

ENVIRONMENTAL ASSESSMENT

National Petroleum Reserve-Alaska (NPR-A) 4 -Year Winter Exploration Drilling Program 2008-2012 Anadarko Petroleum Corporation

December 2008

BLM

Arctic Field Office, Alaska



It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

DOI-BLM-AK-023-2009-0001-EA

**ENVIRONMENTAL ASSESSMENT
DOI-BLM-AK-023-2009-0001-EA**

**National Petroleum Reserve-Alaska (NPR-A)
4 -Year Winter Exploration Drilling Program
2008-2012**

Anadarko Petroleum Corporation

November 14, 2008

Prepared By:

**USDOI Bureau of Land Management, Alaska
Fairbanks District Office
Arctic Field Office**

Technical Assistance:

**MWH
Anchorage, Alaska**

ENVIRONMENTAL ASSESSMENT

Title: National Petroleum Reserve-Alaska (NPR-A)
4-Year Winter Exploration Drilling Program

EA Number: DOI-BLM-AK-023-2009-0001-EA

Serial Number: AA 086604, AA 086615, AA 086616, AA 086617, FF095310

Applicant: Anadarko Petroleum Corporation
3201 C Street, Suite 603
Anchorage, Alaska 99503

Date Prepared: November 2008

District: Fairbanks District Office

Planning Unit: NPR-A, Northeast (NE) and Northwest (NW) Planning Areas

Prepared By: Arctic Field Office
Fairbanks District Office
Bureau of Land Management
1150 University Avenue
Fairbanks, Alaska 99709
(907) 474-2301

Technical assistance provided by:
MWH
1835 S. Bragaw Street, Suite 350
Anchorage, Alaska 99508
(907) 248-8883

Lands Involved: Proposed Right-of-Way (ROW) inside the NPR-A totals approximately 66 miles of snow trail and 35 miles of in field ice road to drill sites, storage sites, and water supply lakes. A new ROW of approximately 4.75 miles of new access route on federal lands outside the NPR-A is proposed. Also proposed are three new ice drill sites at the Wolf Creek prospect and five new ice drill sites at the Tsavorite prospect, two temporary ice staging pads, two ice airstrips, and temporary use of 23 water supply lakes on federal land in the NPR-A. Specific locations are identified in the project plans. Proposed Wolf Lake drilling locations were staked at the following locations:

T1S, R6W, Section 9, Umiat Meridian (Wolf Creek #4)
T1S, R6W, Section 16, Umiat Meridian (Wolf Creek #5)
T1S, R6W, Section 8, Umiat Meridian (Wolf Creek #6)

At Tsavorite, the following five drilling locations have been identified, but not yet staked:

T1N, R11W, Section 20, Umiat Meridian (Tsavorite #1A)
T1N, R11W, Section 36, Umiat Meridian (Tsavorite #1B)
T1N, R10W, Section 30, Umiat Meridian (Tsavorite #1C)
T1N, R11W, Section 17, Umiat Meridian (Tsavorite #1D)
T1N, R11W, Section 26, Umiat Meridian (Tsavorite #1E)

TABLE OF CONTENTS

LIST OF ACRONYMS	<i>iv</i>
1 INTRODUCTION	1-1
1.1 BACKGROUND	1-1
1.2 PURPOSE OF AND NEED FOR THE PROJECT	1-1
1.3 THE DECISION TO BE MADE	1-1
1.4 PUBLIC INVOLVEMENT AND ISSUES	1-2
2 PROPOSED ACTION AND ALTERNATIVES	2-1
2.1 DESCRIPTION OF THE PROPOSED ACTION	2-1
2.1.1 <i>Access and Construction</i>	2-2
2.1.2 <i>Water Use</i>	2-3
2.1.3 <i>Drilling Operations and Support</i>	2-6
2.1.4 <i>Waste Management</i>	2-7
2.1.5 <i>Contingency Plans</i>	2-7
2.1.6 <i>Abandonment and Restoration</i>	2-8
2.2 NO ACTION ALTERNATIVE	2-8
2.3 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS	2-8
2.3.1 <i>Construct Water Supply</i>	2-8
2.3.2 <i>Select Sites That Conserve Water</i>	2-8
2.3.3 <i>Use Modern Technology</i>	2-9
2.4 CONFORMANCE	2-9
3 AFFECTED ENVIRONMENT	3-1
3.1 INTRODUCTION	3-1
3.1.1 <i>Water Resources</i>	3-1
3.1.2 <i>Wetlands and Floodplains</i>	3-2
3.1.3 <i>Fish and Wildlife</i>	3-2
4 ENVIRONMENTAL IMPACTS	4-1
4.1 DIRECT AND INDIRECT EFFECTS	4-1
4.1.1 <i>Water Resources</i>	4-1
4.1.2 <i>Wetlands and Floodplains</i>	4-2
4.1.3 <i>Fish and Wildlife</i>	4-3
4.2 CUMULATIVE EFFECTS	4-6
4.2.1 <i>Water Resources</i>	4-7
4.2.2 <i>Wetlands and Floodplains</i>	4-7
4.2.3 <i>Fish and Wildlife</i>	4-7
4.3 RESIDUAL IMPACTS	4-8
4.4 MITIGATION AND MONITORING	4-9
4.5 SUMMARY OF ENVIRONMENTAL CONSEQUENCES	4-11
5 CONSULTATION AND COORDINATION	5-1
5.1 AGENCY COORDINATION	5-1
5.2 PUBLIC COORDINATION	5-1
5.3 LIST OF PREPARERS	5-2
6 REFERENCES	6-1

FIGURES

Figure 1 Proposed Anadarko Project Area Map 1-5
Figure 2 Proposed Drill Sites and Access to Wolf Creek 2-11
Figure 3 Proposed Drill Sites and Access to Tsavorite 2-12
Figure 4 Oil and Gas Fields and Selected Exploration Wells 3-4

TABLES

Table 1.1 Permits and Approvals for Proposed Project in the NPR-A 1-2
Table 1.2 Issues Considered in Evaluating Impacts 1-3
Table 2.1 Drill Sites Staked and Field Inspected in 2008 2-1
Table 2.2 Drill Sites Proposed For Future Staking 2-1
Table 2.3 Summary of Proposed Project 2-2
Table 2.4 Wolf Creek #4 Water Requirements 2-4
Table 2.5 New Water Sources Proposed in Plan of Operations 2-5

APPENDICES

Appendix A General Stipulations (Federal Land outside the NPR-A)
Appendix B Wolf Creek #4 Ice Pad Configuration

LIST OF ACRONYMS

ADEC.....	Alaska Department of Environmental Conservation
ADNR	Alaska Department of Natural Resources
ADF&G.....	Alaska Department of Fish and Game
Anadarko.....	Anadarko Petroleum Corporation
ANILCA	Alaska National Interest Lands Conservation Act
AO.....	(BLM) Authorized Officer
AOGCC.....	Alaska Oil and Gas Conservation Commission
BLM.....	Bureau of Land Management
C-Plan	Oil Discharge Prevention and Contingency Plan
CRSA	Colville River Special Area
CRSAMP	Colville River Special Area Management Plan
DS	Drill Site
EA	Environmental Assessment
EFH.....	Essential Fish Habitat
EIS.....	Environmental Impact Statement
EO	Executive Order
FLPMA	Federal Land Policy and Management Act of 1976
gpd.....	gallons per day
IAP	Integrated Activity Plan
LPV	Low-Pressure Vehicle
MG	million gallons
NE	Northeast
NEPA	National Environmental Policy Act
NPR-A.....	National Petroleum Reserve – Alaska
NSB.....	North Slope Borough
NW.....	Northwest
Renaissance.....	Renaissance Umiat, LLC
ROD	Record of Decision
ROP.....	Required Operating Procedure
ROW	Right of Way
TCH.....	Teshkepuk Lake Caribou Herd
TWUP	Temporary Water Use Permit
USDOI	U.S. Department of Interior
WAH.....	Western Arctic Caribou Herd

1 INTRODUCTION

Anadarko Petroleum Corporation (Anadarko) has applied for permits and/or posted notices to access and drill on valid oil and gas leases during a 4-year winter exploration program in the Northwest (NW) National Petroleum Reserve-Alaska (NPR-A). Anadarko (the Applicant) has submitted permit applications to Federal and State agencies and the North Slope Borough (NSB), including the Bureau of Land Management (BLM) Right-of-Way (ROW) application (**Figure 1**).

1.1 BACKGROUND

This Environmental Assessment (EA) has been prepared to meet requirements of the National Environmental Policy Act (NEPA), evaluate conformance with the relevant Integrated Activity Plan (IAP) and associated Environmental Impact Statement (EIS), and to support U.S. Department of Interior (USDOI) BLM decision-making on issuing permits required to construct and implement the proposed project. This EA is tiered to the: 2003 NW Planning Area IAP/EIS (USDOI BLM, 2003 – hereinafter known as 2003 NW IAP/EIS), 2004 NW Record of Decision (ROD – USDOI BLM, 2004), 2008 Northeast (NE) Planning Area Supplemental IAP/EIS (USDOI BLM, 2008a – hereinafter known as 2008 NE IAP/EIS), and 2008 NE ROD (USDOI BLM, 2008b).

This EA is the most recent in a series of NEPA assessments prepared by the BLM in evaluating potential and proposed oil and gas exploration and delineation activities in the NPR-A (2008 NE IAP/EIS – Bibliography, Vol. 5). This EA is tiered to and incorporates relevant portions of these documents, as described in more detail in this analysis

1.2 PURPOSE OF AND NEED FOR THE PROJECT

The purpose of the proposed project is to determine whether lease holdings contain economically recoverable natural gas. The project is needed to supplement already known reserves of North Slope natural gas and potentially provide gas for instate use. Revenues from production are needed to support local, state, and national economies.

Anadarko is currently proposing to drill at up to eight new sites in the NW NPR-A, with access via packed snow trail and ice road – as well as the existing gravel road system and airport in the Umiat area. Use of facilities in the Umiat area is also proposed to minimize the impact of water use. The proposed exploration program is intended to span up to four winter drilling seasons, beginning in late 2008, with the drilling schedule contingent upon permitting, weather, ongoing data analysis, and funding. Alternatives to the proposed project are evaluated on the basis of their effectiveness in meeting purpose and need, as well as compliance with protective measures of the NW and NE RODs.

1.3 THE DECISION TO BE MADE

The BLM must conduct a project-specific NEPA analysis and determine whether the proposed project should be approved, rejected, or approved with modifications, and if additional mitigation is needed. This EA will be based on the findings, management controls, and protective measures of the 2004 NW ROD, 2008 NE ROD, and the 1991 Utility Corridor Resource Management

Plan/EIS ROD (USDOI BLM, 1991), as well as other laws and regulations. The scope of this EA includes analysis that enables the BLM to select among alternatives that meet the purpose and need, and are within the BLM's jurisdiction (40 Code of Federal Regulations 1506.1(a)(2)). The scope, location, and timing of potential summer monitoring and mitigation are currently undefined, and are subject to future BLM evaluation.

1.4 PUBLIC INVOLVEMENT AND ISSUES

Development of the 2003 NW IAP/EIS and 2008 NE IAP/EIS involved extensive input from other Federal agencies, the State, the NSB, thousands of individuals, and many institutions. A number of permits and approvals are required for oil and gas exploration. These are described in the 2003 NW IAP/EIS (Vol. 3, Appendix 4) and the 2008 NE IAP/EIS (Vol. 5, Appendix B), many of which are available for public review prior to agency decision-making. **Table 1.1** summarizes permits and approvals associated with the proposed project.

Table 1.1 Permits and Approvals for Proposed Project in the NPR-A

Federal Authorizations and Approvals	
Bureau of Land Management	Right-of-Way (ROW) Application for Permit to Drill and Surface Use Plan Threatened and Endangered Species "No Effect" Determination Essential Fish Habitat Assessment (No consultation with National Marine Fisheries Service required) Alaska National Interest Lands Conservation Act (ANILCA) 810 Evaluation and Findings Archaeological and Cultural Resources Clearance
U.S. Fish and Wildlife Service	Concurrence on BLM Threatened and Endangered Species "No Effect" Determination
U.S. Environmental Protection Agency	Wastewater Discharge, under National Pollutant Discharge Elimination System (NPDES) General Permit No. AKG-33-0000 Spill Prevention, Control, and Countermeasures Plan (drilling contractor)
State Authorizations and Approvals	
Alaska Department of Natural Resources	<u>Division of Coastal and Ocean Management</u> Single agency review for temporary construction camp (not on federal lands). General Concurrence Determinations (GCD) for other related elements <u>Division of Mining, Land and Water</u> Temporary Water Use Permits (ice roads and ice pads construction and maintenance, drilling and human use)
Alaska Department of Fish and Game	Fish Habitat Permits for water extraction/use and stream crossings with fish habitat
Alaska Oil and Gas Conservation Commission	Authorization to Drill Annular Disposal Approval (optional)
Alaska Department of Environmental Conservation	Temporary Storage of Drilling Wastes Air Quality Minor Source General Permit (MGP-1) Oil Discharge Prevention and Contingency Plan (ODPCP) and Certificate of Financial Responsibility
Local Government Authorizations and Approvals	
North Slope Borough	Development Permits (for related elements)

Notes: 1. Outside the NPR-A, a BLM ROW permit is required for packed snow trails/ice roads crossing federal lands; an ADNDR Land Use Permit is required for packed trails/ice roads crossing State Lands. Crossing private or selected lands requires the concurrence of the landowner.

