ARCTIC NATIONAL WILDLIFE REFUGE, ALASKA, COASTAL PLAIN RESOURCE ASSESSMENT

REPORT AND RECOMMENDATION TO THE CONGRESS OF THE UNITED STATES

AND FINAL LEGISLATIVE ENVIRONMENTAL IMPACT STATEMENT

APPENDIX--PUBLIC COMMENTS AND RESPONSES

U.S. Department of the Interior

ARCTIC NATIONAL WILDLIFE REFUGE, ALASKA, COASTAL PLAIN RESOURCE ASSESSMENT

Report and recommendation to the Congress of the United States and final legislative environmental impact statement, 1987

Volume 1--Report
Volume 2--Appendix (Public comments and responses)

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Washington, D.C. 20240

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Recommended citation for this report shown in Volume 1.

COVER PHOTOGRAPH

A typical view southward across the coastal plain toward the foothills and the Brooks Range.

ARCTIC NATIONAL WILDLIFE REFUGE, ALASKA, COASTAL PLAIN RESOURCE ASSESSMENT

APPENDIX
PUBLIC COMMENTS AND RESPONSES

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APPENDIX

PUBLIC COMMENTS AND RESPONSES

On November 24, 1986, the draft Arctic National Wildlife Refuge Coastal Plain Resource Assessment and legislative environmental impact statement (LEIS) were made available for public review and comment. Originally scheduled to close January 23, 1987, the comment period was extended to February 6, 1987, at the request of the Governor of Alaska and others. Public meetings were held January 5, 1987, in Anchorage, Alaska; January 6, in Kaktovik, Alaska; and January 9, in Washington, D.C.

More than 200 individuals participated in the public meetings and submitted oral or written statements, or both. Transcripts of these three hearings are available for public review in the following locations:

U.S. Fish and Wildlife Service
Division of Refuges
Room 2343, Main Interior Building
18th and C Streets, NW.
Washington, D.C. 20240

and

U.S. Fish and Wildlife Service
Alaska Regional Office - Planning
1011 East Tudor Road
Anchorage, Alaska 99503

Copies of the draft report/LEIS were sent to all Federal, State, and local agencies with jurisdiction by law or special expertise, to the Government of Canada and the Yukon and Northwest Territories, to conservation organizations, oil and gas industry, selected libraries, the media, and others who requested copies.

During the comment period, 11,361 letters were received. The vast majority of these letters (11,244) were generally a statement either that the area should be opened to further oil and gas activity or that the area should be designated as wilderness. Of these letters, 7,491 favored leasing and 3,707 favored wilderness designation. Forty-six letters expressed no definite opinion. Statistical summaries by State and position are presented in the adjacent table.

Many of the letters were the results of various mail-in campaigns inspired by industry and conservation organizations. A variety of these comment letters have been reproduced in this volume. They were selected at random and represent examples of the pro and con statements, petitions, individually thought-out responses, and mail-in campaigns. All these comment letters are available for public review in the Washington Office of the U.S. Fish and Wildlife Service, address provided above. Included in the 11,244 letters were responses from 821 organizations, industries, associations, etc.; and 10,423 private individuals.

Responses to proposed recommendation in the draft LEIS.

State/Country	Yes	No	Total
Alabama	18	2	20
Alaska	1,311	407	1,718
Arizona	90	28	118
Arkansas	21	1	22
California	564	839	1,403
Colorado	138	43	181
Connecticut	98	46	144
Delaware	27	6	33
District of Columbia	16	5	21
Florida	258	124	382
Georgia	42	33	75
Hawaii	4	4	8
Idaho	13	7	20
Illinois	230	130	360
Indiana	86	140	226
Iowa	27	21	48
Kansas	134	7	141
Kentucky	35	4	39
Louisiana	181	21	202
Maine	13	9	22
Maryland	53	50	103
Massachusetts	53	118	171
Michigan	62	105	167
Minnesota	55	57	112
Mississippi	26	4	30
Missouri	94	46	140
Montana	84	33	117
Nebraska	55	7	62
Nevada	21	11	32
New Hampshire	10	14	24
New Jersey	156	67	223
New Mexico	66	19	85
New York	169	289	458
North Carolina	41	28	69
North Dakota	42	1	43
Ohio	142	50	192
Oklahoma	609	17	626
Oregon	34	44	78
Pennyslvania	547	128	675
Rhode Island	13	12	25
South Carolina	15	48	63
South Dakota	18	2	20
Tennessee	35	19	54
Texas	1,192	64	1,256
Utah	25	3	28
Vermont	4	34	38
Virginia	90	41	131
Washington	128	422	550
West Virginia	208	7	215
Wisconsin	58	74	132
Wyoming	51	7	58
Canada	1	5	6
Total	7,491	3,707	11,198

Substantive comments on the contents of the report itself were received from the remaining 117 respondents and are published in their entirety in this volume, in the following categories:

Federal governments and agencies
State and local governments
Industry
Organizations
Private individuals

If written testimony filed at the public meetings contained substantive comments, it has also been reproduced in this section.

Each of the 117 letters was analyzed and substantive issues or additional information were delineated. Oral testimonies presented at the hearings and documented in the transcripts were reviewed, and the concerns and issues raised addressed in the report and responses as appropriate.

Over 1,650 individual comments are contained in the 117 letters. These substantive comments have been summarized by major topic or issue, and detailed responses are included below. The final report/LEIS was modified as appropriate based on comments received.

The substantive comment letters and the letters concerning the overall issue of whether or not to open the coastal plain of the Arctic National Wildlife Refuge to further oil and gas activity follow the "Responses to Comments" section in this appendix volume.

RESPONSES TO COMMENTS

Environmental Issues (Chapters II and VI)

CARIBOU

The anticipated effects on the Porcupine caribou herd (PCH) and, to a lesser extent, the Central Arctic Herd (CAH), generated more public comment than any other aspect of possible oil and gas activity in the 1002 area. This topic has been extensively revised in both Chapters II and VI based on these comments. Additional information has become available since the draft LEIS/report was prepared, and has been reflected in the analysis in the final. Although the comments were numerous, most were repetitive of a few major concerns, which have been summarized and responded to below.

PCH CORE CALVING AREA

On the basis of respondents' comments, it was obvious that the draft report's designation of a "core" calving area was being misinterpreted as a very specific area absolutely essential to the viability of the PCH.

The term "core" was used to identify areas repeatedly used by large numbers of calving caribou (density of at least 50 animals/square mile as described in the draft LEIS/report). Areas were identified as core calving areas in the draft report where surveys indicated concentrated use in at least 5 of the 14 years for which detailed observations have been made. Information received since the draft report was prepared added another year of calving distribution information to this data base.

