geological, and biological resources. The program must also be designed to increase the sensitivity and understanding of personnel to community values, customs, and lifestyles in areas in which such personnel will be operating. The lessee must also submit for review and approval a continuing technical environmental briefing program for its supervisory and managerial personnel and those of its agents, contractors, and subcontractors.

Access:

18. No restriction of public access to, or use of, the leased area will be permitted as a consequence of oil and gas activities except in the immediate vicinity of drill sites, buildings, and other related structures. Areas where access is to be restricted must be identified in the plan of operations. No lease facilities or operations may be located where they would block public access to or along navigable and public waters as defined in AS 38.05.965(12) and (16). If lease facilities will be located in the vicinity of these public waters, an easement will be reserved under AS 38.05.127 and 11 AAC 53.330 to ensure the right of public access.

19. Surface use will be restricted, as necessary, to prevent unreasonable conflicts with local subsistence harvests.

Third-party Interests:

20. If only the subsurface estate is owned by the state, or if the surface is owned by the state but subject to third party interests, the lessee must not enter upon such land until the lessee makes a good faith effort to agree with the surface interest holder on settlement of damages that may be caused by lease activities. If an agreement cannot be reached, the Director, Division of Oil and Gas, has the authority to approve the activity, provided adequate provisions have been made by the lessee with the state to pay for any damages the surface interest holder may suffer.

21. The activities proposed under a plan of operations must not unreasonably diminish the use and enjoyment of lands within a native allotment. Before entering a pending or approved native allotment, lessees must contact the Bureau of Indian Affairs and the Bureau of Land Management and obtain permission to enter, if required. Lessees must also comply with applicable federal law regarding native allotments.

Archeological and Historical Sites:

22. Prior to the construction or placement of any structure, road, or facility resulting from exploration, development, or production activities, the lessee must conduct an inventory of archeological and historical sites within the area affected by a proposed activity. Such inventory must consider literature provided by the North Slope Borough and local residents, documentation of oral history regarding historic and prehistoric uses of such sites, evidence of consultation with the Alaska Heritage Resources Survey and the National Register of Historic Places, and site surveys. The inventory must also include a detailed analysis of the potential effects estimated to result from the proposed activity. The

Explosives must not be detonated in close proximity to fishbearing waters unless the detonation produces a pressure rise in the waterbody of no more than 3 psi or the waterbody, including its substrate, is solidly frozen. The minimum acceptable offset from fishbearing waters for various size single charge detonations is:

1-2 pound charge -- 80 feet
5 pound charge -- 120 feet
10 pound charge -- 170 feet
25 pound charge -- 270 feet
100 pound charge -- 530 feet.

Disposal of produced water, drilling muds, and cuttings:

24. Solid waste disposal into rivers, streams, natural lakes, and Class III, IV, and VI wetlands is prohibited. Before the lessee disposes of solid waste in other areas, the disposal must be approved through permits issued by Department of Environmental Conservation.

25. All garbage and refuse must be incinerated. Residue and nonburnables must be disposed of at an upland site approved by the Department of Environmental Conservation. No new solid fill disposal sites, except possibly for the disposal of drilling muds and cuttings, will be approved during the exploratory phase.

26. Discharge of produced water, drilling muds, and cuttings:

    a. Disposal of drilling muds and cuttings is subject to a Department of Environmental Conservation solid waste disposal permit and any guidelines and conditions accompanying the solid waste disposal permit. Disposal of wastewaters generated from drilling operations will be subject to a Department of Environmental Conservation wastewater disposal permit.

    b. Disposal of produced waters will be by subsurface disposal techniques, except that the Department of Environmental Conservation may permit alternate disposal methods if the department determines that subsurface disposal techniques are not feasible or prudent. Disposal of produced water to estuarine waters at river mouths and freshwater bodies, including Class III, IV, and VI wetlands, is prohibited.

    c. Discharge of drilling muds and cuttings to lakes, streams, rivers, tidally influenced mouths of rivers, and Class III, IV, and VI wetlands is prohibited. Disposal of muds and cuttings may be made into sumps and reserve pits approved through a solid waste disposal permit from the Department of Environmental Conservation.

Gravel Mining:

27. In meeting gravel needs for exploration, development, and production, gravel from nearby abandoned drill pads, roads, and airstrips, and existing material sites must be used first unless it is demonstrated to the Director, Division of Land and Water Management, after consultation with the Division of Oil and Gas and the Department of Fish and Game, that

with the U.S. Fish and Wildlife Service. All known nest sites will be considered active between April 15 and June 1. Known nest sites that have not been surveyed will be considered active throughout the summer season. Nest sites not having a peregrine falcon present by June 1 will be considered inactive, and oil and gas activities near inactive nests will not be subject to the restrictions listed under b, c, and d. Activities at existing development sites within two miles of newly established nests will not be subject to these restrictions.

a. Within one mile (1.6 km) of all nest sites -- Facilities, including but not limited to roads, pipelines, disposal sites, gravel mines, storage facilities, and camps will be prohibited.