For this project, the Applicant met with representatives from Anaktuvuk Pass, Barrow, and Nuiqsut to discuss issues of public interest. Community representatives from Nuiqsut and Barrow also accompanied Anadarko on fly-overs of the project area, focusing on subsistence issues. Anadarko also made a presentation at a public meeting in Nuiqsut and to the North Slope Borough Planning Commission. No major issues with the proposed exploration program were identified.

BLM guidelines include a list of authorities that are addressed, where applicable, in NEPA assessments, previously called “critical elements” of an EA (BLM, 2008, Appendix 1). Some elements are not present in the project area and are, therefore, not discussed further. A summary listing of related issues considered is provided in **Table 1.2**.

Table 1.2 Issues Considered in Evaluating Impacts

Issue Considered	Determination	Basis of Determination (See Note 1)
Air Quality	NI	Air quality impacts likely to remain below applicable ambient air quality standards and increments. Protection provided by: ADEC air permit and NE ROP A-9.
Cultural and Paleontological Resources	NI	Archaeological and Cultural Resources Clearance by the BLM required under the NHPA. Cultural resources survey was completed. Cultural resources expected to remain unaffected, based on location. No impacts to paleontological resources expected, based on identified locations and <i>de minimus</i> surface disturbance. Protection provided by NW/NE ROP C-2, E-13, and I-1; and GS 7.
Subsistence	NI	Large game could be deflected from areas of activity, but effects are expected to be short term and minor. ANILCA 810 Evaluation and Findings by the BLM required. Additional protection provided by: NW/NE Stipulation D-1 and D-2; NW/NW ROPs A-1- A-7; NE ROP A-11; NW/NE ROPs B-1, B-2, C-4, F-1, H-1, H-2, and I-1; and GS 1, 2, 4, 8, 11, 12, and 14-18. [See Note 2.]
Environmental Justice	NI	Impacts would be incurred primarily through restriction in subsistence, which are not expected to be more than minor and short term. Protection provided by NW/NE Stipulations D-1 and D-2; ROPs A-1 – A-7, B-1, B-2, F-1, H-1, H-2, and I-1; GS 1, 2, 4, and 5; and EO 12897 [See Subsistence]
Waste (Hazardous/Solid)	NI	Protection provided by ADEC waste storage permit and the Anadarko Waste Management Plan Protection provided by required C-Plans and SPCC Plans, and BLM-required Orientation and Subsistence Protection Plans. Other protections provided by NW ROPs A-1 – A-7; and GS 10, 11, 14, 16-18.
Water Resources	PA	Applicants request to exceed ROP B-2. Construction of ice roads/pads, with some thickened to accommodate topography. Water Quality protected by frozen, snow-covered water bodies, as well as COE, EPA, ADEC, ADF&G, and ADNR required permits. Other protections provided by: NW/NE Stipulation D-1 and ROPs A-1 – A-7, B-1, B-2, C2 – C-4, I-1; and GS 5, 6, 8, 10-12, and 14-18.
Floodplains and Wetlands	PA	New heavy traffic patterns on cross-country snow roads possible. Impact evaluation required under EO 11990 and EO11988. Additional protection provided by NW/NE Stipulation D-2 and ROPs A-3 – A-7, B-2, C-2 –C-4, I-1; and GS 5, 6, 8, and 16.
Threatened & Endangered Species	NI	Protection provided by NW/NE Stipulation J-1 and ROPS C-1, E-11; GS1-3. Threatened and Endangered Species “No Effect Determination” made by the BLM. [See Note 3.]
Fish	PA	Applicants request to exceed ROP B-2. Protection provided by EFH assessment, ADF&G required permits and NW/NE Stipulation D-1 and ROPs A-1 – A-7, B-1, B-2, C2 – C-4, I-1; and GS 1, 5, 8, 10, 12, 14, and 16.
Wildlife	PA	Moose and caribou may inhabit the area. Raptors, including the peregrine falcon inhabit the project area, particularly along the Colville River. Protection provided by the CRSAMP in Protections 1-9. Other protection provided by NW/NE Stipulation D-1, ROPs A-2 – A-6, A-8, C-1, E-9, F-1, I-1; GS 1 – 6, 8, 12, 14 – 18.

Key to Table 1.2:

ADEC – Alaska Department of Environmental Conservation
ADF&G – Alaska Department of Fish and Game
ADNR – Alaska Department of Natural Resources
ANILCA – Alaska National Interest Lands Conservation Act
BLM – Bureau of Land Management
COE – U.S. Army Corps of Engineers
C-Plan – Oil Spill Discharge and Contingency Plan
CRSAMP – Colville River Special Area Management Plan
EFH – Essential Fish Habitat
EIS – Environmental Impact Statement
EO – Executive Order
EPA – U.S. Environmental Protection Agency
GS – General Stipulations (BLM) derived from the 1989 USDO I BLM Utility Corridor Resource Management Plan
IAP – Integrated Activity Plan
NE – Northeast
NHPA – National Historic Preservation Act
NI – Present, but not affected to a degree that further analysis is required.
NW – Northwest
PA – Present, with potential for impacts requiring further analysis.
ROD – Record of Decision
ROP – Required Operating Procedure
SPCC – Spill Prevention Control and Countermeasures
USFWS – U.S. Fish and Wildlife Service

Notes:

1. Determination tiered from: 2003 NW IAP/EIS, Vol. 2, Section 5; 2004 NW ROD; 2008 NE IAP/EIS Vol. 2, Chapter 4; and 2008 NE ROD; BLM General Stipulations (GS) for federal lands outside the NPR-A (derived from the 1989 USDO I BLM Utility Corridor Resource Management Plan); and laws and regulations as noted.
2. Under the required Subsistence Plan, the Applicant will have subsistence advisors that will be familiar with local subsistence activities and will be on-site at all times. Part of their responsibility will be to monitor ongoing activities and identify issues that have the potential to impact subsistence. The Applicant will address identified conflicts. Based on BLM consultations and BLM protection measures in both the NE and the NW NPR-A, no issues have been identified that require additional analysis of subsistence or environmental justice in the Environmental Assessment.
3. The polar bear has recently been added to the Threatened and Endangered Species list. No federally designated Critical Habitat exists within or adjacent to the planning area. The Endangered Species Act Consultation is summarized in the 2008 NE ROD. The Biological Assessment prepared by the BLM and submitted to the USFWS found that the Preferred Alternative may affect, but was not likely to adversely affect, the polar bear. The USFWS concurred with BLM's findings on the polar bear and issued its Biological Opinion (BO) for the northern planning areas (2008 NE ROD, p. 2). The BO included Reasonable and Prudent Measures that are implemented through non-discretionary Terms and Conditions. In the ROD, the BLM adopted all of the Terms and Conditions. In both the NE and NW Planning Areas, ROP C-1b specifically provides protection for polar bear denning. There are no polar bear den sites and sitings reported in and near federal lands associated with the project (2008 NE IAP/EIS, Vol. 6, Map 3-29; 2003 NW IAP/EIS, Vol. 3, Map-51). The BLM has made a Threatened and Endangered Species "No Effect Determination" for this project.

In summary, BLM resource specialists have identified the following issues for further evaluation in this EA: 1) water resources, 2) wetlands and floodplains, and 3) fish and wildlife.

Figure 1 Proposed Anadarko Project Area Map

2 PROPOSED ACTION AND ALTERNATIVES

The proposed project includes exploration drilling at any of eight well sites during a 4-year winter program in the NPR-A. Anadarko filed Notices of Staking for three wells, which were staked and field inspected, as required by the BLM (see **Table 2.1**). Anadarko identified five additional well sites, with plans for staking and field inspection in 2009 or 2010 (see **Table 2.2**). Access routes and stream crossings have been identified and field examined. Locations of both staked and unstaked drill sites and local access routes are depicted on **Figures 2** and **3**.

Table 2.1 Drill Sites Staked and Field Inspected in 2008

Drill Site	Notice of Staking Date	BLM Field Inspection Date	BLM Lease No.	Section Location (Umiat Meridian)
Wolf Creek #4	08/19/2008	08/21/2008	AA 086604	Section 9, T1S, R6W
Wolf Creek #5	08/19/2008	08/21/2008	AA 086604	Section 16, T1S, R6W
Wolf Creek #6	08/19/2008	08/21/2008	AA 086604	Section 8, T1S, R6W,

Key:

BLM – Bureau of Land Management

Table 2.2 Drill Sites Proposed For Future Staking

Drill Site	BLM Lease No.	Section Location (Umiat Meridian)
Tsavorite #1A	AA 086616	Section 20, T1N, R11W
Tsavorite #1B	AA 086616	Section 36, T1N, R11W
Tsavorite #1C	AA 086615	Section 30, T1N, R10W
Tsavorite #1D	AA 086617	Section 17, T1N, R11W
Tsavorite #1E	AA 086616	Section 26, T1N, R11W

Key:

BLM – Bureau of Land Management

The Applicant submitted a summary of compliance with the stipulations and Required Operating Procedures (ROPs) of the 2008 NE ROD and 2004 NW ROD, which has been considered in this analysis.

2.1 DESCRIPTION OF THE PROPOSED ACTION

The proposed project is described below, with main project components summarized in **Table 2.3**. Details are provided in the Applicant's Plan of Operations, submitted to multiple agencies, and on file with the BLM Arctic Field Office.

Drill site locations are in the same general area as drill sites constructed during previous federal exploration programs at Wolf Creek and Titaluk. Approval to drill at any of the proposed sites during the 4-year period was proposed to accommodate changes in drilling strategy and funding priorities as new data become available. The proposed project is similar to previous exploration programs completed in the NPR-A during the past nine winter seasons (1999/2000 through 2007/2008). Additional information on winter access and drilling can be found in the 2003 NW IAP/EIS (Volume 1, Section IV.A) and 2008 NE IAP/EIS (Volume 2, Chapter 4.2).

Table 2.3 Summary of Proposed Project

Project Component	Program Total ¹
Ice Drill Pads and Wells	Full project comprises up to eight ice drill pads (approximately 9.7 acres each; 77.6 acres total), each for a 60 to 70 man camp, fuel storage, maintenance, and drilling operations. One gas well at each drill site (8 wells).
Construction/ Drilling Support Facilities	One ice staging ice pad (8.2 acres) will be constructed at each prospect area for a 20 to 40 man camp and fuel and materials storage. Staging and storage at Umiat will use existing infrastructure.
Access	Approximately 80 miles of access corridor from Drill Site-2P to Umiat, crossing approximately 4.75 miles (approximately 1.25 miles of ice road and 3.5 miles of packed trail) of federal land outside the NPR-A. Approximately 36 miles of snow road from Umiat to Wolf Creek. A total of approximately 17 miles of ice road at the Wolf Creek area connecting the storage pad, drill sites, and water supply lakes. Approximately 30 miles of snow road from Wolf Creek to Tsavorite. A total of approximately 18 miles of ice road at the Tsavorite area connecting the storage pad, drill sites, and water supply lakes. Access by air will use existing gravel airstrip at Umiat, and two 2,500- by 100-foot ice airstrips (5.7 acres each; 11.4 acres total) will be constructed, one at each prospect area
Water Requirement	Approximately 25-30 million gallons per well at Wolf Creek, and 60 million gallons per well at Tsavorite. Total project demand of approximately 375 to 390 MG. Up to 23 water supply lakes.

Key:

1 – Quantities estimated for comparative impact analysis.

NPR-A – National Petroleum Reserve-Alaska

2.1.1 Access and Construction

The proposed schedule calls for mobilization and ice construction to begin as soon as required authorizations and weather conditions allow in winter 2008/2009, with drilling expected to begin in January 2009. The drill sites at Wolf Creek are located approximately 80 miles southwest of Nuiqsut and 130 miles southwest of Deadhorse. Tsavorite sites are located approximately 100 miles from Nuiqsut and 150 miles from Deadhorse. The overland routes will be within an approximately 0.5-mile wide corridor along the alignment depicted on Figure 1. This flexibility is needed to accommodate minor rerouting due to snow conditions, animal dens, changes in creek crossing characteristics, or other field conditions.

Access for aircraft ranging up to a C-130 Hercules will be provided via the existing 5,000-foot gravel airstrip at Umiat, managed by the Alaska Department of Transportation and Public Facilities. Access by smaller aircraft (e.g., Twin Otter) will be provided via a 2,500- by 100-foot ice air strip constructed on Lake M0829 near the staging pad at Wolf Creek and on Lake M0832 at Tsavorite.

To conserve time and resources, Anadarko will share the main access ice road with other exploration projects on state and private lands outside the NPR-A, as appropriate. From Drill Site (DS)-2P, a road will be pre-packed for ice construction to the Applicants staging area outside the NPR-A. From the end of the ice road, a packed snow trail will be constructed to the NPR-A boundary, where it will connect with existing gravel roads in Umiat, inside the NPR-A.