Data leave little doubt that there are important birthing areas in spite of some broad variations from year to year (fig. II-5 and pl. 2A). Based on further review and consultations with Canada, it is questionable to conclude that the repeatedly used concentrated calving habitat on the Jago River is "unique and irreplaceable on a national basis or in the ecoregion" (Resource Category 1 designation, FWS mitigation policy), or that displacement would be sufficient to threaten the viability of the PCH. Accordingly, designations of a "core" calving area and Resource Category 1 habitat have been deleted from the final report.

We believe that the documentation of PCH calving within the 1002 area and additions to the discussion of the importance of calving in the caribou life cycle adequately address this issue without using strictly subjective measures for impact analysis.

PCH DISPLACEMENT VS. DECREASE IN POPULATION

Several commenters, including those from Canada, were concerned with what seemed to be a 20 to 40 percent projected population decline for the PCH.

The draft report did not predict a 20 to 40 percent decrease in herd size. The percentage was related to distribution changes, but through an editing error in punctuation, the relationship was obscured. However, this prompted the FWS to conduct further analysis and consideration of concentrated calving patterns which has suggested that quantifying a percentage in change of distribution (that is, percent displaced) would be highly speculative. Therefore, such information has been dropped from the text and clarification provided.

AREA OF DISPLACEMENT

One of the more controversial aspects of the environmental analysis for caribou concerned the assumption that caribou would be displaced 3 km out from either side of development, roads, and associated facilities. The draft LEIS described this area as 2 miles (3 km = 1.86 mi) in conformance with use of English units throughout the report. However, all computer analyses of areas which would be affected on the basis of this displacement used 3 km, as reported in the literature (Dau and Cameron, 1986). Because several commenters expressed confusion over the use of 2 miles, the references and discussion in the final LEIS were changed to 3 km to be consistent with the literature.

The text has been modified to correct the implication that there would be a complete loss of habitat values within this 3-km area. There would be a reduction in habitat values in varying degrees throughout the area within 3 km of development, with significant declines most likely 2 km outward from the development facilities. This is based on the Dau and Cameron study which showed such decreases in use from disturbance levels much lower than are likely to occur under the full and limited leasing scenarios. Further information on the Dau and Cameron (1986) study, which was the basis for the 3-km displacement zone, has been provided.

Because of concerns over use of the Dau and Cameron data, the Alaska Department of Fish and Game (ADF&G) met with representatives of the oil industry February 13, 1987, to clarify data collection and analysis procedures. Additional statistical tests were applied to the data; reanalyses confirmed displacement, and consistently supported the results and conclusions of the original Dau and Cameron report. Oil industry representatives agreed that displacement of caribou from the Milne Point road had occurred even though the Dau and Cameron study was conducted during periods of very low traffic activity. On February 27, 1987, the ADF&G and oil industry representatives presented the clarified data to FWS. The analysis in Chapter VI has been revised to reflect this clarification.

MAPPING AREAS OF PCH CONCENTRATION

A few commenters suggested that the maps and calculations concerning areas of concentration and densities of PCH on their calving grounds did not reflect all available information.

Further information on the caribou densities in observed concentration areas has been provided in the report, including the assumptions used to calculate densities of between 46 and 128 caribou/square mile for each concentration area in 1983 and in 1984. Limited measurements made in 1972 near the Jago River showed densities ranging from 8.2 to 375 caribou/square mile. Because the difference between high density concentrated and low-density scattered calving areas is readily apparent, use of the term "concentrated" by previous observers was assumed to reflect densities of similar magnitude.

Since preparation of the draft report, additional information has been made available to the FWS concerning the distribution of PCH calving. This has permitted refinement in mapping and analyzing calving distributions in Alaska and Canada for 1972-81. Some of these refinements have been made possible through the recent preparation of large-scale maps of calving distribution for the years 1978-81 by the Yukon Wildlife Branch. The Yukon Wildlife Branch maps were based on field notes and maps prepared by the original investigator, and are more accurate than the small-scale maps used by the FWS for preparation of the draft report.

For the years 1972-77, large-scale maps prepared by the original investigators were destroyed in a fire, leaving only small-scale maps for use in preparing the draft report. Working with the FWS, D. G. Roseneau, one of the field investigators working on the Arctic Refuge during the Arctic Gas studies, identified and corrected inaccuracies in the maps in the draft report for calving distribution for 1972-77. Earlier inaccuracies resulted from the FWS interpretation and transformation of small-scale maps to a larger scale. The refinements are based upon Roseneau's field notes and recollection.

The refined concentration areas are depicted in figure II-5 and plate 2A of the final LEIS and included in all quantifications of calving areas.

CARIBOU INSECT RELIEF

Numerous comments addressed the issue of insect relief, the areas and conditions sought by caribou for relief, and the significance of insect avoidance behavior in relation to the effects of possible development. The report has been revised to clarify or expand the discussion of insect relief phenomenon.

Insect relief is generally meant to include avoidance of both mosquitoes and oestrid flies. On the 1002 area oestrid flies are not believed to be the nuisance to the PCH that they are to the CAH. The majority of the PCH have generally left the area by peak oestrid fly emergence, although some flies may be present in early July. Generally, PCH movements to insect-relief habitats appear to be in response to mosquitoes.

Evidence suggests that insects play a very strong role in influencing caribou behavior, activity and movements. The text in Chapter VI has been expanded to reflect this fact.

Some commenters suggested that use of coastal areas for insect relief was inconsistent. The FWS disagrees. During the last 15 years, coastal insect relief was used on the average of every other year by extremely large numbers of PCH caribou (Garner and Reynolds, 1982, 1983, 1984, and 1985).

These and other commenters pointed out that the main oil pipeline should present no obstacle to PCH in their movements to coastal relief habitats, based on CAH crossing success in the Prudhoe Bay area. Even large groups (a few thousand) in the CAH that successfully negotiate pipelines, roads, and other developments are much smaller than postcalving aggregations of the PCH (up to 80,000). If these large groups of PCH caribou react negatively to disturbance as some observations suggest, there could be large-scale exclusion of caribou from coastal areas.

POLAR BEARS

There were numerous comments that loss of the one or two bears known to den on the 1002 area each year did not indicate a moderate impact to the Beaufort Sea polar bear population. This section in Chapter VI has been clarified. Figures presented in the text are for known dens, based on radio-telemetry studies of only a fraction of the total denning bears within the Beaufort Sea population. Only 5 to 20 percent of the approximately 150 females which den each year are radio tagged. Thus, there are probably numerous other bears denning on the 1002 area which could also be adversely affected by development. These numbers are even more important when considering that 10 of the 12 land dens found during the 1981-86 radio telemetry studies were located on the Arctic Refuge. Seven of those dens were within the 1002 area.