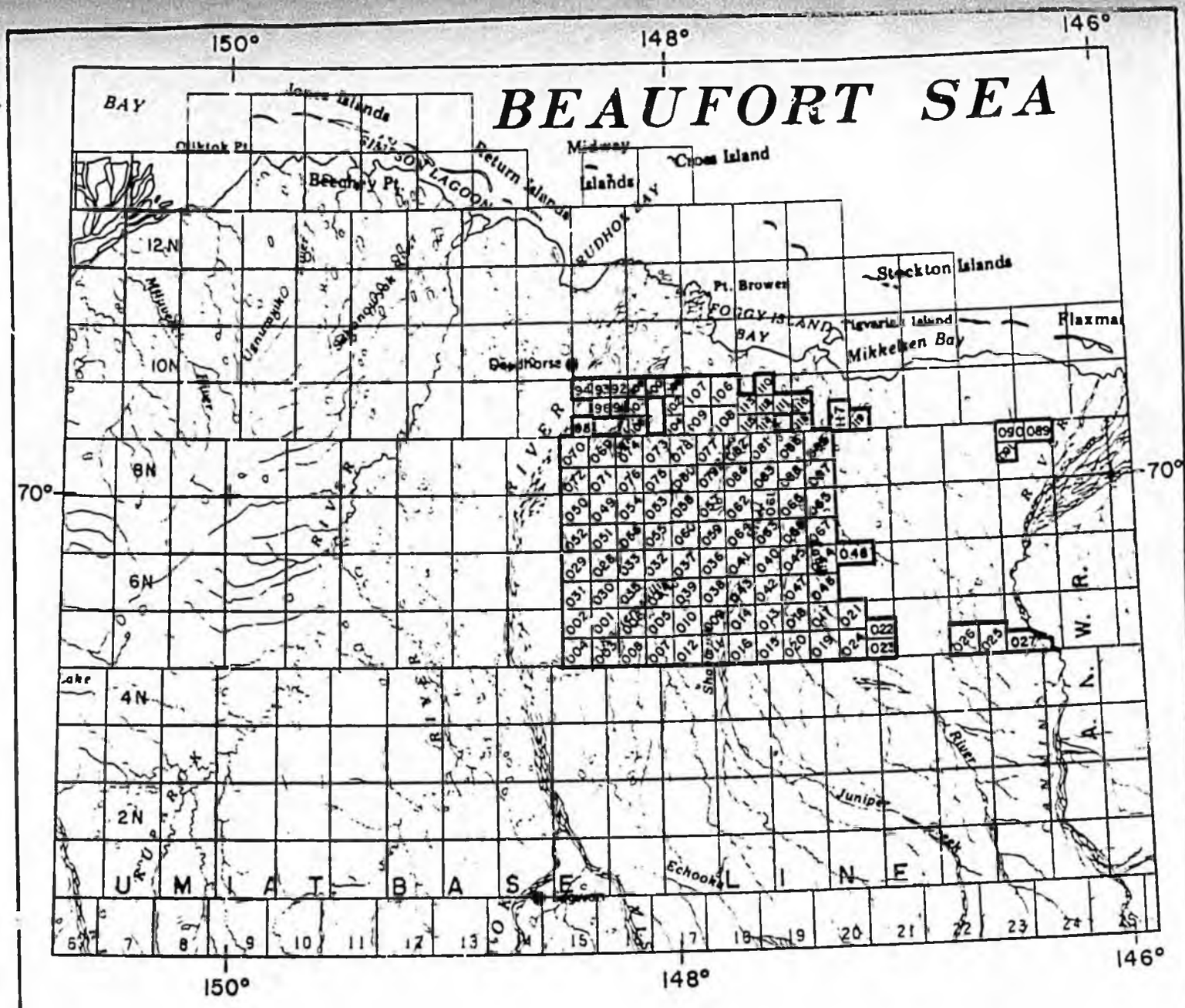
b. Within one mile (1.6 km) of active nest sites -- Between April 15 and August 31, surface entry will be prohibited and aircraft overflights must avoid nest sites by an altitude of 1500 feet (457 m) above nest level.

c. Within two miles (3.2 km) of active nest sites -- Noisy activities, including blasting and gravel washing, will be prohibited between April 15 and August 31. Airfields, construction camps, disposal sites, compressor stations, and other permanent facilities that occupy large areas, which are noisy, or which require sustained human occupancy will be prohibited.

d. Within 15 miles (24 km) of active nest sites -- Except for limited non-aerial applications of approved non-persistent insecticides, pesticide use will be prohibited.

32. a. To minimize impacts on caribou, pipelines must be consolidated to the extent feasible and must be designed, sited, and constructed to allow safe passage of caribou. Adequate elevation, ramping, or burial of pipelines will be required in areas identified by the Department of Fish and Game as important caribou movement zones.

b. Exploratory drilling operations may be restricted or prohibited on Tracts 89, 90, and 91 and on other tracts as necessary during the caribou calving period, generally May 15 through June 20. Development and production activities, with the exception of drilling, maintenance, and operation of production wells, may be restricted or prohibited on these tracts during the calving period, except that such activities will be allowed year-round in any core area of intense industrial activity. In order to assist the assist the Director, Division of Oil and Gas, in determining the necessity for restrictions, the lessee may be required to conduct caribou monitoring studies in consultation with the Department of Fish and Game.



STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL & GAS

OIL AND GAS LEASE SALE 51
PRUDHOE BAY UPLANDS TRACT MAP

SCALE 1:1,000,000 1 inch = 16 Miles
16 0 10 20 30 40 50 Miles

ACTING DIRECTOR, DOG&G JIM EASON	DRAWN BY O.D.S.	DATE APPROVED 8/18/86
LEASING MANAGER, PAMELA ROGERS	CHECKED BY:	BASE MAP: COPYRIGHT ARCTIC ENVIRONMENTAL INFORMATION & DATA CENTER, 1978 ALL RIGHTS RESERVED, INCLUDING REPRODUCTION IN WHOLE OR IN PART IN ANY FORM. UNIVERSAL TRANSVERSE MERCATOR PROJECTION ON SIX DEGREE BANDS.