From Umiat, an approximately 36-mile long, packed snow trail will be constructed to the Wolf Creek area staging pad. In following winters, access to the Tsavorite Prospect area will require an additional 30 miles of snow trail from Wolf Creek. Equipment may be flown into Umiat so trail construction can concurrently start there – going west towards Wolf Creek and decreasing the total time necessary to construct access to the drilling area.

Packed snow trails will be approximately 50 feet wide (approximately 6 acres/mile) for use in mobilizing the drilling rig and providing primary logistics support to the NPR-A drilling areas. Low-pressure ground vehicles (LPVs – e.g., Rolligons, Steiger tractors, and Tundra Bears) approved for off-road winter travel will be used to transport equipment and ice construction crews to the drilling areas. The packed trail will remain for use in backhauling equipment, supplies, and wastes. Maintenance will generally be accepted North Slope practices that have been developed over time to protect the tundra and support safe operations. Rig mats, if used, will be removed prior to the end of the operating season.

At the end of the snow trail to each prospect area, a work camp and staging area will be established to support ice road/pad construction and drilling operations. The ice staging pads will be constructed to approximately 600 feet by 600 feet (8.2 acres). Ice roads will be constructed from the staging areas (Wolf Creek and/or Tsavorite) to the drilling pads and water supply lakes used each year. Ice road, airstrip, and pad construction may be concurrent.

Ice roads will typically be approximately 30 to 40 feet wide (up to 4.8 acres/mile), with thickness varying to maintain the surface and grade needed over irregular terrain. Anadarko estimates that smaller spur roads to water sources will be approximately 20 feet wide. Some segments will follow old winter trails in the area.

Drilling pads will be approximately 650 feet by 650 feet (9.7 acres), or the equivalent. Pad thickness and pad dimensions will vary, depending on irregularity and slope of the underlying terrain. To create a level work surface, thicker pads will be required for well sites on steeper gradients.

2.1.2 Water Use

The freshwater requirements are for constructing the project features in the NPR-A (infield ice road/pads construction, maintenance, drilling operations, and camp use). For Wolf Creek #4, Anadarko has estimated approximately 25 to 30 million gallons (MG) of water/ice will be required (Britch, 2008), as shown in **Table 2.4**.

For purposes of this analysis, it is assumed that water requirements would be similar for the other two Wolf Creek wells. Based on general locations provided for Tsavorite wells, it is assumed that the water requirement would be approximately 60 MG per winter season, due to the longer infield ice road system. A total project requirement for all eight wells over a four year period is estimated at 390 MG of water/ice. Only those ice roads and ice drill pads needed each winter season of exploration will be constructed.

Table 2.4 Wolf Creek #4 Water Requirements

Project Element	Water/Ice Requirement ¹ (MG)
Infield ice road (6 miles @ 20 to 40 feet wide)	7.1 – 14.2
Lake spur roads	3
Staging pad	4
Drill pad	6.5
Runway and road maintenance	3
Drilling and camps	1
TOTAL	24.6 – 31.7

Key:

1 – Anadarko has requested approximately 10 MG of the total needed as water.

MG – million gallons

Anadarko requested approval to harvest water and ice aggregate from local lakes, as shown on **Table 2.5**. The Applicant has also requested use of Lake M0681 covered under the Alaska Department of Natural Resources (ADNR) Temporary Water Use Permit (TWUP) A2007-103. This lake was previously permitted by ADNR in 2007 for withdrawal up to 3.3 MG of water and ice, or 20 percent of the lake volume, based on no fish present, which complies with NE ROP B2(c). Authorization for water removal from this lake, and other requested lakes, has also been issued to Renaissance Umiat, LLC (Renaissance), with a requirement for coordination to ensure that combined water withdrawal does not exceed the maximum volume limitation authorized for each lake.

Initially, Anadarko requested a total of 5.9 MG of water and 11.3 MG of ice equivalent (i.e., a total of 17 MG) from seven lakes in the immediate Wolf Creek area: M0824, M0825, M0826, M0827, M0828, M0829, and M0830.

In refining project logistics, Anadarko requested an additional volume of water and ice out of these seven lakes. On October 3, 2008, Anadarko requested to withdraw an additional 8 MG from the seven lakes, approximately 4 MG of which were requested as water. No lake-specific allocation has been requested.

This request would also require approval from ADNR and concurrence from the Alaska Department of Fish and Game (ADF&G), because all seven lakes provide sensitive fish habitat. The Applicant has applied for water from other lakes, approximately 8 to 14 miles away; the closest two of which contain 7.6 MG of free water.

The BLM, State, and Applicant understand that water may be limited in certain locations. In these cases, Anadarko will make every effort to use other methods to limit water requirements. These may include such activities as use of snow fences to collect snow in areas where roads and pads are needed. In other cases, it may be possible to use narrower ice roads or smaller pads to reduce water requirements, as has been proposed for infield ice roads at Wolf Creek #4.

Table 2.5 New Water Sources Proposed in Plan of Operations

Lake ID ^a	Section Township Range (Umiat Meridian)	Surface Area (acres)	Max. Depth (feet)	Calculated Total Lake Volume (MG)	Fish Present ^b	Total Water Withdrawal per NE/ NW ROP B-2 (a-f) (MG)	Proposed Water Withdrawal (MG)	Proposed Ice Removal (MG)	Total Proposed Water + Ice Withdrawal (MG) ^c	Requires BLM Approval per NE/NW ROP B-2
LAKES IN NORTHEAST NPR-A										
M0681	Sec 3, T1S, R1W	Approved under DNR TWUP A2007-103 for 20% total lake volume based on No Fish							3.3	No
M0811	Sec 8, T1S, R1W	9.8	<4.0	4 (est)	No	≤35% total	0	0.77	0.77	No
M0812	Sec 12, T1S, R2W	20.3	7.2	23.72	No	≤8.30	4.74	0.88	5.62	No
M0813	Sec 14, T1S, R2W	18.0	6.9**	12.85	Yes - S	0.00	0	1.16	1.16	Yes (B-2f)
M0814	Sec 13/14, T1S, R2W	25.6	13.8	26.25	No	≤9.19	5.25	1.22	6.47	No
M0815	Sec 21/28, T1S, R2W	61.1	4.1	27 (est)	No	≤35% total	0	4.78	4.78	No
M0816	Sec 28/29, T1S, R2W	6.9	6.4	7.64	No	≤2.67	1.53	0.32	1.85	No
M0817	Sec 32, T1S, R2W	18.4	6.2	15.17	No	≤5.31	3.03	1.19	4.22	No
M0818	Sec 31/32, T1S, R2W	19.0	7.2	17.28	No	≤6.05	3.46	1.12	4.58	No
M0819	Sec 14, T2S, R5W	18.1	5.5	10.06	No	≤3.52	2.01	1.35	3.36	No
M0820	Sec 22, T2S, R5W	53.8	8.5	92.54	No	≤32.39	18.51	0.34	18.85	No
M0821	Sec 7/8/17/18, T2S, R5W	137.2	10.5	216.66	Yes - R	5.40	5.40	1.66	7.06	Yes (B-2f)
M0822	Sec 19, T2S, R5W	19.9	8.6	30.86	No	≤10.80	6.17	0.45	6.62	No
LAKES IN THE NORTHWEST NPR-A										
M0823	Sec 24/25, T2S, R6W	88.6	7.2	92.34	Yes - R	0.00	1.46	4.04	5.5	Yes (B-2a,f)
M0824	Sec 31/36/1/6, T1/2S, R6/7W	232	9.5	436.40	Yes - S	0.42	0.42	2.31	2.73	Yes (B-2f)
M0825	Sec 29/32, T1S, R6W	35.7	15.9	69.44	Yes - S	1.18	1.18	0.69	1.87	Yes (B-2f)
M0826	Sec 30, T1S, R6W	39.2	10.4	61.86	Yes - S	0.10	0.10	0.90	1.0	Yes (B-2f)
M0827	Sec 25, T1S, R7W	59.7	9.7	111.46	Yes - S	0.54	0.54	0.86	1.4	Yes (B-2f)
M0828	Sec 29, T1S, R6W	23.2	9.2	41.60	Yes - S	0.33	0.33	0.48	0.81	Yes (B-2f)
M0829	Sec 19/20/29/30, T1S, R6W	128.7	8.4	157.00	Yes - S	0.006	0.006	5.15	5.156	Yes (B-2f)
M0830	Sec 19/24, T1S, R6/7W	45.6	14.9	107.10	Yes - S	3.37	3.37	0.72	4.09	Yes (B-2f)
TSAVORITE PROSPECT AREA:										
M0831	Sec 19/30, T2N, R9W	156.7	19.6	360.18	Yes - S	10.57	10.57	2.22	12.79	Yes (B-2f)
M0832	Sec 4/8/9, T1N, R10W	393.8	16.5	386.24	No	varies	77.25	27.09	104.34	Yes (B-2c)

Key: % – percent
BLM – Bureau of Land Management

MG – million gallons
NPR-A – National Petroleum Reserve-Alaska

ROP – Required Operating Procedure

Notes:

- ^a. Source: 9/29/08 Anadarko Plan of Operations, 2008 Lake Survey Report (MJM, 2008), and 9/29/08 ADNDR Temporary Water Use Permit applications
^b. No = No fish caught; Yes = fish present during survey; S = Sensitive fish species; R = Resistant fish species only
^c. Total amount of water/ice needed for 4-year project of up to 8 wells is 375 - 390 MG.

Based on the volumes available from the two lakes identified near the Tsavorite wells (M0831 and M0832), it appears uncertain that sufficient water and ice is available to support expected drilling operations (i.e., 60 MG/well). The Applicant has not yet filed applications with ADNDR for water use from these two lakes.

2.1.3 Drilling Operations and Support

Anadarko has the State and Federal Oil and Gas Bonds required for the proposed drilling operations. The initial well will be drilled using the Arctic Fox drill rig for the BLM/NPR-A drilling program in 2008/2009. The planned well design will be similar to that employed in previous North Slope exploration wells and in accordance with a Permit to Drill from the BLM and the Alaska Oil and Gas Conservation Commission (AOGCC). Due to the exploratory nature of the wells, nearly all information regarding the downhole aspects of the well is confidential.

The drilling pad will include the drilling rig, rig camp buildings, warm and cold storage areas, maintenance buildings, and other equipment necessary to conduct the operations. Communications systems will be installed in the camp buildings.

The operations will also use camp facilities located at the ice staging pad. A 60 to 70 man camp will be located at each drilling location while the rig is onsite, and a 20 to 40 man camp will be at a staging pad that is connected to the drilling site by ice road. Additional camp facilities are available at Umiat, if needed.

Up to 50,000 gallons of diesel fuel will be stored at the drilling site in lined, bermed fuel storage areas. The staging pad will also have diesel storage capabilities for up to 20,000 gallons. Fuel will be re-supplied to the site from existing operations at Umiat, or it will be hauled in from various commercial sources in the Prudhoe Bay/Kuparuk River area. Anadarko has requested that an alternative to ultra low sulfur diesel be allowed until such time this fuel is readily available on the North Slope.

Anadarko will obtain the Alaska Department of Environmental Conservation (ADEC) General Permit MGP-1 for Oil & Gas Drilling and will comply with the stipulated parameters established under this authorization. Until the use of ultra low sulfur diesel is required by ADEC and the BLM, Anadarko has proposed to implement a public access control plan, with entry by unauthorized personnel restricted from an area at least 230 meters (755 feet) from the edge of the drilling pad, as required under MGP-1.

Drilling and testing operations will be used to determine future drilling plans. Production tests may be performed, as needed, after the production casing is set. Testing may include extended flow periods to determine the productivity of the well. Testing will be accomplished in accordance with approved techniques. For drilling a second season, the rig will be transported back to Umiat for storage at existing facilities or outside the NPR-A.

Vertical seismic profiles may be acquired using off-road capable vibroseis trucks. These operations will generally occur within a 2-mile radius of the surface location of the well and will either be conducted on ice roads or using equipment approved for tundra travel.

Auxiliary facilities include pump houses on lakes used as water sources and, possibly, light plants near pump houses. Storage and maintenance facilities may be provided by Ukpeagvik Inupiat Corporation at their existing (commercial) camp at Umiat.

2.1.4 Waste Management

Wastes will be handled according to the comprehensive waste management plan required by the BLM under ROP A-2, as summarized below.

A water- or oil-based drilling mud may be used for the proposed operations. Waste drilling muds and cuttings will either be hauled to an approved processing facility and injection well at existing North Slope facilities, or they may be disposed of on-site by annular disposal, as approved by the BLM and AOGCC. An average of 20,000 gallons per day (gpd) of drilling wastes from each well may require disposal. Offsite grinding may be required to prepare well cuttings for downhole disposal. Prior to hauling offsite, the cuttings and liquids will be temporarily stored in onsite containers either on the well site or at the staging areas. All drilling wastes will be disposed of prior to completion of winter operations.