CARRYING CAPACITY

A few commenters noted that carrying capacities of the Arctic Refuge coastal plain are not presented in the Baseline Study, as was required by Section 1002(c)(b), or in the draft LEIS/report. Despite the extensive baseline studies that have been conducted, current knowledge is inadequate to address the concept of carrying capacity on the 1002 area for the various fish and wildlife species that seasonally occupy the coastal plain. This fact is noted in the final Baseline Report and throughout Chapters II and VI of the report.

The use of primary productivity (annual growth of vegetation) by the various secondary consumers (herbivores) is not well documented for the Arctic. Similarly, the role of interspecific and intraspecific competition of herbivores in altering the biotic carrying capacity of the coastal plain of the Arctic Refuge has not been quantified. Also, nonhabitat factors (predation, disease, behavior, weather, etc.) that can modify the carrying capacity of the area are not well understood. Carrying capacity of tertiary consumers (predators and omnivores) is dependent upon the distribution and abundance of their prey species. Therefore, carrying capacity of tertiary consumers can only be established after the carrying capacity of their prey has been established. Until data are available to address these information gaps, valid estimates of carrying capacity of the 1002 area are not possible.

TRANSBOUNDARY CONSEQUENCES

The Government of the Yukon felt that there was inadequate treatment of the transboundary consequences of those direct impacts on wildlife that use the coastal plain and Canadian habitats or are important constituents of a larger regional population. This point is well taken, and Chapters II and VI have been expanded to address the effects on transboundary wildlife species: caribou, waterfowl, and marine mammals.

BASELINE REPORT

A few organizations commented that the final baseline report was unavailable at the time the draft report/LEIS was made public. This was true due to printing difficulties; however, the final baseline was available by January 1987, allowing sufficient time for review. Despite its length, that report provides updates and summaries of previous annual baseline reports published and publicly available since April 1982. The reports were prepared by those who also contributed to the preparation of the 1002 report, so, inevitably, the report reflects information in all the baseline studies. In fact, these baseline studies have provided the basis for the biological and socioeconomic portions of Chapters II and VI, as they were intended to do.

The final report/LEIS also has been updated to include the 1985 baseline information. The 1985 baseline is in press, and the entire baseline series will be available for the Congress and the public when the Congress begins consideration of the report and the Secretary's recommendation.

REGULATORY PROCESSES

The Environmental Protection Agency concluded that the discussion of the regulatory process and its relationships to the alternatives needed to be expanded. The focus of their comments was on:

- The existing regulatory process including examples of how existing regulations are applied on the North Slope for oil and gas development.

- The Section 404 program, in particular the success of Abbreviated Permit Process, designed to expedite oil and gas development on the North Slope.

- The potential applicability and use of the advanced identification process for advanced planning.

Department of the Army Section 10/404 permits are the primary basis for current FWS involvement in existing North Slope oil and gas developments. The FWS does not believe that the effectiveness of this process has been impaired by development of the Abbreviated Permit Process. Also, the FWS has supported the advanced identification process, and considers it to be useful for making concerns known early in the decisionmaking process.

MITIGATION

Comments relevant to mitigation, ranging from criticism that ameliorative measures were too stringent to complaints that they were totally inadequate, revolved generally around the following issues:

1. Some reviewers criticized the FWS mitigation policy and its habitat-based evaluation system. They contended that animal populations in the Arctic have not been shown to be regulated by habitat availability. They further contended that the most biologically effective approach to assessing and mitigating effects is to determine how oil development will adversely affect given populations and then apply mitigative measures that avoid or minimize impacts.

   Animal populations are considered by many experts to provide an unreliable basis for evaluating fish and wildlife impacts. Sampling errors, cyclic fluctuations of populations and the lack of time-series data all contribute to the problem. Therefore, FWS feels that determining habitat value provides a better basis for developing mitigation recommendations. But the use of population information is not foreclosed. In fact, concern for potential population losses led to the formulation of the general policy to seek to mitigate all losses to fish, wildlife, their habitat, and uses thereof. The FWS believes that mitigation of potential population losses is a necessary aspect of this policy.

   The FWS mitigation policy mirrors the consideration of mitigation as required by the CEQ regulations (40 CFR 1502.14, 1502.16, 1505.2(c) and 1508.20). It sets out goals and planning guidance for the development of FWS mitigation recommendations. The policy does not require absolute strict adherence to a required standard.

   The discussion of mitigation in Chapter VI has been revised and expanded to clarify the use of the FWS mitigation policy in establishing mitigation goals and developing mitigation recommendations.

2. Concern was expressed that many mitigation measures imposed on industry at Prudhoe Bay were found to be unnecessary, ineffective, or, in some cases, detrimental to the environment. Blanket restrictions were viewed as inefficient and less desirable than mitigation measures based on case-by-case evaluations.

   Some mitigation measures originally imposed on frontier oil and gas development activities at Prudhoe Bay either have been ineffective or have been found to be unwarranted. Preventive techniques are continually being improved with advances in state-of-the-art technology and additional biological data on the effects to fish and wildlife from various development activities in the Alaskan Arctic. Mitigation measures must be viewed in the light of past experience and present technology. Flexibility should also be maintained to rescind or add mitigative measures as determined necessary on the basis of day-to-day experience. This approach was reflected in the draft report/LEIS and is reaffirmed in the final.

3. A number of comments expressed concern that, in evaluating potential impacts of oil development in the 1002 area, the report relied too heavily on mitigation techniques used in the Prudhoe Bay area. The general theme of these comments was that serious impacts have occurred at Prudhoe Bay, in spite of mitigation measures, and that impacts of similar activities might be greater in the 1002 area.

   Experience gained at Prudhoe Bay has been relied on as a basis for evaluating impacts where appropriate. Parallels relative to certain types of activities are obvious; that is, many studies contain conclusive evidence of impacts that will occur under certain conditions or circumstances, regardless of location. On the other hand, there are dangers in drawing analogies where conditions, potential scenarios, or habits of affected species are significantly different. The text in Chapter VI has been modified to emphasize this point and to more clearly explain the rationale for the use of FWS mitigation policy as a means for determining potential loss of habitat values as a basis for impact measurement and evaluation.

   It is unrealistic to expect that all impacts will be ameliorated or that there may not be unavoidable impacts having significant adverse effects. For example, potential impact on wilderness values is perhaps the most significant adverse impact likely to occur, as well as the least possible to effectively mitigate.