SALE AREA

NOTE: THIS MAP IS NOT TO BE CONSTRUED AS AN OFFICIAL TRACT MAP. A SET OF 1:63,360 SCALE TRACT MAPS ARE AVAILABLE AT THE DEPT. OF NATURAL RESOURCES, DIVISION OF OIL AND GAS, 3601 C. ST., P.O. BOX 7034, ANCHORAGE, ALASKA 99510-7034 PHONE (907)561-2020

STATE OF ALASKA

STEVE COWPER, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF OIL AND GAS

PO. BOX 7034
ANCHORAGE, ALASKA 99510-7034

Phone: 762-2586

August 13, 1987

-NOTICE-
OF
FINAL FINDING AND DECISION UNDER AS 38.05.035(e)
REGARDING PROPOSED OIL AND GAS LEASE SALE 54 (KUPARUK UPLANDS)

The Department of Natural Resources, Division of Oil and Gas (DO&G), gives formal notice under AS 38.05.945(a)(3) of its intention to make a final finding and decision under AS 38.05.035(e) regarding the sale of oil and gas leases in proposed Oil and Gas Lease Sale 54 (Kuparuk Uplands). Before this sale may be held, the Director of the Division of Oil and Gas must make a written final decision that the sale serves the best interests of the state. This decision will set out the facts and applicable policies upon which the director bases his determination that the sale of oil and gas leases in proposed Sale 54 will or will not best serve the interests of the state. This final decision is expected to be available to the public in October 1987.

Proposed Oil and Gas Lease Sale 54 includes 108 tracts with a total area of approximately 507,979 acres. The proposed sale area consists of onshore acreage lying between the National Petroleum Reserve Alaska (NPRA) boundary and the area of state Kuparuk Uplands Sale 48. The entire sale area is within the North Slope Borough. The North Slope communities of Deadhorse/Prudhoe Bay, Nuiqsut, Barrow, and Kaktovik may be affected by the proposed sale.

Proposed Sale 54 includes approximately 53,186 acres of Colville River delta lands, which were previously contained in proposed exempt Oil and Gas Lease Sale 52A. In June 1986, Sale 52A was postponed from its original September 1986 sale date. The acreage within that sale area was combined with the lands proposed to be offered through Sale 54. This additional acreage consists of (1) approximately 30,481 acres of state selected lands that are Tentatively Approved (TA) by the federal government for conveyance to the State of Alaska, and (2) an additional 22,705 acres that are subject to a 1974 agreement between the Arctic Slope Regional Corporation (ASRC) and the State of Alaska. In 1974, ASRC and the state agreed that ASRC would exchange these lands and others in the area for approximately 65,000 acres of state owned land in the Point Lay area. The department has sought to implement the agreement. ASRC, however, no longer recognizes the validity of the agreement, and has brought suit against the department to nullify the agreement and prevent the subject lands from being leased by the state for oil and gas exploration and development. The inclusion of these lands in Sale 54, comprised of Tracts 91, 93, 94, 98, 99, 100 and 102, is conditional based upon an acceptable settlement in this case.

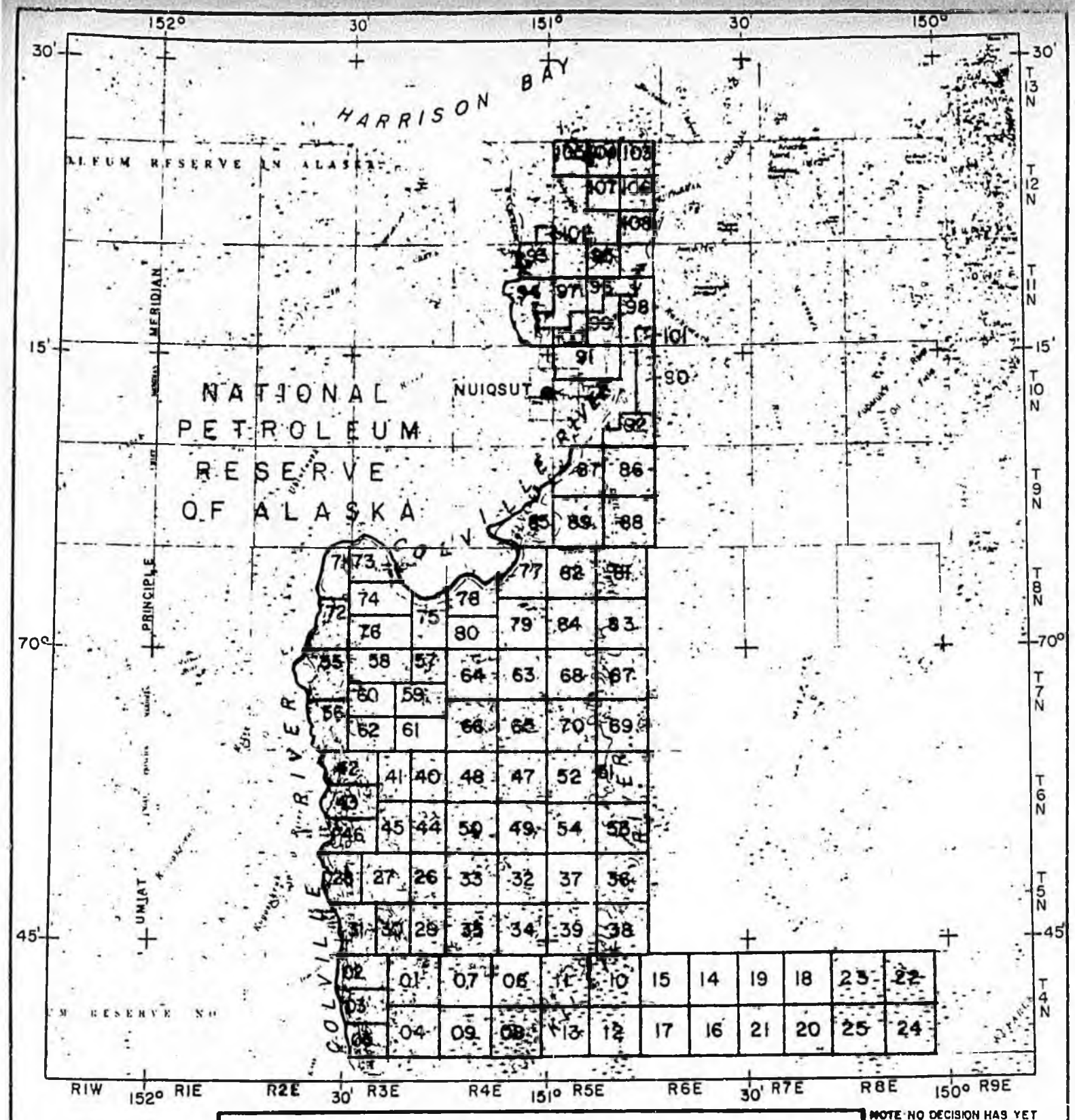
The tracts added to Sale 54 from Sale 52A are being offered as "exempt" acreage under the terms of AS 38.05.180(d), which allows the Commissioner of the Department of Natural Resources to issue oil and gas leases in an area that has not been included in the state's five-year leasing program, if the land to be leased (1) was previously subject to a valid state or federal oil