Solid, non-burnable waste will be deposited in dumpsters located at each site. These containers will be back-hauled to the NSB landfill at Prudhoe Bay. The food waste that could attract wildlife either will be stored in enclosed containers waiting periodic hauling, or will be hauled daily to an approved disposal center (such as at Kuparuk). To reduce the amount of trash that must be hauled from the drilling location, all solid, burnable waste may be incinerated at the location. The ash will be hauled to the NSB landfill.

Camp domestic wastewater will either be treated and disposed of onsite or hauled to an approved disposal facility on the North Slope. The rig camp should generate less than 7,000 gpd of domestic wastewater, and the construction camp at the staging pad should generate less than 3,000 gpd of domestic wastewater.

All fluids from production testing will be held in tanks until the testing is completed. After testing, the fluids will either be injected back into the formation from which they were produced, or hauled to North Slope oil and gas production facilities for processing and/or product recovery. Produced gas will be flared.

2.1.5 Contingency Plans

Anadarko will have a number of contingency plans in place. These include an Oil Discharge Prevention and Contingency Plan (C-Plan), an oil spill and hazardous materials Spill Prevention, Control and Countermeasures (SPCC) Plan, and a Bear Interaction Plan.

Anadarko currently has an approved C-Plan that will be modified, as needed, to include additional regulated operations for this proposed activity. The AOGCC has determined that the Wolf Creek #4 well would be a natural gas exploration facility. Future wells drilled under the proposed program will be evaluated on a well-by-well basis to determine the need for coverage in the C-Plan as an oil exploration facility.

2.1.6 Abandonment and Restoration

Upon completion of drilling and evaluation operations, all debris will be hauled to an approved disposal site. Spills or ice/snow contamination occurring on the ice pads or roads will be chipped or scraped and disposed of in an approved manner, or at an authorized disposal facility.

Depending on the results of the drilling activities and/or testing, the wells may either be plugged and abandoned in accordance with applicable BLM/AOGCC regulations, or left in a condition to permit the well to be produced. Site closure requirements will be approved by the appropriate agencies.

2.2 NO ACTION ALTERNATIVE

With the no-action alternative, exploratory drilling under existing, valid oil and gas leases would not be allowed as proposed. Permit applications to the BLM would be denied, and no access by 66 miles of packed snow trail or 35 miles of ice road, construction of up to eight ice drill pads, two ice airstrips and two ice storage pads, use of up to 390 MG of water (project total) from 23 water supply lakes, drilling up to eight exploratory wells, or drilling support activities on Federal lands in the NW or NE NPR-A would be allowed. While this alternative is contrary to the current Administration's policy and lease rights, analysis is required by NEPA.

2.3 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

Some alternatives were considered, but eliminated from detailed analysis. Alternatives previously considered, but rejected from detailed consideration (e.g., primary access only by air, packed snow trail, or ice road), have been previously analyzed, and none offer a distinct environmental advantage. Additionally, for the proposed project, ice road-only access from Umiat to the prospect areas is not feasible, due to restrictions in water supply imposed by ROPs and stipulations in place without approved exceptions. These action alternatives to the proposed project were eliminated from further consideration because they are technically infeasible, unreliable, or unavailable; or fail to reduce environmental impact or provide an environmental advantage.

The other alternatives considered but eliminated from detailed analysis at this time are discussed below.

2.3.1 Construct Water Supply

This alternative involves a constructed water supply to supplement water withdrawal from multiple fish-bearing lakes.

2.3.2 Select Sites That Conserve Water

The foothills area of the NPR-A is dryer than the coastal plain, with few lakes to supply water for ice construction and drilling. Alternatives to conserve water would include use of thaw-stable, well-drained ridge tops for airstrips, drilling and storage pads, and overland transport without

standard ice structures. Conditions at some sites may support surface activity without any ice structure (e.g., on well-drained, thaw stable and/or rocky ground). This alternative is based on previous drilling activities in the vicinity of the proposed project (e.g., Knifeblade, Titaluk, and Wolf Creek), where ground support was provided by pilings, timbers, and skid or track-mounted drill rigs. A summer air strip at Knifeblade was constructed on a ridge top that supported use by the cargo aircraft of the time (Collins, 1959; Robinson, 1959).

Other options to conserve water include pruning vegetation to minimize ice thickness requirements, minor terrain leveling and/or minor gravel fill to reduce ice road and pad thickness (i.e., that needed for minor grade or work surface adjustment), or foam insulation. A thin gravel or composite pad could eliminate the need for winter ice drill pads, as proposed.

Such alternatives were considered by the BLM in the 2004 NW ROD, by Lease Stipulation D-2:

“Exploration drilling shall be limited to temporary facilities, such as ice pads, ice roads, ice airstrips, temporary platforms, etc., unless the lessee demonstrates that construction of permanent facilities such as gravel airstrips, storage pad, and connecting roads is environmentally preferable or necessary to carry out exploration more economically.”

2.3.3 Use Modern Technology

Modern operations could include timber or synthetic platforms, steel platforms, fiberglass and plastic mats, or pilings. Another option is use of an Arctic platform (similar to the Anadarko/U.S. Department of Energy’s Hot Ice platform).

2.4 CONFORMANCE

The proposed action is in conformance with the: NE and NW IAP/EISs and associated RODs, Colville River Special Area Management Plan (CRSAMP, USDO I BLM, 2008c) and associated Decision Record, Federal Land Policy Management Act (FLPMA), Alaska National Interest Lands Conservation Act (ANILCA), Endangered Species Act, Executive Order (EO) 11988, EO 11990, and terms of the federal leases.

In the two respective IAP/EIS documents, the BLM evaluated the direct, indirect, and cumulative effects of winter exploration in the NPR-A. These analyses concluded that the stipulations and ROPs provided adequate protection for surface resources and subsistence activities in both planning areas. In each of the associated RODs, several changes were made to those protective measures to address new data, new regulations, and new public concerns.

As part of the most recent analysis, the BLM considered site-specific evaluations of exploration programs in both the NE and the NW Planning Areas over the past 9 years, all of which received a Finding of No Significant Impact by the BLM. Findings for these winter exploration programs included analysis of Threatened and Endangered Species, Essential Fish Habitat (EFH), and Subsistence Use under ANILCA 810, as well as coordination with the State Historic Preservation Officer. In addition to BLM permits, other required authorizations were issued by other Federal and State agencies and the NSB.

The proposed project involves conventional methods and procedures for exploration on the North Slope in general, including the NE and NW NPR-A. Except as noted below, the proposed action has incorporated all of these protective measures. As provided for in the NE and NW RODs, the applicant has asked for:

1. Exception or deviation from standard water withdrawal limits.
2. Delayed use of ultra low sulfur diesel until required by ADEC and readily available on the North Slope. Ultra low sulfur diesel is currently available on the North Slope, and should be available when required by ADEC. No further discussion in this EA is needed.
3. Deferred timing of some community involvement requirements. The Applicant has asked to extend the timeframe for meeting with all affected communities and the Subsistence Advisory Panel. The BLM has approved this delay, and no further discussion in this EA is needed.

Figure 2 Proposed Drill Sites and Access to Wolf Creek

Figure 3 Proposed Drill Sites and Access to Tsavorite

3 AFFECTED ENVIRONMENT

Previous federal exploration in the NPR-A included the Titaluk well and three Wolf Creek wells (i.e., legacy wells) in the foothills of the NW NPR-A. The proposed Wolf Creek drill sites are close to the three Wolf Creek legacy wells, and the Tsavorite drill sites are near the Titaluk legacy well, as shown on Figures 2 and 3. The general relation of the project area to other existing exploratory wells in and near the NPR-A, and oil and gas fields on the North Slope is shown on **Figure 4**.

3.1 INTRODUCTION

Environmental characteristics of the general project area have been extensively described in the 2008 NE IAP/EIS (Vol. 1, Chapter 3), and the 2003 NW IAP/EIS (Vol. 1, Section 3) to which this analysis is tiered, with some site-specific features described below.

Proposed activities will take place in the northern foothills of the Brooks Range. The access corridor crosses the Colville River valley and adjacent uplands. The Colville River valley is generally flat to gently rolling terrain with occasional pingos. The uplands are characterized by tundra-covered rolling hills and low east-west trending ridges, with entrenched streams (Gallant et al., 1995 and Robinson, 1959). The ridges commonly are formed of relatively resistant sandstone and conglomerate (Schindler, 1983). Permafrost is continuous, with a generally shallow annual depth of thaw in the upland areas and somewhat deeper annual thawing close to the Colville River.

Proposed drilling activities are located approximately: 90 to 100 miles southwest of Nuiqsut, 100 to 110 miles northwest of Anaktuvuk Pass, and 145 to 155 miles southeast of Barrow. The overland corridor runs from DS-2P to the drilling areas, including several small tracts of federal land approximately 60 to 80 miles south of Nuiqsut. Although some distance from these communities, residents of Nuiqsut, Barrow, and Anaktuvuk Pass may use the project area to harvest subsistence resources. Nuiqsut and Anaktuvuk Pass have substantial subsistence economies, supplemented by employment in local construction and energy production jobs. Barrow is a regional center and the seat of local government, but also supports a subsistence economy.

Based on the proposed project and the issues analysis in Section 1.4, the following discussion of the affected environment covers water resources, wetlands and floodplains, and fish and wildlife.

3.1.1 Water Resources

The project area has fewer and generally smaller lakes than those previously evaluated by the BLM for similar winter exploration drilling operations in the northern portions of the NE and NW Planning Areas, with the exception of the Renaissance exploration program in the Umiat area that was evaluated in 2007 (USDOI BLM, 2007).

Anadarko has identified 13 lakes on federal land in the NE NPR-A and 10 lakes in the NW NPR-A that would be used for water supply to construct ice roads and pads and for drilling operations

(see Table 2.5). Lakes M0681 and M0811 are also lakes authorized for water/ice withdrawal by Renaissance. The volume of water authorized for use is based on depth and habitat value for fish. Based on available data, water quality of potential sources for this project appear to be within the general ranges of water quality in the NPR-A. Recharge of lakes in the NPR-A occurs through melting snow, stream overbank flooding, and rainfall.

Along the way from DS-2P to the Tsvavorite drilling area, the proposed access route crosses several rivers, including drainages of the Chandler and Colville rivers on federal land outside the NPR-A. Streams crossed inside the NPR-A include Seabee, Rainy, Prince, and Fry creeks.

3.1.2 Wetlands and Floodplains

The project area is located in the Arctic Foothills, which is generally characterized by a wide swath of rolling east-west hills and plateaus that grades from the coastal plain on the north to the Brooks Range on the south.

Vegetation over most of the project area is predominantly tussock tundra with a dwarf shrub canopy. The access route to the Wolf Creek and Tsvavorite drilling areas generally follow winter trail routes along ridge tops, with primarily dwarf shrub cover. Going west from Wolf Creek towards Tsvavorite, the access corridor also crosses moist tundra along drainage patterns and around lakes. Small, localized patches of wet tundra are found around lakes in the Wolf Creek area. For the purposes of this EA, it is assumed most all of the proposed project area is classified as wetlands; some of the high, well-drained ridge tops may not meet this classification (2008 NE IAP/EIS – Section 3.3.3).

The general definition of a floodplain is the lowland and relatively flat area adjoining inland and coastal waters, including (at a minimum) that area subject to a 1 percent or greater change of flooding in any given year (also referred to as the 100-year floodplain). Portions of the access route on federal lands outside the NPR-A cross floodplains of the Anaktuvuk, Chandler, and Colville river systems. Inside the NPR-A, the access route crosses floodplains of a number of named (i.e., Seabee, Rainy, Prince, Fry, and Wolf creeks) and unnamed drainages. The access route also traverses ridge tops that drain into Kay, Baby, Anak, and Maybe creeks, as well as tributaries of the previously mentioned creeks. Ice storage pads and airstrips are located within floodplains. All drill sites appear to be outside the 100-year floodplain. All crossings will be conducted in the winter when the ground is frozen and snow-covered.

3.1.3 Fish and Wildlife

Lake fish are classified according to their susceptibility to low levels of dissolved oxygen. Some species are considered “resistant” due to their greater tolerance to low dissolved oxygen concentrations. Other species are considered “sensitive.” Of the 23 lakes proposed for water/ice removal in the NPR-A (Table 2.5), only 11 lakes have fish present – nine have sensitive fish (grayling and broad whitefish) and two have resistant fish only (ninespine stickleback).

The avian species that maybe present in the project area during winter include owls, ravens, ptarmigan, and gyrfalcon. During March through May, birds of special interest in the project area are peregrine falcon, gyrfalcon, and rough-legged hawk, due to nesting and activity sites located

along the Colville River bluffs. The majority of the access corridor from Umiat to Wolf Creek lies within the Colville River Special Area and the 15-mile foraging area around peregrine falcon nest sites (2008 NE IAP/EIS – Map 3-19; USDOI BLM, 2008c – Maps 1 and 4).

Terrestrial mammals of particular interest in the project area are caribou, moose, and wolverine. Other mammals that might be present during winter include: Arctic fox, red fox, rodents, weasels, and (possibly) musk ox. A pack of seven wolves was observed in spring 2007 about 1 mile downstream from Umiat (Carroll, 2007). Wolves and wolverines are reported to be hunted in the area during the winter (Anadarko, 2008). Grizzly bear populations have been increasing on the North Slope, with more bears especially where humans are present (USDOI BLM, 2005 – Vol. 1, Cpt. 3.3.7.1). Typically, these bears hibernate in dens throughout winter, although individuals occasionally could be encountered during early or late phases of project activity. Polar bears are the only threatened or endangered species that might be in the project area; however, they are not reasonably expected to be this far inland from the coast.