   Section 1002(h) of ANILCA does not require "no significant adverse impact" as a standard for further oil exploration and development, as was used in the previous seismic exploration program on the 1002 area. It does require "an evaluation of the adverse effects that the carrying out of further exploration for, and the development and production of, oil and gas within such areas will have on the resources." Although there is a risk of significant population declines for PCH caribou and muskoxen, the likelihood of these "catastrophic consequences" is very low. Also, such consequences would not be permanent, because most perturbations would disappear with depletion and shutdown of oil activities and the restoration of the coastal plain (primarily removal of infrastructure).

4. A number of respondents felt that the draft report did not adequately acknowledge the mitigative effects of existing regulatory programs of Federal, State, and local governments having jurisdiction over the 1002 area.

   We believe that the importance of these controls is adequately recognized in the report, although some additional information has been provided. We generally believe it (1) unnecessary to belabor well-known regulatory processes and (2) more important

to focus on areas where additional mitigation may be necessary to ensure that refuge resources are not subject to unnecessary adverse effects.

5. Although a number of comments were critical of the draft LEIS/report in not adequately acknowledging the mitigative effects of existing regulatory programs, an almost equal number voiced concern that existing regulations, standards, and stipulations are inadequate to ensure mitigation.

   As stated in Chapter I, more than 36 Federal laws, 5 State of Alaska laws, and 111 separate regulations currently apply to oil and gas activities in Alaska. The FWS believes that these laws and regulations provide ample guarantee for protection of the resources of the 1002 area. Laws such as ANILCA and the National Wildlife Refuge System Administration Act give additional controls to FWS which are lacking on nonrefuge lands.

WATER AVAILABILITY AND DEVELOPMENT

A variety of comments were received regarding 1002 area water supplies large enough to support oil and gas exploration and development. The following information is expanded on in the final report.

The limited availability of fresh water on the Arctic coastal plain is not unique to the 1002 area, nor has it precluded development. Sources used and methods developed to satisfy water requirements in other areas in the Arctic would apply to activities in the 1002 area. Solutions to providing/obtaining water would be considered on a site-by-site basis. Sources and methods used to obtain winter water supplies in earlier exploratory development and production activities in Arctic Alaska are discussed in Chapter II of the report.

AIR QUALITY

Many commenters criticized the lack of information and analysis of effects regarding air quality in the draft report. Additional information has been made available to the Department, and expanded discussions have been included in Chapters II and VI. Several issues were raised:

1. One commenter indicated that the draft LEIS should include a discussion of the process for regulating air quality in the 1002 area. Another commenter expressed confidence in the current process for regulating air quality in Alaska and suggested that changes were not needed in the regulatory framework.

   It is difficult to predict the impacts on air quality in the 1002 area without knowing the scope, timing, and location of oil development. However, the existing regulatory structure is designed to assess the potential effects of oil development on air quality once such critical variables are known. Under this structure, the State of Alaska Department of Environmental Conservation must grant permits prior to any construction on the 1002 area. For significant activities, permits require that major sources of pollution apply best available control technology, that minor sources apply new source performance standards, and that Alaska's control requirements be written into State implementation plans.

2. Several commenters suggested that the final LEIS include results from modeling emissions estimates for the 1002 area.

   The Department does not believe that current information permits reliable modeling of the impact of 1002 area oil development on air quality. Moreover, given that the current regulatory structure and the mitigation measures that it requires are adequate, such modeling is unnecessary at this time. Air-quality modeling would be an important component of subsequent deliberations by the State on whether to grant permits for activities in the 1002 area.

3. Several commenters expressed concern about the potential contribution of oil development on the 1002 area to a buildup of carbon dioxide (CO_2) concentration levels in the Earth's atmosphere.

   Development in the 1002 area would not lead to a significant increase in the CO_2 concentration in the atmosphere, which could, in turn, via the "greenhouse effect," raise the earth's temperature. This is true for several reasons. First, CO_2 concentration is a global phenomenon. The potential resources on the 1002 area, though sizable, are relatively insignificant in relation to worldwide fossil fuel consumption. Second, if the 1002 area's oil resources are not developed, it is likely that other fossil fuel resources would be developed in their place. Some fossil fuels, such as coal, can have greater air-quality impacts than oil. Third, fossil fuel combustion is only one of the ways which contributes to CO_2 buildup. Fourth, CO_2 is only one of several gases contributing to the "greenhouse effect." Some investigators believe that, over the next 50 years, these other gases may play an equally important role in CO_2 buildup. Finally, there is substantial uncertainty about the likelihood of global warming.

4. Some commenters expressed concern that the impact of oil production on ambient ozone concentrations could be significant and that it should be dealt with in the final report.

   Ozone is formed by a complex series of atmospheric reactions between volatile organic compounds and

nitrogen oxides in the presence of sunlight. Generally, ozone formation is not expected to be significant in Alaska, and especially in the 1002 area, because the intensity of sunlight and temperatures--two critical factors in the formation of ozone--is quite low.

5. There was some concern that there could be significant effects from acid rain and that this issue was ignored in the draft LEIS.

   Chapter VI deals with this issue explicitly. Sulfate deposition is expected to be relatively low even under the 5-percent-probability case. Moreover, data from the Prudhoe Bay vicinity, where the FWS has been measuring pH values of ponds and lakes since 1983, show that these surface waters are neutral or alkaline.

GRAVEL

Several commenters found the implied shortage of gravel in the 1002 area to be somewhat overstated in light of the difficulties encountered with gravel in drilling seismic shotholes during the 1983 exploration season. Also pointed out was the fact that shothole logs and samples from the entire area were made available to the Department. The drillers' logs are not adequate for a detailed geotechnical analysis, but they do indicate the presence of widespread, thick upland and channel gravel deposits. Even though the gravel may not be optimally located for all possible developments in the 1002 area, generalizations about gravel shortages are inappropriate. The text has been revised accordingly.

ENERGY CONSERVATION

Many comments noted the importance of conservation in meeting national energy goals. The Department of Energy is responsible for the development of national energy policy, including means of achieving conservation. The Department of the Interior's role in this energy policy is to comply with its legal mandate to manage the development of energy resources on Federal lands in an environmentally acceptable manner. The focus of this report/LEIS is to respond to the statutory questions about the potential petroleum and biological resources in the 1002 area, not to review the full scope of national energy policy. Nonetheless, a discussion of alternative energy resources, including energy conservation, has been added to Chapters V and VI, to give the reader a better idea of the impacts if energy development is forgone on the 1002 area. Conservation and increased domestic production are, of course, complementary components of a broader national energy policy.

USE OF "WORST CASE" ANALYSIS

Many commenters, especially those from industry, criticized the FWS for using a "worst case" analysis in determining environmental effects.