Comments should be mailed to DO&G, P.O. Box 107034, Anchorage, Alaska 99510-7034, Attention: Pam Rogers. Comments should be received at DO&G by September 18, 1987 in order to be considered in the final decision of whether or not this sale is to be held. The final ACMP consistency determination will be included in the Final Finding and Decision of the Director. Preliminary legal descriptions for Sale 54 are available upon request to potential bidders and the public at DO&G. Preliminary Tract Maps are also available at a cost of $50 per set.

If a decision is made that the proposed sale best serves the interest of the state, an "Information to Bidders" packet will be made available in October 1987. If a decision is made to hold the sale, it is tentatively scheduled to occur at the William A. Egan Civic and Convention Center, 555 West Fifth Avenue, in Anchorage, on January 26, 1988 in accordance with AS 38.05.180.

James E. Eason
Director

0852b



STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL & GAS

PROPOSED OIL AND GAS LEASE SALE 54

KUPARUK UPLANDS PRELIMINARY TRACT MAP

SCALE 1:500,000 ONE INCH EQUALS EIGHT MILES

MILES 6 5 4 3 2 1 0 6 12 18 MILES

DIRECTOR, DIV. OF OIL & GAS JIM EASON		DRAWN BY O.D.S.	DATE APPROVED 8/4/87
LEASING MANAGER PAMELA ROGERS		CHECKED BY	BASE MAP: Reduced From U.T.M. Projection By USGS Original Scale 1:250,000 Portions Of Harrison Bay, Beechey Pt., Umiat, & Sag. River

NOTE: NO DECISION HAS YET BEEN MADE ON WHETHER THE STATE WILL HOLD THIS LEASE SALE. THE STATE IS GATHERING SOCIAL, ENVIRONMENTAL & ECONOMIC INFORMATION ON WHICH TO BASE A DECISION

NOTE: THIS MAP IS NOT TO BE CONSTRUED AS AN OFFICIAL TRACT MAP. A SET OF 1:63,360 SCALE (1" = 1 MILE) TRACT MAPS ARE AVAILABLE AT THE DEPT. OF NATURAL RESOURCES, DIV OF OIL AND GAS, 3601 C. ST., P.O. BOX 107034, ANCH., AK 99510-7034
PHONE 561-2020

PROPOSED SALE AREA

PROPOSED MITIGATING MEASURES FOR SALE 54

AS 38.05.035(e) and the departmental delegation of authority provide the Director, Division of Oil and Gas, with the authority to impose conditions or limitations, in addition to those imposed by statute, to ensure that a resource disposal is in the state's best interests. If adopted, stipulations will be enforced throughout the term of the lease and measures listed under "Proposed Permit Terms" will be imposed through plans of operations and other permits to mitigate the social and environmental effects of lease activities. These proposed measures were developed after considering stipulations and terms of sale imposed in other North Slope sales; fish and wildlife resource and harvest data submitted by the Alaska Department of Fish and Game; environmental data relating to air and water quality, solid waste disposal, and oil spills submitted by the Alaska Department of Environmental Conservation; and comments submitted by the public, the North Slope Borough, and other federal, state, and local agencies.

Proposed Lease Stipulations

1. Spill Prevention Control and Countermeasure Plan: Lessees are required to comply with federal guidelines (40 CFR 112.7) for the preparation and implementation of a spill prevention control and countermeasure (SPCC) plan. On addition to addressing the prevention, detection, and cleanup of oil, the SPCC plan for drilling operations should include, but not be limited to, methods for controlling blowouts, location of spill cleanup equipment, identification and location of a suitable alternative drilling rig, and the time required to obtain equipment, mobilize, rig-up, and commence drilling of a relief well, if needed.