Caribou, moose, and wolverine are important to subsistence. The Colville River valley provides important habitat for moose. The area adjoining the river is classified by the BLM as high density moose habitat. High density moose habitat on the North Slope is only found along the Colville River and a few major north-flowing drainages from the Brooks Range (USDOI BLM, 2005 – Vol. 3, Map 3-27). Over the past 30 years, the moose population has cycled, reaching a peak in about 1990, dropping to a low in 1996, with population increases noted after that. The population is currently stable, but still below the 1990 peak (Carroll, 2004).

Members of the Teshekpuk Lake Caribou Herd (TCH) might be present in the drilling area during the winter. The Western Arctic Caribou Herd (WAH) also may pass through the project area (USDOI BLM, 2005 – Vol. 3, Maps 3-21 and 3-23; 2008 NE IAP/EIS – Map 3-20). Actual timing of spring migration varies from year-to-year. Neither the TCH nor the WAH have calving areas in the project area, or the winter access route to the project area.

Figure 4 Oil and Gas Fields and Selected Exploration Wells

4 ENVIRONMENTAL IMPACTS

If authorized, the proposed project would be the 14th winter exploration drilling program in the NPR-A since the 1999/2000 winter drilling season. Three of these drilling programs have been in the NW Planning Area; and this is the second evaluated in the Arctic Foothills. Several other programs involving summer storage or alternative overland access also have been evaluated.

Activities proposed by Anadarko are similar to previously authorized exploration activities in the NPR-A over the past 9 years. All of these programs have been approved and monitored on the basis of full implementation of relevant restrictions, protective measures, and the mitigation set forth in the applicable RODs, as well as state and local permits, and compliance with enforceable standards of the NSB Coastal Management Program, where applicable. To date, authorizations to conduct winter exploration in the NPR-A have resulted in no long-term significant impacts to the environment, or access to and the use of subsistence resources.

Because the proposed activities are not substantially different from those previously evaluated, and because no significant new scientific information or analyses have been developed since the most recent related evaluation (i.e., May 2008), this NEPA analysis will focus on impacts due to the project-specific/site-specific differences of the proposed action.

4.1 DIRECT AND INDIRECT EFFECTS

The proposed action is built on experience gained from decades of similar operations on the North Slope. This EA is tiered from the 2003 NW IAP/EIS and its ROD and the 2008 NE IAP/EIS and its ROD. Related discussion of impacts is found in: 2008 NE IAP/EIS, Vol. 2, Chapter 4.6 (Environmental Consequences of Alternative D, the preferred alternative); and 2003 NW IAP/EIS, Vol. 2, Section V.B (Environmental Consequences of the Preferred Alternative).

Issues specifically identified in Section 1.4 for further analysis in this EA are discussed below.

4.1.1 Water Resources

Proposed Action

Impacts to water quality can result from spills, runoff from melting ice, modification of local hydrology, and lake water withdrawal. Impacts of spills on water quality depend on type, size, location, and duration of the discharge, but are expected to be minor and short-term. Anadarko will need to provide the BLM with updated C-Plan requirements for future wells. An approved C-Plan, where applicable, including the mandated “end date” for drilling, will help ensure that required cleanup would occur under winter conditions to the extent practicable. In the foothills, runoff from melting ice can cause erosion and transport sediments to receiving water bodies. Wastewater may be treated and discharged under the National Pollutant Discharge Elimination System (NPDES) permit. Fish stream crossings will comply with approvals from ADF&G. Lakes used for water supply are expected to recharge, with timing dependent on amount withdrawn and hydrologic and climatic conditions.

To evaluate potential impacts of water withdrawal from the lakes near Wolf Creek, the Applicant prepared preliminary estimates of likely average annual recharge based on drainage area measured from topographic maps and estimated snowmelt (3-inch water equivalent, as suggested by a BLM hydrologist). Results suggest that the lakes would fully recharge if the requested volume is approved for withdrawal (Britch, 2008). Additional discussion of water withdrawal and recharge is provided in Section 4.1.3.

Related effects are expected to be minor, localized, and short-term, typically lasting only one season, with mitigation provided by regulatory requirements for water use and discharge, existing protective measures of the NE and NW RODs, and site-specific mitigation (see Section 4.4).

No-Action Alternative

There would be no spills associated with Anadarko transportation and drilling activities in the NPR-A. There would be no ice road and pad construction; therefore, no runoff during breakup. There would be no crossing at the four streams on federal land outside the NPR-A and seven streams inside the NPR-A, or potential ice dams at crossing sites. Additionally, there would be no withdrawal of up to 390 MG of water from a total of 23 lakes in the NPR-A.

4.1.2 Wetlands and Floodplains

Proposed Action

Proposed operations will occur only during winter, when wetlands and floodplains are frozen and snow covered. Ice pads, ice roads, and packed snow trails, as alternatives to permanent structures, are designed to minimize impact to wetlands and floodplains. The direct, surface-disturbing activities expected are *de minimis* acreage lost to construction of well cellars (approximately 6-foot diameter collar; 0.0006-acre footprint per well); and minor, short-term impacts from ice construction and LPV travel (e.g., limited extent of scuffing, compaction, crushing, or breakage). Studies on the North Slope have shown that willows recover quickly from 1 to 2 years of this type of impact (McKendrick, 2003; Yokel et al., 2007). Ice roads are typically constructed to accommodate the load they will bear.

It is expected that ice cover of any of the thicker pads (over 6 feet) on ridge tops will remain into the growing season. Growth of vegetation underlying residual ice could be delayed. Ice melting from thicker pads has the potential for extended discharge that could cause soil erosion. The extent of this impact would depend on the rate of melt, total volume of ice melt, and the surrounding soil types and gradient.

The BLM completed an evaluation of impacts on wetlands and floodplains in compliance with EO 11990 and EO 11988, respectively. Results of those evaluations were summarized in the 2004 NW ROD (pp. 16-18) and the 2008 NE ROD (pp. 24-28), and are incorporated by reference.

No feasible or prudent locations to avoid wetlands are available. Mitigation of potential impacts to wetlands may be provided by decreasing the thickness and extent of an ice pad when the pad is no longer needed for drilling activities. Ice aggregate removed from the pad may have the

potential for reuse in other ice pad/road construction or maintenance of existing roads and pads for winter use (see Section 4.4).

None of the proposed drilling operations in the NPR-A will be in active floodplains. Depending on the final alignment each year, segments of winter trail on federal land inside and outside the NPR-A will cross floodplains when the ground, rivers, and streams are frozen. Based on associated regulatory authorizations, requirements for tundra opening (e.g., ADNR tundra travel/opening criteria), protective measures of the NE and NW RODs, and BLM field examinations, site-specific impacts of proposed activities in floodplains are expected to be short-term and minimal. No feasible or prudent locations to avoid active floodplains are available.

Anadarko may need water from one or more lakes outside the immediate Wolf Creek area that would require hauling water on snow roads for a distance of up to 14 miles. Water is typically transported over an ice road. To convert the snow trail to an ice road of this length would require up to approximately 15 MG of water, which would substantially increase the overall project need. To haul over snow trail, LPV vehicles would be required (e.g., Steigers and Rolligons), which have a smaller haul capacity. This high level of traffic (up to 160 round trips per MG; 800 roundtrips for 5 MG), may have the potential for tundra damage. This potential damage to vegetation and wetlands would be visible, but not expected to be long-term and significant. Impacts to vegetation and wetlands could be minimized by changing the type of vehicle used, offsetting the location of the snow trail, or creating an ice road (see Section 4.4).

In consideration of activities evaluated in both the 2003 NW IAP/EIS and 2008 NE IAP/EIS, the BLM completed impact analyses and made findings contemplated by both EO 11988 (floodplain management) and EO 11990 (protection of wetlands). The 2004 NW ROD and the 2008 NE ROD concluded that the long-term effects of exploration and development activities, both direct and cumulative in nature, on wetlands and floodplains are expected to be insignificant.

No-Action Alternative

There would be no ice road on federal land associated with the Anadarko exploration program in the NPR-A (up to 35 miles in the NPR-A and approximately 1.25 miles outside the NPR-A). Likewise, there would no new trail network on federal land associated with the Anadarko exploration program in the NPR-A (up to 66 miles in the NPR-A and 3.5 miles outside the NPR-A). The ice road and snow trail to Umiat are also intended for use to support other exploration activities inside and outside the NPR-A (e.g., Anadarko and Renaissance), which would also be impacted. There would be no construction of up to two ice airstrips, up to two ice storage pads, and up to eight ice drill pads. There would be no tundra impact of thicker ice pads on ridge top locations

4.1.3 Fish and Wildlife

Proposed Action

Fish. Impacts to fish would most likely result from water withdrawal, stream crossings, and/or degraded water quality (e.g., spills and runoff). BLM protective measures limit water withdrawal from lakes, prohibit winter water withdrawal from streams, and limit stream crossing operations in

the NPR-A – substantially limiting potential impact on fish and fish habitat. Previous winter exploration drilling activities in the NPR-A have not produced evidence of adverse effects to fish due to water quantity or water quality changes.

Due to the scarcity of water in the drilling area, Anadarko has designed an oval ice drilling pad for Wolf Creek #4 that is specific to the terrain and saves water over standard rectangular or square designs (See Appendix B). Also due to scarcity of water in the immediate area, the Applicant has requested an exception from the standard restrictions of NW ROP B-2, to provide the water needed for the drilling program at Wolf Creek.

In considering the Applicant's request for exception, the BLM must make an assessment of potential impacts to water quality and fish resources. The seven lakes in the immediate vicinity of the Wolf Creek Prospect identified as potential water sources have sensitive fish species and, in combination, can provide up a total of 17 MG of water/ice. The Applicant has estimated a minimum requirement of 25 MG of water to construct the ice pads and ice roads at the Wolf Creek Prospect, which would require an additional 8 MG of water/ice. As a result, Anadarko has requested the 8 MG additional withdrawal from an unspecified source(s) among the seven lakes at Wolf Creek.

After careful consideration, BLM concurs with the State's decision that additional water and ice removal, as follows, does not create an adverse impact to fish: lake M0825 (up to 1.57 MG from 1.18 MG, or 20 percent of the volume below 7 feet); Lake M0830 (up to 5.61 MG from 3.39 MG, or 25 percent of the volume below 7 feet); and increased ice chip removal from all seven lakes (up to 23 MG total, based on two 6-inch passes in the 4-foot contour interval) with additional requirements by the State and BLM (see Section 4.4).

In addition to those seven lakes, Anadarko has proposed to take a combination of water and ice chips from two lakes in the NE and three lakes in the NW Planning Areas that exceed the standard allocation (See Table 2.5). The BLM concurs with the State's decision that additional water and ice removal does not create an adverse impact to fish in lakes M0813, M0821, M0823, and M0831. The BLM defers a decision on Lake M0832 until such time an application for water removal from that lake is submitted to the State.

In the existing areas of oil exploration and development on the North Slope, pumped lakes have recharged in the spring to prior-year levels (Baker, 2002 and 2007; Streever et al., 2001; URS, 2001). Although there is some indication that winter water withdrawals can reduce the amount of dissolved oxygen available for fish (Cott et al., 2006), changes are not apparent at current levels of withdrawal on the North Slope (Hinzman et al., 2006).

The Wolf Creek ice airstrip, proposed for construction on Lake M0829 (a sensitive fish lake), is expected to be on grounded ice. The bathymetric map provided in the Applicants lake study shows possible airstrip alignments over water depths of 4 to 5 feet. An ice airstrip on grounded ice is not expected to have more than a minor effect on the fish population in the lake. The ice airstrip proposed for Tsavorite support is on Lake M0832, which has no fish.

BLM stipulations are in place to reduce the risk of degrading water quality in streams. Fish Habitat Permits are also required for stream crossings that can impact fish. ADF&G makes decisions on fish stream crossings specifically to protect fish that might be present. ADF&G has issued permits to Anadarko for fish stream crossings along the proposed packed snow trail and ice road from DS-2P to the Tsavorite area. On federal land outside the NPR-A, there are only limited BLM requirements for stream crossings. The BLM concurs with the State determinations that fish will not be adversely impacted by the proposed water and fish stream crossings.

The BLM completed an EFH assessment for salmon resources regarding the proposed action, as required by the National Marine Fisheries Service. The finding is “*not likely to adversely affect, and no further EFH consultation is required.*”

In summary, impacts of ice structures, access, and water/ice aggregated withdrawal to water quality, fish, and fish habitat are expected to be minor, localized, and temporary – resulting in no significant impacts. Problems have been identified with the very small ninespine stickleback young of the year being killed on water uptake fish screens. This issue is addressed with mitigation described in Section 4.4.