Leasing and development, from field exploration through oil production, transportation, rehabilitation and abandonment, would be sequential on the 1002 area. For purposes of impact assessment, it was assumed that Blocks A, C, and D (for Alternative A) were leased and that exploration was successful. It was further assumed that each of these blocks, plus Block B which would be crossed by the main pipeline, would at some point in time have some concurrent activity, whether it be winter seismic work; exploration and development well drilling; construction of airstrips, port developments, pipelines; or rehabilitation. If some of the currently prospective areas that were assessed contain no economically recoverable oil (of which there is an 81-percent chance), then predicted impacts would be substantially less, probably limited to those associated only with exploratory well drilling and cleanup. This would be particularly true if delineated prospects in Blocks C and D produced "dry holes." Not only would development of the fields not occur, but the main pipeline could be shortened by a significant amount, and the Pokok port site would be unnecessary. Such speculation, however, precludes meaningful analysis.

Therefore, as required by the Council on Environmental Quality (CEQ) regulations (40 CFR 1502.22) for purposes of impact assessment, oil-related activities reasonably foreseeable at some point in time in the 1002 area were assessed.

The lands under consideration are National Wildlife Refuge System lands, lands that by their designation and through the legislative history have been deserving of special resource protection. Therefore, the impact assessment must clearly provide the Secretary of the Interior the information necessary for his decision as to the recommendation to the Congress. Through such an analysis he can understand and answer the question, "What is the most that can reasonably be expected to happen if the 1002 area is opened to further oil and gas activity; what natural resource risks and tradeoffs are involved?" It does not present analysis and probable conclusions as to what is the worst that can happen. The text has been clarified accordingly.

As further required by the CEQ's regulatory amendments (40 CFR 1502.22(b)(3) and (4)), Chapter VI summarizes existing credible scientific evidence relevant to evaluating reasonably foreseeable significant adverse impacts, based upon theoretical approaches or research methods generally accepted in the scientific community. There is substantial uncertainty about the ability of wildlife in the 1002 area to adapt to oil activity or to seek out other appropriate habitats. In the report, the FWS has taken special care to identify areas of biological uncertainty. Biological conclusions that can not be drawn with certainty have been noted as speculative.

The report also recognizes, and in fact places some assurance on, the ability and willingness of the oil industry to work with State and Federal regulatory and management

agencies in consolidating facilities and developing other mitigating technology and techniques for environmentally acceptable Alaska North Slope operations. Even with this assurance it cannot be assumed that oil and gas activities on the 1002 area will not result in population declines, changes in distribution, or behavioral changes in certain wildlife species which use the 1002 area for critical segments of their life cycles.

CUMULATIVE EFFECTS

A number of individuals commented that the potential cumulative effects of oil and gas leasing and other development activities within the Canadian and Alaskan Arctic regions had not been fully addressed. In response to these concerns, a section on cumulative effects has been added to Chapter VI. The discussion of this issue is brief, because the programmatic LEIS/report is intended to focus on the 1002 area and the specific natural resource questions raised by the Congress. The issue of cumulative effects would be addressed in detail as part of the comprehensive environmental reviews that would be required if the Congress authorizes the leasing of oil resources within the 1002 area.

OIL SPILLS

The Alaska Oil and Gas Association, by telegram, expressed its concern about the 23,000 oil spills referenced in the draft report. They contended that this number of spills appeared to be erroneously attributed to the North Slope alone, and asked that the information in Chapter VI be verified. The figure was obtained through staff communications between the FWS and the Alaska Department of Environmental Conservation, which advises now that the information cannot be verified without extensive record reviews. Therefore, the reference to 23,000 spills has been removed from the final report, and the discussion clarified.

Socioeconomic Issues (Chapters II and VI)

SOCIOCULTURAL CONCERNS

Concerns that the sociocultural issues were ignored in the draft have been addressed. A section on "Sociocultural System" has been added to Chapters II and VI, and the "Socioeconomic" environment has been retitled the "Human" environment. The importance of cultural values from activities such as subsistence, accelerating changes to traditional Native activities, and potential benefits of increasing social services are discussed in the new sections.

Canadian government entities and some villages were concerned that the potential impacts on Canadian Native subsistence opportunities had not been adequately considered. The discussions have been expanded in Chapters II and VI.

RECREATIONAL USE

A few commenters wanted precise statistics concerning recreational use of the area. Precise data on the average number of recreational visits to the 1002 area are not available. Best estimates for recreational use are presented in Chapter II. As stated in the report, data on the number of unguided recreational users is not available. A comparison with other areas of the State would have little meaning. Special-use permits are issued only for commercial activities or "nonprogram" uses (50 CFR 27.97 and 29.3). They do not reflect the number of recreational users visiting the coastal plain, because recreational hunters, fishermen, backpackers, hikers, rafters, etc., do not need permits. A summary of the number of permits issued per year would be a poor index to the actual recreational use of the 1002 area.

WILDERNESS REVIEW

A few commenters were concerned about a perceived lack of wilderness review as a part of the report/LEIS.

Section 1002(h) does not require a wilderness review pursuant to the Wilderness Act. The public land order that established the Arctic National Wildlife Range recognized the wilderness values of the range, including the 1002 area. The Congress recognized this again in 1980 when it passed ANILCA, as well as recognizing the possibility that large quantities of oil and gas may exist on the 1002 area. It excluded the coastal plain from the area within the Arctic Refuge that it did designate as wilderness, pending consideration of the 1002 area study and further congressional action. Nonetheless, this report/LEIS evaluates a wilderness alternative to comply with NEPA.

COMPLIANCE WITH TITLE VIII

Section 810 of ANILCA requires, prior to any Federal agency determination to withdraw, reserve, lease, or otherwise permit the use, occupancy, or disposition of public lands under any of the provisions of the law authorizing such actions, that the head of the Federal agency evaluate the effects on subsistence uses and needs. Although subsistence uses and needs were identified, and the impacts assessed as part of the draft LEIS/report, the Department of the Interior did not conduct a formal 810 evaluation.

This final LEIS/report represents recommendations for legislative action, rather than a determination under existing provisions of law. Formal procedural requirements pursuant to Section 810 are not required to be met at this point in time. If, however, the Congress decides to open all or part of the 1002 area to oil and gas leasing, formal 810 Evaluations and Findings would be conducted. The statute requires that if such an evaluation resulted in a finding of significant restriction to subsistence uses and needs, public hearings would be conducted in the vicinity of the 1002 area. If further determination is made that the significant restriction is necessary, the statute requires that the minimum amount of public lands must be considered, and steps to minimize adverse impacts to subsistence must be assured.