2. Discovery of Historic or Archeologic Objects: In the event any site, structure, or object of historic or archeologic significance is discovered during operations on the leased area, the lessee must report immediately such findings to the Director, Division of Oil and Gas, and make every reasonable effort to preserve and protect such site, structure, or object from damage until the Director, Division of Oil and Gas, after consultation with the State Historic Preservation Officer, has given directions as to its preservation.

Plans of Operations and Other Proposed Terms of Sale

Lessees must submit a detailed plan of operations to the Division of Oil and Gas for approval before conducting any exploratory or development operations. Plans of operations must identify the specific measures, design criteria, and construction methods and standards that will be employed to meet the restrictions listed below. The lessee shall concurrently submit an informational copy of its plan of operations to the North Slope Borough. For those activities occurring on leases located in the coastal zone, review of plans of operations and other required permits will comply with coastal zone consistency review procedures established under 6 AAC 50. Except as indicated, the restrictions listed below do not apply to geophysical exploration on state lands; geophysical exploration activities are governed by 11 AAC 96. The following restrictions will be imposed on lands leased in this sale as a condition of the approval of plans of operations.

General:

1. Plans of operations for lease activities and specific permit applications which are subject to approval by the U.S. Corps of Engineers; which require a Certificate of Reasonable Assurance from the Alaska Department of Environmental Conservation; or which require other state agency authorizations must be submitted simultaneously for state agency review and approval at least 60 days prior to conducting the activities.

2. Bidders are advised that the North Slope Borough (NSB) Assembly has adopted a comprehensive plan and land management regulations under AS 29. The regulations require NSB approval for certain activities necessary for exploration and development of the lease. The state may not in all instances accept this assertion of jurisdiction.

3. All lease-related activities in the coastal zone are subject to the standards of the Alaska Coastal Management Program (ACMP) (6 AAC 80) and to the provisions of all approved coastal management plans. The Division of Oil and Gas will require, as a condition for consistency approval of lease operations, such modification or stipulations as may be necessary to ensure consistency with the Alaska Coastal Management Program, and with sound planning and management of coastal zone resources.

4. Except for approved off-road travel, exploration activities must be supported only by ice roads, winter trails, existing road systems, or air service. Wintertime off-road travel across tundra and wetlands may be approved in areas where snow and frost depth are sufficient to protect the ground surface. Summertime off-road travel across tundra and wetlands may be approved subject to time periods and vehicle types approved by the Division of Land and Water Management. Exceptions may be granted by the Director, Division of Land and Water Management, and the Director, Division of Oil and Gas, if an emergency condition exists or if it is determined, in consultation with the Alaska Department of Fish and Game, that travel can be accomplished without damaging vegetation or the ground surface.

5. An application for water rights must be submitted to the Alaska Department of Natural Resources prior to diverting, impounding, or withdrawing water from any ground or surface source. The lessee will be responsible for ensuring that an adequate supply of water is available for winter use through development of such means as storage reservoirs and snow melting. A permit must also be obtained from the Alaska Department of Fish and Game prior to using, diverting, obstructing, polluting, or changing the natural flow or bed of a designated anadromous waterbody (AS 16.05.870) or obstructing fish passage (AS 16.05.840).

6. The following provisions will govern aircraft operations in and near the sale area:

   a. From May 15 through September 30, aircraft must fly at altitudes greater than 1,500 feet (457 m) or at a lateral distance of one mile around barrier islands, lagoon areas, river deltas, and wetlands within one mile of the Beaufort Sea coast (excluding take-offs and landings).

b. From May 15 to June 20, aircraft flying within 30 miles of the coast between the Colville and Sagavanirktok Rivers must avoid caribou by an altitude of 1,500 feet (457 m) or a lateral distance of one mile (excluding take-offs and landings).

c. Human safety will take precedence over flight restrictions.

Facilities:

7. All permanent facilities, with the exception of approved road and pipeline crossings aligned perpendicular to watercourses, will be prohibited within 500 feet (152 m) of the active channel of the Colville and Itkillik Rivers. Permanent facilities will be prohibited within 100 feet (30 m) of all other fishbearing streams and lakes unless the Director, Division of Oil and Gas, after consultation with the Alaska Department of Fish and Game, determines that such facilities placement will not significantly disturb sensitive wildlife habitats or that such a requirement is not feasible or prudent.

8. Measures will be required to minimize the impact of industrial development on key wetlands that are important to waterfowl and shorebirds. Key wetlands include shallow-Arctophilia (Class III), deep-Arctophilia (Class IV), basin-complex wetlands (Class VI), and coastal wetlands (Class VIII). Specific measures include the requirements that:

   a. Lessees must identify on a map or aerial photograph the largest surface area within which it is anticipated that a facility is to be sited, or an activity is to occur. The map or photograph must accompany the plan of operations submitted to the Division of Oil and Gas. The Division of Oil and Gas will consult with the Alaska Department of Fish and Game to identify the least environmentally sensitive area(s) within the industry-identified area of interest. The industry-identified surface area must be large enough to contain the facility and to accommodate planned expansion.

   b. Drill pads, roads, pipelines, and other facilities must be sited outside of key wetlands, unless the Director, Division of Oil and Gas, after consultation with the Alaska Department of Fish and Game, determines that there are no feasible or prudent alternatives.

   c. Where facilities must be sited within key wetlands, such facilities will be sited, designed, constructed, and maintained in a manner that will preserve natural hydrological patterns and prevent oil contamination.

   d. Draining or dewatering key wetlands is prohibited, unless no feasible or prudent alternative exists.