Wildlife. Three raptor species (gyrfalcon, peregrine falcon, and rough-legged hawk) nest along the Colville River. The project includes a snow trail from Umiat to the Wolf Creek area that crosses through the Colville River Special Area (CRSA) and the raptor foraging habitat area designated in the 2008 CRSAMP (USDOI BLM, 2008c – Map 2). Project activities in the CRSA during the spring nesting season (see NE ROPs C-2 and F-1) would include approximately 126 take-offs and landings (e.g., Hercules aircraft) at the Umiat airstrip, 93 take offs and landings (e.g., Skyvan, Twin Otter) at the Wolf Creek ice airstrip, and ground transportation of equipment and supplies, with predominant activity likely to be demobilization of the drill rig. Anadarko has filed with the BLM an aircraft use plan for the winter exploration program showing the number of aircraft, type, and flight plans, and will implement the flight requirements established in the NE and NW RODs and the CRSAMP Decision Record. No significant impact to nesting raptors is expected.

The project area is high density moose habitat, and caribou and wolverines may be present. Construction of ice roads and pads could result in temporary minor loss of willow shrubs, but due to the presence and resilience of willows, this is not expected to have a measurable impact on moose. Caribou, moose, and wolverines present in the project area will be subject to disturbance by drilling, vehicle traffic, aircraft, and human activity. The construction of ice roads and pads can cause these animals to avoid using habitat in close proximity to the areas where construction is underway.

Impact to caribou, moose, or wolverines that are avoiding the immediate vicinity of drilling activities is not expected to be more than minimal and short-term, but may have an additive effect on winter mortality. In most cases, these activities are expected to cause short-term, minor displacement and/or disturbance. Camp and drilling activity can cause localized disturbance and/or displacement for several weeks to months.

Impacts from transportation via air and road/trail to caribou, moose, and wolverines are expected to be minor and short-term. Because animals are mobile and operations are seasonal and affect only a very small proportion of available winter habitat, no lasting adverse impacts to caribou – as well as to moose, muskoxen, and furbearers – are expected. Conditions for winter survival of caribou, moose, or wolverines vary from year-to-year, and it is possible that this disturbance could have some degree of additive effect on winter mortality. As an additional measure, local subsistence advisors will be hired by Anadarko for the winter exploration program to monitor activities to ensure the objectives of protecting subsistence resources are met.

Direct or indirect adverse impacts on the habitats of these populations are expected to be negligible. This assessment is consistent with results of compliance monitoring from previous winter exploration activities in the NPR-A and other federal lands on the North Slope. If so, this impact would likely be insignificant at the population level. Additionally, the Applicant will have plans in place to minimize harassment, displacement, or injury to wildlife.

No-Action Alternative

There would be no water withdrawn from the 11 fish lakes, nine of which are sensitive fish lakes, as proposed by Anadarko. There would no crossing of the seven fish streams on federal land inside and outside the NPR-A, at the new locations proposed by Anadarko. There would no impact to raptors, moose, caribou, wolverines, and other wildlife due to construction and operation of the proposed Anadarko NPR-A drilling program.

4.2 CUMULATIVE EFFECTS

The BLM has evaluated the cumulative effects of past, present, and reasonably foreseeable oil and gas activities in and around the NPR-A in a series of recent NEPA analyses. This EA tiers to the most recent cumulative impact analysis in the 2008 NE IAP/EIS (Volume 3, Chapter 4, Section 4.7). That analysis was based on a timeframe of approximately 1900 through 2100, and a geographic range incorporating the entire North Slope of Alaska and adjacent marine waters.. Based on the requirements of 40 CFR 1508.7, and guidance provided in the Council on Environmental Quality handbook on cumulative effects (CEQ, 1997), this analysis of winter exploration drilling considers a narrower temporal and spatial framework (i.e., approximately 30 years past and future and influences limited to a distance of approximately 15 miles from the access corridor and drilling areas). The causes and impacts of climate change are global in scope, with associated impacts evaluated in the 2008 NE IAP/EIS. The primary influences in the current analysis include: oil and gas activities; the community of Nuiqsut; and subsistence, research/inventory, and recreation activity, as analyzed in the 2008 NE IAP/EIS.

Since the 2008 NE ROD, one new potential gas project has been identified: a small diameter gas pipeline for instate delivery to the Railbelt (Enstar Natural Gas Company). The impacts of such a gas pipeline would be similar in nature, albeit on a reduced scale, to those analyzed for the potential gas pipeline in Sections 4.7.3.3 and 4.7.7 of the 2008 NE IAP/EIS. Other local exploration projects either recently approved or currently being revised are: Anadarko gas exploration programs at Gubik and Chandler, a Renaissance exploration program at Umiat, and Chevron's White Hills exploration program southwest of the Prudhoe Bay field.

To date, no recent exploration activities authorized by the BLM in the NPR-A, individually or in combination, have caused significant direct, indirect, or cumulative adverse impacts to the environment. There have been some minor, short-term, local adverse impacts as a direct result of activities associated with approved winter exploration programs. The small number and minimal severity of the impacts occurring from 1999 to 2008 demonstrates the overall effectiveness of the environmental protections that are applied to winter exploration activities in the NPR-A.

Results of previous analyses that have been incorporated by reference, and consideration of existing and proposed protective measures in the NPR-A, are key factors in limiting this cumulative impacts analysis to the issues listed below. Neither the proposed action or the no action alternative would add substantially to the incremental past, present, and future impacts described below.

4.2.1 Water Resources

Past studies have shown that impacts of lake water withdrawal for exploration have been short term, and that lakes fully recharge. The proposed project is in a region of limited water resources. It is possible that construction of ice roads and pads could have an additive demand for water from the same sources. Neither the BLM nor ADNR permit water withdrawal from a lake to exceed the authorized withdrawal limit, regardless of the number of authorized users. This limitation, along with other protective measures of the RODs, would reduce cumulative impact to water resources. The limited availability of water in this area could, however, limit concurrent operations requiring water from the same source(s) (see additional discussion in Section 2.2.1).

4.2.2 Wetlands and Floodplains

A large percentage of the defined area for evaluating cumulative impact is comprised of wetlands and floodplains. Wetlands and floodplains have been impacted by past activities, and are susceptible to alteration from future activity and (possibly) from climate change. Federal and State protective measures include restrictions on development, winter tundra travel, and stream crossings, and as a result, cumulative effects on wetlands and floodplains are expected to be minimal.

Large volumes of traffic on snow trails may result in impacts to wetlands and floodplains that could be mitigated by implementation of new mitigation measures (e.g., offset of snow trails in a manner similar to ice roads). At this time, however, no significant cumulative impacts are foreseen.

4.2.3 Fish and Wildlife

As discussed in the 2008 NE IAP/EIS (Section 4.7.7), restricted winter habitat for fish makes many species highly vulnerable to the effects of exploration. Some effects may accumulate, but based on federal and state protective measures in place, effects to fish at the population level are not anticipated.

Caribou, moose, and wolverines are of special importance for subsistence purposes, and are therefore the focus of this analysis. Over the next several decades, habitat in the project area could be affected by climate change; however, the type and magnitude of potential change cannot be predicted with certainty. Federal and state protective measures minimize other habitat impacts, and only minimal impact is expected. Concurrent construction and drilling activities and overland movement of multiple exploration drill rigs and associated equipment would have the potential to cause localized, short-term displacement of caribou, moose, and wolverines. Possible cumulative impacts are expected to be short-term, localized, and not significant. Conditions vary from year-to-year, and it is possible that continuing disturbances to caribou, moose, or wolverines could have an additive effect on natural winter mortality.

BLM protective measures (e.g., controlling timing and location of overland travel and aircraft traffic) minimize impacts to sensitive raptor species. The recently adopted CRSAMP expands protective measures for peregrine falcon.

4.3 RESIDUAL IMPACTS

Despite the system of controls in place, and the modern technology and methods proposed, some minor impacts from the proposed action cannot be avoided. The impacts include:

1. Temporary surface disturbance by winter drilling at well sites.
2. Temporary increase in industrial activity affecting wintertime local tranquility and solitude.
3. Temporary minor impacts to tundra from ice roads and pads. Longer-term, but relatively minor, visual impacts from multiple green and/or brown trails along portions of the spur routes to ice pads and water supply lakes.
4. Short-term visual and noise impacts of drill rig, camp, traffic, etc.
5. Temporary disturbance, with possible displacement of some wildlife, in the area while exploration activities are underway. Possible additive effect on winter wildlife mortality.
6. Possible minor, temporary impact on subsistence resources and activities if caribou or other animal movements shift away from places where winter activity occurs.
7. Possible loss of some small mammals (e.g., lemmings, voles, and ground squirrels) due to ice road/pad construction and the hardened overland trail. This would be an adverse impact to those individuals lost, but not to any local wildlife population.
8. Temporary, localized, minor degradation of air quality and, possibly, water quality (oxygen depletion, wastewater disposal, and spills).
9. Possible temporary restriction of public access to land around drill sites during active drilling activities to meet air quality requirements and increase public safety.

Residual effects have been broadly evaluated for those areas considered for leasing, leased, and subsequently explored (2008 NE IAP/EIS – Vol. 3, Section 4.8). With the additional mitigation measures described in Section 4.4, the site-specific effects expected from the proposed action are consistent with those impacts, and none of the impacts are expected to be significant during exploration over the 4-year program.

4.4 MITIGATION AND MONITORING

In consultation with agencies and local residents, North Slope operators have actively worked to develop winter exploration technologies that create minimal impacts to the environment and to local residents. Many of these enhancements, such as ways to reduce damage to tundra, have been incorporated into operational plans, including the proposed project.

The BLM will continue to monitor the following resources as the proposed action is implemented:

1. Access to subsistence use areas and winter caribou movements.
2. Cultural resources.
3. Tundra/vegetation.
4. Fish habitat.
5. Lake recharge.
6. Colville River Special Area.

BLM monitoring measures will involve: 1) the drilling operation, including the drill rig and ancillary facilities, and 2) other surface activities. The former involves geotechnical and engineering considerations such as the presence of hydrogen sulfide gas. The latter includes the movement of equipment, supplies, and personnel to and from the drilling operations and the continuing protection of vegetation, fish, and wildlife habitat, as well as subsistence activities.

The objective of this monitoring program is to ensure that all terms and conditions in the Federal oil and gas leases, 2008 NE ROD, 2004 NW ROD, and the 2008 CRSAMP Decision Record are met inside the NPR-A, and the FLPMA and the Utility Corridor Resource Management Plan/EIS (USDOI BLM, 1989) are met outside the NPR-A.

Additional Mitigation and Monitoring

The BLM will incorporate the following additional mitigation measures into approvals for the Anadarko Applications to Drill and ROW permit. Anadarko shall:

1. Consult with the BLM to develop a plan to reduce the ice thickness of ice drill pads (> 6 feet thick) left in place where underlying vegetation is likely to remain covered during the growing season.
2. Consult with the BLM to develop and implement a multiyear plan to monitor recovery of vegetation beneath thick ice pads (greater than 6 feet thick). The plan shall specify a threshold level of recovery that must be reached within a specified time period. If not met, manipulation to enhance recovery may be required.
3. Cover wellheads left in place to prevent use by ravens, raptors, and foxes (adopted from the 2004 NW ROP E-9).
4. Secure wellhead covering to maintain function and prevent littering.
5. Coordinate with other overland transportation programs to minimize impact to willows in the Anaktuvuk and Colville river valleys.

6. Monitor condition of the ice roads and snow trails and terminate use if environmental degradation is observed, and immediately report degradation to the BLM AO.
7. Consult with the BLM AO to determine when and how snow pre-packing may commence. A BLM representation must be on-site when pre-packing activities commence on Federal land.
8. Provide the BLM AO with copies of the lake recharge monitoring reports required by ADNR and the BLM. Future use of the lake water depends on the results of the recharge studies.

The following eight mitigation measures implement practices that will help reduce the likelihood of impacts to fish habitat and water resources (Noel et al., 2008). Anadarko shall:

9. At time of ice road construction, take the following measurements at stream or river channel crossings and provide the data to the BLM AO within 1 week of collection. Measure the ice thickness and water depth under ice (if not grounded) at a minimum of three locations (mid-channel, at road midline, and outside boundary of road on each side).
10. Provide the BLM with an as-built of the snow and ice roads, and as-built corner locations for the airstrips and ice pads. Data should be in the format of global positioning system (GPS) points or tracks at the time structures are ready for utilization.
11. Post a sign on the access road to each lake being utilized as a water source, clearly identifying the lake by its number.
12. For each lake utilized as a water source, maintain a daily record of water removed in liquid form and in the form of ice chips. Provide the BLM with this daily tracking record on a weekly basis. The BLM will provide Anadarko with a formatted spreadsheet to be used for the required reporting. The completed weekly spreadsheet should be submitted to BLM within 5 days.
13. Notify the BLM AO within 24 hours if water/ice removal exceeds the volume approved at any lake in the NPR-A.
14. Make possible any compliance checks to be conducted by the BLM for the purpose of checking fish screens on water intake hoses.
15. Notify the BLM AO within 24 hours of any observation of dead fish on intake screens, or in the hole being used for pumping. Temporarily cease pumping from that hole until discussions with the BLM or ADF&G Division of Habitat result in application of additional preventative measures to avoid additional fish mortality.
16. Provide the BLM with photographs documenting breaching/slotting of ice road channel crossings at the end of the winter season.