Oil and Gas Resource Assessment Issues (Chapters III and VII)

MARGINAL PROBABILITIES FOR COMMERCIAL HYDROCARBON OCCURRENCE

Several comments indicated a misunderstanding of the term marginal probability, as defined as an output of the PRESTO model. The text of Chapter III has been revised and expanded at several points to clarify the definition generally, and the derivation and significance of the marginal probability reported for the 1002 area. The effect of the minimum economic field size on the marginal probabilities of occurrence generated by the PRESTO model cannot be overemphasized, particularly for remote, high-cost frontier areas such as the 1002 area.

As noted in the revised text, the reported 19 percent or a "one in five" chance for the 1002 area can hardly be characterized as a "high risk" when viewed in the context of the statistical success rates for discoveries of significant size, to say nothing of the field sizes expected in the 1002 area. The statement that there is a 19-percent chance of finding recoverable oil in the 1002 area needs to be interpreted in the context of past experience in oil exploration and resource assessment. Generally speaking, the chance of oil's being present will be lower, the smaller the unexplored area being considered. The 19-percent chance for the 1.5-million-acre 1002 area thus indicates a very high potential when compared to the 27-percent chance for the 37-million-acre Navarin Basin or the 22-percent chance for the 70-million-acre St. George Basin (table III-1).

The text in Chapter III has been revised to include references to probability of occurrence where appropriate.

SMALL AND UNIDENTIFIED PROSPECTS

Several commenters expressed concern that the economically recoverable resource estimate does not adequately account for potential resources in unidentified prospects, and in the smaller identified prospects.

With respect to unidentified prospects (stratigraphic traps and structures smaller than the seismic grid), the text has been expanded to emphasize the concept that the recoverable estimate represents an "identified minimum" volume.

The PRESTO model does include resources from small, apparently subeconomic, prospects on those Monte Carlo simulation passes where optimum values for volumetric parameters are sampled from the distributions. Naturally, this occurs less often for smaller prospects, and so their relative contribution to the aggregate area resource is less than for larger prospects. Also, the "most favorable case" economic scenario (table III-3) provides some idea of the effect of lower costs and lower minimum field sizes.

PROBABILITY DISTRIBUTIONS

Some comments indicate a lack of understanding of the manner in which both the in-place and recoverable resource estimates are presented.

Owing to the uncertainty inherent in all oil and gas resource estimates, current and almost universal practice is to use ranges of values for many of the input variables which affect the volume of resources in a geologic play or prospect, and to report the results as a range of values with an associated probability distribution.

Three "measures of central tendency" are associated with probability distributions. These are the mode, the median, and the mean. For the purposes of characterizing a resource distribution curve, the mean is considered most appropriate, because it takes into account the size, as well as frequency of occurrence, of values in the range. Technically, the "most likely" value, or mode, is the value which occurs most frequently in the range, not the lowest value as suggested by one commenter. The median is simply the midpoint in the range.

GEOLOGIC RISK

The discussion of area, prospect, and zone risk factors used for the Recoverable Resource analysis has been revised and expanded, as has the discussion of marginal probabilities. This will clarify the crucial differences between prospect and area risk factors, and between input risk factors and output marginal probabilities.

EXISTENCE OF THE ELLESMERIAN SEQUENCE

A number of comments focused on the question of the presence or absence of Ellesmerian sequence rocks, particularly the Ivishak Formation, in the subsurface in the 1002 area. Certainly, as has been pointed out by several commenters, the seismic data alone cannot conclusively resolve this question. Nevertheless, the data do provide some basis for considering the possibility in a more favorable light than in the 1980 resource assessment.

As noted in the description of structure in Chapter III, the only horizon which can be mapped with any semblance of continuity across the entire 1002 area is the top of the pre-Mississippian basement complex. In many parts of the area, parallel and locally continuous reflectors are associated with the mapped horizon, indicating substantial thicknesses of stratified rocks which have different structural characteristics from the overlying, intensely deformed Brookian rocks. Some limited reprocessing and detailed analyses of seismic data from the eastern part of the 1002 area indicate a similarity in character to reflectors known to be associated with Ellesmerian rocks west of the Canning River.

Uncertainty about the existence of the Ellesmerian sequence was accounted for in risk factors applied to pertinent play and prospect attributes. Uncertainty about quantitative attributes was accounted for in the ranges of values used for volumetric parameters, and reflected in the range of resource estimates.

TABLE III-1 (OCS PLANNING AREAS)

Several comments suggested that marginal probabilities for commercial hydrocarbon occurrences for OCS planning areas and for the 1002 area be added to table III-1. The table has been modified to show conditional resource estimates for unleased areas only, and the marginal probabilities have been added. The source for OCS estimates is Cooke (1985).

The information in table III-1, as revised, may be subject to misinterpretation unless certain considerations are kept in mind:

1. For areas where a commercial discovery has occurred, no matter how small, the marginal probability for occurrence of commercial hydrocarbons is by definition 100 percent.

2. For OCS planning areas, some of the reported marginal probabilities may be based on the probability of occurrence of commercial gas accumulations. For the 1002 area, only oil was considered.

3. The relatively high marginal probability for the Beaufort Sea planning area may be a consequence of a "potentially commercial accumulation" at Seal Island (Cooke, 1985, p. 33), which extends into the planning area. If the planning area were subdivided, it is very unlikely that the eastern Beaufort Sea offshore from the 1002 area would have such a high probability for commercial hydrocarbons.

4. In making comparisons between the areas shown in table III-1, both the volume of resource and the probability of occurrence should be considered (see Cooke, 1985, p. 13).

5. Planning areas are different sizes; the larger the area, the greater the likelihood that hydrocarbons will be present.

FIGURE III-2 (PROSPECT SIZES)

A number of comments indicate some confusion about the intent and proper interpretation of the graphic field size comparisons shown in figure III-2.

Figure III-2 is not intended to imply that undrilled prospects in the Arctic Refuge are directly comparable to proven fields. The purpose of figure III-2 is to illustrate the range of possible prospect resources in terms of known quantities that a layman can relate to. The caption for the illustration has been revised to reflect probabilities associated with the 1002 prospect resources.

Some commenters apparently have equated the solid black pattern (95-percent probability range) for the 1002 prospects with the same pattern for proven fields. The pattern has been changed to avoid this confusion.

The text discussion of prospects shown in figure III-2 has also been revised to reflect probabilities of occurrence.

DATA CONFIDENTIALITY

A few commenters were concerned by what they perceived to be a failure to release for public review and comment the geologic information critical to the assessment process. The subsurface seismic information was collected by a permittee--Geophysical Service Inc. (GSI)--and submitted to the U.S. Government under 50 CFR Part 37. It is protected under the these regulations which require the Government to hold confidential or proprietary the geologic data collected by a permittee on the 1002 area.