9. Impermeable lining and diking will be required for sewage ponds and oil storage facilities with a storage capacity greater than 660 gallons. Buffer zones of not less than 100 feet (30 m) and up to 1,500 feet (457 m) will be required to separate oil storage facilities (with a capacity greater than 660 gallons) and sewage ponds from marine areas, freshwater supplies, streams, lakes, and Class III, IV, VI and VIII wetlands unless the Director, Division of Oil and Gas, after consultation with the Alaska

Department of Environmental Conservation, determines that such a requirement is not feasible or prudent. Sumps and reserve pits must be rendered impermeable and otherwise fully contained through diking or other means.

10. To the extent feasible and prudent, all lease activities will be conducted and all structures will be designed, sited, and constructed to maintain normal water flow and drainage patterns and to allow free movement and safe passage of fish and mammals.

11. Facilities and surface transportation routes will, to the extent feasible and prudent, be sited and consolidated to avoid sensitive fish and wildlife habitat.

12. Exploration facilities, with the exception of drill pads, must be temporary and must not be constructed of gravel. Reuse of existing abandoned gravel structures may be permitted on a case-by-case basis by the Director, Division of Oil and Gas, after consultation with the Director of the Division of Land and Water Management and the Alaska Department of Fish and Game. Approval for use of abandoned structures will depend on the extent and method of restoration needed to return these structures to a usable condition.

13. Pipelines must be located so as to facilitate the containment and cleanup of spilled hydrocarbons. Where feasible and prudent, pipelines must be located on the upslope side of roadways and construction pads unless the Director, Division of Land and Water Management, determines that an alternative site is environmentally acceptable.

14. Except for those on approved exploratory drill sites, stationary fuel storage facilities must not be placed, nor vehicle refueling occur, within active floodplains. Exceptions may be allowed for the refueling of slow-moving construction equipment.

15. Upon abandonment of drilling sites, roads, buildings, airstrips or other facilities, such facilities must be removed and the site rehabilitated, unless the Director, Division of Oil and Gas, after consultation with the Alaska Departments of Fish and Game and Environmental Conservation, determines that such removal and rehabilitation is not in the state's best interests.

Local Hire:

16. The lessee is encouraged to hire and employ local and Alaska residents and companies, to the extent they are available and qualified, for work performed on the leased area.

Environmental Training:

17. The lessee must include in any exploration or development plan a proposed environmental training program for all personnel involved in exploration or development activities (including personnel of the lessee's contractors and subcontractors) for review and approval by the Director, Division of Oil and Gas. The program must be designed to inform each person working on the project of specific types of environmental, social, and cultural

concerns which relate to the individual's job. The program must be formulated and implemented by qualified instructors experienced in each pertinent field of study and must employ effective methods to ensure that personnel understand and use techniques necessary to preserve archeological, geological, and biological resources. The program must also be designed to increase the sensitivity and understanding of personnel to community values, customs, and lifestyles in areas in which such personnel will be operating. The lessee must also submit for review and approval a continuing technical environmental briefing program for its supervisory and managerial personnel and those of its agents, contractors, and subcontractors.

Access:

18. No restriction of public access to, or use of, the leased area will be permitted as a consequence of oil and gas activities except in the immediate vicinity of drill sites, buildings, and other related structures. Areas where access is to be restricted must be identified in the plan of operations. No lease facilities or operations may be located where they would block public access to or along navigable and public waters as defined in AS 38.05.965(12) and (16). If lease facilities will be located in the vicinity of these public waters, an easement will be reserved under AS 38.05.127 and 11 AAC 53.330 to ensure the right of public access.

19. Surface use will be restricted, as necessary, to prevent unreasonable conflicts with local subsistence harvests.

Third-party Interests:

20. If only the subsurface estate is owned by the state, or if the surface is owned by the state but subject to third party interests, the lessee must not enter upon such land until the lessee makes a good faith effort to agree with the surface interest holder on settlement of damages that may be caused by lease activities. If an agreement cannot be reached, the Director, Division of Oil and Gas, has the authority to approve the activity, provided adequate provisions have been made by the lessee with the state to pay for any damages the surface interest holder may suffer.

21. The activities proposed under a plan of operations must not unreasonably diminish the use and enjoyment of lands within a native allotment. Before entering a pending or approved native allotment, lessees must contact the Bureau of Indian Affairs and the Bureau of Land Management and obtain permission to enter, if required. Lessees must also comply with applicable federal law regarding native allotments.

Archeological and Historical Sites:

22. Prior to the construction or placement of any structure, road, or facility resulting from exploration, development, or production activities, the lessee must conduct an inventory of archeological and historical sites within the area affected by a proposed activity. Such inventory must consider literature provided by the North Slope Borough and local residents, documentation of oral history regarding historic and prehistoric uses of such sites, evidence of consultation with the Alaska

Heritage Resources Survey and the National Register of Historic Places, and site surveys. The inventory must also include a detailed analysis of the potential effects estimated to result from the proposed activity. The inventory must be submitted to the Director, Division of Oil and Gas, for distribution to the Director of the Division of Parks and Outdoor Recreation and the Mayor of North Slope Borough for purposes of review and comment. In the event that an archeological or historical site or area may be adversely affected by an activity, the Director, Division of Oil and Gas, after consultation with the Director of the Division of Parks and Outdoor Recreation and the North Slope Borough, will direct the lessee as to what course of action will be necessary to mitigate the adverse effect.