The following additional mitigation measures are required for the removal of ice chips and liquid water in 2008-2009 in excess of current standard practice. Based on results of the first year's program, the BLM may add, delete, or modify mitigation measure for water use in future years of exploration covered by this EA. Anadarko shall:

17. Submit to the BLM the water quality monitoring data required by ADF&G under State Fish Habitat Permit FH08-III-0273 and FH08-III-0278 for Lakes M0825 and M0830 within 1 week of collecting in situ field measurements and within 1 week of receiving lab analytical data. Water quality data collected at these lakes under other programs must also be provided to the BLM within 1 week of obtaining the data.
18. At the end of winter operations, conduct snow surveys in the following two drainage basins: the vicinity of the seven lakes utilized in the Wolf Creek area (M0824, M0825, M0826, M0827, M0828, M0829, and M0830); and the vicinity of Lakes M0813 and M0821. Consult with the BLM in developing the methodology, timing, and selection of appropriate locations for these surveys. Provide snow survey data to the BLM within 1 week of collection.
19. Survey water levels at Lakes M0825 and M0830 in the Wolf Creek area and at Lakes M0813 and M0821 in the NE NPR-A. Document conditions at the outflow with photographs and flow measurements taken: immediately after spring breakup, at the end of June, and at the end of August. At lakes M0823, M0824, M0826, M0827, M0828, M0829, and M0831, document conditions at the outflow with photographs taken: immediately after spring breakup, at the end of June, and at the end of August. Provide data to BLM within 1 week of collection. These requirements apply when the listed lakes are used for water supply.

4.5 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

This analysis has considered, tiered from, and incorporated by reference, previous studies and findings on oil and gas winter exploration activities on the North Slope and, specifically, in the NPR-A. Also considered were the requirements and restrictions for water withdrawals and fish stream crossings included in Fish Habitat permits. Based on this analysis, it is concluded that direct, indirect, and cumulative impacts from the proposed action should be relatively minor and short-term, with no significant impacts foreseen.

5 CONSULTATION AND COORDINATION

5.1 AGENCY COORDINATION

The preparers of this EA have consulted with the following contacts in setting the scope of analysis and alternatives to be addressed:

1. ADNR, Division of Mining Land and Water
2. ADF&G
3. ADEC

In preparing its plan of operations, Anadarko conducted a series of meetings with resource agencies, regulatory agencies, and local government. The proposed project has recently undergone review by the NSB, as well as other State and Federal agencies, as described in Section 1.4.

Anadarko provided the BLM with permit applications and support documentation that summarize the proposed project and their compliance with applicable stipulations. The BLM has inspected the proposed drill sites at Wolf Creek and access routes. Tsavorite drill sites will be inspected when they are staked. The BLM and Anadarko discussed the proposed action as the proposed program was being developed. These discussions will continue as the project progresses.

5.2 PUBLIC COORDINATION

In preparing its plan of operations, Anadarko conducted meetings with affected North Slope community residents, as described in Section 1.4. Local residents provided Traditional Knowledge that was considered in the project plan and in this EA.

Anadarko has prepared a Subsistence Plan that presents measures to mitigate potential impacts on subsistence resources and access.

5.3 LIST OF PREPARERS

This EA was prepared by the BLM, with technical assistance from MWH – a third-party EA contractor. Following is a list of BLM staff and MWH team members involved in preparation of this EA.

BLM

Dave Yokel, Wildlife Biologist
Michael Kunz, Archaeologist
Susan Flora, Environmental Scientist
Mike Worley, Realty Specialist
Richard Kemnitz, Hydrologist
Donna Wixon, Natural Resource Specialist
Debbie Nigro, Wildlife Biologist
Matthew Whitman, Fisheries Biologist
Stacie McIntosh, Anthropologist/Subsistence Specialist
Roger Sayre, NEPA Specialist

MWH Team

Sandra Hamann, Project Manager
Bob Elder, Ph.D., Supervising Environmental Scientist
Doug Quist, Senior Chemist
David Short, Assistant Environmental Scientist
Gwen Turner, Technical Editor
Jules Tileston, Tileston & Associates
Don Meares, Plover Associates

6 REFERENCES

- Anadarko Petroleum Corporation. 2008. Notes from Subsistence Advisor Site Visit, September 19. Submitted to the BLM October 14, 2008.
- Baker, M. Jr. 2002. Alpine Facility and Vicinity 2002 Lake Monitoring and Recharge Study. Report prepared for ConocoPhillips Alaska, Anchorage.
- Baker, M. Jr. 2007. Colville River Delta Lakes Recharge Monitoring and Analysis. Report 110919-MBJ-RPT-001, prepared for ConocoPhillips Alaska, Anchorage.
- Britch, Bob (Anadarko Representative). 2008. Email regarding water Evaluation in Wolf Creek Area. Sent to ADNR, ADF&G, and BLM. October 3.
- Bureau of Land Management (BLM). 2008. BLM National Environmental Policy Act Handbook H-1790-1. January.
- Carroll, G. 2004. Unit 26-A Moose Management Report of Survey and Inventory Activities, 1 July 2001 – 30 June 2003 in C. Brown, editor. ADF&G. Project 1.0, Juneau, Alaska. pp. 597-612.
- Carroll, G. 2007. Alaska Department of Fish and Game. Personal communication with BLM on November 5.
- Collins, F.R. 1959. Test Wells Square Lake and Wolf Creek Areas. Geological Survey Professional Paper 305-H.
- Cott, P.A., P.K. Sibley, A.M. Gordon, R.A. Bodaly, K.H. Mills, W.M. Somers, and G.A. Fillatre. 2006. The Effects of Water Withdrawal from Ice-Covered Lakes on Oxygen, Temperature.
- Council on Environmental Quality (CEQ). 1997. Considering cumulative Effects Under the National Environmental Policy Act. December.
- Gallant, A., E. Binnian, J. Omernikand, and M. Shasby. 1995. Ecoregions of Alaska. U.S. Geological Survey Professional Paper 1567.
- Hinzman, L.D., M.R. Lilly, D.L. Kane, D.D. Miller, B.K. Galloway, K.M. Hilton, and D.M. White. 2006. Physical and Chemical Implications of Mid-Winter Pumping of Tundra Lakes – North Slope, Alaska. December 2006, University of Alaska Fairbanks, Water and Environmental Research Center. Report INE/WERC 06.15. Fairbanks, Alaska.
- McKendrick, J.D. 2003. Report on Condition of Willows at Four Streams Crossed by the 2002 Grizzly Ice Road. Prepared for ConocoPhillips Alaska, Inc. February 15.
- MJM Research. 2008. Survey of Lakes in Association with Anadarko Prospects – 2008. Final Report. September.
- Noel, L.E., L.L. Moulton, M.S. Whitman, and L. Bontrager. 2008. NPR-A Fisheries Monitoring Implementation Plan. Prepared by ENTRIX for U.S. Department of the Interior, Bureau of Land Management, Arctic Field Office, Fairbanks, AK.
- Robinson, F. M. 1959. Test Wells Titaluk and Knifeblade Areas, Alaska. Geological Survey Professional Paper 305-G.

- Schindler, J. F. 1983. The Second Exploration 1975-1982 National Petroleum Reserve in Alaska. Prepared by Husky Oil NPR Operations, Inc. For the U.S. Geological Survey. August.
- Streever, B., S. Bendewald, A. McCusker, and B. Shaftel. 2001. Winter Measurements of Water Quality and Water Levels: The Effects of Water Withdrawal for Ice Road Construction on Lakes of the NPR-A. Report by BP Exploration, Oasis Environmental, Inc., and Hoefler Consulting Group, Anchorage, Alaska.
- URS. 2001. Lake Monitoring Study, National Petroleum Reserve-Alaska. Final Report Prepared for Phillips, Alaska, Anchorage.
- U.S. Department of the Interior Bureau of Land Management (USDOI BLM). 1989. Utility Corridor Proposed Resource Management Plan and Final Environmental Impact Statement. Signed September 27.
- USDOI BLM 1991. Utility Corridor Resource Management Plan/Environmental Impact Statement Record of Decision. Signed January 11.
- USDOI BLM. 2003. Northwest National Petroleum Reserve-Alaska Final Integrated Activity Plan/Environmental Impact Statement. Volumes 1, 2, and 3. Prepared in association with the USDOI Minerals Management Service. November.
- USDOI. BLM. 2004. Northwest National Petroleum Reserve-Alaska Integrated Activity Plan/Environmental Impact Statement Record of Decision. January.
- USDOI BLM. 2005. Northeast National Petroleum Reserve-Alaska Final Amended Integrated Activity Plan/Environmental Impact Statement. Volumes 1, 2, and 3. Prepared in association with the USDOI Minerals Management Service. January.
- USDOI BLM. 2007. EA: AK-023-08-002. Environmental Assessment National Petroleum Reserve-Alaska (NPR-A), Northeast Planning Area 2-Year Winter Delineation Drilling Program 2007-2009. Renaissance Umiat, LLC. Prepared by USDOI BLM Alaska, Fairbanks District Office, Arctic Field Office. December
- USDOI. BLM. 2008a. Northeast National Petroleum Reserve-Alaska Final Supplemental Integrated Activity Plan/Environmental Impact Statement. May.
- USDOI BLM. 2008b. Northeast National Petroleum Reserve-Alaska Supplemental Integrated Activity Plan/Environmental Impact Statement Record of Decision.
- USDOI BLM. 2008c. Colville River Special Area Management Plan. Arctic Field Office. July.
- Yokel, D., D. Huebner, R. Myers, D. Nigro, and J. Verhoef. 2007. Offsetting vs. Overlapping Ice Road routes from Year to Year: Impacts to Tundra Vegetation. BLM, Alaska. Open File 112. Anchorage, AK.

APPENDIX A

**GENERAL STIPULATIONS FOR OVERLAND TRAVEL OUTSIDE THE NPR-A
(Derived from the 1989 BLM Utility Corridor Resource Management Plan)**

APPENDIX A

GENERAL STIPULATIONS

(ACTIVITY ON FEDERAL LAND OUTSIDE THE NPR-A)

1. All operations will be conducted in such a manner as not to cause damage or disturbance to any fish or wildlife and subsistence resources.
2. No chasing by vehicles or buzzing by aircraft of any wildlife. Particular attention will be given to not disturbing caribou.
3. Holder shall prohibit the feeding of wildlife. Garbage or other potentially edible items which would attract wildlife shall be kept in covered containers while awaiting incineration.
4. Aircraft shall maintain 1,000 foot above ground level (AGL) (except for take off and landings) over designated caribou concentration areas (i.e., winter and summer ranges, insect relief areas, etc.) during the specific time period designated (winter - October 1st through May 15th, summer - May 15th through September 30th) unless doing so would endanger human life or safe flying practices.
5. All operations shall be conducted with due regard for good resource management and in such a manner as not to block any stream, or drainage system, or change the character or course of a stream, or cause the pollution or siltation of any stream or lake.
6. All activities shall be conducted so as to avoid or minimize disturbance to vegetation.
7. Cultural and Paleontological Resources. Any cultural or Paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the authorized officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the AO. An evaluation of the discovery will be made by the AO to determine appropriate actions to prevent the loss of significant cultural or scientific values. The Holder will be responsible for the cost of evaluation and any decision as to the proper mitigation measures will be made by the AO after consulting with the Holder.
8. Crossing of waterway courses shall be made using a low angle approach in order not to disrupt the naturally occurring stream or lake banks.
9. Camps will be situated on gravel bars, sand, or other durable lands. Where leveling of trailers or modules is required and the surface has a vegetative mat, leveling will be accomplished with blocking rather than leveling with a bulldozer.
10. Black water shall be kept separate from grey wash and kitchen waste water. Grey wash water and kitchen waste water may be filtered to remove the solids and the liquid discharged to the land surface. All solids and sludges shall be incinerated.
11. All solid wastes shall be removed from the public lands to Alaska State DEC approved solid waste disposal facilities. Solid waste combustibles may be

incinerated. All non-combustible solid waste, including ash from incineration and fuel drums, shall be removed for approved disposal. There will be no burial of garbage or human wastes.

12. All fuel spills will be cleaned up immediately, taking precedence over all other matters, except the health and safety of personnel. Spills will be cleaned up utilizing absorbent pads or other Alaska State DEC approved methods.
13. As soon as possible, but not later than 24 hours, notice of any such discharge of oil or hazardous substance as defined in AS 46.03.755, 18 AAC 75.300-.307, will be given to the Authorized Officer and any other Federal and State officials as are required by law.
14. DEC approved oil spill cleanup materials (absorbents) will be carried by each field crew and stored at all fueling points and vehicle maintenance areas.
15. State and Federal safety standards for fuel handling will be followed.
16. No fuel storage or refueling of equipment will be allowed within the flood plain of a river or lake.
17. Drip basins or absorbent diapers will be placed under all non dry-disconnect-type fuel line couplings and valves.
18. Fuel and other petroleum products storage of 55 gallons or greater must have secondary containment with 110% of the capacity of the primary storage. The secondary containment, such as lined and bermed systems, must meet local, State and federal codes and regulations. Above ground storage of fuels or other petroleum products in excess of 660 gallons, or an aggregate above ground storage capacity of greater than 1320 gallons; or any facility which, due to location, could reasonably expect spilled fuels to reach waters of the United States or adjoining shorelines must prepare and maintain a Spill Prevention Control and Countermeasure (SPCC) Plan in accordance with 40 CFR 112 regulations.
19. All fuel containers, including barrels and propane tanks, shall be marked with Permittee's name, product type, and year filled or purchased (e.g., Company Name, Hydraulic Fluid, 1994).