Analysis in the report is based on government-processed data resulting from processing industry's raw data (seismic tapes). The Department will make raw data available to the public after the report is formally submitted to the Congress, pursuant to regulations (50 CFR Part 37.54). Industry-processed, analyzed, and interpreted data obtained as a result of exploration activities by the permittee or a third party will not be released to the public until 10 years after the submission of such data or information, or until 2 years after any lease sale, whichever period is longer, in accordance with the regulations.

The volume of geologic data and the proprietary nature of the seismic data precluded including all data in the Chapter III summary of the geology of the 1002 area. Scientists of the GS and BLM reviewed all the data to present this condensed report for the government and the public. A more comprehensive technical report (USGS Bulletin 1778) will follow later this year.

Conversely, GSI's comments focused on what they perceived to be a breach of the regulations concerning some of the data and level of detail in Chapter III and the accompanying plates. Because of continued concern from members of the GSI participant group, the Department thoroughly reviewed its data confidentiality policy during 1986, and the regulations implementing the exploration program (50 CFR Part 37). The review led the Department to reaffirm its previous decision that the government-processed data (government seismic record sections) are not required to be withheld pursuant to 50 CFR 37.54(a). Data in the report are based entirely on government-acquired information, and raw data (seismic tapes) acquired by GSI.

OIL PRICES

Many commenters questioned the assumptions regarding oil prices used for economic analyses which are the basis for the minimum economic field size estimates in Chapter III.

Oil price assumptions used in the economically recoverable resource analysis were developed for the year 2000 and beyond, when crude oil production from the 1002 area was forecast to begin. Therefore, these prices are not directly comparable to current crude oil prices. The $33 per barrel (1984 dollars) oil price assumed in the most likely case analysis for 1002 area crude oil was set at an intermediate level from the range of future oil prices projected in numerous price forecasts. These forecasts were conducted by the Department of Energy (DOE); private research firms, such as Data Resources Incorporated; and several oil companies such as Chevron Corporation, Texaco, Conoco, and Ashland Oil, and were the latest available at the time the analysis was completed. Recent, unpublished DOE projections indicate an 8-percent reduction from DOE estimates available at the time the analysis was completed.

A complete and thorough discussion of the sources of oil price forecasts and related assumptions is included in Young and Hauser (1986).

OIL PRICE GROWTH RATE

Several comments suggest that the rate of increase in oil prices used in the report should be the same as used by the U.S. Minerals Management Service (MMS).

In the recently published MMS 5-year Outer Continental Shelf Oil and Gas Leasing Program for 1987, the starting oil prices ranged from $9 to $34, in 1987 dollars. The year 2000 prices ranged from $10 to $45, in 1987 dollars. The $33/barrel price (1984 dollars) used in this LEIS clearly falls within that range when the MMS figures are adjusted to 1984 dollars. The figures used herein are thus consistent with the MMS figures.

NATURAL GAS

Comments on the subject of natural gas resources in the 1002 area fall into two categories:

1. Section 1002, NEPA, and CEQ require an assessment of the environmental effects of exploration for and development of natural gas, as well as oil.

2. The potential significance and future value of natural gas deposits are not adequately addressed.

With respect to the first concern, exploratory wells in the 1002 area could encounter dry gas, oil, oil with associated gas, or water. The impacts of exploratory drilling would be the same regardless of what is found. The effects of natural gas development and production would be somewhat less intensive than for oil, due to wider well spacing and smaller production facilities, but would involve virtually the same surface area. That is, for the purposes of impact analysis, the same prospects would be considered. In the unlikely event that only gas would be produced from the 1002 area, impacts associated with a trunk pipeline would likewise be less, inasmuch as "hot oil"/permafrost engineering problems would not be a factor. It might be possible to bury a gas pipeline over most of its length. Concurrent development and production of oil and gas from the same prospect and the area would have roughly the same impacts as for oil alone, as was pointed out in the draft report.

With respect to the second concern, the method used for the estimation of economically recoverable resources in the 1002 area requires the estimation of a minimum economic field size for each prospect, which in turn, requires demonstration of a positive net present value. Given the current economics of North Slope natural gas, and the immense proven gas reserve base elsewhere, natural gas from the 1002 area simply cannot be demonstrated as having any present economic value using standard discounted cash flow procedures. See Young and Hauser (1986) for a complete discussion of natural gas economics for the 1002 area.

ECONOMIC SCENARIOS

Several commenters expressed the opinion that a "pessimistic" or low-side recoverable resource assessment should be included based on lower oil prices, as well as the "optimistic" or "most favorable" case.

Sensitivity analyses were conducted to determine effects of variations in several economic parameters, including oil prices, on the economics of "typical" prospects in the western and eastern parts of the 1002 area. The lowest oil price modeled was $22/barrel (year 2000 price, 1984 dollars). The minimum economic field size for the eastern 1002 area prospect using this price is over 2 billion barrels (recoverable). For the western 1002 area

prospect, the minimum field size would be about 1.4 billion barrels. Minimum field sizes for actual prospects in the 1002 area, using this price, were not estimated, but it is likely that the minimum for the area would be close to that for the "typical" western prospect (1.4 BBO). All else being equal, the effect of this would be to lower the marginal probability for commercial hydrocarbons from the 19-percent "most likely" case.

National Need Issue (Chapter VII)

MARGINAL PROBABILITIES AND THE NATIONAL NEED

Many commenters suggested that the National Need analysis in Chapter VII is misleading, and that projected economic benefits are overstated, because the analyses are based on conditional recoverable resource estimates.

The economic and domestic supply benefits described in Chapter VII (and the environmental consequences of development described in Chapter VI) are conditional on the discovery of commercial quantities of oil in the 1002 area.

The purpose of estimating economically recoverable hydrocarbon resources was to provide a basis for assessing possible environmental and socioeconomic effects of development, and for projecting potential economic benefits of developing. For the 1002 area, the Congress specifically requires an evaluation of how the potential resources of the area relate to domestic oil and gas supply-and-demand projects. None of these types of analyses can be conducted using risked resource estimates.

Other Issues

CONSULTATION AND COORDINATION

The North Slope Borough and a few other commenters expressed concern that there appeared to be no specific mechanisms outlined in the report to ensure public involvement in Federal decisionmaking concerning development of the 1002 area.

Chapters I, IV, V, and VI recognize the existing statutes that require coordination and consideration during the various stages of development, if the 1002 area is opened for oil leasing. It would be premature to outline specific measures at this point in the process. The final LEIS/report provides a broad, programmatic discussion of management options for the Congress to consider.

This report is not intended to be, nor should it be used as, a local planning document by potentially affected communities. The facility locations and transportation scenarios described in this LEIS represent very broad assumptions that were made as a basis for identifying characteristic activities and any resulting environmental effects. These assumptions do not represent a Department of the Interior recommendation, preference, or endorsement of any facility, site, or development plan. Local control of events may be exercised through planning, zoning, land ownership, and applicable State and local laws and regulations.