Fishbearing Streams:

23. The measures listed below will be imposed by the Alaska Department of Fish and Game under AS 16 to protect anadromous streams. Similar provisions will be imposed by the Alaska Department of Natural Resources to protect nonanadromous fishbearing streams. Exceptions to these requirements may be allowed on a case-by-case basis by the agency having jurisdiction. Lessees are advised that the Colville and Itkillik Rivers are documented anadromous streams. Specific information on the location of anadromous waterbodies in and near the sale area may be obtained from the Alaska Department of Fish and Game.

    a. Alteration of river banks will be prohibited.

    b. Except for approved stream crossings, equipment must not be operated within willow stands (Salix spp.).

    c. The operation of equipment, excluding boats, in open water areas of rivers and streams will be prohibited.

    d. Bridges must be used as watercourse crossings whenever feasible. Culverts may be used only when bridges are shown not to be feasible or prudent. If approved, culverts must be installed so as not to block fish passage. The siting, design, and construction of both bridges and culverts must be approved prior to the placement of either of these structures.

    e. Removal of freshwater or snow cover from fishbearing rivers, streams, and natural lakes will be prohibited from freeze-up until spring break-up unless approved by the Division of Land and Water Management and the agency having jurisdiction. Compaction of snow cover overlying fishbearing waterbodies will be prohibited except for approved perpendicular crossings. If ice thickness is not sufficient to facilitate a crossing, ice and/or snow bridges will be required.

    f. Water intake pipes used to remove water from fishbearing rivers and lakes must be surrounded by a screened enclosure to prevent fish entrainment and impingement. Pipes and screening must be designed and constructed so that the maximum water velocity at the surface of the screen enclosure is no greater than 0.1 foot per second. Screen mesh size shall not exceed 0.04 inch.

g. To protect fish and other aquatic fauna, geophysical surveys in freshwater will require the use of nonexplosive energy sources. Explosives must not be detonated in close proximity to fishbearing waters unless the detonation produces a pressure rise in the waterbody of no more than 3 psi or the waterbody, including its substrate, is solidly frozen. The minimum acceptable offset from fishbearing waters for various size single charge detonations is:

1-2 pound charge -- 80 feet
5 pound charge -- 120 feet
10 pound charge -- 170 feet
25 pound charge -- 270 feet
100 pound charge -- 530 feet.

Disposal of produced water, drilling muds, and cuttings:

24. Excluding muds and cuttings (see Term 26), solid waste disposal into rivers, streams, natural lakes, and Class III, IV, VI, and VIII wetlands is prohibited. Before the lessee disposes of solid waste in other areas, the disposal must be approved through permits issued by the Alaska Department of Environmental Conservation.

25. All garbage and refuse must be incinerated. Residue and nonburnables must be disposed of at an upland site approved by the Alaska Department of Environmental Conservation. No new solid fill disposal sites, except possibly for the disposal of drilling muds and cuttings, will be approved during the exploratory phase.

26. Discharge of produced water, drilling muds, and cuttings:

a. Disposal of drilling muds and cuttings is subject to an Alaska Department of Environmental Conservation solid waste disposal permit and any guidelines and conditions accompanying the solid waste disposal permit. Disposal of wastewaters generated from drilling operations will be subject to an Alaska Department of Environmental Conservation wastewater disposal permit.

b. Disposal of produced waters will be by subsurface disposal techniques, except that the Alaska Department of Environmental Conservation may permit alternate disposal methods if the department determines that subsurface disposal techniques are not feasible or prudent. Disposal of produced water to intertidal habitat, estuarine waters at river mouths, and freshwater bodies, including Class III, IV, VI, and VIII wetlands, is prohibited.

c. Discharge of drilling muds and cuttings to lakes, streams, rivers, intertidal habitat, tidally influenced mouths of rivers, and Class III, IV, VI, and VIII wetlands is prohibited. Disposal of muds and cuttings may be made into sumps and reserve pits approved through a solid waste disposal permit from the Alaska Department of Environmental Conservation.

Gravel Mining:

27. In meeting gravel needs for exploration, development, and production, gravel from nearby abandoned drill pads, roads, and airstrips, and existing material sites must be used first unless it is demonstrated to the Director, Division of Land and Water Management, after consultation with the Division of Oil and Gas and the Alaska Department of Fish and Game, that use of these sources is not feasible or prudent or in the state's best interests. The Alaska Oil and Gas Conservation Commission will be consulted when gravel is to be removed from a wellhead.

28. Gravel mining sites required for exploration activities must not be located within an active floodplain of watercourses, unless the Director, Division of Land and Water Management, after consultation with the Alaska Department of Fish and Game, determines that no feasible and prudent alternative exists and that a floodplain source will cause the least adverse environmental impact. Mining site development and rehabilitation within floodplains must follow the procedures outlined in Gravel Removal Guidelines Manual For Arctic and Subarctic Floodplains, 1980, U.S. Fish and Wildlife Service, Woodward Clyde Consultants. Alaska Department of Fish and Game approval is required if the mining site is located within an anadromous stream (AS 16.05.870) or could block fish passage (AS 16.05.840).

29. Gravel mining sites required for development activities will be restricted to the minimum number of upland sites needed to develop the field efficiently and with minimal environmental damage. Where feasible and when large quantities of water will be needed for domestic or industrial use, upland gravel sites must be designed and constructed to function as reservoirs for future use. Gravel mining will not be allowed from active floodplains during development and production, unless the Director, Division of Land and Water Management, after consultation with the Alaska Department of Fish and Game, determines that there is no other feasible and prudent alternative and, if applicable, AS 16 requirements are met.