(Note: Numbering of stipulations added to facilitate reference in this document)

APPENDIX B

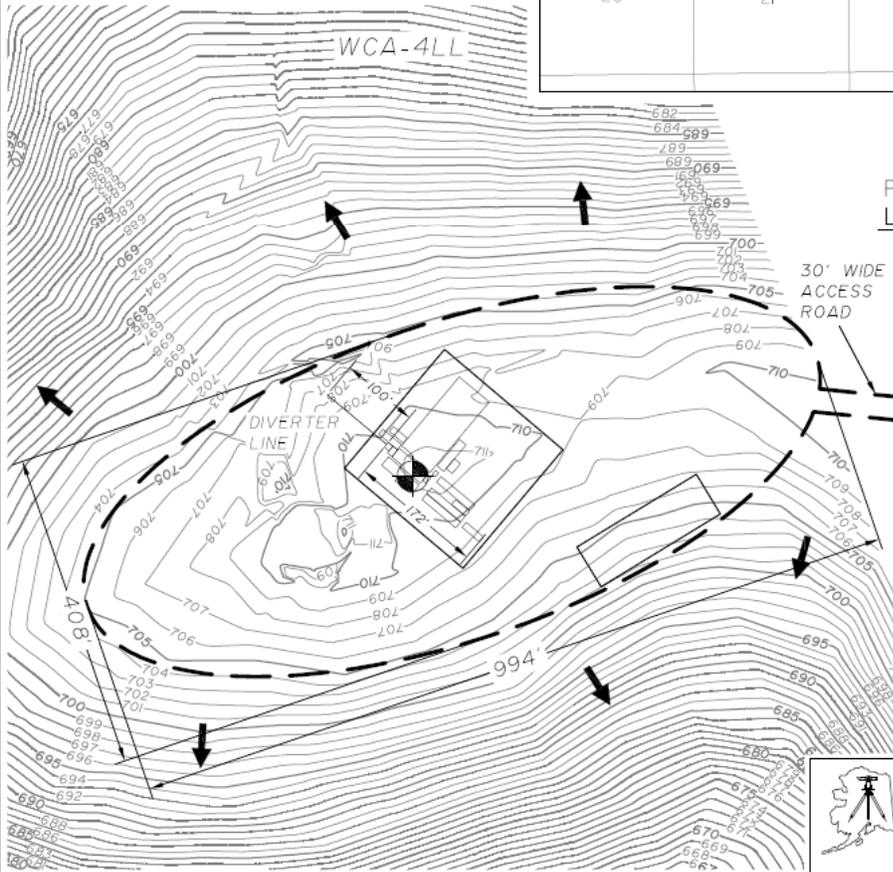
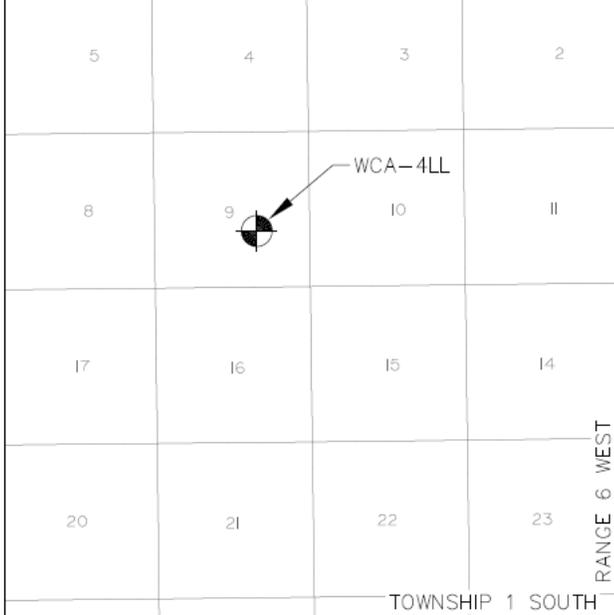
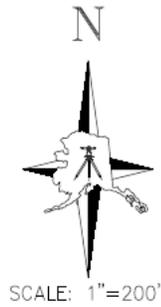
ICE PAD LAYOUT FOR WOLF CREEK #4

REV	DATE	BY	CK	APP	DESCRIPTION	REV	DATE	BY	CK	APP	DESCRIPTION
1	9-16-08	SAS			MODIFY SECTION LINE CALL OUTS	2	9-26-08	SAS			MODIFY SECTION LINE CALL OUTS

NOTES

1. ELEVATIONS SHOWN ARE NAVD88 PER OPUS SOLUTION.
2. COORDINATES SHOWN IN NAD83 AND NAD27, ALASKA STATE PLANE ZONE 5.
3. GEOGRAPHIC COORDINATES ARE NAD83 AND NAD27.
4. ALL DISTANCES ARE TRUE.

- ➔ DENOTES SPILL TRAJECTORY
- ⊙ STAKED CONDUCTOR LOCATION



VICINITY MAP
1" = APPROX. 1 MI.

PRIMARY WOLF CREEK LOCATION "WCA-4LL"

LOCATED WITHIN PROTRACTED SEC. 9, T 1 S, R 6 W UMIAT MERIDIAN.
1912' F.S.L.,
1796' F.E.L.

NAD83 COORDINATES:
LAT=69°22'03.12" N
LONG=153°21'00.19" W
Y = 5,618,337
X = 1,724,297

NAD27 COORDINATES:
LAT=69°22'04.59" N
LONG=153°20'49.35" W
Y = 5,618,616
X = 584,271

LOUNSBURY & ASSOCIATES, INC.
SURVEYORS ENGINEERS PLANNERS
19071 272-7787

Anadarko
Petroleum Corporation

**"WCA-4LL" EXPLORATORY WELL
AS STAKED EXHIBIT WITH PAD CONFIGURATION
INCLUDING CONTOURS AND SPILL TRAJECTORY**

CADD FILE NO. WCA-4LL.dwg	12 SEPT. 08	DRAWING NO: WCA-4LL.dwg	SHEET: 1 OF 1	REV: 2
------------------------------	-------------	----------------------------	------------------	-----------

Last Page, intentionally left blank

Finding of No Significant Impact

Type of Action: Application for Permit to Drill, 3100.00
Right-of-way, 2884.01

Serial Number: AA086604, AA086615, AA086616, AA086617 and
FF095310

Applicant: Renaissance Umiat, LLC
1029 W. 3rd Ave., Suite 402
Anchorage, Alaska 99501

District: Arctic Field Office

Planning Unit: National Petroleum Reserve in Alaska (NPR-A), Northeast & Northwest
Planning Area
Utility Corridor

Lands Involved: The lands are described as proposed drilling locations within lease tracts
with associated access routes. The legal descriptions can be found in the
referenced case files. The drill sites are in the following locations:

T01S, R06W, Sec. 09, Umiat Meridian (Wolf Creek #4)
T01S, R06W, Sec. 16, Umiat Meridian (Wolf Creek #5)
T01N, R01W, Sec. 10, Umiat Meridian (Wolf Creek #6)

The following well locations have not been staked but identified as:

T01N, R11W, Sec. 20, Umiat Meridian (Tsavorite #1A)
T01N, R11W, Sec. 36, Umiat Meridian (Tsavorite #1B)
T01N, R10W, Sec. 30, Umiat Meridian (Tsavorite #1C)
T01N, R11W, Sec. 17, Umiat Meridian (Tsavorite #1D)
T01N, R11W, Sec. 26, Umiat Meridian (Tsavorite #1E)

The applicant, Anadarko Petroleum Corporation proposes to conduct winter season oil and
gas exploration drilling activities the Northwest & Northeast NPR-A Planning Area, with
travel through the Utility Corridor Resource Management Plan Area. The proposed action
consists of drilling up to 8 wells on up to 8 locations over 4 years with 4 years of access.

Anadarko filed Notices of Staking for three wells (Wolf Creek #4-6), and have identified 5 locations for the Tsavorite Wells 1A-1E, which will be staked at a future date. The proposed action includes a combination of access methods (snow trails, snow roads, and ice roads) with all stationary work occurring on temporary ice work pads.

Context and Intensity of Environmental Impacts

Based upon a review of the EA and the supporting documents, I have determined that the proposed action will not have a significant effect on the quality of the human environment, individually or cumulatively with other actions in the general area. No environmental effects meet the definition of significance as defined at 40 CFR 1508.27. Therefore, an environmental impact statement is not required. We reviewed the context of the Proposed Action and found that it would not result in any significant effects to resources and values in NPR-A and surrounding lands. The Proposed action would provide new benefits through economic development to the area and potentially energy resources for the Alaska and the Nation. Meanwhile, the mitigation measures and environmental protections would ensure that the Proposed Action would not add significantly to incremental impacts to NPR-A and surrounding lands.

The following factors have been considered in evaluating significance for this proposal (40 CFR 1508.27):

- 1. Impacts that may be both beneficial and adverse:** The beneficial effects of the Proposed Action include continued exploration and development of energy resources, and associated economic benefits to Alaska and the Nation. Adverse impacts could occur to water resources, fisheries, wildlife, and subsistence.
- 2. Degree of effect on public health and safety:** The Proposed Action would have no effect on public health and safety.
- 3. Unique characteristics of the geographic area such as proximity to cultural or ecologically critical areas:** The Proposed Action, which would be implemented with mitigation and existing protections, would not impact any cultural or ecologically critical areas. In addition the proposed action would not impact park lands or prime farmlands. Impacts to wetlands and floodplains would be localized and not significant, based on impact analysis done in compliance with Executive Orders 11990 and 11988. The long-term effects of exploration activities both direct and cumulative in nature on wetlands, soils, water resources, and fresh estuarine water quality are expected to be insignificant (minimal to negligible) in this area and would be mitigated to the greatest extent practicable.
- 4. The degree to which the effects on the quality of the human environment are likely to be highly controversial:** There is no scientific controversy over the nature of the environmental impacts of the Proposed Action.

5. Degree to which the possible effects on the quality of the human environment are highly uncertain or involve unique or unknown risk: No highly uncertain or unknown risks to the human environment were identified.

6. Degree to which the action may establish a precedent for future actions with significant effect: The proposed action was considered within the context of past, present, and reasonably foreseeable actions and no significant cumulative effects are expected.

7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts: No individually or cumulatively significant impacts were identified for the proposed action. The cumulative effects are analyzed in Section 4.2 of the EA.

8. Degree to which the action may adversely affect district, sites, highways, structures, or other objects listed on the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural or historical resources. The proposed action will not adversely affect any historic, cultural, or scientific resources in the CRSA. There are no districts, sites, highways, structures or other objects listed on the National Register of Historic Places in the area where the project is proposed.

9. The degree to which the action may adversely affect an endangered or threatened species or its habitat: A “no effect” determination was made for the federally listed threatened species, spectacled eider and Steller’s eider, and polar bear by a BLM biologist. The US Fish and Wildlife Service issued a letter of concurrence on October 29, 2008. There are not expected to be any long-term, significant impacts to these threatened species. Additional clearances have been completed, such as cultural and Essential Fish Habitat (EFH). A cultural clearance of the proposed project features in accordance with the NHPA was completed during August 2008 with a report of clearance on September 22, 2008. An EFH finding of “Not likely to adversely affect, and no EFH consultation is required” was completed on October 30, 2008.

10. Whether the action threatens a violation of federal, state, local or tribal law, regulation or policy imposed for the protection of the environment, where non-federal requirements are consistent with federal requirements: The Proposed Action does not violate any known federal, state, local, or tribal law or requirement imposed for the protection of the environment. The evaluation and finding completed to comply with Section 810 of ANILCA found “The proposed action will not significantly restrict subsistence uses. No reasonably foreseeable and significant decrease in the abundance of harvestable resources or in the distribution of harvestable resources, and no reasonably foreseeable limitations on harvester access will result from the proposed action. The Subsistence Monitoring Plan is intended to resolve concerns at a very early stage, thereby reducing or eliminating subsistence conflicts.

Monitoring and Mitigation

BLM will monitor on the ground activities throughout the winter season. This will be accomplished through periodic on-site compliance inspections of all project components including drilling, camp construction, ice roads, snow trails, pads, and other facilities. If any instances of non-compliance are observed BLM will work with Anadarko to remedy the problem.

When winter activity ceases, BLM will continue to monitor the project area through periodic on-site inspections to ensure that all standards have been met and that the areas of operations are clean and free of debris.

Mitigation measures will be implemented as described in Section 4.4 of the EA.

APPROVED:

/s/ Lon Kelly

Lon Kelly
Arctic Field Office Manager

November 8, 2008

Date