If the area is eventually made available for further exploration or leasing, site-specific NEPA compliance, and compliance with sections of ANILCA and numerous other Federal, State and local requirements, would ensure full coordination with all entities that would be affected.

CONSULTATION WITH CANADA

The Canadian Government was concerned that consultations had not been adequate. The following information leads the Department of the Interior to conclude differently:

The Canadian Wildlife Service (CWS) and its Yukon Wildlife Branch independently conducted studies of the Porcupine caribou herd (PCH) during 1978-81 relative to potential oil and gas developments in the Yukon Territory and Northwest Territories. In conducting the studies for preparation of the baseline reports and the Report to Congress, the FWS worked closely with biologists from the CWS, and the State of Alaska as well.

Before assessing the effects of oil and gas development, production, and transportation in the 1002 area, the FWS conducted a Caribou Impact Analysis Workshop, as explained in Chapter VI of both the draft and final LEIS/reports. Canadian biologists participated at FWS invitation. The forum provided the opportunity for FWS biologists to compare research results and gain valuable information on what impacts the Canadian's own transportation and exploration activities may have had in and near the PCH's migration routes and concentrated calving and wintering areas.

In addition to the technical consultations that have occurred independent of the 1002 process, representatives of the FWS and CWS had been negotiating a PCH agreement for the past several years. This agreement calls for both countries to take appropriate steps to ensure international cooperation and coordination of actions that may affect this internationally shared resource, in order to conserve the species and its habitat. The agreement would establish an advisory board to assist in management. Such an agreement will enhance consultation on future activities.

Once the draft 1002(h) LEIS/report was made available to the Congress and the public for review, the Assistant Secretary of the Interior for Fish and Wildlife and Parks sent the Embassy of Canada a letter of invitation to consult on the draft report. To date, three consultation

sessions have been held--two in Ottawa and one in Washington, D.C. The Government of Canada submitted written comments on the report. The consultations have further provided both countries the opportunity to discuss the biological and geological data upon which the assessments are based, and to address the assessment of potential impacts on the PCH and other internationally shared wildlife resources from possible development activities. Either country may initiate further consultations.

PUBLIC HEARINGS

The Department was criticized for the number of public hearings scheduled. As noted elsewhere in this section, public hearings were held in Anchorage and Kaktovik, Alaska, and Washington, D.C. The hearings satisfied the requirements of the National Environmental Policy Act, and the court's order in Trustees for Alaska, et al., v. Donald P. Hodel that public hearings be held in Alaska and elsewhere. Furthermore, the report was widely distributed and received international media coverage. Most of the media used Interior-prepared press releases and emphasis was placed on the fact that oral testimony and letters of comment submitted through the mail were given equal consideration.

Because the concerns expressed at the three hearings were comprehensive and substantially the same as written comments received, additional hearings would have provided a forum for people to express their opinions, but probably would not have raised any new matters warranting further revision of the report. The Department believes, as was its intent with an LEIS, that the proper forum for this debate is the Congress. The Congress will make the actual decision, after the Secretary's role of analysis and recommendation. There will be ample opportunity for public input during congressional consideration of this report.

SUBMERGED LANDS

The State of Alaska criticized the report for not addressing the ownership status of the beds of nontidal navigable waters. The State asserts ownership of the submerged lands underlying the Aichilik, Jago, Okpilak, Hulahula, Sadlerochit, Staines, and Canning Rivers within the 1002 area. The FWS does not recognize the State of Alaska's claim to these submerged lands. Although the State usually has ownership status for the beds of navigable waterways, the Federal Government claims lands submerged under navigable waters that were reserved to the Federal Government prior to statehood (January 3, 1959). The Arctic Refuge lands were withdrawn for military purposes prior to this date (Public Land Order 82, 1943).

ARCTIC REFUGE LAND EXCHANGE

Several commenters expressed concern about the Department's participation in negotiations with the State of Alaska and with a number of Alaska Native corporations regarding the possible exchange of limited oil and gas interests on the 1002 area for Native and State owned inholdings within other National Wildlife Refuges in Alaska. Of primary concern was the lack of discussion of an exchange and its associated environmental and economic impacts in the draft report.

The determination as to whether the Department would propose such an exchange could not be made until after the Secretary had decided upon his recommendation to the Congress regarding future management of the 1002 area. A discussion of the exchange was not included in the draft or final reports. Exploration and development of State or private oil and gas interests within the 1002 area would be subject to the same regulations and environmental controls as Federal lands in the area, and so the draft and final reports do in effect describe the potential impacts of such operations on Arctic Refuge resources and subsistence use.

Although section 910 of ANILCA exempts land exchanges with Alaska Natives from compliance with the National Environmental Policy Act, the FWS ascertainment reports which would accompany any exchange proposal that may be submitted to the Congress would specifically address impacts of any land exchange on the 1002 lands, as well as on the refuge inholdings to be acquired, and would discuss the economic effects of exchanging limited 1002 area oil and gas interests. The ascertainment reports would also discuss other options considered and the rationale for selecting a land exchange as the means of acquiring Alaska refuge inholdings.

The Department's efforts related to a possible land exchange have been independent of those aimed at preparing and submitting the 1002 report, and have therefore, not compromised the objectivity of the report or the Secretary's recommendation. An exchange agreement will be submitted to the Congress only if the Secretary determines the exchange to be in the public interest. Furthermore, implementation of a land exchange will be contingent upon Congress opening the 1002 area to oil and gas exploration, development, and production, and upon congressional approval of any exchange agreement.

Although an exchange of this nature would create private interests on the Arctic Refuge, it would actually result in a net reduction of private inholdings on Alaska refuges due to the multiple return expected for each acre exchanged on the 1002 area. Also, only subsurface oil and gas interests in the Arctic Refuge would be exchanged. Surface ownership and control would remain vested in the Federal Government. Any exchange agreement would contain such surface use provisions as are necessary to ensure protection of refuge resources and maintain the integrity of the area.

DEVELOPMENT AND TRANSPORTATION SCENARIOS (CHAPTER IV)

Much of the original (draft) description of facilities, equipment, procedures, and practices included in Chapter IV was obtained through consultation with oil companies, from trade publications, or from exploration and development plans and proposals. Most of the comments received on Chapter IV are likewise from oil companies or trade associations and concern recent advancements in technology or alternative technological approaches not considered in the draft LEIS. These comments have been accommodated by minor changes in the text. However, where there is some question as to the universal applicability of an improved or alternative technology cited from the Prudhoe Bay area, the technology is acknowledged in the text as a possibility, but not necessarily endorsed as being applicable for the 1002 area.