Special Areas:

30. Prior to initiating any field activities which could impact denning polar bears, lessees must consult with the appropriate state and federal agencies to acquire the most recent information on possible locations of den sites and the location of any radio-tagged bears. Winter travel routes and exploration activities must avoid preferred polar bear denning habitat unless human safety dictates otherwise. Onshore, polar bears den within 25 miles (40 km) of the coastline in deeply drifted areas (6 ft. or greater) adjacent to the cutbanks of drainages. The use of explosives will be prohibited within 1/4 mile (0.4 km) of cutbanks identified by the Alaska Department of Fish and Game. Exploration activities within one mile (1.6 km) of documented, active polar bear dens may be restricted or prohibited during plan of operations approval. If the lessee encounters polar bear dens in the field, the lessee must immediately report the den(s) to the Director, Division of Oil and Gas, and subsequently avoid the den(s).

31. Peregrine falcon nesting sites are known to occur near the Sale 54 area and may occur within the Sale 54 area. Lessees are advised that disturbing a peregrine falcon nest violates federal law. If the lessee discovers active peregrine falcon nest sites, the lessee must immediately report the nest locations to the Director, Division of Oil and Gas. To comply with state and federal endangered species acts, the following restrictions will apply in the vicinity of peregrine falcon nests sites, except as approved by the Alaska Department of Natural Resources in consultation with the Alaska Department of Fish and Game and the U.S. Fish and Wildlife Service. All known nest sites will be considered active between April 15 and June 1. Known nest sites that have not been surveyed will be considered active throughout the summer season. Nest sites not having a peregrine falcon present by June 1 will be considered inactive, and oil and gas activities near inactive nests will not be subject to the restrictions listed under b, c, and d. Activities at existing development sites within two miles (3.2 km) of newly established nests will not be subject to these restrictions.

    a. Within one mile (1.6 km) of all nest sites -- Facilities, including but not limited to roads, pipelines, disposal sites, gravel mines, storage facilities, and camps will be prohibited.

    b. Within one mile (1.6 km) of active nest sites -- Between April 15 and August 31, surface entry will be prohibited and aircraft overflights must avoid nest sites by an altitude of 1500 feet (457 m) above nest level. Human safety will take precedence over flight restrictions.

    c. Within two miles (3.2 km) of active nest sites -- Noisy activities, including blasting and gravel washing, will be prohibited between April 15 and August 31. Airfields, construction camps, disposal sites, compressor stations, and other permanent facilities that occupy large areas, which are noisy, or which require sustained human occupancy will be prohibited.

    d. Within 15 miles (24 km) of active nest sites -- Except for limited non-aerial applications of approved non-persistent insecticides, pesticide use will be prohibited.

32. To minimize impacts on caribou, pipelines must be consolidated to the extent feasible and must be designed, sited, and constructed to allow safe passage of caribou. These measures may include elevation or burial of pipelines, ramping, separation of roads and pipelines, traffic control, and siting of facilities away from important caribou movement zones.

33. All Sale 54 acreage in the Colville River Delta (Tracts 95, 96, 99, 100, and 102 to 108 and portions of Tracts 91, 93, 94, 97, and 98) will be subject to the following terms and conditions designed to maintain the production and harvest of key fish and wildlife species in the delta. When considering modifications to these terms and conditions, the Director of the Division of Oil and Gas will consult with and give due deference to comments and recommendations received from the Alaska Department of Fish and Game, the Alaska Department of Environmental Conservation, and the Division of Land and Water Management. When considering a request for a waiver or modification of these terms, environmental values and wildlife harvest will be given great weight and will take precedence unless there is a significant public need for the proposed use or activity; there is no feasible or prudent alternative to meet the public need for the proposed

use or activity which would conform to Sale 54 terms and conditions; and all feasible and prudent steps to maximize conformance with Sale 54 terms and conditions have been taken.

a. All onshore exploration activities will be restricted to the period between October 1 through April 30 unless the director determines that an extension can be granted to May 15.

b. During development and production, all major construction activities including, but not limited to, facility, road and pad construction, gravel washing and blasting, will be restricted to the period between October 1 through April 30 unless the director determines that summer construction will cause the least adverse environmental impact.

c. The surface movement of equipment and personnel may be restricted from May 15 to October 1. All authorized surface movement of equipment and personnel during this period must be on established roads and must be consolidated and scheduled to minimize disturbance to waterfowl. The necessity and conditions for limiting equipment and personnel movement will be identified on a case-by-case basis during review of plans of operations.

d. Material extraction on the delta will be prohibited unless the director determines that material extraction from the delta will cause the least adverse environmental impact.

e. Facilities and activities within the Colville River Delta to support industrial operations located outside the delta will be prohibited unless the director determines that the siting of facilities and activities in the delta will cause the least adverse environmental impact.

f. Permanent facilities will be prohibited within black brant colonies and the traditional black brant brood rearing area unless the director determines the siting of permanent facilities in these areas will cause the least adverse environmental impact.

g. To provide additional swan protection, drill pads, roads and other facilities must be sited outside of Class III wetlands.

h. To provide additional protection to yellow-billed loons, permanent facilities will be prohibited in the immediate vicinity of large, clear lakes located in the delta unless the director determines that such placement will cause the least adverse environmental impact.